MINNESOTA FOREST RESOURCES COUNCIL

West Central
Landscape Plan

DRAFT for Public Review: October 2026










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Section 1. Introduction

A. Plan Purpose and Development

Sustainable Forest Resources Act

In 1995, the Minnesota State Legislature enacted the Sustainable Forest Resources Act (SFRA, Minn. Statues, Chapter 89A) establishing the Minnesota Forest Resources Council (MFRC). The SFRA outlines MFRC as a 17-member board created to develop policy recommendations to the Governor and federal, state, and local governments and to encourage the adoption of sustainable forest management policies and practices. Council members are outlined by statute to represent a wide range of forest resource interests. MFRC's purpose is to support and make recommendations that align with the state's policy to:

- Pursue sustainable management, use, and protection of the state's forest resources to achieve the state's economic, environmental, and social goals;
- Encourage cooperation and collaboration between public and private sectors in the management of the state's forest resources;
- Recognize and consider forest resource issues, concerns, and impacts at the site and landscape levels; and
- Recognize the broad array of perspectives regarding the management, use, and protection of the state's forest resources and establish processes and mechanisms that seek and incorporate these perspectives in the planning and management of the state's forest resources.

Regional Forest Resources Committees

The SFRA also outlined a framework for long-term landscape-based forest resources planning and coordination activities through a network of regional forest resource committees. These committees are a forum for planning, coordination, and communication among the region's forest land managers and owners.

Members of forest resource committees (regional committees), comprised of local and regional stakeholders, work together to strategically plan and collaborate on sustainable forest management across all landownership types (state, federal, private industrial, and family forests). Regional committees also provide critical feedback to the MFRC on regional and statewide forestry-related topics.

While MFRC provides funding, facilitation, and support, the program is voluntary, grassroots, and incorporates a broad variety of perspectives on forest management and forest resource issues. Regional committees operate in an open and public process to identify goals, challenges, and solutions to Minnesota's evolving landscape.

The West Central Landscape Plan

MFRC maintains six regional committees: one for each delineated landscape within the forested region of Minnesota. Regional landscape boundaries are roughly based upon Minnesota's Ecological Subsections. As part of the program and coordination, regional committees each develop an "all lands" plan of agreed upon goals to address the challenges unique to their region. The region covered in this plan is the West Central Landscape.

The West Central Landscape Regional Committee (the Committee) was organized in October 2002 and began long-term sustainable forest resource planning for mutually agreed upon desired future outcomes. The committee collaboratively developed goals and strategies to achieve these desired outcomes. This led to the first West Central Regional Landscape Plan in 2004.

In 2026, the Committee began the process of collaboratively revising and updating that first 2004 landscape plan. Three committees served the development of the plan update: the Leadership, Steering, and Fiscal Committee (see Acknowledgements page for list of members). The Leadership Team met bimonthly to lead the planning process. The Steering Team met every couple months to provide oversight and guidance for the plan. The full committee met five times covering the following topics: Social Aspects, Economic Aspects, Ecological Aspects, Vegetation Management Framework, and Climate Adaptation.

The 2027 plan has the following substantial improvements and additions:

- Full plan revision, providing current conditions for stakeholders
- Incorporation of climate adaptation into all components of the plan
- Addition of a Vegetation Management Framework with outlined goals and strategies for each DNR Native Plant Community.

Landscape Plan Purpose

MFRC Regional Landscape Plans are designed to be strategic in purpose and transcend all ownerships in a region. MFRC landscape plans also provide perspective on environmental, social, and economic aspects of forests and forest resource management within the region.

This plan is intended to be utilized by a broad scope of stakeholders, including forestry and other natural resource professionals of various disciplines that intersect with forestry such as wildlife, non-game, and fisheries specialists, forest industry, and community leaders that support natural resource management.

Forest resource planning takes place on many scales based on administrative (e.g., township or county) or ecological boundaries (e.g., watershed or ecological subsections). As planning scales decrease to the sub-landscape and eventually to the site-level, forest resource plans typically become more project-specific in nature and cover fewer ownerships. Yet all scales are



connected. Landscape-level plans can help to broadly guide plans that occur at a smaller scale, whose collective accomplishments help to achieve landscape level goals and objectives.

The goals and strategies in this plan are intended to be useful for:

- Forest management plans for specific land managing entities,
- Agency programmatic plans for other disciplines such as watershed plans,
- Informing decision makers on regional needs and conditions in forest and natural resources management, and
- Funding development plans.

B. The West Central Landscape

The West Central Landscape is defined largely based on county boundaries which include: Otter Tail, Wadena, Todd, Douglas, Pope, Stearns, Kandiyohi, Meeker and Morrison west of the Mississippi River (approximately 5.5 million acres).

Ecological Subdivisions

Ecologically the West Central Landscape is diverse, spanning several ecological land classification units. Ecological units are used to group areas with similar ecological characteristics such as geology, vegetation, soils and other features. At the largest scale, the West Central Landscape contains three of Minnesota's four ecological provinces (Figure 1-1). The Eastern Broadleaf Forest Province cuts through the West Central region from northwest to southeast. The northern corner of the region is within the Laurentian Mixed Forest Province, and the southwest area is within the Prairie Parkland Province. At a finer scale, there are four sections in the region and six subsections. The majority of the region is within the Minnesota River Prairie, Hardwood Hills, and Pine Moraines & Outwash Plains subsections. Characteristics of each unit can be found on the DNR website: https://www.dnr.state.mn.us/ecs/index.html

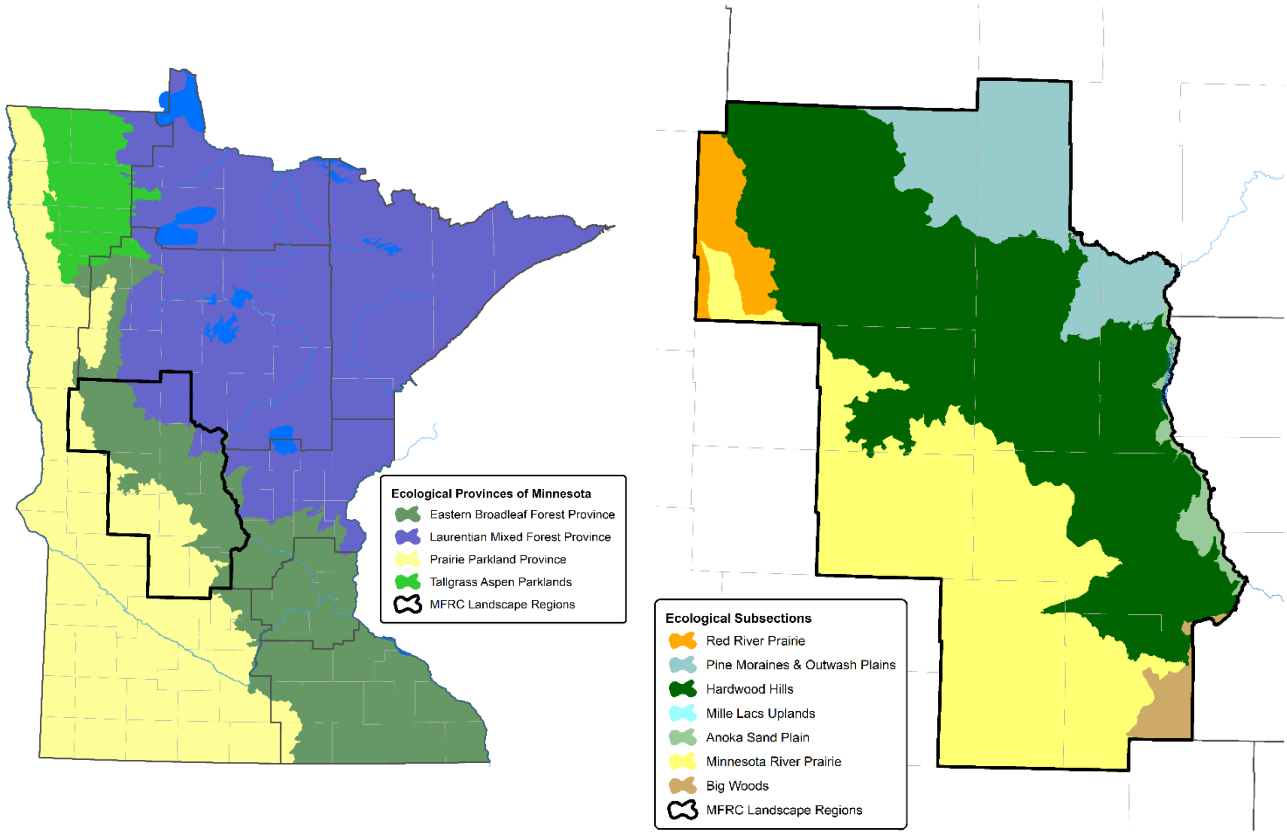


Figure 1-1. Provinces (above) and subsections (right) in Minnesota

Land Cover

Land cover has changed very quickly in ecological timescales following European settlement. Historically, the region was reportedly covered in prairie and woods. Today, the majority of the region is cultivated land (Figure 1-2). The most abundant forest types are red oak, oak, hickory, aspen, and central hardwoods, which provide economic, social, and ecologic value for the state.

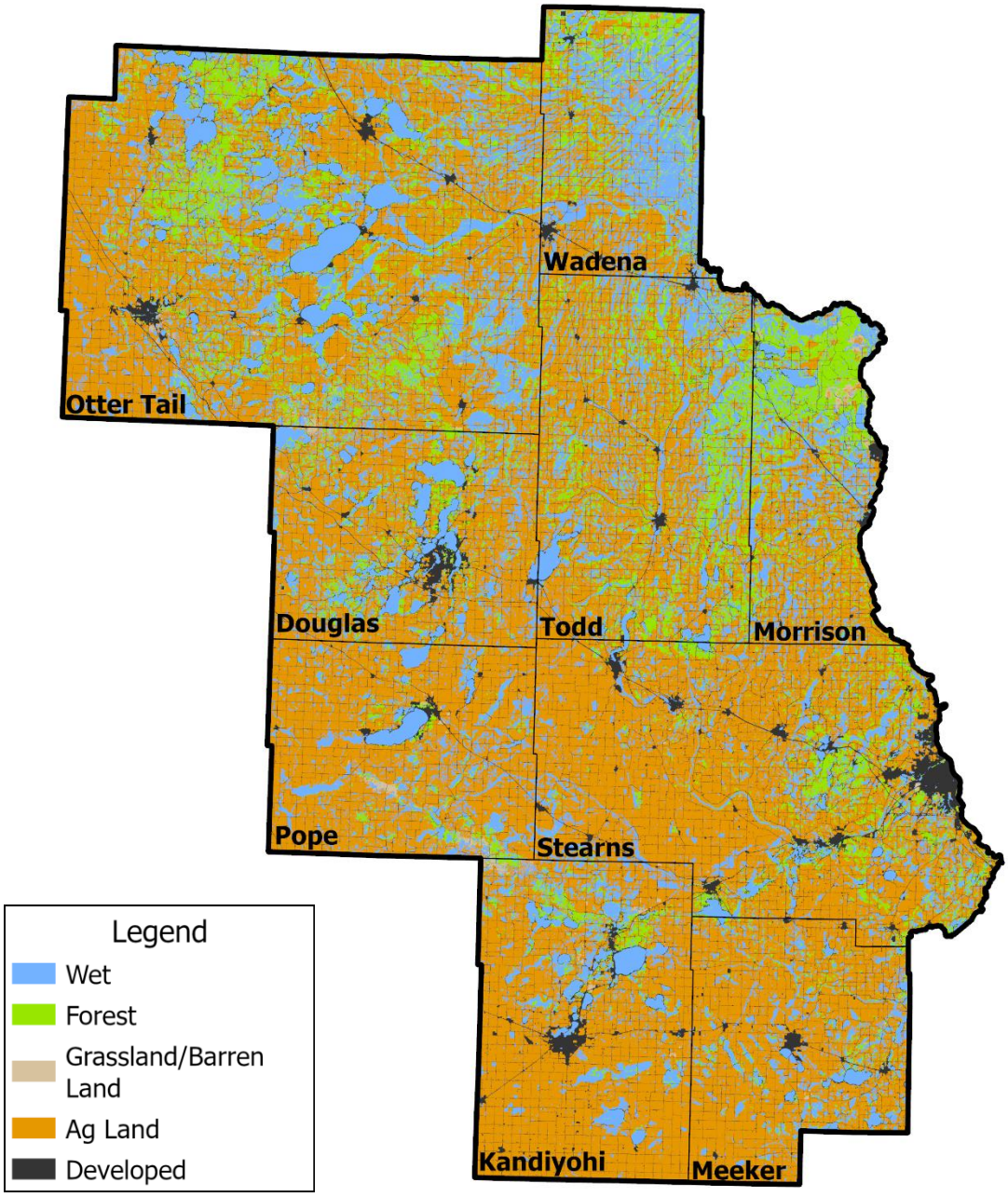


Figure 1-2. Land Cover

Water Resources

The region is covered by lakes, streams, and wetlands that provide freshwater, recreational opportunities, and habitat (Figure 1-3). Many historic wetlands have been drained and the hydrology of the landscape has been altered. The region also contains many outstanding and significant lakes and rivers with designated protection for wild rice, fish, or biological significance.

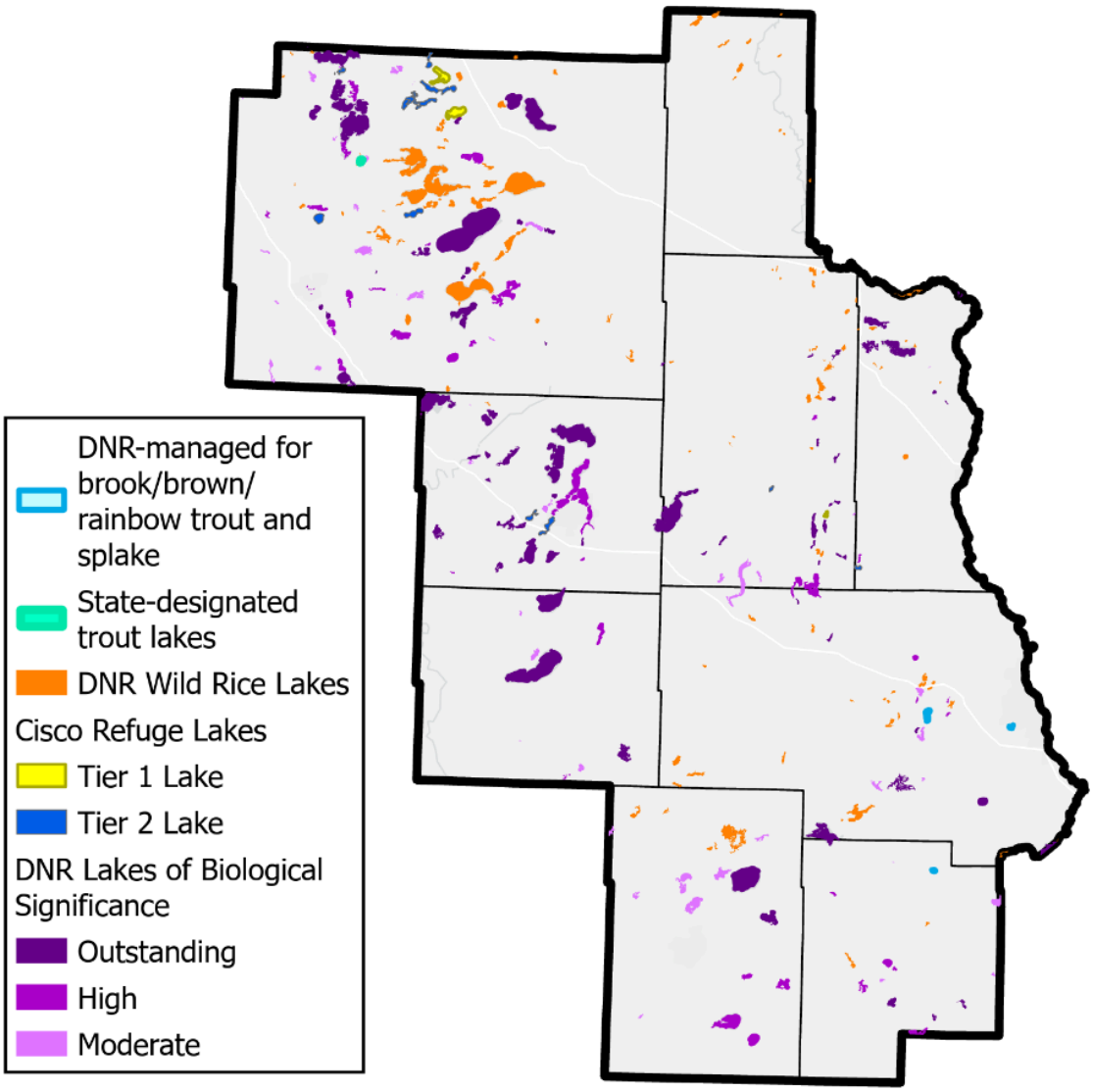


Figure 1-3. Protected or managed lakes in the West Central Landscape

C. Climate Change

Minnesota's climate has been changing and is expected to continue to do so into the future. In the West Central Region, the average annual temperature has risen by over 3 degrees over the 20th century. While 3°F may not seem like an issue when thinking about daily temperatures, on a climate scale this rate of change is extremely fast and often outpacing the rate at which some tree species can migrate to stay in their climatic ranges. By the mid-21st century, average annual daily high temperatures are estimated to increase from 1995-2025 averages by 3-4 degrees.

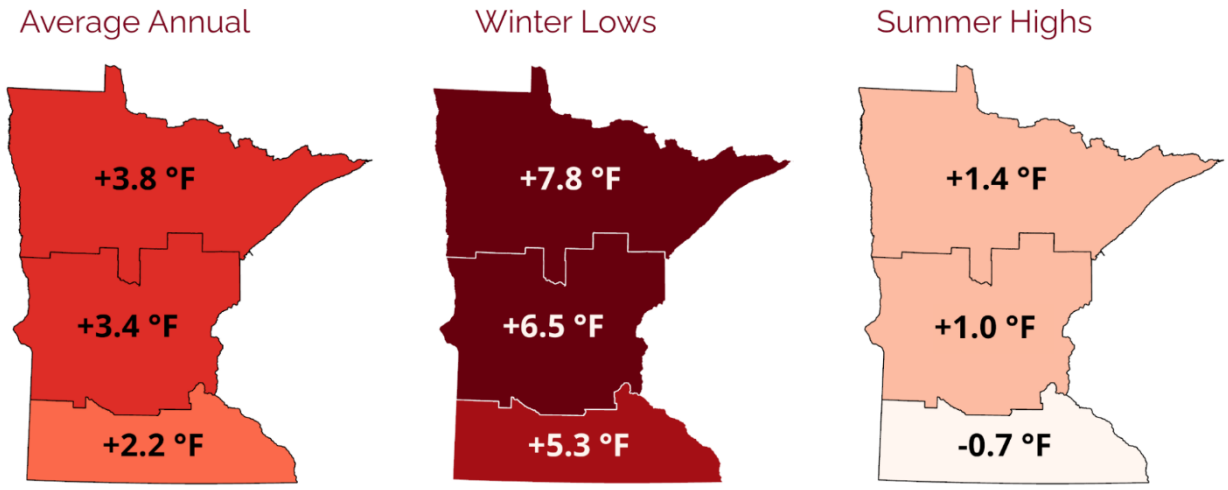


Figure 1-4. Observed changes in temperature in Minnesota, 1895-2025

A decrease in extreme cold, with warmer winter low temperatures occurring at night, will allow some southern species to expand their ranges north. Climate change does not only affect trees - it impacts the ecosystems around them. Pests and invasive species have and will continue to benefit from warmer winters, as species such as emerald ash borer and eastern larch beetle can survive winters and access trees already stressed from other factors.

The region is experiencing an increase in annual precipitation from the late 19th century through the present. Most of the West Central Region has observed annual precipitation increase by around 20% from the late 19th century to the present. Additionally, extreme events such as rain, droughts, or heat waves are predicted to happen with more intensity.

Quick stats for modeled climate projections in the West Central Region

Source: MN CliMAT, 2060-2079
Relative to the climate of 1995-2014
Averaging outcomes between intermediate to very high emission scenarios

- Annual daily temperatures increased by 5.2-7.2 F
- 22-34 additional days per year exceed 90 F
- Average annual precipitation changing by -1.4” to + 2.1”
- Increased seasonality in precipitation— drier summers and wetter springs

Climate Consideration in Planning

Building landscape scale climate resiliency was a priority during planning. This plan was written through a lens of climate change consideration. Adaption to climate change is incorporated into plan development, strategies, and goals. Incorporating climate change in the plan was done with the intent to guide landscape management to be as prepared for climate impacts as possible.

This plan contains goals and strategies for all aspects of forest management in the region. Following brainstorming of goals, committee members analyzed projected impacts of climate change on the region and adjusted goals and strategies to best prepare for impacts. Specific strategies were added to increase adaption.

In addition to plan goals, the Vegetative Management Framework (see Section 3) assigns climate change vulnerability levels to each plant community in the region. Climate opportunities were incorporated into goals and strategies, and climate change impacts are listed for each plant community.

The knowledge and understanding of the role forests and grasslands play in carbon storage and sequestration has grown and continues to grow. Proactive management of forests in particular and storage of carbon in durable wood products or use of biofuels (in lieu of non-renewable petroleum) continues to be a statewide nature-based strategy outlined in Minnesota's Climate Action Framework.

Section 2. Landscape Management Framework

A major focus of the planning effort was creating a long-term vision to support sustainable landscape stewardship across the West Central Landscape. Formerly called the Strategic Policy Framework, this Landscape Management Framework is expressed through the identification of desired future conditions (DFCs), which outline broad, forward-looking expectations for the landscape roughly 100 years into the future—essentially describing the direction in which landscape management should progress. To support these long-term outcomes, the Committee then established a set of goals and more detailed strategies that explain how the DFCs can be realized. These goals and strategies represent practical, near-term actions, typically spanning 10 to 20 years, that guide progress toward the desired future conditions. Collectively, the DFCs, goals, and strategies form the foundation of the landscape management policy framework.

This plan presents landscape management goals and strategies within three frameworks: social, economic, and ecological. Each framework contains a description of current conditions and trends, strengths and weaknesses related to landscape management, desired future conditions, goals, and strategies (Figure 2.1).

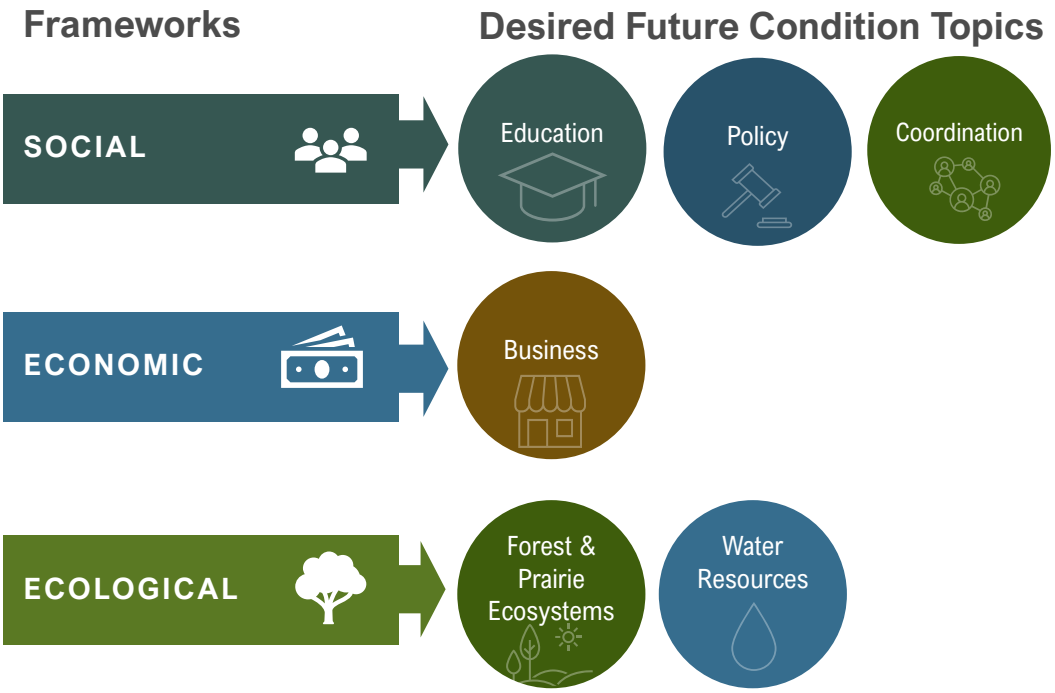


Figure 2.1. Social, Economic, and Ecological Frameworks and their associated Desired Future Conditions.

Desired Future Conditions

In 100 years, the West Central Landscape will have the following characteristics:

- Natural resource-based **businesses** are viable and geographically diverse, which advocate the long-term stewardship of natural resources.
- **Cooperation and coordination** between agencies, interest groups, and private landowners results in effective communication, planning, and natural resource management.
- **Land use policies**, regulations, tax incentives, and cost share opportunities are developed to preserve the rural land base, recognizing that sustainable development is necessary.
- **The public is well informed** relative to environmental concerns and how to obtain technical environmental assistance.
- **Forest and prairie ecosystems** are healthy, resilient, and functioning providing sustainable economic and/or recreational opportunities.
- **Water resources** are managed to sustain their quality for human use and provide habitat for many species of plants and animals.

Identification of Strengths, Challenges, Goals and Strategies

Through a sequence of structured discussions open to any interested members of the public, the Full Regional Committee and any interested stakeholders collaboratively developed the desired future conditions, goals, and stategies. Each meeting concentrated on one of the core frameworks—social, economic, or ecological. Discussions were informed by presentations highlighting relevant data and regional trends associated with each focus area. In advance of the meetings, Committee members provided input on perceived strengths and challenges related to the topic at hand through an online survey.

In addition, attendees reviewed the desired future conditions, goals, and strategies from the previous 2004 plan. This review and discussion informed revisions and updates to goals and strategies to ensure alignment with current strengths, challenges, opportunities, and regional priorities. The identified strengths and challenges, along with the associated 10-year short-term goals and strategies, are summarized in the following sections addressing the plan's social, economic, and ecological components (Sections 2a, 2b, and 2c).

Social Trends and Conditions

The West Central Landscape is characterized by a mix of farmland, forest, and prairie, dotted with many lakes and rivers that provide recreational opportunities. The Committee reviewed the demographics and other social trends and conditions for the region to inform development of the plan.

Regional Population

The population of the West Central Landscape is estimated to be about 415,000. The county with the most West Central Landscape residents is Stearns, at over 40% of the population. Pope County is the least populated.

Historically, the population has been increasing. An increase in population has concentrated around lakes and cities (Figure 2-2). The region is expected to continue the trend of population growth, as all counties except for Stearns are expected to grow in population by 2035. Overall, the West Central Landscape is expected to increase in population by about 10,000 people by 2035.

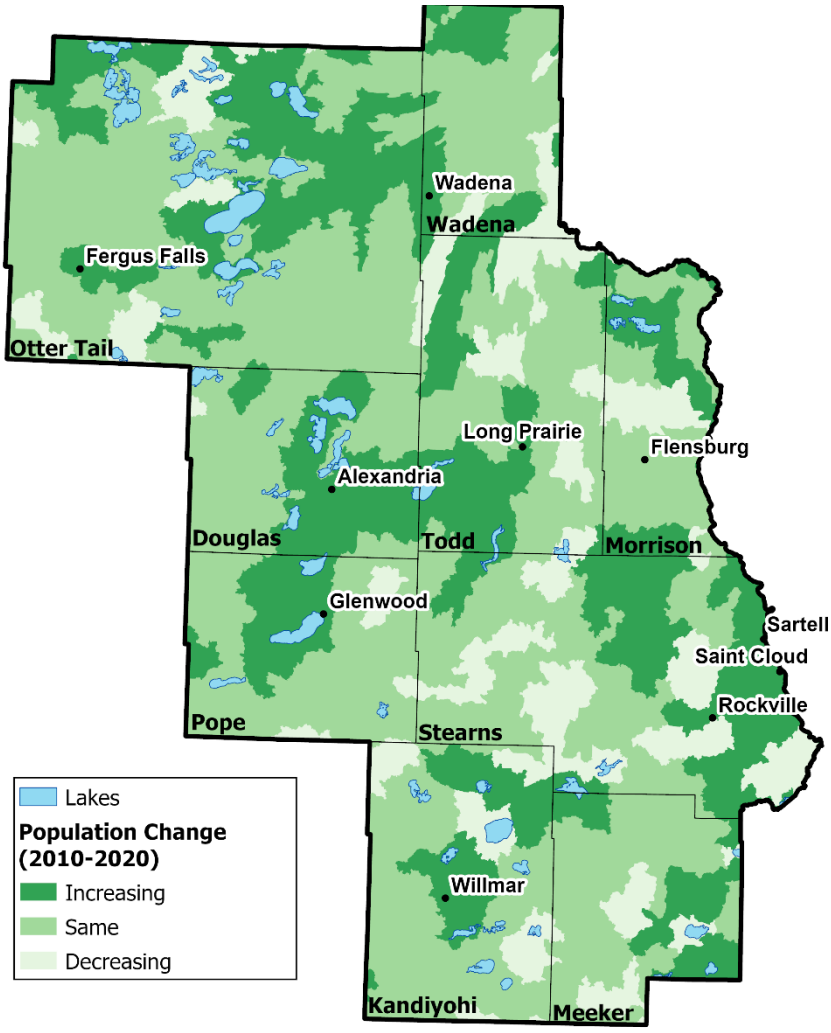


Figure 2-2. Population change 2010-2020

Population Characteristics

Beyond population, age distribution, workforce, and education are typical demographics used to get a snapshot of a population (Figure 2-3). In the West Central Landscape, the largest age group present is 55-64 years old and about half of the population is of working age. Children make up about a quarter of the region. Ages 55-64 are the largest age group, and the current children have a much smaller population. As the largest population group ages and the upcoming young adult population shrinks, changes to the workforce are expected.

The majority of adults have some level of college education, and the industry that employs the largest share of people is education and health services (about one third of the workforce). The smallest employer is the agriculture and forestry sector (6%).

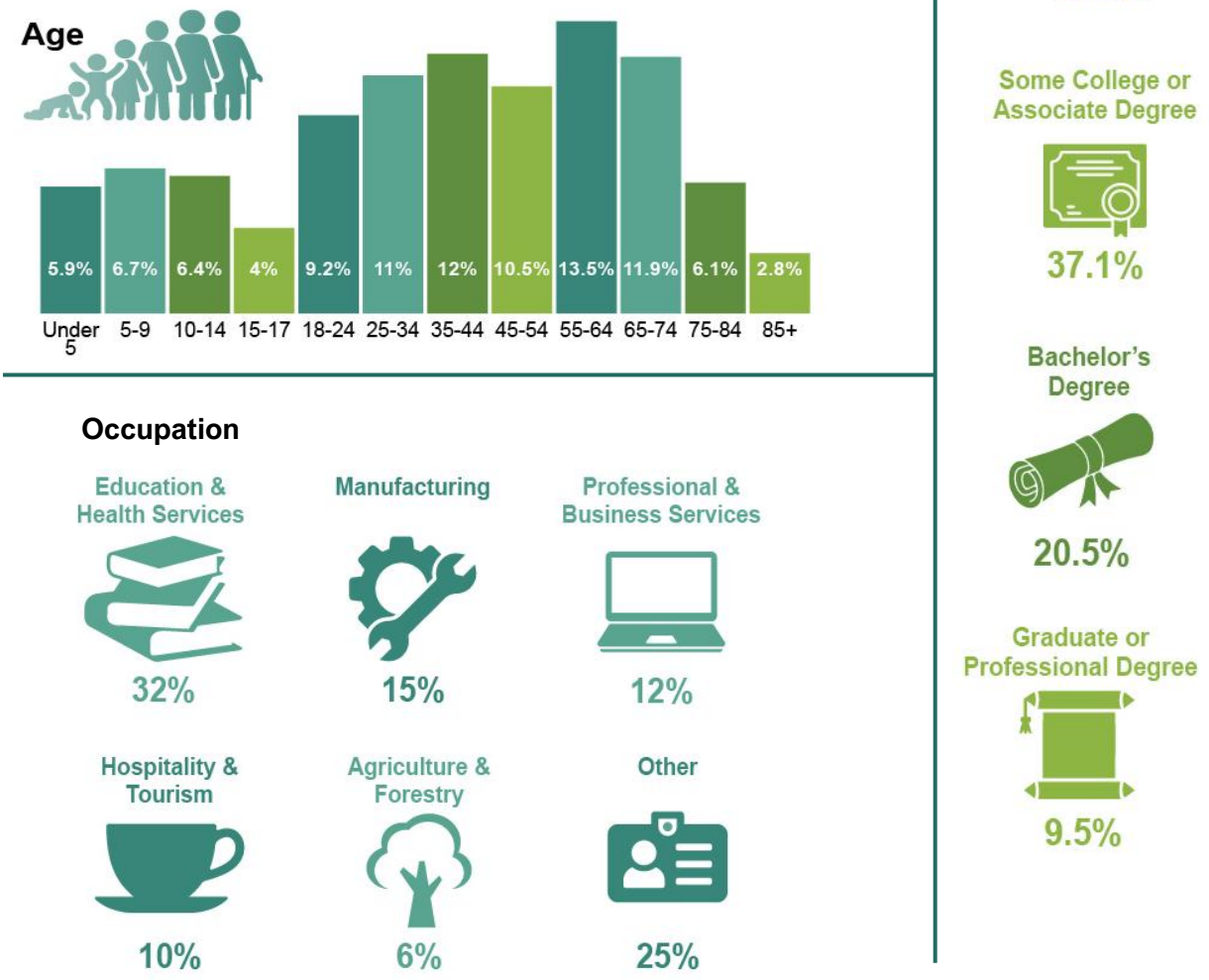


Figure 2-3. Distribution of West Central occupant age, occupation, and education

Financial Demographics

Financial demographics are shown in Figure 2-4. Overall, each county has a lower median household income than the average state of Minnesota. Five of the eight counties in the region have a poverty rate above the state average. Todd and Wadena Counties have much lower median incomes than other nearby counties and accordingly are joined by Stearns County for the highest portion of the population in poverty.

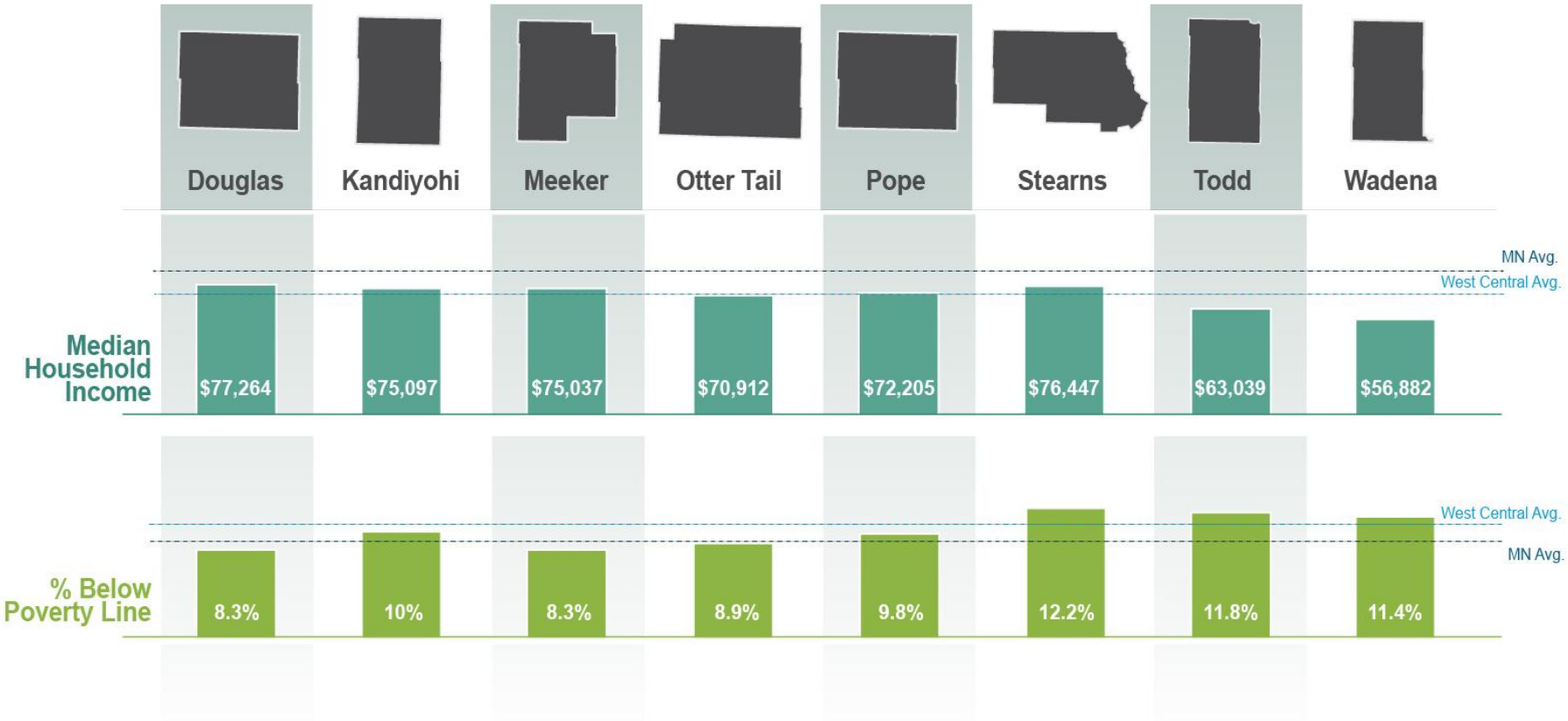


Figure 2-4. Income and poverty data (excluding Morrison County, which is only partially in the West Central Landscape)

The Minnesota Pollution Control Agency has developed areas of concern for environmental justice issues throughout the state. Environmental justice is the idea that there are certain populations that are vulnerable to pollution, that have experienced the historic burden of pollution, or that have limited access to natural spaces. Identifying demographic risk factors allows for intentional consideration of these areas in planning.

In the West Central Landscape, there are pockets of MPCA-identified areas of environmental justice concern for poverty (Figure 2-5). These are mostly focused in Todd and Wadena Counties.

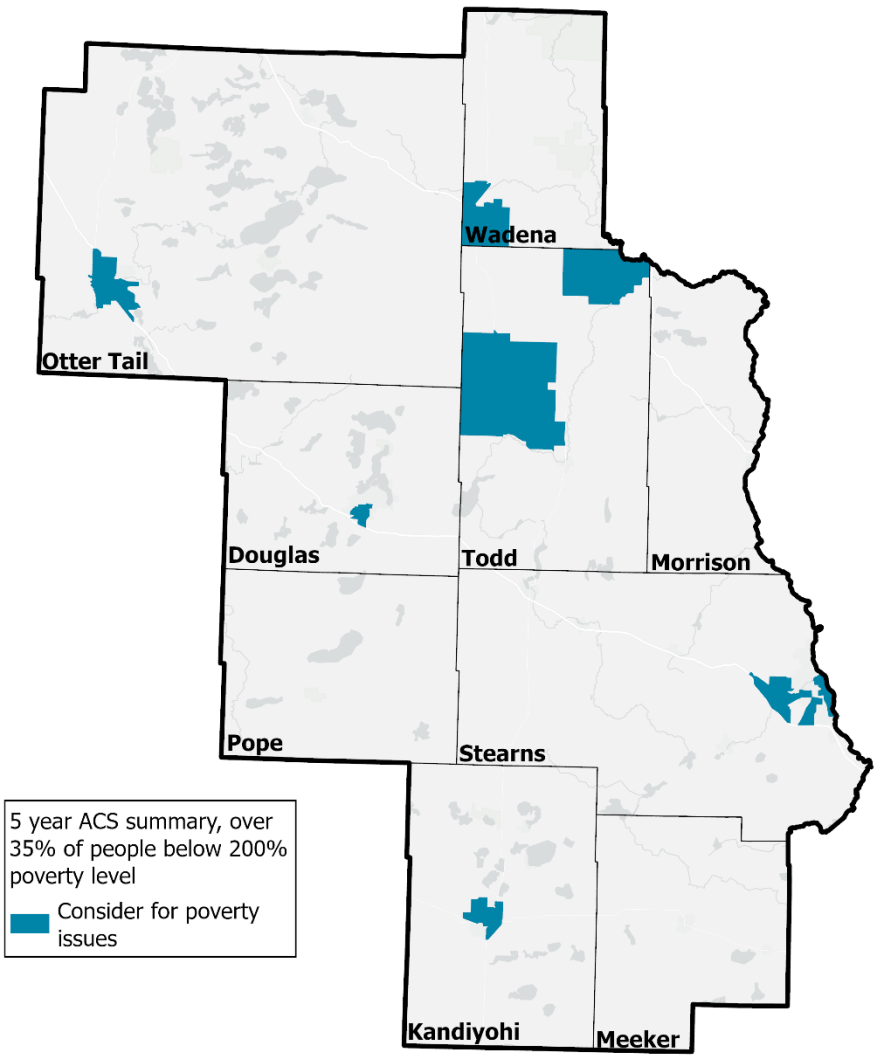


Figure 2-5. MPCA environmental justice areas


Credit: Kanati Land Management

Tribal Treaty Boundaries

The West Central Landscape includes traditional, ancestral, and contemporary lands of the Očhéthi Šakówiŋ (Dakota Sioux) and Anishinaabe (Ojibwe/Chippewa). Tribal treaty boundaries are shown in Figure 2-6. MFRC has communicated and offered coordination to all tribes associated with treaties within the region in the planning process. MFRC encourages continued coordination by regional committee members with treaty holders of the West Central Landscape.

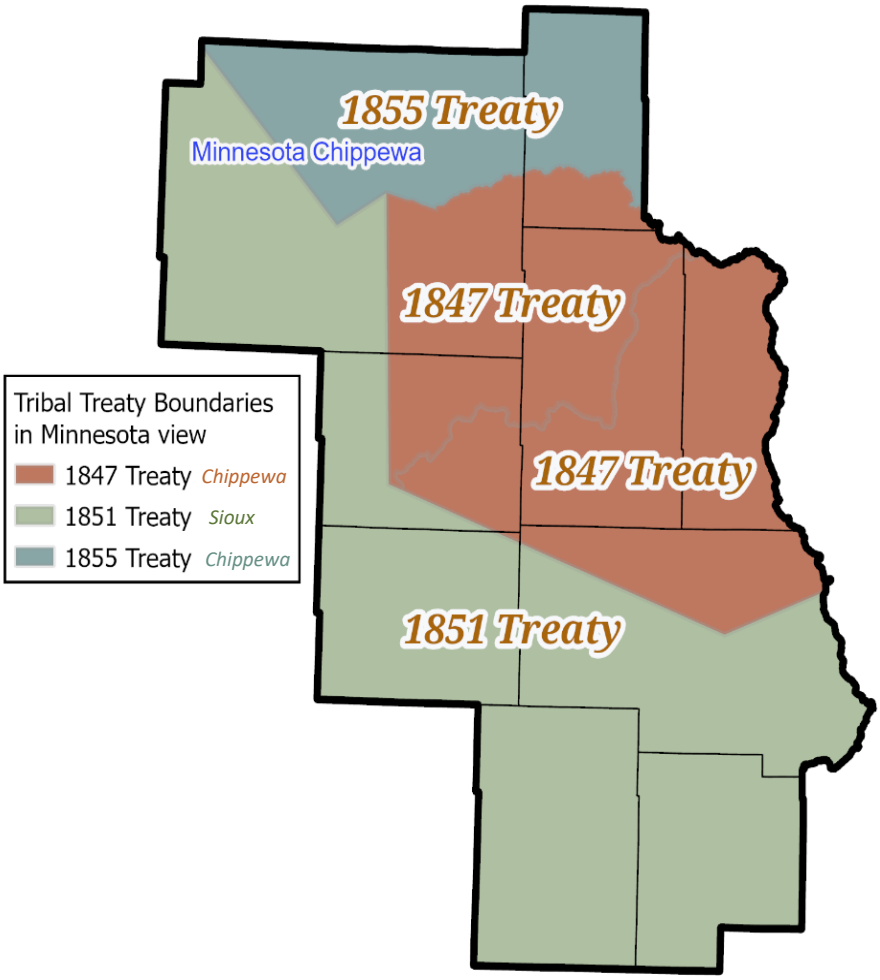


Figure 2-6. Tribal treaty lands

Land Ownership

The vast majority (95%) of land in the region is privately owned. The State of Minnesota owns and manages 3% of the land, and the other 2% is owned by local governments or the federal government. A minimal amount, about 1,000 acres, are tax forfeited lands. The portion of public land has been growing. Since the 1970s, the area of public land has nearly tripled. The amount of state-owned forest land has stayed relatively constant in the past two decades, and makes up about 13% of forested land.

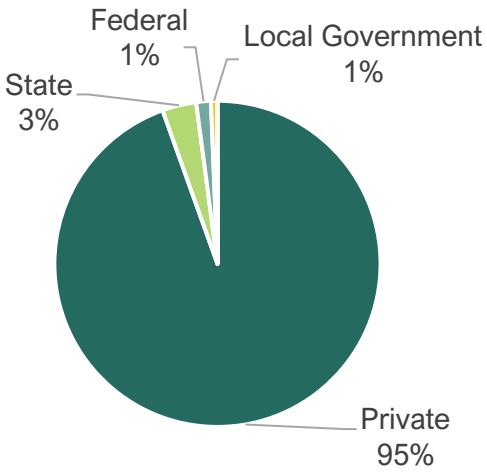


Figure 2-7. Portion of land ownership

The value of state or federally managed lands as a public good has increased in recent decades. In the West Central Landscape, public lands include state forests, state parks, Wildlife Management Areas, state trails, and recreational rivers (Figure 2-8).

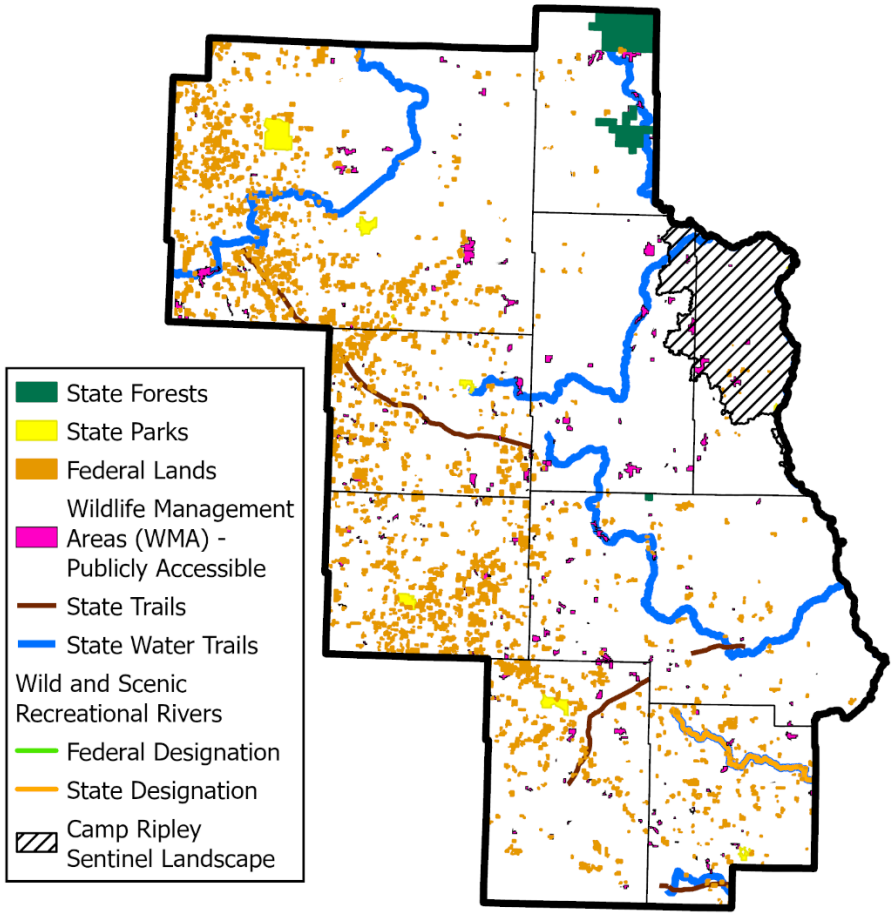


Figure 2-8. Public and recreational lands.

Social Strengths and Challenges

There are characteristics embedded in the social fabric of the West Central Landscape that provide great value to forest management (Figure 2-9). These are recognized as a benefit to the region and to achieving goals in this Plan.



Figure 2-9. Strengths of the West Central Landscape.

On the other hand, the region also faces challenges to forest management. Potential challenges include the following items below (Figure 2-10).

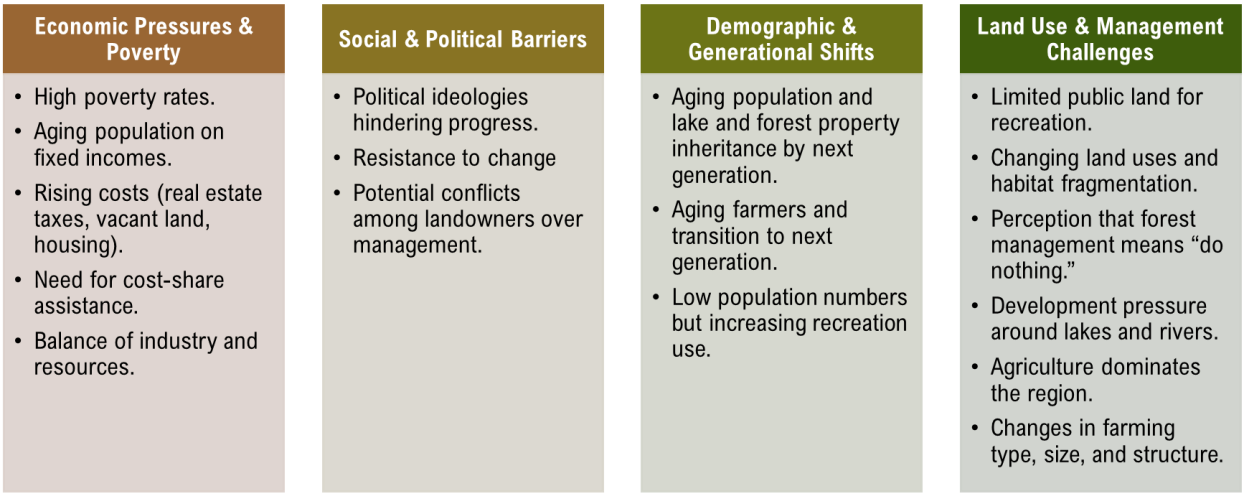


Figure 2-10. Challenges of the West Central Landscape.

Climate change adds a unique group of sociopolitical challenges. There is a level of uncertainty in how and to what extent climate change will impact rural land and natural habitat, adding to the complexity of coordinated long-term planning and zoning.

Desired Future Condition – Education

The public is well informed on a wide range of natural resource issues and how to obtain assistance for management.

Goal A

Public officials, legislature, and their staff are aware of the benefits of healthy ecosystems and the value of viable natural resource-based businesses.

Strategy 1

Identify and articulate the impacts of environmental policy to decision-makers.

Strategy 2

Provide environmental education opportunities for government staff in appropriate areas of concern.

Strategy 3

Encourage committee members and natural resource managers to attend and present at annual statewide township and county association meetings about different forest programs and their tax impacts (i.e. PILT, 2c, and SFIA).

Strategy 4

Take advantage of existing opportunities to disseminate information on the importance of forestry to the local economy. When capacity allows, host workshops, invite local officials, and prioritize landowner advocacy.

Strategy 5

Empower landowners to advocate for natural resource programs and expand adoption.



Goal B

Promote natural resource educational programs for grades K-12 that result in students understanding ecological functions and values.

Strategy 1

Fund and promote existing environmental education programs (Project Learning Tree, Project Wild, Project Wet, 4H, Scouts, and Future Farmers of America).

Strategy 2

Encourage an ecosystem and experienced-based approach to teaching natural resource management.

Strategy 3

Encourage collaboration between schools, teachers, agencies, master naturalists, non-profits, and private industry.

Strategy 4

Address barriers such as funding, staff, and teacher involvement.

Strategy 5

Encourage incorporation of sustainable forestry and natural resource education into core curriculum.

Strategy 6

Use and support school forests for experiential learning.



Goal C

Landowners and potential landowners understand their role as land stewards and are aware of sources of professional natural resources assistance.

Strategy 1

Encourage information sharing between organizations.

- *Extension*
- *Private landowners*
- *Central Minnesota Woodland Owners Group*
- *Minnesota Tree Farm*
- *West Central Initiative*
- *Consulting Foresters*
- *Minnesota Forestry Association*
- *Agricultural organizations*
- *Watershed professionals*
- *Lake and Homeowner Associations*
- *MNSCU Farm Business Management Program*

Strategy 2

Encourage state and local agencies and others to promote forestry assistance resources (forest stewardship planning, etc.) in their media.

- *Local papers, coffee house, table of knowledge, social media, podcasts, mailings, CTIC, etc.*

Strategy 3

Engage in more frequent collaborative, holistic planning between agriculture, forestry, conservation, and development.

Strategy 4

Educate landowners on estate and asset planning that benefits taxes and land retention.

Goal D

The public is informed of natural resource issues through mass media about basic ecological concepts and that forest resources are renewable.

Strategy 1

State agencies, local agencies, and NGOs conduct outreach to the public about natural resource management issues.

- *Outreach in person, field visits, conservation days, social media, radio*
- *West Central Initiative*
- *Consulting Foresters*
- *Minnesota Forestry Association*
- *Peer to peer learning events*

Strategy 2

Work with agencies and NGOs to develop and share messaging on sustainable forest management and how it supports regional social, ecological, and economic goals.

Desired Future Condition – Policy

Land use policies, regulations, tax incentives, and cost share opportunities are developed to preserve the rural land base, recognizing that sustainable development is necessary.



Goal A

Preserve rural land and natural habitat and reduce infrastructure costs through careful development planning.

Strategy 1

Encourage counties and townships to adopt land use planning and zoning regulations, which preserves an appropriate and significant portion of the non-developed private land base in 40 acre or greater parcels of forest, wetland, prairie, and agriculture.

Strategy 2

Support the development and distribution of model land use plans and ordinances that promote sustainable resource management.

Strategy 3

Coordinate amongst conservation and local government groups on model ordinances.

Goal B

Provide cost share incentives for sustainable natural resource practices.

Strategy 1

Utilize federal, state, and local agencies, sportsmen, service, farm organizations, conservation, and environmental groups to develop and/or expand cost share programs in the following areas:

- *reforestation projects*
- *prairie restoration*
- *wetland restoration*
- *riparian area restoration*
- *erosion control systems*
- *forest health management*
- *invasive species prevention and management*



Strategy 2

Incentivize and support the development and growth of small, private, natural resource-based businesses through technical and financial assistance.

Goal C

A tax structure that provides incentives for sustainable natural resource management.

Strategy 1

Support revisions in current tax law and/or propose new tax laws (property and/or income) that:

- *tax land relative to the social costs required by the taxing authority, including lower costs for large undeveloped parcels and higher costs for smaller developed parcels.*
- *incentivize long term commitment to land stewardship through various tax reductions.*
- *promote an income and/or property tax credit or direct payment for clean water produced on well managed riparian forests.*
- *Incentivize keeping forests forest and prairies prairie.*
- *provide favorable capital gains taxes on the sale of undeveloped, naturally vegetated land.*
- *reward landowners that practice sustainable management of forest and prairie ecosystems.*
- *encourage families to keep land holdings as one parcel.*
- *allow tax benefits on lands under conservation easement.*

Strategy 2

Promote Sustained Forestry Incentives Act (SFIA) with eligible landowners.

Strategy 3

Explore a sales tax exemption or other incentives for certified timber and nontimber products.

Desired Future Condition – Coordination

Cooperation and coordination between agencies, interest groups, agriculture, and private landowners result in effective communication, planning, and natural resource management.

Goal A

Encourage cooperative inventory, analysis, and sharing of forest resource data.

Strategy 1

House forestry data in an online database and interactive viewer at the regional level. Create a single hub for information including state and federal data, the Great Lakes Silviculture Library, and case studies.

Strategy 2

Supplement Forest Inventory Analysis (FIA) with other analyses (LiDAR and other new analyses).

Strategy 3

Support and encourage the resurrection of the Interagency Information Cooperative to serve as a data clearinghouse as outlined in the Sustainable Forest Resources Act.

Strategy 4

Increase collaboration on seed collection between agencies, NGO's, tribes, and natural resource businesses to increase seed sources from desired species and preferred genetic source locations for climate adaptation and resiliency.

Strategy 5

Offer regional committee letters of support for committee member grant applications that support goals and strategies of the regional landscape plan.



Economic Trends and Conditions

Outdoor recreation such as hunting, fishing, hiking, and trail riding are a large part of the economy in the West Central Landscape. Forests are very valuable economically for these activities. Forest harvest has been relatively stable over the last decade.

Business

The job market in the region has been slowly improving in the past decade. Unemployment has been trending downward (note the peak in 2020 is related to the COVID-19 pandemic) (Figure 2-11).

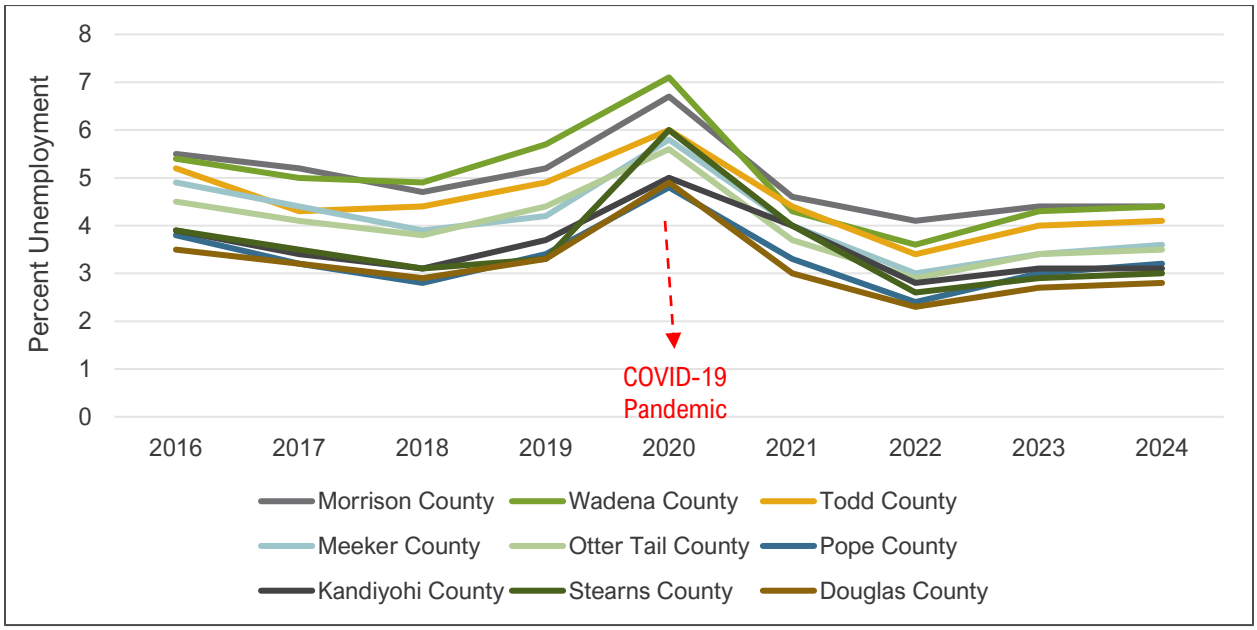


Figure 2-11. Unemployment Rate in West Central Landscape Counties from 2010-2024
(Source: https://mn.gov/deed/data/current-econ-highlights/state-national-employment.jsp).

Forests provide tremendous value to the economy. Mills, loggers, and log trucking provide about 70,000 jobs largely located in rural areas. Minnesota's forest product industry is a $14 billion industry (Deo and Fauskee, 2023).

Hence, forest loss is not only an environmental loss, but an economic one. Figure 2-12 shows the amount and sources of damage to forests. The amount of forests lost to animals, fire, floods or wind, or degraded health has doubled in recent years. Concerningly, poor forest health has been an increasing cause of forest loss in the past decade. In 2012, poor health was responsible for 6% of forest damage, and in 2022 poor health was responsible for 38% of forest damage.

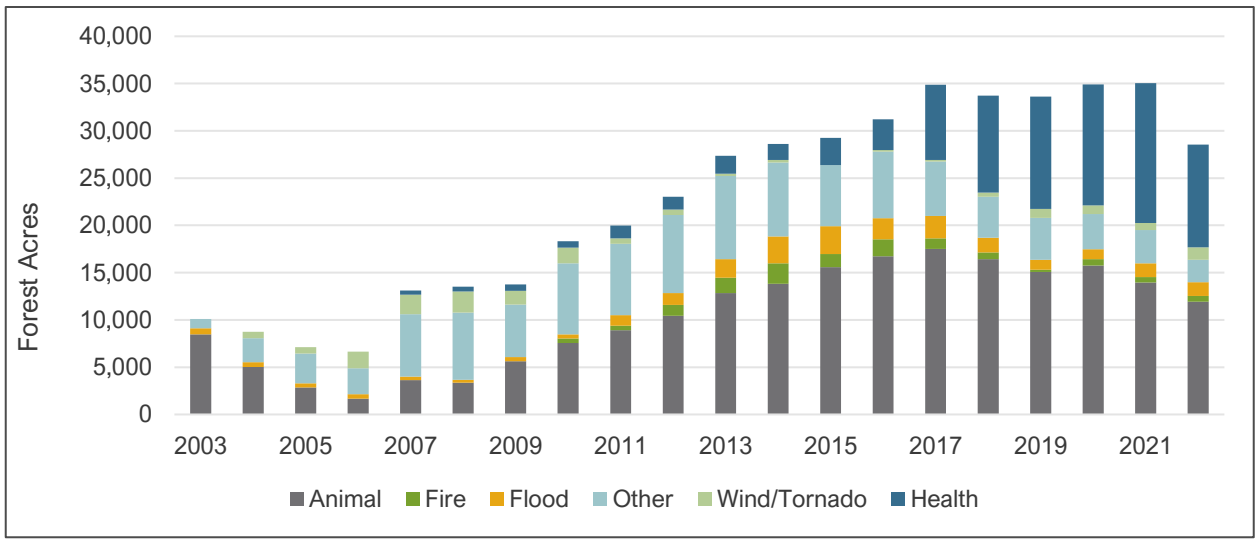


Figure 2-12. Annual acres of forest damage (Source: MFRC Data Viewer; plots with at least 25% trees damaged are represented)

Figure 2-13 shows the 28 forest product mills in the West Central Landscape. There are likely additional mills not mapped which are run by Amish communities. Amish mills are small local mills that typically accept more diverse species (i.e., oak and other hardwoods) than standard mills. Markets for timber include areas such as:

- Paper
- Pulp
- Building timber
- Posts and fencing
- Flooring and paneling
- Animal bedding
- Mulch

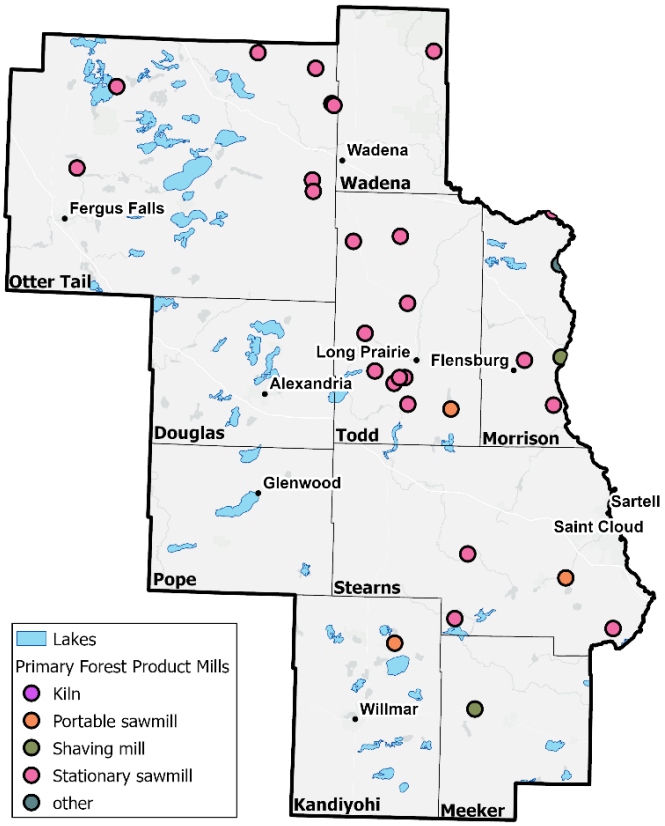


Figure 2-13. Forest Mills

Utilization of wood for energy, lumber, specialty use, and pulp and paper have remained relatively stable in the 2000s. However, oriented strand boards were the largest consumer of wood in the late 1990s and the market has declined by over 60% (Deo and Fauskee, 2023). Variations in demand and economic pressures have resulted in mill closures.

The price of pulpwood has shifted based on species- the value of aspen and spruce has dropped since the 1990s. Protecting forest stands of species with a high demand or potential market is a way to sustainably grow the forestry industry. Currently, species such as aspen, maple, basswood, oak, and ash have the opportunity for additional sustainable harvest and utilization. Woody biomass from nonmarketable forestry activities such as addressing forest health issues, timber stand improvement, early thinning, and savanna management is also identified as a forest product with more potential use (Deo and Fauskee, 2023).

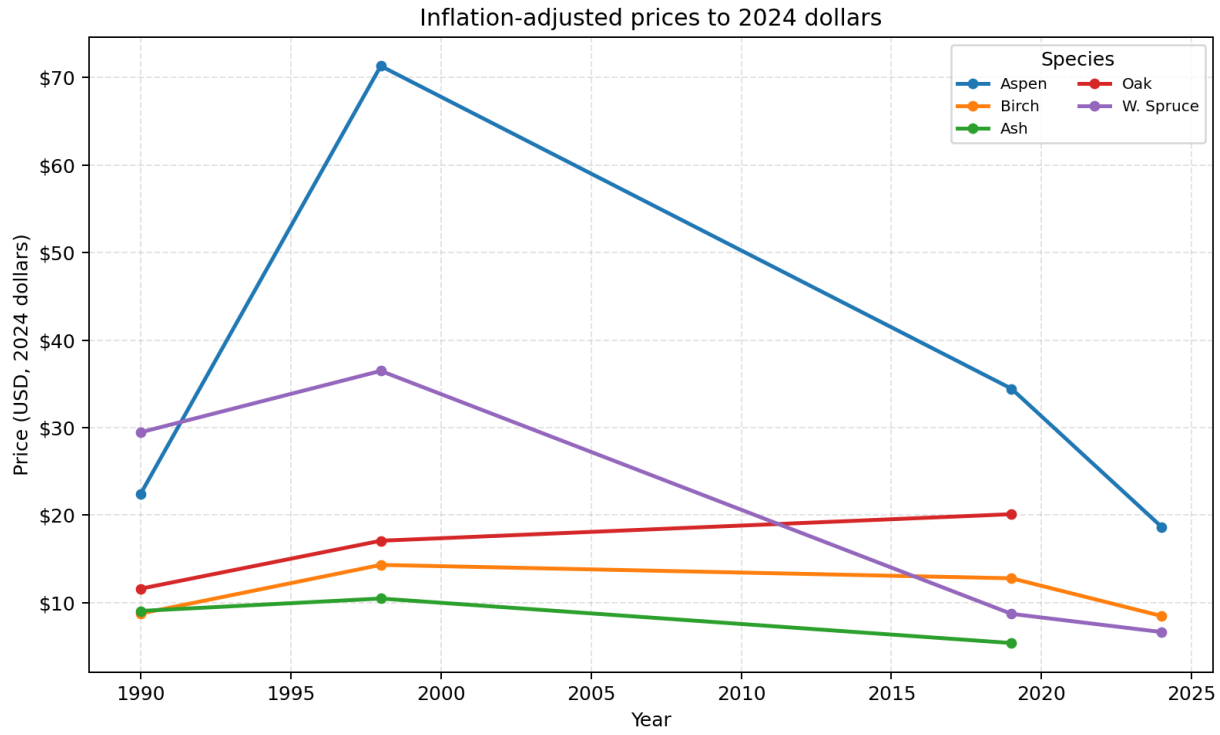


Figure 2-14. Average price received per cord for pulpwood, MNDNR 2024.

Tourism & Recreation

The lakes, rivers, forests, and prairies of the West Central Landscape provide recreational enjoyment for both residents and visitors. While the timber economy is directly related to forest resources, the tourism and recreational industries are indirectly supported by the wealth of natural resources present in the region.

Many people live and vacation in this area because they enjoy outdoor recreation including hiking, lake life, fishing, atv-ing or snowmobiling, hunting, and more. Counties track visitor spending on lodging, food, recreation, retail, transportation, and second home ownership. In the West Central Landscape, Stearns County brings in the greatest amount of money, at over $300 million. The smallest amount of recreational visitor spending ($2 million) is done in Todd County. While some second homes may be owned by Region residents, many are owned by people outside the area seeking a cabin. Otter Tail County has the largest amount of spending on second homes, which is logical given the many lakes scattered throughout the area.

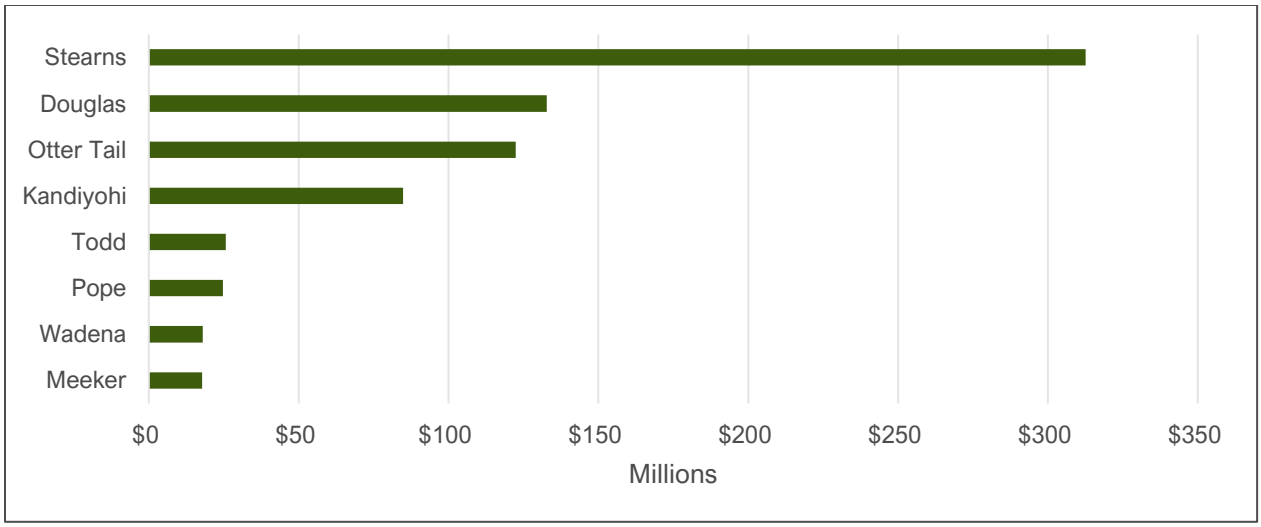


Figure 2-15. Visitor spending (Source: MFRC Data Viewer).

DNR requires hunting and fishing licenses or tags. While data is statewide, many people in the West Central Landscape participate in these activities. Stamps purchased for pheasant hunting, fishing licenses, and deer hunting licenses have varied recent years (Figure 2-16, Figure 2-17).

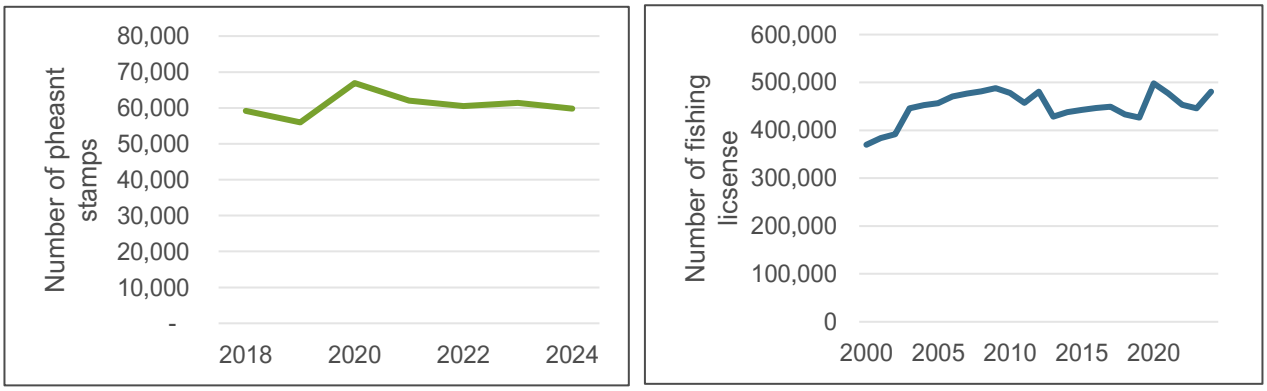


Figure 2-16. Pheasant stamps (left) and fishing licenses (right)

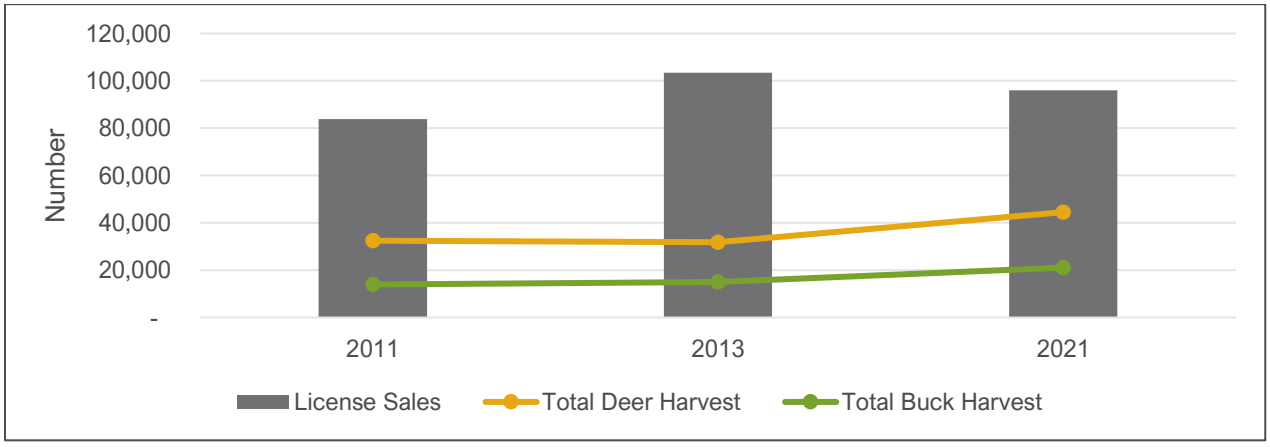


Figure 2-17. Deer hunting licenses and harvest, 2011, 2013, and 2021.

Economic Strengths and Challenges

The natural resources of the area, along with the recreational activities they support, provide great economic value (Figure 2-18). These are recognized as a benefit to the region and to achieving goals in this plan. Additionally, economic barriers and shifting demographics provide challenges to the forest economy.

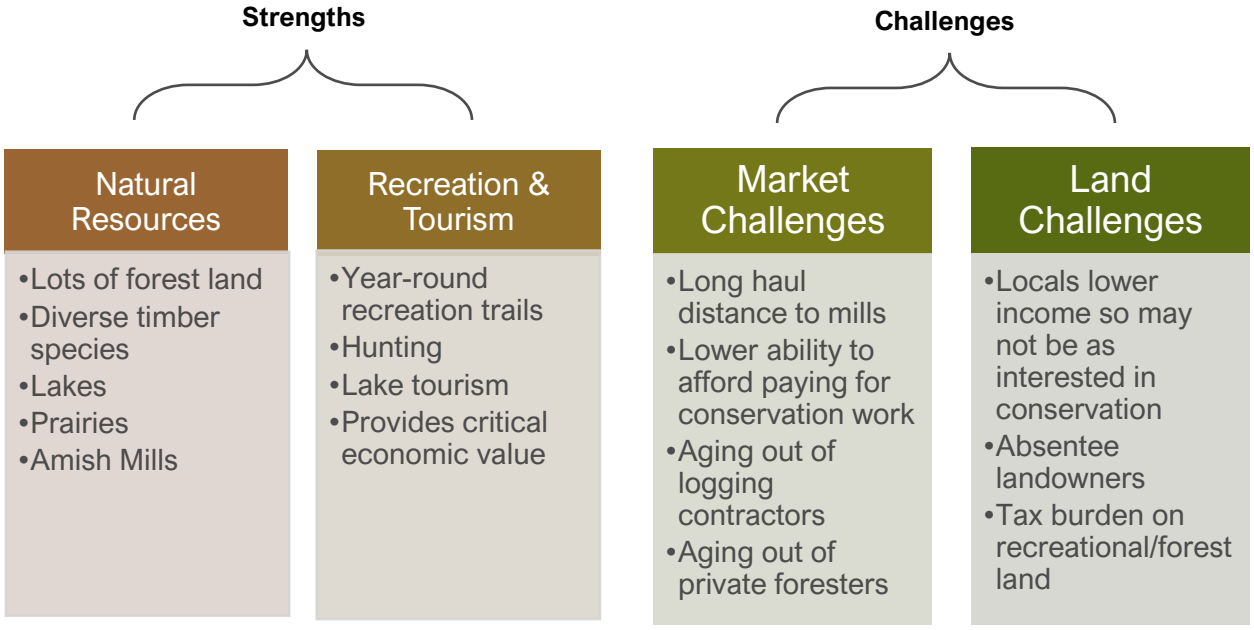


Figure 2-18. Economic strengths and challenges of the Region

A decrease in the amount of time the soil is frozen has and will continue to impact winter logging operations and market supply. Additionally, climate change is expected to favor invasive species and insect predation which will lower merchantable timber stand supply and increase forest management costs.



Desired Future Condition – Business

Encourage viable and geographically diverse natural resource-based businesses, which advocate the long- term stewardship of natural resources.

Goal A

Encourage natural resource-based businesses, both service and product driven, of all sizes.

Strategy 1
Encourage partnering of for-profit and non-profit organizations to promote favorable business opportunities/climates.

Strategy 2
Use government purchasing power to encourage business development, for example purchase locally.

Strategy 3
Support forest industry by encouraging sustainable use of locally sourced forest-based material for potential business, including timber and non-timber products (i.e. maple syrup).

Strategy 4
Encourage/support start-up of and maintenance of businesses who assist landowners with land management.

Strategy 5
Identify and articulate barriers to start up and operations for loggers, mills, and forestry professionals.

Strategy 6
Support and increase outdoor recreation and tourism opportunities including projects that create access to land or waters.

Goal B

Maintain a stable supply of forested natural resources products.

Strategy 1
Support active forest management and promote sustainable forestry.

Strategy 2
Encourage balanced distribution of age classes to support timber supply.

Strategy 3
Maintain forest land base for public and private timber supply.

Strategy 4
Support and enhance opportunities for carbon credits on both public and private forest land that allow for continued sustainable forest management.

Strategy 5
Promote forest management and a wood products industry that facilitates use and management of diverse species.

Strategy 6
Acknowledge the impacts of the statewide, midwest, national, and global forest resource economies.



The West Central Landscape contains a variety of cover types, including forest, prairie, and agriculture and spans several watersheds. There is a wide variety of forest types from fire dependent, to mesic hardwood, to floodplain and wet forest.

Ecological Trends and Conditions

Ecological units are used to group areas with similar ecological features. At the largest scale, the West Central Landscape contains three of Minnesota's four provinces. The Eastern Broadleaf Forest Province cuts through the West Central forest region from northwest to southeast. The northern corner of the region is within the Laurentian Mixed Forest Province, and the southwest area is within the Prairie Parkland Province. At a finer scale, there are four sections in the region and six subsections. The majority of the region is within the Minnesota River Prairie, Hardwood Hills, and Pine Moraines & Outwash Plains subsections. Characteristics of each unit can be found on the DNR website: https://www.dnr.state.mn.us/ecs/index.html

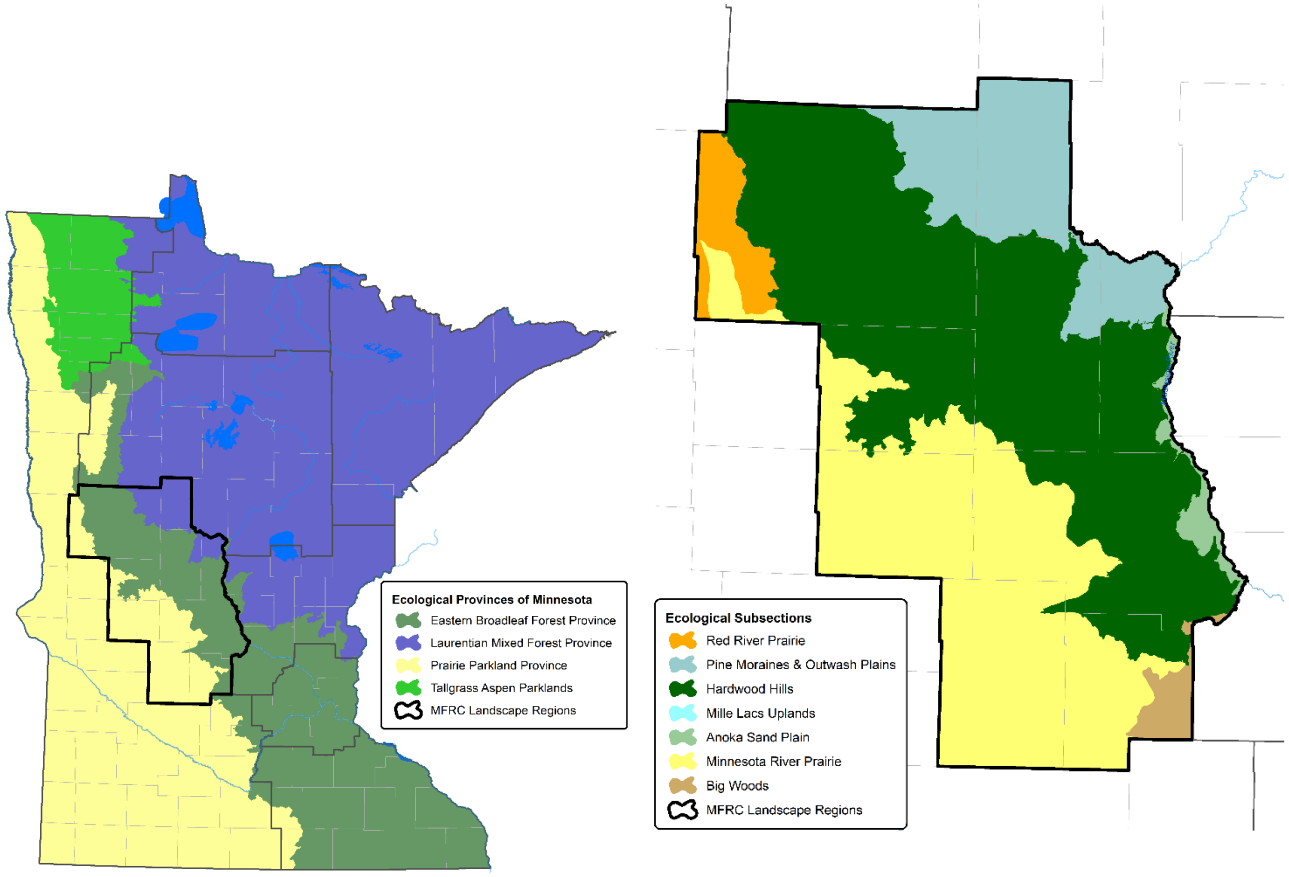


Figure 2-19. Provinces (above) and subsections (right) in Minnesota

History

Land cover has changed very quickly in ecological timescales following European settlement. Historically, the region was reportedly covered in prairie and woods (Figure 2-20).

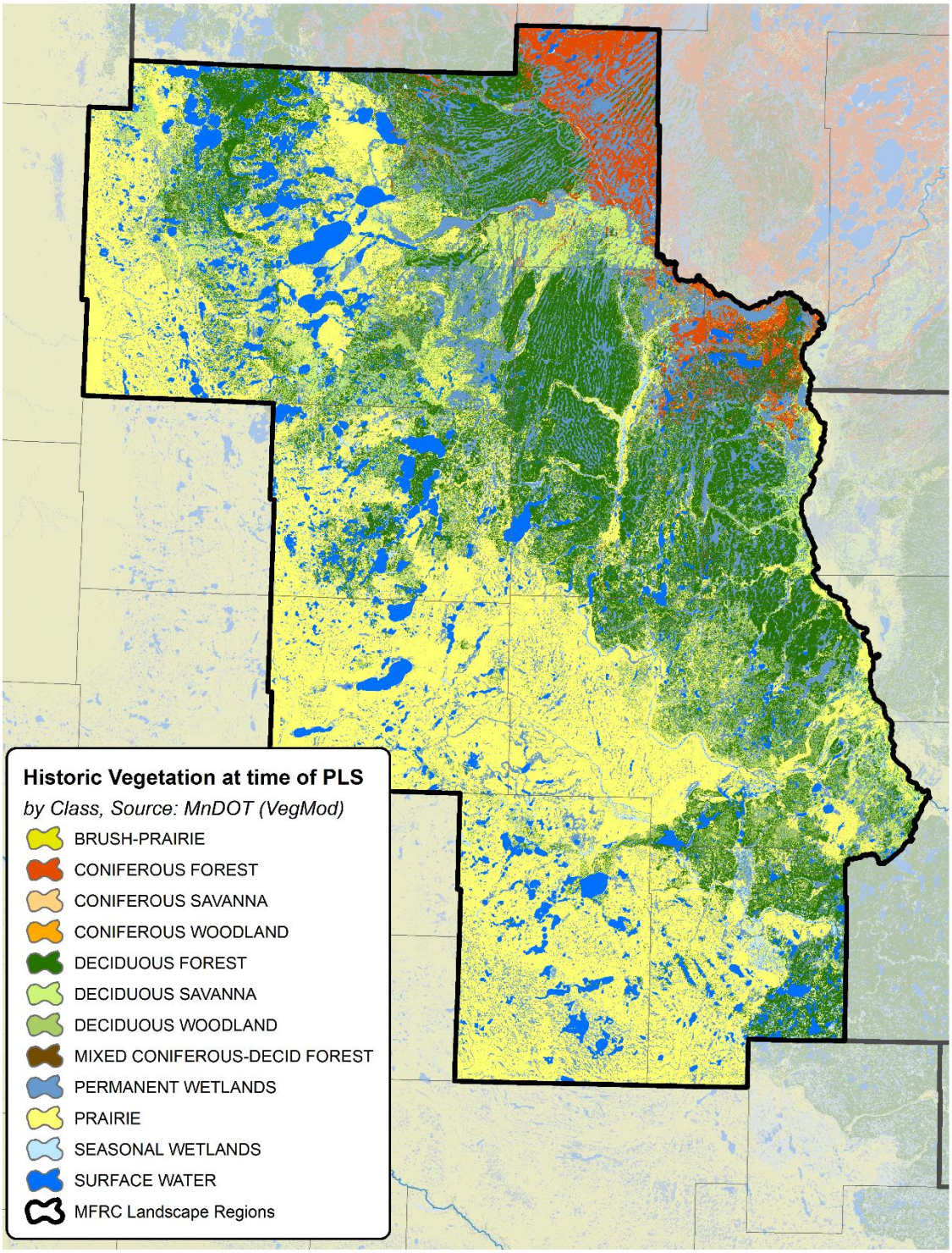


Figure 2-20. Estimated vegetative cover in the late 19th century.

Water Resources

The region is covered by lakes, streams, and wetlands that provide freshwater, recreational opportunities, and habitat (Figure 2-21). Many historic wetlands have been drained and the hydrology of the landscape has been altered. Approximately 229 stream reaches or lakes are impaired with top impairments as fish biology, bacteria, and invertebrate biology.

The region also contains many outstanding and significant resources (Figure 2-21). There are lakes designated for protection for wild rice, fish, or biological significance.

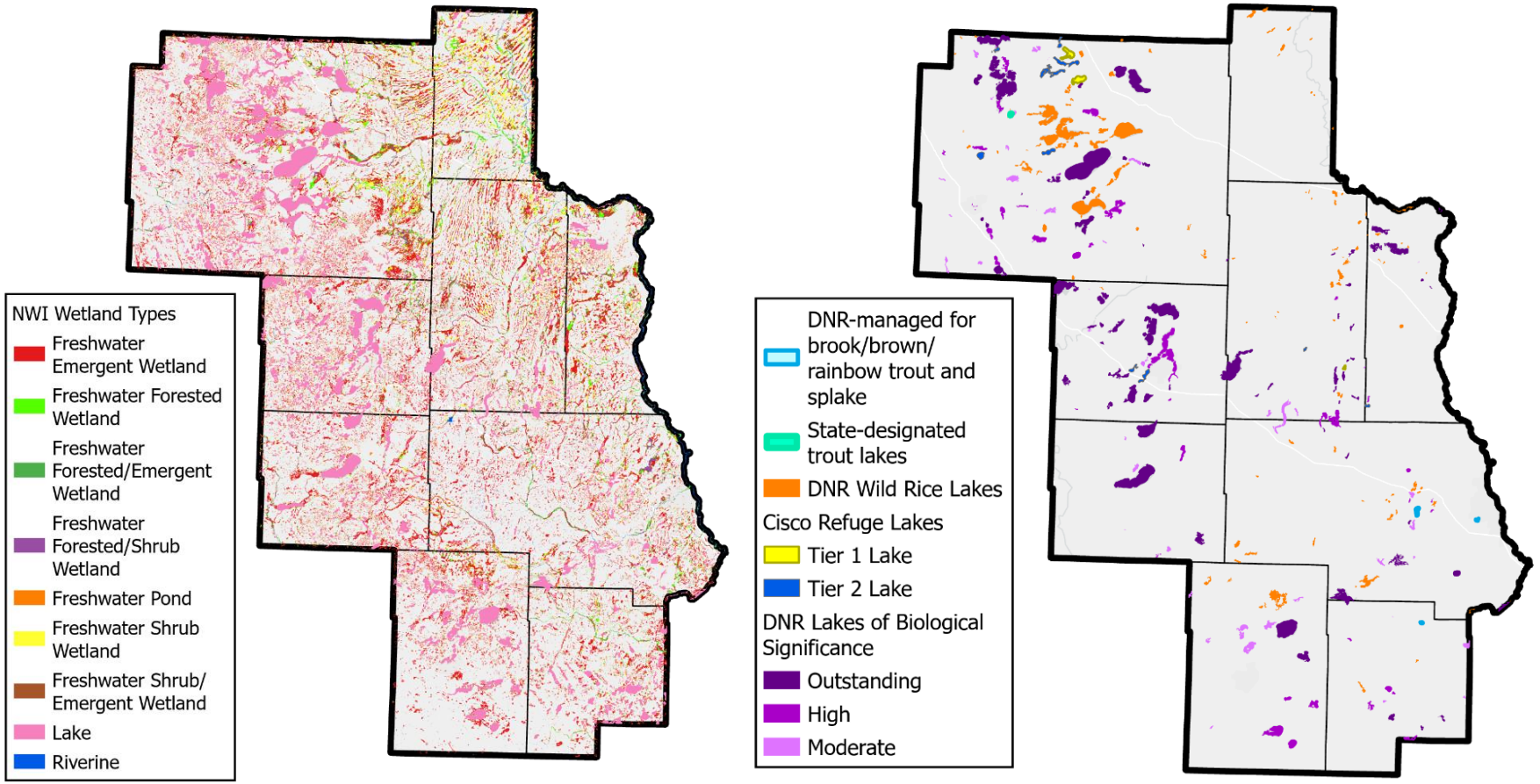


Figure 2-21. West Central Landscape wetlands (left) and notable surface water (right)

Land and Water Management

There are numerous local and state management plans active in the Region. There are 15 major watersheds (HUC-8) in the Region with Comprehensive Watershed Management Plans and one Landscape Plan for Camp Ripley Sentinel Landscape (Figure 2-22). About half of the region (the Eastern side that has more forest) is also included in Landscape Stewardship Plans (Figure 2-23). These plans guide the management of the landscape from Forest Stewardship Plans, to shoreline enhancements, to agricultural best management practices.

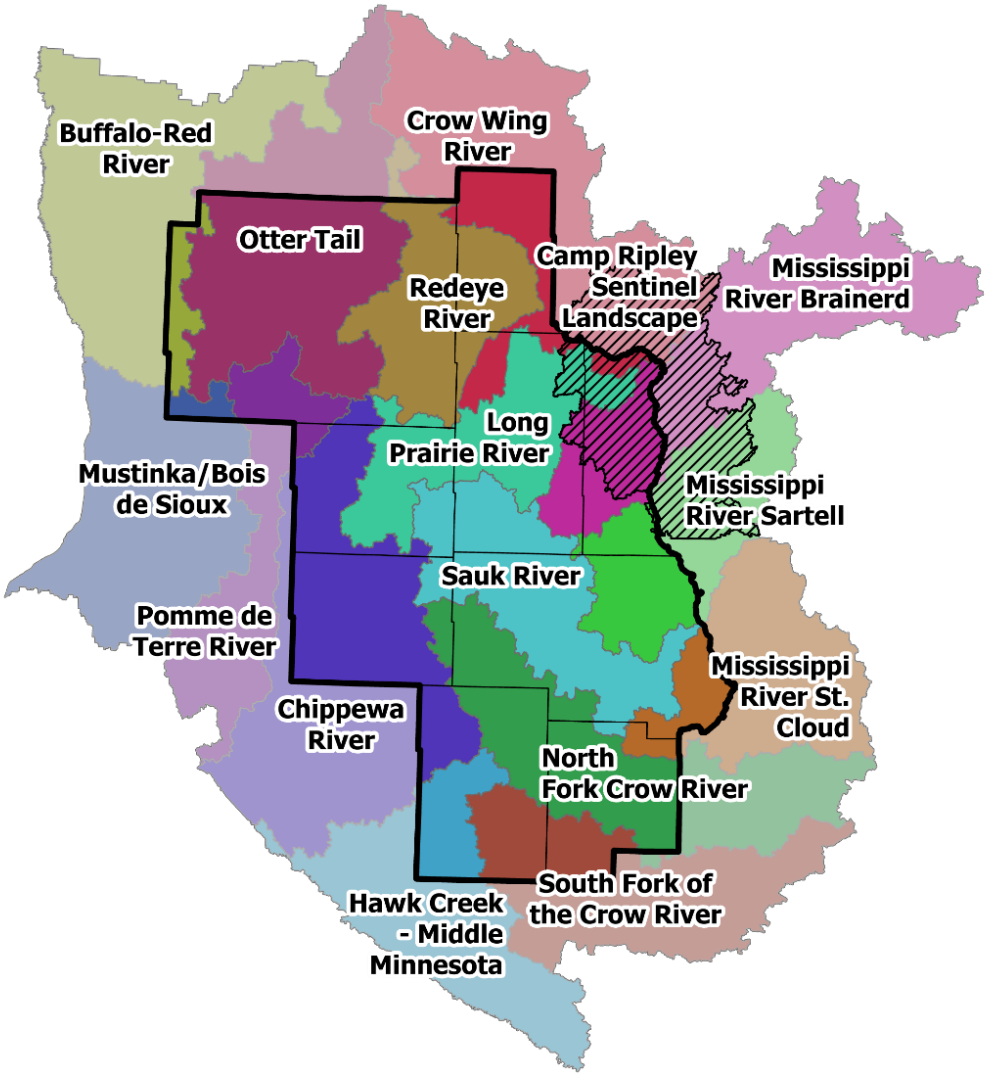


Figure 2-22. Watershed Plans in the Region

Wadena County has a unique history of forest management. Historically, the DNR managed most county-administered forest land as the county had insufficient land to justify a Land Management Department. However, in 2020 the County was approached by The Conservation Fund and Northern Waters Land Trust with the opportunity to acquire Potlach acres and began managing their own forests.

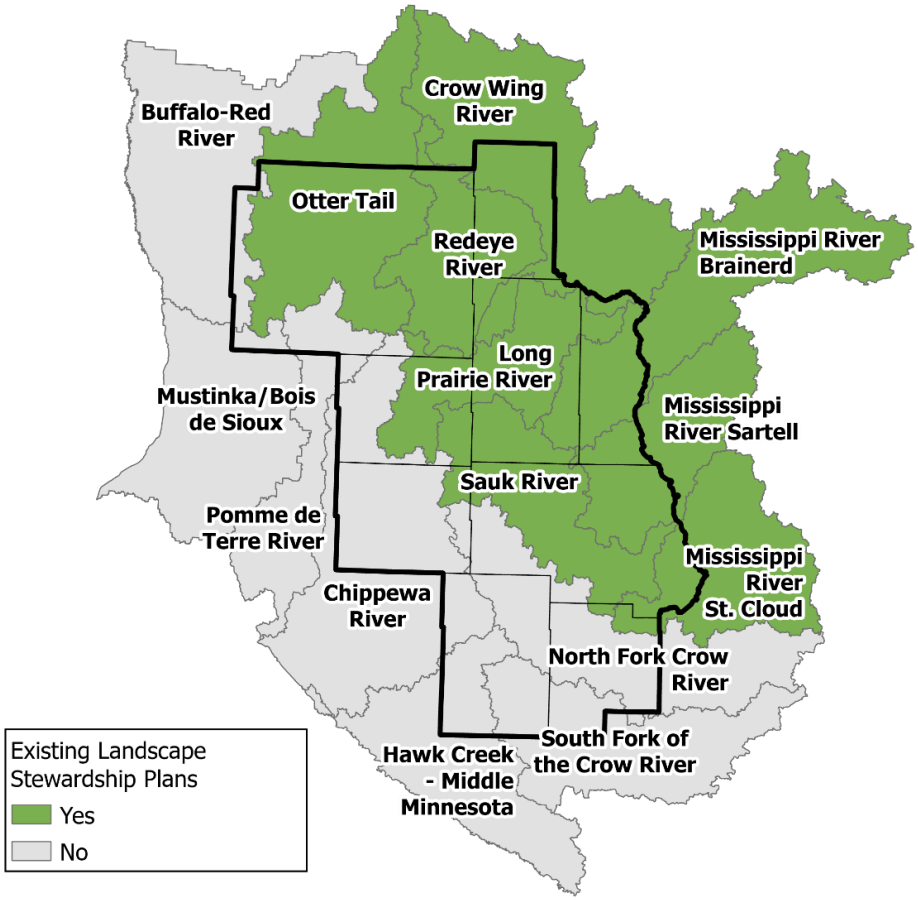
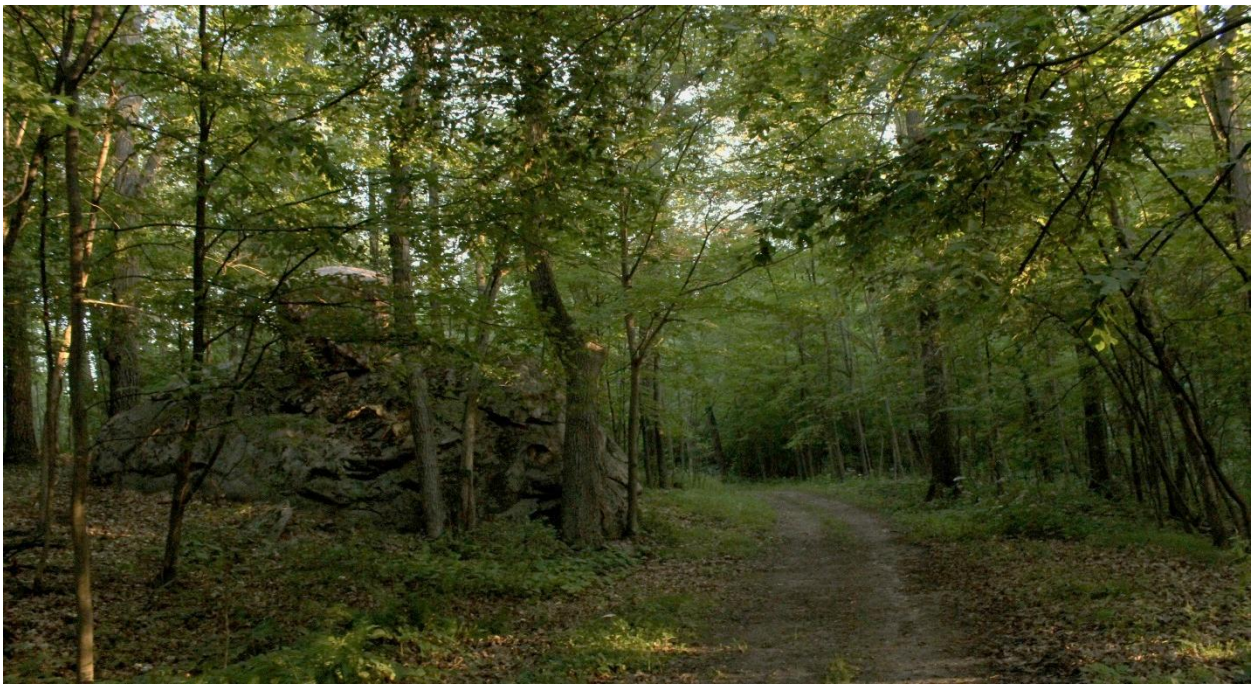


Figure 2-23. Landscape Stewardship Plans in the Region



Forest Trends

Forested land in the West Central Landscape has remained relatively stable the past two decades (Figure 2-24). However, the species composition of the forest shifts over time (Figure 2-25). In the region, the predominant species are red oak and bur oak.

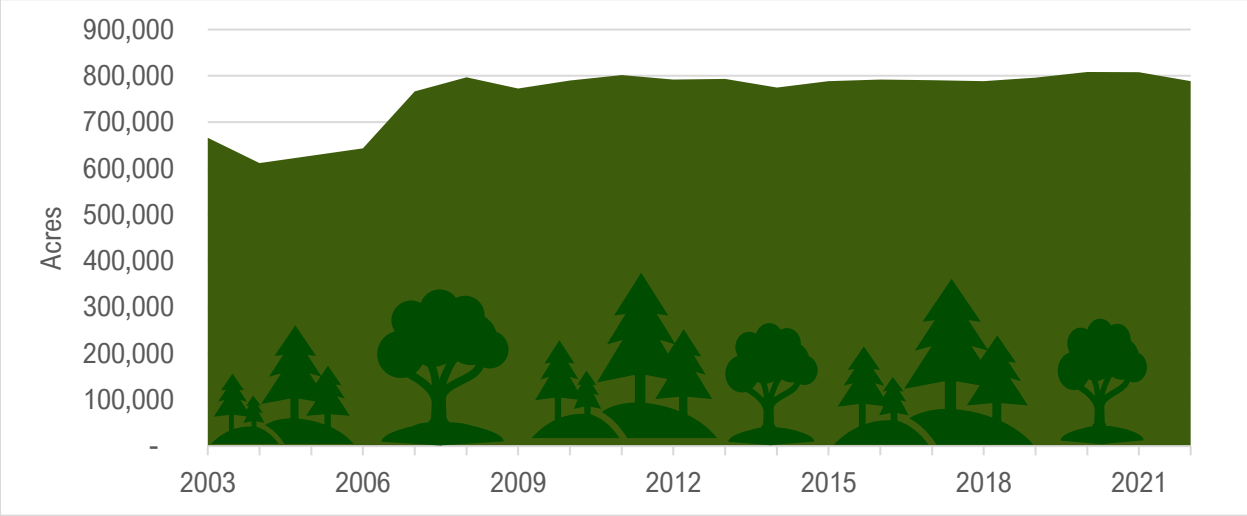


Figure 2-24. Forested acres over time

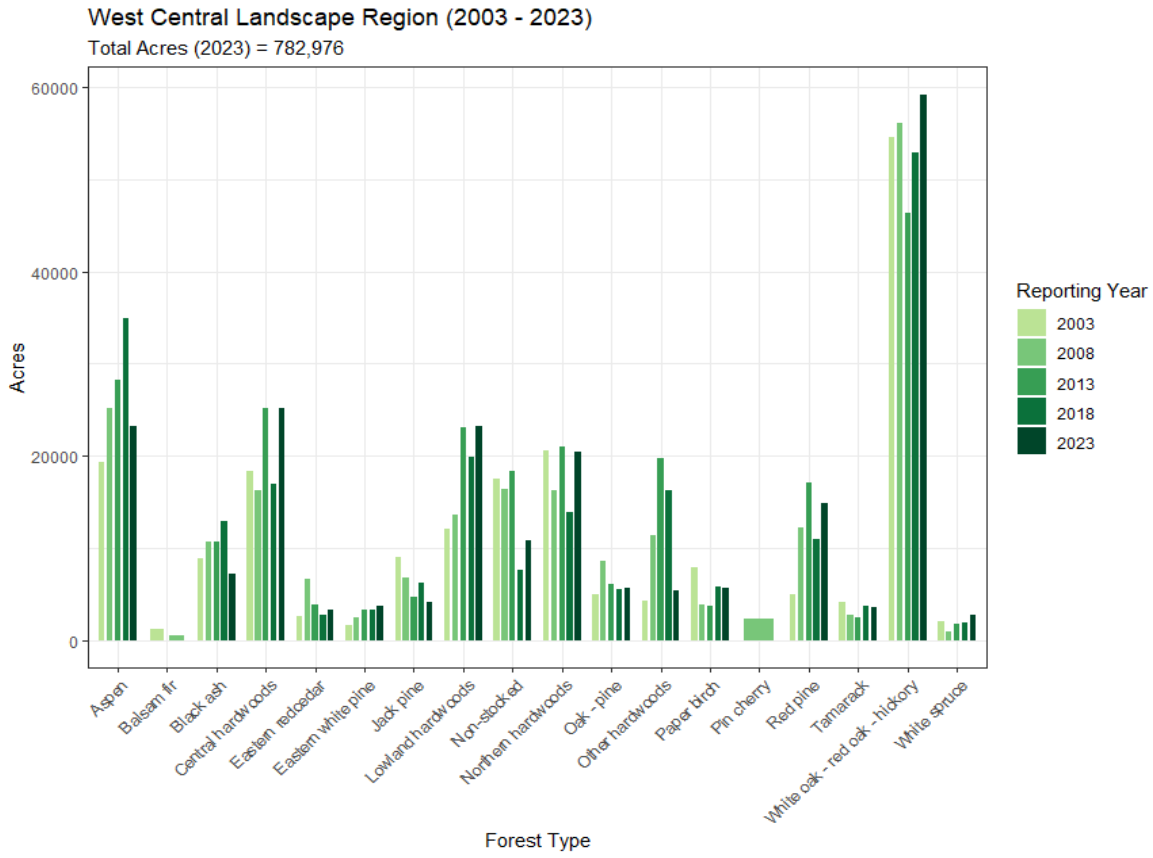


Figure 2-25. Forest types over time (DNR).

Ecological Strengths and Challenges

The abundance of natural resources of the region and planned management of them is a strength for forest management. Challenges the environment faces include weather events, poor forest health, and land conversion.

Strengths

Natural Resources	Human Aspects
• Diverse forests and habitats • Clean water • Beauty of the landscape • Forest/prairie biome edge	• Land use and watershed plans cover the region • Interspersion of woodland and agriculture

Challenges

Forest Health	Land
• Invasive species • Drought • Wind events • Aging forests, especially oak • Potential shift in the prairie/forest border to favor more prairie	• Fragmentation of woodlands (parcelization) • Land conversion from virgin woodland and prairie to agriculture or developed use

Figure 2-26. Ecological strengths and weaknesses

Ecological climate challenges include potential change in the distribution and range of native species, increasing wildfires, vegetative stress due to drought or heat, decreased seed production, and a movement of the prairie biome north and east.



Desired Future Condition – Forest and Prairie Ecosystems

Forest and Prairie ecosystems are healthy, resilient, and functioning providing sustainable economic and/or recreational opportunities.

Goal A

Keep current forested acres forested (800,000 acres in 2025) and expand forest cover in coordination with partner goals.

Strategy 1
Maintain existing and promote new windbreaks and encourage agroforestry practices.

Strategy 2
Use Federal and State programs, partner with NGOs to access private funding, and coordinate with agricultural partners to reforest marginal agricultural land and riparian areas with appropriate native species.

Strategy 3
Expand and promote forest management to 1) improve forest health, 2) promote wildlife habitat, and 3) build resilience to climate, disturbance, and invasive species in areas ecologically appropriate for forested.

Strategy 4
Coordinate ecological goals for Wadena County with the North Central Landscape goals.

Strategy 5
Support and educate family forest landowners with the management and retention of their forests through education and enduring technical and financial assistance.

Strategy 6
Expand forest cover by 50,000 acres to accrue progress towards the Minnesota Million acres goal to increase carbon sequestration and storage in areas delineated as high potential for reforestation by the Million Acre goal.

A movement to reforest one million acres of Minnesota by 2045, led by The Nature Conservancy

Goal B

Encourage private forest management programs (Sustainable Forest Incentive Act, Forest Stewardship Plans, 2c Managed Forest, etc.).

Strategy 1

Publicize the importance of forest and ecosystem management through outreach efforts.

Strategy 2

Support funding for private land technical and financial assistance forestry programs through the state of Minnesota and bring federal funds (e.g. EQIP, CSP, and funding to DNR) to Minnesota.

Strategy 3

Explore program options for supporting landowners with management or retention of forested parcels less than 20 acres.

Strategy 4

Continue to engage with easement and carbon banking program administrators to stress the importance of forest management and stewardship.



Goal C

Maintain connected diverse wildlife habitat complexes across multiple landowners.

Strategy 1

Identify and map 500 acres or greater habitat complexes and distribute the map and data to local land use authorities.

Strategy 2

Encourage organizations and landowners to adopt conservation easements or other incentives to retain natural habitat and pay stewardship costs. Easements should allow for active stewardship.

Strategy 3

Explore ways to encourage counties and townships to adopt land use planning and zoning regulations, which preserves strategically located portions of the non-developed private land base in 40 acre or greater parcels.

Strategy 4

Encourage cluster development zoning to concentrate development in defined areas while preserving the remaining land in its natural, vegetated state.

Strategy 5

Manage for resiliency to extreme weather events, especially in large habitat complexes.

Strategy 6

Create priority forest management areas similar to the Prairie Conservation Plan, CWMPs, and State Wildlife Action Plan priority areas.

Goal D.

Retain all current grasslands and native prairies (no net loss of prairies or savannah).

Strategy 1

Increase native prairie following the Minnesota Prairie Plan in collaboration with the Prairie Reconstruction Initiative.

Strategy 2

Strengthen protection efforts of existing grassland into large corridors following the Minnesota Prairie Plan and Ducks Unlimited Grassland Project.

Strategy 3

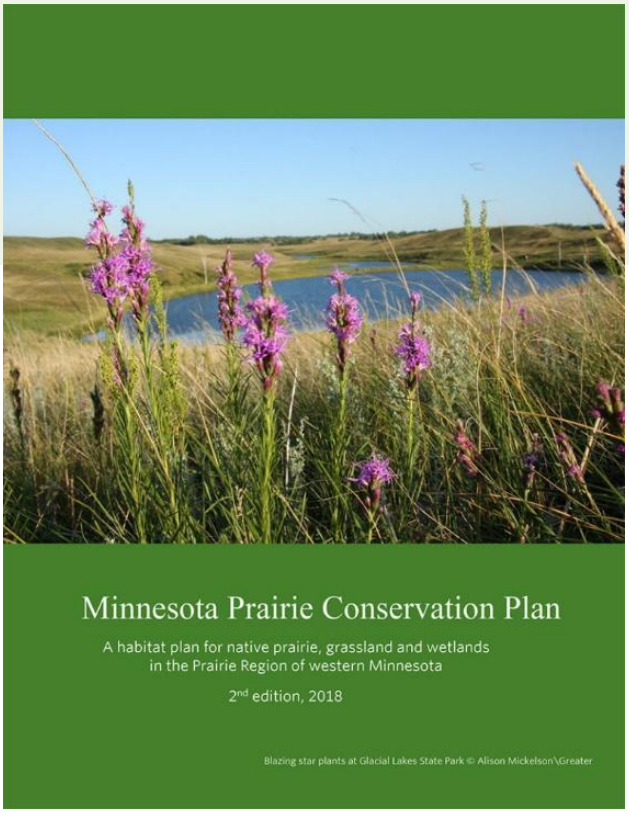
Restore a range of woodland and grassland, including oak savannah and other areas with varying amounts of shrub/grass understory.

Strategy 4

Discourage planting trees on inappropriate sites in the prairie region, such as areas in close proximity to existing native grasslands or areas being managed by mutual agreement of the affected parties as treeless habitat.

Strategy 5

Encouragement of prescribed burning, managing invasives, careful prescribed grazing, and education.



Desired Future Condition – Water Resources

Water resources are managed to sustain their quality for human use and provide habitat for many species of plants and animals.

Goal A

MFRC Forest Management Guidelines (FMGs) are used on 100% of the management activities in forests and forest riparian zones to protect water quality.

Strategy 1

Support regional training on FMGs for loggers and foresters. Training areas of importance include new climate considerations, water management, and logging roads.

Strategy 2

Expand FMG monitoring in the West Central Landscape.

Strategy 3

Increase number of landowners with forest management plans, targeting areas near lakeshores and riparian areas. Offer trainings for landowners and ensure plans are implemented.

Goal B

Support the implementation of Comprehensive Watershed Management Plans to protect and enhance water quality and habitat.

Strategy 1

Support SWCDs, NRCS, and MDA on implementation of agricultural best management practices.

Strategy 2

Maintain, increase, and manage buffers of perennial or natural vegetation along and around all public waters and ditches (public and private).

Strategy 3

Support Cities, SWCDs, MDH, and MDA on groundwater protection practices (i.e. wellhead protection, water quantity, drinking water supply management area protection).

Section 3. Vegetation Management Framework

Introduction

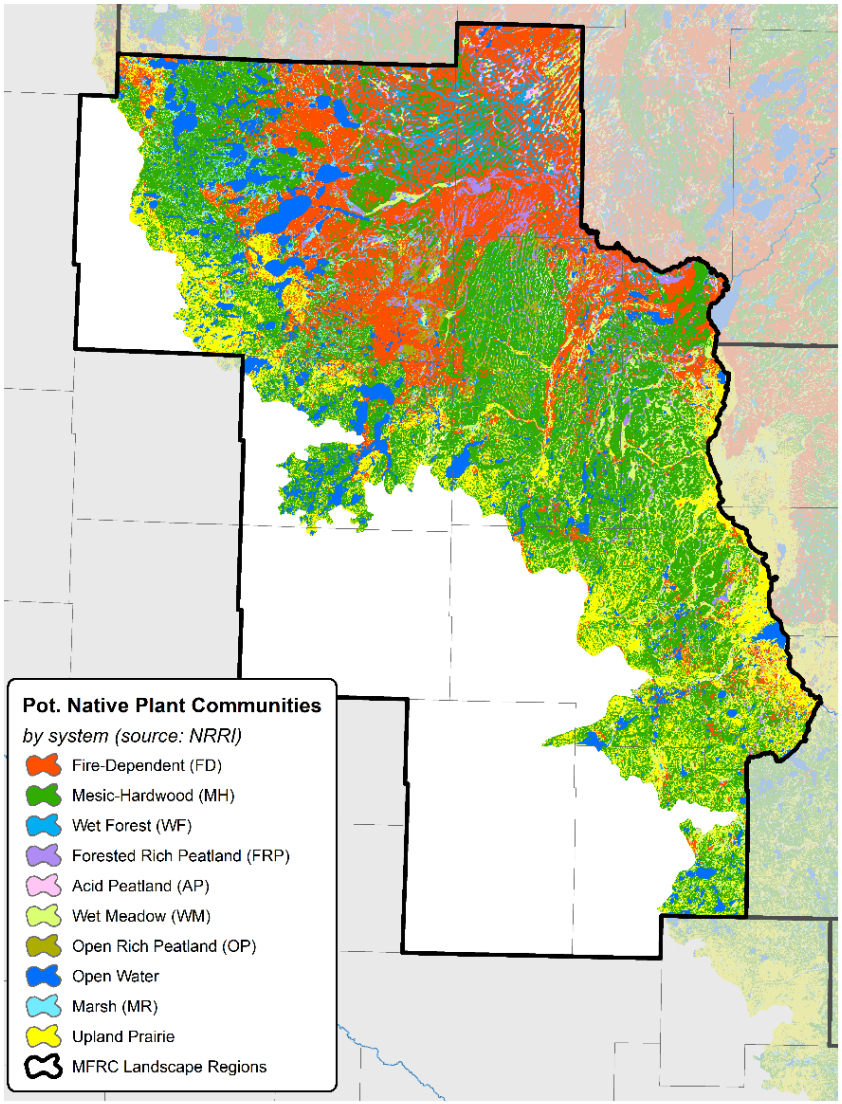
Many land managers in Minnesota manage habitats based on the Minnesota Department of Natural Resources (DNR) Native Plant Community Classification System. This system provides a common language for vegetation management, biodiversity conservation, and research. For this reason, the West Central Landscape Plan utilizes this system as the foundation of the Vegetation Management Framework.

Minnesota DNR Native Plant Communities (NPCs) are groups of native plants which interact with each other and the environment in ways not greatly altered by human activity or invasive species. They are classified by similar characteristics such as vegetation, hydrology, soils, landforms, and disturbance regimes. Areas where native species have been largely replaced by plantations, lawns, farms, non-native pastures, or other significantly altered ecosystems are not considered native plant communities.

NPCs have been mapped in the majority of the West Central Landscape Region, but not all of it. Historic and current land cover are presented in Figures 3-1 and 3-2 as an ancillary to a comprehensive map of NPCs. NPCs that have been mapped in order of greatest to least land area are:

- Mesic Hardwood
- Fire Dependent
- Wet Meadow
- Forest-rich Peatlands
- Upland and Wet Prairie
- Marsh
- Complex Community
- Open Rich Peatland
- Wet Forest
- Floodplain Forest
- Acid Peatland

Eight of these NPCs in the West Central Landscape are explored in this Plan. This section further elaborates on Section 2 goals within a Vegetation Management Framework by setting NPC-specific goals and objectives.



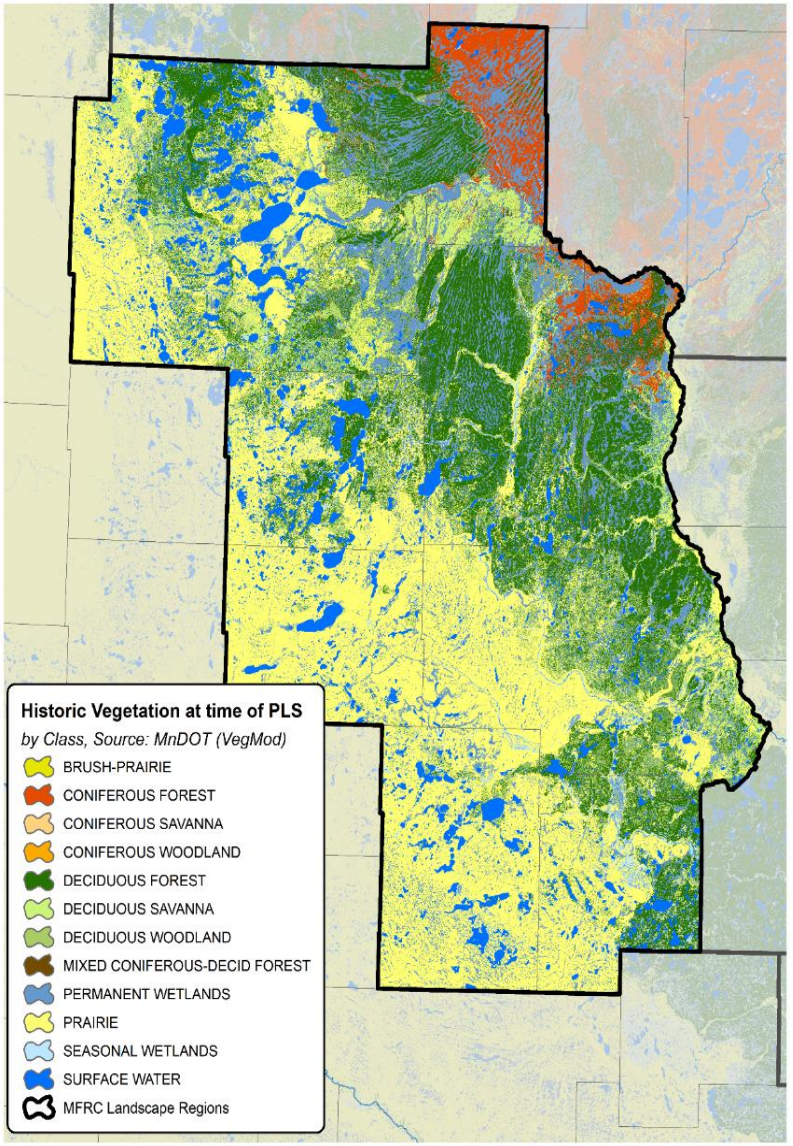
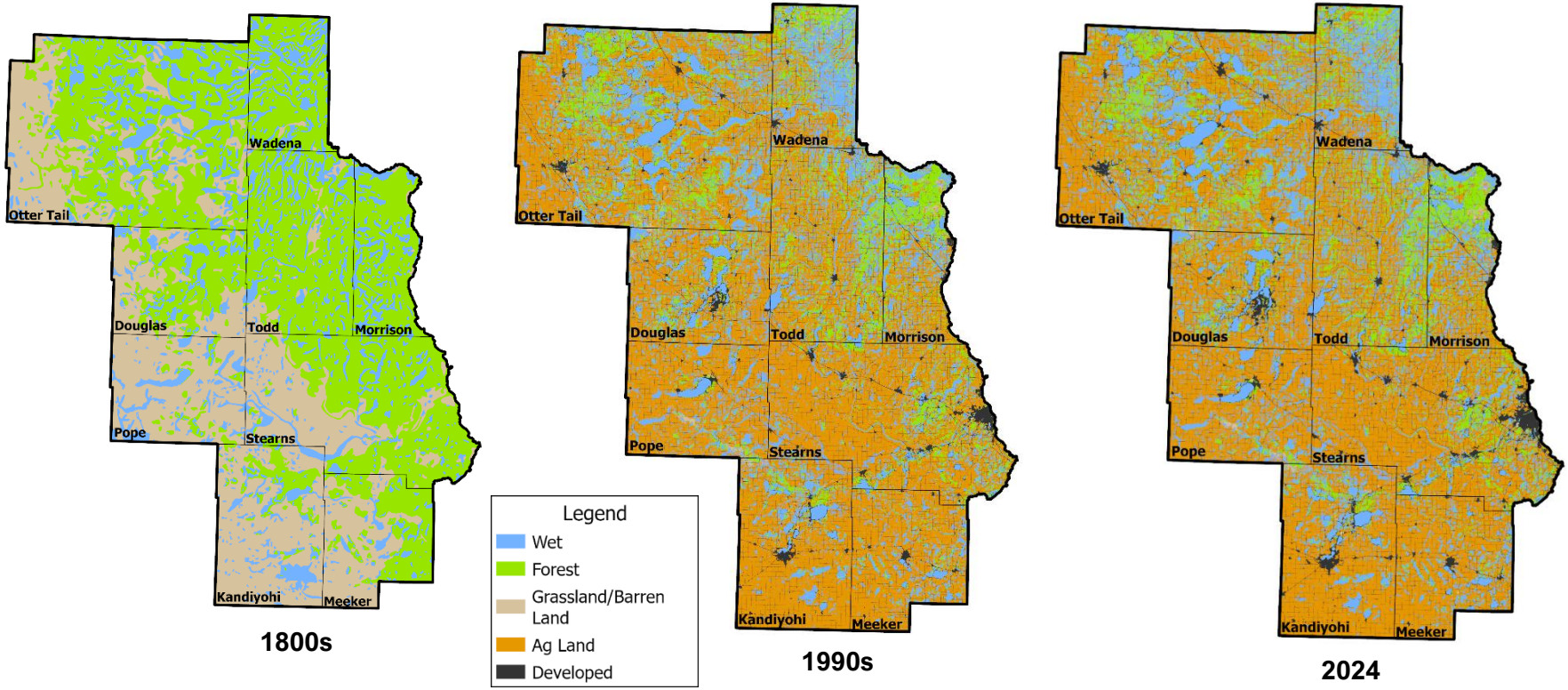


Figure 3-1. Present mapped Potential Native Plant Communities (left), versus historic (right)



Type	Percentage
Forest	48%
Wetland	17%
Grassland/Barren	34%

Type	Percentage
Forest	12%
Wetland	23%
Grassland/Barren	1%
Developed	6%
Agriculture	58%

Type	Percentage
Forest	12%
Wetland	23%
Grassland/Barren	1%
Developed	7%
Agriculture	57%

Figure 3-2. Land cover in 1800s, 1990s, and 2024. Source: National Land Cover Database

Forest Values Survey

Committee members were surveyed for value and vulnerability of each forest community type in Table 3-1. Responses are grouped into categories of economic, social, and ecological value, as well as ecological and climate change vulnerability.

Table 3-1. Value of forest by community. H = High, M = Medium, L = Low

Cover Type	Productivity* "Economic" Value	Recreation Opportunities* "Social" Value	Ecological Value*	Ecological Vulnerability* "Ecological" Vulnerability	Climate Change Vulnerability*
Mesic Hardwood	H Forest industry and landowners	H Hunting, outdoor recreation	M	H Threat of conversion, invasive species	M
Floodplain	M	H Hunting, recreation	M	H Risk of adjacent development, hydrologic alteration, emerald ash borer (EAB)	H
Fire Dependent	H Forest industry and landowners	H Hunting, outdoor recreation	M	H Threat of conversion, invasive species, fire suppression	M
Acid Peatland	L	L	H	M Hydrologic alteration	H
Forest-rich Peatlands	L/M	L	H	M Hydrologic alteration	H
Upland and Wet Prairie	L/M Seed production, pollinators	M/H Hunting, hiking	H	H Threat of conversion, fire suppression, invasive species	M (prairie) / H (savanna)
Wet Forest	M	M	M	M/H EAB, Hydrologic alteration	H
Wet Meadow	L	M	M	M Hydrologic alteration	M

*Ratings sourced from Committee members

Mesic Hardwood NPC

Mesic Hardwood Forest (MH) communities are present on upland sites with moist soils, usually in settings protected from fire. They are characterized by continuous, often dense, canopies of deciduous trees, including sugar maple, American basswood, paper birch, and northern red oak, and understories with shade-adapted shrubs and herbs.

- ✓ MH communities are the most abundant of the West Central Landscape NPCs

Mesic Hardwoods Goals and Strategies:

Goal 1. Maintain and enhance forest structure diversity

Strategies:

a. Increase younger age classes of oak and aspen
b. Help landowners regenerate and maintain a diversity of species and forest age classes
c. Encourage doe harvest through education of landowners and policy makers
d. Provide cost-share and incentives for management and protection

Goal 2. Manage and educate about invasive species

Strategies:

a. Manage and educate on buckthorn
b. Manage and educate on emerald ash borer (EAB)
c. Conduct outreach on oak wilt prevention
d. Educate the public on the impact of earthworms
e. Maintain knowledge on the status of all invasive species impacting the region

Goal 3. Maintain oak as a component, with emphasis on those more adaptive to climate change

Strategies:

a. Support research on how to increase oak component
b. Apply intermediate treatments to encourage oak regeneration through burning, mechanical methods, and herbicide
c. Promote diversity and selective harvesting of oak species to for climate adaptability and resilience to oak wilt
d. Promote planting of more southerly species or southerly genetics of species commonly found in the region consistent with current assisted migration guidance
e. Implement crop tree release where needed
f. Increase seed collection efforts to obtain target species from desired locations

Hybrid Poplar Plantations

Hybrid poplar plantations are present in the West Central region. These plantations occur within non-naturally occurring plant communities, planted in rows. Plantings occur commonly on former pastures and row-crop fields.

Goal 4. Increase management of hybrid popular plantations

Strategies:

a. Managing existing stands is important for conversion or succession to more appropriate and diverse forest types and habitats for the landscape.
b. No longer encourage hybrid poplar plantations.

Potential Mesic Hardwood Management Challenges:

- Invasive species (EAB, buckthorn)
- Large deer population
- Two-lined chestnut borer
- Armillaria (causes root rot)
- Lack of markets
- Proximity to mills and loggers
- Lack of small loggers
- Lack of active management on private land, specifically efforts to increase age diversity
- MH forests are increasing due to fire suppression
- Parcelization & climate change
- Lack of oak regeneration
- Lack of companies to provide management service
- Increased risk of oak wilt

Climate Change Impacts:

- Increased wind events may facilitate the regeneration of some species due to light penetration from blowdowns
- Wind events may also open the canopy and growing space for invasives
- Some species may be well suited for changing temperatures (e.g. from the south, species like red maple or ironwood)
- Deer browsing impacts ability to get proper tree regeneration to create a diverse mesic hardwoods stand with multiple within-stand age-classes. Deer herbivory also reduces abundance of herbaceous understory species.
- Milder winters are more favorable for higher deer populations
- Climate change affects deer problems beyond population size. Milder winters with less snow cover allow for earlier, longer browsing of plants. This can result in less selective browsing on less favorable species such as white spruce.
- Warmer / milder years may impact invasive species, pests, pathogens

Fire Dependent NPC

Fire-Dependent Forest (FD) communities are largely oak, pine, and aspen and are strongly influenced by wildfires. Fires are the major source of species mortality and exert strong influence on patterns of plant reproduction by exposing mineral soil seedbeds, triggering dispersal of propagules, and increasing the amount of light reaching the ground or understory. Fires periodically remove much of the litter, duff, and other organic material from the community and can have a significant effect on nutrient cycling and nutrient availability.

- ✓ Jack pine and red pine are prominent in northeastern most edge of Wadena and Otter Tail counties
- ✓ Oaks and aspen are prominent through the northeastern end of Otter Tail County
- ✓ In this plant community, red pine is the most economically valuable species

Fire Dependent Goals and Strategies:

These goals and strategies are not relevant to plantation communities but are instead intended to focus on naturally occurring plant communities. See callout box on page 3-8 for a conifer plantation goal.

Goal 1. No net loss of fire-dependent forests

Strategies:

a. Use harvest and intermediate treatments to mimic fire disturbance regime and prevent mesophication
b. Maintain conifers on the landscape through supplemental regeneration

Goal 2. In non-plantation plant communities, maintain or restore fire through prescription

Strategies:

a. Conduct private landowner outreach on how to implement fire, make connections to those who can help, and provide education on timing of fire to avoid impacts to marketability
b. Encourage and support Prescribed Burning Associations

Goal 3. Manage and educate about invasive species

Strategies:

a. Provide technical assistance and education on buckthorn, exotic honeysuckle, etc.
b. Conduct outreach on oak wilt prevention

Goal 4. Maintain and manage forest structure diversity

Strategies:

a. Increase species diversity (e.g. pine, oak, and maple) at various growth stages through planting and encouragement of natural regeneration through harvesting and intermediate treatments.
b. In mixed species stands, manage for a wide range of growth stages at the landscape and site level through timber stand improvement, harvesting, reforestation, and afforestation on ecologically appropriate sites
c. In post-harvest regeneration, include supplemental conifer plantings for thermal wildlife cover to reintroduce this component and increase diversity.
d. Manage understory diversity and abundance of brush or hazelnut species through various methods, inclusive of prescribed burning, brushing, mowing, and herbicides

Conifer Plantations

Pine plantations in the West Central region include red pine, jack pine, white pine, and white spruce. These plantations occur within non-naturally occurring plant communities, planted in rows. Plantings occur commonly on former pastures and row-crop fields.

Goal 5. Increase timely management of conifer plantations to maintain marketability and viability

a. Where wildlife and biodiversity are the primary goals, consider increasing species diversity and keep a regular thinning schedule. This will increase ground cover for wildlife, resilience for pests, drought, and other climate related impacts.
b. Educate and encourage landowners to plan for and implement early and frequent thinning to increase understory diversity, wildlife habitat, tree health, and economic return.



Potential Fire Dependent Management Challenges:

- Fire suppression over generations can cause mesophication and loss of conifers through natural regeneration, especially jack pine.
- Conifer plantations are not native plant communities and prescribed burning is often inappropriate and can result in catastrophic fire.
- Returning fire to the landscape is increasingly difficult due to the narrow window of opportunity to implement, increased fuel loading across the landscape, changing weather patterns, liability, and safety of prescribed burns.
- Fire has the potential to limit marketability of timber due to charring on trees, with low severity fires having less of an impact on marketability. Timely management of fire should be considered for landowners wishing to market their timber.
- Bark beetles
- Deer herbivory
- Lack of landowner understanding of forests
- Parcelization

Climate Change Impacts:

- Warmer temps and longer growing conditions may make it easier for invasives to take over
- Fire activity is occurring for longer durations, starting earlier in the spring and extending later in the fall than historical patterns
- Warmer and more frequent drought conditions could increase pests and tree mortality; more prone to weather events (e.g. wind, ice, drought)
- Changes in weather and natural disasters due to climate change are somewhat uncertain. Rather than trying to predict specific conditions, increasing species diversity will promote forest resilience.

Wet Meadow NPC

Wet Meadow Forest (WM) communities are shrub-dominated wetlands with annual water inundation and heavy rainfall. Plants are adapted to wet conditions and may include willows, dogwoods, and sedges.

- ✓ WM communities are commonly found in the West Central Landscape NPCs

Wet Meadow Goals and Strategies:

Goal 1. Advocate for and encourage sustainable grazing and haying practices

Strategies:

a. Using forage production methods consistent with soil characteristics including soil wetness, etc.
b. Minimize soil compaction by grazing or haying during dry times and avoiding operations when soil conditions are too wet

Goal 2. Manage wet meadows for pollinators and wildlife

Strategies:

a. Consider seasonal timing of wet meadow operations to avoid disruptions to pollinators and nesting birds (rotational grazing and haying)
b. Consider management techniques for shrub-resting birds (e.g. woodcock and golden wing warbler)
c. Consider use of prescribed burning to increase plant diversity for wildlife (especially in cattail and reed canary systems)

Goal 3. Protect these wet meadow plant communities

Strategies:

a. Educate public on wildlife value of wet meadows
b. Prevent drainage (e.g. road ditches), water table impacts, or inflow of surface water runoff
c. Prevent changes to groundwater flow

Goal 4. Restore wet meadow communities that have been degraded or lost due to drainage

Strategies:

a. Manage invasive species such as reed canary, cattails, and buckthorn to maintain wildlife habitat
b. Promote or pursue wetland restorations

Potential Wet Meadow Management Challenges:

- Deer overpopulation
- Climate change
- Agriculture
- Invasive reed canary
- Frequent drought and flooding

Climate Change Impacts:

- Changing hydrology from increased runoff
- Increase fire potential
- Increased invasive species

Acid Peatland NPC

Acid Peatland (AP) communities are characterized by peatland, a type of wetland in which permanently saturated and anaerobic conditions organic matter accumulates rather than decomposes. Peatlands store carbon and provide unique habitat. AP communities typically have sparse canopy, shrub understory, and carpets of *Sphagnum* moss. Black spruce and tamarack are dominant tree species.

- ✓ AP communities are a very small component of the West Central Landscape NPCs.

The West Central Landscape contains the westernmost occurrences of acid peatland ecological systems in Minnesota and western most example boreal peatlands of North America.

Acid Peatland Goals and Strategies:

Goal 1. Educate people on the importance of this plant community and ecosystem function

Strategies:

a. Increase knowledge on the unique and rare presence of this plant community as the westernmost example in North America
b. Increase knowledge on the exceptional carbon storage of peatlands

Goal 2. Protect these sensitive plant communities

Strategies:

a. Education on wildlife value of acid peatlands
b. Prevent drainage (e.g. road ditches), water table impacts, or inflow of surface water runoff
c. Prevent changes to groundwater flow

Potential Acid Peatland Management Challenges:

- Frozen ground
- Lack of markets
- Parcelization
- Removal of Acid Peatland Forests will reduce their functions to wetlands
- Groundwater levels

Climate Change Impacts:

- Changing of hydrology may lead to drying of peat in extreme drought conditions (which may release carbon dioxide)

Forest-rich Peatlands NPC

Forest-rich Peatlands (FP) communities are also peatlands, with more tree cover than AP. FP communities are sparse canopy, dense shrubs, and a mossy underlayer. Tree species are tamarack, black spruce, white cedar, balsam fir, and paper birch.

- ✓ FP communities make up a small component of West Central Landscape NPCs
- ✓ FPs are used for recreation and peatland research, and provide timber and non-timber products
- ✓ The West Central Landscape contains the westernmost occurrences of forest-rich peatland ecological systems in Minnesota and western most example boreal forested peatlands of North America.

Forest-rich Peatlands Goals and Strategies:

Goal 1. Educate people on the importance of this plant community and ecosystem function

Strategies:

a. Increase knowledge of the uses and attributes of tamarack
b. Increase knowledge on unique presence of this plant community as the westernmost forested rich peatlands in North America
c. Manage expectations of larch beetle impacts on plant community (reseeding likelihood is high)
d. Increase knowledge on the exceptional carbon storage of peatlands

Goal 2. Educate loggers on the sensitivity of forest-rich peatlands

Strategies:

a. Increase knowledge of the importance of frozen ground conditions and timing of freeze in groundwater fed systems. Stress the importance of validating for frozen conditions prior to operations.

Goal 3. Protect these sensitive plant communities

Strategies:

a. Education on wildlife value of forest-rich peatlands compared to market value of timber harvesting
b. Prevent drainage (e.g. road ditches), water table impacts, or inflow of surface water runoff
c. Prevent changes to groundwater flow

Potential Forest-rich Peatlands Management Challenges:

- Winter-only harvest, lack of frozen ground for adequate time to harvest
- Loggers and mills
- Lack of active management
- Parcelization
- Climate change
- Water level fluctuations
- Beavers
- Slow growth of trees
- Low regeneration

Climate Change Impacts:

- Plant community may change with tree mortality if temperatures rising change species composition
- May increase pests (like eastern larch beetle) due to rising temperatures
- Less frozen ground conditions due to warming winter temperatures
- Changing of hydrology may lead to drying of peat in extreme drought conditions (which may release carbon dioxide)
- Fires are more challenging to suppress and release large amounts of stored carbon



Floodplain NPC

Floodplain Forest (FF) communities are present on occasionally or annually flooded areas, typically on terraces and floodplains. They support deciduous species including maple, American elm, ash, basswood, and cottonwood.

- ✓ FF communities make up a very small component of West Central Landscape NPCs.
- ✓ Forests are high value for unique terrestrial and aquatic habitat

Floodplain Forest Goals and Strategies:

Goal 1. Maintain riparian forest land cover to buffer against water level fluctuations

Strategies:

a. Replacement of ash with species found successful in other areas (silver maple, swamp white oak, and other native wetland adapted species)
b. Leverage Clean Water Funds for riparian enhancement
c. Educate private landowners on impacts of EAB and water level impacts from ash die-off. Encourage ash species replacement through underplanting.
d. Manage invasive species to allow for regeneration (e.g. buckthorn, reed canary grass)

Goal 2. Protect from land use conversion, degradation, and fragmentation

Strategies:

a. Pursue conservation easements, land protection, and management programs (e.g. SFIA, Woodland Stewardship Plans) (see Ecological Goals)
b. Administer / enforce local controls pertaining to shoreland (see Ecological Goals)
c. Advocate to prevent soil impacts from timber harvest on ground that is not frozen

Goal 3. Restore and maintain hydrologic connections

Strategies:

a. Proper placement and replacement of ill-fitting bridges, dams, and culverts
b. Minimize fragmentation by new roads and development
c. Increase floodplain connectivity through use of properly designed culverts in addition to floodplain culverts
d. Engage with utility companies that own dams to advocate for natural flow regimes that support floodplain forest natural processes

Potential Floodplain Forest Management Challenges:

- Beaver
- Invasive species (emerald ash borer, buckthorn)
- Loggers and mills
- Roads and hydrological alterations
- Lack of active management
- Winter-only harvest, lack of frozen ground in adequate time to harvest
- Drainage of wetlands and wet forest
- Weather patterns
- Loss of ash and impact on the water table
- Water level fluctuations impede growth and management
- Lack of stand age diversity and regeneration due to water levels, grass competition
- Large deer population

Climate Change Impacts

- More extreme wet and dry periods have ecological impacts including encouragement of invasive species
- Major rain events resulting in changes in floodplain activity (scour and ponding) which can impact seedlings germination and success, and other types of understory plants that can occur
- Hydrological changes can further impact habitat and wildlife corridors through lack of or change in forest cover or flooded forest (prevents travel for some wildlife)
- Soil / frozen ground conditions less frequent with warmer winters



Wet Forest NPC

Wet Forest (WF) communities are present where the water table is high but not often visibly flooded. WF is typically in transition zones, on raised wet meadows, and on gently rolling outwash plains. Tree species are largely black ash and white cedar.

- ✓ WF communities are a small component of the West Central Landscape NPCs

Wet Forest Goals and Strategies:

Goal 1. Maintain wet forest land cover to buffer against water level fluctuations

Strategies:

a. Replace ash with species found successful in black ash diversification demonstration projects elsewhere (silver maple, swamp white oak, red maple, hackberry, and other native wetland adapted species)
b. Leverage Clean Water Funds for wet forest enhancement
c. Educate private landowners on impacts of EAB and water level impacts from ash die-off. Encourage ash replacement through underplanting.
d. Manage invasive species to allow for regeneration (e.g. buckthorn, reed canary grass)
e. Utilize assisted migration to species well suited for that system (e.g. bur oak, white oak, silver maple, yellow birch, red maple, hackberry, balsam poplar)

Goal 2. Protect from land use conversion, degradation, and fragmentation

Strategies:

a. Pursue conservation easements, land protection, and management programs (e.g. SFIA, Woodland Stewardship Plans) (see Ecological Goals)
b. Administer / enforce local controls pertaining to wetlands (see Ecological Goals)
c. Advocate to prevent soil impacts from timber harvest on ground that is not frozen

Goal 3. Restore and maintain water table levels to support wet forests

Strategies:

a. Advocate for management of existing regulatory systems to support groundwater levels and aquifer recharge to maintain baseflow to support plant communities
b. Support evapotranspiration ecosystem service through keeping the ash forest forested. This includes trying various techniques such as underplanting and when appropriate, careful harvest and replanting using silvicultural techniques outlined in DNR's Ash Management guidelines.

Potential Wet Forest Management Challenges:

- Rising / fluctuating water levels
- Beavers
- Invasives (emerald ash borer, buckthorn)
- Winter-only harvest, lack of frozen ground in adequate time to harvest
- Loggers and mills
- Lack of active management, especially if landowners are not using it for recreation
- Size may not allow for harvest so it is left unmanaged and invasive species spread
- Drainage of wetlands and wet forest
- Weather patterns and frozen ground season
- Loss of ash and impact on the water table

Climate Change Challenges

- More extreme wet and dry periods have ecological impacts including the encouragement of invasive species
- Major rain events resulting in changes in runoff events can impact seedlings germination and success, and other types of understory plants can occur
- Soil / frozen ground conditions less frequent with warmer winters
- Drier period of less precipitation likely to result in higher use of groundwater for irrigation pivots. This can further decline water table levels.
- More extreme rain events cause higher runoff and lower aquifer recharge
- Milder winters may increase EAB rate of spread



Upland and Wet Prairie NPCs

Upland Prairie (UP) communities are herbaceous communities dominated by graminoid species. They have scattered trees, typically oak. The region also has reconstructed prairies found on historically disturbed sites revegetated with native grasses and forbs to emulate the prairie ecosystem. These reconstructed grasslands are important for wildlife such as grassland birds, ducks, and pheasants along with their associated hunting opportunities.

Wetland Prairie (WP) communities are similar to UPs with the addition of forbs and nearly always occur within UPs. Minnesota has lost 99% of its native upland prairie to agriculture and development, with only pocket remnants intermingled along the hardwood forest transition zone.

- ✓ The West Central Landscape has approximately 7% of the remaining prairie in Minnesota.
- ✓ The West Central Landscape has 1,455 known remnant upland prairies totaling 15,684 acres. Over 76% of those prairies are less than 10 acres in size.

Upland and Wet Prairie Goals and Strategies:

Goal 1. Protect remnant and reconstructed prairies

Strategies:

a. Easements, acquisitions, and covenants (follow Minnesota Prairie Plan core areas)
b. Develop a tax incentive program or covenant program to keep prairies prairie (like SFIA)
c. Be more inclusive in SFIA
d. Increase value of protection programs to be comparable with agriculture and gravel mining conversion
e. Increase knowledge of existing incentive, management, and protection programs
f. Help people identify prairie and savanna remnants

Goal 2. Manage prairies

Strategies:

a. Promote use of flash grazing to mimic herbivory by bison, reduce fuel loading, minimize spread of invasive and manage species composition
b. Promote integrative vegetation management with the inclusion of managed livestock grazing, fire, herbicide, and mechanical management to manage prairie species composition and reduce invasive species
c. Provide management cost share/incentives along with easement programs
d. Follow and support Prairie Reconstruction Initiative guidelines
e. Encourage funding or awareness of Prescribed Burn Associations
f. Evaluate management results

Goal 3. Reconstruct prairies

Strategies:

a. Promote gravel pit reclamation with native prairie species
b. Follow and support Prairie Reconstruction Initiative guidelines
c. Goals to guide restoration and evaluate before and after conditions
d. Convert marginal agricultural land back to prairie

Goal 4. Increase communication between Prairie Management Community and the Forest Management Community

Strategies:

a. Hold trainings inclusive of forestry
b. Identify liaisons between the communities
c. Develop a list of resources of people in the West Central Landscape to help with prairie and forest
d. Use education to prevent tree planting on prairie remnants or grassland areas

Potential Upland and Wet Prairie Management Challenges:

- Housing developments
- Burning constraints
- Invasive species
- Seed availability
- Agricultural land conversion and parcelization making Upland Prairie more rare
- Challenging to restore Upland Prairie
- Minimal economic opportunities to incentivize landowners to maintain Upland Prairie
- Gravel mining

Climate Change Impacts:

- Forest transitional zone line may move further east. Resilient tree and shrub species may change composition and the region may gain more prairie
- Warmer temperatures and longer growing seasons may favor invasives
- Increased wildland fire activity and changing fire behavior causing fire to occur at times of the year not previously experienced, extending fire seasons through summer and fall
- Social desire to mitigate climate change (with limited ecological knowledge) may result in planting trees in prairies. This can impact the whole ecosystem, especially wildlife
- Using livestock in prairies to mitigate effects of invasive species and mimic fire through flash grazing
- Integrative vegetation management with the inclusion of managed livestock grazing and fire to manage prairie

Section 4. Coordination/Implementation/Monitoring

The Committee agreed to the following:

- The individuals on the Committee and the Committee itself do not have sufficient funding, personnel, or direct influence to carry out the desired outcomes, goals and strategies.
- Actions to implement goals and strategies will be done primarily through the collaborative network of agencies, organizations, businesses, individuals, and decision-makers within the region and Minnesota participating in the Committee.
- Often regional landscape plan goals and strategies are implemented by non-MFRC member organizations to support local efforts and priorities.
- The key implementation task is to increase Committee participation and awareness with organizations, local government, non-profits, and others of the Landscape Planning effort and the goals and strategies in the approved plan.
- The Committee will continue to meet quarterly to exchange information on member activities and discuss resource issues. Often these exchanges generate synergy through learning from each other or spur ideas for collaborative projects that solve problems experienced at the regional level. The Committee or sub-committee should design a process to make key contacts, presentations, and other outreach efforts to tell people about the landscape plan.
- The Committee or sub-committee should also survey to find out what other organizations are doing to further the landscape goals and opportunities for coordination.
- The Committee should follow up initial contacts in a year to see how things are going and what was accomplished. This could be used to monitor the non-measurable outcomes.
- The Committee also discusses and comes to mutual understanding on resource issues experienced locally. Due to members' on-the-ground experience and interdisciplinary conversations at quarterly meetings, regional committees provide valuable recommendations and insight to the MFRC on regionally specific issues.
- The Committee agrees to discuss how the plan is being used, successes, and challenges, one year post-release.

Section 5. Glossary of Terms and Acronyms

Term	Definition
Forest fragmentation	The breaking up of a forest by various forest or non-forest uses*
Forest parcelization	The subdividing of forestland for residential and/or commercial building*
Productive Conservation	Active or semi active management of ecosystems for product and/or benefit
Agro-forestry (international definition)	A land use system that involves deliberate retention, introduction, or mixture of trees or other woody perennials in crop and animal production systems to take advantage of economic or ecological interactions among components *
Short Rotation Woody Crops	Plantations of fast maturing shrubs or trees that are produced as crops to supply wood fiber to industry or biofuel to generate electrical power**
Native species	An indigenous species that is normally found as part of a particular ecosystem*
Natural area	A physical and biological area in nearly natural condition that exemplifies an ecological community and its associated vegetation and other biotic, soil, geologic and aquatic features *
Restoration	The process by which natural flora is reintroduced into an area and maintained to prevent repeated extirpation (Wisconsin DNR Silvicultural Manual)

*From the "The Dictionary of Forestry", John A. Helms, editor, Society of American Foresters.

** Minnesota Chapter of the Wildlife Society 2002 Position Paper "Short Rotation Woody Crops in Minnesota's Historically Open Landscapes: Information Concepts and Recommendations in Regard to Native Wildlife and their Habitats".

Term	Definition
AP	Acid Peatland
CSP	Conservation Stewardship Program
CWMP	Comprehensive Watershed Management Plans
DFC	Desired Future Condition
DNR	Department of Natural Resources
EAB	Emerald Ash Borer
EQIP	Environmental Quality Incentives Program
FD	Fire Dependent
FF	Floodplain Forest
FP	Forest-rich Peatland
FFA	Future Farmers of America
FIA	Forest Inventory and Analysis
FMG	Forest Management Guideline
GAP	Gap Analysis Program
GIS	Geographic Information System
GBCAs	Grassland Bird Conservation Areas
HUC	Hydrologic Unit Code
LCMR	Legislative Commission on Minnesota Resources
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MPCA	Minnesota Pollution Control Agency
MFRC	Minnesota Forest Resources Council
MH	Mesic Hardwood

Term	Definition
MLEP	Minnesota Logger Education Program
NGO	Non-governmental Organization
NPC	Native Plan Community
NRCS	Natural Resources Conservation Service
PILT	Payment in Lieu of Property Taxes
PLT	Project Learning Tree
PSA	Public Service Announcement
R&D	Research and Development
SFIA	Sustained Forestry Incentives Act
SWCD	Soil and Water Conservation District
UP	Upland Prairie
WF	Wet Forest
WM	Wet Meadow
WP	Wetland Prairie

Section 6. References

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Section 7
Appendix

Appendix A: Planning Process Timeline

Goals and Strategies	Timeline
Social	December 2025
Economic	January 2026
Ecological	February 2026
Vegetation Management Framework	March 2026
Weather and Resiliency	April 2026

Review Process	Timeline
Steering Team Review	June – July 2026
Advisory Committee Review	August 2026
Public Comment and Tribal Coordination	September 2026