Michigan Department of Natural Resources

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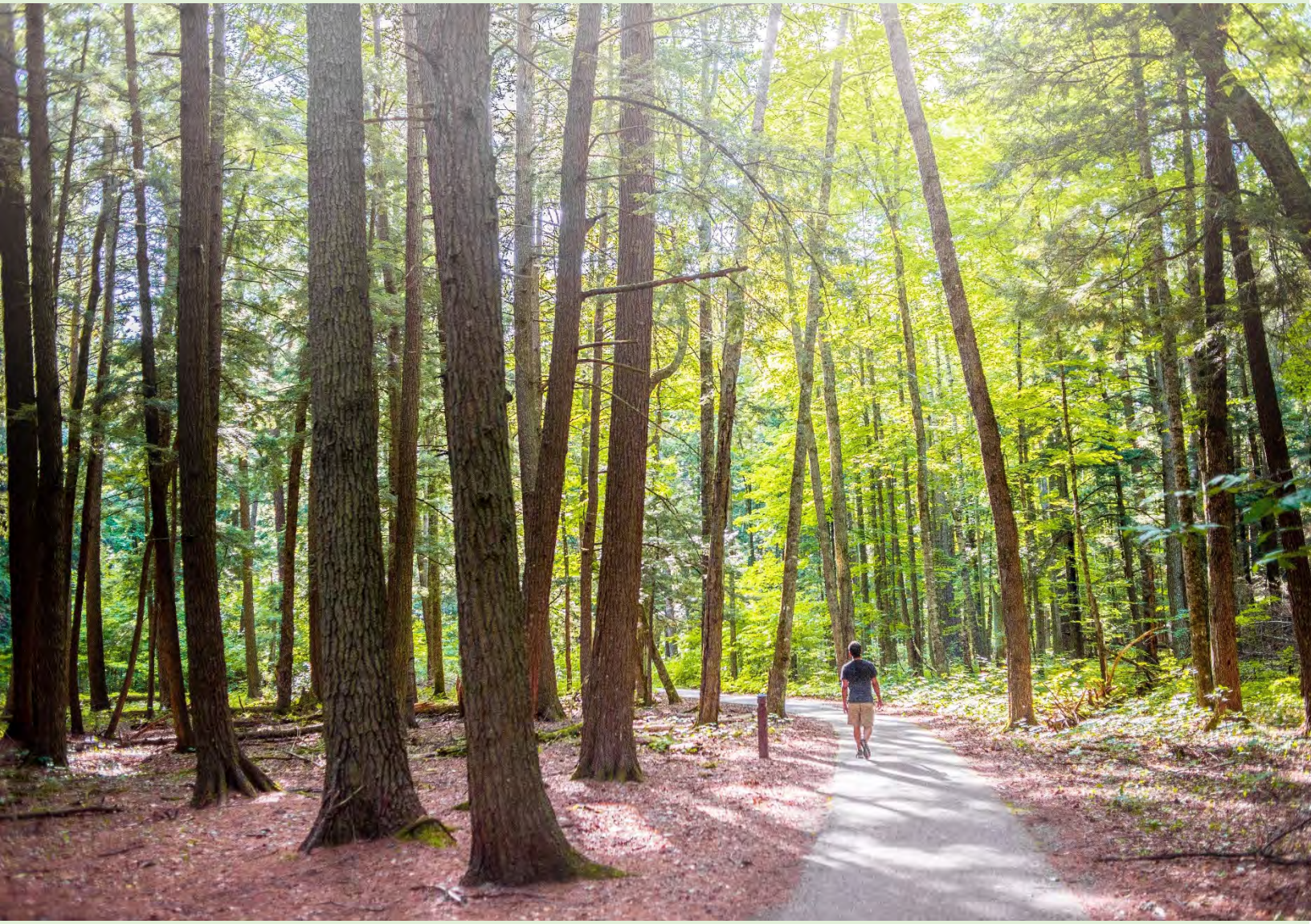
FOREST ACTION PLAN 2020



Forest Resources Division

IC4027(2020)

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INTRODUCTION

From old-growth hemlocks in the western Upper Peninsula to newly planted jack pines that support the rare Kirtland's warbler, Michigan's forests offer an astounding range of resources. These forests, which cover half the state, are important to the people of Michigan, the Great Lakes region and the nation. These extremely complex forests are responsible for a variety of ecosystem services that contribute to the unique quality of life in the state. Managers have a responsibility to make sure Michigan's forests reflect all values and serve the needs of all people in the present and the future.

Michigan's Forest Action Plan is the state's contribution to a national assessment and strategy for all forest land across all ownerships in the United States. Each state has an assessment and plan. Individually and collectively, these plans identify important challenges and opportunities for forest management and ultimately to keep forests as forests. This is necessary to benefit from the full range of values and benefits from forest lands, and "beyond materially sustaining us through goods and services, nature - when we engage in it for its own sake, for the pure joy of it – sustains ourselves: and we are motivated, in turn, to sustain nature (*"Endpaper" by Lena Heinrich in* Natural History, *June 2020*).

This 2020 Forest Action Plan consists of two primary components, a landscape scale assessment of all public and private forest resources in Michigan and a strategy that guides management activities to address issues and trends primarily on private forest lands. The landscape assessment is based on the Montreal Process Criteria and Indicator Framework, modified for use in Michigan. The Montreal Process is a set of internationally agreed-upon criteria and indicators for the conservation and sustainable management of temperate and boreal forests. The assessment, where possible, employs an evaluation of readily available data from two or more time periods to suggest trends. The landscape assessment is meant to provide background in terms of status and trends for all forest planning in Michigan. All components will not necessarily be used in each individual plan. The Michigan Department of Natural Resources is beginning to renew its 2008 State Forest Management Plan. The three regional forest management plans and the plans for the three National Forests are also due for renewal. This 2020 Forest Action Plan will address some statewide aspects of good forestry practices (Community Wildfire and Forest Health) as well as forest management on private forest land in the state.

Human values and professional judgement were used to identify issues based on trends in data and professional knowledge and experience. Stakeholders were recruited to help prioritize issues and develop strategies that were then transformed into objectives, providing the context for action. This strategy, then, provides the basis for action over the 10-year term of this plan.

The overall intent of the strategies and objectives is to provide direction to stakeholders and the DNR that will result in collaborative partnerships to address the objectives with appropriate actions and provide forest management context to the U.S. Department of Agriculture Forest Service.

Federal legislation in the form of the 2008 Farm Bill and the Cooperative Forestry Assistance Act of 1978, as amended, require and support the assessment and strategy. These acts provide a mechanism to invest federal grant money in five cooperative programs in Michigan: Forest Stewardship, Forest Legacy, Forest Health, Urban and Community Forestry and Community Wildfire Protection. These grants require matching funds from within the state.

The DNR is committed to providing for the conservation, protection, management, use and enjoyment of the state's natural and cultural resources for current and future generations. Its vision is vital, healthy and abundant forests that provide social, economic and ecological benefits to all.

SUMMARY OF LANDSCAPE ASSESSMENT

The landscape assessment is organized around the seven criteria identified in the Montreal Process Criteria and Indicator framework.

This assessment is intended to be a living document with new information added as it becomes available. A summary of important trends and major threats to forests follows.

Criterion One: Conservation of Biological Diversity

Status and Trends:

- Community Diversity
  - Diversity of forest-type groups is high and stable, as is evenness (the number of individual trees of each species in a forest area). The western Upper Peninsula is the lowest of the four eco-regions for both parameters. The other three regions are virtually the same for both parameters.
  - The hydrologic unit code, abbreviated as HUC, is a scaled method of categorizing watersheds, or hydrologic units, including features such as lakes and rivers. Forest area increased at the HUC8-watershed scale by 3.7% (more than 727,000 acres) and in the riverside areas – also known as riparian - at that same scale by 9.8% over the period from 2006-2016.
  - The area of young forest (1-20 years old) is just under 10% with a slightly declining trend.
  - The number of young trees (less than 6 inches in diameter) makes up 25% of municipality-managed urban forest, and this measure is increasing.
  - The area of mid-aged forest (21-39 years old) is 22% and declining.
  - The area of mature forest (40-80 years old) is 43% and slightly declining.
  - The area of old forest (more than 80 years old) is 25% and increasing.
  - At the state scale, the proportion of protected forest, meaning no commercial harvest allowed, is 2.5%.
  - Forest structure includes an abundance of fine and coarse woody debris and standing dead timber.
  - Natural vegetation, consisting of forest, wetland, shrubland and grassland, averages 61% across the state and is stable from 2006-2018. The bottom category consists of areas with less than 10% natural vegetation cover, referred to as truly fragmented cover. Only 6% of Michigan falls into this category, but 21% of the landscape is at high risk to drop below the 10% cover threshold.
  - Overall, the natural vegetation cover decreased at the HUC8 watershed scale from 2006-2016 by 4.7% (about 1.04 million acres) and increased in riparian zones by 4.9% (more than 628,000 acres).
  - Urban tree canopy cover in Michigan communities ranges from 5% to 75%, with an average of 30% and declining.
- Species Diversity and Richness
  - Species diversity is based solely on the diversity of conifer trees and the diversity of broadleaf trees.
  - Broadleaf tree diversity and evenness across the state is stable; 15 of the 45 eco-sub-sections show a slight decline in both values.
  - Conifer tree diversity and evenness across the state is stable, although 11 of the 45 eco-sub-sections show a slight decline in both values.
  - An estimated 203 million trees exist within urban and community areas of Michigan.

    - Species richness is generally high in urban and community areas; however, nearly 45% of all municipality-managed urban trees are of a single genus *Acer* (maple) resulting in a low level of richness at the genus level.
    - Species richness in municipal urban trees is higher among small/young trees, categorized as less than 6 inches in diameter, compared to large/old trees that are greater than 20 inches in diameter.
- Genetic Diversity
    - Genetic diversity assessment was based on five categories: trailing-edge species, leading-edge species, threatened species, endangered species and outlier plant species.
    - Genetic diversity scores are critically low for herbaceous outlier species and endangered species, very low for threatened and trailing-edge species and poor for leading-edge species. For most species assessed, the trend is declining and is of concern.

Nearly half of urban trees are maple species.

Threats or Challenges to Forest Lands and Values:

- Young forest types make up only 10% of the statewide forest area.
- The area of protected forest - not subject to resource extraction - is very low compared to global recommendations of at least 13%.
- Only 6% of the landscape represents a true threat to biodiversity with less than 10% natural vegetation cover. However, an additional 21% is in the high-risk category.
- Loss of genetic diversity is a definite threat for trailing-edge, leading-edge, threatened and endangered species and for plant populations isolated from their primary ranges.
- Urban forest structure and diversity are not well understood due to a lack of data, highlighting the need for urban forest inventory and analysis (National Forest Inventory and Analysis program data) in Michigan.
- Availability of diverse nursery stock (size and species) is critical to ensuring future species richness in urban forests.
- Climate change will influence future species suitability, selection and establishment, especially in urban settings.

Criterion Two: Productive Capacity of the Forest

Status and Trends:

- Gross growth volume (cubic feet of wood) for the forest shows a slight increase at the state scale.
- Annual mortality volume shows a statewide increasing trend.
- Harvest removal volume at the state scale shows a slightly increasing trend.
- Annual net volume added to the forest shows a slight decline.
- Tree seedling numbers (trees less than1-inch diameter) show a decline at the state scale.
- Tree sapling numbers (1-5 inches in diameter) show an increasing trend for conifer and a very slight declining trend for broadleaf species.
- Tree numbers with less than a 5-inch diameter show an increasing trend for conifer and a very slight declining trend for broadleaf species.
- All regions in the state show slight increases in forested area based on FIA data with the largest in the southern Lower Peninsula.

Threats or Challenges to Forest Lands and Values:

- Annual mortality and harvest removals are increasing and may outpace increases in annual growth.
- The number of seedlings in all species is declining.
- Urban FIA data is needed to inform productivity and regeneration of urban trees and forests.

- Climate change will have important impacts on forest health, depending upon how fast and to what magnitude the climate changes:
    - Trees: Weather extremes could cause die-back in some species, create the potential for total mortality in others and could cause regeneration failure.
    - Insects and diseases: Warmer, wetter and longer growing seasons could potentially allow insects to go through more than one life cycle in a season and create conditions for diseases to become more virulent.
    - Invasive species: A change in climate could result in more rapid spread of invasive species already in Michigan and allow for new species to invade.

Criterion Three: Forest Health and Vitality

Status and Trends:

- Forest Health
    - Insects are somewhat episodic in abundance; some are at low levels and restricted geography and others are at high levels and broader geography.
    - Disease agents tend to be increasing and spreading.
    - More than 40% of trees inventoried in municipality-managed urban forests are comprised of three-to-five species, leaving these forests vulnerable to insects and disease issues.
    - Most trees inventoried in municipality-managed urban forests are rated as in fair or better condition.
- Wildland Fire
    - The number of wildfires each year is highly variable and depends on weather conditions.
    - Area burned is highly variable, with most large fires occurring in fire-dependent forest types.
    - From 2009-2018, most wildfires and the largest area burned is in the eastern Upper Peninsula; the least is in the western Upper Peninsula and the southern Lower Peninsula.
- Prescribed fire
    - Prescribed fire numbers and area burned from 2007-2018 are both increasing across the state; they are greatest in the southern Lower Peninsula.
    - Most prescribed fires are in non-forest areas to control invasive species and create wildlife habitat.

Threats and Challenges to Forest Lands and Values:

- Non-native insects and diseases are increasing and spreading; this drives up annual mortality.
- Prescribed fire is underused as a silvicultural (cultivation) tool.
- Populations of invasive species are increasing, and their area of influence is expanding.
    - New invasive species are poised to enter Michigan.
- Urban FIA data must better address the condition and health of urban forests.
- The low species richness of trees in urban areas may negatively impact their resistance and resilience to threats related to insects, diseases, invasive species and climate change.
- Climate change is likely to impact forest health due to increasing weather extremes – precipitation and temperature – causing increased stress and potential range shifts.
- Development will result in loss of natural cover, particularly forest cover. It will increase the Wildland Urban Interface, which will threaten forest biodiversity and forest health management goals.

A Forest Health Response Team member trains an educator on invasive insect surveying.

Criterion Four: Soil and Water Resources

Status and Trends:

- Soil
    - There is limited soil data and information available, but this assessment was done at the HUC8 watershed scale and did not result in issues at that scale.
    - Michigan tends to have low slopes (mean value of 1.54 with 10 being the highest value) that limit soil erosion at the landscape scales. The highest value is 4.08 for the Dead-Kelsey HUC8 watershed in the Upper Peninsula and the lowest is 0.25 for the Saginaw HUC8 watershed in the southern Lower Peninsula.
    - Michigan tends to have low mean soil erodibility values (0.25 with 1 being the highest value for highly erodible soil) at the broad scale.
    - Stream-borne sediment levels are low with some notable exceptions of northwest Lake Huron in the Upper Peninsula and around Lake St. Clair and Lake Erie in the southeast Lower Peninsula.
    - Wetland area increased across the state by 17.7% or more than 1.2 million acres (dominated by a 24% increase in swamps (lowland forest). This offsets the 42.5% loss in emergent wetland area over the 2006-2016 period.
    - Despite an increase in agricultural area, natural vegetation cover experienced an overall increase at the HUC8 scale and in the riparian zones from 2006-2018.
    - Even with Michigan's tourism goal to expand trails and become known as "the Trails State," compacted soil from trails of all sizes is very low at 0.08% of the landscape.
    - Soils in urban and community areas are often highly heterogeneous and compacted. This contributes to tree stress and negatively impacts tree health.
- Water
    - There are more than 866,000 acres of inland lakes in Michigan, with the majority in the Lower Peninsula (over 626,000 acres).
    - There are nearly 52,000 miles of streams and rivers in Michigan, with the majority in the Lower Peninsula (39,490 miles).
    - Natural vegetation in riparian zones increased from 2006-2016 by 4.4% (657,292 acres excluding Isle Royale which had no data for 2006). This could have a positive influence on water quantity and quality.
    - Michigan has 57 EPA-designated impaired watersheds due to total maximum daily loads of *Escherichia coli* bacteria.
    - The Grand River in Grand Rapids is one of 19 EPA-designated Urban Waters locations in the US.
    - Agricultural area in riparian zones increased by 1.55 times the 2006 value or 2,014,695 acres between 2006 and 2016.
    - Urban area in the riparian zones increased by 3.0% (33,806 acres) between 2011 and 2016.
    - The area of human use in the riparian zone increased by 19.6% (743,908 acres) between 2006 and 2016.
    - Area of developed, high intensity use in riparian zones increased by 38.8% (8,365 acres) between 2006 and 2016.
    - The area of developed medium-intensity uses in riparian zones increased by 36% (28,070 acres) between 2006 and 2016.
    - Michigan's urban trees intercept millions of gallons of stormwater runoff annually, but tree cover area is declining and consists mostly of small trees which intercept less water.
    - Soils in urban and community areas are often heterogeneous and compacted. This reduces infiltration and ground water recharge, exacerbates stormwater runoff and degrades water quality and waterways.

Threats and Challenges to Forest Land and Values:

- Agricultural land showed a large overall increase in riparian areas, which can have a negative effect on water quantity and quality.

- Area of grassland/herbaceous vegetation (35.2%) and shrub land (49.3%) declined in riparian areas.
- Forested riparian area is declining (7%) over time and is converting to more agricultural land and urban area. This results in more exposed and more compacted soils, which can negatively impact water quantity and quality.
- Using best management practices is voluntary in Michigan, which can impact their effectiveness.
- Compliance to best management practices is high on certified forest lands but unknown on private forest lands.
- Current drought measurements are for agricultural land and there are no soil moisture data for forested sites. This makes it challenging to understand the impact of droughts on forests.

Criterion Five: Carbon Cycles

Status and Trends:

- Carbon Cycles
    - Atmospheric carbon concentration continues to increase above 410 parts per million.
    - Organic soil carbon is the largest and most stable of Michigan's carbon pools. Keeping forests as forests helps protect and maintain this important carbon pool.
    - Live-tree carbon is the next largest pool.
    - Michigan data suggests that trees sequester the most carbon in the 30- to 60-year age-classes, but more carbon is stored in older age classes.
    - Wood that is turned into durable wood products or disposed of in landfills continues to store carbon into the future.
    - The balance between carbon emissions and sequestration for Michigan's forestry sector is favorable. More carbon is sequestered annually than is released as emissions.
    - Urban and community trees in Michigan currently store 33.7 million tons of carbon and sequester 962,000 tons of carbon per year.
- Climate
    - Since 1969, Michigan's mean annual temperature has increased by 0.5 degrees F per decade; the mean annual precipitation has increased by 0.5 inches per decade.
    - Mean temperature has been rising for all seasons with winter showing the fastest rate, especially the mean low winter temperature.
    - Mean precipitation for all seasons increased with spring precipitation showing the largest increase (1 inch).
    - The timing of ecological events (between plants and animals), commonly referred to as phenology, is changing.
    - Impervious surface cover and population density are correlated with the urban heat island effect. Both measures are greatest in nine counties of southern lower Michigan (especially Macomb, Wayne and Oakland counties).

Threats and Challenges to Forest Land and Values:

- Changes in phenology could negatively affect ecological processes such as pollination of the many plant species that rely on insects and reproduction in animals that depend on insects to feed their young.
- Climate changes can result in wiping out certain plants and animals and allow for the northward movement of unwanted plant and animal pests.
- Climate changes can lower the resilience of ecological systems.
- An increase in average low temperatures in winter could have a negative impact on Michigan's boreal tree species, which require cold winter temperatures.

Wildlife like black-capped chickadees rely on insects to feed their young.

- Warmer winters make it challenging to conduct winter logging and trucking, which require frozen soil to support equipment.
- Warmer winters will result in changes to seasonal recreational activities and patterns in Michigan.
- Increasing temperatures and changing precipitation patterns threaten the health, structure and function of existing trees. This threatens their ability to mitigate the impacts of climate change.
- Changing climate makes it difficult for managers to predict what species will thrive in 50 to 100 years.
- Climate change will make cities even warmer and increase human heat vulnerability, especially in urban areas.
- Extreme weather events damage existing infrastructure, especially roads, culverts and bridges.
- There is regulatory uncertainty in state and national responses to climate change.
- There is limited access to forest carbon markets for states and owners of large private forest lands.
- Landowners and managers often lack access to sound science and the ability to implement it in a meaningful way.

Criterion Six: Socio-Economic Benefits

Status and Trends:

- Michigan's population of 10 million is classified as 78% urban and 22% rural.
- Urban land area in Michigan comprises 3,623 square miles (6.4% of the total area) and rural land area comprises 52,916 square miles (93.6% of the total area).
- Michigan ranks 19th in the U.S. in terms of urban land area.
- Michigan's population density is 177 people per square mile, ranking it 17th nationally. Wayne, Oakland and Macomb counties have the highest density at 1,800 people per square mile.
- Michigan's urban trees and forests remove an estimated 30,000 tons of air pollutants annually, an ecosystem service valued at $638 million.
- Michigan's urban trees and forests provide an estimated $406 million in ecosystem service benefits annually
- Nearly two-thirds of Michigan's forest land (12.5 million acres) is in private ownership. That's about 182,000 owners with 76% owning less than 50 acres, 23% owning 50 to 499 acres and 1% owning more than 500 acres. Family ownership constitutes 70% of the private forest land in the state.
- Timberland in Michigan consists of 64.6% private, 20.5% state-owned, 12.8% national forests and 2.1% local government. In-state sawmills and pulp mills dominate consumption and processing of roundwood; most of Michigan's wood product and paper output is shipped out of state.
- A well-attended Forest Summit was held in Michigan in 2012 and the forest products industry grew to provide 99,235 jobs as of 2015, contributing to a $20 billion forest-based contribution to Michigan's economy, and continues to be stable.
- In 2011, people spent $6.1 billion on wildlife-related recreation in Michigan, of which $1.8 billion was trip-related and $3.2 billion was equipment expenditures.
- In 2011, there were 529,000 hunters, of which 521,000 lived in Michigan.
- About 3.2 million U.S. residents observe or photograph wildlife in Michigan.
- In 2011, 1.7 million people fished Michigan's waters; 1.4 million were Michigan residents.
- Fishing-related expenditures in Michigan in 2011 were about $2.4 billion.
- In 2017, an estimated 574,000 hunters spent 8.7 million days hunting and harvested about 376,000 deer.
- Relaxing and walking outdoors are the two activities with the highest participation rates of 75%.
- In Michigan (2011), 93% of people either agree or strongly agree that public lands and forests are valuable and important to people regardless of whether they visit them.

Threats and Challenges to Forest Land and Values:

- There is pressure to grow Michigan's forest products industry.
- Recreational use will likely shift among recreation types, but it is expected and encouraged to increase.
- DNR investment in management of private forest land is inadequate.
- DNR investment in urban and community forests is inadequate.

- Urban tree canopy in Michigan communities ranges from 5% to 75% with an average of 30%. Most communities are less than the nationally recommended goal of 40%.
- Incentives alone are insufficient to compel private forest landowners to keep their forests as forests.
- The size of the wildland urban interface continues to grow. This presents challenges to the management of biodiversity, wildland fire and the loss of natural cover, especially of forest and wetlands.
- Forest landowners are getting older. This presents challenges to forest management since succession planning is rare among landowners. This often results in parcellation and can lead to land-use changes.
- Risks to forest land through parcellation continues to increase. A greater number of landowners who own smaller forest parcels can lead to the conversion of forest to non-forest conditions.
- Increasing the knowledge and understanding of the importance of forests and forest values among Michigan residents is a challenge.

Criterion Seven: Legal Management Framework

Status and Trends:

- A legislative framework is supported by policy and guidelines.
- There is no regulatory prohibition on land use change to keep forests as forests.
- A suite of planning documents covers national forests, state forests, industrial properties and a small portion of private family ownerships.
- Monitoring is largely focused on certified lands (Sustainable Forestry Initiative, Forest Stewardship Council and American Tree Farm System standards). Although national forests are not certified, there is also some monitoring of them as well.
- Data on forest values in Michigan are collected regularly by agencies including the USFS, the U.S. Geological Service, the EPA, the Census Bureau, the Michigan Department of Environment, Great Lakes and Energy and many others.
- Much of the data is managed by the collecting agency but is accessible to the public and the DNR for forest-management purposes.
- Effectiveness monitoring is not done at a broad scale but will be applied to some management components in the near future.
- Reporting of monitoring and assessment results could be improved; the DNR's Landscape Assessment story map is a start.
- Research is being carried out on many aspects of forest ecology, social values and economic topics; this also could be focused and fine-tuned.

Threats and Challenges to Forest Land and Values:

- A legal and policy vacuum exists when it comes to private forest land in Michigan.
- By far, most private forest land has no management plan.
- There is inadequate inventory, monitoring, assessment and reporting of forest resources on private forest lands and for urban trees and forests in Michigan.
- Educating residents about forests and forest values and getting them involved in forest management in Michigan is an ongoing challenge.

NATIONAL PRIORITIES AND OBJECTIVES

The Cooperative Forestry Assistance Act of 1978 (Public Law 95-313) was amended by the Food, Conservation and Energy Acts of 2008, 2014 and 2018, referred to as the Farm Bills. They codify the national priorities for state and private forestry programs and require statewide forest assessments and strategies. The three national priorities and their 11 associated objectives are:

1. **Conserve and Manage Working Forest Landscapes for Multiple Values and Uses**
   This priority addresses the three pillars of sustainability (ecological, economic and social) through the consideration of the seven criteria that define sustainable forest management (the Montreal Process) which address temperate and boreal forests. This priority has two objectives:
   1.1 Identify and conserve high-priority forest ecosystems and landscapes.
   1.2 Actively and sustainably manage forests.

2. **Protect Forests from Threats**
   The most important threats are climate change, insects, diseases and wildfire. This national priority has two objectives.
   2.1 Restore fire-adapted lands and/or reduce risk of wildfire impacts.
   2.2 Identify, manage and reduce threats to forest and ecosystem health.

   Forest Health and Community Wildfire Protection are the lead programs for achieving this priority.

3. **Enhance Public Benefits from Trees and Forests**
   Forests and trees protect and enhance water quantity and quality; improve air quality; conserve and supply fish and wildlife habitat; and provide a broad range of economic benefits including mitigation of climate change. Social benefits can be derived from reducing wildfire and forest health risks and connecting people to forests. This national priority is served by all five cooperative programs through seven objectives.

   3.1 Protect and enhance water quality and quantity.
   3.2 Improve air quality and conserve energy.
   3.3 Help communities plan for and reduce wildfire and forest health risks.
   3.4 Maintain and enhance economic benefits and values of trees and forests.
   3.5 Protect, conserve and enhance wildlife and fish habitat.
   3.6 Connect people to trees and forests and engage them in environmental stewardship activities.
   3.7 Manage trees and forests to mitigate and adapt to global climate change.

COOPERATIVE FORESTRY PROGRAMS

The three national priorities of sustainable forestry are achieved through partnerships with the USFS, DNR and many stakeholders. The five cooperative programs described below also contribute to these national priorities and objectives.

Community Wildfire Protection Program

The program provides local counties and/or communities (especially communities at risk – those with an elevated potential for fire impacts) with guidance, advice and financial support to address and reduce potential risks from wildfire. This is accomplished through raising awareness among local emergency managers and the public about the catastrophic effects of wildfire on human lives and property; the benefits of prescribed fire; management of fuel levels and fire breaks and grant application processes to receive financial support.

Forest Health Program

This program is focused on addressing threats to forest health from insects, diseases and invasive plant species. The program strives to provide all land managers and landowners with the best, most up-to-date information and tools. The program is geared towards preventing the introduction, establishment and spread of new invasive species, mitigating the impact of current invasive species, responding to outbreaks of forest pests and monitoring forest health conditions.

Forest Legacy Program

The mission of the Forest Legacy Program is to identify and protect environmentally important forest areas that are threatened by conversion to non-forest uses and to promote forest land protection and conservation opportunities. Desired outcomes include the protection of important scenic, cultural, fish, wildlife, recreational resources, riparian areas, and other ecological values. Traditional forest uses, including timber management, hunting, fishing, hiking, and similar recreational uses are consistent with the purposes of the Forest Legacy Program. Protection (either fee acquisition or conservation easement) is to ensure the continuity of ecological, economic, aesthetic and cultural benefits derived from forests. This will enable traditional use of environmentally important, threatened forests on private lands.

The Forest Legacy Program has a rigorous application process. Additional context and the application process are described in detail in the landscape assessment story map that is a companion to this report.

Forest Stewardship Program

A Delta County landowner enrolled in the Forest Stewardship Program.

The vision of the Michigan Forest Stewardship Program is that Michigan's forest landowners and their families have access to information, markets, people and programs to help them manage, protect and enjoy their woods. The mission is to partner with USFS, other government agencies and private organizations to provide 300 foresters and 1,500 loggers with resources to help them serve 400,000 forest owners who have 12.5 million acres of private forest land.

The five priorities of Michigan's program are empowered landowners, accessible markets, clean water, certified forests and school forests. The three strategies to accomplish these priorities are to invest in the professional development of foresters and loggers, build the capacity of private-sector partners and use Forest Stewardship Plans as connections to other programs and resources for landowners. Geographic priorities include private forest land within 70 miles of a primary forest products company, within a half-mile of surface water and within a mile of public recreation areas and forest types described in the Wildlife Action Plan.

Urban and Community Forestry Program


Youth participate in an urban tree planting program.

The mission of this program is to promote and facilitate the effective management of trees and forests where people live, work and play to optimize the benefits they provide. It is also to increase awareness and appreciation of the role trees and forests play in making Michigan's communities healthy, attractive, resilient and vibrant for current and future generations. The Urban and Community Forestry program provides leadership to urban and community stakeholders and decision-makers; building capacity through collaboration and partnerships; improving the extent, condition and resilience of urban trees and forests; increasing awareness of benefits; and understanding and reporting on the condition and status of urban and community trees and forests statewide.

To accomplish this, more data is needed about urban environments, including an analysis of tree canopy by neighborhood, with an emphasis on providing equal access for all.

STAKEHOLDER ENGAGEMENT

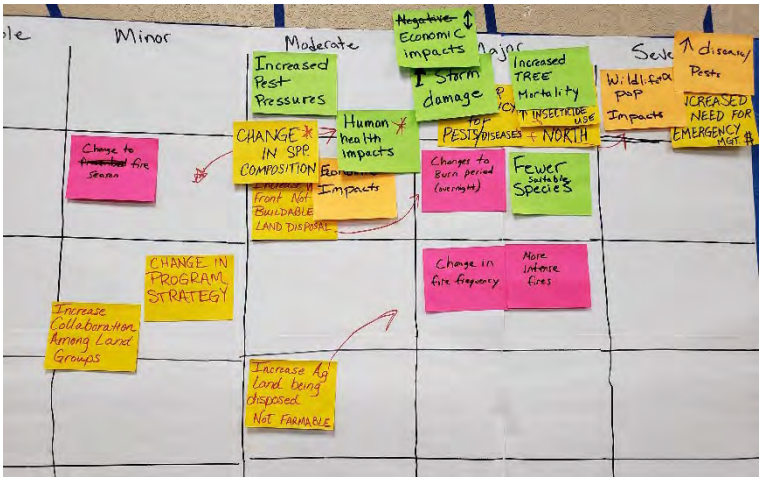
The planning team undertook a collaborative engagement process for input as the 2020 Forest Action Plan was developed. The stakeholder engagement process started with identifying 86 groups that could potentially partner in developing and implementing plans. The list of potential stakeholders and their respective representatives is found in Appendix I.

Once the landscape assessment was completed and posted online, the data were provided to identified stakeholder groups and representatives. Although more than one representative could take part in the workshops, we wanted only one representative to 'sit at the table' to ensure that all groups had an equal voice. These groups were asked to review the assessment, identify data gaps and issues and to be prepared to discuss these items in a workshop setting.

A consultant was hired to organize our approach, coordinate a group of six facilitators and help summarize input. Input came from four workshops held around the state (Lansing, Cadillac, Marquette and Gaylord) to develop the full suite of issues facing the five cooperative programs. These issues were summarized and formed the basis of a strategy development workshop held in Gaylord. There was only one strategy development workshop to minimize potential duplication and allow maximum interaction among stakeholders.

To complete the process, we established five task teams, one for each of the five cooperative programs. Each team was led by a facilitator and included the program specialist and four to 11 interested and willing stakeholders. The teams were given six weeks to complete the strategy development task, which included listing of related actions.

All meetings/workshops were well attended; Public department meetings and participants were deeply engaged in the process and discussions. A climate change adaptation workshop, sponsored by the DNR and hosted by the Northern Institute of Applied Climate Science, was also held in Gaylord and provided stakeholders with training on applied climate science. This helped everyone focus on one of the most important issues across all five programs.



A brainstorming exercise from a stakeholder workshop

The draft plan was developed and provided to all stakeholders. A virtual meeting was held to go over the plan in detail and discuss potential revisions. The draft plan was made available for public review through the division web site.

The planning team compiled information from all the workshops and task teams, and then organized strategies into a series of eight common themes - the goals. The issues were transformed into objectives and organized based on strategies under each goal. These are outlined in the section on Goals, Strategies and Objectives.

The draft plan was developed and provided to all stakeholders and the public for review. A virtual workshop was held to review the plan in detail and discuss potential revisions.

CROSS-PROGRAM ISSUES AND STRATEGIES

The stakeholder engagement process identified several strategies that were common to two or more of the five cooperative programs. Several more strategies stood out and were worthy of highlighting.

Program Coordination and Implementation

There are many similarities among the programs and many actions that multiple programs can address. It makes little sense to keep implementing each program independently. There are so many cross-cutting issues and actions that a coordinated effort will produce more, better results with less effort. The stakeholders recommended that a cohesive planning, management and communication process be developed that promotes collaboration among government departments and divisions. A strategy to develop program oversight would reduce inefficiencies in program delivery and would cause greater collaboration among key players.

Comprehensive Communications

Each of the five cooperative programs could benefit from improved communication to increase the awareness of the program; describe its mission; and provide access to what each program has to offer to individual citizens, community groups and organizations. In addition, each program depends on effective communication about forest values and forest management to achieve its mission and contribute to the national priorities and objectives. Communication is required to promote available programs so that partner groups and stakeholders can build the messages into their existing programs and so private landowners can take advantage of what is available.

In addition, the DNR's Forest Resources Division recently conducted a survey to assess public knowledge about trees, forests and forest values as the starting point for a comprehensive public education campaign regarding the many values of forests. The survey showed that general knowledge about Michigan's trees and forests is lowest in the state's urban southeast corner, with knowledge increasing as one heads north and west where forests and logging are more prevalent in communities. The division is directing a broad communication effort with special focus on the southern Lower Peninsula. The five cooperative programs could benefit by partnering with the division to coordinated communications more strategically.

Improved Engagement

Engagement is a key component of each of the five programs. Although there may be a good deal of program specificity, all five programs could benefit from a coordinated effort closely linked to comprehensive communications along with stakeholder engagement. This includes efforts to engage diverse groups from across the state in providing input as well as a comprehensive public outreach effort to explain the basic importance of forests and how Michigan residents can become connected to forests in various ways. Many stakeholders address issues contained in more than one of the programs. Many of the engagement topics flow from communication needs and follow through to engagement as an obvious outcome. Similarly, many issues cross multiple landowner boundaries and each program can provide perspective within a collaborative effort. Improved engagement that capitalizes on collaboration is well warranted.

Comprehensive Monitoring and Assessment

Monitoring and assessment were cited as issues in almost all the cooperative programs. The needs covered many program aspects. The Forest Health Program had monitoring needs related to insects, diseases and invasive plants; for plant host species; and a need for risk assessment. The Urban and Community Forestry Program has basic inventory needs before it can develop program priorities at the strategic and operational scales. The Forest Stewardship Program needs include understanding if the plans created under its guidance are being implemented as written – essentially conformance monitoring. The Community Wildfire Protection Program has monitoring needs related to prescribed fire, hazard reduction efforts and community preparedness. Each program could benefit from more ecological monitoring to support the need for measuring and assessing conservation outcomes. Stakeholders saw that as a high priority. Related to this is a desire to encourage stakeholders and partners to contribute to citizen-science opportunities and to use the data in monitoring and evaluation. There was also a strong recommendation to provide stakeholders with understanding and access to the FIA data sets to benefit their programs and projects. Clearly, a

comprehensive monitoring, assessment and reporting framework should be developed for these programs and a strategy to address this should be included.

Forest Health

Forest health is a cross-cutting concern identified by stakeholders. Several stressors that are trending upward represent important threats to forest health across all ownerships. Although much is known about forest pests in Michigan, there are also many unknowns. Monitoring and assessment are two very important needs. Forest health also has important research needs, especially in the area of risk assessment and the potential effects of introduction, spread and treatments of invasive species; herbivory (wildlife eating plants) and its effect on regeneration and plant diversity; and, the effect of climate change on pests, trees and herbaceous plants. Climate change could affect the phenology and life histories of forest pests, including how and where they spread. It will be necessary to address forest health issues across boundaries to reduce the effort for small landowners. A comprehensive strategy for addressing forest health threats is required.

Climate Change

Climate change injects a high degree of uncertainty into all aspects of urban and rural forest management. Confronting that uncertainty must be a high priority. A changing climate influences almost every component of the forest: life histories and phenology, timing of management activities and changing composition of plant and animal species. Confronting climate change will require enhanced monitoring, targeted research, increased communication and enhanced engagement with other agencies, stakeholder groups and partners. A collaborative effort will be required to include climate mitigation and adaptation strategies into management plans of the state forests, national forests, private landowners and urban and community forestry partners. Collectively, we will need to identify and promote native species that can be adapted to future conditions; identify management options for invasive species; and identify links between extreme weather events and the impact on trees, forests and pests. A comprehensive approach for our programs is needed.

The State of Michigan may develop a climate change strategy in a separate exercise to provide a comprehensive approach for state-managed lands and programs. In the meantime, it is recognized that planting more trees will help address carbon storage and annual carbon sequestration needs. To maximize the benefit, there will need to be a comprehensive assessment of the landscape to identify understocked forest and non-forest areas that could be planted to achieve these carbon-related goals. It will also be important to match the appropriate tree species to various sites identified for planting.

Project proposals or grant proposals will be required to consider climate change mitigation and adaptation principles, which will be evaluated in the review and approval process.

FOREST USE AND MARKETING

A survey of the actions developed during the stakeholder sessions and by staff specialists involved with the five cooperative programs clearly defines the need for the removal of small trees, underused tree species of all sizes and traditionally unused tree species of all sizes. The key issue: in most locations around the state, there is no market for these products and the cost of removing them from a forest is prohibitive regardless of ownership. If there is no market for this material, there is a good chance that many of the management activities recommended in this plan will not happen. To address this issue, there needs to be a strategy that encourages creation of markets for underused species, non-traditional species and for small-diameter wood produced by pre-commercial thinning.

WATERSHED FORESTRY

Clean, high quality, running fresh water is abundant and highly valued in Michigan. Conserving this resource is critical and forests play a large role in ensuring its availability. Conversely, highly developed urban areas can contribute disproportionally to degradation of water through pollution and excessive runoff. Recognizing this, important actions to maintain and replant forest riparian zones and urban areas are integral to this value and are included in many of the strategies that follow.

The landscape assessment has a comprehensive summary of the extent of natural vegetation (including forests) at the HUC12 watershed scale in the Conservation of Biological Diversity story map. The map shows all HUC12 watersheds in Michigan, which are color-coded based on the extent of natural vegetation. This assessment has important implications for both the conservation of biodiversity and water resources. From this assessment, it was determined that watersheds that had 1% to 30% natural cover remaining were the watersheds of highest priority to address in terms of improving the extent of natural vegetation, specifically thorough afforestation – planting trees in unforested areas – and particularly in riparian zones. The intent is to prevent further vegetation loss, especially where the extent would drop below 10%. This would have negative implications for biodiversity, water quantity and water quality. High priority watersheds for surface drinking water in relation to high priority HUC12 watersheds for vegetation rehabilitation are shown below in Map 10 (Priority Landscape section).

GOALS, STRATEGIES AND OBJECTIVES

The table that follows is a comprehensive list of goals, strategies and objectives produced by stakeholders and program specialists to guide the development and implementation of private land forest management over the 10-year period of this plan (2021-30). These objectives reflect the issues identified and prioritized by stakeholders during the stakeholder engagement process and added to by program specialists based on the landscape assessment and firsthand program knowledge and experience. The table also includes a column in which the lead program responsible for implementing the objective is listed. This does not mean that that program works alone; there must be an appropriate level of collaboration in implementation among all cooperative programs, other parts of DNR Forest Resources Division, DNR Wildlife Division (by means of the State Wildlife Action Plan) and other DNR divisions. It is also expected that there will be collaboration with and among stakeholders necessary to implement objectives. There is also a column that links the objectives of the plan to the three National Priorities and their 11 objectives. A timeline column and a priority column round out the table. Only the high and medium priorities are listed in the plan. Low-priority items as ranked by stakeholders are included in Appendix 4. These goals may reflect specific projects that regional stakeholders are willing to complete as well as cross-cutting issues that are worthy of future action.

Although all forests are important, a few forest types have been identified as having priority related to their short supply, challenging management prescriptions or their value as wildlife habitat. These important forest types are mesic northern forests, northern dry forests, floodplain forests, oak forests (particularly white oak), young forest types, pine barrens and savannas (particularly oak savannas.)

Table abbreviations:

- **CWPP**: Community Wildfire Protection Program
- **FHP**: Forest Health Program
- **FLP**: Forest Legacy Program
- **FRD**: DNR Forest Resources Division
- **FSC®**: Forest Stewardship Council®
- **FSP**: Forest Stewardship Program
- **FU&M:** Forest Utilization and Marketing
- **MOD**: DNR Marketing and Outreach Division
- **MSU**: Michigan State University
- **MUCFC**: Michigan Urban and Community Forestry Council
- **NREPA**: Natural Resources Environmental Protection Act
- **PERM**: Partnership for Ecosystem Research and Management
- **PRD:** DNR Parks and Recreation Division
- **SFI®**: Sustainable Forestry Initiative®
- **TFS:** Tree Farm Systems
- **UCF**: Urban and Community Forestry Program
- **WAP**: Wildlife Action Plan

Goal 1: Enhance coordination among cooperative programs, stakeholders, and partners.

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Strategy 1.1:	Improve oversight and delivery of the five cooperative programs to help ensure the provision of ecosystem services so important to Michigan' people.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 1.1.1:	Ensure annual engagement and an annual meeting with stakeholders.	FRD	1.2	Annually	High
Objective 1.1.2:	Engage stakeholders in a collaborative effort to review and update the statewide forest action plan every five years.	FRD	1.2	2024, 2029	High
Objective 1.1.3:	Improve year-end accomplishment reporting to better inform the people of Michigan.	FRD	3.6	Annually	High
Objective 1.1.4:	Define the conditions required to justify increasing staffing for UCF program by 1 FTE and pursue opportunities to achieve this.	FRD	3.6	2030	High
Strategy 1.2:	Forest Resources and the Marketing and Outreach divisions collaborate with stakeholders and the Eastern Region State and Private Forestry technology transfer process to develop and deliver comprehensive communication messages and engagement activities.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 1.2.1:	Deliver public messages that create awareness and lead to engagement with cooperative programs and other related forestry efforts. Ensure that program challenges are linked to communication messages.	FRD & Stakehol-ders	3.6	Ongoing	High
Objective 1.2.2:	Improve efficiency and effectiveness of program steering committees.	FRD	2.1	Annually	High
Strategy 1.3:	Develop a comprehensive and coordinated approach to deal with cooperative program challenges that includes stakeholders.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 1.3.1:	Seek funding sources to support cooperative program and stakeholder organization positions which will increase awareness and engagement.	FRD & Stakehold ers	2.2	Ongoing	High
Strategy 1.4:	Ensure that any government or department climate action plan includes communication and engagement activities and allows for collaboration with partner organizations.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 1.4.1:	Align the climate change approach in cooperative programs with regional and state climate action plan(s) and ensure there is a link to inventory, monitoring and assessment.	FRD & Stakehold ers	3.7	Ongoing	High

Goal 2: Advocate for sound forestry policies

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Strategy 2.1:	Address social and political barriers to improve planning and management of Michigan's forest resources.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 2.1.1:	Promote awareness and use of best management practices to protect water quality.	FSP, UCF and WAP	1.2	Ongoing	High
Objective 2.1.2:	Create, maintain and promote an online database of community tree ordinances.	UCF	3.6	2025	High

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Objective 2.1.3:	Help communities to assess, achieve and maintain a goal of 40% urban tree canopy cover to realize maximum associated economic and ecosystem benefits and better serve the people of the community. Desired communitywide goal is 40% unless locally determined.	UCF	1.2 and 3.4	Ongoing	High
Objective 2.1.4:	Promote voluntary best management practices, policies and regulations and work with partners to slow and prevent the introduction and spread of invasive species.	FHP, FSP, UCF, PRD and WAP	2.2	Ongoing	Medium
Objective 2.1.5:	Routinely engage stakeholders to inform and review the list of priority forest health and invasive species concerns/actions, and direct resources to high-priority areas.	FHP, FSP, UCF and WAP	3.6 and 2.2	Annually	Medium
Strategy 2.2:	Using the best available science, all partners should collaborate to implement a landscape approach to tree and forest management that can address all aspects of sustainable forest management in forested landscapes and urban settings.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 2.2.1:	Establish a state fund and use protocol for responding to new watch-list species through early detection and rapid response efforts.	FHP, FSP and WAP	2.2	2025	High
Objective 2.2.2:	Develop and distribute urban forestry best management practices for invasive species, climate adaptation and storm preparedness and response.	UCF	3.6	2030	High
Objective 2.2.3:	Distribute information and resources (e.g. standards, polices, best management practices) to achieve sustained urban forest management.	UCF	3.3	Ongoing	High
Objective 2.2.4:	Adapt national Urban Forest Strike Team protocols for use in an early detection, monitoring and reporting program for urban forest health threats.	UCF	3.3	Ongoing	High
Objective 2.2.5:	Strengthen network of specialists across all agencies and stakeholders to assist with forest health management.	FRD, FHP and Stakeholders	2.2	Ongoing	Medium
Objective 2.2.6:	Develop adaptation plans to address loss of plant species due to invasive species, disease and/or climate change, including developing species-specific action plans (i.e., white-tailed deer herbivory).	FRD and WLD	3.7	Ongoing	Medium
Objective 2.2.7:	Promote the Michigan Invasive Species Information Network (MISIN) and Eyes on the Forest and implement invasive species prevention campaigns (Don't Move Firewood, Play Clean Go and Stop Aquatic Hitchhikers).	FRD, FHP, FSP, UCF and WAP	2.2	Ongoing	Medium
Objective 2.2.8:	Keep prohibited species list (NREPA Part 451 Section 324.41302) current.	FHP and WAP	2.2	Ongoing	Medium
Objective 2.2.9:	Encourage foresters to develop forest management plans that landowners understand, support and implement.	FSP and WAP	3.6	Ongoing	Medium
Objective 2.2.10:	Partner with wildlife agencies and organizations to help landowners improve their wildlife habitat.	FSP, UCF and WAP	3.5 and 3.6	Ongoing	Medium

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Objective 2.2.11:	Use prescribed burning in concert with cutting and other treatments to effectively manage takeover by red maple and invasive plants.	CWPP, FSP and WAP	1.2	Ongoing	Medium
2.2.12	Continue to prioritize forest health watch-list species for developing species-specific action plans.	FHP	2.2	Ongoing	Medium
Strategy 2.3:	All partners engaged in the management of trees, forests and forest values should engage in continuing education for staff.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 2.3.1:	Ensure continuity of institutional knowledge over the long term for all programs, agencies and stakeholders.	FHP, FSP, UCF and WAP	3.3	Ongoing	High
Objective 2.3.2:	Gain access to university electronic library resources (e.g., via PERM agreement) to facilitate staff learning.	FRD	1.2	2025	High
Objective 2.3.3:	Develop internal and external staff expertise to develop actions that will lead to the restoration of ecosystem resilience after treating invasive species.	FRD and Stakehol-ders	1.2 and 2.2	Ongoing	Medium

Goal 3: Increase economic productivity and benefits

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Strategy 3.1:	Communicate and engage with landowners and professional foresters to ensure awareness of ecosystem services values, availability of forest management information and how to collaborate in forest management.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 3.1.1:	Collaborate with private sector organizations to offer landowners access to information and assistance including forest product market and professional forest/logger networks.	FRD, FSP, WAP	3.4 and 3.6	2025	High
Objective 3.1.2:	Collaborate with partners to provide ongoing training opportunities to help improve skills and grow business in the private sector.	FSP and UCF	3.4	Ongoing	High
Objective 3.1.3:	Collaborate with partners to quantify economic and ecosystem benefits of community forests and tree plantings at multiple scales (local, regional, statewide).	UCF	3.1	2025	High
Objective 3.1.4:	Leverage the annual community forestry grant program to incentivize urban wood use projects, training and economic/market analysis.	UCF	3.4	Ongoing	High
Objective 3.1.5:	Align funding, planning, grant opportunity timelines with other agencies to allow for leveraged funding across landscapes.	CWPP	2.1 and 3.3	2025	High
Objective 3.1.6:	Promote economic, ecological, social and public health benefits of trees and forests including ecosystem services. Facilitate access to emerging markets.	FRD, FSP, UCF	3.4	Ongoing	Medium
Objective 3.1.7:	Engage with communities and stakeholders to provide materials for adjacent riparian habitat restoration efforts in the St. Clair–Detroit River System that discuss the importance of ecological and economic values.	WAP	3.3 and 3.5	2025	Medium

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Objective 3.1.8:	Improve marketability and demonstrate and promote the use of non-traditional species, non-commercial sizes or damaged/diseased trees, including the use of urban wood, for environmental and economic reasons.	FU&M	1.2 and 3.4	Ongoing	Medium
Objective 3.1.9:	Standardize cooperative interagency fire agreements to facilitate resource sharing and reimbursements nationally and across jurisdictions.	CWPP	2.1 and 3.3	Ongoing	Medium

Goal 4: Communicate the value and importance of forestry

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Strategy 4.1:	Communicate directly with the public, wildland urban interface landowners, youth and state politicians about the principles of forest management; how certification systems work to ensure sound management; and how managing to provide forest values leads to multiple benefits from the forest for the people of Michigan.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 4.1.1:	Communicate regularly with primary stakeholders including the Forest Management Advisory Council, Timber and Forest Products Advisory Council, Interagency Forest Invasive Committee, Forest Stewardship Advisory Committee, Forest Legacy Committee and the Urban and Community Forestry Council.	FRD	3.6	Ongoing	High
Objective 4.1.2:	Develop communication materials that explain the value of forests and potential forest management activities, as well as programs offered by public agencies and private organizations that benefit the people in the state.	FRD	3.6	Ongoing	High
Objective 4.1.3:	Develop messages about active forest management with communications staff targeted to urban and suburban communities to improve health for humans and trees, resilience and maximize benefits.	UCF and FSP	3.6	2025	High
Objective 4.1.4:	Increase awareness and use of technology (e.g. i-Tree) for quantifying urban forest benefits and improving management.	UCF	3.6	2025	High
Objective 4.1.5:	Promote participation in all three forest certification programs (FSC®, SFI®, American Tree Farm System.) *The DNR Forest Resources Division is certified under license codes FSC-C014912 and SFI-01796.*	FSP	3.6 and 1.2	Ongoing	High
Objective 4.1.6:	Promote peer learning networks for landowners to help them exchange information.	FSP, UCF and WAP	3.6	Ongoing	High
Objective 4.1.7:	Create an Advocacy subcommittee of the Michigan Urban and Community Forestry Council.	UCF	3.6	2025	Medium

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Objective 4.1.8:	Provide information to elected officials about the importance and value of proper and sustained forest management.	FRD	1.2, 3.6	Ongoing	Medium
Objective 4.1.9:	Explain the benefits of young forests and management tools for landowners including silvicultural practices such as prescribed fire and regeneration harvests (clear cuts).	FSP and WAP	3.5, 3.6 and 2.2	Ongoing	Medium
Objective 4.1.10:	Increase citizen science and community engagement for help with monitoring tree conditions, forest health and water quality issues to improve environmental quality and human health.	FSP, UCF and FHP	3.6	Ongoing	Medium
Objective 4.1.11:	Promote awareness and protection of Michigan's rare natural communities, native plants and the importance of pollinators.	FSP and WAP	3.6 and 3.5	Ongoing	Medium
Strategy 4.2:	Increase awareness among Michigan's forest owners, partners and residents about forests, partnership opportunities and the benefits of collaboration that will benefit all residents of Michigan.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 4.2.1:	Create a communication and outreach plan that outlines extension methods for forest owners and stakeholders using audience-targeted outreach tools.	FLP and FSP	3.6 and 1.1	Ongoing	High
Objective 4.2.2:	Increase participation in Tree City USA programs among communities, schools, utilities and healthcare institutions by 5%.	UCF	3.1-9	2025	High
Objective 4.2.3:	Collaborate with partners to engage with K-12 and higher education to promote interest and awareness in natural resources, volunteer, internship and career opportunities.	FRD	3.6	Ongoing	Medium
Objective 4.2.4:	Update the Forest Legacy Program nomination application to focus on and prioritize protection of climate-resilient landscapes.	FLP	3.1	2020	High
Objective 4.2.5:	Increase stakeholder and recreational user awareness of threats and impacts to forest health including invasive species.	FHP	1.1 and 3.6	Ongoing	High
Objective 4.2.6:	Inform landowners about public and private forestry programs and organizations; engage them in active management.	FSP	3.6	Ongoing	Medium
Objective 4.2.7:	Help landowners enroll in the Commercial Forest and Qualified Forest programs or to develop management plans under the Forest Stewardship program to lower their property taxes and to help keep forests as forests.	FSP	3.6	Ongoing	Medium
Objective 4.2.8:	Benchmark and increase youth education and engagement programs such as Project Learning Tree, Tree Campus, Campus K-12 and Wheels to Woods.	FSP and UCF	1.2, 3.6	Ongoing	Medium
Objective 4.2.9:	Encourage volunteer and citizen scientist activities through communication, training and access to opportunities to share the importance and value of forestry.	FHP, FSP and UCF	3.6	Ongoing	Medium
Objective 4.2.10:	Increase communication between biologists and fire professionals through the Michigan Prescribed Fire Council.	CWPP and WAP	2.1	Ongoing	Medium

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Strategy 4.3:	Effectively communicate priorities, requirements, relevance and focus of cooperative programs to the people of Michigan.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 4.3.1:	Use The Nature Conservancy's climate-resilient landscapes to identify areas that should have priority for protection; include this as a priority in project evaluation and scoring.	FLP	3.6 and 1.1	Ongoing	High
Objective 4.3.2:	Implement components of a climate change communications plan, developed by the department and/or the division, and use supporting material emphasizing forest adaptation and resilience planning.	FHP and FSP	3.6 and 3.7	2025	High
Objective 4.3.3:	Assist communities in developing climate adaptation strategies and incorporating them in forest management plans, with information on urban tree selection, planting and maintenance that address community needs.	UCF	2.2 and 3.7	Ongoing	High
Objective 4.3.4:	Share prescribed burn successes, lessons learned, training opportunities and other related resources on the Michigan Prescribed Fire Council website or other platform.	CWPP and WAP	2.1 and 3.3	Ongoing	High
Objective 4.3.5:	Promote the role of trees and forests in urban areas in mitigating stormwater runoff and improving water quality.	UCF	3.1	Ongoing	Medium
Objective 4.3.6	Improve public awareness and acceptance of prescribed fire and its benefits to the ecosystem and people.	CWPP	2.1	Ongoing	Medium

Goal 5: Involve partners and the public in managing Michigan's forests

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Strategy 5.1:	Collaborate with a diverse group of partners including state agencies, land trusts and other conservation organizations to protect working forests.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 5.1.1:	Re-engage the Forest Stewardship Advisory Committee to ensure a public-private working group for conservation across the landscape. Encourage regular meetings and involvement by committee members.	FSP, FLP and WAP	1.1, 1.2 and 3.4	2022	High
Strategy 5.2:	Engage with forest landowners to encourage the protection and sound management of privately-owned forests through collaborative programs.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 5.2.1:	Collaborate with conservation organizations, local governments and private forest landowners to identify, target and protect large forest areas (500 or more acres).	FLP, FSP and WAP	1.1, 1.2 and 3.4	Ongoing	High
Objective 5.2.2:	Seek opportunities across all forested ownerships to protect important forests using conservation easements or land acquisition to help assure the long-term viability of restored habitats such as remnant prairie and savanna (particularly oak	FSP and WAP	1.1 and 3.5	Ongoing	High

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
	savanna) and to create important linkages for focal species.				
Objective 5.2.3:	Engage Michigan's forest owners and residents in activities that connect them with forests and to forest-related programs to increase quality-of-life benefits they provide.	FSP and UCF	3.6	Ongoing	High
Objective 5.2.4:	Engage and assist school-owned forests in active management and sustained forest use.	FSP and UCF	1.2 and 3.6	Ongoing	High
Objective 5.2.5:	Collaborate with FSP, communication staff and MSU Extension to develop and promote a Michigan-specific bulletin on protecting trees and forests in development projects.	UCF, FSP	3.6	2025	High
Objective 5.2.6:	Engage with private landowners adjacent to public or land conservancy holdings to manage and expand the size of suitable habitats for focal species.	FSP, UCF and WAP	3.5 and 3.6	Ongoing	Medium
Objective 5.2.7:	Assist landowners with management of small forests (less than 20 acres), often overlooked by urban and rural forestry programs.	FSP and UCF	3.6 and 3.3	Ongoing	Medium
Strategy 5.3:	Assess outreach and engagement needs to ensure an appropriate distribution of resources across the state.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 5.3.1:	Increase participation in UCF program grants from economically underserved community areas by 25%.	UCF	1.2 and 3.4	2025	High
Objective 5.3.2:	Identify, post web links and promote partner agency and organization guides designed to support wildland fire management.	CWPP	2.1 and 3.3	Ongoing	High
Objective 5.3.3:	Increase prescribed burning capacity through greater resource sharing among federal, state and local government agencies and non-government organizations in Michigan and with Forest Fire Compact partners.	CWPP	2.1 and 3.3	Ongoing	High
Objective 5.3.4:	Support development of additional and improved wildfire risk assessment and Community Wildfire Protection Plans, focusing on high-risk landscapes and encouraging collaboration, outreach and engagement at the local level.	CWPP	2.1 and 3.3	Ongoing	High
Objective 5.3.5:	Promote community-level collaboration to form tree advocacy groups/boards and increase the number of communities with recognized tree boards to advance the quality of life benefits that trees provide.	UCF	3.6	Ongoing	High
Objective 5.3.6:	Help landowners find information, tools, programs and people to help them manage their trees and forests.	FSP, WAP and UCF	3.5 and 3.6	Ongoing	Medium
Objective 5.3.7:	Benchmark and increase public tree maintenance through provision of program financial and technical assistance.	UCF	3.3 and 3.6	Ongoing	Medium
Objective 5.3.8:	Develop outreach messages and communication channels to engage fire departments in support of wildland fire suppression. Tools will include agreements, participation in inter-agency training opportunities and increasing experience with prescribed fire.	CWPP	2.1 and 3.3	Ongoing	Medium
Objective 5.3.9:	Provide guidance to agencies and organizations to facilitate better pre-fire/pre-season coordination at the local level.	CWPP	2.1	Ongoing	Medium

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Objective 5.3.10:	Expand and develop initiatives to protect wildland fire responders and the public from unnecessary risk while protecting communities and restoring landscapes.	CWPP	2.1 and 3.3	Ongoing	Medium
Objective 5.3.11:	Accelerate deployment of wildland fire management support technology and applications to improve safety and efficiency.	CWPP	2.1 and 3.3	Ongoing	Medium
Strategy 5.4:	Develop partnerships to address the threats and impacts to forests from major stressors such as climate change, invasive pests and native insects and diseases.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 5.4.1:	Develop communication and engagement material that covers all forest health issues and management activities including planning, collaboration and use of volunteers.	FHP, UCF and WAP	2.2 and 3.5	Ongoing	High
Objective 5.4.2:	Engage with agencies, stakeholders and partners to share prevention protocols and promote a common understanding and approach to managing diseases and pests.	FHP	2.2, 3.3 and 3.6	Ongoing	High
Objective 5.4.3:	Sustain key program capacity partnerships through financial assistance to sustain delivery and achieve UCF program goals and objectives.	UCF	3.6	Ongoing	High
Objective 5.4.4:	Engage partners across multiple sectors and industries to improve management and maintenance and maximize benefits from forests to people.	FSP and UCF	1.2 and 3.4	Ongoing	Medium
Objective 5.4.5:	Expand cooperative program connections to non-profits and conservancies such as land trusts.	FHP, FSP and UCF	3.6	Ongoing	Medium
Strategy 5.5:	In cooperation with urban tree and forest managers, actively work to establish standards, policies, green infrastructure plans and best management practices and improve awareness and engagement in actively managing urban trees and forests to benefit the people of the community.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 5.5.1:	Collaborate with green industry partners to promote and ensure availability of diverse tree species for planting.	UCF	1.2, 2.2 3.4 and 3.7	2025	High
Objective 5.5.2:	Promote trees and forests as green infrastructure to protect water quality in urban and rural areas to the benefit of local people.	FSP and UCF	3.1 and 3.3	Ongoing	High
Objective 5.5.3:	Develop communications and engagement material that covers the full range of urban forest values and management activities.	UCF	1.2, 3.1, 3.3 and 3.2	Ongoing	Medium
Objective 5.5.4:	Work with utility partners to secure and maintain sponsorship of community tree planting programs and promote “right tree, right place” messages.	UCF and FSP	3.1, 3.2 and 3.3	Ongoing	High
Objective 5.5.5:	Benchmark and increase community participation in climate adaptation and resilience planning related to urban forest management to maintain resilient communities.	UCF	3.4 and 3.7	Ongoing	Medium
Objective 5.5.6:	Collaborate with municipal and nonprofit partners to increase citizen engagement for public tree maintenance.	UCF	1.2 and 3.6	Ongoing	Medium
Objective 5.5.7:	Develop a program to help municipalities and contractors/consultants conduct public tree inventories, complete resource assessments and	FSP and UCF	3.1, 3.2 and 3.3	Ongoing	Medium

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
	develop management plans that benefit local people.				
Strategy 5.6:	Engage with volunteers and professionals to provide training for participation in citizen-science opportunities and use of public data sets.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 5.6.1:	Proactively engage with stakeholder groups, municipalities and other partners to provide workshops about monitoring, citizen science, scenario planning and financial and technical assistance.	FSP, UCF and WAP	3.3 and 3.7	Ongoing	Medium
Objective 5.6.2:	Provide training and outreach opportunities for disaster/emergency readiness, planning, response and recovery.	CWPP and UCF	3.3 and 3.7	Ongoing	Medium
Strategy 5.7:	Engage with the private sector to provide professional development opportunities, tools and training relevant to management for healthy trees and forests and their associated benefits.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 5.7.1:	Increase the number and availability of qualified personnel, and maintain their qualifications, to support wildfire suppression and prescribed burning.	CWPP	2.1	Ongoing	High
Objective 5.7.2:	Develop, promote and disseminate information about the national and Northeastern Cohesive Wildland Fire Management strategies as well as wildland fire training opportunities.	CWPP	2.1 and 3.3	Ongoing	High
Objective 5.7.3:	Provide financial assistance to partners for annual workshops and training sessions relevant to urban forestry policy, planning and management.	UCF	3.6	Ongoing	High
Objective 5.7.4:	Assist developers, foresters and local governments in conserving and actively managing trees and forests in developments.	FSP and UCF	3.3 and 3.6	Ongoing	Medium
Objective 5.7.5:	Provide resources to land-use planners and local governments for considering conservation values and the benefits they provide to people in their decisions.	UCF and WAP	3.3	Ongoing	Medium
Objective 5.7.6:	Ensure that agency efforts related to staff recruitment and retention provide training opportunities that include transfer of institutional knowledge to the next generation of leadership.	CWPP	2.1 and 3.3	Ongoing	Medium

Goal 6: Monitor the condition of the forest and impacts of our work

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Strategy 6.1:	Address the needs for inventory and monitoring and provide for the establishment of baseline urban tree and forest data, forest health data, recreational use, risk assessment, future projections and measurement of conservation outcomes through collaboration with partners and citizen-science projects for the five federal cooperative programs.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 6.1.1:	Develop comprehensive monitoring activities that incorporate inventory, economic and environmental components, including invasive species and climate change; and develop conformance monitoring for all Forest Action	FRD and Stakehold-ers	1.2	2025	High

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
	Plan strategies to track implementation of plan objectives.				
Objective 6.1.2:	Maintain the landscape assessment and add specific data relevant to monitoring questions that help characterize private land forest resources and values.	FRD	1.2	Ongoing	High
Objective 6.1.3:	Strategically inventory, monitor and assess current and potential invasive species to Michigan and rationalize this against the national list of forest health concerns. Coordinate forest health monitoring and management across ownerships and/or jurisdictions.	FHP & Federal Programs	1.2 and 2.2	Ongoing	High
Objective 6.1.4:	Invest state funding in support of U.S. Forest Service's Urban Forest Inventory and Analysis Initiative to accelerate data collection and analysis in Detroit and additional plots in other communities.	UCF	1.2, 2.2 and 3.4	2025	High
Objective 6.1.5:	Use i-Tree software to quantify air pollution reduction and other benefits from urban tree canopies for at least 50% of Michigan communities.	UCF	3.4	2025	High
Objective 6.1.6:	Create Michigan UCF data and assessment guidelines and develop baseline dataset.	FRD	1.2	2025	High
Objective 6.1.7:	Adapt national Urban Forest Strike Team protocols for use in data collection for detecting, monitoring and reporting urban forest health and threats.	UCF	2.2	Ongoing	High
Objective 6.1.8:	Benchmark and increase volunteer or citizen-science-based UCF data collection efforts in Michigan communities.	FRD and UCF	1.2 and 3.6	Ongoing	High
Objective 6.1.9:	Award up to 60% of annual community forestry grant funding for projects to address community tree/forest assessments and/or management plans.	UCF	3.6	Ongoing	High
Objective 6.1.10:	Submit updated treatments and vegetation/fuel/disturbance data to LANDFIRE annually and encourage partners to do so to keep LANDFIRE up-to-date and relevant.	CWPP	2.1	Ongoing	High
Objective 6.1.11:	Provide direction and training to ensure that fire occurrence data is being reported consistently as digital spatial perimeter data and that other appropriate attributes are tracked.	CWPP	2.1	Ongoing	High
Objective 6.1.12:	Improve reporting, record keeping, spatial data mapping and effectiveness monitoring of prescribed burns across all ownerships.	CWPP	2.1	Ongoing	High
Objective 6.1.13:	Use Google Analytics, social media analysis and other tools to inform the five federal cooperative forest programs in respect to social values.	FRD	1.2	2025	Medium
Objective 6.1.14:	Monitor trends in recreational, wildlife habitat/viewing and other uses of forest lands and their connection to private forests.	FRD & PRD	1.2	Ongoing	Medium
Objective 6.1.15:	Increase the spatial extent of data gathering related to forest health and disease management.	FHP	2.2	Ongoing	Medium
Objective 6.1.16:	Improve data quality, use and access and tools in support of risk assessment.	CWPP	2.1 and 3.3	Ongoing	Medium

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Objective 6.1.17:	Provide a way for landowners to use citizen-science datasets to provide management direction for private forests.	FHP, FSP and UCF	3.6	Ongoing	Medium
Objective 6.1.18:	Partner with other agencies to collect and analyze data on both urban and rural forests.	FSP and UCF	1.2	Ongoing	Medium
Objective 6.1.19:	Survey landowners who have Forest Stewardship Plans to monitor implementation and effectiveness including best management practices.	FSP	1.2 and 3.6	2025	Medium

Goal 7: Improve understanding of forests through research

	Objectives	Lead Program	National Priority & Objective	Timeline	High Priority
Strategy 7.1:	Expand the scope of and support for federal and university-based research and associated extension.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 7.1.1:	Link research with monitoring to create specific effectiveness monitoring protocols that lead to adaptive management.	FRD	1.2	Ongoing	High
Objective 7.1.2:	Expand the scope of support and funding for federal and university-based research and associated extension, emphasizing prediction and detection of new forest health threats. Include the impacts of climate change on trees and forest health, with respect to range expansion and life history of invasive species.	FRD and FHP	1.2, 2.2, and 3.7	Ongoing	High
Objective 7.1.3:	Create a list of research priorities with input from stakeholders and establish partnerships with educational institutions (e.g., MSU's urban Forestry Program).	FRD	1.2	2022	High
Objective 7.1.4:	Leverage existing and new PERM agreements to facilitate needed research, especially in urban forestry, forest management, forest health, climate change and water quality issues.	UCF, FHP, and FSP	3.3, 3.4 and 3.6	Ongoing	High
Objective 7.1.5:	Collaborate with researchers to describe and quantify threats to urban trees and forests from climate change scenarios related to invasive species, insects/disease and storms.	UCF and Stakeholders	3.7	Ongoing	High
Objective 7.1.6:	Renew five-year agreement for UCF research through existing PERM partnership.	FRD	3.6	2022	High
Objective 7.1.7:	Continue research on biocontrol for key invasive species with minimal negative effects to native species.	FHP and WAP	2.2	Ongoing	Medium
Objective 7.1.8:	Support social science research, including landowner surveys, to improve delivery of assistance and share results through extension outreach.	FSP and UCF	1.2	Ongoing	Medium
Objective 7.1.9:	Make sure models are up to date and accurately represent fuel types and epicenters of invasive plant species populations.	CWPP and FHP	2.1 and 2.2	Ongoing	Medium
Objective 7.1.10:	Determine methods for regenerating mesic northern hardwood and oak forest types to inform management and best practices, especially related to herbivory.	CWPP, FSP and FRD	1.2	Ongoing	Medium
Objective 7.1.11	Use latest research to create extension bulletins focused on tree selection to promote urban	UCF and FHP	3.6	2025	Medium

	Objectives	Lead Program	National Priority & Objective	Timeline	High Priority
	forest resilience, climate adaptation and ecosystem service benefits.				

Goal 8: Implement actions to improve Michigan's forests

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Strategy 8.1:	Work with stakeholders and private landowners to improve forest planning and implementation of management practices across the state.	Lead Program	National Priority & Objective	Timeline	Priority
Objective 8.1.1:	Develop plans to ensure that strategies, actions and recommendations contained in other management plans are incorporated for coordinated results.	FHP and FSP	1.2 and 2.2	Ongoing	High
Objective 8.1.2:	Monitor appropriateness of local community forestry assessments and plans to ensure relevance and activity (i.e. less than 10 years old).	UCF	3.6	Ongoing	High
Objective 8.1.3:	Achieve 50% of Michigan communities meeting USFS definition as "managing" their urban forest resources and achieving 40% canopy cover.	UCF	3.6	2030	High
Objective 8.1.4:	Recommend silviculture, cultivation and stand/tree conversions that are ecologically suited to site and/or soil/pest/disease conditions and the changing climate.	FHP and FSP	1.2 and 2.2	Ongoing	High
Objective 8.1.5:	Manage priority invasive species and address factors making ecosystems susceptible to invasion.	FHP and WAP	1.2, 2.2 and 3.5	Ongoing	High
Objective 8.1.6:	Use prescribed fire to promote fire-adapted natural communities and consider burning in varying seasons to increase plant diversity, including refuge areas in known or suspected focal species sites.	FRD and WAP	1.2, 2.1, 2.2 and 3.5	Ongoing	High
Objective 8.1.7:	Use prescribed fire in fire-adapted ecosystems to increase resiliency to invasive pests and existing invasive species populations.	CWPP, FHP and FSP	1.2, 2.1, 2.2 and 3.5	Ongoing	High
Objective 8.1.8:	Identify communities where tree-planting assistance is most critical to address low canopy cover and high impervious cover issues.	UCF	3.4 and 3.6	2025	High
Objective 8.1.9:	Benchmark current community adoption of routine pruning cycles for public trees. Desired goal: 30% community adoption.	UCF	3.4	2025	High
Objective 8.1.10:	Stop and reverse the trend of annual net tree loss in Tree City USA communities.	UCF	1.2	2025	High
Objective 8.1.11:	Increase species tree diversity (evenness and richness) in urban forests by enforcing minimum diversity standards in all program tree-planting grants.	UCF	2.2 and 3.7	Ongoing	High
Objective 8.1.12:	Help four to eight communities in two to four watersheds implement green infrastructure practices and/or adopt policies as part of watershed or climate adaptation plans.	UCF and WAP	3.4	2025	High
Objective 8.1.13:	Determine where there is potential to implement tree planting in understocked forest and non-forest sites across the state.	FRD	1.2 and 3.7	2025	High
Objective 8.1.14:	Encourage planting of appropriate tree species as part of Michigan's climate change adaptation response and the need to sequester and store more carbon in the forest.	FRD, UCF and FSP	1.2 and 3.7	Ongoing	High
Objective 8.1.15:	Create young forests to address forest health and wildlife habitat issues.	FHP, FSP and WAP	1.2 and 3.5	Ongoing	Medium

	Objectives	Lead Program	National Priority & Objective	Timeline	Priority
Objective 8.1.16:	Conduct habitat management to mimic natural disturbance regimes, based on historical data assessment.	FHP, FSP and WAP	1.2, 3.4 and 3.5	Ongoing	Medium
Objective 8.1.17:	Manage northern dry forest, floodplain forest and pine barrens for wildlife that rely on them.	WAP, FSP and CWPP	1.2 and 3.5	Ongoing	Medium
Objective 8.1.18:	Use a combination method of prescribed fire and then cutting of sub-canopy to more effectively manage red maple invasion, particularly in white oak forests.	WAP	1.2, 2.1 and 3.5	Ongoing	Medium
Objective 8.1.19	Develop a guide for engaging people in tree planting, care and maintenance.	UCF	2.2 and 3.7	2025	Medium
Objective 8.1.20:	Provide communities with technical and financial assistance to assess urban tree canopy cover, set goals, and maintain or increase it.	UCF	1.2, 2.2, 3.4, 3.6 and 3.7	Ongoing	Medium
Objective 8.1.21:	Increase prescribed fire opportunities using the best available science to meet treatment objectives in a variety of fuel types, outside the peak spring fire season.	CWPP and WAP	2.1 and 3.3	Ongoing	Medium
Objective 8.1.22:	Reduce overall damage to forests from outbreaks of insects, disease-causing pest and vegetative invasive species using prevention and control measures.	FHP	1.2	Ongoing	Medium

PRIORITY LANDSCAPES

Priority landscapes have been developed by reviewing the full suite of objectives and identifying those that have some spatial reference. In some cases, areas of work priority were not suggested in the objectives and these areas have been included. Priority work areas for surveillance of invading invasive species is an example – it is a priority and an important workload, but geographical areas were not alluded to in the objectives.

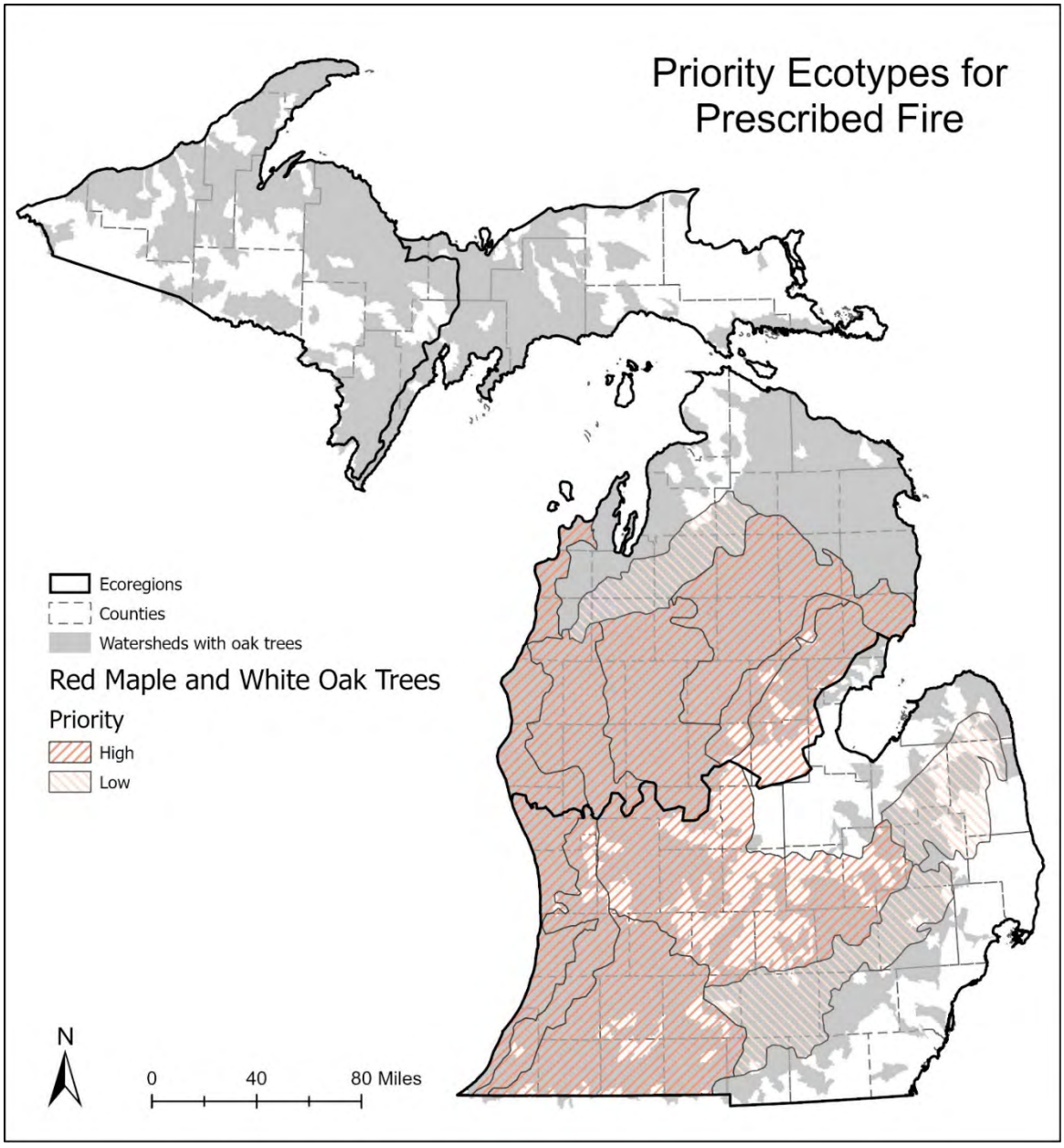
There are many objectives and consequently there are many maps to present the priority areas without making any one map overly complex. Maps are built to show related priorities and do not strictly follow program area or objectives related to a single goal.

Maps 2 through 7 show the probable locations of important forest types in Michigan, which are mentioned in some of the objectives. Maps 2 and 3 are from the Michigan Natural Features Inventory and Maps 4 through 7 are reproduced from Michigan's Wildlife Action Plan and were all developed by partners to help them connect around important places for focal wildlife species. Voluntarily working together on conservation actions provides great benefits to wildlife and people. These maps are included in the Forest Action Plan to show where priorities for wildlife are and to point to opportunities for collaborations in forest management.

To be clear, these maps show areas where conducting management on these forest types is a priority and where partners and stakeholders should target these forest types (they may not represent the full extent of those types in Michigan). Oak barrens, pine barrens and savannas are fire-dependent communities and benefit from prescribed fire. Some of these may already be included in the prescribed fire program as indicated in Map 8.

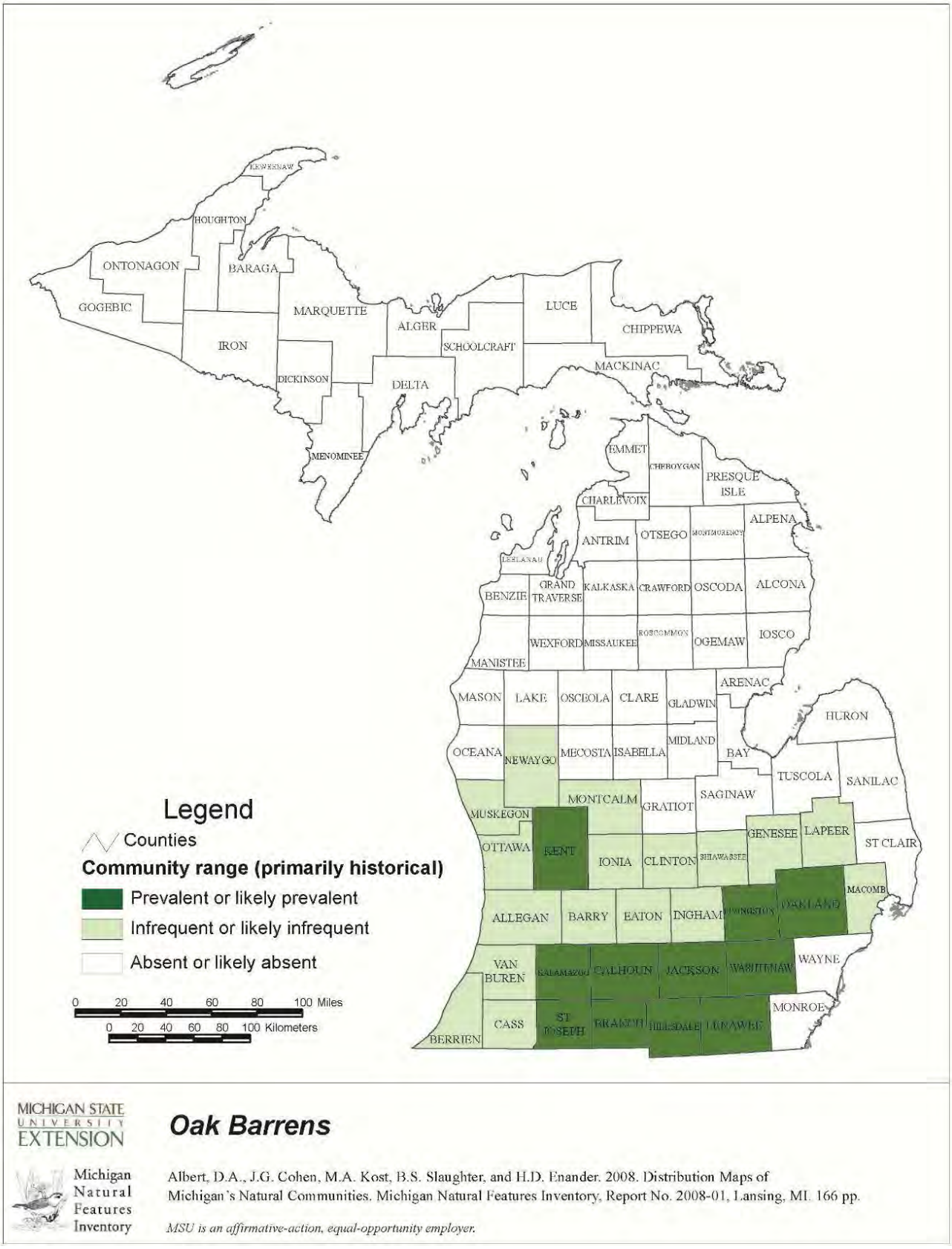
Map 1: Priority ecotypes for prescribed fire

Map 1 shows the area where red maple is found in association with white oak. Red maple is taking over and will take over upland white oak sites as white oak is harvested or dies out of the stand. This is a silviculture issue as the conditions necessary for white oak regeneration are not being met and red maple is out-competing white oak. This will be more of an issue in the near term as white oak starts to die off from old age. With climate change moving our forest systems towards the oak-hickory type, it is not prudent to let red maple take over. On these sites, re-introduction of fire into the system will prevent the red maple takeover. This is a priority forest type to treat with periodic prescribed fire and these efforts will be highly dependent upon communication and engagement with private landowners. They will require more resources related to prescribed fire. Addressing this issue has benefits for wildlife in terms of habitat, recreation in terms of game hunting, and for the conservation of biodiversity that depends on the upland oak community.



Map 2: Oak Barrens

Map 2 shows primary oak barrens communities in southern Michigan.



MICHIGAN STATE UNIVERSITY EXTENSION

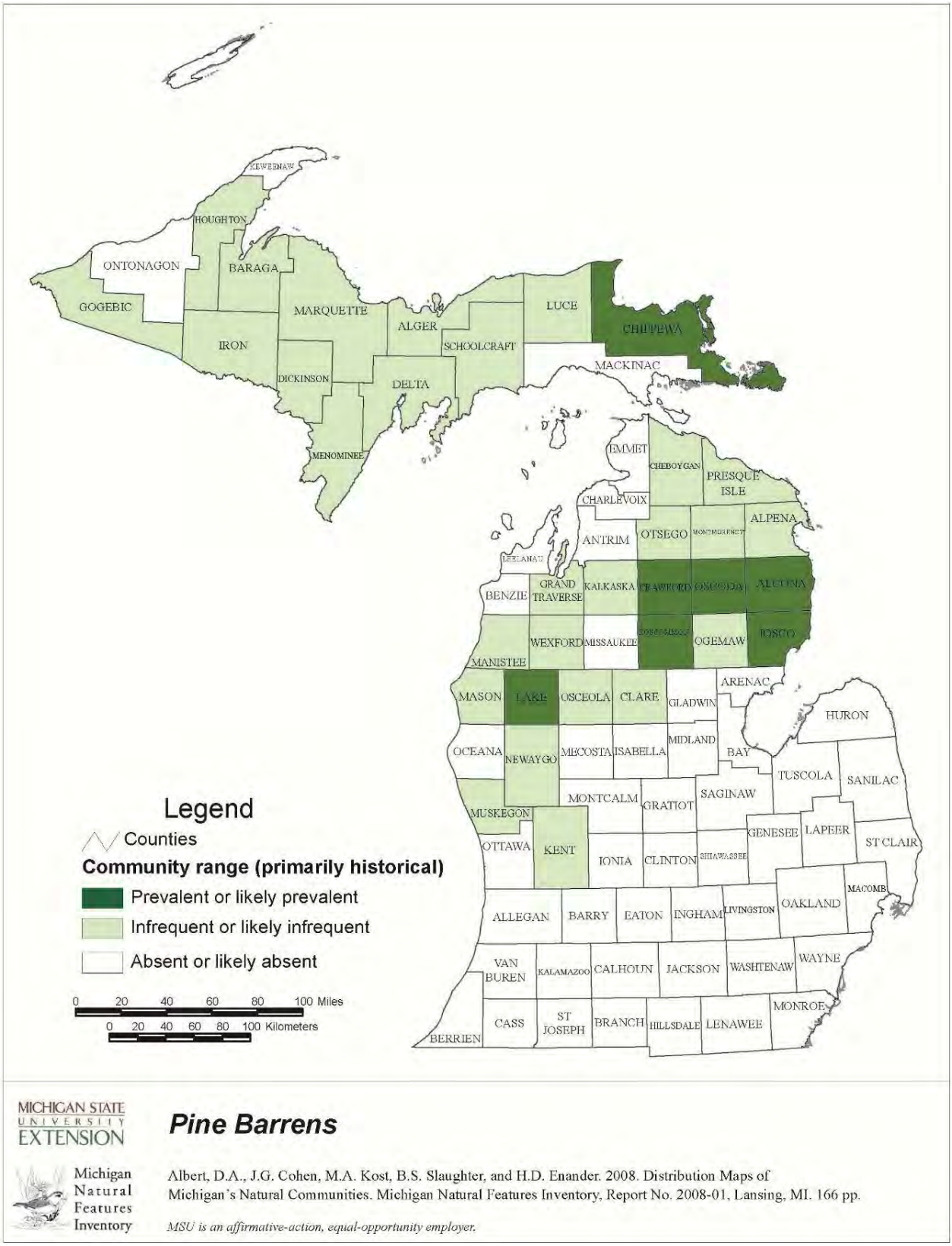
Michigan Natural Features Inventory

Oak Barrens

Albert, D.A., J.G. Cohen, M.A. Kost, B.S. Slaughter, and H.D. Enander. 2008. Distribution Maps of Michigan's Natural Communities. Michigan Natural Features Inventory, Report No. 2008-01, Lansing, MI. 166 pp.

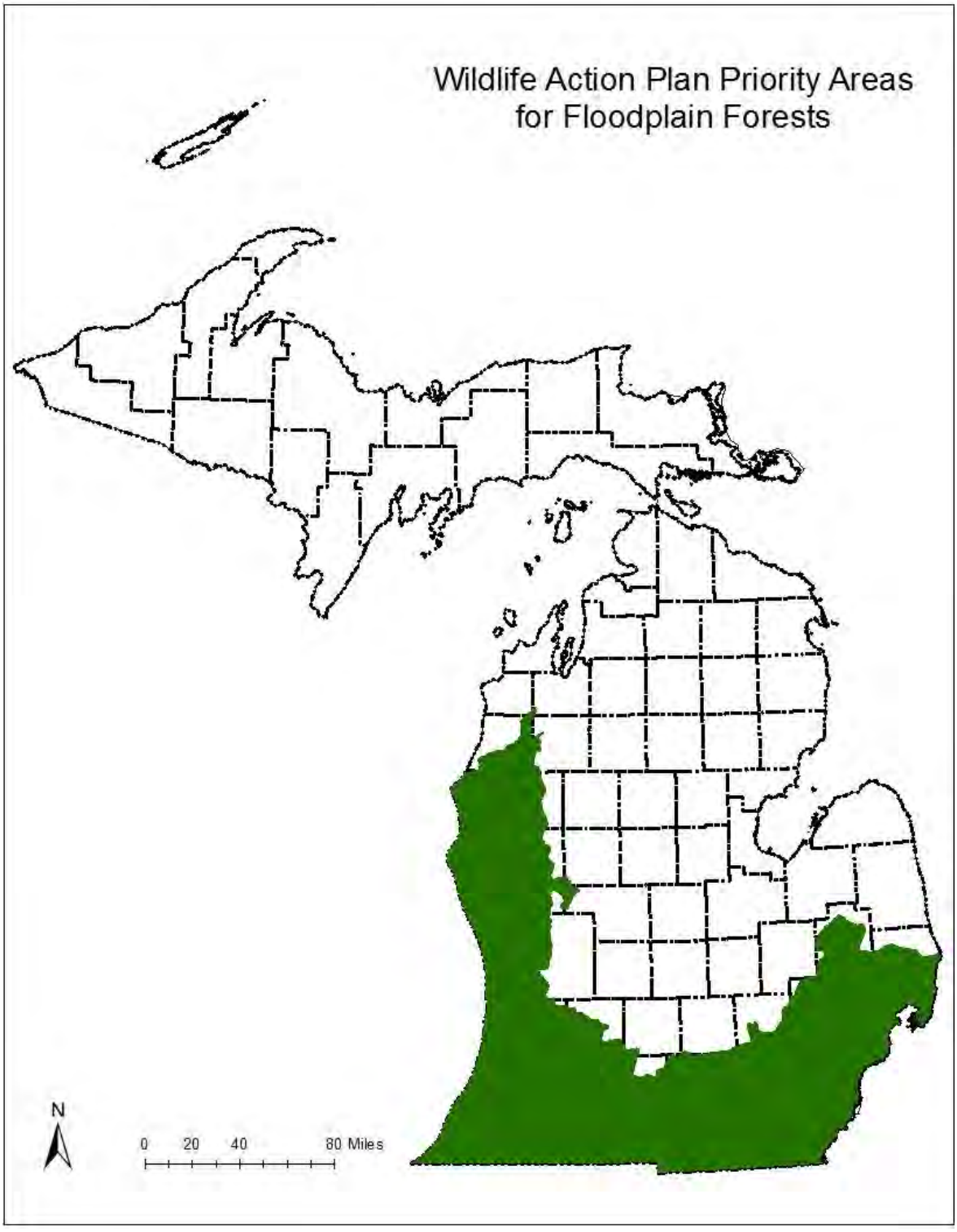
Map 3: Pine Barrens

Map 3 shows the extent of pine barrens across the state.



Map 4: Floodplain Forests

Map 4 shows floodplain forest in southern Michigan that are priority areas for the Wildlife Action Plan based on their focal species priorities. The Michigan Natural Features Inventory shows the broader range of floodplain forests in the state. The floodplain forests map is based on wildlife focal species occurrences in Cleland's level III and IV Ecoregions of Michigan. Focal wildlife include the cerulean warbler (state threatened), Indiana bat (federally and state endangered) and copperbelly water snake (federally threatened and state endangered).

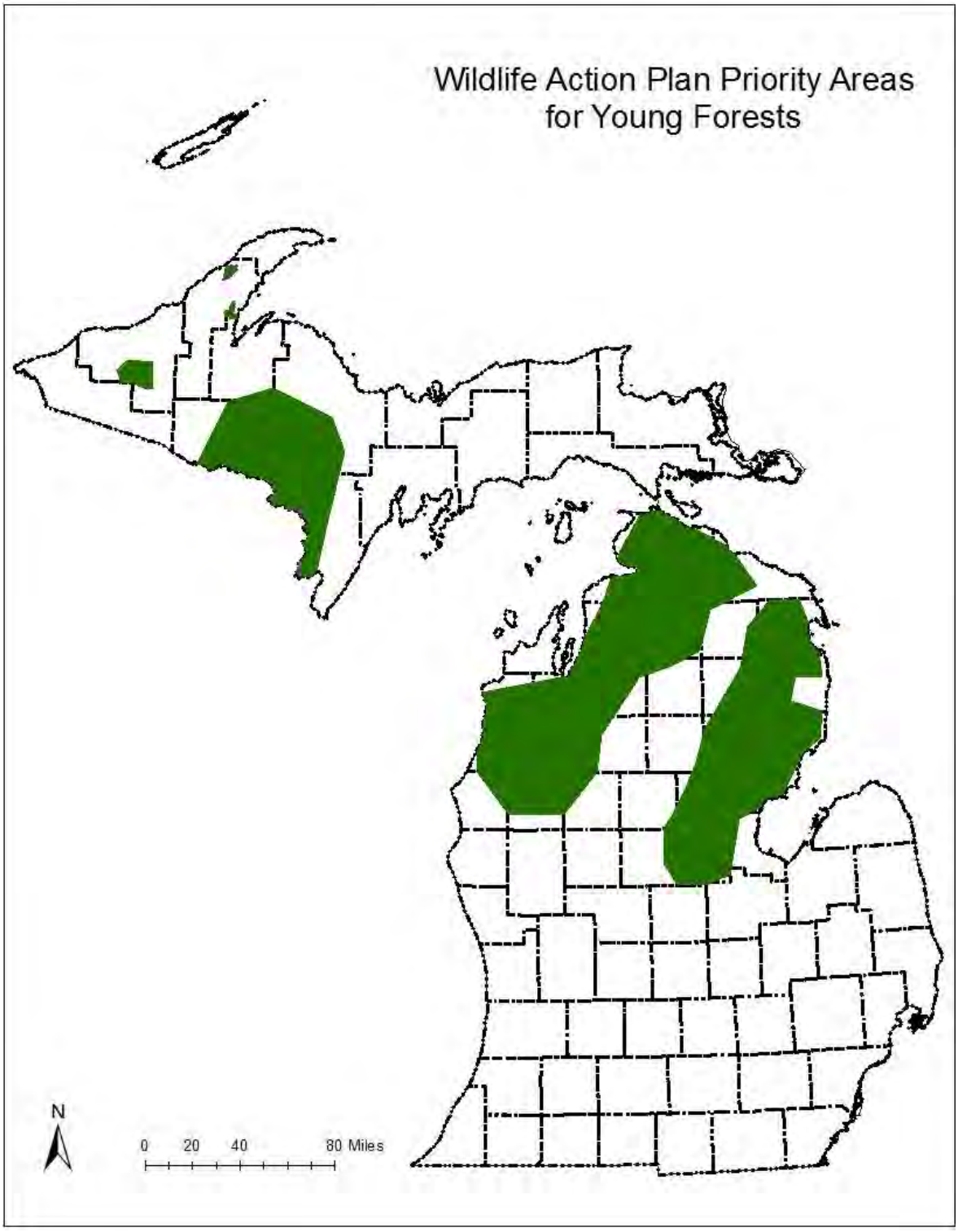


Map 5: Prairies and Savannas

The prairies and savannas map is based on wildlife focal species occurrences in Cleland's level III and IV Ecoregions of Michigan. Focal wildlife include: Karner blue butterfly (federally endangered and state threatened), frosted elfin butterfly (state threatened), rusty-patched bumble bee (federally endangered and state special concern), eastern Massasauga (federally endangered and state special concern), eastern box turtle (state special concern), blazing star borer (state special concern) and monarch butterfly.

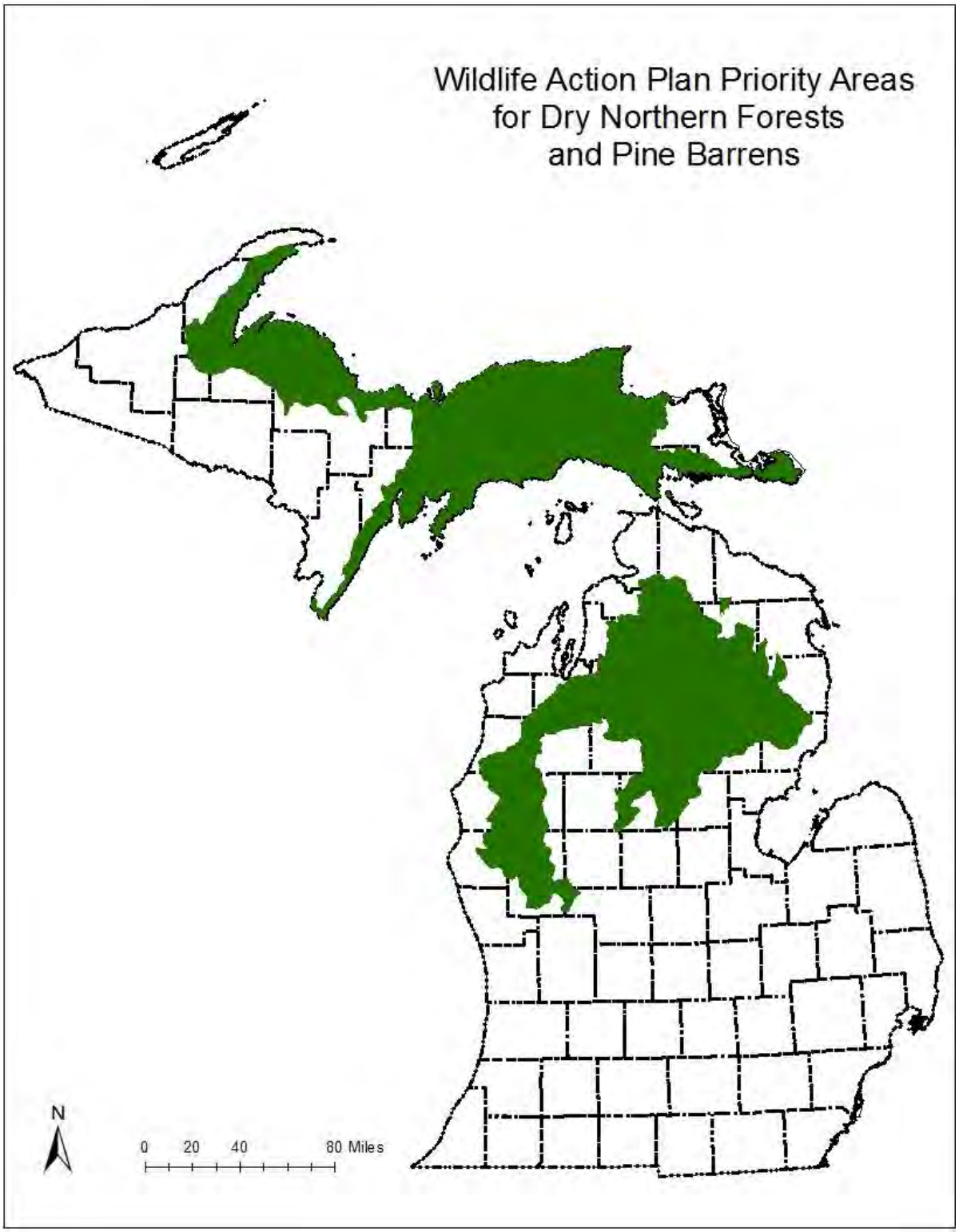
Map 6: Young Forests

Golden-winged warbler (state special concern) is the focal species used for identifying young forest priority areas. This map is based on the Golden-wing Warbler Breeding Season Conservation Plan.



Map 7: Dry Northern Forests and Pine Barrens

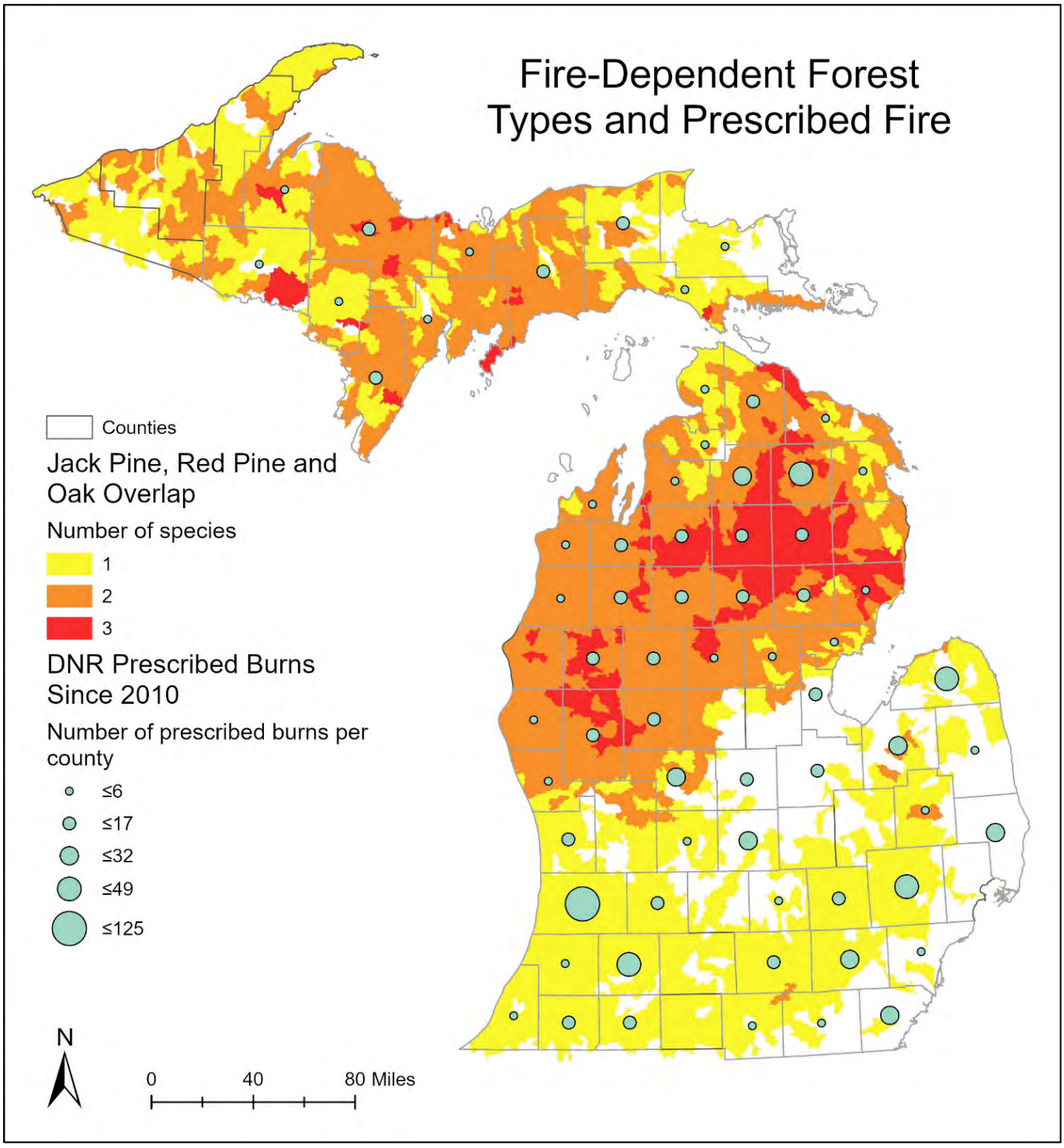
The dry northern forests and pine barrens map is based on wildlife focal species occurrences in Cleland's level IV Ecoregions of Michigan and priority Kirtland's warbler areas. Focal wildlife include: Kirtland's warbler (state endangered), dusted skipper (special concern), eastern Massasauga (federally threatened and state special concern) and secretive locust (special concern).



Map 8: Fire-dependent Forest Types and Prescribed Fire

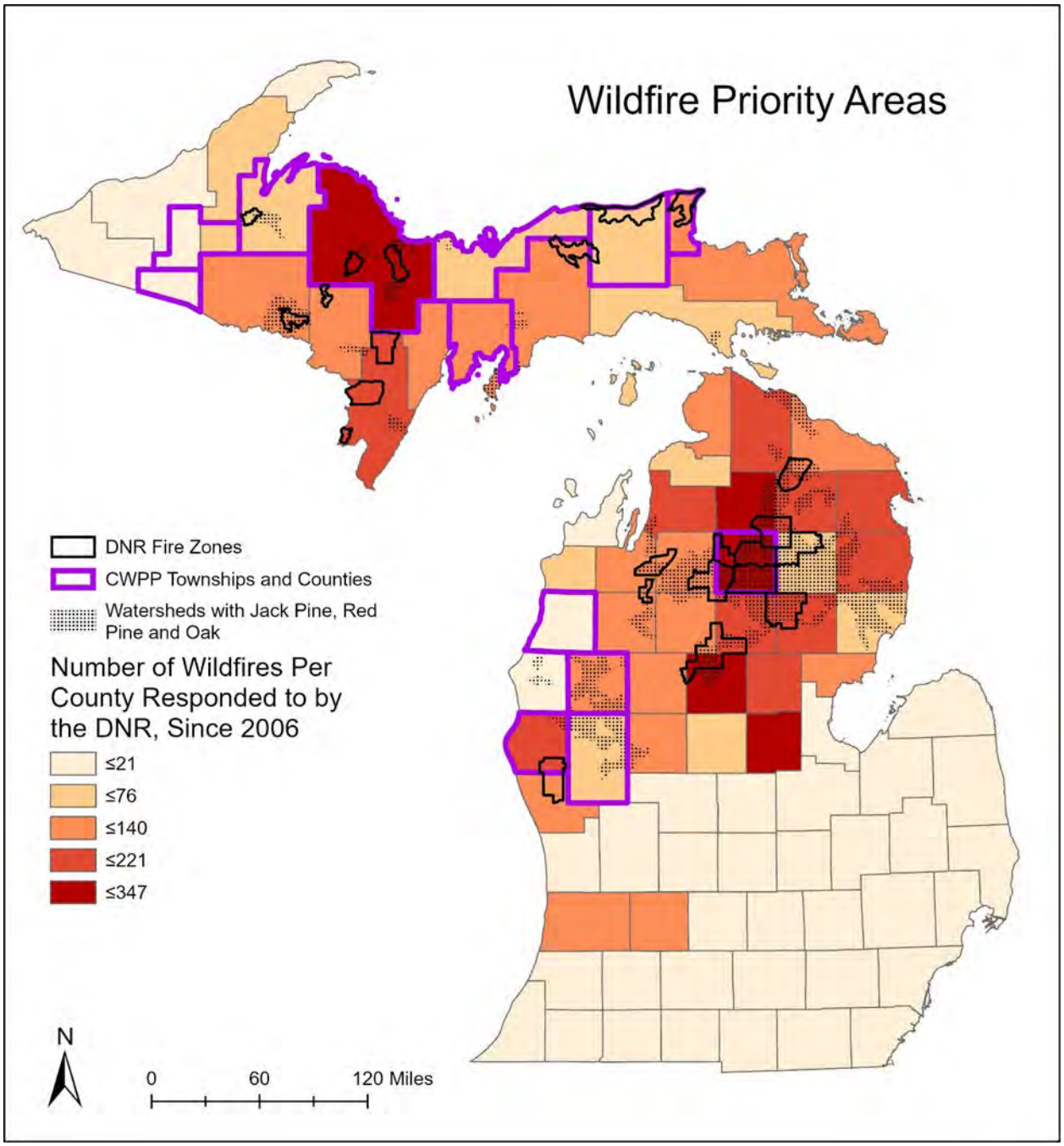
Map 8 shows the overlap of the three main fire-dependent forest types: jack pine, red pine and oak. These are also forest types that are most prone to wildfire. The map also shows the location of prescribed fire treatments implemented by DNR since 2010. Some have had repeated treatments, and most have been related to wildlife habitat, invasive species and fuel reduction treatments.

The area in the southern Lower Peninsula showing as one species is primarily white oak.



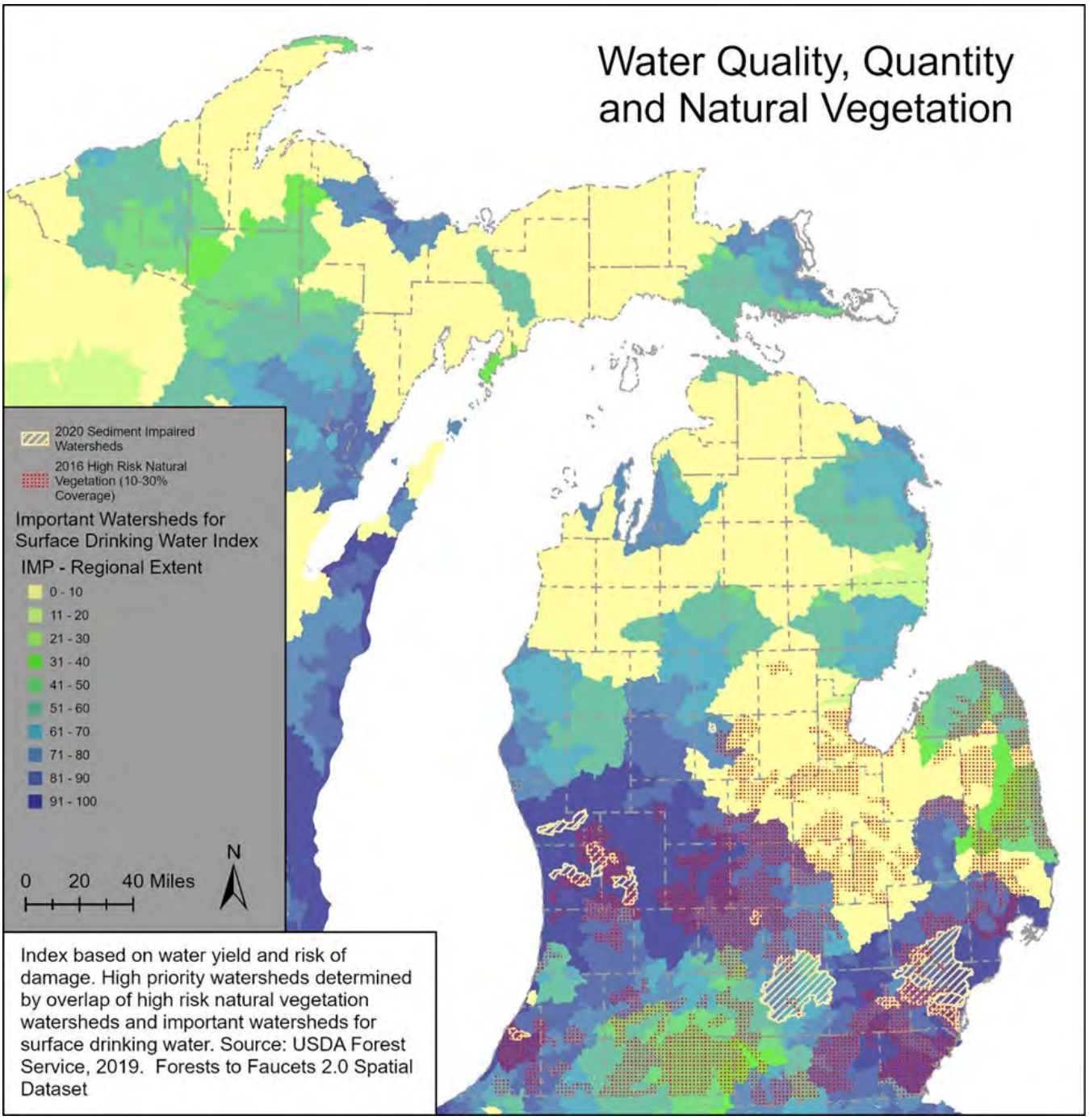
Map 9: Objectives Related to Wildfire

Map 9 shows the wildfire frequency across the state. Areas with the highest wildfire frequency tend to have multiple fire prone forest types (Map 8) or extensive areas of one or more of these forest types. The black polygons represent fires zones where wildfire response is a high priority. Counties that have existing Community Wildfire Protection Plans are outlined in purple. These plans need to be kept current. Areas of high wildfire frequency that do not have Community Wildfire Protection Plans are priority areas for plan development.



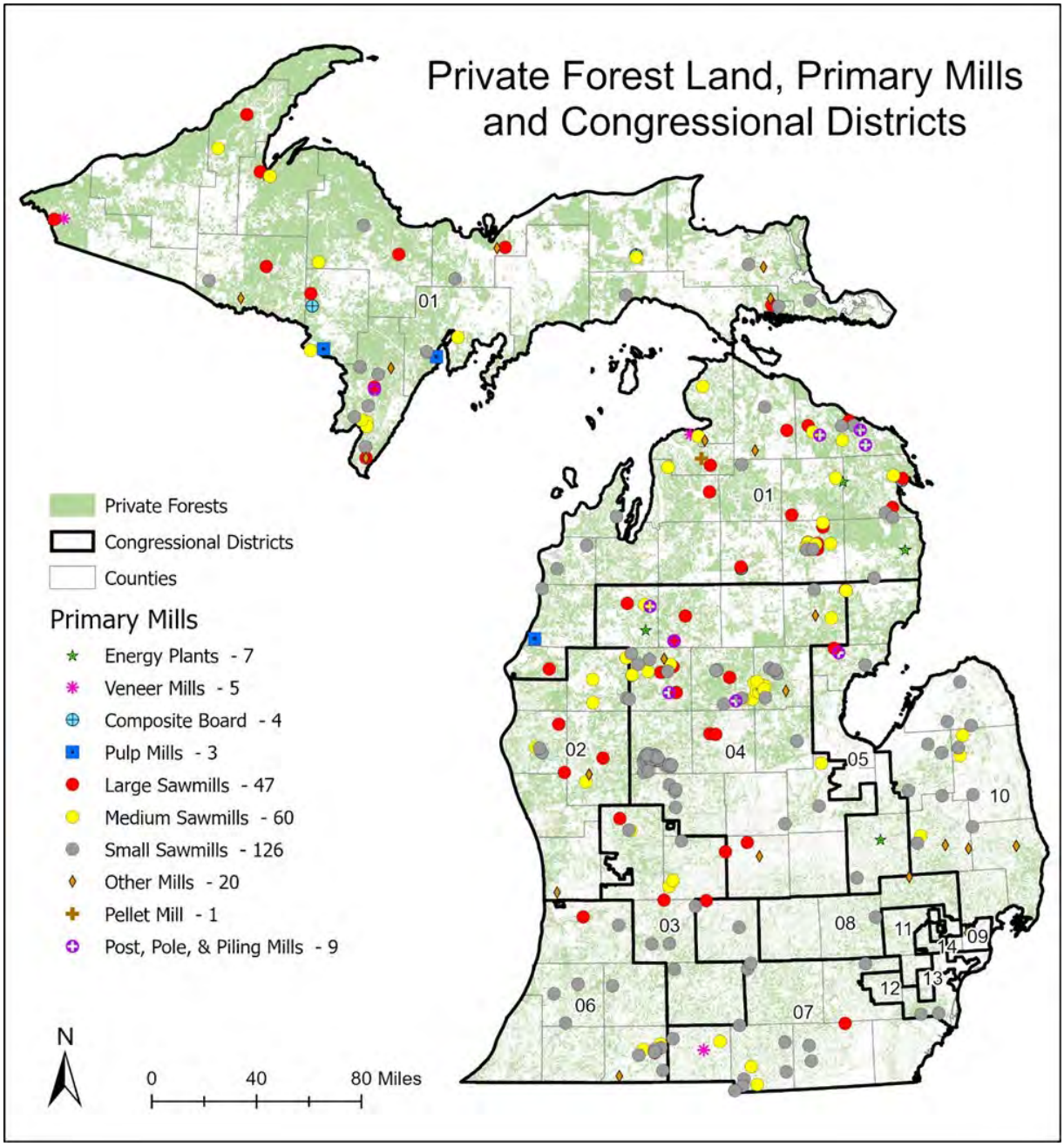
Map 10: Water Quality, Quantity and Native Vegetation

Map 10 identifies watersheds where surface water is very important for drinking water based on the Forest to Faucets assessment done by the USFS. It also shows the HUC12 watersheds where natural vegetation cover is very low or in jeopardy of further decline. Reforestation in these watersheds is a priority related to the protection of surface drinking water sources. Maintaining forest cover and improving infrastructure is important in all forests in Michigan near surface water.



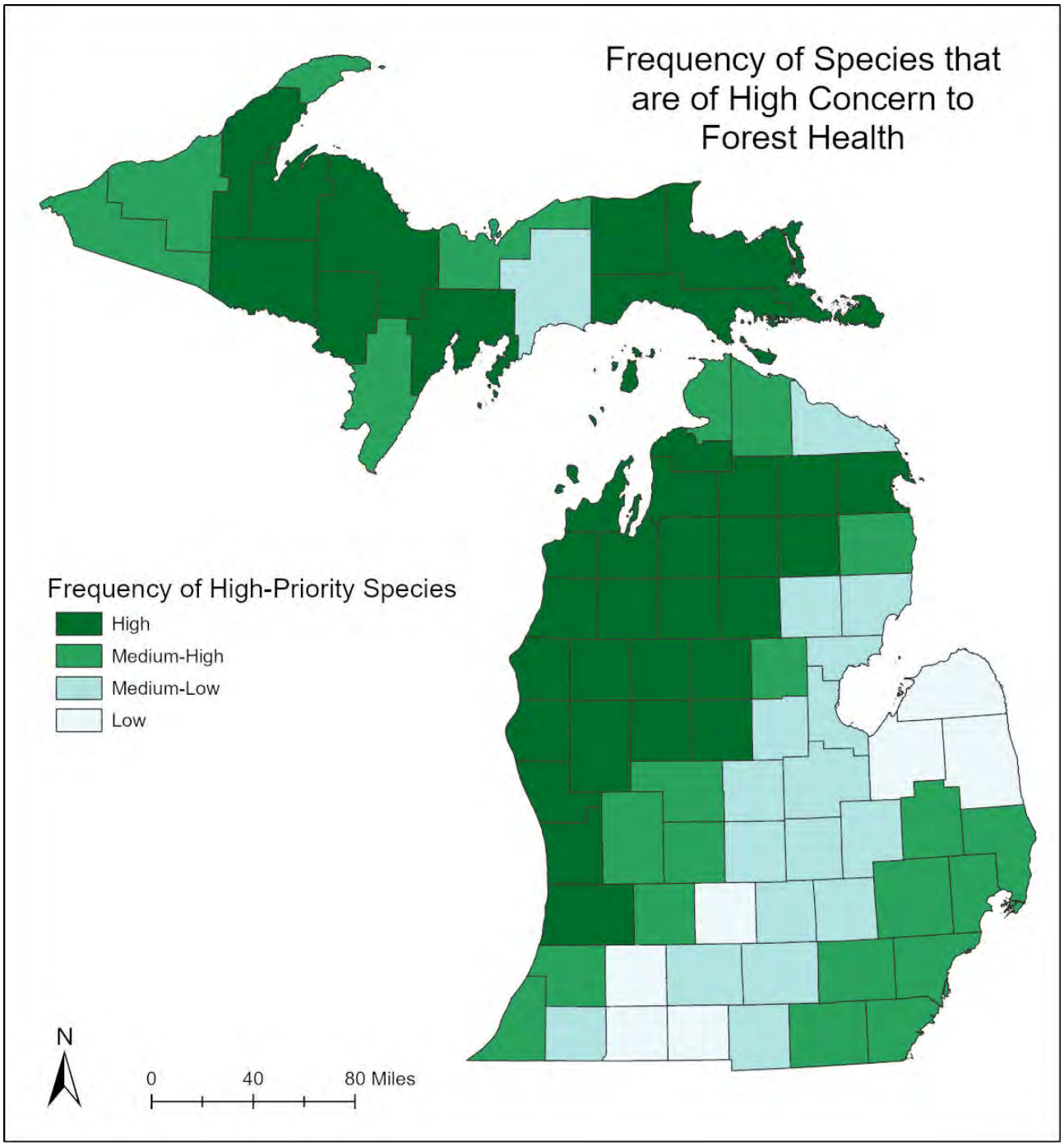
Map 11: Private Forest Land, Primary Mills and Congressional Districts

Map 11 shows private forest land and the location of primary forest product companies. All private forest land is less than 70 miles from a sawmill which is the average procurement radius.



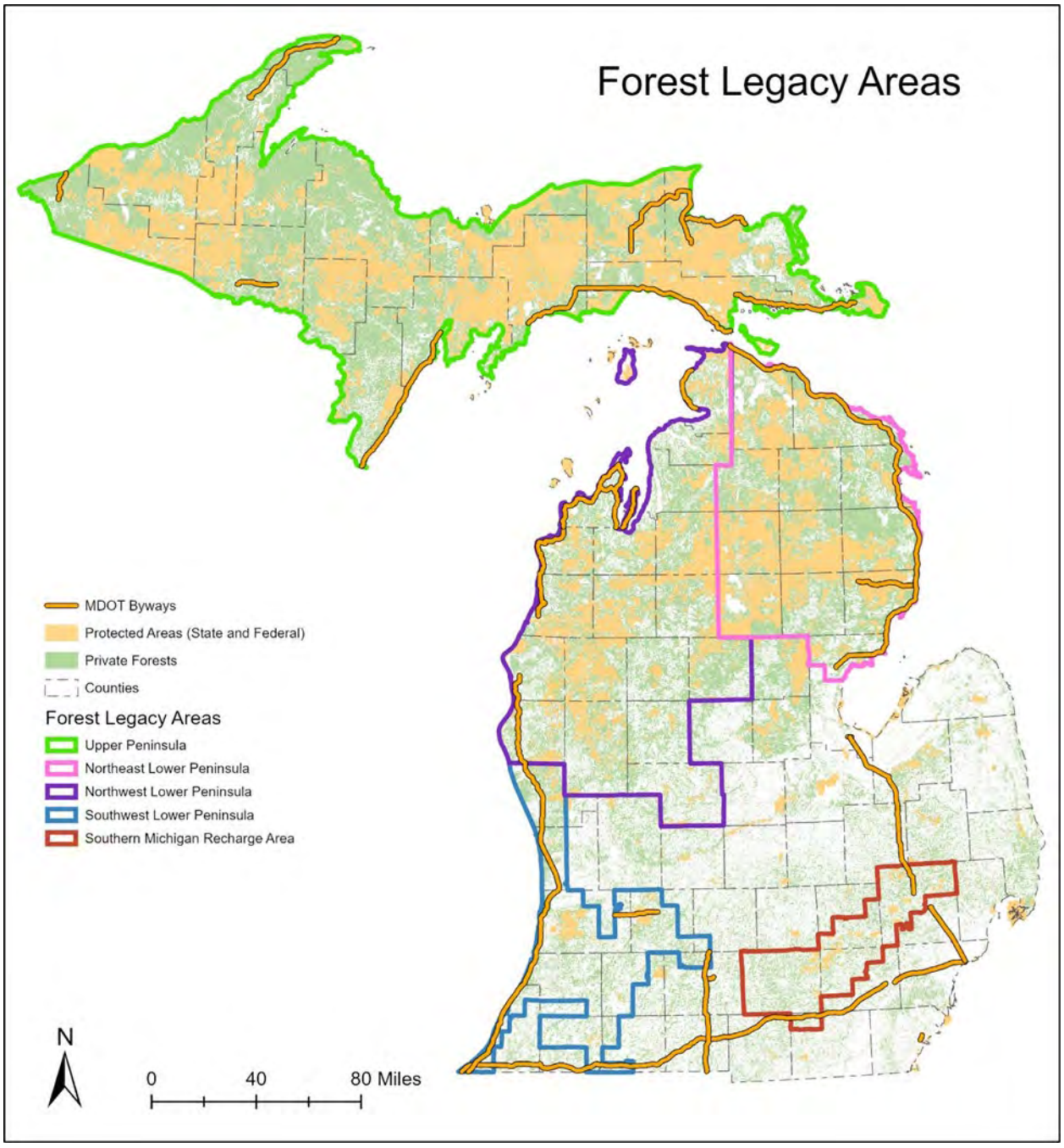
Map 12: Frequency of Species of High Concern for Forest Health

Map 12 identifies areas of concern and effort for Forest Health based on the frequency of species for which there is a forest health concern. These include areas where there is active work ongoing to contain existing threats such as oak wilt and hemlock wooly adelgid. Native pests and diseases consume about 25% of our forest health effort and with climate change, these forest health stressors could become some of our major concerns as they are well-established and thrive on stressed trees. They will also likely benefit from some aspects of climate change. The map also includes priority surveillance areas where new pests and/or diseases may show up in the next 10 years. Asian long-horn beetle could start anywhere in the state given the large host range. Beech leaf disease could most likely enter the state from the southeast, although there is some evidence that it may already be here in Barry and Mason counties. Spotted lantern fly is a concern along the southern border and may be closely tied to railroads, travel associated with recreation and importing with industrial pallets. Mountain pine beetle is coming from the northwest through jack pine stands and its first occurrence will likely be the western Upper Peninsula.



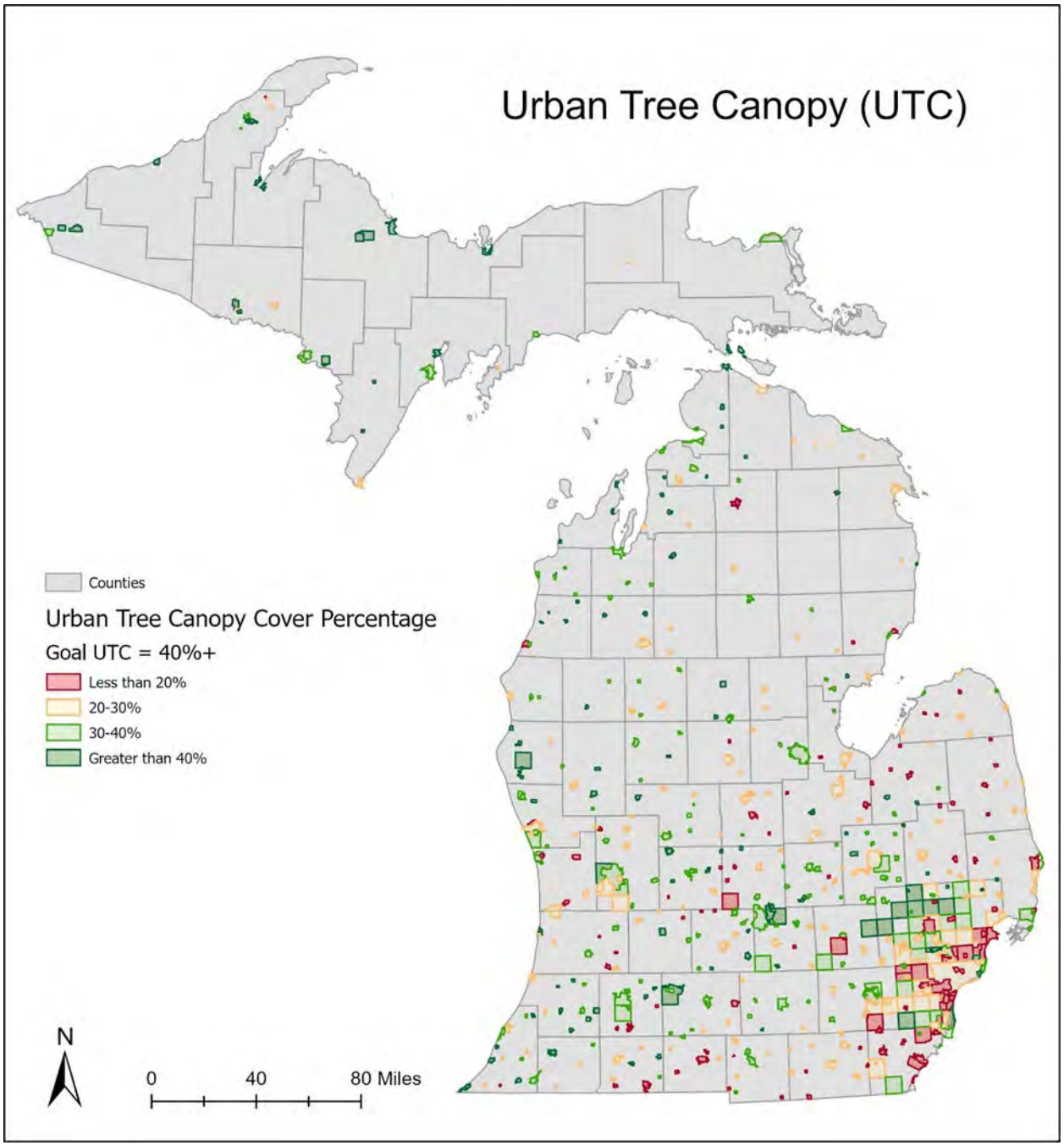
Map 13: Forest Legacy Areas

Map 13 shows the Forest Legacy Areas in the state, where forested private land is eligible for inclusion in the Forest Legacy Program. Properties eligible for inclusion in the Forest Legacy Program must be at least partially within the boundaries of any of the areas and must have a landowner willing to participate in the program. Participation may be through a fee sale of the property or through a conservation easement. The highest priority for inclusion in the program is usually given to larger parcels adjacent to existing protected areas that include characteristics such as quality forest conditions that have community support, important wildlife habitat, scenic value, ecologically significant resources, economic significance through traditional forest use, aquatic resources, cultural resources, water quality protection, public access, resistance to climate change and are under threat of conversion to non-forest conditions.



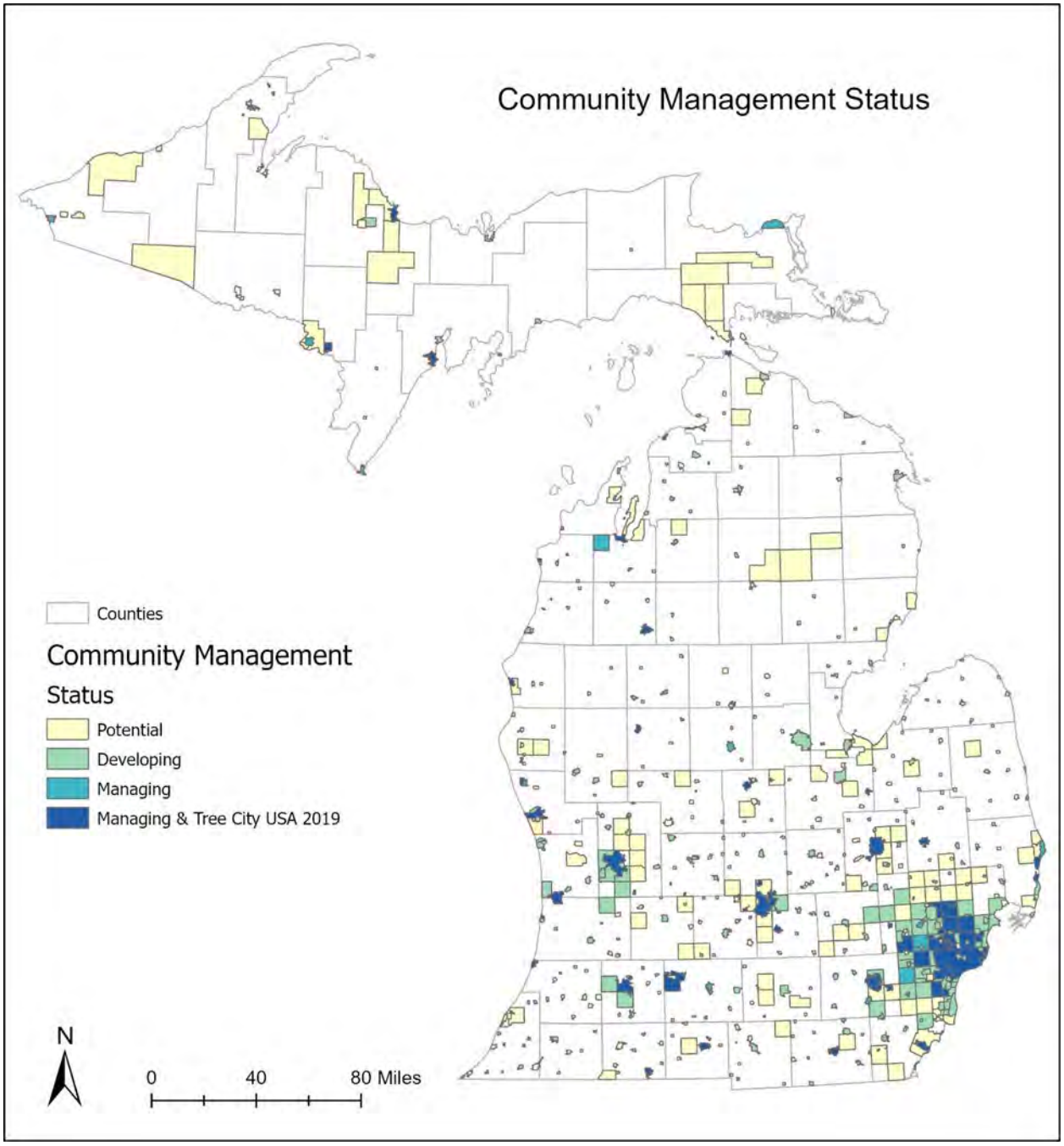
Map 14: Urban Tree Canopy

Map 14 shows selected communities in Michigan and their associated urban tree canopy cover. The goal is to have all communities with more than 40% tree canopy. The economic, ecological and social benefits of having tree canopy at or greater than 40% have important consequences for all people, but especially those who make those communities their home. It is important to address the shortfall in all communities with less than 40% canopy cover, but the highest priority for the next 10 years is in those communities that currently have between 30 and 40 percent canopy cover. Tree planting support will continue for all communities.



Map 15: Urban and Community Forestry - Community Management Status

Map 15 shows selected communities in Michigan with the status of urban tree management programs as well as those communities that have achieved Tree City USA status. The main priorities for the Urban and Community Forestry Program will be to focus on communities with developing urban tree management programs and encouraging more communities to achieve Tree City USA status. Communities that are already managing urban trees will continue to be supported and those with the potential to develop programs will also be supported and encouraged to start program development.



IMPLEMENTATION

Implementation of the Forest Action Plan is largely the responsibility of the five cooperative program leads collaboratively with stakeholders and private landowners using federal funding to supplement limited state and stakeholder funding. However, other staff in the DNR Forest Resources Division will play roles in coordination among the programs. These roles include communication and engagement, planning, monitoring and assessment, GIS services and reporting.

The Forest Stewardship Program is administered by a statewide coordinator and three service foresters. About 150 private sectors foresters develop custom Forest Stewardship Plans for landowners. The DNR provides a partial cost share for landowners to incentivize developing a more comprehensive plan than is required by the Commercial Forest and Qualified Forest programs, which drive most demand for forest management plans in Michigan. DNR staff monitor the implementation of Forest Stewardship Plans with landowner surveys that exceed the sample intensity required by the USFS. The program seeks to influence forests and landowners in ways beyond management plans by investing in forest certification, ecosystem services, professional development, organizational capacity and school forests. Additional state or federal funding would be invested in private sector partners, logger and forester training, and landowner outreach and engagement. DNR staff will work with many public and private sector partners to implement this Forest Action Plan.

Forest Legacy has only one specialist who is pulled in several other directions. One of our largest challenges is developing and security of forested landscape connections and corridors that permit northward movement of plant and animal species. Additional federal funding would help to address this issue through fee acquisition the establishment of conservation easements.

The Forest Health program has three specialists and a technician reporting to a program supervisor (who also oversees the Forest Stewardship and Urban and Community Forestry programs). Forest health was identified as one of the most important threats to Michigan's forests and will be a very high priority for the foreseeable future. Federal funding is a key part of addressing forest health issues as is cooperation with the Forest Service in collecting data, mapping and spatial analysis. Additional federal funding would further engage our stakeholders in all aspects of monitoring and in some cases of treatment.

The Urban and Community Forestry Program has one full-time specialist. Given the past and future interest in urban and community forestry, the program is understaffed. Federal support for another position would be most helpful and is identified as an objective in this planning period. The program will also continue to develop cooperation with Michigan State University which has recently begun the development of an Urban and Community Forestry program. Additional funding would also help the program access and assess relevant data in both the *i*-Tree and Urban FIA programs to further refine both research needs and specific program strategies and objectives in the second half of this planning period.

The Community Wildfire Protection Program has two specialists reporting to the state fire supervisor. The program will continue to work with Forest Service fire specialists, National Forest fire staff and community fire staff to address all aspects of protecting communities from the risk of wildfire. Additional federal funding could allow the program and the state to further develop prescribed fire as a management tool for silviculture and treatment of forest health issues as well as in the development of effectiveness monitoring protocols.

Communication and engagement were identified as important issues across all programs. It was also made clear that these issues could not and should not be addressed individually by each program, a coordinated program addressing the needs of all programs is warranted. Communication and engagement needs will be addressed in a much more coordinated fashion through two communication specialists in DNR Forest Resources Division supported by the cooperative program staff and assisted by the department's Marketing and Outreach staff and staff from Michigan State University forest extension program. Efforts would also be supported by the USFS Eastern Region communication specialists. This is especially important since implementation of the Forest Action Plan is highly dependent upon the active engagement of stakeholders.

Climate change was also identified as an issue that cut across all programs. Development of a climate action plan for the state will likely be pursued by government staff and implementation of identified mitigation and adaptation strategies will be supported by department specialists and staff specialists from the Northern Institute of Applied Climate Science.

Shared objectives between the Wildlife Action Plan and the Forest Action Plan will result in a closer working relationship with wildlife staff particularly in southern Michigan where private forest land dominates the landscape and there is not state forest.

MONITORING

Monitoring will consist of inventory, surveillance, conformance and validation monitoring (research). The process will be collaborative. Monitoring will be coordinated by DNR Forest Resources Division and the cooperative program leads and will involve federal agency partners, state agencies, universities, stakeholder and partner agencies and citizens through citizen-science projects. DNR Forest Resources Division will maintain and update the landscape assessment and contribute to forest health monitoring and the Forest Inventory and Analysis initiatives of the USFS. DNR Forest Resources Division will also consider coordinating a data clearing house to provide data or links to data that can be used for assessment and planning by all agencies and stakeholders and partners.

The DNR Forest Resources Division will continue to produce program reports and will add annual summaries of cooperative and collaborative projects as well as five- and 10-year reports on Forest Action Plan implementation.

REFERENCES AND LINKS

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Community Wildfire Protection Plans Story Map:
usfs.maps.arcgis.com/apps/MapJournal/index.html?appid=0cb28162e4ed41a8920beb0d567b643f
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Grand River Watershed:
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Great Lakes Indian Fish and Wildlife Commission: http://glifwc.org/
Great Lakes Restoration Initiative:
epa.gov/great-lakes-funding/great-lakes-restoration-initiative-glri
nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/initiatives/?cid=nrcsdev11_023903
Great Lakes Areas of Concern: epa.gov/great-lakes-aocs
List of Great Lakes Areas of Concern:
epa.gov/great-lakes-aocs/list-great-lakes-aocs
Map:
epa.gov/sites/production/files/2019-06/documents/aoc_map_b3_text_002.pdf
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epa.gov/great-lakes-aocs/beneficial-use-impairments-great-lakes-aocs
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Lake Erie Biodiversity Conservation Strategy:
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Landscape Conservation Initiatives:
nrcs.usda.gov/wps/portal/nrcs/main/national/programs/initiatives/
Michigan Association of Regions: miregions.com/
Michigan Invasive Species: michigan.gov/invasives/
Michigan Karst Conservancy: caves.org/conservancy/mkc/index.html
Michigan Statewide Comprehensive Outdoor Recreation Plan:
michigan.gov/documents/dnr/SCORP_2018_2022_Draft_599512_7.pdf
Michigan Wildlife Action Plan:
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Midwest Glacial Lakes Conservation Planner:
midwestglaciallakes.org/grant/
ifrshiny.seas.umich.edu/mglp/
Montreal Process: montrealprocess.org/
National Landscape Conservation System:
fs.fed.us/rm/pubs/rmrs_p064/rmrs_p064_185_189.pdf
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nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid=stelprdb1047761
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northeasternwildfire.net/
forestsandrangelands.gov/documents/strategy/rsc/northeast/NERSAugust2012update_LB.pdf
Northeast Wildfire Preparedness Resource Guide:
Northern Institute of Applied Climate Science: https://www.nrs.fs.fed.us/niacs/
Ottawa National Forest: fs.usda.gov/ottawa/
2006 Plan: fs.usda.gov/main/ottawa/landmanagement/planning
Preparing Community Wildfire Protection Plans:
fs.fed.us/projects/hfi/field-guide/web/page15.php
Saginaw Bay Watershed Initiative Network:
saginawbayrcd.org/watersheds.shtml
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U.S. Census Bureau: census.gov/
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National Association of State Foresters: stateforesters.org/forest-action-plans/
National Woodland Owners Survey: fia.fs.fed.us/nwos/
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Working Lands for Wildlife: Blanding's turtle (Emys blandingii): en.wikipedia.org/wiki/Blanding%27s_turtle nrcs.usda.gov/wps/portal/nrcs/detail/national/plantsanimals/fishwildlife/?cid=stelprdb1046975

APPENDIX I

Planning Team and Stakeholder List

Planning Team

Agency	Name	Title
Team Lead	Scott Jones	Forest Management Planning Specialist
Forest Legacy Program	Kerry Wieber	Resource Specialist
Forest Health Program	Sue Tangora	Forest Health and Cooperative Programs Section Manager
Forest Health Program	James Wieferich	Forest Health Resource Analyst
Forest Stewardship Program	Mike Smalligan	Resource Specialist
Urban and Community Forestry Program	Kevin Sayers	UCF Program Coordinator
Community Wildfire Protection Program	Dan Laux	State Fire Supervisor
Community Wildfire Protection Program	Paul Rogers	Fire Prevention Specialist
Field Planner	John Hamel	Inventory and Planning Specialist Forester
Communications	Kathleen Lavey	Communications Representative
Communications	Rachel Coale	Communications Representative
Forest Socioeconomics	Jagdish Poudel	Forest Economist
Management	David Price	Forest Planning and Inventory Unit Supervisor
Management	Debbie Begalle	FRD Chief, State Forester (retired)
Management	Jeff Stampfly	Acting FRD Chief, State Forester
GIS Support	John Spitzley	GIS Resource Specialist
GIS Support	Paige Gebhardt	GIS Resource Analyst
GIS Support	Holly Reed	GIS Resource Analyst
GIS Support	Anna Boruszewski	GIS Resource Analyst
Wildlife Division, Action Plan	Amy Derosier	Planning and Adaptation Section Supervisor
Wildlife Division, Action Plan	Erin Victory	Wildlife Ecologist
Parks and Recreation Division, SCORP	Anna Sylvester	Field Coordinator (retired)
Parks and Recreation Division, SCORP	Heidi Frei	Natural Resources Steward
Department of Agriculture and Rural Development	Ben Schram	Forester

Note: A draft of the Michigan 2020 Forest Action Plan was shared with the Natural Resources Conservation Service of Michigan Technical Committee for their review and comments.

Stakeholders

Forest Action Plan development was assisted by an extensive stakeholder engagement process. The following table lists attending stakeholder groups and representatives with category designations.
Categories for stakeholder list table:

- **CONS** - Consulting company
- **FA** - Federal agency
- **FIND** - Forest industry
- **GA** - Government agency
- **GC** - Governance committee
- **IA** - Industrial agency

- **MGA** - Municipal government agency
- **NFI** - Non-forest industry
- **NGO** - Non-government organization
- **SA** - State agency
- **UNIV** – University

Category	Stakeholder group	Representative
CONS	Association of Consulting Foresters & Grossman Forestry	Gerry Grossman
CONS	Davey Tree Expert Company	Lee Mueller/Kerry Gray
FA	Bureau of Indian Affairs	Scott Verdin
FA	Camp Grayling	Cullen Haesler/Matt Klietch
FA	Detroit River International Wildlife Refuge	Susan White
FA	Hiawatha National Forest	Christopher Williams
FA	Hiawatha National Forest, West Ranger District	David Osmak
FA	Huron-Manistee National Forests	Christopher Frederick/Trevor Hobbs
FA	National Park Service Isle Royale	Phyllis Green
FA	National Park Service Pictured Rocks	Bruce Leutscher
FA	National Park Service Sleeping Bear Dunes	Julie Christian
FA	Natural Resource Conservation Service	Andy Henriksen
FA	Ottawa National Forest	Marlanea French-Pombier
FA	Seney National Wildlife Refuge	Sara Siekierski
FA	US Fish and Wildlife Service - Shiawassee Wildlife Refuge	Pamela Repp
FA	US Fish and Wildlife Service East Lansing Office	Scott Hicks
FA	US Fish and Wildlife Service, Marquette	Katie Koch
FA	USDA APHIS PPQ	Craig Kellogg
GC	Michigan Prescribed Fire Council	Michelle Richards
GC	Forest Stewardship Council	Amy Clark Eagle
GC	Stewardship Advisory Council	Jeff Breuker
GC	NRCS Michigan Technical Committee*	Greg Elliott
GC	Timber and Forest Products Advisory Council	Warren Suchovsky
GC	Timber Advisory Council & Edward Lowe Foundation	Mike McCusition
GC	Timber Advisory Council & Michigan Biomass	Gary Melow
GC	Urban and Community Forestry	Barb Bennett
GC	Urban & Community Forestry Committee	Dean Hay
IA	Arboriculture Society of Michigan	Julie Stachecki/Annie Kruise
IA	Great Lakes Timber Professionals Association	Mike Elenz/Henry Shienebeck
IA	Lake States Lumber Association	Jim Maltese/Rob Paradise
IA	Michigan Association of Timbermen	Glen Tolksdorf
IA	Michigan Association of Timbermen	Wes Windover
IA	Michigan Forest Products Council	Scott Robbins/Raymond Gurley
IA	Michigan Green Industry Association	Diane Banks
FIND	Arauco and Michigan Forest Products Council	Tony Fox
MGA	Dept of Parks and Recreation, Grand Rapids	Dan Coy
MGA	East Michigan Council of Governments	Bill Ernat
MGA	Networks Northwest	Mathew Cooke
MGA	Northwest Council of Governments	Kathy Egan
MGA	Southeast Michigan Council of Government	Kelly Krall

Category	Stakeholder group	Representative
MGA	West Michigan Shoreline Regional Development Commission	Gale Nobes
MGA	West Michigan Shoreline Regional Development Commission	Jamie Way
FA	Michigan Association of Conservation Districts	Lori Phalen
FA	Michigan Association of Conservation Districts	Drew Rayner
FA	Michigan Association of Conservation Districts (NC CISMA)	Vicki Sawicki
NFI	International Transmission Company	Charles DeVries
NFI	Farm Bureau	Stanley Johns
NFI	DTE Energy	Garry Tolar
NFI	Farm Services Agency	Dale Allen
NFI	International Transmission Company	Gary Kirsh
NFI	International Transmission Company	Mark Yoders
NFI	Michigan Farm Bureau – Forestry Subcommittee	Tess Van Gorder
NFI	Michigan Oil and Gas Association	Erin McDonough
NGO	Friends of Grand Rapids Parks	Lauren Davis
NGO	Huron Pines	Lisha Ramsdell
NGO	Huron Pines	Steve Woods
NGO	Kalamazoo Nature Centre	Anna Kornoelje
NGO	Little Traverse Conservancy	Derek Shiele
NGO	Little Traverse Conservancy	Becky Wadleigh
NGO	MATSIF	Brian LeBouef
NGO	Michigan Arbor Day Alliance	Hannah Reynolds
NGO	Michigan Audubon Society	Linnea Rouse
NGO	Michigan Environmental Council	Brad Garmon
NGO	Michigan Forest Association	Debra Huff
NGO	Michigan Forestry and Parks Association	Jim Kielbaso
NGO	Michigan Nature Association	Andy Bacon
NGO	Michigan Nature Conservancy	Rich Bowman
NGO	Michigan Resource Stewards	Cara Boucher
NGO	Michigan United Conservation Clubs	Carol Rose
NGO	North Country Trail Association	Ken Wawsczyk
NGO	ReLeaf Michigan	Melinda Jones
NGO	Ruffed Grouse Society	Heather Shaw
NGO	Sierra Club	Marv Roberson
NGO	Superior Watershed Partnership	Carl Lindquist
NGO	The Greening of Detroit	Lionel Bradford
NGO	Trout Unlimited	Nichol DeMol
SA	DNR Parks and Recreation Division	Nikki Van Bloem
SA	MDNR Trail Specialist	Paige Perry
SA	Michigan Department of Agriculture and Rural Development	Robert Miller
SA	MDARD Forestry Assistance Program	Ben Schram
SA	Michigan Department of Transportation	Todd Neiss
SA	Michigan Dept of Energy, Great Lakes and Environment	Anne Garwood
UNIV	Grand Valley State University	Alexandra Locher
UNIV	Michigan State University	Rich Kobe

Category	Stakeholder group	Representative
UNIV	Michigan State University (Urban Forestry)	Asia Dowtin
UNIV	Michigan Technological University	Andrew Storer
UNIV	University of Michigan	Ines Ibanez
UNIV	Michigan Natural Features Inventory	Josh Cohen

APPENDIX II

Multi-State Priorities

There are several initiatives that involve Michigan but are large enough to include other jurisdictions. These are included here because their goals and objectives are consistent with or address some of the strategies and actions of Michigan's 2020 Forest Action Plan. Grant applications for cooperative program financial support pursuant to the Forest Action Plan will be given higher consideration if the proposals also address one or more of the objectives of these initiatives. Grant applicants are encouraged to explore the information related to these initiatives as they develop their proposals to identify common actions and outcomes.

Great Lakes Basin Initiatives

The Great Lakes — Superior, Michigan, Huron, Erie and Ontario — hold about 21 percent of the world's fresh surface water, providing habitat for a variety of fish and wildlife and drinking water for more than 40 million people. Recreational and commercial fishing are among the region's major industries and the lakes facilitate transportation and commerce in the nine jurisdictions that border them. Jurisdictions that cooperate in management of the Great Lakes are Illinois, Wisconsin, Minnesota, Ontario, Michigan, Indiana, Ohio, Pennsylvania and New York.

Great Lakes Regional Collaboration and Strategy

Governors of the Great Lakes states established a list of nine priorities to guide the restoration and protection of the largest single source of fresh surface water in the world. They are:

1. Ensure the sustainable use of our water resources while confirming that the states retain authority over water use and diversions of Great Lakes waters.
2. Promote programs to protect human health against adverse effects of pollution in the Great Lakes ecosystem.
3. Control pollution from diffuse sources into water, land and air.
4. Continue to reduce the introduction of persistent bio-accumulative toxics into the Great Lakes ecosystem.
5. Stop the introduction and spread of non-native aquatic invasive species.
6. Enhance fish and wildlife by restoring and protecting coastal wetlands, fish and wildlife habitats.
7. Restore to environmental health the Great Lakes Areas of Concern identified by the International Joint Commission as needing remediation.
8. Standardize and enhance the methods by which information is collected, recorded and shared within the region.
9. Adopt sustainable use practices that protect environmental resources and may enhance the recreational and commercial value of our Great Lakes.

Through the Great Lakes Regional Collaboration, the Great Lakes governors partnered with members of Congress, state agencies, mayors, tribal leaders and more than 1,500 stakeholders to develop a comprehensive restoration and protection strategy for the Great Lakes. The Great Lakes governors continue to lead aggressive state action and are partnering with other collaboration members to turn the strategy's recommendations into reality.

Great Lakes Restoration Initiative

This initiative, led by the U.S. Environmental Protection Agency, targets the most significant problems in the region, including invasive aquatic species, nonpoint-source pollution and contaminated sediment. The Environmental Protection Agency and its federal partners are coordinating with state, tribal, local and forest industry entities to protect, maintain and restore the chemical, biological and physical integrity of the Great

Lakes. To date, the U.S. Forest Service, Eastern Region, state and private forest program alone has administered grants for nearly 100 projects that will plant tens of thousands of trees and treat hundreds of acres of contaminated brownfields.

The Great Lakes Restoration Initiative was launched in 2010 with Natural Resources Conservation Service as one of several federal agency partners. Great Lakes Restoration Initiative helps Natural Resources Conservation Service accelerate conservation efforts on private lands located in targeted watersheds throughout the region. NRCS works with farmers and landowners to combat invasive species, protect watersheds and shorelines from non-point source pollution and restore wetlands and other habitat areas.

NRCS is also working with partners in the eight U.S. Great Lakes states. Through financial and technical assistance, NRCS helps private landowners with conservation planning and practices such as cover crops, conservation crop rotations, filter strips, prescribed grazing, and wetlands restoration.

Other Great Lakes Basin Initiatives or Projects:

The Grand River Urban Waters Federal Partnership is a business and community-led effort to restore the Grand River through downtown Grand Rapids, beginning with recreating the namesake rapids. The Grand River is the longest river in Michigan and a tributary to Lake Michigan.

In Michigan, the National Water Quality Initiative is focused on Pigeon Creek, located in Ottawa County and flowing into Lake Michigan at Port Sheldon, and Hayworth Creek located in Clinton County and flowing into the Grand River at Muir.

The Detroit River goes along the U.S.-Canadian border and divides the major metropolitan areas of Detroit, Michigan and Windsor, Ontario, winding through an area home to 5.7 million people. This 32-mile long American Heritage River is an important natural resource amidst an urban environment. It offers outdoor recreation and wildlife access that residents would not otherwise have. In downtown Detroit, efforts include work by the City of Detroit to engage youth, particularly from underserved minority communities, to help with waterfront and river restoration work.

The Detroit River Restoration Project will connect parks throughout the riparian corridor via trails and an extended boardwalk, providing improved land-based recreational opportunities that will benefit underserved minority populations. In addition, the project aims to reopen the city’s only access point for fishing and boating and improve access to the river.

Midwest Glacial Lakes Fish Habitat Partnership

The Midwest Glacial Lakes Fish Habitat Partnership works to protect, rehabilitate, and enhance sustainable fish habitats in glacial lakes larger than 10 acres.

The partnership provides a forum for sharing programs, strategies and techniques that have proven their worth but have not yet been applied at a larger, regional scale. The goals are to protect and maintain intact and healthy lake systems; prevent further degradation of fish habitats that have been adversely affected; reverse declines in the quality and quantity of aquatic habitats in lakes to improve the overall health of fish and other aquatic organisms; and increase the quality and quantity of fish habitats in lakes that support a broad natural diversity of aquatic species.

The partnership uses its grant funding and other resources to conduct scientific assessments to determine the condition and threats to fish habitats; enable partners to complete habitat conservation projects; offer education and outreach; and proved a forum for those seeking inland lake fish habitat conservation to share strategies and resources.

Urban Waters Federal Partnership Grant Locations

The Urban Waters Federal Partnership reconnects urban communities, particularly those that are overburdened or economically distressed, with their waterways by improving coordination among federal agencies and collaborating with community-led revitalization efforts to improve our nation's water systems and promote their economic, environmental and social benefits. It breaks down federal program silos to

promote more efficient and effective use of federal resources; works with local officials and community organizations to leverage area resources and stimulate local economies; and learn from early and visible victories to fuel long-term action.

Landscape Conservation Initiatives

Honey Bee Initiative

One out of every three bites of food in the United States depends on honeybees and other pollinators. Honeybees pollinate $15 billion worth of crops each year, including more than 130 fruits and vegetables. Managed honeybees are important to American agriculture because they pollinate a wide variety of crops, contributing to food diversity, security and profitability.

Working Lands for Wildlife

Through Working Lands for Wildlife Program, the U.S. Department of Agriculture uses a win-win approach to systematically target conservation efforts to improve agricultural and forest productivity which enhance wildlife habitat on working landscapes. Target species are used as barometers for success because their habitat needs are representative of healthy, functioning ecosystems where conservation efforts benefit a much broader suite of species. The targeted species for Michigan is Blanding's turtle (*Emys blandingii*).

Karst Topography Areas

Karst topography areas have geology of limestone or other soluble rock that is characterized by caves, sinkholes and sinking streams. These areas are important for native bat populations, which are being impacted by white-nose syndrome, as well as other threats. Efforts in Michigan are being coordinated by the Michigan Karst Conservancy.

Climate Change Response Framework (Midwest) Regions

The Climate Change Response Framework (https://forestadaptation.org/) is a collaborative, cross-boundary approach among scientists, managers and landowners to incorporate climate change considerations into natural resource management.

Demonstration projects (https://forestadaptation.org/) are real-world examples of how managers have integrated climate considerations into natural resource management planning and activities. These projects use the partnerships and resources developed through the framework to test new ideas and actions for responding to changing conditions. Demonstrations come in all shapes and sizes, showcasing a variety of adaptation actions that achieve diverse land management goals.

Each Climate Change Response Framework project provides an integrated set of tools, partnerships and actions to support climate-informed conservation and management.

Green Ribbon Initiative

The Green Ribbon Initiative (oakopenings.org/) is a partnership of conservation groups working together for many years to protect the natural beauty and biological diversity of the Oak Openings Region. While GRI was originally formed in northwestern Ohio in 2000, the partnership has since been broadened to include partners from the Oak Openings Region of southwest Michigan. The GRI is a shared vision of public and private organizations, landowners and individuals working to conserve, enhance and restore critical natural areas in the Oak Openings Region of northwest Ohio and southeast Michigan.

White Oak Initiative

The White Oak Initiative is a collaboration working to ensure the long-term sustainability of America's white oak and the economic, social and conservation benefits derived from white oak dominated forest. It works to ensure the long-term sustainability of America's white oak and the economic, social and conservation benefits derived from white oak dominated forests. While currently white oak growing stocks are enough to meet demand, forest monitoring and long-term projections indicate problems in maintaining high-quality white oak regeneration. White oak is critical to many wildlife species and to industries making forest products such as furniture, flooring, cabinetry, barrels for wine and spirits, as well as for recreational activities like hunting.

Other Michigan Plans Relevant to the Forest Action Plan

Joint Chiefs' Landscape Restoration Partnership Projects

USFS and NRCS are working together to improve the health of forests where public forests and grasslands connect to privately owned lands.
nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/initiatives/?cid=stelprdb1244394

Partnering for Watershed Restoration of Lake Superior (Ottawa National Forest)

This is a landscape-scale restoration project covering the western Upper Peninsula of Michigan and the heart of the Lake Superior watershed. This project is designed to increase forest resiliency by reducing wildfire threats through outreach, fuel reduction, and stand management on private and tribal lands; provide abundant clean water for all residential, recreational and industrial needs; and to improve and restore at-risk fish and aquatic species habitat on federal and private forest lands.

Partners Include: Michigan Department of Natural Resources, Keweenaw Bay Indian Community, Superior Watershed Partnership, Keweenaw Land Trust, Iron-Baraga Conservation District, Gogebic Conservation District, Central Upper Peninsula Cooperative Weed Management Area, Ruffed Grouse Society, Superior Watershed Partnership and The Nature Conservancy.

APPENDIX III

Forest Legacy Program

Information regarding the Forest Legacy designated areas and the application process and selection criteria can be found in the Landscape Assessment Forest Legacy Story Map.

Additional Context

The Forest Legacy program has many components that must be considered. These components are listed with the location of where the data/information can be found within the Landscape Assessment Story Maps. All story maps can be accessed from the main page. Some of the more important trends are discussed above in the section summarizing the landscape assessment.

A. Forest Resources and Benefits
    1. Aesthetic and Scenic Values
    2. These values are represented by scenic byways, scenic areas, the Great Lakes shoreline and the many trails in the state – see the Socio-Economic Benefits Story Map.
    3. Fish and Wildlife Habitat
        i. Michigan has an extensive forest habitat that supports a broad range of wildlife species including wide-ranging species (i.e., black bear, wolves and deer). Deer have important winter habitat requirements as shown on a winter deer range map in the Socio-Economic Story Map. Many miles of riverine habitat also provide habitat for many species of wildlife and fish. More details can be found in the Wildlife Action Plan and in the Forest Legacy Program Assessment of Need.
        ii. Rare species and species of concern are discussed in the Biodiversity Story Map section on Genetic Diversity.
    4. Public Recreation Opportunities
        i. A map of the public lands and a trail map for the state are shown in the Socio-Economic Benefits Story Map section on recreation.
        ii. Protected areas including state parks are shown in the Biodiversity Story Map section on Protected Lands.
        iii. The Statewide Comprehensive Outdoor Recreation Plan also contains more details on recreation opportunities.
    5. Soil Productivity
        i. Soil productivity is reflected in forest productivity which can be reviewed in the Productive Capacity Story Map.
        ii. There is also a Soils Resources Story Map and a Water Resources Story Map that discuss related values.
    6. Forest Products and Timber Management Opportunities

i. A map of the mill types and location is found in the Socio-Economic Benefits Story Map (in the Additional Information section) along with detailed information on the forest sector by county which is in the Forest Products Industry Total Output section.

7. Watershed Values
    i. Water quantity and water quality are discussed in the Water Resources Story Map.

B. Threats of Forest Conversion
    1. Threats of forest conversion to non-forest use comes primarily from agriculture, so forest adjacent to agricultural areas is under the greatest threat for now. Conversion to urban land use is another threat, but this seems to be somewhat stable right now although the Wildland Urban Interface continues to grow and the threat of large blocks of commercial forest land being sold has the potential to contribute to this issue. Look for more information in the Soil Resources and Water Resources Story Maps.

C. Historic or Traditional Use
    1. Hunting, fishing, timber harvesting, gathering of non-timber products, wildlife observation and trail use (either motorized or non-motorized) tend to be the most important traditional uses. Although timber harvesting is relatively stable, hunting and fishing are in decline and gathering is difficult to quantify.
    2. There is also a strong desire for people to live in forested settings and the mix of human habitation in forests is referred to as the Wildland Urban Interface. This measure in Michigan is increasing and is expected to continue increasing into the foreseeable future.

D. Current Ownership Patterns
    1. The National Woodland Owners Survey is conducted every five years and provides an assessment of private forest land ownership. The Michigan results of this survey are found in the Socio-Economic Benefits Story Map.

E. Cultural Resources
    1. Tribal communities have the strongest ties to cultural values in the forest and important areas are found mapped in the Socio-Economic Benefits Story Map.

F. Outstanding Geological Features
    1. There is a map of geological features presented in the Socio-Economic Benefits Story Map.
    2. Michigan also has a great deal of Karst topography. Check out the Michigan Karst Conservancy information and the description under Multi-State Priorities.

G. Threatened and Endangered Species
    1. There is an interactive component on threatened and endangered species in the Genetic Diversity section of the Biodiversity Story Map.

H. Other Ecological Values
    1. Another huge value of forests is their ability to sequester and store carbon and help mitigate the effects of climate change. Detailed information is found in the Carbon Cycles Story Map.

I. Mineral Resources
    1. A map of the oil wells in the state as well as currently active hard rock mining operations is found it the Socio-Economic Benefits Story Map.

J. Protected Land in the State
    1. Protected areas including state parks are shown in the Biodiversity Story Map section on Protected Lands.

K. Issues Identified through Public Involvement
    1. Issues that were identified through public involvement were converted to objectives and can be found above. The objectives that have the Forest Legacy Program as the lead program are identified. These will be the specific objectives to be accomplished by the Forest Legacy Program.

L. There are no new Forest Legacy Areas being proposed. The existing areas are shown in the map in the Priority Landscapes section and are described in detail in the Forest Legacy story map.

M. The eligibility criteria and the process to be used by Michigan to evaluate and prioritize Forest Legacy projects are presented in the next section.

APPENDIX IV

Low Priority Issues Identified by Stakeholders

There were 21 issues identified by stakeholders during the collaborative process considered to be of low priority. These issues were not translated into objectives nor assigned to any of the strategies. However, the root of the issue may have been captured in some of the strategies and/or objectives associated with high and medium objectives.

Program Area	Low-Priority Issue Identified by Stakeholders
Forest Stewardship	NRCS offers financial assistance. Does FSP need to duplicate efforts?
Urban and Community Forestry	How is Wildlife Action Plan incorporated into urban and community forestry?
Urban and Community Forestry	Increase urban plantings to reduce climate change and increase human well-being.
Urban and Community Forestry	Explore benefits and opportunities to connect with the health care and wellness industries.
Urban and Community Forestry	Look into the Bird City Program, which has community forests and native landscaping components.
Forest Legacy	Opportunities to support rustic forest recreation/rustic trails.
Forest Legacy	Need strategy around using revenues from forest lands to meet forest legacy goals.
Community Wildfire Protection	Multiuse trails and utility corridors to serve as firebreaks without creating more forest roads.
Forest Health	Plan future trails to deter user-created trails, which tend to cause problems.
Forest Health	Need to create procedures to remove dead or dying trees from road easements to protect infrastructure.
Forest Health	Can timber harvest be increased to reduce mortality percentage?
Crosscutting Issue	Create a network of specialists across all lands to assist with resource management inquiries.
Crosscutting Issue	Consider the future of our forests; don’t waste resources on what won't make it.
Crosscutting Issue	Encourage and increase tribal participation in FAP process.
Crosscutting Issue	Refine prioritization of different strategies to align with management goals nearby (e.g., NPS goals, connectivity)
Crosscutting Issue	Improve communication between DNR and Michigan Department of Transportation to reach forest health goals.
Crosscutting Issue	Provide technical support for forest stewardship plans on smaller land holdings in suburban/urban areas.
Crosscutting Issue	Restore wildlife habitat where appropriate.
Crosscutting Issue	Manage for highest use of species.
Crosscutting Issue	Focus on diseased/dead/dying trees in riparian corridors (watershed health and recreation impacts).
Crosscutting Issue	Understand residual market /role of residual management in forest stewardship best management practices.