

COUNTY FOREST COMPREHENSIVE LAND USE PLAN

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CHAPTER 800

INTEGRATED RESOURCE MANAGEMENT

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800 CHAPTER OBJECTIVES

To introduce and communicate to the public, the County Board of Supervisors, and to the Wisconsin DNR, the integrated resource approach that forestry, wildlife and other natural resource staff will use on the Sawyer County Forest during this planning period.

805 INTEGRATED RESOURCE MANAGEMENT APPROACH

Integrated Resource Management is defined as: "the simultaneous consideration of ecological, physical, economic, and social aspects of lands, waters and resources in developing and implementing multiple-use, sustained yield management" (Helms, 1998).

This balance of ecological, economic, and social factors is the framework within which the Sawyer County Forest is managed.

The working definition of Integrated Resource Management means, in large part, keeping natural communities of plants and animals and their environments healthy and productive so people can enjoy and benefit from them now and in the future.

The remainder of this chapter is written to help communicate how the Forest is managed on an integrated resource approach.

810 SUSTAINABLE FORESTRY

"the practice of managing dynamic forest ecosystems to provide ecological, economic, social and cultural benefits for present and future generations" NR 44.03(12) Wis. Adm. Code and s.28.04(1)(e), Wis. Stats.

For the purpose of this chapter, sustainable forestry will be interpreted as the management of the Forest to meet the needs of the present without knowingly compromising the ability of future generations to meet their own needs (economic, social, and ecological) by practicing a land stewardship ethic which integrates the growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water quality, and wildlife and fish habitat. This process is dynamic, and changes as we learn from past management.

810.1 TOOLS IN INTEGRATED RESOURCE MANAGEMENT

810.1.1 Compartment Recon

The County will support and utilize the compartment reconnaissance procedures as set forth by the DNR Public Forest Lands Handbook 2460.5. WisFIRS serves as the database for housing recon information.

810.1.2 Forest Habitat Classification System

The Forest Habitat Classification System (*A Guide to Forest Communities and Habitat Types of Northern Wisconsin Second Edition; Kotar, et al.*) is a natural classification system for forest communities and the sites on which they develop. It utilizes systematic interpretation of natural vegetation with emphasis on understory species.

The Forest Habitat Classification System is an ecological tool that promotes a common language for interpreting site capability based on potential natural vegetation. Through the application of the classification, land managers are better able to assess site potential of current stands, identify ecological and silvicultural alternatives, predict the effectiveness of possible silvicultural treatments, assess management alternatives, and choose appropriate management objectives.

810.1.3 Soil Surveys

Forestry staff's knowledge of forest ecology and their experience across the landscape can assist in associating forest habitat types and site indices with soil type information. These associations can be beneficial in determining management prescriptions for specific sites. WisFIRS contains soil survey data, and this information can also be found on the NRCS website-based soil survey.

810.1.4 Ecological Landscapes of Wisconsin

The Wisconsin DNR uses Ecological Landscapes of Wisconsin (WDNR Handbook 1805.1) which is an ecological land classification system based on the National Hierarchical Framework of Ecological Units (NHFEU). Ecological landscapes distinguish

land areas different from one another in ecological characteristics. A combination of physical and biological factors including climate, geology, topography, soils, water, and vegetation are used. They provide a useful tool and insight into ecosystem management. Land areas identified and mapped in this manner are known as ecological units.

Generally accepted silvicultural systems are prescribed on a stand level scale, in recognition of the position within an ecological landscape.

810.1.5 Integrated Pest Management

“The maintenance of destructive agents, including insects, at tolerable levels, by the planned use of a variety of preventive, suppressive, or regulatory tactics and strategies that are ecologically and economically efficient and socially acceptable”

The Committee has the authority to approve and direct the use of pesticides and other reasonable alternatives in an integrated pest management program on the Forest.

Refer to Chapter 600 (610.3) for more detailed discussion and integrated pest management strategies.

810.1.6 Best Management Practices for Water Quality

The most practical and cost-effective method to assure that forestry operations do not adversely affect water quality on the County Forest is to utilize "best management practices" (BMP's) as described in *Wisconsin's Forestry Best Management Practices for Water Quality*. Publication number FR-093.

Consistent with the aforementioned manual (page 6), Sawyer County will use BMP's on the Forest with the understanding that the application of BMP's may be modified for specific site conditions with guidance from a forester or other natural resource professional. Modifications will provide equal or greater water quality protection or have no impact on water quality. Areas with highly erodible soil types, proximity to streams or lakes, or steep slopes may require mitigating measures in excess of those outlined in the manual. All Sawyer County employees practicing forestry will receive BMP training.

Additionally, Sawyer County will encourage BMP training of all logging contractors that operate on County timber sales.

810.1.7 Fire Management

Reference Chapter 600.

810.1.7.1 Prescribed Fire

Prescribed burning on the County Forest may play an important role in management. Many of the plant communities present today are the result of wild fires.

As the needs are presented to regenerate or maintain timber types or other plant communities, the Committee will examine the costs and benefits of each opportunity. Increased regulations, the county's cost of completing the burn, and the risk of breakouts and uncontrolled fires will have to be considered with any benefits of vegetation management through prescribed burning.

All prescribed burning will be done in accordance with Wisconsin State Statutes 26.12, 26.14, and the DNR Prescribed Burn Handbook 4360.5 and in cooperation with the Department of Natural Resources per section 605.5 of this plan.

810.1.8 Outside Expertise, Studies and Survey

Additional data necessary to make management decisions on the County Forest will be sought from agencies or individuals, who have the best capability and technical expertise, including, but not limited to:

- Water Resources: WDNR
- Wildlife Resources: WDNR
- Soil Resources: NRCS
- Mineral Resources: WDNR
- Wetland Resources: WDNR, Army Corps of Engineers, County Zoning
- Navigable Streams: WDNR, Army Corps of Engineers, County Zoning

- Floodplains: County Zoning
- Cultural Resources: WDNR, State Historical Society
- Entomology / Pathology: WDNR
- Endangered Resources: WDNR
- Forestry: Cooperative Field Trials, see WDNR website
- Other subjects as needed

810.1.9 Local Silvicultural Field Trials

To date, numerous field trials have been completed or are ongoing on the Sawyer County Forest. These trials include:

- Red Oak Regeneration, Pre-harvest scarification including prescribed fire for seed bed preparation and release. Located throughout county blocks containing suitable oak stands.
- Northern Hardwood, even-aged treatments. Shelterwood/Seed Tree with pre-harvest scarification. Located throughout county blocks

815 MANAGEMENT CONSIDERATIONS TO REDUCE LOSS

815.1 RISK FACTORS

815.1.1 Wind

Wind events have and will continue to occur on the County Forest. Although these events are not preventable, the County can take steps to reduce loss in the event of a wind storm. Planning of timber harvest to minimize risk of wind-throw on shallow soils and other areas prone to damage is one method of reducing risk. When wind damage occurs, the quick response of the department is critical to salvage forest products before the economic value is reduced or lost. Salvage sales will be a priority immediately following clean-up operations to open roads and facilities and to reduce risks to the public.

815.1.2 Flooding

Management strategies such as encouraging the growth of, or the planting of flood tolerant species in areas that may be prone to flooding, may help reduce losses due to flooding. Monitoring beaver activities in areas where beaver induced flooding may impact forest resources will be undertaken when appropriate. Beaver activity that is or may impact forest resources, may be mitigated by removal of beaver and the removal of dams. These activities will be undertaken by the Animal and Plant Health Inspection Services (APHIS) of the USDA through a contract with the County.

815.1.3 Fire

Areas of the forest, due to tree/plant species composition and droughty soils, may have a higher risk of wildfire than other areas of the forest. The impacts of fire can be mitigated through forest management to a certain degree. Maintaining a road system that provides access to fire prone areas may reduce losses in the event of a wildfire. A close working relationship with the DNR fire staff will also help minimize the chance of wildfire and the damage sustained in the event of a wildfire on the County Forest.

815.1.4 Climate Change

Climate change may pose a significant challenge to the management of the County Forest. The County recognizes these potential changes could impact the forest and various programs that are managed. A proactive approach will be followed with consideration given to how changing conditions could impact forest composition, management of roads and recreational trails, wildlife habitat, watersheds, invasive species and forest pests/diseases.

815.1.5 Timber markets

Volatile timber markets are a common issue faced by the forest products industry and will likely continue to be. Managing for a diverse forest is one way to help mitigate this issue. By having a variety of species and types of forest products available, market fluctuations in one species or product can be offset by other

available species and products. Establishing timber harvests in a variety of timber types each year according to the annual allowable harvest will make a variety of species and products available that can help reduce impacts of the markets.

820 PLANT COMMUNITIES MANAGEMENT

Sawyer County recognizes the importance of maintaining the diversity of the forest under an ecosystem approach. The process involved in making management decisions to encourage or not encourage specific species or communities is complex. It includes an understanding of:

- Objectives of the County
- Integration of landforms, soils, climate, and vegetative factors
- Habitat classification
- Past, present and future desired condition
- Surrounding ownership patterns and general objectives
- Wildlife habitat and other values
- Social needs

820.1 SILVICULTURAL PRACTICES/TREATMENTS

Silviculture is the art and science of controlling forest composition, structure, and growth to maintain and enhance the forest's utility for any purpose. These practices are based on research and general silviculture knowledge of the species being managed. The goal is to encourage vigor within all developmental stages of forest stands, managed in an even aged or uneven aged system. The application of silviculture to a diverse forest needs a unified, systematic approach. The DNR Public Forest Lands Handbook (2460.5) and DNR Silvicultural Guidance will be used as guidelines for management practices used on the County Forest.

820.1.1 Natural Regeneration

Where feasible, natural regeneration will be encouraged through the use of silvicultural methods that promote regrowth and recruitment of the forest. In general, the particular silvicultural method chosen will depend on the biological functions of the target species

or forest type.

820.1.1.1 Clearcutting/Coppice

Clearcutting is a silvicultural method used to regenerate shade intolerant species. Complete, or nearly complete removal of the forest canopy will stimulate the regeneration and growth of species such as aspen, jack pine and white birch. This method is also used as a final rotation removal in species such as red oak, red pine and others. Tree retention guidelines are followed when prescribing clear-cut or coppice cuts.

820.1.1.2 Shelterwood / Seed Tree

Shelterwood harvest is a method used to regenerate mid-shade tolerant and shade tolerant species. Partial canopies stimulate regeneration, enhance growth and can provide seed source. Canopies are eventually removed. This method is used for white birch, white pine, red oak, and northern hardwood (when managing even aged).

820.1.1.3 All Aged Regeneration Harvests

All aged regeneration harvests are used in shade tolerant species. Gaps in the forest canopy allow regeneration to occur throughout the stand. Over time, multiple entries into the stand will create multiple age class structure with the intent of creating a fully regulated stand. All aged regeneration harvests may be prescribed in the form of single tree selection, group selection or patch selection. This method is used in northern hardwood and occasionally in swamp hardwoods (when managing for all aged)

820.1.1.4 Prescribed Burning

Prescribed burning may be utilized as a tool to promote regeneration. A number of forest types in Sawyer County are ecologically tied to fire. Burning may create seeding conditions or release regeneration from competing vegetation. Prescribed fire may be used for regeneration of red oak, jack pine or white pine. See section

810.1.7, and 605.4.

820.1.1.5 Soil Scarification

Scarification is a technique used to prepare a seedbed beneath forest stands scheduled for harvest and regeneration. This mechanical disturbance that exposes bare mineral seedbeds and creates conditions necessary for regeneration of pine species. Disturbance that mixes seed into duff and soil layers creates optimal conditions for regeneration of oak, white birch, fir and others. Sawyer County utilizes salmon blades, root rakes, and straight blade for soil scarification.

820.1.1.6 Other

Other natural regeneration techniques may be considered where necessary and appropriate. New methods for natural regeneration are continually tested for effectiveness.

820.1.2 Artificial Regeneration

When natural regeneration fails, or when tree species present do not coincide with management objectives for the site, artificial means will be employed to establish a desirable stand of trees. Artificial regeneration on a site usually requires some form of site preparation followed by seeding or planting.

820.1.2.1 Mechanical Site Preparation

Mechanical site preparation includes the use of soil disturbance equipment such as a disc, roller chopper, patch scarifier, disk trencher or V-plow prior to tree planting or seeding. These types of equipment are used to reduce logging debris to a smaller size, incorporate debris into the soil, clear brush and debris from the site, and to reduce competition from other vegetation.

820.1.2.2 Chemical Site Preparation

Herbicide application can be an effective means of controlling unwanted vegetation in order to establish seedlings or plantations. It should be used sparingly and in

situations where mechanical treatment is not expected to provide the level of vegetative control needed. Chemical will be applied in strict accordance with label recommendations, requirements, and under the oversight of a certified applicator. Herbicides will normally be applied with motorized, ground based equipment, hand applications, or aerially. A written prescription for each herbicide application will be prepared and kept on file.

820.1.2.3 Prescribed Burning

Prescribed burning for site preparation can be used to reduce logging debris, clear the site, reduce competing vegetation, and to release nutrients into the soil.

820.1.2.4 Tree Planting / Seeding

Both machine and/or hand planting/seeding will be utilized to insure adequate regeneration. The selection of species will be determined according to the specific management objectives and capabilities of each site. Planting or seeding will primarily occur in areas where natural regeneration is inadequate or conflicts with the management goals of the site. County will make all reasonable efforts to source seeds/seedlings from local genetics.

820.1.3 Intermediate Treatments

Intermediate treatments are those practices used to enhance the health and vigor of a forest stand. In general, intermediate treatments are applied to forest stands managed as even aged.

820.1.3.1 Mechanical Release

Mechanical release is the removal of competing vegetation by means other than herbicide or fire. Mechanical may include releasing young pine plantations from competing vegetation using chain saws or other hand-held equipment; or mowing to release regeneration.

820.1.3.2 Chemical Release

Chemical Release is the removal of competing vegetation from desirable trees through the use of herbicides. It should be used sparingly and in situations where mechanical treatment is not expected to provide the level of vegetative control needed. Chemical will be applied in strict accordance with label recommendations, requirements and under the oversight of a certified applicator. A written prescription for each herbicide application will be prepared and kept on file.

820.1.3.3 Non-Commercial Thinning (TSI)

In general, most thinning needs are accomplished through commercial harvest operations. Non-commercial thinning may be considered if the individual site requirements, funding and/or available labor make it desirable.

820.1.3.4 Thinning / Intermediate Cuts

Management of some even aged forest types necessitates the use of commercial thinning, also known as intermediate harvests, to maintain forest health and vigor. Thinning is generally prescribed in forest types such as red pine, red oak, and in cases of even aged hardwood management. Thinning may be prescribed on other even aged types as appropriate and where feasible. Intermediate harvests include prescriptions for residual densities, marking priorities, spacing, crown closure, diameter distribution, or other measurements.

820.2 SILVICULTURAL PRESCRIPTIONS

820.2.1 Even-Aged Management

A forest stand composed of trees having relatively small differences in age. Typical cutting practices include: clear cutting, shelterwood cutting and seed-tree cutting. Even aged management is generally required to manage shade intolerant, early successional forest types.

820.2.1.1 Aspen

These are types where aspen trees comprise of more than 50% of the stems. On the

forest, aspen types may be dominated by quaking or big tooth aspen or a combination of both. Aspen stands contain a wide variety of associated hardwood and conifer species.

Aspen is a shade intolerant species that is found throughout the forest and is managed on an even-aged basis. This means that aspen needs full sunlight to regenerate and the best method for creating optimum conditions for stand replacement is clearcutting.

The aspen type is recognized as providing habitat values to a wide variety of wildlife species as well as being an important species for economics and fiber production. A large portion of the County Forest revenue is generated through the management of aspen.

The extent of this vital resource statewide has been steadily declining since the 1960s. The main reasons for the decline are a lack of regeneration harvests as stands reach maturity, and selective harvest. In both instances, the end result is conversion to more shade tolerant timber types.

Sawyer County is committed to maintaining its aspen acreage and will accomplish this by regenerating mature aspen stands with clear-cuts and other even-aged harvesting techniques. Aesthetic concerns can be mitigated by retaining pine, spruce, fir and/or red oak tree species on the sites, limiting the size of harvests, and creating irregularly shaped harvest boundaries.

<u>Shade tolerance:</u>	Intolerant
<u>Intermediate treatments:</u>	None
<u>Median rotation age:</u>	50
<u>Primary regeneration method:</u>	Natural
<u>Harvest method:</u>	Clearcutting with coppice
<u>Habitat value:</u>	Early successional related species
<u>Economic value:</u>	Fiber production / bolts
<u>Insect disease considerations:</u>	Hypoxylon and other cankers
<u>Trends:</u>	General declines on statewide acreage
<u>Landscape considerations:</u>	Retain/increase acreages where possible

820.2.1.2 Jack Pine

These are types where jack pine makes up more than 50% of the stems. Common associates in Sawyer County are pin oak, aspen, and white birch. Jack Pine cover types make up a very small component of the county forest. It is the intention of Sawyer County to maintain or increase the acreage of jack pine on the forest.

<u>Shade tolerance:</u>	Intolerant
<u>Intermediate treatments:</u>	Plantation/Planting Release
<u>Median rotation age:</u>	50 years
<u>Primary regeneration method:</u>	Planting/seeding/presale scarification
<u>Harvest method:</u>	Clear-cut
<u>Habitat value:</u>	Conifer and early successional species
<u>Economic value:</u>	Fiber production, bolts
<u>Insect disease considerations:</u>	Jack Pine Budworm
<u>Trends:</u>	Declining on a statewide basis
<u>Landscape considerations:</u>	Retain/increase where possible

820.2.1.3 Red Pine

Red Pine comprises 50% or more of the stems. Red Pine on the Sawyer County Forest is typically plantation origin. The majority of the plantations were established in the 1930's by the Civilian Conservation Corps. Natural stands of red pine also occur on the County Forest. Red Pine is managed for high quality timber production. Typical management of red pine plantations consist of a row thinning followed by a combination of row and individual tree selection. Red Pine stands on higher quality sites or in aesthetically sensitive areas may be managed on an extended rotation.

<u>Shade tolerance:</u>	Intolerant
<u>Intermediate treatments:</u>	Plantation Release, Row Thinning, single tree selection.
<u>Median rotation age:</u>	80-120 years
<u>Primary regeneration method:</u>	Planting
<u>Harvest method:</u>	Intermediate row and single tree selection. Clear-Cut.
<u>Habitat value:</u>	Conifer and early successional species along with extended rotation large tree species.
<u>Economic value:</u>	Fiber production, bolts, logs, utility poles
<u>Insect disease considerations:</u>	Bark Beetles, Heterobasidion Root disease
<u>Trends:</u>	Maintaining Acreage

Landscape considerations: Retain acreage where possible

820.2.1.4 White Pine

White Pine (*Pinus strobus*) comprises 50% or more of the basal area in saw timber and pole timber stands, or 50% or more stems in the sapling/seedling stands. In mixed pine stands, white pine is predominant.

White pine on the Sawyer County Forest is typically natural origin although there are plantations of pure white pine and mixed pine and spruce plantations.

Plantations were established in the 1930's by the Civilian Conservation Corps.

Natural stands of white pine occur in areas that were likely heavily stocked with white pine prior to the initial harvesting of the forest in the late 1800's. Following these harvests, fires ran through much of the county. Following these fires, white pine was able to re-establish in areas where a seed source remained.

Management of white pine includes producing fiber and bolts/sawlogs. This is accomplished through intermediate thinnings. Plantations are row thinned initially then thinned through individual tree selection. Natural origin stands are thinned using individual tree selection. White pine stands that occur in aesthetically sensitive or ecologically important areas may be managed on an extended rotation of 120 years or more.

Regeneration of white pine can be accomplished through intermediate thinnings that encourage natural regeneration to establish. Shelterwood harvest to release existing regeneration followed by seed tree harvests when regeneration is well established can be successful in regenerating white pine. Scarification of the site to expose mineral soil and reduce competition will be used to enhance regeneration.

<u>Shade tolerance:</u>	Intermediate
<u>Intermediate treatments:</u>	Plantation Release, Row Thinning, single tree selection.
<u>Median rotation age:</u>	80-120+ years
<u>Primary regeneration method:</u>	Natural seeding, planting

<u>Harvest method:</u>	Intermediate row and single tree selection, shelterwood, seed tree.
<u>Habitat value:</u>	Conifer and early successional species along with extended rotation large tree species.
<u>Economic value:</u>	Fiber production, bolts, logs, utility poles
<u>Insect disease considerations:</u>	Bark Beetles, Heterobasidion Root disease, white pine blister rust, tip weevil.
<u>Trends:</u>	Maintaining Acreage
<u>Landscape considerations:</u>	Retain acreage where possible

820.2.1.5 Northern Red Oak

Northern Red Oak (*quercus rubra*) is found throughout the County Forest. It occurs in nearly pure stands and as a component of Northern Hardwood and Aspen/Birch stands. The management of red oak concentrates on production of quality saw timber and retention of oak for its value to wildlife. Oak is typically managed on an even-aged basis. In pure oak stands, several thinnings may occur before regeneration of the stand is needed. Individual tree selection to improve stand quality occurs during these thinnings. Regeneration is accomplished through shelterwood or seed tree harvests. Ground scarification in conjunction with prescribed fire is often required to provide a suitable seed bed for the germination of acorns. Deer browse on regeneration is a significant problem, areas with high deer populations may pose a significant challenge to the regeneration of oak.

Oak is a declining cover type throughout Wisconsin and the Great Lakes area due to improper management, difficulty regenerating oak, deer browse and mortality due to insects and disease. Sawyer County will continue to maintain the oak cover type and increase where possible within the county forest.

<u>Shade tolerance:</u>	Intolerant
<u>Intermediate treatments:</u>	Single tree selection.
<u>Median rotation age:</u>	80-120+ years
<u>Primary regeneration method:</u>	Natural seeding, stump sprouting
<u>Harvest method:</u>	Single tree selection, shelterwood, seed tree.
<u>Habitat value:</u>	Mast producer, large diameter trees, den/nest/cavity potential.
<u>Economic value:</u>	Fiber production, bolts, logs.

<u>Insect disease considerations:</u>	Oak wilt, Two-lined chestnut borer, deer browse.
<u>Trends:</u>	Declining Acreage
<u>Landscape considerations:</u>	Retain acreage where possible

820.2.1.6 Swamp Hardwoods

Swamp hardwood stands in Sawyer County are typically dominated by black ash (*Fraxinus nigra*) and red maple (*Acer rubrum*). Associated species include black spruce (*Picea mariana*), tamarack (*Larix laricina*), and northern white cedar (*Thuja occidentalis*). These stands are found in areas with high water tables.

Swamp hardwood stands are typically managed for the production of fiber and logs/bolts, however due to the extremely wet soil conditions management can be very difficult.

With the discovery of Emerald Ash Borer (EAB) in the state and a positive confirmation of an ash borer in Sawyer County, it is assumed that black ash will eventually decline in representation within the county. Management of swamp hardwood stands focus on the salvage of ash before EAB mortality renders it non-merchantable and encouraging other species such as red maple, black spruce, and tamarack to become more dominant within these sites. Weather conditions, sites require frozen ground access and market limitations for ash are the limiting factors with management options on these sites in a large scale.

Silvicultural systems that are used in swamp hardwood can either be even-aged or uneven-aged. For even aged management, strip clear-cuts, seed tree, and overstory removal harvests are generally accepted practices. For uneven-aged management, single tree selection and group selection are accepted practices.

Due to possible impending infestation by EAB, swamp hardwood stands that are dominated by black ash will be managed by removing a majority of black ash while leaving as many of the associated species as possible to encourage conversion to non-ash dominated stands, as market conditions allow.

<u>Shade tolerance:</u>	Intolerant
<u>Intermediate treatments:</u>	None.
<u>Median rotation age:</u>	80-120+ years
<u>Primary regeneration method:</u>	Natural seeding, stump sprouting
<u>Harvest method:</u>	Strip Clear-cut, clear-cut with reserves, shelterwood, seed tree.
<u>Habitat value:</u>	Lowland swamp related species.
<u>Economic value:</u>	Fiber production, bolts, logs.
<u>Insect disease considerations:</u>	Emerald Ash Borer, flooding, swamping.
<u>Trends:</u>	Declining Acreage likely
<u>Landscape considerations:</u>	Convert where feasible.

820.2.1.7 Swamp Conifers (Black Spruce and Tamarack)

Swamp conifer stands are made up of 50% or more of wither black spruce (*Picea mariana*) or tamarack (*Larix laricina*). Associated species include northern white cedar (*Thuja occidentalis*) and balsam fir (*Abies balsamea*). Tamarack and black spruce are considered different cover types, they are most often managed in the same manner. Accepted management for both cover types include strip clearcutting in two or three entries, with each subsequent strip being cut when previously cut strips have adequate regeneration.

<u>Shade tolerance:</u>	Intolerant
<u>Intermediate treatments:</u>	None.
<u>Median rotation age:</u>	80-120+ years
<u>Primary regeneration method:</u>	Natural seeding.
<u>Harvest method:</u>	Strip Clear-cut, clear-cut with reserves.
<u>Habitat value:</u>	Lowland conifer related species.
<u>Economic value:</u>	Fiber production, bolts, logs.
<u>Insect disease considerations:</u>	Larch casebearer, larch sawfly, windthrow.
<u>Trends:</u>	Maintaining acreage.
<u>Landscape considerations:</u>	Retain where possible.

820.2.1.8 Red Maple

Red maple (*Acer rubrum*) stands are made up of 50% or more of red maple in basal area in pole timber and sawtimber stands, or 50% or more of the stems in seedling and sapling stands. Common associated species on the Sawyer County Forest include balsam fir (*Abies balsamea*), white pine (*Pinus strobus*), aspen (*Populus grandidentata* and *P. tremuloides*) and northern red oak (*Quercus rubra*).

Red maple can typically be managed either even-aged or uneven-aged, the intermediate thinnings or individual selection harvests are nearly identical with a final decision to be made at the time of rotation to rotate the stand or convert to another type.

<u>Shade tolerance:</u>	Mid-tolerant
<u>Intermediate treatments:</u>	Single tree selection
<u>Median rotation age:</u>	50-90 years
<u>Primary regeneration method:</u>	Natural seeding, stump sprouts.
<u>Harvest method:</u>	Strip Clear-cut, shelterwood, overstory removal
<u>Habitat value:</u>	Early successional, potential cavity trees
<u>Economic value:</u>	Fiber production, bolts, logs.
<u>Insect disease considerations:</u>	Gypsy moth
<u>Trends:</u>	Increasing acreage.
<u>Landscape considerations:</u>	Retain where possible, convert to aspen or northern hardwood where appropriate.

820.2.1.9 White Birch

White birch (*Betula papyrifera*) on the County forest is usually found in conjunction with other species such as aspen, red maple, balsam fir and red oak, it is seldom found in pure stands of significant size. White birch is a desirable and valuable species used by wildlife and sought after for paper and lumber production.

Management of white birch is typically done on an even-aged basis. Stands that are predominantly white birch (>50% of the overstory) and regeneration of white birch is planned require removal of the majority of the overstory in all or part of the stand in conjunction with ground scarification either pre or post-harvest. The overstory removal can be then accomplished through a shelterwood harvest.

White birch cover types make up a very small component of the county forest. It is the intention of Sawyer County to maintain or increase the acreage of white birch on the forest.

<u>Shade tolerance:</u>	Intolerant
<u>Intermediate treatments:</u>	Single tree selection

<u>Median rotation age:</u>	50-70 years
<u>Primary regeneration method:</u>	Natural seeding, stump sprouts.
<u>Harvest method:</u>	Strip Clear-cut, shelterwood with scarification.
<u>Habitat value:</u>	Early successional, potential cavity trees
<u>Economic value:</u>	Fiber production, bolts, logs.
<u>Insect disease considerations:</u>	Bronze birch borer, leaf miner.
<u>Trends:</u>	Acreage declining.
<u>Landscape considerations:</u>	Retain or increase where possible.

820.2.2 Uneven-Aged Management

A forest stand composed of trees in various age and size classes. The typical cutting practice is selection cutting, where individual trees are removed from the stand. Regeneration is continually occurring after the stand is cut. Uneven-aged management is generally used to manage shade tolerant forest types.

820.2.2.1 Northern Hardwood

These are stands dominated by shade tolerant and mid-shade tolerant species. In Sawyer County, northern hardwood stands are typically dominated by sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), basswood (*Tilia americana*), red maple (*Acer rubrum*), yellow birch (*Betula allegheniensis*), and red oak (*Quercus rubra*). Generally accepted practices for managing northern hardwood include individual tree selection following the standard order of removal with canopy gaps.

<u>Shade tolerance:</u>	tolerant to mid-tolerant
<u>Intermediate treatments:</u>	none
<u>Median rotation age:</u>	n/a
<u>Primary regeneration method:</u>	natural – all aged regeneration
<u>Harvest method:</u>	single tree, gaps,
<u>Habitat value:</u>	Multi stage canopy species, cavity nesters
<u>Economic value:</u>	high: fiber, bolts, high quality sawlogs
<u>Insect disease considerations:</u>	emerald ash borer,
<u>Trends:</u>	Maintaining acreage.
<u>Landscape considerations:</u>	Maintaining acreage

820.3 LOCALLY UNCOMMON TREES / FOREST TYPES

The presence or lack of a particular tree species is dependent on land capability, climate, natural range, natural or human disturbance and many other factors. The following trees and types are considered uncommon on the Sawyer County Forest and likely across the general region. These trees may be left as reserves in even aged management prescriptions, or in thinnings and all aged regeneration harvests.

820.3.1 American Elm (*Ulmus americana*.) is scarce primarily due to Dutch elm disease. Healthy looking elm may be left uncut in hope that they may continue on the landscape as potential resistant seed sources.

820.3.2 Butternut (*Juglans cinerea*) is declining due to butternut canker. Healthy individuals that appear to be canker free will be reserved in the forest as potential resistant seed sources.

820.3.3 Eastern Hemlock (*Tsuga canadensis*) is a highly preferred deer and small mammal browse species. Regeneration is difficult and remnant stands will be retained to provide seed sources for future management activities

820.4 FOREST TYPES REQUIRING INTENSIVE EFFORT TO REGENERATE

There are certain forest types within the County Forest that are difficult to regenerate. In many cases, this difficulty may be related to the exclusion of fire from the landscape, deer herbivory or other factors. The following list itemizes forest types with difficult regeneration and County management goals:

820.4.1 White birch

White birch is a shade intolerant species normally found in even aged stands. It appears white birch evolved to regenerate after disturbances such as fire. The County is committed to retain as much of the existing acreage of white birch as possible. Regeneration efforts will include pre-sale salmon blade scarification.

820.4.2 Northern red oak

Northern red oak is a shade intolerant to mid tolerant species found in primarily even aged stands. Northern red oak appears to require disturbance to regenerate and herbivory appears to be a limiting factor on regeneration success. The County is committed to retain as much of the existing acreage of northern red oak as possible. Regeneration efforts will focus on timing soil scarification with good acorn crops and shelterwood harvests. Regeneration may require prescribed burning to release seedlings from competing vegetation.

820.5 INVASIVE PLANT SPECIES OF CONCERN

Invasive plants can cause significant damage to the forest. Invasive species can displace native plants and hinder the forest regeneration efforts. Preventing them from dominating forest understories is critical to the long-term health of the forest. There are a number of invasive plant species in varying densities on the County Forest. Some warrant immediate and continual treatment efforts while others may be allowed to remain due to extent and financial ability to control them. The County will continue to train staff in invasive species identification as well as attempt to secure funding sources to control them as much as is practical.

820.6 LEGALLY PROTECTED AND SPECIAL CONCERN PLANT SPECIES

There are plants in Wisconsin that are protected under the Federal Endangered Species Act, the State Endangered Species Law, or both. On County Forest, no one may cut, root up, sever, injure, destroy, remove, transport or carry away a listed plant without a valid endangered or threatened species permit. There is an exemption on public lands for forestry, agriculture and utility activities under state law. The County will, however, make reasonable efforts to minimize impacts to endangered or threatened plants during the course of forestry/silviculture activities (typically identified in the timber sale narrative).

The Wisconsin Department Natural Resources Bureau of Natural Heritage Conservation tracks information on legally protected plants with the Natural Heritage Inventory (NHI) program. The NHI program also tracks Special Concern Species, which are those for which some problem of abundance or distribution is suspected, but not yet proven. The

main purpose of this category is to focus attention on certain species before they become threatened or endangered.

The County has access to this data under a license agreement and is committed to reviewing this database for endangered resources that may occur within proposed land disturbing project areas.

820.7 TREE RETENTION GUIDELINES

Sawyer County Forest Green Tree Retention Guidelines (GTR)

Reserve Trees

Reserve trees are living trees, ≥ 5 inches dbh, retained after the regeneration period under even-aged or two-aged silvicultural systems. They are retained well beyond stand rotation, and for purposes other than regeneration. They may be harvested eventually or retained to complete their natural lifespan (becoming a snag and then coarse woody debris). Reserve trees can be dispersed uniformly or irregularly, as single trees or aggregated groups or patches, or any mixture thereof. Synonyms include standards, legacy trees, and green tree retention.

The characteristics of desirable reserve trees are highly variable and depend on the intended benefits, the species present, stand condition, and site. Desired compositional and structural attributes may be present when trees are selected and stands are rotated, or additional time may be required for development.

Typical characteristics of desirable individual reserve trees (either scattered or within patches) include:

- Large size (tree height, diameter, crown dimensions) for the species and site. If large trees are lacking, then potential future large trees can be selected.
- Older trees with large size and rough bark.
- A mix of vigorous and decadent trees.
 - Vigorous trees of long-lived species can enable long-term retention

and potentially yield a variety of benefits.

- Decadent trees can provide current and future cavity trees, as well as future snags and down coarse woody debris.
- A mix of species, including locally uncommon species and mast trees.

The development and maintenance of large structures (vigorous trees, cavity trees, snags, down woody debris) and species diversity is typically encouraged.

Generally, poor candidates for individual reserve trees include:

- Relatively small (height, diameter, crown), suppressed to intermediate trees.
- Relatively young trees within the stand.

These smaller, younger trees are retained in reserve groups and patches along with larger, older trees.

Exceptions to these typically desirable and generally poor reserve tree characteristics will occur.

Benefits of Reserve Tree Retention

Silvicultural practices are designed to manipulate vegetation to achieve management objectives. At its foundation, silviculture is based on understanding and working with ecological processes. Silvicultural practices that more closely emulate natural disturbance and stand development processes are more likely to sustain a wide array of forest benefits. Most natural disturbance regimes and events retain compositional and structural legacies in heterogeneous patterns and create ecological complexity.

Silvicultural practices that develop and maintain reserve trees in managed stands can enable the promotion of ecological complexity – composition, structure, and pattern.

The retention of reserve trees can provide a “lifeboat” function that contributes to the conservation of biological diversity (see preceding section). These structures facilitate the perpetuation of some biota (plant and animal species and genotypes) on site. They

also perpetuate habitat for re-colonization and occupation. They can improve landscape connectivity, facilitating the movement of some organisms. Reserve trees influence reorganization and recovery processes in post disturbance ecosystems; they can sustain functional roles and modify the post-disturbance environment.

The actual benefits achieved through the retention of reserve trees can be variable, depending on such factors as landscape composition and structure, stand composition and structure, site, retention design, and management objectives.

Some specific potential benefits include:

- Timber Production
 - Reserve high quality trees for future harvest
 - Perpetuation of tree species diversity
- Wildlife and Plant Habitat (Biodiversity)
 - Cover
 - Cavity (den) and nest trees
 - Display locations
 - Food (foraging, hunting)
 - Future snags and down woody debris (coarse and fine)
 - Habitat diversity
 - Protect special habitat
 - Travel corridors
- Aesthetics
 - Limit line of vision
 - Break up “clear-cut” look
 - Retain visually unique trees
 - Provide diversity in future stand
- Water and Soil Quality
 - Reduce run-off
 - Reduce erosion
 - Maintain water and nutrient cycles
- Miscellaneous
 - Buffer adjacent stands

- Protect cultural resources
- Landmarks, such as marker trees and witness trees

Potential Costs of Reserve Tree Retention

The retention of reserve trees in actively managed stands can provide ecological benefits desired by landowners and society. However, there are also costs or trade-offs. The primary potential cost is reduced timber yield at the stand-level. Also, retention can result in less available habitat for some wildlife species, particularly those that prefer open, treeless habitat. However, impacts on long-term forest ecosystem sustainability and productivity are uncertain; current understanding suggests that the maintenance of ecological complexity will more likely sustain long-term productivity.

Some specific potential costs include:

- Potential additional operational costs to manage reserve tree retention
- Potential for reduced timber growth rates maintained by larger, older trees
- Potential for reduced short-term stand-level timber yields by foregoing harvest of some trees
- Potential for epicormic branching
- Potential for stem and crown damage during stand harvest
- Potential for crown dieback and mortality following harvest
- Potential for windthrow, particularly on wet or shallow soils, or for shallow rooted species
- Potential damage to younger stand if reserve trees are harvested during mid-rotation
- Reduced growth rates of regeneration occurring beneath reserve trees
- Potential sites for pathogen breeding and maintenance
- Potential for reduced habitat for or increased predation of certain wildlife species

Considerations for Reserve Tree Retention

Reserve overstory trees will shade portions of a newly developing stand. Increased numbers of dispersed reserve trees and trees with larger and denser crowns will cause more shading. Furthermore, reserve tree crowns can expand over time, increasing

shading effects. Shading by reserve trees potentially can reduce growth within portions of newly developing established even-aged stands. The point at which growth reductions become significant depends on a variety of factors, including: stand management objectives (for reserve trees and young trees), growth rates and potential development of reserve trees, growth rates and shade tolerance of species comprising the new stand, site quality, understory competition, and potential damaging agents. In general, to promote optimum growth of established even-aged stands of reproduction, (nearly) full sunlight is preferred. Under even-aged management systems, when objectives include the retention of reserve trees beyond the regeneration establishment phase, crown cover of <20% generally (for most species and conditions) will not significantly reduce vigor, growth, and development of most of the developing stand. If reserve trees are dispersed and expected to survive and grow, crown cover will increase over time; 15% crown cover is a generally recommended maximum for dispersed retention at final rotation. If reserve trees are aggregated, then shading impacts will be reduced; total crown cover retained could be greater, and will depend on stand management objectives.

Excessive shading may also be a concern when regenerating shade intolerant species in small stands or in narrowly linear stands, surrounded by relatively mature forest. In such cases, it may be necessary to retain fewer reserve trees. Alternatively, there may be opportunities to redesign stand boundaries creating a larger stand with increased opportunities for internal tree retention.

Reserve tree retention is a generally recommended silvicultural practice for stands ≥ 10 acres. It is encouraged in smaller stands, but operational, shading, and other biological issues may limit application.

Insect and disease issues and potential impacts on tree health should be another consideration in reserve tree selection and design. Regeneration methods are designed to foster the vigor of the regenerating stand. Although the imminent mortality of some reserve trees may be desirable or acceptable, typically some vigorous trees will be retained with the expectation of continued growth and survival (perhaps for a long time).

When regenerating a stand and retaining reserve trees, potential risks to tree health should be evaluated, and methods implemented to reduce risks while achieving stand management objectives. In most cases, well designed regeneration and retention strategies can minimize risks; however, stand and site conditions may limit options in some cases. Refer to the cover type chapters in this handbook and forest pest management guidelines to appropriately consider and address insect and disease risks when selecting and designing regeneration methods and reserve tree retention for a specific stand and site.

Two examples of how insect and disease considerations can influence reserve tree selection and design:

- Red pine: Retaining red pine reserve trees when regenerating a new red pine stand may significantly increase the risk of *Sirococcus* and *Diplodia* incidence within the young stand. This risk is highly variable geographically; where experience has shown the risk to be significant, then retaining red pine reserve trees over red pine regeneration would be poor silviculture. In such cases, retain other species (e.g. oak) as reserve trees if available; if not available, then it may not be possible to retain reserve trees as generally recommended, but consider including representation of other species as part of stand regeneration to provide increased options for future managers. Red pine can be an excellent reserve tree when regenerating other species (e.g. aspen or oak).
- Jack Pine: In general, retaining jack pine reserve trees when regenerating a new jack pine stand is not recommended, because of the risk of budworm outbreaks. When regenerating jack pine, other species (e.g. oak) should be retained as reserve trees if available. Jack pine can be retained as a reserve tree when regenerating other species.

Representation of reserve trees can range from none to many. If silviculture is to simulate, to some extent, natural disturbance processes, then most actively managed stands should include some level of structural retention. To accomplish general sustainable forestry goals that include multiple stand management objectives, recommended representation could typically range from 3-15% of stand area or crown

cover. In some stands, particularly intensively managed single objective stands (e.g. maximize short-term economic returns, maximize pulp production, or maximize populations of wildlife species that prefer completely open, treeless habitat), landowners may choose to not retain reserve trees. In some stands, with appropriate species and site characteristics, where the optimization of tree vigor and timber quantity and quality is a minor concern, adaptive silvicultural practices that retain 20-60% cover could be considered by the landowner. It is recommended that sound reasons and expected impacts be documented when the decision is to retain reserve trees at less than or greater than the recommended level of 3-15% of stand area or crown cover.

Distribution of reserve trees can be evenly or irregularly dispersed individuals, groups, and patches.

Retention in aggregated patches generally provides the most benefits, including:

- patches of habitat that maintain forest floor, understory plants, and vertical structure within the patch, and increase compositional and structural diversity,
- more heterogeneity across the stand,
- less damage to retained trees during harvesting operations, and
- less impact on regeneration in stand matrix.

Patch retention should consider retention of large trees, cavity trees, and snags within the patches. Reserve patches can be thinned during the even-aged rotational harvest of the matrix; however, retention of unthinned patches potentially provides the greatest benefit. Patches can be located to complement other management objectives or respond to stand conditions; for example, patches can be located in riparian management zones, to provide connectivity between stands, and to protect sensitive sites (e.g. cliff faces and vernal pools) or endangered resources. Patches should be >0.1 acres and generally <2.0 acres, but can be larger; patches, particularly large ones, should be documented as retention patches.

Retention of evenly dispersed individual trees also provides unique benefits, including:

- retention of comparatively more large trees, and

- wide distribution of structural benefits (large trees, snags, and coarse woody debris) and seed sources.

Retention of irregularly dispersed individual trees and small groups provides another strategy; this can be particularly useful to develop feathered edges to stands and reduce abrupt transitions and edge effects.

The general recommended strategy is to retain irregularly distributed patches along with scattered groups and individuals.

Area (acres)	Diameter (feet)	Square (feet)
0.1	74	66 x 66
0.25	118	104 x 104
0.5	167	148 x 148
0.75	204	181 x 181
1.0	236	209 x 209
1.5	288	256 x 256
2.0	333	295 x 295

Stand representation and spatial distribution patterns of reserve trees can be highly variable. The goal of heterogeneity of conditions indicates a wide array of retention strategies. Retention design, including amount to retain, species, and distribution, can enable the production of increased benefits and minimize potential costs. Criteria to consider when determining desired representation and distribution include: landowner goals and stand management objectives, current and desired stand and community condition, characteristics of current and desired plant and animal species, potential damaging agents, site, and landscape characteristics. Detailed landscape analysis and planning that clearly addresses the sustainable allocation of resources, including the production of timber and the conservation of biodiversity, can improve upon stand-based management guidelines (such as those offered herein).

Figure 24-7. Reserve trees retained in patches.



Photo by Jeff Martin,
J-Mar Photography

Figures 24-8. Reserve trees retained as a group.



Photo by Joe Kovach

Figures 24-9. Reserve trees retained irregularly as individuals.



Photo by Joe Kovach

Recommendations for Retention in Managed Stands: Reserve Trees, Mast Trees, Cavity Trees, and Snags

Sustainable forest management is implemented within a framework defined by landowner goals and objectives, ecosystem condition and potential, and sustainable silvicultural systems and practices. Forests are cultivated to provide a variety of socio-economic and ecological benefits. Sustainable forest management integrates multiple management goals and objectives into most silvicultural systems and the management of most stands and landscapes.

Most stands that are actively managed include timber production as a management goal (often in concert with other goals). Tree retention typically focuses on crop tree selection and regeneration methods. To satisfy multiple objectives and provide multiple benefits, retain additional trees to achieve non-timber management objectives. Integrate the following recommendations for tree and snag retention into the management of most forest stands:

- Even-aged rotations
 - Retain ≥ 3 (if available), preferably large, snags per acre.
 - Retain reserve trees and/or patches at 3-15% crown cover or stand area, including large vigorous trees, mast trees, and cavity trees. Reserve tree retention is a generally recommended silvicultural practice for stands ≥ 10 acres. It is

encouraged in smaller stands, but operational, shading, and other biological issues may limit application.

- Even-aged intermediate treatments
 - Retain ≥ 3 (if available), preferably large, snags per acre.
 - Retain ≥ 3 (if available), preferably large, cavity trees per acre.
 - Retain ≥ 3 (if available), preferably large, mast trees per acre.
 - If previously established, manage reserve trees and patches. Management may include timber harvesting or passive retention. Consider retaining ≥ 3 trees per acre to develop into large, old trees and to complete their natural lifespan. These trees may also satisfy cavity and mast tree recommendations. These trees will often become large snags and coarse woody debris.
- Uneven-aged systems
 - Retain ≥ 3 (if available), preferably large, snags per acre.
 - Retain ≥ 3 (if available), preferably large, cavity trees per acre.
 - Retain ≥ 3 (if available), preferably large, mast trees per acre.
 - Consider retaining ≥ 3 trees per acre to develop into large, old trees and to complete their natural lifespan. These trees may also satisfy cavity and mast tree recommendations. These trees will often become large snags and coarse woody debris.

In cases where these recommendations for retention are not applied, then sound reasons and expected impacts of deviation should be documented.

When applying retention recommendations, be sure to consider:

- Retention will occur at the “Harvest Unit” level. Harvest Unit is defined as the stands within a timber sale. RMZ or Z prefix stands occurring within or adjacent to the Harvest Unit can provide retention opportunities. Retention will be encouraged in stands 10 acres in size or less that are managed as even-aged, but will not be required.
- Individual trees can provide multiple benefits and fulfill the intent of more than one of the above recommendations. For example, three large oak trees with cavities could satisfy the mast tree and cavity tree recommendations, as well as the large, old tree

consideration.

- Retention of both vigorous and decadent trees will provide an array of benefits.
- In general, species diversity is encouraged when selecting trees to retain.
- Large trees and snags are >12 inches dbh, and preferably >18 inches dbh.
- Trees retained can be scattered uniformly throughout a stand or irregularly dispersed, as single trees, groups, and patches. The general recommended strategy is to retain irregularly distributed patches along with scattered groups and individuals.
- Retention in aggregated patches generally provides the most benefits for wildlife and biodiversity. Also, patches retained can satisfy multiple benefits; for example, at stand rotation, an internal or adjacent unharvested buffer along a stream (RMZ) could provide a portion of reserve tree retention as well as satisfy BMP (water quality) recommendations. Patches should be >0.1 acres and generally <2.0 acres, but can be larger; reserve tree patches, particularly large ones, should be documented as retention patches.
- Harvesting of reserve trees may occur in the future or may be foregone to achieve other benefits. Retain reserve trees for at least one-half the minimum rotation age of the new stand (e.g. retain reserve trees at least 20-25 years if regenerating aspen). Consider retaining some trees to develop into large, old trees and to complete their natural lifespan; these trees will often become large cavity trees, snags, and coarse woody debris.
- Retain as many snags as possible. Retention of snag diversity (species and size) can potentially provide the greatest array of benefits. Snags that are determined to be a threat to human safety can be cut and retained on site as coarse woody debris.
- Clearly designate, in writing and/or by marking, which trees should be retained prior to any cutting operations.

820.8 BIOMASS HARVESTING GUIDELINES

Biomass harvesting is the practice whereby all or nearly all of the above ground portions of a tree are harvested and utilized. This includes the bole, limbs, twigs and leaves/needles. In traditional harvesting, only those parts of the tree that are larger than four inches in diameter are utilized. Issues of concern regarding biomass harvesting include the removal of woody debris that may serve as habitat for a variety of plants and animals as well as the removal of the vegetative matter which will eventually decay and become part of the soils. Studies have been conducted that show that biomass harvesting leaves sufficient woody debris on site through incidental breakage and the requirement that 10% of the tops harvested must be left scattered throughout the harvest area. A set of guidelines has been developed to help land managers determine if biomass harvesting is appropriate on a given site. These guidelines can be found at:

825 ANIMAL SPECIES MANAGEMENT

Sawyer County Forest provides a wide range of wildlife habitats from open grasslands/barrens to mature forests, from bogs to forested wetlands, from spring ponds to lake shorelines. A primary goal of wildlife management on the Sawyer County Forest is to provide a diversity of healthy ecosystems necessary to sustain and enhance native wildlife populations. This forest will be managed primarily to provide habitats for a suite of species rather than focusing on a specific species, with exceptions made for Federal or State Listed Endangered or Threatened Species.

825.1 TECHNICAL PLANNING

Management of wildlife populations on the Sawyer County Forest falls under the jurisdiction of the DNR. Planning may be a cooperative effort of the County Forest staff, DNR liaison forester and wildlife manager in formulating management plans and utilizing forest and wildlife management techniques to accomplish desired forest and wildlife management goals.

825.2 GUIDELINES

DNR operational handbooks including the Public Forest Lands Handbook (2460.5),

manual codes and guidance documents are important references and guidelines to utilize in fish and wildlife planning efforts.

825.3 INVENTORY

Habitat needs will be determined by analysis of forest reconnaissance information. Population estimates will be conducted periodically by DNR wildlife, endangered resources personnel, and other trained cooperators. Currently, Department Wildlife staff conduct the following surveys on or adjacent to the Sawyer County Forest:

- Biotic Inventories
- Summer deer observations
- Brood surveys
- Furbearer tracking
- Frog and Toad Surveys
- Bat Monitoring
- Bear bait surveys
- Snapshot Wisconsin
- Elk population monitoring

825.4 RESOURCE MANAGEMENT CONSIDERATIONS FOR WILDLIFE

The following areas of focus are identified for achieving plan objects and for benefit of wildlife.

825.4.1 General Management Policies

Forest management practices may be modified to benefit wildlife and diversity. The following will be considered when planning for management activities:

- Even-aged regeneration harvests (clear-cuts) should vary in size and shape and include retention considerations.
- A diversity of stand age, size and species.
- Mast-bearing trees and shrubs, cavity trees, and an adequate number and variety of snags.
- Cull trees (future snag or den trees) not interfering with specific high value trees.

- Timber types, habitat conditions and impacts on affected wildlife.
- Access management.
- Best management practices for water quality (BMP's).

825.5 IMPORTANCE OF HABITATS

Important habitat types are those cover types known to be of importance to certain native wildlife and whose absence would make that wildlife significantly less abundant. These shortages may be on a local or broader scale. The following habitat types can be considered important:

825.5.1 Non-forested wetlands

The Sawyer County Forest contains 16,277 acres of non-forested wetland types providing a variety of habitats for common, rare and endangered species. Emergent wetland, sedge meadow, muskeg bog and deep marsh provide habitat for species such as wood turtle, black tern, American bittern, and numerous other species.

825.5.2 Aquatic habitats

The Sawyer County Forest includes 1,215 acres of lakes, rivers, streams, ponds and other aquatic habitats. Open water provides habitat for species such as wood duck, boreal chorus frog, water shrew and many other species reliant on water related resources.

825.5.3 Riparian and other non-managed areas

Undisturbed shoreline and riparian areas present on the forest and provide habitat for species such as red shouldered hawk, green frog, and woodland jumping mouse.

825.5.4 Early successional forests

Management of aspen, white birch, jack pine and other shade intolerant species creates habitat for a large suite of wildlife species that benefit from early successional forests. On the Sawyer County Forest there are currently 40,202 acres of these forest types present. This is a key habitat used for recreational hunting activities providing conditions favorable

for American woodcock, ruffed grouse, white-tailed deer and non-game species such as golden-winged warbler, Kirkland's warbler and black-billed cuckoo.

825.5.5 Conifers

Conifers, whether jack pine, white pine, spruce, fir or other types appear to be an important habitat for a number of wildlife species. The Sawyer County Forest currently has 13,596 acres of coniferous habitat. Connecticut warbler, red crossbill, northern flying squirrel, and many others utilize conifer types. Jack pine areas can be managed to provide temporary barrens habitat providing habitat for Kirtland's warbler and other barren related species.

825.5.6 Oak management

Oak is an important mast producing food source on the forest, providing acorns for a wide variety of game and non-game species. The Sawyer County Forest has 10,084 acres of oak habitat. It is considered a critical resource to retain on the landscape for both its timber and wildlife value, providing habitat for species such as scarlet tanager, wood thrush, red headed woodpecker, and black bear.

825.5.7 Uneven/all aged management

Management of uneven aged stands provides for multi-storied canopies, diverse age structure and potentially older forest characters. The Sawyer County Forest has 24,451 acres being managed under an all aged management system. Species such as Canada warbler, little brown bat, black throated blue warbler and many others benefit from these forest type, in addition, numerous amphibian and reptiles utilize these forest types.

825.5.8 Large forest blocks

Large blocks of County Forest provide habitat for numerous interior species. Gray wolf, black throated blue warbler, Canada warbler and least flycatcher are a few examples of animals that rely on these large blocks.

825.5.9 Grasslands, openings, upland brush

Wildlife openings, grass rights-of-way, natural openings, upland brush and other upland open habitats provide for diversity and unique habitats benefitting pollinators, numerous species including upland plover and whip-poor-will. Sawyer County Forest currently has 988 acres identified as open grassland or upland brush habitat.

825.6 INTENSIVE WILDLIFE MANAGEMENT PROJECTS

Sawyer County Forest is located within the elk reintroduction project area, primarily in the Winter Block of the forest. Opening maintenance through burning and mowing is ongoing to improve habitat for the elk in those areas.

Thornapple River Oak Savannah, approximately 200 acres located in the Winter Block between the Thornapple River and Little Thornapple River is designated as the Thornapple Rover Oak Savannah project. The area consists of open grassland with heavy component of hazel with a scattered overstory of both Bur, and White Oak species. 66 acres is scheduled for prescribed fire to re-establish and maintain the openings while retaining the oak component.

825.6.1 Wisconsin Wildlife Action Plan / Species of Greatest Conservation Need (SGCN)

In addition to species listed as endangered, threatened or special concern within the NHI database, the Department also maintains a statewide list of species of greatest conservation need.

This list includes species that have low or declining populations and may be in need of conservation action. The list includes birds, fish, mammals, reptiles, amphibians and insects that are:

- Already listed as threatened or endangered
- At risk due to threats
- Rare due to small or declining populations
- Showing declining trends in habitat or populations

The WWAP working list can provide information on how management activities may impact, or in many cases benefit species of greatest conservation need. More information is available on the WWAP website:

<https://dnr.wi.gov/topic/wildlifehabitat/actionplan.html> .

825.7 FISH AND WATERS MANAGEMENT

Public waters shall be managed to provide for optimum natural fish production, an opportunity for quality recreation, and a healthy balanced aquatic ecosystem. Emphasis will also be placed on land-use practices that benefit the aquatic community. Management of County Forest lands will attempt to preserve and/or improve fish habitat and water quality.

825.7.1 Technical Planning and Surveys

Management of all waters within the County Forest is the responsibility of the DNR. Technical assistance will be provided by the local fisheries biologist. Studies and management will be conducted in the manner described in DNR Fish Management Handbook 3605.9. Water and Population Surveys fall under the jurisdiction of the Department and will be conducted as needed by fisheries biologists.

825.7.2 Special Projects

“Fish Sticks” Fish sticks projects are intended to restore woody habitat in lakes by adding trees to the near-shore area. They are large woody habitat structures that utilize whole trees either grouped together or single trees that result in the placement of more than 1 tree per 50 feet of shoreline. Fish sticks structures are anchored to the shore and are partially or fully submerged near the shoreline of a lake. A Fish Sticks project was installed on County Forest owned shoreline of Nelson Lake in cooperation with WDNR and the Nelson Lake Association.

825.7.3 Shoreland Zoning

Development and harvesting are regulated by Wisconsin's Forestry Best management Practices for Water Quality and by the Sawyer County Shoreland-Wetland Protection Ordinance. A copy of which is located in the appendix or by following the link below.

<https://www.sawyercountygov.org/DocumentCenter/View/1974/Shoreland-Wetland-Protection-Ordinance-effective-04-19-17-amended-01-17-19>

825.7.4 Access and development

Access and development of County Forest waters will be limited to those activities consistent with the above water management policies. See Chapter 740 also for further information on water access.

825.7.5 Important Water Resources

Management activities adjacent to these water resources, or in areas with sensitive soils or severe slopes should consider measures beyond the customary BMP practices. County staff may work with their DNR liaison forester in cooperation with the local DNR Water Resources staff to develop site-specific measures where appropriate. An inventory of water resources can be obtained for the County from DNR Water Resources staff. A map and list of the Outstanding and Exceptional Water Resources in Sawyer County are included in the appendix

830 EXCEPTIONAL RESOURCES, UNIQUE AREAS

830.1 HCVF FOR FSC AND DUAL CERTIFIED COUNTIES

The DNR established criteria for establishing HCVFs on state lands is found below. For the purpose of this plan, the county recognizes this criterion for identifying HCVFs on county land. This does not preclude the county from identifying other unique areas that do not meet the definition of HCVFs.

<https://dnr.wi.gov/topic/TimberSales/documents/DNRLandsHCVFSelectionCriteriaFinal.pdf>

HIGH CONSERVATION AREAS

- Forest areas containing globally, regionally or nationally significant

concentrations of biodiversity values including RTE species.

- Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.
- Forest areas that are in or contain rare, threatened or endangered ecosystems.
- Forest areas that provide basic services of nature in critical situations (e.g., watershed protection). **Wisconsin does not have known locations meeting this criterion.**
- Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health of indigenous communities) **Wisconsin does not have known locations meeting this criterion.**
- Forest areas critical to local communities' traditional cultural identity (e.g. areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

The HCVFs on Sawyer County Forest are the following:

Totogatic River Hemlocks FSC Category 3 HCVF

This approximately 40-acre high conservation value forest lies in section 3 T42N R9W. Hemlock is important to the diversity of our northern hardwood stands and provides needed habitat for many species, including migratory songbirds and a seed source for regeneration. Management is currently keyed to maintaining hemlock in this stand and improving the health and vigor of individual trees and islands of hemlock trees on this site.

830.2 AREAS RECOGNISED BY STATE OR FEDERAL GOVERNMENT

830.2.1 State Natural Areas

Sawyer County manages a variety of property designations including Wisconsin State Natural Areas (SNA's). The SNA system represents the wealth and variety of Wisconsin's biological diversity. They contain outstanding examples of native biotic communities and are often the last refuges in the state for rare and endangered plant and animal species. The Wisconsin SNA program

works with counties to further recognize outstanding native biotic communities that Sawyer County is presently managing as exceptional resources. SNA's are unique in that they can exist as stand-alone properties or be designated within the boundaries of another property type. Sawyer County maintains its land ownership, management and decision-making authority, but with cooperative recognition of these sites the County can enhance its ability to provide a broader range of opportunities for the citizens. Department of Natural Resources (DNR) Endangered Resources staff will work cooperatively with the County Forest by coordinating educational, monitoring, and research activities. Assistance on management projects can provide the county with more resources to accomplish necessary management. Management will protect the unique character of the area. The importance of Wisconsin State Natural Areas has been recognized on the County Forest by cooperating with Department staff.

830.3 AREAS RECOGNIZED BY COUNTY OR LOCALLY

Sawyer County may contain areas that are locally considered exceptional or unique. Some are recognized by other agencies, while others are designated only within this Plan. These resources may include wild rivers, lakes, natural areas, geological features or historical/archeological sites.

830.3.1 Forests with Old Growth Characteristics

Certain stands within the county forest may exhibit old growth characteristics, the main being large diameter trees. Examples of these areas are natural red and white pine stands and hemlock stands that are found throughout the forest. These stands may be managed to maintain or enhance the characteristics that make them unique. Thinning these stands from below removing suppressed trees, and retaining the majority of the large diameter trees are ways to maintain these characteristics.

830.3.2 Wildlife Sites (Hibernacula, Rookeries, Special Habitats)

No specific wildlife sites have been identified on the county forest, in the event

any are, they will be managed in consultation with DNR wildlife biologists.

830.3.3 Wild Rivers, Wild Lakes

The Totogatic River was designated as a “Wild River” by the state legislature in 2009. The river runs through Bayfield, Washburn, Douglas, and Sawyer Counties. The designation in Sawyer County is all portions of the river upstream from Nelson Lake, which flows through the County Forest.

The County Forest also contains numerous undeveloped wild lakes and stretches of river. These waterbodies are managed to maintain the wild nature that makes them unique.

830.4 CULTURALLY SIGNIFICANT SITES

Sites of significant cultural value are found on the Sawyer County Forest. Management practices will be modified to minimize any disturbance to the sites. State archaeologists and tribal experts are routinely consulted when management activities may impact culturally significant sites.

830.4.1 Burial mounds, cemeteries

None have been identified at this time but state archeologists and tribal experts will be contacted and consulted with if sites are located.

830.4.2 Logging Camps, Dams, Forest History

Remnants of old logging camps and dams exist throughout the forest. These sites will be inventoried and noted when management activities occur in the area.

Harvesting restrictions are placed on timber sales to protect these sites.

830.4.3 Civilian Conservation Corp (CCC) Camp

Camp Smith Lake camp is adjacent to Camp Smith Lake, and currently contains stone piles, cement slabs and foundations. The site has been planted with pines and spruce from the camp and management of the plantation takes into account these features and is modified to protect them.

- Dynamite Shack

A stone building known as the Dynamite Shack is in the Seeley Block, likely

associated with the CCC camp. Structure is mostly intact and any management activities are modified to protect it.

835 AESTHETICS

Public perception of forestry has changed over the last planning period and in general it appears that the public is much more accepting of the visual impact of sound forestry. In response to this, aesthetic management planning is intended to be much more simplified in this Plan.

835.1 AESTHETIC MANAGEMENT

The purpose of aesthetic management is to minimize negative aesthetic impacts of timber harvesting or other forest development projects. This is typically accomplished by modifying the timing, design, or intensity of the harvest or development projects. The goal of the County will be to protect and/or enhance the aesthetic value of these unique natural resources within reason. However, the overriding accountability of the County is the entire forest eco-system and managing the balance of this system in the best interest of current and future residents and visitors to the County Forest.

835.2 AESTHETIC MANAGEMENT ZONES

The aesthetic classification system used in this Plan places all land in the forest into either Aesthetic Management Zones A, B, or C. Land is placed into one of the three zones based on a number of factors including intensity of public use, type of recreational use, unique or scenic features, or visibility from a State or County Highway.

835.2.1 Class A Aesthetic Management Zones

Class A Aesthetic Zones include areas where there is intensive public presence or use, or areas with unique or scenic values. The primary goal of management will be either for scenic values, for the conservation of a unique resource itself, or for the betterment of the facility or recreational trail itself. For recreational facilities placed in the Zone A classification, timber will be managed to afford the greatest scenic potential for public enjoyment, but not to the detriment of the

facility itself, or the public’s safety. “Boundaries” for a Class A Zone may include the area within the reasonable visible horizon of the use area. The Class A Zone may also include adjacent areas that receive a considerable amount of use as a result of the recreation area.

CLASS A ZONES	DEFINED BOUNDARY
American Birkebeiner Trail	150 feet from the trail edge on both sides of trail
Nelson Lake Shoreline	100 feet from the ordinary high-water mark
Weirgor Lake Shoreline	100 feet from the ordinary high-water mark
Hatchery Creek Park	Undefined
Thornapple River	100 feet from the ordinary high-water mark
State HWY 27, 63, 70, and 77	50 feet from the hwy r.o.w. boundary

835.2.2 Permitted Uses – Class A Zone

- Timber harvesting relating to forestry regeneration practices
- Road and trail construction
- County directional, informational and recreational signs conforming to approved standards
- Borrow pits are discouraged, but may be approved by the Committee on a site-specific basis if reasonable alternate sites are not available.

835.2.3 Restricted Uses – Class A Zone

- Timber harvesting and other development may be prohibited during periods of peak public use.
- All slash must be lopped to with 18 inches of the ground or removed from view.
- Log landings are to be no closer than 100 feet from the affected facility without permission of the Forest Administrator.
- All tree and shrub planting will be space at random to enhance a natural appearance.
- New access roads will be permitted if they join the main road/trail at right angles. All such access roads/trails will be, when possible, curved so that no cleared line of sight will be created from the main road to the exterior boundary of the zone.
- Borrow pits are only allowed during the time a road is under construction.

When any borrow operation is completed the site will be restored pursuant to Chapter NR 135, Wis. ADM. Code and must aesthetically conform to general use of the area. Permanent pits shall be located outside the Class A Zone boundaries and screened from the Class A Zone.

835.2.4 Class B Aesthetic Management Zones

Class B Aesthetic Zones will be recreational trails or navigable waterways with the County Forest that are not used or viewed by the public as intensively as Class A Zones. Timber harvesting is considered of equal importance to the recreational use of these zones. Aesthetic practices are accomplished with some minor harvesting or design modifications to retain some level of scenic attractiveness.

CLASS B ZONES	DEFINED BOUNDARY
All waterways not designated as Zone A	75 feet from the ordinary high-water mark
Specific recreational trails designated by Committee (none designated currently)	

835.2.5 Permitted Uses – Class B Zone

- All land management activities are permissible but should be exercised with sensitivity to aesthetics and maintaining the long-term quality of the trail surface.

835.2.6 Restrictions – Class B Zone

- Sales must be designed where possible to create irregular harvest boundaries to soften aesthetic impacts
- Slash must be removed within 10 feet of the trail’s edge.
- Slash must be lopped to within 25 inches of the ground.
- Roads and landings must be rehabilitated to near original condition by implementing erosion control and vegetation (seeding) practices.
- Silvicultural practices must be implemented that will encourage growth and regeneration of species/timber types that are long-lived and can be managed by thinnings or selection harvests.

835.2.7 Class C Zones

The majority of the forest is classified as Zone C. Zone C includes all parts of the forest not contained in Zones A or B. Logging, hunting, snowmobiling, ATV riding, and bike riding are generally the most common uses of Zone C.

The primary management objectives in Zone C are to optimize timber production and wildlife habitat using sustainable forestry and wildlife habitat management practices. Implementation of special Aesthetic Management practices in Class C Zones is not normally a high priority. Sawyer County Forest standard timber sale contract language regarding maximum allowable stump heights, slash heights and placement, road rehabilitation responsibilities, and Water Quality Best Management Practices contribute to a minimum aesthetic management standard for Zone C. Other opportunities to maintain or enhance scenic quality should be considered and implemented where practical, but are not required.

835.2.8 Permitted Uses – Class C Zone

All land management activities that are consistent with the goals of the County Forest are allowed.

835.2.9 Restrictions – Class C Zone

No special aesthetic management practices are required.

835.2.10 Aesthetic Management Policy – American Birkebeiner Trail

The Sawyer County Land, Water, and Forest Resources Committee has the authority and establishes the direction for management of the County Forest as outlined in the Comprehensive Land Use Plan. The County Forest Administrator is empowered by the Committee to administer and implement the County Forest Program in a manner consistent with the intent and purpose of the County Forest Law (s. 28.11(1), Wis. Stats.). The County Forest Administrator will coordinate activities and programs with the appropriate Federal, State and Local governmental agencies to ensure that Forestry Best Management Practices are applied in the majority, if not all, situations.

A specific situation is the management of the aesthetic corridor along the American Birkebeiner Trail System. The Trail traverses approximately twenty-six (26) miles of Sawyer County Forest land. Timber production and Forest management is a high priority throughout the Forest including the Trail corridor area. Visual quality is a high priority on Class A Aesthetic Zones. The Trail is a unique international tourist attraction to the area and requires the implementation of Forestry management guidelines and practices that reasonably protects and/or enhances the aesthetic value of the area directly adjacent to the Trail.

Therefore, the following policy will apply to the management of the Class A Aesthetic Zone along the American Birkebeiner Trail:

- Timber harvesting in the immediate vicinity of the Trail official buffer zone (within one hundred fifty (150) feet from trail edge will be aimed specifically at improving the timber conditions of the Trail. The intent might be to provide vegetative screens and windbreaks to visually isolate Trail users from management activity; and, to provide for more environmentally appealing conditions for Trail users.
- County, State and American Birkebeiner representatives will coordinate timber sale activity along the Trail corridor to ensure that Forestry Best Management Practices are applied in all situations. The County Forest Administrator ultimately makes the decision on the appropriate course of action based on available information and facts.
- At times, due to disease, insect infestation, timber regeneration, or reforestation, the County Forest Administrator, in conjunction with the Department of Natural Resources (DNR), may determine that in the best interest of a forested area along the Trail more severe actions need to be taken to appropriately manage the area for the long-term. This might include actions such as clear-cut, select cut, slash of ground vegetation, etc. The American Birkebeiner will be notified in advance of such decisions to ensure that appropriate communication might be posted for users of the Trail.
- The goal of the Committee will be to protect and/or enhance the aesthetic value of this unique natural resource, within reason. However, the overriding accountability of the Forestry Committee is the entire Forest eco-system and

managing the balance of this system in the best interest of current and future residents, property owners, visitors to the forest and the State of Wisconsin.

840 LANDSCAPE MANAGEMENT

The County will make efforts to evaluate surrounding landscapes while managing the County Forest. The County will strive to provide management that compliments the landscapes, but also try to provide for resources or forest types that are lacking or declining within surrounding landscapes.

840.1 CONSERVATION OF BIOLOGICAL DIVERSITY

For the purposes of this plan, biological diversity will be interpreted to reference the variety and abundance of species, their genetic composition, and the communities, ecosystems, and landscapes in which they occur. Forest management activities on the Sawyer County Forest enhance biological diversity by managing for a wide variety of habitat types, age structures and by attempting to perpetuate and protect declining forest types.

840.2 HABITAT FRAGMENTATION

For the purposes of this plan, habitat fragmentation is interpreted as conversion of forests to land uses other than forestry. Lands enrolled in the County Forest Law help protect against habitat fragmentation. A continued program of encouraging land acquisition within the forest blocking boundary is intended to decrease the conversion of forest land to other uses.