

NORTHERN HIGHLAND AMERICAN LEGION STATE FOREST



NORTHERN HIGHLAND-AMERICAN LEGION STATE FOREST

DRAFT MASTER PLAN AND ENVIRON- MENTAL IMPACT STATEMENT

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ACKNOWLEDGMENTS

This plan has been developed through a team effort by many individuals from the Department of Natural Resources. Through their hard work and expertise, these people have developed a plan that will guide the Northern Highland-American Legion State Forest into the future.

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LETTER FROM PROPERTY SUPERINTENDENT

Wisconsinites care deeply about the current and future use of public forests in Wisconsin. The Northern Highland-American Legion (NH-AL) State Forest is no exception. As the largest state-owned property, the NH-AL is a vast and cherished part of Wisconsin's ecological, economic and social past, present and future. The NH-AL State Forest covers 225,000 acres located in northern Wisconsin in Vilas, Oneida and Iron counties.

This draft NH-AL master plan is designed to inform both general and technical readers about the future use and management of the forest. The department is committed to working with citizens and businesses alike to manage Wisconsin's state forests in a sustainable manner for current and future generations—an approach that incorporates ecological, economic and social values. I hope the information and vision in this plan will encourage enthusiasm and constructive discussion.

The NH-AL state forest is important to many people because it has the unique ability to meet many different needs. The forest generates employment and supports the economic well being of rural and urban communities alike, through the production of forest products we use daily and the recreation and tourism generated by the fantastic forest and lakes setting within the forest. The forest provides opportunities for a diverse array of recreation such as hiking, snowmobiling, biking and hunting, as well as the opportunity to simply sit quietly and enjoy its natural beauty. In addition, the forest cleans our air and water, provides habitat for a wide range of plant and animal species, and helps us sustain our quality of life.

Virtually all elements of the forest have seen increasing demands in the last decade—demands for ecological protection, forest production, and recreation activity. These demands have potential positive impacts—if development and use is properly planned and managed. Unplanned use and management could, however, overwhelm the Northern Highland-American Legion State Forest's unique ability to provide the ecological, economic, and social benefits that are so highly valued by current residents, visitors, and businesses.

How is it possible to understand all of the various dimensions of the NH-AL and meet the increasing demands? What is the future of the forest and what policies will ensure its long-term sustainability?

The Department of Natural Resources, in partnership with Wisconsin citizens, businesses and visitors, provides this plan as the basis for that discussion and the future use and management of the Northern Highland-American Legion State Forest.

Your feedback on the plan is welcomed and encouraged. With over 225,000 acres of land in the heart of the "Northwoods", Wisconsinites have a real opportunity to contribute to sustainable forestry. Together we can ensure that the NH-AL State Forest continues to provide ecological, economic and social benefits to future generations.



Dennis Leith
State Forest Superintendent

NORTHERN HIGHLAND-AMERICAN LEGION STATE FOREST: MASTER PLAN

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FOREWORD



INTRODUCTION

FOREWORD

The Northern Highland-American Legion State Forest plays a critical role in the well-being of Wisconsin's environment, economy and communities. Ensuring sustainable forest management is vital to the area's health and vitality on many levels.

This NH-AL master planning effort began with a comprehensive assessment of the ecological, economic, and social conditions. These assessments represent a very detailed review of the NH-AL State Forest its resources, how its used, and its role in the region and state. The master plan aims to extensively involve many publics and partners who are interested and affected by the ecological, economic and social benefits of the forest.

The NH-AL State Forest master plan spells out how the property will be managed, used and developed, how it will look, and the benefits it will provide. It defines the recreational uses, forestry and other land management practices in addition to other aspects of the property's future use and development. The master planning process includes preparing both the plan and an Environmental Impact Statement. Master plans are guided by Wisconsin administrative code NR 44.

The development of the NH-AL Master Plan has been guided by a commitment to sustainable forestry. Forest practices have addressed aspects of sustainability for decades, but "sustainable forestry" is a relatively new concept. While individual definitions may vary slightly, there is general agreement that sustainable forestry focuses on meeting the environmental, economic, recreational and social needs of current

generations while protecting the forest's ability to fill the same role for future generations.

The NH-AL State Forests progress in achieving sustainable forestry is relatively complex to evaluate given the varying opinions, viewpoints, and values people bring to the issues. An understanding of the current conditions and the desired future conditions will provide the basis on which to make informed decisions into the future.

IMPORTANCE OF THE NH-AL STATE FOREST

The NH-AL is essential to providing and sustaining ecological, economic and social benefits and is particularly important to local and state economies. Understanding the economic significance of the NH-AL to the surrounding region is vital to comprehending not only the impact of forest management and recreation decisions on community development, but also in understanding the perspectives of those who depend on forest resources for their livelihood.

The physical setting of the Northern Highland-American Legion State Forest supports a diverse range of forest types and habitats. The majority of the forest is currently young to middle-aged (20–80 years old) with only a few areas containing old-growth characteristics.

The forest supports over thousands of acres in wetlands and lakes—all part of the complex ecosystem that provides habitat to diverse fish, birds, insects and plants, as well as many rare species.

As one of the state's major tourist areas, the NH-AL State Forest supports local communities by providing outdoor recreation for local citizens and tourists. A major attraction is the area's exceptional combination of highly scenic forests, undeveloped lakes and streams, and range of quality outdoor recreational opportunities. Forest-based recreation brings millions of dollars into the local economy every year.

While the increasing interest in outdoor activities and forest recreation is a positive turn of events, it also brings a complex set of new forest management challenges. For example, continuing growth in trails-based activities has heightened tension between user groups—particularly between outdoors enthusiasts who use motorized vehicles and those who do not.

Many visitors also find timber harvesting unsightly and report negative attitudes towards its immediate effects. In some cases, this attitude can make active forest management difficult to undertake. An increased commitment to outreach, community dialogue, and planning will be needed to inform the public about the importance of sustainable forest management practices.

The enduring productivity of the NH-AL forest has long been essential to the stability and growth of the local and state economies. Thirty percent of the north-central Wisconsin's (i.e. 7 counties containing and around the NH-AL) regional economic output and 27% of the region's jobs can be tied to either wood products or tourism. Over the years, we have

learned the important lesson that sustainable management of the forest is integral to the health of the economy.

In addition to its major economic impact, many wildlife species find a seasonal or year-round home in the NH-AL State Forest. The forest is home to many firmly established species. Some of these are popular game species, such as white-tail deer and grouse, which depend on active forest management for suitable habitat. Non-game wildlife species such as herptiles, which include salamanders and frogs, need breeding habitat in ephemeral pools that form on the forest floor. Likewise, songbirds dwell in forested habitats, where their nests can be found in fallen snags or high in the canopy. While some wildlife and plants thrive on disturbed habitats, other species require older undisturbed forests.

The NH-AL remains extremely important to the region's Ojibwe Tribes (Known to themselves as Anishinaabe or to others as Chippewa). It is located in ancestral Ojibwe homelands where the Tribes may exercise their rights to hunt, fish and gather (including wild plants and miscellaneous forest products). These rights—reserved in 1837 and 1842 land cession treaties with the United States—help provide for the subsistence, cultural, medicine and spiritual needs of tribal communities. The NH-AL is among the larger blocks of public land in what has become known as the “ceded territory” where these rights may be exercised. Today many tribal members use the NH-AL to harvest many resources, including deer, walleye, wild rice and other plants, black bears, fishers and other furbearers. Proper forest management figures prominently in preserving



Ojibwe culture and life ways now and for seven generations into the future.

The NH-AL supports the highest concentration of lakes in Wisconsin. With over 900 lakes and more than 300 miles of rivers and streams water-based recreation is often one of the primary reasons people visit the NH-AL. Sport fishing, along with swimming, water skiing, canoeing and sightseeing top the list of activities. There are also many remote canoe campsites for those wishing to get away from crowded campgrounds.

Land-based recreation includes activities in both developed and primitive environments. The NH-AL supplies a variety of trail-based recreation from hiking and snowshoe trails to interpretive nature trails and mountain bike trails. The forest also offers a range of camping opportunities. Campers seeking the full outdoor experience have the opportunity to camp along designated backpacking trails with no developed facilities. Campers can also choose modern and rustic campgrounds where developed facilities are available.

Each year, an increase in forest visitors places higher demands on the recreational facilities. In addition, water- and forest-based recreation is expected to increase in the NH-AL region.



NEED TO REVISE THE MATER PLAN

The last master plan for the NH-AL State Forest was approved in 1982. The Department determined the need to revise the plan in light of changing ecological, economic, and social conditions, to incorporate new information learned since that time and to consider management in context of the larger landscape in which the forest is located as required by Wisconsin State Statute 28.04.

This is your plan. The NH-AL State Forest master plan addresses people's desires for the future. Wisconsinites want their forest resources sustained for future generations. At the same time, they expect a full range of environmental, social, and ecological benefits today and in the future. This plan attempts to achieve that balance in a scientifically credible and sustainable way. It was developed with countless hours of public input and several rigorous scientific and technical reviews. Many hands were involved in shaping it.

This is a visionary plan. The NH-AL State Forest master plan captures an idealized view of the state forest's long-term future. This points general direction for short-term actions. The diversity of the forest structure is enhanced over time, providing for a broad range of social and ecological values important to Wisconsin citizens, including recreation. Diverse forest communities contribute to the range of fish and wildlife habitats necessary for all native species, and contribute to broad biodiversity.

PURPOSE OF THE MASTER PLAN

To plan for the future use and management of the forest, the Department of Natural Resources worked actively with federal, state, and local governments (particularly towns), tribes, non-governmental organization, citizens, and businesses over several years to revise the Northern Highland-American Legion State Forest Master Plan. The planning process is guided by State Statute 28.04 and Wisconsin Administrative code NR44.

This is a focused plan. The plan calls for active and passive management across the landscape and over time to achieve its goals and objectives. It relies on integrated and adaptive management of the forest resources and focuses on the compatibility of forest uses over time.

This is a flexible and adaptive plan. The plan calls for adaptive management and monitoring the response of the forest to strategies outlined in the plan. The responses are evaluated against the objectives. The plan calls for continuous monitoring and regular public reviews and a major review every 15 years.

This is a sustainable plan. A sustainable forest requires flexibility and adaptability. This plan will assure sustainable forest products, continued recreation opportunities as well as a sustainable ecosystem and healthy watersheds.



The Northern Highland-American Legion State Forest Master Plan:

- Provides a vision and framework for the use, development, management and acquisition of the forest well into the future with an emphasis on the next 15 years.
- Identifies and plans areas for future management and use. Use designations include: forest production, habitat, native community, wilderness, scenic, special, and recreation.
- Describes general land management and specific management objectives and prescriptions for each management area.
- Makes recommendations for recreation, forest production, and habitat conservation to serve future needs.
- Provides for continuing public involvement during plan implementation.

ABOUT THIS PLAN

From its inception, the Northern Highland-American Legion State Forest master plan has been driven by a strong commitment to public participation and sustainable forestry. Sustainability, a concept that is not new to forestry, is generally defined as meeting the needs of current generations while protecting the ability of future generations to meet their own needs. Based on sustainability, a common vision and goals have guided the planning process.



This plan updates the previous NH-AL master plans, the latest of which was published in 1982. While earlier master plans were scheduled to be revised every ten years, this plan and future forest plans will be continuously revised and updated with a formal, rigorous review every 15 years. This process will allow for greater public comment and input, and permit the Department to better anticipate and respond to changing issues, technologies, and forest conditions.

OVERVIEW OF PLANNING PROCESS

The process for updating the Northern Highland-American Legion State Forest Master Plan began in 1997. Collectively, past management plans and extensive ecological, economic, and social assessments, public input and government-to-government consultation with affected Indian Tribes provide the foundation for future management of the NH-AL.

Public involvement has been an integral part of the planning process, beginning with public open house meetings and surveys to identify important planning issues and views on the forest's future direction. Involvement continued through the other steps in the process, writing a draft vision and goals of the forest, developing and evaluating management alternatives, and informing the preferred alternative (i.e. draft concept plan). This planning process culminates with the public review of the Draft Master Plan and EIS followed by plan review and approval by the Natural Resources Board.



PURPOSE OF STATE FORESTS

State forests are defined by Wisconsin Statutes 28. The purposes and benefits of state forests are outlined in the following language of 28.04 (2):

- (a) The department shall manage the state forests to benefit the present and future generations of residents of this state, recognizing that the state forests contribute to local and statewide economies and to a healthy natural environment. The department shall assure the practice of sustainable forestry and use it to assure that state forests can provide a full range of benefits for present and future generations. The department shall also assure that the management of state forests is consistent with the ecological capability of the state forest land and with the long-term maintenance of sustainable forest communities and ecosystems. These benefits include soil protection, public hunting, protection of water quality, production of recurring forest products, outdoor recreation, native biological diversity, aquatic and terrestrial wildlife, and aesthetics. The range of benefits provided by the department in each state forest shall reflect its unique character and position in the regional landscape.
- (b) In managing the state forests, the department shall recognize that not all benefits under par. (a) can or should be provided in every area of a state forest.
- (c) In managing the state forests, the department shall recognize that management may consist of both active and passive techniques.



HOW THE STATUTORY AND OTHER PURPOSES AND BENEFITS OF THE STATE FOREST WILL BE REALIZED THROUGH THE DRAFT PLAN:

Local and Statewide Economies

Under the plan the forest would increase its contribution to the state and local forest products industry and tourism. Annual harvest levels could rise to nearly double the current levels. The maintenance of a wide range of diverse recreational opportunities and settings, expansion of camping and trail facilities, maintenance of the forest scenic resources and wild life and fisheries will continue the forest's role as one of the state's leading recreation destination areas.

A Healthy Natural Environment and the Long-term Maintenance of Sustainable Forest Communities and Ecosystems

Due to the NH-AL size and varied resources all of the prescribed benefits of a state forest may be realized on the property. By managing for these benefits, as prescribed in the draft plan, the goals of achieving a healthy natural environment and the long-term maintenance of sustainable forest communities and ecosystems would be realized.

Full Range of Benefits

Protection of soils and water quality: Soils and water quality will continue to be protected by maintaining 97 percent or more of the land in an undisturbed condition and by following erosion control practices, such as the Best Forest Management Practices for Water Quality, when conducting forest and other management activities. Maintaining the forest's undeveloped shorelands is another important way to safeguard the forest's high water quality. Expansion of the forest boundary will provide opportunities to expand protection to new areas and waters.

Production of recurring forest products: Under the proposed plan 93 percent (154,000 acres) of the potentially productive lands, will be under active, sustainable management producing forest products.

Outdoor recreation: The plan proposes to maintain all existing recreational opportunities and expand most.

Family camping capacity would increase by 27 percent, raising the total number of family campsites to 1,106. Group camping capacity would double. Canoe and other remote campsites would increase by 20 sites.

The 400+ miles of snowmobile trails would be maintained, use on designated ATV trails would be allowed. Other additions to forest trails include a new mountain bike trail, a family paved bike trail, and hiking/backpacking trails.

The abundant access to state forest lakes would be maintained, as well as opportunities for boating, canoeing, or fishing on wilderness, wild, and other non-motor lakes.

Hunting and fishing opportunities will remain abundant.

The development of a Forestry Awareness, Education, and Visitor Center would greatly expand the recreational and educational opportunities for visitors and local school students.

Native biological diversity: Native biological diversity would be enhanced through the gradual increased presence of old-growth forest communities and habitat, primarily of the oak and red/white pine type. This native community type is rare in the state, and so are good opportunities for restoration. Approximately 13 percent of the forest's upland acreage would be under old-growth forest management. Endangered and threatened species will continue to be protected, primarily this would be accomplished through a high level of protection of the abundant wetland and shoreline habitats. About 75% of the NH-AL's rare plants and animals are dependent upon in wetlands.

Aquatic and terrestrial wildlife: All wetlands and lakes would receive a high level of protection. Nearly all wetlands would be passively managed. Best Forest Management

Practices for Water Quality (BMPs) will be followed and the undeveloped shorelines would remain undeveloped.

Aesthetics: Over time the general scenic quality of the forest would be further enhanced as large pines and oaks become more common through the practice of Big Tree Silviculture and old-growth forest management. The scenic quality of all shorelines and primary roadways will be maintained and enhanced through the application of aesthetic management techniques.

PLAN CONTENT AND ORGANIZATION

The Master Plan is organized into three chapters. Chapter Two is the PLAN chapter. Here you will find the proposed vision, goals, objectives, management prescriptions and development prescriptions, other management plans and policies as well as a plan for ongoing public involvement. A separate document provides an analysis of impacts of the plan, an overview of alternatives considered and their impacts, and finally a review of the public involvement.





THE PLAN

Vision, Goals, Management Provisions and Prescriptions, Land Management Classifications and Management Areas and Objectives

VISION STATEMENT

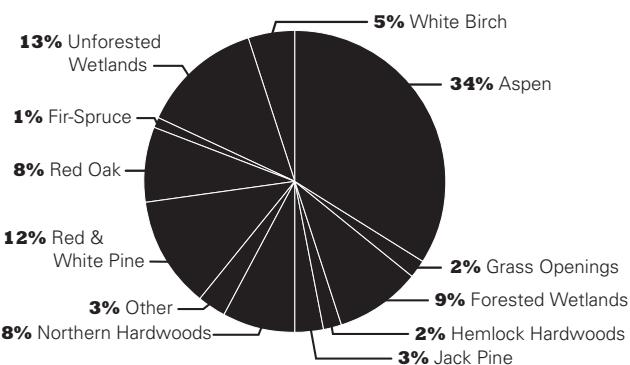
The Northern Highland-American Legion State Forest is a dynamic environment comprised of a variety of biological communities that contribute to the diversity of ecosystems in the region. The state forest provides a range of cultural, social, economic and ecological benefits, within its capabilities, for present and future generations. The unique, aesthetic character of the NH-AL State Forest and the quality of its waters are perpetuated and enhanced. The forest is managed in consultation with federal, tribal, local and other governments, and with other people who care about the forest, including those who live, work and recreate in and around it.

PROPERTY GOALS

1. Provide a diversity of terrestrial and aquatic biological communities, including a range of forest types and age classes, with emphasis on communities that are special to the Northern Highland-American Legion State Forest.
2. Maintain and enhance aesthetic qualities of the Northern Highland-American Legion State Forest.
3. Identify and protect endangered and threatened resources, historic properties, and areas of geological, archaeological or cultural significance.
4. Provide a variety of renewable forest products consistent with forest capabilities.
5. In consultation with tribal governments, provide for the availability and enhancement of treaty resources.
6. Provide a variety of recreational settings and activities, ranging from primitive to developed, consistent with resource capabilities.
7. Provide a diversity of hunting, trapping, fishing and wildlife viewing opportunities.
8. Protect and enhance wild resource values such as solitude, remoteness, and the sights and sounds of a natural environment.
9. Resolve or minimize conflict among different types of recreational uses and among various types of forest uses and management activities.
10. Provide a variety of educational opportunities for state forest visitors.

Vision, Goals and Overview

Figure 2.1 Current Cover Types on the NH-AL State Forest



OVERVIEW OF THE FOREST

The forests of the NH-AL are part of a complex ecosystem, with a mix of forest communities that provide habitat for a diversity of plants and animals. Most of the uplands have dry sandy soils that can support red and white pine, aspen, white birch, red oak, and jack pine forest communities. A few upland areas have richer loamy soils that support northern hardwood (sugar maple and yellow birch) or hemlock-hardwood forest communities. Most of the forest is young to middle-aged, while a few areas contain old trees and old growth characteristics. The many wetlands and lakes on the NH-AL help protect water quality and provide habitat for a variety of fish, birds, insects, and plants, including many rare species. About 75% of the NH-AL is uplands, 23 is wetlands, and 3% is unclassified.

Figure 2.1 shows the general plant community makeup on the NH-AL. For inventory purposes forest compartments are classified by their dominant cover type. This means that forest stands listed as aspen have 50% or more of its basal area in aspen trees. Most forest stands contain a mix of tree species. For example, an “aspen” area probably also has red and white pine, red oak, and white birch mixed in. Therefore, two forest stands with the same dominant cover type may not have the same overall forest composition.

LAND AND FOREST MANAGEMENT

The Land/Forest Management Section of the plan describes the management for the forests, wetlands, and other resource components of the NH-AL, except for wildlife and fisheries, which are in their own separate sections.

This section of the plan is divided into the following primary sub-sections:

1. General Land Management Provisions

A listing of forest-wide policies related to land management.

2. General Management Prescriptions for Each Primary Forest Type

Describes the standard management approach and techniques that will be used for each primary forest type, unless otherwise prescribed in an individual management area plan.

3. Individual Land Management Area Plans

The NH-AL is divided into 22 land management areas based on differences in resources, management potential, and management objectives. This section describes the specific management to occur in each area.



General Forest Management Provisions

A

GENERAL FOREST MANAGEMENT PROVISIONS

BIG TREE SILVICULTURE

As a result of a Governor appointed committee, timber management policies were reviewed and it was recommended that on state forest lands the recreational and aesthetic values of old growth and big trees be recognized. Criteria included species of tree, habitat type, cutting cycle, risk and vigor, regeneration harvest and residual basal area levels. These criteria are outlined in the Silviculture and Forest Aesthetics Handbook- 2431.5. (Sloan 1986)

Big Tree Silviculture would continue to be used in the management of the NH-AL. Big Tree Silviculture maintains older white pine, red pine, northern hardwood, hemlock-hardwood, and red oak on high quality sites.

FOREST PEST CONTROL

As stated in Wisconsin Statutes 26.30, "It is the public policy of the state to control forest pests on or threatening forests of the state..." Within the Northern Highland-American Legion State Forest significant forest pest events will be evaluated with consideration of the property management goals and the potential threat of the pest to other landowners. Responses to significant infestations may include timber salvage or pesticide treatments. Any response to a significant pest outbreak will be evaluated by an interdisciplinary team of scientists and communicated through press releases and notices to interested parties.

FOREST RECONNAISSANCE

The State Forest uses a forest inventory system to gather and record information on their lands. The database created from the inventory captures the physical description of these

areas (dominant forest cover type, soils, ecological attributes, stand origin, guidelines, restrictions and goals). Reports are then generated to show forest stands that are listed for management review. The acreage listed for review is considered the forest's "sustainable harvest" meaning that the lands are due for a decision regarding management. Some stands inventoried in the reconnaissance are excluded from management, for example, wilderness and wild lake zones and passive management zones. Forestry staff then examines stands potentially due for management and verifies the information with a field visit. If the stand is not ready for management, their information is updated in the reconnaissance database and rescheduled for another review in the future. Those areas not ready for management and rescheduled are considered managed and counted as part of the forest's sustainable harvest acreage. If the forested areas are ready for management, then the forestry staff consults with other Department programs such as endangered resources, fisheries, and wildlife to integrate a multifaceted approach to the proposed management and subsequent sustainable harvest. When setting up the management, forestry staff follow guidelines and best management practices.. After a management practice occurs the forest reconnaissance is updated.

In the future, the State Forest will be using a Continuous Forest Inventory system in conjunction with the reconnaissance system. The Continuous Forest Inventory will track growth, mortality, management and sustainable harvest of forested lands. This will allow for more concise management of state forest lands. Using the Continuous Forest Inventory system will not change the objectives stated in the master plan.

HERBICIDE USE

Approved herbicides may be used for various purposes on the forest, such as the control of invasive plants or to control plant competition in forest regeneration areas, except as restricted in the management prescriptions in this master plan. Prior to treatment, local governments and tribes will be informed of the

DIFFERENT TREES - DIFFERENT MANAGEMENT

Many different types of timber harvests and other vegetative management techniques are used, depending on individual site characteristics and the specific management objectives. For actively managed areas, the type of harvest used on any site is primarily determined by the requirements of the type of trees that are desired in the stand after the harvest. For example, aspen, white birch, jack pine need sunlight and open space to regenerate. So, clearcutting would be commonly used to regenerate them. On the other hand, northern hardwoods can grow in more shade and can not readily compete with more sun-loving trees. Selective harvesting is used on northern hardwoods to retain more of a tree canopy. Red oak stands are typically harvested in stages, leaving some older trees to drop acorns which sprout into young oak trees. In some cases ground disturbance, such as mechanical scarification, is needed to expose bare soil to encourage regeneration of species like jack pine and white birch. Prescribed burning may be used to manage some forest and barrens communities. Some species such as red pine and jack pine often are planted. On some site, particularly hemlock stands, passive management (no action) is the best tool.

General Forest Management Provisions

areas where herbicide will be applied. For the tribes the information will be provided to a designated tribal representative. Additional information will be provided upon request.

INVASIVE SPECIES CONTROL

Invasive nonnative aquatic and terrestrial plants have become recognized in recent years as a major threat to the integrity of natural areas, including the many lakes on the NH-AL. These species have the ability to invade natural systems and proliferate, often dominating a community to the detriment and sometimes the exclusion of native species. Invasive species can alter natural ecological processes by reducing the interactions of many species to the interaction of only a few species.

If detected on state lands, invasive exotic plants will be controlled using appropriate and effective methods, including but not limited to the use of herbicides, cutting, or hand removal. Control methods may be restricted in certain sensitive management areas. Before initiating control measures, refer to the management prescriptions for the area being treated.

BEST MANAGEMENT PRACTICES FOR WATER QUALITY

All management activities within the state forest would follow, as a minimum standard, the guidelines in the Wisconsin's Forestry's Best Management Practices for Water Quality (BMPs). A Field Manual for Loggers, Landowners and Land Managers, DNR publication PUB-FR-093-95.

ENDANGERED, THREATENED AND SPECIES OF SPECIAL CONCERN PROTECTION

Thirteen State or Federally Threatened Species, one State Endangered Species and seventy-nine Species of Special Concern Species were identified through inventories on NH-AL by the Endangered Resources program. All management prescriptions in the proposed master plan have considered the needs of these species and the potential impacts to the species and their habitat. Annual management actions being planned on the state forest are checked against an up-to-date database of listed species to assure that no department actions results in the direct taking of any known endangered or threatened resource. Please refer to the appendix for a listing of the endangered, threatened and species of special concern.

MANAGEMENT OF PINES AND ASPEN COVER TYPES

The long-term goal (150 years) of the NH-AL master plan is to increase the forest's composition of red and white pine in mixed stands. Other forest types, such as aspen, will dominate

stands on targeted sites as well as be a component of the mixed pine stands. Over the next 50 years the composition of the NH-AL will change very little, reflecting the slow pace of ecological change. During the same time period of this plan, the plan will result in a slight decrease in aspen and a slight increase of red and white pine dominated cover types. Stands classified as aspen or pine cover types contain 50 percent or more of its basal area in that species, not just a pure stand of the dominant tree species. For example, a stand labeled as aspen may have a mix of red and white pine, red oak, and white birch.

The slight increase in pine acreages will come from forest stands that are converted to pine through natural succession or are harvested to remove other species and favor natural pine regeneration. Some areas that see no management will convert naturally to white pine as short-lived species, such as aspen fall out through mortality. Examples of this are, the Wild Resources Area, Wilderness Lake zones, Wild Lake zones and passive management zones in Native Community Areas.

The reduction in aspen in the future will be primarily from active or passive management that favors alternative tree species to dominate the stands. Natural regeneration is the primary source of new stands but planting can also be a tool to convert stands. White pine or a mixture of pine and shade tolerant hardwoods and softwoods can grow to dominate stands after aspen dies or is removed. The Area objectives will determine where this will occur. It is a slow process that will take 100-150 years to achieve.

Please refer to Area management tables for specific details.

MANAGEMENT OF SMALL, SCATTERED OLDER STANDS OF RED AND WHITE PINE

Manage the small, scattered red and white pine stands with a year of origin of 1910 or earlier for old growth characteristics using active and passive techniques. (Old growth characteristics will begin to develop at age 150 to 180 years as some of the large trees begin to die and become snags and coarse woody debris.)

Unless active management is restricted, if appropriate lightly thin the stands to remove small and crowded trees to allow the age and structure of the remaining trees to increase. Entry into these stands should be at longer intervals than typical for areas managed under Big-Tree Silviculture. Regenerate these stands after they have established old growth characteristics and before the age when establishing regeneration would be a problem. In areas or zones designated as passive management only allow the stands to naturally regenerate. Passive management may be used in actively managed areas as deemed appropriate, particularly along

General Forest Management Prescriptions

shorelines, on small swamp islands, or for pine stands that are 150 or more years old.



GENERAL FOREST MANAGEMENT PRESCRIPTIONS, BY PRIMARY FOREST TYPE

For each forest-type there is a specific set of management techniques that favor the maintenance and regeneration of that type. The following describes the general management prescriptions to be used for each primary forest type on the NH-AL. Each prescription will be applied wherever management for that specific forest type is an objective, as stated in the individual management area plans later in this chapter. The individual management area plans may modify or limit these general prescriptions to fit the area.

ASPEN DOMINATED MIXED FOREST

This forest type is an early successional forest that requires disturbance and abundant sunlight to regenerate. It typically will be managed with clearcuts and modified clear cut harvests of various shapes and sizes occurring at intervals of 45-60 years to maintain this forest type.

General Management Prescriptions

Depending on whether the stand is pure aspen or a mixed aspen community, different management activities will be used to move the forest toward the future desired state.

- When planning individual management actions, consider the ecological values through a landscape view of aspen's role on the NH-AL. A variety of age classes and stand sizes across the landscape provide value to wildlife and aesthetics. Some considerations in landscape planning include the age classes and patch sizes across the landscape, the natural disturbance regime in the area, the surrounding cover types and management.
- Harvest and regenerate aspen naturally, primarily through clearcutting. In stands where the objective is to develop or maintain mixed species the primary management strategy to use "coppice with standards", which means to harvest aspen trees but retain individual red oak, red pine, and white pine trees within a stand. This allows the remaining oak and pine trees to provide seed to the area thus increasing the diversity of the stand.
- Harvest aspen, white birch, red maple and other short-lived species in the stand, leave red oak, red pine, white pine and individual trees of high value to wildlife, forest diversity and aesthetics.

- Research alternative regeneration techniques for the aspen cover type. Specifically, determine if selective harvest or disturbance may reduce aspen root-sprouting and encourage growth of remaining trees, and if such techniques will help convert some aspen stands to other desired species.
- In aspen stands along lake and stream borders, road aesthetic strips, or as islands in wetlands, as appropriate, modify the standard management practices or apply no management to meet the management objectives for these areas.

RED AND WHITE PINE DOMINATED MIXED FOREST

This forest type occurs in a wide range of current conditions that require a range of management intensities and a variety of techniques. Some soil disturbance is required for successful regeneration of these pine species.

General Management Prescriptions

Depending on the origin and composition of the red and white pines, several management activities will be used to manage pine forests toward future desired condition of increased pine composition and mixed species stands.

- Where red and white pine are of natural origin and the primary cover type, use selective to harvests maintain the health, vigor and growth of the pines. Remove selected individuals or small groups to maintain species diversity and structural diversity. At biological maturity (140-250 years red pine, 150- 350 years white pine) harvest pine and replant or naturally regenerate. Clearcutting, seed tree harvest and overstory release may be used depending on site conditions. Stand considerations, seed sources, and site prep needs will determine the appropriate management action to use.
- Plant red and white pine plantations as needed to maintain pine on sites or to convert other forest types to pine. Hand or machine plant nursery stock seedlings following site preparation by mechanical and herbicide application. Use hand or herbicide release following planting to maintain growth and vigor of planted pine trees and increase survival of planted trees.
- Thin pine plantations (red, white, possibly jack) on a recurring basis (8-20 year intervals), according to prescriptions outlined in the DNR Silviculture and Forest Aesthetics Handbook, to gradually create a structure similar to that of a naturally appearing pine stand.
- Mixed pine stands containing a large percentage of tree species other than pine may be treated with selection harvest, shelterwood harvest or overstory removal of other species to promote pine to dominate the future stand or increase the numbers of pine in natural regeneration after harvest. Several harvest entries may be

General Forest Management Prescriptions

required to bring pine to a dominant position.

- Where red and white pine is a viable understory component, use natural regeneration techniques. Plant pine if natural regeneration fails or is not possible.
- Leave scattered large red and white pine in many harvest areas if they are healthy and do not pose a risk to humans or forest health (Big Tree Silviculture).
- Ground disturbance or prescribed fire may be used to promote regeneration of red or white pine where feasible and safe.

RED OAK DOMINATED MIXED FOREST

Oak forests historically developed or regenerated following a significant disturbance event such as fire or blow-down and fire. Much of the current red oak developed following the large scale cutover and wildfire era in the early 1900's. Red oak may be encouraged on sites with appropriate soil, slope and other conditions. This forest type has high value to a wide number of game and non-game wildlife species. Disturbance is required to regenerate existing stands and to maintain an oak component in mixed stands.

General Management Prescriptions

- Use thinnings to develop oak stands as they near biological maturity, and use shelterwood and selective cuts to regenerate this species. Regenerate red oak at 90-150 years of age, depending on site characteristics. Other management techniques that may be applied when needed to red oak stands include single tree selection, clear-cuts with reserves, scarification, hand-release and herbicide treatments to promote regeneration. A diverse stand is a good goal of regeneration. Oak is typically harvested through the shelterwood method. In a shelterwood harvest, about 30-40% of the mature trees are harvested, depending on site characteristics, to allow for sunlight and the regeneration of young oak trees. After the young oak trees have regenerated, about 10 to 15 years later, the majority of the mature trees are harvested, while maintaining 5 to 10 old trees for age and structural diversity and wildlife.
- On mixed stands of red oak with white pine, northern hardwoods or other species manage to promote components of older long-lived trees and natural regeneration of these species and other secondary species.
- On nutrient poor droughty soils with scrub oak stands, use clearcutting to regenerate a component of oak along with aspen/white birch/jack pine. (Some individual management area prescriptions call for converting such sites to jack pine.)

JACK PINE DOMINATED FOREST

This is an early successional forest type that requires disturbance and full sunlight conditions to regenerate. Historically, jack pine stands regenerated following fire or insect infestation/fire events. Harvest and ground disturbance not only provide for good regeneration of jack pine but also support the development of a diverse mix of grasses, forbs and shrubs, which are important during successional stages of this forest community.

General Management Prescriptions

- On dry sites, clear-cut jack pine at biological maturity (50-80 years) and use appropriate means to regenerate the stand. Clear-cutting and planting, mechanical scarification or fire may be used. Currently planting is the most effective method for maximum survival of Jack Pine because of the quality of the seedlings and an initial advantage over the competing vegetation. Establish Jack Pine plantations as necessary to maintain pine on sites or to convert other forest types to Jack pine. Prepare the site using mechanical and herbicide treatment, then follow-up with hand or machine planting of nursery stock seedlings. Use hand or herbicide release following planting to maintain seeding growth, vigor, and to increase the survival rate.
- On mixed stands of jack pine, aspen and white birch, clear-cut harvest to regenerate a mixed stand or planted to jack pine.

WHITE BIRCH FOREST

White birch was one of the top 3 species present on the NH-AL prior to European settlement and was another early successional forest type that came in strongly following the fires of early 1900's. White birch requires mineral soil for a proper seedbed to germinate seed, and it is a highly drought sensitive species. Many of the white birch stands are mature and declining. To maintain this forest community in the landscape, harvest followed by active management is the most effective method. Harvest and ground disturbance provide for good regeneration of white birch as well as development of a diverse mix of grasses, forbs and shrubs important during successional stages of this forest community.

General Management Prescriptions

- Regenerate white birch by clearcutting stands, strip cutting, shelterwood harvest or by modified clear-cuts that open up stands. Typically use ground disturbance during harvest, mechanical scarification, or prescribed fire to prepare the forest floor for white birch seed germination.
- On mixed stands of white birch and other species use selection harvest, shelterwood harvest, and clear-cut harvest, as appropriate, for diverse natural regeneration. Harvest mature white birch in areas where another forest type is the primary objective.

General Forest Management Prescriptions

- Where white birch is an associate in aspen stands, clear-cut harvest the birch along with aspen. (White birch can stump sprout from healthy cut trees and can seed in on soils that are exposed by mechanical methods along with the aspen regeneration.)

NORTHERN HARDWOODS FOREST

This forest type is managed as an all-aged forest stand. Most of the hardwoods will be managed to diversify tree ages, sizes and types of tree species in each stand as specified in the individual the management area plans.

General Management Prescriptions

- Use selection harvest as the primary management tool, and vary harvest intensity according to site specific conditions and needs. Plan harvests to maintain or increase species diversity in these stands.
- Depending on the objectives of a particular management area, more intensive silviculture systems such as shelterwood harvest, group selection, or gap creation may be used on some sites. These techniques may be applied to an entire stand or to parts of a stand in conjunction with a selection harvest.
- Manage mixed Pine-red oak-aspen-northern hardwood stands through a wide variety of active techniques, depending on site conditions and the management objectives for the area.
- Where northern hardwoods are to be maintained, generally schedule management entries at intervals of every 15-20 years. To develop a northern hardwood stand with many age classes, evaluate the regeneration, spacing, density and other stands conditions. Harvests can take place at every interval but will be less intense than at the initial entry.

HEMLOCK - HARDWOOD FOREST

This forest community is represented by generally small, mostly older stands scattered throughout the NH-AL. Overall, these areas would be maintained as they exist and regeneration will be encouraged where appropriate. Most hemlock stands would not be actively managed but some may see selective harvest of other species in the stand to enhance existing hemlock and promote hemlock regeneration.

General Management Prescriptions

Because of the low acreage and scattered presence of the hemlock-hardwood forest, very little will be done to manage this community.

- Use passive management as the dominant management system on these stands. Where needed, selectively harvest competing species to remove them from mixed hemlock-hardwood stands. Retain hemlock

in northern hardwood and other stands to promote diversity and maintain seed sources for potential natural regeneration.

- On a periodic cycle, monitor hemlock-hardwood stands for growth, regeneration and the presence of invasive plants.
- The richer soils of this northern forest type can support larger white birch trees that can be useful to tribal gathering of bark. Management will preserve appropriate individual trees and communicate this to tribal members.

FORESTED AND UNFORESTED WETLANDS

The forested wetland areas typically contain stands of swamp conifer (black spruce, tamarack, white cedar and associated tree species). They can be pure stands of individual species or combinations of two or more tree species. Also included in this category are swamp hardwood stands. Examples of these are black ash, red maple and other species that occupy a wet forest environment. The unforested wetlands are represented by large areas of sphagnum peat and open bogs as well as alder thickets and marshes.

General Management Prescriptions

- No management activities will be conducted within wetlands with small sized slow growing trees, lowland brush, or areas of open bog and marsh. (Note: these vegetation types make up most of the wetland acreage.) However, access across these stands on a frozen ground temporary road may be required.
- Productive stands of swamp hardwood, primarily black ash, may be regenerated by limited harvesting (create partial openings or use shelterwood cuts) following the guidelines in the DNR Silvicultural and Forest Aesthetics Handbook.
- Productive stands of tamarack and black spruce may be regenerated by limited harvesting of stands (clear-cut) following the guidelines in the DNR Silvicultural and Forest Aesthetics Handbook and in consultation with an integrated team of scientists.
- Conduct timber harvests on forested wetlands only under frozen ground conditions to prevent rutting and potential damage to organic soils.
- Retain all white cedar.

Land Management Areas

The NH-AL has been divided into 22 Land Management Areas. (See Index Map: **Land Management Areas**). Each Management Area describes a unique landscape or management focus based on differences in soil, forest community, and other factors. These characteristics help shape the recommended management direction for each area.

LAND MANAGEMENT CLASSIFICATIONS AND AREAS

Forest Production Areas

AREA 1: Vinegar Moraines

AREA 2: Manitowish Peatlands

AREA 3: Vilas Sandy Plains North

AREA 4: Vilas Sandy Plains Central

AREA 5: Big Arbor Vitae Loamy Hills

AREA 6: Oneida Sandy Plains

Habitat Management Area

AREA 7: Ruffed Grouse Demonstration Areas

Native Community Management Areas

AREA 8: Lake Laura Loamy Hills

AREA 9: Hemlock Hardwoods

AREA 10: Peatland Wetlands

AREA 11: Red and White Pine

AREA 12: Mixed Forest

AREA 13: Special Aquatic

AREA 14: Johnson lake Barrens

Scenic Management Areas

AREA 15: Manitowish River

AREA 16: Rustic Road

Wild Resource Area

AREA 17: Manitowish Wild Resource Area

Special Management Areas

AREA 18: Trout Lake Administration

AREA 19: Woodruff Administration

Recreation Management Areas

AREA 20: Crystal Lake

AREA 21: Bittersweet

AREA 22: Clear Lake

Each Management Area has Area-specific short and long-term objectives that articulate the future desired condition of each area within that areas ecological capabilities. Because forests and landscapes change slowly, actions taken (or not taken) over the next 15 years may require 50-100 years to affect the forest as a whole.

Each Land Management area contains the following information:

- Map of Individual Area
- Pie chart showing percent of area in each major cover type
- Short and Long Term Objectives
- Management Prescriptions

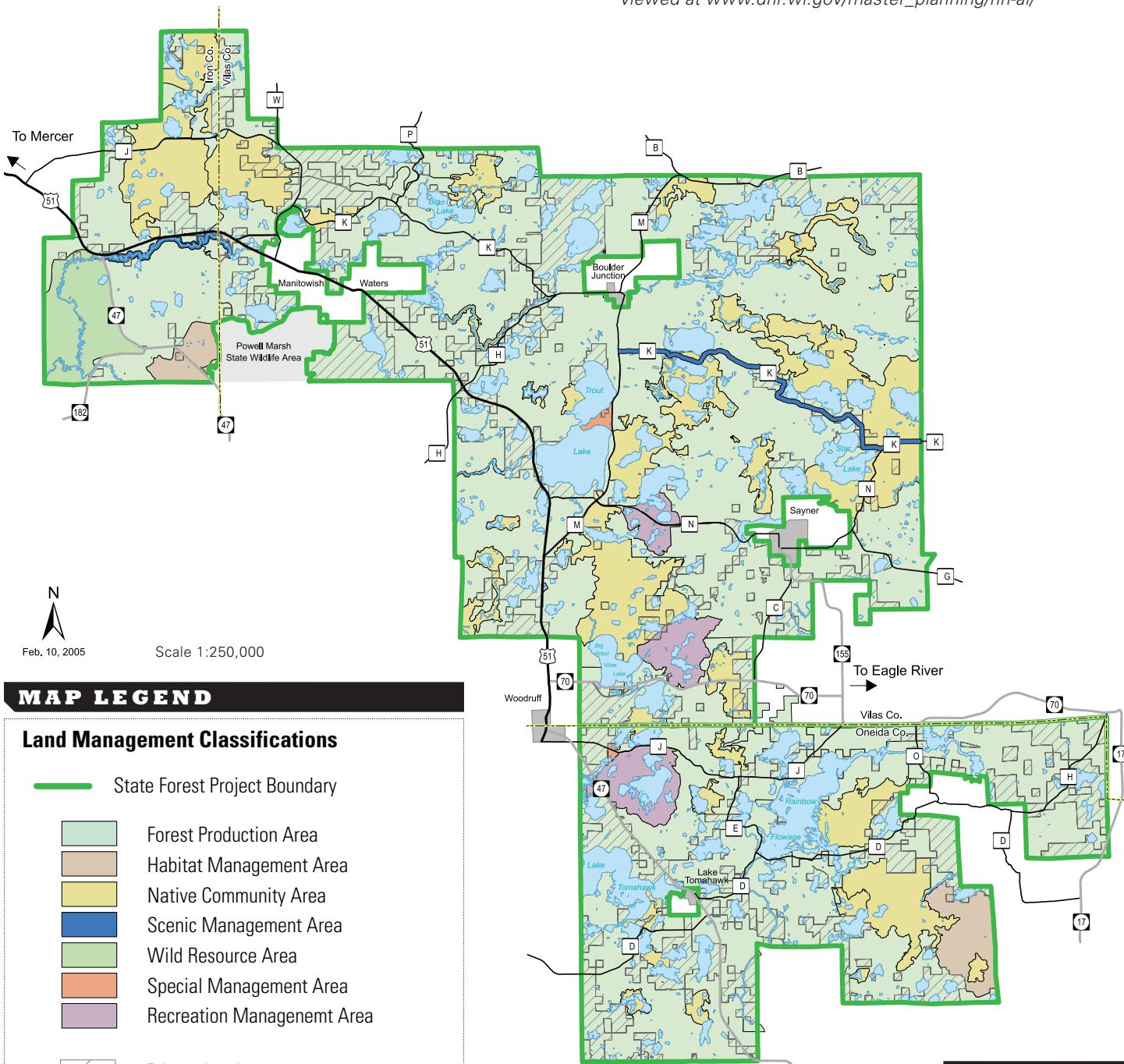
The General Forest Management Prescriptions given earlier in this chapter outline the standard management practices to be used for each forest type (e.g. aspen, white/red pine, northern hardwoods). However, as the management objectives and needs vary from area to area, the individual area management prescriptions may be modified from the standard prescriptions.

New land acquisitions will be classified under the land management classification system outlined in Wisconsin Administrative Code NR 44.05. State forest staff will base the classification of the acquisition on the ecological suitability and state forest management objectives.

Land Management Areas

Northern Highland-American Legion State Forest - Land Classifications

A color version of this map is located in the Appendix or viewed at www.dnr.wi.gov/master_planning/nh-al/



MAP LEGEND

Land Management Classifications

- State Forest Project Boundary
- Forest Production Area
- Habitat Management Area
- Native Community Area
- Scenic Management Area
- Wild Resource Area
- Special Management Area
- Recreation Management Area

- Private Land
- Municipality
- County Boundary
- U.S. Highway
- State Highway
- County Highway
- Open Water

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

LOCATOR



Within the NH-AL, there are six Forest Production Areas. These Areas include:

AREA 1: Winegar Moraines

AREA 2: Manitowish Peatlands

AREA 3: Vilas Sandy Plains North

AREA 4: Vilas Sandy Plains Central

AREA 5: Big Arbor Vitae Loamy Hills

AREA 6: Oneida Sandy Plains

The management objectives of a forest production area is the sustainable production of timber and other forest products. The objectives for any given management area may vary depending on site capability, timber types, markets, and societal needs. Desired associated benefits, the desired future conditions, adjacent land uses and local economic conditions all influence the objectives.

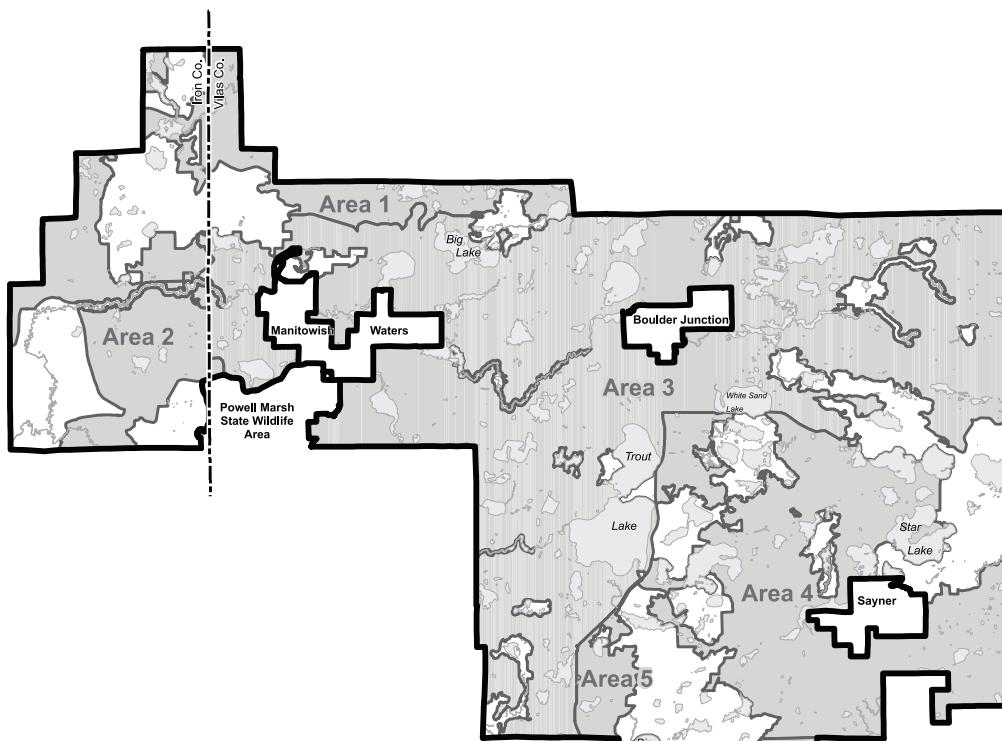
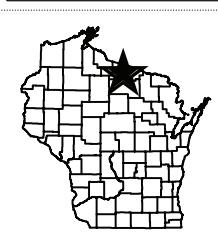
Examples of timber management activities and techniques include clearcutting, selection harvesting, thinning, and other routine stand improvement activities (i.e., pruning, non-commercial thinning, crop release and the elimination of competing trees, shrubs, vines and grass) Timber stand improvement refers to management practices for the purpose of improving the overall rate of growth. Herbicide application, mowing, burning, and planting in addition to accomplishing the previously mentioned, may also be used to assist with erosion control and road construction (WDNR 2001).

While managing for timber products, ecological attributes that are characteristic of older forests are maintained within forest production areas. Also, in areas of high recreation use and where site conditions allow, timber is managed in a manner that promotes long-term visual appeal (WDNR 2001).



Forest Production Management Areas

INTRODUCTION

**AREAS
1-6****MAP 1: FOREST MANAGEMENT CLASSIFICATION AREAS****LOCATOR**

Scale 1:400,000

MAP 1 LEGEND

— State Forest Project Boundary

Forest Production Management Classification Areas

- Area 1. Winegar Moraine
- Area 2. Manitowish Peatlands
- Area 3. Vilas Sandy Plains North
- Area 4. Vilas Sandy Plains Central
- Area 5. Big Arbor Vitae Loamy Hills
- Area 6. Oneida Sandy Plains

— County Boundary

Open Water

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

**AREA
1****Forest Production Management Areas**
WINEGAR MORAINES

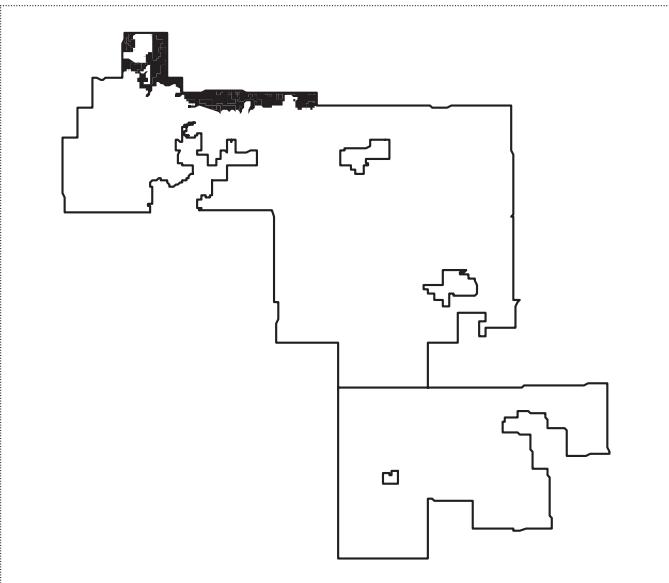
The Winegar Moraines Ecological Landscape is located at the northwest "top" of the NH-AL and is considerably more widespread in the proposed northern boundary expansion. Only a small portion of this landscape is currently in state ownership. The predominately loamy soils and hardwood forests of this area are uncommon within the state forest. The topography of the Winegar Moraines is predominantly rolling, with abundant wetlands and many lakes. It is characterized by heavier soils that support northern hardwoods and hemlock-hardwoods with associated herbs such as wild lily-of-the-valley, lady fern, shield fern, grasses and sedges, and big leaf aster, with a poorly developed shrub layer. Soils are mostly well drained sandy loams, silt loams and organic deposits.

At European settlement, the uplands were mostly covered with hemlock/yellow birch, with sugar maple as a secondary species which reflects primarily a disturbance pattern of frequent small blowdowns, infrequent large blowdowns and extremely rare catastrophic fires. The drier sites in the area included white birch and white pine with secondary aspen, red pine, yellow birch and sugar maple which reflects a greater frequency of fire disturbance on these sandy soils. Within the forested wetlands, tamaracks dominated, with black spruce as a secondary component.

Within the current state ownership of this ecological area, the highest quality sites of northern hardwoods and hemlock hardwoods have been proposed as Native Community Management Areas and are described in Area 9 – Hemlock Hardwoods. The remaining state forest land in this management area is more fragmented by private ownership and is dominated by aspen, poorer quality northern hardwoods and wetlands.

AREA 1 SUMMARY

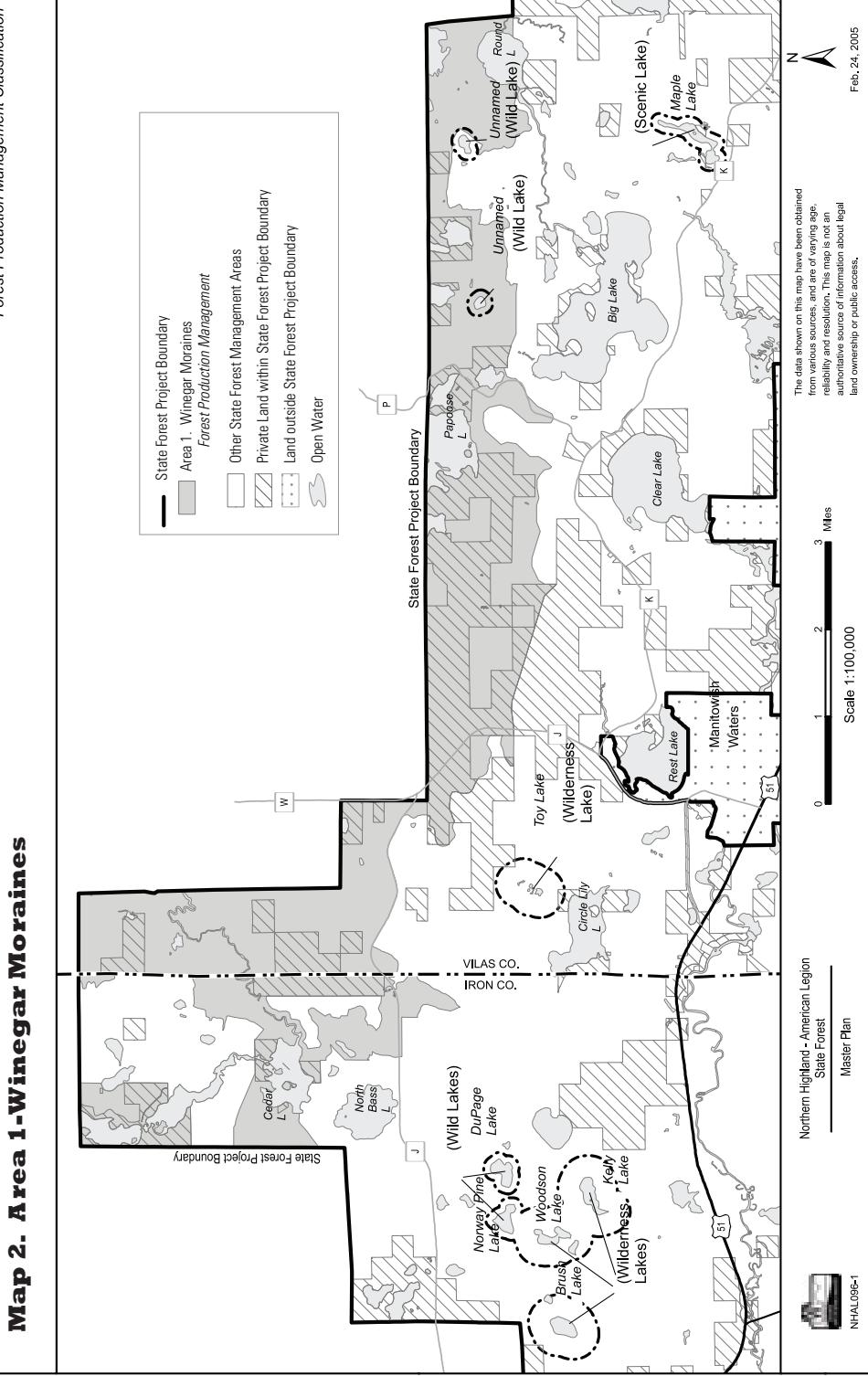
- ▲ This area is approximately 10,523 acres in size with 4,918 acres in state ownership.
- ▲ Most of the northern boundary expansion would be in this ecological type.
- ▲ Opportunity to complement management of northern hardwood and hemlock-hardwood communities in adjacent Hemlock Hardwood Native Community Management Area.
- ▲ Conservation of forested and unforested wetlands that provide habitat for many rare species and help protect water quality.

AREA 1 LOCATOR MAP

Forest Production Management Areas**AREA
1**

WINEGAR MORAINES

Forest Production Management Classification

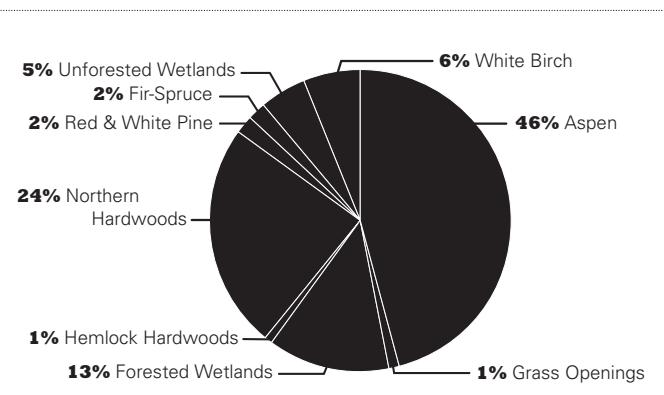
Map 2. Area 1-Winegar Moraines

**AREA
1****Forest Production Management Areas****WINEGAR MORAINES****LONG-TERM OBJECTIVES
(100 YEARS)**

- Maintain and enhance existing stands of northern hardwoods to increase age diversity and to maintain stand health and vigor.
- Manage at a landscape level considering how these lands can compliment the objectives in the adjacent Hemlock Hardwood Native Community Management Areas.
- Maintain areas of early successional forest (aspen, white birch) in mixed forest stands.
- Maintain diversity of forested and unforested wetlands.

**SHORT-TERM OBJECTIVES
(50 YEARS)**

- Develop a diversity of ages and stand sizes for aspen, white birch and northern hardwoods.
- Retain and encourage yellow birch, white pine and hardwood components on aspen dominated sites. Some harvesting of these species is permitted to meet stand goals.
- Maintaining diversity of forested and unforested wetlands. Some black spruce and tamarack stands would be regenerated through active management. Priorities are in biologically mature stands on productive sites that can be regenerated by recommendations outlined in the General Management Prescriptions section.
- Manage a small reduction of aspen acreage to northern hardwood stands.
- Increase northern hardwoods with active management from aspen, white birch and fir-spruce cover types. Manage these stands for multiple age classes, tree sizes and a diversity of tree species.
- Encourage white pines, red pine components in natural stands and manage plantations for biological maturity.
- Maintain hemlock-hardwood stands at existing levels and encourage scattered hemlock in all stands.

AREA 1 CURRENT LAND COVER**RESOURCE MANAGEMENT
PRESCRIPTIONS**

Please see the General Management Prescriptions at the beginning of this section for general management prescriptions by forest type. The General Management Prescriptions apply and all management activities are authorized, except as noted below for this management area. The richer soils and northern hardwood component make this area different than most of the rest of the NH-AL.

- Clearcut harvest aspen maintaining the current mosaic of size and age class within the aspen forest type, and retain groups or individuals of northern hardwoods, pine, spruce, or oak to promote a mix of tree species on these sandy soils.

This Management Area may contain designated Wilderness Lakes, Wild Lakes, and Scenic Lakes. The land management surrounding these lakes must be consistent with the management objectives and prescriptions for the respective lake designation. The list and map of Wilderness, Wild, and Scenic lakes as well as their objectives and prescriptions can be found in the Lake Management Zone section.

Forest Production Management Areas**AREA
1**

WINEGAR MORAINES

Table 2.1. Area 1 – Winegar Moraines, Current and desired future conditions for community types in acres and percent of total.

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Acres
Aspen	2,259	46%	2,209	45%
Grass openings	57	1%	57	1%
Forested wetlands	623	13%	623	13%
Hemlock Hardwood	75	1%	75	2%
Northern hardwoods	1,175	24%	1,348	27%
Red & White pine	93	2%	100	2%
Fir-Spruce	92	2%	42	1%
Unforested wetlands	264	5%	264	5%
White birch	280	6%	200	4%
TOTAL	4,918	100%	4,918	100%

Northern hardwood community type increased due to decrease in aspen, white birch, and fir-spruce community types

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.



**AREA
2****Forest Production Management Classification**
MANITOWISH PEATLANDS

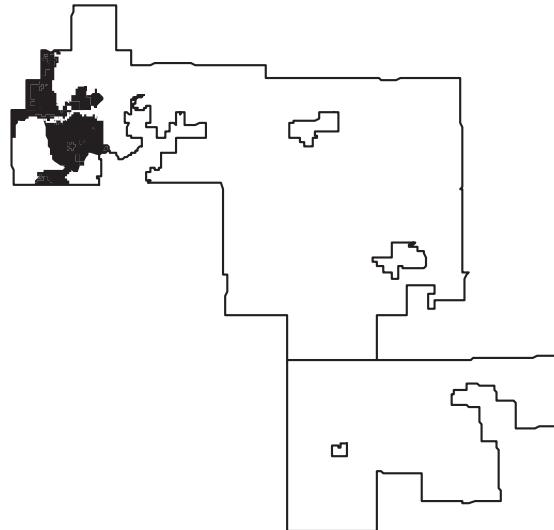
This 15,000 acre area is part of one of Wisconsin's largest peatlands, and covers a significant portion of the Manitowish – Turtle – Flambeau river watershed. The topography is nearly level throughout. Soils are mostly very poorly drained organic peat.

This area is a complex, diverse mosaic of different tree species and communities, and the lowlands are very much the way they were before European settlement. The area's vegetation is characterized by large expanses of lowland communities, including open bog, poor fen, black spruce, swamp hardwoods and tamarack. Many of the lowland areas contain sandy "islands" that are forested mainly with scattered red, white and jack pine. Some areas have sandy and loamy sand soils. Unforested wetlands dominate approximately half of the area. Forested wetlands, the majority of which are unmerchantable tamarack and black spruce, are scattered across the landscape. Aspen, white birch, red pine and white pine are found in significant amounts on the uplands. There are also areas of northern hardwoods and hemlock-hardwoods. Most stands are a mixed mosaic of tree species.

At European settlement, the vast majority of the area was dominated by swamp conifers and open wetlands, with the northern portion of uplands associated with hemlock, white birch, and white pine, while the southern areas had more red pine, white pine, and aspen. Within the forested wetlands, tamarack was predominant, with black spruce, swamp hardwoods and white cedar forest also present in significant numbers. Historically, fire was a significant disturbance factor within this area, as it was in almost every area on the NH-AL. In addition to fire, windthrow was and continues to be a major influence due to the shallow roots of trees associated with high water tables.

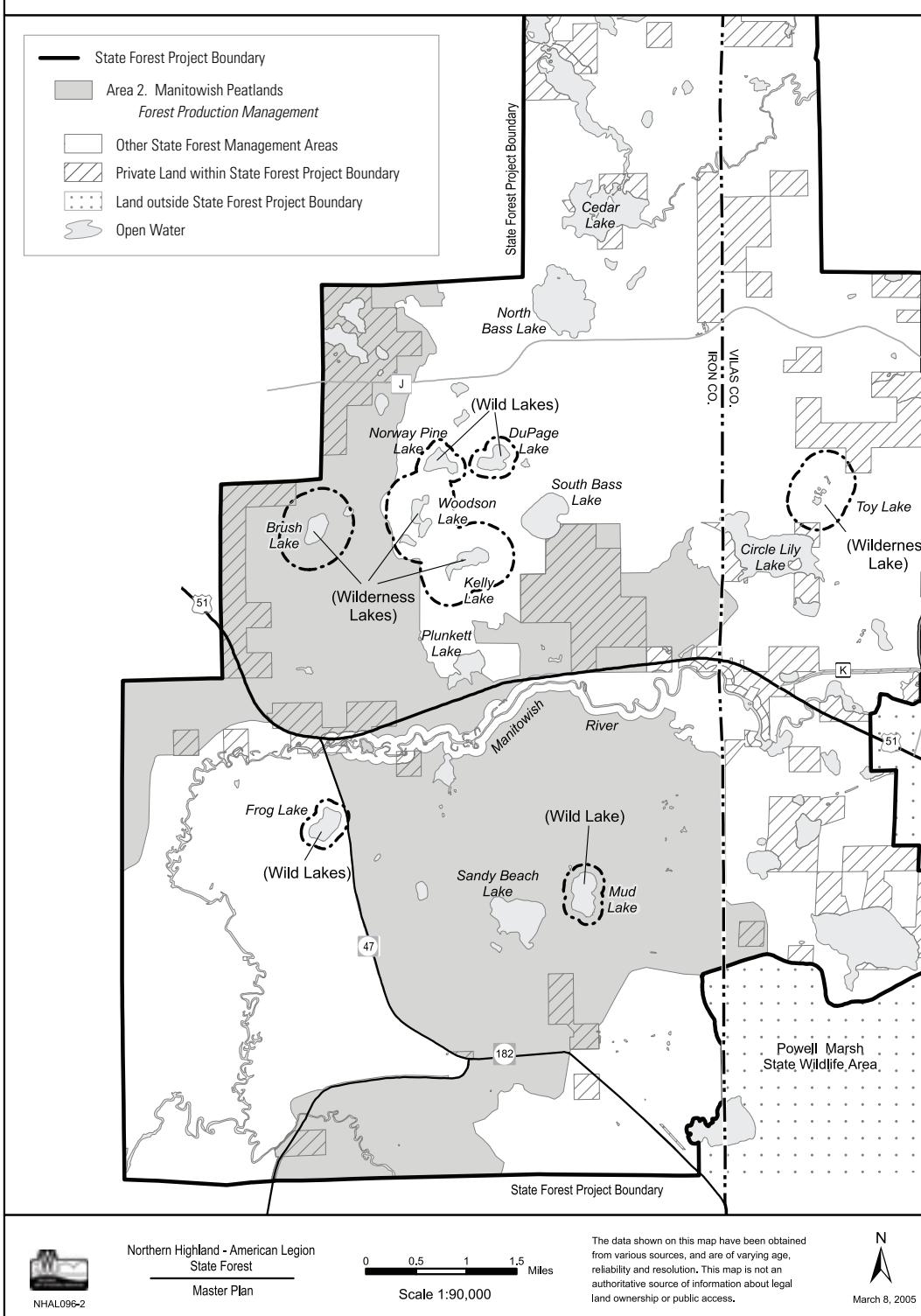
AREA 2 SUMMARY

- ▲ This area is approximately 14,966 acres in size with 12,220 acres in state ownership.
- ▲ Opportunity to maintain the high quality open sedge meadow, bog, shrub and forested wetland system for ecological, water quality and habitat values.
- ▲ Conservation of wetland habitat for many rare species.
- ▲ Management for "islands" of mature pine and hemlock within a complex mosaic of wetland communities.

AREA 2 LOCATOR MAP

Forest Production Management Classification**AREA
2****MANITOWISH PEATLANDS**

Forest Production Management Classification

Map 3. Area 2 - Manitowish Peatlands

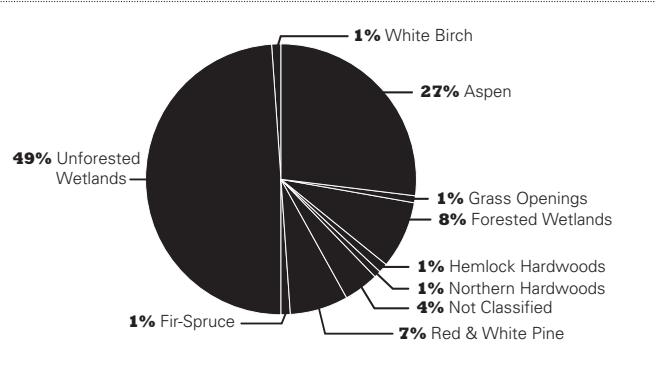
LONG-TERM OBJECTIVES (100 YEARS)

- Maintain the high quality open sedge meadow/bog, shrub and forested wetland system primarily for ecological, water quality and habitat values.
- Maintain a diversity of forested and unforested wetlands. The small patches of existing old growth pine and hemlock-hardwoods would be maintained, and expanded where possible.
- A larger portion of the upland area would maintain a variety of successional forest types and stages. Early successional types (aspen, white birch and fir) would be managed at economic age maturity. Later successional stages of long-lived trees (hemlock hardwoods, northern hardwoods, and red and white pine) would be managed to their biological mature ages (Eckstein, 2001).

SHORT-TERM OBJECTIVES (50 YEARS)

- Encourage forest management practices and the production of forest products that sustainably meet the needs of current generations while providing adequate resources to meet the needs of the future.
- Maintain red and white pine communities where possible. There are many small scattered stands existing as islands in wetland communities that are challenges to access. Plantations will be managed at biological maturity and replanted back to pines.
- Increase acres of Northern Hardwood stands with management as mixed stands of white birch and 'not classified' acreages are harvested. Most Hemlock-Hardwood stands will not be managed or will use special techniques to attempt hemlock regeneration.
- Maintain aspen stands using General Management Prescriptions.
- Unforested-Wetland community's long-term objectives would be met through passive management in most areas.
- Regenerate black spruce and tamarack stands through active management.
- Access across some wetland areas in a frozen ground condition may be required in certain circumstances.

AREA 2 CURRENT LAND COVER



RESOURCE MANAGEMENT PRESCRIPTIONS

Please see the General Management Prescriptions at the beginning of this section for information on general management prescriptions by forest type. The General Management Prescriptions apply and all management activities are authorized, except as noted below for this management area.

- Establish dead tree snags of early successional species and coarse woody habitat by leaving selected aspen, white birch, balsam fir and red maple trees in harvest areas.
- Some of the wetland areas in this management unit will be passively managed and some will be actively managed. Place heavy emphasis on protection of the streams, waterways and watersheds in this area. Temporary road access across some of these wetlands may be required. To protect wetlands during timber harvests, temporary road access across wetland areas would only be allowed when there are frozen ground conditions.

This Management Area may contain designated Wilderness Lakes, Wild Lakes, and Scenic Lakes. The land management surrounding these lakes must be consistent with the management objectives and prescriptions for the respective lake designation. The list and map of Wilderness, Wild, and Scenic lakes as well as their objectives and prescriptions can be found in the Lake Management Zone section.

Forest Production Management Classification

MANITOWISH PEATLANDS

**AREA
2**

Table 2.2 Area 2 – Manitowish Peatlands, Current and desired future conditions for community types in acres and percent of total.

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Acres
Aspen	3,350	27%	3,317	27%
Grass openings	108	1%	108	1%
Forested wetlands	1,008	8%	1,008	8%
Hemlock Hardwood	105	1%	105	1%
Northern hardwoods	90	1%	190	2%
Not Classified	452	4%	212	2%
Red & White pine	886	7%	886	7%
Fir-Spruce	180	1%	180	1%
Unforested wetlands	5,914	49%	6,114	50%
White birch	127	1%	100	1%
TOTAL	12,220	100%	12,220	100%

Future acres of unforested-wetlands increased from the Not Classified category being re-classified to unforested wetlands

** Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.*



**AREA
3****Forest Production Management Classification****VILAS SANDY PLAINS NORTH**

The rolling pitted outwash topography, sandy soils, and abundant lakes in this large area represent the most common landscape features of the NH-AL. This area, along with Areas 4 and 6, makes up the Vilas-Oneida Sandy Plains ecological landscape. Area 3 has 62,600 acres of state-owned land.

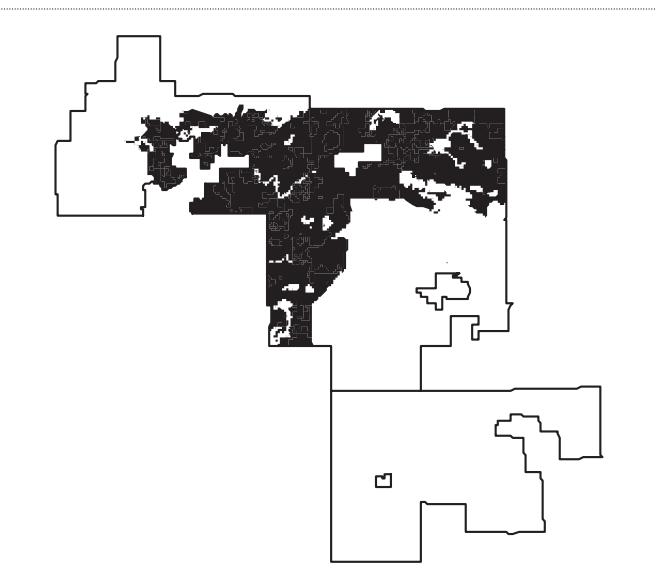
Currently, aspen dominates many areas, with red oak, white birch, red pine, and jack pine existing in significant amounts. The landscape is a forest of various covertypes with large and small patches of different dominant tree species. Even though forest stands are labeled according to the dominant tree species, most forest stands here are highly diverse. For example, white pine is present in most aspen stands as scattered large trees and understory seedlings or saplings. Common understory plants include shrubs such as hazelnut, juneberry, low sweet blueberry, sweetfern, and maple-leaf viburnum, and herbs such as wild lily-of-the-valley, bracken fern, grasses and sedges, and big leaf aster. As is common across the NH-AL, unforested wetlands, lakes and streams are found throughout the area. Most of the rare and listed species found on the NH-AL inhabit these wetland and aquatic habitats.

At European settlement, this area was mostly covered with white and red pine. White birch and aspen were found as secondary components, with some patches of jack pine and northern hardwoods. This historically fire influenced mixed forest was composed of many stands 50-200 years old with some trees surviving as old as 300 years. Within forested wetlands, tamarack was the dominant species with black spruce commonly found throughout. Hemlock and white pine were minor components in forested wetlands.

Note: The Partridge and Frank Lake Wild Areas (1982 Plan) located in this Area are redesignated as Semi-Remote Areas to follow the new master planning code requirements and to better describe the recreational experience and management practices found in these areas. Please refer to the Semi-Remote description in the Recreation Section of this document for more details.

AREA 3 SUMMARY

- ▲ This area is approximately 100,985 acres in size with 62,600 acres in state ownership.
- ▲ Characteristic sandy, pitted outwash topography.
- ▲ Increase red and white pine as a dominant community in some areas and as a greater component in other areas over the long term.
- ▲ Maintain aspen as a strong component in mixed stands across the landscape and as the dominant of more diverse stands.
- ▲ Maintain a diversity of habitat conditions to support harvestable populations of the major forest game species including white-tailed deer, black bear, ruffed grouse, American woodcock, and snowshoe hare.
- ▲ Conservation of forested and unforested wetlands that provide habitat for many rare species and help protect water quality.

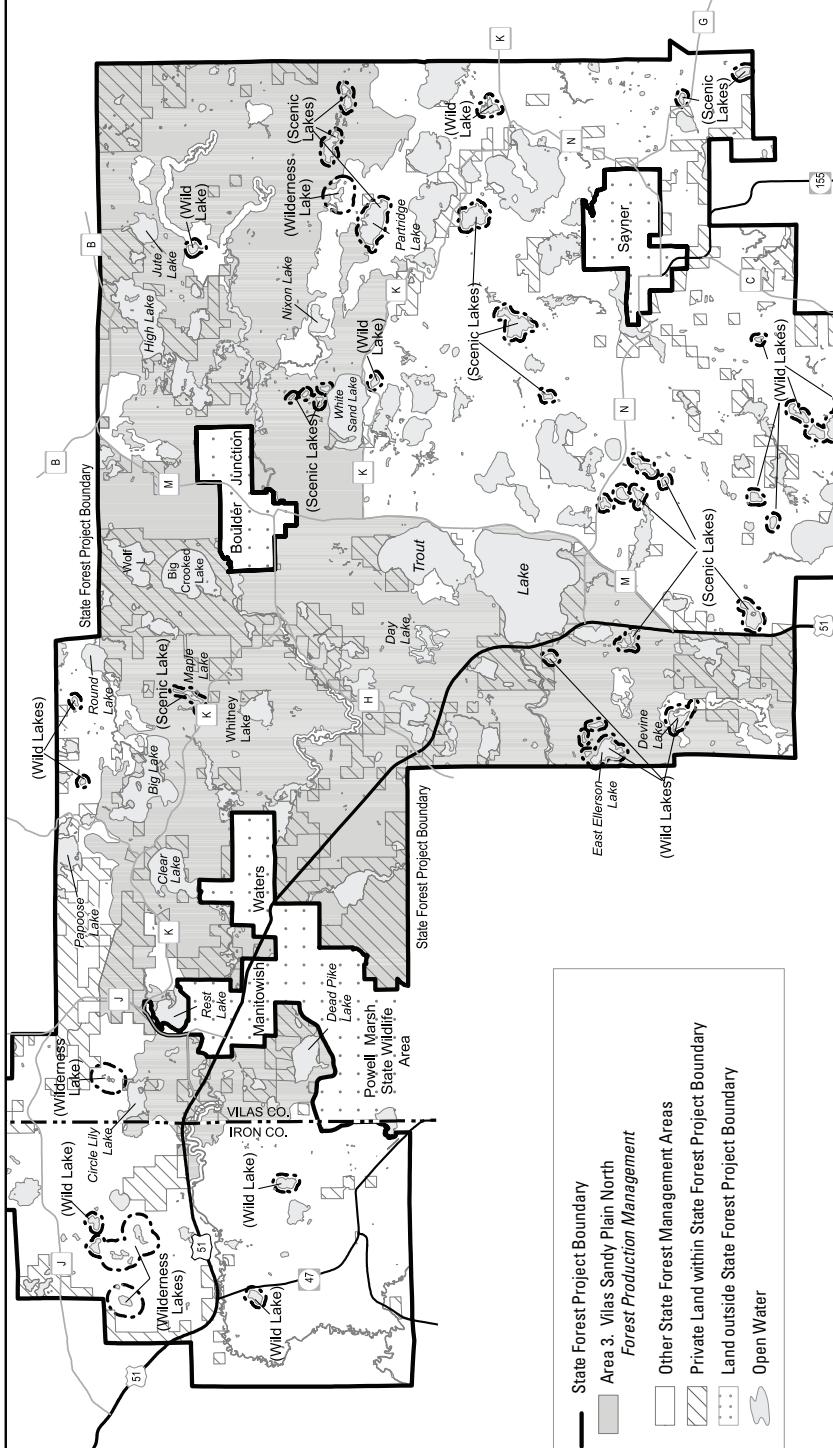
AREA 3 LOCATOR MAP

Forest Production Management Classification

VILAS SANDY PLAINS NORTH

**AREA
3**

Forest Production Management Classification

Map 4. Area 3 - Vilas Sandy Plain North

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

Scale 1:220,000
0 2 4 6 Miles
July 6, 2005

Northern Highland-American Legion
State Forest
Master Plan

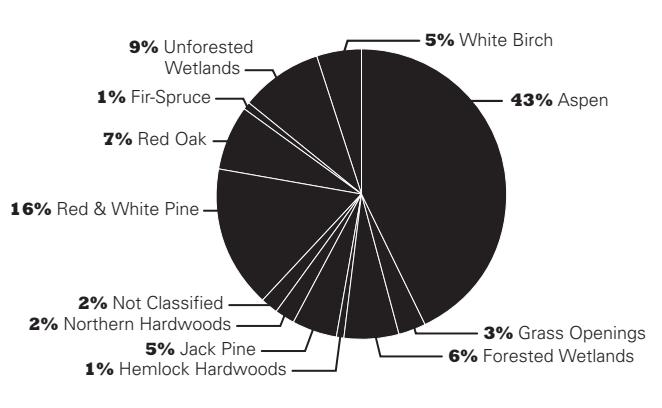
NHAL098-3

**AREA
3****Forest Production Management Classification****VILAS SANDY PLAINS NORTH****LONG-TERM OBJECTIVES
(100 YEARS)**

- Increase red and white pine as a dominant community type in some stands and as a greater component in others.
- Maintain aspen as a strong component in mixed stands across the landscape and as the dominant component of more diverse stands.
- Develop a primarily mixed forest with areas dominated by older red and white pine (150-250 years old) with aspen, white birch, jack pine, and older red oak as important secondary species. Other areas will continue to be dominated by aspen but with greater stand diversity and older pines than exist today.
- Maintain a diversity of habitat conditions to support harvestable populations of the major forest game species including white-tailed deer, black bear, ruffed grouse, American woodcock, and snowshoe hare.
- Increase the availability of habitat for non-game species which use pine forests such as evening grosbeak, pine siskin, red crossbill and pine warbler.
- Maintain a diversity of forested and unforested wetlands.
- Protect and maintain the water quality and riparian habitat on lakes and streams.

**SHORT-TERM OBJECTIVES
(50 YEARS)**

- Increase the presence and age of red and white pine on suitable sites across the area. Specifically, increase the acreage of stands that are dominated by red/white pine and, in mixed forest stands where red and white pine are not the dominant species, increase the average pine component.
- Maintain aspen as a strong component in mixed stands across the landscape but reduce the number of aspen dominated stands as the red/white pine increase. Manage for a variety of stand sizes and species mixtures.
- Manage for current levels of red oak, assuring natural regeneration through harvest and site disturbance and increasing the average age of this type.
- Manage for current levels of white birch, jack pine, fir-spruce and northern hardwoods.
- Maintain forested wetlands with a representation of multiple age classes of black spruce and tamarack applying General Management Prescriptions.
- Maintain current levels of natural and artificial grass openings for wildlife.

AREA 3 CURRENT LAND COVER**RESOURCE MANAGEMENT
PRESCRIPTIONS**

Management actions in this area follow the General Management Prescriptions, as described in the beginning of the Land Management section and all management activities are authorized.

This Management Area may contain designated Wilderness Lakes, Wild Lakes, and Scenic Lakes. The land management surrounding these lakes must be consistent with the management objectives and prescriptions for the respective lake designation. The list and map of Wilderness, Wild, and Scenic lakes as well as their objectives and prescriptions can be found in the Lake Management Zone section.

- Lake Trout Lake, Little Rock, and Sparkling Lakes are designated as experimental lakes as per Administrative Code NR 20.41. All management activities should consider the long and short term impacts to the research lake.

Forest Production Management Classification

VILAS SANDY PLAINS NORTH

**AREA
3**

Table 2.3 Area 3 - Vilas Sandy Plains North, Current and desired future conditions for community types in acres and percent of total

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Area
Aspen	27,052	43%	25,040	40%
Grass Openings	1,513	3%	626	1%
Forested Wetlands	4,056	6%	4,056	6%
Hemlock Hardwoods	113	1%	113	1%
Jack Pine	3,357	5%	3,900	6%
Northern Hardwoods	1,465	2%	1,500	2%
Not Classified	1,483	2%	400	1%
Red and White Pine	10,058	16%	12,520	20%
Red Oak	4,083	7%	4,000	6%
Fir-Spruce	474	1%	400	1%
Unforested Wetlands	5,876	9%	7,025	11%
White Birch	3,070	5%	3,020	5%
TOTAL	62,600	100.00%	62,600	100.00%

Future unforested wetlands increased from acres manually reclassified in the Not Classified category.

* Predicted 50-year Condition is an estimate of the forest cover type in 50 years and does not necessarily reflect the long-term objectives of the Area.



**AREA
4****Forest Production Management Classification****VILAS SANDY PLAINS CENTRAL**

This Area, with its pitted outwash topography of predominately rolling, well-drained sandy soils, and abundant lakes, represents the most common characteristics of the NH-AL. Area 4 has 27,351 of its 37,226 acres in state ownership. Glaciers helped shape the landscape, forming many ridges and lakes, and depositing sand and gravel outwash. This area, along with Areas 3 and 6, makes up the Vilas-Oneida Sandy Plains ecological landscape.

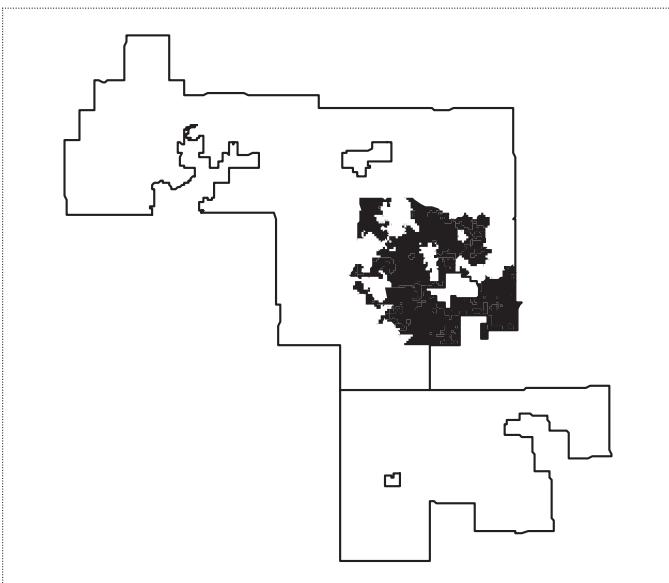
At European settlement, this area was mostly covered with white and red pine. White birch and aspen were found secondarily across the area with patches of jack pine and northern hardwoods. Within forested wetlands, tamarack was predominate, black spruce was common, and hemlock was a minor species. Historically, fire was a significant disturbance factor in this Area. Stand-replacing fires had cycles of every 50-200 years, but some trees survived over 300 years. Some fires burned the understory without killing the pine trees, creating a more open forest. Today, aspen dominates many areas, with red oak, white birch, red pine, and jack pine found in significant amounts, as well. Red oak is more common here than in any other management area. The small percentage of northern hardwood represents a mixed stand type with common species of white birch, red maple, aspen, red oak, white pine and some sugar maple. Most are even aged. White pine exists in most stands of aspen as scattered large trees and understory seedlings or saplings.

The habitat types common in this area are typically characterized by an understory of shrubs such as hazelnut, juneberry, low sweet blueberry, sweetfern, and maple-leaf viburnum, and herbs such as wild lily-of-the-valley, bracken fern, grasses and sedges, and big leaf aster. Unforested wetlands are found throughout the area, and provide habitat for many rare species.

Note: The Partridge and Frank Lake Wild Areas (1982 Plan) located in this Area are re-designated as Semi-Remote Areas to follow the new master planning code requirements and to better describe the recreational experience and management practices found in these areas. Please refer to the Semi-Remote description in the Recreation Section of this document for more details.

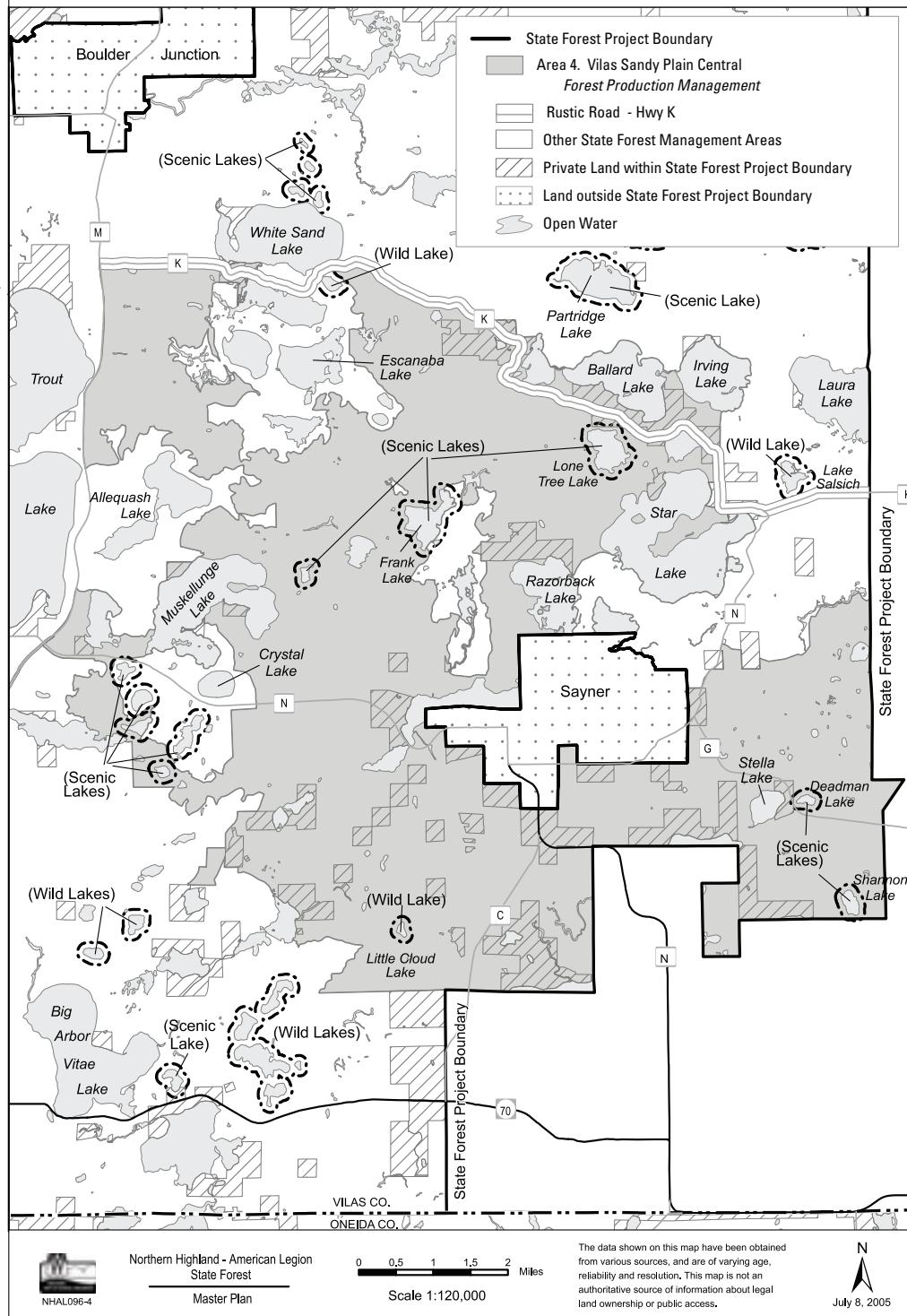
AREA 4 SUMMARY

- ▲ This area is approximately 37,226 acres in size with 27,351 acres in state ownership.
- ▲ Characteristic sandy, pitted outwash soils and rolling topography.
- ▲ Opportunity to begin restoration of white and red pine communities.
- ▲ Opportunity to manage for mixed forests of pines, oaks, aspens, and birches.
- ▲ Opportunity to maintain and enhance significant red oak forests.
- ▲ Conservation of forested and unforested wetlands that provide habitat for many rare species and help protect water quality.

AREA 4 LOCATOR MAP

Forest Production Management Classification

VILAS SANDY PLAINS CENTRAL

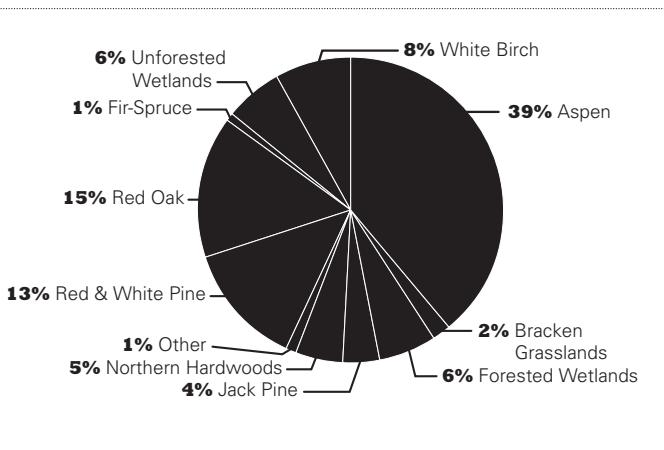
**AREA
4***Forest Production Management Classification***Map 5. Area 4 - Vilas Sandy Plain Central**

**AREA
4****Forest Production Management Classification****VILAS SANDY PLAINS CENTRAL****LONG-TERM OBJECTIVE (100 YEARS)**

- Develop, increase and maintain a mixed forest dominated by older red and white pine with aspen, red oak, white birch, and jack pine as important secondary species. Areas with slightly richer soil would be managed for red oak with red and white pine.
- Maintain a diversity of forested and unforested wetlands.
- (Harvest would occur when long-lived trees reach biological maturity.)

SHORT TERM OBJECTIVE (50 YEARS)

- Increase the presence and age of red and white pine on suitable sites across most of the mixed forest as opportunities present. Specifically, increase the acreage of stands that are dominated by red and white pine and, in mixed forest stands where red and white pine are not the dominant species, increase the average pine component.
- Maintain or increase abundance of red and white pine trees in aspen, red oak, white birch, jack pine and northern hardwood stands.
- Maintain sites with early successional forest types such as aspen, jack pine, and white birch. Although white birch will be decreased by mortality and regeneration challenges. Some white birch stands will be converted to pine plantations.
- Maintain aspen as a dominant community as well as maintain aspen as a secondary component in other stand types. Some of the white birch and fir-spruce types will convert to aspen. Some aspen type will convert to pine types.
- Manage for current levels of red oak, assuring natural regeneration through harvest and site disturbance and increasing the average age of this type in mixed stands.
- Northern hardwood communities will be decreased as these stands are managed for red oak and natural pine regeneration.
- Maintain forested wetlands with a representation of multiple age classes of black spruce and tamarack, applying General Management Prescriptions.
- Grass opening reduction will go to pine plantation or natural regeneration of aspen or white pine.

AREA 4 CURRENT LAND COVER**RESOURCE MANAGEMENT PRESCRIPTIONS**

Please see General Management Prescriptions in the beginning of the Land Management section for information on general management prescriptions by forest type to Pines. All management activities managing this forest type are authorized.

- Retain long-lived trees to biological maturity

This Management Area may contain designated Wilderness Lakes, Wild Lakes, and Scenic Lakes. The land management surrounding these lakes must be consistent with the management objectives and prescriptions for the respective lake designation. The list and map of Wilderness, Wild, and Scenic lakes as well as their objectives and prescriptions can be found in the Lake Management Zone section.

- Forestry staff will work cooperatively with volunteers to develop erosion control measures at Musky Mountain. Erosion control activities may include tree planting, seeding, and gating of area.

Forest Production Management Classification

VILAS SANDY PLAINS CENTRAL

**AREA
4**

Table 2.4 Area 4 – Vilas Sandy plains Central, Current and desired future conditions for community types in acres and percent of total.

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Area
Aspen	10,390	39%	10,390	38%
Grass Openings	650	2%	275	1%
Forested Wetlands	1,646	6%	1,646	6%
Jack pine	1,040	4%	1,090	4%
Northern Hardwoods	1,460	5%	1,000	4%
Not Classified	283	1%	183	1%
Red and White Pine	3,591	13%	4,746	17%
Red Oak	4,172	15%	4,172	15%
Fir-Spruce	256	1%	206	1%
Unforested Wetlands	1,643	6%	1,643	6%
White Birch	2,220	8%	2,000	7%
TOTAL	27,351	100.00%	27,351	100.00%

Not Classified category decreased in the “future” due to manually reclassifying the community types to Pines.

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.



**AREA
5****Forest Production Management Classification****BIG ARBOR VITAE LOAMY HILLS**

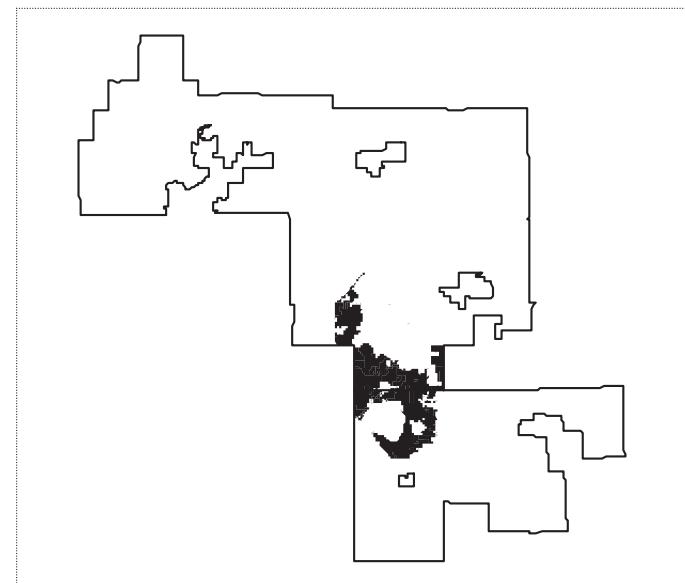
This area represents 11,523 acres of state owned land with varied topography and an assortment of different forest types. At a large scale, this is one of the more ecologically intact forested portions of the NH-AL. Lakes are common but lowlands, while certainly present, are not as widespread as in other areas on the NH-AL.

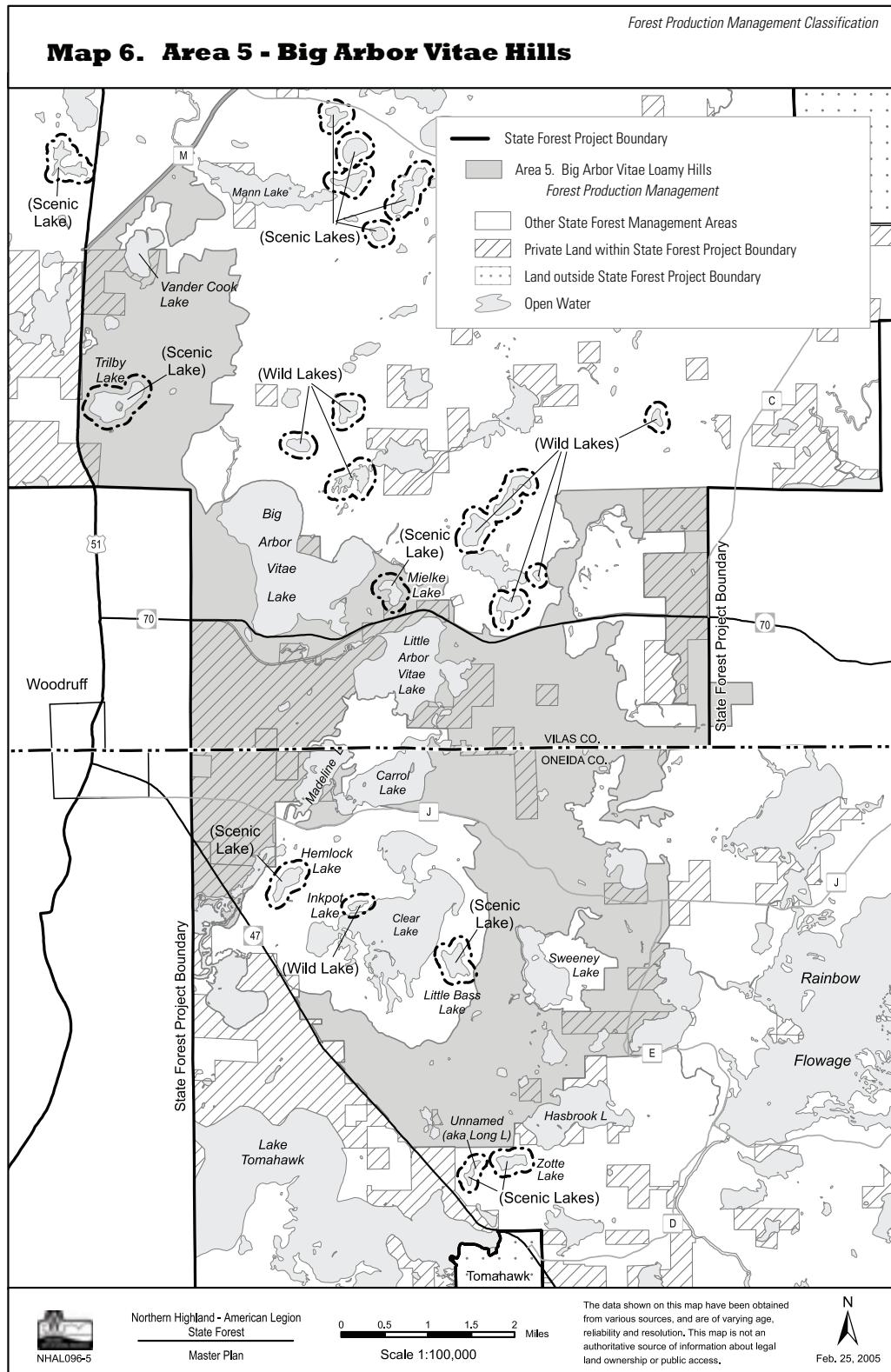
Area 5 is characterized by a mix of tree species with aspen, white and red pines, northern hardwoods, white birch, and red oak dominant on the uplands. Tree composition is slowly being replaced by white pine, balsam fir and red maple over time. There are some areas of mature red and white pine also, and these are found extensively throughout the area as important secondary species. The sandy soils and habitat types common to the area support this mixture of tree species in a variety of ages and sizes. The common habitat types here are typically characterized by a moderately developed shrub layer of hazelnut, low sweet blueberry, juneberry, and maple-leaf viburnum, and herbs such as wild lily-of-the-valley, bracken fern, grasses and sedges, and big leaf aster.

At European settlement, the upland areas contained several different forest types including white and red pine, northern hardwoods, hemlock-hardwoods, and even some jack pine/scrub oak. White birch, red maple, aspen and oak were found secondarily across the region. Red and sugar maple are successfully competing on the landscape because of their shade tolerance and lack of fire to control these species. Within the forested wetlands, tamarack and black spruce were predominant, with some scattered cedar. Historically, fire was a significant disturbance factor as it was in almost all areas. Wind throw was and is another important disturbance factor, especially in areas with wetter soils. Sporadic wind events also occurred on drier upland sites and played a vital role in shaping forest succession.

AREA 5 SUMMARY

- ▲ This area is approximately 18,309 acres in size with 11,523 acres in state ownership.
- ▲ Mixed forest on sandy-loamy soils including aspen, pines, hardwoods, and red oak.
- ▲ Opportunity to restore a large scale, older aged mixed red and white pine, red oak, and hardwoods forest in this central area.
- ▲ Opportunity for large-scale forest community connectivity.
- ▲ Management for early successional forest types.

AREA 5 LOCATOR MAP

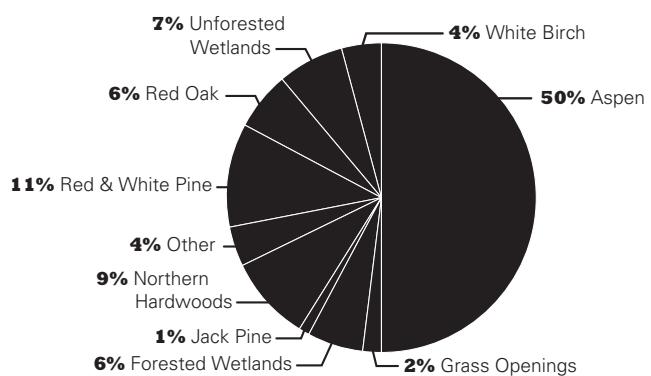
Forest Production Management Classification**AREA
5****BIG ARBOR VITAE LOAMY HILLS**

**AREA
5****Forest Production Management Classification****BIG ARBOR VITAE LOAMY HILLS****LONG-TERM OBJECTIVES
(100 YEARS)**

- Maintain a mixed forest dominated by older red and white pine and (northern hardwoods) with aspen, red oak, white birch, and jack pine as important secondary species.
- Large-scale ecosystem management with increased forest block size, stand age, and conifer component that enhances the ecological characteristics of this area.
- Maintain a diversity of forested and unforested wetlands.
- Maintain and expand the white birch and red oak type.
- Maintain early successional forest types.
- Manage small scattered old growth stands.

**SHORT-TERM OBJECTIVES
(50 YEARS)**

- Increase the presence and age of red and white pine on suitable sites across the area. Specifically, increase the acreage of stands that are dominated by red/white pine and, in mixed forest stands where red and white pines are not the dominant species, increase the average pine component.
- Retain and increase pine components on aspen, red oak, white birch and northern hardwood stands as secondary objectives to their active management.
- Maintain aspen as a strong component across the landscape. Manage for a variety of stand sizes and ages. Look for opportunities to manage for larger stand sizes. Aspen would see gains from managing white birch stands and grassy openings filling in naturally.
- Maintain and increase the red oak component of this area. Increase oak components in management of all stands and assure natural regeneration through harvest and site disturbance.
- Maintain current levels of jack pine with active management activities.
- Maintain forested wetlands with a representation of multiple age classes of black spruce and tamarack applying General Management Prescriptions.

AREA 5 CURRENT LAND COVER**RESOURCE MANAGEMENT
PRESCRIPTIONS**

The General Management Prescriptions for each appropriate forest type, found at the beginning of the Land Management section, apply to this management area. All management activities appropriate for the forest type are authorized.

This Management Area may contain designated Wilderness Lakes, Wild Lakes, and Scenic Lakes. The land management surrounding these lakes must be consistent with the management objectives and prescriptions for the respective lake designation. The list and map of Wilderness, Wild, and Scenic lakes as well as their objectives and prescriptions can be found in the Lake Management Zone section.

Forest Production Management Classification**AREA
5**

BIG ARBOR VITAE LOAMY HILLS

Table 2.5 Area 5 – Big Arbor Vitae Loamy Hills, Current and desired future conditions for community types in acres and percent of total.

Community Type	Current		Predicted 50-year Condition*	
	Acres	Percent of Total Area	Acres	Percent of Total Area
Aspen	5,844	50%	5,905	51%
Grass openings	218	2%	118	1%
Forested wetlands	641	6%	641	6%
Jack pine	160	1%	160	1%
Northern hardwoods	1,038	9%	1,000	9%
Not Classified	432	4%	232	2%
Red & White pine	1,357	11%	1,557	13%
Red oak	635	6%	735	6%
Unforested wetlands	775	7%	775	7%
White birch	423	4%	400	4%
TOTAL	11,523	100.00%	11,523	100.00%

Not Classified category consists of 300' lakeshore set backs, Current acres reclassified to Northern Hardwoods and Aspen.

Northern Hardwoods community type decrease as these mixed stands convert to pines and oaks.

** Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.*



**AREA
6****Forest Production Management Classification****ONEIDA SANDY PLAINS**

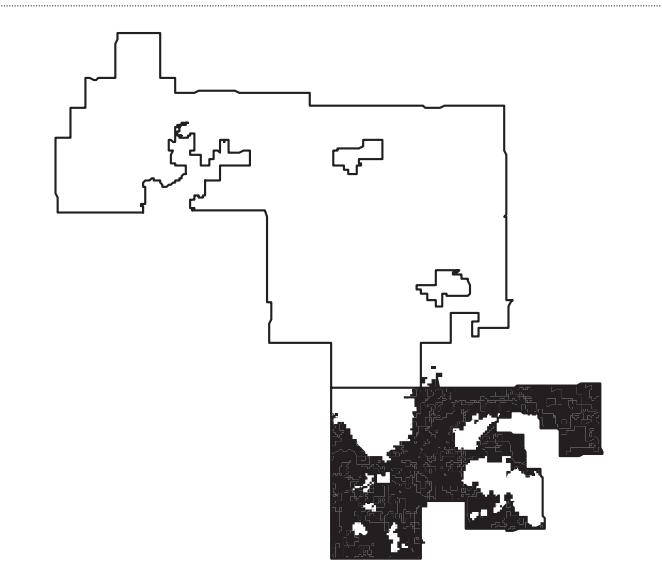
The pitted outwash rolling topography, well-drained sandy soils, and abundant lakes in this 70,169 acre area represent the most common characteristics of the NH-AL. Glaciers helped shape the landscape, forming many ridges and lakes, and depositing sand and gravel outwash. This area, along with Areas 3 and 4, makes up the Vilas-Oneida Sandy Plains ecological landscape. Due to its large size, this area was and continues to be a matrix of different tree species and communities. Part of the formerly designated Indian Creek Wild Area is in this Forest Production Area. This area now will be managed to meet the objectives of Area 6.

At European settlement, this area was mostly covered with white and red pine. White birch and aspen were found secondarily across the area with patches of jack pine and northern hardwoods. Within forested wetlands, tamarack was predominantly, black spruce was common, and hemlock was a minor species. Historically, fire was a significant disturbance factor in this Area. Stand-replacing fires had cycles every 50-200 years, but some trees survived over 300 years. Some fires burned the understory without killing the pine trees, creating a more open forest. Today, aspen dominates a little less than half the area, with red and white pine, red oak, white birch, and jack pine found in significant amounts, as well. White pine exists in most stands of aspen as scattered large trees and understory seedlings or saplings. The habitat types common in this area are typically characterized by an understory of shrubs such as hazelnut, juneberry, low sweet blueberry, sweetfern, and maple-leaf viburnum, and herbs such as wild lily-of-the-valley, bracken fern, grasses and sedges, and big leaf aster. Unforested wetlands and forested wetlands are found throughout the area, and provide habitat for many rare species.

Note: The Partridge and Frank Lake Wild Areas (1982 Plan) located in this Area are re-designated as Semi-Remote Areas to follow the new master planning code requirements and to better describe the recreational experience and management practices found in these areas. Please refer to the Semi-Remote description in the Recreation Section of this document for more details. Indian Creek Wild Area becomes part of Area 4 and part of Area 17.

AREA 6 SUMMARY

- ▲ This area is approximately 70,169 acres in size with 32,010 acres in state ownership.
- ▲ Characteristic sandy, pitted outwash topography.
- ▲ Opportunity to begin restoration of white and red pine communities.
- ▲ Opportunity to manage for mixed forests of pines, oaks, aspens, and birches.
- ▲ Conservation of forested and unforested wetlands that provide habitat for many rare species and help protect water quality.
- ▲ Opportunity to maintain and enhance significant red oak forests.

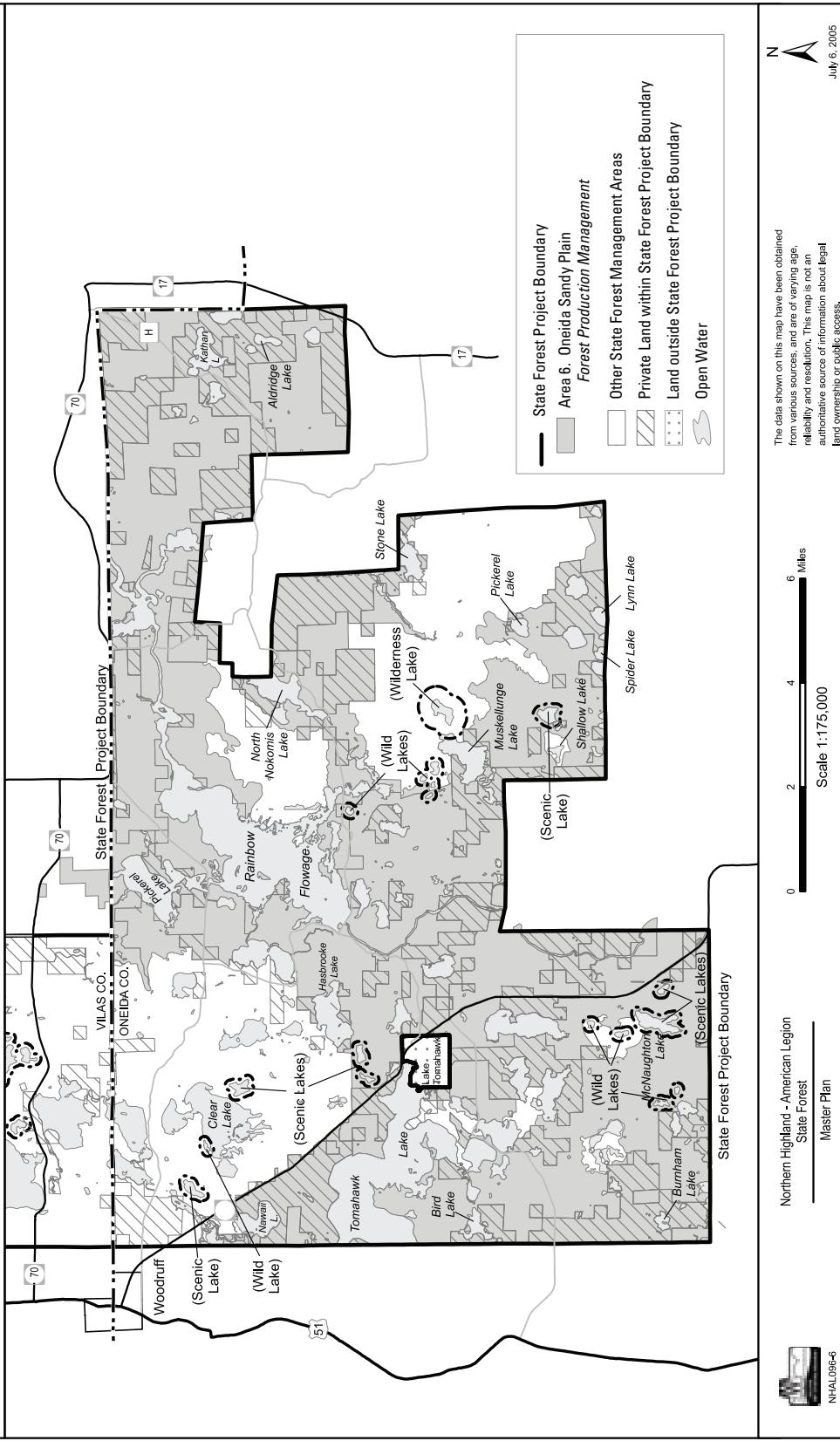
AREA 6 LOCATOR MAP

Forest Production Management Classification

ONEIDA SANDY PLAINS

**AREA
6**

Forest Production Management Classification

Map 7. Area 6 - Oneida Sandy Plain

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July 6, 2005

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

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Northern Highland - American Legion State Forest
Master Plan

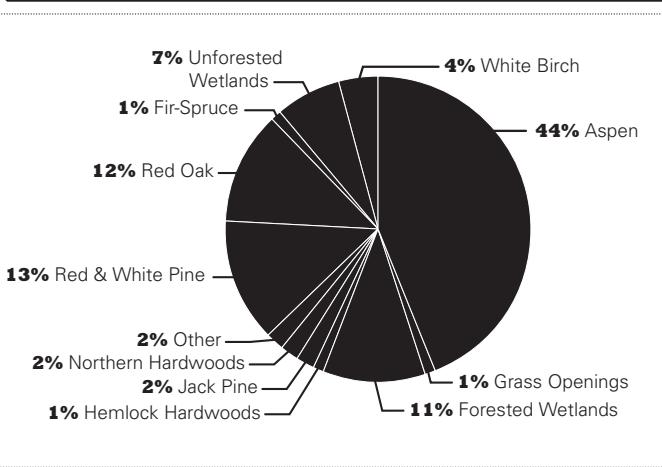
NHAL098-6

**AREA
6****Forest Production Management Classification****ONEIDA SANDY PLAINS****LONG-TERM OBJECTIVES
(100 YEARS)**

- Maintain a mixed forest dominated by older red and white pine with aspen, red oak, white birch, and jack pine as important secondary species.
- Maintain a diversity of forested and unforested wetlands.
- Maintain white birch and expand the red oak type.
- Maintain early successional forest types as a strong component of the landscape.
- The age range of major tree species will be up to biological age for longed lived species and economic age on the short-lived species.

**SHORT-TERM OBJECTIVES
(50 YEARS)**

- Increase the presence and age of red and white pine on suitable sites across most of the mixed forest as opportunities present. Specifically, increase the acreage of stands that are dominated by red and white pine and in mixed stands where pines are not the dominant species, increase the average pine component.
- Retain and increase pine components on aspen, red oak, white birch and northern hardwood stands as secondary objectives.
- Maintain aspen component as a dominant community as well as maintain aspen as a secondary component in other stand types. Some aspen will convert to pine types with active management and by forced conversion to pine types.
- Maintain white birch, jack pine, fir-spruce and hemlock-hardwood types.
- Manage for current levels of red oak and look for opportunities to expand the red oak type with active management on suitable soils. Increase red oak component in mixed stands.
- Maintain forested wetlands with a representation of multiple age classes of black spruce and tamarack, applying General Management Prescriptions.

AREA 6 CURRENT LAND COVER**RESOURCE MANAGEMENT
PRESCRIPTIONS**

The General Management Prescriptions for each appropriate forest type, found at the beginning of the Land Management section, apply to this management area. All management activities appropriate for the forest type are authorized.

This Management Area may contain designated Wilderness Lakes, Wild Lakes, and Scenic Lakes. The land management surrounding these lakes must be consistent with the management objectives and prescriptions for the respective lake designation. The list and map of Wilderness, Wild, and Scenic lakes as well as their objectives and prescriptions can be found in the Lake Management Zone section.

Forest Production Management Classification

AREA

ONEIDA SANDY PLAINS

6

Table 2.6 Area 6 – Oneida Sandy Plains, Current and desired future conditions for community types in acres and percent of total.

Community Type	Current		Predicted 50-year Condition*	
	Current Acres	Current % Cover	Future Acres	Future % Cover
Aspen	14,557	45%	14457	45%
Grass Openings	363	1%	363	1%
Forested Wetlands	3,432	11%	3,432	11%
Hemlock Hardwoods	176	1%	176	1%
Jack Pine	640	2%	640	2%
Northern Hardwoods	522	2%	542	2%
Not Classified	520	1%	200	0%
Red and White Pine	4,165	13%	4,515	14%
Red Oak	3,966	12%	4,016	12%
Fir-Spruce	289	1%	289	1%
Unforested Wetlands	2,178	7%	2,178	7%
White Birch	1,202	4%	1,202	4%
TOTAL	32,010	100.00%	32,010	100.00%

Not Classified category contains forested stands along lakeshores, riverfront, new land acquisitions, and many campground areas. Current acres reclassified to red and white pine and red oak

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.



**AREA
7****Habitat Management Classification****INTRODUCTION**

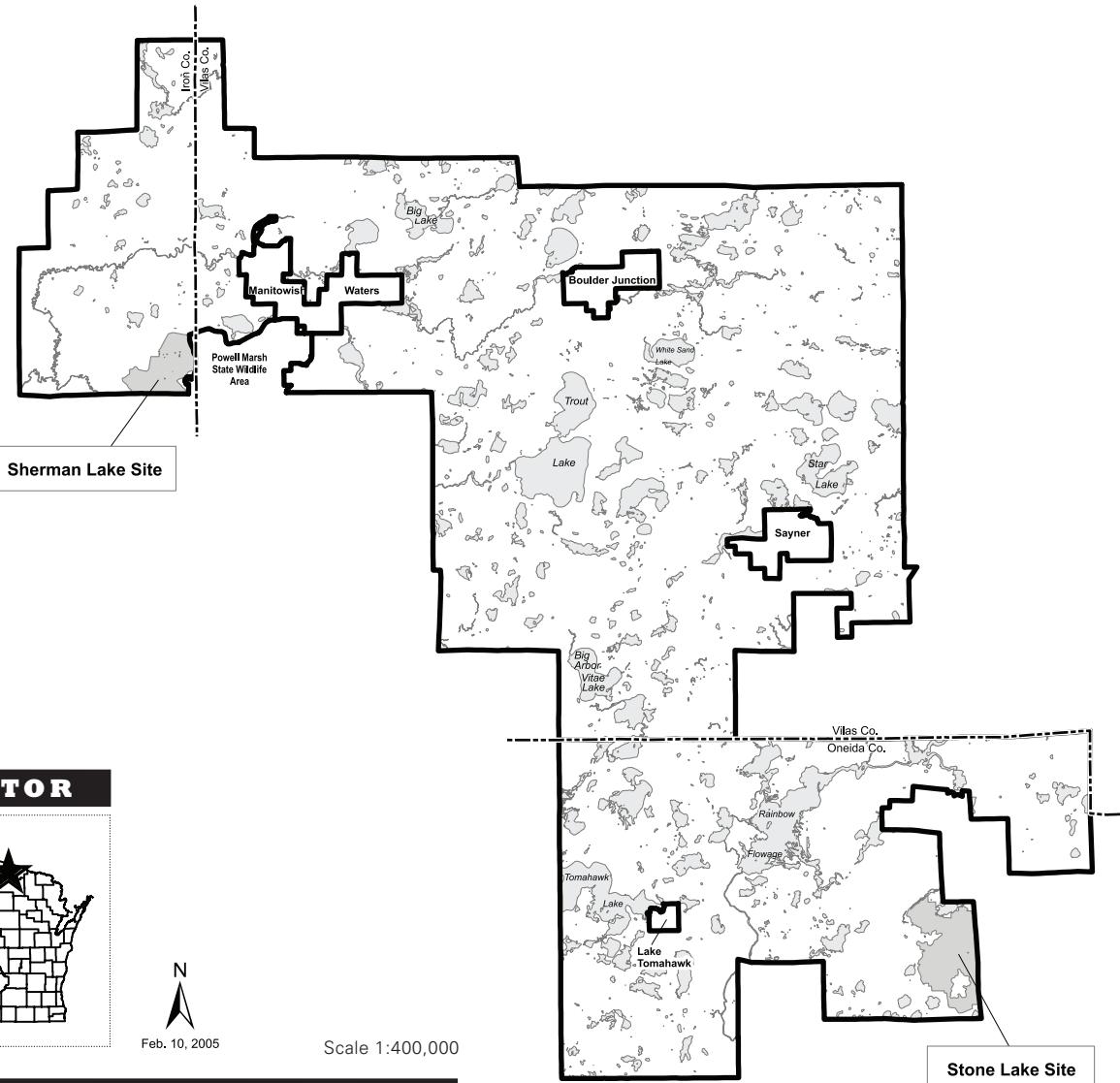
There is one Habitat Management Area located within the NH-AL.

AREA 7: Ruffed Grouse Demonstration Area

The management objective of Habitat Management Areas is to provide or enhance habitat (upland, wetland, or aquatic) to support specific species of plants or animals. Habitats and communities with this designation are managed for a wide variety of purposes, including focused species production and protection (WDNR 2001).

Examples of management activities within the Habitat Management Area, are dependent upon the habitat or species type included. Management could potentially include timber harvesting, herbicide application, mowing, burning, flooding, agricultural cropping, and installation of fish habitat improvement devices, road construction, site prep, planting and erosion control (WDNR 2001).



Habitat Management Classification**AREA
7****INTRODUCTION****MAP 8: HABITAT MANAGEMENT CLASSIFICATION AREA****MAP 8 LEGEND**

- State Forest Project Boundary
- Habitat Management Classification Areas**
- Area 7. Ruffed Grouse Demonstration Sites
 - Sherman Lake Site
 - Stone Lake Site
- Other State Forest Management Areas
- - - County Boundary
- Open Water

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

**AREA
7****Habitat Management Classification****RUFFED GROUSE DEMONSTRATION AREA****SHERMAN LAKE**

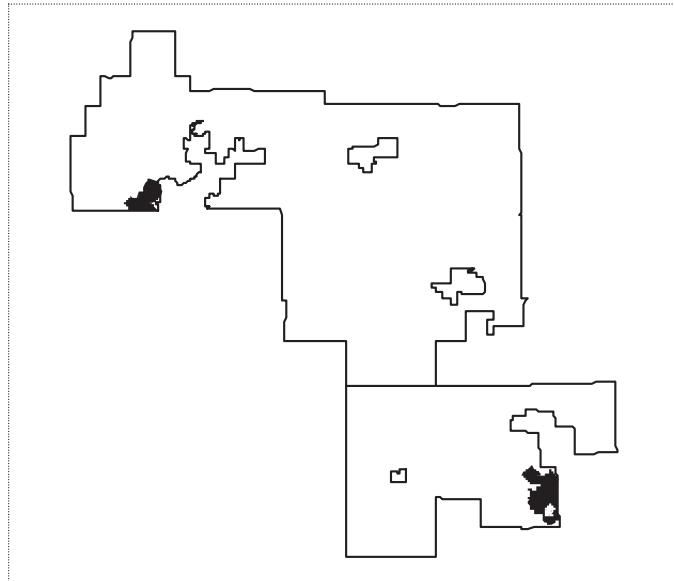
This 1,942 acre area is predominantly an aspen forest that has been managed for ruffed grouse habitat for over 15 years. Its sandy soils and rolling topography are similar to much of the Vilas-Oneida Sandy Hills. Lowlands are common but lakes are more scattered. The area began to be managed for ruffed grouse habitat in the mid 1980s when Forestry staff planned to reduce the size of individual aspen stands and break up the aspen age classes with multiple harvests.

At European settlement, the upland areas were mostly covered with white and red pine. White birch and aspen occurred secondarily across the region. Historically, fire was the dominant disturbance factor.

Today aspen dominates the area. Common understory plants include shrubs such as hazelnut, juneberry, low sweet blueberry, maple-leaf viburnum and herbs such as wild lily of the valley, bracken fern, grasses and sedges and big leaf aster.

STONE LAKE

This 3,549 acre area includes the eastern portion of the former Indian Creek Wild Area. It is predominantly aspen in the uplands, with considerable lowland. The topography is varied and runs from nearly level in some areas to rolling in others. Lowlands are common but lakes are more scattered. Soils are predominately well-drained sandy loams to excessively drained loamy sands. Organic deposits are also common. This location has been managed in the past as a ruffed grouse habitat experimental area. The focus of the experimental area was to regenerate aspen with various patch clearcuts to maximize the age class distribution and placement of the patches.

AREA 7 LOCATOR MAP

At European settlement, the upland areas primarily supported white and red pine and white birch, aspen, yellow birch, and hemlock were found secondarily. Within the forested wetlands, tamarack, cedar, and black spruce swamp conifer forests were well distributed. Historically, fire was the dominant disturbance factor.

Today, a mixture of aspen in various age classes characterizes the Stone Lake area. Other timber types are present in significant amounts as well, including northern hardwoods, hemlock-hardwoods, some white birch, and forested wetlands. Some very limited areas of mature red and white pine also exist, and these can be found throughout as important secondary species. Common understory plants include shrubs such as hazelnut, juneberry, low sweet blueberry and maple-leaf viburnum and herbs such as wild lily of the valley, bracken fern, grasses and sedges and big leaf aster. There are significant wetlands, both forested and non-forested, and windthrow is a very important disturbance factor given the many wetland high water table sites here. Many ancient tip-up mounds can be observed throughout the area. The Stone Lake area would continue to be managed as a habitat management demonstration area for ruffed grouse and other forest game species.

AREA 7 SUMMARY**Sherman Lake**

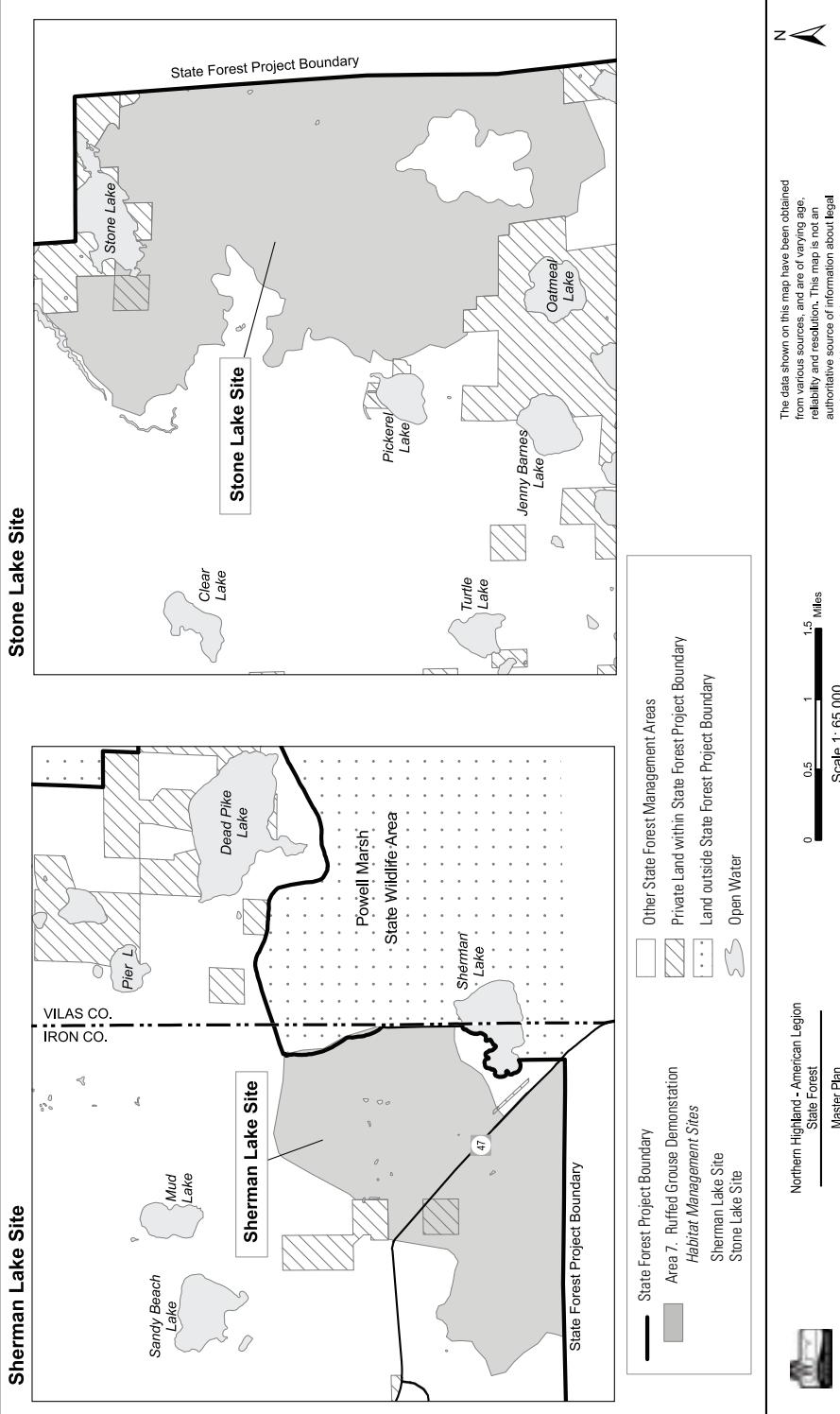
- ▲ Aspen management for ruffed grouse and other forest game.
- ▲ This area is approximately 1,942 acres in size with 1,852 acres in state ownership.
- ▲ Opportunity to provide a diversity of aspen age classes with scattered red and white pine and red oak trees.

Stone Lake

- ▲ Opportunity to provide a demonstration area for ruffed grouse habitat management.
- ▲ This area is approximately 3,549 acres in size with 3,398 acres in state ownership.
- ▲ Opportunity to provide a diversity of aspen age classes with scattered red and white pine and red oak trees.
- ▲ Conservation of forested and unforested wetlands that provide habitat for many rare species and help protect water quality.

Habitat Management Classification**RUFFED GROUSE DEMONSTRATION AREA****AREA
7**

Habitat Management Classification

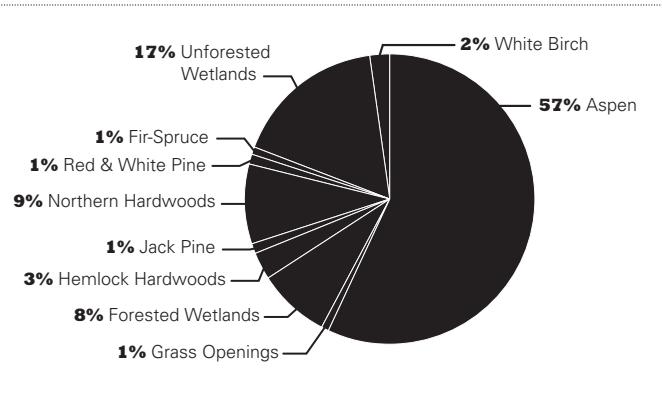
Map 9. Area 7 - Ruffed Grouse Demonstration

Habitat Management Classification**RUFFED GROUSE DEMONSTRATION AREA****LONG-TERM MANAGEMENT OBJECTIVES (100 YEARS)**

- Maintain it as a ruffed grouse habitat management demonstration area. Aspen would dominate the mixed forest in a variety of age classes and patch sizes. Other associated species would be managed along with the aspen, to the extent that they do not interfere with adequate aspen regeneration.
- Patches of existing mature pine, northern hardwoods, hemlock-hardwoods, white birch and red oak would be maintained or managed for wildlife habitat along with the aspen. Representatives of these types would be present.
- Maintain this area in early successional forest types that benefit wildlife and incorporate research, wildlife education, pulpwood production and provide excellent hunting opportunities. Most trees would reach economic maturity before harvesting for regeneration.

SHORT TERM MANAGEMENT OBJECTIVES (50 YEARS)

- Maintain current aspen dominance for ruffed grouse habitat across most of the mixed forest. Management strategy is to clear-cut aspen stands to regenerate them naturally. Frequent entries would be made to increase the number of age classes and maintain high stem densities needed by game birds.
- Roads, trails and openings would be seeded with clover and grasses.
- All forest cover types other than aspen will be managed to retain the current acreage. However the age structure of the community types, especially aspen, will change over time.
- Develop research in partnership with other staff or cooperators to document regeneration and development of high quality wildlife habitat.
- Use monitoring information on changes in population from sampling to aid future management decisions.

AREA 7 CURRENT LAND COVER**RESOURCE MANAGEMENT PRESCRIPTIONS**

Management within this area emphasizes the development of aspen communities using active techniques, and all appropriate management actions contained within the General Management Prescriptions, found earlier in this section, are authorized. It is recognized that adaptations to manage for Ruffed Grouse habitat will result in high forest product utilization. Some prescription elements unique to this area include:

- Adapt the General Management Prescriptions for each stand to create, enhance and maintain game bird habitat characteristics, including a diversity of tree ages and stand sizes, providing nesting, forage and brooding environments. Age structure for the species would fall into the economic life expectancy consistent with the local site quality.
- Timber harvest to achieve Area goals would use various patch sizes and techniques for regeneration harvests. Techniques may include use of large and small patch clear cuts or group selection, shelterwood harvest, seed tree retention, ground disturbance, seeding or prescribed burning either alone or in combination with the above treatments.
- Red oak and other mast or fruit bearing trees would be mostly retained during harvest operations to favor game food source species and gradually increase their numbers in the forest.

Habitat Management Classification**RUFFED GROUSE DEMONSTRATION AREA****AREA
7**

Table 2.7 Area 7 – Ruffed Grouse Demonstration Area, Current and desired future conditions for community types in acres and percent of total.

Community Type	Current		Predicted 50-year Condition*	
	Current Acres	Current % Cover	Future Acres	Future % Cover
Aspen	2,998	57%	2,998	57%
Grass Openings	55	1%	55	1%
Forested Wetlands	460	8%	460	8%
Hemlock Hardwoods	138	3%	138	3%
Jack Pine	47	1%	47	1%
Northern Hardwoods	453	9%	453	9%
Red and White Pine	76	1%	76	1%
Fir-Spruce	37	1%	37	1%
Unforested Wetlands	895	17%	895	17%
White Birch	91	2%	91	2%
TOTAL	5,250	100.00%	5,250	100.00%

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.

This Area may contain Wilderness Lakes, Wild Lakes, and Scenic Lakes. The land management surrounding these Lakes must be consistent with the objectives and prescriptions of not only the Area but the objectives and prescriptions for the Lake designation. The list and map of Wilderness, Wild, and Scenic lakes as well as the objectives and prescriptions can be found in the Lake Management Zone section.



Native Community Management Classification

INTRODUCTION

Within the Northern Highland-American Legion State Forest, there are seven Native Community Areas.

Area 8: Lake Laura Loamy Hills

Area 9: Hemlock Hardwoods

Area 10: Peatland Wetlands

Area 11: Red and White Pines

Area 12: Mixed Forest

Area 13: Special Aquatic

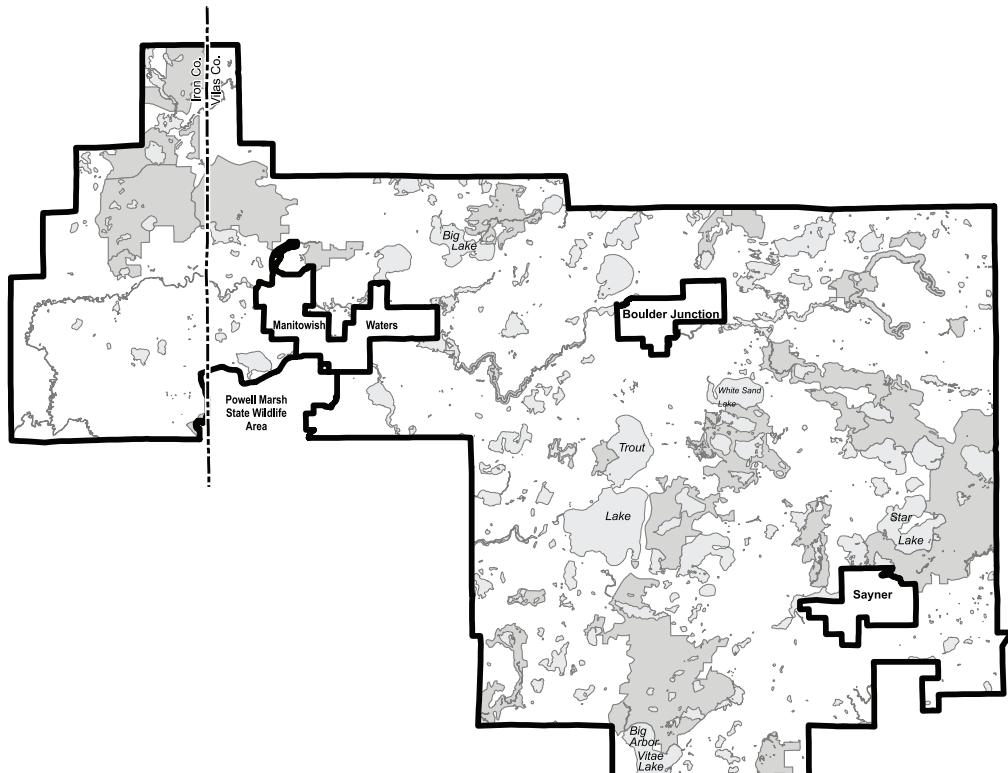
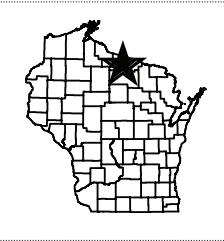
Area 14: Johnson Lake Barrens

INTRODUCTION

Native community areas are managed with the primary objective of representing, restoring, and perpetuating native plant and animal communities, whether upland, wetland or aquatic, and other aspects of native biological diversity. Management activities are designed to achieve land management objectives through natural processes whenever possible. Examples of management activities within native community areas include timber harvesting, herbicide application, burning, limited planting, road construction and erosion control (WDNR 2001).

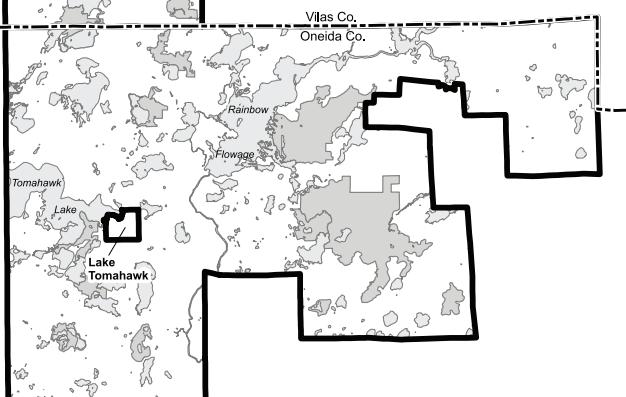
For millennia on the NH-AL, climate and natural processes such as fire, ice, wind, drought and insects. In today's landscape, mimicking requires combinations of passive and active techniques. These processes have been greatly altered during periods of the past century via resource exploitation, patchy intense development, and fire suppression to name a few. Native community management areas would use these past natural disturbance patterns as a model for making management decisions regarding passive management, the intensity of active management at any one site and the use of fire as a management technique.

Native community areas will be managed to provide the full range of native plants and animal communities found on the NH-AL including old growth forests, open barrens, and undisturbed wetlands. These management areas were chosen using biotic inventory, community restoration and old-growth data and through the public involvement process. Only those areas of highest value for protection or community restoration were selected. Whenever possible, management activities in native community management areas achieve their objectives through natural processes (passive management) and active management techniques that mimic natural processes. A comparison of the various ecological attributes provided by each type of land management area is shown in the appendix.

Native Community Management Classification**INTRODUCTION****AREAS
8-14****MAP 10: NATIVE COMMUNITY MANAGEMENT CLASSIFICATION AREAS****LOCATOR**

Feb. 10, 2005

Scale 1:400,000

**MAP 1 LEGEND**

— State Forest Project Boundary

Native Community Management Classification Areas

- Area 8. Lake Laura
- Area 9. Hemlock Hardwoods
- Area 10. Peatland Wetlands
- Area 11. Red and White Pine
- Area 12. Mixed Forest
- Area 13. Special Aquatic
- Area 14. Johnson Lake & Barrens

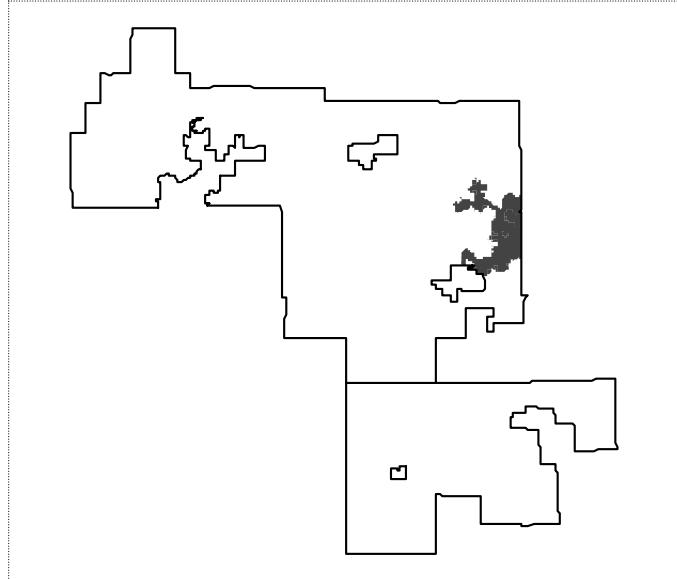
- Other State Forest Management Areas
 County Boundary
 Open Water

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

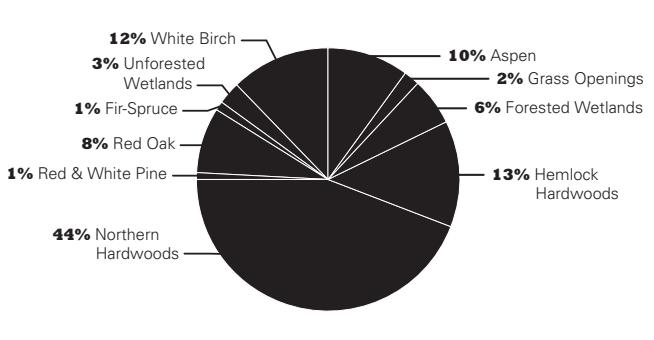
**AREA
8****Native Community Management Classification****LAKE LAURA LOAMY HILLS**

This area consists of 8,268 acres of primarily rolling upland northern hardwoods with well-drained sandy loam soils in the east central portion of the forest. Loamy sands and organic deposits also are common. The area is mostly public land (6,896 acres) with a smattering of private parcels.

The forest at present is dominated by northern hardwoods composed of a mix of sugar maple, basswood, aspen, yellow birch, and hemlock which is in or approaching mature forest conditions. In addition, stands of relict old growth hemlock hardwoods, white birch and aspen are present within this northern hardwood landscape. This is in contrast to most of the NH-AL, which features sandy soils and forests of red/white pine, aspen, and oak. Three groves of hemlock comprising the oldest known stands on the NH-AL with many trees over 270 years in age are found in this area. The habitat types in Area 6 are typically characterized by a moderately developed under-story of shrubs such as hazelnut, maple-leaf viburnum, leatherwood and ground layer plants such as wild lily-of-the-valley, wood fern, grape ferns, and sedges. Small areas of unforested and forested wetlands (tamarack, black spruce and white cedar) are also found here. At European settlement, the upland areas were mostly covered with white pine, yellow birch and white birch. Aspen and sugar maple were important secondary species.

AREA 8 LOCATOR MAP**AREA 8 SUMMARY**

- ▲ This area is approximately 8,268 acres in size with 6,896 acres in state ownership.
- ▲ Opportunity to maintain a forest with large, old trees, and the characteristic species and ecosystem functions associated with old growth hemlock-hardwood forests.
- ▲ Establish three passively managed old growth forest sites.
- ▲ Opportunity to manage a portion of the area using extended rotation and retention of early succession patches to complement the old growth and retain structural diversity.

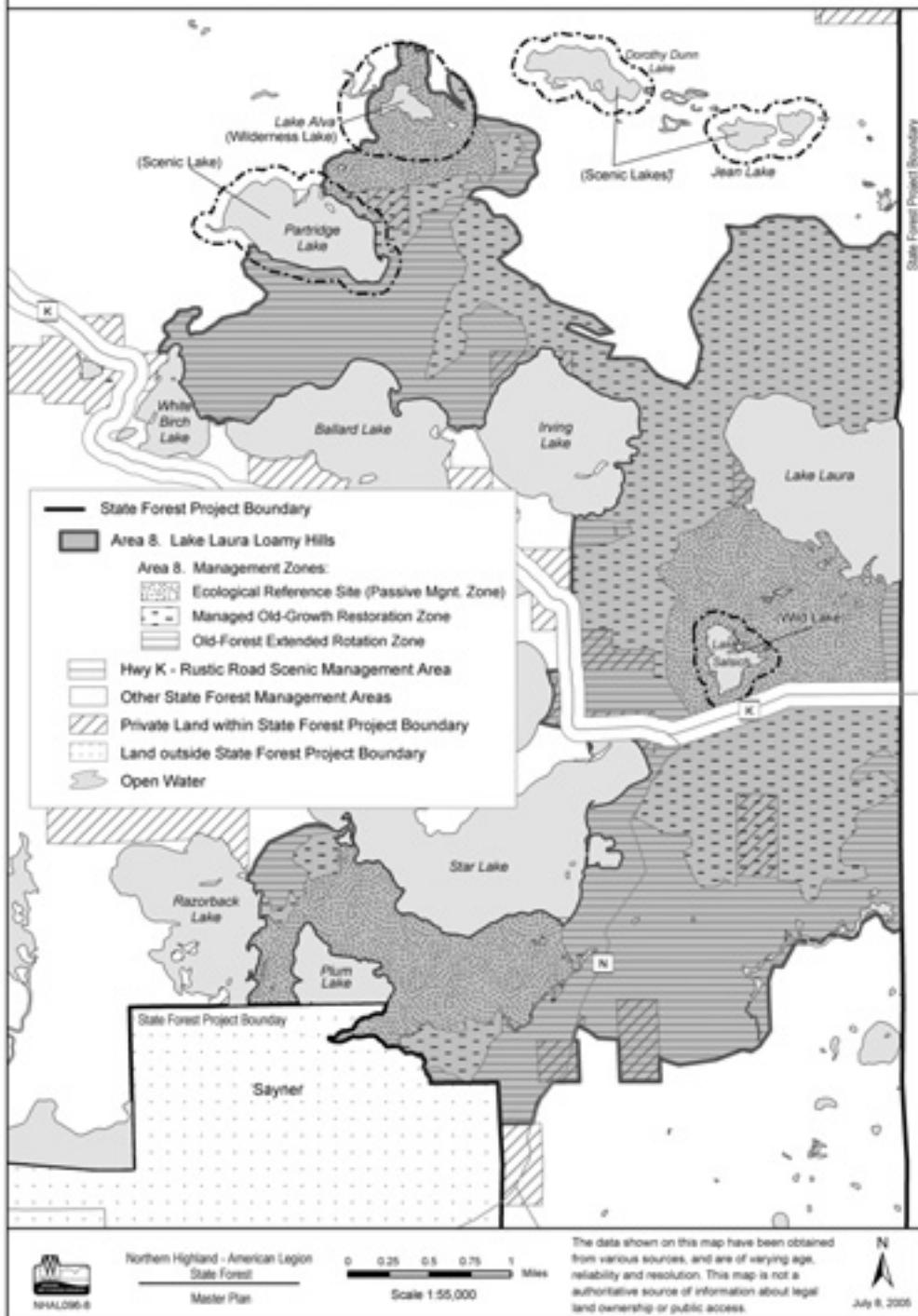
AREA 8 CURRENT LAND COVER

Native Community Management Classification

LAKE LAURA LOAMY HILLS

**AREA
8**

Native Community Management Classification

Map 11. Area 8 - Lake Laura Loamy Hills

Northern Highland - American Legion
State Forest
Master Plan

Scale 1:55,000

Native Community Management Classification**LAKE LAURA LOAMY HILLS****LONG-TERM MANAGEMENT OBJECTIVES (100 YEARS)**

- Develop a structural, compositional, and functional hemlock and northern hardwood forest with old-growth characteristics. Within the old-forest portion of the management area, retain trees to their biological age to maintain and enhance ecological functions.
- Provide opportunities for research, education, and interpretation on the ecological reference zones and the managed old-growth restoration zone.
- Provide old-growth wildlife viewing opportunities and sites where people can experience the inspirational aesthetic and philosophical values associated with an old-growth forest.

SHORT-TERM MANAGEMENT OBJECTIVES (50 YEARS)

- Maintain three passively managed ecological reference sites within the old-growth restoration zone—Lake Alva Birch-Hemlocks (314 acres, includes lake acres), Lake Laura Hardwoods (852 acres, includes lake acres), and Plum Lake Hemlocks (744 acres).
- In the old-growth restoration zone and outside of the ecological reference sites, use limited active management to increase old-growth forest attributes (e.g. snags and coarse woody debris) and to enhance the composition of northern hardwoods (i.e. increase the amount of white pine, yellow birch, white cedar, and hemlock).
- In the old-forest extended rotation zone, use active management to establish a mixed forest with abundant old-forest characteristics; particularly large, vigorous trees, and increased the dominance of white pine and other long-lived species throughout the zone.
- Maintain the forested and unforested wetlands of the Ecological Reference Sites in a natural, unmanaged condition, except for invasive species control. In the actively managed zones manage forested wetlands to meet their individual zone objectives.

RESOURCE MANAGEMENT PRESCRIPTIONS

The General Timber Type Management Prescriptions and their all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

ECOLOGICAL REFERENCE SITES

- Passively manage these sites. Perform no active forest management, including any salvage operations, except to clear trails or roads. The material would be left on site. Exceptions to salvage restrictions because of statutory responsibilities for fire protection or forest pest control may be granted after review by an interdisciplinary team.
- The State Natural Areas Program will coordinate base line vegetation data collection within ten years, then monitor the changes to that vegetation once every ten years thereafter to compare with the managed old-growth data collection.
- The State Natural Areas program will work with local fire suppression staff to develop strategies that consider the management goals of this area while conducting wild-fire suppression activities.
- Salsich Lake, a designated wild lake, lies within this area. The passive management prescribed is fully compatible with the management requirements for a wild lake. See the wild lakes management zone section for information on the non-vegetation management requirements within the wild lake zone.

MANAGED OLD-GROWTH RESTORATION ZONE

The management strategy for this zone is to maintain a landscape that contains old growth components, yet will still contain early and mid successional parts. These conditions will shift location in the zone over time as disturbance occurs. Ongoing research on old-growth characteristics should help develop active management guidelines.

- Adapt the techniques described in the General Management Prescriptions to specific stand conditions with the goal of creating, enhancing and maintaining old growth northern hardwood characteristics on appropriate sites, including promoting coarse woody debris and snag densities similar to the old-growth reference sites. In hardwood stands emphasize various combinations of sugar maple, hemlock, yellow birch, white pine, basswood, red oak, and white birch.

Native Community Management Classification**AREA**

LAKE LAURA LOAMY HILLS

8**Table 2.8 Area 8 Lake Laura Loamy Hills, Current and desired future conditions for community types in acres and percent of total.**

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Area
Aspen	669	10%	400	6%
Grass Openings	143	2%	0	0%
Forested Wetlands	418	6%	290	4%
Hemlock Hardwoods	925	13%	1,000	15%
Northern Hardwoods	3,011	44%	3,721	54%
Red & White Pine	75	1%	100	1%
Red Oak	541	8%	300	4%
Fir-Spruce	62	1%	0	0%
Unforested Wetlands	237	3%	365	6%
White Birch	815	12%	720	10%
TOTAL	6,896	100.00%	6,896	100.00%

*The increase and decrease of forested and unforested wetlands is due to natural succession or natural catastrophes.*** Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.*

- Salvage of trees damaged by storms, fire, insects or disease will be evaluated by an integrated team led by Forestry staff. The decision whether to salvage or not will be based on the management goal of increasing coarse woody debris and snag components in this management area while considering fire suppression, forest pest control and product values.
- Conduct experimental management to enhance the composition and structure of managed old-growth northern hardwood stands. Techniques may include canopy gaps and small scale shelterwood or seed tree harvests to increase yellow birch regeneration. Also, areas may be under planted with white pine and when the pine are large enough to be released, a harvest to remove the trees shading the young pines could take place.

OLD-FOREST - EXTENDED ROTATION ZONE

The management strategy in this zone is to use extended rotation (biological age harvest) and a variety of active management techniques to grow large vigorous trees while maintaining early successional types of forest stands, such as aspen and birch as a forest component.

- Conduct small-scale shelterwood harvests to enhance forest composition by identifying white pine and yellow birch seed trees and assess the surrounding land for conducting natural regeneration cuts or under-planting. Small areas may be scarified or removal of advanced regeneration sugar maple to enhance seedling establishment.
- Continue to retain most white cedar, hemlock, white pine and yellow birch in harvest areas.
- Regenerate some aspen, white birch and other early

successional species. Maintain white pine and other suitable mixed forest species following the General Management Prescriptions for those species. Convert those stands not regenerated to northern hardwoods.

- Convert 143 acres of scattered grassland to natural early succession forest and remove Scotch pine. Supplemental planting of white pine may be necessary to prevent re-establishment of Scotch pine.
- Salvage of trees damaged by storms, fire, or insect disease would occur, but small-scale windthrow could be left in place to complement adjacent old growth attributes.

ALL OF MANAGEMENT AREA

- Conduct research to identify ways to manage for old-growth forest characteristics while producing some economic timber products. Use data from forest reconnaissance monitoring of vegetation to measure change in active and passive managed areas. Apply the information from this research to the adaptive management approach on the forest.
- To the degree possible, use the existing trail network to provide public access for education and ecological interpretation.

STATE NATURAL AREA DESIGNATION

See State Natural Area discussion in the Appendix for detailed information.

Proposed overlay designations for State Natural Area would occur for Lake Alva Birch-Hemlocks (314 acres, includes 26 lake acres), Lake Laura Hardwoods (852 acres, includes 60 lake acres) and Plum Lake Hemlocks (744 acres).

**AREA
9****Native Community Management Classification**
HEMLOCK/NORTHERN HARDWOOD

This management area is comprised of six sites, Catherine Lake, North Bass Lake West, Plunkett Lake, Sweeney Lake, Jute Lake, and Tomahawk Lake Hemlocks, distributed across the forest. Together these sites total 3,798 acres. (There are two other sites on the NH-AL that were also identified to be managed for similar objectives; however, they are within the Clear Lake and Bittersweet Recreation Management Areas. See those sections for management of those sites.)

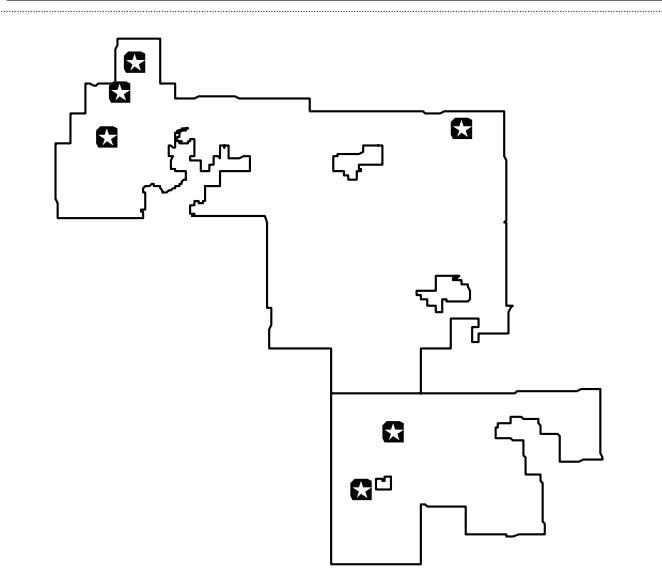
The wide distribution of sites cross most of the landforms found in the NH-AL. The soils range from the deep silty loams of the Winegar moraine to very sandy soils of the Vilas-Oneida Sandy Plains. All of the sites are found on rolling topography and all are positioned on the east side of large water bodies. These sites were selected through an integrated scientific process to represent the best locations for developing old growth hemlock hardwood and northern hardwood communities on the NH-AL. As a result, the overall composition of these sites is 50% northern hardwood and hemlock hardwoods, while only 12% supports drier soil higher disturbance species such as aspen, white birch and red oak. Wetlands cover most of the remaining acreage.

The generally richer soils that support northern hardwoods and hemlock-hardwoods will be expected to have associated ground layer plants such as bluebead lily, lady fern, shield fern sedges and clubmoss, with a poorly developed shrub layer. These six sites occur in a wide variety of land type associations and exist on habitat types appropriate to these species.

Historically, within the NH-AL landscape these sites were likely the least disturbed communities with a disturbance pattern of frequent small blowdowns, infrequent large blowdowns and extremely rare catastrophic fires. Such conditions would produce uplands with primarily hemlock/yellow birch with sugar maple as a secondary species.

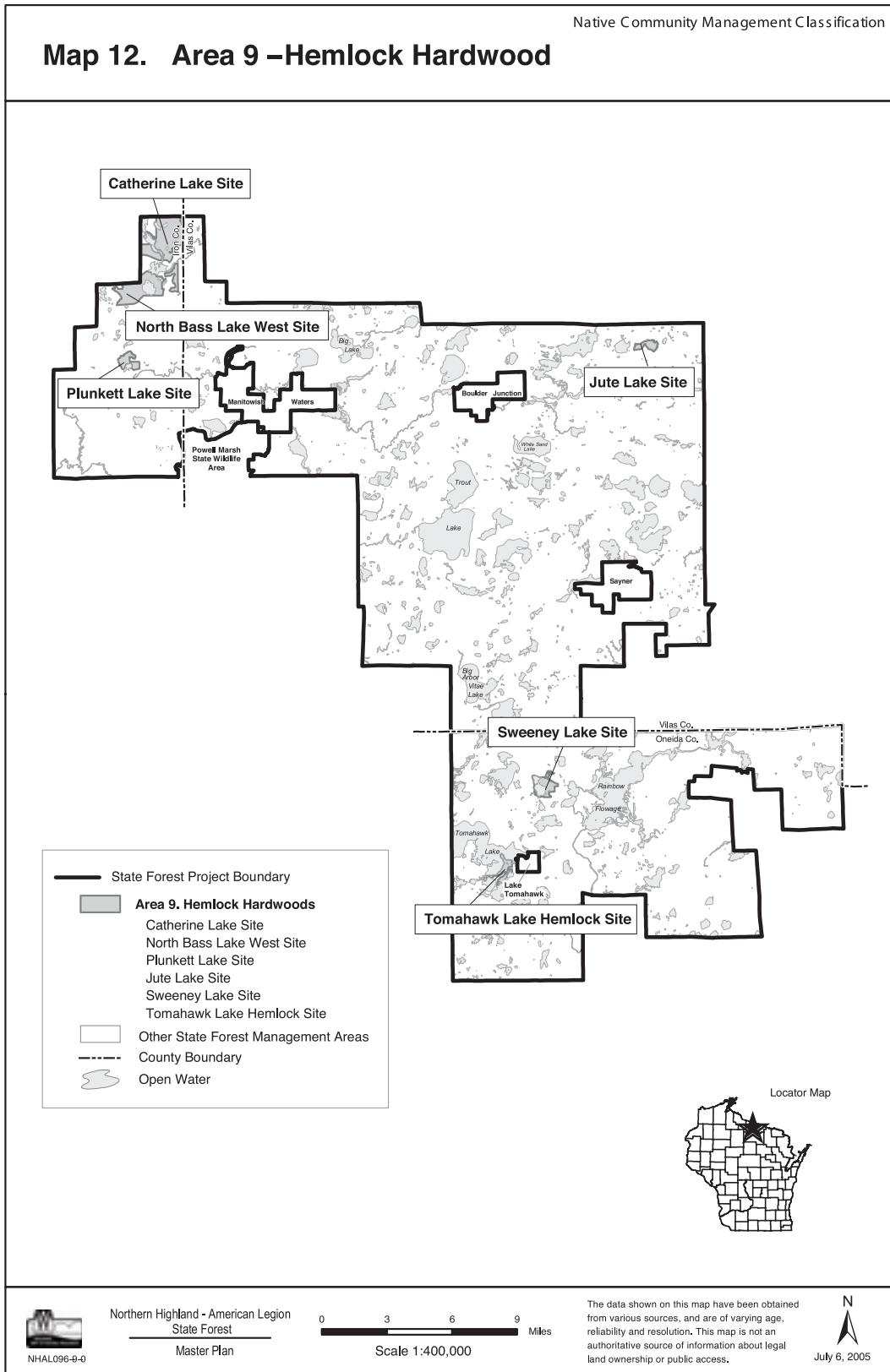
AREA 9 SUMMARY

- ▲ This area is approximately 4,494 acres in size with 3,798 acres in state ownership.
- ▲ Management for old growth hemlock hardwood, northern hardwood and wetlands.
- ▲ Opportunity for scenic shorelines, low intensity recreation, research and education management.

AREA 9 LOCATOR MAP

Native Community Management Classification**HEMLOCK/NORTHERN HARDWOOD****AREA
9**

Native Community Management Classification

Map 12. Area 9 –Hemlock Hardwood

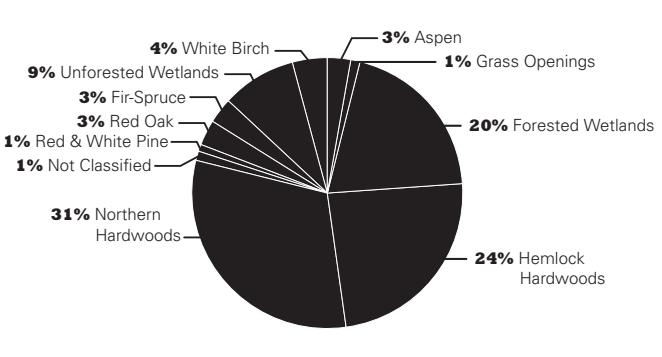
Native Community Management Classification**HEMLOCK/NORTHERN HARDWOOD****LONG-TERM OBJECTIVES
(100 YEARS)**

- Maintain multiple sites across the NH-AL landscape that supports old-growth hemlock hardwood communities. These sites support very old trees, complex old-growth forest dynamics and provide habitat for those species that do best in these ecological conditions.
- Use these sites as ecological reference areas and also for research, education, and interpretation.
- Provide old-growth wildlife viewing opportunities and sites where people can experience the inspirational aesthetic and philosophical values associated with an old-growth hemlock forest.

**SHORT-TERM MANAGEMENT
OBJECTIVES (50 YEARS)**

- Increase the age diversity, composition, and the patch size of stands within the forested area, emphasizing hemlock, white pine, sugar maple, yellow birch and basswood.
- Increase the extent of white pine.
- Establish and maintain large amounts of coarse woody debris, numerous standing dead snags, and an age diversity of trees.
- Maintain four passively managed ecological reference sites; part of Catherine Lake (867 acres, includes lake and private acres), part of North Bass Lake West (213 acres), part of Sweeney Lake (60 acres), and Tomahawk Lake Hemlocks (226 acres).
- Maintain small acres of red oak, white birch, and aspen in the actively managed zones.
- Maintain existing levels of public use and access.

Management in the Hemlock Northern Hardwoods Management Area relies on both passive and active techniques to develop old-growth hemlock/northern hardwood forest communities.

AREA 9 CURRENT LAND COVER**RESOURCE MANAGEMENT
PRESCRIPTIONS**

The General Timber Type Management Prescriptions and their all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

- In areas outside of the passively managed ecological reference sites, conduct small-scale shelterwood harvests to enhance forest composition by identifying white pine and yellow birch seed trees and assess the surrounding land for conducting natural regeneration cuts or under-planting. To enhance seedling establishment, small areas may be scarified or remove advanced regenerated sugar maple. This can be accomplished as part of larger management plans or on its own. Retain coarse woody debris and snag densities similar to the old-growth reference sites.
- Continue to retain most white cedar, hemlock, white pine and yellow birch in harvest areas when suited to the site.
- Regenerate some aspen, white birch and red oak stands to maintain this component of the northern hardwood landscape. Decisions will be made based on the stand characteristics as well as the landscape level composition and goals.
- In portions of the actively managed areas of the North Bass Lake West, Catherine Lake, and Jute Lake sites, encourage research in partnership with other Department programs or cooperators to determine techniques for hemlock regeneration. Use the passively managed ecological reference area as control sites.
- On all of the management area, including the ecological reference sites, to the degree possible, use the existing trail network to provide public access for education and ecological interpretation.

Native Community Management Classification

HEMLOCK/NORTHERN HARDWOOD

**AREA
9****Table 2.9 Area 9- Hemlock Northern Hardwoods, Current and desired future conditions for community types in acres and percent of total.**

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Area
Aspen	133	3%	90	2%
Grass Openings	18	1%	18	1%
Forested wetlands	758	20%	758	20%
Hemlock Hardwoods	925	24%	925	24%
Northern Hardwoods	1,167	31%	1,166	31%
Non Classified	53	1%	53	1%
Red and White Pine	14	1%	94	3%
Red Oak	100	3%	60	2%
Fir-Spruce	120	3%	80	2%
Unforested Wetlands	354	9%	354	9%
White Birch	156	4%	200	5%
TOTAL	3,798	100.00%	3,798	100.00%

*Not Classified category contains acres of lakeshore under passive management.*** Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.***ECOLOGICAL REFERENCE SITES**

- Passively manage the four ecological reference sites; part of Catherine Lake, North Bass Lake West, Sweeney Lake, and Tomahawk Lake Hemlocks. The use of active management to control of invasive plants and to maintain public safety on public use areas is allowed. Salvage will not generally be conducted in the passive areas. Exceptions to salvage restrictions because of statutory responsibilities for fire protection or forest pest control may be granted after review by an interdisciplinary team.

STATE NATURAL AREA DESIGNATION

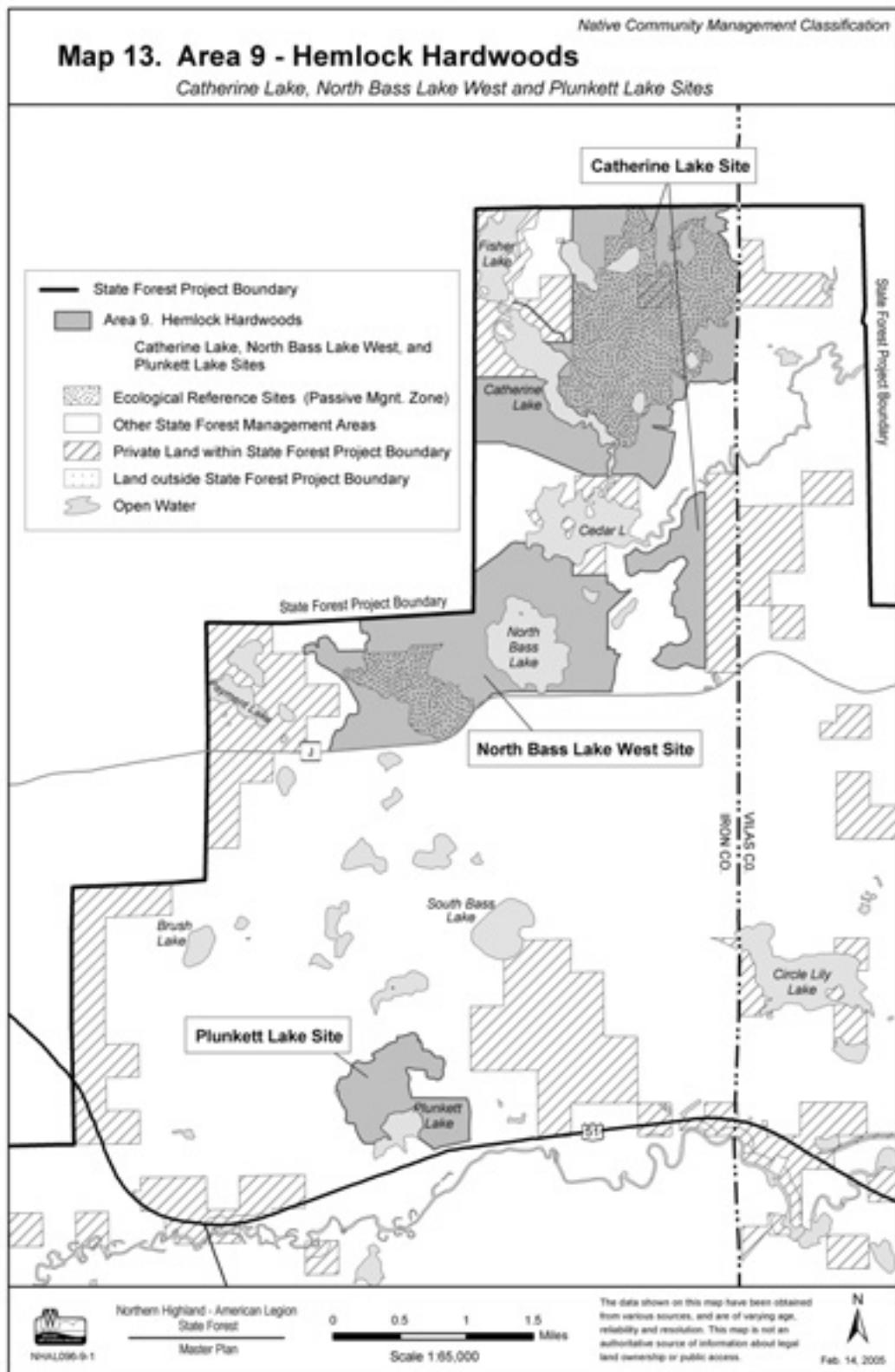
See State Natural Area discussion in the Appendix for detailed information.

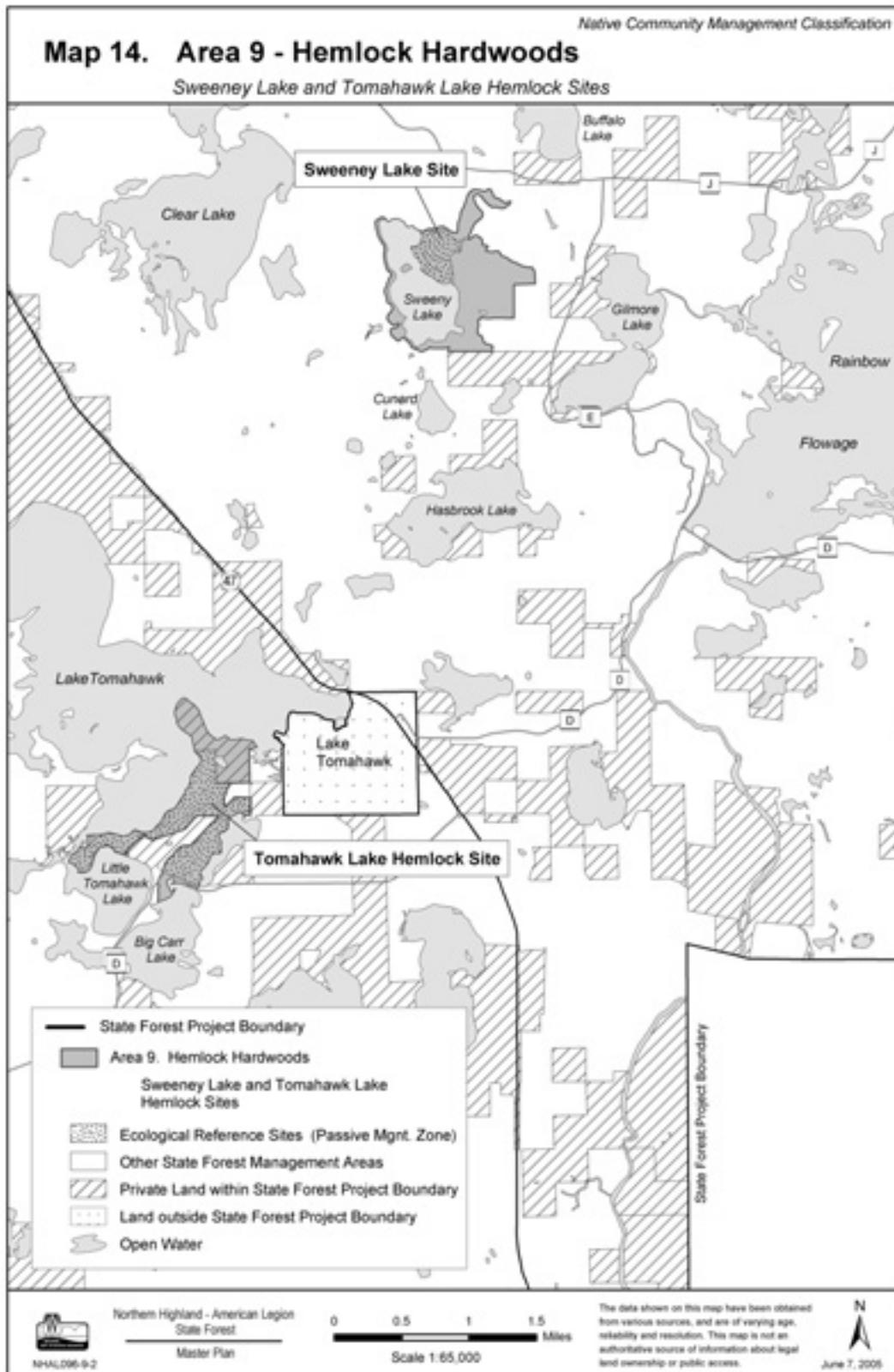
Proposed overlay designations for State Natural Area would occur for Catherine Lake Hemlock-Hardwoods (867 acres, includes 33 lake and 40 private acres), DuPage Lake, which includes the passively managed portion of North Bass Lake West (213 acres) and Tomahawk Lake Hemlocks (226 acres).

Note: Inclusion of private acres in no way inhibits the owners from conducting legal management activities on their land, nor does it inhibit them from selling their land to whomever they desire. However, if the owner wishes to cooperate with the Department in management plan or acquisition, the Department would work with those landowners

Native Community Management Classification

HEMLOCK/NORTHERN HARDWOOD



Native Community Management Classification**AREA****9****HEMLOCK/NORTHERN HARDWOOD**

Northern Highland - American Legion

State Forest

Master Plan

0

0.5

1

1.5

Miles

Scale 1:65,000

The data shown on this map have been obtained from various sources, and are of varying age, availability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

N
June 7, 2005



Native Community Management Classification**AREA****9****Hemlock/NORTHERN HARDWOOD**

**AREA
10****Native Community Management Classification****PEATLAND / WETLANDS**

This peatland/wetland natural community management area is made up of seven similar sites across the Forest totaling 16,115 acres. These sites have significant ecological qualities such as exceptional concentrations of rare species and/or contain some of the best examples of representative natural features. These peatland sites are composed primarily of open bog and fen systems and their corresponding adjacent wetland communities, soils and topography. In some cases the sites also contain some upland areas within their boundaries. These sites host a large portion of the rare species found on the State Forest. Also found within some sites is the very rare boreal rich fen natural community. These sites are found on a wide variety of landforms and soils, and are located throughout the State Forest. The primary soil types are lowland acid and non-acid organic peat.

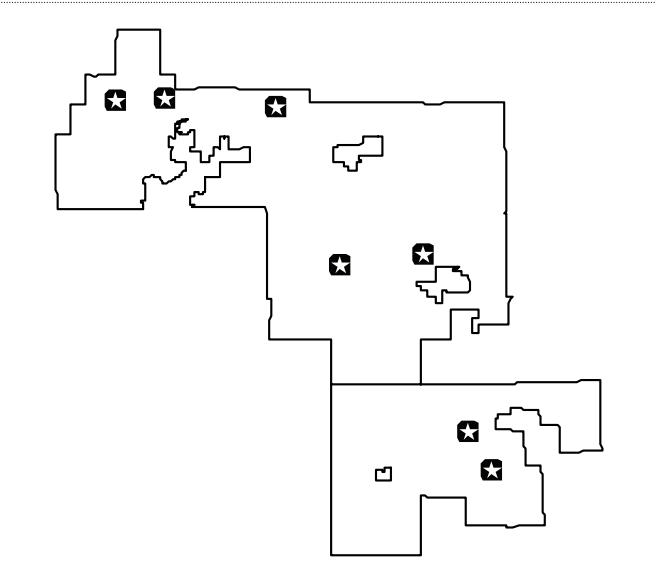
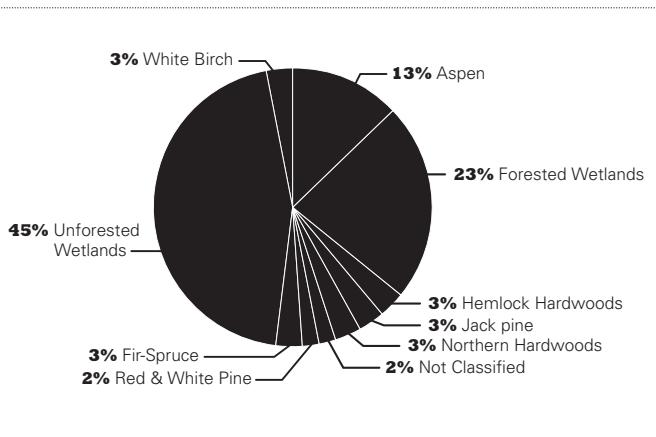
The majority of these lowland sites contain either open wetland or non-merchantable conifer forests. They also contain some significant cedar swamp conifer and swamp hardwood forests. The upland areas contain a mixed composition of forests of aspen, white birch, fir-spruce, jack pine and red and white pine. Hemlock hardwoods and northern hardwoods can also be found in certain areas.

The diverse peatlands support a lush ground layer of mosses, goldenthread, fringed polygala, twinflower, cranberries, and snowberry. A few pine plantations also exist within the boundary. Habitat types on the uplands span the range from low to relatively high fertility.

The wetland areas exist today much as they were at the time of European settlement. Historically, fire probably played a significant role in the species composition of these areas as well as wind events and periodic droughts, but to a lesser extent.

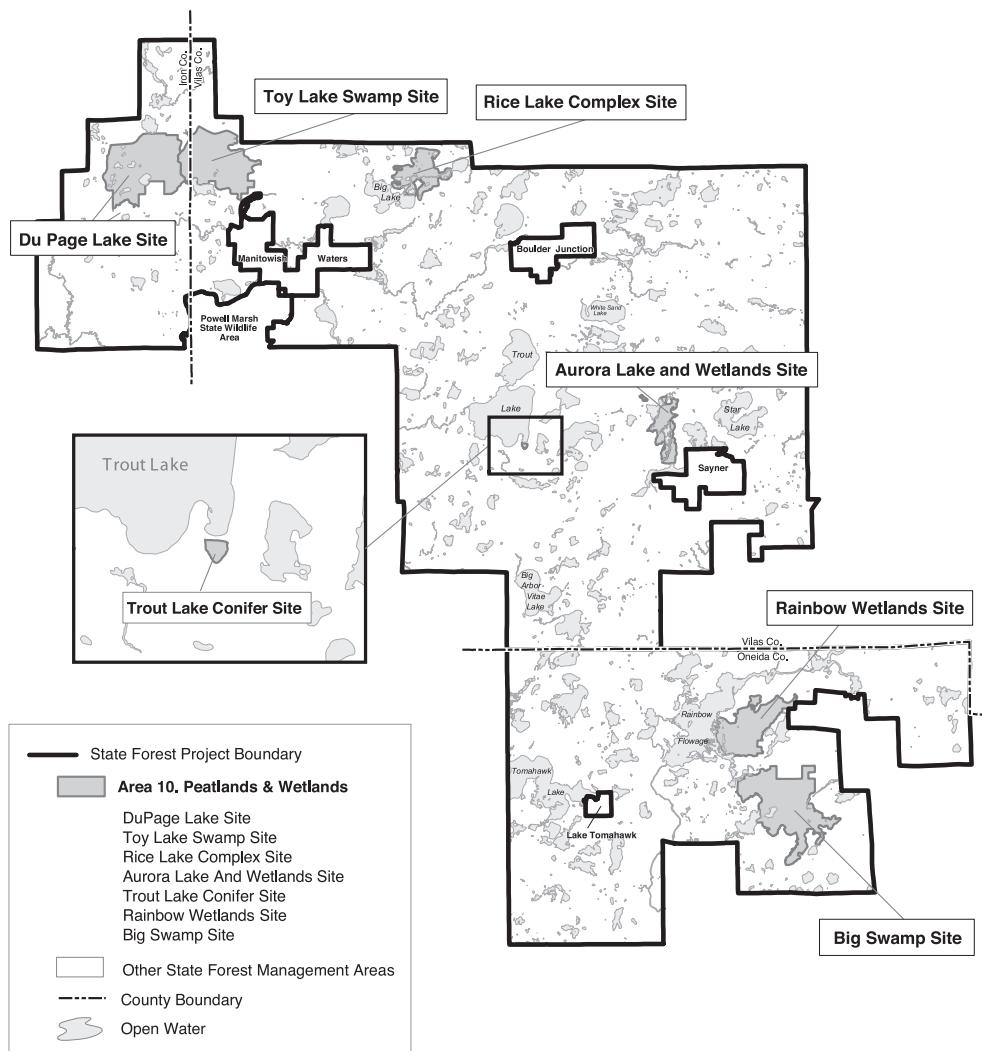
AREA 10 SUMMARY

- ▲ This area is approximately 16,115 acres in size with 14,555 acres in state ownership.
- ▲ Management of high quality peatland sites for ecological, water quality and rare species habitat values.
- ▲ Maintenance of the overall scenic nature of the rivers, wetlands, and lakes, and old growth characteristics.

AREA 10 LOCATOR MAP**AREA 10 CURRENT LAND COVER**

Native Community Management Classification**AREA
10****PEATLAND / WETLANDS**

Native Community Management Classification

Map 16. Area 10 –Peatlands & Wetlands

Locator Map

Northern Highland - American Legion
State Forest

Master Plan

0 3 6 9 Miles
Scale 1:400,000

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.
June 6, 2005

N



LONG-TERM OBJECTIVES (100 YEARS)

- Maintain a high quality series of sites that support old-growth white cedar, black spruce, tamarack, and swamp hardwoods. These sites would also support other high quality peatland communities, such as open bog, muskeg, boreal rich fen, sedge meadows, and open water communities. Interspersed in the lowlands are uplands old-growth communities of northern hardwood, hemlock-hardwood, white pine, red pine, and fir-spruce.
- Protect ecological, water quality and rare species habitat values.
- Use the sites for research, education, and ecological interpretation as well as demonstration areas of peatlands management.

SHORT-TERM OBJECTIVES (50 YEARS)

Maintain seven passively managed ecological reference sites; DuPage Lake (2,992 acres, includes lake acres), Toy Lake (2,815 acres, includes lake and private acres), Rice Creek (495 acres, includes stream and private acres), Aurora Lake (834 acres, includes lake acres), Trout Lake Conifer Swamp (22 acres), Rainbow Wetlands (2,323 acres) and Big Swamp (2,513 acres, includes lake acres). These passively managed ecological reference sites harbor the highest concentrations of rare species and least disturbed examples of peatland/wetlands.

- Outside of the ecological reference sites, use active management to increase the age, diversify the composition, and reduce fragmentation of the forested patches. Maintain aspen and white birch in accessible areas in the active management zone. On suitable sites increase the abundance of northern hardwood, hemlock hardwood, fir-spruce, red and white pine through active management.
- Maintain limited low-impact public access and provide opportunities for education and interpretation of these natural communities and habitats.
- Provide for research, ecological interpretation, and education, including demonstrations of peatlands management.

RESOURCE MANAGEMENT PRESCRIPTIONS

The General Timber Type Management Prescriptions and all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

- Manage upland sites for a variety of species types and age classes using the General Forest Management Prescriptions with special emphasis on safeguarding the area's unique wetland characteristics and water quality.
- Manage upland sites with red and white pine, northern hardwood-hemlock or spruce-fir to maintain or increase their abundance.
- Use experimental techniques in addition to standard management practices, such as the thinning of even-aged types, to hasten the conversion to longer-lived and uneven-aged species on ecologically appropriate upland sites.
- Manage stands isolated by wetlands only under frozen conditions.
- Passively manage all open, unforested wetland communities. Perform no active forest management, including salvage, except to clear trails or roads and then leave the material on site. Exceptions to salvage restrictions because of statutory responsibilities for fire protection or forest pest control may be granted after review by an interdisciplinary team.

On all of the management area, including the ecological reference sites:

- Actively suppress forest fires, and restore any soil to its original topography that's disturbed by suppression activities. The Department shall develop a wild fire response plan that minimizes adverse soil disturbance, while assuring public safety. Develop a disturbed soil planting and monitoring strategy by an integrated team.
- To the degree possible, use the existing trail network to provide public access for education and ecological interpretation.

Native Community Management Classification**AREA
10****PEATLAND / WETLANDS**

Table 2.10 Area 10- Peatlands/ Wetlands, Current and desired future conditions for community types in acres and percent of total.

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Area
Aspen	1,845	13%	1,460	10%
Forested wetlands	3,366	23%	3,486	24%
Hemlock Hardwoods	439	3%	579	4%
Jack Pine	354	2%	354	2%
Northern Hardwoods	478	3%	679	5%
Non Classified	344	2%	100	1%
Red and White Pine	342	2%	442	3%
Fir-Spruce	393	3%	477	3%
Unforested Wetlands	6,554	45%	6,678	46%
White Birch	440	4%	300	2%
TOTAL	14,555	100.00%	14,555	100.00%

The decrease in the Not Classified category describes the acres that went into Forested-wetlands and non-forested-wetlands. The increase and decrease of Forested and Unforested wetlands is due to natural succession or natural catastrophes.

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.

ECOLOGICAL REFERENCE SITES

- Passively manage the ecological reference sites. Perform no active forest management, including salvage, except to clear trails or roads and then leave the material on site. Exceptions to salvage restrictions because of statutory responsibilities for fire protection or forest pest control may be granted after review by an interdisciplinary team.

compatible with the management requirements for a wild, wilderness, and scenic lakes. For the lake that is not within an ecological reference site, maintain a 400 ft. passive management zone buffer around the lake. See the wild lakes management zone section for information on the non-vegetation management requirements within the wild lake zone.

OTHER SITE SPECIFIC MANAGEMENT

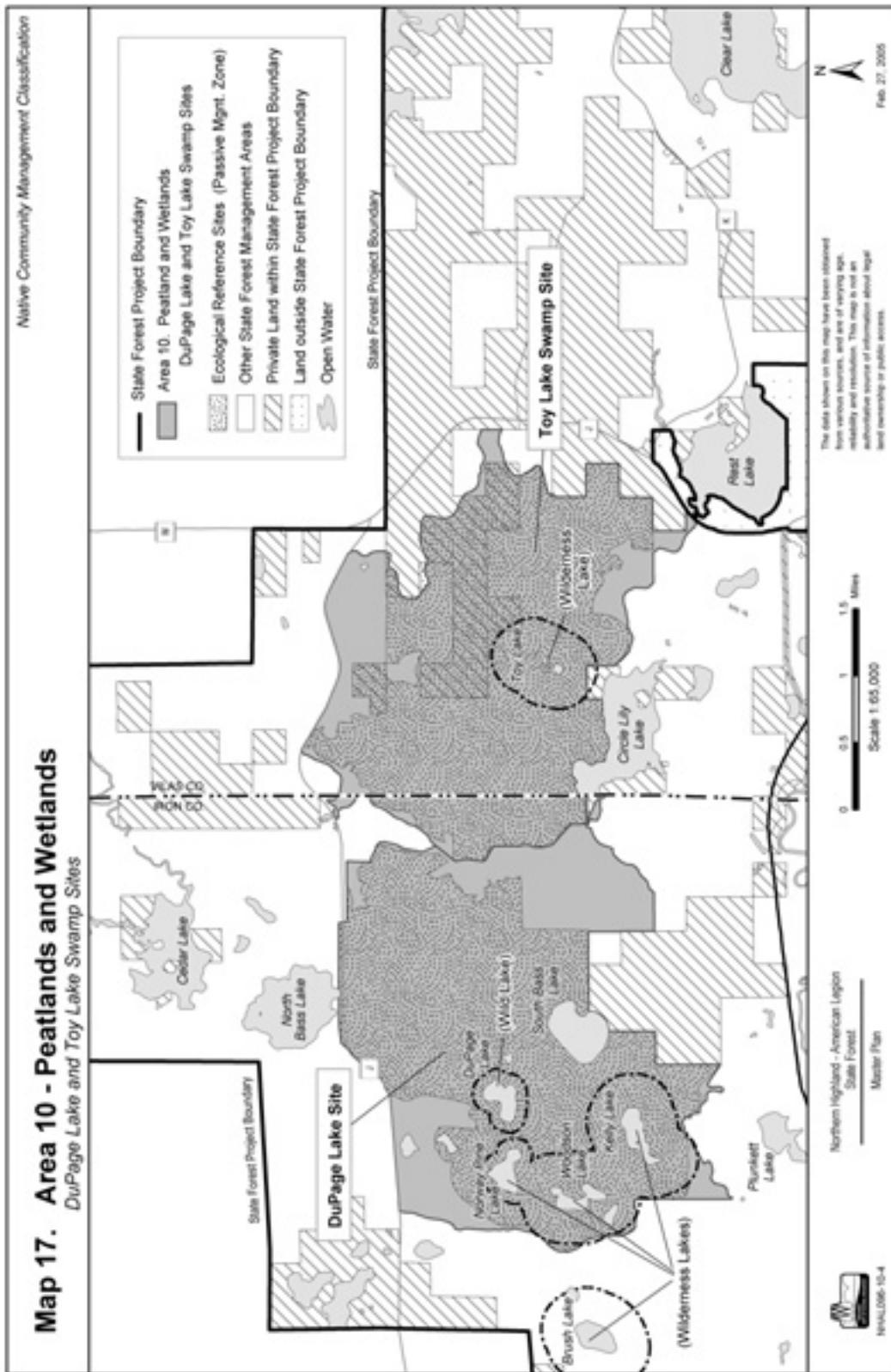
- In the aspen and birch stand near the entrance road to DuPage Lake, on two stands along County Highway J in the Toy Lake Swamp, and on other ecologically appropriate sites across the actively managed area, manage to convert these stands to longer-lived forest types.
- Investigate the feasibility of rerouting the snowmobile trail that travels through the eastern portion of Toy Lake Swamp to uplands outside the swamp. Maintain the same number of miles of trail over time.
- Develop a boardwalk-hiking trail (contingent on adequate funding for such) into Trout Lake Conifer Swamp. The short loop boardwalk is to provide educational and interpretive access to the white cedar swamp. Connect the hiking trail with the existing paved Boulder Junction bicycle path.
- Manage wild, wilderness, and scenic lakes consistent with the requirements for each lake designation. Three designated wilderness, three wild lakes, and part of one scenic lake lie within this management area. All, except one wild lake, are within the ecological reference site. The prescribed passive management is fully

STATE NATURAL AREA DESIGNATION

See State Natural Area discussion in the Appendix for detailed information.

Proposed overlay designations for State Natural Area would occur for DuPage Lake Peatlands (3,205 acres, includes 230 lake acres), Toy Lake Swamp (2,803 acres, includes 124 lake acres and 506 private acres that would be added upon acquisition), Rice Creek (426 acres, includes 22 stream acres and 40 private acres that would be added upon acquisition), Aurora Lake (834 acres, includes 301 lake acres), Trout Lake Conifer Swamp (22 acres), Rainbow Wetlands (2,323 acres), and Big Swamp (2,513 acres, includes 79 lake acres).

Note: Inclusion of private acres in no way inhibits the owners from conducting legal management activities on their land, nor does it inhibit them from selling their land to whomever they desire. However, if the owner wishes to cooperate with the Department in management plan or acquisition, the Department would work with those landowners

**AREA
10****Native Community Management Classification****PEATLAND / WETLANDS**

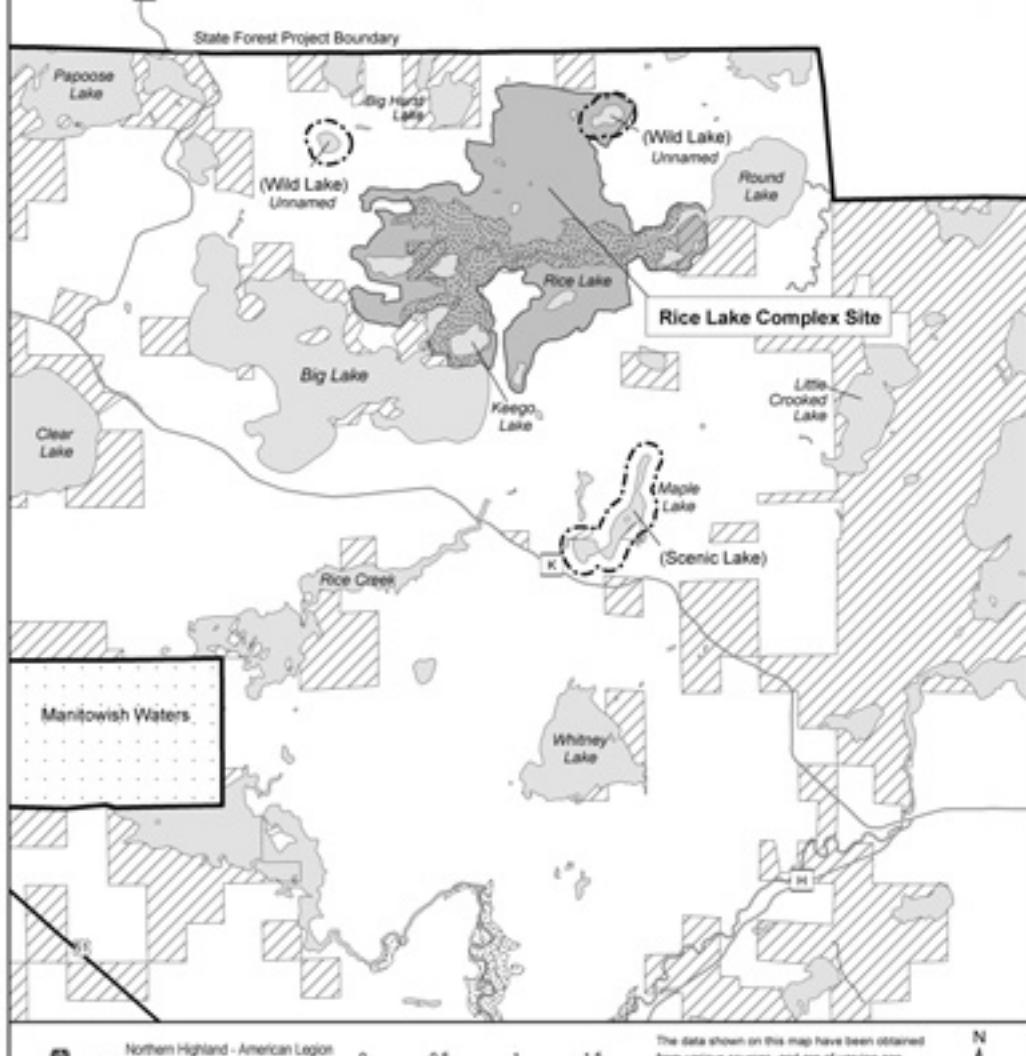
Native Community Management Classification**AREA
10****PEATLAND / WETLANDS**

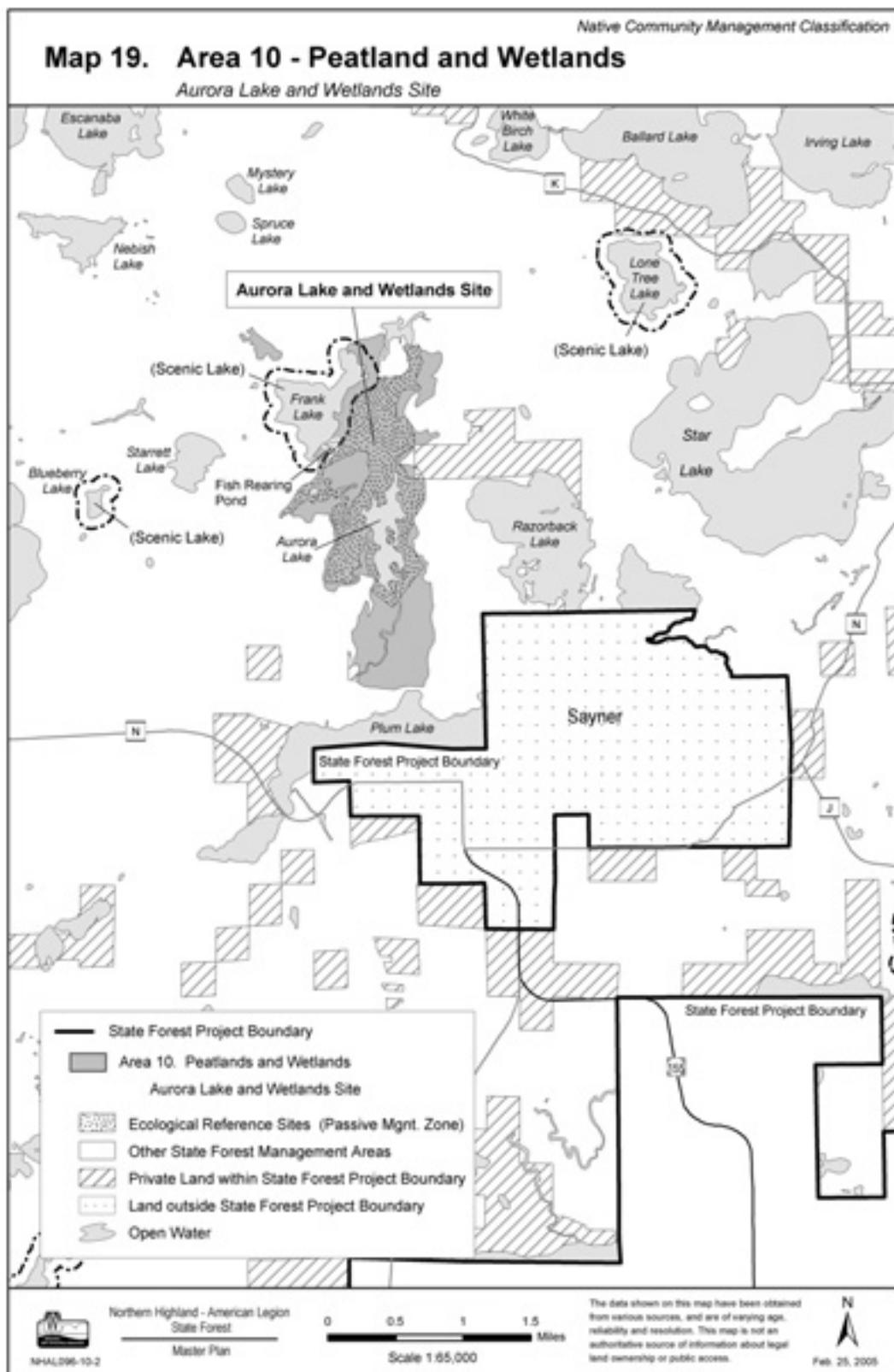
Native Community Management Classification

Map 18. Area 10 - Peatland and Wetlands

Rice Lake Complex Site

- State Forest Project Boundary
- Area 10. Peatland and Wetlands
- Rice Lake Complex Site
- Ecological Reference Sites (Passive Mgmt. Zone)
- Other State Forest Management Areas
- ▨ Private Land within State Forest Project Boundary
- ▨ Land outside State Forest Project Boundary
- ▨ Open Water



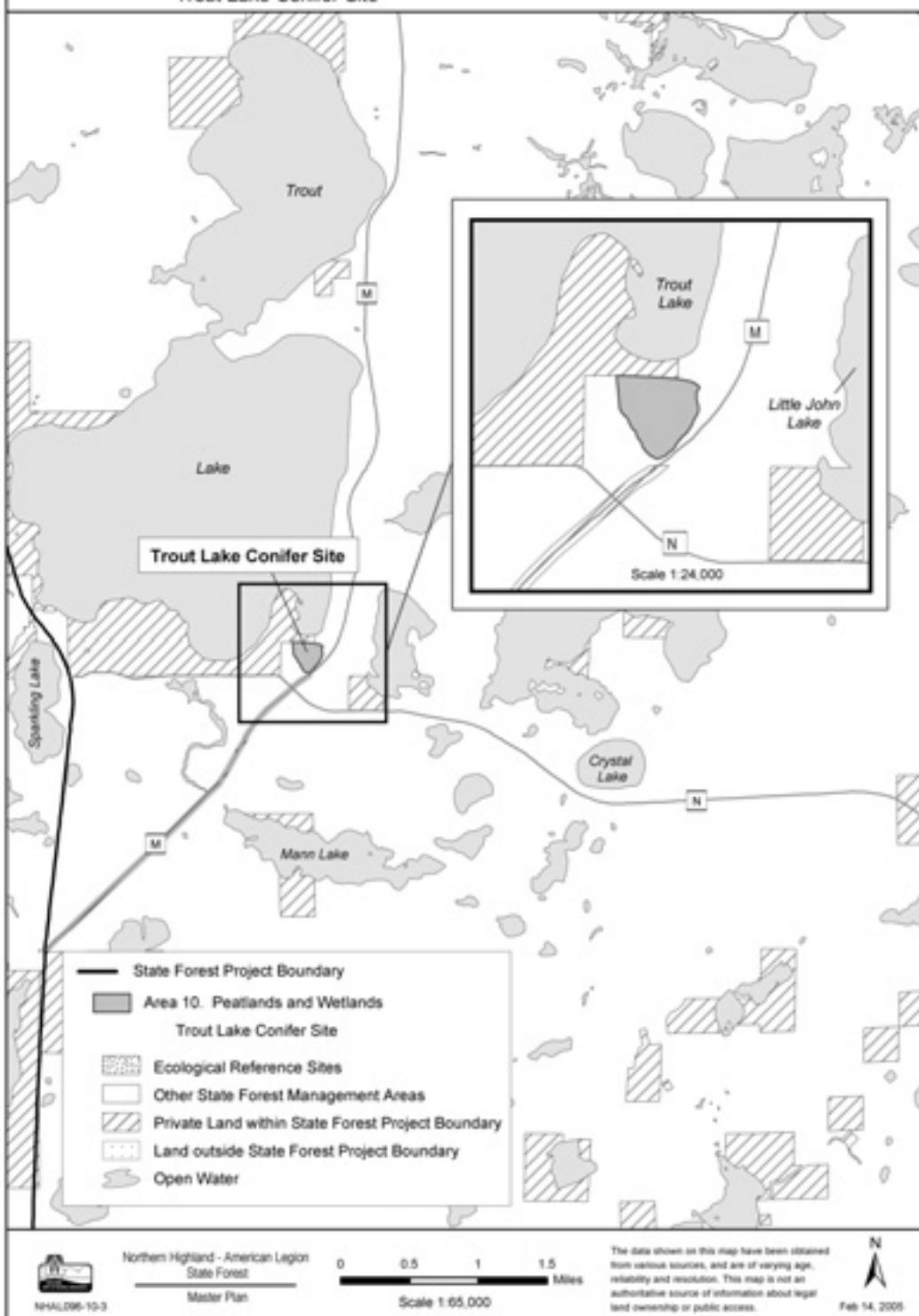
**AREA
10****Native Community Management Classification****PEATLAND / WETLANDS**

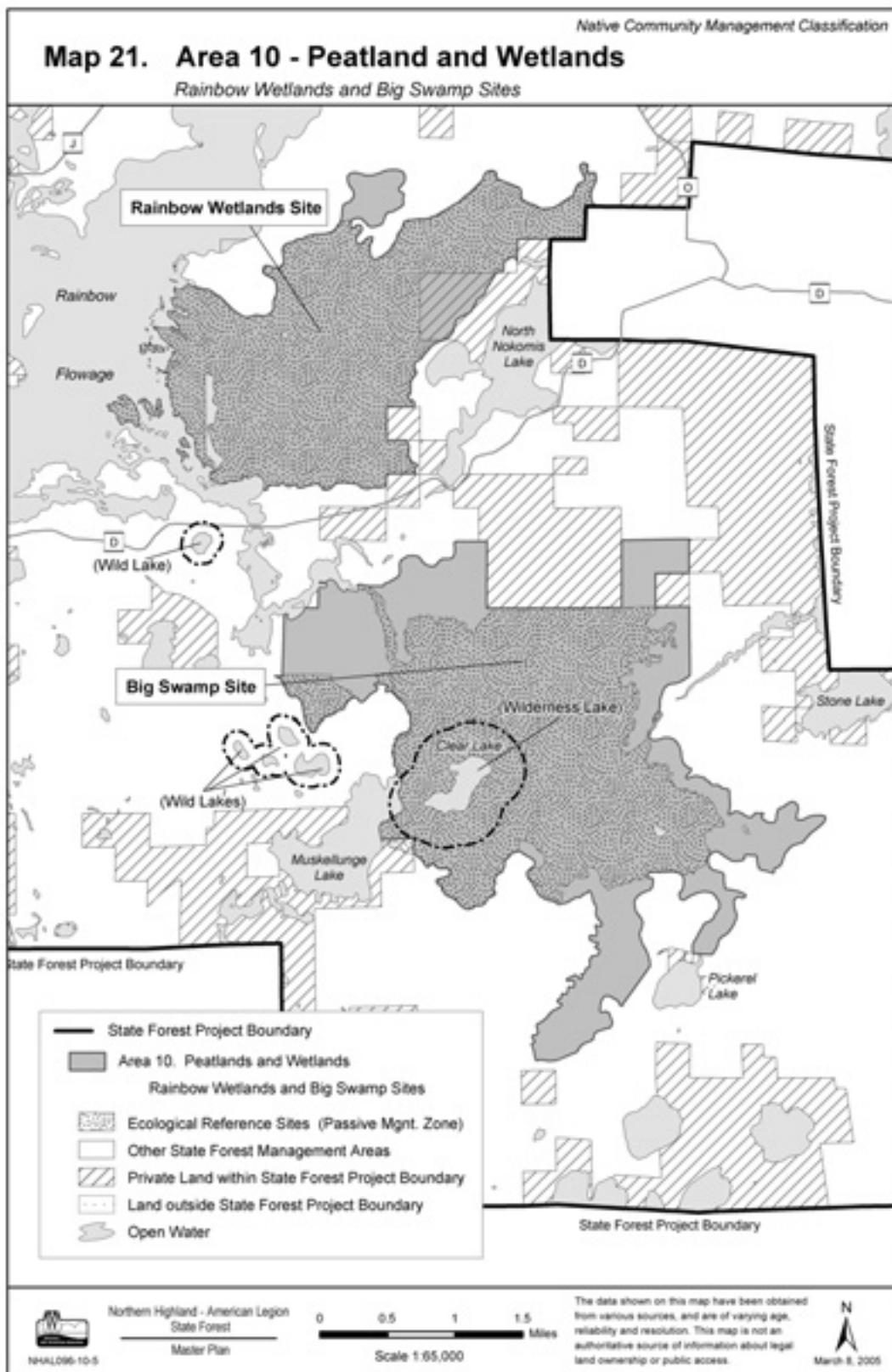
Native Community Management Classification**AREA
10****PEATLAND / WETLANDS**

Native Community Management Classification

Map 20. Area 10 - Peatland and Wetlands

Trout Lake Conifer Site



**AREA
10****Native Community Management Classification****PEATLAND / WETLANDS**

Native Community Management Classification**AREA
10****PEATLAND / WETLANDS**

**AREA
11****Native Community Management Classification****RED AND WHITE PINE**

The Red Pine-White Pine Native Community Management Area is comprised of eight sites: Papoose Creek, High Lake, Camp Lake, Mud Creek Springs, Buffalo Lake, Swanson Lake and Pines, Helen Lake and Stone Lake Pines distributed across the NH-AL. Together these sites total 3,958 acres. These sites are found on sandy soils in a rolling to level outwash topography with kettle lakes and wetlands which is typical of most of the NH-AL. Cathedral Pines is a comparable site but will be managed passively as part of the Trout Lake Administrative Area.

The sites within this management area contain the largest patches of older red and white pine within the younger mixed forest matrix. The uplands within these sites support primarily red and white pine with aspen as the second largest upland coverts. Common understory plants include shrubs such as hazelnut, juneberry, low sweet blueberry, sweetfern, and maple-leaf viburnum, and herbs such as wild lily-of-the-valley, bracken fern, grasses and sedges, and big leaf aster. Numerous kettle wetlands are interspersed and contain open bog, poor fen, muskeg, black spruce swamp, tamarack swamp, alder thicket, and spring ponds.

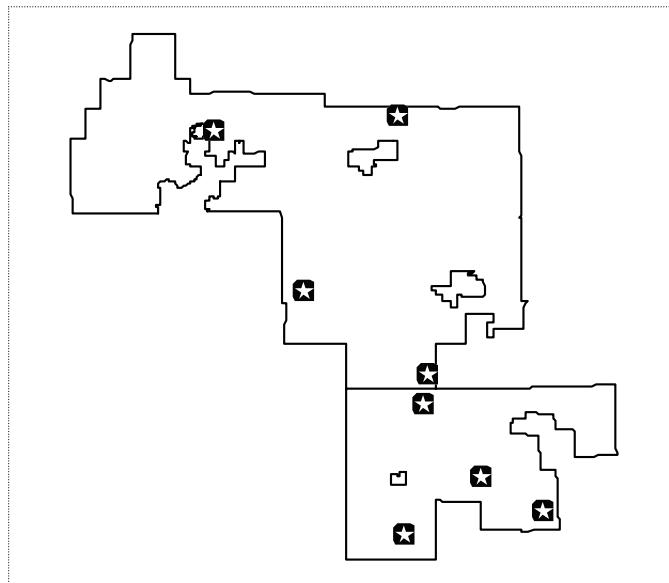
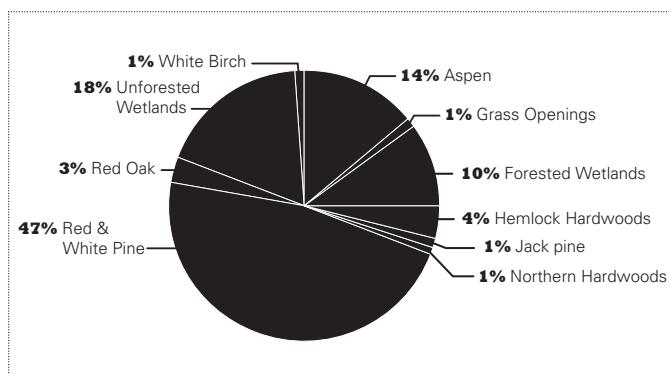
At European settlement, the composition of these sites was likely similar to the dominant historic NH-AL profile of an upland forest with white and red pine as primary species and aspen and white birch as important secondary species. Many pine stands were up to 200 years old with some trees surviving as long as 300 years.

This ecological landscape was subjected to and evolved with fire and wind disturbance for millennia. These disturbance events often set forest succession back to the starting point, but many areas, some for centuries, were missed by these disturbance events because of the protection afforded by lakes and wetlands.

Big tree silviculture techniques will be used in the forest production areas to manage for mixed forests with biologically mature white pine, red pine and red oak. These forests will have abundant early successional aspen and white birch trees growing under scattered big, old pines and red oaks. In contrast, the red and white pine native community areas will have a much larger component of red and white pine and will have a larger component of dead trees and coarse woody habitat. A few places will receive more intense of a fire which will allow development of a savanna-like community with larger diameter pines, scattered smaller pines, fewer shrubs or hardwood saplings with an abundance of grasses, heaths and flowers.

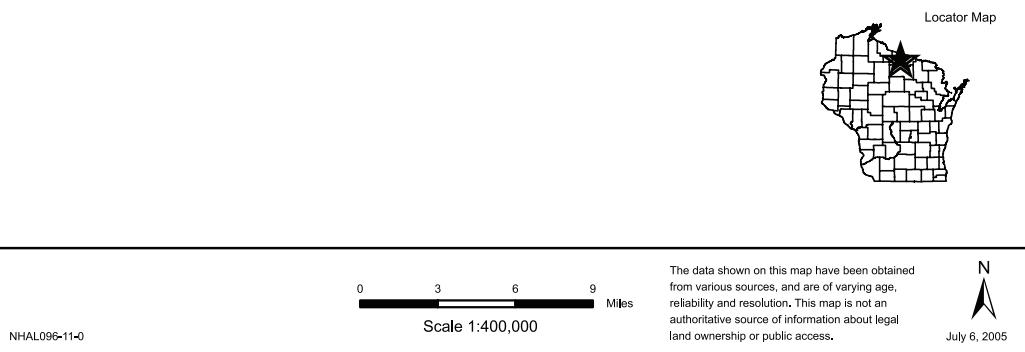
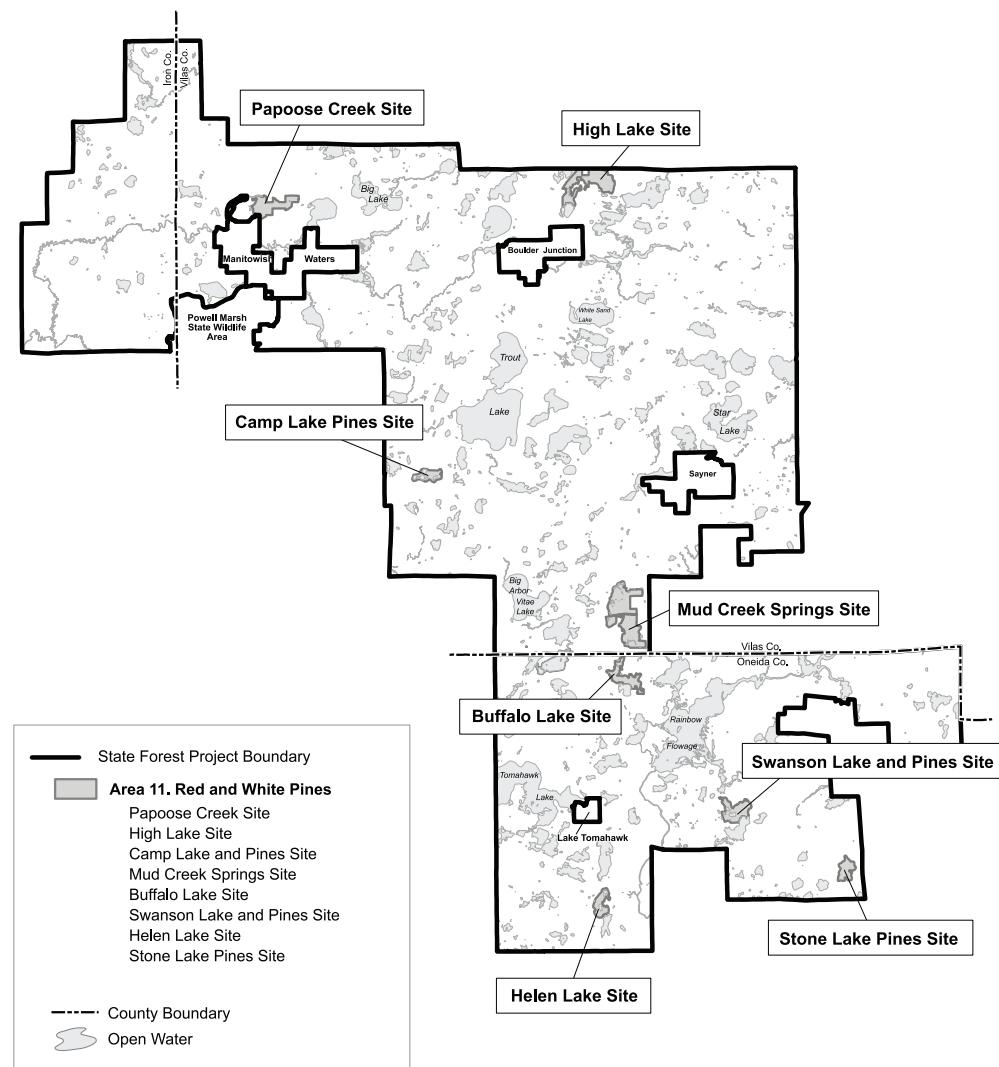
AREA 11 SUMMARY

- ▲ This area is approximately 4,316 acres in size with 3,958 acres in state ownership.
- ▲ Management for old-growth red and white pine and scenic qualities.
- ▲ Opportunity to use prescribed fires as a management strategy in a landscape shaped by fire for millennia.

AREA 11 LOCATOR MAP**AREA 11 CURRENT LAND COVER**

Native Community Management Classification

RED AND WHITE PINE

**AREA
11****Map 22. Area 11 - Red and White Pines**

LONG-TERM MANAGEMENT OBJECTIVES (100 YEAR)

- Develop and maintain sites across the NH-AL landscape that represent old-growth red and white pine characteristics.
- Develop and maintain sites that have open woodland (savanna) structure containing large conifers, few under-story deciduous trees and numerous grasses, heaths, and flowers in the understory.
- Provide opportunities on these sites for research, education, and ecological interpretation using demonstrations of old-growth red and white pine management.
- Maintain the high quality of the forested and unforested wetlands interspersed throughout these sites.

SHORT-TERM MANAGEMENT OBJECTIVES (50 YEARS)

- Develop a mixed pine forest having a greater abundance of pine that is dominated by old trees, large amounts of coarse woody debris, numerous standing dead snags, and a wide age diversity of trees.
- Maintain three passively managed ecological reference sites. They are the 211 acre Camp Lake and Pines (includes lake acres), a 306 acre part of Swanson Lake and Pines (includes 36 lake acres), and the 199 acre Stone Lake Pines site. These sites serve as ecological reference areas for adaptive old-growth management activities elsewhere in the pine management area. Use monitoring information from these existing old-growth reference stands on changes in composition and structure over time to aid in future management decisions.
- Develop two actively managed ecological reference sites for pine woodland community at Papoose Creek Pines (approximately 533 acres) and at Swanson Lake and Pines (approximately 32 acres).

Management for Red and White Pine Native Community Management Area emphasizes the development of old growth pine and mixed forest communities using both passive and active techniques as outlined below.

RESOURCE MANAGEMENT PRESCRIPTIONS

The General Timber Type Management Prescriptions and their all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

- Adapt the General Forest Management Prescriptions for each stand to create, enhance and maintain old growth red/white pine characteristics, including a diversity of tree ages and stand sizes, and providing coarse woody debris and snag densities. Age structure for the species should fall into the average life expectancy consistent with the local site quality.
- Manage to various patch sizes using techniques for regeneration harvests to achieve ecological objectives. Such techniques may include use of large and small patch clear cuts or group selection, shelterwood harvest, seed tree retention, ground disturbance, tree planting or prescribed burning either alone or in combination with the above treatments.
- Convert some deciduous forest types to pine types on appropriate sites, and manage pine plantations toward a more natural density and composition.
- Actively manage that part of the Swanson Lake and Pines site that was salvaged after the 1999 blowdown, (passively manage the unsalvaged portion as described in the ecological reference site section).
- Hawk Lake and Helen Lake are designated wild lakes within the Helen Lake site. Passively manage a 400 foot buffer area around these lakes. See the wild lakes management zone section for information on the non-vegetation management requirements within the wild lake zone.
- Camp Lake is designated as an experimental lake as per Administrative Code NR 20.41. All management activities should consider the long and short term impacts to the research lakes.

On all of the management area, including the ecological reference sites:

- Develop research in partnership with other staff or cooperators to document regeneration and development of old growth characteristics. Using the ecological reference sites as controls, manipulate the other areas to test the management methods.
- Salvage trees damaged by wind, ice, fire, and insects after consultation with managers from affected Department programs.

Native Community Management Classification

RED AND WHITE PINE

**AREA
11****Table 2.11 Area 11- Red and White Pine, Current and desired future conditions for community types in acres and percent of total.**

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Area
Aspen	527	14%	400	10%
Grass Openings	24	1%	24	1%
Forested Wetlands	379	10%	379	10%
Hemlock-Hardwood	141	4%	140	4%
Jack Pine	37	1%	40	1%
Northern Hardwoods	56	1%	60	2%
Not Classified	206	0%	0	0%
Red and White Pine	1,771	47%	2,144	52%
Red Oak	106	3%	70	2%
Unforested Wetlands	661	18%	661	18%
White Birch	50	1%	40	1%
TOTAL	3,958	100.00%	3,958	100.00%

The Not Classified category includes lakeshore areas on Camp Lake and Swanson Lake. Decrease in future acres is due increase in red and white pine cover type.

* Predicted 50-year Condition is an estimate of the forest coverts in 50 years and does not necessarily reflect the long-term objectives of the Area.

ECOLOGICAL REFERENCE SITES

A. Camp Lake and Pines, part of Swanson Lake and Pines, and Stone Lake Pines

- Passively manage the three ecological reference sites except for the control of invasive plants and to maintain public use areas. Salvage generally will not be conducted. Exceptions to the salvage restrictions because of statutory responsibilities for fire protection or forest pest control may be granted after review by an interdisciplinary team.
- Develop research in partnership with other staff or cooperators to assess forest sustainability. Compare growth and regeneration in passive and active management areas in addition to the collection of reconnaissance data.
- Three unnamed lakes within the Swanson Lake and Pines Site are designated wild lakes. The prescribed passive management for this site is fully compatible with the management requirements for a wild lake. See the wild lakes management zone section for information on the non-vegetation management requirements within the wild lake zone.

B. Papoose Creek and part of Swanson Lake and Pines

- Actively manage these two ecological reference sites using prescribed fire along with timber thinning. Develop site-specific goals for composition, regeneration and structure that can be reached through a combination of

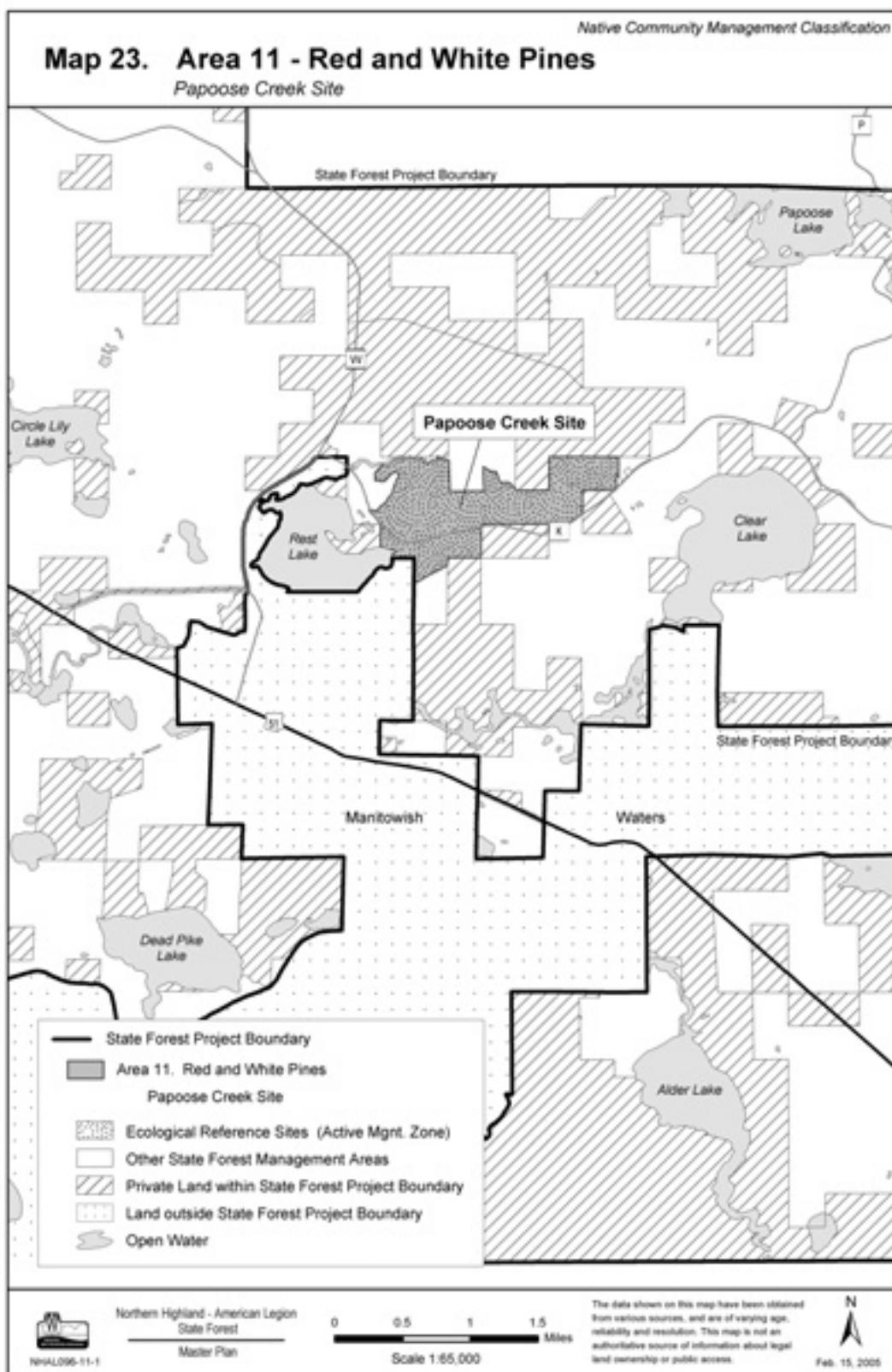
prescribed fire, timber harvest, ground disturbance or other mechanical methods. Using an integrated team of biologists, foresters and fire control specialists, develop specific strategies to plan, educate and manage fire more effectively as a tool in this landscape.

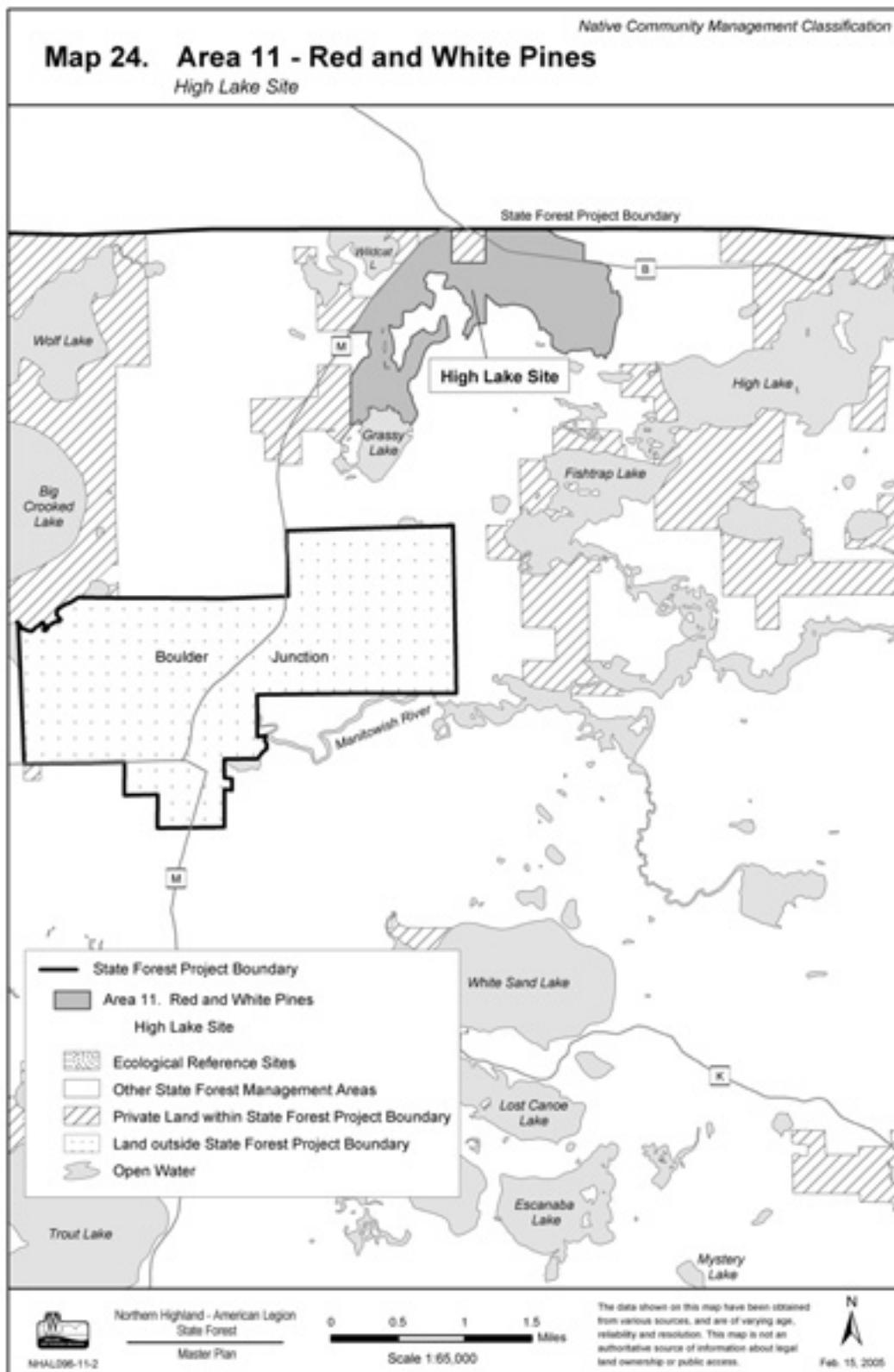
- Develop prescribed burn prescriptions for the burn management areas. Based on the prescriptions, develop prescribed burning plan and information materials, and conduct open houses meetings before burning to inform forest users and neighbors about the plan and the values of burning.
- Prior to burning an area, reduce fuel loads through timber harvest or mechanical means, and develop fire-breaks and other control elements necessary for safe burning. Salvage after blow downs would generally occur to remove potential fuels, which may hamper prescribed fire application.

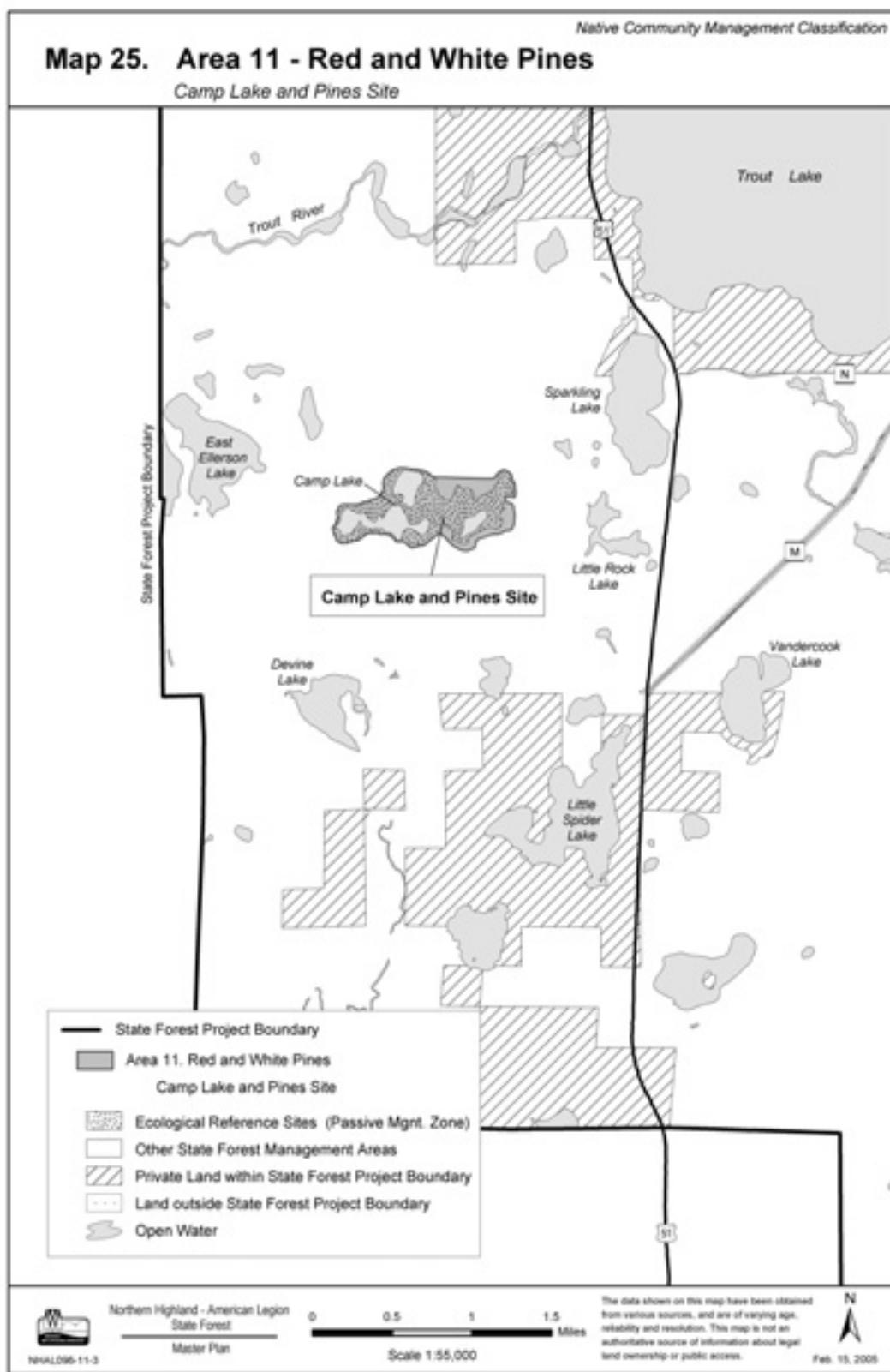
STATE NATURAL AREA DESIGNATION

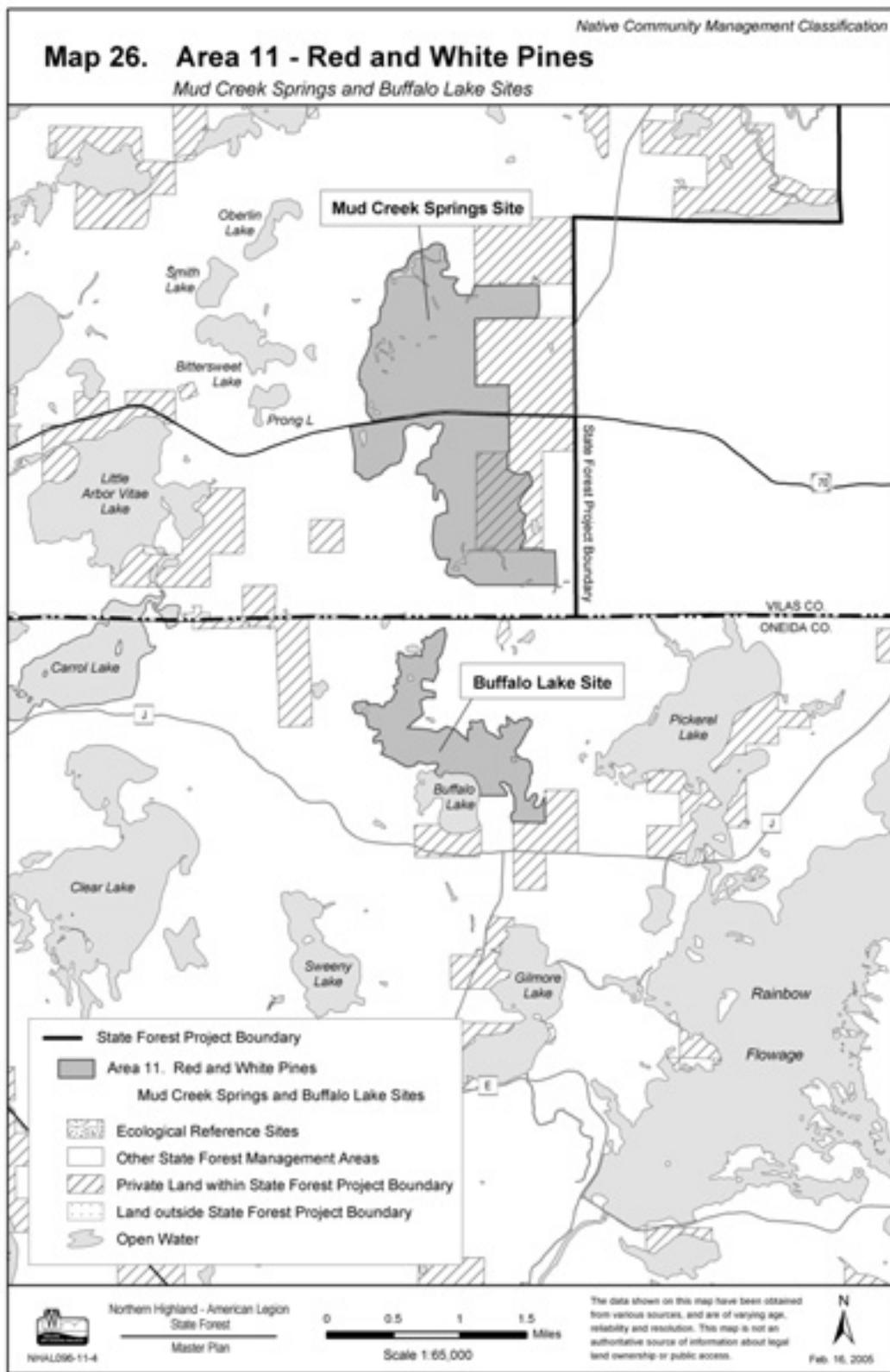
See State Natural Area discussion in the Appendix for detailed information.

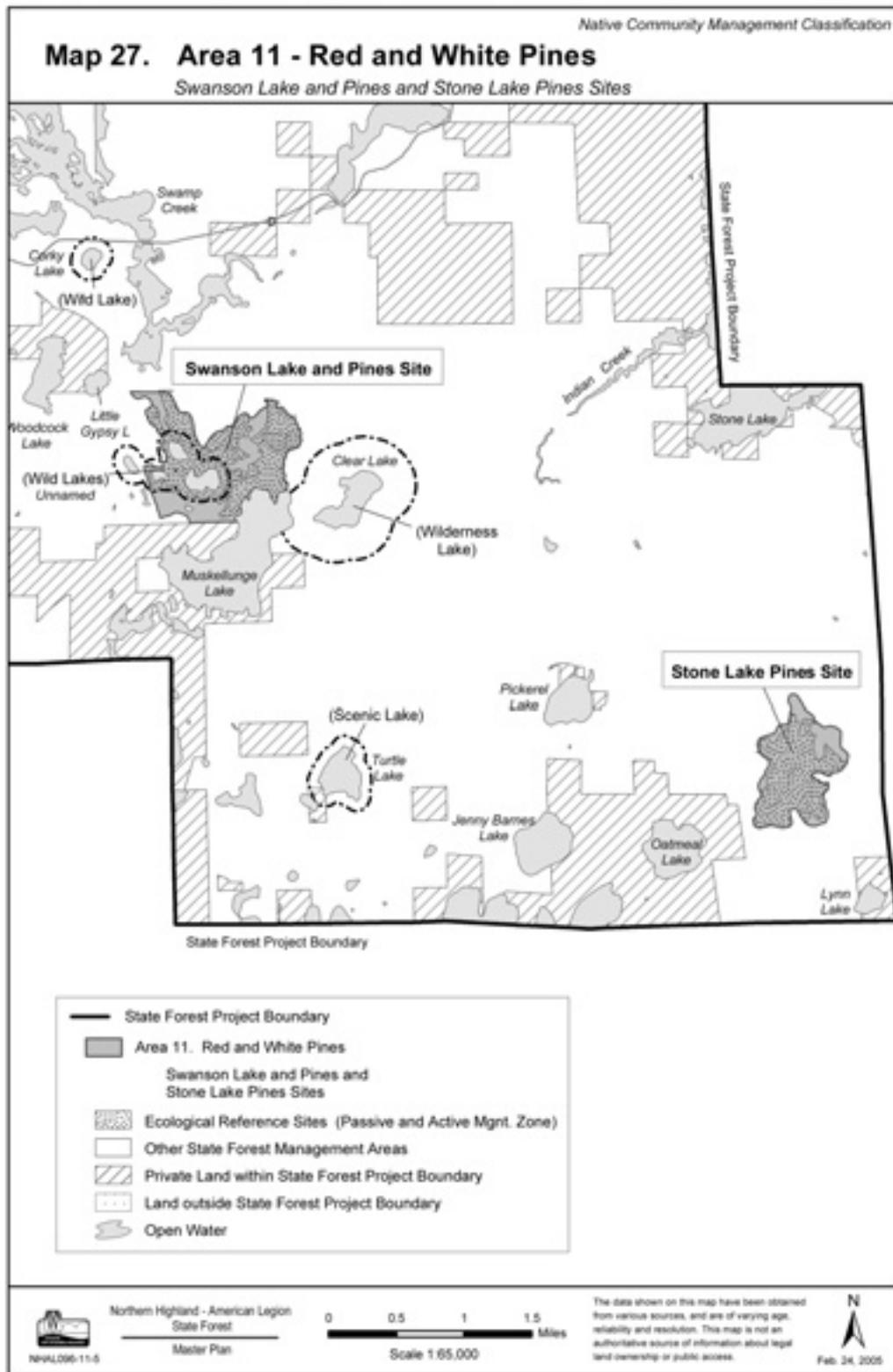
Proposed overlay designations for State Natural Area would occur for Camp Lake and Pines (243 acres, includes 65 lake acres), Papoose Creek Pines (533 acres), Stone Lake Pines (199 acres), and Swanson Lake and Pines would become part of Big Swamp (306 acres, includes 36 lake acres).

**AREA
11****Native Community Management Classification****RED AND WHITE PINE**

Native Community Management Classification**AREA
11****RED AND WHITE PINE**

**AREA
11****Native Community Management Classification****RED AND WHITE PINE**

Native Community Management Classification**AREA
11****RED AND WHITE PINE**

**AREA
11****Native Community Management Classification****RED AND WHITE PINE**

Native Community Management Classification**AREA
11****RED AND WHITE PINE**

**AREA
12****Native Community Management Classification****MIXED FOREST**

This area is comprised of seven nearly adjacent sites totaling approximately 13,117 acres. They are Lost Canoe Lake, Allequash Lake, Big Arbor Vitae/Mann, Mann Lake North, Trout Lake West, Carroll Lake, and Two Lakes Pine and Oak Forest. They are distributed primarily in the center of the NH-AL in the Vilas Sandy Plains and Big Arbor Vitae Loamy Hills ecological landscapes. The landscape is a rolling sandy outwash topography with numerous lakes and kettle depressions. In addition, a comparable site is located within the Crystal Lake Recreation area and will be managed similarly.

The present forest is characterized by a mixed forest matrix of tree species with northern hardwoods, red oak, red and white pine, aspen, and white birch dominant on the uplands but slowly being replaced by white pine, balsam fir and red maple through succession. Many areas typed northern hardwoods on these sites are more a mix of red oak, aspen, white birch, red maple, sugar maple and white pine than the more traditional northern hardwoods mix of sugar maple, basswood, yellow birch that is found in the Lake Laura Loamy Hills area. This composition reflects the poorer sandier soils of this area. There are some areas of mature red and white pine also, and these species are found extensively throughout the area as important secondary species.

The habitat types in this area are typically characterized by a moderately developed shrub layer of hazelnut, low sweet blueberry, juneberry, and maple-leaf viburnum, and ground layer plants such as wild sarsaparilla, wintergreen, cow wheat and starflower. Kettle lakes and wetlands are interspersed with these forest stands and contain open bog, poor fen, muskeg, black spruce swamp, tamarack swamp, alder thicket, and spring ponds.

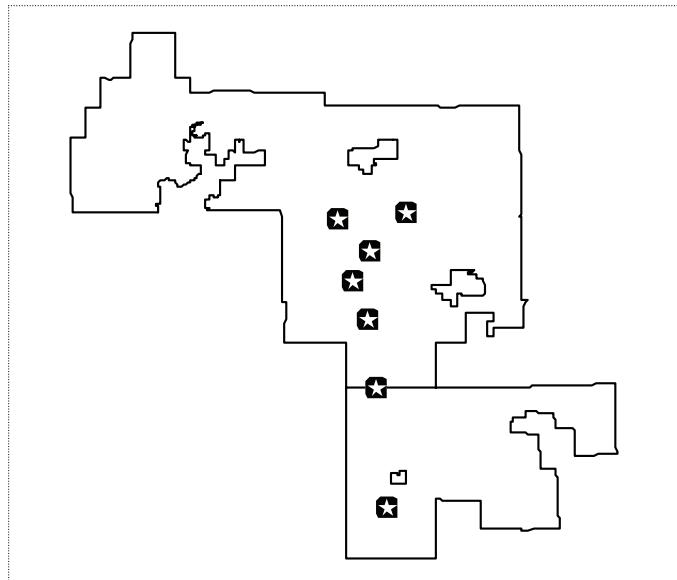
At European settlement the upland areas contained several different forest types representing the diversity of the topography. Some areas were dominated by aspen/white birch, some by white/red pine, while others supported northern hardwoods.

Historically, fire was a significant disturbance factor within this area but would have been less of an influence on areas lying to the east side of lakes or wetlands. Wind throw was and is an important disturbance factor playing a vital role in shaping forest succession. This ecological landscape was subjected to and evolved with fire and wind disturbance for millennia, but less intense compared to red and white pine communities. These disturbance events often set forest succession back to the starting point, but many areas, some for centuries, were missed by these disturbance events. These longer intervals gave a competitive advantage to mid-succession species such as white pine, red oak, and yellow birch. Forest produc-

tion areas can provide the ecological character of the early to mid-succession, however, large patches with old-growth characteristics and disturbance patches that cross stand boundaries are missing. These Mixed Forest Native Community Areas will provide the NH-AL with that older component of large trees, numerous standing dead and hollow trees, large amounts of coarse woody debris, and patch sizes more closely aligned with range of natural variability. A few places could receive fire.

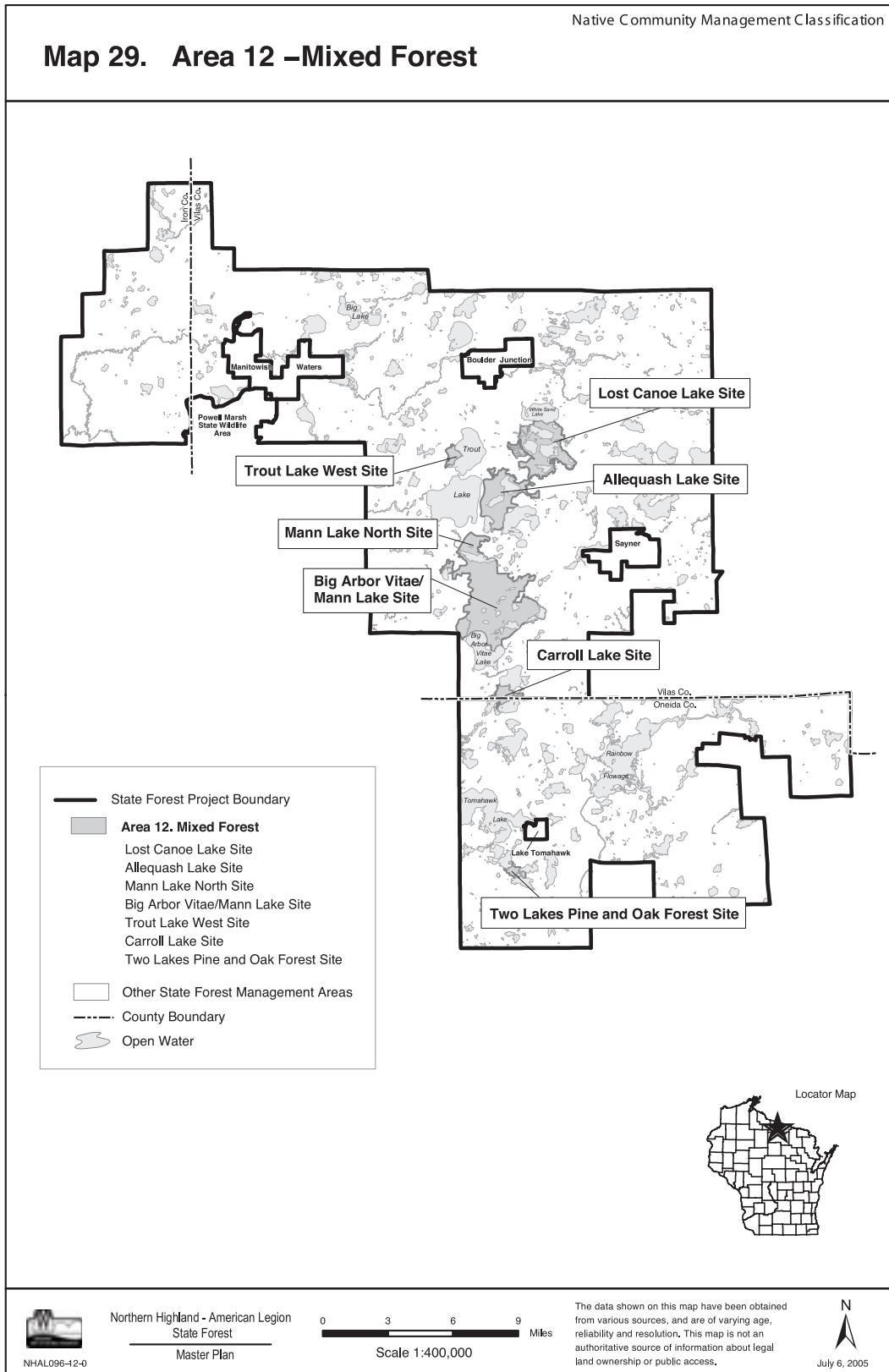
AREA 12 SUMMARY

- ▲ This area is approximately 13,117 acres in size with 9,738 acres in state ownership.
- ▲ Management for old growth characteristics of a forest dominated by red oak, white pine, sugar maple, and yellow birch.
- ▲ Opportunity to maintain scenic qualities for lake and other users, and regenerate early and mid succession tree species.

AREA 12 LOCATOR MAP

Native Community Management Classification**AREA
12****MIXED FOREST**

Native Community Management Classification

Map 29. Area 12 –Mixed Forest

**AREA
12****Native Community Management Classification****MIXED FOREST****LONG-TERM OBJECTIVES (100 YEAR)**

- Maintain sites across the NH-AL landscape with old-growth pine, oak and mixed hardwood characteristics and variable patch sizes, including some patches that are not limited to stand boundaries (i.e. may include all or portions of several forest stands). The mix of forest types reflects the diversity of the topography and site conditions across the landscape.
- Provide opportunities for research, education, and ecological interpretation as well as demonstration of old-growth mixed forest management.

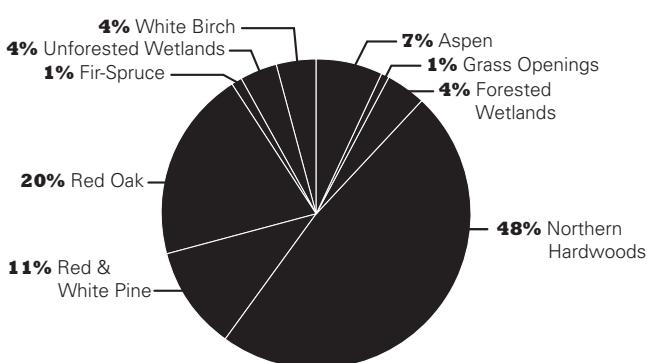
SHORT-TERM OBJECTIVES (50 YEAR)

- Enhance the development of a mixed forest dominated by old trees, large amounts of coarse woody debris, numerous standing dead snags, and an age diversity of trees.
- Maintain mid-tolerant tree species composition while incorporating variable patch sizes, and increase the overall age of the forest.
- Maintain three passively managed ecological reference sites – Lost Canoe (1,136 acres, includes 269 lake and spring acres), Allequash Lake and Pines (398 acres, includes 133 lake acres), and Two Lakes Oak-Pine Forest (112 acres). Use these three sites as an ecological reference for adaptive old-growth management activities elsewhere in the mixed forest management area.

RESOURCE MANAGEMENT PRESCRIPTIONS

Management actions in this area follow the General Management Prescriptions, with emphasis on development of old growth pine and mixed forest communities using both passive and active techniques. Some management elements unique to this area are described below:

- Adapt the General Management Prescriptions for each stand to create, enhance and maintain old growth red/white pine, red oak, and stands of mixed northern hardwoods consisting of short-lived and long-lived species characteristics. This includes providing coarse woody debris, leaving large cull trees and increased snag tree densities.

AREA 12 CURRENT LAND COVER

- Use timber harvesting to regenerate forest stands and to create and maintain forest patches of various sizes ranging from 30 to 200 acres. The management techniques may include large and small patch clear cuts or group selection, shelterwood harvest, seed tree retention, ground disturbance, limited planting or prescribed burning either alone or in combination with the above treatments. These treatments should simulate natural disturbance patterns that provide a variety of community sizes and shapes appropriate to this dry, nutrient-poor habitat. Change the boundaries of forest stands as necessary to better reflect the natural diversity of patch sizes that result from natural disturbances.

While many timber harvest techniques may be used to regenerate forest stands, the activities would occur only on a portion of the area. Thus focusing active management on old forest and managed old-growth stands and less on regeneration objectives. It is important to apply techniques that can mimic natural processes and maintain or move the mixed forest natural community into mid and late successional stages. This management can be monitored and compared to the passive zones. Retain healthy white and red pine and yellow birch during harvest operations, and create appropriate seedbed and shade conditions to favor these species and gradually increase their numbers in the forest.

- Use monitoring information on changes in composition and structure from old-growth reference stands to aid in future management decisions.

Native Community Management Classification**AREA
12****MIXED FOREST****Table 2.12 Area 12- Mixed Forest, Current and desired future conditions for community types in acres and percent of total.**

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Area
Aspen	723	7%	723	7%
Grass openings	73	1%	73	1%
Forested wetlands	382	4%	382	4%
Northern hardwoods	4,683	48%	4,418	45%
Red & White Pine	1,026	11%	1,226	13%
Red Oak	1,961	20%	2,061	20%
Fir-Spruce	77	1%	77	1%
Unforested wetlands	378	4%	378	4%
White birch	435	4%	400	5%
TOTAL	9,738	100.00%	9,738	100.00%

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.

- Develop research strategies and conduct research to determine techniques for natural regeneration of white pine-red oak-yellow birch. Use the passively managed ecological reference sites as controls to compare to test methods used on actively managed areas.
- On all of the management area including the ecological reference sites, to the degree possible, use the existing trail network to provide public access for education and ecological interpretation.
- Bug Lake and Benedict Lake (Big Arbor Vitae-Mann Lake Site) and an unnamed lake north of Lost Canoe Lake are designated wild lakes. Passively manage a 400 feet buffer area around these lakes. See the wild lakes management zone section for information on the non-vegetation management requirements within the wild lake zone.
- Lake Trout Lake, Escanaba, Pallette, Nebish, Mystery, and Spruce Lakes are designated experimental lakes as per Administrative Code NR 20.41. All management activities should consider the long and short term impacts to the research lakes.

ECOLOGICAL REFERENCE SITES

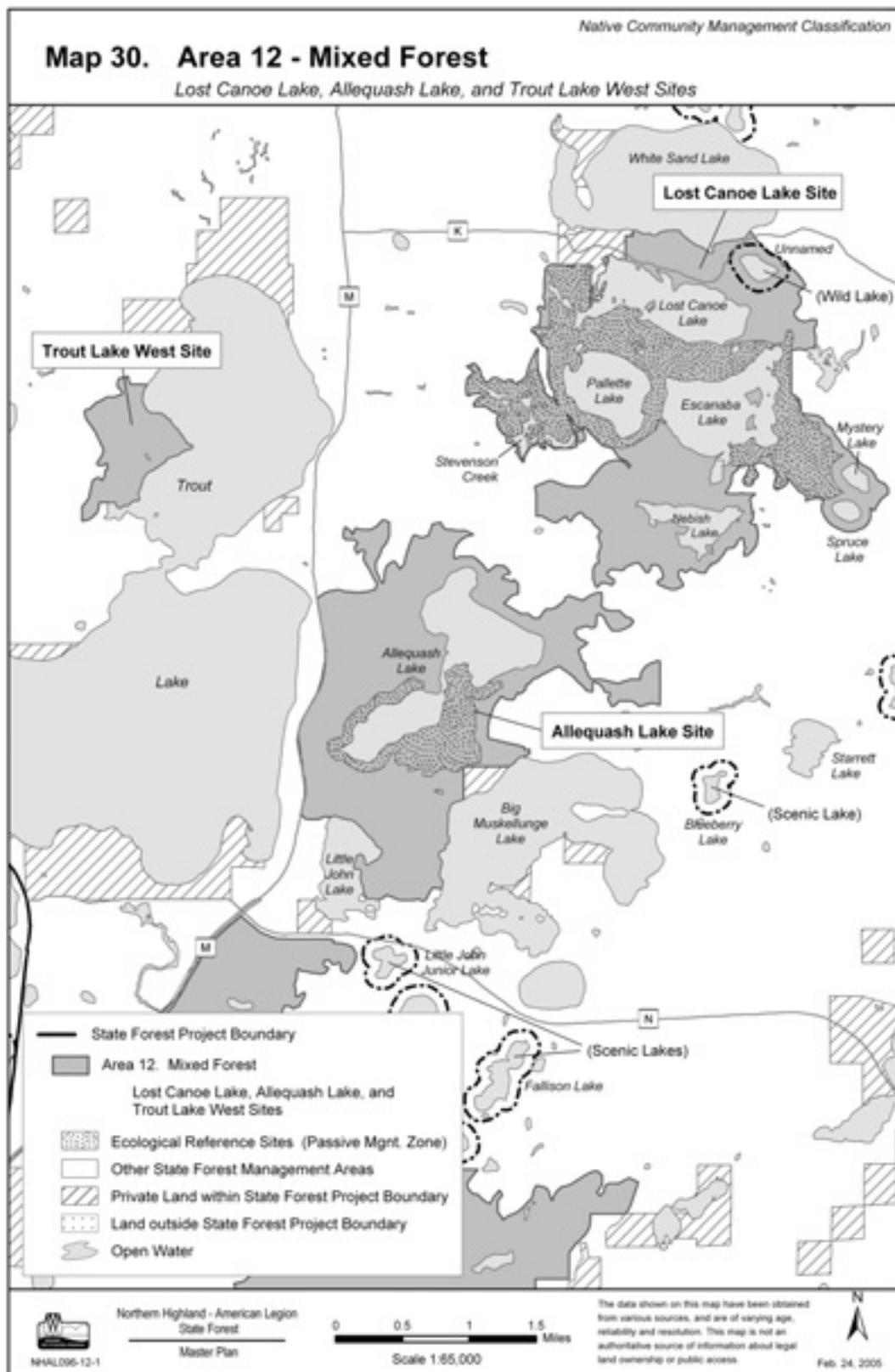
- Passively manage three ecological reference sites, Lost Canoe Lake, Allequash Lake and Pines, and Two lakes Oak-Pine Forest.
- Develop research in partnership with other staff or cooperators to compare growth and regeneration in passive and active management areas in addition to the collection of reconnaissance data.

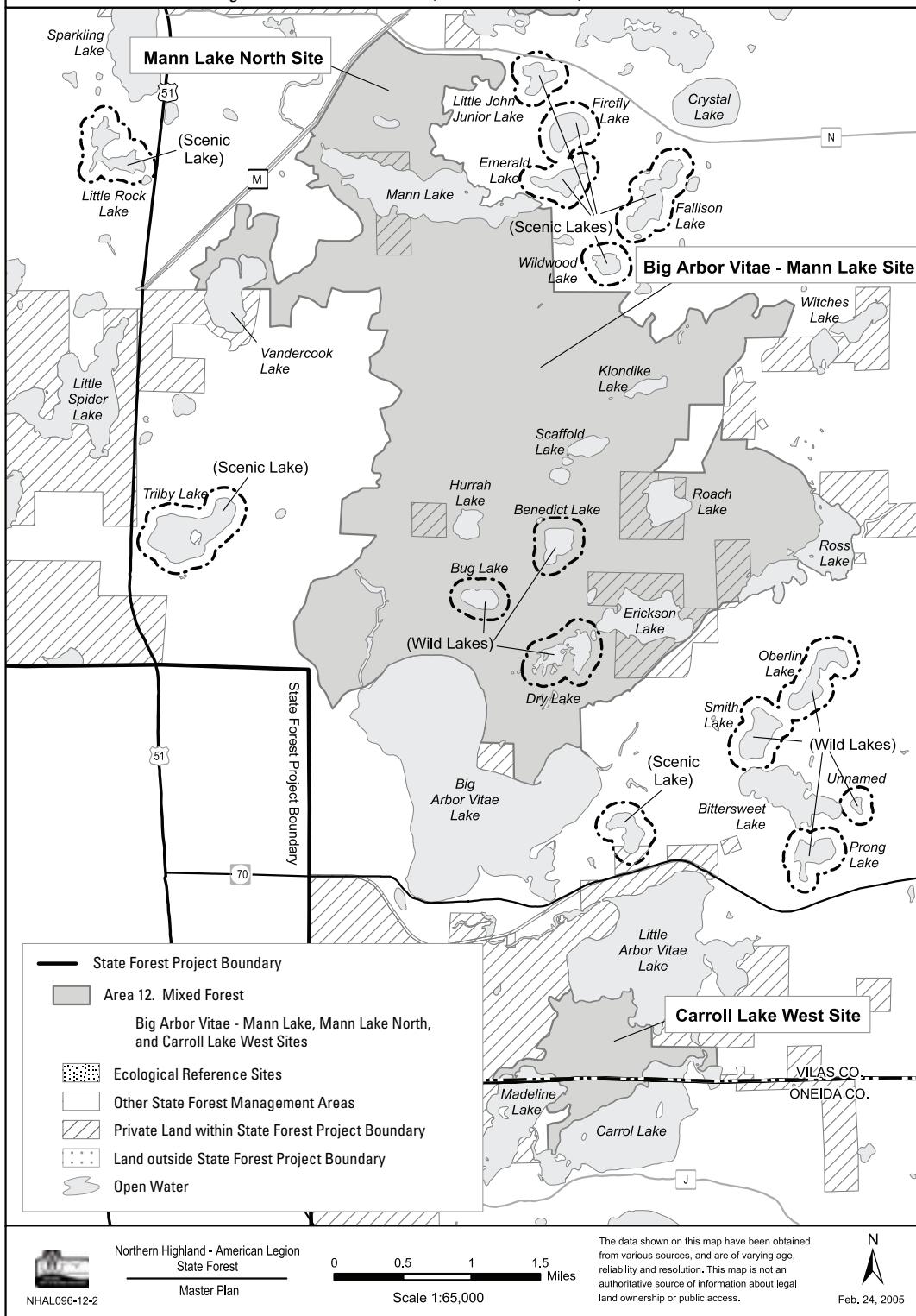
With the age of the current majority of stands (1910-1920 origins) in the passively managed areas, forest visitors will see the white birch, aspen, red maple, and fir falling out of the stand's composition by mortality or blow down. They will gradually be replaced with sugar maple, white pine, yellow birch, and ironwood coming in the understory along with shade tolerant shrubs. The pines and oak should remain.

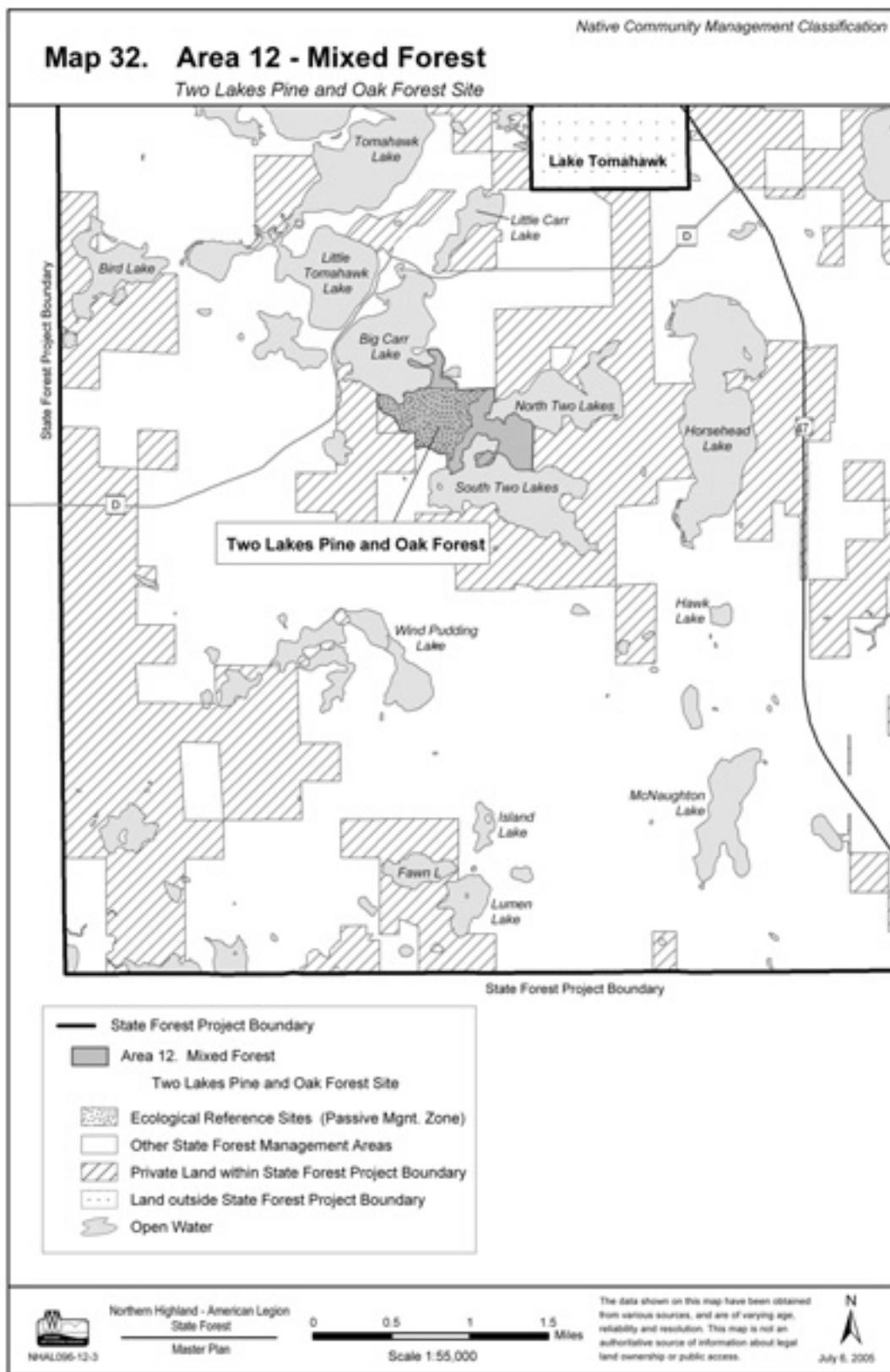
STATE NATURAL AREA DESIGNATION

See State Natural Area discussion in the Appendix for detailed information.

Proposed overlay designations for State Natural Area would occur for Lost Canoe (1,136 acres, includes 269 lake and spring acres), Allequash Lake and Pines (398 acres, includes 133 lake acres), and Two Lakes Oak-Pine Forest (112 acres).

**AREA
12****Native Community Management Classification****MIXED FOREST**

Native Community Management Classification**AREA
12****MIXED FOREST***Native Community Management Classification***Map 31. Area 12 - Mixed Forest***Big Arbor Vitae - Mann Lake, Mann Lake North, and Carroll Lake West Sites*

**AREA
12****Native Community Management Classification****MIXED FOREST**

Native Community Management Classification**AREA
12****MIXED FOREST**

**AREA
13****Native Community Management Classification**
SPECIAL AQUATIC

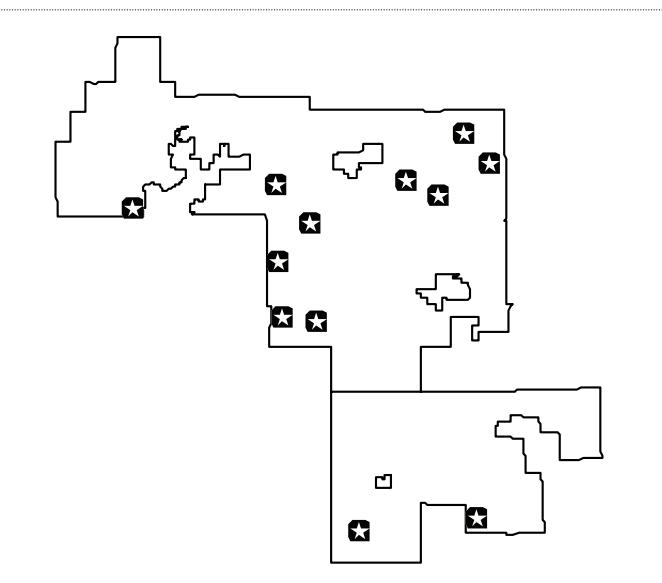
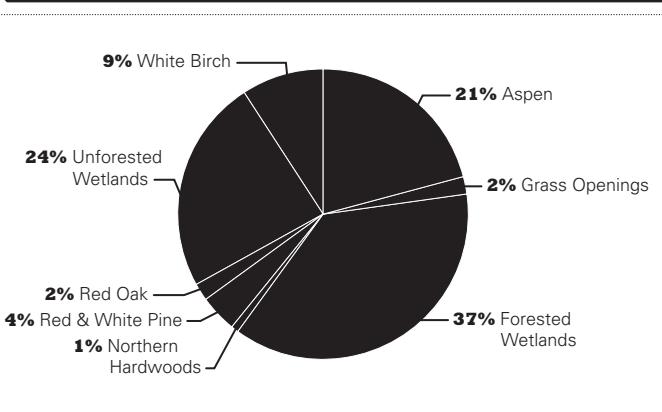
This area is comprised of twelve different sites covering some 5,737 acres. By their very nature, these aquatic sites are composed primarily of open water systems and their corresponding adjacent wetland communities, soils and topography. These sites are found on a wide variety of landforms and soils, and are located throughout the State Forest. The primary soil types are lowland acid and non-acid organic peat. In some cases, the sites also contain some upland areas within their boundaries, to the extent necessary to ensure the long-term maintenance of the ecological integrity of the area.

The majority of these lowland sites contain either open wetland or non-merchantable conifer forests. The upland areas contain a mixed composition of actively managed forests of aspen, white birch, pine and oak. These sites host a large portion of the rare species found on the State Forest. Clearly, there are other sites on the Forest that also contain special aquatic features, and these are considered and addressed as a component of the other management areas included elsewhere in this plan.

These wetland areas exist much as they were at the time of European settlement. Historically, fire played a limited role in the species composition of these areas. Wind events and periodic droughts would also have influenced the development of the floristic habitat.

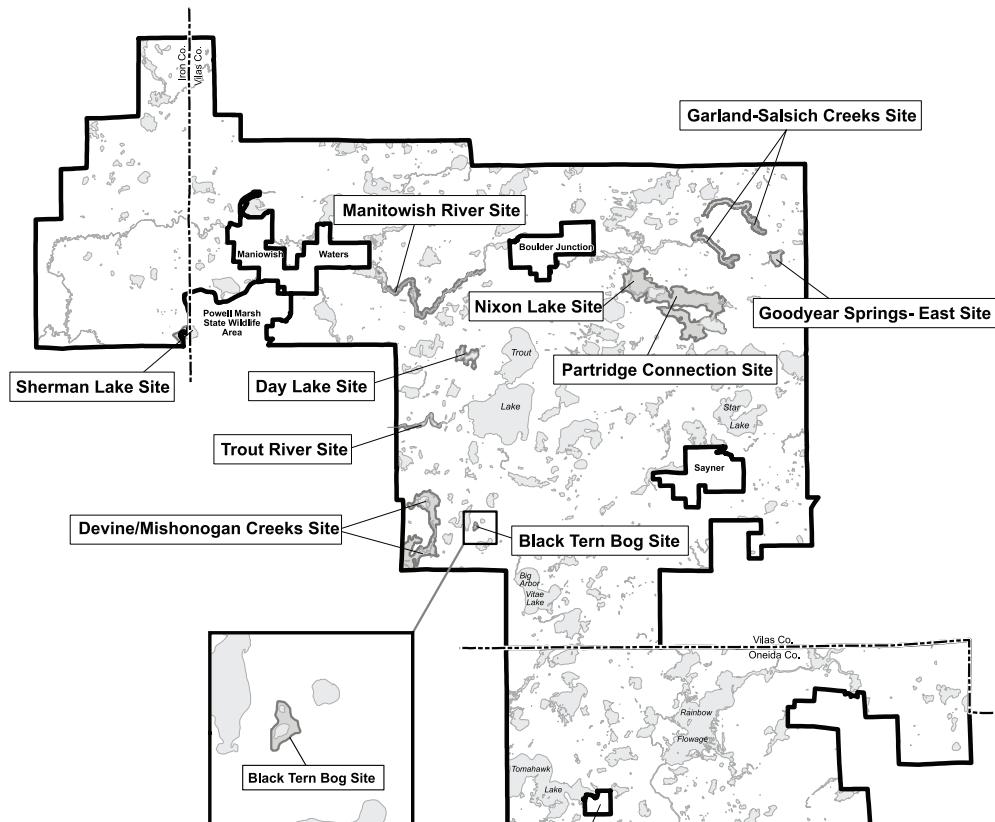
**AREA 13 SUMMARY**

- ▲ This area is approximately 5,737 acres in size with 4,694 acres in state ownership.
- ▲ Management of high quality aquatic sites for ecological, water quality and rare species habitat values.
- ▲ Maintenance of the overall scenic nature of the rivers, wetlands, and lakes.

AREA 13 LOCATOR MAP**AREA 13 CURRENT LAND COVER**

Native Community Management Classification**SPECIAL AQUATIC****AREA
13**

Native Community Management Classification

Map 33. Area 13 - Special Aquatic

- State Forest Project Boundary
Area 13, Special Aquatic
- Sherman Lake Site
 - Manitowish River Site
 - Day Lake Site
 - Garland-Salsich Creeks Site
 - Soodyear Springs-East Site
 - Partridge Connection Site
 - Nixon Lake Site
 - Trout River Site
 - Devine/Mashonagan Creeks Site
 - Black Tern bog Site
 - Wind Pudding Lake Site
 - Shallow Lake Site
- - - County Boundary
 Open Water



Northern Highland - American Legion
State Forest

Master Plan

Scale 1:400,000

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

July 6, 2005



LONG-TERM OBJECTIVES (100 YEARS)

- Maintain a high quality series of sites across the NH-AL for their ecological, water quality, and rare species habitat values. Natural processes shape these sites with coarse woody debris in the water, numerous stand dead snags along the shore, open sedge meadows and bogs, muskeg vegetation, and scenic waters.
- Provide opportunities for research, education, and ecological interpretation as well as demonstration areas of old-growth forest management on shorelines.

SHORT-TERM OBJECTIVES (50 YEARS)

- Maintain all aquatic and unforested wetlands in an undisturbed condition through passive management.
- Provide a diversity of uplands management that complements the aquatic features associated with each site while maintaining water and scenic quality.
- Improve the forest composition on upland sites by accelerating or enhancing the long-lived tree species component.
- The increase of longer lived species is part of maintaining BMPs for water quality and enhancing aesthetic values. Increase in northern hardwood and red oak will be at the conversion of white birch stands through mortality in passive management zones.

RESOURCE MANAGEMENT PRESCRIPTIONS

The General Timber Type Management Prescriptions and all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

- Passively manage all wetlands and aquatic features (except control of invasive species) including manipulation of aquatic vegetation or bottom materials in the large eastern basin of Wind Pudding Lake.
- Passively manage white cedar and swamp hardwoods along the Manitowish River within the Passive Management Zone shown on the Special Aquatic Management Area map.
- The Department will develop a monitoring strategy for the wetlands, rivers and lakes, focusing on the invertebrates, plants, animals and rare species, and conduct research to determine the affects of adjacent land management on maintaining the rare species on the sites.

- Maintain existing boat landings.
- Perform all vegetation management in ways or at times that protect the quality of aquatic communities, and with aesthetic sensitivity to recreational users.
- Other management activities that may be conducted as needed include individual hazard tree removal along trails, roads, and public access points; invasive species control activities; maintenance of existing roads and public use access sites; mowing and brush cutting in existing public use areas; development activities necessary for stated improvements to public use facilities; fish management actions and prescriptions; monitoring and research activities are all authorized activities. Some small areas may require site preparation for and planting of long-lived tree seedlings to restore vegetation cover.

MANAGEMENT PRESCRIPTIONS FOR SPECIFIC SITES

1. Day Lake and Wind Pudding Lake sites: Manage the uplands for a variety of long-lived tree species and age classes, and convert early successional forest types to long-lived pine and oak.
2. Garland and Salsich Springs, Goodyear Springs East, and Nixon Lake Sites: Use a variety of active management techniques to maintain aspen and jack pine in the uplands. Maintain the open bracken grasslands using brushing and possibly fire.
3. Trout River and Black Tern Bog Sites: Passively manage the lands below the high water mark. Manage the uplands as forest production area, emphasizing BMPs for water quality and aesthetic considerations.
4. Devine Lake-Mishonagon Creek, Shallow Lake and the cedar and swamp hardwoods at Manitowish River: Use passive management only, except to control invasive species.
 - 4a. Devine Lake is also a designated wild lake. The prescribed passive management prescribed for this site is fully compatible with the management requirements for a wild lake. See the wild lakes management zone section for information on the non-vegetation management requirements within the wild lake zone.
 - 4b. Devine Lake will be open for wild rice harvesting during a suitable time frame to be determined by the forest superintendent.

Native Community Management Classification**AREA
13****SPECIAL AQUATIC**

Table 2.13 Area 13- Special Aquatic, Current and desired future conditions for community types in acres and percent of total.

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Area
Aspen	984	21%	984	20%
Grass Openings	111	2%	111	2%
Forested Wetlands	1,745	37%	1,745	37%
Northern Hardwoods	44	1%	145	3%
Red & White Pine	175	4%	175	4%
Red Oak	106	2%	106	4%
Unforested Wetlands	1,128	24%	1,128	24%
White Birch	401	9%	300	6%
TOTAL	4,694	100.00%	4,694	100.00%

* Predicted 50-year Condition is an estimate of the forest coverts in 50 years and does not necessarily reflect the long-term objectives of the Area.

5. Sherman Lake, Partridge Lake and the remaining uplands at Manitowish River:

Apply appropriate forest management techniques to maintain upland forest types and to promote diversity in composition and age, especially for long-lived tree species.

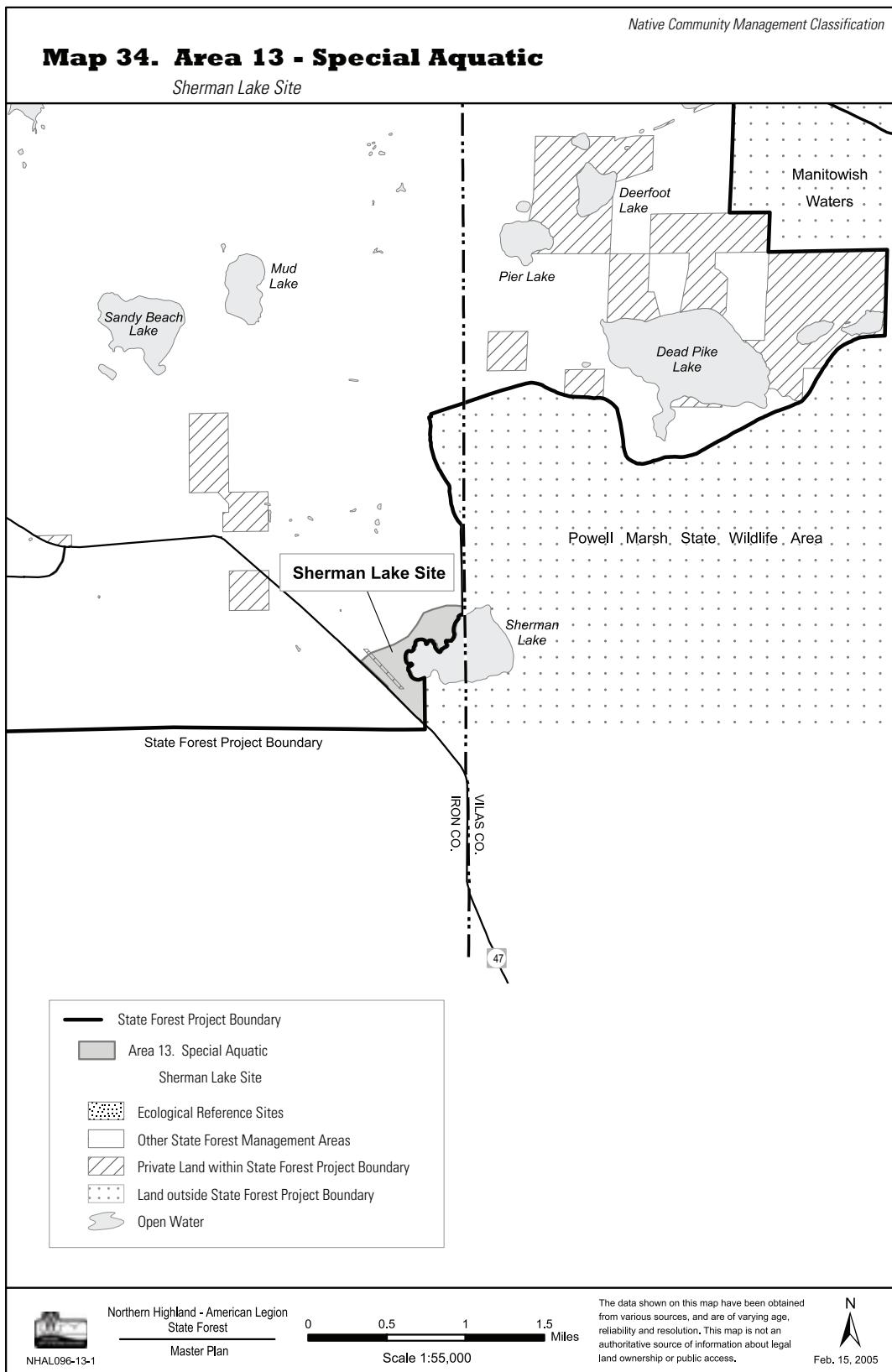
STATE NATURAL AREA DESIGNATION

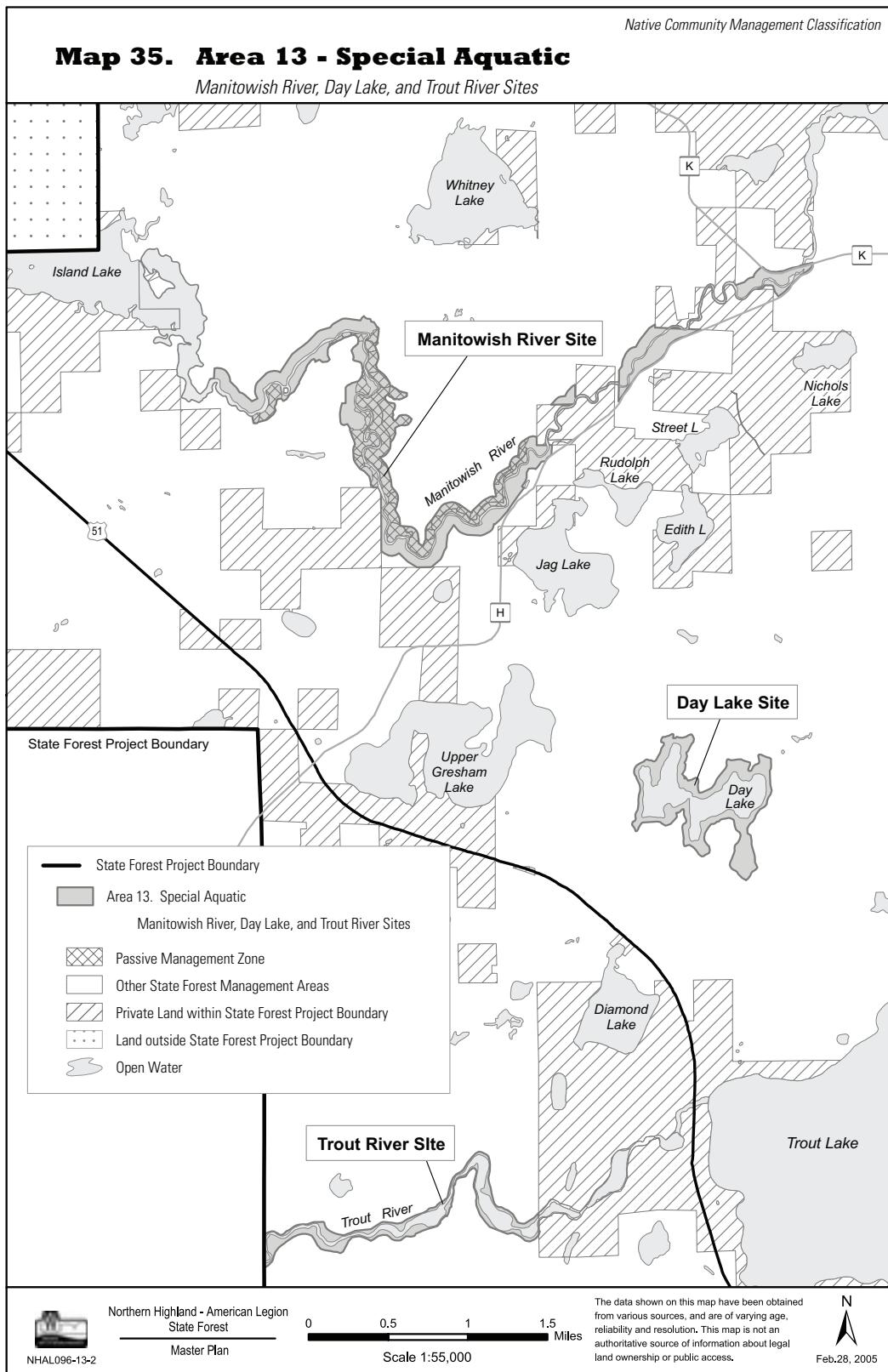
See State Natural Area discussion in the Appendix for detailed information.

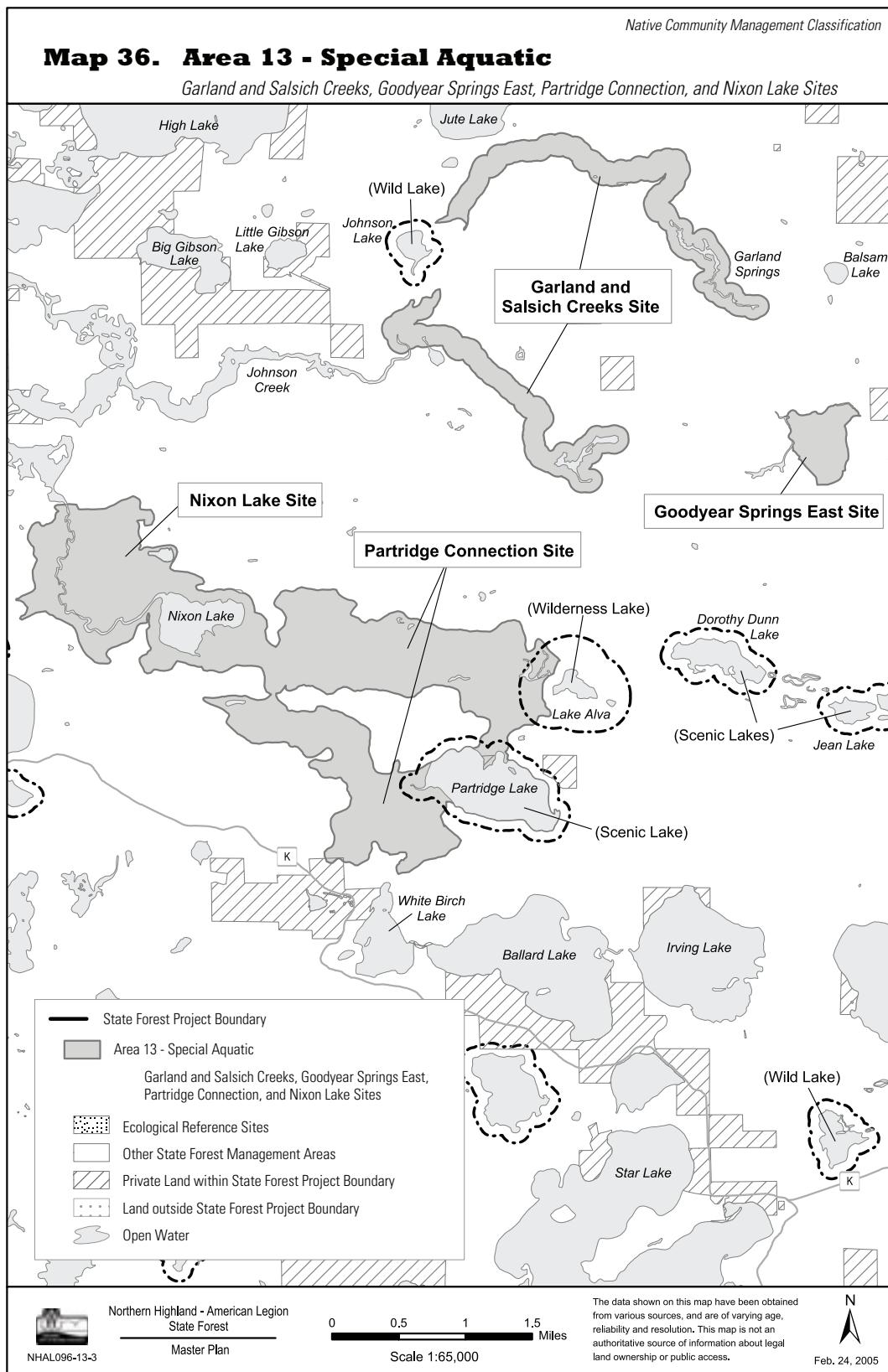
Proposed overlay designations for State Natural Area would occur for Day Lake (209 acres, includes 110 lake acres),

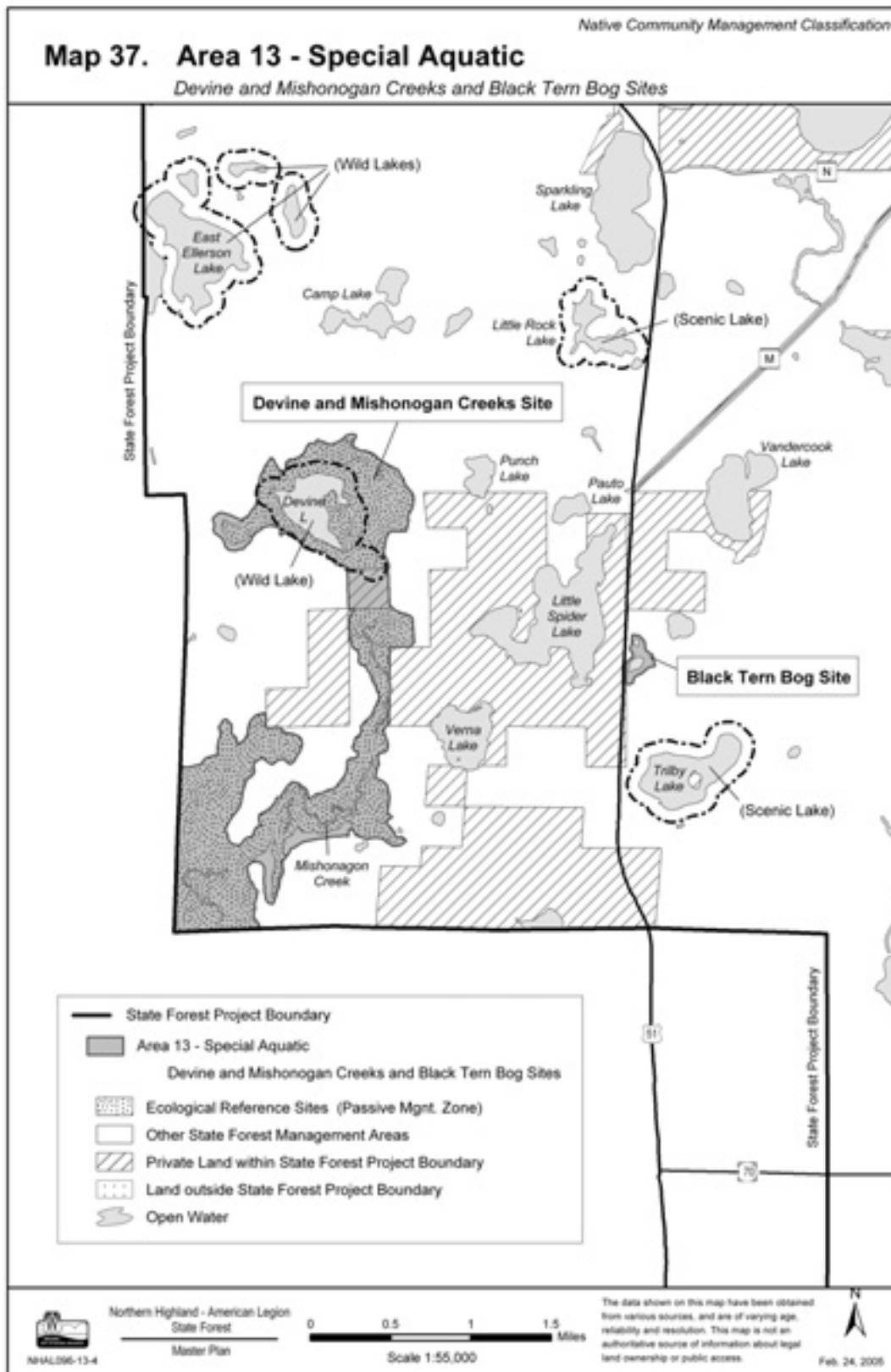
[Garland and Salsich Springs (775 acres, includes 37 stream acres), Goodyear Springs East (131 acres, includes 4 spring acres) – Together these two sites would be combined with Johnson Lake Barrens to form the Johnson Lakes Barrens and Springs SNA], Nixon Lake (737 acres, includes 137 lake acres), Trout River (108 acres – all river), Devine Lake – Mishonagon Creek (1,185 acres, includes 90 acres of lake and stream), Black Tern Bog (15 acres – all lake), Wind Pudding Lake (340 acres, includes 159 lakes acres), and Shallow Lake (103 acres, includes 28 lake acres).

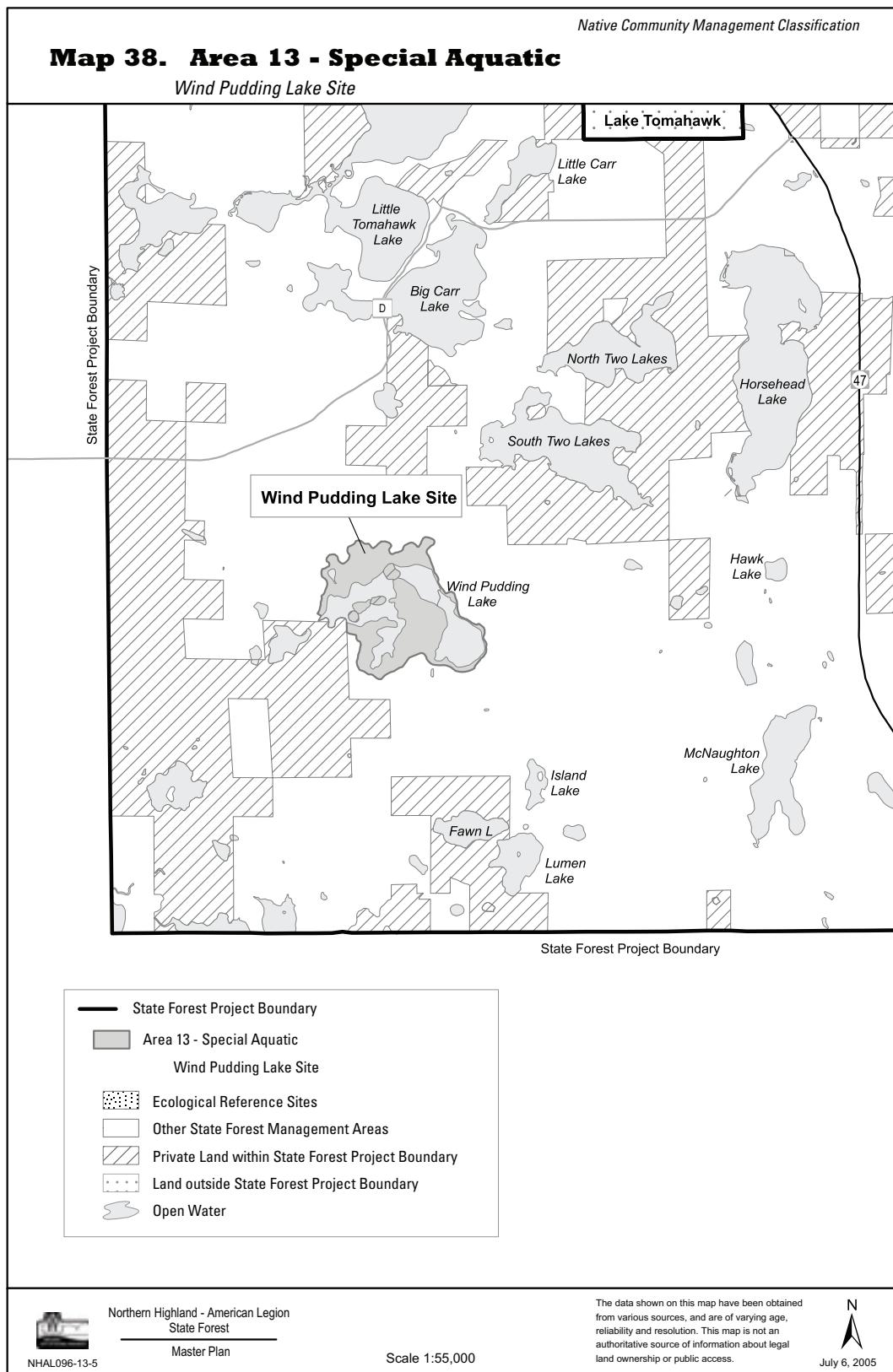


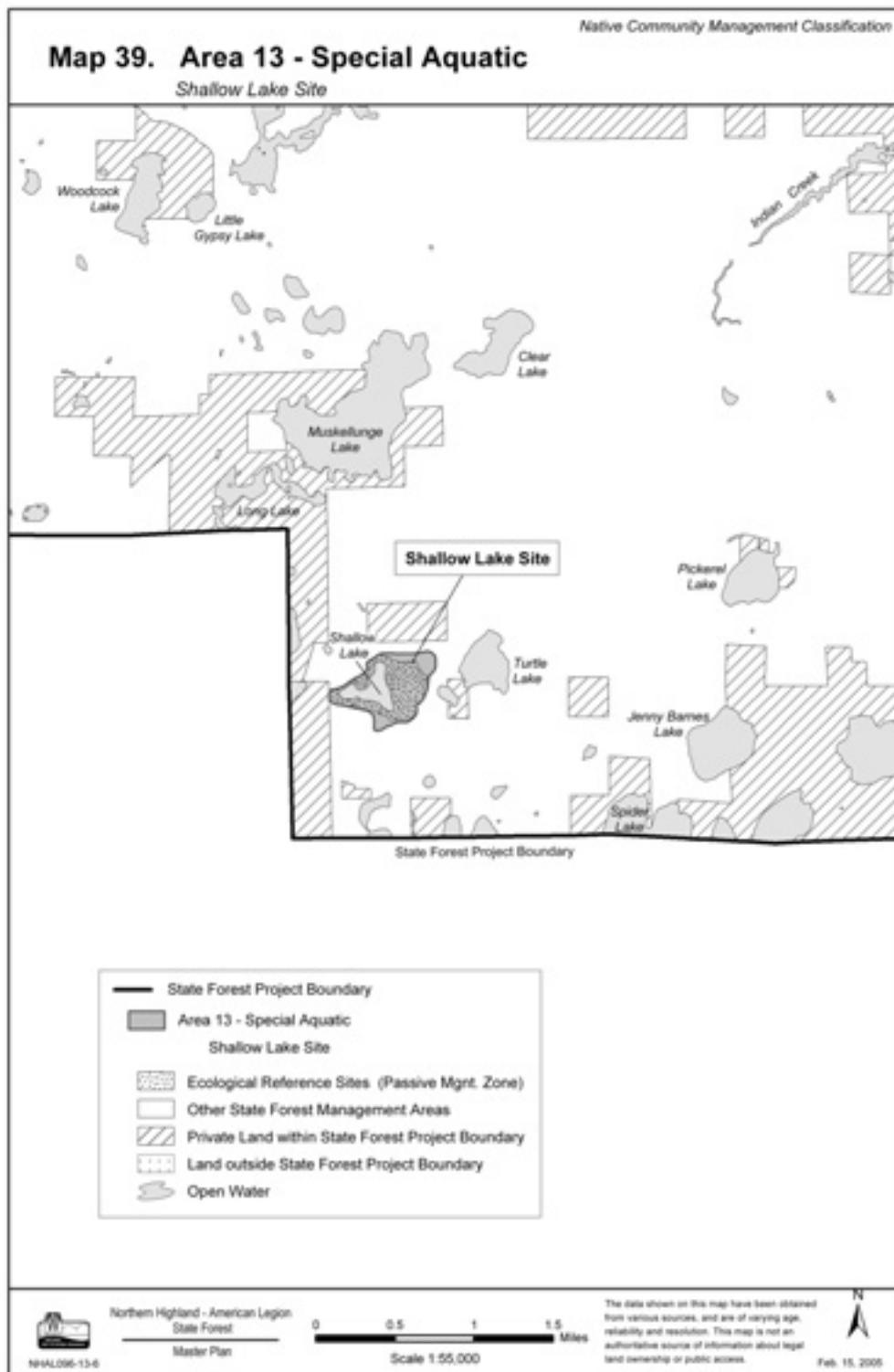
**AREA
13****Native Community Management Classification**
SPECIAL AQUATIC

Native Community Management Classification**SPECIAL AQUATIC****AREA
13**

**AREA
13****Native Community Management Classification**
SPECIAL AQUATIC

Native Community Management Classification**AREA
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Native Community Management Classification**AREA
13****SPECIAL AQUATIC**

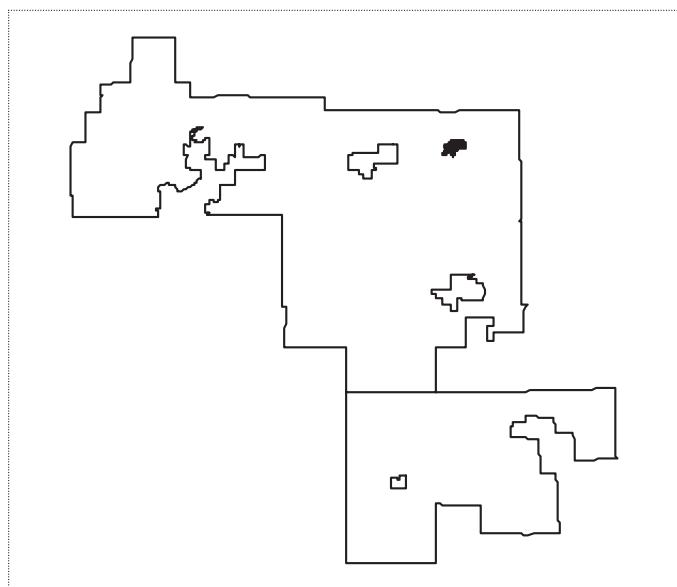
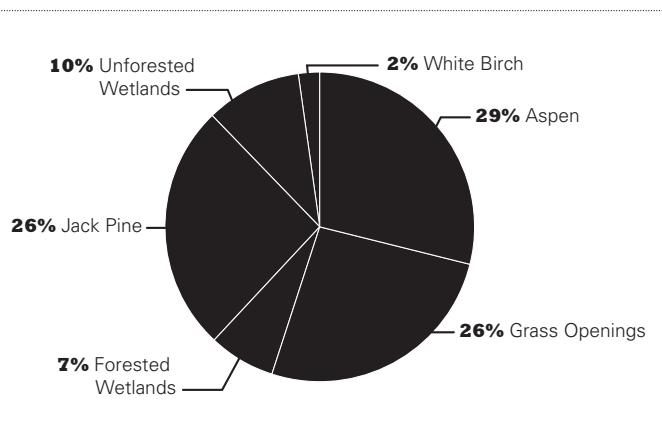
**AREA
14****Native Community Management Classification****JOHNSON LAKE BARRENS**

The 514 acre Johnson Lake Barrens Management Area has been maintained as open barrens community with jack pine and aspen using timber harvest and prescribed fire. It is located on the dominant sandy rolling to level outwash plain. The rolling topography also supports wetland depressions. The eastern portion has been managed with fire and is dominated by a heath community of blueberries, bearberry and sweet fern. Jack pine and aspen along with open and black spruce wetlands dominate the western portion of the area.

Historically, fire regularly burned across this rolling to level landscape, promoting a relatively open landscape with dense and productive crops of blueberries and other heath plants. Variations in the local topography, lakes, streams and wetlands acted as fire breaks or helped reduce the intensity of fires resulting in a patchwork of groves of oak, jack pine and trembling aspen, and isolated large open-grown red pine.

**AREA 14 SUMMARY**

- ▲ This area is approximately 552 acres in size with 514 acres in state ownership.
- ▲ Management for barrens community with early successional forest components.

AREA 14 LOCATOR MAP**AREA 14 CURRENT LAND COVER**

Native Community Management Classification

JOHNSON LAKE BARRENS

**AREA
14**

Native Community Management Classification

Map 40. Area 14 - Johnson Lake Barrens

Johnson Creek and Pines, and Johnson Lake and Barrens Sites

State Forest Project Boundary



LONG-TERM OBJECTIVES (100 YEAR)

- Maintain an early successional, harvest driven older jack pine community in the upland portion of Johnson Creek and Pines site.
- Maintain an early successional, fire driven barrens in the upland portion of Johnson lake and Barrens sites.
- Maintain water quality and native species composition of the springs streams and wetlands.
- Provide sites for research, education, and ecological interpretation as well as demonstration areas of barrens and old jack pine forest management.

SHORT-TERM OBJECTIVES (50 YEAR)

- Maintain open barrens.
- Maintain jack pine stands.
- Continue to protect the springs, steams, lakes and wetlands with passive management.
- Accommodate recreational hiking use on logging roads and firebreaks.

**RESOURCE MANAGEMENT PRESCRIPTIONS**

Management actions in this area follow the General Management Prescriptions, described in the beginning of the Land Management Section, with emphasis on creating and maintaining a site dominated by open barrens and jack pine. Some prescription elements unique to this area include:

- All upland acres will be managed for barrens – mostly open land with a few large red pines, scattered jack pine trees and grooves, and patches of brush (mostly hazel and aspen).
- Clear cut aspen stands at appropriate age and follow with fire, ground disturbance and/or site preparation (including herbicides) and supplemental planting to convert some aspen stands to jack pine. Priority will be in mixed stands of aspen and jack pine.
- To regenerate existing jack pine stands use a combination of timber harvest followed by prescribed fire if conditions are suitable. If regeneration is not successful then use site preparation and supplemental planting of jack pine.
- Conduct prescribed burns east of Johnson Lake on 5 to 10 year rotations in the east unit Johnson Lake and Barrens to promote the heath ground layer.
- Maintain firebreaks for access by fire control and land maintenance vehicles.
- Use mechanical cutting, brush burning, or limited herbicide as needed to manage fuel loads and increase desired species.
- To the degree possible, use the existing trail network to provide public access for education and ecological interpretation.
- Johnson Lake is a designated wild lake. Passively manage a 400 ft. buffer area around the lake. See the wild lakes management zone section for information on the non-vegetation management requirements within the wild lake zone.

STATE NATURAL AREA DESIGNATION

See State Natural Area discussion in the Appendix for detailed information.

Proposed overlay designations for State Natural Area would occur for Johnson Lake Barrens and Springs (171 acres, includes 25 lake acres) [Together with Garland and Salsich Springs and Goodyear Springs-East would form the Johnson Lake Barrens and Springs SNA – 1,077 acres].

Native Community Management Classification

JOHNSON LAKE BARRENS

**AREA
14**

Table 2.14 Area 14 - Johnson Lake Barrens, Current and desired future conditions for community types in acres and percent of total.

Community Type	Current		Predicted 50-year Condition*	
	Acres	% of Total Area	Acres	% of Total Area
Aspen	147	29%	107	21%
Grass openings	136	26%	136	26%
Forested wetlands	35	7%	35	7%
Jack pine	132	26%	172	33%
Unforested wetlands	52	10%	52	10%
White birch	12	2%	12	2%
TOTAL	514	100%	514	100%

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.

Scenic Resource Management Classification

INTRODUCTION

Within the NH-AI, three areas have been identified as "Scenic Resource Management Areas"

Area 15: Manitowish River

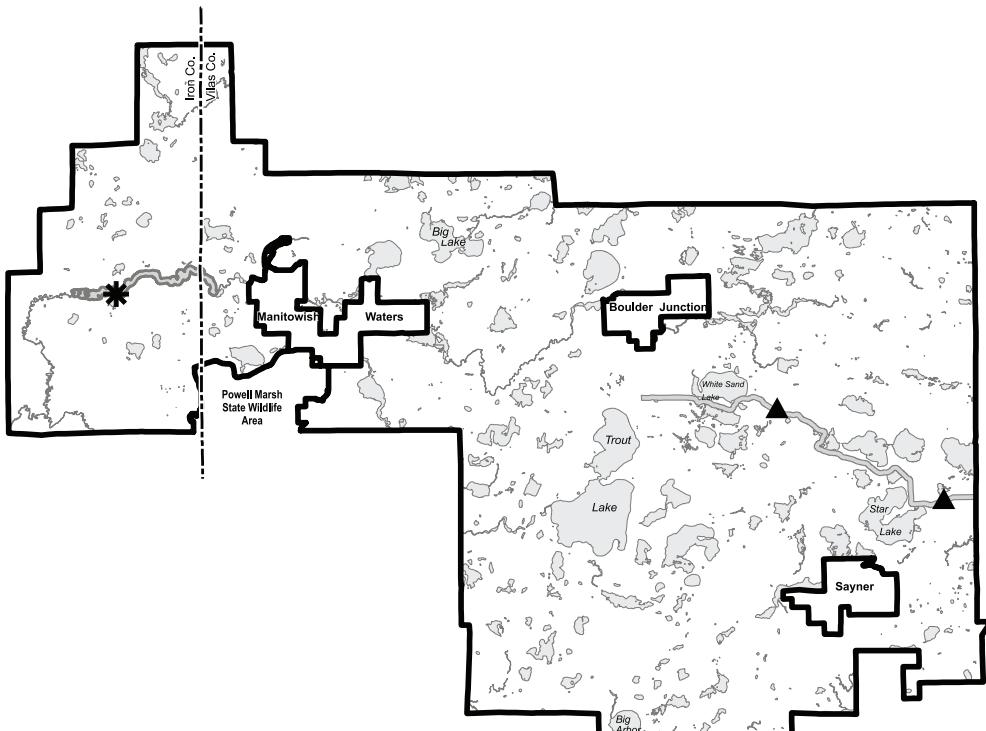
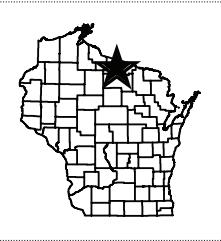
Area 16: Rustic Road

The scenic resources management classification is applied to lands with outstanding scenic attractions, scenic lakes, rivers and streams with high value for water-based recreation. This classification may be applied to scenic highways, roads, trails or vistas for the specific use of enjoying the scenery (WDNR 2001).

The management objective of a scenic resources management area is to protect, maintain, and enhance for long-term public enjoyment lands or waters having unique aesthetic qualities or outstanding scenic beauty. Development within the scenic resource management areas will be located and designed to be harmonious with the surrounding landscape and have minimal negative impact upon its scenic values (WDNR 2001).

Vegetation management approaches appropriate for use within scenic resource management areas may vary from passive management to active management, depending upon the long-term scenic management objective for the area and the site's ecological capability, vegetation types, and site conditions. Examples of potential vegetation management activities that may be prescribed by the master plan include timber harvesting, planting, herbicide application, mowing, burning, flooding, installation of fish habitat improvement devices, road construction, and erosion control. Additional restoration activities potentially include cutting trees and shrubs to maintain or create scenic vistas, underplanting or replanting (preferably native trees and shrubs) for visual variety or to speed conversion to a scenically desirable forest type and removal of invasive species.



Scenic Resource Management Classification**INTRODUCTION****AREAS
15-16****MAP 41: SCENIC MANAGEMENT CLASSIFICATION AREAS****LOCATOR**

Feb. 10, 2005

Scale 1:400,000

MAP ## LEGEND

— State Forest Project Boundary

Scenic Management Classification Areas

* Area 15. Manitowish River

▲ Area 16. Rustic Road



Other State Forest Management Areas



County Boundary



Open Water

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

**AREA
15****Scenic Resource Management Classification****MANITOWISH RIVER**

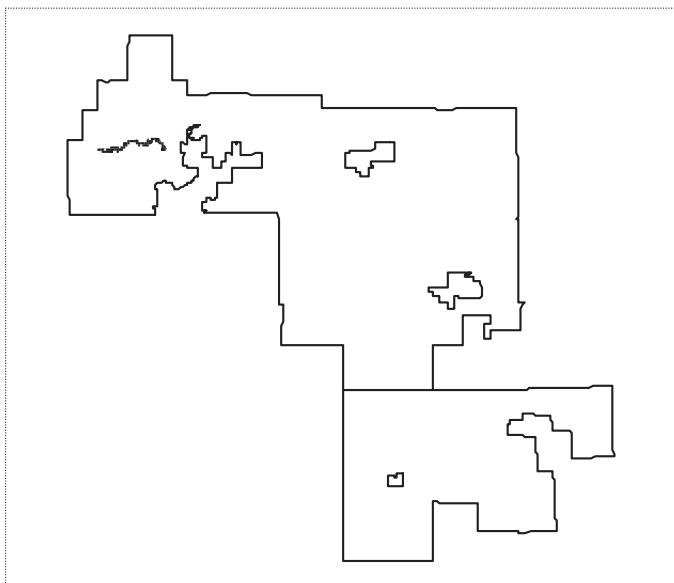
The scenic management area includes the stretch of the Manitowish River corridor from Benson Lake to State Highway 47. The downstream end of the scenic area abuts the Manitowish River Wild Resources Area. The scenic area corridor stretches for 300 feet each side of the river. The topography is mostly level to gently rolling with excessively drained, sandy soils. The river corridor was designated a scenic resource area in the 1982 Master Plan.

Historically the river was a well traveled transportation route and was used extensively for the logging trade at the turn of the century. At European settlement the river was flanked with a mix of wetland forest and high ground red and white pine stands. Presently, the area has a natural look and its undeveloped shore adds to the beauty of the riverway.

This area is classified a Type 3 Recreational use setting.

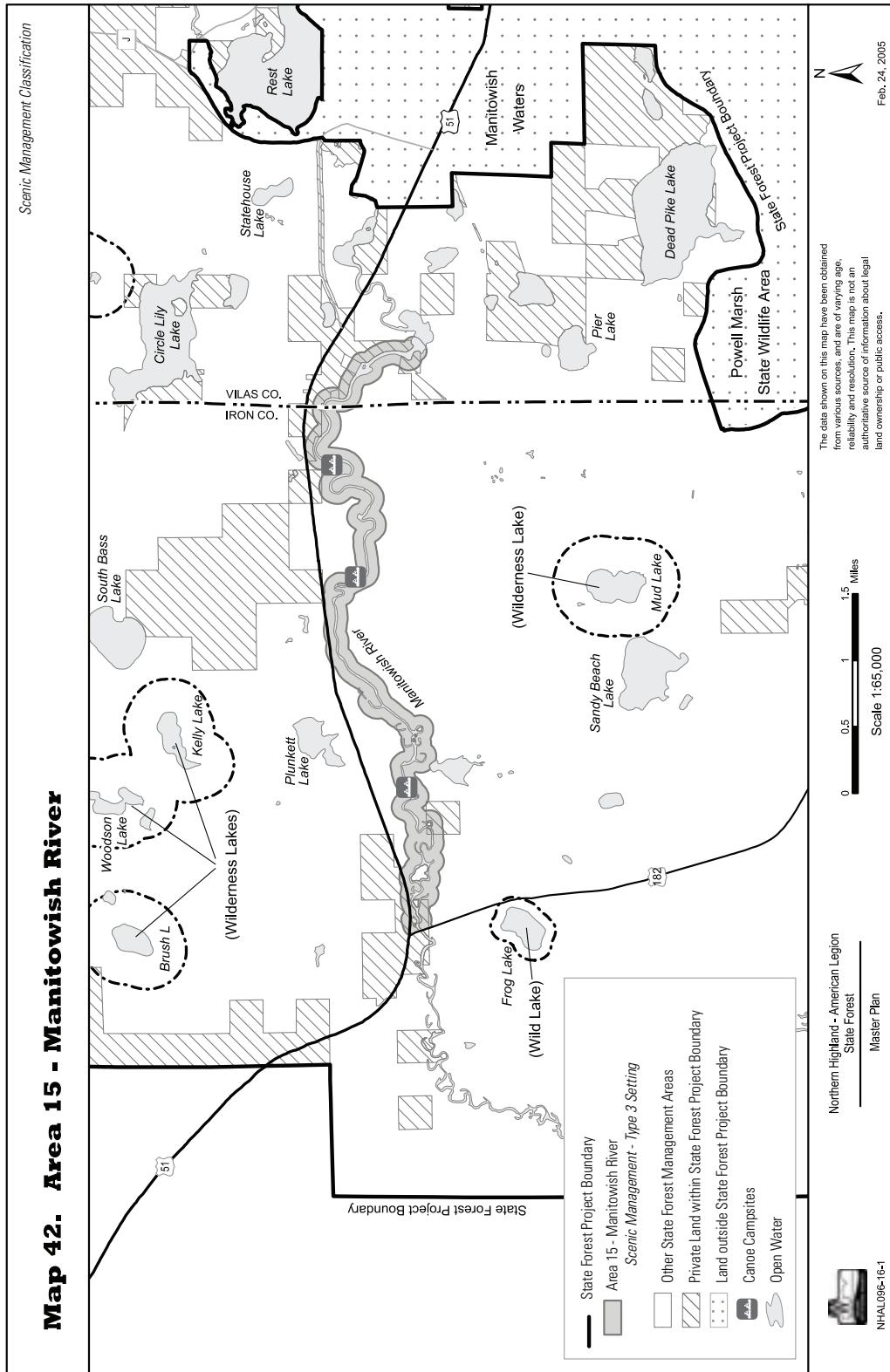
**AREA 15 SUMMARY**

- ▲ This area is approximately 759 acres in size with 524 acres in state ownership.
- ▲ Management to protect, maintain and enhance aesthetic qualities and outstanding recreational opportunities of the Manitowish riverway.
- ▲ Type 3 Recreation Setting

AREA 15 LOCATOR MAP

Scenic Resource Management Classification

MANITOWISH RIVER

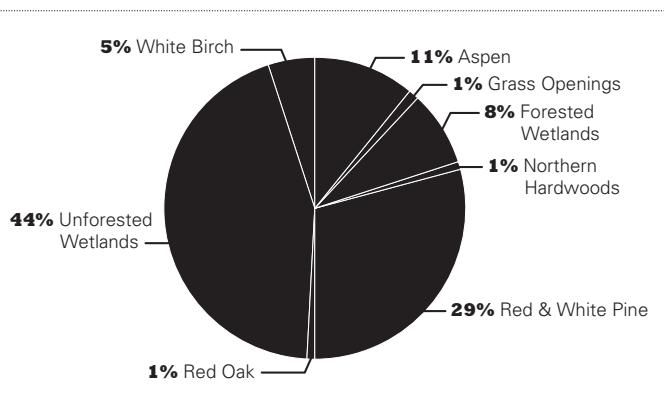
AREA
15**Map 42. Area 15 - Manitowish River**

**AREA
15****Scenic Resource Management Classification****MANITOWISH RIVER****LONG-TERM AND SHORT-TERM
OBJECTIVES (100 TO 50 TO YEARS)**

- Maintain and enhance the natural appearing, undeveloped, and highly scenic Manitowish River corridor between Benson Lake to State Highway 47.
- Provide opportunities for high quality, non-motorized recreation and education in a generally undeveloped river setting. Maintain an undeveloped shoreline, except for primitive canoe campsites that are harmonious with the surrounding landscape and have minimal negative impact upon scenic values.

**RESOURCE MANAGEMENT
PRESCRIPTIONS**

- Maintain the corridor in a natural appearing condition. Manage for large longer-lived trees such as red and white pine on suitable sites. If needed, under-plant to increase stocking levels of desirable species. Retain white cedar. Leave abundant snags, dead-downed trees, and downed trees in the river.
- When cutting timber or performing other management activities, modify the standard management prescriptions to minimize to the degree practicable the visibility of management activities from the river.
- Generally, leave natural disturbances to regenerate naturally. Consider salvage when the visual qualities along the river can be enhanced and erosion potential can be mitigated. Plant following salvage if the desired natural regeneration would not occur.
- Remove or control invasive species.
- Locate any new canoe campsites where they will be harmonious with the landscape. Remove hazard trees from campsites. Plant native trees and shrubs as need for shade and screening.
- Other management activities that may be conducted as needed include timber harvesting (except for clear-cutting not related to salvage) other tree cutting, passive forest management, tree and shrub planting, herbicide application, burning, installation of fish habitat improvement devices, trail or road construction, erosion control, campsite maintenance and construction, and the removal of hazard trees in public use areas.

AREA 15 CURRENT LAND COVER

Scenic Resource Management Classification

MANITOWISH RIVER

**AREA
15**

**AREA
16****Scenic Resource Management Classification****RUSTIC ROAD**

There is one rustic road designated within the Northern Highland-American Legion State Forest. This road, also known as Rustic Road 60, follows the eastern portion of County Highway K located in Vilas County in the northeastern section of the forest between County Highway N and County Highway M. An additional 2 miles of County Highway K extending to the eastern edge of the NH-AL forest boundary will also be included and managed as a scenic resource. The rustic road is approximately 12 miles in length and 200 feet on each side of the road beginning at the County Highway Right-of-Way. The County Highway Right-of-Way is 33 feet on each side from the center of the road. The road right-of-way is managed by Vilas County, not the Department.

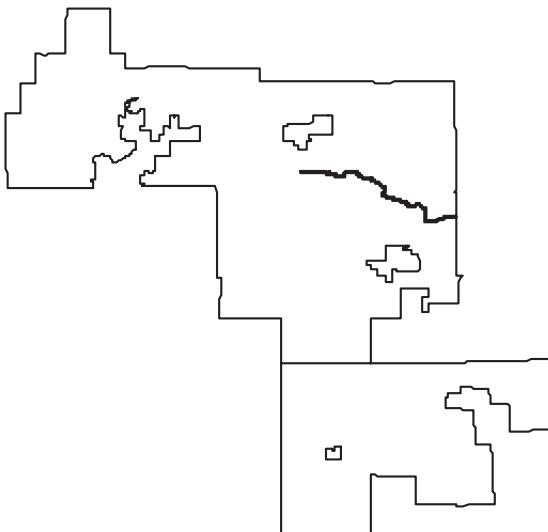
The topography is mostly level to gently rolling. The Rustic Road is of special importance because it travels through heavily forested areas, near hiking trails, and past an old logging camp. It supports a high traffic load and offers travelers scenic vistas of numerous lakes and forests. (DOT 2002).

According to State Statute 83.42 the purpose of a rustic road is "...to create and preserve rustic and scenic roads for vehicular, bicycle, electric personal assistive mobility device, and pedestrian travel in unhurried, quiet and leisurely enjoyment; to protect and preserve recreational driving, culture, beauty, trees, vegetation and wildlife.

This area is classified as a Type 3 Recreation Setting.

AREA 16 SUMMARY

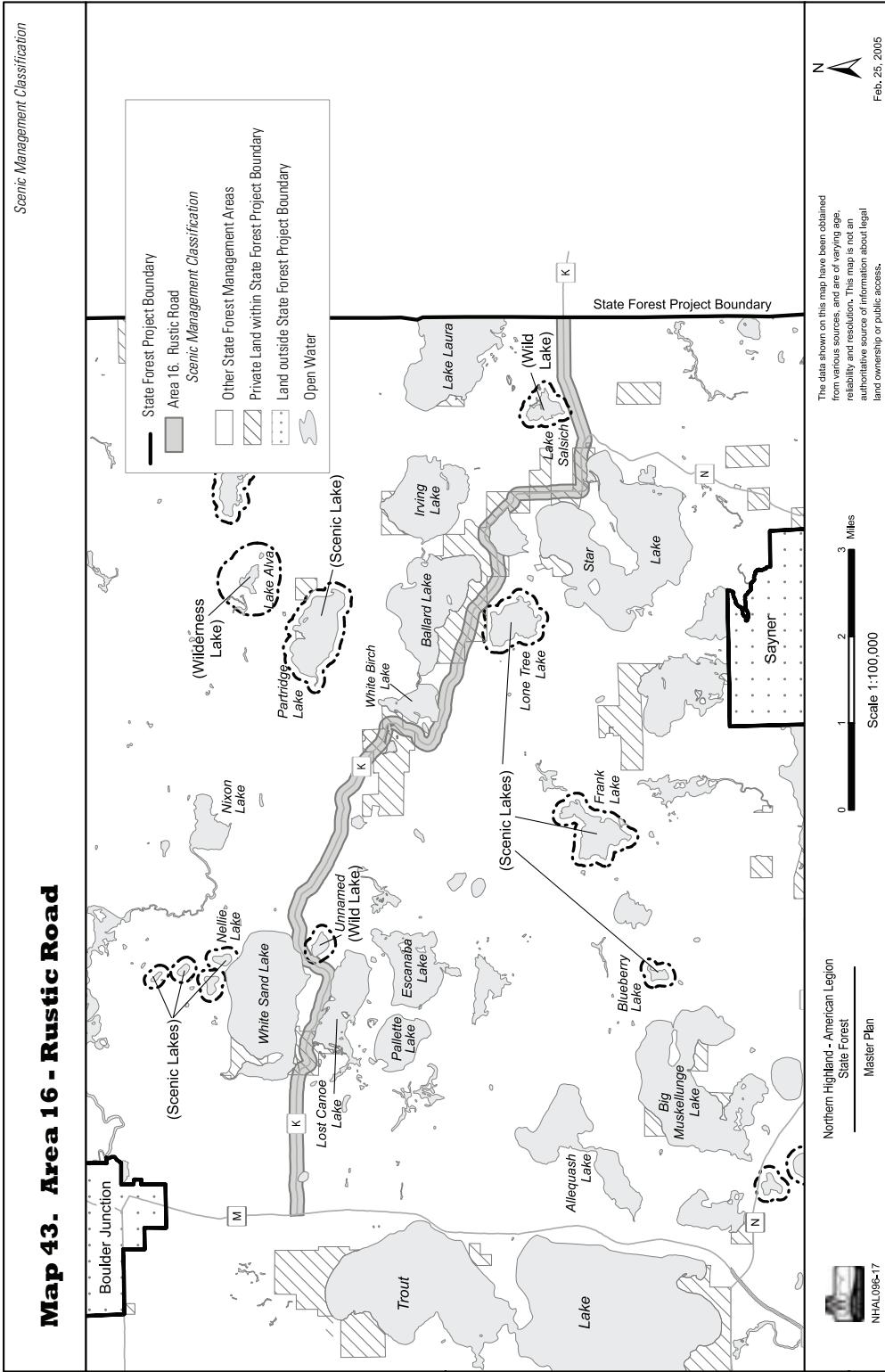
- ▲ Follows Rustic Road #60, along County Highway K.
- ▲ This area is approximately 12 miles in length and 400 feet wide for a total of 567 acres.
- ▲ Manage to protect and enhance the scenic beauty of the Rustic Road corridor.

AREA 16 LOCATOR MAP

Scenic Resource Management Classification

AREA
16

RUSTIC ROAD

Map 43. Area 16 - Rustic Road

Scenic Resource Management Classification**RUSTIC ROAD****LONG-TERM OBJECTIVES (100 YEAR)**

- In cooperation with Vilas County, protect and enhance the aesthetic and scenic beauty of the rustic road corridor.
- Maintain a mix of forest types but generally favor longer-lived species of red and white pines or other long-lived tree species.

SHORT-TERM OBJECTIVES (50 YEAR)

- Maintain the Department managed lands along the road corridor in a natural appearing condition.
- Maintain a healthy, forested condition and a broad mix of forest types, with an emphasis on longer-lived tree species. In areas of predominantly shorter-lived, even-aged tree species, convert to longer-lived species as quickly as possible while retaining the high visual quality of the area.
- Maintain or create scenic vistas that enhance the visual variety and quality of the landscape.
- Eliminate visual impacts and safety concerns created by dead or declining trees and broken or leaning trees.
- Minimize the visual and audible impacts of management activities, including impacts from slash, forest roads, and log landings.

RESOURCE MANAGEMENT PRESCRIPTIONS

The General Timber Type Management Prescriptions and all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

- Manage for large longer-lived trees such as red and white pine on suitable sites. If needed, under-plant to increase stocking levels of desirable species. Restoration activities are allowed to promote long-lived species and promote natural appearing forest stands. Underplant native species for visual variety.
- Within 50 feet of the County Highway Right-of-Way:
 1. When harvesting timber or performing other management activities, to the degree possible, minimize disturbances, except as necessary to create or maintain scenic vistas.
 2. Remove dead, declining or short-lived species near maturity as well as invasive species.
 3. Eliminate slash.
- Beyond 50 feet of the County Highway Right-of-Way:
 1. To the degree practicable, modify the standard forest management prescriptions to minimize the visibility of management and development activities as viewed from the road.
 2. Reduce slash not screened from view from road to a maximum height of 24 inches.
- Landings for forest products are not permitted within this management area.
- Design forest access roads to have the minimal visual impact.
- Time management activities so they coincide with lower levels of recreational use periods whenever possible.
- Identify, maintain or create key scenic vistas along the road corridor as appropriate.

Wild Resource Management Classification

INTRODUCTION

One area has been identified as a "Wild Resource Management Area"

Area 17: Manitowish Wild Resource Area

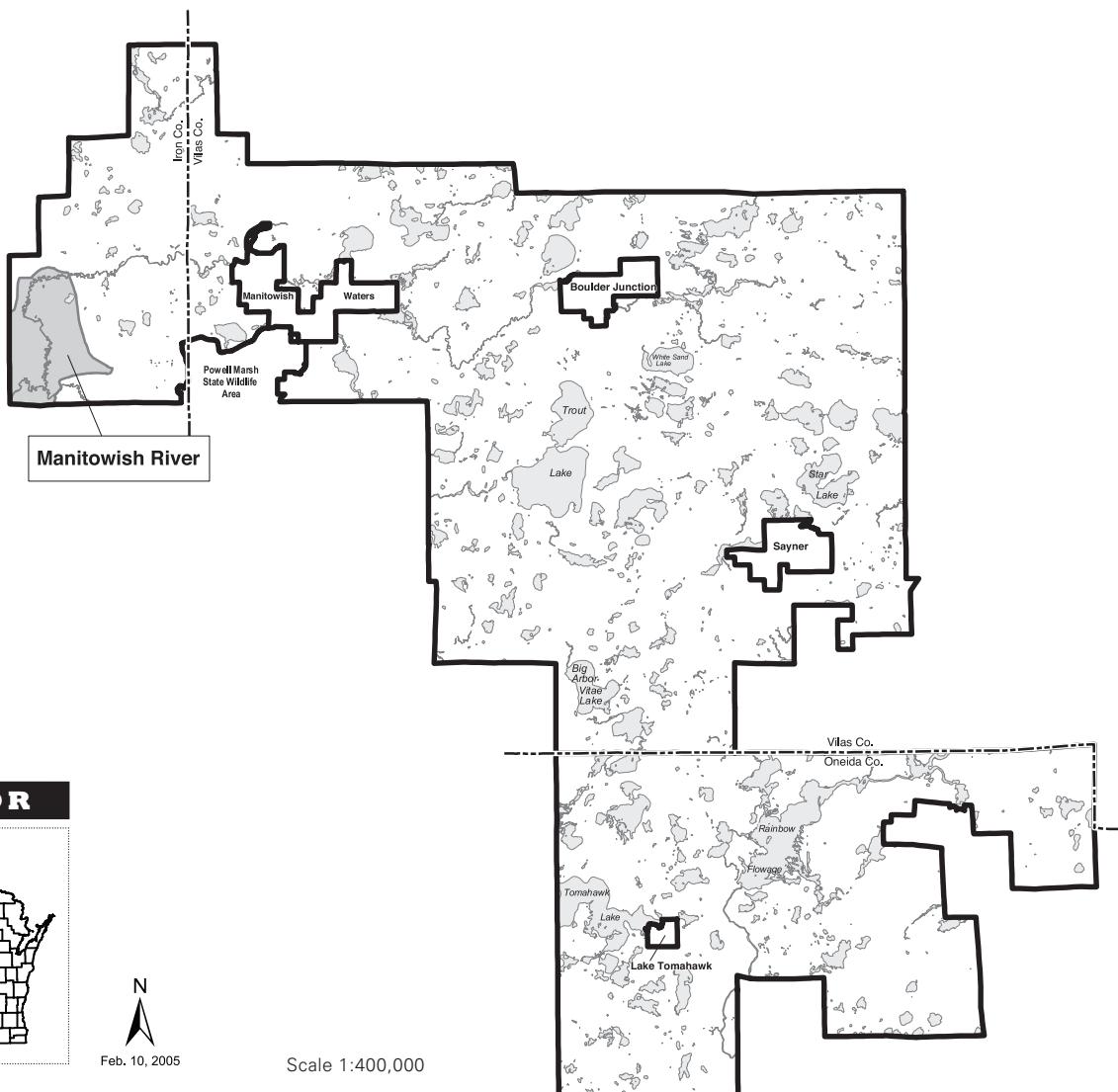
The Manitowish River Wilderness is classified as a Wild Resources Management Area. The Wild Resource management classification is typically applied to undeveloped areas that have the potential to be restored to a substantially wild condition. These locations are managed to provide land and water areas where natural ecological processes predominate and evidence of human activities is low.

Any management activities conducted within Wild Resource Areas are performed in a manner that attempts to minimize the perception of human activity. Typically there are little or no visible resource management activities and the facility development is limited to primitive recreational uses. Road construction to support management and restoration activities within a wild resource area are limited to the degree possible and are generally abandoned after completion of the management activity. Also, all pre-existing structures (i.e., roads, buildings, bridges, and dams) will be removed if they are not specifically identified in this master plan. Structures with

historical value are an exception and may be maintained within the wild resource area. Action is taken to control invasive species that threaten the Area's wildland character or outstanding natural values. Fire is suppressed in wild resource areas as much as possible and timber salvage after a natural disturbance is not allowed.

Management activities within the Wild Resource Areas are generally authorized for the purpose of protecting or enhancing the outstanding natural or aesthetic values and restoring the Area's wild character. Planting native vegetation and limited vegetation cutting. These include: thinning of residual tree plantations to create a more natural appearing forest condition, the removal of trees considered to be a hazard to the public or when associated with a recreational facility, and the removal of invasive species may be conducted within a Wild Resource Area. However, other types of vegetation management or timber harvesting activities are not allowed.



Wild Resource Management Classification**INTRODUCTION****AREA
17****MAP 44: WILD RESOURCE MANAGEMENT CLASSIFICATION AREAS****MAP 44 LEGEND**

- State Forest Project Boundary
- Wild Resource Management Classification Area
- Area 17. Manitowish River
- Other State Forest Management Areas
- County Boundary
- Open Water

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

**AREA
17****Wild Resource Management Classification****MANITOWISH RIVER WILDERNESS**

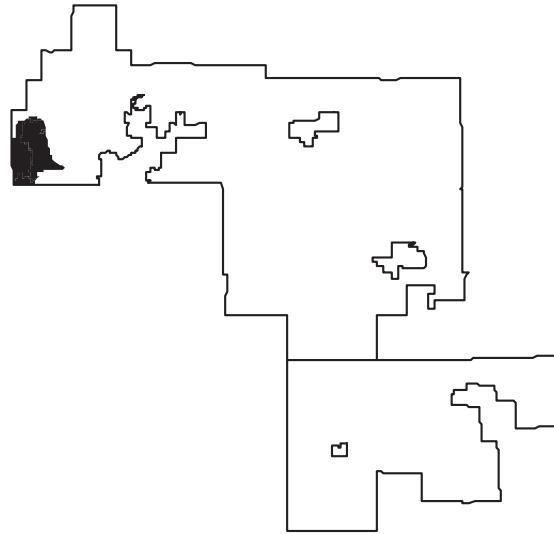
The Manitowish River flows through the heart of this 6,265 acre area. The landscape of the Manitowish River Wilderness Area is mostly flat and wet, supporting a mosaic of wetland and upland habitats. The wetlands flow from the Winegar Moraines south through the Manitowish Peatlands, and then into adjacent lands such as the Turtle-Flambeau Scenic Waters Area, Lac du Flambeau Reservation, and the Chequamegon Unit of the National Forest. The soils are mostly very poorly drained organic peat with some areas of sands or loamy sands.

The current landscape is a mosaic of wetland and upland habitats. The wetlands are mostly open bog with little woody growth, or are covered by wetland shrubs, although areas of black spruce and tamarack do occur. The uplands contain aspen and red and white pine stands with some mixed hardwoods. Some upland islands contain old growth red and white pine stands. The area contains one 54 acre red pine plantation of 1967 origin.

Historically, both fire and floods with the water table rising in wet years and dropping in drought years, were the major influences on the vegetation. Upland stand-replacing fires had cycles every 50-200 years, but some trees survived over 300 years. These conditions created a forest of red/white pine with aspen and white birch. Fires also maintained the open treeless bog habitat. Bog, poor fen, and tamarack forest are the historical wetland vegetation, and are represented today much as they probably were before European settlement.

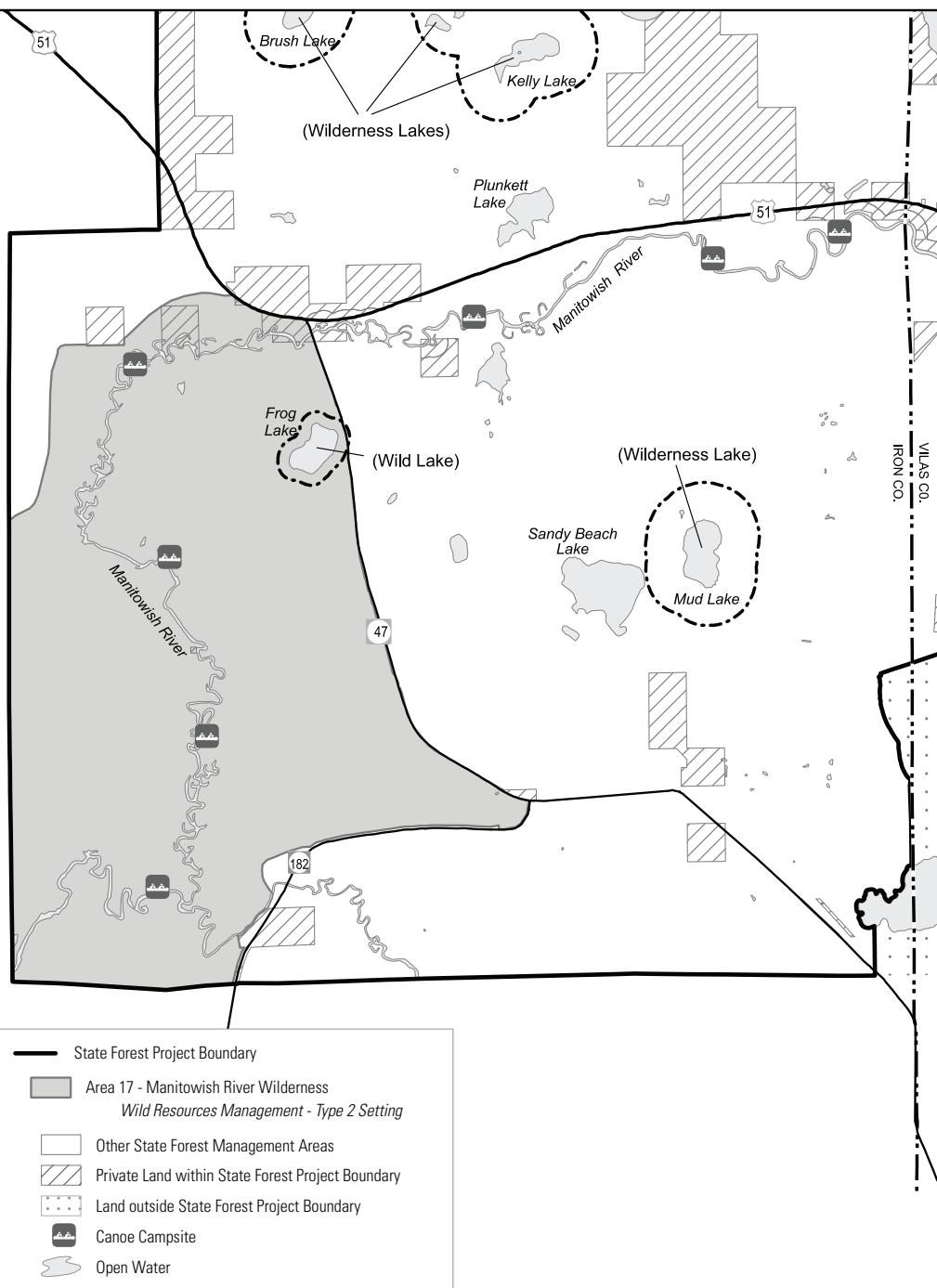
AREA 17 SUMMARY

- ▲ This area is approximately 6,265 acres in size with 5,939 acres in state ownership.
- ▲ Opportunity to maintain the high quality open sedge meadow, bog, shrub and forested wetland system for ecological, water quality and habitat values.
- ▲ Conservation of wetland habitats for many rare species.
- ▲ Passive management throughout this area, allowing most natural forces to determine the future composition of wetland and upland habitats.

AREA 17 LOCATOR MAP

Wild Resource Management Classification

MANITOWISH RIVER WILDERNESS

**AREA
17***Wild Resource Management Classification***Map 45. Area 17 - Manitowish River Wilderness**Northern Highland - American Legion
State Forest

Master Plan

0

0.5

1

1.5

Miles

Scale 1:65,000

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

Feb. 25, 2005



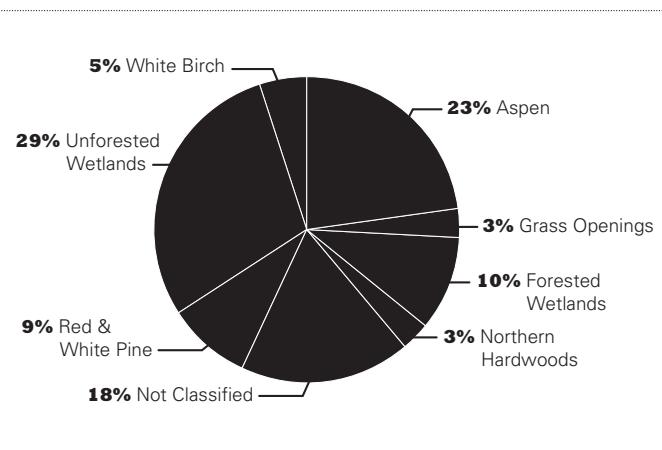
**AREA
17****Wild Resource Management Classification****MANITOWISH RIVER WILDERNESS****LONG AND SHORT-TERM OBJECTIVES
(100 AND 50 YEAR)**

- Through passive management, develop and maintain a red pine and white pine forest with gradual transition (>100 years) to maple/ hemlock forest, swamp conifer and lowland brush with old-growth characteristics.
- Protect Frog Lake, an ultrasoft water lake, for its biotic community and scenic values.
- Provide remote, quiet, non-motorized recreation in a setting with limited access and low signs of human activity. Provide primitive canoe camping opportunities and limited trail access into the area.

**RESOURCE MANAGEMENT
PRESCRIPTIONS**

Only the management activities outlined below may be conducted within this management area.

- Permit natural processes to predominate. Passively manage the entire management area, except to remove invasive species, restore forest stands to a natural appearing forest, particularly restoring pine plantations, and restore roads to a natural condition, or maintain designated trails and canoe campsites. Salvage activities following a natural disturbance is not allowed.
- Monitor insect and disease outbreaks when they occur and take action only when there is a strong threat to forests outside of the management area.
- Actively suppress forest fires that threaten areas outside of the management area using the minimum actions required. Restore any soil disturbed to its original topography. Develop a wild fire response plan to minimize adverse soil disturbance, while assuring public safety.
- Conduct regular reconnaissance monitoring and explore opportunities for additional research regarding forest composition and change within the Wild Resource Area.
- Develop a plan to monitor the forest composition and rare species populations to learn more about forest regeneration and its affects on rare plant and animal populations.
- Maintain a primitive trail for walk-in access to Frog Lake's north shore, and develop a four car parking area and install a pedestrian only access fence at the trailhead on Highway 47.
- Level the berm and restore pine forest vegetation on the former logging road west of the snowmobile trail.

AREA 17 CURRENT LAND COVER

- Maintain several primitive canoe campsites along the Manitowish River. Remove the picnic tables located at these sites due to the new standards for campsites located in wild resource areas.
- Restrict all motor vehicle access to the area, except to respond to health and safety or other emergencies.
- One wilderness lake, Frog Lake, lie in this management area. The prescribed passive management in this area is fully compatible with the management requirements for a wilderness lake. Manage frog lake consistent with the wilderness lakes designation. See the wilderness lakes management zone section for information on the non-vegetative management requirements within the wilderness lake zone.

STATE NATURAL AREA DESIGNATION

See the State Natural Area discussion in the Appendix for detailed information.

The Manitowish River Wilderness Area contains a proposed 1,248 acre State Natural Area designation for Frog Lake and Pines. See the State Natural Areas discussion and map for additional information.

Wild Resource Management Classification

MANITOWISH RIVER WILDERNESS

**AREA
17**

Table 2.15 Area 17- Manitowish River Wilderness, Current and desired future conditions for community types in acres and percent of total.

Community type	Current		Predicted 50-year Condition*	
	% of Total Area	Acres	% of Total Area	Acres
Aspen	1,386	23%	400	7%
Grass openings	153	3%	0	0%
Forested Wetlands	613	10%	370	7%
Northern hardwoods	170	3%	1,520	25%
Not Classified	1,061	18%	1,039	17%
Red & White pine	514	9%	510	9%
Unforested wetlands	1,739	29%	2,000	33%
White birch	303	5%	100	2%
TOTAL	5,939	100%	5,939	100%

The table shows estimated changes in vegetation that are predicted to naturally occur under passive management in the absence of a significant natural disturbance. The increase and decrease of forested and unforested wetlands is due to natural succession or natural catastrophes. The Not Classified category includes river frontage, lake zones and recent acquisitions.

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.



Special Management Classification

INTRODUCTION

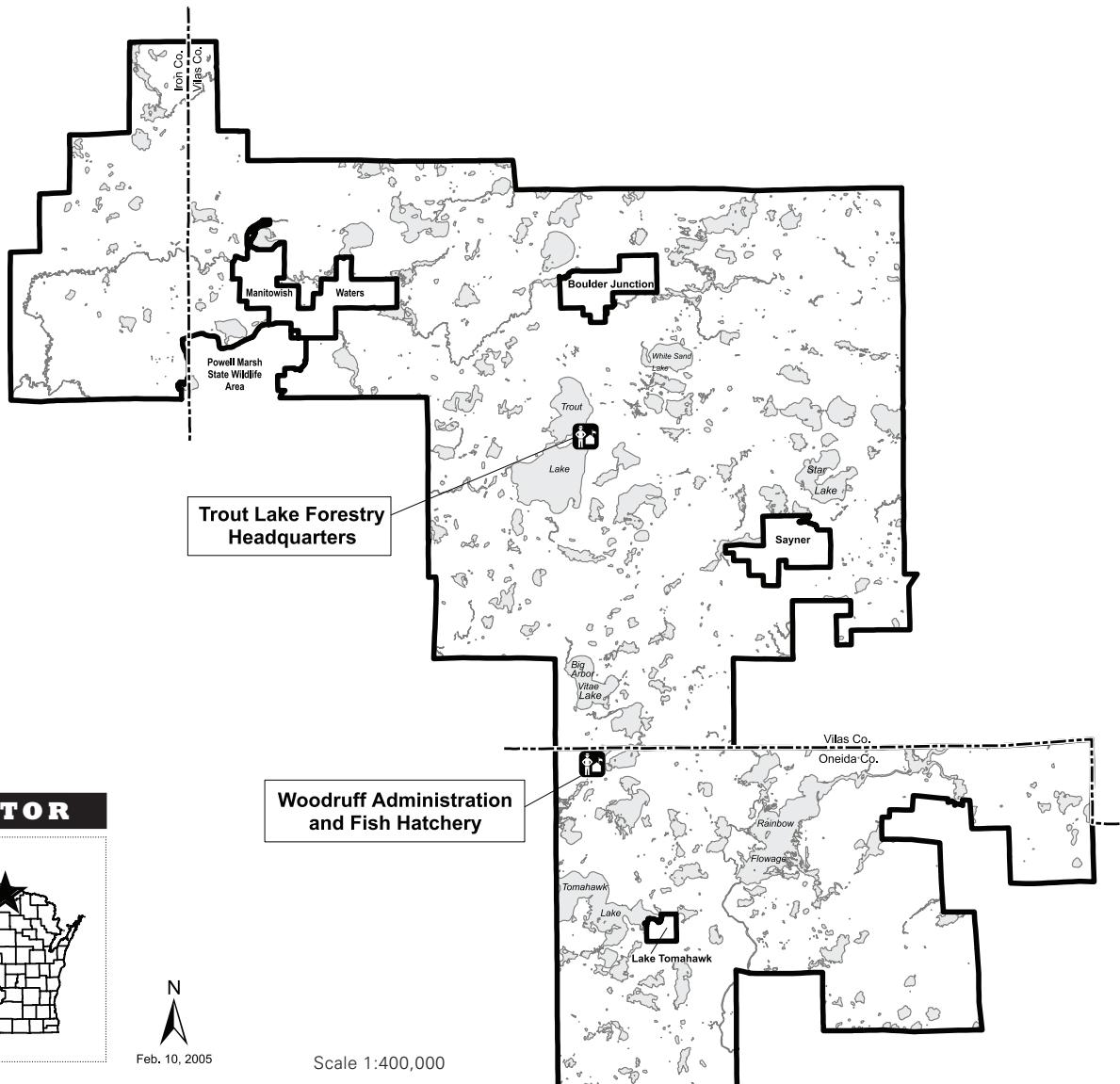
Within the NH-AL State Forest, two areas have been identified as "Special Management Areas"

Area 18: Trout Lake Forestry Headquarters

Area 19: Woodruff Administration and Fish Hatchery

The management objective of a special management area is to provide and maintain areas and facilities for special uses not included under other land management classifications. Examples of special management areas include administrative or service facility areas, cultural resource protection areas, propagation or nursery areas and demonstration or experimental management areas when the primary use is for research and testing of new resource management methods and techniques (WDNR 2001).



Special Management Classification**INTRODUCTION****AREAS
18-19****MAP 46: SPECIAL MANAGEMENT CLASSIFICATION AREAS****LOCATOR**

Feb. 10, 2005

Scale 1:400,000

MAP 1 LEGEND

- State Forest Project Boundary
- Special Management Classification Areas**
- Area 18. Trout Lake Forestry Headquarters
- Area 19. Woodruff Administration and Fish Hatchery
- Other State Forest Management Areas
- - - County Boundary
- Open Water

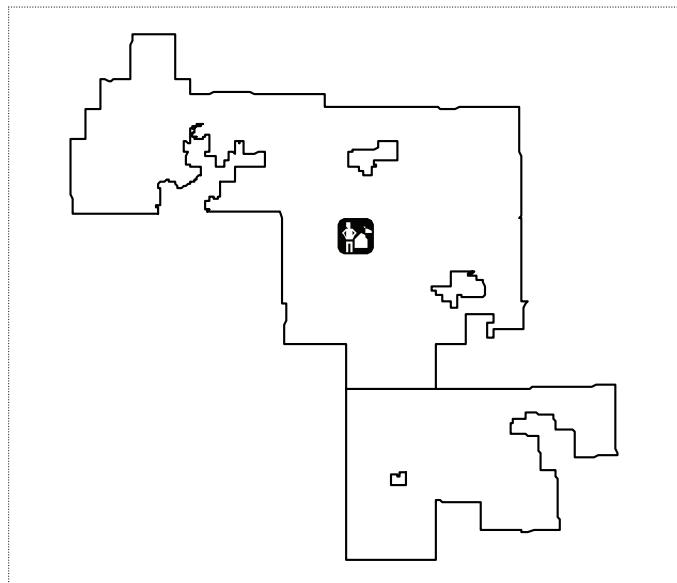
The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

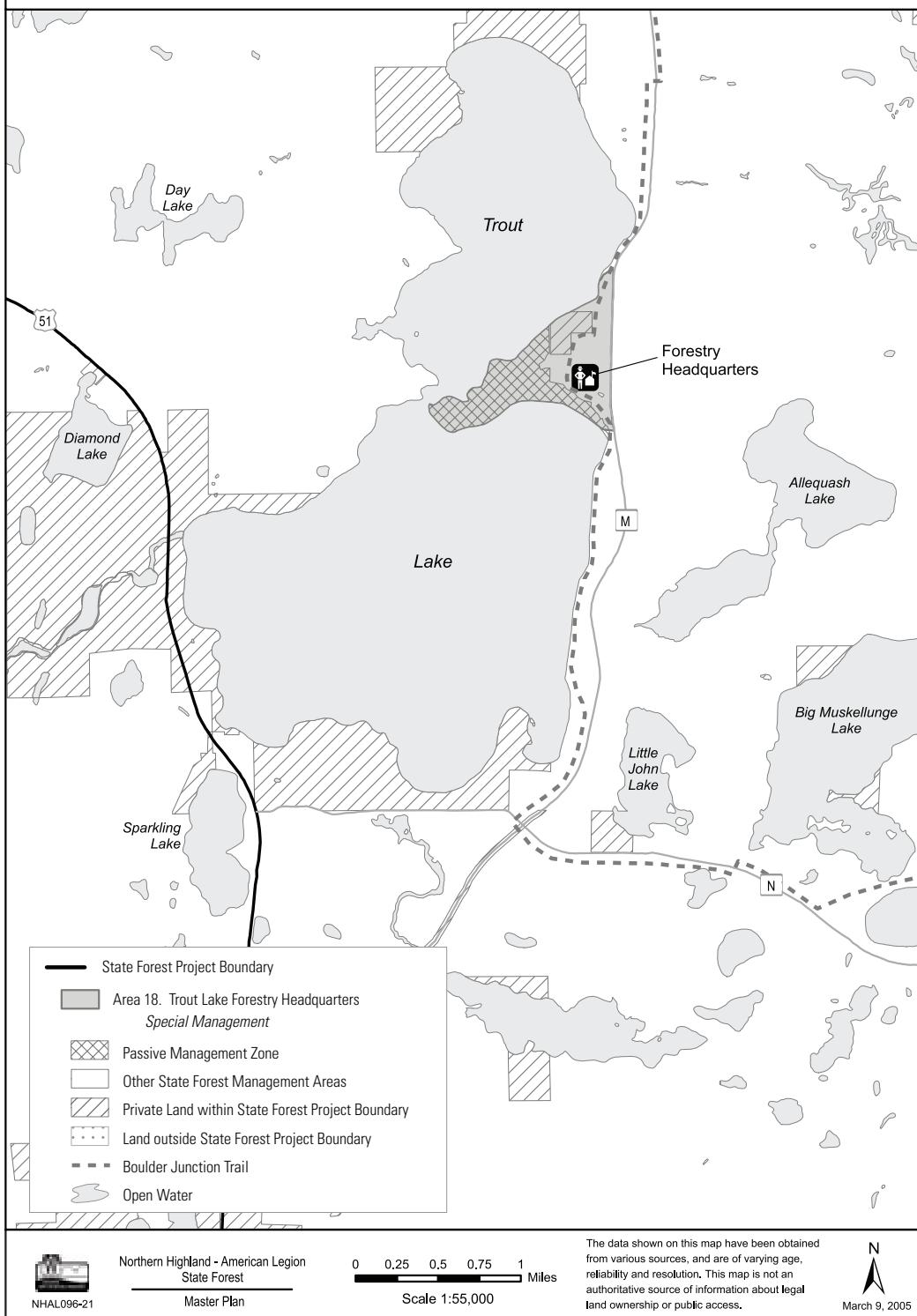
**AREA
18****Special Management Classification****TROUT LAKE FORESTRY HEADQUARTERS**

This administrative area encompasses the Trout Lake Headquarters/public contact building, the maintenance garages, and seasonal employee residence halls. This area is approximately 292 acres in size and is located near Trout Lake on HWY M. The Boulder Junction bike trail, which runs along HWY M, passes through the Trout Lake Administration area. This is also the former site of Wisconsin's first state tree nursery. It was established in 1911 and closed in 1968. The nursery area is managed as a pine plantation today.

**AREA 18 SUMMARY**

- ▲ This area is approximately 292 acres in size with 263 acres in state ownership.
- ▲ Management for State Forest administrative buildings, aesthetic values, and recreational/educational uses.

AREA 18 LOCATOR MAP

Special Management Classification**TROUT LAKE FORESTRY HEADQUARTERS****AREA
18***Special Management Classification***Map 47. Area 18 - Trout Lake Forestry Headquarters**

**AREA
18****Special Management Classification****TROUT LAKE FORESTRY HEADQUARTERS****LONG AND SHORT-TERM
MANAGEMENT OBJECTIVES**

- Provide general visitor information and support services as well as compatible educational opportunities.
- Provide facilities for state forest administrative and staff support functions, such as staff offices, customer service, and equipment storage and maintenance.
- Manage the forest across the management area primarily for long-term aesthetics. Maintain the scenic, old-forest characteristics of the Trout Lake Peninsula, including stands of large pines. In the other forest stands, manage to establish large trees with old-forest characteristics.

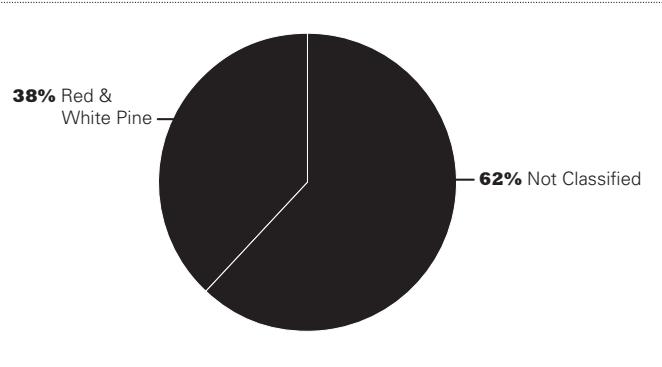
MANAGEMENT PRESCRIPTIONS**Facility Management**

This master plan does not control the specific operations or development of facilities within this area. Administrative and operational facilities are managed under separate state administrative processes. Any historical buildings are managed according to the requirements of DNR manual code 1810.1.

Vegetation Management

The General Timber Type Management Prescriptions and all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

- Passively manage the Cathedral Point site. The area extends from the natural stands west of the office out to the point. An exception to the passive management prescription is the stand of the planted pines within this area. It should be actively managed until the stand reaches maturity (30-50 years), then review the long-term management needs for this stand.
- On the lands outside of the Cathedral Point area, use appropriate management techniques across the management area to develop large pines and northern hardwoods. Specifically, thin the plantations when they reach full stocking to promote larger trees and a natural stand appearance. Establish and maintain old-forest characteristics in the natural pine and red oak stands located east of the Office.
- Remove diseased and defective trees that are hazardous to staff or the public.
- Trout Lake is designated as an experimental lake as per Administrative Code NR 20.41. All management activities should consider the long and short term impacts to the research lakes.

AREA 18 CURRENT LAND COVER

Special Management Classification
TROUT LAKE FORESTRY HEADQUARTERS

**AREA
18**



**AREA
19****Special Management Classification****WOODRUFF ADMINISTRATIVE AND FISH HATCHERY**

This special management area encompasses the Woodruff administration/service center facility, maintenance garages, and the Art Oehmcke Fish Hatchery. This area is approximately 111 acres in size and bisected by HWY J.

**LONG AND SHORT-TERM
MANAGEMENT OBJECTIVES**

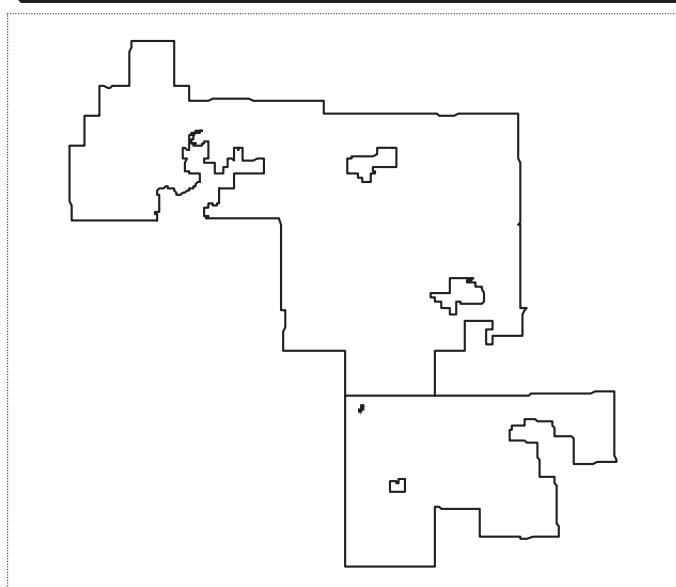
- Provide facilities for NH-AL, a variety of customer services or programs, administrative offices, and equipment storage and maintenance.
- Provides facilities for fish rearing and related activities.

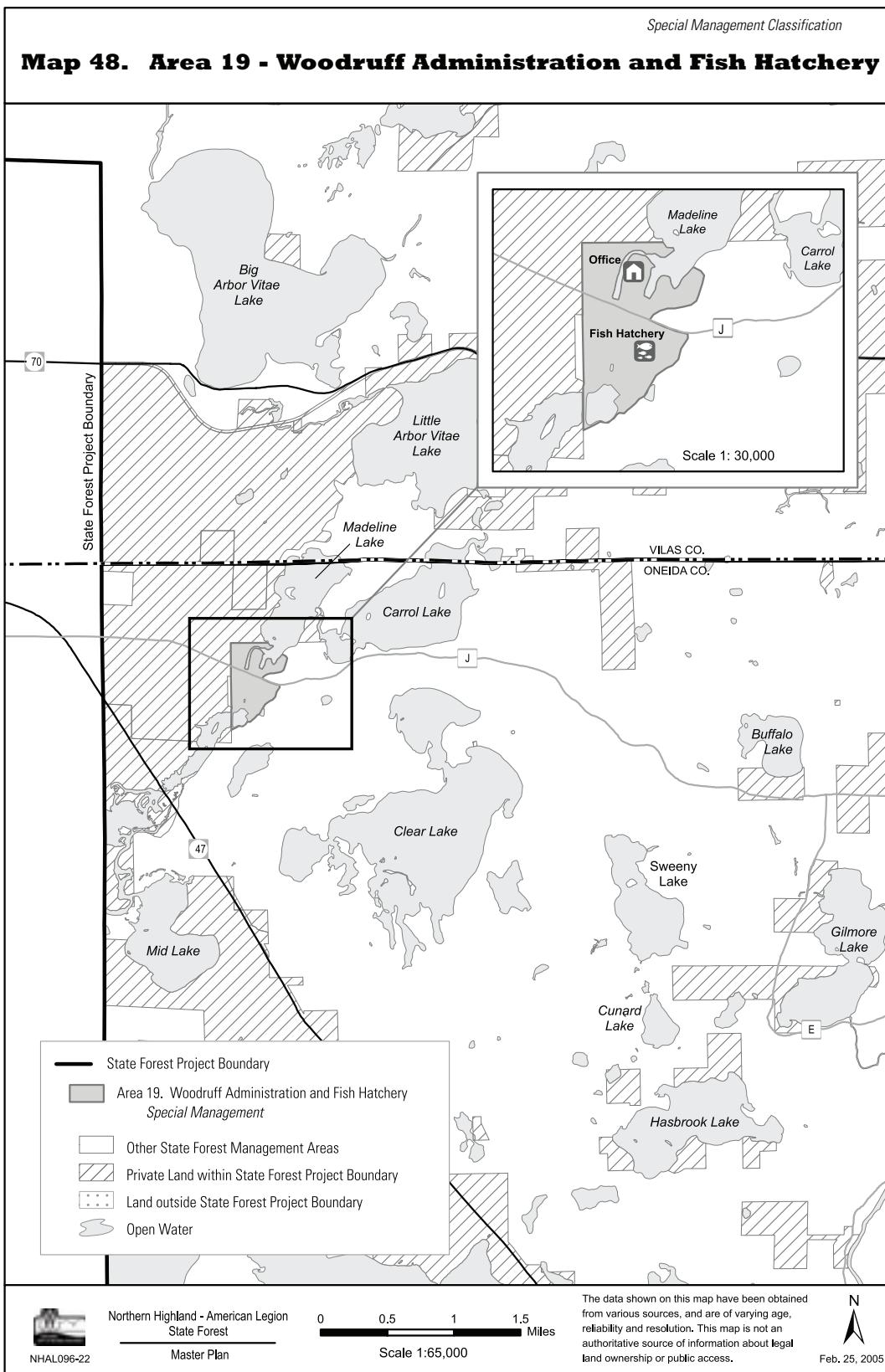
MANAGEMENT PRESCRIPTIONS**Facility Management**

This master plan does not control the specific operations or development of the facilities within this area. Administrative and operational facilities are managed under separate state administrative processes. The day-to-day operations of this management area is under the direction of the fisheries program.

Vegetation Management

- Annually remove diseased and defective trees that may be hazardous.
- Periodically thin pine plantations around the buildings to maintain their growth and vigor.
- Other vegetation management activities may be conducted as needed to support the use and purposes of the area.

AREA 19 LOCATOR MAP

Special Management Classification**WOODRUFF ADMINISTRATIVE AND FISH HATCHERY****AREA
19**

Recreation Management Classification

INTRODUCTION

Within the NH-AL, three areas have been identified as "Recreation Management Areas"

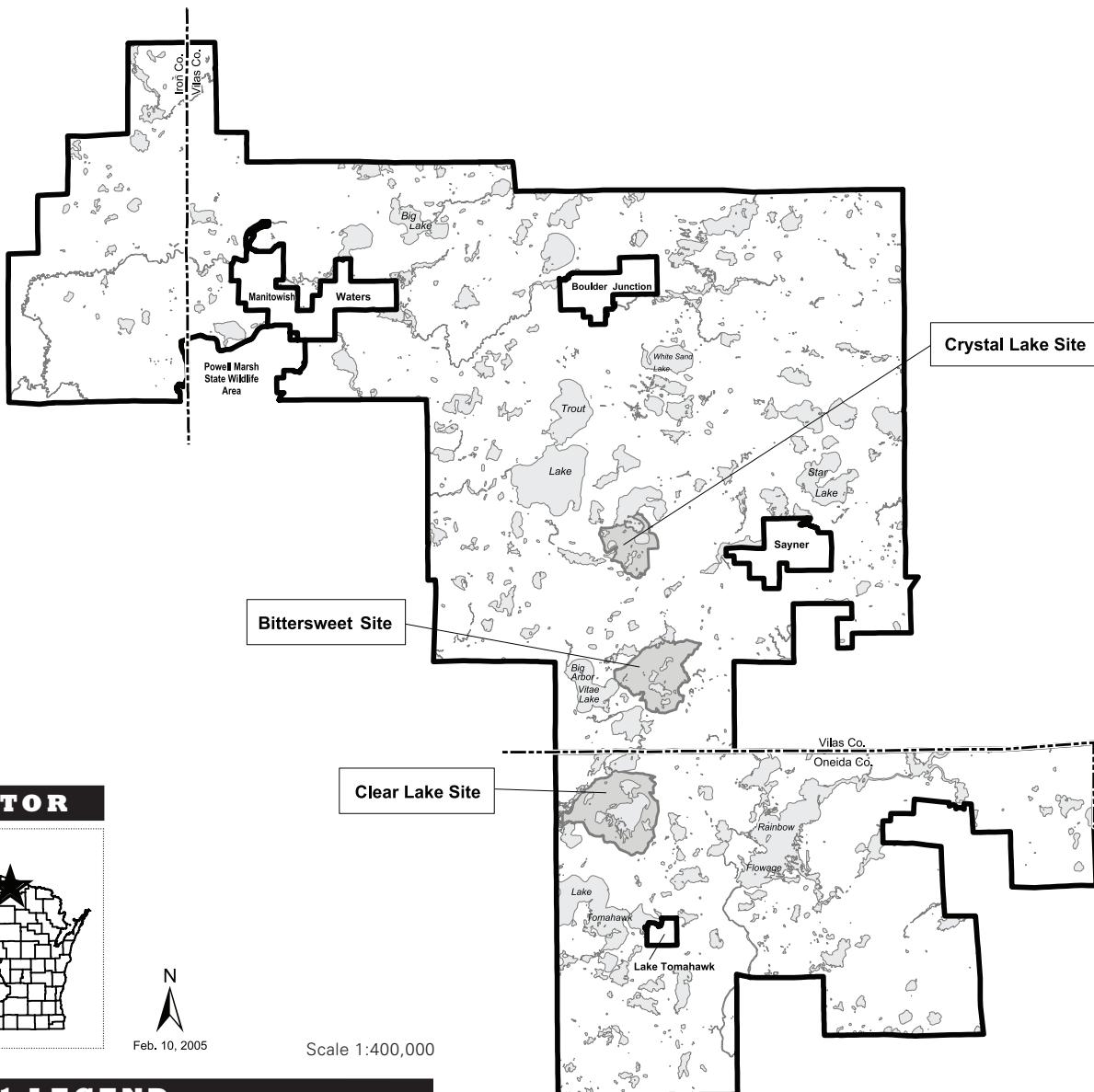
Area 20: Crystal Lake Recreation Area

Area 21: Bittersweet Recreation Area

Area 22: Clear Lake Recreation Area

The purpose of a recreation management area is to provide and maintain land and water areas and facilities for outdoor public recreation or education. Each separate recreation area has different goals regarding future landscape conditions, management activities, policies for protection, maintenance, enhancement or restoration of the visual characteristics important to the recreational use of the area.



Recreation Management Classification**INTRODUCTION****AREAS
20-22****MAP 49: RECREATION MANAGEMENT CLASSIFICATION AREAS****MAP 1 LEGEND**

- State Forest Project Boundary
- Recreation Management Classification Areas
 - Area 20. Crystal Lake Site
 - Area 21. Bittersweet Site
 - Area 22. Clear Lake Site
- Other State Forest Management Areas
- - - County Boundary
- 🌊 Open Water

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

**AREA
20****Recreation Management Classification****CRYSTAL LAKE**

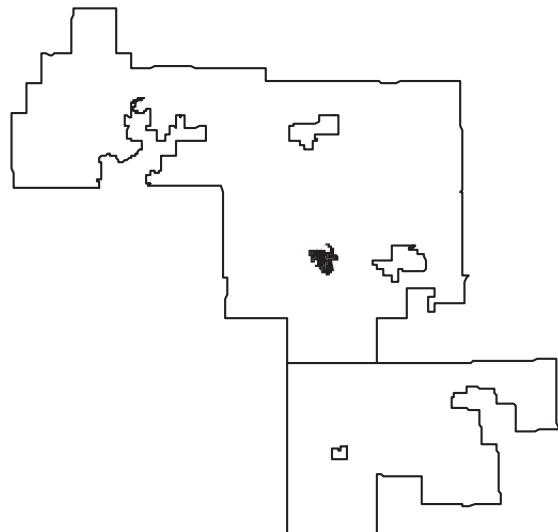
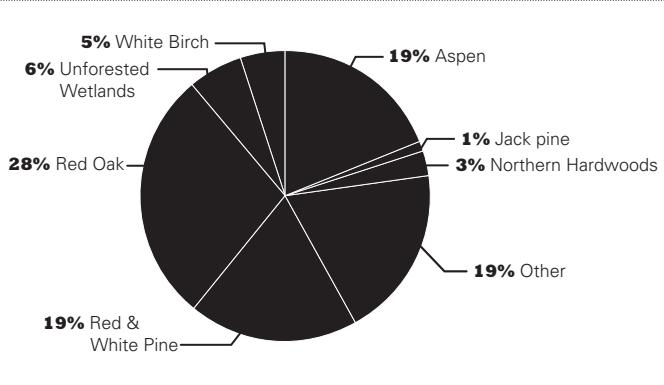
This small 1,447 acre area is a subset of Area 7 – Vilas Sandy Plains Central. As such, it contains much of the same geological and ecological characteristics of that larger unit. It consists of pitted outwash topography with well-drained sandy soils and several high quality lakes. The unit is located within two different land types situated to the north and to the south, with the more productive habitats occurring in the southeast corner, south and east of Fallison Lake.

Red oak is the dominant type found in this area today, followed by equal parts of red and white pine and aspen types. All three of these types are well suited to the ecological capability of the area. Typical understory shrubs in this unit consist of hazelnut, juneberry, low sweet blueberry, sweetfern, and maple-leaf viburnum. Typical herbs include wild lily-of-the-valley, bracken fern, grasses and sedges, and big leaf aster. Forested wetlands are essentially non-existent; however, a fair amount of open wetlands are scattered throughout.

At European settlement, this area was mostly covered with red and white pine. White birch and aspen were also present in significant amounts as secondary types, along with patches of jack pine and an area of northern hardwood. Historically, fire was a significant disturbance factor in this area. Stand replacing fires had cycles every 50-200 years, but some trees probably survived over 300 years. Some fires may have burned the understory without killing the pines, creating a more open forest where this occurred. Other fires opened up stands and set succession back to the early pioneer species and shrubs.

AREA 20 SUMMARY

- ▲ This area is approximately 1,447 acres in size with 1,178 acres in state ownership.
- ▲ This area is the most heavily used recreational area on the State Forest.
- ▲ Aesthetic quality and safety of forest users will be the primary objectives in this area.
- ▲ This area contains the Firefly Lake managed old growth forest site.

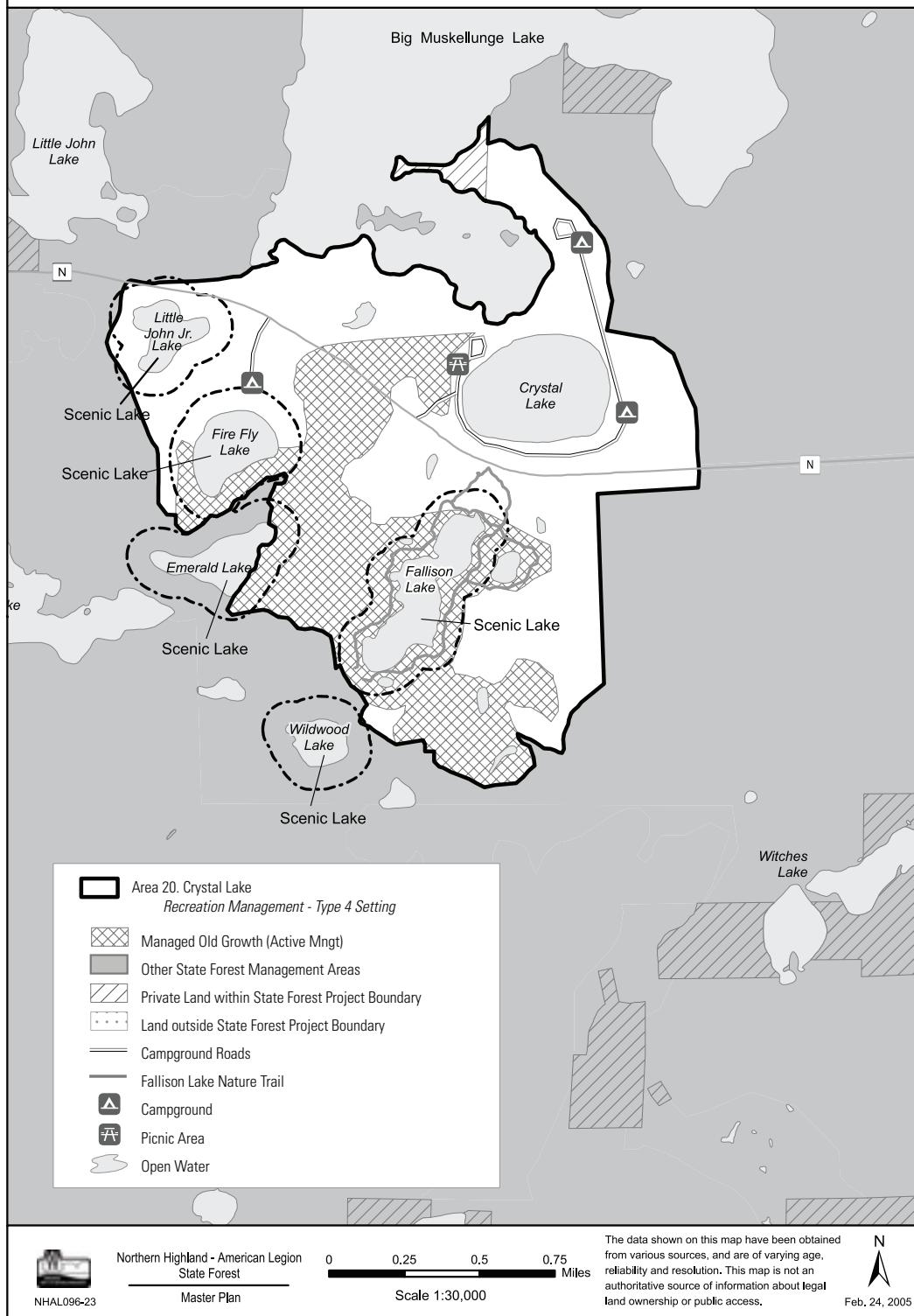
AREA 20 LOCATOR MAP**AREA 20 CURRENT LAND COVER**

Recreation Management Classification

AREA
20

CRYSTAL LAKE

Recreation Management Classification

Map 50. Area 20 - Crystal Lake

DESCRIPTION OF THE RECREATIONAL SETTING

The Crystal Lake Recreation Area is the most developed and the most used recreational complex site on the NH-AL. It has three modern campgrounds, Crystal Lake, Firefly Lake, and Muskellunge Lake. A day use area and nature center and the Fallison Nature Trail compliments the area. Other facilities within this management area include large sandy beaches, swimming areas, showers, vault and flush toilets, a sanitary dump, a paved bike trail leading to Boulder Junction, boat landings to area lakes, and a public contact station.

LONG-TERM OBJECTIVES (100 YEARS)

- Maintain the area as an attractive and safe setting for intensive and non-intensive types of recreational use, such as camping, picnicking, water sports, trail activities, and nature interpretation.
- Maintain a mixed forest dominated by older red and white pine and red oak with aspen, white birch, and jack pine as important secondary species. Maintain red oak on sites with slightly richer soils.
- Maintain and protect open wetlands.
- Within the Firefly Lake old-growth site maintain old-growth pine, oak and mixed hardwoods.

SHORT-TERM OBJECTIVES (50 YEARS)

- Provide opportunities for high quality, modern, intensive recreational uses featuring modern camping and day uses and nature interpretation/education in an attractive outdoor setting.
- Increase red and white pine and red oak dominance across most of the mixed forest stands as opportunities arise.
- Retain and increase red and white pine in aspen, red oak, white birch and jack pine stands.
- Maintain a diversity of the early forest succession types over the area with a slight decrease in their relative abundance over time.
- Maintain the northern hardwood community type.
- Maintain and enhance red oak on suitable sites.
- Within the Firefly Lake old growth site encourage the development of a mixed pine forest dominated by old trees, large amounts of coarse woody debris, numerous standing dead snags, and an age diversity of trees.

RESOURCE MANAGEMENT PRESCRIPTIONS

The General Timber Type Management Prescriptions and all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

- Conduct forest management activities at times that will have the least conflict with recreational use. Adjust management techniques to minimize negative visual impacts on recreational uses.
- Adapt the General Management Prescriptions for each stand to create, enhance and maintain old growth red/white pine, red oak, and stands of mixed northern hardwoods consisting of short-lived and long-lived species characteristics. This includes providing coarse woody debris, leaving large cull trees and increased snag tree densities.

RECREATION MANAGEMENT

Maintain the existing array of recreational facilities and expand or redevelop facilities within the area as described in the property-wide recreation management plan and consistent with the standards for a Type 4 Recreational Use Setting and modern campgrounds and dayuse areas in NR 44.07(7)(e)5b. Specific new developments or management actions include:

- An additional 50 campsites at the Firefly Lake Campground
- A 1.6 mile paved bike trail loop and a one mile nature trail that is in part disabled accessible.
- An outdoor seating area near the nature center for educational programs

Recreation Management Classification
**AREA
20**
CRYSTAL LAKE

Table 2.16 Area 20 - Crystal Lake, Current and desired future conditions for community types in acres and percent of total.

Community type	Current		Predicted 50-year Condition*	
	Current Acres	Current % Cover	Acreage Objective	Future % Cover
Aspen	230	19%	200	17%
Jack Pine	9	1%	9	1%
Northern Hardwoods	37	3%	37	3%
Other - Campground	219	19%	219	19%
Red and White pine	224	19%	254	21%
Red Oak	331	28%	351	30%
Unforested Wetlands	74	6%	74	6%
White Birch	54	5%	34	3%
TOTAL	1178	100.00%	1178	100.00%

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.



**AREA
21****Recreation Management Classification****BITTERSWEET**

The 2,553 acre Bittersweet area lies just a few miles north and east of the towns of Woodruff off State Highway 70. It is located on fine sandy loam soils with a gentle to moderate rolling topography. Besides the sandy loams, a portion of the area also contains some excessively drained outwash sands, particularly in the southeast corner of the site. A range of habitat types can be found here. The site contains four undeveloped, high quality softwater seepage lakes in close proximity to one another. An existing State Natural Area is located around these four lakes.

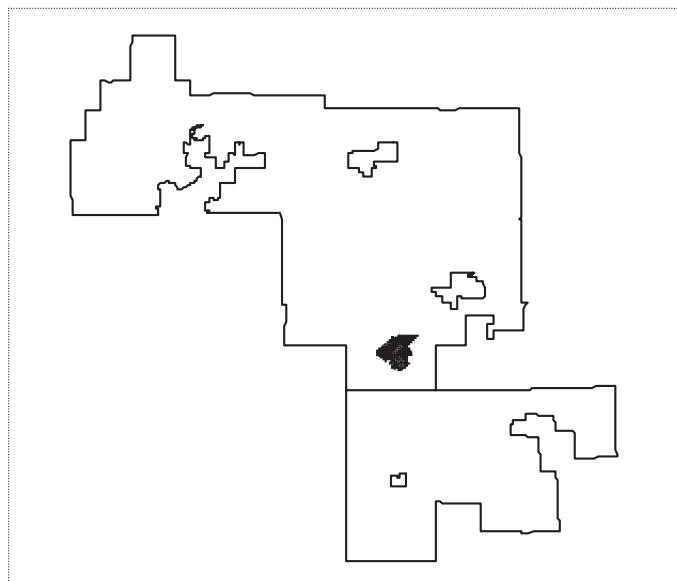
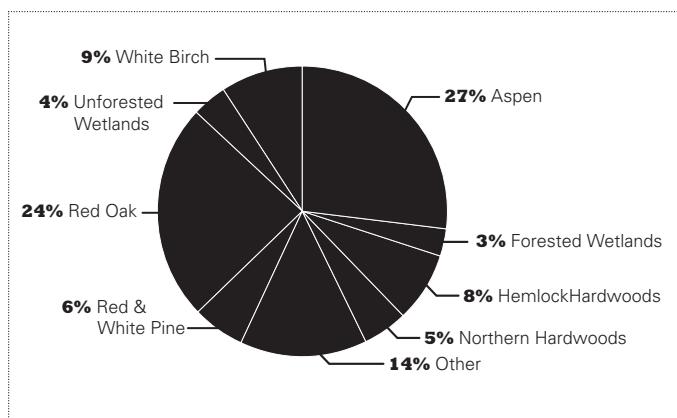
At European settlement the area contained stands of hemlock hardwood on the richer soils and red and white pine on the sandier soils. Early successional species like aspen, white birch, and oak also were present as secondary associates or in disturbance patches. Historically, fire was a significant disturbance factor within this unit, as it was in many areas on the State Forest. Wind throw was and is another important disturbance factor. Sporadic wind events played a vital role in shaping forest succession.

At present the most common forest types are aspen, red oak and white birch, although the latter is rapidly declining and will soon no longer be a component of the stand. There are also significant areas of northern and hemlock hardwoods and red and white pine. There are relatively few forested and unforested wetlands scattered across the landscape.

This area contains a complex of small, scenic, undeveloped, wild lakes (Bittersweet, Prong, Oberlin, and Smith) connected by portage trail. Another unique recreational quality of the area is its remoteness and the solitude it affords. Access is only via rough and unmarked roads (i.e. snowmobile trails) that generally require a 4W-drive vehicle. Low to moderate fishing is the primary recreational use. Currently camping is not allowed.

AREA 21 SUMMARY

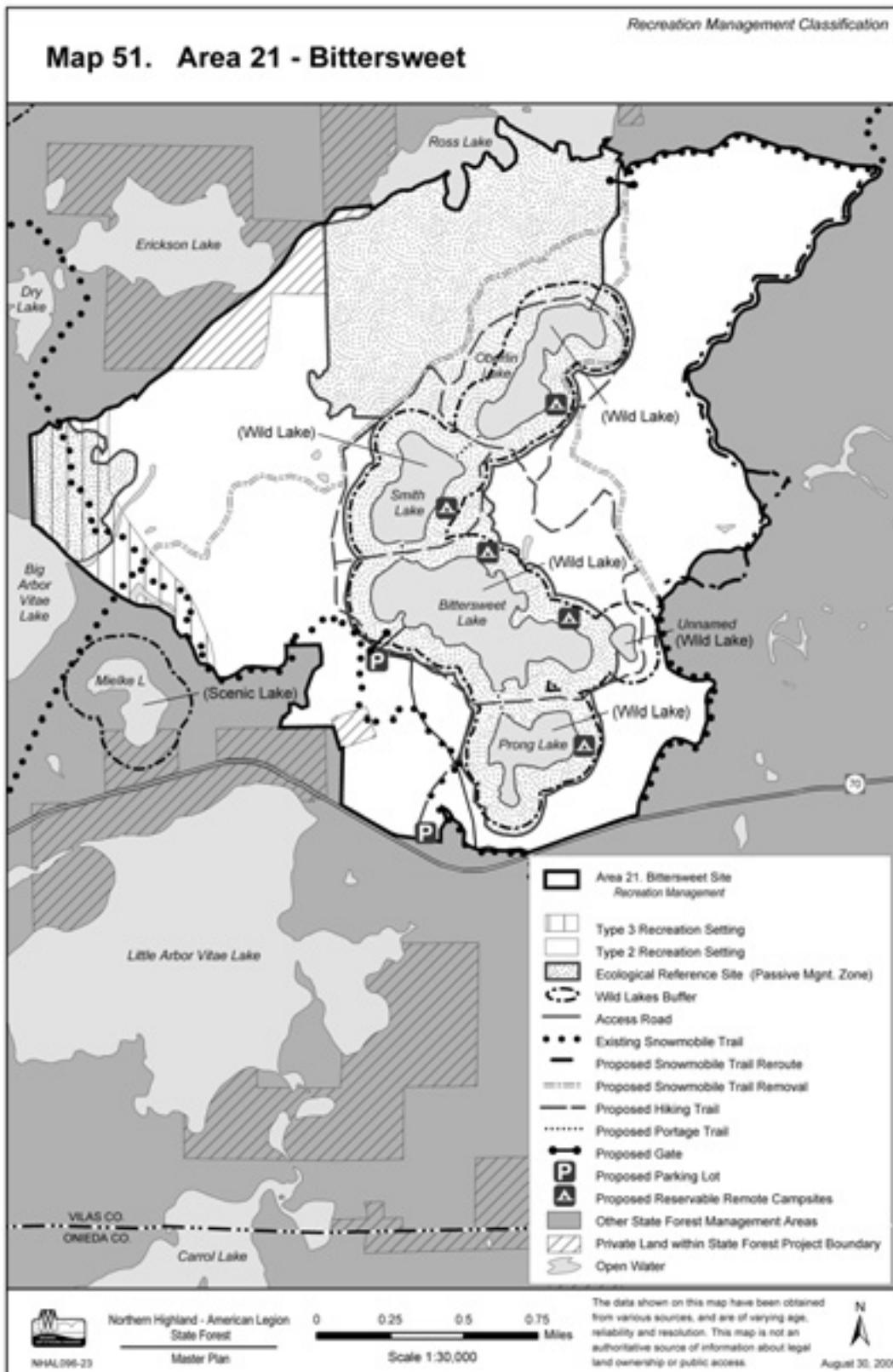
- ▲ This area is approximately 2,553 acres in size with 2,553 acres in state ownership.
- ▲ Opportunity to manage for quiet year-round recreation in a non-motor area.
- ▲ Manage for scenic qualities, user safety, and old-growth forests.
- ▲ Five Wild Lakes

AREA 21 LOCATOR MAP**AREA 21 CURRENT LAND COVER**

Recreation Management Classification

AREA
21

BITTERSWEET



LONG-TERM OBJECTIVES (100 YEARS)

- Develop and maintain a hemlock hardwood, northern hardwood, red pine, and white pine forest with old-growth characteristics across the management area.
- Maintain four ultra-soft water lakes for their biotic community and scenic values.
- Maintain opportunities for low density/low impact, and primarily non-motor recreation in a somewhat remote and natural appearing setting.

SHORT-TERM OBJECTIVES (50 YEARS)

- Maintain a core 1,136 acre passively managed ecological reference area surrounding the lakes that captures the oldest stands of hemlock, red pine and white pine known on the NH-AL. (The acreage figure includes 288 lake acres.)
- Outside of the core ecological reference site restore old-growth red and white pine and hemlock hardwood cover types wherever possible, and on dry, sandy sites maintain and enhance red oak, aspen, and white birch.
- Maintain water quality and species diversity of the aquatic areas.
- Provide an undeveloped, natural appearing setting on and around the lakes offering opportunities for solitude and primitive types of non-motorized, low-density recreation, including fishing, canoeing, hiking, and primitive camping.



RESOURCE MANAGEMENT PRESCRIPTIONS

The General Timber Type Management Prescriptions and all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

- Apply passive management to the core ecological reference site. The lakes within this zone are designated wild lakes. The prescribed passive management is fully compatible with the wild lake management requirements.
- Outside of the ecological reference site, increase the proportion and age of red pine, white pine, red oak, and hemlock. Active management techniques may be used.
- Manage within the zone classified as a Type 2 Recreational Setting consistent with the requirements for that setting described in NR 44.07(5).
- Conduct management activities at times that will have the least conflict with recreational use. Adjust management techniques to minimize negative visual impacts on recreational uses. Give aesthetic and recreational uses preference when making active timber management decisions.
- Oberlin, Smith, Bittersweet and Prong Lakes are designated experimental lakes as per Administrative Code NR 20.41. All management activities should consider the long and short term impacts to the research lakes.

RECREATION MANAGEMENT

As shown on the Bittersweet Recreation Management Area map, the majority of the management area is designated as Type 2 Recreational Use Setting. The intent of a Type 2 Recreation Use setting is to provide a somewhat remote, non-motorized recreation in a highly natural appearing setting. The remainder of the management area is designated as a Type 3 Recreational Use Setting. The Type 2 and 3 settings are defined in NR 44.07(5). The lakes in the management area are designated wild lakes.

Within the Type 2 Management Area

Public use of the area is primarily by non-motorized means. This management area is closed to public motor vehicle use of all types, except for the access roads to Bittersweet Lake, the access road to Oberlin Lake for disabled persons, and to snowmobiles operated on trails designated in this plan. Other recreational facilities to be developed within this area are primitive hiking trails and a limited number of reservable, remote primitive campsites.

Recreation Management Classification**AREA
21****BITTERSWEET****Table 2.17 Area 21 – Bittersweet, Current and desired future conditions for community types in acres and percent of total.**

Community type	Current		Predicted 50-year Condition*	
	Current Acres	Current % Cover	Acreage Objective	Future % Cover
Aspen	579	27%	530	24%
Forested Wetlands	74	3%	74	3%
Hemlock Hardwoods	176	8%	176	8%
Northern Hardwoods	103	5%	103	5%
Not Classified	308	14%	308	14%
Red and White pine	133	6%	163	7%
Red Oak	516	24%	585	26%
Unforested Wetlands	85	4%	85	4%
White Birch	579	27%	529	24%
TOTAL	2553	100.00%	2553	100.00%

Not Classified category contains acres that community types have not been inventoried and management set backs along lakeshores.

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.

Specific recreation management/development actions in the area include the following:

- Maintain a primitive to lightly-developed public vehicle access road from Highway 70 to Bittersweet Lake. Provide a carry-in boat/canoe access to the lake with a 6-8 vehicle parking area outside of the 400 foot wild lake management zone.
- Permanently maintain the existing lightly-developed vehicle access road to Oberlin Lake from the north for use by Department staff for management or research purposes. Allow disabled persons (with a permit issued by the Forest Superintendent) motor vehicle access to Oberlin Lake via this road for fishing until 2015.
- Close all other roads and snowmobile trails to public vehicles and snowmobiles, except the snowmobile trail lying to the southwest of Bittersweet and Prong Lakes. As shown on Bittersweet Recreation Management Area map, this trail will remain open to snowmobile use. If a suitable location can be found, relocate the northwestern snowmobile trail portion of the snowmobile trail to the west, further away from Bittersweet and Prong Lakes. If a suitable location can be found a portion of the area can be reclassified to a Type 3 Recreation Area north of the trail.
- Relocate a portion of the north/south snowmobile trail located on the eastern side of the lakes to the eastern border of the management area as shown on Map 51.
- Abandon the closed snowmobile trails that are not

designated as hiking trails by grading and seeding to control erosion, then allowing the trail to naturally re-vegetate.

- Develop and maintain five reservable remote primitive campsites, two on Bittersweet Lake, and one each on Smith, Oberlin, and Prong Lakes in the approximate locations shown on Bittersweet Recreation Management Area map.
- Maintain a system of primitive portage trails between the four lakes.
- Develop and maintain a lightly developed hiking trail system.
- Develop and maintain a 10-12 vehicle parking lot at the hiking trail head located near Hwy 70.
- The department or its contractors are authorized to use motor vehicles to conduct management activities in any area outside the 400 foot wild lake management zones.

Within the Type 3 Management Area

Continue to maintain the snowmobile trail and allow all vehicle access on the non-gated portion of snowmobile trail (the north-south portion near Big Arbor Vitae Lake).

STATE NATURAL AREA DESIGNATION

See State Natural Area discussion in the Appendix for detailed information. Proposed overlay designations for State Natural Area would occur for Bittersweet Lakes (1,136 acres, includes 288 lake acres).

**AREA
22****Recreation Management Classification****CLEAR LAKE**

This small 3,728 acre area is a subset of Area 11 – Big Arbor Vitae Loamy Hills. As such, it contains much of the same geological and ecological characteristics of that larger unit. The main focus of this area is to provide for quality recreational experiences through a number of developed facilities and trail systems in an attractive setting. The topography of the area consists of rolling pitted outwash soils with several wetlands and quality lakes of various sizes. The unit is located within two different land types. Clear Lake is the centerpiece and is roughly situated in the middle of the management unit. A variety of habitat types can be found here.

At European settlement, the area contained stands of northern hardwoods with pockets of hemlock hardwood on the richer soils and red and white pine on the sandier soils. Early successional species like aspen, white birch, red maple and oak were also present as secondary associates or in disturbance patches. Within the forested wetlands, tamarack and black spruce were predominant, with some scattered white cedar. Historically, fire was a significant disturbance factor in this area, especially in the western side of the unit. Stand replacing fires had cycles every 50-200 years, but some trees probably survived over 300 years. Wind throw was and is another important disturbance factor. Sporadic wind events, even recently, have played a vital role in shaping forest succession.

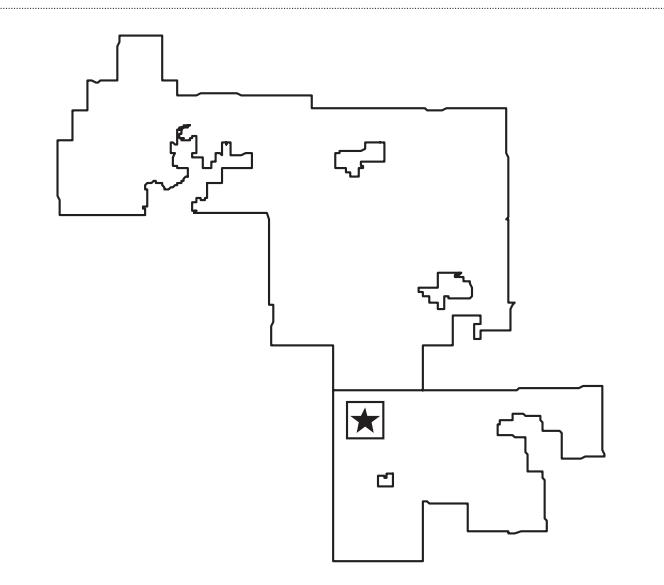
Today the area is primarily forested with northern hardwoods and red oak, with aspen and red and white pine also found in significant amounts. There are stands of older hemlock hardwoods and white-red pine forest located within close proximity to Hemlock Lake.

Description of the Recreational Setting

The Clear Lake Recreation Area is within easy access of the Minocqua/Woodruff tourist attractions. This area contains the most popular campground on the American Legion State Forest (Clear Lake). It also has a designated nature/hiking/cross country ski trail (Raven) and two popular day use/picnic areas. The modern Clear Lake Campground has flush toilets, showers and a sanitary dump station. A small rustic campground is also located on Carroll Lake. A remote camping opportunity is available at four reservable, remote campsites on Clear Lake's east shore. Other recreational facilities in this area are a large sandy beach, swimming area, water ski area, picnic area, boat landings, accessible fishing pier, and a contact station.

AREA 22 SUMMARY

- ▲ This area is approximately 3,728 acres in size with 2,659 acres in state ownership.
- ▲ Designated as a Recreation Management area.
- ▲ Management to provide and maintain land and water areas and facilities for outdoor public recreation or education.
- ▲ Integrate recreational use with forest management practices.
- ▲ The Hemlock Lake site will be passively managed.
- ▲ This area contains Inkpot Lake which is a Wild Lake.

AREA 22 LOCATOR MAP

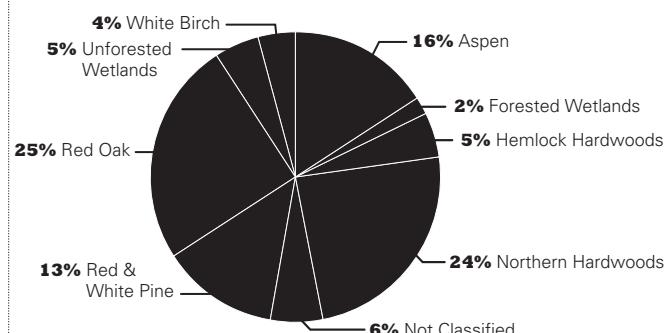
LONG-TERM OBJECTIVES (100 YEARS)

- Maintain the area as an attractive and safe setting for intensive and non-intensive types of outdoor recreational use, such as camping, picnicking, water sports, trail activities, and nature interpretation.
- Develop a complex of mesic hemlock hardwoods, northern hardwoods and dry-mesic white pine-red pine and red oak forest with old growth characteristics. Secondly, maintain limited amounts of aspen and other minor early successional types.
- Maintain and enhance the hemlock hardwood and pine types and maximize their old growth characteristics through a variety of active and passive management techniques.
- Maintain open and forested wetlands.

SHORT-TERM OBJECTIVES (50 YEARS)

- Increase white pine-red pine as opportunities allow with a corresponding small reduction of red oak and aspen.
- Maintain red oak on the most suitable sites.
- Maintain the northern hardwoods,
- Maintain pine plantations with regular silvicultural techniques (thinning) to promote health, vigor, and large tree size.
- Provide opportunities for high quality, modern, intensive recreational uses featuring modern camping and day uses and nature interpretation/education. Provide for non-motorized trail uses.
- In the area around Hemlock Lake, located west of Raven nature trail, maintain and enhance the hemlock hardwood and pine types to maximize old growth characteristics.

AREA 22 CURRENT LAND COVER



RESOURCE MANAGEMENT PRESCRIPTIONS

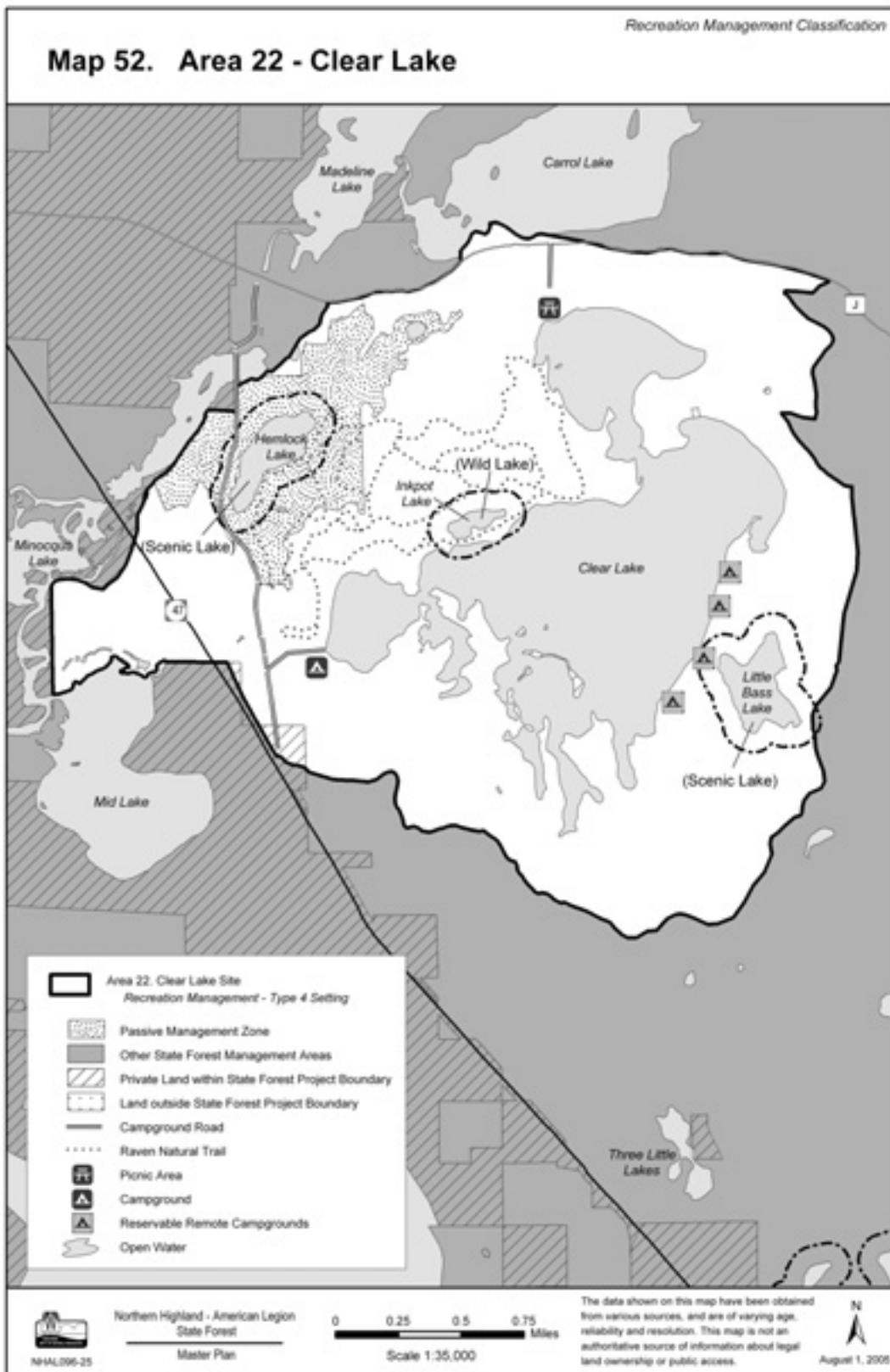
The General Timber Type Management Prescriptions and all of their associated management activities (described at the beginning of the Land Management Section) apply, except as limited by the prescriptions below:

- Use a variety of management techniques to maintain and enhance the hemlock hardwood and pine and to maximize their old growth characteristics and lands outside of the Passive Management Zone.
- Passively manage the passive management zone shown on map 52. Except that salvage may be done as necessary to clean trail corridors or to remove hazard trees along trails.
- Maintain open and forested wetlands largely through passive management.
- When harvesting in mixed forest stands retain most red and white pine and encourage pine regeneration at the expense of aspen, birch, and in some cases, red oak.
- On several suitable sites retain and maintain red oak as the dominant cover type. On these sites use mechanical scarification or understory planting with white pine to increase its presence where natural regeneration is inadequate. (These sites will be managed for a mixture of red oak and white pine, which are most suitable to these sites.)
- The extent, timing and frequency of any activity will generally be consistent with low use times of the year to minimize conflicts with most recreational users.
- Conduct forest management activities at times that will have the least visual, noise and access conflicts with recreational use. Adjust management practices to minimize negative visual impacts on recreational uses.

Recreation Management Classification

AREA
22

CLEAR LAKE



Recreation Management Classification**AREA
22****CLEAR LAKE**

Table 2.18 Area 22 - Clear Lake, Current and desired future conditions for community types in acres and percent of total.

Community type	Current		Predicted 50-year Condition*	
	Current Acres	Current % Cover	Acreage Objective	Future % Cover
Aspen	430	16%	400	15%
Forested Wetlands	60	2%	60	2%
Hemlock Hardwoods	122	5%	122	5%
Northern Hardwoods	634	24%	674	25%
Not Classified	147	6%	147	6%
Red and White pine	358	13%	462	17%
Red Oak	674	25%	600	23%
Unforested Wetlands	137	5%	137	5%
White Birch	97	4%	57	2%
TOTAL	2,659	100.00%	2,659	100.00%

Not Classified category contains 80 acres in campground and 67 acres in a utility Right of Way and picnic area.

** Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.*

RECREATION MANAGEMENT

Maintain the existing array of recreational facilities and expand or redevelop facilities within the area as described in the property-wide recreation management plan and consistent with the standards for a Type 4 Recreational Use Setting and modern campgrounds and dayuse areas in NR 44.07(7)(e)5b. Specific new developments or management actions include:

- Add 50 campsites at the Clear Lake campground
- Construct a modern 60 unit campground and a boat landing on the north-east shore of Carrol Lake.
- Convert the existing 19 site rustic Carrol Lake campground into a picnic area with beach access, swimming, and boat landing.
- Build a five mile hiking, backpacking and snowshoeing trail around Clear Lake.
- Close the Raven Trail to bicycles, maintain the trail for skiing/hiking.



Lakes Overlay Zone

WHAT IS A LAKE OVERLAY ZONE AND WHERE IS IT APPLIED?

Since the 1982 NHAL plan was developed the wild and wilderness lake qualifications have become more restrictive. Therefore, some lakes no longer qualify for their present designation and have been assigned new designation in the draft plan. Previously designated Wilderness or Wild Lakes have been evaluated for a scenic lake overlay designation based on the management area in which they are located. To avoid excess labeling and complicating management, those de-listed lakes that were located within native community areas did not receive a scenic lake overlay designation. This is because the management objectives of the native communities provided similar management goals as the scenic lake overlay zone. The de-listed lakes that were located outside of native community areas were given the designation of scenic lake overlay zones so that they land management surrounding the lakes would remain similar to their previous designation and management activities would not be obvious.

Wilderness Lake Overlay Zone: has a $\frac{1}{4}$ mile passive management zone. Within that management zone there is an undeveloped shoreline, except for primitive campsites. Public motor vehicle use for lake access and all recreational uses are not allowed. Motor vehicle use for management activities is allowed only to respond to significant health and safety emergencies or to accomplish restoration activities specified in the master plan. Limited primitive campsites may be present.

Wild Lake Overlay Zone: has a 400-foot passive management zone and human influence on the lake or its surrounding lands is not conspicuous. Wild Lake shorelines, within 400 feet, are essentially undeveloped, other than possibly primitive campsites and an access road, and no structural developments are visible from the water. While limited motor vehicle access to the lake shore may be present; all other motorized recreational vehicle use within the 400-foot Wild Lake Zone is prohibited. Motor vehicles may be used for management activities in response to significant health and safety emergencies or for restoration activities specified in the master plan.

Scenic Lake Overlay Zone: managed with protection of their scenic values as a high priority in conjunction with the underlying Area's land management objectives. The Scenic Lake Overlay Zone objectives are to protect, maintain and enhance for long-term public enjoyment. Due to significant or special public use of these areas, a primary concern is management for aesthetics, or retaining the unique qualities or outstanding scenic beauty.

The wild and wilderness lake locations are displayed on Special Lake Use Designations map.

Wild, Wilderness, and Scenic Lake Overlay zones are also indicated on individual area maps.

Lakes Overlay Zone**"WILDERNESS" LAKES**

Six NH-AL lakes, listed in the table below, are designated as Wilderness Lakes.

The Wilderness Lake shorelines are primarily forested, the forest composition varying with the site characteristics and the area's management history. Each lake has an undeveloped shoreline, with no structures, except primitive campsites, within $\frac{1}{4}$ mile. The lake and its shoreline within $\frac{1}{4}$ mile, or to the visual horizon if it is further, are passively managed. Public motor vehicle use for lake access and all recreational uses are not allowed. Motor vehicle use for management activities is allowed only to respond to significant health and safety emergencies or to accomplish restoration activities specified in the master plan. Limited primitive campsites may be present.

Wilderness Lakes are defined as Wild Resources Management Areas in NR 44.06(10). Wilderness lakes also have Type 1 Recreational Use Setting classification. That is defined in NR 44.07(4).

Wilderness Lakes Overlay Zone SUMMARY

- ▲ Six Wilderness Lakes
- ▲ Opportunity to maintain the lakes in an undeveloped condition and without significant signs of human influence for recreational, ecological, and habitat values.
- ▲ Conservation of wetland habitats for rare species.
- ▲ Within $\frac{1}{4}$ mile, passive forest management and no motor use.

Table 2.19 List of Designated Wilderness Lakes

Lake Name	County	Acres (water)
Brush Lake	Iron	33
Clear Lake	Oneida	62
Kelly Lake	Iron	32
Lake Alva	Vilas	23
Toy Lake	Vilas	70
Woodson Lake	Iron	27

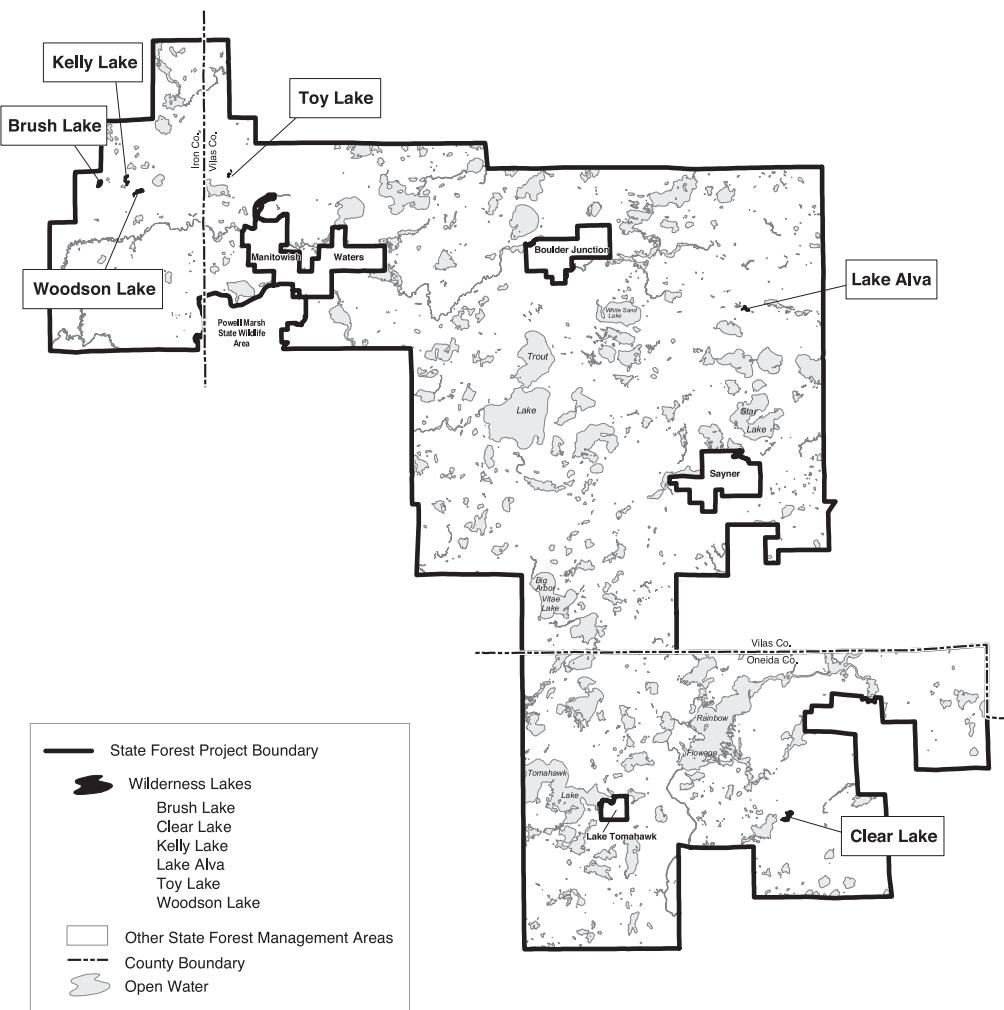
LONG AND SHORT-TERM OBJECTIVES (100 AND 50 YEAR)

- Maintain the lakes in an undeveloped condition and without significant signs of human influence for recreational, ecological, and habitat values.
- Provide for remote, quiet, non-motorized, low-impact recreation in a wild setting with limited, non-motorized access. Provide primitive canoe camping opportunities as appropriate.

MANAGEMENT PRESCRIPTIONS

- Permit natural processes to predominate: Passively manage the entire management area (a $\frac{1}{4}$ mile buffer around the lake), except to remove invasive species, for forest restoration (i.e. thin pine plantations to restore them to a more natural appearing condition), to restore roads to a natural condition, or maintain designated trails and primitive canoe campsites. Salvage activities following a natural disturbance are not allowed. Planting native species of trees is allowed for restoration or scenic enhancement purposes.
- Restrict all motor vehicle access within $\frac{1}{4}$ mile of the lake into the area, except to respond to health and safety or other emergencies, or to conduct authorized restoration activities.
- Actively suppress forest fires when they threaten areas outside of the management area using the minimum actions required. Restore any soil disturbed to its original topography.
- Maintain limited primitive to lightly developed trails for water access or hiking.
- On lakes where camping is appropriate, construct and maintain primitive campsites at locations that are out of sight and sound of other campsites to provide a high level of solitude. Place no picnic tables at these sites.
- Monitor insect and disease outbreaks when they occur and take action only when there is a threat to forests outside of the management area.

Map 53. Wilderness Lakes Management Zone



Northern Highland - American Legion
State Forest
Master Plan

0

3

6

9

Miles

Scale 1:400,000

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

July 6, 2005
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Lakes Overlay Zone**"WILD" LAKES**

Thirty-three lakes, listed in the table below, are designated as Wild Lakes.

On Wild Lakes human influence on the lake or its surrounding lands is not conspicuous. The shore-lands are primarily forested, the composition varying with the site characteristics and the area's management history. The lakes and their shore-lines, within 400 feet or to the visual horizon from the lake if that is further, are natural appearing without signs of management. The lakes are essentially undeveloped, other than possibly primitive campsites and an access road, and no structural developments are visible from the water.

While limited motor vehicle access to the lake shore may be present, all other motorized recreational vehicle use within the Wild Lake Management Zone is prohibited. Motor vehicles may be used for management activities in response to significant health and safety emergencies or for restoration activities specified in the master plan.

Wild Lakes are defined as Wild Resources Management Areas in NR 44.06(10). Wild lakes also have Type 2 Recreational Use Setting classification. That is defined in NR 44.07(5).

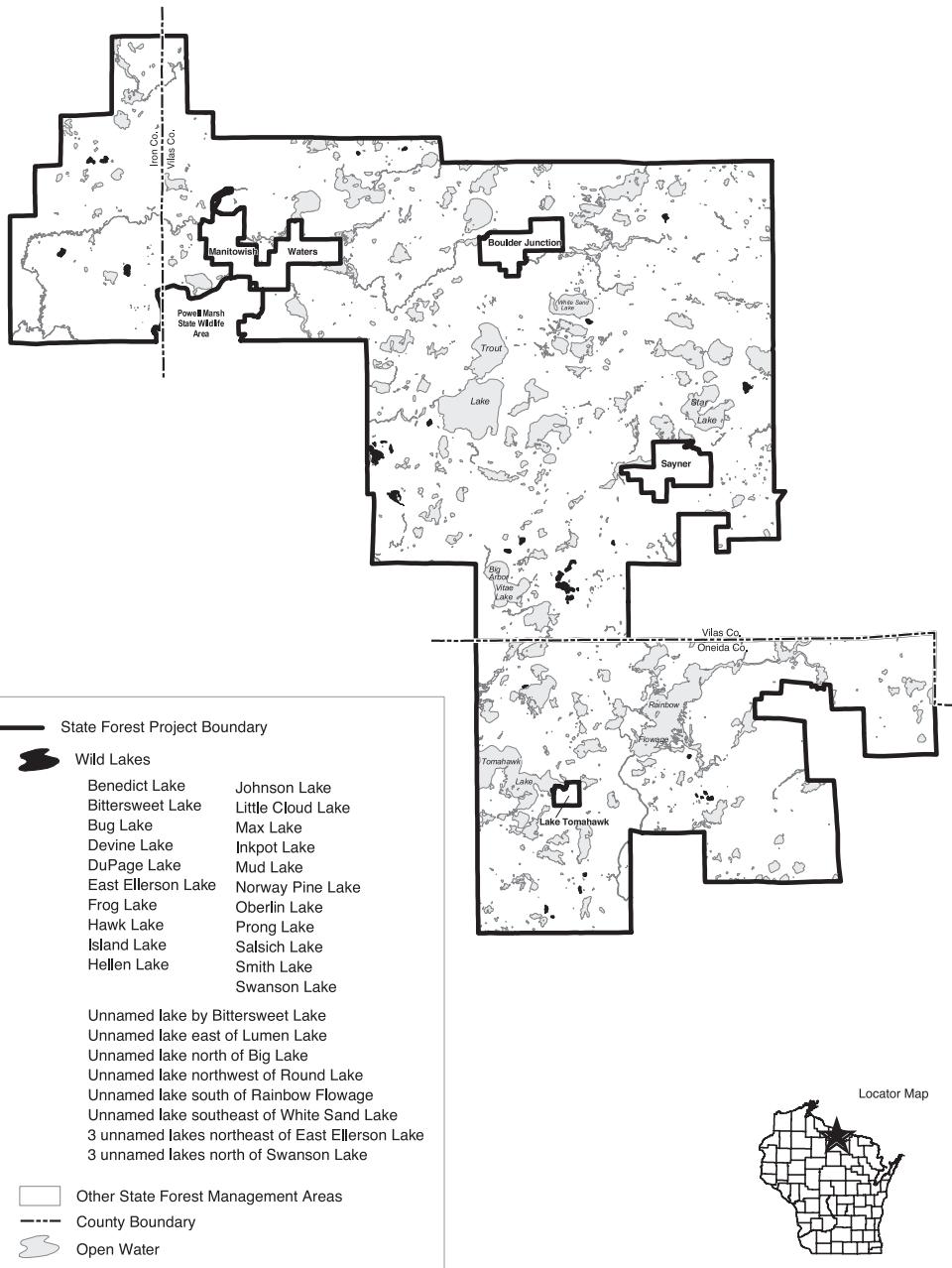
Wild Lakes Overlay Zone SUMMARY

- ▲ 33 Lakes
- ▲ Maintain the lakes in an undeveloped condition without conspicuous signs of human influence for quiet, low-impact recreation, and ecological and habitat values.
- ▲ Conservation of wetland habitats for rare species.
- ▲ Passive management within 400 feet of the lake, and only non-motorized use of the lake.

Table 2.20 - List of Designated Wild Lakes

Lake Name	County	Acres (water)
Benedict Lake	Vilas	26
Bittersweet Lake	Vilas	103
Bug Lake	Vilas	19
Devine Lake	Vilas	95
Du Page lake	Iron	32
East Ellerson Lake	Vilas	136
Frog Lake	Iron	42
Hawk Lake	Oneida	10
Helen Lake	Oneida	12
Inpot Lake	Oneida	14
Island Lake	Oneida	17
Johnson Lake	Vilas	24
Little Cloud Lake	Vilas	10
Max Lake	Vilas	24
Mud Lake	Iron	56
Norway Pine Lake	Iron	30
Oberlin Lake	Vilas	42
Prong Lake	Vilas	31
Salsich Lake	Vilas	48
Smith Lake	Vilas	41
Swanson Lake	Oneida	21
Unnamed lake east of Lumen lake	Oneida	7
Unnamed lake east of Bittersweet Lake	Vilas	5
Unnamed lake south of Rainbow Flowage	Oneida	13
Unnamed lake north of Big Lake	Vilas	10
Unnamed lake west of Round Lake	Vilas	15
Unnamed lake southeast of White Sand Lake	Vilas	20
3 small unnamed lakes around East Ellerson Lake	Vilas	19, 10, 8
3 small unnamed lakes west of Swanson Lake	Oneida	9, 5, 4

Map 54. Wild Lakes Management Zone



Northern Highland - American Legion
State Forest

Master Plan

0 3 6 9 Miles
Scale 1:400,000

The data shown on this map have been obtained from various sources, and are of varying age, reliability and resolution. This map is not an authoritative source of information about legal land ownership or public access.

July 6, 2005

Lakes Overlay Zone Wild**LONG AND SHORT-TERM OBJECTIVES
(100 AND 50 YEARS)**

- Maintain the lakes in an undeveloped condition without conspicuous signs of human influence for recreational, and ecological, and habitat values.
- Provide a primarily non-motorized recreational setting for low-impact activities such as boating, canoeing, or fishing and, where appropriate, primitive camping.

MANAGEMENT PRESCRIPTIONS

- Permit natural processes to predominate: Passively manage the entire management area (a 400 foot wide buffer around the lake shore). Exceptions are allowed for the removal of invasive species, for forest restoration (i.e. thin pine plantations to restore them to a more natural appearing condition), limited tree-drops for fish habitat restoration, to restore roads to a natural condition, or to maintain designated trails and primitive canoe campsites. Salvage activities following a natural disturbance are not allowed. Planting native species of trees is allowed for restoration or scenic enhancement purposes.
- Limited shoreline tree-drops may be used where needed to add coarse woody debris for restoration and enhancement of aquatic habitat. This shall be done in a manner that maintains a general natural appearance along the shoreline, as required for a Wild Resources Management Area and Type 2 Recreational Use Setting (NR 44.06(10)). Motorized watercraft or other motorized equipment may be used for this fishery habitat restoration and for associated monitoring of the fishery populations.
- On lakes where camping is appropriate, construct and maintain primitive campsites.
- Provide limited public water access ranging from carry in trails to simple road access as authorized in the lake access plan in this master plan. Locate vehicle parking in areas not visible from the lake.
- Restrict all motor vehicle use within 400 feet of the lake except for a designated lake access road.
- Motorized vehicles or watercraft are not allowed for routine management activities. They may be used only when responding to health and safety or other emergencies, or to conduct restoration activities authorized by this plan.
- Primitive to lightly developed trails for non-motorized uses may be located within the Wild Lake Zone
- Actively suppress forest fires that threaten areas outside of the management area using the minimum actions required. Restore any soil disturbed to its original topography.
- Monitor insect and disease outbreaks when they occur and take action only when there is a strong threat to forests outside of the management area.



Lakes Overlay Zone**"SCENIC LAKES"**

Due to a statewide policy change that tightened the criteria for allowable uses on designated wilderness and wild lakes, several NH-AL lakes that were designated under the 1982 plan no longer qualify for designation without changing their long established pattern of use. Under the revised forest plan they will be assigned a classification that fits their current conditions; thus, allowing all of the present uses and similar management objectives to continue.

Sixteen of these lakes fall within Native Community Management Areas that will have limited or no forest management in order to protect the natural scenic values of the lake shore.

To continue the high level of shoreline protection, the shoreline of the remaining 29 lakes will be classified as scenic lake zones. A 400 foot scenic management zone, similar to the wild lake management zone, will surround each lake. Many of these lakes also have motorized watercraft use restrictions, which are listed in the Recreation Management Section of this plan.

**LONG AND SHORT-TERM OBJECTIVES
(100 AND 50 YEARS)**

- Maintain and enhance the natural appearing and generally undeveloped landscape of each lake.
- Maintain the existing level and type of public access and use of the lake and adjacent shoreline.

**RESOURCE MANAGEMENT
PRESCRIPTIONS**

- Manage the forest within the scenic management zone (that area within 400 feet of the lake shore) to favor a mixed composition of species with emphasis on larger, longer-lived trees. Scenic lake zones that overlay passively managed areas shall be passively managed as well. Maintain an abundant amount of snags and coarse woody debris. Retain all white cedar. Underplant with red or white pine if necessary to speed the conversion to longer-lived species.
- Locate and design development to be harmonious with the landscape and with Type 3 Recreational Use Setting standards (NR 44.07(6)).
- Maintain or improve the road access and boat landings to minimize visual effects from the water. Maintain existing primitive canoe campsites. The development of new primitive campsites is authorized.
- All types of trails, motorized and non-motorized, are allowed within the Scenic Lake Management Zone.

Scenic Lakes Overlay Zone SUMMARY

- ▲ 29 lakes
- ▲ This area is approximately 2,587 land acres with 1,296 acres in state ownership.
- ▲ To protect, maintain and enhance for long-term public enjoyment lands or waters having unique aesthetic qualities or outstanding scenic beauty and lands for managing for aesthetics is a primary concern due to significant or special public use of the area.

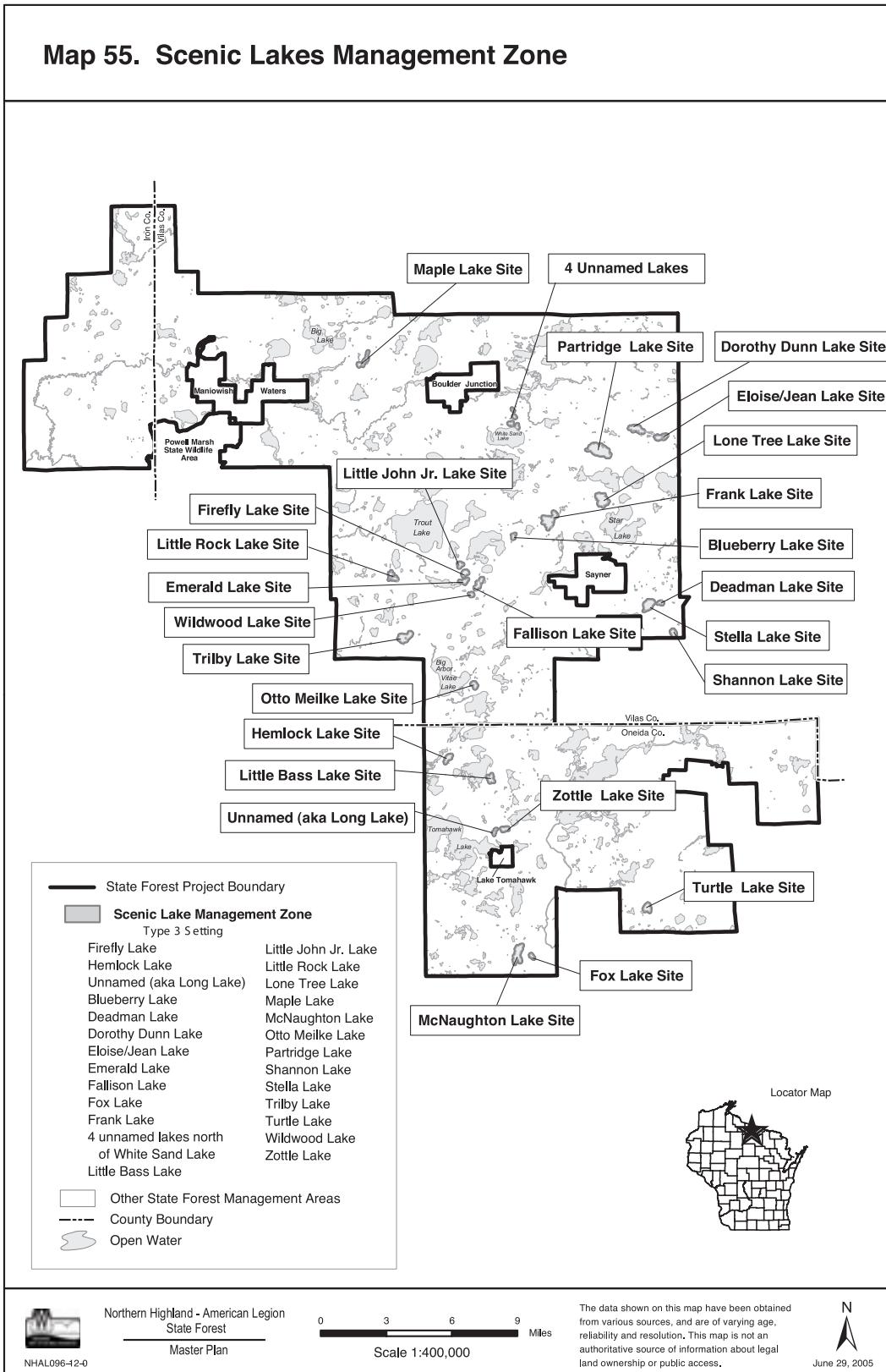
Figure 2.21 - List of Scenic Lakes

Lake Name	
Blueberry Lake	Little Rock Lake
Deadman Lake	Lone Tree Lake
Dorothy Dunn Lake	Maple Lake
Eloise Lake	McNaughton Lake
Emerald Lake	Otto Meilke Lake
Fallison Lake	Partridge Lake
Firefly Lake	Shannon Lake
Frank Lake	Trilby Lake
Fox Lake	Turtle Lake
Hemlock Lake	Wildwood Lake
Jean Lake	Zottle Lake
Little Bass Lake	4 Un-named lakes north of White Sand lake
Little John Jr. Lake	Un-named (aka Long Lake)

- Generally, leave natural disturbances to naturally regenerate. Consider salvage when the visual qualities along the lake shore can be enhanced and erosion potential can be mitigated. Plant following salvage if the desired natural regeneration would not occur.
- When harvesting timber or performing other management activities within this zone, modify the standard prescriptions to minimize the visibility of management activities as viewed from the water and access roads. Clearcutting is not authorized, except as necessary for salvage operations.
- The use of motorized vehicles, watercraft, or other equipment for management activities is not limited.
- Other management activities that may be conducted include; herbicide application, burning, installation of fish habitat improvement devices- including tree-drops along the shoreline, trail or road construction, erosion control, and removal of hazard trees in public use areas.

Scenic Lakes Overlay Zone

Map 55. Scenic Lakes Management Zone



NON-DESIGNATED LAKES AND STREAMS

Lakes and streams are likely the NH-AL's number one recreational attraction. Most are highly scenic and generally undeveloped or are lightly developed shorelines. All shorelines are designated Class A Scenic Management Zones. Therefore, all management activities along the shorelines will follow guidelines of the Silviculture and Forest Aesthetics Handbook (WDNR 1995).

MANAGEMENT OBJECTIVE

Aesthetic management considerations predominate along all lake and stream shorelines. Develop and maintain the environment on the state-managed shorelands to the greatest scenic potential for public enjoyment.

RESOURCE MANAGEMENT PRESCRIPTIONS

- Manage the forest along shorelines to favor a mixed composition of species with emphasis on longer-lived trees. Consider salvage when the visual qualities along the lake shore can be enhanced and erosion potential can be mitigated. Plant following salvage if the desired natural regeneration would not occur.
- When harvesting timber or performing other management activities near shorelines modify the standard prescriptions to minimize to the degree practicable the visibility of management activities. Clearcutting is not authorized, except as necessary for salvage operations.

Other management activities that may be done when needed include: the development and maintenance of authorized facilities, herbicide application, burning, installation of fish habitat improvement devices- including tree-drops along the shoreline, trail and road construction, erosion control, hazard trees removal in public use areas, and the removal of trees to maintain or create scenic vistas.



Wildlife Management

WILDLIFE MANAGEMENT

The NH-AL State Forest supports a great diversity of wildlife species, including all game, furbearer, and bird species common to Northern Wisconsin and Wisconsin's highest population of breeding bald eagles, osprey, common loons, and river otter. The wildlife species list includes approximately 150 types of birds, 50 mammals, 18 amphibians and 13 reptiles. The NH-AL's diverse mixed conifer and hardwood forests also has one of North America's richest diversity of breeding songbirds. Birds associated with Canada's boreal forest, such as the evening grosbeak, pine siskin, gray jay, and palm warbler, are well represented. A wide variety of birds migrate through the NH-AL as well. The numerous lakes, the Rainbow Flowage, the Wisconsin River, and the adjacent Powell Marsh Wildlife Area provide important migratory bird habitat.

Endangered and threatened species (listed species) on the NH-AL include the following terrestrial vertebrates: timber wolf, osprey, bald eagle, trumpeter swan, wood turtle, yellow rail, and spruce grouse. The NH-AL contains 67 special concern animals including various mammals, reptiles, amphibians, insects, fish, and mussels. Terrestrial vertebrates of special concern include the northern goshawk, merlin, four-toed salamander, bullfrog, northern myotis bat, black tern, common merganser, Connecticut warbler, and boreal chickadee.

WILDLIFE HABITAT MANAGEMENT

The wildlife management program on the NH-AL focuses on maintaining and enhancing habitat and assessing the population status of the important game, non-game, and listed species. The abundant wildlife on the NH-AL requires diverse forest habitats in all the various successional stages from very young through old growth. Diverse and healthy wildlife populations will be maintained by managing the composition and structure of forest habitats integrated with the management objectives and activities outlined for each land management area in the Land Management Section of this plan. Wildlife habitat values are further assured by the wildlife biologists working with foresters on timber sales in order to maximize tree species diversity and improve vegetative structure, consistent with the management objectives for the area.

This wildlife management plan has been integrated into the management prescriptions for the individual management areas.

Forested Habitats

- Approximately 25 to 30 percent of the NH-AL will be managed in forests dominated by aspen and white birch through clearcut and shelterwood harvests. There will be a diversity of different age classes by harvesting some aspen stands before economic rotation and some aspen stands beyond economic rotation. While aspen-birch forests are dominated by aspen, they also contain a mixture of various pines, oaks, maples, and white birch.
- Approximately 7 percent of the NH-AL will be managed in forests dominated by red oak. Red oak stands will be grown to biological maturity (age 90 to 150 years) and regenerated through the shelterwood system. In all types of forest stands, when red oak is present, full-crowned red oak will be maintained as a canopy tree at the rate of 5 to 10 trees per acre across all sites and stands, consistent with the management objectives of the area.
- Approximately 1.5% of the NH-AL will be managed in hemlock-yellow birch forests. Most hemlock-dominated stands will be reserved from harvest during this planning period. Some hemlock stands will receive treatment to encourage hemlock regeneration. Individual trees and groves of eastern hemlock and yellow birch will be maintained during forest management activities. Most white cedar forests will be reserved from active management.
- The white pine community will slowly increase throughout the NH-AL. Individual trees will be grown to biological maturity. Stands of white and red pine will be thinned from below and grown to biological maturity. Active forest management will allow the slow expansion of white pine throughout the NH-AL. Disease problems may require all large red pine to be removed from new plantation areas.
- Approximately 3 to 4% of the NH-AL will be maintained in jack pine and scrub oak forests. Jack pine forests will be managed through a combination of natural regeneration and plantations. Scrub oak forests will be managed with clearcut harvests with scattered reserve oaks and pines.
- Approximately 1% of the NH-AL will be maintained in grassy openings. Forest openings and bracken grassland communities occur in areas of the NH-AL managed for aspen, white birch, oak, and jack pine. Most openings are about one acre in size but some, such as the Johnson Lake bracken grassland, are larger. There are currently about 500 relict openings such as frost pockets and old home sites as well as 300 constructed openings. Maintain the openings by mechanical mowing, hand cutting, and prescribed fire. No herbicides will be used and no new openings will be constructed.

Wildlife Management

- Long-lived trees such as red oak, white pine, and red pine will be maintained in clearcuts as long as their biological maturity allows. Trees will be harvested if they will not survive until the next stand entry. Small clumps of aspen-birch may be reserved in clearcuts for ruffed grouse budding and cavity trees. A ring of aspen trees may be reserved around grassy openings. Aspen and white birch trees may be reserved along wetland edges to act as ruffed grouse budding trees and as cavity trees.
- Vegetative height diversity will be developed in areas managed by selective harvests. Most northern hardwood stands will be managed to promote an all-aged structure including shrubs, saplings, mid-canopy trees, canopy trees, and super canopy trees.
- Large, full-crowned trees with dens and cavities as well as dead trees (snags) will be maintained on appropriate sites in all management areas. These trees will be maintained unless they are unsafe, cause aesthetic concerns, or increase insect pests. Forest stands subject to large-scale death from disease, insects, or fire will be salvaged.
- Selected areas and stands will be managed for old growth forest characteristics through active and passive management. Old growth management examples include various hemlock-yellow birch, northern hardwood, and red oak-pine forests. Old growth characteristics that provide important wildlife habitat include abundant coarse woody debris; large, old trees; abundant large snags, cavity trees, and den trees; tall, supercanopy trees; and various sized canopy gaps with dense young trees.

Non-forested Wetlands

All non-forested wetlands, including various poor fens, northern sedge meadows, shrub-carr, boreal rich fen, and open bogs will be protected. These wetlands provide habitat for a wide variety of wetland wildlife including species of special concern. Protective management prescriptions for non-forested wetlands are outlined in the Land Management Section of this plan.

Ruffed Grouse Management Areas

Two special ruffed grouse demonstration areas will be managed through timber harvests to demonstrate the value of aspen and forest management in ruffed grouse conservation. The Sherman Lake and Stone Lake Areas will be managed

using normal forest management practices but with various sizes of scattered timber harvests. The Stone Lake Area will continue to have the ruffed grouse population monitored each spring through intensive drumming surveys. Please refer to Area 7 in the Land Management section of this chapter.

Wildlife Flowages

Five small flowages on the NH-AL, Mann Creek, Stevenson Creek, Ristow, Little Bear Creek, and Brandt Lake, are managed for wildlife habitat. They will continue to be maintained and managed for that purpose. No new flowage construction is planned.

Aquatic Habitats

- Wild rice beds occur in 19 streams, flowages, and lakes on the NH-AL. Wild rice is significant in Native American culture and is an important wildlife habitat. Wild rice beds will receive an annual inventory and be managed for wild rice production.
- Undeveloped lake and stream shoreline is important wildlife habitat. All undeveloped lake and stream shoreline will be managed to protect water quality, maintain wildlife and fisheries habitat, and enhance aesthetics. Shoreline management will include vegetative zones. They will be maintained by following Best Management Practices for Water Quality when performing all forest management activities.
- Ephemeral ponds and permanent small ponds provide important breeding sites for amphibians and waterfowl. These sites will be protected through vegetative management adapted to minimize impacts and by following Best Management Practices for Water Quality.

Endangered, Threatened, and Species of Special Concern

- Individuals of all endangered, threatened, and special concern wildlife species will be protected.
- All known critical breeding habitat for these species will be protected or maintained through management. Examples of critical habitat includes sites used for breeding and foraging such as bald eagle, osprey, and great blue heron nest sites, wood turtle nest sites, wolf den and rendezvous sites, northern goshawk nest territories, and trumpeter swan and common loon nest sites. The Natural Heritage Inventory (NHI) will be checked prior to all timber sales, ground breaking projects, recreational and trail development.

Wildlife Management

Integrated Management

Most of the forest habitat work on the NH-AL occurs through the timber sale program. Activities associated with timber sales directly impact wildlife habitat. Wildlife biologists review all timber sales and provide recommendations to maintain and improve wildlife habitat.

WILDLIFE POPULATION MONITORING

Populations of important game species will be monitored through annual surveys at the local or region level. Species surveyed include white-tailed deer, black bear, ruffed grouse, woodcock, river otter, and mammalian predators. Beaver are surveyed once every three years. Waterfowl are surveyed through the annual statewide waterfowl breeding survey.

Populations of important endangered, threatened, and species of special concern will be monitored through annual surveys. Species surveyed include bald eagle, osprey, trumpeter swan, Great blue heron, northern goshawk, and timber wolf. Common loons are surveyed every five years through

Northland College's Sigurd Olson Institute. Two frog and toad survey routes are located in the NH-AL.

Rare and uncommon wildlife such as badger, moose, spruce grouse, Great gray owl, black tern, and merlins are monitored through reports from staff and citizens. The reports are organized in the Bureau of Endangered Resources' Natural Heritage Inventory.

WILDLIFE POPULATION MANAGEMENT

Game species are managed through hunting and trapping seasons. Each game species has a population goal set for a certain local or regional area. Hunting and trapping regulations and population goals are not set through the Master Planning process. Game populations are managed through regulations and goals set by the Natural Resources Board and the Voigt Intertribal Task Force. The public is involved in all stages of this review and implementation process.

WILDLIFE RESEARCH

DNR, tribal and university-sponsored wildlife research occurs on the NH-AL. Current research projects include work on common loons, bald eagles, osprey, ruffed grouse, northern goshawks, old growth, and golden-winged warblers. New research projects may be undertaken if they do not conflict with this master plan.

FINANCIAL AND WORKFORCE CONSTRAINTS

All of the above activities will ultimately be limited by financial and workforce constraints. Currently, a wildlife biologist or an endangered resource specialist are not assigned to the NH-AL staff. Wildlife management work is funded through the Wildlife Management and Endangered Resources Programs. The wildlife biologists stationed at Woodruff and Rhinelander and a wildlife technician at Rhinelander spend part of their time working on the NH-AL.



Fisheries Management



FISHERIES MANAGEMENT

The uniquely abundant water resources in the NH-AL State Forest provide for a wide range of fish communities. This resource attracts a diverse group of anglers that play a major role in how these waters are managed. Native American treaty harvest rights also play a role. Management goals and activities for these waters vary by the type of water and angling potential. The waters in the forest can be divided into four major types: Cool Water Lakes, Warm Water Lakes, Cool Water Streams, Cold Water Streams. The management for each type is described individually below.

COOL WATER LAKES

Cool water lakes comprise the major water resource within the forest. These lakes are typically infertile, greater than 200 acres, have clear or slightly stained water and have a maximum depth of more than 30 feet. The typical gamefish are walleye, muskellunge, northern pike, smallmouth bass, yellow perch and black crappie. Other species of interest include cisco, redhorse, and white sucker. The unique lake trout and whitefish fishery of Trout Lake also falls into this group. Other examples of NH-AL lakes in this classification are: Papoose Lake (Vilas Co.), White Sand Lake (Vilas Co.), Plum Lake (Vilas Co.), and Lake Tomahawk (Oneida Co.).

Management Objectives

- Provide a quality harvest as well as trophy opportunities.
- Rehabilitate historic lake trout populations to provide increased future lake trout fishing opportunities.
- Stock muskellunge and walleye on waters suited to these species but have recruitment problems. (The vast majority of the cool water lakes have adequate natural reproduction of the major game species.)
- Maintain brook and/or brown trout fishing opportunities on several small cool water lakes.
- Regularly assess the health of these waters and their fishery

Management Activities

- Continue to conduct creel, electrofishing, and netting surveys to statewide monitoring guidelines. Make the results available to the public.
- Set fishing regulations to provide a quality harvest as well as trophy opportunities. Evaluate the regulations to ensure the desired response is occurring in the fishery.
- Stock the Trout Lake strain of lake trout into suitable lakes on the forest.
- Stock muskellunge and walleye on suitable waters that have recruitment problems.
- Stock selected small cool water lakes for a put, grow and take brook and/or brown trout fishery.

WARM WATER LAKES

There are numerous warm water lakes in the forest. These lakes are typically moderately fertile, less than 200 acres, and have a maximum depth of less than 30 feet. The fishery in most of these waters consists of bass and panfish, but some waters also have significant northern pike populations. These waters have simple fish communities compared to larger lakes in the area. They have fewer habitat types, thus fewer fish species. Most of these fisheries can not sustain high levels of harvest due to their small size and limited fertility. Lakes that fit this classification include: North Bass Lake (Iron Co.), Stella Lake (Vilas Co.), Partridge Lake (Vilas Co.), Bittersweet Lake (Vilas Co.), and Miller Lake (Oneida Co.).

Management Objectives

- Provide a quality harvest as well as trophy opportunities.
- Provide more catch and release fishing opportunities.
- As few of these waters have naturally reproducing walleye or muskellunge, use stocking to provide panfish control and additional angling opportunities.
- Regularly assess the health of these waters and their fishery

Management Activities

- Continue to conduct creel, electrofishing, and netting surveys to statewide monitoring guidelines. Make the results available to the public.
- Set fishing regulations to provide a quality harvest as well as trophy opportunities. Evaluate the regulations to ensure the desired response is occurring in the fishery.
- Stock muskellunge and walleye where needed to provide panfish control and angling opportunities.
- Evaluate and recommend some of the smaller warm water lakes for catch and release fishing regulation.

COLD WATER STREAMS

Of all the waters in the forest the cold water streams are the most limited. These waters have summer water temperatures that do not get above 70 degrees and have moderate flows. The fisheries present in most of these waters consist of brook and/or brown trout. The major waters in the forest that fit this designation are: Plum Creek (Vilas Co.), Stevenson Creek (Vilas Co.), and Mishonagon Creek (Vilas Co.).

Management Objectives

- Maintain and enhance a self-sustaining trout fishery. Improve the food supply, provide cover, and improve spawning substrates.
- Provide a quality harvest as well as trophy opportunities.
- Regularly assess the health of these waters and their fishery.

Management Activities

- Continue to conduct creel, electrofishing, and netting surveys to statewide monitoring guidelines. Make the results available to the public.

Fisheries Management

- The waters in this group have adequate natural reproduction of the major game species and are not stocked. Plum creek is currently the only exception, continue stocking brown trout.
- Maintain existing trout habitat structures, and perform new traditional in-stream trout habitat improvements as staff and money allow.
- Set fishing regulations to provide a quality harvest as well as trophy opportunities. Evaluate the regulations to ensure the desired response is occurring in the fishery.
- Conduct beaver control as necessary (limit dams that slow water flow and increase water temperatures).

COOL WATER STREAMS

There are cool water streams scattered throughout the forest. Most of these waters have their origin at the outlets of lakes and many connect two lakes. Due to a lack of significant ground water input these waters have summer water temperatures that regularly get above 70 degrees. These waters have moderate to low flows and are usually fertile. The fisheries present in most of these waters are typically the same as the lakes they are connected to. Due to their high summer water temperatures they do not have trout. Little, if any, habitat work is conducted on these waters, and none are currently stocked. These streams have adequate natural in-stream reproduction or are adequately stocked by fish from the lakes they are connected to. The basic statewide fishing regulations currently apply on all these streams, and there currently are no plans to modify them. Representative waters in the forest that fit this classification are: Manitowish River (Vilas and Iron Co.), Trout River (Vilas Co.), and the Wisconsin River (Vilas and Oneida Co.).

Management Objectives

- Regularly assess the health of these waters and their fishery.
- Rehabilitate the sturgeon fishery of the Manitowish River system.

Management Activities

- Continue to conduct creel, electrofishing, and netting surveys to statewide monitoring guidelines. Make the results available to the public.
- Maintain the existing spring fish refuges.
- As may be necessary to rehabilitate the Manitowish River system's sturgeon fishery:
- Use stocking and spawning habitat improvement
- Recommend modifications to the seasonal discharges of water at the Rest Lake dam.
- Recommend closure of the Manitowish River to sturgeon fishing.

GENERAL HABITAT MAINTENANCE AND IMPROVEMENT

Losses of habitat and shoreline/bank development are common issues on all these waters. Management activities

that enhance habitat (such as tree drops, half logs and bank structures) may be applied on waters, consistent with the site's land use classification, where they would provide a meaningful return to the fishery. Additionally, riparian shoreline and stream bank activities have a tremendous effect on the health of our fisheries. Buffer strips and shoreline restoration on all waters in the forest will be promoted.

MANAGEMENT PRIORITIES

All of the above activities will ultimately be limited by financial and workforce constraints. Attempts will be made to maximize efforts to manage these fisheries for the health of the resource first and secondly for public opportunity.

FISHING REGULATIONS

Controlling fish harvest through the use of lake and stream specific fishing regulations is the most effective tool in managing the fisheries on our waters. A variety of fishing regulations cover the waters in the NH-AL state forest. The types of fishing regulations that are currently in use include closed seasons, bag limits, and length restrictions. These regulations are not set through the master planning process, but through an annual rule making process that involves the local fisheries biologist or warden, conservation congress, DNR secretary, natural resources board, legislature, and the governor. The public is involved at all the stages in this process.

RESEARCH ACTIVITIES

The large numbers of waters in this area provide unique fisheries research opportunities. State and university sponsored studies that have meaningful management applications should be encouraged. These types of studies can provide insight into fisheries issues that will benefit waters well beyond the boundaries of the state forest.

All the waters in the forest boundary have management research value. Issues that are of significant management concern are always changing and any of these waters may meet the requirements of important future studies. Research activities will be carried out in locations and using methods that are consistent with the management classifications and management objectives in this property plan. Waters that currently have major ongoing fisheries studies include: Escanaba Lake (Vilas Co.), Pallette Lake (Vilas Co.), Nebish Lake (Vilas Co.), Mystery Lake (Vilas Co.), Spruce Lake (Vilas Co.), Little Rock Lake (Vilas Co.), Camp Lake (Vilas Co.), Bittersweet Lake (Vilas Co.), Smith Lake (Vilas Co.), Oberlin Lake (Vilas Co.), Prong Lake (Vilas Co.), Lake Trout Lake (Vilas Co.), and Sparkling Lake (Vilas Co.). All management activities should be considered the long and short term impacts to these research lakes.

Recreation Management



RECREATION MANAGEMENT

Recreation on the NH-AL is important to many people, and it provides an important supporting role in the regional tourism economy. Visitors have been coming to the NH-AL for generations, and those who vacation or live near the forest know the beauty of its lakes and streams, diversity of trails and campgrounds, and extent of its forests.

Annual visitation to the NH-AL is now over two million visits per year. According to staff estimates, most recreational activities on the NH/AL have increased steadily since the mid-1990's. Hiking and canoeing have seen dramatic increases. Boulder Junction's paved bike trail has become immensely popular. Camping has increased fairly steadily. The most popular campgrounds on the forest, especially those offering more modern amenities like showers and flush toilets, can not meet the demand throughout most of the camping season. At the other end of the scale, primitive camping at remote canoe or hike-in sites, which is a rather unique offering at the NH-AL, is also seeing high demand. Hunting, fishing, and boating are experiencing slow but steady increases. Participation in winter sports has fluctuated with snow conditions, but use levels remain steady when conditions are good. Interpretation and educational programs are highly popular and demand is rising. While the NH-AL currently does not have ATV riding opportunities, there has been a dramatic increase in ATV ownership and demand for riding opportunities statewide and in the NH-AL area.

This plan maintains nearly all of the existing recreational facilities and opportunities. It also provides for a number of facility expansions or new additions to help meet growing demands.

RECREATION MANAGEMENT

Recreational use on the NH-AL is highly diverse, occurring across a wide spectrum of settings, ranging from well-developed, intensively used complexes to remote hiking, canoeing and primitive camping. The NH-AL's recreation program integrates public use into all ecological settings and management areas consistent with the area's capability the plan's land management objectives. In some management areas, such as the Forest Production Areas and Native Community Management Areas, recreational use is accommodated as an important but secondary objective. In these areas, trails or dispersed primitive camping as well as traditional hunting, fishing, boating are the predominant recreational uses. In other areas of the forest managing for recreation or to provide a specific type of recreational setting is the primary objective. These areas are classified as either as a Recreation Management Area, Scenic Management Area, or Wild Resources Management Area.

This section summarizes the NH-AL's property-wide recreation management program. It covers both the existing recreational uses, facilities and policies that will be retained under the revised plan and the new changes, primarily facility expansions planned for the future. Additional site-specific management prescriptions for recreation facilities within the Recreation Area, Scenic Area, and Wild Resources Area are included in the Land Management Section.

The primary additions include several expanded campgrounds, more canoe and primitive/remote campsites, more hiking and bike trails, and expanded interpretation/education programs and facilities. The major interpretation/education expansion being a new forestry awareness and education center. Most of the existing and proposed recreational facilities are shown on the Existing and Proposed Recreation map and the Boat Landings and Canoe Routes map.

WHAT'S THE DIFFERENCE BETWEEN...

Modern campgrounds:

Typically include more than 75 campsites, flush toilets, showers.

Rustic campgrounds:

Fewer than 75 campsites, pit toilets and hand pump water (no flush toilets or showers)

Primitive camping:

Single, remote campsites, usually walk-in or canoe-in. three types of camping fall within this category: reservable-remote, canoe, and backpack camping.

[refer to NR 44.07(7)(e) for additional information]

RECREATION MANAGEMENT OBJECTIVES

- Provide varied and high quality recreational opportunities through well-designed and maintained facilities in a highly attractive outdoor environment.
- In harmony with the Forest's land management program, maintain the general level and variety of recreational uses

Recreation Management

and experiences the NH-AL has offered in the past, and expand opportunities for camping, hiking and snowshoeing, backpacking, biking, and interpretation/education. In addition, provide new the opportunity for future ATV riding.

- Maintain abundant opportunities for hunting, boating, fishing, trapping, hiking, nature study, and remote, non-motorized recreation.

CAMPING

The NH-AL provides a variety of modern, rustic, and primitive camping opportunities. Currently there are 18 family campgrounds offering approximately 900 campsites, plus two outdoor group campgrounds that accommodate up to 100 people. Compared to state parks, most of the NH-AL's campgrounds are small. Just over one third of the NH-AL's campsites (352 sites in four campgrounds) are served by showers and flush toilets, but do not have electric hook-ups. The remaining campgrounds are rustic with only the basic amenities, such as hand-pumps for water and pit toilets. Five campgrounds offer special facilities, including sites with electricity, for disabled campers. In addition to the campgrounds, for people wanting less social, more primitive camping, there are 131 remote canoe and reservable-remote (i.e. wilderness) campsites are scattered across the NH-AL. The NH-AL also offers backpack camping along specific trails by permit, and hunter camping is also available during the traditional November deer gun season.

The future camping expansions are based on camping demand projections. The completion of these expansions will depend on continued demand and available funding. The proposed campground expansions would occur primarily in developed areas of the NH-AL to avoid adversely impacting new areas. Other considerations used when determining the best location for campground expansions were lake size and level of use of as well as the availability of suitable land for expansion.

In addition to adding new campsites, all or portions of some campgrounds may be renovated. To address safety or site suitability concerns, at the discretion of the Forest Superintendent, campsites may be closed and relocated to another part of the campground. Also, the density of campsites (i.e. separation distance between sites) in some campgrounds is substantially out of compliance with newer requirements of NR 44.07(7)(e). It requires 100 –200 feet between sites for rustic campgrounds and approximately 100 feet for modern campgrounds. The purpose of this wider campsite spacing is to enhance privacy and minimize conflicts between camping groups. Over time, some campsites will be closed and relocated to reduce campsite density and bring the campgrounds more closely into alignment with the intent of the code.

Modern Family Campgrounds

As of 2004 the NH-AL has four modern campgrounds, Crystal Lake, Big Musky, Firefly, and Clear Lake, with a total of 352 sites. They are shown on Map 62, Current Recreation. Modern campgrounds on the forest typically have paved roadways, flush toilets, and showers, but not electrical hook-ups. Generators are allowed by permit during certain hours of the day. The existing campgrounds will be maintained and 160 new campsites will be added. Sixty of these will be at a new campground on Carrol Lake. The expansions will bring the NH-AL's number of modern campsites up to 512. Table 2.22 below shows the changes by campground.

The new campground at Carrol Lake will be constructed at a new site on the north east side of the lake. (When it is built the rustic 19 site campground on the east side of Carrol Lake will be converted to a day-use area.) Facilities at the new Carrol Lake campground will include a shower building, flush toilets, pressurized drinking water, and a boat landing and swim area.

More than one ADA group cabin may be constructed at the modern campgrounds. A feasibility study may be completed to find a suitable site at the desired campground.

For additional site details for these campgrounds see the Crystal Lake Recreation Management Area and the Clear Lake Recreation Management Area write-ups in the Land Management Section.

Rustic Family Campgrounds

Many people have come to associate traditional rustic style campgrounds with the NH-AL. Of special attraction is their small, more quiet nature. Typically, these campgrounds range from about 20 to 70 campsites, usually having a wider spacing than modern campgrounds. They have only minimal facilities - hand-pumped water, pit toilets, and no electricity. Many campers feel offering this traditional style of camping is a special niche for the state forests, and there is a strong demand to maintain or expand this opportunity on the NH-AL.

Table 2.22 - Modern Family Campgrounds

Modern Family Campgrounds:	Existing Sites	Proposed additions	Future Total Sites
Big Muskellunge Lake	81	0	81
Carrol Lake (new location)	0	+60	60
Clear Lake	101	+50	151
Crystal Lake	100	0	100
Firefly Lake	70	+50	120
Total	352	+160	512

Recreation Management

As of 2004, the NH-AL has 14 rustic campgrounds totaling 518 campsites. See Current Recreation map in the index. By permit, generators will be allowed to operate during specific hours. All existing rustic campgrounds will be maintained under the plan, except for the 19 site Carroll Lake campground. (It will remain until the new modern campground is built on the other side of the lake. Then the site will be converted to a day-use area). Expansions will also occur in five campgrounds, adding a total of 66 additional rustic sites. Table 2.23 shows a full listing of the forest's rustic campgrounds and the specific, proposed changes.

Group Campgrounds

As of 2004 there are 2 group campgrounds on the NH-AL, there is space for up to 50 campers at each location. These campgrounds, at Jag Lake and North Muskellunge Lake, are equipped with pit toilets and hand-pumped water. Group campgrounds provide an important camping opportunity for large groups such as boy/girl scouts or church groups to have a rustic camping experience while not affecting other campers. These two campgrounds will be maintained and an additional 50 person capacity group campground with similar amenities will be constructed at Buffalo Lake.

Primitive Camping

The NH-AL currently offers four types of primitive camping - canoe camping, reservable-remote camping (i.e. wilderness camping), and backpack camping. The current locations of existing designated primitive campsites are shown on Map 62 Current Recreation. Permits are also offered for deer camps during the traditional November deer gun season. Primitive

campsites generally are widely dispersed and have a minimal clearing and a primitive soil surface. Primitive campsites are limited to a tent clearing, fire ring, box latrine, and a picnic table (except in a Type 1 recreational use setting where tables are prohibited). Each type of primitive camping is discussed below.

The State Forest Superintendent has the authority to close and relocate primitive campsites as needed.

Canoe Camping

There are currently 74 primitive remote canoe campsites located on more than 20 lakes across the NH-AL's lakes and rivers. These sites are accessible only by water, stays are limited to one night and they can not be reserved. Ten new canoe campsites will be developed at sites to be designated by the Forest Superintendent.

Reservable-remote camping

The NH-AL has 12 reservable-remote primitive campsites. They are on Allequash, Day, Nebish and Clear Lakes, and they are accessible only by water. These sites may be occupied up to 14 days per visit. Five new additional sites will be added. They are on Bittersweet, Prong, and Oberlin Lakes. (See the Bittersweet Recreation Management Area in the Land Management section for more site-specific details.) The campsites on the newly acquired Rainbow Flowage will be designated for reservable-remote camping.

Rustic Backpack Camping

A new type of primitive camping, rustic backpack camping, is being introduced on the forest. Up to 10 primitive campsites will be built along a new 10-20 mile long backpacking trail to be developed near Nixon Lake in the Jute Flats area of the forest. Stays will be limited to one night at a site.

Backpack Camping

Permits for backpack camping are issued for camping along the designated snowmobile trails and along the Lumberjack cross-country ski trail during the off season. Backpackers are allowed to camp at any location along the trail they choose as long as it is at least 50 feet off the trail and 200 feet from a body of water. No facilities of any kind are provided.

Deer Hunter Camping

An additional somewhat unique and primitive camping opportunity is offered during the November nine-day gun deer season. Deer camps have been a tradition on the NH-AL for decades. Hunter Camping is allowed only along certain woods roads. Tents or camper units are allowed,

Table 2.23 - Rustic Family Campgrounds

Rustic Family Campgrounds:	Number of Existing Sites	Proposed Changes	Future Total Sites
Big Lake	72	0	72
Buffalo Lake	52	+8	60
Carroll Lake – <i>(to be converted to a day-use area after the new 60 unit modern campground is constructed)</i>	19	-19	0
Cunard Lake	33	+17	50
East Star Lake	30	+30	60
Indian Mounds Area	39	0	39
North Trout Lake	48	0	48
Plum Lake	18	0	18
Razorback Lake	55	+10	65
Sandy Beach Lake	37	0	37
South Trout Lake	24	0	24
Starrett Lake	46	0	46
Upper Gresham Lake	27	+20	47
West Star Lake	18	0	18
Total	518	+66	584

Recreation Management

no facilities are provided. Free special camping permits, available at the state forest office, are required.

Table 2.24 displays the current and proposed additions to primitive camping opportunities on the NH-AL.

Equestrian Campground

A group equestrian campground will be established on the forest. The location and layout of the campground will be determined using the best available equestrian design standards. The forest staff will work with local and statewide stakeholder groups to identify and meet horse camping needs and establish siting criteria. Siting criteria will consider the proximity to existing horse trail networks, distance to lakes and streams; other use areas that may conflict with horse camping including natural areas and other recreation areas with potential conflicts.

Day-use or Picnic Areas

Day-use areas typically provide for activities like picnicking, sunbathing, and swimming. Some sites may also feature scenic vistas, hiking and nature trails, and boat landings, sometimes with fishing piers. As of 2004 there are eleven designated day-use areas at various locations across the NH-AL. See the listing in table 2.26. Also, there are many other undeveloped, undesignated sites that are frequently used for these activities as well.

All the existing designated day-use areas will be continued under the plan, and a new day-use area is to be developed at Carroll Lake in place of the rustic 19-site campground. This new day-use area will include a picnic area with about 10 tables, flush toilets, a beach, a mobility-impaired accessible boat

landing and fishing pier, and a paved parking lot with space for between 30 and 40 cars.

Non-Motorized Trails

The NH-AL will continue to offer a variety of designated trails under the Proposed Master Plan. The phrase "designated trails" refers to trails that are designed, maintained, and limited to specific uses, such as hiking or interpretive nature trails. Currently, there is a large non-motorized trail system located within the NH-AL State Forest. These trails are available for recreation activities including hiking, biking, cross-country skiing and snowshoeing. In addition to designated trails, the NH-AL offers hundreds of miles of "woods roads", which are open to hiking, biking, horseback riding, and snowshoeing (unless marked closed for a specific activity).

Each type of trail is discussed below. Many of these trails are shown on Map 62, Current Recreation. Table 2.27, Non-Motorized Trail of the NH-AL, lists both the existing and proposed non-motorized trails within the NH-AL state forest, designated used, length, width and level of development according to NR 44 classification.

Bicycle Trails

Road Bike Trails

A new 1.6 mile paved bike trail known as the Crystal-Muskie Campground biking loop will be constructed within the Crystal and Muskie campgrounds. The path will connect to the existing paved Boulder Junction trail, which is maintained by the community of Boulder Junction. This highly popular, surfaced bike path currently extends from Boulder Junction to the NH-AL Crystal Lake Picnic Area and Campground. In the future, the NH-AL will maintain the option of cooperating with local communities in developing additional miles of paved bike paths along highway rights-of-way through the forest.

Table 2.24 - Primitive Camping

Primitive Camping Type:	Existing Sites	Proposed Additions	Future Total Sites
Canoe camping	74	10	84
Reservable-remote camping	13	5	18
Rustic backpack camping	0	10	10
Backpack camping	NA	NA	NA
Deer Hunter camping	NA	NA	NA

Table 2.25 - Group Campgrounds

Group Campgrounds (Rustic):	Capacity at Existing Sites	Proposed Future Capacity
Buffalo Lake - North Shore	0	50
Jag Lake	50	50
North Muskellunge	50	50
Total	100	150

Table 2.26 - Day Use Areas

Day Use Areas	Status	Additional Info
Carroll Lake	New	Toilet and beach
Crystal Lake	Existing	Toilet and beach
Clear Lake	Existing	Toilet and beach
Big Arbor Vitae Lake	Existing	Toilet and beach
Indian Mounds (Lake Tomahawk)	Existing	Toilet and beach
Little Star Lake	Existing	Toilet and beach
Nichols Lake	Existing	Toilet and beach
Cathedral Point (on Trout Lake)	Existing	Toilet and beach
Sandy Beach Lake	Existing	Toilet and beach
White Sand Lake	Existing	Sm. Parking lot
Sparkling Lake	Existing	Sm. Parking lot
WI River	Existing	Sm. Parking lot

Recreation Management

Table 2.27 - Non-Motorized Trails of the NH-AL

Trail Name	Designated Uses				Length (miles)	Average Width	NR 44 Classification
	Hike	Bike	Ski	Snowshoe			
NEW TRAILS:							
Bittersweet	X	-	-	X	8.4	6'	Primitive
Clear Lake	X	-	-	X	5	6'	Lightly developed
Crystal-Muskie bike trail	X	-	-		1.6	12'	Fully developed
Crystal Lake Nature Trail	X	-	-	X	0.5	12'	Developed
Jute Lake Flats hiking trail	X	-	-	X	15-20	6'	Lightly developed
Vandercook mountain bike trail	-	X	-	-	20-25	6-12'	Lightly developed
EXISTING TRAILS:							
Crystal Lake Nature Trail	X	-	-	X	0.5	12'	Lightly to mod. dev.
Escanaba	X	-	X	-	11.0	6'	Primitive to lightly
Fallison Nature Trail	X	-	-	X	4.0	6'	Lightly developed
Lumberjack*	X	X	X	X	12.5	16'	Lightly developed
Madeline	X	X	X	-	9.5	16'	Lightly developed
McNaughton	X	X	X	-	10.0	12'	Lightly developed
North Trout Nature Trail	X	-	X	X	1.0	6'	Primitive
Powell*	X	-	-	X	8.5	16'	Lightly developed
Raven	X	X	X	-	11.0	16'	Primitive to light
Raven Nature Trail	X	-	X	-	1.5	6'	Primitive
Razorback Ridges	X	X	X	X	23	unknown	Primitive to light
Shannon	X	X	X	X	7.0	12'	Lightly developed
Star Lake Nature Trail	X	-	-	X	2.5	6'	Primitive

* Un-groomed ski trails

* Predicted 50-year Condition is an estimate of the forest covertype in 50 years and does not necessarily reflect the long-term objectives of the Area.

Mountain Bike Trails

Mountain biking will continue on state forest-operated mountain bike trails including Lumberjack, Madeline, McNaughton, and Shannon trails. These trails total 39 miles and a trail pass is required. The Razorback Ridges mountain bike trail is operated through a land use agreement with a private organization that will continue under the Plan.

A new 20-25 mile long mountain bike trail loop will be developed. This new trail system will be located south of Hurrah Lake off Vandercook Road, north of Big Arbor Vitae Lake in Vilas County. This trail system will be designed to challenge different ability levels. A portion of the trail will be routed on closed forest roads, which will provide a wide tread surface suitable for casual or family biking. A "challenge" segment of the trail will be developed with a narrow course in a hilly area. Under the new trail designation, the best available design standards will be employed to ensure minimal erosion from mountain bike use.

Portions of the Raven Trail may be designated for mountain bike use after it has been redeveloped to meet the best available mountain bike trail design standards. During the redesign process portions of the trail may be closed. If it is determined that it is not feasible to upgrade the Raven Trail system, a new mountain biking trail may be constructed within the Clear

Lake Management Area 22. Portions of the existing Raven Trail that are not part of the redeveloped mountain bike trail will be retained for hiking whenever possible, with the possibility of adding new hiking loops. The forest staff will include area mountain bike clubs in the development and implementation of a mountain bike trail management plan.

The Escanaba Trail will be closed to mountain bikes. The trail was not designed for mountain bike use and adverse impacts are occurring. The Escanaba Trail will remain a designated hiking and ski trail. The plan includes the construction of 20-25 additional mountain bike trails.

Hiking and Backpacking

The existing 18.5 miles designated hiking trails will be maintained under the Plan. Day hiking opportunities will continue to be offered on the forest along cross-country ski trails, nature trails, on the extensive woods road network, and off-trail throughout the forest.

A new five-mile hiking/snowshoeing trail will be developed around Clear Lake. (Please refer to the Area 25 map in the Land Management section in this chapter.) Also a new 10-20 mile hiking trail system for rustic backpacking will be developed near Nixon at the Jute Lake Flats area. A number of primitive campsites will be located along this route for backpacker use.

Recreation Management**Ski Trails**

Currently 70 miles of designated cross-country ski trails are available on the NH-AL. This trail system will be maintained. Four trails are currently groomed by the WDNR: the Raven Trail, Madeline Trail, McNaughton Trail, and Escanaba Trail. Other ski trails, including the Shannon Trail, Razorback Ridges, and the North Lakeland Discovery Center (formerly the Statehouse Lake Trail) are maintained by private organizations through agreements with the WDNR. Some small adjustments will be made to the Shannon and McNaughton Trails to avoid conflicts with town roads. Ungroomed ski trails include the Lumberjack Trail and the Powell Trail. Cross-country skiing in ungroomed areas is also available across most of the NH-AL.

Snowshoe Trails

Snowshoeing is currently allowed everywhere on the forest except on groomed, designated cross-country ski trails. In addition, the Plan will designate and promote the use of Fallison Lake, North Trout Lake, Star Lake, and the proposed Crystal Lake Nature Trails as ungroomed winter snowshoe trail routes. Powell and Lumberjack trails will continue to be open for snowshoeing as well as skiing. The new Clear Lake trail described under the hiking trail section will also be available for snowshoeing.

Horseback Riding

There will be no change in the horseback riding opportunities on the forest. While the NH-AL does not manage designated equestrian trails, riding opportunities are abundant on undesignated trails. Horses may be ridden on roads, snowmobile trails, and other undesignated trails that are not signed as closed. Horseback riding is only prohibited on designated nature, hiking, or mountain biking trails. These trails have "no horses" sign posted at the trailhead. Through land use agreements, several equestrian clubs and other organizations maintain public horse trails on state forest land. One such trail, the Fort Wilderness Trail, is located in the southeast portion of the NH-AL state forest. Access to these riding opportunities will be considered when sighting the new equestrian campground.

MOTORIZED TRAILS**Snowmobile Trails**

Currently the NH-AL has an extensive 400-mile plus network of snowmobile trails that link state land with private and county snowmobile trails. Snowmobile trails within the NH-AL are generally developed to NR 44's Lightly Developed trail standards and they are operated partly on state land and partly on private land. Sections of the trail on private land are used through land lease agreements, often operated by snowmobile clubs. There will be no significant changes overall to the snowmobile trails located in the NH-AL.

At the discretion of the Forest Superintendent, changes to the NH-AL snowmobile trail system may be made to ensure safety, to keep snowmobiles off roads, in response to the loss of route access across private lands, if resource degradation develops, or if unacceptable user conflicts occur. Any changes must be consistent with the requirements of the area's land use classification.

Cycles, 4x4s, and other licensed motor vehicles (forest road access)

The NH-AL policy regarding the use of street licensed motor vehicles will remain unchanged. Under this policy, licensed cycles, 4x4s, and other vehicles meeting street-legal requirements may operate on open NH-AL roads (including logging roads) that are not bermed, gated or signed as closed.

NEW ATV TRAIL OBJECTIVE

Provide sustainable ATV riding opportunities and a quality riding experience with an emphasis on trails that link or are connected to a regional network of ATV trails.

ALL-TERRAIN VEHICLES

The Department supports the development and maintenance of ATV riding opportunities on appropriate trails, particularly trails that contribute to regional trail networks. To support the statewide and regional goal the use of ATVs is authorized on trails designated for ATV use on the NH-AL. However, because a suitable route or routes for ATV trails on the NH-AL have not been identified, this plan does not designate any trail for the use of ATVs at this time. The Department may designate ATV trails in the future when suitable trail routes are found. Trails would be sited and developed according to the Department's established ATV trail policies and standards. The trails would be fully-developed trails as defined by NR 44.07(3)(h) except that native soils may be used as the tread surface where suitable soils are present.

Additional analysis of potential trail routes will be conducted within 18 months of the approval of this plan. This analysis will evaluate and consider potential environmental, social, economic, and safety issues. The review process will also examine alternative trail locations and recommend any mitigation measures that might lessen environmental and social impacts. Public involvement opportunities will be part of the ATV trail siting process.

Table 2.28 - Motorized Trail Use

Trail Use	Length (miles)	Average Width	NR 44 level of Development
Snowmobile Trails	400	12 – 16 ft	Lightly developed

Recreation Management

To aid in the trail siting process the Department will establish a stakeholder group to make recommendations to the Department on potential, suitable ATV trail sites and routes. The stakeholder group will be established within six months of the date of the approved plan. The Department will consider the stakeholder group's recommendations when making a determination of the appropriate designation of an ATV trail or trails on the NH-AL. If no suitable sites are found to be feasible, no trail will be designated.

Note: By permit ATVs may also be used by persons with disabilities for personal conveyance on non-designated trails or off-trail, and by Department staff for management and law enforcement purposes.

SWIMMING

Swimming occurs at both non-designated and designated swimming beach areas. A designated beach has a regulatory marker or posted notice. Most designated swimming areas have toilet facilities. Non-designated swim areas are any waters that are not signed as "closed to swimming." State forests do not supply lifeguards at any beaches; swimming is at the users discretion.

All nine existing designated swimming beaches will continue to be maintained under the revised Plan. These beaches are at the Indian Mounds picnic area and Indian Mounds campground, Crystal Lake campground, Clear Lake picnic area, Muskie Lake campground, Big Lake campground, Jag Lake and North Muskellunge group campgrounds, and little Star Picnic area. In addition, a new swimming beach will be designated at the new Carroll Lake day use area.

BOATING, CANOEING ACCESS AND CANOE TRAILS

With 900 lakes and many streams water-based recreation is a primary attraction for NH-AL visitors. The master plan's focus relates primarily to access sites because on-the-water operation of watercraft, including jet skis, falls mainly under the control of local governments rather than the state.

Under the revised plan, boating and canoeing access sites (boat landings) will be maintained. A new, additional landing will be added to serve the proposed new campground on Carroll Lake. (Some changes are proposed in the lakes where motorized watercraft may be used or where motor use is limited to electric motors.)

There are more than 100 designated boat launch sites in the NH-AL. (*Please see map in the appendix, The Current Boat Landings and Canoe Routs*). Boat landings within the NH-AL have different characteristics regarding degree of development

and type of access to the water. These boat landing types include canoe slide, carry-in, cement plank, gravel, and unimproved. An unimproved boat landing is characterized the least developed of the types, where no effort used to create the landing. These landings usually include a pull-off for cars on a dirt road where users are required to walk to the lake. Table 2.29 summarizes the existing landings by type.

The designated access type and level of development for each boat access site is shown in the Appendix.

An extensive network of canoe trails and portages can be found within the forest boundary. The most popular canoe routes are shown on Map 65, DNR Boat Landings and Canoe Trails. Canoe campsites typically are found along these routes. Portages are not actively maintained and are subject to change. Current trail location information may be found by contacting the forest office.

FISHING

Fishing regulations are outside the scope of the Proposed Master Plan. The revised Plan supports fishing primarily by providing water access to anglers, which includes boat landings and fishing piers. Fishing piers are usually located in association with campgrounds and picnic areas. A number of the piers are disabled-accessible. The Forest Superintendent may construct or relocate fishing piers as deemed necessary, consistent with the landuse classification standards for the site.

Some access sites are open in the winter for ice fishing. The Towns determine the plowing of town roads for ice fishing access.

HUNTING AND TRAPPING

The NH-AL will continue to offer abundant opportunities for small and big game hunting and trapping. The diverse landscape of different forest types, lakes and wetlands currently found on the property will continue to provide important habitat for many game species. Hundreds of miles of logging roads and non-designated trails will continue to be open for hunting access by foot and motor vehicle. Non-motorized areas where

Table 2.29 - Boat Landing Type

Boat Landing Type	# of Landings
Cement plank	73
Gravel	22
Canoe slide	9
Carry-in	11
Unimproved	21
TOTAL	136

Recreation Management

one can seek a more remote, solitary walk-in hunting experience will remain at approximately current levels. Hunting and trapping regulations are outside the scope of the NH-AL Master Plan.

EDUCATION AND INTERPRETATION

Presently the NH-AL maintains four self-guided interpretive trails, including, Fallison, Raven, North Trout, and Star Lakes as well as the Manitowish River Canoe Trail. A rustic Nature Center exists in the Crystal-Muskie Campground complex. The NH-AL naturalist holds interpretive programs at campgrounds throughout the summer. In addition to the state programs, the North Lakeland Discovery Center, operated on the forest by a private organization, also provides a variety of educational programs that are open to the public. The existing education/interpretation facilities will be maintained under the revised plan. Also, the following facility additions are planned:

Crystal-Muskie Nature Center and Clear Lake Campground

A rustic amphitheater will be built at the Crystal-Muskie Nature Center to support educational programs. The Crystal-Muskie facility will be further enhanced by the addition of a new one-mile nature trail adjacent to the interpretive building. The trail will include a disabled-access loop.

At the Clear Lake campground the delivery of educational programs will be improved by the construction of a new summer-use interpretive shelter building.

Forestry Awareness, Education and Visitor Center

The objective of this new year-round facility is to offer campers, school children and local visitors the opportunity to learn about themes found on the NH-AL such as ecological, economic and social benefits of the forest. Through permanent and temporary displays they will be exposed to general natural resource topics, such as sustainable forest management, natural communities, and wildlife management. Other amenities that may be provided at the Center are public restrooms, conference room, presentation rooms and classrooms, Internet access, an amphitheater, staff offices, and a gift shop. Additionally, visitors will have the opportunity to interpret the natural and cultural history of Wisconsin's northern forests on a new 1-2 mile nature trail adjacent to the Center. It would include a disabled-access loop.

The specifics of this center, including its location, will be determined by a future design planning effort to be completed within the next decade. The site location will be chosen based on such factors as available space, a scenic and peaceful vista and ease of access for all visitors including the handicapped. The development of this facility offers new

opportunities for Department partnerships with other organizations and friends groups.

RECREATION LAND USE AGREEMENTS

The WDNR has a long history of cooperation with private organizations to manage and maintain recreational and essential community facilities. Examples of land use agreements include the Razorback Ridges trail area, the North Lakeland Discovery Center, over 400 miles of snowmobile trails on the NH-AL, several youth camps, many smaller trail systems, and public shooting ranges. Land use agreements on the NH-AL will continue to be evaluated periodically.

The Leased Land Table, table 2.30, lists the lease name, type of land leased, and number of acres or miles currently under lease agreements.

REMOTE AND NON-MOTORIZED RECREATION

The NH-AL offers a wide range of recreational settings and opportunities. In addition to well developed intensively used facilities like campgrounds and day-use areas there also are opportunities to enjoy the peace and solitude of areas removed from motorized uses. These areas range from nearly non-developed passively managed areas to managed areas that are closed to public motorized access. Recreational facilities within these areas are limited primarily to trails and primitive campsites. These less-intensive recreational settings are provided in the Manitowish Wild Resources Area, the motor-restricted lakes, the Bittersweet Lake Recreation Management Area, and the Semi-remote Recreation Areas. Each is discussed below:

Manitowish Wild Resources Area

Wild Resources Areas provide remote, quiet, non-motorized recreation where natural ecological processes predominate (no timber management), and evidence of human impact is low.

The 6,150 acre Manitowish Wild Resources Area is located in the northwest corner of the NH-AL.

This area contains a remote stretch of the Manitowish River, which is surrounded by bogs, forested wetlands, and some upland areas. Several primitive canoe campsites are maintained along the river. This area will continue to be maintained in the same manner as it had been under the 1982 plan where it was designated a wilderness area. (Recent changes in the Department's land use classification system has replaced the wilderness area designation with wild resources manage-

Recreation Management

Table 2.30 - NH-AL Leased Land Agreements

Lease	Use or Site Name	Acres
Town of Boulder Junction	Shooting Range	56 acres
Vietnam Vets - Chapter 256 of Minocqua/Caywood	Shooting Range	5 acre
Northwoods Wetland and Wildlife Club - Mercer	Shooting Range	40 acre
Town of Lake Tomahawk	Recreation Park	5 acres
Town of Arbor Vitae	Big Arbor Vitae Picnic Area	3 acres
Town of Boulder Junction	Recreation Area / Chambers Bldg	7 acres
Town of Boulder Junction	Nichols Lake Picnic Area	20 acres
Town of Boulder Junction	Boulder Lake Landing	1.3 acres
Town of Manitowish Waters	Rest Lake Recreation facility	10 acres
Town of Plum Lake	Plum Lake Recreation facility	2.9 acres
Town of Plum Lake	Star Lake Picnic Area	5 acres
Town of St. Germain	Fern Ridge Trail	1.75 acres
Future Farmers of America	Jag Lake Camp	4.4 acres
YMCA	Camp Jorn Trail System	7 acres
YMCA	Camp Manitowish Trail System	5 acres
Elmer Packard, Jr.	Trail System in Newbold	3.5 acres
NON-RECREATION LEASES:		
Town of Woodruff	Burn pad / Compost site	5 acres
Town of Lake Tomahawk	Burn pad	5 acres
Town of Arbor Vitae	Burn pad / Compost site	5 acres
Town of Boulder Junction	Airport runways	66 acres
UW-Madison	Forestry Genetics Project	26 acres
		Total 283.85

SNOWMOBILE CLUB AGREEMENTS:

	Trail Miles
Town of Manitowish Waters	2 miles
Town of Boulder Junction	9 miles
Oneida Co. Trail Corporation	12 miles
Town of Plum Lake	Not developed
Sayner-Star Lake Chamber of Commerce	32 miles
North Lakeland Discovery Center	12.4 miles
North Lakeland Elementary School	3.2 miles
Fort Wilderness	26.9 miles

97.5 Total miles

ment area.) Refer to the Land Management Section for a more detailed description of management of this area.

Bittersweet Lake Recreation Area

The new Bittersweet Lake Recreation Area encompasses 2,300 acres area located just north of Highway 70 in Vilas County. It contains four undeveloped wild lakes (Bittersweet, Prong, Oberlin, and Smith Lakes) surrounded by a mixed northern hardwood forest. Access to the area has been and will continue to be only by primitive road and primitive or lightly developed trails. A core area surrounding the lakes will be a Non-Motor Area, except for a single access road to Bittersweet Lake and a short section of snowmobile trail

along the southwest side of the area. Recreational facilities within this area are limited to hiking trails and primitive, reservable campsites. Refer to the Land Management Section for a more detailed description of management of this area.

Recreation Management

The 1982 master plan designated three "wild areas"- Frank Lake, Partridge Lake and Indian Creek. They were public non-motor areas where some forest management occurred but all Department managed roads were closed to public use. Limited snowmobile trails crossed the area.

Like the wilderness area designation, the wild area designation no longer exists due to changes in the Departments land use classification system. However, in order to continue the same type recreational opportunity (i.e. large areas with only limited public motor vehicle access) the revised plan designates two areas as "Semi-Remote Areas" which will have similar characteristics. The boundaries of these new areas are similar but not identical to the wild area's boundaries. The new semi-remote area boundaries have been redrawn somewhat to include lands that better fit the objectives and exclude lands that don't. For example, several popular motor-use lakes, Allequash Lake, Partridge Lake, and Nebish Lake, that were within the wild areas will be excluded from the new semi-remote areas.

Under the revised plan the Indian Creek Wild Area will no longer have a special recreational use designation because, being mainly bog with some upland jack pine, it provides only low recreational opportunity. It will be managed as part of the Peatland Wetlands Native Community Management Area. No changes in recreational facilities or access are planned.

Frank Lake and Partridge-Nixon Lake**"Semi-remote Areas"**

The new Partridge Lake Semi-Remote Recreation Area (formerly the Partrige-Nixon Wild Area) includes approximately 12,900 land acres. All but 300 acres are state-owned. Frank Lake Semi-Remote Recreation Area (formerly the Frank Lake Wild Area) includes approximately 7,400 land acres, all of which is state owned. They are shown on the Proposed Semi-Remote Areas map in the Appendix.

The management objective for these areas is to provide a somewhat remote, non-motorized recreational opportunity. The following management prescriptions apply:

- Limited public vehicle access - the town roads and existing snowmobile trails will remain open. All logging roads, active or passive, will be closed to public access (in the past nearly all have been bermed or gated).
- Lakes will be limited to non-motorized or electric powered watercraft.
- No new recreational developments are permitted.
- Timber harvesting and other resource management activities will occur within these areas according to the requirements of respective management area as described in the Land Management section of this plan.
- Motor vehicle use by Department staff or its contractors engaged in management or enforcement activities is permitted.

Non-motor and Electric Motor Lakes

The 900 lakes within the boundaries of the NH-AL provide some of the property's most sought after recreational attractions. A unique opportunity available on the NH-AL, more so than anywhere else in the region, is a number of undeveloped, non-motor or electric-motor-only lakes where one can find a quiet, and often more remote experience. In total, **85.5 lakes** have some type of special designation that prohibits or limits the use of motorized watercraft. The breakdown by designation category is shown in the table below. Table 2.33 at the end of this section has a complete listing of all special use designations. These lakes are also shown on the Lakes with Special Lake Designations in the Appendix.

The state-wide qualifications for wild and wilderness lakes, now defined by NR 44, have changed and become more restrictive since the 1982 NH-AL plan was approved. Under the new definition electric and gas motors are prohibited. Previously they were allowed on wild lakes with Natural Resources Board Approval. In the draft plan the traditional use patterns are generally being continued; therefore, the designation of a number of lakes has been changed to match the current type of use or development. Table 2.33 lists the lakes with special use designations. An analysis of the specific changes in the lake designations from the 1982 to the revised plan may be found in the impact analysis in Chapter One in the EIS.

An overview of these lake designations is given below:

Wilderness Lakes: These lakes provide a wilderness experience with no motors (gas or electric) and at least a $\frac{1}{4}$ mile buffer without roads or motorized trails, timber harvesting, or other human influences, except primitive campsites.

Recreation Management

Wild Lakes: These lakes provide a somewhat remote experience, with no motors (gas or electric) and at least a 400 ft. buffer area with no timber harvest or motorized recreation. Developments may include an access road, boat landing, and primitive campsites. Other structural developments are not allowed.

More detailed definitions and requirements for wilderness and wild lakes may be found in the Wild Resources Management Area in the Land Management Section of this plan and in NR 44.06(10)(f).

Public Non-Motor Lakes: Public Non-motor lakes provide a quiet recreation setting, with no use of motors (gas or electric) by the public. All motors are permitted for management and enforcement activities. There are no special restrictions on shoreline management and development.

Electric-Motor Lakes: Battery or non-motor powered watercraft only are allowed for recreational use. All motors are permitted for management or enforcement activities. There are no special restrictions on shoreline management and development.

Table 2.31 - Summary of Acreages for Non-motor Recreation Lands

Area Type	Acres (State Owned)
Wild Resources	6,150
Bittersweet Non-Motor Area	2,000
Frank Lake Semi-Remote Area	7,400
Partridge Lake Semi-Remote Area	12,600

Table 2.32 - Summary of Non-motor and Electric Motor Lake Designations

Proposed Designation	Proposed # of Lakes
Wilderness Lake	6
Wild Lake	33
Public Non-motor Lake	22
Electric Motor Lake	24.5
TOTAL	85.5

Recreation Management**Table 2.33 - NH-AL Designated Non-motor and Electric Motor**

Lake Name Access Designation	Proposed Water Mgmt. Designation	Proposed Lake Designation	Lake Name Access Designation	Proposed Water Mgmt. Designation	Proposed Lake Designation
BRUSH LAKE	No Motors Allowed	Wilderness	4 small unnamed lakes north of White Sand Lake	Public Non-Motor	None
CLEAR LAKE	No Motors Allowed	Wilderness	BLUEBERRY LAKE	Public Non-Motor	None
KELLY LAKE	No Motors Allowed	Wilderness	DEADMAN LAKE	Public Non-Motor	None
LAKE ALVA	No Motors Allowed	Wilderness	DRY LAKE	Public Non-Motor	None
TOY LAKE	No Motors Allowed	Wilderness	EMERALD LAKE	Public Non-Motor	None
WOODSON LAKE	No Motors Allowed	Wilderness	FIREFLY LAKE	Public Non-Motor	None
3 small unnamed lakes around E. Ellerson Lake	No Motors Allowed	Wild	LITTLE BASS LAKE	Public Non-Motor	None
3 small unnamed lakes west of Swanson Lake	No Motors Allowed	Wild	LITTLE JOHN JR. LAKE	Public Non-Motor	None
BENEDICT LAKE	No Motors Allowed	Wild	LITTLE ROCK LAKE	Public Non-Motor	None
BITTERSWEET LAKE	No Motors Allowed	Wild	MAPLE LAKE	Public Non-Motor	None
BUG LAKE	No Motors Allowed	Wild	PLUNKETT LAKE	Public Non-Motor	None
DEVINE LAKE	No Motors Allowed	Wild	TRILBY LAKE	Public Non-Motor	None
DU PAGE LAKE	No Motors Allowed	Wild	UNNAMED LAKE (aka LONG LAKE) 39-7-34	Public Non-Motor	None
EAST ELLERSON LAKE	No Motors Allowed	Wild	WILDWOOD LAKE	Public Non-Motor	None
FROG LAKE	No Motors Allowed	Wild	ALLEQUASH SPRINGS	Public Non-Motor	None
HAWK LAKE	No Motors Allowed	Wild	BEAR SPRINGS	Public Non-Motor	None
HELEN LAKE	No Motors Allowed	Wild	CRYSTAL LAKE	Public Non-Motor	None
INKPOT LAKE	No Motors Allowed	Wild	NICHOLS LAKE	Public Non-Motor	None
ISLAND LAKE	No Motors Allowed	Wild	STEVENSON SPRINGS	Public Non-Motor	None
JOHNSON LAKE	No Motors Allowed	Wild	AURORA LAKE	Electric-Motor Only	None
LITTLE CLOUD LAKE	No Motors Allowed	Wild	CAMP LAKE	Electric-Motor Only	None
MAX LAKE	No Motors Allowed	Wild	CUNARD LAKE	Electric-Motor Only	None
MUD LAKE	No Motors Allowed	Wild	DAY LAKE	Electric-Motor Only	None
NORWAY PINE LAKE	No Motors Allowed	Wild	DOROTHY DUNN LAKE	Electric-Motor Only	None
OBERLIN LAKE	No Motors Allowed	Wild	ELOISE LAKE	Electric-Motor Only	None
PRONG LAKE	No Motors Allowed	Wild	FALLISON LAKE	Electric-Motor Only	None
SALSICH LAKE	No Motors Allowed	Wild	FOX LAKE	Electric-Motor Only	None
SMITH LAKE	No Motors Allowed	Wild	FRANK LAKE	Electric-Motor Only	None
SWANSON LAKE	No Motors Allowed	Wild	GYPSY LAKE	Electric-Motor Only	None
UNNAMED LAKE east of Bittersweet Lake	No Motors Allowed	Wild	HEMLOCK LAKE	Electric-Motor Only	None
UNNAMED LAKE east of Luman Lake (38-7-33)	No Motors Allowed	Wild	JEAN LAKE	Electric-Motor Only	None
UNNAMED LAKE north of Big Lake	No Motors Allowed	Wild	LONE TREE LAKE	Electric-Motor Only	None
UNNAMED LAKE south of Rainbow Flowage	No Motors Allowed	Wild	MCNAUGHTON LAKE	Electric-Motor Only	None
UNNAMED LAKE southeast of White Sand Lake	No Motors Allowed	Wild	NIXON LAKE	Electric-Motor Only	None
UNNAMED LAKE west of Round Lake	No Motors Allowed	Wild	OTTO MIELKE LAKE	Electric-Motor Only	None
			PAUTO LAKE	Electric-Motor Only	None
			SCAFFOLD LAKE	Electric-Motor Only	None
			SHANNON LAKE	Electric-Motor Only	None
			STARRETT LAKE	Electric-Motor Only	None
			TURTLE LAKE	Electric-Motor Only	None
			UNNAMED LAKE west of High Lake	Electric-Motor Only	None
			WHARTON LAKE	Electric-Motor Only	None
			ZOTTLE LAKE	Electric-Motor Only	None
			ALLEQUASH LAKE	½ Electric-Motor Only, ½ No Restriction	None

Road Management



ROAD MANAGEMENT

Access across and within the NH-AL is on a variety of roadways – Federal, State, County highways, and Town and DNR roads. The Department has identified over 60 miles of designated management and access roads. Some roads are maintained as permanent management roads, while other roads are only temporary for timber harvesting or other management activities. The present road inventory is not complete. A full inventory, mapping and classification of the permanent NH-AL road network is underway.

Unless closed by a gate, a berm, or a sign, department roads are open to public access with street licensed vehicles. Permanent roads may be closed to the public if they are deemed unsafe for public vehicles due to the condition of the road or because of potential conflicts with timber harvesting or other management activities occurring in the area. Temporary logging roads are generally open to the public during the period of management and for a short time thereafter to allow firewood gathering.

ROAD CLASSIFICATION AND GENERAL ROAD MANAGEMENT

There are several types of road classifications outlined in NR44.07(3). The classifications reflect a range of development and maintenance standards. The road classifications include primitive, lightly-developed, moderately developed, and fully developed. Each Department managed road will be assigned a development classification as part of the road inventory project described above.

Management of lands along the roads within the NH-AL will reflect the management specifications for the underlying area classifications. All road right-of-ways (66 ft.) will continue to be controlled and maintained by their current operator (Federal, State, County, or Town).

The Department managed roadways within the NH-AL will be maintained in part according to the following requirements from the Best Management Practices for Water Quality:

- Regularly inspect active roads (especially after heavy rainfall). Clear debris from culverts, ditches, dips and other drainage structures to decrease clogging that can lead to washouts.
- Kept to a minimum during wet periods and spring breakup to reduce maintenance needs.
- Shape road surfaces periodically to maintain proper surface drainage, and remove berms on the edge of the

road that trap water.

- When dust control agents are used, apply them in a way that will keep them from entering lakes, streams and groundwater.

County and Township Roads

There are numerous state, county, and town roads within the state forest boundary. These roadways will continue to be managed by the municipalities outside the scope of the NH-AL Master Plan.

AESTHETIC MANAGEMENT FOR ROADWAYS

Forest management techniques are adjusted along roadways on the forest to ensure the long-term maintenance of scenic conditions proportionate to the road's level of public use. The Silviculture and Aesthetics Handbook distinguishes three separate road types within the NH-AL forest including Class A, Class B, and Class C roads (WDNR 1995).

Class A Roads – highest level of aesthetic management

Travel routes with heavy to medium use or roads where the use is for the specific purpose of enjoying scenery. All Federal, State, and County roads located (with the exception of County Highway "K", a designated Rustic Road that is covered separately) are classified as "A" type roads.

Management objective

- Aesthetic management considerations predominate along Class A roads. These areas should be developed and maintained in the forest environment to the greatest scenic potential for public enjoyment. All management activities will follow guidelines according to the Silviculture and Forest Aesthetics Handbook (WDNR 1995).

Class B and C Roads – These roads are characterized as having no moderate to low levels of aesthetic management. Because the aesthetic management needs are highly dependent on site specific conditions the NH-AL Superintendent will determine the classification (B or C) of roadways that do not fall into Class A.

Class B Roads serve a variety of uses where the public traffic load is generally light to medium. Scenic attractiveness is of equal importance to other land management objectives.

Management objective

- Maintain scenic attractiveness in balance with other management objectives for adjacent lands.
- The appropriate scenic management treatments for each Class B roadway will be determined by the NH-AL

Road Management

Superintendent on a case-by-case basis as management activities are scheduled. All management activities will follow the appropriate guidelines according to the Silviculture and Forest Aesthetics Handbook (WDNR 1995) to meet the scenic objective.

Class C Roads are primarily used for management access and public use does not occur or it is infrequent or it is primarily for activities such as hunting, fishing, or berry picking. Aesthetics are considered in the management along these roadways; however, they are secondary to the prescribed land management activities for the area.

Management objective

- The specific aesthetic management objective and the appropriate scenic management treatments for each Class C roadway will be determined by the NH-AL Superintendent on a case-by-case basis as manage-

ment activities are scheduled. All management activities will follow the appropriate guidelines according to the Silviculture and Forest Aesthetics Handbook (WDNR 1995) to meet the scenic objective.

A boundary expansion does not give the Department any authority over private land in the area; it merely gives the Department the authority to seek to purchase land from willing sellers within the expanded boundary area. The revised state forest boundary does not in any way encumber, restrict, or place any other controls on private land within the boundary. When property owners want to sell their lands they may sell to whomever they choose- private parties, other conservation organizations or the State of Wisconsin.



Non-Metallic Mining

NON-METALLIC MINING

Mining Policy

The Department may use gravel, sand, fill dirt or other fill material from department-owned lands for Department use. On the NH-AL sand and gravel is used for road construction and maintenance. Under certain circumstances other government bodies or agencies may also have access to these materials. Section 23.20 of the Wisconsin Statutes states, "the department may permit any town, county, or state agency to obtain gravel, sand, fill dirt or other fill material needed for road purposes from any department-owned gravel pit or similar facility if this material is unavailable from private vendors within a reasonable distance of the worksite. The department shall charge a fee for this material commensurate with the fee charged by private vendors.

All nonmetallic mining in the NH-AL is regulated under the requirements of NR 135 Nonmetallic Mining Reclamation, Wis. Adm. Code, except for sites that do not exceed one acre in total for the life of the mining operation. Site reclamation under NR 135 is administered by the county. NR 135 requires mining sites to be located appropriately, operated in a sound environmental manner, and that all disturbed areas be reclaimed according to a reclamation plan. Department of Transportation (DOT) projects are exempt because DOT projects have their own reclamation requirements. The use of state-owned land by the state and municipalities for gravel pits and sand will continue on a case-by-case basis. New sites will not be permitted where a Geological Feature of Importance has been identified. For a list of features, please see the Important Geological Features section below.

Gravel pits on the NH-AL

The list of non-metallic mining sites includes those originally surveyed in 1985. There may be additional active sites that have not been surveyed as well as other unrecorded abandoned sites within the State Forest. Most have been converted or reclaimed.

Important Geologic Features

The NH-AL contains some good examples of drumlins, eskers, outwash plains and moraines, distinctive landforms left behind by the glaciers more than 10,000 years ago. (These glacial features are described in more detail in the glossary.) Because many of these glacial features contain high quality sand and gravel deposits they are slowly being lost over time to sand and gravel extraction and other disturbances.

The Department recognizes the importance of setting aside and preserving representative examples of these non-renewable geological features to serve as a base for geological and ecological educational programs and as a baseline against which to compare sites that become disturbed in various ways. The following are considered the more significant examples of glacial features on the forest that will be protected from mining:

Geological Features of Importance

- Winegar moraine – silt-rich soil, northern hardwoods covertype.
- Eskers near Morton Lake (in proposed northern boundary expansion area)
- Drumlins west of Trout Lake
- Muskellunge Moraine (high ridge) south of HWY N near Muskellunge Lake
- Vistas of moraines in Firefly Lake area
- Outwash heads near Lake Laura
- Outwash plains in the Boulder Junction area
- Vistas of general topography in Star Lake area

Real Estate Management**A****REAL ESTATE MANAGEMENT****FOREST BOUNDARY EXPANSION**

The largest expansion area, approximately 61,000 acres north of the existing property boundary and extending up to the Wisconsin/Michigan boarder. Two smaller expansion areas totaling 3,900 acres lie to the south of the forest along the Wisconsin River and near the Rainbow Flowage. The expansion areas and the revised boundary are illustrated on Map 61 in the appendix. The new NH-AL acquisition goal would be 291,200 acres. The Department will continue its long-standing policy of purchasing lands from willing sellers only.

The expanded boundary will meet overall forest ecology, environmental health, and recreation needs of the NH-AL State Forest. Areas within the revised boundary will be considered for a range of protection options including purchase, cooperative agreements and conservation easements.

The revised northern boundary area represents one of the last places in Wisconsin where there is an opportunity to protect a reasonably large number of undeveloped or lightly developed lakes within a mosaic of high quality northern forest. The ecological values here are outstanding. The lakes support an unusually diverse and high quality assemblage of aquatic natural communities. The areas high quality forest habitat also has several patches of old growth. Numerous rare species are known to occur here, particularly birds and plants. Acquisition of land within this area would significantly expand the opportunity for larger scale management of hemlock-hardwood forest. This is a forest community type that is uncommon within the current forest boundary. Like the state forest lands to the south, this area is rich in high quality outdoor recreational opportunities. The proposed northern boundary expansion would have large-scale ecological benefits by linking large tracts of public land — including state, county, and national forests in Wisconsin and Upper Michigan. There would be large-scale hydrological benefits as well. It would add additional watershed protection to the headwaters of the Wisconsin and Flambeau Rivers, a primary reason for the original establishment of the NH-AL State Forest.

The southern boundary expansion runs along the Wisconsin River in from the southern edge of the forest boundary to the head of the Rhinelander Flowage. The purpose of this boundary change is to assure permanent conservation of the immediate Wisconsin River shoreline, which has important wildlife and endangered species habitat, and a variety of recreational opportunities. The third expansion area north of the Rainbow Flowage squares off the boundary to block-in lands recently purchased around the Flowage.

REAL ESTATE ACQUISITION POLICIES

All property purchases are on a willing seller basis. As required by state and federal laws, the Department pays "just compensation" for property, which is the estimated market value based on an appraisal by a certified licensed appraiser. At times, it is in the interest of the Department and the landowner for the Department to acquire only part of the rights to a property, or an easement. The Department has a number of easement alternatives available to address these situations.

Landowners within the state forest boundary will be contacted periodically by Department staff to explain the Department's land acquisition program and to see if they have an interest in selling their property. Acquisition priorities within the state forest vary from year to year and is based on a variety of factors, such as resource management or recreation needs and available funding, but acquisition is always based on the landowner's willingness to sell or donate their property.

New land acquisitions will be classified under the land management classification system outlined in Wisconsin Administrative Code NR 44.05. State forest staff will base the classification of the acquisition on the ecological suitability and state forest management objectives.

AIDES IN LIEU OF TAXES

For all new properties purchased, the Department makes an annual payment in lieu of real estate taxes to replace property taxes that would have been paid if the property had remained in private ownership. The payment is made to the local taxing authority where the property is located. More detailed information on how the Department pays property taxes may be found in a publication titled, *Public Land Property Taxes*, PUB-LF-001.

ACQUISITION NEAR MUNICIPAL AREAS

The existing land acquisition moratorium areas around Sayner, St. Germain, Boulder Junction, Lake Tomahawk, and Manitowish Waters will continue to be honored.

ADDITIONAL INCLUSION OF STATE LANDS IN MANITOWISH WATERS

The Department owns 4 parcels (2 designated as state forests and 2 designated as wildlife) within the Town of Manitowish Waters moratorium (T42N R5E Section 4 - gov lot 6 (pt of SWNW west of Rest Lake, T42N R5E Section 23 - gov lot 5 (pt of SESE), T42N R5E Section 15 - gov lot 7 (part of SWSE south of Little Star Lake) T42N R5E Section 4 - gov lot 4 (pt of SW of the NW of the SW west of Rest Lake)) These parcels are adjacent to the existing NH-AL project boundary. The

Real Estate Management

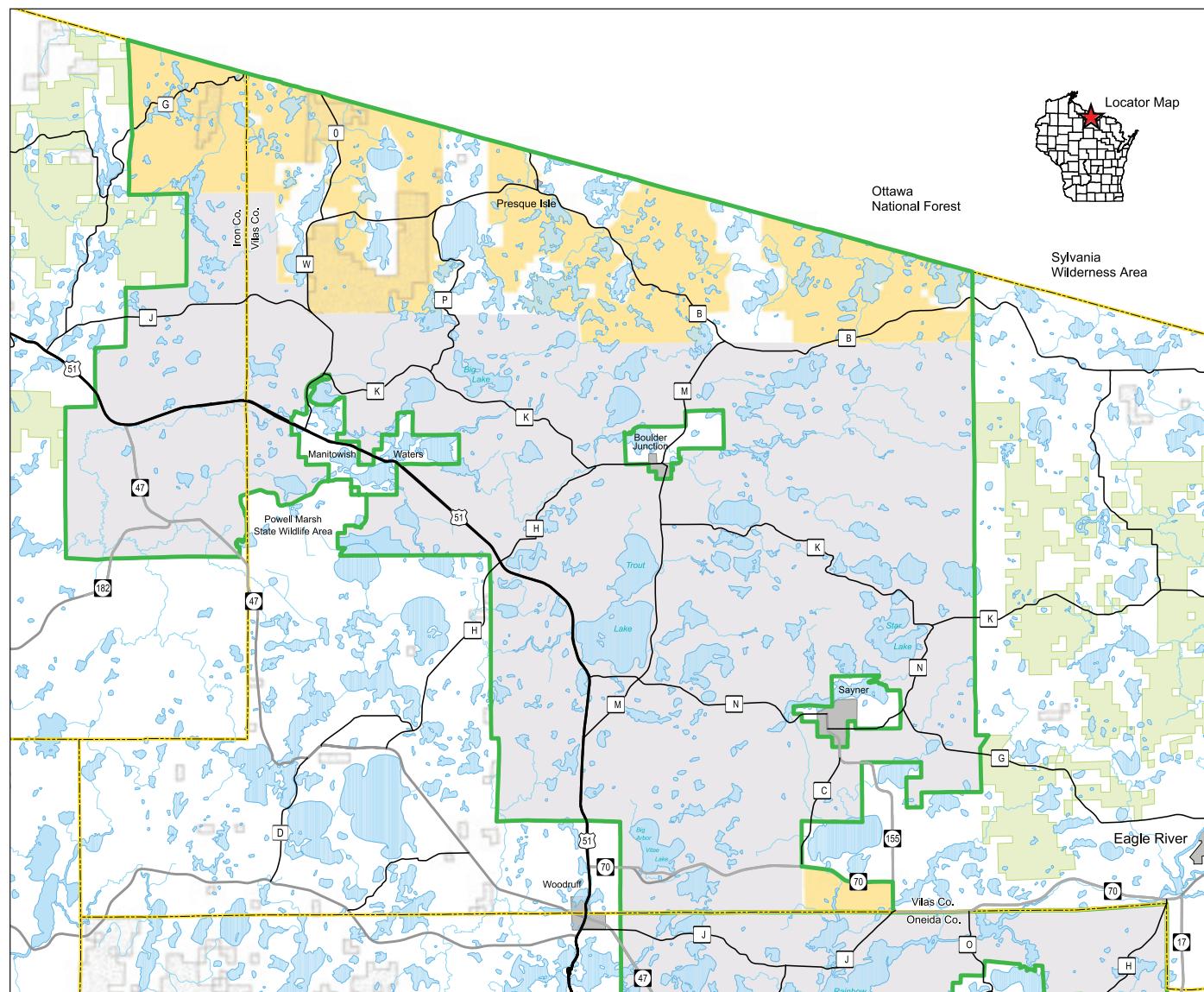
township of Manitowish Waters passed a resolution in January of 2005 requesting the Department include these parcels in the NH-AL project boundary as a means to protect undeveloped lake shore. These parcels will be included within the proposed project boundary for the NH-AL state forest and re-designated as state forest lands.

FUTURE BOUNDARY ADJUSTMENT PROCESS

From time to time adjustments in the Forest boundary are needed. In some cases parcels of land are removed from the boundary to allow alternative, necessary public uses by local governments. In other cases it may be desirable to add small parcels adjacent to the Forest so they can be purchased for

resource protection or to meet expanding recreational needs. Property boundary changes of 40 acres or more require approval by the Natural Resources Board. Ch. NR 44 provides a plan amendment process that may be used to make adjustments in the Forest boundary. Requests to amend the master plan for a property boundary change are forwarded to the Natural Resources Board. If the Board agrees to consider the proposal, the subsequent review process includes public notification and an opportunity to comment. The Board must approve all plan amendments. Because Federal funding has been used for land acquisition on the NH-AL, approvals from federal agencies may also be required prior to removing land from the approved boundary.

NH-AL Proposed Boundary Expansion



Administration and Operations Provisions

EASEMENTS, ACCESS PERMITS, AND LAND USE AGREEMENTS

Easements provide access across state property for utilities, town roads, or county highways. Easements are permanent and would continue to be upheld under the revised master plan. Access Permits provide access across state property to private ownership within the forest boundary. Land use agreements provide for a variety of uses on state forest property, such as snowmobile trails and other recreational facilities open to the public. Land use agreements and Access Permits would continue to be evaluated periodically. The Department may grant new land use agreements where they meet a significant public good and do not conflict with the plan's goals and objectives.

State forests, including the NH-AL, regularly open and close forest roads primarily to conduct forest management. Roads open for management purposes are generally open to the public during the management period (one to two years) and a short time thereafter to allow access for firewood collection or other uses. Following this period they are closed with gates or berms. The same general miles are open to public vehicles across the NH-AL over time, but in different locations. This variable condition represents the historic use availability for public and tribal access. Road access for the disabled is provided of on a case-by-case basis by permit from the NH-AL Superintendent.

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ADMINISTRATION AND OPERATIONS PROVISIONS

The following section describes general practices, laws, policies, facilities, and other factors that are applied to all lands of the Northern Highland – American Legion State Forest that are under state ownership.

FUNDING CONSTRAINTS

Implementation of the master plan is dependent upon staffing and funding, which are set outside of the master plan. Operational funding for state forests is established biannually by the state legislature. Development projects also follow an administrative funding and approval process outside of the master plan. Many of the initiatives proposed in the revised plan are dependent upon additional funding and staffing support. Therefore, a number of legislative and administrative processes outside of the master plan will determine the rate this revised master plan can be implemented.

FACILITY MANAGEMENT

New or renovated recreational facilities will be designed according to state building codes and Department design standards and codes. The Forest Superintendent may also close and relocate campsites, renovate facilities, and relocate trail segments as deemed necessary.

The Forest Superintendent may maintain and construct storage buildings or other similar facilities to support the management of the state forest, as is authorized by normal Department facility approval processes. The structure's location and design must be consistent with the land classification requirements (NR 44) and the management objectives for the Area in which it is located.

DISABLED ACCESSIBILITY

All new construction and renovation of facilities will follow guidelines set forth within the Americans with Disabilities Act (ADA) and also be done in a manner consistent with NR 44 standards of the landuse classification of the site where the development is located. Across the NH-AL, the State Forest Superintendent has the authority to make reasonable accommodations for people with disabilities, consistent with the requirements of the area's landuse classification.

STATE FOREST ROAD ACCESS POLICY

There are currently about 60 miles of permanent department-managed inventoried roads on the forest and many of these roads are open to public vehicles. All state forest roads are open to public access with street licensed vehicles unless the road is bermed, gated, or signed closed. Roads are closed to ATVs. The Forest Superintendent may close a road to public use if it becomes degraded, causing unsafe conditions for public vehicles.

PUBLIC HEALTH AND SAFETY

All facilities will comply with federal, state, and local health and sanitation codes; such as well testing, campground licensing and wastewater treatment. The Forest Superintendent has the authority to close campsites or campgrounds, trails, and other facilities on the forest when necessary due to health, safety, or environmental damage concerns.

Within designated public use areas such as campgrounds, picnic areas, parking lots, and high use trail systems, trees or other natural elements that are deemed public hazards will be removed. Safety inspections are done at least twice per year.

Administration and Operations Provisions

EMERGENCY ACTION PLAN

The property maintains on file an emergency action plan that describes staff response and coordination with other agencies to natural disasters as they affect public safety and facilities. It is reviewed annually.

AUTHORIZED RESPONSE TO CATASTROPHIC EVENTS

Wildfires, timber diseases and insect infestations shall be controlled to the degree appropriate to protect the values of each management area. Necessary emergency actions may be taken to protect public health and safety. The appropriate management responses to catastrophic events are prescribed in each individual management area write-up.

FIRE SUPPRESSION

As stated in Wisconsin Statutes 26.11, "The Department is vested with power, authority and jurisdiction in all matters relating to the prevention, detection and suppression of forest fires outside the limits of incorporated villages and cities in the state except as provided in sub (2), and to do all things necessary in the exercise of such power, authority and jurisdiction." Forest fire suppression actions within the state forest will consider the property management goals and the threats of the fire to life and property. Appropriate techniques will be used in each event to provide effective fire suppression while minimizing resource damage.

REFUSE MANAGEMENT

Refuse is collected by a private contractor from designated sites at campgrounds and other primary use facilities. Recyclable items are collected by NH-AL staff. Visitors are required to carry out any refuse they bring in when there are no designated refuse or recycling receptacles present. This carry-in-carry-out policy applies to most primitive campsites, trails, and boatlandings. Burying of refuse is not allowed anywhere on the property.

MILITARY ACTIVITIES

Use of the property by the military will be restricted to those uses that are compatible with the objectives of the proposed master plan. Approved military activities would require a special use permit. Military activities that generally occur on state forests include: orienteering training, wilderness camping, cooperative training, and development projects that further the goals of the property, such as trail construction or fish habitat improvement.

COOPERATION WITH WISCONSIN VALLEY IMPROVEMENT COMPANY

The NH-AL acquired lands surrounding the Rainbow Flowage in 2004 from Wisconsin Valley Improvement Company (WVIC). The Rainbow Flowage is located in the American Legion part of the NH-AL in Oneida County. Much of the land immediately surrounding the Rainbow Flowage is covered by restrictive covenants held by the WVIC.

The DNR and WVIC have individual roles and responsibilities for managing the Rainbow Flowage. However, each is dependent upon the other to successfully fulfill its management objectives. WVIC and the DNR will continue to consult regularly to maintain clear understanding of their management roles and objectives and cooperative approaches through lease or land use agreements. Through the NH-AL Master Plan the DNR will implement a multi-use resource program and provide compatible recreation. Under the authority of the FERC license, WVIC will continue to implement the required and approved flowage operation and related environmental and recreational plans. The DNR may petition FERC if any major issues arise.

RESEARCH

The Northern Highland-American Legion State Forest is an ideal place to conduct experimental trials and research. For many years various universities and other institutions have used this forest for research, much of which has been conducted at the UW Kemp Research Station located within the NH-AL boundary. The research conducted by forest managers, scientists and partners from the University of Wisconsin has been beneficial for the forest as well as for the Department over all. There are always many new research projects being proposed and the forest will continue to review these requests to be conducted on state forest land.



A**PUBLIC COMMUNICATION PLAN**

The public and other governments will be provided opportunities to have an on-going involvement in the application of this master plan. This communication plan describes how the public will be periodically informed about activities and developing issues on the Forest, and it provides information on how the public will be notified of opportunities for involvement when significant, new issues related to management of the NH-AL arise.

Annually the Forest Superintendent will issue a report that summarizes the following:

- For the past year, the primary management and development activities (including timber sales) that were completed and other significant issues that were addressed.
- For the following year, outline any proposed management and development activities (including timber sales) and any changing management actions or approaches.

The annual report may also include other information of interest to the public on various topics related to management and use of the Forest. Some of the additional types of information that may be included from time to time are: the status of forest insect or disease problems, fire or storm damage, new information on endangered or threatened species, recreational management problems or new opportunities, and recreational use changes or trends.

The Forest Superintendent will maintain a list of persons, groups, and governments interested in receiving information about on-going management of the Forest. The annual report will be made available via mail or e-mail to persons on the list. The annual report will also be available to other potentially interested parties on the WDNR Internet Web site.

In the event the Department considers a change to the master plan (plan variance or amendment) all parties on the mailing list will be advised of the proposal and informed of the review and comment process. As appropriate, news releases will also be used to announce master plan amendment and variance proposals and review procedures.

Tribal Consultation

The NH-AL Superintendent will consult at least annually with the Lac du Flambeau Band as well as the Voight Intertribal Task Force of the Great Lakes Indian Fish and Wildlife Commission on state forest management issues related to their treaty rights. Special consultation meetings with the Band will be scheduled as needed, should any issues warrant immediate attention.

Contact Person

The NH-AL Superintendent should be contacted regarding questions about the State Forest or its master plan. At the time of this publication, the NH-AL superintendent may be contacted at:

WDNR Service Center

8770 Highway J

Woodruff, WI 54568

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BACKGROUND AND AFFECTED ENVIRONMENT

INTRODUCTION

The Northern Highland-American Legion State Forest (NH-AL) is located in central northern Wisconsin in Vilas, Oneida, and Iron Counties. This area epitomizes the state's "northwoods" with its vast forests, lakes, wetlands, streams, and diverse recreational opportunities. Almost half of the land within the region is publicly owned in national, state, and county forests.

The region's bountiful natural resources drive its economy, primarily through the forest products and tourism industries. Second-growth northern hardwood and aspen forests dominate most of the forests, while wetlands, streams, and lakes provide habitat for many species, including rare plants and animals.

The NH-AL, Wisconsin's largest state forest, has more than 226,000 acres of state-owned land. More than two million visitors come each year to enjoy the area's natural beauty. The forest's world-class lakes and easily accessible location near the Minocqua-Woodruff tourist center set the stage for the NH-AL to play a major role in the region's outdoor recreation.

EARLY HISTORY

The greatest event to shape the Northern Highland-American Legion State Forest landscape occurred some 10,000 years ago when the last glacier retreated. The Ontonogan Ice Lobe transported huge deposits of boulders, rocks, gravel and sand, or "outwash" as the foundation layers of sand and gravel are termed. Frequently, ice blocks broke off the retreating glacier, and became mired in the layers of outwash. As the ice blocks melted, they left deep depressions or "pits" that filled with water to become lakes. In fact, the glacier left one of the largest concentrations of these "kettle lakes" in the world. Over 900 lakes and hundreds of miles of streams and rivers lie

within the state forest's boundaries. Vast wetlands formed where shallower ice blocks left low depressions.

The resulting pitted outwash helps define the ecological profile of the NH-AL State Forest. Most of the upland soils that developed in the centuries following the glacier are dry, sandy, and low in nutrients. Before European settlers came to the region, the sandy pitted outwash forests gave rise to one of the upper Midwest's extensive red and white pine-dominated forests with a mixture of white birch, aspen, and jack pine. Sandy soils, periodic fires, and other natural disturbances such as windstorms, insects or disease contributed to the formation of forests composed of white pine, red pine, aspen, red oak, and white birch.

The Menominee, Sioux, Ojibwe people occupied the NH-AL area from time immemorial to Euro-American settlement leaving a legacy not only of forest settlements and burial grounds, but also of ecological stewardship derived from an intimate and interdependent relationship with the natural world. Through the 1825 Prairie du Chien Treaty, these tribal nations resolved their own respective territorial claims and recognized the NH-AL area as within Ojibwe territory. While their respective histories are complicated and intertwined, a common thread running through their culture and lifestyles remains a profound connection to the natural world.

For the Ojibwe, this connection manifests itself today through the continuing exercise of their reserved rights to hunt, fish, and gather in the NH-AL as guaranteed in the 1837 and 1842 land cession treaties with the United States. Although disputed through a number of lawsuits during the 1970s and 1980s, these rights – including the rights to regulate these activities in cooperation with the state to ensure that they do not adversely impact species' long-term conserva-

tion needs – was affirmed in federal court in 1983 in what is known as the “Voight decision.”

Throughout the 1800s, the young nation’s expanding Euro-American population inexorably pushed further and further into the western Great Lakes. For Wisconsin’s native peoples, in influx of settlers accelerated the changes already underway. The new settlers were focused on staking a claim to property they could call their own. By 1860, through a series of sales, treaties, and armed conflicts, most tribal lands in Wisconsin had passed into the hands of non-Native Americans.

Gradually, pioneers, loggers and tourists came to the NH-AL region. Logging began in the 1890s and continued to boom in the early 1900s as the railroad system reached northward. Years of logging dramatically changed the forest’s beauty, leaving behind stumps and slash, which in turn provide fuel for the forest fires that followed.

The barren and burned land lay unproductive, causing lumber companies to sell. The State Legislature saw value in this land, and beginning in 1907, provided the financial means to acquire large land holdings. By late 1908, the state had purchased a total of 33,884 acres in parts of Vilas, Oneida, and Iron counties. This land was designated as the Northern Wisconsin State Park.

The State Legislature established the Northern Highland State Forest in 1925 and the American Legion State Forest in 1929 from forest reserves set aside earlier in Iron, Oneida and Vilas counties. The two forests were managed separately until 1968, when they were combined into one administrative unit. Today, the NH-AL State Forest is Wisconsin’s largest state-owned property.

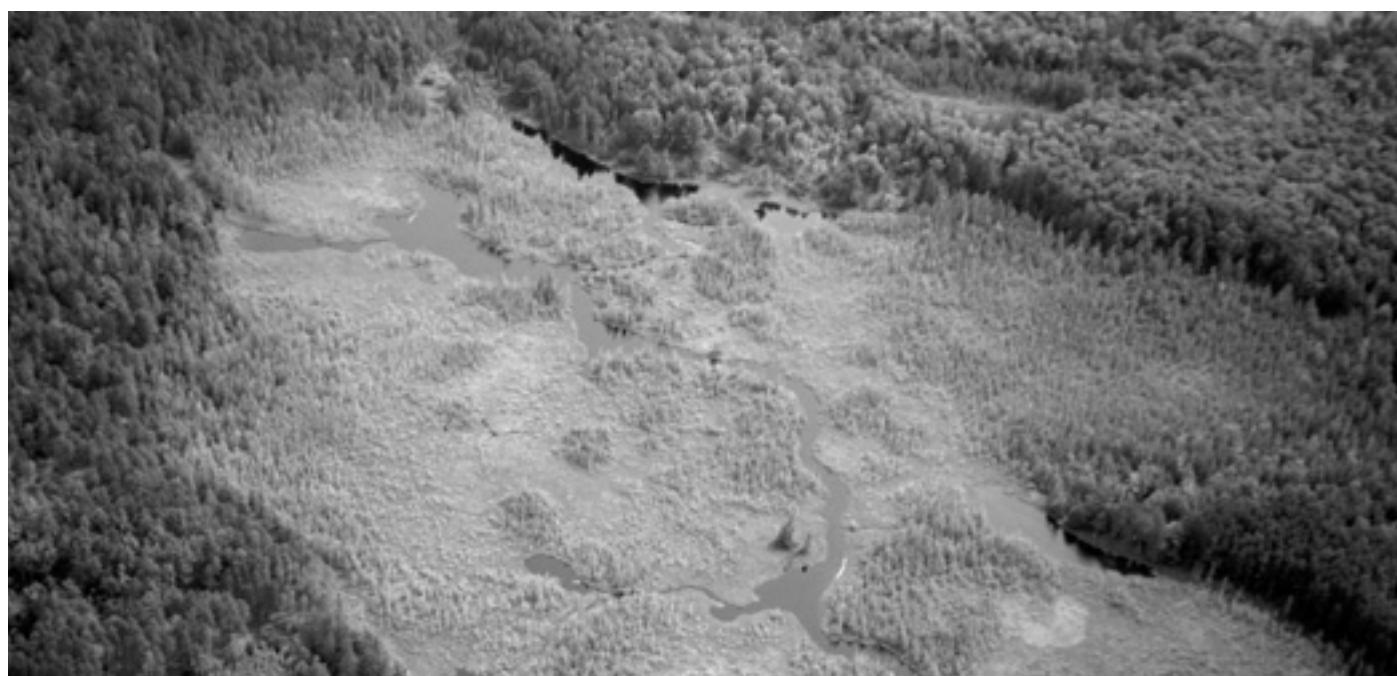
PAST STATE FOREST MANAGEMENT AND USE

The Northern Wisconsin State Park, as the 1908 acreage was originally called, took on a pioneering role in initiating many programs that are important in forestry today. Wildfires were controlled, and an aggressive reforestation program began with the first state-owned tree nursery established at the Trout Lake Headquarters in 1911. Tree seedling production increased to 11 million trees per year during the era of the Civilian Conservation Corps (CCC), between 1933 and 1942.

The reforestation program on the Northern Highland State Forest began in 1911 with the planting of 154 acres. With the exception of two years, 1915 and 1943, the reforestation program has been in operation each year since 1911.

The program reached its peak in 1934 with the planting of 4,276 acres. From 1911 until 1949, the total acreage planted (original plus replanting) was 27,027 acres. The reforestation program on the American Legion State Forest began in 1931 and continued up to 1946, with the exception of 1935 and 1942. During that time, 3,722 total acres were planted (original plus replanted) (WCD 1950).

Early timber management included prescriptions for recreational and scenic considerations by designating river, lake, and roadside timber preserve strips. It also classed all state-owned islands as timber preserve areas, and established the Dunn Lake Natural Area, Escanaba Lake Natural Area, Star Lake Natural Area and Trout Lake timber preserve area. Land not reserved for aesthetic purposes was managed to produce the maximum volume of forest products.



Much of the area was reforested with pine or developed a second-growth forest dominated by early successional trees, such as aspen and white birch. Considering the relatively young age of the forest, prior to 1943 the production of timber products in the state forest consisted only of the sale of fuel-wood and timber salvage from blown-down trees. Management operations occurred to a limited extent during the late 1940s.

From 1944 until 1949 on the Northern Highland State Forest, a total of 3,207 acres were cut, yielding an average annual cut of 2,383 cords per year. In that same period, 552 total acres were cut on the American Legion State Forest for an average annual cut of 425 cords per year (WCD 1950).

As the forest matured, timber management became more significant to maintain the health of the forest and sustain it over time. As a result, the number of timber sales and the annual timber revenue climbed steadily through the 1950s and 1960s. The forests of aspen and birch were around the same age and reached harvestable age in the 1970s.

Management of the Northern Highland and American Legion State Forests also focused on recreational development to improve the facilities and opportunities for participation in outdoor recreation. In general, recreational development focused on campsites, picnic grounds, "bathing beaches," and other water-related activities of canoe routes and public access. Two principal hiking trail systems were laid out, but over the years, many of the trails fell into disuse and public use did not live up to expectations (WCD 1950).

The report further indicates that in the mid-to-late 1940s, camping as a principal form of outdoor recreation grew "phenomenally" on the Northern Highland and American Legion State Forests. Campsites were divided into two classifications: primary and secondary. Primary campsites were equipped with picnic tables, pit toilets, pumps, and in some cases, piers. Secondary campsites, also called wilderness campsites, were mainly located on canoe routes, islands or remote lakeshores inaccessible by automobile. No effort was made to provide formal camping facilities at these sites.

Prior to 1967, game management was treated separately from recreational development as a cooperative effort between the Game Division and Forests and Parks Division. No definite projects or detailed game management techniques were included. In general, managing for maximum recreational and scenic attractions plus maximum forest and game yields over time was encouraged.

After 1975, management for wildlife habitat and endangered resources were integrated with overall forest management

activities. Since the 1982 NH-AL master plan was approved, management has continued to evolve based on new knowledge and policies related to state forests. Over the years, foresters incorporated management techniques including forest reconnaissance mapping, Big Tree Silviculture, and the WDNR Habitat Classification System. Management also addressed outdoor recreation and aesthetic practices as interest in those needs increased.

OVERVIEW OF CURRENT STATE FOREST USE AND MANAGEMENT

Current land management of the NH-AL reflects an integrated approach and considers the needs of all resource elements and their uses. Management actions account for forest stands and conditions, aesthetics, water quality, aquatic and terrestrial wildlife habitat, forest products, native biological diversity, resource protection, and recreation.

Many land management practices are also designed to support natural processes by simulating some aspects of the natural disturbance caused by fire through timber harvest, planting, soil disturbance, and other methods. For some areas, no active or passive management is used to protect or perpetuate certain habitats. The use of aesthetic management practices, particularly along roadways and shorelines, is a common element of timber harvesting. Water resource management objectives aim to maintain the high water quality, scenic beauty, and diverse habitats provided by the NH-AL's extensive lakes and streams.

The forest is managed for a variety of habitat and ecological goals that result in the production of valuable forest products. The annual production of forest products on the NH-AL averages over 40,000 cords and 2 million board feet. About 20% of the forest (43,848 acres) ranges from no management to reduced or modified management practices. These are lands classified in the 1982 plan as wilderness areas, wilderness lakes, wild areas, wild lakes, public use natural areas, scientific areas, and scenic areas.

Recreation is an important component of current management and use of the NH-AL. With over 225,000 acres, 900 lakes, and hundreds of miles of streams and rivers, it is the state's largest and most visited property.

Ojibwe tribes with treaty-reserved rights continue to hunt, fish and gather within the NH-AL boundaries.

People are drawn to the forest for many different recreational opportunities. The NH-AL offers a wide variety of water-based activities and a range of camping experiences. There are more than 900 total campsites. This includes remote canoe and backpacking sites and modern sites that feature showers and flush toilets. Year-round visitors use the designated trail

system for hiking, mountain biking, cross-country skiing and snowmobiling. Hundreds of miles of logging roads and non-designated trails are also open for all types of non-motorized uses.

The NH-AL offers numerous hunting opportunities. Each fall the state forest draws hunters from across the state and region for gun and archery deer hunting, as well as hunting ruffed grouse, woodcock, and waterfowl.

Another important offering is remote, non-motorized recreational activities. Currently, the remote, non-motorized recreation lands on the NH-AL include the 5,400-acre Manitowish Wilderness Area, and nearly 27,900 acres of wild areas with timber management, but limited motor vehicle access. The NH-AL also has 19 wilderness lakes and 41 wild lakes, which are quite rare regionally, and are highly popular for their remote, backpack and canoe campsites. These wild lands and lakes are sought by hikers, hunters, canoeists, and wildlife viewers who desire quiet, more pristine "backcountry" experiences.

Whether camping or staying in a resort or vacation home, visitors have long considered the NH-AL and nearby tourist service area a major vacation destination area. The NH-AL offers visitors an exceptional combination of scenic undeveloped forests, lakes, streams and bogs, along with a full range of quality outdoor recreational opportunities in a readily accessible location. Management of the state forest reflects the multiple benefits provided.

LAND OWNERSHIP

In a regional context, the NH-AL State Forest sits amid numerous other public lands in north central Wisconsin. The major public land ownership includes the Chequamegon and Nicolet National Forests, county forests, and other state-owned lands such as the Willow Flowage Scenic Waters Area and Turtle Flowage Scenic Waters Area. Private lands in the area include industrial forests, non-industrial private forests and tribal lands, including the Lac Du Flambeau Indian Reservation adjacent to the NH-AL.

Total acreage within the NH-AL boundary is approximately 345,000 acres, and covers parts of three counties (Vilas, Oneida and Iron) and 14 townships. This acreage includes approximately 48,000 acres of surface water (in over 900 lakes). The acquisition goal for the Forest is 226,200 acres; currently the state owns 99 percent of this goal, about 225,000 acres. A significant proportion of the private ownership within the NH-AL occurs around the lakes. This is especially true for large lakes of over 100 acres.

Primary uses of the lands of the region include recreation, timber production, limited agriculture (cranberry and wild rice

production), and residential and tourism development. Private lands within and around the state forest are experiencing increasing development pressures, especially on lake and stream shores. Increased development pressure also increases the demand for property, thus raising property values and making it difficult to purchase additional public land.



ECOLOGICAL CAPABILITIES MAJOR ECOLOGICAL LANDSCAPES

The National Hierarchical Framework of Ecological Units (NHFEU) classification system describes the overall ecological characteristics of the NH-AL. This system provides a basis for assessing resource conditions and capabilities at multiple levels.

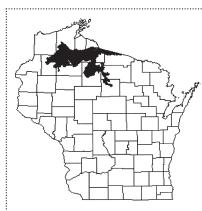
All the lands within these units have similar ecological characteristics that are formed by such things as climate, soils, geology, relief, and natural disturbance history. The NH-AL is primarily in the NHFEU Sub-section 212Jm, Northern Highland Pitted Outwash. A small amount of the northwestern edge of the NH-AL lies in Subsection 212Jc, Winegar Moraines Sub-section. This regional information is important because it defines how the capabilities of the NH-AL differ from other large public lands such as county and national forests in northern Wisconsin.

(Please refer to for the *Ecological Landscapes of Northern WI p3-2 Shaping the Future binder*).



Subsection 212 Jm. Significant ecological resources on the NH-AL State Forest that occur in Subsection 212Jm (Northern Highland Pitted Outwash) include high densities of kettle lakes, the headwaters for many major streams, large open acid peatlands and sedge meadows, and extensive dry forest types. Currently, the NH-AL forest contains a high density and composition of aspen and is important for species that utilize saplings and young upland deciduous forest as habitat. At the subsection level, there is considerable potential for large-block management since the forests are only moderately fragmented and connections might be made with the Nicolet-Chequamegon and Ottawa National Forests. Within the subsection, in high density lake areas, the shoreline is highly developed with second homes and roads that make much of this area unsuitable for species that require large unfragmented blocks of habitat, such as the wolf. The area holds high management potential for a variety of neotropical migrant birds, bald eagles, ospreys, common loons, and aquatic features. Habitats most in need of management attention are lakes, mature upland conifers,

mature upland mixed coniferous-deciduous forests, mature and sapling upland deciduous forests, sedge meadows, and bogs. Species in need of management attention include the mudpuppy in lakes; Connecticut and Blackburnian warbler in mature upland conifers; black-throated blue warbler and four-toed salamander in mature deciduous forests; northern goshawk in mature upland mixed forests; star-nosed mole in open lowland conifers; golden-winged and chestnut-sided warbler and pygmy shrew in deciduous saplings.



Subsection 212Jc. A small portion of the NH-AL State Forest is located in Subsection 212Jc (Winegar Moraines). Significant ecological resources that occur in this subsection are large wetlands including forested, shrub, and herbaceous types, as well as bogs. Kettle lakes are quite common but are often acidic and low in nutrients. Many cedar swamps exist that are important as deer wintering yards. Uplands contain mesic hardwood forest communities that have been fragmented by intensive forest management. However, the potential to manage for forest interior species occurs here because the matrix is primarily comprised of forests. This area may be suitable for wolf management

because of the low density of roads and lack of human development. Given current land management, this area is important for species requiring sapling and young upland deciduous forest habitats. Habitats most at risk or in need of management attention are mature upland deciduous forests, marshes, mature lowland deciduous forests, closed lowland conifers, and shrub habitats. Species in need of management attention in this subsection are the Canada warbler and arctic shrew in closed lowland conifers; black-throated blue warbler and four-toed salamander in mature upland deciduous forest; northern goshawk in mature upland mixed forests; star-nosed mole in open lowland conifers; golden-winged warbler and pygmy shrew in shrub swamps.

A more detailed discussion of the ecology of the NH-AL and surrounding region may be found in the *Regional Ecology Wisconsin Northern State Forest Assessment, March, 1999*.

ECOLOGICAL ZONES OF THE NH-AL

For planning purposes, the NH-AL's two primary ecological landscapes, the Winegar Moraines Sub-section and the Northern Highland Pitted Outwash Sub-section discussed above, were further divided into smaller ecological zones.

NATURAL DISTURBANCES—A STRONG FORCE IN SHAPING THE NH-AL'S HISTORICAL VEGETATIVE LANDSCAPE

Prior to the extensive removal of timber in the Northern Highland Ecological Landscape, the location and age of the majority forest stands was mostly a result of the complex natural interactions. Fire occurred as both high intensity stand-replacement fires that killed the canopy trees and as lower intensity fires that burned under the trees modifying the structure and composition of the shrub and ground layer species. Windthrow from large storms (downbursts, ice storms and tornadoes) toppled many trees, especially large old trees, in their path. Insect outbreaks attacked many tree species, but were especially prominent on jack pine and balsam fir stands older than 50 years. Drought patterns reoccurred every 10 to 12 years. When the drought years coincide with the other forces, exceptional landscape changes in forest structure can occur.

Relationships exist between fire patterns, forest communities, and landscape patterns. The location, size, shape, and compass alignment of lakes and streams along with the abundance and location of islands influenced fire patterns. The fires also entered wetlands, which in a similar pattern were affected by size, shape, and alignment.

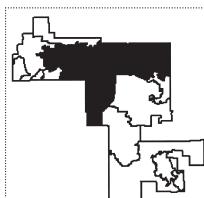
The combined effects of the above events shaped a landscape of varying tree composition and ages of stands. The average interval of stand replacement fires favored different tree species.

- The landscape was open or dominated by barren species (oak grubs), scattered jack pine groves and individual red pine trees for less than 60 or 70 years..
- Jack pine forest, which included aspen, birch and groves of red pine was promoted by forest conditions for 70 to 120 years.
- Red pine forests with numerous pockets of white pine, aspen, and paper birch were favored by conditions for 120 to 150 years.
- White pine, red pine, red oaks and numerous groves of aspen and white birch accompanying the pines were favored by 150 to 250 years..
- 250+ favored development of a White pine, yellow birch, and eastern hemlock forest development were favored for 250+ years. Aspen and paper birch were limited to ridge tops and wetland edges.

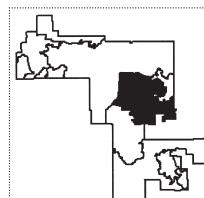
The division is based on local differences in soils, topography, vegetation, pre-settlement and current conditions, and other data. (Note: These ecological zones are not part of the National Hierarchical Framework of Ecological Units (NHFEU) classification system.)

The ecological capabilities of these zones provide the framework for understanding the forest type or natural community a specific area can produce and what it does best. In other words, these ecological zones highlight ecological potentials for different parts of the NH-AL. The following ecological zone descriptions also give an overview of the land resources of the NH-AL. The acreages listed includes all land, both public and private.

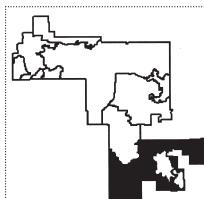
Vilas/Oneida Sandy Plains



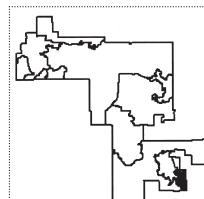
Vilas Sandy Plains North



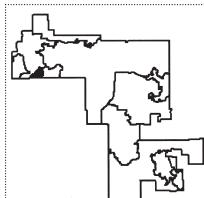
Vilas Sandy Plains Central



Oneida Sandy Plains



Stone Lake Ruffed Grouse Area



Sherman Lake Ruffed Grouse Area

The Vilas/Oneida Sandy Plains covers 148,800 acres or 66 percent of the NH-AL, and is by far the most dominant ecological zone on the forest. This zone showcases the forest's most common characteristics, the rolling (pitted outwash) topography peppered with abundant lakes and wetlands, and highly sandy soils.

Historically, fire was a significant factor here, as the soils are excessively well-drained sands that tend to produce very dry, fire-prone conditions. Forest stand-replacing fires occurred in 50- to 200-year cycles, but some trees survived to live over 300 years. Also, some fires burned along the ground, without killing the larger pines. This created a more open forest condition that is generally not seen today.

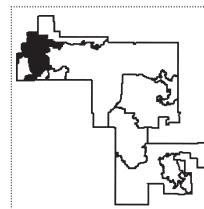
Before Northern Wisconsin was settled by Europeans, this zone was mostly covered with white and red pine stands, with white birch and aspen found secondarily across the zone. Some patches of jack pine and northern hardwoods were also present. The forested wetlands in this zone were tamarack historically, with black spruce being common and hemlock a minor species.

Today, aspen dominates this zone with white birch, red oak, and red pine mixed in at significant amounts as well. Those sites with slightly richer soils, such as in the Trout Lake area, have a higher oak component. Overall, the vegetation can be described as a varied "patchwork" of large and small patches of different timber types common to this zone.

The habitat types in this zone are typically characterized by an understory of shrubs such as hazelnut, juneberry, low sweet blueberry, sweetfern, and maple-leaf viburnum, and herbs such as wild lily-of-the-valley, bracken fern, grasses and sedges, and big leaf aster.

Based on the zone's ecological capability of its current forest conditions, the best management opportunities for this zone lie in increasing the pine acreage over time. The use of regeneration cuts to encourage aspen, white birch and jack pine would simulate some of the natural disturbance that fire created in the past. Some fire use may be incorporated into management.

Manitowish Peatlands



The Manitowish Peatlands include approximately 25,650 acres, which represents 11 percent of the land within the NH-AL boundary. It is one of Wisconsin's largest peatlands. The topography is nearly level throughout. It is characterized by large expanses of lowland communities, including open bog, poor fen, black spruce, swamp hardwoods and tamarack, much as it was before European settlement.

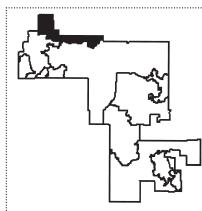
Many of the lowland zones contain sandy "islands" that are forested mainly with scattered red, white and jack pine. Soils are mostly very poorly drained organic peat. Some areas have sandy and loamy sand soils. Historically, both fire and floods, with the water table rising in wet years and dropping in drought years, were the major influences to the vegetation.

Prior to European settlement, the northern portion of uplands were dominated by hemlock, white birch, and white pine, while uplands areas to the south were dominated by red pine, white pine, and aspen. Within the forested wetlands, tama-

rack was predominant, with black spruce, swamp hardwoods and white cedar forest also present in significant numbers.

Today, this zone is a matrix of different tree species and natural communities. Unforested wetlands dominate half of the zone. Forested wetlands such as tamarack and black spruce are scattered across the landscape. Aspen, white birch, red pine and white pine are found in significant amounts on the uplands. There are also areas of northern hardwoods and hemlock-hardwoods. Most stands are a mixed mosaic of tree species. Management today has the opportunity to protect the habitat and rare species that prefer it.

Winegar Moraines



The loamy soils and Northern hardwood and hemlock-hardwood forests are uncommon within the NH-AL. The topography of the 10,000-acre Winegar Moraines zone is predominantly rolling, with abundant wetlands and many lakes. This zone covers 4 percent of the state forest.

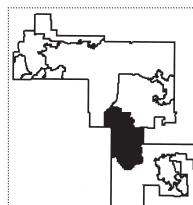
Soils are mostly well-drained sandy loams, silt loams and organic deposits. Historically in this zone, wind was the dominant disturbance factor in the older forest. Blowdowns of individuals and small groups of trees were frequent, while blowdowns of larger patches were infrequent. Catastrophic fires were extremely rare here, in sharp contrast to the drier, sandier soil areas.

At the time of European settlement, the uplands were mostly covered with hemlock and yellow birch, with sugar maple as a secondary species. The drier sites in the zone included white birch and white pine with secondary aspen, red pine, yellow birch and sugar maple. Within the forested wetlands, tamaracks dominate, with black spruce secondary. Today's upland forest contains both aspen and northern hardwoods stands. There are also areas of hemlock-hardwoods, white birch, and black spruce forest, and unforested wetlands.

The habitat types in this zone are characterized by herbs such as wild lily-of-the-valley, lady fern, shield fern, grasses and sedges, and big leaf aster, with a poorly developed shrub layer.

This zone offers an opportunity to restore hemlock and yellow birch. The dominance of eastern hemlock or sugar maple would have to be developed with selective thinnings in the northern hardwood type. Yellow birch is present in the stands, and with some gaps created in the forest stands it potentially could become a greater component in the future.

Big Arbor Vitae Loamy Hills



This zone represents 25,000 acres, about 11 percent of the NH-AL. It has varied topography and an assortment of different forest types. Lakes are common but lowlands, while certainly present, are not as widespread as in other zones on the NH-AL. At a large scale, this is one of the more ecologically intact forested portions of the NH-AL. Many of the white and red pine and northern hardwoods stands possess or are developing old-growth characteristics.

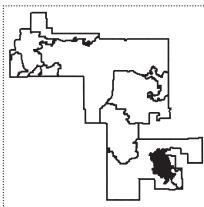
Fire was a significant disturbance factor within this zone's history, as it was across almost all the state forest. Wind-thrown was and still is another important disturbance factor, especially in areas with wetter soils. Sporadic wind events also occurred on drier upland sites as well and played a vital role in shaping forest succession. At European settlement, the upland areas contained several different forest types including northern hardwoods, hemlock-hardwoods, white and red pine, and even some jack pine/scrub oak. White birch, red maple, aspen and oak were found secondarily across the region. Within the forested wetlands, tamarack and black spruce were predominant, with some scattered cedar.

Today the zone's forest is characterized by a mixed matrix of tree species with northern hardwoods, aspen, oak and white birch dominant on the uplands but slowly being replaced by white pine, balsam fir and red maple through succession. There are some areas of mature red and white pine also, and these species are found extensively throughout the zone as important secondary species. While there are significant northern hardwood areas, hemlock-hardwoods are relatively scarce.

The habitat types in this zone are typically characterized by a moderately developed shrub layer of hazelnut, low sweet blueberry, juneberry, and maple-leaf viburnum, and herbs such as wild lily-of-the-valley, bracken fern, grasses and sedges, and big leaf aster.

The ecological capability of this zone offers the opportunity to restore the white pine, white birch and the northern hardwood species (red oak, yellow birch, sugar maple and eastern hemlock). Harvests that encourage the shade-loving species include thinnings and gap openings. To perpetuate stands of white birch and oak, significantly more open management harvests, including clearcuts, would be necessary in those areas.

Rainbow Wetlands (Big Swamp)



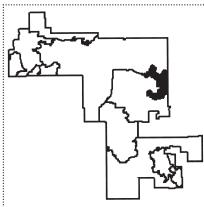
This 8,300 acre zone (4 percent of the NH-AL) is characterized by peat or wet, organic soils covered by large expanses of open bog, northern sedge meadow, shrub swamp, open bog, and muskeg. Scattered, low sandy ridges and islands covered with mixed aspen/pine forest punctuate this peatland landscape. A mature red and white pine forest covers some of the adjacent uplands.

Like nearly all of the NH-AL, fire was the dominant natural disturbance factor in this zone. Wind-throw, as well, was and continues to be a major influence due to the shallow root systems of trees in high water-table areas.

At European settlement, white pine, red pine, and white birch were the predominant upland trees. Aspen, yellow birch, and hemlock were found here secondarily. Within the forested wetlands, tamarack and black spruce were predominant, with white cedar present as a secondary component. This zone continues to be a patchwork of different tree species and communities. Today, lowland types dominate most of the zone, with aspen, white birch, jack pine, red pine and white pine found in significant amounts on the uplands.

Based on the zone's ecological capability, the most suitable management opportunities include continued protection of the wetlands and management of the uplands for a combination of white and red pine, aspen, and white birch.

Laura Lake Loamy Hills



The Laura Lake Loamy Hills ecological management zone covers approximately 7,400 acres, or 3 percent of the NH-AL. The land has a rolling to hilly topography. The zone's mostly well drained sandy loam soils are the richest soils on the forest, except for the Winegar Moraine zone, and it supports a mixed forest of sugar maple, basswood, aspen, yellow birch, and hemlock forests that is at or approaching mature forest conditions. Loamy sands and organic deposits also are common across the zone.

Historically, fire was the major disturbance factor. Stand replacing fires probably had 100-300 year cycles. Wind was a factor in disturbance in the older forest, especially where the local landscape was more moist and protected.

At European settlement, the upland areas were mostly covered with white pine, white birch and yellow birch. Aspen, red pine and sugar maple were the important secondary species. Within the forested wetlands, tamarack and spruce predominate, with hemlock, white pine and jack pine secondary. Today, the upland forests are dominated by old-growth

northern hardwoods and hemlock-hardwoods, with aspen, red oak, and white birch.

The habitat types in this zone are typically characterized by a moderately developed understory of shrubs such as hazelnut, maple-leaf viburnum, and low sweet blueberry, and herbs such as wild lily-of-the-valley, bracken fern, grasses and sedges, and big leaf aster. Small, forested wetlands of tamarack, black spruce and white cedar are also found here.

The ecological capabilities of the richer soils here favor continuing the present day management trends, management to increase the white pine and yellow birch to establish a forest with the composition and characteristics of a late-successional forest. The diversity of age classes can be increased through selective harvests and gap openings. On appropriate sites, the hemlock that is present could be maintained and expanded.

OVERVIEW OF CURRENT VEGETATION OF THE NH-AL

The current vegetation of the NH-AL can be described in more detail by examining the plant communities or forest types that are present. The composition of the plant communities present today on the NH-AL and their distribution across the forest is a reflection of the land's ecological capability, as discussed earlier, and the management and natural disturbance history of the forest.

Sand-based soils and plant communities that do well on these sandy soils dominate the NH-AL. Loamy soils and the plant communities that thrive on these loamy soils are uncommon. Twenty-nine terrestrial and wetland plant communities were identified on the NH-AL. Table 3.1 lists the natural plant communities, which include 11 upland forest, 7 lowland forest, 7 lowland non-forest, and 4 upland non-forest communities. In addition, 6 aquatic and 3 miscellaneous categories were recognized (Eckstein et al. 2001).

(Please refer to Appendix 4 Map 1: Natural Community Distribution - CROG p.80.)

Several community types express major ecological themes of the NH-AL landscape. The NH-AL includes some of Wisconsin's least disturbed remnants of white and red pine communities. The hemlock-sugar maple-yellow birch forests on the NH-AL are among some of the largest such remnants on state land. A number of specialized plants and animals occur in the peatlands of the NH-AL, while wild rice marshes, no longer common throughout Wisconsin, are found on and around the property. The NH-AL contains a diverse array of aquatic features, including seepage lakes, drainage lakes, spring lakes, spring ponds, small streams, and selected

stretches of medium-size streams, such as the Manitowish and Wisconsin Rivers.

Upland communities account for approximately 72 percent coverage of the public land within the NH-AL property boundary; forested and non-forested wetland coverage accounts for around 23 percent (refer to Hydrology section for discussion of wetlands)¹. In comparing the current forest cover for the NH-AL to the larger northern Wisconsin region, the proportion of northern hardwoods is smaller for the NH-AL and the proportion of both aspen and pines is larger.

The character of the current forest cover on the NH-AL is in part explained by looking at soil types and forest management practices. As discussed previously in the ecological landscape section, the drier and lower nutrient soils of the Northern Highland Pitted Outwash are more ideal for forest communities dominated by red pine, white pine, jack pine, red oak, and paper (white) birch. The prevalence of aspen, a young forest species, is a result of turn-of-the-century logging and fire, and forest management practices of the past decade. Figure 5.1 illustrates the acres of plant communities on state-owned land in the NH-AL.

MAJOR COMMUNITIES OF THE NH-AL

Aspen Community: The aspen community is found throughout the NH-AL and dominates the landscape in many areas. Aspen trees occur as associates in almost all of the other upland forest communities on the NH-AL. While the aspen timber type covers about 33.7 percent of the NH-AL, it

occupies nearly 50 percent of the area available for active management. Because of the practice of Big Tree Silviculture², most aspen stands contain scattered individuals and clumps of mature white pine, red pine, and red oak.

White Pine and Red Pine Communities: While communities dominated by white pine (3.3 percent) and red pine (7.4 percent) make up about 11 percent of the NH-AL, these two tree species are found as very common associates throughout the upland forests of the NH-AL. For the last 25 years, the NH-AL has applied Big Tree Silviculture when managing forest stands. As a result, mature white and red pines occur throughout the NH-AL as individuals or as small clumps in most aspen, white birch, red oak, and northern hardwood communities. As illustrated in figure 3.1, those communities dominated by red pine total 15,964 acres (8,427 acres in plantations). Those communities dominated by white pine total 7,137 acres (588 acres in plantations).

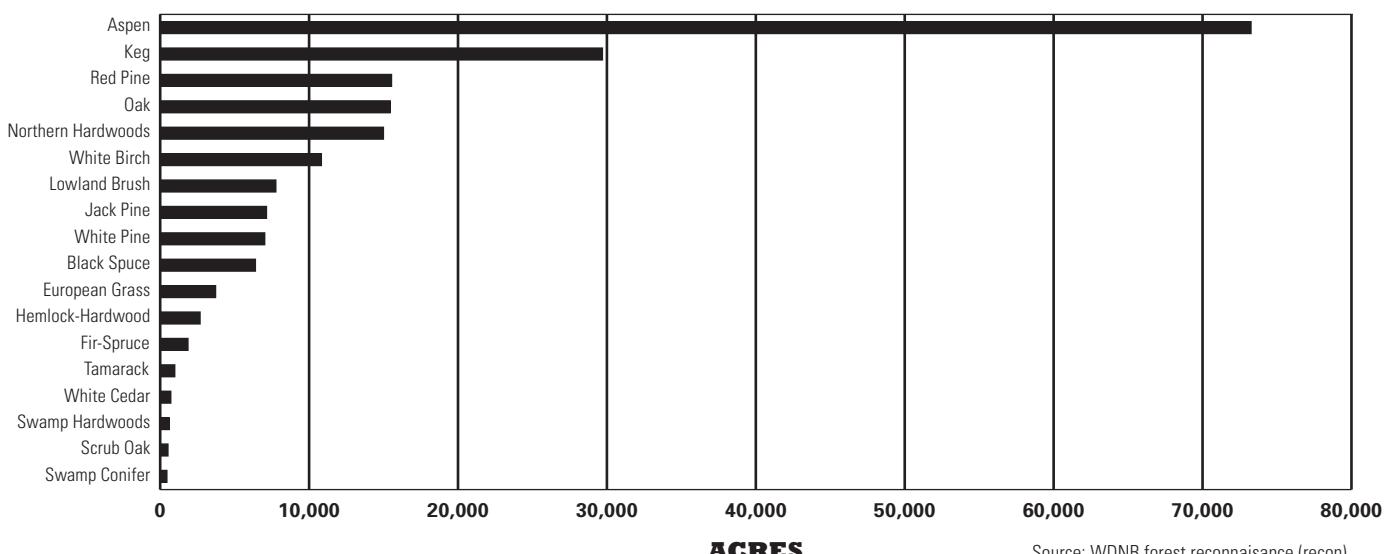
Northern Hardwood and Hemlock-Hardwood Communities: Northern hardwood forests make up about 7 percent of the NH-AL and hemlock-hardwood forests make up about 1.5 percent. Three general areas on the NH-AL have soils with enough nutrients and moisture to allow the growth of northern hardwoods. One location is on the Winegar Moraine in the far north and northwest portions of the NH-AL. Another location is just east of Star Lake, and the third location is just north of Big Arbor Vitae Lake. Most northern hardwood communities are 80 to 90 years old and are very slowly increasing as some aspen stands are converted to northern hardwoods.

Table 3.1 Natural Plant Communities on the NH-AL

Upland Forest	Upland Non-forest	Lowland Forest	Lowland Non-forest	Aquatic	Misc.
Jack Pine	Pine Barrens	Swamp Conifer (fir)	Lowland Brush	Ephemeral Pond	Unclassified
Red Pine	Bracken Grasslands	Black Spruce	Alder Thicket	Emergent Aquatic	Developed
White Pine	Upland Brush/ European Grass	Tamarack	Shrub-Carr	Interior Beach	Private
Aspen	Bedrock Glade	Northern White Cedar	Keg	Submergent Aquatic	
White Birch		Swamp Hardwoods	Muskeg	Aquatic	
Scrub Oak		Bottomland Hardwoods	Poor Fen	Wild Rice Marsh	
Red Oak		Forested Seep	Open Bog		
Red Maple			Northern Sedge Meadow		
Northern Hardwoods			Boreal Rich Fen		
Hemlock-Hardwoods					
Fir-Spruce					

From WDNR Cover Types and Natural Heritage Inventory Communities.

² Since 1974, WDNR's State Forests have been mandated to use Big Tree Silviculture (BTS). Using this policy, NH-AL forestry staff reserved many individual white pine, red pine, sugar maple, eastern hemlock, and red oak trees when conducting clearcut and selective cut timber sales. Because of BTS, the current landscape on the sandy soils on the NH-AL is dominated by young aspen forest with a good mixture of 80-120-year-old white pine, red pine, and red oak.

Figure 3.2 Plant Community Types on State-owned Lands in the NH-AL.

Source: WDNR forest reconnaissance (recon)

Source: WDNR Forest Reconnaissance. The remaining percentage is classified as "miscellaneous" and includes areas "that are either unclassified in the RECON database, such as aesthetic buffers, or occur in rare community types that make up only a fraction of a percent," Eckstein et al. 2001.

Eastern hemlock occurs on the NH-AL as small stands in scattered locations. Logging and fires eliminated most of the eastern hemlock many years ago. The best stands include the former State Trust Lands that escaped the turn-of-the-century logging. Some of these eastern hemlock stands are the oldest forest communities on the NH-AL.

Red Oak Community: Red oak communities make up 7 percent of the NH-AL. Red oak trees are associated with many of the pine, aspen, white birch, and northern hardwood communities on the NH-AL. Most stands are about 80 to 90 years old. The NH-AL's red oak forests are some of the most extensive in the region (i.e., Laurentian Mixed Forest, Province 212).

Jack Pine Community: Jack pine communities make up about 3.5 percent (7,484 acres) of the NH-AL. About 58 percent of jack pine stands are of plantation origin. The largest area of jack pine occurs on very sandy soils in the Boulder Junction area and is of plantation origin. Small stands occur in scattered areas throughout the NH-AL. Small islands of jack pine occur in the Rainbow Flowage peatlands and a wet variant of the jack pine community occurs along Highway 51 just northwest of CTH H.

Large Peatlands: Two large peatlands are found on and near the NH-AL. One includes the Powell Marsh State Wildlife Area and adjacent NH-AL lands. The other is located east (Rainbow Sedge Meadow) and south (Big Swamp) of the Rainbow Flowage. These peatlands are regionally significant habitat areas.

Opportunities for Landscape-scale Management: The Northern Highland-American Legion State Forest is the largest state property. Three National Forests (the Chequamegon, Nicolet, and Ottawa) are very close to its boundaries (but occur on very different landscape types), as are several county forests, intensively managed but undeveloped industrial forests, and a large tribal reservation. Other state lands (e.g., State Wildlife Areas, State Trust Lands, SNAs) are scattered throughout the region. The NH-AL State Forest is the best location in the state of Wisconsin to manage for a major pinery at a large scale, featuring extensive forests that are dominated by white pine and red pine, with associated hardwoods such as red oak, red maple, and paper birch. Representation of missing or diminished successional stages and patch sizes for pine-dominated and other forest communities is not only possible but feasible here, a situation that is matched at few, if any, other locations in the state. Both natural processes and restoration techniques can be used to re-establish the pinery.

Table 3.3 Age of Forested Plant Communities

Age Class (years)	Percent of state owned land open to active management in each age class
1 to 40	44%
41 to 80	22%
81 to 120	31%
120 +	3%

Eckstein et al. 2001.

The property also contains one of the upper Midwest's greatest concentrations of glacial kettle lakes, an abundance of diverse wetlands and streams, excellent examples of less common or well-represented natural communities, and many populations of rare plants and animals.

OPPORTUNITIES TO RESTORE NATIVE COMMUNITIES AND OLD-GROWTH FOREST

Table 3.2 indicates the relatively young age of the NH-AL's forests. About 85 percent of the aspen stands are less than 40 years old. About 50 percent of the red and 60 percent of the jack pine stands are of plantation origin.

Overall, 97 percent of the NH-AL's actively managed forest is distributed between young, intermediate, and mature forest. Less than 3 percent of the actively managed forest is older growth—more than 120 years in age. The oldest forest includes various scattered hemlock-hardwood, northern white cedar, and white pine communities.

The drier upland habitats areas that cover most of the NH-AL (i.e., the Northern Highland Pitted Outwash Ecological Landscape) have the ecological capability to support red, white, and jack pine, aspen, white birch, and red oak, along with northern hardwoods on a few richer sites. The NH-AL represents the best opportunity in the region to restore large areas of red and white pine-dominated forest while maintaining a mix of aspen, white birch, red oak, and jack pine. Opportunities exist for developing old-growth forest in selected areas of white pine, red pine, hemlock-hardwood, northern hardwoods and red oak. The NH-AL uplands also offer opportunities to manage some areas for old-growth forest characteristics and protect diverse communities of plants and animals (refer to Eckstein et al. 2001 for ranking and identification of 52 old-growth site candidates).

WATER RESOURCES

The NH-AL State Forest and surrounding area contains a concentration of lakes that is higher than anywhere else in northern Wisconsin. The area, known as one of the most concentrated lake districts in the world, has the largest number of "kettle lakes," which formed in the deep pits left by blocks of melting glacial ice. The NH-AL contains over 900 lakes within its boundaries, over 6 percent of Wisconsin's total, while the NH-AL land area is barely 0.5 percent of Wisconsin's total land base. Extensive bogs and swamps that formed in poorly drained depressions cover about 21 percent of the Northern Highlands Region (i.e., the NH-AL and the adjacent area with similar geologic landscape). The region is an important headwater area for much of Wisconsin because of its relatively high elevation, great infiltration capacity, and mostly forested watershed.

The lakes and streams in the NH-AL are treasured for their high water quality and provide a variety of habitats, supporting diverse fish, amphibian, invertebrate, and plant communities, with many rare species. The majority of rare plants and animals on the NH-AL were identified in wet habitats. The NH-AL holds the state's largest known populations and large portions of the total number of populations of many aquatic plants. The NH-AL contributes to one of the highest known regional concentrations of bald eagle, osprey, and common loon, which depend on open lakes and rivers. The NH-AL is also fast becoming one of the last places in the state with large undeveloped lakes.

LAKES

The Northern Highlands Region has one of the highest concentrations of kettle lakes in the world. Lakes cover over 12 percent of the surface of the NH-AL State Forest. Lakes can be classified by their hydrology into four main groups. Each provides different aquatic habitats.

- Seepage – landlocked with no surface inlets or outlets
- Drainage – with surface inlet and outlet streams
- Drained – intermittent outlet, no inlet
- Spring – permanent outlet, no inlet

The majority of lakes on the NH-AL larger than 10 acres are seepage lakes. While less numerous, drainage lakes comprise 67% of the surface acreage in the NH-AL. The majority of lakes larger than 100 acres in size are drainage lakes. According to the Biotic Inventory (Epstein et al. 1999), the NH-AL presents exceptional opportunities to protect and manage a diverse array of aquatic habitats including seepage lakes, drainage lakes, spring lakes, spring ponds, small streams, and selected stretches of larger streams such as the Manitowish and Wisconsin Rivers.

One aquatic habitat, soft-water seepage lakes, are particularly diverse and well represented on the NH-AL. A special feature of the NH-AL's primary ecological landscape (Northern Highland Pitted Outwash) is the concentration of very soft seepage lakes. These lakes feature a unique aquatic community characterized by a number of aquatic plants that exhibit a sterile rosette growth form carpeting the lake bottom. A number of rare invertebrates are found in these lakes as well. Large, firm-bottomed lakes are common on the forest. The NH-AL offers perhaps the only opportunity to continue to protect these large lakes—a type facing especially strong development pressure in northern Wisconsin.

WETLANDS

Wetlands represent the vital transition between the dry habitats of the uplands and the surface waters of lakes and streams. A wide variety of wetland habitats are found on the forest including open bog, forested bog, sedge meadow,

emergent and submergent aquatic plants, hardwood swamp, white cedar swamp, and fen. Non-forested wetlands are much more common on NH-AL than are the forested wetlands, covering 16.7 percent and 4.2 percent of the NH-AL property, respectively.

NON-FORESTED WETLANDS

Most of the non-forested wetlands in the NH-AL are areas of open sphagnum moss, while some are lowland brush (i.e., alder thickets or wet meadows). These community types support many rare species and are valued for watershed protection. Unforested wetlands are typically stable, though some are succeeding to tamarack and black spruce.

The use of management tools, like prescribed burning and mechanical shearing, can be used when needed to maintain the open habitat, though most unforested wetlands are unmanaged.

The NH-AL offers the opportunity to protect wetland communities that are rare or representative in the region, or that are common and in need of protection from drainage and development. Seventy-nine percent of the rare plants documented on the NH-AL grow primarily in wet habitats, illustrating the biodiversity significance of abundant high-quality lakes, streams, and wetlands in the region. The NH-AL hosts many of Wisconsin's largest known populations of shore sedge, marsh willow-herb, and leafy white orchids. Rare bryophytes (mosses, liverworts) and lichens are also found on the NH-AL, the majority of them in wetland habitats. The high number of rare aquatic animals is also a reflection of the abundance of high-quality lakes, streams, and wetlands on the property. A suite of butterfly species including the bog copper is associated with peatlands. The yellow rail is one rare bird that lives in the NH-AL's unforested wetlands.

Extensive acreages of good quality acid peatlands on the NH-AL offer an opportunity for protection, as all of the larger sites within the region have been somewhat altered or compromised by various developments. The boreal fen is rare on the NH-AL and apparently uncommon throughout Wisconsin, but several excellent examples with unusually rich repositories of rare plants were identified on the forest. The northern sedge meadow is widespread in the region with several large, high quality occurrences along streams and lakeshores in the NH-AL (Epstein et al. 1999). Protection of the existing forested and unforested wetlands within the NH-AL is critical for maintaining the high quality of the region's lakes and streams.

Two wetland communities that are well represented on NH-AL, but relatively rare through the region, are wild rice marshes and inland beach communities. Wild rice marshes were identified by both the Biotic Inventory (Epstein et al. 1999) and CROG (Eckstein et al. 2001) as having a high opportunity for conservation. Emergent aquatic, submergent aquatic, and inland beach communities are widespread in northern Wisconsin, and have excellent occurrences on the NH-AL.

FORESTED WETLANDS

The forested wetlands of the NH-AL include black spruce, tamarack, northern white cedar, and swamp hardwoods habitats. Forested wetlands have high value for various wildlife species such as neotropical migrant birds, and rare species like the Yellow-Bellied Flycatcher. And, like non-forested wetlands, forested wetlands have high watershed protection value. Forested wetlands have slow plant succession and a low potential for the land to support other tree species.

In pre-European settlement forested wetlands, tamarack was by far the leading dominant tree with black spruce as a common associate. The peatland forests were cut at the turn of the century and have regenerated naturally, with a slow increase in tamarack in open areas. Over time, there has been a shift from tamarack to later-successional black spruce. Restoration of tamarack on some of the NH-AL's wetlands is one of the community restoration opportunities identified in the CROG Assessment and Biotic Inventory.

The northern white cedar forests are represented on the NH-AL in two exceptional, large, and diverse occurrences. The northern hardwood swamp (black ash) has one large occurrence and is naturally rare in Wisconsin.

The forested and unforested wetlands and aquatic habitats of the NH-AL represent highly significant opportunities for protection and management of rare and biologically diverse communities, restoration of pre-logging settlement wetland vegetation, and maintenance of wetland communities on the landscape level. The high density of lakes and the abundance of undeveloped lakes, is unique to the NH-AL State Forest and surrounding region. Few lakes outside of the NH-AL in this region have significant undeveloped shoreline and development continues to shrink the habitat that remains. The number of undeveloped, high quality lakes and wetlands within the NH-AL are unique in the region. They provide critical habitats for the species that depend on them.

³ Includes total length of streams that cross the property.

⁴ Outstanding Resource Waters (ORW) have the highest-quality water and fisheries in the state and deserve special protection.

⁵ Exceptional Resource Waters (ERW) have excellent water quality and valued fisheries, but already receive existing wastewater discharges.

Table 3.4 Stream Classifications in the NH-AL

Existing Biological Use Classification

Number of Streams	Total Miles	WWFF Miles	WWSF Miles	Cold I Miles	Cold II Miles	Cold III Miles	Not Classified
126	338.5	20.0	142.7	12.9	28.9	4.0	130.0

Source: WDNR Shaping the Future binder 1999.

STREAMS

Within the NH-AL State Forest, there are 126 streams, comprising 338.5 stream miles³. Three streams are designated as Outstanding Resource Waters (ORW)⁴: Allequash Creek, Siphon Creek and Trout River. Four streams are designated as Exceptional Resource Waters (ERW)⁵: McGinnis, Mishonagon, Stella, and Plum Creeks. (Please refer to *NH-AL Surface Water Resources map p.10-1a* from Shaping the Future binder).

Streams can be further classified based on their "existing biological use," which is used to describe the current condition of the surface water in a stream, and the biological community (fish and other aquatic life) living in that surface water. Table 5.3 summarizes the streams and their classifications (Refer to WDNR Shaping the Future binder 1999 for listing of streams, total miles, and watershed location).

As noted in the Biotic Inventory (1999), most streams on the NH-AL are small, originating in or connecting lakes. They feature few rare species; however, they support excellent examples of macroinvertebrate communities dominated by filter feeding and collecting/gathering detritivores. Only portions of the Wisconsin and Manitowish Rivers represent larger non-wadeable streams on the forest. These two streams have a number of rare fish and invertebrates found nowhere else on the NH-AL. Spring ponds are characteristic of a small

portion of the NH-AL and are generally the source of the dozen trout streams found here.

The primary detriment to habitat on NH-AL streams are dams. Dams have been constructed on the largest streams within the NH-AL—the Wisconsin and Manitowish Rivers. They have an adverse impact on the stream's biodiversity, especially affecting fish, mussels, and certain aquatic insects.

THE FISHERY

The uniquely abundant water resources in the state forest provide for a wide range of fish communities. This resource attracts a diverse group of anglers that play a major role in how these waters are managed. Native American treaty harvest rights also play a role. Management goals and activities for these waters vary by the type of water and angling potential. The waters in the forest can be divided into four major types: cool water lakes, warm water lakes, cool water streams, and cold water streams.

COOL WATER LAKES

Cool water lakes comprise the major water resource within the forest boundary. These lakes are typically infertile, greater than 200 acres, have clear or slightly stained water and a maximum depth of greater than 30 feet. The typical gamefish

DESCRIPTION OF EXISTING BIOLOGICAL USE CLASSIFICATIONS

WWFF: Warm Water Forage Fishery. Includes surface waters capable of supporting an abundant, diverse community of forage fish and other aquatic life.

WWFS: Warm Water Sport Fishery. Includes surface waters capable of supporting a community of warm water sport fish or serving as a spawning area for these fish.

Cold: Cold Water Community. Includes surface waters capable of supporting a community of cold water fish and other aquatic life or serving as a spawning area for cold water fish species.

Class I streams are high quality streams where populations are sustained by natural reproduction.

Class II streams have some natural reproduction but need stocking to maintain a desirable fishery.

Class III streams have no natural reproduction and require annual stocking of legal-size fish to provide sport fishing.

community in these lakes consists of walleye, muskellunge, northern pike, smallmouth bass, yellow perch, and black crappie. Other species of interest include cisco, redhorse, and white sucker. The unique lake trout and whitefish fishery of Trout Lake is also part of this lake type. Other examples of lakes in the NH-AL that are in this classification include: Papoose Lake (Vilas Co.), White Sand Lake (Vilas Co.), Plum Lake (Vilas Co.), and Lake Tomahawk (Oneida Co.). The vast majority of the waters in this group have adequate natural reproduction of the major game species. Stocking of muskellunge and walleye occurs on some of these waters that are suited to these species but have experienced recruitment problems. The Trout Lake strain of lake trout are also stocked into suitable lakes on the forest. This stocking program is designed to rehabilitate historic lake trout populations and provide future fishing opportunities. There are several small cool water lakes that are managed specifically for brook and/or brown trout. These waters are stocked to provide a put-grow-and-take fishery.

WARM WATER LAKES

There are numerous warm water lakes in the forest. These lakes are typically moderately fertile, less than 200 acres, and have a maximum depth of less than 30 feet. The fishery in most of these waters consists of bass and panfish. Some waters also have significant northern pike populations. These waters have simple fish communities compared to larger lakes in the area. These lakes have fewer habitat types, thus fewer fish species. Lakes that fit this classification include: North Bass Lake (Iron Co.), Stella Lake (Vilas Co.), Partridge Lake (Vilas Co.), Bittersweet Lake (Vilas Co.), and Miller Lake (Oneida Co.).

Almost all the waters in this group have adequate natural reproduction of the major game species. Stocking of muskellunge and walleye occurs on some of these waters to provide panfish control and angling opportunities. Few of these waters have naturally reproducing walleye or muskellunge fisheries.

COLD WATER STREAMS

Of all the waters in the forest, the cold water streams are the most limited. These waters have summer water temperatures that do not get above 70 degrees and have moderate flows. The fisheries present in most of these waters consist of brook and/or brown trout. The major waters in the forest that fit this designation are: Plum Creek (Vilas Co.), Stevenson Creek (Vilas Co.), and Mishonagon Creel (Vilas Co.).

The waters in this group have adequate natural reproduction of the major game species and are not stocked. Plum creek is currently the only exception in this group and is stocked with brown trout.

COOL WATER STREAMS

There are cool water streams scattered throughout the forest. Most of these waters have their origin at the outlets of lakes and in many cases connect two lakes. Due to a lack of significant ground water input these waters have summer water temperatures that get above 70 degrees regularly. These waters have moderate to low flows and are usually fertile. The fisheries present in most of these waters are typically the same as the waters they are connected to. Due to their high summer water temperatures they do not have trout in them. Representative waters in the forest that fit this classification are: Manitowish River (Vilas and Iron Co.), Trout River (Vilas Co.), and the Wisconsin River (Vilas and Oneida Co.).

None of these waters are currently stocked. The waters in this group have adequate natural reproduction or rely on the waters they are connected to for their fish populations. Little, if any, habitat work is conducted on these waters. There are several spring fish refuges on some of these streams.

HABITAT NEEDS

Losses of habitat and shoreline/bank development are common issues on all these waters. Management activities that enhance habitat such as tree drops, half logs and bank structures are important. These efforts should be applied where they are needed and will provide meaningful return to the fishery. Riparian shoreline and stream bank activities have a tremendous effect on the health of our fisheries. Efforts should be taken to promote buffer strips and shoreline restoration on all waters in the forest.

FISHING REGULATIONS

Controlling fish harvest through the use of lake- and stream-specific fishing regulations is the most effective tool in managing the fisheries on these waters. A variety of fishing regulations cover the waters in the NH-AL state forest. The types of fishing regulations that are currently in use include closed seasons, bag limits, and length restrictions.

Fishing regulations are set through a separate rule-making process, not by the master plan. The regulations review process involves the local fisheries biologist or warden, conservation congress, the DNR secretary, natural resources board, legislature and the governor. The public has opportunities to be involved at all the stages process.

RESEARCH ACTIVITIES

The abundant waters on the forest provide unique fisheries research opportunities. State and university sponsored studies that have meaningful management applications should be encouraged. These types of studies can provide insight into fisheries issues that will benefit waters well beyond the

boundaries of the state forest. Waters that currently have major ongoing fisheries studies include: Escanaba Lake (Vilas Co.), Pallette Lake (Vilas Co.), Nebish Lake (Vilas Co.), Mystery Lake (Vilas Co.), Spruce Lake (Vilas Co.), Little Rock Lake (Vilas Co.), Camp Lake (Vilas Co.), Bittersweet Lake (Vilas Co.), Smith Lake (Vilas Co.), Oberlin Lake (Vilas Co.), Prong Lake (Vilas Co.), Lake Trout Lake (Vilas Co.), and Sparkling Lake (Vilas Co.). Since the issues of significant management concern are always changing, other NH-AL waters may meet the requirements for future studies.

WILDLIFE

In general, the wildlife of the NH-AL is typical of the Upper Great Lakes Region. The NH-AL provides habitat to forest game species such as white-tailed deer, black bear, ruffed grouse, woodcock, snowshoe hare, red fox, and coyote. The aspen forest is the preferred habitat for these forest game species.

Characteristic birds of the NH-AL's forest habitats include broad-winged and sharp-shinned hawks, barred and saw-whet owls, downy and pileated woodpeckers, and a wide variety of songbirds. Wood turtle, northern ring-necked snake, and red-backed salamander are characteristic reptiles and amphibians.

Common mammals found in the NH-AL's lakes and wetlands include beaver, river otter, mink, and muskrat. The wood, frog, spring peeper, and eastern gray tree frog are common amphibians. Typical birds observed in these habitats include mallard, wood duck, black duck, hooded merganser, great blue heron, bald eagle, osprey, and common loon. The Mann, Stevenson, Ristow, and Bear Creek Flowages are managed for waterfowl. Existing wild rice beds are protected and several historic beds have been restored.

There are some wildlife features unique to the NH-AL and its immediate surroundings. The large number of lakes and wetlands provide habitat for the most concentrated populations of bald eagles, ospreys, common loons, and river otters anywhere in the region. Areas of mature upland conifer forest support a variety of songbird species including the blackburnian, black-throated green, and pine warblers and the red-breasted nuthatch. As documented in the Biotic Inventory (1999), the NH-AL occurs within a band of physiographic strata that supports the most species of breeding neotropical migrant birds north of Mexico.

CURRENT MANAGEMENT

Forestry and wildlife staff work together to insure wildlife habitat needs are met on all timber sales. Special attention is paid to management of red oak, aspen, hemlock, white pine, white cedar, snags, and den trees.

Currently there are 707 relic and 342 constructed wildlife openings on the NH-AL. Wildlife openings are generally 1 acre or smaller grassy areas; some are old homesteads or frost pockets while others were constructed during the 1980s.

Deer populations are managed for a population goal set for individual deer management units as part of a statewide process that is independent of the master plan. The current over-winter goals for the units within the NH-AL range from 12 to 25 deer per square mile of deer range.

RARE SPECIES

RARE ANIMALS

The NH-AL has 67 documented species of rare animals. These include one Wisconsin Endangered, nine Wisconsin Threatened, and 57 Wisconsin Special Concern species (refer to Epstein et al. 1999 for methodology, detailed information and lists of rare animals.). Of the 67 species, more than 75 percent dwell in wetland and aquatic sites. Only 19 (28 percent) occur on upland sites (difference in percentages is due to species occurring in more than one habitat).

Included in these 67 species are one US Endangered (timber wolf) and one US Threatened (bald eagle). As of 2004, a pack of four wolves live in the west part of the forest (Miles Lake Pack) and another pack of two occurs on the northeast side of the forest (Nineweb Lake Pack). Because of the large average size of wolf territories (from 20 to 120 miles), no pack territory is likely to be completely contained within the forest, and some areas of suitable habitat may not be fully occupied. Links to other surrounding properties from the NH-AL are important to maintain populations of timber wolf in the north central Wisconsin landscape.

The lakes of the NH-AL contribute significantly to one of the highest known regional concentrations of bald eagle, osprey, and common loon. All bald eagle, osprey, and great blue heron nests are protected. The NH-AL offers a significant opportunity to provide secure habitat for a large number of forest-dependent birds, including the northern goshawk (Wisconsin Special Concern), several boreal species, and many forest interior species.

RARE PLANTS

The Wisconsin Heritage Database lists 33 rare plant species on the NH-AL (refer to Epstein et al. 1999 for methodology, detailed information and lists of rare plant species and communities). Moor rush is listed as Endangered in Wisconsin, and Calypso orchid, shore sedge, and algae-like pondweed are listed as Threatened in Wisconsin. Seven of the 33 rare species grow on upland sites, 17 in wetlands, and nine in water.

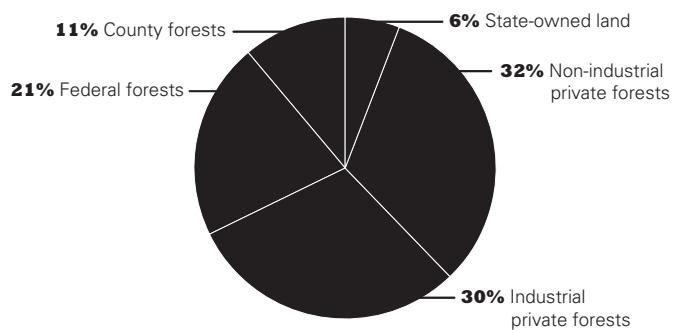
This high concentration of rare plants in aquatic habitats illustrates the significant biodiversity found in abundant high-quality lakes, streams, and wetlands in the Northern Highland region. Many of these habitats are vulnerable to invasion by aggressive exotic species such as purple loosestrife, reed canary grass, Eurasian water milfoil, and glossy buckthorn. Preventing the spread of these species would greatly aid the survival of rare aquatic and wetland species at NH-AL.

NH-AL provides excellent opportunities for assuring the viability of algae-like pondweed, shore sedge, Robbins spikerush, and American shoregrass in Wisconsin, claiming the state's largest known populations and large portions of the total populations in the state. In addition, NH-AL hosts many of Wisconsin's largest known populations of marsh willowherb, leafy white orchid, hidden-fruited bladderwort, purple bladderwort, and northeastern bladderwort.

SOCIO-ECONOMICS

The socio-economics assessment for the NH-AL State Forest region documents the contribution of timber and recreation to the region's economy (Watkins et al. 1999)⁶. The assessment found that almost 30 percent of the regional output and 27 percent of the region's jobs are somehow tied to either wood products or tourism-sensitive sectors. In comparison, statewide estimates show that combined wood-products and tourism-sensitive sectors make up only 12 percent of state output and 18 percent of statewide jobs (refer to Watkins et al. 1999 for a more detailed socio-economics discussion).

Figure 3.2 Percent of Annual Timber Removals in the NH-AL Region by Ownership in 1996



In 1996, the average annual value of timber removals in this seven-county region was approximately \$33 million. Figure 3.2 shows how this value is divided among five major groups of landowners. Industrial and non-industrial private landowners account for the majority of the region's annual timber removals. Of the \$33 million, approximately \$2 million (6 percent) was harvested from state properties. Over the four-year period (1992-1996), the NH-AL contributed 4.2 percent of the volume of timber harvested in the region.

Table 3.4 shows a breakdown of the timber and recreation revenue generated on the NH-AL from 1997-2001 (Gardner 2002)⁷. The timber revenues support the findings in the regional analysis (Rissman et al. 2002) that the NH-AL timber is important to local logging operations. However, the NH-AL does not play a major role in the regional wood products industry, given the relatively small proportion of regional

Table 3.5 NH-AL Annual Timber and Recreation Revenue, 1997-2001

Timber Revenue	1997	1998	1999	2000	2001
Logging Sales	1,167,991	1,575,760	1,746,974	2,055,514	1,480,156
Boughs	770	760	845	985	855
Christmas Trees	666	1,308	998	694	590
Fuelwood (firewood)	1,372	1,715	2,215	2,760	3,355
Miscellaneous		101	3,159	16,703	10,170
Sub-total	1,170,799	1,579,644	1,754,191	2,076,656	1,495,126
Recreation Revenue	1997	1998	1999	2000	2001
Camping	429,561	463,521	522,130	315,423	452,809
Admission stickers/passes	163,776	179,065	177,119	187,103	182,513
Miscellaneous	290	425	787	1,112	1,482
Sub-total	593,627	643,011	700,036	503,638	636,804
TOTAL REVENUE	\$1,764,426	\$2,222,655	\$2,454,227	\$2,580,294	\$2,131,930

Source: Gardner, 2002

⁶ This assessment defined the region as six Wisconsin counties (Iron, Forest, Lincoln, Oneida, Price and Vilas) and one Michigan county (Gogebic).

⁷ It is important to note that not all revenue generated from timber or recreation on the NH-AL is kept by or budgeted to the NH-AL, but is deposited in a segregated account called the Forestry Account. These revenues are appropriated by the Wisconsin Legislature for a variety of statewide forestry-related programs.

timber volumes harvested from the NH-AL (roughly 4%) and the fluidity of timber flows within and outside the region. Although less significant than timber harvesting, the gathering and use of forest resources as a contributor to timber revenues illustrates the NH-AL's importance to specific local economies.

Table 3.4 also shows the recreation revenues generated on the NH-AL between 1997-2001. These figures indicate only a small portion of the total revenue generated by recreational visitors. The full economic contribution of NH-AL recreation reaches far beyond the forest campgrounds and trails to the many resorts, restaurants, service stations and other businesses in the area. However, considering only a portion of the area's tourism business revenue comes from forest-based recreation it cannot be quantified with existing data. Clearly though, the NH-AL is an important supporter of the local tourism-based economy.

POPULATION TRENDS

Data from the NH-AL Regional Analysis documents the accelerated rate of population increase in the NH-AL region compared to statewide numbers. Table 3.5 illustrates that Vilas and Oneida counties are experiencing the largest increases, the two main counties within which the NH-AL State Forest lies.

Note that these numbers do not include seasonal populations, which often far exceed resident populations. U.S. Census Bureau data (US DOC 2001) is useful in looking at the housing trends. Census information indicates that of the 22,397 total housing units in Vilas County in 2000, 12,587 or 56.2 percent are designated as vacant housing for "seasonal, recreational or occasional use." Similarly, seasonal housing in Oneida County accounts for 39.2 percent of the total housing units. In comparison, statewide numbers show only 6.1 percent of the total housing units are designated as vacant housing for seasonal, recreational or occasional use.

The increased demand for housing in the northwoods has caused a sharp increase in property values, outpacing the rest of the state. The Wisconsin Department of Revenue

found that land values rose in a four-county study region (Iron, Oneida, Price, and Vilas Counties) an average of 15.5 percent between 1998 and 1999. Shoreland property is in particular demand.

Secondary impacts of increasing residential growth and tourism include more pressure on public lands to support outdoor nature-based recreation. The Minocqua-Woodruff area, located just outside the NH-AL's western border, is one of the most rapidly growing tourist areas in the state. New housing and tourist infrastructure development has been extremely rapid. Forest land is being divided into parcels, shorelands developed, wetlands removed and roads built and expanded. This trend focuses more intensive pressure on public land, and the centrally located and highly accessible NH-AL State Forest, in particular.

RECREATION FACILITIES

WATER RECREATION OPPORTUNITIES

With more than 900 lakes and 300 miles of streams, the NH-AL offers abundant, high quality water recreation opportunities. Please refer to the current boat landings and canoe map in the appendix.

Popular water-oriented recreation includes fishing, swimming, water skiing, boating, jet-skiing, canoeing, and sightseeing. The facilities on the forest supporting water recreation are nine designated swimming beaches, and more than 100 designated boat launch sites. The boat access sites range from well-developed, cement sites (73) to gravel and unimproved sites (233) to carry-in and canoe slide sites (9).

WILD RESOURCE RECREATION

The NH-AL offers a large number of natural lakes with undeveloped or mostly undeveloped shorelines, which are quite rare in the state. Most of the lands offering this special type of recreational opportunity are officially designated as wilderness lakes and wild lakes.

The NH-AL includes the 5,460-acre Manitowish River Wild Resource Area, which is a large roadless area closed to motor-

Table 3.6 Comparison of Census Results, March 2000

WI County	Census Population 2000	Population Change 1990-2000	% Change 1990-2000
Vilas	21,033	3,326	16%
Oneida	36,776	5,097	14%
Forest	10,024	1,248	12%
Iron	6,861	708	10%
Lincoln	29,641	2,648	9%
Price	15,822	222	1%
Regional Total	120,157	13,249	11%
Statewide	5,363,675	471,906	9.6%

Table 3.7 NH-AL State Forest Camping and Picnic Facilities

	Number of Sites	Reservable sites	Toilets: pit/flush	Drinking Water	Showers	Dump station	Firewood	Shelter	Swimming Area	Picnic Area	Fishing	Boat Landing	Handicap Accessible	Fee Required
Campgrounds:														
Big Lake	72	p	X				X				X	X		X
Crystal Lake	100	r	p/f	X	X	X	X	X	X	X	X	X	X	X
Big Muskie Lake	81	r	p/t	X	X	X	X	X	X	X	X	X	X	X
Firefly Lake	70	r	p/f	X	X						X	X	X	X
Plum Lake	18		p	X							X	X	X	X
Razorback Lake	55		p	X							X	X		X
East Star Lake	30		p	X							X	X		X
West Star Lake	18		p	X							X	X		X
Sandy Beach Lake	37		p	X						X	X	X		X
Starrett Lake	46		p	X						X	X	X		X
North Trout Lake	48		p	X		X	X			X	X	X		X
South Trout Lake	24		p	X		X	X			X	X	X		X
Upper Gresham Lake	27		p	X							X	X		X
Cunard Lake	33		p	X							X	X		X
Buffalo Lake	52		p	X			X				X	X		X
Carrol Lake	19		p	X							X	X		X
Clear Lake	98	r	p/f	X	X	X	X			X	X	X	X	X
Indian Mounds Area	39		p	X						X	X	X		X
Jag Lake (Group)	50	r	p	X						X		X		X
North Muskellunge (Group)	50	r	p	X						X		X		X
Canoe Campsites	74		p											
Wilderness Campsites	12	r	p											X
Day Use Areas:														
Clear Lake Picnic Area			p	X						X	X	X		X
Little Star Picnic Area			p	X						X	X	X		X
Nichols Lake Picnic Area			p	X						X	X	X		X

Source: NH/AL State Forest Staff, 2000.

ized recreation and timber harvesting. The Indian Creek, Partridge Lake and Frank Lake Wild Areas, which total 27,900 acres, are open to snowmobiles and some timber harvesting, but are closed to other public motorized uses. The NH-AL also has 19 wilderness lakes and 41 wild lakes.

CAMPING

The NH-AL offers 18 developed family campgrounds with approximately 850 campsites, plus two outdoor group camping areas that accommodate up to 100 people. Most of the campgrounds are small and rustic in nature; about two-thirds have about 50 or fewer campsites. These rustic campgrounds have only hand-pumped water and pit toilets. They do not have showers. Just over one third of the family campsites (349) on the forest have the more modern amenities of showers and flush toilets. These are offered at two locations, the Crystal-Big Muskie-Firefly Lakes campground complex and the Clear

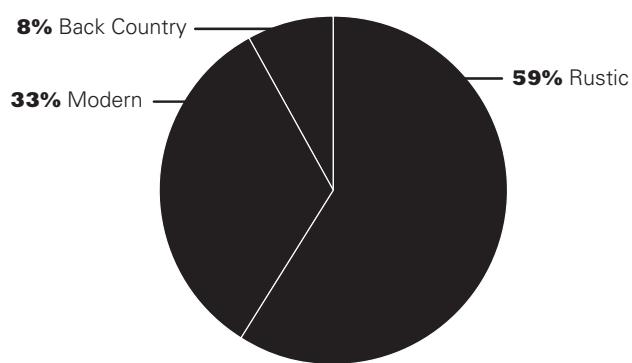
Figure 3.3 Percent of Camping Opportunities by Type

Figure 5.3 illustrates the majority of campsites on the NH-AL are rustic, followed by modern and back-country. Source: WDNR Recreational Supply & Demand 2001.

Lake campground. Electric hook-ups are not provided at any of the NH-AL campgrounds. Six campgrounds offer special facilities for campers with disabilities. Table 3.6 identifies the forest's campgrounds and their facilities.

Remote, primitive camping is highly popular on the NH-AL. There are 74 canoe campsites and 12 wilderness campsites. Access to canoe campsites is by watercraft only and is available on a first come-first served basis. Use is restricted to one night. The wilderness campsites may be accessed by hiking or watercraft, and they may be reserved in advance. Canoe and wilderness campsites are single, remote sites with only a fire ring and open pit toilet.

In addition to designated camping facilities, by special permit the NH-AL allows back-country camping at non-designated sites along approximately 85 miles of back-country trail. Camping permits are also given for off-site hunter camps during the traditional November nine-day gun deer season.

The NH-AL does not provide any fully developed camping opportunities. However, numerous fully-developed camping opportunities are provided throughout the region by the private sector. (Refer to WDNR Recreational Supply & Demand for complete breakdown of camping opportunities.)

HUNTING

There are abundant small and big game hunting and trapping opportunities on the NH-AL.

Each fall the NH-AL State Forest draws hunters from across the state and the region for gun and archery deer hunting in particular. Ruffed grouse and woodcock hunting are also popular. Hundreds of miles of logging roads and non-designated trails are open for hunting. Some unimproved forest roads are open and accessible to street licensed motor vehicles.

DESIGNATED TRAILS

The NH-AL offers a variety of designated trails for all seasons. The term "designated trails" refers to maintained trails where only specified uses are permitted. The forest also has hundreds of miles of logging roads and other paths that are open for hiking, mountain biking, skiing or snowshoeing, and other public use, but these roads/trails are not signed or maintained for recreational purposes. These undesignated trails are discussed further in a following section.

Currently, there are three designated hiking trails totaling 18.5 miles, but no extensive designated trail system for backpackers. Seventy miles of cross country ski trail are available on the NH-AL. Groomed ski trails are among the most popular on the forest. The groomed ski trails include Raven Trail, Madeline Trail, McNaughton Trail, Escanaba Trail, Shannon Trail, Razorback Ridge, and the North Lakeland Discovery Center. The NH-AL also has a network of over 400 miles of snowmobile trails. These link state land with private and county snowmobile trails that run throughout the region. Table 3.7 summarizes the NH-AL's designated trails. Some of these trails are dual purpose; for example, mountain bike trails that double as re cross-country ski trails.

UNDESIGNATED TRAILS

Looking at the designated trails alone does not fully describe the trail opportunities on the NH-AL. Hundreds of miles of logging roads and non-designated trails are open for all types of non-motorized uses including hiking, skiing, horseback riding, and mountain biking. Some unimproved forest roads are open and accessible to licensed motor vehicles as well.

Snowshoeing is currently available throughout the forest, except on groomed cross-country ski trails. There are no designated snowshoeing trails. Currently, horseback riders can ride on most of the forest, unless they are in a prohibited area (i.e., nature trails). There are no designated equestrian riding trails. The NH-AL does not have ATV trails. Some town roads within the NH-AL boundary are open to ATVs. Town road routes are under the jurisdiction of individual townships. (Refer to the following section on General Forest Access for more on recreation use policies.)

EDUCATION AND INTERPRETATION PROGRAMS AND FACILITIES

The NH-AL's interpretive programs are extremely popular with visitors. Presently the forest maintains four, self-guided interpretive walking trails (Fallison, Raven, North Trout, and Star Lake). They range from .5 to 2.5 miles long. A water interpretive trail is also maintained on a segment of the Manitowish River. A rustic Nature Center exists in the popular Crystal-Muskie campground complex. Interpretive programs are offered throughout the summer. Educational programs are also offered at the North Lakelands Discovery Center, which is operated on the NH-AL through a land use agreement.

Table 3.8 NH-AL State Forest Designated Trails (Length in miles)

Hiking	Biking	Mountain Biking	Snowmobile	X- Ski	ATV	Horse	Nature
18.5	0	32	400	70	0	0	6.8

Source: WDNR Recreational Supply and Demand 2001.

NH-AL RECREATIONAL TRAIL USE POLICIES

ATV, Cycles and other Motor Vehicles – ATVs and unlicensed off-road cycles may be ridden only on trails designated for their use. Presently, there are no designated ATV trails on the NH-AL. ATVs and unlicensed off-road motor cycles may not be operated on forest logging roads as all state forest roads (including logging roads) are classified by statute as public roads. Therefore, for motor vehicles to be operated on the forest, they must meet the license vehicle requirements set by the DOT and be legally licensed. (A special statutory exemption allows snowmobiles to be operated on public roads that are not normally maintained in the winter.) Some on-off road vehicles meet the street-legal requirements. When licensed, these cycles, 4X4s and other vehicles may operate on open roads (roads that are not gated, bermed or signed as closed.)

Horses – horses may be ridden on any public road, including logging roads, in the forest. They may go on roads that are bermed or gated, unless signed as closed to horses. They may not be ridden on designated nature and hiking or ski trails.

Mountain bikes – mountain bikes can be ridden on the three designated bike trails on the forest (trail pass required) as well as on any public road, including logging roads. They can go behind the earth berms and gates on roads closed to motor vehicles, except in designated wilderness areas. They may also be ridden on cross country ski trails during the off-season. Bikes are not allowed on designated nature trails.

Snowmobiles – snowmobiles are allowed on the Bearskin Trail and designated snowmobile trails on the state forest. They are not allowed off designated trails.

NH-AL STATE FOREST ROAD ACCESS/CLOSURE POLICY

The NH-AL State Forest is a working forest with an active timber management program. A necessary component of the timber management program is the creation or maintenance of logging roads to facilitate the removal of timber. Most logging roads remain open for public use for two years after completion of the timber sale. After this two-year period, they are closed. Circumstances that may cause road closure *prior two years* include:

- Reduction of fire hazard
- Reduction of garbage dumping incidents
- Restoration of wild land character
- Attention to public safety and reduction of liability
- Protection of the integrity of special use areas
- Protection of natural and artificial tree regeneration
- Protection of wildlife openings
- Protection of wetlands and water resources from erosion

Some roads are permanently maintained open for management purposes. Roads that are not bermed, gated, or otherwise blocked, or signed as closed are open for public access by licensed motor vehicles and for all types of non-motorized public use.

USE AND DEMAND

As documented in the property's regional analysis (Rissman et al. 2002), the 225,000-acre NH-AL State Forest plays an important role in providing outdoor recreational opportunities in the region. The NH-AL is dotted with hundreds of beautiful, undeveloped lakes and provides a wide variety of recreation. The NH-AL is centrally located in northern Wisconsin close to the tourist communities of Minocqua, Woodruff, Rhinelander, and Eagle River. It is the largest and most visited state property with more than two million visitors annually from across Wisconsin, as well as from Illinois, Iowa, Minnesota and other states. Recreating on the NH-AL is a regular part of the culture and lifestyle of many local residents in Vilas, Oneida, and Iron Counties. For some people the NH-AL is a vacation destination or a place to get together with family and friends. Many visitors say their families have come to the NH-AL for generations and may continue to do so.

The NH-AL is a popular vacation destination year round, but most people visit during the peak season from Memorial Day through Labor Day. Visitors have increased steadily over the past decade. NH-AL staff estimate that in 2001 there were about 340,000 boaters and anglers, 150,000 swimmers and picnickers, and 22,000 canoeists. During the peak season, demand for camping on the NH-AL is high. Crystal-Muskie, Clear Lake, and Firefly Lake (three large campgrounds with flush toilets and showers) are at capacity almost all summer long. Campsites at Crystal, Muskie, Firefly and Clear Lake campgrounds may be reserved on the automated PARRS reservation system from Memorial Day through Labor Day. In total, the NH-AL hosts nearly 300,000 campers annually.

Similarly, users visit the NH-AL for the miles of various trails. NH-AL staff estimated that in 1998 there were 58,000 mountain bikers, 29,000 hikers, and 6,000 horseback riders. Staff estimated 57,000 cross country skiers in 1996 and only 9,000 in 1998, due to variable snow conditions. The NH-AL's 400-mile snowmobile trail system is extensive, popular, and well-maintained, but use also varies with snow conditions. NH-AL staff found that snowmobilers fluctuated between 175,000 in 1996 and 42,000 in 1998.

Although the NH-AL provides a relatively small amount of land in the region, general observations suggest that hunting pressure per acre is greater there, due to its high visibility, familiarity, good quality habitat, and ready access. There are abundant small game and big game hunting and trapping

opportunities on the NH-AL. Staff estimated that in 1998 there were about 178,000 hunters.

Even with two million visitors annually to NH-AL, the number of visitors is expected to grow. According to staff estimates, the greatest growth in recent years was in hunting, fishing and boating. The activities showing the most rapid growth on the forest are hiking and canoeing.

The primary issues affecting recreation management are silent-sport versus motorized forest users, crowding, personal safety, camping and campground amenities, and timber harvesting. Perhaps the most contentious of these issues is between the non-motorized/motorized users in relation to use of state lands, which have been the mainstay of silent-sport user groups. Projections indicate that over the next ten years the silent-sport user group, which is many times larger than the motorized user group, will add the most new participants. Projections for motorized recreation, on the other hand, show that jet-skiing and ATV riding are among the fastest growing sports (the demand for more ATV riding opportunities is already high and is bound to escalate as the sport grows).

Therefore, the difficult problem facing state forest recreation managers and planners in this time of increasing recreational use and conflict is how to provide quality opportunities without one style of recreation dominating, displacing, or overly affecting the experiences of others. To meet the wide and ever-growing outdoor recreation demands of the public, recreation providers will need to work together, each providing a part of the "recreational pie" (refer to WDNR Recreational Supply & Demand for detailed analysis).

CULTURAL RESOURCES

The earliest evidence of human habitation in the NH-AL area dates back thousands of years. Early use of the area by native peoples is documented through research on over 60 sites on the NH-AL alone. An archaeological survey of land surrounding Trout Lake, located within the NH-AL boundary, resulted in the identification and documentation of 11 previously unrecorded sites (Egan-Bruhy 2001). Nine of the sites are located on the NH-AL State Forest; two sites are located on land owned by the University of Wisconsin. Eight of the sites on public land are considered potentially eligible for the National Register of Historic Places.

The sites include both logistical and residential camps, which range in age from at least the Late Archaic period to the Late Woodland (around the seventh century A.D. until European contact, circa 1700). Both at the Trout Lake survey area and

elsewhere in northern Wisconsin, the highest frequency and largest sites are attributable to the Woodland occupation. Characteristic features of Woodland culture include the construction of earthen mounds, which appear to have served both mortuary and ceremonial purposes, along with the introduction of horticulture (refer to Egan-Bruhy 2001 for additional information).

Today, the reservation for the Lac du Flambeau band (part of the Ojibwe tribe) borders the NH-AL to the west. Many Native Americans participate in gatherings such as pow-wows, creation of Native American artwork, and a continued use of natural resources through hunting, fishing, and gathering bark and medicinal plants. The Lac du Flambeau cultural center and museum offers educational programming to visitors. Lac du Flambeau has also undertaken a major effort to identify and preserve historical and cultural sites on the reservation.

The cultural resources of the NH-AL and surrounding region are best understood in light of the region's history. Native Americans, loggers, early pioneers, and tourists all came to central northern Wisconsin for its natural resources, scenery and ability to renew the spirit. While efforts have been made to educate visitors on the cultural resources of the area, more opportunities are available to incorporate cultural resources into education and outreach efforts on the NH-AL, linking the state forest with the Lac du Flambeau reservation, historic and prehistoric landmarks, and the history of loggers, pioneers, and early visitors.

SOIL SUITABILITY FOR RECREATIONAL USE

While it is important to understand use and demand when considering recreation development, it is also important to understand soil suitability and limitations. The soil surveys for Vilas and Oneida counties express the degree of soil limitations ranging from slight, to moderate, to severe.⁸ As discussed in the soil surveys, the suitability ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered; soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. The capacity of the soil to absorb septic tank effluent and its ability to support vegetation are also important considerations (refer to the soil surveys, Natzke 1988, Boelter 1993, for a more complete discussion of use and management of soils, and soil series descriptions).

In general terms, the soils suitable for camp and picnic areas are well-drained with moderate permeability, and level to

⁸ Slight means that soil properties are generally favorable and that limitations are minor and easily overcome; severe means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

gentle slope. Suitable soils in the NH-AL area are in the following soil series: Alcona, Pence, Karlin, Manitowish, Padus, and Keweenaw. Many of the NH-AL soils are unsuitable due to wetness, slope and soils being too sandy. Because of the high potential for soil variations on any given site, an on-site soil suitability analysis would be necessary before siting new or expanding existing campgrounds and picnic areas. In addition to the soil attributes listed above, the analysis would also examine suitability for sanitary facilities where those facilities would be constructed.

Soils suitable for path and trail development have similar features to those for camp and picnic areas. The soil survey notes the best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface. Based on the Vilas and Oneida soil surveys, approximately 55 percent of Vilas County and 41 percent of Oneida County contain soils with severe limitations for path and trail development. Soils limitations for the NH-AL would be similar. Common restrictive features include wetness, slope, and soils that are too sandy.

REGIONAL ANALYSIS SUMMARY

As part of the planning process, the Department prepared an analysis of the ecological, economic, recreational, and social conditions, opportunities and constraints associated with the NH-AL on a local and regional scale (Rissman et al, 2002). The purpose of the regional analysis is to help reveal the best niche or role for the property locally and in the region. The following are the findings of the regional analysis.

The Northern Highland-American Legion State Forest plays a significant role in central northern Wisconsin. Although the NH-AL makes up only 5 percent of the land in the six-county region, it stands out for possessing one of the highest lake densities in the world, being the largest public property in an area with extensive dry forest communities, and offering a diverse "recreation package" near one of the most rapidly developing tourist centers in the region.

The abundance of kettle lakes on the NH-AL draws people from across the state and the midwest for boating, fishing, and swimming. These same lakes provide excellent habitat for large concentrations of eagles, osprey, and common loons. Lakeshore development has been rapid in the region, with heavy pressure from the booming housing market in particular. As tourism and development increase, the undeveloped lakes of the NH-AL and the availability of non-motor lakes will become even more prized than they are today.

Land and Water Resources: The NH-AL is the largest public property in the Northern Highland Pitted Outwash, a broad ecological subsection that is unique for its sandy soils and

rolling topography with abundant kettle lakes and wetlands. The ecological conditions on the NH-AL State Forest offer regionally significant opportunities to manage for pine dominated, dry to dry-mesic forests at a large scale. An important opportunity exists to manage mesic hardwood hemlock types because significant stands of more mature stages currently exist.

Numerous large, relatively undisturbed bogs and conifer swamps, as well as rare and uncommon rich fens and rice marshes, occur on the property. The opportunity to protect and manage these types could be pursued. There is an opportunity to manage for large-scale, extensive forests because fragmentation is moderate. Extensive forests could benefit forest interior species, including neotropical migrant birds, as well as disturbance-sensitive predators and certain habitat specialists. This property contains a globally significant concentration of freshwater kettle lakes, many of which have rare aquatic plants and invertebrates. Development pressure on these lakes is very high. Many rare aquatic plants and invertebrates also occur in the rivers on this property. Regionally significant breeding populations of bald eagle, osprey, common loon, and other water-dependent wildlife dwell here. Opportunities to preserve and restore these aquatic resources could be pursued.

The NH-AL is also important on a larger scale, connecting to national, county, and state properties and other large blocks of forest. A potential boundary expansion to the north could connect with the Ottawa National Forest, providing a valuable connection to large blocks of undeveloped land to the north.

Recreational Resources: Public outdoor recreation in central northern Wisconsin is provided by a mix of federal, state, county, tribal, and private landowners. The region offers high quality forest and water-based recreation. Increasingly, recreational providers will need to work together—each providing that part of the recreational pie that it can best provide—to meet the region's wide and ever-growing outdoor recreation demands. People generally consider state forests to be somewhat more developed than national forests, but less developed than state parks. State forests are considered a primary provider of silent-sport recreational opportunities in northern Wisconsin. Campers, also, look to the state forests for a high quality rustic camping experience.

The NH-AL and nearby tourist areas have long been a major vacation destination area. The NH-AL offers visitors an exceptional combination of diverse forests, lakes, and streams along with a range of quality outdoor recreational opportunities in a readily accessible location.

Due to the many lakes and streams, water recreation on the NH-AL is popular. Though the NH-AL provides only a small percentage of land open to public hunting, it is popular because of its diverse, high quality habitat and high visibility, familiarity,

and ready access. The NH-AL is also an important provider of wild resources recreation, especially wild/wilderness lakes, which are rare in the region.

The NH-AL is only a minor provider of designated trail opportunities in the region, except for snowmobile trails. However, it is one of the major trail providers in Vilas and Oneida Counties. In terms of total number of campsites, the NH-AL is slightly behind the national forest, but it offers the most balanced array of non-electrified camping in the region. ATV access is a growing issue as ATVs are not currently allowed on the NH-AL; however, ATV riders are looking for riding opportunities on the property. This is a change opposed by many non-motorized recreational NH-AL users. Because ATV trails and road routes currently border the NH-AL on only one side in Iron County, the NH-AL is not needed to connect existing regional ATV trails.

Social-economic and Cultural Role of the NH-AL: People and households in rural resource-dependent regions of Wisconsin have traditionally relied upon natural resources for economic sustenance. The NH-AL lies at the heart of central

northern Wisconsin, supporting local communities through both forest products and forest- and water-based recreation. Management of the forest has an impact on the socioeconomic ties that bind residents and visitors to the forest. A recent study shows that timber production and recreation are generally compatible land uses.

While some efforts have been made to educate visitors on the cultural and historical resources of the area, more opportunities are available to incorporate cultural resources into education and outreach efforts on the NH-AL, linking the state forest with local tribes, landmarks, and the history of Native Americans, loggers, pioneers, and early visitors. Natural resources education is available in the region through school programs, camps, and interpretive programs. The NH-AL has an opportunity to expand its facilities to educate the public about natural resources and forest management.

Given the increasingly complex nature of natural resources management, understanding the niche of the NH-AL in its region is critical. As Wisconsin's largest state forest, the NH-AL has a significant role to play in providing ecological, economic, recreational, and cultural benefits to the region.

