

JUNEAU COUNTY FOREST COMPREHENSIVE LAND USE PLAN
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CHAPTER 800
INTEGRATED RESOURCE MANAGEMENT

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800 CHAPTER OBJECTIVES

1. 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 Juneau 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 Juneau 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 Central and Southern 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.

Forest Habitat Classification Types are discussed in greater detail in the "Integrated Resource Management Units" (Section 880) section of this chapter.

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. The Juneau County Forest lies primarily in the Central Sand Plains Ecological Landscape, with the exception of the Bass Hollow Unit that falls within the Western Coulee & Ridges Landscape. Appendix 1000 includes a map of Ecological Significant Places of the Central Sand Plains.

810.1.5 Integrated Pest Management

For the purpose of this Plan, Integrated Pest Management is defined as “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 Juneau 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), Juneau 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 Juneau County employees practicing forestry will receive BMP training. Additionally, Juneau 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 Juneau 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 Juneau 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

Field trials are an effective way to test new ideas and methods. As field trials are developed on State and County lands they will be made available at: <https://dnr.wisconsin.gov/topic/forestmanagement/silviculturetrials>

- Juneau County Forest Prescribed Fire followed by Jack Pine Seeding
Location: 20N-R4E, Sec. 26, SWNW, SENW
Date: October 21-23, 2015. The WI DNR prepared a burn plan to conduct a fall burn on 72-acres of Juneau County Forest Land in Armenia Township. The burn followed a salvage harvest of an oak-wilt infected black oak stand. Oak retention pockets were left on site for stand diversity and were burned through. The goal of the burn was to set back competing vegetation, consume logging slash, increase nutrient availability, and prepare the ground for jack pine seeding. Post-burn the site was seeded to jack pine prior to winter by the Juneau County Forestry Dozer dragging a Seed Bomb. Jack Pine seed was provided through the WI DNR Nursery.

815 MANAGEMENT CONSIDERATIONS TO REDUCE LOSS

815.1 RISK FACTORS

815.1.1 Wind

The effect of damaging winds on the Juneau County Forest is of real concern and can have lasting impacts. Strong winds more commonly have damaged red pine plantations in Juneau County, though the mature hardwood forest of Bass Hollow has also experienced blow downs. Timber sale planning and design can be used to avoid exposing adjacent crop trees to the prevailing winds. Selectively leaving groups of trees to support each other rather than leaving single trees during a harvest may also prevent some blow down from occurring. Maintaining forest health and reacting quickly following a severe wind storm to salvage down trees is crucial in mitigating this risk factor.

815.1.2 Flooding

Seasonal flooding along the Yellow River in Finley Township is a regular occurrence and can be expected each spring. Adjacent to the Yellow River in Finley lies 969 acres of the Juneau County Forest classified as bottomland hardwoods. The bottomland hardwood timber type regularly endures temporary flooding each year and is a product of the Yellow River's flood regime. In developing forest management goals in this flood prone environment near the Yellow River, proper application of BMPs for Water Quality and careful consideration of timber sale design can reduce risk to the bottomland hardwood forest, roads and trails.

815.1.3 Fire

The Juneau County Forest neighbors many private properties elevating the risk of wildland fire. Reducing the risk of catastrophic fire damage can be aided by continuing to promote young healthy forests and maintaining the health of older forests by reducing buildup of understory fuels and ladder fuels during management. Juneau County will continue to support efforts to inform the public of the wildfire risk and require spark arresters to be equipped on ATVs, UTVs and other equipment that operate on County Forest routes and trails.

815.1.4 Climate Change

Climate change has the potential to raise temperatures, alter the frequency, distribution and intensity of precipitation, storms and flood events in Juneau County. Forest pests and invasive species may also find conditions more favorable for outbreaks and expansion in a changing climate. This may have lasting effects on stand composition and could displace native communities. One of the ways we can mitigate the effects of climate change is through regular reconnaissance of Juneau County Forest stands and being alert to the effects of climate change on the County Forest over time. The Juneau County Forest will strive to promote forest health and diversity of native species across the forest to strengthen natural resiliency to cope with climate change.

815.1.5 Timber Markets

Changes in market supply and demand or loss of a nearby mill can quickly alter what forest products are economical for loggers to harvest. This may delay or postpone some harvests or alter cutting specifications to make a timber sale more feasible. Establishing a variety of timber sales with a mix of wood products and species can help Juneau County manage the forest and cope with unpredictable timber markets in the future. Juneau County is also an active member in the Wisconsin County Forest Association (WCFA) and supportive of the Association's efforts to promote the Wisconsin forest industry.

820 PLANT COMMUNITIES MANAGEMENT

Juneau 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 oak. Tree retention guidelines are followed when prescribing clearcut 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 pine and red oak (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 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 Juneau 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.

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 exposes bare mineral seedbeds and creates conditions necessary for regeneration of pine species, particularly jack pine.

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 and incorporation into practice.

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 aurally. 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. Juneau 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 and seed-tree. 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 and requires full sunlight to regenerate in abundance. The best method for creating optimum conditions for stand replacement is by 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 economic and fiber production. Management on the county forest will attempt to maintain the current acreage of aspen by natural means.

<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 Juneau County are black oak and aspen. This species is shade

intolerant and is naturally regenerated by wildfire. Full sunlight, prepared seedbed, and heat are the key conditions provided by fire. With the control of wildfire, other techniques have become necessary in order to perpetuate this forest type.

Juneau County has mainly used artificial methods to regenerate jack pine. Once a site is clearcut, then a seeder bomb pulled by a bulldozer is used to cover over the area with jack pine seed purchase from the WI DNR nursery. The bulldozer is equipped with a FELCO blade on the front which creates a furrow that the seeder bomb spirals within as it's dragged and deposits seed. The seeder bomb is set to disperse about one-quarter pound of seed per acre. More recently, the WI DNR Wildland Fire staff have pulled the seeder bomb behind their tractor plows to regenerate jack pine stands on the County Forest. Seeding jack pine in the fall is more successful than seeding in the spring. Planting seedlings has also been successful, however it requires more expenditure and administration.

From a landscape perspective, the jack pine type is declining as it is converted either through natural succession or through planting to another species. The Juneau County Forest is attempting to increase jack pine abundance on the County Forest, particularly where oak-wilt is devastating oak stands. Juneau County is aware of the state-wide decline of this important forest type and is striving to reduce that trend.

<u>Shade tolerance:</u>	Intolerant
<u>Intermediate treatments:</u>	None
<u>Median rotation age:</u>	60
<u>Primary regeneration method:</u>	Natural/Artificial
<u>Harvest method:</u>	Clearcutting
<u>Habitat value:</u>	Early successional related species
<u>Economic value:</u>	fiber production / bolts
<u>Insect disease considerations:</u>	Jack pine budworm / pine bark beetle

820.2.1.3 Red Pine

The Central Sands of Wisconsin at one time maintained a significant pinery

consisting of jack pine, white pine and red pine. As time passed after European settlement, the white pine and red pine were logged off and jack pine became the significant conifer in the Central Sands. European settlement also opened up a lot of forested areas so that cultivated crops could be planted. After a time farmers realized that the soil and climate would not permit them to produce enough to become economically successful. They eventually abandoned their farms and left the area. The open lands either naturally reverted back to jack pine or were planted to red pine.

Juneau County grows red pine on an even-aged rotation cycle. The sites are prepared for planting either mechanically or with chemicals to remove other vegetative competition. After planting there may be need for additional release from other plants. This can also be done chemically. The first thinnings occur at about 25 years of age with subsequent thinnings every 10 to 15 years depending on growth. The final harvest can be scheduled for 75 to 100 years after initial establishment. The stand is then re-established through planting. Red pine management on the County Forest will attempt to maintain the current acreage of this important type primarily by artificial means. Red pine is the most valuable timber species on the County Forest, however red pine plantations can lack diversity for wildlife.

<u>Shade tolerance:</u>	Intolerant
<u>Intermediate treatments:</u>	Thinning
<u>Median rotation age:</u>	75-80
<u>Primary regeneration method:</u>	Primarily artificial
<u>Harvest method:</u>	Clearcut
<u>Habitat value:</u>	Habitat and shelter / food source for some mammals and birds
<u>Economic value:</u>	Fiber / bolts / saw timber / utility poles
<u>Insect disease considerations:</u>	Pine bark beetle / Heterobasidion Root Disease (HRD)

820.2.1.4 White Pine

White pine has also been a locally significant tree species in the Central Sands

area since the first European settlements were established. The species grew to a great size and supported large harvesting operations in the later 1800s in the northwest portion of Juneau County. This large pinery was logged off by such eminent logging entrepreneurs such as Weyerhauser and others in just a few years.

Initially white pine re-established itself by the few trees that were “left behind” for various reasons. Later, in other areas, planting white pine also became popular. White pine was established in areas that were too moist for red pine. Juneau County manages white pine using even-aged management techniques with periodic thinnings when stocking levels indicate the need for thinning. There are places where white pine has established itself under the shade of a hardwood overstory. In these instances, the over-story will be removed to permit the white pine to stay healthy and continue to grow. In some circumstances a stand that has white pine may have uneven-aged characteristics and will be treated as such. Regeneration of white pine can be done by either natural means or through planting. White pine can produce high grade lumber if it is pruned early in its life cycle.

<u>Shade tolerance:</u>	Intermediate
<u>Primary regeneration method:</u>	Natural
<u>Harvest methods:</u>	Intermediate thinning / overstory removal
<u>Habitat value:</u>	Habitat and shelter / food source for some mammals and birds
<u>Economic value:</u>	Fiber production / saw timber
<u>Insect disease considerations:</u>	White pine blister rust / White pine tip weevil / Pine bark beetle / HRD

820.2.1.5 Oak and Scrub Oak

Oaks are an important wildlife tree in Juneau County. Mature oak trees provide valuable cover, den sites, hunting perches and roosts for a variety of wildlife species. Acorns are the most important food item for a great number of forest species during the fall and winter months. Oaks are also a valuable timber species

and sought for firewood collection. The Juneau County Forest grows a variety of oaks from black oak, red oak, white oak and swamp white oak depending on the location and soil conditions. Oak wilt is widespread and a prominent disease in Juneau County and is responsible for the majority of mortality in the black and red oak trees. Oak management on the County Forest will attempt to mitigate the impacts of oak wilt and maintain or increase the current acreage of oak. There are currently 1,746 acres typed as oak on the Juneau County Forest. Oak designated stands exist on better quality sites.

Scrub Oak

The Juneau County Forest consists of 2,847 acres of scrub oak type forest. The scrub oak type is of lower economic value and is found on upland nutrient-poor sites with sandy soils. Although other oak species can be present, the scrub oak type on the Juneau County Forest is predominantly black oak and northern pin oak. Associated species within scrub oak stands are jack pine, red maple and aspen.

<u>Shade tolerance:</u>	Intermediate
<u>Primary regeneration method:</u>	Natural
<u>Harvest methods:</u>	Overstory removal
<u>Habitat value:</u>	Habitat / shelter / mast production
<u>Economic value:</u>	Fiber production / bolts / sawtimber
<u>Insect disease considerations:</u>	Oak Wilt, Gypsy Moth, Two-lined Chestnut Borer

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 Bottomland Hardwood

These are stands dominated by shade tolerant and mid-shade tolerant species. In Juneau County, Bottomland hardwood stands are typically dominated by swamp white oak, bitternut hickory, ash, basswood, silver maple and red maple. Management in Bottomland Hardwood stands should avoid harvesting systems that create too large of openings that will allow reed canary grass to overtake and suppress forest regeneration.

<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>	Important to many birds / mammals
<u>Economic value:</u>	Low
<u>Insect disease considerations:</u>	Emerald ash borer, others
<u>Trends:</u>	Ash decline because of EAB

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 Juneau 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. *(Choose those applicable to your county.)*

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. Hemlock is only found in a small area in the Bass Hollow Unit of the County Forest. It is a remnant stand that has hung on since the last glaciation occurred in the State. It is located on the south side of a valley on a north-facing slope. This small stand will be left untouched so that it will have an opportunity to maintain itself under natural conditions.

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 Northern red oak

Approximately 264 acres of the Bass Hollow Unit of the Juneau County Forest is classified as northern red oak. Northern red oak is a shade intolerant to mid tolerant species and appears to require disturbance to regenerate effectively. Juneau County is committed to retain as much of the existing acreage of northern red oak as possible, however the steep terrain of Bass Hollow makes forest management challenging. Regeneration efforts will focus on timing soil scarification with good acorn crops and shelterwood harvests.

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. To date, invasive species such as garlic mustard, parsnip and buckthorn have been found in several location on County

Forest Land. These locations include forest compartments in Cutler Township as well as the Bass Hollow Recreation Area. Invasive species locations are being document in the Wisconsin Forest Inventory and Reporting System (WisFIRS) for future planning and treatment. Local contractors have assisted in establishing yearly treatments for the garlic mustard and parsnip found at Bass Hollow to stay ahead of the infestation. 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

The retention of reserve trees can provide a “lifeboat” function that contributes to the conservation of biological diversity and continuation of habitat after a harvest. Juneau County has adopted the Green Tree Retention Guidelines (GTR) developed by the WCFA and can be referenced in Chapter 1010.

820.8 BIOMASS HARVESTING GUIDELINES

Juneau County has adopted the Wisconsin’s Forestland Woody Biomass Harvesting Guidelines developed by the WI DNR Division of Forestry and Wisconsin Council on Forestry. Field manual can be referenced by Wisconsin’s Forestland Woody Biomass Harvesting Guidelines, PUB-FR-435-2014 (WI DNR Division of Forestry and Wisconsin Council on Forestry).

825 ANIMAL SPECIES MANAGEMENT

Juneau 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 Juneau 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 Juneau 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. The Juneau County Forestry Department does not carry out any independent wildlife population studies currently. For more information, consult with WI DNR Wildlife staff on current surveys or studies on or adjacent to the Juneau County Forest.

825.4 RESOURCE MANAGEMENT CONSIDERATIONS FOR WILDLIFE

The following areas of focus are identified for achieving plan objectives 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 (clearcuts) 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 Juneau County Forest contains 1,662 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 Juneau County Forest includes 72 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 are 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, jack pine and other shade intolerant species creates habitat for a large suite of wildlife species that benefit from early successional forests. On the Juneau County Forest there are currently 2,388 acres of jack pine and 1,890 acres of aspen 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 species on the Juneau County Forest are predominately jack pine, white pine, and red pine, though spruce and cedar may occasionally be found. The Juneau County Forest currently has 7,236 acres of habitat in pines. 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 Juneau County Forest has 4,595 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 Juneau County Forest has 162 acres of Bottomland Hardwood forest 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. Keeping these large forest blocks intact and preventing further fragmentation is very important to the Juneau County Forest.

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. The Juneau County Forest currently has 55 acres identified as open grassland or upland brush habitat.

825.6 WILDLIFE MANAGEMENT PROJECTS

825.6.1 Wisconsin Wildlife Action Plan / Species of Greatest Conservation Need

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 (SGCN).

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 Shoreland Zoning

The Juneau County Wetland/Shoreland Ordinance can be found in Chapter 3000.

825.7.3 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.

825.7.4 Important Water Resources

There several significant water resources within or adjacent to the Juneau County Forest, they include Petenwell Lake, Castle Rock Lake, Lemonweir River and Yellow River. Petenwell Lake is a man-made lake (impoundment of the Wisconsin River), recognized as Wisconsin's 2nd largest body of water (23,000+ acres) and lies adjacent to the Juneau County Wilderness Park & Campground. Castle Rock Lake (13,955 acres) borders the Juneau County Castle Rock Park & Campground, the largest campground the Juneau County Land, Forestry & Parks Department manages with over 300 campsites. The Lemonweir River flows by Kennedy Park, a 200-acre day-use park with a canoe/kayak launch on the banks of the Lemonweir. Large white pine trees dot the shoreline along the Lemonweir River within Kennedy Park and are often used by eagle's for nesting. The Yellow River courses over 3 miles along Juneau County Forest Land in Finley and Necedah Township. The Yellow River is the longest river running unobstructed through Juneau County Forest Land. The large block of Juneau County Forest Land adjacent to the Yellow River provides excellent habitat for gray wolf, turkey, black bear, deer, birds and many other species that benefit from the river corridor.

830 EXCEPTIONAL RESOURCES, UNIQUE AREAS

830.1 HCVF FOR FSC AND DUAL CERTIFIED COUNTIES

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

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

HIGH CONSERVATION VALUES (HCVs)

1. Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values including RTE species.
2. Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.
3. Forest areas that are in or contain rare, threatened or endangered ecosystems.
4. Forest areas that provide basic services of nature in critical situations (e.g., watershed protection). **Wisconsin does not have known locations meeting this criterion.**
5. 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.**
6. 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 High Conservation Value Forest Areas on the Juneau County Forest are the following:

830.1.1 Bass Hollow Recreation Area – HCV 3

3. Forest areas that are in or contain rare, threatened or endangered ecosystems.

Description:

The Bass Hollow Recreation Area encompasses 295 acres and has an exceptional southern mesic to dry-mesic forest. The forest is recognized as containing rare, threatened or endangered ecosystems (HCV 3). The composition of the forest in canopy, understory and ground layer is very diverse. This forest is as biologically rich as any known forest of comparable size in Wisconsin and is the most important High Conservation Value Forest in the Greensand Cuesta Ecological places of the Central Sand Plains Landscape. Four plant species of special concern with good populations are found here. Two state-threatened bird species nest in Bass Hollow. The State of Wisconsin purchased a tract north of the County owned Bass Hollow Recreation Area to provide a larger block of forest land to enhance habitat for rare species. This WI DNR managed property is known as the Bass Hollow State Natural Area.

The Juneau County Bass Hollow Recreation Area consists of a small park, shelter and playground on the ridge that is frequently used by the local population. A 3½ mile hiking and horseback riding trail winds down into the hollow from a starting point near the Bass Hollow park shelter. The trail circles the 295-acre Bass Hollow Recreational Area and is restricted to non-motorized uses.

Management:

Management goals for the Bass Hollow Recreation Area are to preserve and protect the rare, threatened or endangered ecosystems for future generations. Management will focus on preventing disturbance or destruction, monitoring and removing invasive exotics, and by permitting public uses that are compatible with the natural area values. Management goals for the property will be met by working cooperatively with WI DNR Ecologists, State Archeologists and environmental consultants.

Monitoring:

Monitoring of the Bass Hollow Recreation Area to preserve the integrity of the

natural resources has been accomplished through planned forest reconnaissance, yearly trail inspection, and the monitoring and removal of invasive species. The forest stands in Bass Hollow are scheduled for reconnaissance updating regularly through the WisFIRS Forest Inventory System and were last surveyed in 2012 and 2014. The 3½ mile hiking and horseback riding trail is inspected twice yearly to monitor for human impacts and to ensure the public uses are sustainable and preserving the natural resource values. To improve monitoring and coverage of Bass Hollow, The Juneau County Forestry Department has partnered with an environmental consultant company to conduct invasive species monitoring and control beginning in 2018. This partnership has improved the monitoring of Bass Hollow through surveying for invasive species during the spring, mapping their locations, and enabling earlier detection and eradication of exotics.

830.1.2 Burial Site – HCV6

6. 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).

Description:

The Bass Hollow Recreation Area also contains a burial site significant to Native American culture and the Ho-Chunk Nation (HCV 6). Known grave sites have been investigated and recorded by the Ho-Chunk Nation Archeologist and State Archeologist. The location of the burial sites will not become a part of the public information domain. These sites are legally protected by several State and Federal laws. If any disturbance or destruction is observed on the sites, the proper authorities will be notified.

Monitoring:

To ensure continued protection of the burial site and surrounding area, Juneau County Forest staff will monitor the burial site annually for the duration of this Plan (2021-2035). Monitoring will involve inspection of the site once a year to

verify the area remains undisturbed and protected. Any management required near the site to preserve the integrity of the area will be done according to the recommendations of the Ho-Chunk Nation Archeologist. Consultation with the WI State Archeologist and Ho-Chunk Nation Archeologist will occur if further protective measure are warranted in the future.

830.2 AREAS RECOGNIZED BY STATE OR FEDERAL GOVERNMENT

830.2.1 State Natural Areas

The Bass Hollow State Natural Area abuts the Juneau County Bass Hollow Recreation Area. The WI DNR manages this 193 acres property that was designated a State Natural Area in 1999.

Cranberry Creek Mound Group (No. 203)

Cranberry Creek Mound Group preserves one of the most significant archeological sites in Wisconsin and one of the largest and best preserved mound complexes in the Upper Midwest. The site contains excellent examples of conical, linear, oval, and effigy mounds built by Native Americans of the Woodland period (ca. 100-800 A.D.). Owned by the WI DNR, Cranberry Creek Mound Group was designated a State Natural Area in 1986.

Necedah National Wildlife Refuge

Established in 1939, the 44,000 acre Necedah National Wildlife Refuge is a mosaic of sedge meadow, savanna, prairie, and pine-oak forest. The Refuge is home to ringed boghaunter dragonflies, whooping cranes, trumpeter swans, wolves, Karner blue butterflies, badgers, and red-headed woodpeckers.

830.2.2 State Scientific Areas

Currently there are no State Scientific Areas on the Juneau County Forest.

830.2.3 Endangered species habitats (Karner Blue Butterfly, Kirtland's Warbler, etc.)

There are areas of the Juneau County Forest that are considered "high potential range" of the Karner Blue Butterfly. When harvests or other projects are identified within this "high

potential range”, the protocols identified in the Habitat Conservation Plan for the Karner Blue Butterfly will be followed.

830.2.4 Rare communities

There are a number of rare communities that are present on the Juneau County Forests

- Hemlock Relic
- Southern Dry-Mesic
- Moist Cliff
- Floodplain Forest

Detailed descriptions of each rare community can be found in the “Ecological Landscapes of Wisconsin” publication. This can be found by visiting dnr.wisconsin.gov keyword “landscapes”.

830.3 AREAS RECOGNIZED BY COUNTY OR LOCALLY

Currently there are no known areas on the Juneau County Forest.

830.3.1 Forests with Old Growth Characteristics

Sites on the County Forest in Cutler Township, in the area known as Blueberry Trail, have large, old white pine trees that have not been aged. The sites have wet ground nearly year-round and are remote making timber harvesting unpractical. These sites because of their small size and will not have any special management practices applied to them other than those which would help to maintain them on the County Forest landscape. Management of the lands adjacent to them will be modified so that the practice will not interfere with the natural processes occurring on these areas.

Kennedy Park also contains scattered large, old white pine and oaks that have been protected in the Park. Management of the lands adjacent to them will also be modified so that future harvest activity will not interfere with the natural processes occurring on these areas.

830.3.2 Wildlife Sites (Hibernacula, Rookeries, Special Habitats)

Other areas of wildlife significance have not yet been located and identified. As they

become known, assistance will be sought from resource experts to determine which management practices could be modified according to their recommendations.

830.3.3 Endangered or Threatened Species Habitat

The Juneau County Forestry Department is a participant in the Wisconsin Karner Blue Butterfly Habitat Conservation Plan (HCP) and has been from the beginning of the project. Land Management is done according to the HCP Protocols to promote Karner Blue Butterfly habitat. The Juneau County Forest uses the “shifting mosaic” management scheme for its management of the forest in attempt to continually provide habitat for Karner butterfly. Wild lupine has established itself very well in areas where soil disturbance has just occurred, i.e. jack pine seed plantings, new red pine plantings and timber sale activity. Continued disturbances will provide additional opportunities for creating KBB habitat.

830.4 CULTURALLY SIGNIFICANT SITES

830.4.1 Burial mounds, Cemeteries

A small burial dating back to early settlers of Juneau County is located in the Town of Clearfield on Juneau County Forest land. Forest Management will be modified to protect the integrity of the burial site. A fence delineates the area that will receive protection to preserve the integrity of the site. Thinning in the pine plantation will be done to protect the fence so the burial site will not be disturbed by the logging. At present, the general management is by selectively marking the trees to be harvested. Selective harvesting would be done near the site but the residual basal area would be slightly lower than the other areas of the stand so that additional intrusions into the area will not be as frequent as in the remainder of the stand. The use of heavy equipment will be restricted in the area.

830.4.2 Logging Camps, Dams, Forest History

There are no areas of this nature identified on the Juneau County Forest.

830.4.3 Landmarks

There are no areas of this nature identified on the Juneau County Forest

830.4.4 Other

There are no other locally significant sites on the Juneau County Forest. If any are developed or discovered, advice and recommendations from experts will be sought to determine the procedures necessary for their management.

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

Aesthetic management techniques may be applied in areas of high visibility or high public use. Altered management, visual screens, slash disposal, conversion to other species, no cut zones or other methods may be employed, depending on the circumstances of the specific site.

835.2 AESTHETIC MANAGEMENT ZONES

Aesthetic Management Zones include areas where there may be high levels of public presence because of scenic attraction, or some use of the area that would be enhanced by special timber management practices. Specific prescriptions will be developed on a case by case basis with consultation with County and DNR Foresters.

835.2.1 Aesthetic Management Zone Examples

- Park and recreation areas: Castle Rock Park, Wilderness Park, Kennedy Park, and Bass Hollow Recreation Area. Maps of these parks and recreation areas are included in Appendix 1020.

- Lakes and rivers with significant recreational use: Wisconsin River, Yellow River Corridor.

835.2.2 Aesthetic Management Prescriptions/Options

- Staggered Harvests / Visual Screens
- Forced or natural conversion to longer lived species
- Irregular harvest lines, interrupted sight distances

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 Juneau 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 and improve access for forest management.