



**Forest Resources Plan
for
Tax-Forfeited Lands
Crow Wing County
2025**

Forest Resources Plan for the Tax-Forfeited Lands of Crow Wing County

Recommended to County Board by Advisory Committee: 01/08/2025

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This document updates “Forest Management Plan for the Tax-Forfeited Lands of Crow Wing County” that was first adopted December 2000 and updated in 2004 and 2015.

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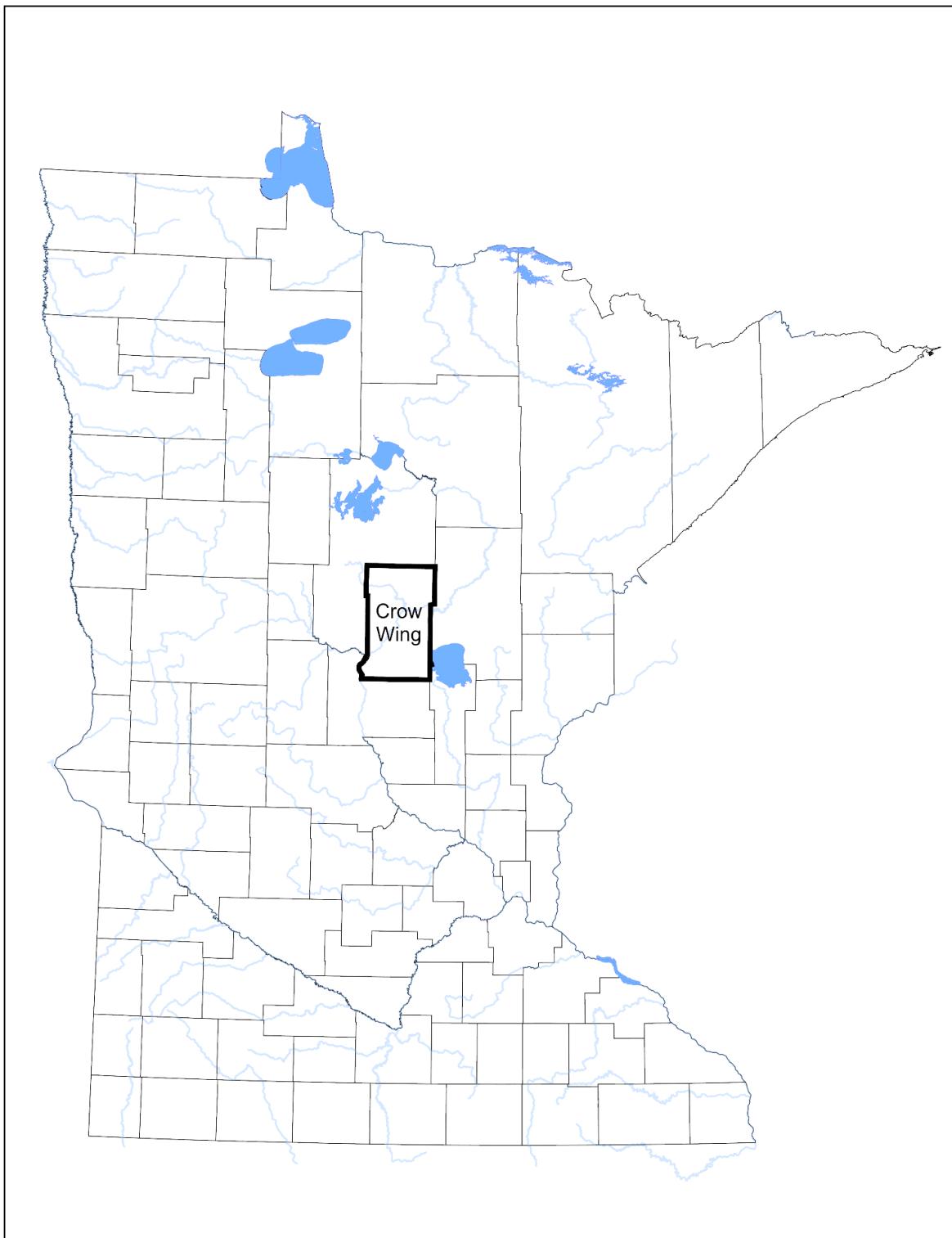
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Map 1. Minnesota and Crow Wing County



Chapter 1.0 Mission

1.1 Scope and Purpose

The scope of this plan covers matters related to the use and management of the tax-forfeited lands of Crow Wing County. The plan addresses a wide range of topics associated with management, describes the resource base, and sets forth the County's strategic approach for land and resource management. It updates the current management plan that was last updated in 2015.

The plan serves the following purposes and benefits:

- Describes the County's forest resource, its extent, location and current condition.
- Sets forth a desired future condition to which actions are directed.
- Documents County management policies, practices and management initiatives.
- Provides the basis for improved coordination with other public and private resource managing agencies.
- Promotes continuity of management efforts over time.

1.2 Value of Tax Forfeited Lands

Through the 1970s, most Minnesota counties sought to sell their tax forfeited lands to private owners. However, at that time, some counties recognized the direct and indirect values of forested tax forfeited lands that would be lost if these large blocks of land were sold into highly fragmented private ownerships. Since then, Crow Wing and the other forested counties have adopted management plans and undertaken active programs to manage their lands to meet an array of multiple uses. Minnesota Statute 282 provides the primary source of legislative guidance for this management.

Tax forfeited lands under public management produce direct and indirect benefits. Over the past five years, Crow Wing County has generated an average of \$968,000 per year from its roughly 104,000 acre land base. The timber sold from these lands created employment for loggers, truckers, suppliers and mill workers. In addition, the land base provides highly valued opportunities for hunting, trail users, and a pleasing landscape essential to the region's tourism economy.

Unlike Minnesota's more northern counties, Crow Wing lacks substantial amounts of non-County public land. As a result, nearly all the economic, social and ecological demands generally applied to undeveloped forested public lands fall upon the County and its relatively limited land base. Clearly, this land base cannot satisfy all the demands that may be placed on it.

The County recognizes this limiting factor. Within the framework of the management principles set forth in this plan, the County seeks to address as wide a range of the various demands placed on the land base while necessarily noting that many of these demands will not be satisfied. Thus, the County will cooperate with private landowners as well as individuals and groups, to coordinate land management wherever viable to help achieve the objectives of this plan.

Tax Forfeited Lands

For the purposes of this plan, the term tax forfeited lands includes tax forfeited lands administered by the County and certain fee lands owned and administered by the County. The terms "tax forfeited lands", "tax forfeit lands", and "land administered by Crow Wing County" are considered interchangeable.

1.3 Vision, Mission & Values

Our Vision

Crow Wing County's vision is:

Being Minnesota's Favorite Place

Our Mission

Crow Wing County will achieve its vision by undertaking this mission:

Serve Well. Deliver Value. Drive Results.

Our Values

Crow Wing County incorporates these values in undertaking its Mission:

Be Responsible. Treat People Right. Build a Better Future.

1.4 Sustainable Forest Management Policy

A critical component of Crow Wing County Land Services' philosophical approach to managing the lands under its care is the Sustainable Forest Management Policy adopted through the County's participation in the Minnesota Counties Sustainable Forest Co-operative (see discussion in Chapter 4).

As the manager of public lands in the County, the Land Services Department, operates on a commercial basis and is required to ensure that an optimal financial return is attained from the use of the forest lands managed by the Land Services Department. At the same time, the Land Services Department also has a duty to the people of the county to maintain the recreational and other social values of the forest resource and to protect the long-term sustainability of the resource. Sustainable forest management is about striking a balance between economic, social and environmental values in a manner that protects all of these values over time.

The Land Services Department is committed to the principles of sustainable forest management and will manage the lands in our care in accordance with those principles. We have established a sustainable forest management system (SFMS) that helps us achieve and be environmentally appropriate, socially beneficial and economically viable. Through our SFMS we commit to:

- Protect the integrity and longevity of forest lands under our management.
- Comply with all applicable laws, regulations and voluntary guidelines.
- Acquire and maintain third party certification to the Sustainable Forest Management principles.
- Plan and conduct forest management activities in a manner that:
 - Protects and maintains biodiversity across the forest ecosystem;
 - Prevents damage and protects forest health and productivity;
 - Minimizes chemical use;
 - Protects the integrity of riparian areas;
 - Minimizes aesthetic impact;

- Protects threatened and endangered species and their habitat;
- Conserves areas with special attributes such as cultural, ecological, geological, economic or social attributes; and
- Promotes efficient utilization.
- Promote and incorporate applied research and technology to improve sustainable forest management.
- Enhance public recreation values by providing opportunities for dispersed recreation on County lands.
- Provide public education on forest ecology, sustainable forest management and the economic value of forests.
- Solicit public input on forest management plans, policies and county performance.
- Communicate our performance to the county board, employees, the public and other stakeholders.
- Ensure the capability of our employees and field operators to perform their responsibilities with the highest degree of professionalism.
- Continually improve performance of the SFMS through regular reviews and audits.

1.5 Desired Future Condition

Management Objectives

Crow Wing County intends to satisfy the following objectives as it implements this management plan in achieving the desired future forest of 2125.

Ecological Sustainability: To sustain a healthy and diverse forest.

1. Enhance and preserve the natural environment, unique recreational, historical and scenic values, essential habitat, rare and endangered species and plant communities, as well as forest soil and water quality.
2. Strive toward a natural forest structure.
3. Maintain ecosystem diversity at all levels – landscape, stand, species, and genetics.
4. Protect water bodies and watersheds to maintain water quantity and quality.
5. Maintain diversity and quality of riparian habitats.
6. Maintain productivity of forest soils except on areas needed for permanent roads or other permanent infrastructure.
7. Encourage other forest resource managers, public and private, to adopt ecosystem-based management.
8. Cooperate with other area forest resource managers to implement ecosystem-based management.

Economic Sustainability: To ensure continuing viability of timber and non-timber economic activities dependent upon Crow Wing County's forested lands.

1. Contribute to the local economy over time in terms of economic opportunity and employment as well as provide direct financial returns to the County and its subdivisions.
2. Provide a sustained yield of renewable resources for utilization for multiple purposes.

3. Maintain a safe working environment for employees, contractors, and the public.
4. Maintain and/or enhance timber quality and productivity of the forests.
5. Encourage the best use of wood from the land base.
6. Reduce losses in timber productivity from insects and disease.
7. Provide forest qualities that support and enhance non-consumptive economic values such as tourism, recreation, second home development, and lakeshore development.

Social Sustainability: To satisfy Crow Wing County's obligation as steward of the lands.

1. Assure orderly and controlled development resulting from the disposition of tax forfeited land.
2. Maintain a progressive, cost-effective resource development program and investment in proven management systems.
3. Meet contractual and legal obligations specifically including such agreements and arrangements as the Mississippi Headwaters Board and the 1837 Treaty.
4. Anticipate and respond to concerns about potential and actual impacts of forest management activities on other forest uses, users, and managers.
5. Provide recreational opportunities on forested lands for residents and visitors.
6. Maintain visual values in areas of high public use and visibility such as resort lakes, recreational rivers, and nearby communities.
7. Sustain socio-economic benefits of forestry activities for area communities.
8. Enhance Crow Wing County as Minnesota's Favorite Place.
9. Affirm and establish direction through a public involvement process which utilizes evaluation of issues and policy recommendations of the Natural Resources Advisory Committee.
10. Provide opportunities for meaningful and effective public involvement throughout the forest management planning cycle before irreversible decisions are made.

Crow Wing County's Tax Forfeited Lands in 2125

This plan is a strategic document that outlines the path Crow Wing County intends to take its forested lands over the next one hundred years. The future forest, or “desired future condition,” is not an absolute objective but a general depiction guiding ongoing management activities.

Crow Wing County will manage its tax forfeited land base to achieve a forested landscape in which:

- Primary commercial forest species are sustainable over time:
 - Aspen resources have continued, sustainably balanced age classes and have approximately the same presence on the landscape as in 2025.
 - Oak age classes are better balanced than in 2025
 - Northern Hardwood resources are of higher quality and vigor over their conditions in 2025.
 - Conifer resources are more numerous than in 2025 and have sustainable balanced age classes.
- The forest ecology is resilient, appropriately diverse, and healthy:
 - Forest cover is compatible with the underlying ecological systems.
 - Distributions of the forest in terms of succession and growth stages are more in keeping with historical ranges than was the case in 2014.
 - Forest cover is holding its place in the face of changing climatic dynamics.
- Forest resources are the basis for an appropriate mix of recreational opportunities:
 - A network of trails and forest-based recreation opportunities are compatibly located on the landscape.
 - Travel corridors and scenic landscapes are enhanced through forest management.

Strategic Assumptions

The following assumptions are considered intrinsic to the formulation and execution of this long-range resource management plan:

- The amount of tax-forfeited land administered by the County will remain relatively constant throughout the management period.
- The plan was developed using the most current and accurate information available although it is recognized that some components may not fully represent the resource's characteristics.
- Within the context of managing for multiple uses and values, overall management will generate sustained net income for the County and benefiting local units of government.
- For the purposes of projecting management forward over 100 years, it is necessary to assume there will be markets for all timber resources offered by the County as per the management plan.
- The use of native plant communities as the foundational framework for management in conjunction with active forest management will lead to a resilient, diverse, and healthy forest that is best suited to adapt to changes in environmental dynamics.

- The land base of the Minnesota Department of Natural Resources (DNR) will remain relatively unchanged.
- Forest management planning is an ongoing process in which continual monitoring directs appropriate responses to changes in such key factors as markets, insect and disease, and natural disturbance.

1.6 Certification

In 2008 Crow Wing County's forests were certified under the Sustainable Forest Initiative (SFI) program. The County sought certification to assure the public and consumers of products from the forest that the lands are managed in an environmentally, economically, and socially sound manner. The County intends to manage its forest in a manner that will allow it to retain certification. The following are the current principles for SFI; any future changes will be adopted by the County.

SFI Certification

In keeping with its responsibilities under certification by the SFI program, Crow Wing County agrees to implement and achieve the following SFI principles:

1. Sustainable Forestry

To practice sustainable forestry means meeting the needs of the present while promoting the ability of future generations to meet their own needs by practicing a land stewardship ethic that integrates reforestation and the managing, growing, nurturing and harvesting of trees for useful products, and for the provision of ecosystem services such as the conservation of soil, air and water quality and quantity, climate change adaptation and mitigation, biological diversity, wildlife and aquatic habitats, recreation and aesthetics.

2. Forest Productivity and Health

To provide for regeneration after harvest, maintain the health and productive capacity of the forest land base, and to protect and maintain long-term soil health and productivity. In addition, to protect forests from economically, environmentally or socially undesirable impacts of wildfire, pests, diseases, invasive species and other damaging agents and thus maintain and improve long-term forest health and productivity.

3. Protection of Water Resources

To protect and maintain the water quality and quantity of water bodies and riparian areas, and to conform with forestry best management practices to protect water quality, to meet the needs of both human communities and ecological systems.

4. Protection of Biological Diversity

To manage forests in ways that protect and promote biological diversity, including animal and plant species, wildlife habitats, ecologically and culturally important species, threatened and endangered species (i.e., Forest with Exceptional Conservation Values) and native forest cover types at multiple scales.

5. Aesthetics and Recreation

To manage the visual impacts of forest operations, and to provide recreational opportunities for the public.

6. Protection of Special Sites

To manage lands that are geologically or culturally important in a manner that takes into account their unique qualities.

7. Legal Compliance

To comply with applicable federal, provincial, state, and local forestry and related environmental laws, statutes, and regulations.

8. Research

To support advances in sustainable forest management through research, science, and technology.

9. Training and Education

To improve the practice of sustainable forestry through training and education programs.

10. Community Involvement and Social Responsibility, and Respect for Indigenous Rights

To broaden the practice of sustainable forestry on all lands through community involvement, socially responsible practices, and through recognition and respect of Indigenous Peoples' rights and traditional forest-related knowledge.

11. Transparency

To broaden the understanding of forest certification to the Forest Management Standard by documenting certification audits and making the findings publicly available.

12. Continual Improvement

To continually improve the practice of forest management, and to monitor, measure and report performance in achieving the commitment to sustainable forestry.

13. Responsible Fiber Sourcing

To use and promote sustainable forestry across a diversity of ownership and management types in the United States and Canada that is both scientifically credible as well as socially, environmentally, and economically responsible and to avoid sourcing from controversial sources both domestically and internationally.

Chapter 2.0 Context

2.1. Socio-Economic Context

Population Trends & Projections

From 2010 to 2040 Crow Wing County's population grew nearly twice that of the North Central Region and the state as a whole. As shown in Table 1, that high level of growth is projected to continue through 2030 and then slow down the decade after that.

Table 1. Crow Wing County Population, 2010 - 2040					
		US Census		Projections	
		2010	2020	2030	2040
Population		62,500	66,123	73,438	79,802
Change			3,623	7,315	6,364
Percent Change			5.8%	11.1%	8.7%

Source: US Census; Minnesota State Demographic Center.

Table 2 places Crow Wing's population change in the context of the five-county North Central region. Every county has grown in the recent past and all are projected to grow through 2040. Crow Wing's growth, however, has been greater than that of the other counties and is projected to remain so through 2040. Between 2020 and 2023, Crow Wing county's population growth ranked 12th highest in the state.¹

Table 2. North Central Region Population, 2010 - 2040				
	US Census		Projections	
	2010	2020	2030	2040
Crow Wing	62,500	66,123	73,438	79,802
Cass	28,567	30,066	33,874	37,157
Morrison	33,198	34,010	35,931	37,473
Todd	24,895	25,262	27,022	28,557
Wadena	13,843	14,065	15,319	16,434
Total	163,003	169,526	185,584	199,423
Change		6,523	16,058	13,839
Percent Change		4.0%	9.5%	7.5%

Source: US Census; Minnesota State Demographic Center

The relationship between the county's past and future growth is closely tied to sound public land management. According to the county comprehensive plan, one of the major factors driving the county's past and anticipated future growth is its "abundant lakes, forests, wetlands, and natural

¹ DEED County Profile Crow Wing Co., updated 6/4/2024

beauty". The plan also notes the importance of forestry, tourism, and outdoor activities such as hunting, fishing, hiking and skiing, demonstrating the importance of ecological balance and sustainable growth.²

County Economy

Overview

Crow Wing County has a diverse economy that has rebounded from the Great Recession of the late 00's and remained resilient through the Covid-19 Pandemic and associated recession. It also serves as an employment hub, attracting workers from outside the county. As noted in Table 3, in terms of number of firms, the largest economic sector is Trade, Transportation and Utilities. This sector saw growth in the total number of firms as well as employment. In terms of employment, the largest sector is Education and Health Services, which also had growth in the total number of firms and people employed.

Table 3. Number of Firms and Jobs in Crow Wing County; Average, All Quarters 2023						
Industry Title	Number of Jobs	2013-2023 Change 10-Year Trend		Number of Firms	2013-2023 Change 10-Year Trend	
		Numeric Change	% Change		Numeric Change	% Change
Construction	2,214	659	42%	303	42	16%
Education and Health Services	8,215	600	8%	283	53	23%
Financial Activities	1,629	177	12%	211	7	3%
Information	405	-138	-25%	55	24	77%
Leisure and Hospitality	4,632	713	18%	299	39	15%
Manufacturing	3,066	560	22%	121	10	9%
Natural Resources and Mining	72	-14	-16%	22	-1	-4%
Other Services	1,042	184	21%	209	39	23%
Professional and Business Services	1,582	-546	-26%	278	29	12%
Public Administration	1,443	162	13%	74	5	7%
Trade, Transportation and Utilities	6,277	523	9%	488	24	5%
Total, All Industries	30,577	2,880	10%	2,343	271	13%

Source: DEED Quarterly Census of Employment and Wages (QCEW)

Given the county's population growth and increasing demand for housing, it comes as no surprise that Crow Wing's Construction sector has seen significant growth in terms of number of firms and jobs. Across all industries, construction had the highest growth in the number of jobs (percent wise and total number) with a 42% increase between 2013 and 2023.

The manufacturing sector has grown in terms of total number of jobs by nearly one-quarter since 2013. Within the county's manufacturing sector there are a total of 121 firms and 3,066 jobs.³ A number of these are directly or indirectly involved with wood and timber resources. There are 13

² "Crow Wing County Comprehensive Plan 2024-2040", adopted 8/27/24

³ DEED County Profile Crow Wing Co., updated 6/4/2024

establishments with 224 jobs in Wood Product Manufacturing, 15 establishments with 147 jobs in Furniture & Related Product Manufacturing, 6 establishments with 15 jobs in Forestry & Logging, and 7 establishments with 13 jobs in Support for Agriculture & Forestry.

A number of likely timber resource workers are self-employed. Within Crow Wing County there are 5,182 self-employed establishments. The largest sector is construction with 743 establishments. The Agriculture, Forestry, Fishing & Hunting sector has 101 establishments.

In terms of income, Crow Wing County is around average for the region and below the average for the state. According to a 2021 analysis, Crow Wing had a median income of \$46,818 compared to \$47,601 for the region and \$67,047 for the state as a whole.⁴

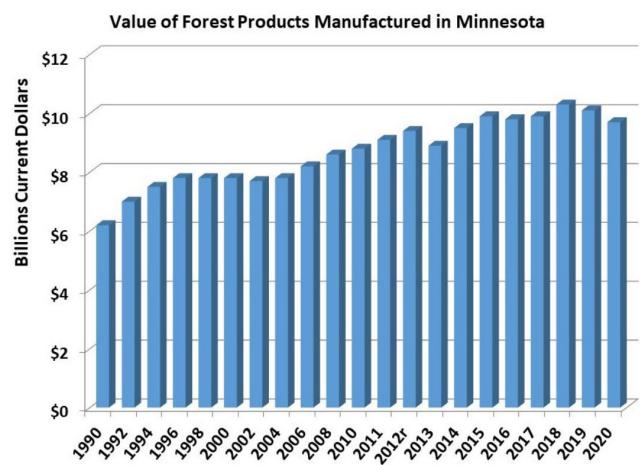
Forest Resource Economic Issues

Minnesota's forest products industry is the fifth largest manufacturing sector in the state by employment providing 30,045 direct jobs and another 39,060 indirect jobs. The total economic output exceeds \$17.4 billion. The industry is diverse, producing a variety of products including lumber, pallets, engineered wood products, pulp and paper products.⁵

Crow Wing County contributes to those statewide forest products industry impacts. Yet, recent setbacks have adversely affected the state and the county. The Covid-19 pandemic did not affect the industry evenly, with pulp and paper industries most negatively affected. Softwood lumber and engineered wood products were least impacted due to the pandemic's influence on construction.⁶

In the last two decades, there have been a number of major mill closures including Ainsworth's OSB plants, Weyerhauser's Trus Joist operation in Deerwood, the Brainerd paper mill (twice), Georgia Pacific hardboard, and in 2012 the Verso paper mills in Sartell. These losses have meant a 25% decline in total wood harvested in Minnesota from 2005 to 2010⁷. However, this reduction has resulted in a sustainable wood fiber surplus that is able to support new mill announcements and mill expansions.⁸ Due to changes in regulations and available markets, the Biomass Market has struggled and almost stopped in the region in the last five years. There is an opportunity to explore both traditional and non-traditional biomass markets in Northern Minnesota.

While the impact of the mill closures was broadly felt across the forested regions of the state, they have been particularly acute in Crow Wing County. Verso was the closest large mill served by the county's forested land. The remaining major buyers are now farther away: (100 miles), Grand Rapids (90 miles), and Cloquet/Duluth (90 miles). The Sappi operation in Cloquet, which is the county's major consumer, does operate a wood yard west of Baxter helping in marketing wood to that facility.



Source: Minnesota's Forest Resources 2020

⁴ Economic Development Region 5: North Central, 2022 Regional Profile

⁵ "Minnesota's Forest Resources 2020", MnDNR.

⁶ "Minnesota's Forest Resources 2020", MnDNR.

⁷ "Minnesota Forest Resources Annual Report 2012" MnDNR.

⁸ "Minnesota's Forest Resources 2020", MnDNR.

Being on the edge of the procurement markets for the large mills affects stumpage prices for timber on Crow Wing County's tax forfeited lands. While the county continues its historic pattern of selling all the timber it offers for sale, stumpage prices have declined in response to the realities of decreased demand and distance to the mills.

Another set of issues facing Crow Wing County is logging industry capacity. First, the North Dakota oil boom has created a powerful competitor for employees and trucks. The wages and fees paid by the oil industry far outweigh those the local logging industry can provide. This has been exacerbated by an already tight local labor market.

Another issue centers on the shift in resource management on County lands. Over the past twenty years, the inherited age imbalance of the dominant aspen resource has been aggressively managed to ensure that the resource is not lost and is brought into a more appropriate age distribution. At the same time, the County has initiated responsible management of its significant hardwood resource. The result is that timber harvesting will increasingly demand loggers with selection harvest skills.

Finally, there are the unknown but feared impacts of external forces on the resource itself. Prime among these are invasive species and diseases such as spongy moth, oak wilt and emerald ash borer. Changing climate and extreme weather events also have potential to stress ecosystems and damage critical infrastructure.

2.2 Land Ownership Context

The level of publicly owned land in Crow Wing County reflects the county's location within the transition zone of three ecological provinces where the amount of forested land is relatively low, the quality of agricultural land is good, and the demand for private land ownership remains consistent over time. Map 2 shows generalized public land ownership within the county and on portions of the adjoining counties.

For the most part, the amount of tax forfeited lands has remained relatively constant over time. However, over the past 20 years or so, the County made several significant acquisitions that greatly enhanced management opportunities in key areas. These included 1,500 acres from the University of Minnesota, 2,000 acres from Potlatch (Mississippi River Northwoods site), and 1,250 acres from the Conservation Fund (Dahler Lake addition). In addition, the County acquired full ownership of roughly 1,000 acres of previously undivided interest parcels.

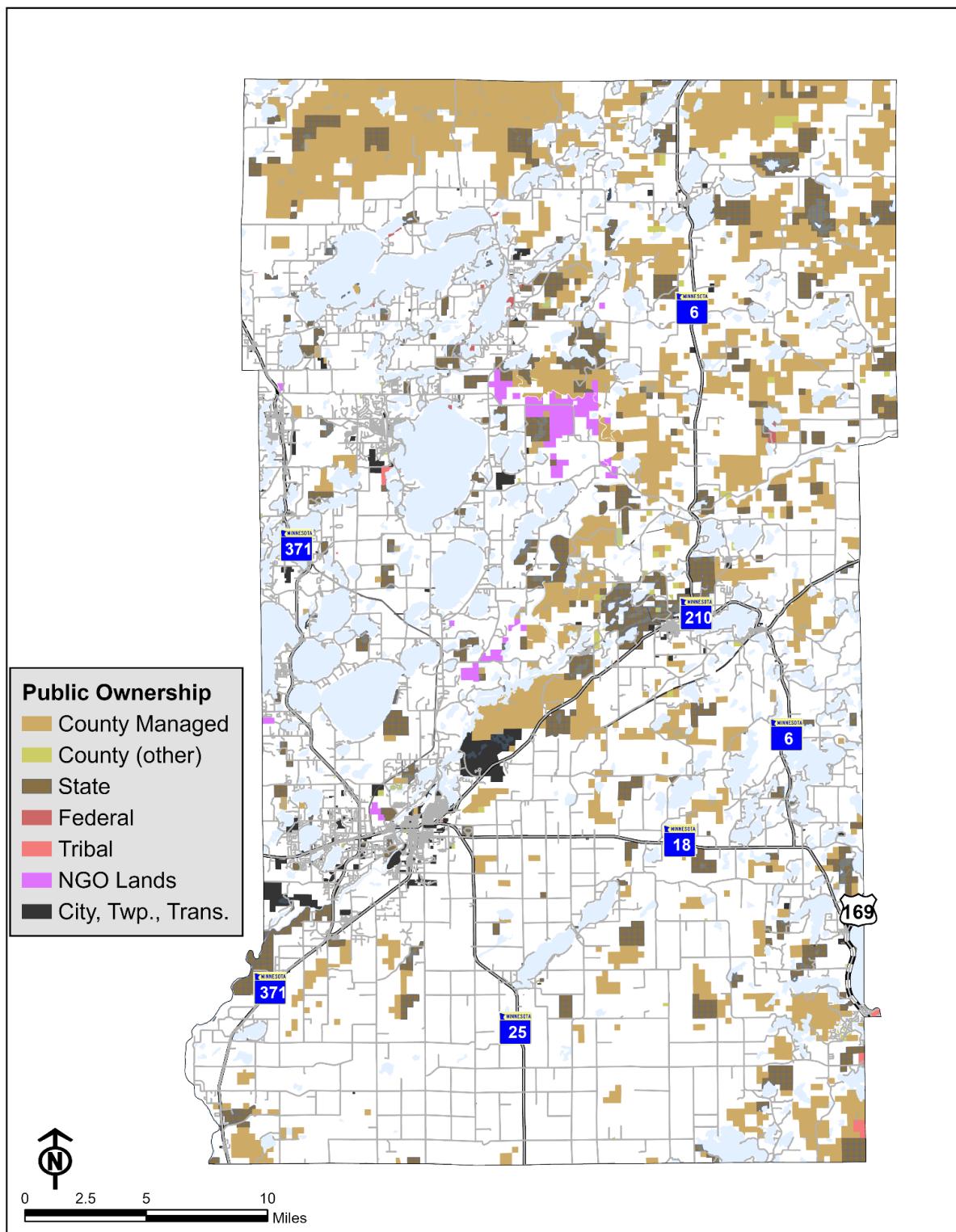
Unlike Cass, Aitkin and other northern counties, Crow Wing County has no significant federal land ownership and none within a national forest. Similarly, State ownership is exceptionally limited. Table 4 depicts the land ownership picture for the county.

Table 4. Land Ownership in Crow Wing County in 2024 (acres)		
Owner	Acres	Percent
County	104,060	14.1%
State	39,179	5.3%
Federal	472	0.1%
Tribal	451	0.1%
Industrial	895	0.1%
All Other (Private, NGO, Transportation, etc.)	481,748	65.1%
Lakes/Rivers	112,993	15.3%
Total	739,798	100.0%

Source: County Auditor

Tax forfeit land with undivided ownership poses a management issue for the County whereby neither it nor the other owners can effectively manage or develop the property. For its part the County does not even include these lands in its forest resource database.

Map 2. Public Lands of Crow Wing County



2.3 Ecological Context

Ecological Classification System

A description of the ecological characteristics of Crow Wing County relative to land form and vegetative cover is provided through the use of National Hierarchical Framework of Ecological Units adopted by various land management entities including Crow Wing County⁹. This Ecological Classification System (ECS) provides a series of increasingly smaller and more detailed levels of description of the landscape. It is exceptionally well suited to understanding the potential for forest cover and growth and for framing appropriate strategic and tactical management decisions.

Provinces

As shown in Map 3, Minnesota is divided into three major ecological provinces each representing distinctive ecological features and processes.¹⁰

- Laurentian Mixed Forest Province: Minnesota's true forested lands, at the time of settlement this region consisted of extensive conifer, conifer-hardwood mix, or hardwood forest. The topography is variable with landforms ranging from lake plains and outwash plains to ground and end moraines. Extensive peatlands occupy much of this area. All but a small sliver of Crow Wing County is in this province.
- Eastern Deciduous Forest Province: This is the transition zone between the prairie to the south and west and the true forest to the north and east. It is a species-rich area with many species at the edges of their ranges. Variability in soils, moisture, and landform creates opportunities for a wide variety of forest types including maple-basswood hardwoods and fire-dependent pine/oak. The extreme southwest corner of Crow Wing County is in this province.
- Prairie Grassland Province: Slicing across western Minnesota is the tall grass prairie, little of which remains in its original condition today. Mainly various forms of prairie, some portions which experienced lower levels of fire saw the formation of a dry oak savanna.

Sections

The ecological classification system divides provinces into sections. These are defined mostly by the origin of glacial deposits, regional elevation, floristic regions, and regional climate. Minnesota has ten sections (Map 4). Crow Wing County is roughly divided in half by the Northern Minnesota Drift and Lake Plains and the Western Superior Uplands sections.¹¹

- Northern Minnesota Drift and Lake Plains Section: This section covers the center of northern Minnesota and possesses a complex surface geology shaped by glaciation. The array of outwash plains, lake plains, till plains, outwash channels, moraines, and drumlin fields is the basis for an equally complex and patchy vegetation pattern. Hardwood forests (maple, basswood, oak, aspen) are common on mesic sites, mainly moraines and till plains, while fire-dependent conifer communities occur on the sandy outwash plains. Glacial lakes Upham and Aitkin created conditions for expansive areas of acid peatland communities (e.g.,

⁹ McNab, W. H. and P.E. Avers, 1994, Ecological Subregions of the United States: Section Descriptions, US Forest Service publication WO-WSA-5, Washington, D.C.

¹⁰ The descriptions of Provinces are based on material from the MDNR's web site: www.dnr.state.mn.us/ecs/212/index.html; www.dnr.state.mn.us/ecs/222/index.html; and www.dnr.state.mn.us/ecs/251/index.html; accessed 9/11/2024.

¹¹ The descriptions of Sections are based on material from the MDNR's web site: www.dnr.state.mn.us/ecs/212N/index.html; www.dnr.state.mn.us/ecs/212K/index.html; accessed 9/11/24

black spruce bogs) and swamp forests of white cedar and black ash. Wet meadows and alder and willow swamps occur along the sluggish streams draining the flat lake plains and along the Mississippi and Leech Lake rivers.

- Western Superior Uplands Section: This section is a large region of non-calcareous till deposited by glacial ice that advanced southward from the Lake Superior Basin. Dominant landforms are level to undulating ground moraines and drumlins. The Southwestern portions have coarser drift materials and are occupied by forests dominated by northern red oak. To the northeast areas of clayey till have forests of sugar maple, aspen, and birch. Small sand plains in parts of the Section have fire-dependent woodlands or forests of jack pine, bur oak, northern pin oak, and aspen. Fire-dependent pine, oak, and aspen forests are also present occasionally with mesic hardwood forests on coarse till and drumlins. There are inclusions of peatlands and other wetland communities.

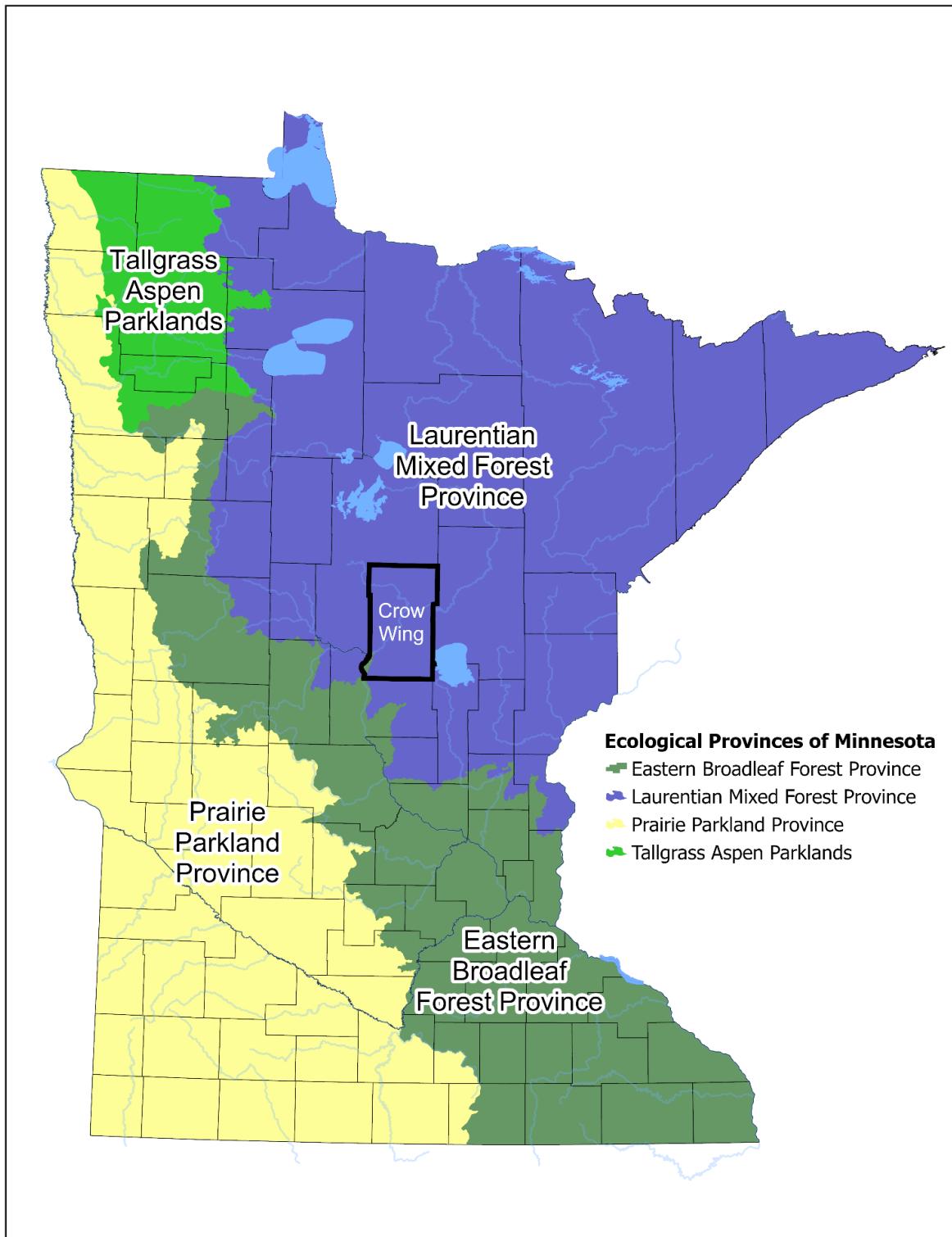
Subsections

As shown in Map 5 the ten sections in Minnesota are divided into 26 subsections of which five cover Crow Wing County.¹²

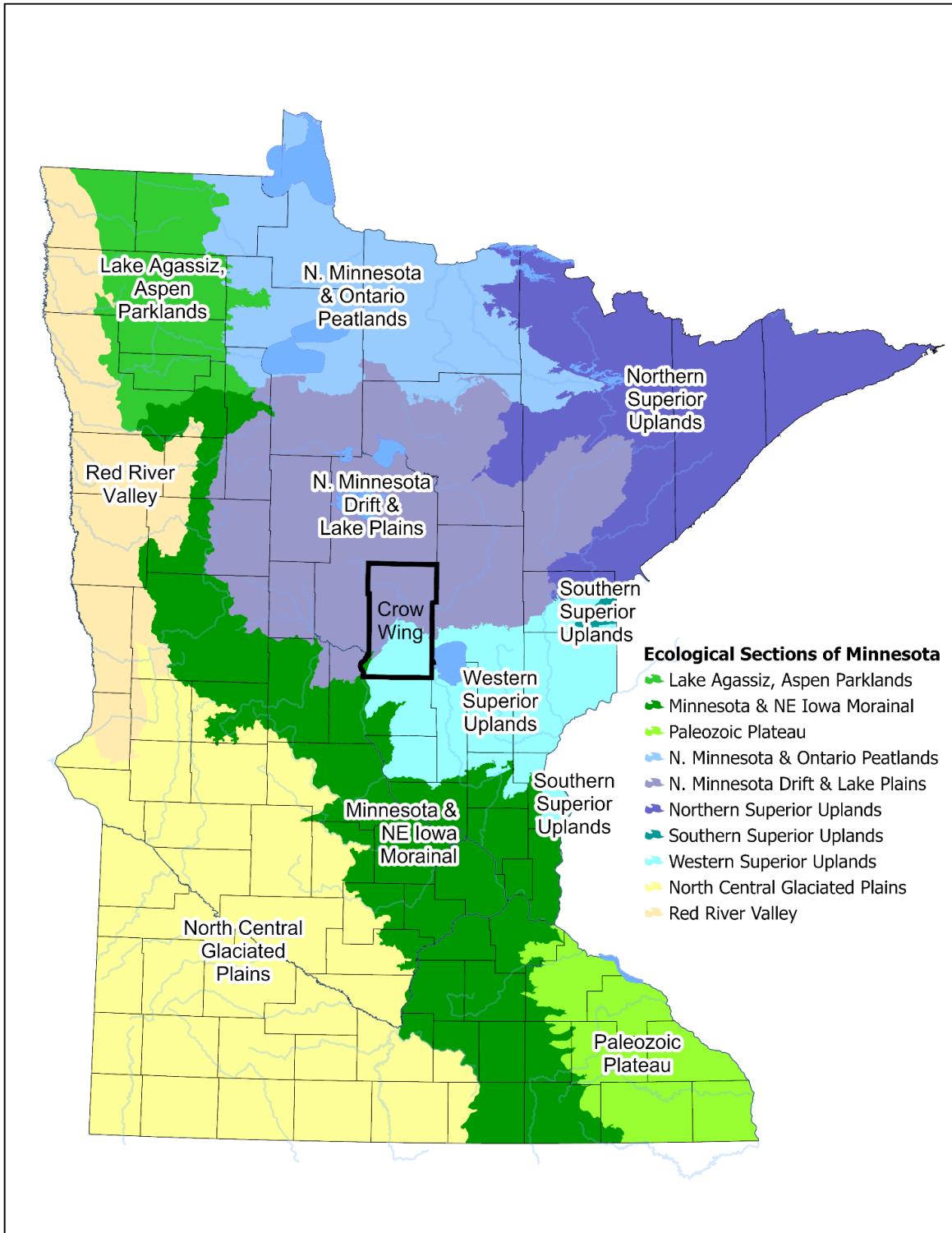
- Pine Moraines and Outwash Plains: “This subsection is a mix of end moraines, outwash plains, till plains, and drumlin fields. [Historically] white and red pine dominated the majority of forest communities on end moraines and till plains. Jack pine barrens and jack pine woodlands were found on well-drained sites on outwash plains. Black spruce, tamarack, white cedar, and black ash were prominent tree species in poorly to very poorly drained soils. Lakes are very common on the end moraines and some of the Outwash plains.”
- St. Louis Moraines: “Rolling to steep slopes characterize much of this subsection. End moraines are the dominant landform. The underlying topography was formed by the Rainy lobe. It was later overridden by the St. Louis sublobe of the last glaciation period. Northern hardwood forests were common in the southern portion of the region, south of Grand Rapids. North of Grand Rapids, white pine, sugar maple, basswood, and balsam fir were common tree species.”
- Tamarack Lowlands: The boundaries of this subsection coincide with the boundaries of the Glacial Lake Upham Plain and the Aurora Till Plain. This is a unique area topographically and climatically.... Level to gently rolling topography is characteristic of this region. The largest landform is a lake plain. Around the edges of the old glacial lake is a till plain ... formed in Superior lobe sediments. There is also a small piece of end moraine north of Sandy Lake that is related to the St. Louis moraines. [Historically] lowland hardwoods and conifers were the most common forest communities. Northern hardwood and aspen-birch forests were common on the other portions of this region. Presently, much of the land is in public ownership.”
- Mille Lacs Uplands: “Gently rolling till plains and drumlin fields are the dominant landforms in this ecoregion.... Brown and red till forms the parent material. In the southern portion, upland hardwood forests consisting of northern red oak, sugar maple, basswood, and aspen-birch were common before settlement.”
- Anoka Sand Plain: “This subsection consists of a flat, sandy lake plain and terraces along the Mississippi River. Recent mapping suggests that much of the sand plain, once thought to be fluvial, is probably lacustrine in origin.... Low moraines are locally exposed above the outwash and there are small dune features.”

¹² The descriptions of Subsections are based on material from the MDNR's web site: www.dnr.state.mn.us/ecs; accessed 9/11/24.

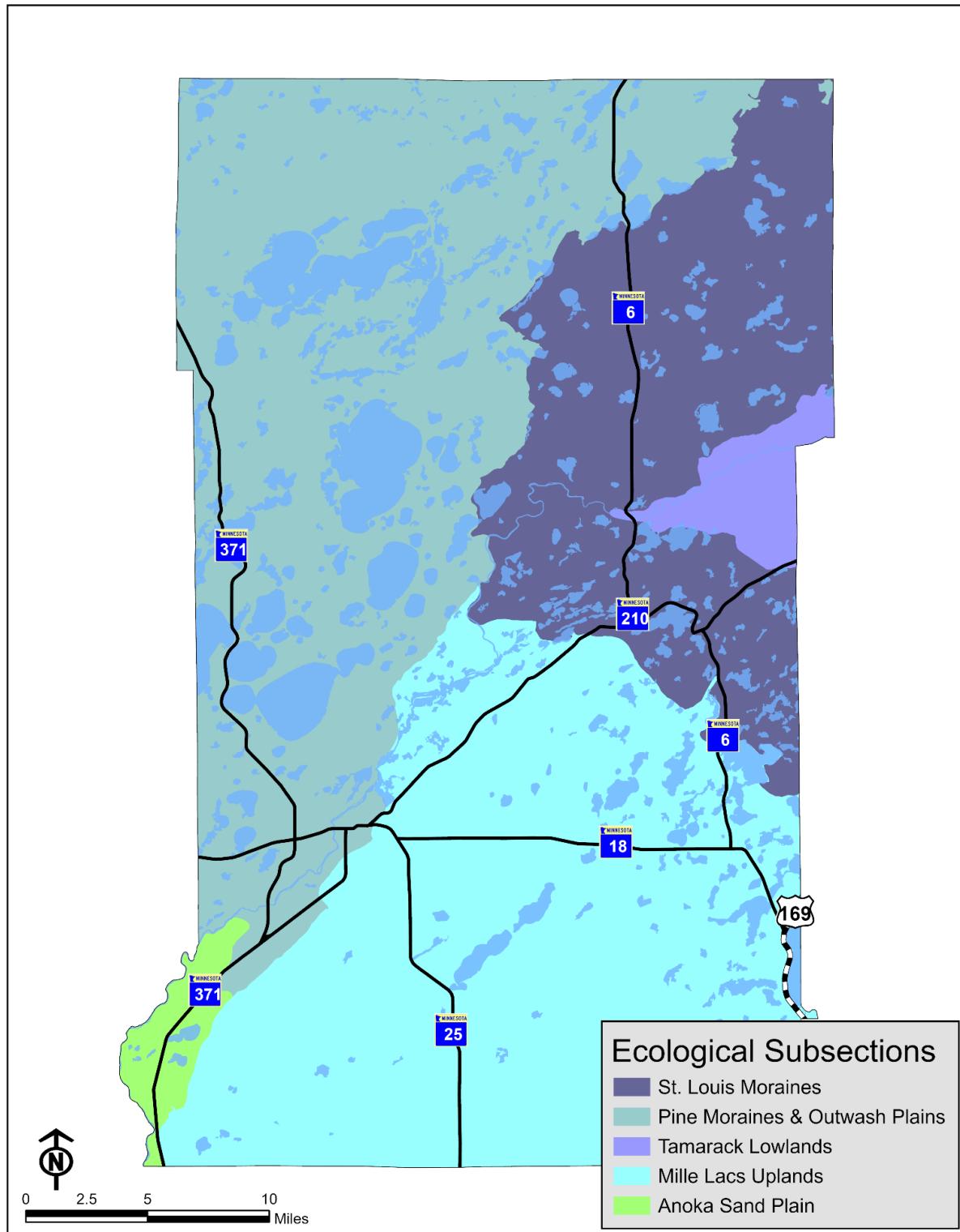
Map 3. Ecological Provinces of Minnesota



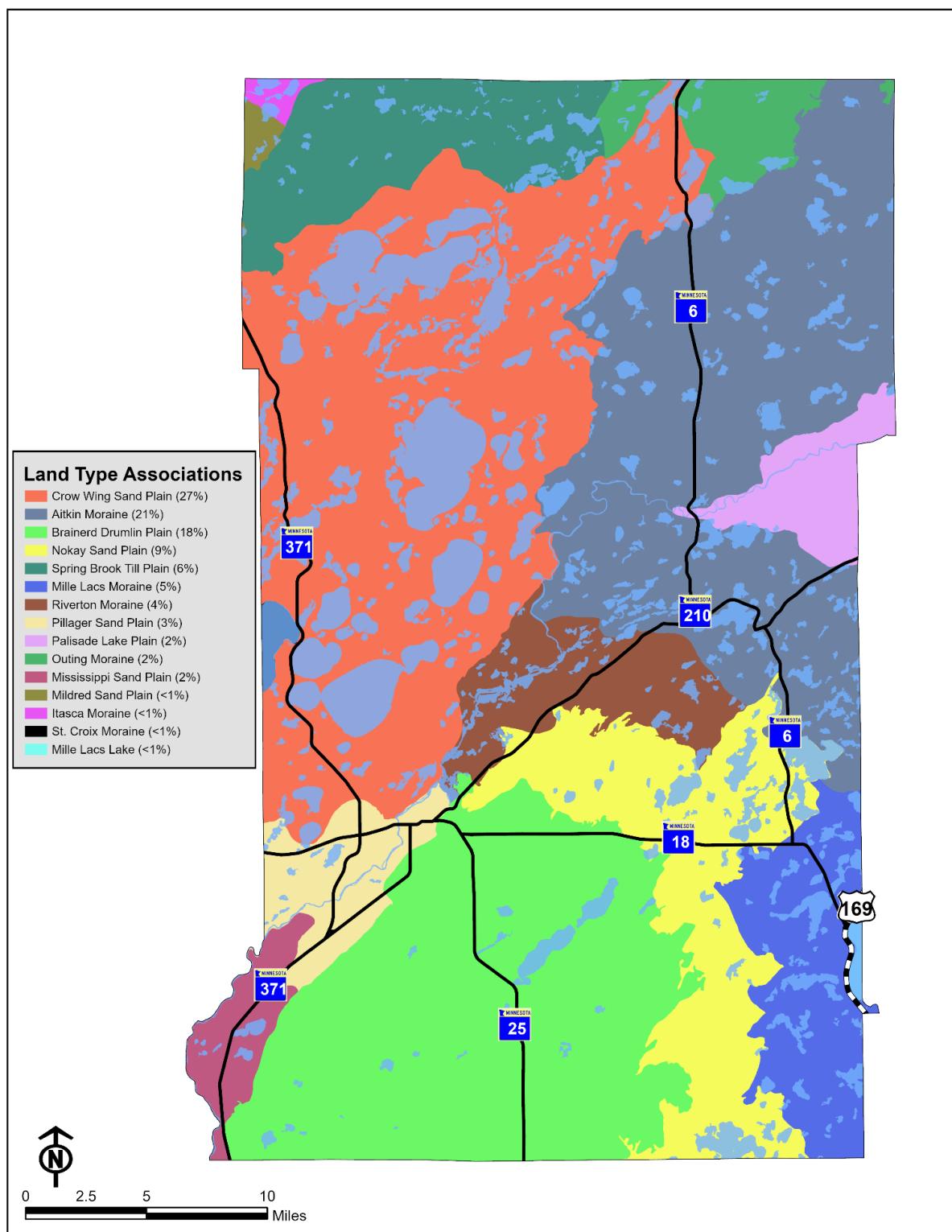
Map 4. Ecological Sections of Minnesota



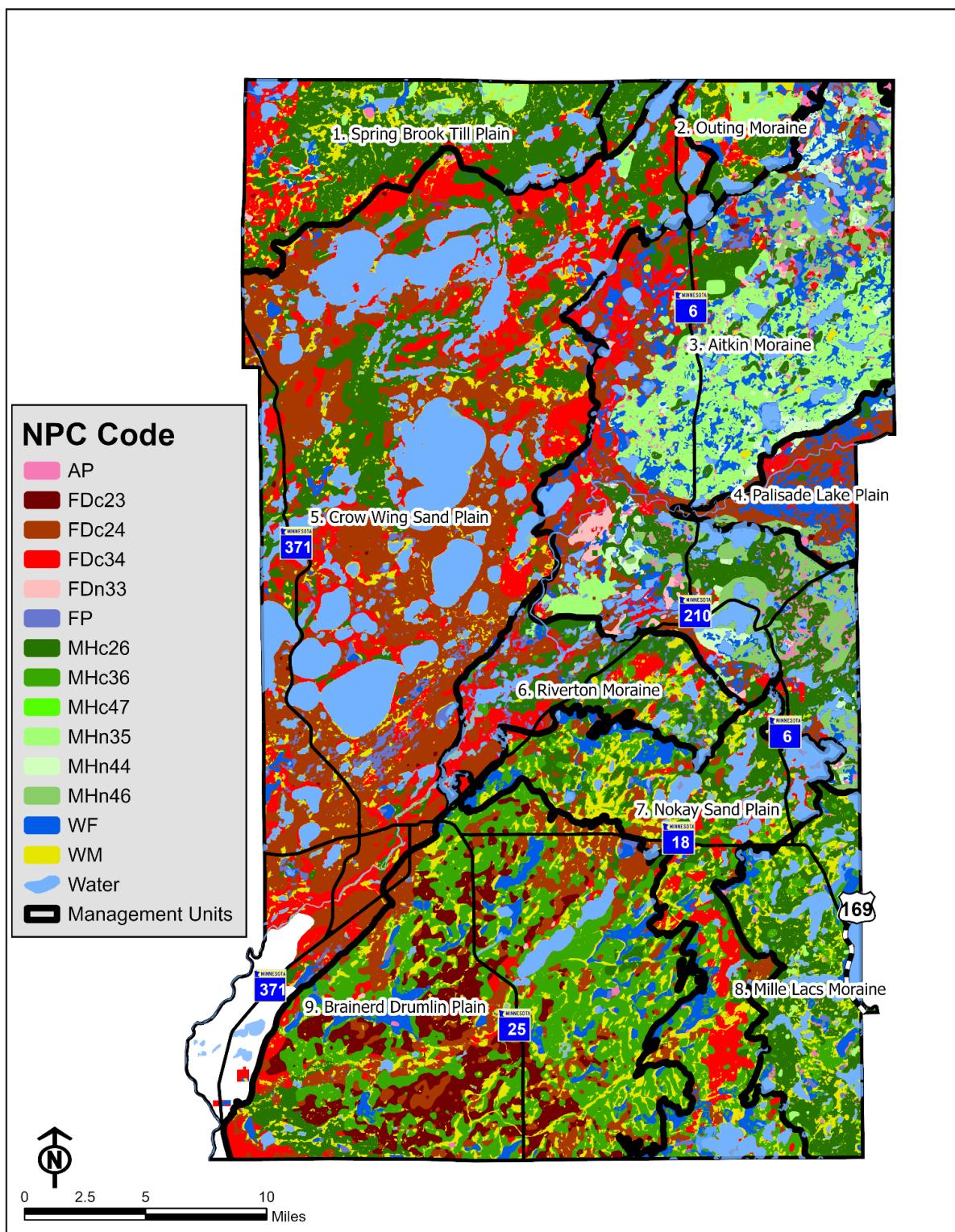
Map 5. Ecological Subsections of Crow Wing County



Map 6. Land Type Associations (LTA) of Crow Wing County



Map 7. Native Plant Communities & Management Units of Crow Wing County



Land Type Associations

The smallest ecological class above native plant communities to be mapped is the Land Type Association (LTA). This geographic level is well suited to some levels of strategic forest management planning because of its smaller size (50,000-300,000 acres) and more uniform characteristics. Crow Wing County uses LTAs to define its Management Units (see Chapter 9). LTAs are generally defined by glacial landforms, bedrock types, topographic roughness, lake and stream distributions and types, wetland patterns, and soil parent material.¹³

- Pine Moraines and Outwash Plains Subsection
 - Nc01. Crow Wing Sand Plain: A gently rolling pitted outwash plain with islands of till, all formed by the Rainy Lobe. Soil parent material is sandy loam or sand. Soils were formed under forest vegetation. Lakes occupy 24%.
 - Nc02. St. Croix Moraine: A steep end moraine formed by the Rainy Lobe glacier. Soil parent material is coarse loamy (sandy loam) and sandy till. Soils formed under forest vegetation. Uplands occupy over three-quarters of the landscape.
 - Nc04. Pillager Sand Plain: A nearly level to rolling outwash plain intermixed with peatlands (west side) formed by the Superior Lobe glacier. Soil parent material is sand and gravel. Soils were formed under forest and occasionally prairie vegetation.
 - Nc12. Mildred Sand Plain: A landscape dominated by rolling to steep terrain. The landforms were deposited by melt water flowing from the Rainy and Wadena Lobes. Soils in the east unit were formed under forest vegetation from sandy loam, sand, and gravel parent material. Soils in the west unit have formed under both forest/woodland vegetation (northern half) and prairie vegetation (southern half). The soil parent material in the west unit is a mixture of sandy loam over clay loam with a minor amount of sandy loam in the northeast corner. Peatlands are common in both units. Lakes occupy 1% of the area.
 - Nc13. Spring Brook Till Plain: A landscape dominated by a rolling till plain with small areas of steep pitted outwash, eskers, and melt water channels. All landforms were created by the Rainy Lobe. Lakes occupy 6% of the area.
 - Nc14. Outing Moraine: A landscape dominated by rolling till plains and steep end moraines all dissected by outwash channels. All features were formed by the Rainy Lobe. Soil parent material is stony sandy loam till in the till plains and moraines and sandy in the outwash channels. Soils were formed under forest vegetation. Lakes occupy 5% of the area.
 - Nc16. Itasca Moraine: A landscape characterized by steep irregularly shaped slopes with many closed depression. This end moraine was formed by the Wadena Lobe. Soil parent material is a complex of sand, loam, and clay loam till with a high content of granitic stones. Soils have formed under forest vegetation. Organic soil deposits are common, often as small closed depressions. Lakes occupy 21% of the area. Stream density is 0.2 miles/square mile (total of 66 miles).
- St. Louis Moraines Subsection
 - Nb02. Aitkin Moraine: A landscape dominated by rolling to steep end moraine formed by the St. Louis Lobe. Small area of rolling outwash is present at the elbow. Soil parent material is clayey and sandy till with some silty lake sediments in areas. Lakes occupy 10% (33,328 acres). Stream density is .44 miles/square mile (total of 239 miles).

¹³ Due to the large number of LTAs the MDNR does not provide detailed information online. The following descriptions were provided by Dan Hanson, MN DNR, personal communications, 12/23/1999 and 5/12/2014.

- Tamarack Lowlands Subsection
 - Nd08. Palisade Lake Plain: A nearly level landscape formed by shallow water lake deposits. Some areas have thin cap of wind-blown silt on the soil surface. Peatlands are common. Alluvial deposits from the Mississippi River are common. Lakes occupy 1.2% (1,783 acres). Stream density is 1.4 miles/square mile (total of 330 miles).
- Mille Lacs Uplands Subsection
 - Kb10. Nokay Sand Plain: A nearly level outwash plain formed by the Rainy Lobe. Peatlands are common. Soil parent material is sandy with some small areas of sandy loam till. Lakes occupy 12% (10,337 acres). Stream density is .36 miles/square mile (total of 47 miles).
 - Kb11. Brainerd Drumlin Plain: A rolling till plain, with abundant drumlin features, formed by the Rainy and Superior lobes. Outwash channels, with a rough northeast – southeast orientation, dissect the LTA. Peatlands are common. Soil parent material is sandy loam till with hardpans in the till plains and sandy in the outwash channels. Lakes occupy 1% (3,473 acres).
 - Kb27. Riverton Moraine: Rolling to steep end moraine formed by the Rainy Lobe. Small areas of outwash plains are common. Soil parent material is a mixture of sand and sandy loam till in the moraine and sandy in the outwash plains. Lakes occupy 7% (2,261 acres). Stream density is .93 miles/square mile (total of 45 miles).
 - Kb28. Mille Lacs Moraine: A rolling to steep end moraine formed by the Rainy Lobe. Small isolated peatlands are common. Soil parent material is a mix of loamy till and stony sandy loam till with a hard pan. Lakes occupy 13% (8, 143 acres). Stream density is .2 miles/square mile (total of 19 miles).
- Anoka Sand Plain Subsection
 - Mc05. Mississippi Sand Plain: A nearly level to rolling landscape formed primarily by post-glacial river terraces. Soils have formed under prairie vegetation in sandy parent material. Pre-European settlement vegetation was a mix of oak savanna and prairie.

Native Plant Communities

The smallest geographic unit within the Ecological Classification System is the native plant community (NPC). The MnDNR, which has identified the NPCs within Minnesota, defines NPC as “a group of native plants that interact with each other and with their environment in ways not greatly altered by modern human activity or by introduced organisms. These groups of native plant species form recognizable units, such as oak savannas, pine forests, or marshes, that tend to repeat over space and time. Native plant communities are classified and described by considering vegetation, hydrology, landforms, soils, and natural disturbance regimes. Examples of natural disturbances include wildfires, severe droughts, windstorms, and floods.”¹⁴

The probable distribution of NPCs has been mapped for Crow Wing County through a project of the Natural Resources Research Institute. Map #7 uses that information to indicate the location of NPCs within the county with several caveats including that there was an insufficient number of data

¹⁴ <http://www.dnr.state.mn.us/npc/index.html>, 2014 Minnesota Department of Natural Resources.

points to make certain determinations, especially on the wetter and organic soil sites.¹⁵ The following narrative briefly identifies the major NPCs likely found on County-administered tax-forfeit land.¹⁶

- FDc23 Fire Dependent Central Dry Pine Woodland: Dry-mesic pine woodlands on sandy, level undulating deposits. Canopy strongly dominated by jack pine with occasional quaking aspen, northern red oak, or red pine. Crown fires and surface fires were common historically.
- FDc24 Fire Dependent Central Rich Dry Pine Woodland: Dry-mesic pine woodlands on sandy, level to gently undulating outwash deposits or occasionally on sandy inclusions in rolling to hummocky stagnation moraines and till plains. Canopy strongly dominated by jack pine with minor amounts of paper birch, red pine, quaking aspen, bur oak and northern red oak. Crown fires and mild surface fires were common historically.
- FDn33 Fire Dependent: Northern Dry-Mesic Mixed Woodland: Dry-mesic conifer, conifer-hardwood, or hardwood woodlands dominated by red pine, white pine, jack pine, black spruce, quaking aspen, or paper birch. Most common on sandy soils but also present on shallow, loamy soils over bedrock. Crown and surface fires were common historically.
- FDc34 Central Dry-Mesic Pine-Hardwood Forest: Dry-mesic pine, hardwood, or pine-hardwood forests on hummocky glacial moraines, often adjacent to outwash plains. Crown fires and mild surface fires were common historically.
- MHc26 Central Dry-Mesic Oak-Aspen Forest: Dry-mesic hardwood or, rarely, hardwood-conifer forests, usually with northern red oak as a canopy dominant. Present on well-drained loamy or sandy soils, primarily on stagnation moraines and less frequently on till plains or glacial river terraces.
- MHc36 Central Mesic Hardwood Forest (Eastern): Mesic hardwood forests dominated by basswood, northern red oak, and sugar maple. Present on loamy or sandy loam soils on hummocky stagnation moraines and rolling till plains.
- MHn35 Mesic Hardwood: Northern Mesic Hardwood Forest: Mesic to dry-mesic hardwood forests on well-drained to moderately well-drained loamy soils, most often on stagnation moraines and till plains and less frequently on bedrock hills.
- MHn44 Mesic Hardwood: Northern Wet-Mesic Boreal Hardwood-Conifer Forest: Wet-mesic or mesic hardwood and hardwood-conifer forests, most commonly on level, clayey sites with high local water tables on glacial lake deposits, stagnation moraines, and till plains.
- MHn46: Mesic Hardwood: Northern Wet-Mesic Hardwood Forest: Wet-mesic, lowland hardwood forests on level sites with clayey subsoils or high local water tables.
- MHn47: Mesic Hardwood: Northern Rich Mesic Hardwood Forest: Mesic hardwood forests on well-drained to somewhat poorly drained, rich loamy soils on glacial drift and till in areas of undulating to hummocky topography.

¹⁵ Brown, T.N., Meysembourg, P., Host, G.E. Geospatial Modeling of Native Plant Communities of Minnesota's Laurentian Mixed Forest. Natural Resources Research Institute, University of Minnesota, NRRI Technical Report NRRI/TR-2013/28

¹⁶ For more information on NPCs see previously cited MnDNR website or "Field Guide to the Native Plant Communities of Minnesota The Laurentian Mixed Forest Province", MnDNR August 2003.

- WFn55 Wet Forest: Northern Wet Ash Swamp: Wet hardwood forests on mucky mineral soils in shallow basins and groundwater seepage areas or on low, level terrain near rivers, lakes, or wetlands. Typically with standing water in the spring but draining by late summer.
- WFn64 Wet Forest: Northern Very Wet Ash Swamp: Wet hardwood or hardwood-conifer forests on peaty soils in small closed depressions or around the edges of large peatlands. Typically with standing water present throughout spring and summer.
- FPn72 Forested Peatland: Northern Rich Tamarack Swamp (Eastern Basin): Tamarack-dominated swamps on shallow to deep peat in basins and in depressions in abandoned river channels.
- FPn82 Forested Peatland: Northern Rich Tamarack Swamp (Western Basin): Tamarack-dominated swamps on moderately deep to deep peat in basins on glacial till or outwash deposits, or occasionally along the margins of large peatlands on glacial lake plains or on floating mats along lake or river shores.
- WMn82 Wet Meadow/Carr: Northern Wet Meadow/Carr: Open wetlands dominated by dense cover of broad-leaved graminoids or tall shrubs. Present on mineral to sapric peat soils in basins or along streams.
- APn80 Acid Peatland: Northern Poor Conifer Swamp: Black-spruce-dominated peatlands on deep peat. Canopy is often sparse, with stunted trees. Understory is dominated by ericaceous shrubs and fine-leaved graminoids on high Sphagnum hummocks.
- APn81 Acid Peatland: Northern Poor Conifer Swamp: Conifer-dominated peatlands with sparse canopy of stunted trees. Understory is depauperate and dominated by ericaceous shrubs, fine-leaved graminoids, and low hummocks of Sphagnum moss. Minerotropic plant species are present.

A detailed digitized soil survey has been completed for the county but it was not available for the NRRI's mapping effort. It will be used over time to verify and refine the NPC designations.

Climate Adaption

With respect to observed and potential future changes in environmental dynamics, the County believes that the use of native plant communities as the foundational framework for management in conjunction with active forest management will lead to a resilient, diverse, and healthy forest that is best suited to adapt to any such changes.

The Sustainable Forestry Initiative (SFI) requires land managers to identify climate change risks to forests and forestry operations as well as develop adaptation plans to assist with climate change adaptation. These efforts may be done individually by the county, or can be developed cooperatively, such as through an SFI Implementation Committee or other partnerships.

In general, sustainable forestry practices help ensure a forest that is more resilient to a broad range of threats, including climate change. However, it is important to still recognize the unique threats to forests and infrastructure that climate change may impose. Historical data from the past 100 years shows that northern Minnesota's average temperatures have increased, with a greater average increase in winter temperatures. Precipitation patterns have changed and are projected to continue to change, with an overall increase in precipitation, especially in summer and fall, with heavy rainfall events (3 inches or greater) becoming more common.¹⁷

¹⁷ Handler Et al. 2014. Minnesota forest ecosystem vulnerability assessment and synthesis: a report from the Northwoods Climate Change Response Framework. Gen. Tech. Rep. NRS-133. Newtown Square, PA; U.S. Department of Agriculture, Forest Service, Northern Research Station. 228 p.

Given these documented and projected changes, some species of trees are predicted to fare well in a changing climate while others are predicted to fare worse. In general, boreal species (such as balsam fir and aspen) will face increased stress while more temperate species such as sugar maple and white oak will benefit. Crow Wing County's Tax-Forfeit lands are covered under the North Central Landscape Plan (see Section 2.5) which provides specific information related to climate change risk depending on forest type.

While changing precipitation and temperatures may stress vulnerable forest types, the increased occurrence of heavy rainfall events can damage infrastructure critical to forest management, such as culverts and forest roads. Warmer winters limit operability on low-lying stands that rely on frozen soils for access. When land management planning, the best available science should be referenced to address climate change impacts and adaptability on county managed tax-forfeited lands.

2.4 Watersheds and Water Resources¹⁸

Crow Wing County is home to over 400 lakes and thousands of miles of rivers, including the Mississippi River, which flows through the county and forms part of its eastern border, and the Pine River, which flows into the Mississippi. The county's smaller rivers and streams include the Crow Wing River, the Nokasippi River, and the Daggett Brook.

Crow Wing County is in the Upper Mississippi River Basin. Portions of five watersheds are located within Crow Wing County. The Mississippi River—Brainerd Watershed occupies most of the county's area. The Pine River Watershed, Crow Wing River Watershed, Rum River Watershed, and the Mississippi River—Sartell Watershed comprise the remainder of the County's area.

The Mississippi River – Brainerd Watershed has a Comprehensive Watershed Management Plan spanning four counties: Aitkin, Crow Wing, Morrison, and Todd. The Mississippi River – Brainerd watershed extends over 1,079,950 acres (1,687 square miles) in the northern-central portion of the Upper Mississippi River Basin. Its boundaries originate in Aitkin County, extending through the municipalities of Aitkin, Brainerd/Baxter, and Little Falls. Approximately 42 percent of the watershed is covered by forests, with 38 percent grasslands and shrub wetlands, 10 percent dedicated to row crops, 6 percent featuring water bodies, and 4 percent designated as urban areas. This watershed mostly falls within the North Central Hardwood Forest region, with small sections in the Northern Lakes and Forests ecoregion. This expansive watershed features approximately 2,149 miles of total river length and accommodates 212 lakes exceeding 10 acres in size. Notably, there are impaired lakes and streams within the Mississippi River – Brainerd Watershed. While the lakes in Crow Wing County may not be impaired, the section of the Mississippi river running through the city of Brainerd is impaired. The Mississippi River is not designated as a "wild and scenic river," but segments within Crow Wing County are designated as state water trails. The Mississippi Headwaters Board, founded in 1980, is an eight-county collaborative organization that oversees the protection of this waterway and, by state statute, has the authority to impact the development of its periphery.

The Pine River Watershed spans approximately 502,400 acres (784.37 square miles) in size, with its drainage area encompassing segments of Aitkin, Cass, Crow Wing, and Hubbard counties. The primary cities situated within this watershed are Pine River and Crosslake. This watershed has a network of 586 miles of streams and rivers, varying in size, and includes 441 lakes exceeding 10

¹⁸ Information in this section taken from "Crow Wing County Comprehensive Plan 2024-2040", adopted 8/27/24

acres in size. Fifty-six percent of the land is privately owned, while more than 40 percent falls under state ownership. The landscape within the Pine River Watershed is 51 percent forested areas, 21 percent wetlands, and 13 percent open water. This watershed has numerous lakes with substantial development. The lakes are significant recreational assets and offer economic advantages to the entire watershed.

The Crow Wing River Watershed encompasses approximately 1,245,440 acres (1,946 square miles), spanning Becker, Cass, Clearwater, Crow Wing, Hubbard, Morrison, Otter Tail, Todd, and Wadena Counties. This watershed is characterized by two ecoregions: the Northern Lakes and Forests and North Central Hardwood Forests. The predominant land use in the watershed consists of forested and shrublands, agricultural areas, wetlands, open water, and developed land. The watershed features a substantial number of pristine, valuable recreational lakes and cold-water streams that are conducive to trout habitat. There are over 627 lakes with areas exceeding 10 acres and an extensive network of 1,653 stream and river miles. The Crow Wing River eventually joins the Mississippi River at Crow Wing State Park. However, a handful of lakes and tributaries fail to meet water quality standards for various beneficial uses, including aquatic recreation, drinking water, and swimming. The primary pollutant in these lakes is phosphorus, which leads to algae blooms during the summer months.

Encompassing 997,060 acres (1,557.9 square miles), the Rum River Watershed is positioned within the Northern Lakes and Forests and North Central Hardwoods Forest ecoregions. This watershed includes portions of Aitkin, Crow Wing, Morrison, Mille Lacs, Kanabec, Benton, Isanti, Chisago, Sherburne, and Anoka counties. The origins of the Rum River are traced back to Mille Lacs Lake, stretching over 145 miles until it merges with the Mississippi River in Anoka. The Rum River watershed is home to 212 lakes exceeding 10 acres in size. Regarding land usage, the area comprises 39 percent agricultural land, 24 percent forested regions, 18 percent grasslands, shrubbery, and wetlands, and 15 percent water. Due to phosphorous, a few lakes within the Rum River watershed fall short of meeting water quality standards for aquatic recreation, drinking water, and swimming. The Rum River is a "wild and scenic river."

The Mississippi River-Sartell Watershed covers an area of 652,800 acres, including parts of Benton, Crow Wing, Mille Lacs, Morrison, Stearns, and Todd counties. This region has 879 miles of rivers and 232 lakes, spanning 13,319 acres. The landscape is primarily agricultural, with the predominant ownership of 96 percent being private land. The watershed is marked by lakes in the northeast and southwest, with a network of tributaries in the central region. There are ongoing water quality challenges, including issues with some lakes and streams not meeting quality standards for conventional parameters. This underscores the need for collaborative efforts to preserve and restore these valuable resources.

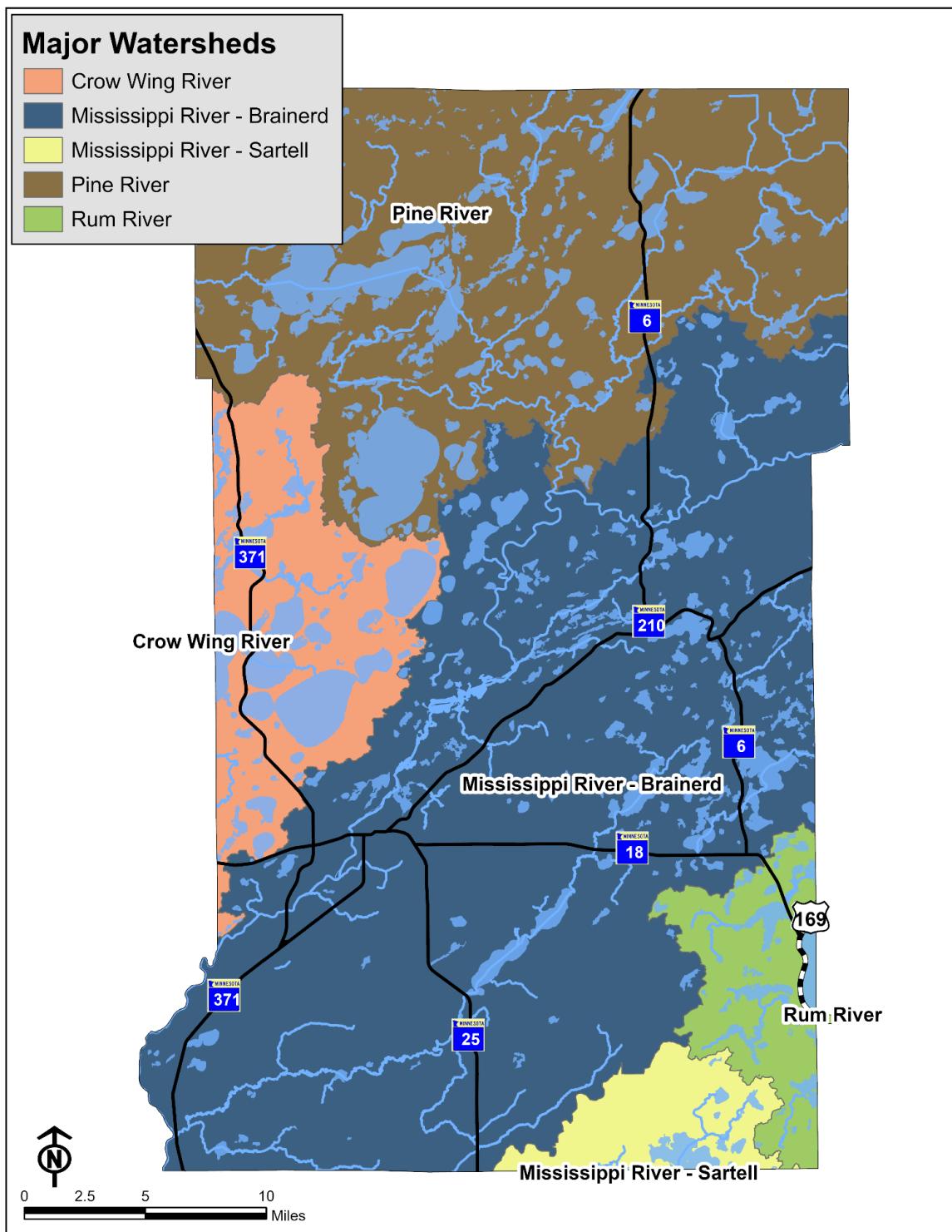
Understanding the watersheds within Crow Wing County is essential for managing the region's water quality, land use, and environmental conservation efforts. The health of these watersheds directly impacts the quality of the lakes, rivers, and other water bodies within the county, making it crucial for sustainable development and natural resource management.

Table 5 shows the distribution of County-administered tax forfeit land by major watershed. Map 8 shows the major watersheds and Map 9 shows wetland and riparian areas. Management of public lands can have significant impacts on surface water flows and quality. Lands managed by the County play an especially important role in the Pine and Rum River watersheds. Of the portion of the watersheds in Crow Wing County, one-quarter of the Pine River system and nearly a fifth of the Rum River system are comprised of tax forfeit land.

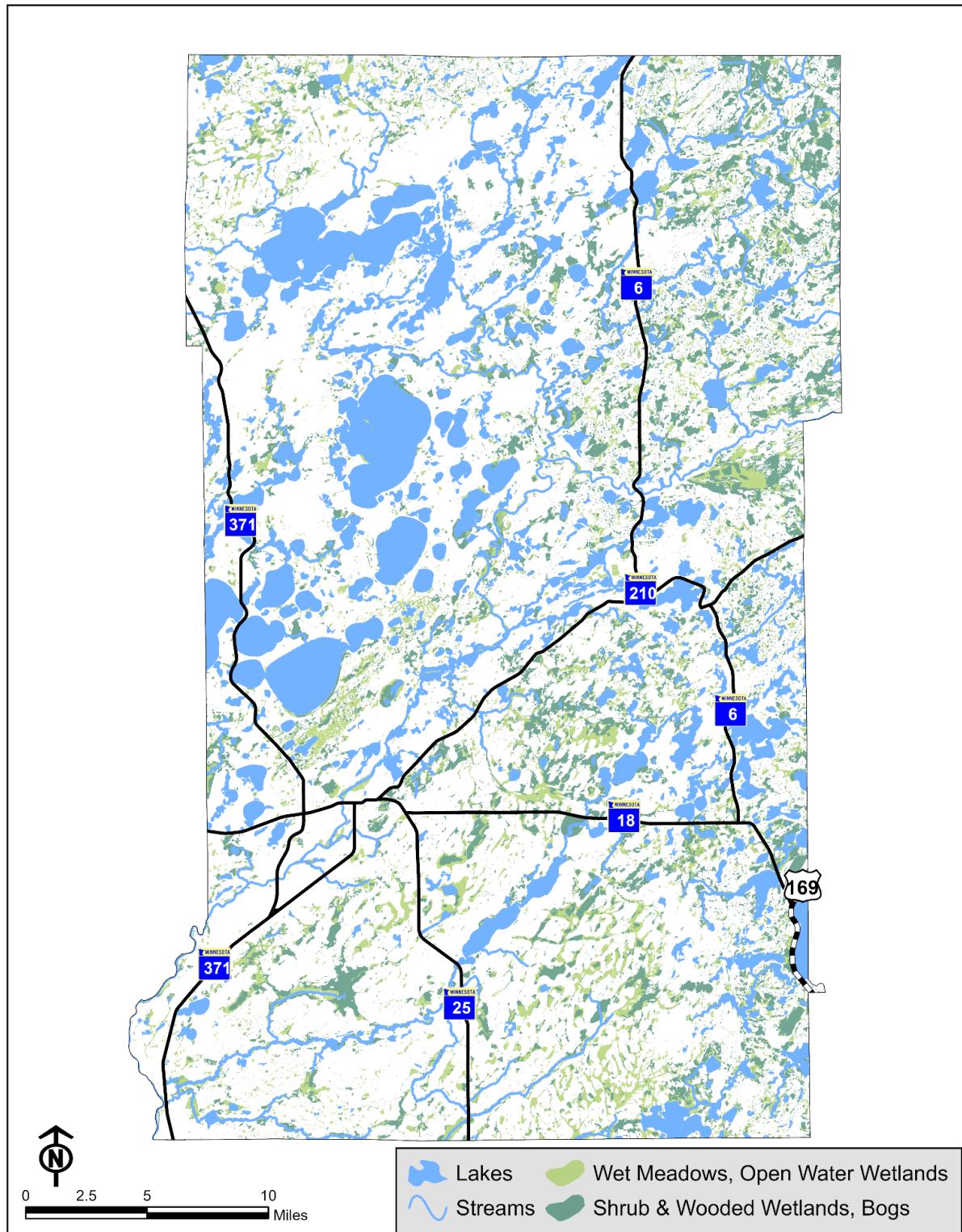
Table 5. County Tax Forfeit Land Ownership by Major Watershed

Watershed	Total Acres	County Tax Forfeit Lands	
		Acres	Percent of Watershed
Pine River	236,885	57,633	24.30%
Crow Wing River	74,900	1,052	1.40%
Rum River	34,734	6,012	17.30%
Mississippi River: Brainerd	369,495	37,312	10.10%
Mississippi River: Sartell	23,785	2,051	8.60%
Totals	739,798	104,060	

Map 8. Major Watersheds of Crow Wing County



Map 9. Lakes, Streams, and Wetlands of Crow Wing County



2.5 Plan Context

This resource management plan exists within the context of other plans and processes. This section identifies a regional forest landscape plan, a multi-county forestry organization in which the county is a member, and three county level plans especially pertinent to public land management.

State Landscape Plans¹⁹

The Minnesota Forest Resources Council (MFRC) was established by the Legislature in 1995 with the purpose to develop recommendations to the Governor and to federal, state, county and local governments regarding policies to foster sustainable forest management. The MFRC created the Landscape Program to help implement state policies at the landscape level across the state. Crow Wing County is within the North Central Landscape Region that also includes Itasca, Aitkin, Cass, Becker, Clearwater, Hubbard, Mahnomen, east half of Polk and south half of Beltrami counties.

A committee with representatives of forest managers within the North Central region began meeting in 2000 to devise a landscape level plan. A key result of the effort was the realization by committee members that “individual land management choices must be viewed in the context of those of their neighbors and that the multiple management objectives of the various land managers can provide for a diverse and balanced landscape condition in terms of ecological health and biodiversity.”

The first version of the North Central Landscape Plan was adopted in 2003 and amended in 2004. The second, current version was adopted in 2017. This new plan considers more economic and social goals, as well as addressing other important landscape scale management issues. While not binding on Crow Wing County, the plan offers overarching guidance within which the County can exercise its management activities.

Sustainable Forest Management Cooperative

Crow Wing County participates in the Minnesota Counties Sustainable Forest Cooperative (MCSFC) along with Beltrami, Carlton, and Koochiching Counties. Through the cooperative, the member counties have achieved third party certification of their forest management practices. As part of that process, the counties have developed a common set of procedures that guide certain management actions. For instance, the Sustainable Forest Management Policy in Section 1.4 was developed through the cooperative. Section 1.4 and the other procedures are an *integral part* of Land Services Department practices and are included by reference as a part of this plan.

County Comprehensive Plan

In 2024, Crow Wing County adopted a comprehensive plan that provides a roadmap guiding growth and development through 2040. The county comprehensive plan provides background information about the county and addresses key areas including water and natural resources, land use, economic development, housing, recreation, transportation and infrastructure and services. The development of this plan engaged the public and community stakeholders to ensure the process was inclusive, transparent and collaborative. The county comprehensive plan underscores the importance of protecting the natural resources that make Crow Wing County Minnesota’s Favorite Place while also fostering job creation, population growth, education and recreation.

¹⁹ Information in this section taken from “Forest Resource Management Plan North Central Landscape”, Minnesota Forest Resources Council, 20 September 2017.

The plan²⁰ specifically addressed forestry and public land management. Four issues were identified:

- “Crow Wing County has some federal or state-owned forestland. However, tax-forfeited land is the main form of public ownership. Some involve shared ownership with private parties, posing management and development challenges.”
- “Citizens value forest resources for many reasons, including their scenic beauty, rare plant species, wildlife habitat, recreational value, and lumber and pulp industries, all of which contribute to the economy, environment, and quality of life in Crow Wing County.”
- “One of the major challenges for long-term sustainability of forest habitat and the forest industry is scattered development leading to fragmented, isolated, and inaccessible forest patches. Small forest patches do not provide adequate food, cover, or genetic diversity for wildlife species and are often subject to invasive species, disease, and degradation and over-use by people living in the new developments.”
- “Small isolated patches also make forestry operations difficult and often impossible due to poor access and land use conflicts. Some residential landowners object to resource utilization such as timber harvesting on lands near their residences, even if the lands are owned by another party and the use is allowed.”

There were three goals related to public land management:

- “Maintain and enhance parks, recreation, and natural resources in Crow Wing County to enhance community well-being by providing diverse park amenities, improving trail connections and safety, and preserving the environment. Ensure accessible and high-quality recreational opportunities for residents while preserving the county's natural areas and open spaces.”
- “Maintain and enhance the overall health of water resources by implementing the 2021 Pine River, 2023 Mississippi-Brainerd, 2022 Rum River, 2024 Crow Wing, and Sartell Watershed One Watershed One Plans. This requires property owners, businesses, farmers, local governments, and state agencies to work together and take steps to protect the quality and quantity of our lakes, wetlands, rivers and streams, and groundwater”
- In the context of transportation, “Promote positive environmental and health outcomes by minimizing the negative impacts on sensitive ecosystems, historically and culturally significant sites, and adjacent land uses.”

The plan listed strategies or policies through which to address the issues and implement the goals:

- “Balance the need for recreational amenities with environmental concerns for the county's natural areas”
- “Recognize the value of all water resources, protect them, and enjoy their use without negative impacts. Draft options for mitigating impacts”
- “Seek opportunities to create new wetlands or wildlife habitat credits, which would act as required mitigation for future transportation system improvements.”

²⁰ “Crow Wing County Comprehensive Plan 2024-2040”, adopted 8/27/24.

One Watershed, One Plan (1W1P)

“One Watershed, One Plan” (1W1P) is a program through the Minnesota Board of Water and Soil Resources (BWSR). This program allows for local governments to collaboratively develop comprehensive watershed management plans. 1W1P emphasizes watershed management by watershed boundaries, rather than county boundaries. This develops local plans based on local priorities, which can be adopted by local governments for the parts of their jurisdictions that are covered by the plan.

It is the intent of the County to manage its land and to encourage other forested land managers to manage their lands in a way that continues the protection and enhancement of water resources. Forests and natural vegetation cover in Crow Wing County, including on tax forfeit land, play an important role in maintaining good water quality in the county and downstream. Forestlands reduce and slow down surface water runoff, prevent soil erosion, and promote groundwater recharge. Forests and trees adjacent to lakes and streams also enhance habitat by regulating water temperatures, stabilizing shorelines, and providing slowly-released nutrients such as wood, branches and leaves.

The following Crow Wing County watersheds are covered under 1W1P plans

- 2021 Pine River One Watershed One Plan
- 2023 Mississippi Brainerd Watershed One Watershed One Plan
- 2022 Rum River One Watershed One Plan
- 2024 Crow Wing River 1W1P (under development)
- Mississippi River - Sartell Watershed 1W1P (under development)

These plans ensure not only the protection of water resources, but also enhance land management and recreational opportunities through cooperative plan development and implementation.

County Recreational Use Plan

Crow Wing County manages a network of recreational trails, boat accesses, and six parks. In February 2022 the county adopted the *Crow Wing County Recreational Use Plan* developed by the Land Services Department which identifies county recreational resources and provides management guidance for strategic planning. The Recreational Use Plan contains the following Sections: Introduction, County Parks, Water Accesses & Water Trails, Recreational Trail Management and Trail Proposal and Planning Process, and Marketing & Promotion.

Chapter 6 of this Forest Resources Plan presents details of the county’s recreational facility system, the recreation trails plan, and management policies.

Chapter 3.0 Resource Description

3.1 Land Ownership

The amount of tax forfeited land administered by Crow Wing County constantly fluctuates as new lands are forfeited and parcels are sold. For the purposes of this plan, the figure of 104,060 acres is used. This total only includes land that the county can manage; it does not include parcels in which the county has an undivided interest.

At the time of the 1985 plan, the county administered 94,493 acres and for the 2000 plan the county managed 98,512 acres. At the 2014 plan update, 103,523 acres were under county administration. The bulk of the land increase between 2000-2014 resulted from two actions: 1,500 acres was gained from the University of Minnesota, and 2,000 acres was obtained from Potlatch.

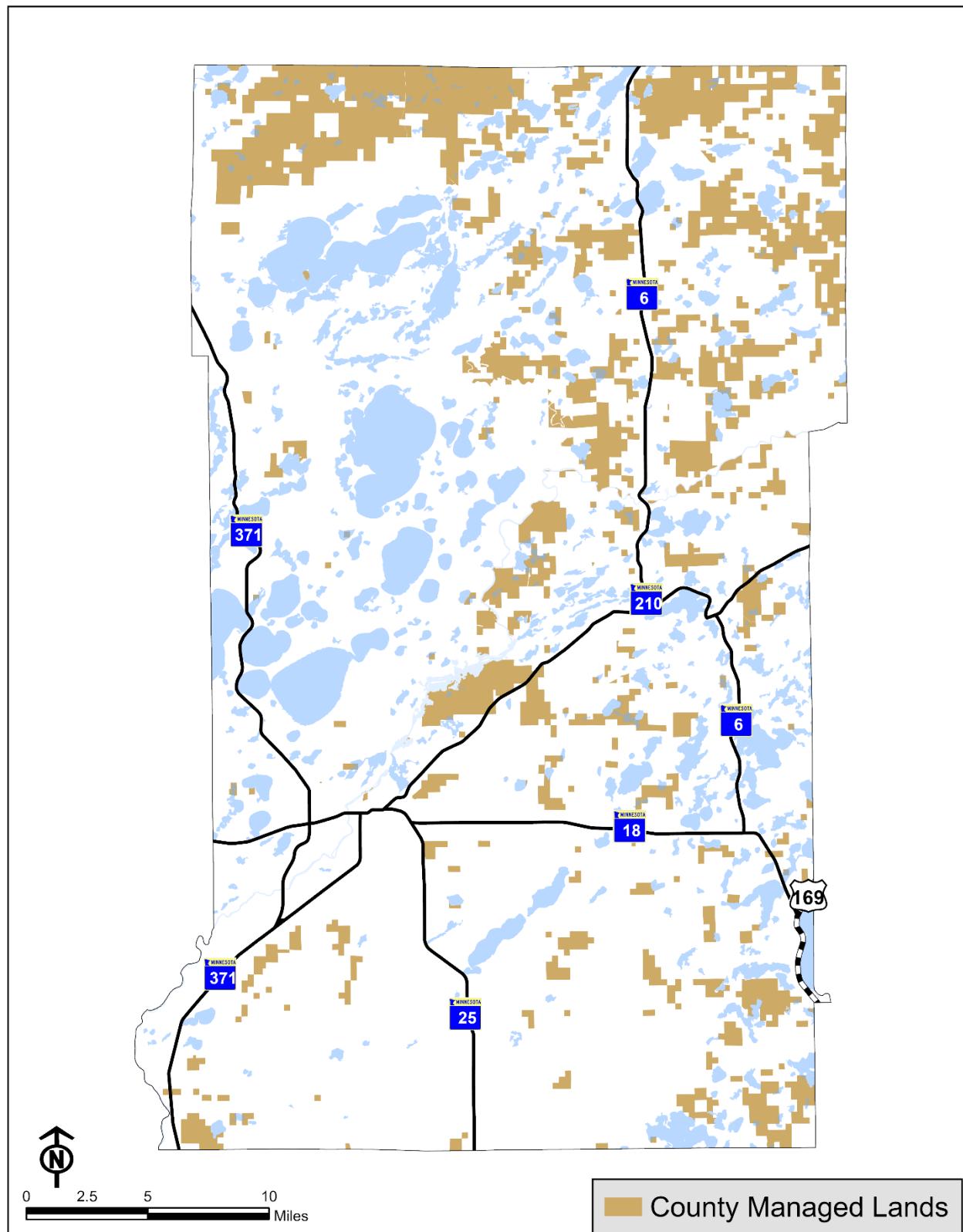
As shown on Map 10, tax forfeited lands are unevenly distributed across the county with the largest blocks being in the northern third.

Not all tax-forfeited land is forested or, if forested, capable of producing commercial products. Table 6 indicates the number of tax-forfeited acres in basic categories.

Table 6. Generalized Cover Types, Crow Wing County Tax-Forfeited Land, 2025

Cover	Acres	% of Total
Commercial forest	73,754	70.9%
Stagnant Conifer	498	0.5%
Lowland brush	10,026	9.6%
Lowland grass	675	0.6%
Upland brush	115	0.1%
Upland grass	245	0.2%
Marsh	11,812	11.4%
Muskeg	709	0.7%
Non-permanent water	2,972	2.9%
Permanent water	1,920	1.8%
Agriculture	15	0.0%
Industrial developed	1,145	1.1%
Recreational developed	116	0.1%
Roads	58	0.1%
Commercial forest	104,060	100%

Map 10. Tax Forfeit Lands of Crow Wing County



3.2 Cover Type

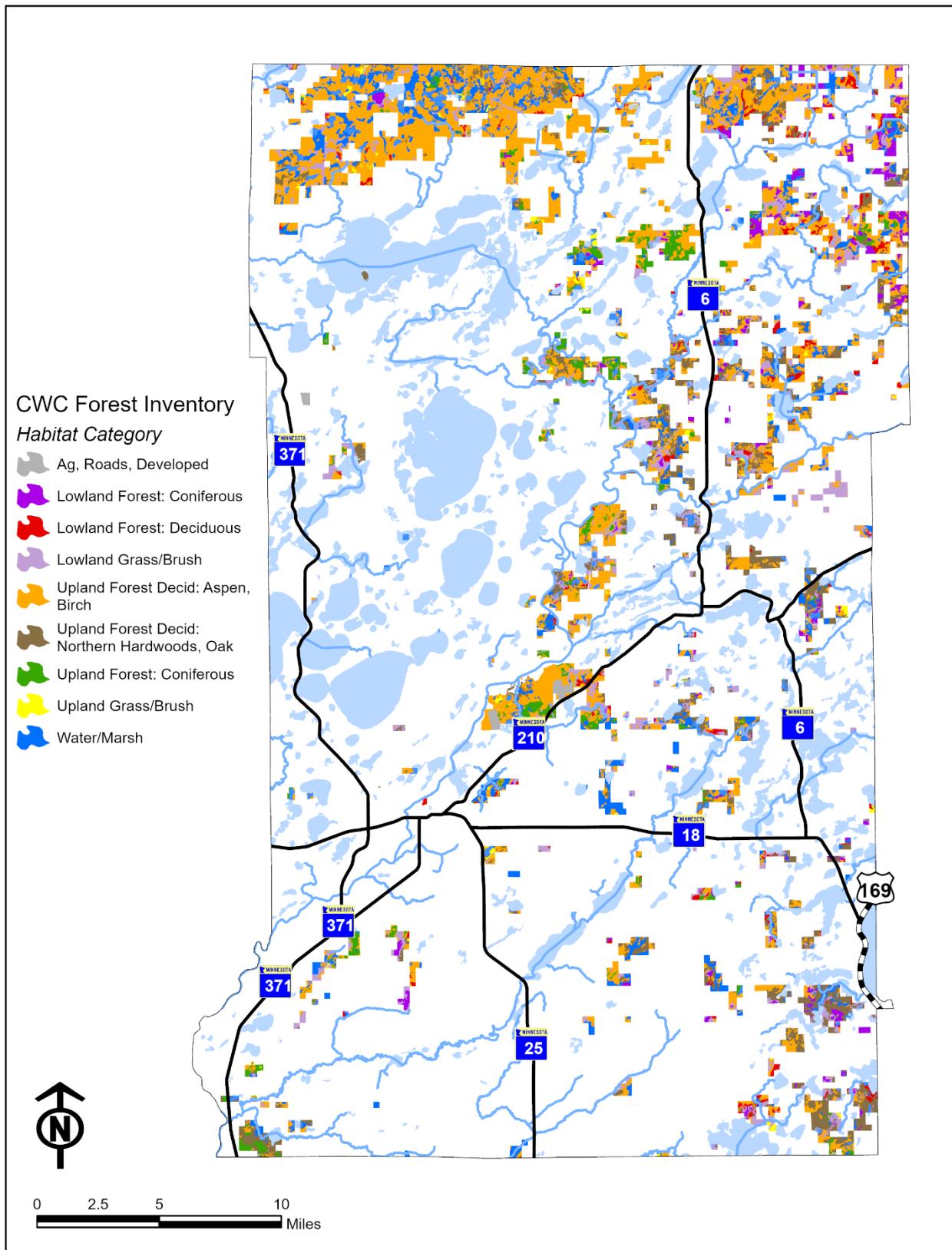
The term *cover type* is used to describe what type of forest (or land use) occupies a given stand. For forested areas, cover type is defined by the dominant overstory tree species. However, in most stands there is a mix of species and the dominant, defining species may account for as little as 30% of the trees. Because most trees can occupy a wide variety of ecological sites, cover type does not generally indicate the potential of a given stand to develop into a mature, late-successional forest.

One way to understand forest cover types is to view their distribution by age class (10-year increments). Age class distributions can indicate the expected flow of harvestable trees, the character of the forests (young versus old), and stands that may be naturally succeeding into other cover types. Table 7 shows the age class distributions for commercial forestlands on Crow Wing County's tax-forfeited lands in 2025. Map 11 indicates the distribution of forest types across the county.

Table 7. Distribution of Selected Cover Types on Crow Wing County Tax-Forfeit Lands by 10-year Age Classes, 2025 (acres)

Cover Type	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	>121	Grand Total	
Ash	162	5	4		23	78	115	154	83	226	676	302	265	2,093	
Aspen	9,744	7,372	8,662	11,919	6,057	56	53	142	23					44,028	
Balsam Fir	30	6	26	15	74	47	43	44	13	35	9			342	
Birch	678	10	35	25	42	52	25	122	21	3				1,013	
Black Spruce Lowlands	109	69	139	41	130	197	150	110	324	458	85	100	96	2,008	
Jack Pine	190	9	72	18	4	3		5		2				303	
Lowland Hardwoods	16				13	31	53	182	175	48	104	135	203	960	
Northern Hardwoods	392	20	15	66	63	159	667	625	690	456	208	87	37	3,485	
Oak	718		40	73	248	571	1,222	3,113	4,023	1,795	328	109	10	12,250	
Red Pine	1,103	197	915	940	160	49	82	248	17	57	52	34	3	3,857	
Tamarack	351	29	73	59	59	136	228	208	205	177	96	105	59	1,785	
White Cedar														94	94
White Pine	30		19				3	50	3		11	3		119	
White Spruce	211	12	112	29		45								409	
Grand Total	13,734	7,729	10,112	13,185	6,873	1,424	2,641	5,003	5,577	3,257	1,569	875	767	72,746	

Map 11. Forest Cover Types of Crow Wing County



3.3 Resource by Native Plant Community

The potential of the landscape to produce forests is encapsulated in the concept of native plant communities (NPC). The NPCs likely found on Crow Wing County tax-forfeited lands were described in Chapter 2. The following table identifies the probable amount of each NPC on tax-forfeited lands.

Table 8. Distribution of Native Plant Communities on Crow Wing County Tax Forfeited Lands, 2025

NPC	Name	Acres	% of Total
FDc23	Fire Dependent: Central Dry Pine Woodland	173	0.2%
FDc24	Fire Dependent: Central Rich Dry Pine Woodland	6,571	6.3%
FDc34	Fire Dependent: Central Dry-Mesic Pine-Hardwood Forest	7,763	7.5%
FDn33	Fire Dependent: Northern Dry-Mesic Mixed Woodland	995	1.0%
MHc26	Mesic Hardwood: Central Dry-Mesic Oak-Aspen Forest	33,933	32.6%
MHc36	Mesic Hardwood: Central Mesic Hardwood Forest (Eastern)	4,215	4.1%
MHn35	Mesic Hardwood: Northern Mesic Hardwood Forest	13,741	13.2%
MHn44	Mesic Hardwood: Northern Wet-Mesic Boreal Hardwood-Conifer Forest	2,101	2.0%
MHn46	Mesic Hardwood: Northern Wet-Mesic Hardwood Forest	2,836	2.7%
FP	Forested Peatland	1,849	1.8%
AP	Acid Peatland	3,272	3.1%
WF	Wet Forest	14,244	13.7%
WM	Wet Meadow	11,090	10.7%
Water	Lake, River, Stream, ect	1,276	1.2%
Total		104,060	100.0%

Source: NRRI; Consultant.

Table 9 shows the distribution of forest cover types by NPC on Crow Wing County tax-forfeited lands. Some of the NPCs have been grouped due to small amounts of acres and/or because management would not likely vary within the type.

Table 9. Cover Type by Native Plant Community, 2025 (Acres)																
Cover Type	AP	FDc23	FDc24	FDc34	FDn33	FP	MHc26	MHc36	MHn35	MHn44	MHn46	Water	WF	WM	Grand Total	
Ash	207	4	97	47	-	54	285	94	153	49	29	1	735	340	2,094	
Aspen	350	121	2,922	3,785	692	165	21,229	2,041	8,023	1,244	1,589	7	718	1,090	43,976	
Balsam Fir	51	5	32	27	-	31	20	1	3	-	8	-	128	39	342	
Birch	1	0	58	124	-	5	633	14	107	-	32	2	6	30	1,012	
Black Spruce Lowlands	567	3	52	9	3	289	27	5	67	14	23	-	777	172	2,008	
Jack Pine	1	-	119	86	28	0	41	10	-	-	6	-	3	5	300	
Lowland Hardwoods	55	10	61	36	-	56	156	63	33	46	14	1	253	175	958	
Northern Hardwoods	73	-	233	133	16	6	855	177	1,171	278	263	1	183	94	3,483	
Oak	146	-	575	954	35	25	6,162	853	2,467	193	302	26	171	341	12,251	
Red Pine	2	8	1,121	1,392	126	10	846	146	70	3	47	0	31	22	3,824	
Stagnant Conifer	134	-	4	8	-	67	20	9	35	5	0	1	144	72	498	
Tamarack	243	1	28	28	-	170	102	15	30	11	14	2	718	423	1,787	
White Cedar	-	2	0	-	-	-	-	-	-	-	-	-	90	1	94	
White Pine	-	-	36	38	-	-	33	4	-	-	2	-	5	2	119	
White Spruce	-	-	40	183	-	-	145	28	12	-	-	-	-	1	409	
Upland Grass/Brush	16	8	18	28	-	1	41	80	59	32	8	9	38	21	360	
All Other	1,425	10	1,177	885	95	969	3,340	677	1,512	226	498	1,225	10,245	8,261	30,547	
Grand Total	3,272	173	6,571	7,763	995	1,848	33,933	4,215	13,741	2,101	2,836	1,275	14,244	11,090	104,060	

3.4 High Conservation Value Forests

High Conservation Value Forests (HCVFs) were introduced in 1999 to ensure identification and proper management of forest areas with exceptional conservation value. High Conservation Value Forests are defined as those that possess one or more of the following High Conservation Values (HCVs):

1. HCV forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia), including RTE species and their habitats;
2. HCV forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance;
3. HCV forest areas that are in or contain rare, threatened or endangered ecosystems;
4. HCV forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control);
5. HCV forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health); or,
6. HCV forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

For the North Woods / Lake States portion of the US, the area in which Crow Wing County is located, HCVF Attributes are defined as:

- Old growth (defined as a stand or forest that demonstrates old-growth characteristics and is unroaded or lightly roaded, with no evidence of previous logging)
- Old forests / mixed age stands that include trees >120 years old
- Blocks of contiguous forest, >500 acres, which host rare, threatened or endangered species
- Oak savannas
- Hemlock-dominated forests
- Pine stands of natural origin
- Contiguous blocks, >500 acres, of late successional species, that are managed to create old growth
- Fens, particularly calcerous fens
- Other non-forest communities, e.g. barrens, prairies, distinctive geological landforms, vernal pools
- Other sites as defined by GAP analysis, Natural Heritage Inventory, and/or the World Wildlife Fund's Forest Communities of Highest Conservation Concern

In 2010 the County assessed its lands for potential HCVF sites.²¹ Five sites have been designated as follows:

- Big Island: old forest, northern hardwood forest; 53 acres.
- Norway (Red) Pine Future Old Growth: future old forest red pine (129 years old in 2025); 13 acres.
- Birchdale WMA Northern Hardwoods Future Old Growth: mature northern hardwoods; 52 acres.
- Ross Lake Northern Hardwoods Future Old Growth: mature northern hardwoods; 40 acres
- Red-Shouldered Hawk Habitat Area: red-shouldered hawk habitat; 2,650 acres.

The County will manage these areas according to the specific HCVF management plans so as to enhance and maintain their HCVF attributes.

3.5 Habitat

The County manages for wildlife habitat at both the coarse and fine filter levels. Coarse filter management tends to focus on sustaining, within the constraints of a limited land base, a wide range of habitat types. At the fine filter level natural resource managers design stand activities to appropriately account for site-specific habitat and resource issues.

Table 10 offers definitions of the coarse habitat types and Table 11 lists the estimated number of acres of each of those habitat types on County administered tax forfeit lands.

It must be noted that this analysis is based on the County's inventory database and not a field survey of habitats. However, the Minnesota County Biological Survey, conducted by the MDNR, has been completed for Crow Wing County. Besides locating specific sites of SGCN, the survey identified areas of Biodiversity Significance (labeled as: outstanding, high, medium, or below). These sites are mapped and are referenced by county staff when preparing area-wide and stand-specific management actions.

Table 10: Definitions of Generalized Habitats

Habitat Categories		Definitions (age or size: cover types)
Open Habitat Types	Lowland open	Lowland grass, brush, marsh or muskeg
	Upland grass opening	Upland grass
	Shrub-Sapling opening / Regeneration	Upland brush, cutover area, and all regeneration under age 11
Upland Forest: Deciduous Aspen-Birch	Young	11-40 years: aspen 11-50 years: birch
	Mature	41-60 years: aspen 51-80 years: birch
	Old	61+ years: aspen 81+ years: birch
Upland Forest: Deciduous [Northern Hardwood/Oak]	Young	11-60 years: northern hardwoods, oak
	Mature	61-120 years: northern hardwoods, oak
	Old	121+ years: northern hardwoods, oak
Upland Forest: Coniferous	Young	11-40 years: balsam fir 11-30 years: jack pine 11-70 years: red/white pine, white spruce, upland black spruce
	Mature	41-60 years: balsam fir 31-60 years: jack pine 71-120 years: red/white pine 71-100 years: white spruce, upland black spruce
	Old	61+ years: balsam fir, jack pine 121+ years: red/white pine 101+ years: white spruce, upland black spruce
Lowland Forest: Deciduous	Young	11-60 years: ash, lowland hardwood
	Mature	61-120 years: ash, lowland hardwood
	Old	121+ years: ash, lowland hardwood
Lowland Forest: Coniferous	Young	11-70 years: black spruce, tamarack, white cedar, stagnant black spruce/tam/white cedar
	Mature	71-100 years: black spruce, tamarack, stagnant black spruce/tam/white cedar 71-120 years: white cedar
	Old	101+ years: black spruce, tamarack, stagnant black spruce/tam/white cedar 121+ years: white cedar

Table 11: Distribution of Generalized Habitats on Crow Wing County Tax-forfeited Land, 2024

Habitat Categories		Acres*	Percent of Land
Open Habitat Types	Lowland open	23,226	22.3%
	Upland grass opening	256	0.2%
	Shrub-Sapling opening / Regeneration	38,242	36.7%
Upland Forest: Deciduous Aspen-Birch	Young	10,171	9.7%
	Mature	680	0.7%
	Old	515	0.5%
Upland Forest: Deciduous Northern Hardwood/Oak	Young	1,231	1.2%
	Mature	13,348	12.8%
	Old	47	>.1%
Upland Forest: Coniferous	Young	2690	2.6%
	Mature	620	0.6%
	Old	156	0.1%
Lowland Forest: Deciduous	Young	154	0.1%
	Mature	2,253	2.2%
	Old	468	0.4%
Lowland Forest: Coniferous	Young	1,559	1.5%
	Mature	1,545	1.5%
	Old	687	0.7%

*Not included is non-forest or non-vegetated land such as open water, developed, roads, etc.

Among the findings generated by the above table are:

- Nearly one-quarter of the land is in lowland open habitat, primarily marsh.
- Over one-third is Shrub/Sapling opening/regeneration, primarily young aspen
- The aspen-birch forest, the largest forested type, is nearly all young and regenerating habitat and given proposed management will remain so.
- The northern hardwoods/oak forest is primarily mature habitat; proposed management will see the northern hardwoods component shift into old habitat while oak will be primarily divided between young and mature.
- Upland conifer habitat reflects historic harvesting and regeneration on a small land base; proposed management will see a broader distribution over time.
- Lowland forest habitats are a small portion of the land base and because of uncertain marketability will not see consistent management; more of these areas will likely shift into more older habitats.

Chapter 4.0 Department Administration

This chapter presents a brief review of the legal and administrative aspect of managing Crow Wing County's tax forfeit lands. It is intended to provide an understanding of the institutional framework within which the County operates.

4.1 Department Organization

Tax forfeited land is land that has been forfeited to the State of Minnesota for non-payment of property taxes. This land is administered by the County as a statutory trust on behalf of the taxpayers, schools, and local governments of Crow Wing County. The primary source of legislative guidance is set forth in M.S. §282.

Since the adoption of the 2000 plan, the County has reorganized its administrative structure including the creation of the Land Services Department. This department houses all related land management activities of the county including environmental services, property valuation and classification, and public land management.

The Land Service Department is responsible for administration of roughly 104,000 acres of tax-forfeited land. Areas of activity include land base management (classification, sale, exchanges, easements, and leases), forest management (timber sales, reforestation, stand improvement), forest roads, recreational facilities and trails, and wildlife habitat improvement projects. The Environmental Services Supervisor is also the designated Land Commissioner. The County Board of Commissioners is the ultimate authority for land acquisition, disposal and management.

Figure 1. Crow Wing County Administrative Structure for the Administration of Public Lands



4.2 Revenue Generation

The Land Service Department management of tax-forfeit lands receives funding for its program from a variety of sources, but no local property taxes are used to operate the department. The department is essentially a financially independent enterprise operation. Management of the stable land base is the primary asset generating revenues for all activities. As shown in Table 12, the major source of revenue is from the sale of timber.

Table 12. Land Services Department Income and Tax Forfeit Apportionment, 2019-2023				
Year	Income			Tax Forfeit Apportionment*
	Timber Sales	Land Sales	Total	
2023	\$1,043,786	\$2,752,270	\$3,796,056	\$780,591
2022	\$822,320	\$1,789,041	\$2,611,361	\$1,052,635
2021	\$993,555	\$2,335,305	\$3,328,860	\$1,026,539
2020	\$1,018,755	\$1,821,782	\$2,840,537	\$1,085,465
2019	\$779,786	\$1,264,730	\$2,044,516	\$1,176,419

*“Tax forfeit apportionment” is the net funds remaining after expenses are deducted from annual revenues. Distribution of the settlement is determined by state law by which a portion can be retained by the department for reforestation activities and recreational facilities; the remainder is distributed to the County and local taxing jurisdictions. These funds are generated in one year and distributed in the next.

4.3 Multi-County Certification Cooperative

In 2005, Crow Wing joined Beltrami, Carlton, Clearwater, and Koochiching Counties in the process of working together to achieve third party certification of their forest management practices. Known as the Minnesota Counties Sustainable Forest Cooperative (MCSFC), the group has successfully attained certification by the Sustainable Forestry Initiative (SFI). The County received SFI certification in 2008. Clearwater County dropped its certification in 2014 while Carlton and Koochiching counties have maintained certification in the Forest Stewardship Council (FSC) in addition to SFI.

While the certifications are held by the counties as a group, each county land department is responsible for management of the tax-forfeited lands in its respective county. The counties feel that by working together they are increasing efficiencies, sharing best practices, and reducing costs.

The cooperating counties believe that certification is essential to the long-term economic sustainability of the forestry community in the region, ensures that forest management will be undertaken with due regard being taken of social and environmental issues, and that certain segments of the retail sector are demanding timber from certified sources and that this demand will only grow over time. More information on the MCSFC can be found at <https://forestmanagement.co.beltrami.mn.us/>.

4.4 Planning and Coordination

Crow Wing County is committed to planning and coordination to guide sound management of its tax-forfeited lands. The initial long range strategic plan was developed in 2000, updated in 2004, 2015 and updated again in 2025.

Annually, the Crow Wing County Natural Resources Advisory Committee reviews proposed harvest plans, as presented by the Land Services Department, and makes a recommendation to the Crow Wing County Board of Commissioners. Typically, the County Board approves the proposed plan as recommended by the Advisory Committee and presented by the Land Services Department. A public hearing is held to further provide review and comment from the general public. Upon receiving public comment, the County Board approves the final harvest plan.

The 5-Year Candidate Stand List is a planning action mid-way between the strategic plan and annual harvest plans. Prepared by the Land Services Department, the list identifies timber stands ready for thinning or harvest. The list is also a proactive approach by the County to inform neighboring landowners and other forest users of the county's forest management plans for the next five years.

The 5-Year Candidate Stand List has become an important planning tool that provides clear direction on which stands are evaluated for a potential harvest in the next five-year period and helps distribute timber harvesting geographically over County managed public lands. GIS and GPS technologies employed by County land managers have increased efficiency and greatly improved the work product.

The county participates in a number of regional processes intended to foster coordination. Among these efforts are the four-county management cooperative and multi-jurisdictional landscape level guidance processes.

In 1976 the County created the Lands and Forest Advisory Committee (now Natural Resources Advisory Committee) which is a mix of citizens, natural resource professionals, and others who advise the Land Services Department on the management of county forest lands. Among other things, the committee assisted in the preparation of the previous and current strategic plans.

4.5 Resource Data

Accurate forest inventory data provides the foundation for sustainable forest management decisions. The data is used for both strategic (long-term) and tactical (short-term) planning. The County has substantially increased its focus on the importance of accurate and reliable forest inventory in the past 15 years.

Further, the County has conducted regeneration surveys on all lands that have been planted, aerially seeded, direct seeded, or naturally regenerated. This is an ongoing practice for all harvested sites.

The County's data practices are guided by one of the procedures adopted by the MCSFC. The procedure, LD-PS2 Resource Data Management, is intended "to establish a process to ensure the integrity of inventory information used for resource management and project plans including data collection, traceability, quality assurance, and control." Specific components of the policy address: annual forest inventory prioritization, stand delineation, individual stand sampling procedures, data collection and entry, updating the forest cover inventory data layer, regeneration survey schedule, stocking standards for regenerating stands, and conducting regeneration surveys.

In general, the County has greatly upgraded its technological capacity to increase productivity and accuracy. This includes increased use of GIS and GPS enabled tools for inventory, timber cruising, regeneration surveys, and location of roads, gates, and other facilities.

4.6 Staff Capacity

Implementing the Forest Resource Management Plan requires an appropriate level of qualified field and office staff. It is the County's intent to maintain such staff capacity throughout the plan period. Currently, the County employs a Supervisor, two Foresters and three Technicians to complete forestry and recreation work on County Land.

4.7 Procedures

As part of its participation in the multi-county Sustainable Forestry Cooperative, through which Crow Wing County's lands receive third-party certification, the Land Services Department has adopted procedures addressing various aspects of its management. For the most part, these procedures are technical in nature.

Administration Policy

Regarding department administration it is the policy of the Crow Wing County Land Services Department:

1. The County will actively participate in the Minnesota Counties Sustainable Forest Management Cooperative to insure retention of its third-party certification.
2. Within the parameters set forth by this management plan the Land Services Department should optimize income opportunities for the County while minimizing costs.
3. Planning for the management of Crow Wing County's tax forfeited lands will occur on three levels: long-range (100-year outlook), short-range (5-10 year outlook), and annual.
4. Management plans for individual parks, trails and other special areas (e.g., wildlife management areas) may be prepared as deemed necessary.
5. Planning, management, and enforcement activities will be coordinated, as appropriate, with other entities including Federal, State and local governments, landowners, and interest groups.
6. The Natural Resources Advisory Committee will regularly advise the County Board on planning and management issues related to tax forfeited lands.
7. Public Participation: General
 - a. The general public will be actively encouraged to participate in the various planning processes for tax forfeited lands.
 - b. Information concerning tax forfeited lands shall be regularly disseminated to the general public through a variety of means.
 - c. The general public and certain legally specified entities will be notified of each year's proposed annual management program.
 - d. Prior to commencement of site activities, reasonable attempts will be made to notify abutting private landowners (i.e., taxpayer of record for such lands) of said activities.

Chapter 5.0 Management: Land Base Administration

5.1 Land Administration and Classification

State law (MS 282.01, Subd. 1) requires county boards to classify all tax-forfeited land as either conservation or non-conservation land. Conservation lands are to be retained for county management and non-conservation lands may be sold or transferred. As guided by statute, classification is to consider such issues as current use of adjacent lands, soil productivity, character of the forest or other growth, access to established roads, schools and public services, and the suitability of the forest resources for management by the county.

Further, the County may designate certain tax forfeited lands as Memorial Forest. Memorial Forest lands have an additional protection against sale in that the MnDNR commissioner must approve the withdrawal from memorial forest status and sale. Nearly 70% (71,442 acres) of Crow Wing's tax forfeited lands have Memorial Forest designation.

In accord with its adopted plans and policies, the County considers the following criteria when determining if a parcel should be acquired or retained.

Consolidation

1. Does the parcel consolidate public ownership (federal, state, county, local) particularly in areas where larger land blocks contribute to proper forest management, where watershed management concerns are especially vital, or where recreational opportunities can be enhanced?
2. Does the parcel adjoin existing Tax Forfeit lands? If so, on how many sides?

Access

1. Does the parcel have physical, legal access?
2. What is the accessibility of this land to established roads, schools, and other public services?
3. Does the parcel obtain forest management or recreation access to larger blocks of land (summer access and access to landlocked parcels being most desirable)?
4. Is the access on a paved road, gravel road or dirt road?
5. Present/ Future Use

What is the present use of adjacent lands?

1. Does the parcel have a peculiar suitability or desirability for particular uses?
2. Does the parcel encourage and foster a mode of land utilization that will facilitate the economical and adequate provision of transportation, roads, water supply, drainage, sanitation, education, and recreation?
3. Does/Can the land facilitate a reduction of governmental expenditures?
4. Does the parcel foster and develop agriculture and other industries in the districts and places best suited to them?
5. Is the tax forfeit parcel better suited for development? (ie. adjacent to transportation and/or utility infrastructure or other development considerations.)
6. Is the parcel better off in other ownership (Federal, State, City, Township Private)?

Natural Resource Management

1. What is the productivity of the soil?
2. What is the character of forest or other growth?
3. Does the parcel conserve and develop the natural resources?
4. Does the parcel serve to protect environmentally sensitive tracts from potential development and subsequent degradation of natural and/or cultural resources?
5. Does the parcel have potential gravel sources?
6. Are there any significant cultural historical features located on the parcel?

Forest Management

1. Is the parcel suitable forest resource, multiple use or sustained yield management?
2. Does the parcel increase timber productivity (acres of upland/commercial forest land)?
3. Does the parcel have mature timber? What is the timber value?
4. Does the parcel reduce the amount of property line to maintain?

Recreation Management

1. Does the parcel provide and/or enhance an important recreational need (lake access, existing trails or future recreation)?

As noted earlier, the county's land base has been relatively stable but with a net gain of roughly 6,500 acres since 2000 due to several unique events. Usually, there are just small amounts of land being newly forfeited and equally small amounts being sold or transferred. Most tax forfeiture activity occurs on platted parcels within urban areas.

The County's general objective is to retain lands that support management objectives. Where possible, land exchanges are conducted to improve the capacity of the land base to sustain desired management; this is primarily accomplished by consolidating County holdings into larger tracts. However, the County continues to sell land when and as appropriate. As noted, most land sales involve platted parcels, although the County considers selling larger tracts, especially those that are isolated from other County or public holdings, inaccessible, or do not contribute to management objectives. Under state law, the sale of tax-forfeited lands must be approved by the MnDNR commissioner. Parcels that forfeited before 2016 may be sold at public oral auction and for not less than the appraised value, unless the County Board adopts a resolution providing for their sale on terms. In accord with state law, the county may sell land to adjacent landowners under specific conditions and by County Board resolution.

In 2024, the Minnesota Legislature revised MN Statute 282 as it pertains to how tax forfeited lands (forfeited in 2016 or later) are managed by the County. The County is no longer able to retain and manage new forfeitures as they must sell them within 6 months. The County also no longer retains funds from the sale of forfeited property that could be used to help offset the costs of clean-up and sale.

The State of Minnesota holds the deed to tax-forfeited lands and owns the mineral rights on county administered lands.

Many parcels in the County's land base include those in which the tax forfeited portion is an undivided partial interest shared with one or more other owners. Undivided interest ownership tends to prevent active resource management of the parcel and, in fact, the County does not include such lands in its resource database. The County's objective is to eliminate the number of undivided interest parcels by either acquiring the interest in those parcels where the County is the majority owner or selling interest in those in which it is not.

The County is responsible for managing all tax forfeited lands many of which are small, developed parcels in platted or urban areas. These parcels can consume considerable County resources to keep them maintained and secure; they also may hold other issues such as liability. The County's policy is to dispose of these parcels back into private ownership or to the pertinent municipality for redevelopment.

Land Administration and Classification Policy

1. Promote no net loss of the amount of land within the tax forfeited land base except in accord with the policies of this plan.
2. Acquisition of land may be considered if it achieves a County management purpose such as to consolidate County land holdings, obtain access to a larger blocks of land, or to further the management objectives of a management unit and/or specific property.
3. In accord with Minnesota Statute 282, the County will evaluate its tax forfeited land base to determine lands that should be classified as conservation or non-conservation. In making the classification, the County shall consider:
 - a. Present use of adjacent lands.
 - b. Productivity of the soil.
 - c. Character of forest or other growth.
 - d. Accessibility of lands to established roads, schools, and other public services.
 - e. Their peculiar suitability or desirability for particular uses.
 - f. Suitability of the forest resources on the land for multiple use and sustained yield management.

The classification, furthermore, must

- a. Encourage and foster a mode of land utilization that will facilitate the economical and adequate provision of transportation, roads, water supply, drainage, sanitation, education and recreation.
- b. Facilitate reduction of governmental expenditures.
- c. Conserve and develop the natural resources.
- d. Foster and encourage agriculture and other industries in the districts and places best suited to them.
4. The following types of property may be considered for sale unless there are sound management reasons for retaining them:
 - a. Shoreland property which does not exceed 150 feet on protected water which is not needed for public access and is not needed for the protection of other resource values.
 - b. City lots and platted property.
 - c. Small oddly sized or shaped parcels.
 - d. New forfeitures after 2016 due to changes of MN Statute 282
 - e. Acreage between 40-80 acres in size with no access or not part of the county's consolidated land base.
 - f. Larger sized tracts that are isolated and landlocked.
5. Partial Interest Ownership
 - a. Where tax forfeited ownership is the majority partial owner and acquisition of the private, fractional undivided interest would serve to complement the long-term management goals and objectives of the tax forfeited land base, the County should seek to obtain the private fractional interest through purchase, land exchange, donation, or court ordered partition for division action.
 - b. All other undivided tax forfeited interests should be disposed of by means of sale at public auction or traded.

6. All tax forfeited lands suited for ongoing natural resource production and all lands within the Upper Mississippi River Corridor are to be granted additional protection by being assigned official status as Memorial Forest.
7. Support efforts to remonument property to reduce survey costs and increase accuracy of property line location.

5.2 Land Exchange

The County has the authority to exchange county administered tax-forfeit land for private land. Land exchanges are a tool to consolidate existing holding of tax forfeited lands, provide access to landlocked public lands, protect sensitive areas from potential development and acquire tracts for recreational purposes.

Land Exchange Criteria and Policy

1. Improve access to county managed land (summer access and access to landlocked parcel being most desirable)
2. Increase timber productivity (acres of upland/commercial forest land)
3. Reduce the amount of property line
4. Consolidates ownership of county managed land
5. Provide and/or enhance an important recreational need
6. Serves to protect environmentally sensitive tracts from potential development and subsequent degradation of natural and/or cultural resources.
7. Resolve cumbersome ownership situations such as undivided interest ownership.
8. Provide both public and private benefits.
9. Acreage given by the County should be approximately equal to or less than the acreage to be acquired by the County. Exceptions to this rule must be reviewed with the Natural Resources Advisory Committee.
10. Proposed land exchanges not meeting any of the above guidelines must be reviewed with the Natural Resource Advisory Committee.

Land exchange proposals that result in one of the following will not be considered:

1. Fragment blocks of existing county ownership
2. Reduce the acreage of productive forest land

5.3 Gravel Resource

The detailed soil survey provides the basis for evaluating potential aggregate (gravel and sand) resources on County administered tax forfeited lands. Aggregate is a potentially valuable resource for the County. Leases for extractive operations including gravel mining or those that involve a structure shall conform to the applicable standards of Crow Wing County land use control (zoning) ordinances.

5.4 Land Leases and Easements

Leases

Tax-forfeited land may be leased under the authority of the county auditor via the land commissioner upon County Board approval to individuals, corporations, or units of government. Leases may be granted for any number of uses including recreation, agriculture, gravel and sand removal, and other temporary uses. There are several hay and pasture leases.

Easements

The County may grant utility easements and roadway easement to public entities. Easements may be granted by the County to individuals for ingress/egress purposes if there are no reasonable alternatives to obtain access to an individual's property and exercising the easement will not cause significant adverse environmental or natural resource management impacts.

In general, the County prefers to provide easements only as a last resort method to secure access to someone else's property. Further, the County seeks to avoid granting easements that require the filling or alteration of wetlands. Finally, the County does not want to grant a conditional easement for the purpose of providing access to platted land; permanent legal access must be secured by the private parties in these situations.

Land Lease and Easement Policy

1. Tax forfeited lands may be leased to individuals, corporations, or organized subdivisions of the state for temporary uses such as agriculture, except for pasture, gravel mining, and structures provided that such leases are consistent with the management objectives of the appropriate management unit and that reasonable terms are attached to the lease including, but not limited to, use of market value rates, lease duration is reasonable and specific, and a reclamation plan is specified. Leases for extractive operations including gravel mining or those that involve a structure shall conform to the applicable standards of Crow Wing County land use control (zoning) ordinances. Lease requests will be subjected to review by the County Attorney to verify they are in accordance with M.S. 282.04, Subd 1.
2. Consistent with the County's tax forfeited land trust obligations, the price of all land leases shall be based upon market values.
3. Easements:
 - a. Easements may be granted to a private individual for ingress/egress purposes if there are no reasonable alternatives to obtain access to an individual's property, and, if exercising the easement will not cause significant adverse environmental or natural resource management impacts.
 - b. Requests for ingress/egress easements will be reviewed considering potential public use conflicts, other reasonable alternative access routes, environmental impacts and natural resource management impacts.
 - c. If an individual or other entity requesting an easement across tax forfeited land has property that will provide access to presently landlocked tax forfeited land, a reciprocal easement must be considered.
 - d. Any delinquent property taxes on any and all property in Crow Wing County owned by the requesting party must be paid in full prior to consideration of an easement request.

5.5 Special Use Deeds

Since the 1940s the Minnesota Department of Revenue (DOR) has issued special use deeds to local government units (LGU) conveying State Tax Forfeited land free of charge for roads, trails, public dump grounds, landfills, parks, fire halls, and other authorized public uses. A 2010 state law change has placed an expiration date on issued special use deeds. The first expiration date was effective January 1, 2015 for special use deeds older than 30 years.

Property conveyed to an LGU under a special use deed must be used for the authorized public use or the property shall automatically return to tax-forfeit status. Property conveyed to an LGU under a special use deed set to expire and used for the authorized public use will result automatically in the LGU holding title to the property in fee simple.

The 2010 legislation defined authorized public uses as:

1. A road, or right-of-way for a road;
2. A park that is both available to, and accessible by, the public that contains amenities such as campgrounds, playgrounds, athletic fields, trails or shelters;
3. Trails for walking, biking, snowmobiling, or other recreational purposes along with a reasonable amount of surrounding land;
4. Transit facilities for buses, light rail, commuter rail or passenger rail;
5. Public beaches or boat launches;
6. Civic recreation or conference facilities;
7. Public services facilities such as fire halls, police station, lift stations, water towers sanitation and water treatment facilities and administrative offices.

Crow Wing County has issued 99 special use deeds. Of these, 61 affecting 199 parcels expired on January 1, 2015.

Special Use Deed Policy

The county has not issued a special use deed since 2007 and encourages LGUs to purchase the parcels at their market value.

5.6 Recreational Cabins and Hunting Stands

Since the adoption of the initial forest management plan in 2000 the County has acted on two fronts regarding recreational structures. First, the remaining handful of “hunting shack” leases were terminated and such leases are no longer issued. Second, the County enacted an ordinance regulating the use of hunting stands on county managed public lands. Key features of the ordinance, which became effective in 2005, include:

- No person may construct, occupy or use any hunting stand on county managed public lands except portable tree stands or portable free-standing stands.
- Permanently constructed or non-portable stands of any type are not allowed.

Recreational Use Policy – Hunting and Trapping

1. In accordance with county ordinance, all permanent hunting stands are prohibited on County managed public lands.
2. The cutting or felling of live trees or removing branches greater than 1 inch in diameter from live trees for the purpose of installing a portable tree stand or for shooting lanes is considered timber trespass and is prohibited.

5.7 Cooperative Activities

Mississippi River Corridor

Crow Wing and seven other counties are members of the Mississippi River Headwaters Board (MHB), a cooperative entity designed to oversee the proper management of private and public land along the river corridor. Of particular relevance to this management plan is the MHB's desire to have public lands retained within the corridor.

Mississippi River Corridor Policy

1. Lands within the Mississippi Headwaters corridor will be managed in accordance with the approved Mississippi Headwaters plan and ordinance adopted by Crow Wing County as per Minnesota statutes. Among the activities covered by the plan and ordinance with potential impact on the management of tax forfeit lands are: public roads, land uses, shoreland alterations and forestry, extractive uses, and public land ownership.

Treaties and Cooperative Efforts

Approximately 15,000 acres of County administered tax forfeited land lying in southern Crow Wing County are within territory covered by the 1837 Treaty between the United States and what is now the Mille Lacs Band of Chippewa. This treaty granted tribal members the right to hunt and gather within the lands ceded by the tribe. There have not been any significant issues regarding the use of forest lands including the gathering of wood or plants.

The County cooperates extensively with the Minnesota DNR regarding management of three state forests within the county. In addition, the County cooperates with private forest owners regarding access and management activities. The potential for enhanced cooperation always exists and will be explored by the County.

The County also cooperates with MnDNR regarding four State Wildlife Management Areas (WMA). The two entities have signed agreements by which certain County lands adjacent to the WMAs are managed by the State for WMA purposes.

The Minnesota legislature enacted the Sustainable Forestry Incentive Act (SFIA) in 2002 at which time it also repealed the Tree Growth Tax program. The SFIA provides payments to qualifying landowners who adopt and implement forest management plans on their property. While the County has no direct role in implementing SFIA, the County actively encourages private property owners to consider enrolling in the program as a way to foster broader application of sound forest management practices across the landscape.

Chapter 6.0 Management: Recreation Facilities and Trails

Crow Wing County's Tax Forfeit lands are distributed throughout the county and reflect its location at an ecological transition zone within Minnesota. In this region, the overall forested land area is relatively low, the quality of agricultural land is good, and the demand for private land ownership has remained consistent over the years. The diverse demands for multiple uses on public lands increase management pressures on the county-managed lands, which represent the vast majority of public land in Crow Wing County. Tax Forfeit land is managed in a way such that the land provides recreational uses such as parks, water access, trails, camping, and hunting, while also conserving scenery, natural features, wildlife, and historical values.

6.1 Recreation Facilities and Trails System²¹

Recreational use of county-administered tax forfeit lands enhances the County's quality of life and contributes to its economic vitality. One way the County helps meet recreational needs is by maintaining a diverse landscape that provides opportunities for dispersed recreational uses such as hunting, hiking, and wildlife observation. In terms of developed facilities, the County's emphasis is on designated managed trails but it also operates a number of boat accesses and six parks. Developed facilities and trails are shown on Map 12 and listed in the following narrative. In recent years, Crow Wing County has worked to provide recreation marketing and promotion activities such as enhanced website services, trail maps, traditional advertising, and diverse public and private partnerships to further enhance opportunities for recreation trail enjoyment.

²¹ Section adapted from: Crow Wing County Recreational Use Plan, Adopted February 2022

Table 13. Summer Use Non-Motorized Trails

Trail	Type	Length (miles)
Al-Pine Trail	Hunter / Hiker	3.3
Big Island Trail	Hunter / Hiker	1.5
Blueberry Bog Trail	Hunter / Hiker	5.2
Cranberry Bog Trail	Hunter / Hiker	2.1
Mississippi Shores Trail	Hunter / Hiker	1.4
North Wolf Lake Hiking Trail	Hunter / Hiker	1.8
Pine Ridge Trail	Hunter / Hiker	2.7
Poor Farm Trail	Hunter / Hiker	2.2
Portage Lake Trail	Hunter / Hiker	0.4
Rice Lake Trail	Hunter / Hiker	1.7
Rock Creek Trail	Hunter / Hiker	1.3
Scrub Oak Trail	Hunter / Hiker	5.9
Thompson Creek Trail	Hunter / Hiker	1.2
White Pine Trail	Hunter / Hiker	2.7
Cuyuna Connection	Mountain Bike	3.3
Crusers Kettle	Mountain Bike	7.3
Fire Tower Trail	Park Trail	3.2
Milford Trails	Park Trail	2.5
South Long Trails	Park Trail	0.1
Little Emily Lake Park Trail	Park Trail	3.3
Rollie Johnson Natural and Rec Area Trails	Park Trail	1.4
Rush Lake Island Trails	Park Trail	0
Total		54.5

Map 12. Crow Wing County Recreational Access

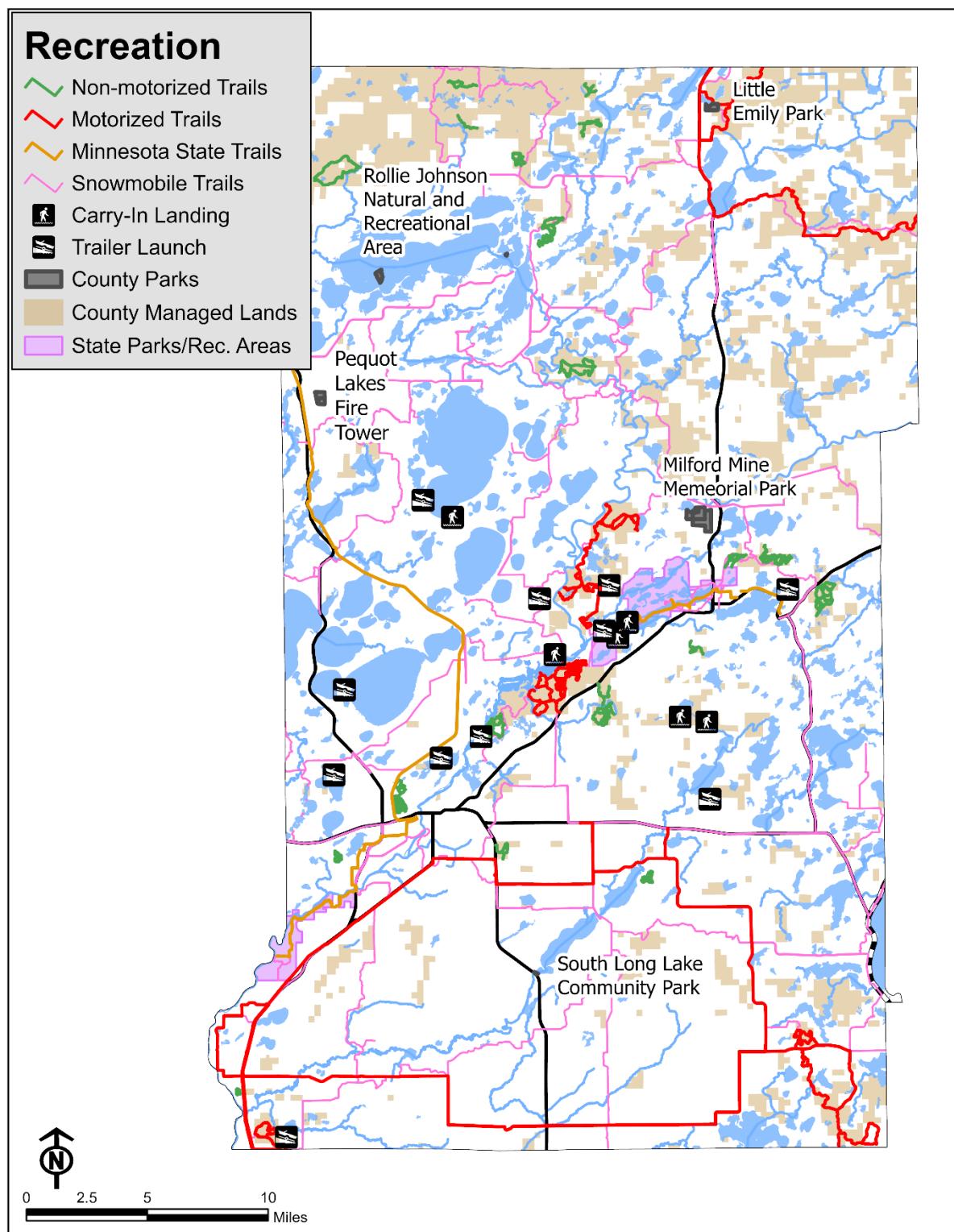


Table 14. Winter Use Non-Motorized Trails

Trail	Type	Length (miles)
Forest View	Cross Country Skiing	2.9
French Rapids Trail	Cross Country Skiing	5.9
Larson Lake Trail	Cross Country Skiing	7.2
Nordic Ridge Trail	Cross Country Skiing	13.7
Northland Arboretum Trails	Cross Country Skiing	7.5
Wolf Lake Trail	Cross Country Skiing	5.6
Total		42.8

Table 15. Summer Use Motorized Trails

Trail	Type	Length (miles)
CWC Southern Loop Trail	OHV	79
Emily to Blind Lake	OHV	15.4
Emily to Outing Trail	OHV	31
Fort Ripley Trails	OHV	14
Miller Black Bear Area Trail	OHV	32
Miller Hills Trail	OHM	13.9
Mississippi River Northwoods Trail	OHV	11.7
Total		197

Table 16. Winter Use Motorized Trails

Trail	Length (miles)
Baxter Snowmobile Club	68
Bay Lake Sno-Packers	Non-Grooming club
Brainerd Snodeos Snowmobile Club	112
Emily/Outing Snowbirds Snowmobile Club	82
Fort Ripley North Country Trail Busters	66
Garrison Commercial Club	111
Gull Lake Drifters	137
Ideal Sno Pros Snowmobile Club	108
Merrifield Marathons Snowmobile Club	55
Pequot Brush Pilots	Non-Grooming Club
Ponto Knight Riders – Sponsored by Cass County	4
Sno-Serpents, Inc.	94
Total	837

Table 17. Water Trails	
Trail	Length* (miles)
Mississippi River Brainerd (French Rapids-SW Baxter)	14
Mississippi River Central (Pine River–French Rapids)	18
Mississippi River East (Aitkin Co. – Pine River)	17
Mississippi River South (SW Baxter – Ft. Ripley)	13
Pine River Canoe Route (Crosslake to Ms. River)	20
Portage Lake (Mississippi River to Mahnomen Lake)	5
Total	87

*Distances for water trails are approximate

Table 18. Public Water Access Sites	
Access	Facilities
Black Lake	Concrete ramps, dock
Butternut Lake	Primitive access, small boat/canoe
Fawn Lake	Boat launch, limited parking
French Rapids (Mississippi River)	Concrete ramp
Gilbert Lake	Concrete ramp, dock
Jones Bay (Pelican Lake)	Two concrete ramps, handicap accessible toilet, dock
Little Rabbit Lake & Rowe Mine Pit	Concrete ramps, pit toilet, dock, limited parking
Loon Lake	Primitive access, small boat/canoe, limited parking
Red Sand Lake	Concrete ramp, dock, limited parking
Sebie Lake	Concrete ramp, dock
Section Six Mine Pit	Boat launch
South Long Lake	Two docks, picnic tables, grills, toilet
South Pelican Lake	Primitive access for small boat/canoe/kayak
Sorenson Point (Mississippi River)	Primitive access, carry-in
Wolf Lake Access	Limited parking

The following **parks** are managed by the Crow Wing County Land Services Department:

- Milford Mine Memorial Park
- South Long Lake Community Park
- Paul M Thiede Fire Tower Park
- Little Emily Park
- Rollie Johnson Natural and Recreational Area (Big Island Park)
- Rush Lake Island Park

6.2 Recreational Use Plan

As discussed in Chapter 2, the county has adopted a Recreational Use Plan that addresses the management of water accesses, recreational trails and maintenance of county parks on the lands managed by the Crow Wing County Land Services Department. This plan includes components that are related to the overall system of management and planning for recreation trails, parks, and public water accesses. As well as the diverse types of recreation trails managed by the county, including existing trails and new trail proposals. In addition, the Recreational Use Plan also describes the trail proposal and planning process, including potential trail linkages and trail development suitability criteria. These important elements foster collaboration between the county, partner organizations, residents, and other stakeholders for the development and maintenance of recreational trails.

Recreational Facilities and Trails Policy

Regarding recreation uses on tax-forfeited land it is the policy of the Crow Wing County Land Services Department:

1. The Crow Wing County “Recreational Use Plan”, prepared February 2022, as it may be amended from time to time, is incorporated into this plan.
2. Tax forfeited lands will be made available for various forms of recreational activities across a continuum of use intensity as follows:
 - a. Park: A relatively small area in which recreation is the primary use and forest management is used for park enhancement and/or education. Multiple recreational opportunities may exist within a concentrated area. Most likely, a park will be highly facility oriented with a corresponding high level of management and maintenance activities. The types of uses likely to occur in a designated park include boat accesses, picnicking, play areas, and support functions (e.g., parking, toilets, shelters).
 - b. Dispersed Recreation: Unless otherwise designated or posted, tax forfeited lands will be available for dispersed forms of recreation. Dispersed recreation is defined as those activities which do not require developed infrastructure such as trails, parking areas, toilets, buildings, play equipment, improved campsites, and the like. Examples of dispersed recreation include hiking, hunting, bird watching, snowshoeing, berry gathering, and the like. Dispersed recreation expressly does NOT include off-travel with motorized vehicles except as may be explicitly allowed elsewhere in this plan.
3. Overnight camping shall only be allowed in posted, designated areas within County Parks. No camping is allowed within parks or within 300 feet of a public water access. Primitive camping on County-administered tax forfeit land is allowed under the following guidelines: camps cannot be used for more than 14 consecutive days; person wishing to camp more than 14 days must relocate their camp onto a site more than a mile distant from the first camp; camps cannot be established within a one (1) mile of any public campground or site; campers must remove all trash and debris from the site; live trees may not be felled for making a camp, accessing a camp, or for use as firewood; no camping is allowed in a wildlife management area that is under cooperative management agreement between the County and State, or in any other area designated no camping by the County.
4. Efforts will be made to develop ongoing partnerships with public and private interest regarding the planning, development and maintenance of designated Parks and Recreation trail systems where appropriate.

Chapter 7.0 Management: Forest Roads

Road System

Crow Wing County has a network of roads and trails that serve the needs of forest management and recreation. The type and level of use and maintenance is defined as follows:

- Designated
A Recreation Trail or Forest Road that is identified by the County for a specific use. This is accomplished through one or more of the following ways:
 - County Board approved Project Plan.
 - State approved Grant-in-Aid trail.
 - County issued permit or resolution.
 - Long-term use and promotion of a trail for a specific purpose.
- Managed
Any Recreation Trail or Forest Road that has all of the following characteristics:
 - Formal, systematic maintenance.
 - Consistent system of signage and maps.
 - Promoted and marketed as such by Crow Wing County (i.e., website, literature).

There are three types of roads and trails managed by the County:

- Forest Road:
These are roads built for the primary purpose of supporting long-term forest management activities.
 - They are constructed as all-weather roads capable of handling heavy trucks except during spring and unusually wet weather.
 - They are Designated and Managed. Parts or all of Forest Roads may also be dual-classified as Recreation Trails.
- Forest Trail:
 - These are trails built for the primary purpose of supporting short-term or irregularly scheduled forest management activities.
 - They are constructed to be capable of handling machinery (e.g., skidders, trucks, etc.) except during spring and unusually wet weather.
 - Trails created by the public through passive recreation use are considered Forest Trails.
 - Forest Trails are neither Designated nor Managed.
 - Forest Trails shall not be rehabilitated following significant disturbances (e.g., windfall to timber harvest operations) unless it is for public safety or environmental best management practices.
 - Forest Trails are not dual-classified as Forest Roads or Recreation Trails.
- Recreation Trails:
 - These are trails built for the primary purpose of supporting long-term recreational uses and the level of construction will depend upon the intended use.

- Recreation Trails will be rehabilitated following significant disturbance to a previous condition commensurate with the primary Designated recreation use unless otherwise stated in a trail project plan or permit.
- Recreation Trails may be dual-classified as Forest Roads.

The use of Forest Roads, Forest Trails and Recreation Trails may be restricted on a permanent or temporary basis. Restricted roads and trails will be appropriately signed and restricted as necessary. Use limitations are guided by the following:

- Temporary:
Closed to specific uses during specified period of time. For example, use restrictions may occur due to:
 - Timber harvesting (logging) operations
 - Special events or races by permit
 - Spring thaw
 - Specific hunting seasons
 - Designated and Managed snowmobile trails during winter
- Permanent:
Closed year-round to specific uses. Examples include:
 - Prohibiting heavy vehicles from a seasonal (i.e., winter only) Forest Road or Recreation Trail
 - Prohibiting motorized vehicles from a system of Designated and Managed non-motorized recreation trails.
 - Skid trails created specifically for the temporary purpose of timber harvests.

There is some concern with “trail creep” where users of off-highway vehicles create or use unauthorized trails for recreation purposes, particularly old skid trails that had been specifically created for the temporary purpose of timber harvests. This can be particularly of concern in areas where there is limited or no system(s) of recreation trails.

Table 19 lists the 37.1 miles of Forest Roads that have been formally approved by the Crow Wing County Board of Commissioners for designation and use. The County will participate in ongoing coordinated planning processes with parties interested in development, designation, and use of forest roads and trails.

Table 19. Crow Wing County Forest Roads

Road Name	Number	Township/City	Miles
Lily Pad	1	Crosslake	1.8
Dutcher	2	Crosslake	1.9
Buckskin	3	Crosslake/Fifty Lakes	2.9
Wolf Lake	4	Irondale	1.1
Mud Lake	6	Rabbit Lake	0.3
Mille Lake	7	Wolford	5.2
Horseshoe Lake	8	Bay Lake	0.4
Stewart Lake	9	Timothy	3.8
Ramsey	10	Timothy	1.3
Van Sickle	11	Emily	2.1
Refuge	12	Fairfield	3.1
Little Thompson Lake	13	Ross L./2nd Assessment	1.4
Browns Lake	14	Ross Lake	2.0
Bass Lake	15	Ross Lake	5.1
Mine Lake	17	Crow Wing	2.2
Mississippi River	19	Irondale	2.6
Total			37.1

Forest Road Policy

1. All roads and trails on tax forfeited lands will be listed, classified, and mapped on an updated basis as the foundation for management and enforcement.
2. Proposed road development is to be coordinated between the County and affected property owners to maximize safety, minimize conflicts, and encourage cooperative development and use.
3. All forest roads and trails on County administered tax forfeited lands are considered open to use by snowmobiles, ATVs, and other motorized vehicles unless expressly posted closed to those uses.
4. Off trail motorized travel across County administered tax forfeited lands is prohibited except to travel to and from a hunting stand one week prior to and during the big game hunting season, to retrieve downed big game during hunting season pursuant to State regulations, or except in winter when the ground is frozen and there is snow cover; these exceptions only apply to Off-Highway Vehicles classified as Class I All-Terrain Vehicles (ATVs) in Minnesota statutes. These exceptions do not apply on County administered lands designated as non-motorized areas except for permitted travel by disabled persons. Under no circumstances may motorized vehicles use designated non-motorized trails.
5. The creation of unauthorized trails on County administered tax forfeited lands is prohibited.
6. Roads and trails may be gated and/or signed, as necessary, to ensure desired use of an area, to protect natural resources, or to otherwise achieve a specified management purpose in the area.
7. The County may, on a case-by-case basis, permit disabled persons to use appropriate motorized vehicles to access County administered tax forfeited lands, including those otherwise designated as non-motorized, for individual, specific, and temporary uses such as hunting.

Chapter 8.0 Management: Habitat

Crow Wing County has long considered wildlife habitat in its forest management strategy. While game species have received special attention, general habitat concerns are part of forest management. Recent innovations, such as ecological classification and the ability to define and map native plant communities are increasing the capacity to undertake enhanced habitat management.

8.1 Species of Concern

The County employs a variety of tools to integrate habitat objectives into forest management activities. Land Services Staff use the state's Natural Heritage Info System as the primary tool for identifying where "Species of greatest conservation need" (SGCN) are or may be located on County-managed lands. Staff also use direct field observations or input from other land managers.

In addition, the Minnesota County Biological Survey, conducted by the Mn DNR, has been completed for Crow Wing County. Besides locating specific sites of SGCN, the survey identified areas of Biodiversity Significance (labeled as: outstanding, high, medium, or below). These sites are mapped and are referenced by county staff when preparing area-wide and stand-specific management actions.

8.2 Biodiversity Management Strategy

Crow Wing County, as part of its multi-county third-party certification program, follows procedure (LD-PS5) regarding Stand and Landscape – Biodiversity Management strategies. The purpose of that procedure is to:

- Define the landscape which include land department managed lands;
- Set general objectives which promote diversity across the forested landscape at stand and landscape levels;
- Maintain and improve wildlife habitat as an integral part of a comprehensive land management program on land department managed lands; and
- Foster greater understanding of the biophysical and social influences which affect the various landscape components.

In Procedure LD-PS5, the county defined landscape management as "an attempt to maintain forest structures within the landscape as the forest changes over time." It notes that while managing forests at the site level is necessary for operational practicality, "managing solely at the site level without attention to larger scale influences may fail to maintain the multiple ecological, social, and environmental values society expects from its forests over time." The procedure notes that "understanding this balance will promote conservation and ensure availability of these resources through time with a certain regulation of need which does not allow exploitation."

The procedure sets forth two levels of strategy:

Strategy for Scattered Ownership

- Apply voluntary site level guidelines to site level activities.
- Incorporate stand level elements into project plans to preserve and promote wildlife and wildlife habitat.
- Landscape species objectives.
- Protect sites with special attributes.
- Monitor performance.
- Participation in landscape programs and initiatives.

Strategy for Contiguous Ownership

- Include all strategies for scattered ownership.
- Knowledge of landscape-based management objectives.
- Precautionary approach.

That last strategy is critically important. As stated in the county's procedure, the precautionary approach is: "While knowledge is the foundation of solid landscape management methodologies, the Land Services Department recognizes that it cannot postpone action until all the data and information is in place. There will always be a need for more and better information to act upon. Our actions will be based on experience and the most reliable and complete information available at the time a decision is made and actions are implemented. Therefore, the Land Services Department will take affirmative steps to ensure that forested landscape, species, and genetic diversity are maintained by ensuring sufficient amounts of native habitats are present on Land Services Department Managed Lands."

Coarse filter / fine filter approach

Crow Wing County has adopted a policy of a dual level *coarse filter / fine filter* approach to habitat. The coarse filter aspect is achieved by striving to ensure that all major habitats are represented on the landscape; the underlying premise is that if the habitats exist, they will be capable of supporting the various species and biotic communities that depend upon them. The fine filter level is undertaken through direct management for individual species when such action is required or desired.

8.3 Focused Management for Habitat

The county specially manages portions of its land base for wildlife habitat. Generally, this management is done for game species and is undertaken in conjunction with hunter walking trail areas. In addition, the county incorporates site-specific actions at the stand level to enhance habitat. The following are the habitat elements that may be incorporated into project plans.

- Timing of activity, where timing is beneficial to wildlife;
- Physical spacing of activities, where spacing is beneficial to wildlife;
- Timber reserves within or adjacent to the project area not less than 5% of the area;
- Reserve trees left at the rate of 6-12 trees per acre;
- Food sources reserved;
- Den trees reserved;
- Riparian zones identified with filter strips used;
- Eagle, osprey, heron, goshawk nests buffered;
- Coarse woody debris reserved, at least 4 leave logs per acre;
- Management on extended rotation
- Establishment of long-lived conifers near streams to provide shade and in-stream structure;
- Retention of 60 basal area within riparian zone for trout streams;
- Re-vegetation of roads and landings to provide forest openings;
- Management of vegetative mixtures to propagate/encourage threatened or endangered species, where such management is documented in the project plan;
- Projects which enhance known populations of threatened or endangered species;
- Other elements which specifically benefit wildlife; and
- Projects designed specifically to enhance wildlife habitat.

Habitat Management Policy

1. Manage for wildlife resources and values in close coordination with the MnDNR Wildlife and Nongame specialists.
2. The County may execute agreements with the MnDNR to allow selected County administered tax forfeited lands to be cooperatively managed as State Wildlife Management Areas (WMA) and to be managed according to the standards, policies, and practices of the pertinent Wildlife Management Area. Lands so designated shall remain in tax forfeited status with timber management responsibilities retained by the County and with any revenues generated by these lands accruing to the County. The following Wildlife Management Areas are under cooperative management agreements:
 - Poor Farm WMA
 - Duck Lake WMA
 - Hesitation WMA
 - Round-Rice Bed WMA

Chapter 9.0 Management: Landscape Perspective

9.1 North Central Landscape Plan

As described in Chapter 2.5 the Minnesota Forest Resources Council (MFRC) created its Landscape Program to help implement state forestry policies at the landscape level. Crow Wing County is within the North Central Landscape Region that also includes Itasca, Aitkin, Cass, Becker, Clearwater, Hubbard, Mahnomen, east half of Polk and south half of Beltrami counties. The North Central Landscape Plan²³, which is not binding on Crow Wing County, offers overarching guidance within which the County can exercise its management activities. In particular it helps promote coordinated management with other regional land managers.

A key aspect of the plan is a description of the desired future condition of the regional landscape. These statements provide overarching direction for forest management within which individual land managers such as Crow Wing County can establish its strategic and tactical objectives. As stated in the regional plan the management the North Central landscape will consider the following goals:

Goal 1: Enhance the ability of the forest ecosystems in the region to adapt and respond to current and future threats by fostering ecosystem resilience, resistance, and adaptability.

Goal 2: Maintain or increase the area of forest land in the North Central Landscape.

Goal 3: Retain contiguous blocks of forest land.

Goal 4: Protect and prevent the loss of sensitive and undeveloped lake and river shorelines. Restore natural characteristics to developed shorelines. Manage stream ecosystems to maintain and protect their dimension, pattern, and profile to minimize erosion and support aquatic biota.

9.2 Land Type Associations as Management Units

Crow Wing County's tax forfeit land base is divided into Management Units in order to better articulate management objectives and actions on a geographic basis. Management Unit boundaries are based on Land Type Associations. The nine units are:

1. Spring Brook Till Plain (Spring Brook Till Plain, Mildred Sand Plain and Itasca Moraine)
2. Outing Moraine
3. Aitkin Moraine
4. Palisade Lake Plain
5. Crow Wing Sand Plain (Crow Wing Sand Plain, St. Croix Moraine, Pillager Sand Plain, and Mississippi Sand Plain)
6. Riverton Moraine
7. Nokay Sand Plain
8. Mille Lacs Moraine
9. Brainerd Drumlins Plain

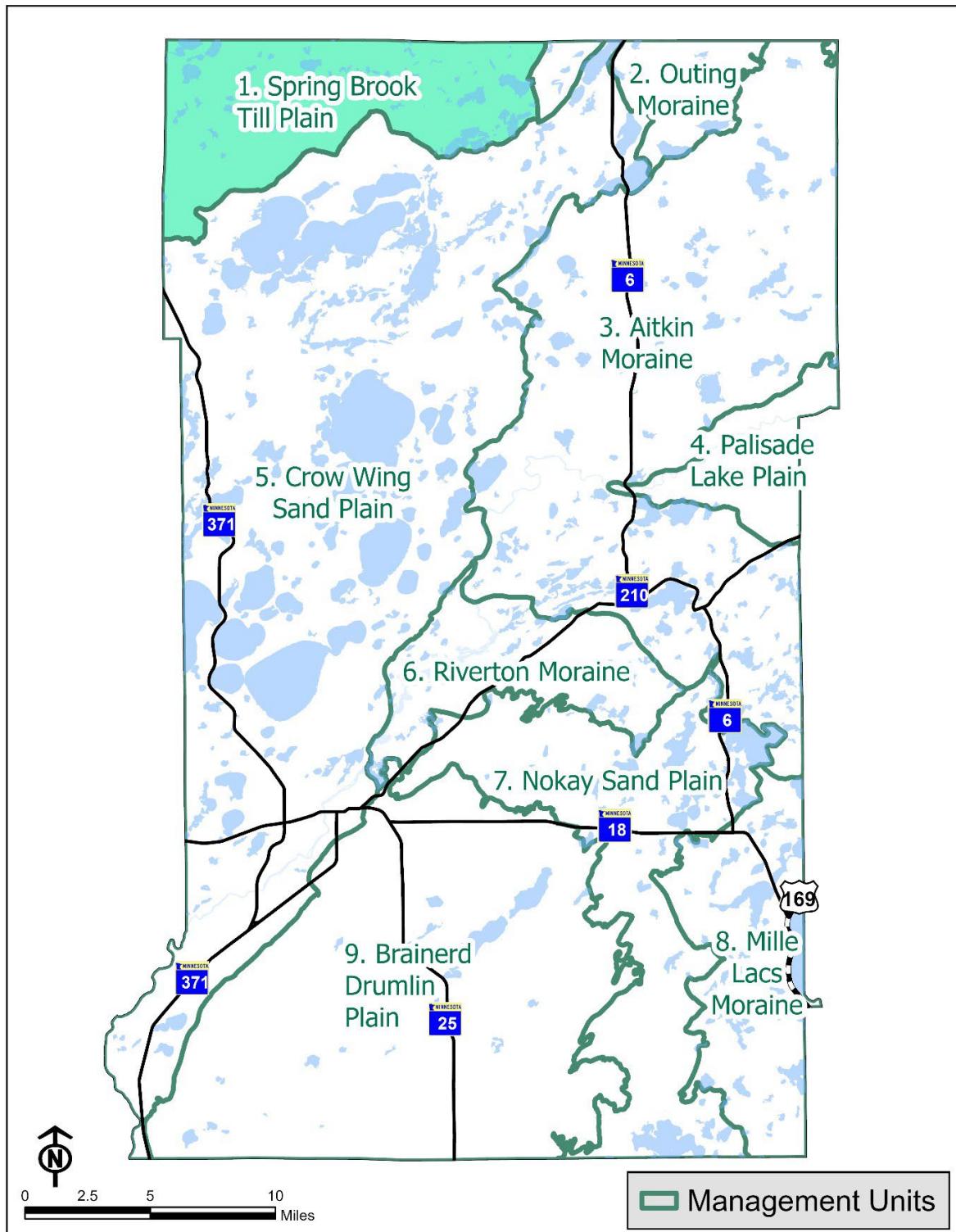
²³ North Central Landscape Forest Resource Management Plan, Minnesota Forest Resources Council, adopted September 20, 2017

On the subsequent pages each management unit is described along with their land administration and resource management objectives and basic management strategies.

Table 20. Management Unit Ownership Summary

Management Unit Ownership Summary		
Management Unit	Management Unit Total Acreage	Percent of Unit Tax Forfeit Land
1. Spring Brook Till Plain	46,933	54.4%
2. Outing Moraine	16,465	47.3%
3. Aitkin Moraine	152,873	23.0%
4. Palisade Lake Plain	16,507	11.3%
5. Crow Wing Sand Plain	236,257	3.3%
6. Riverton Moraine	30,563	22.2%
7. Nokay Sand Plain	67,504	9.0%
8. Mille Lacs Moraine	39,289	18.8%
9. Brainerd Drumlin Plain	133,405	4.2%

Management Unit #1 Spring Brook Till Plain



Management Unit #1 Spring Brook Till Plain

Description: Unit comprises three LTAS – Spring Brook Till Plain (most of tax forfeit land is here), Mildred Sand Plain (only 356 tax forfeit acres) and Itasca Moraine (no acres). Spring Brook LTA is primarily a rolling till plain; Mildred LTA is steeper with sandy loam, sand, and gravel soils; Itasca LTA has irregularly shaped slopes with closed pockets and complex soils. Nearly two-thirds (64.0%) is MHC26 Central Dry-Mesic Oak-Aspen Forest NPC. County tax forfeit lands cover over half (54.4%) of the MU. This MU contains 24.5% of county's tax forfeit land base most of which is found in large contiguous tracts. These lands possess 27.7% of the upland forest on tax forfeit lands within the county.

Cover Type	Tax Forfeit Acres	Percent
Aspen	16,043	62.9%
Oak	1,160	4.5%
Birch	403	1.6%
Other Forested	1,181	4.6%
Lowland/Marsh/Wetland	4,510	17.7%
Upland Grass/Brush	34	0.1%
Water/Other	2,190	8.6%
Total Acreage	25,521	100%

Current Conditions

Land Assets

- Unit represents largest contiguous block of county managed forest land within Crow Wing County.

Forest Resource

- Dominant to aspen and contains the most aspen in the county.

Recreation

- Largest concentration of designated non-motorized hunter/hiker trails in the county.
- Many designated snowmobile trails exist due to seasonally wet and marginal upland ground conditions.
- Popular area for big game and grouse hunting.

Strategies and Actions

Land Assets

- Retain existing large blocks of contiguous public land.
- Seek opportunities to strategically acquire permanent access rights from the west in Gail Lake Township for active management of forestlands.

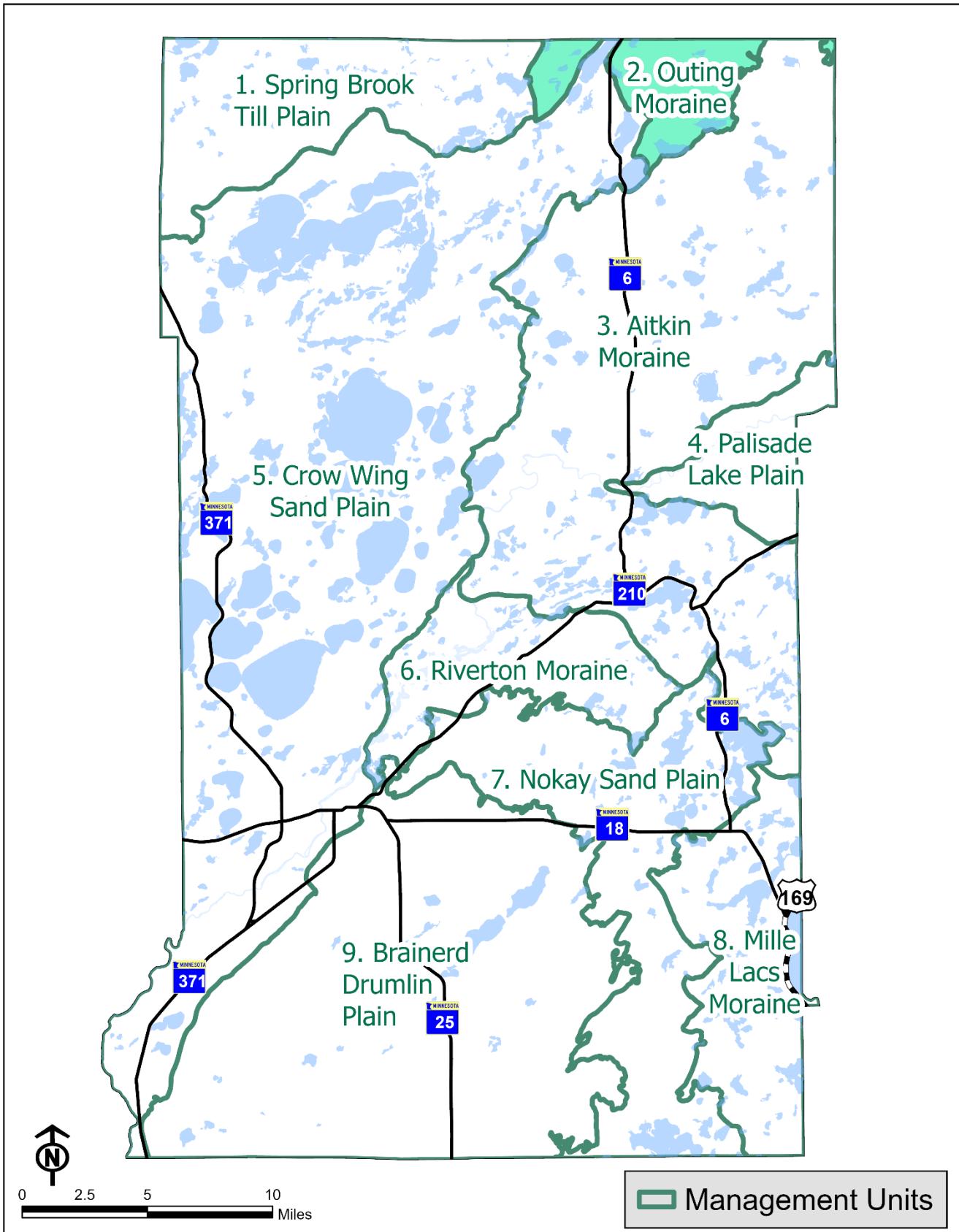
Forest Resource

- Perpetuate oak forest communities on appropriate NPCs using selective harvesting and advanced regeneration techniques.
- Timber harvests will be primarily done in frozen conditions due to dominant soil types.

Recreation

- Provide suitable recreation opportunities given soil and ground conditions.
- Inventory trails in this unit to assess extent of forest trail availability and use by hunters and recreation users.

Management Unit #2: Outing Moraine



Management Unit #2: Outing Moraine

Description: Unit is dominated by rolling till plain and steep end moraines. Parent soil material is stony sandy loam. The Two plant communities that make up 2/3 of this unit's NPCs are the MHc26 Central Dry-Mesic Oak-Aspen Forest (33.4%) and MHn35 Mesic Hardwood Forest (33.5%). County tax forfeit land is nearly half of the unit; county ownership is mainly in contiguous blocks. This small unit contains 7.5% of all tax forfeit land and represents 7.9% of tax forfeit upland forested land.

The dominant (64.7%) native plant community is MHC26 Central Dry-Mesic Oak-Aspen Forest.

Cover Type	Tax Forfeit Acres	Percent
Aspen	4,182	53.7%
Northern Hardwoods	506	6.5%
Oak	422	5.4%
Other Forested	942	12.1%
Lowland/Marsh/Wetland	1,430	18.4%
Upland Grass/Brush	10	0.1%
Water/Other	294	3.8%
Total Acreage	7,787	100.0%

Current conditions

Land Assets

- Large, contiguous block of County managed public forest land.

Forest Resource

- Young aspen and mature oak forest communities dominate. Northern hardwoods also present.
- Lacks young conifer dominated forests such as balsam fir, white pine, and red pine.

Recreation

- Emily to Outing designated ATV trail and designated snowmobile trails travel through this rolling, hummocky topography.

Strategies and Actions

Land Assets

- Continue to seek opportunities to further consolidate public land.

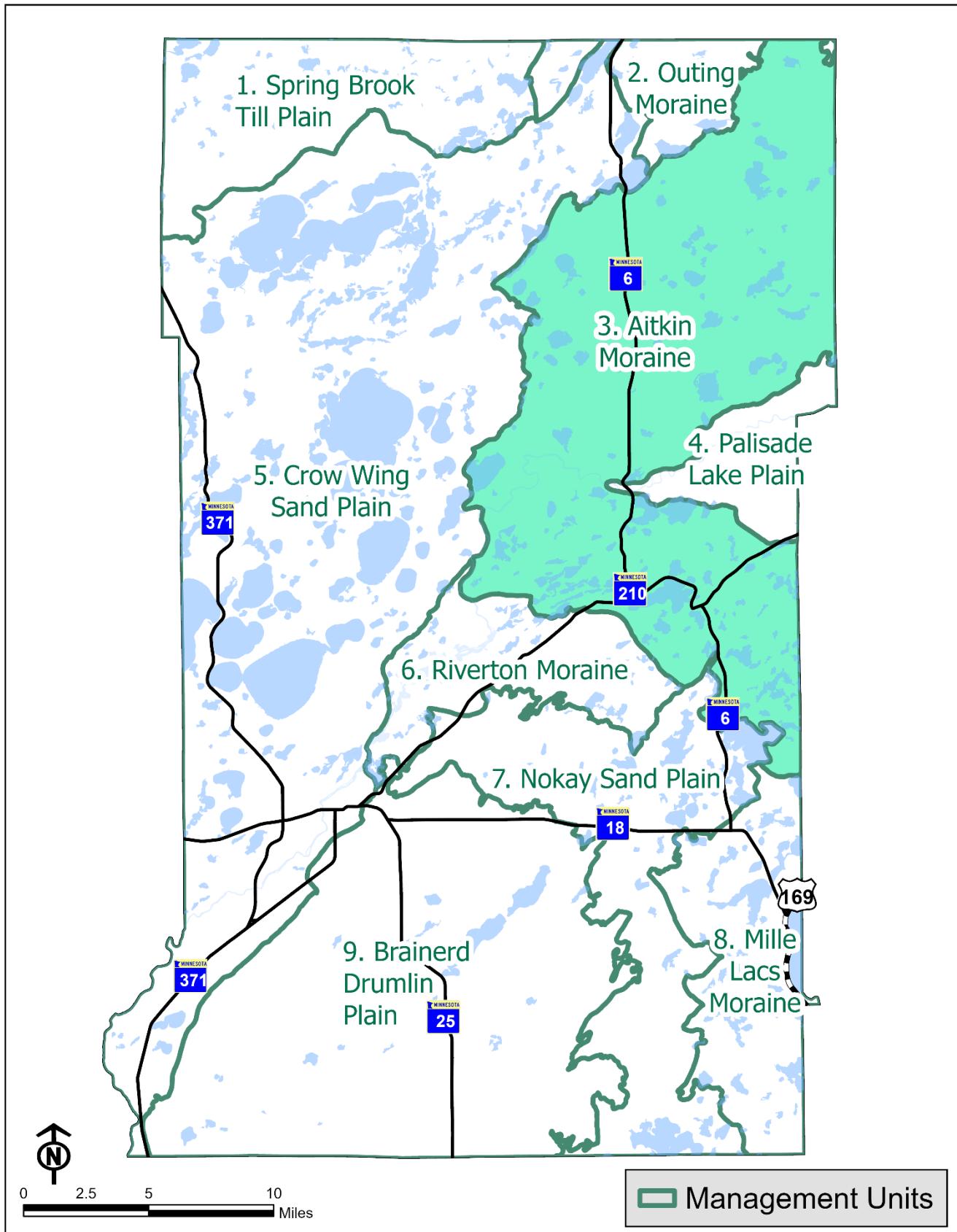
Forest Resource

- Manage good to excellent sites of oak and northern hardwoods to older age classes. Manage aspen for a sustained, balanced resource.
- Enhance the presence of ecologically appropriate conifers.

Recreation

- Provide diverse recreation opportunities to people of all ages and abilities while protecting the natural resource.

Management Unit #3: Aitkin Moraine



Management Unit #3: Aitkin Moraine

Description: The Unit's landscape is dominated by rolling to steep end moraine with an area of rolling outwash is present at the "elbow" in Crow Wing County. Soil parent material is clayey and sandy till with some silty lake sediments in areas. Not quite one-quarter of unit is tax forfeited land; one third (33.8%) of county's tax forfeit land is in this unit. Plant communities on county land are mixed: 25.4% MHn35 (Mesic Hardwood Forest), 22.6% WF (Very Wet Ash Swamp), 11.4% Mhc26 (Dry-Mesic Oak-Aspen Forest) and 8.9% Fdc24 (Rich Dry Pine Woodland). Unit contains 30.7% of tax forfeit land's upland forest and has the largest acreage of lowland conifers on tax forfeited land. It also has the most oak of county tax forfeit lands at 37% of the county's total oak resource.

Cover Type	Tax Forfeit Acres	Percent
Aspen	12,655	36.0%
Oak	4,434	12.6%
Northern Hardwoods	2,155	6.1%
Black Spruce Lowland	1,566	4.5%
Other Forested	4,867	13.8%
Lowland/Marsh/Wetland	7,074	20.1%
Upland Grass/Brush	164	0.5%
Water/Other	2,248	6.4%
Total Acreage	35,163	100%

Current conditions

Land Assets

- Large, contiguous block of county managed public forestland

Forest Resource

- Much of the County's quality oak and northern hardwood forests are in this unit.

Recreation

- This unit contains many designated trail systems, including most of the Cuyuna Country State Recreation Area, including ATV, mountain biking, and cross-country skiing.

Strategies and Actions

Land Assets

- Continue to seek opportunities to further consolidate public and undivided interest lands.

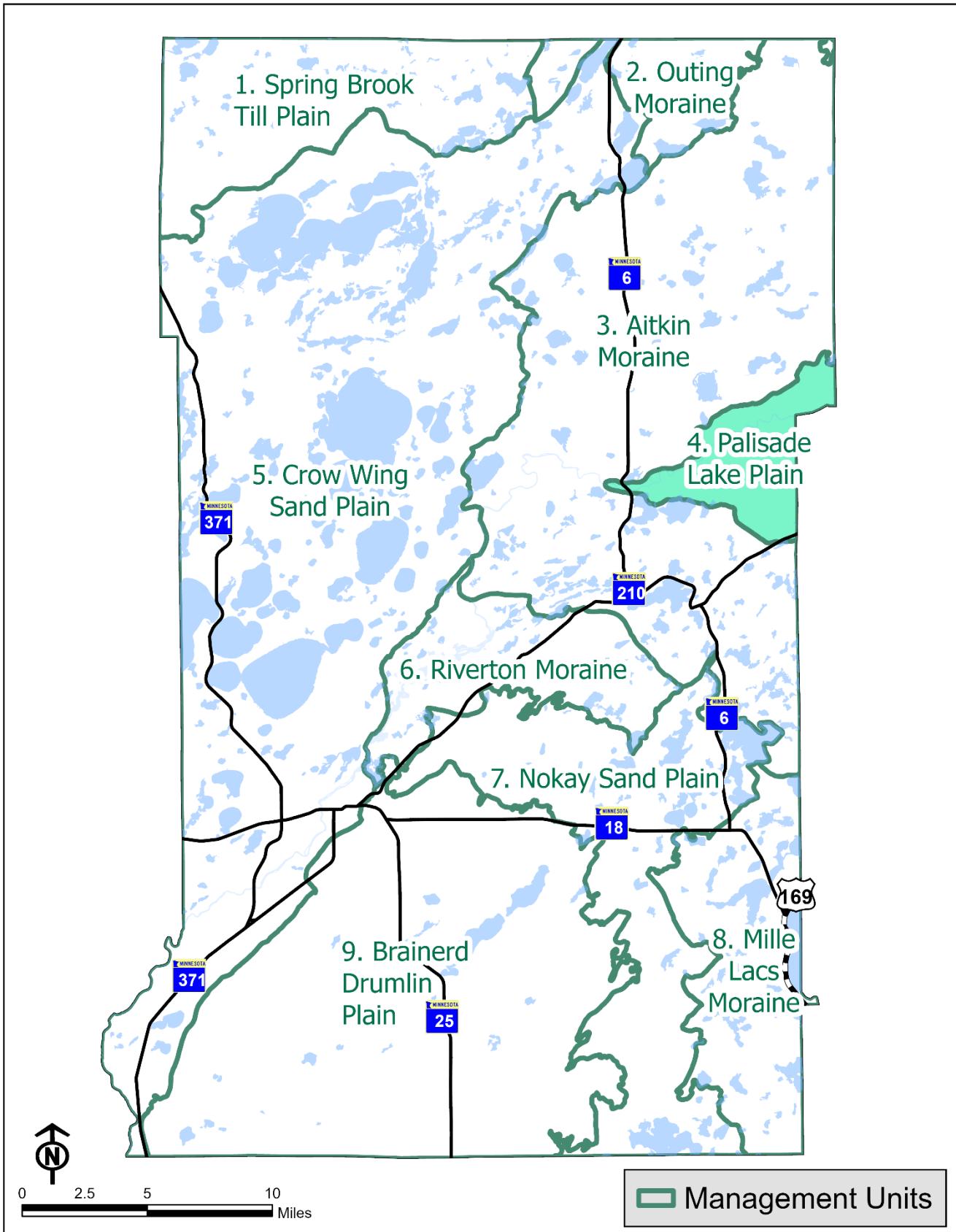
Forest Resource

- Continue to sustain and actively manage the oak and northern hardwood forest communities for quality hardwoods and older forest characteristics. As oak forests reach maturity, implement sound oak regeneration strategies to perpetuate this forest type.
- Avoid spring and early summer harvests to prevent damage to reserve species in oak management areas.

Recreation

- Sustain and promote this unit's world-class designated, managed trail systems as a vital County asset.

Management Unit #4: Palisade Lake Plain



Management Unit #4: Palisade Lake Plain

Description: Unit is a nearly level landscape formed by shallow glacial lake deposits; peatlands are common. Correspondingly, almost half (48.7%) of the tax forfeit lands are WF (Northern Very Wet Ash Swamp); 36.1% is upland on FDc24 (Central Rich Dry Pine Woodland). Unit has the smallest amount of tax forfeited ownership with just 1.8% of all county land and only 1.1% of tax forfeited land upland forest. Over half of county land is lowland, marsh or water.

Cover Type	Tax Forfeit Acres	Percent
Aspen	725	38.7%
Lowland Hardwoods	45	2.4%
Oak	28	1.5%
Other Forested	60	3.2%
Lowland/Marsh/Wetland	983	52.5%
Upland Grass/Brush	12	0.7%
Water/Other	19	1.0%
Total Acreage	1,873	100%

Current conditions

Land Assets

- Highly fragmented County ownership patterns.

Forest Resource

- Largest concentration of lowland forests and marsh among all management units in Crow Wing County.
- Critical wetland/lowland areas for water quality and wildlife habitat.

Recreation

- Designated snowmobile trail runs through the center of this management unit.

Strategies and Actions

Land Assets

- Seek opportunities to consolidate public ownership.

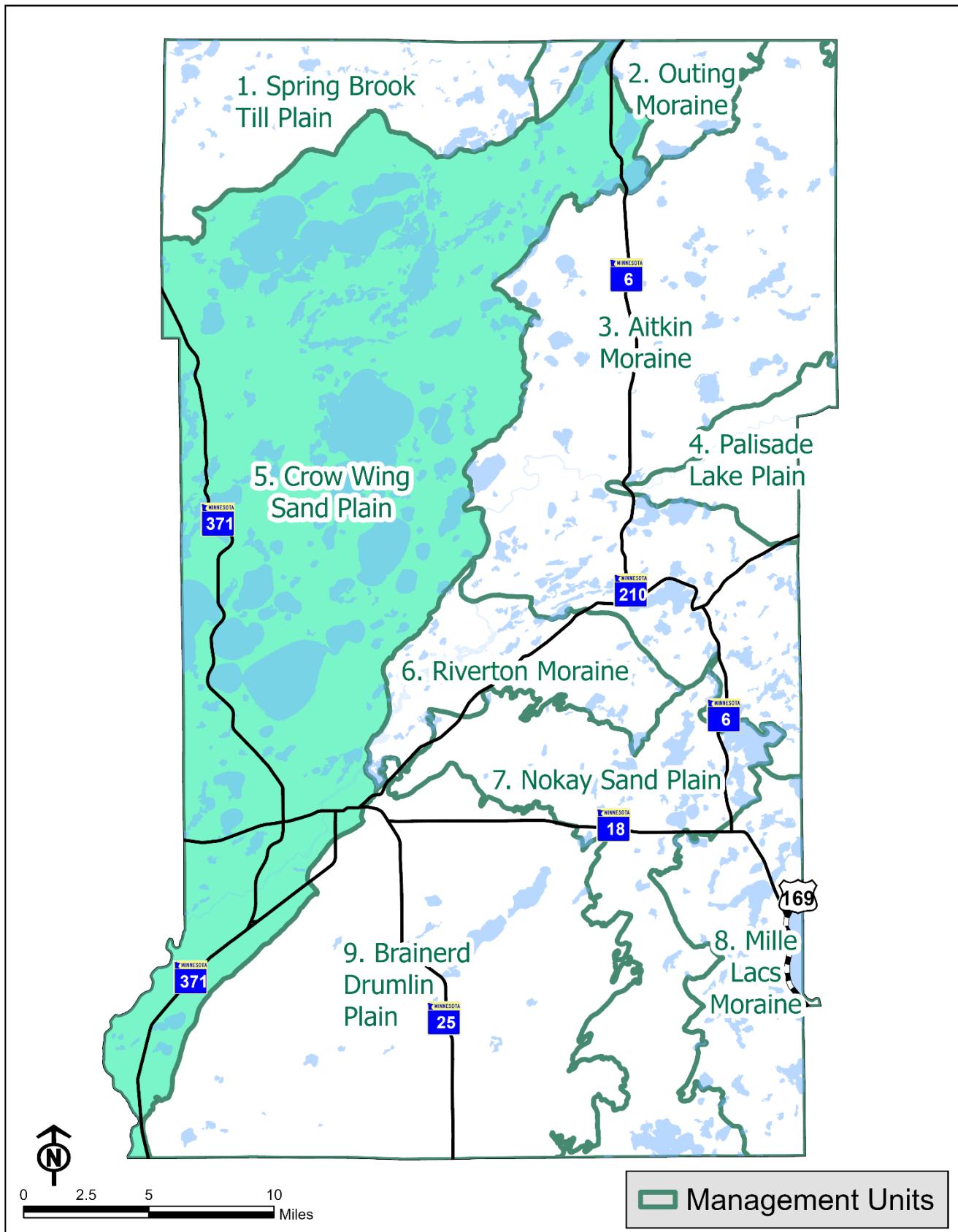
Forest Resource

- Maintain existing forest component.
- Consider sharptail grouse habitat improvement project by partnering with an agency or organization.

Recreation

- Continue to manage for diverse recreation opportunities for people of all ages and abilities, while protecting the natural resources.

Management Unit #5: Crow Wing Sand Plain



Management Unit #5: Crow Wing Sand Plain

Description: Unit is comprised of four LTAs: Crow Wing Sand Plain, St. Croix Moraine, Pillager Sand Plain, Mississippi Sand Plain. Generally rolling landscape with soil parent material being sandy loam or sand. MHC26 (Central Dry-Mesic Oak-Aspen Forest) is dominant plant community (36.1%) with two fire dependent types (FDc24 Central Rich Dry Pine Woodland and FDc34 Central Dry-Mesic Pine-Hardwood Forest) covering 12.4% and 23.5%, respectively. Over two-thirds of the tax forfeit land is upland forest but this is just 7.4% of all tax forfeit upland forest in the county. Ownership is in scattered small tracts.

Cover Type	Tax Forfeit Acres	Percent
Aspen	2,877	37.2%
Red Pine	775	10.0%
Oak	689	8.9%
Other Forested	1,222	15.8%
Lowland/Marsh/Wetland	1,661	21.5%
Upland Grass/Brush	29	0.4%
Water/Other	477	6.2%
Total Acreage	7,730	100%

Current conditions

Land Assets

- Highly fragmented ownership patterns make large-scale active forest management activities and public access difficult.
- Largest percentage of tax-forfeited non-conservation properties occur in this management unit.

Forest Resource

- Primarily fire-dependent forest communities that support pine species. Largest percentage of conifer tree species planting occurs in this unit.
- Due to the fractional nature and adjacency of public lands to private ownerships and resorts, visual qualities are most important in this management unit.
- Where active forest management occurs, retaining or increasing water quality is of utmost importance.
- Deer browse is a major concern especially as it impacts regeneration of desired tree species.

Recreation

- Primarily water-based consisting of leisure boating and fishing (winter and summer). Largest concentration of public accesses managed by Crow Wing County.

Strategies and Actions

Land Assets

- Strategically market and divest small blocks of non-contiguous lands that have limited public access rights or marginal upland timber value.

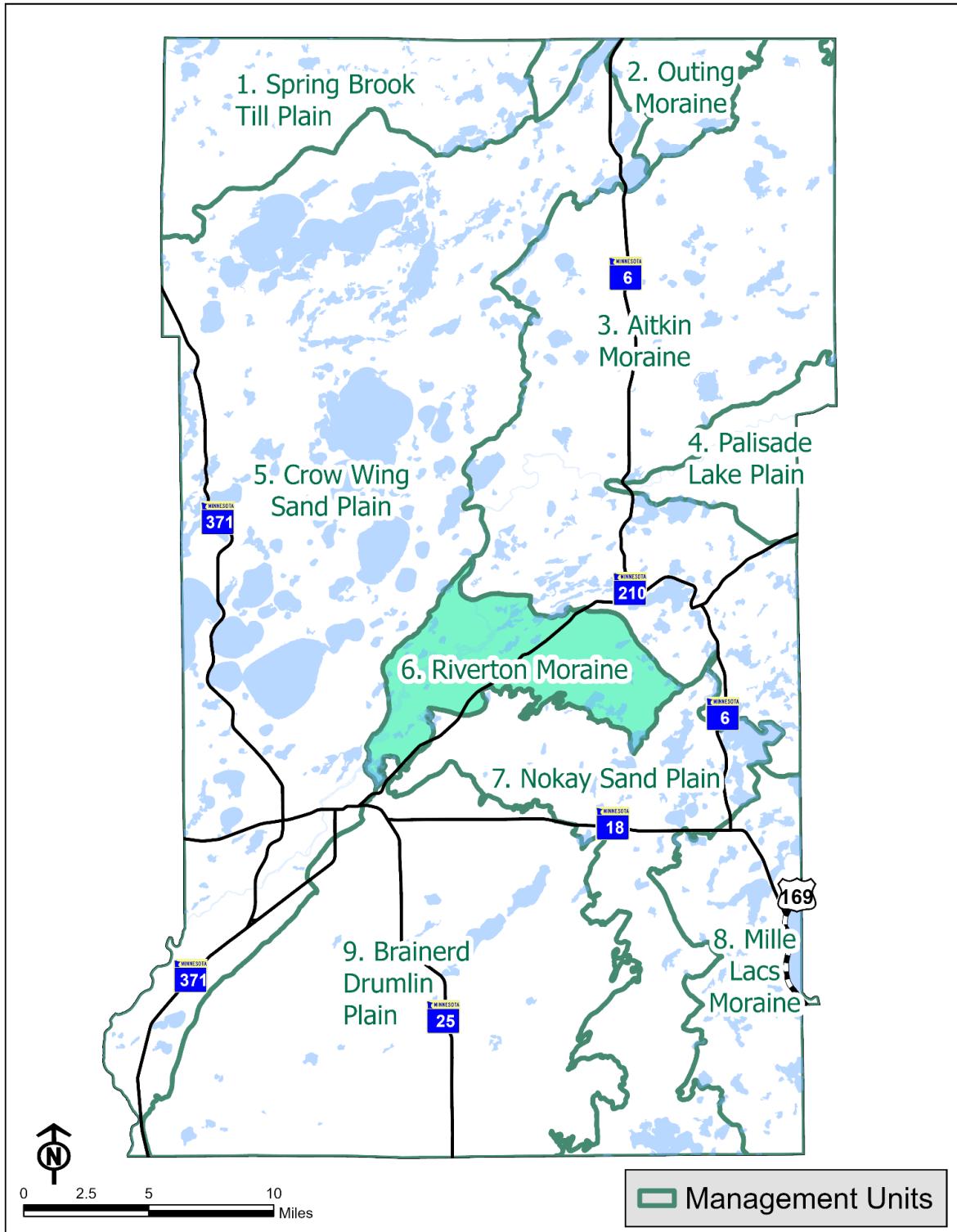
Forest Resource

- In fire dependent forest communities, re-establish or convert cover types to coniferous species that are favorable for quality and competitiveness.
- In areas where deer browse has been high, avoid artificial plantings that sustain heavy losses. These include areas within wildlife management areas and/or non-motorized trail systems.
- Continue to seek non-winter harvest seasons for conifer regeneration soil exposure and economic advantages.

Recreation

- Continue to manage public accesses and maintain/increase water quality by implementing best management practices. Seek recreation opportunities that do not require long corridors of travel, such as cross-country skiing, hiking, and snowshoeing.

Management Unit #6: Riverton Moraine



Management Unit #6: Riverton Moraine

Description: Unit is rolling to steep end moraine whose soil parent material is mixture of sand and sandy loam. Nearly one-quarter of the unit is county owned. One-third (32.8%), of county ownership is MHC26 Central Dry-Mesic Oak-Aspen Forest and another third is covered by two fire dependent types—FDc24 Central Rich Dry Pine Woodland (14.0%) and FDc34 Central Dry-Mesic Pine-Hardwood Forest (18.3%). Two thirds of county ownership is upland forest (64.3%) while one third is lowland, marsh, and water or other type.

Cover Type	Tax Forfeited Acres	Percent
Aspen	3,019	44.5%
Oak	539	8.0%
Red Pine	499	7.4%
Other Forested	467	6.9%
Lowland/Marsh/Wetland	1,496	22.1%
Upland Grass/Brush	21	0.3%
Water/Other	742	10.9%
Total Acreage	6,784	100%

Current conditions

Land Assets

- Large amounts of undivided interest ownership.

Forest Resource

- Other than dominant aspen forest communities, this management unit consists of highly diverse forest community types which are typical of these unsorted soils

Recreation

- Rolling and hummocky topography and well-drained soils with a mixture of large blocks of contiguous State – DNR and County managed public ownership patterns makes this management highly sought after for diverse recreation activities on designated trails. Parts of the Cuyuna Country State Recreation Area lie within this unit.

Strategies and Actions

Land Assets

- Seek full-interest County ownership in large, contiguous acres of undivided interest parcels.

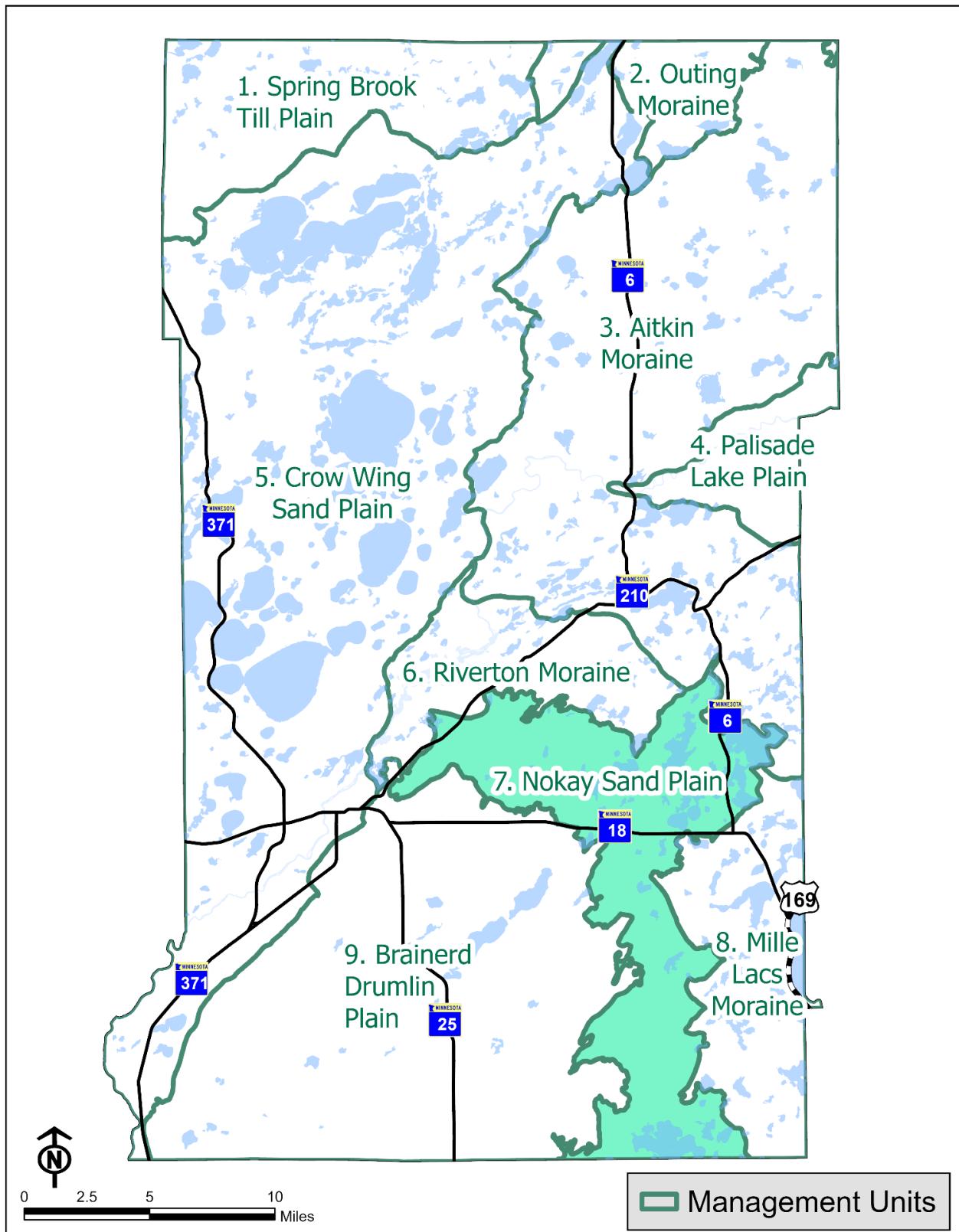
Forest Resource

- Manage the resource according to the most ecologically appropriate forest community types.

Recreation

- Continue to seek opportunities to provide diverse recreation activities for people of all ages and abilities in this attractive recreation area.

Management Unit #7: Nokay Sand Plain



Management Unit #7: Nokay Sand Plain

Description: This unit is a nearly level outwash plain where soil parent material is sandy and peatlands are common. County tax forfeit land is less than a tenth of the unit and represents just 5.9% of the tax forfeit land base. Less than half (45.4%) of tax forfeit land is upland forest; just over a fifth (21.5%) of ownership is in MHC36 Central Mesic Hardwood Forest. Wet plant communities dominate county ownership – 27.2% is WM Northern Wet Meadow/Carr and 25.8% is WF Northern Wet Ash Swamp.

Cover Type	Tax Forfeit Acres	Percent
Aspen	1,559	25.6%
Oak	476	7.8%
Red Pine	255	4.2%
Other Forested	786	12.9%
Lowland/Marsh/Wetland	2,843	46.6%
Upland Grass/Brush	11	0.2%
Water/Other	171	2.8%
Total Acreage	6,101	100%

Current conditions

Land Assets

- Highly fragmented ownership patterns make large-scale active forest management activities and public access difficult.

Forest Resource

- Conifer plantings from 20-plus years ago are an important part of the landscape in terms of having ecologically appropriate species on the landscape in this unit.

Recreation

- Includes the Wolf Lake Trail, a popular cross-country ski trail managed by the County. Most recreation opportunities are primarily passive in nature, including forest trails used by hunters.

Strategies and Actions

Land Assets

- Seek opportunities to secure permanent access rights to strategic County managed parcels that are currently land-locked.
- For non-strategic parcels, divest parcels or seek land exchanges.

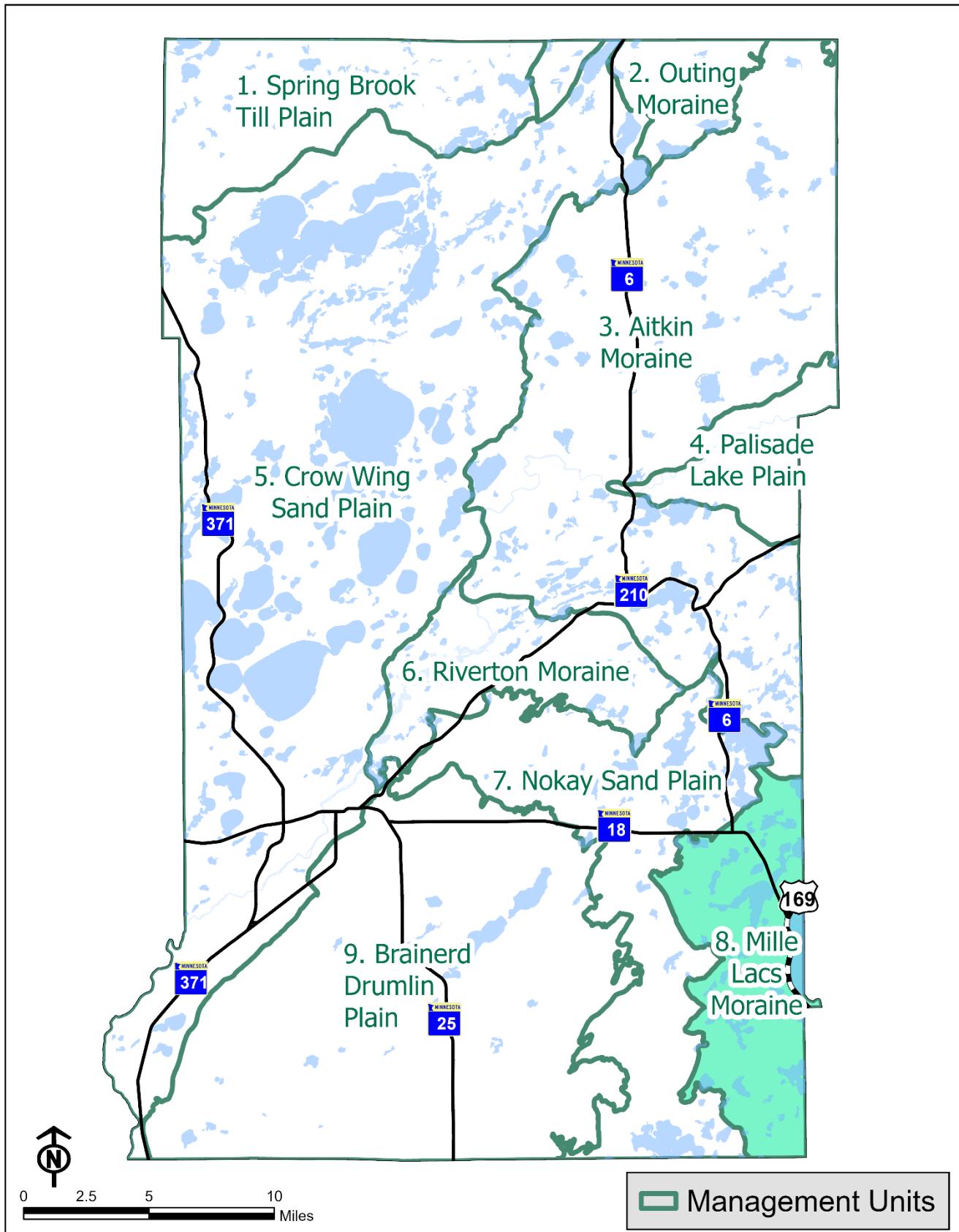
Forest Resource

- Continue to manage for ecologically important conifer species within this unit.

Recreation

- Continue to provide diverse recreation opportunities for people of all ages and abilities while protecting the natural resources.

Management Unit #8: Mille Lacs Moraine



Management Unit #8: Mille Lacs Moraine

Description: Unit consists of rolling to steep end moraine with small isolated peatlands and parent soils a mix of loamy till and stony sandy loam. MHc26 Central Dry-Mesic Oak-Aspen Forest is the dominant NPC at 58.1% of tax forfeit land in this unit. MHc36 Central Mesic Hardwood Forest is less common at 9.4%, while two wet types—WFn64 Northern Very Wet Ash Swamp (8.2%) and WMn82 Northern Wet Meadow/Carr (17.0%) represent a quarter of county ownership in this unit. This unit is distinguished by the fact it is the only one in which aspen is not the dominant cover type on county ownership – oak forest occupies nearly half of county land in the unit. The oak in this unit accounts for 25.9% of total oak county tax forfeit ownership.

Cover Type	Tax Forfeit Acres	Percent
Oak	3,102	42.0%
Aspen	1,285	17.4%
Northern Hardwoods	361	4.9%
Other Forested	1,007	13.6%
Lowland/Marsh/Wetland	1,469	19.9%
Upland Grass/Brush	13	0.2%
Water/Other	153	2.1%
Total Acreage	7,391	100%

Current conditions

Land Assets

- Large amounts of tax-forfeited non-conservation properties occur in this unit.

Forest Resource

- High quality oak forest community resource.
- High Conservation Value Forest (red shouldered hawk habitat complex) exists in the southern portion of this unit.
- Entire unit is listed as an “outstanding” area of high biodiversity significance by the Minnesota County Biological Survey (MCBS).

Recreation

- Diverse recreation opportunities include a designated ATV trail and passive forms of recreation including hunting and hiking trails

Strategies and Actions

Land Assets

- Strategically market and divest small blocks of non-contiguous lands that have limited public access rights or marginal upland timber value.

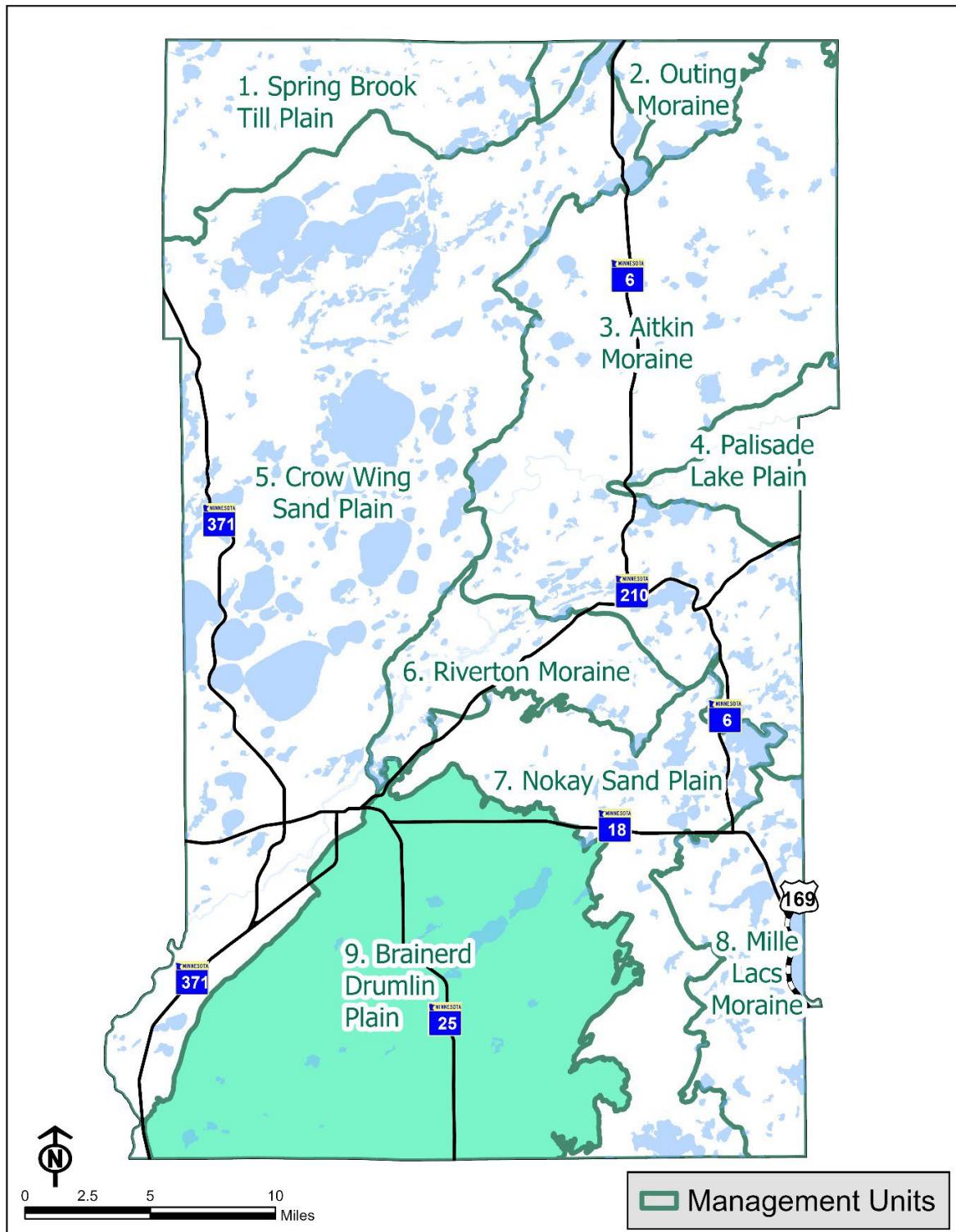
Forest Resource

- Emphasize high-quality oak and northern hardwood forest management (e.g., thinnings).
- Use shelterwood and seed tree harvests to encourage advanced regeneration and perpetuate oak forests.
- Sustain and enhance habitat for the red-shouldered hawk (High Conservation Value Forest) and the older characteristic forests of this outstanding area of biodiversity significance.
- Avoid spring and early summer harvests to prevent damage to reserve species in oak management areas.

Recreation

- Continue to provide diverse recreation opportunities for people while preserving the natural resources.

Management Unit #9: Brainerd Drumlin Plain



Management Unit #9: Brainerd Drumlin Plain

Description: This unit is unique for its rolling till plain with abundant drumlin features; peatlands are common. Parent soils are sandy loam till with hardpans and sand. On county tax forfeit land, almost a third (30.5%) is MHC36 Central Mesic Hardwood Forest and nearly a third is two wet area types, WFn64 Northern Very Wet Ash Swamp (21.3%) and WMn82 Northern Wet Meadow/Carr (12.0%). County ownership is in scattered parcels. Over half (58.3%) of county ownership is upland forest and a third (32.7%) is lowland, marsh or water.

Cover Type	Tax Forfeit Acres	Percent
Aspen	1,573	27.9%
Oak	1,122	19.9%
Red Pine	440	7.8%
Other Forested	565	10.0%
Lowland/Marsh/Wetland	1,732	30.7%
Upland Grass/Brush	78	1.4%
Water/Other	135	2.4%
Total Acreage	5,645	100%

Current conditions

Land Assets

- High agricultural use areas with many water quality related implications
- Fragmented public ownerships with limited access in many areas.

Forest Resource

- Deer browse is high in the western portion of this management unit.
- Southwest portion of management unit has high concentration of oak forest communities, which are popular with recreation enthusiasts and hunters.
- Unique naturally occurring red and white pine forest communities adjacent and east of South Long Lake.

Recreation

- Management unit consists of two hunter/hiker non-motorized trail systems, designated snowmobile trails and a designated ATV trail.

Strategies and Actions

Land Assets

- Retain most of the land base with public access for wetland values associated with non-agricultural lands.
- Other targeted public lands with limited access should be exchanged or sold for other strategic lands in the County.
- Secure long-term access to targeted land-locked properties.

Forest Resource

- In areas where deer browse has been high, avoid artificial plantings that sustain heavy losses. These include areas within wildlife management areas and/or non-motorized trail systems.
- Maintain dominant oak forest community types near Sebie Lake in Fort Ripley for hunting and wildlife purposes.
- Protect the integrity of naturally occurring pine forest communities by limiting clear-cut regeneration harvests and promoting ecological and recreation values within those areas.

Recreation

- Continue to seek opportunities to provide diverse recreation activities for people of all ages and abilities while protecting the natural resources

Chapter 10.0 Management: Forest Resource

10.1 General Timber Management

Management of vegetation through timber harvesting is the primary tool with which the County achieves its goals and objectives. While this strategic plan provides overall guidance, much of the critical decision-making is made at the stand level by Land Services staff. The amount of detail encompassed at the stand level is extensive and not easily reduced for general consumption. This chapter offers a basic review of timber management policies and considerations.

Timber Management Policy

Regarding timber management it is the policy of the Crow Wing County Land Services Department:

1. The purpose of resource management will be to properly utilize renewable resources to their fullest while at the same time providing a continuous supply and quality of resources for future generations.
2. In general, forested lands will be managed in a manner consistent with the native plant community appropriate to the site.
3. A representation of forest successional stages for each forest ecological system will be maintained to accommodate plant and wildlife species and forest uses dependent on each stage of forest growth.
4. Any resident or landowner in Crow Wing County can purchase a permit to cut firewood from designated areas located on county managed lands. The permit allows cutting of firewood for personal home use, but not for resale.

10.2 General Silvicultural Practices

This section is intended to provide only a brief summary of department silvicultural practices. More detailed information is offered in the approved procedures of the Minnesota Counties Sustainable Forest Cooperative (MCSFC).

NPC-Based Management

The native plant community (NPC) of a stand will help guide natural resource manager decisions regarding stand-specific management including desired future condition, harvest techniques, and regeneration.

The Candidate Stand List

The County will generate annual lists of stands to be evaluated for active management in the forthcoming year. This list is framed by the strategic direction set in this management plan and acts as a tactical plan.

Site Level Guidelines

The County utilizes the *Voluntary Site-Level Forest Management Guidelines for Landowners, Loggers and Resource Managers* as prepared by and periodically amended by the Minnesota Forest Resources Council. These guidelines direct forest management activities across a range of topics including harvest intensity, riparian zones, forest road construction, reforestation, inclusions, planned retention, and more.

Site Level Management Policy

1. Adopt *Sustaining Minnesota Forest Resources: Voluntary Site-Level Forest Management Guidelines*, as may be amended from time to time, as County policy.
2. After a significant natural disturbance such as a fire or wind event, severe disease outbreak, or pest infestation, Crow Wing County staff will evaluate the affected area according to the following general procedure:
 - Assess the stand for immediate and future management actions. This assessment involves consideration of the NPC, surviving trees (type, condition, age), and defined management objectives (including recreational activities) for the area. Based on this assessment the County will prepare an action plan that integrates strategic and tactical considerations.
 - Salvage merchantable timber. If the action plan determines that salvage is desired and feasible, a salvage timber sale will be designed and implemented.
 - Revise inventory and management schedules. As part of the County's annual inventory update, information reflecting the stand's new condition and status (e.g., change in cover type) would be entered into the database. Staff would also Re-examine its management schedules (strategic and tactical) to determine if and how they should be revised to reflect the impacts of the natural disturbance and any timber salvage that occurs.

General Timber Sale Procedures

The detailed procedures adopted by the MCSFC address all aspects of timber sales including: forest inventory assessment, field evaluation, timber sale design, timber sale administration, and timber sale closure and monitoring.

In addition, the County has its own policy regarding the structuring of sales to enhance opportunities for a range of timber harvesters to bid on and secure sales.

Timber Sale Policy

Timber sales will be structured so as to provide the opportunity for timber harvesters and users with various capabilities to bid on timber stumps. The department will make additional detailed policies governing various aspects of timber sales available to bidders.

Fire

Primary responsibility for fighting fire lies with the Minnesota Department of Natural Resources. The County may use prescribed fire for certain management activities. Burns will be contracted with and may be done in coordination with the MnDNR and others as appropriate. All burns will follow standards and procedures modified from both State and Federal guidelines. Contracts for prescribed burns will follow the current Crow Wing County contract policy.

Pest Control

The County monitors its lands for signs of pest infestations. Because of its greater staff resources, primary control of pests lies with the MnDNR. The County utilizes up-to-date Integrated Pest Management (IPM) strategies to reduce potential for pest infestations. These are updated through workshops and information from the MnDNR and USFS.

Of particular interest to Crow Wing County are such pests as emerald ash borer, spongy moth, eastern larch beetle and spruce budworm. At the sign of a potential infestation or insect outbreak, county staff will contact MnDNR Forest Health Specialists to help assess the situation and devise an appropriate response.

Exotic Species

The County monitors its lands for signs of undesired exotic species. In general, species being monitored for are trees and upland shrubs. The policy is to remove such species when they occur in situations where they jeopardize stand or area management objectives. The County may confer with MnDNR and USFS specialists when devising appropriate measures to address a particular infestation.

Non-Timber Products

The County will allow gathering of various non-timber resources and products as long as such activity is conducted in a manner not to endanger sustainability of the forest resource.

The gathering of birch tops and boughs (usually balsam fir) will continue to be allowed by permit only. The Land Services Department will monitor this activity to ensure that gathering occurs on the approved site and in the approved manner.

Other gathering activities (e.g., plants for personal medicinal or decorative use) will be allowed in accord with the policies of this plan but there may be informal monitoring of this activity

Decorative Materials Policy

1. Persons may be authorized to decorative materials provided: a permit is obtained from the Land Services Department, harvesting only occurs in areas designated on the permit, permit holder complies with proper harvesting techniques as specified by the department, and the permit holder assumes responsibility for the actions of their crew.
2. The gathering of plants (whole or in parts including berries), pine/fir cones, nuts and seeds, and other similar vegetative materials for commercial purposes is prohibited except where an individual or firm has received a permit from the Land Services Department. No permit will be granted where the gathering activity results in the destruction or serious depletion of the resource. Under no circumstances may Federal or State listed rare, threatened, or endangered species be gathered.

10.3 NPC Management

Native plant community designations guide management at both the strategic and stand-specific levels. At the strategic level, NPC is used to evaluate overall forest potential and to structure basic management on that potential. At the stand level, NPC helps guide Land Services Staff decisions regarding site-specific management. NPC will also assist decisions regarding management and harvest techniques. At the strategic level, the County uses NPC to identify how forest cover types should be managed. It is also used to manage specific species. The following table shows how the County uses NPC to determine the direction of strategic shifts in acres of specific tree species across the landscape.

Native Plant Community	Native Plant Community											
	Aspen	Paper Birch	Red Maple	Bur Oak	Red Oak	Bass wood	Sugar Maple	Jack Pine	Red Pine	White Pine	White Spruce	Balsam Fir
FDc23	<	=	<<	+	<	<<	<<	++	=	<<	<<	<<
FDc24	<	=	<<	+	=	<<	<<	++	+	<<	<<	<<
FDc25	=	=	<	=	=	<<	<<	+	++	<<	<<	<<
FDc34	+	+	=	=	=	<<	<<	+	++	++	<	<<
FDn33	+	+	+	<<	<<	<<	<<	++	++	++	=	+
MHc26	++	++	++	+	++	+	+	<	=	=	<	<<
MHc36	=	=	=	++	++	++	++	<<	<<	<<	<<	<<
MHn35	+	+	+	=	++	++	++	<<	<<	<<	<<	<<
MHn44	++	++	+	=	=	+	=	<<	<<	=	+	+
MHn46	++	++	+	+	=	++	++	<<	<<	<<	=	<
MHn47	=	+	=	<	<	<<	<<	<<	<<	<<	<<	<<

Management key:

= Manage as Component

< Decrease

+ Increase

<< Significantly decrease

++ Significantly increase

10.4 Cover Type Management

The following pages provide key information regarding the County's strategic management direction for each of the major forest cover types. Cover type is the term used by foresters to describe individual forest stands. A stand is typed by the dominant tree species but in most stands there are many other tree species.

The information provided for each cover type is:

General Management Objective: a short statement of the basic purpose of County management for this cover type

Age Class Distribution: number of acres within 10-year age classes for the base plan year and 50 and 100 years in the future

Harvest Guidance: identifies harvesting techniques for this cover type along with regeneration practices

Native Plant Community: listing of NPCs on which the species is most suited

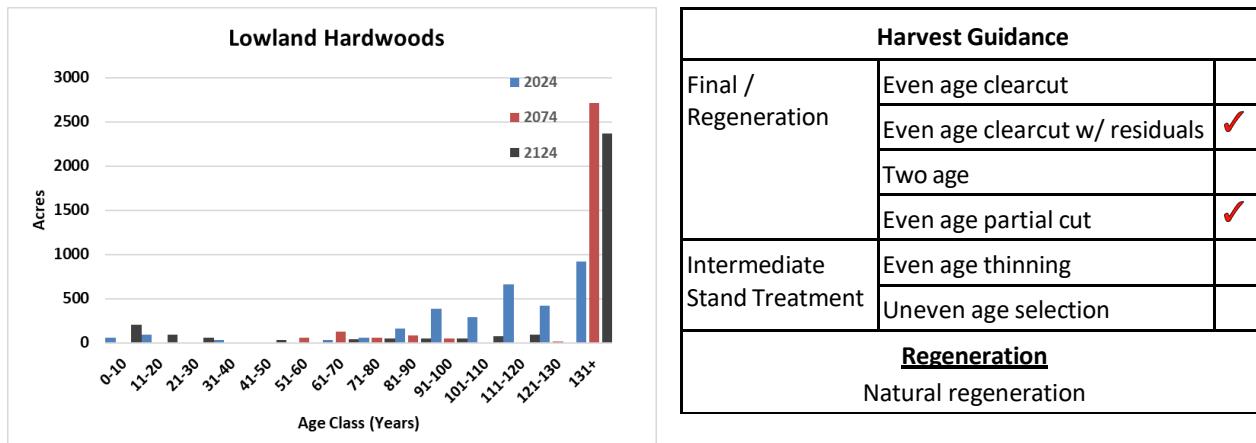
Management Notes: additional notes regarding management of the cover type

Ash/Lowland Hardwoods

General Management Focus:

Identifying and implementing effective regeneration strategies of ash and lowland hardwoods through partial cuttings.

Harvesting in these forest types is highly dependent on market demand, access availability (i.e., winter conditions), and tree size, which fluctuates dramatically. Therefore, no set annual goals have been established for ash.



Native Plant Community Management Direction									
	FDc23 FDc24	FDc34 FDn33	MHc26 MHc36	MHn35 MHn44	MHn46 MHn47	FPn72 FPn82	WFn55 WFn64	WMn82	APn80 APn81
Change Direction	<<	<<	<<	=	=	<<	++	<<	<<
2024 Acres	172	83	597	280	43	109	988	514	3,051

Management Notes:

Rotation Ages: 80 years and at least 100 ft² basal area on average. Existing stands greater than 150 years old will be allowed to succeed.

Intermediate Treatment: Even age partial harvests will be the preferred harvest system due to hydrological concerns.

Regeneration Harvest: Due to the highly variable nature of ash and lowland hardwoods stands (i.e., hydrological/water related harvest access, insect infestations, low density stocking, species mix, small diameter), these cover types will be managed based on market and access availability conditions.

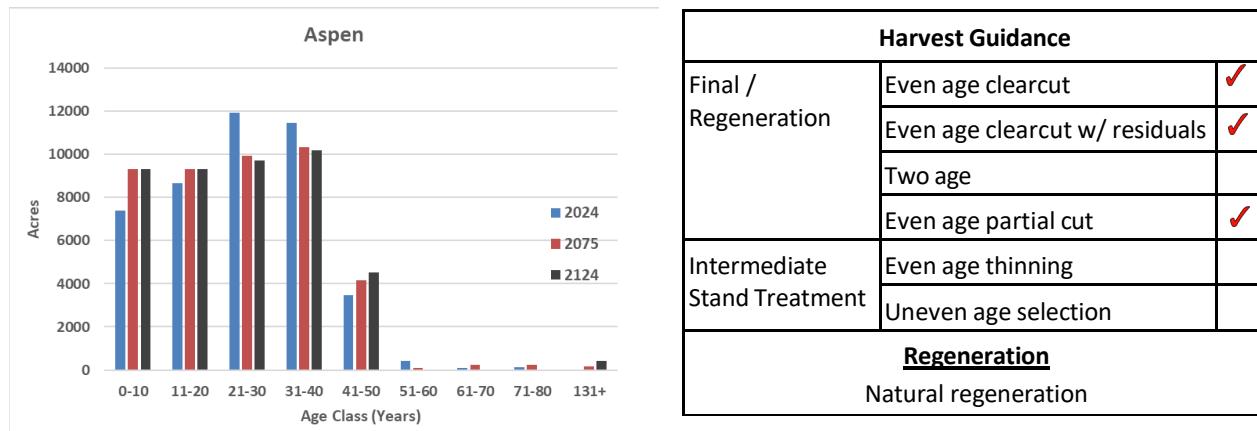
Note: Management objectives for ash will focus on ecosystem health and management and not on emerald ash borer (EAB). The intent is to limit habitat attractiveness to EAB by managing to reduce concentrations of ash while also maintaining hydrologic function to maintain tree cover. There is a high likelihood that the vast majority of ash trees in Minnesota will be killed by EAB regardless of the type or magnitude of actions taken.

Aspen

General Management Focus:

Create a balanced age-class distribution.

From 1991 – 1999, the average annual harvest was above sustainable levels due to the need to correct an extreme age class imbalance. From 2014-2024, management was at lower annual levels to work through the last of the mature aspen resource. Age class distribution is now better balanced.



Native Plant Community Management Direction									
	FDc23	FDc24	FDc34	FDn33	MHc26	MHc36	MHn35	MHn44	MHn46
Change Direction	<	<	+	+	++	=	+	++	++
2024 Acres	121	2,922	3,785	692	21,229	2,041	8,203	1,244	1,589

Management Direction Key:
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease

Management Notes:

Rotation ages: Poor quality sites = 40 years; Medium-Good quality = 45 years; Excellent quality = 50 years.

Intermediate Treatment: None.

Regeneration Harvest: Stands on high quality sites, which represents 12% of the aspen resource, will be managed at the 50-year rotation age. In rare instances, poor quality sites may be converted to jack pine or red pine.

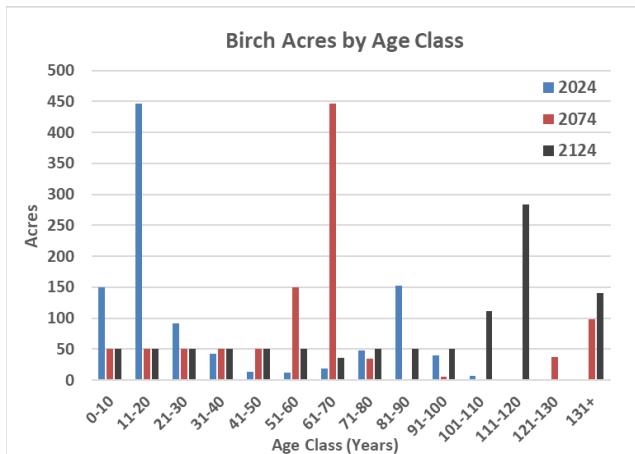
Birch

General Management Focus:

Implementing effective regeneration strategies.

The long-term goal is to reduce birch acres in favor of conversion to conifers on appropriate sites. Efforts to regenerate and maintain this type will focus on mesic NPCs for bolt and sawtimber potential.

Additionally, the goal is to maintain birch as a component in other forest types.



Harvest Guidance		
Final / Regeneration	Even age clearcut	✓
	Even age clearcut w/ residuals	✓
	Two age	
	Even age partial cut	✓
Intermediate Stand Treatment	Even age thinning	
	Uneven age selection	
Regeneration		
Natural regeneration		

Native Plant Community Management Direction									
	FDc23	FDc24	FDc34	FDn33	MHc26	MHc36	MHn35	MHn44	MHn46
Change Direction	=	=	+	+	++	=	+	++	++
2024 Acres	0	58	124	0	633	14	107	0	32
Management Direction Key:									
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease									

Management Notes:

Rotation Ages: Poor quality sites = 50 years; Medium – Excellent quality sites = 60 years.

Intermediate Treatment: Intermediate treatments will not be performed on the birch cover type.

Regeneration Harvest: On poor sites birch may be converted to red pine or jack pine. Medium to excellent sites will be managed for natural birch regeneration. To the extent possible, summer harvests will be emphasized to enhance regeneration.

Northern Hardwoods

General Management Focus:

Improving the growth of quality trees through thinnings and implementing effective regeneration strategies.

Long-term objective is to perpetuate this cover type as a mature species. On most sites, basswood and oak components will be favored but quality trees of other species, including maple, will also be promoted.

On poor sites, northern hardwood sites will be converted to other cover types using even aged management.



Harvest Guidance		
Final / Regeneration	Even age clearcut	
	Even age clearcut w/ residuals	✓
	Two age	
	Even age partial cut	✓
Intermediate Stand Treatment	Even age thinning	✓
	Uneven age selection	✓
Regeneration		
Natural regeneration		

Native Plant Community Management Direction									
	FDc23	FDc24	FDc34	FDn33	MHc26	MHc36	MHn35	MHn44	MHn46
Change Direction	<<	<<	<<	<<	+	++	++	+	++
2024 Acres	0	233	133	16	855	177	1,171	278	263
Management Direction Key:									
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease									

Management Notes:

Rotation Ages: Poor sites = 80 years; Medium – excellent sites = perpetual entries, no “end rotation”.

Intermediate Treatment: On medium to excellent sites, beginning with the first “entry” between 40-90 years of age, northern hardwoods will be managed using uneven aged selection techniques such as single tree or gap-selection methods that retain “all age classes” characteristics. In these areas shade-tolerant regeneration will establish and progress to older age classes through small- or large-gap openings.

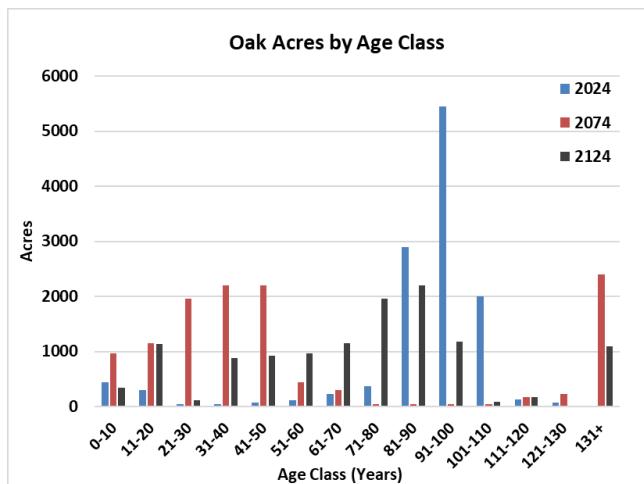
Regeneration Harvest: Regeneration harvests for northern hardwoods will only occur on poor sites that are better suited to other species such as oak or in areas that have been high graded in the past. In all instances, partial cuttings will be the main regeneration method used.

Oak

General Management Focus:

Create a balanced age-class distribution.

Long-term goals are to improve age balance and improve growth and yield of existing stands through intermediate treatments (i.e., crop tree release, thin from below, etc.); and establish advanced regeneration in preparation for subsequent final/regeneration harvest.



Harvest Guidance		
Final / Regeneration	Even age clearcut	✓
	Even age clearcut w/ residuals	✓
	Two age	✓
	Even age partial cut	✓
Intermediate Stand Treatment	Even age thinning	✓
	Uneven age selection	✓
Regeneration		
Natural regeneration, supplemental conifer planting where understocked		

Native Plant Community Management Direction									
	FDc23	FDc24	FDc34	FDn33	MHc26	MHc36	MHn35	MHn44	MHn46
Change Direction	<	=	=	<<	++	++	++	=	=
2024 Acres	0	534	846	34	6,055	853	2,467	193	302
Management Direction Key:									
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease									

Management Notes:

Rotation Ages: Poor quality sites = 80 years; Medium-good quality = 100 years; Excellent quality = 120 years.

Intermediate Treatment: On poor sites, no intermediate stand treatments will be performed. Intermediate intensity harvests to promote growth on quality trees will be performed on medium to excellent sites between 40 and 90 years old consisting of mesic hardwood native plant community classes.

Regeneration Harvest: Poor quality oak sites (mostly fire dependent native plant communities) will be converted to a more competitive conifer species as indicated by the native plant community class using even age clearcuts with residuals. Medium to excellent sites will be managed to establish advance regeneration and perpetuate oak cover type.

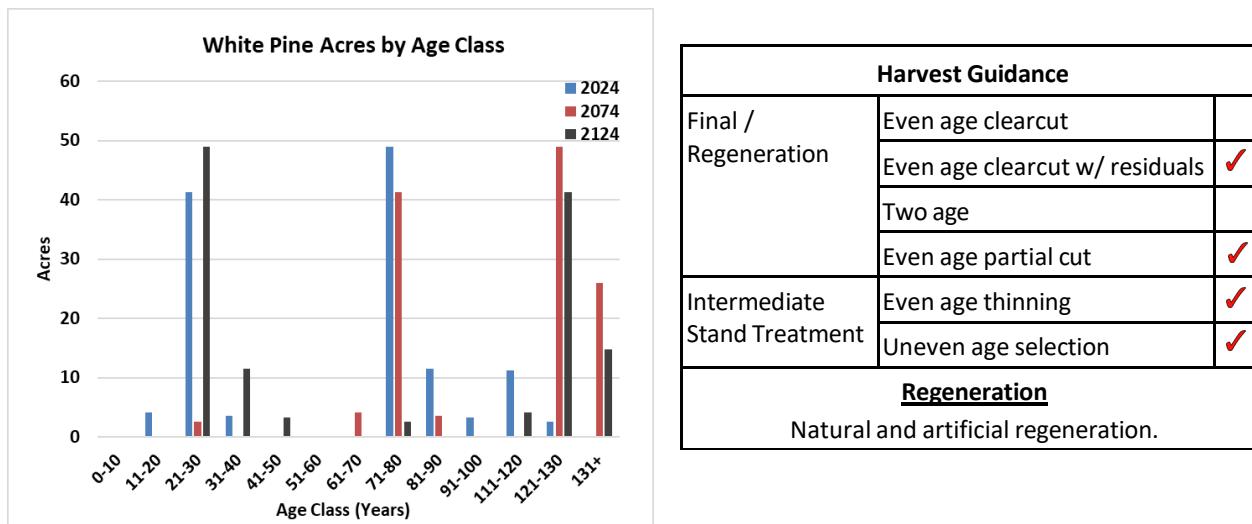
Note: There is a large imbalance in the age class structure of oak. Up until 2008, oak was not managed as a cover type due to market conditions. As a result, much of the oak in the county will be over mature in 100 years. To prevent oak senescence, management will focus on thinning remaining medium-high quality unthinned stands over the next 70 years and regenerating previously thinned stands over the next 70 years. To achieve this, 220 acres will be harvested through shelterwood or clearcut with residuals annually.

White Pine

General Management Focus:

Recent focus has been on artificial establishment of white pine on appropriate sites. Future focus is to manage natural stands and mixed conifer stands to maintain or enhance the presence and health of white pine in those forest stands.

Long-term objective is to increase white pine on the landscape when possible on poor quality aspen, birch or hardwood sites.



Native Plant Community Management Direction									
	FDc23	FDc24	FDc34	FDn33	MHc26	MHc36	MHn35	MHn44	MHn46
Change Direction	<<	<<	++	++	=	<<	<<	=	<<
2024 Acres	0	36	38	0	33	4	0	0	2

Management Direction Key:
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease

Management Notes:

Rotation Ages: 150 years.

Intermediate Treatment: Improve the growth and yield of existing stands through planned intermediate harvests (thinning). These treatments will also serve to maintain or enhance the component of white pine within mixed stands.

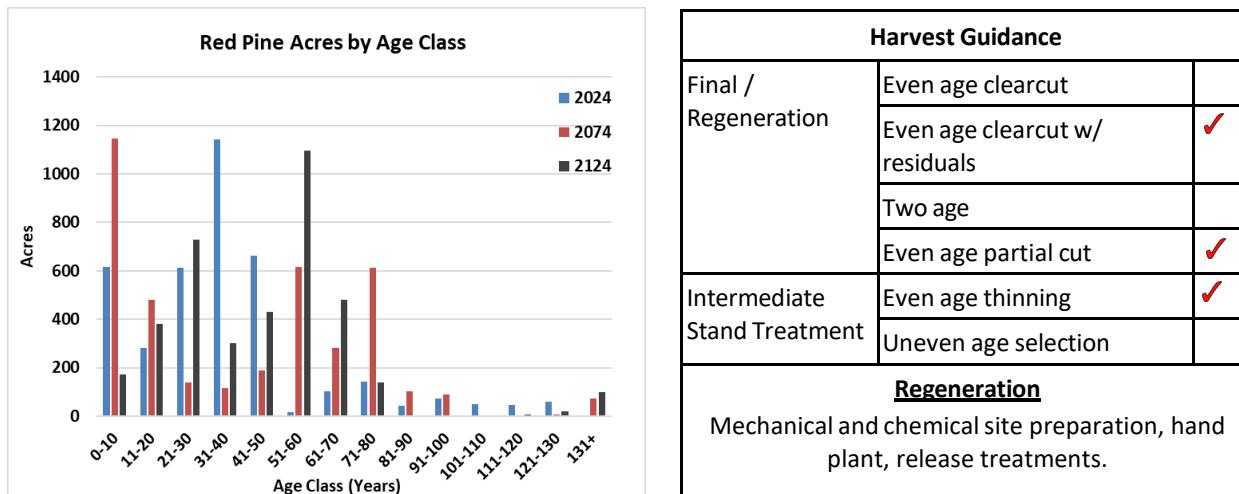
Regeneration Harvest: Regeneration will focus on medium to rich fire dependent forest communities (FDc34, FDn33). Strategies will be implemented to minimize damage from deer browsing and white pine weevil.

Red Pine

General Management Focus:

Improve the growth and yield of existing forest stands through planned thinning harvests and implement effective regeneration strategies on areas following planned regeneration harvests.

Long-term objective is to increase red pine on the landscape when possible on dry-mesic sites with nutrient-poor hardwood cover types with softwood sawtimber growth potential.



Native Plant Community Management Direction									
	FDc23	FDc24	FDc34	FDn33	MHc26	MHc36	MHn35	MHn44	MHn46
Change Direction	=	+	++	++	=	<<	<<	<<	<<
2024 Acres	8	1,121	1,392	126	846	146	70	3	47

Management Direction Key:
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease

Management Notes:

Rotation Ages: 80 years on artificial stands; 100+ years on natural stands.

Intermediate Treatment: Improve the growth and yield of existing stands through planned intermediate harvests (thinning). Intermediate treatments typically begin at age 25 or basal area of 130 sq. ft. or more. Treatment intervals range from 8-12 years.

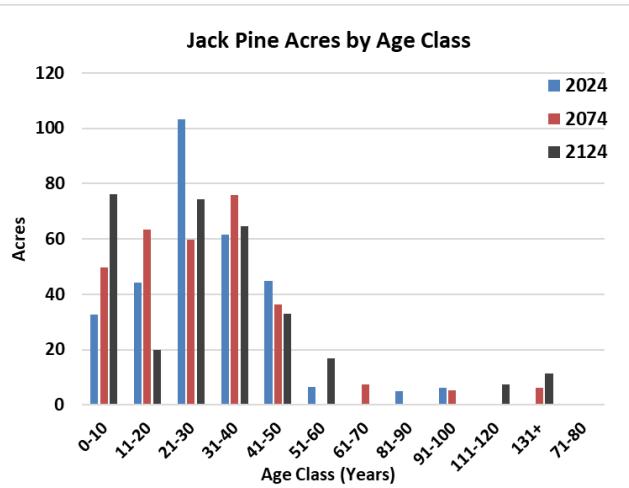
Regeneration Harvest: Most red pine regeneration efforts will focus on medium to richer fire dependent forest communities (FDc34, FDn33). Mechanical and herbicide treatments may be implemented to reduce non-crop competitors achieving optimum regeneration and growth goals.

Jack Pine

General Management Focus:

Manage natural and mixed stands.

Increase regeneration efforts on nutrient poor, fire dependent plant communities.



Harvest Guidance		
Final / Regeneration	Even age clearcut	✓
	Even age clearcut w/ residuals	✓
	Two age	
	Even age partial cut	
Intermediate Stand Treatment	Even age thinning	
	Uneven age selection	
Regeneration		
Natural regeneration, mechanical and chemical site preparation, hand plant, release treatments.		

Native Plant Community Management Direction									
	FDc23	FDc24	FDc34	FDn33	MHc26	MHc36	MHn35	MHn44	MHn46
Change Direction	++	++	+	++	<	<<	<<	<<	<<
2024 Acres	0	119	86	28	41	10	0	0	6
Management Direction Key:									
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease									

Management Notes:

Rotation Ages: 50 years on poor sites; 60 years on richer sites.

Intermediate Treatment: No intermediate treatments will be preferred, except for sanitation treatments for insect or disease considerations.

Regeneration Harvest: Increase regeneration efforts on nutrient poor, fire dependent plant communities.

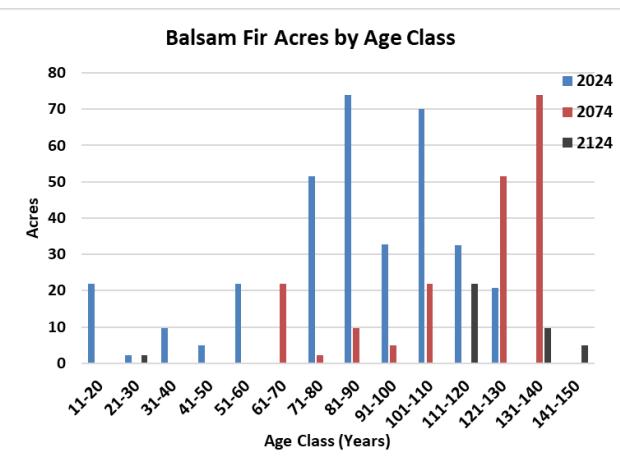
Mechanical and herbicide treatments may be implemented to reduce non-crop competitors achieving optimum regeneration and growth goals.

Balsam Fir

General Management Focus:

Promoting mixed stands comprised of spruce/fir and deciduous trees.

Manage for balsam fir regeneration as the main goal. Most sites will likely convert to aspen or ash depending on soil moisture due to regeneration challenges. Maintain balsam fir as a component in northern floristic sites as much as possible.



Harvest Guidance		
Final / Regeneration	Even age clearcut	✓
	Even age clearcut w/ residuals	✓
	Two age	
Intermediate Stand Treatment	Even age partial cut	
	Even age thinning	
	Uneven age selection	
Regeneration		
Natural regeneration, seed, plant.		

Native Plant Community Management Direction									
	FDc23	FDc24	FDc34	FDn33	MHc26	MHc36	MHn35	MHn44	MHn46
Change Direction	<<	<<	<	=	<	<<	<<	+	=
2024 Acres	5	32	27	0	20	1	3	0	8
Management Direction Key:									
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease									

Management Notes:

Rotation Ages: Mesic sites = 60 years.; Wet sites = 80 years.

Intermediate Treatment: Intermediate treatments will not be performed in this cover type.

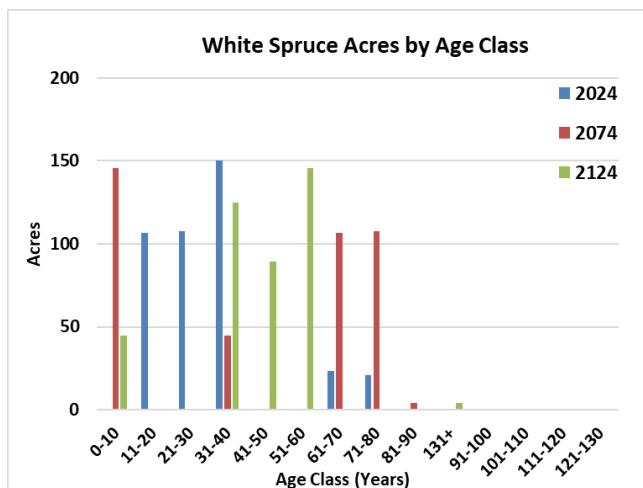
Regeneration Harvest: Mesic sites will likely be converted to aspen and wet sites will be converted to ash. Maintain balsam fir as a component on mixed sites. Manage on an even age basis using clearcut or clearcut with reserves.

White Spruce

General Management Focus:

Manage natural and mixed stands by allowing for natural regeneration of white spruce to occur.

Maintain or enhance the long term presence of white spruce in mixed forest stands. Thin existing planted spruce sites through intermediate treatments.



Harvest Guidance		
Final / Regeneration	Even age clearcut	✓
	Even age clearcut w/ residuals	✓
	Two age	
	Even age partial cut	✓
Intermediate Stand Treatment	Even age thinning	✓
	Uneven age selection	
Regeneration		
Natural regeneration, mechanical site preparation, hand plant.		

Native Plant Community Management Direction									
	FDc23	FDc24	FDc34	FDn33	MHc26	MHc36	MHn35	MHn44	MHn46
Change Direction	<<	<<	<<	=	<<	<<	<<	+	=
2024 Acres	0	40	183	0	145	28	12	0	0
Management Direction Key:									
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease									

Management Notes:

Rotation Ages: 80 years.

Intermediate Treatment: Improve the growth and yield of existing planted stands through planned intermediate harvests through thinning. Intermediate treatments typically begin at ages greater than 25 years or basal area of 130 sq. ft. or more. Treatment intervals range from 7-10 years.

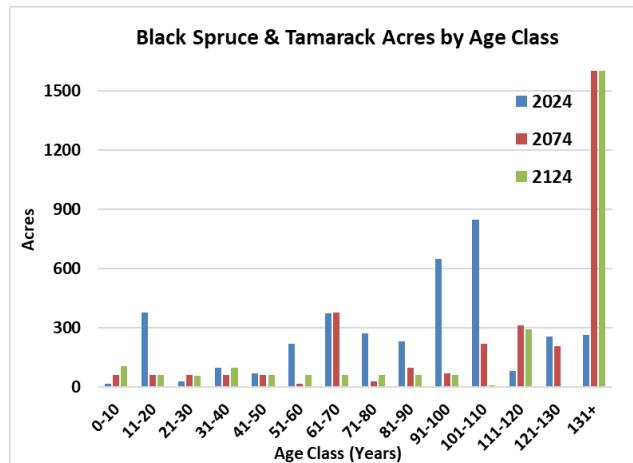
Regeneration Harvest: Increase natural and artificial regeneration efforts in mixed conifer and hardwood sites appropriate for spruce management. In areas where historical and verifiable deer browse has occurred on other more ecologically appropriate species sites, plant white spruce as an alternative to increase conifer component on the landscape.

Black Spruce & Tamarack

General Management Focus:

Establish adequate lowland conifer regeneration by natural or artificial (i.e., aerial seed) methods.

Harvesting in these forest types is highly dependent on market demand, access availability (i.e., winter conditions), and tree size, which fluctuates dramatically. Therefore, no set annual goals have been established for these types.



Harvest Guidance		
Final / Regeneration	Even age clearcut	✓
	Even age clearcut w/ residuals	✓
	Two age	
	Even age partial cut	✓
Intermediate Stand Treatment	Even age thinning	
	Uneven age selection	
Regeneration		
Natural or artificial (i.e., aerial seeding) regeneration		

Native Plant Community Management Direction									
	FDC23 FDC24	FDC34 FDC33	MHC26 MHC36	MHN35 MHN44	MHN46 MHN47	FPN72 FPN82	WFN55 WFN64	WMN82	APN80 APN81
Change Direction	<<	<<	<<	<<	<<	++	=	=	+
2024 Acres	85	40	149	122	36	460	1,495	595	850
Management Direction Key:									
= manage as component; + increase; ++ significantly increase; < decrease; << significantly decrease									

Management Notes:

Rotation Ages: 100 years. Stands greater than 150 years old will be allowed to succeed.

Intermediate Treatment: No intermediate treatments will be performed in these cover types.

Regeneration Harvest: Due to the highly variable nature of black spruce and tamarack stands (i.e., hydrological/water related harvest access, insect infestations, low density stocking, small diameter), these cover types will be managed based on market and access availability conditions.

10.5 Management Implementation

The following tables summarize the anticipated impact on Crow Wing County's tax-forfeited lands if the management described in this long-term resource plan is undertaken. Given the range of possible unconsidered factors affecting the forest over the next century such as fire and disease, these tables should be seen as a prediction of the direction and magnitude of the expected trends in forest change.

Table 22 shows the programmed acres to be managed in 2025 by cover type.

Table 23 presents a summary view of management on all cover types over the course of the next century. This table identifies management in terms of acres managed annually harvested in each decade.

Table 22. Crow Wing County 2025 Timber Management by Cover Type (acres)		
Harvest Method	Cover Type	2025
Final Harvest	Aspen	977
	Ash/Elm	0
	Birch	5
	Oak	220
	Other Hardwood	15
	White Pine	0
	Red Pine	28
	Jack Pine	2
	White Spruce	0
	Black Spruce	0
	Balsam Fir	0
	Tamarack	0
	Cedar	0
Clearcut Total:		1,247
Commercial Thin	Spruce & Pine	187
	Oak	90
Selection Harvest	Northern & Lowland Hardwoods	40
Thinning Total		317
Total all Harvest Methods		1,564

Table 23. Crow Wing County Average Annual Acres of Timber Management by Cover Type, Decade, and Method

Harvest Method	Cover Type	2025-2034	2035-2044	2045-2054	2055-2064	2065-2074	2075-2084	2085-2094	2095-2104	2105-2114	2115-2125
Clearcut & Final Harvest	Aspen	974	1,034	993	931	931	936	1,015	971	931	932
	Ash/Elm	-	-	-	-	-	-	-	-	-	-
	Birch	5	5	5	5	5	5	5	5	5	5
	Oak	220	220	196	114	97	93	89	11	108	38
	Other Hardwood	15	15	15	15	15	15	15	6	15	15
	White Pine	-	-	0	-	-	0	1	5	-	-
	Red Pine	20	13	11	58	104	47	29	78	22	21
	Jack Pine	4	8	6	6	5	3	6	7	0	9
	White Spruce	2	2	-	-	15	11	11	-	-	4
	Black Spruce	-	-	-	-	-	-	-	-	-	-
	Balsam Fir	-	-	-	-	-	-	-	-	-	-
	Tamarack	-	-	-	-	-	-	-	-	-	-
	Cedar	-	-	-	-	-	-	-	-	-	-
Clearcut Total:		1,240	1,297	1,226	1,129	1,171	1,110	1,170	1,084	1,081	1,025
Commercial Thin	Spruce & Pine	202	223	244	199	129	75	163	196	221	216
	Oak	90	90	90	90	148	348	195	163	109	332
Selection Harvest	Northern & Lowland Hardwoods	40	40	40	40	40	40	40	40	40	40
Thinning Total		332	353	374	329	317	463	398	400	370	588
Total all Harvest Methods		1,573	1,650	1,600	1,458	1,488	1,573	1,568	1,483	1,451	1,614