COUNTY FOREST COMPREHENSIVE LAND USE PLAN

TABLE OF CONTENTS

CHAPTER 800

INTEGRATED RESOURCE MANAGEMENT

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 Wood 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 Wood County Forest is managed. This broad definition describes the content of everything within this comprehensive land use plan. Previous chapters have discussed in depth many of the social and economic issues.

For the purpose of this chapter, the scope of Integrated Resource Management includes:

Forests, habitats, biological communities
Wetlands and waters
Wildlife and endangered resources
Soils and minerals
Cultural and historical resources

Management of one resource affects the management or use of other resources in an area. Managing each use or resource by itself is less effective than managing all of them in an integrated way. This is a field level approach to integrated resource management. Management decisions are made while considering that each site is part of a larger ecosystem. Similarly, the development and implementation of this plan also considers other planning efforts in order to provide for broader scale management.

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 Wood County Forest is managed on an integrated resource approach.

810 SUSTAINABLE FORESTRY

The definition of sustainable forestry in the Wisconsin Administrative Code and the Wisconsin Statutes is as follows:

> "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, <u>sustainable</u> <u>forestry</u> 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. The DNR forester will be responsible for the completion and maintenance of the recon system and will assist in interpretation of the data to be utilized in planning and scheduling resource management.

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. Its primary use is the assessment of biological potential of upland forest sites. Through the application of Forest Habitat 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 feasible management alternatives, and choose appropriate management objectives.

Data will be collected in order to classify the entire forest. This information should be collected along with, and made part of, the compartment reconnaissance system during regular field inspections. This data should also be compared to soil survey information in order to associate the relationships between forest habitat types and soil types.

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. Detailed soil surveys, when available, will be made a part of the compartment reconnaissance system and continue to be correlated to the Forest Habitat Classification system.

Soil survey information may be obtained from the Natural Resource Conservation Service office.

810.1.4 National Hierarchical Framework of Ecological Units/Ecological Landscapes of Wisconsin

Integrated resource management recognizes that an individual forest site is part of a larger landscape, and management activities can have an impact beyond a specific site. The National Hierarchical Framework of Ecological Units (NHFEU) is a useful tool in understanding natural landscapes.

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.

Landtype Associations (LTA's) are considered landscape-scale ecological units, and are identified by surficial geology, patterns of vegetation, soil parent materials, and water tables. Most LTA's are between 10,000 and 300,000 acres in size.

Each landtype association contains a general description of characters such as landform, historic vegetation, current vegetation, water resources, land area, socioeconomic data, agriculture, population, and ecological opportunities.

Goals can be developed for an LTA based in part on its capability, productivity, unique character, and the scarcity or abundance of similar LTA's in the state, region or beyond. Objectives for vegetation management, wildlife habitat, ecological restoration, and recreation use can be tailored to the characteristics and potentials of the ecosystem.

810.1.5 Integrated Pest Management

Integrated Pest Management for the purpose of this Plan is defined as follows:

> 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 sound.

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

Often 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 FR093*.

Consistent with the aforementioned manual (page 6), Wood 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 erodable soil types, close proximity to streams or lakes, or steep slopes may require mitigating measures in excess of those outlined in the manual. All Wood County employees practicing forestry will receive BMP training. Additionally, Wood County will require all logging contractors that operate on County timber sales to comply with all SFI certification requirements which includes BMP training.

810.1.7 Forest Fire Management

810.1.7.1 Uncontrolled Fire Refer to Chapter 600

810.1.7.2 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 in the Committee's opinion, are best equipped to provide that service. This data will be used as appropriate for management planning.

810.1.8.1 Water Resources

DNR fisheries personnel and the water management specialist will provide surveys, studies, and technical advice as necessary to prepare and carry out recreational planning affecting waters on the County Forest. (Also see Chapter 840.6)

810.1.8.2 Wildlife Resources

DNR wildlife biologists will implement population and habitat surveys, provide technical advice, and direct assistance needed for wildlife management planning and implementation on County Forest lands. (Also see Chapter 840) Wildlife projects are identified and implemented in collaboration with the County Forest administrator, DNR liaison forester, and the Committee.

810.1.8.3 Soil Resources

Soil maps and surveys prepared by the Natural Resource Conservation Service (NRCS) will be used in various phases of planning.

810.1.8.4 Mineral Resources

The DNR may provide information valuable for management of gravel and other mineral resources. (Also see Chapter 515.2).

810.1.8.5 Wetland Resources

Maps prepared by the DNR's Bureau of Fisheries Management and Habitat Protection, may be utilized for identifying wetlands. Although not comprehensive, particularly in forested areas, these maps are a good initial tool for identifying wetlands on County Forest lands. Assistance and technical advice will be requested from the DNR water management specialist when wetlands may be affected by management practices. The Army Corps of Engineers will also be consulted as appropriate. In addition, Wisconsin's Forestry Best Management Practices for protecting water quality will be used. (Also see 820.2.2 for further details).

810.1.8.6 Navigable Streams

The DNR's water regulations specialist will be consulted when navigable stream crossings or navigable stream management projects are being planned. (Also see Chapter 840.6.5). Best Management Practices for protecting water quality will be used.

810.1.8.7 Floodplains

Maps prepared by the Federal Emergency Management Agency (FEMA) will be used to identify floodplains. The County zoning staff may be consulted regarding management activities in the floodplain.

810.1.8.8 Cultural Resources

Management planning will take into consideration historical and archaeological sites. More information may be obtained from the State Historical Society or the DNR's archeologist.

810.1.8.9 Entomology / Pathology

Wisconsin DNR forest pest staff will provide information and consultation as requested by the County. (Also see Chapter 610 for more information on forest pest control.

810.1.8.10 Endangered Resources

DNR endangered resource staff will provide Natural Heritage Inventory (NHI) information and are available for consultation on endangered resources issues.

810.1.9 Local Silvicultural Field Trials

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

- *Red pine shelterwood*
- *Anchor chain site prep with white pine seeding*
- *Prescribed burning for oak regeneration*

A compilation of silvicultural trials on State and County lands is available at: *http://dnr.wi.gov/org/land/forestry/sciences/silviculture/index.html*

810.1.10 Local Citizen Involvement

The Wood County Parks and Forestry Committee is an open forum to listen, evaluate and incorporate, where appropriate, the public's input into management of the County Forest.

820 BIOLOGICAL COMMUNITY TYPES

A community is an assemblage of different plant and animal species, living together in a particular area, at a particular time in specific habitats. Communities are complex and dynamic systems named for their dominant plant species.

Species/community information has been condensed to familiarize the reader with the make-up of the Forest.

Refer to Chapter 130.1.4 for more information

820.1 FORESTED COMMUNITIES

The forested cover types are made up of a variety of size classes (regeneration, sapling-pole, and saw timber) and structure (canopy, layers, ground vegetation, dead and downed material, and inclusions). Forested communities within the Wood County Forest cover approximately 77% of the Forest.

Wood County contains the following forest communities. (The percentage shown is the coverage of each forest type out of the total forested acreage on the property.)

Aspen - 60%. Consisting of primarily aspen species often found in combination with paper birch, red maple and oak species

Oak - 17%. The oak type includes stands of black and pin oak and also stands with northern red oak and white oak. Red maple and aspen are common associates.

Red Pine - 8%. More than 50% red pine (mostly plantations).

White Pine - 6%. More than 50% white pine (natural stands and plantations).

Bottomland hardwoods - 4%. Typically floodplain species including silver maple, river birch, elm, cottonwood, and green ash.

Red Maple – 2%. More than 50% red maple and associated with aspen and other hardwoods.

Jack Pine - 1%. More than 50% jack pine.

Tamarack - 1%. More than 50% swamp conifer species with tamarack predominating.

Fir-Spruce - <1%. Consisting primarily of planted white spruce stands.

White birch - <1%. More than 50% white birch and often found in combination with aspen and red maple.

Central Hardwoods - <1%. Consisting of upland hardwood species including oaks, elm, aspen and cherry. No one species makes up more than 50% of the stand.

820.2 NON-FORESTED COMMUNITIES

Non-forested communities within the Wood County Forest cover approximately 23% of the forest. In broad categories this acreage consists of: upland communities (1%), wetland communities (20%) and water (2%).

Non-forested habitats are important components of management within the County Forest. Upland and wetland non-forest types provide important habitat for distinct groups of species.

The following provides a general description of the non-forested communities:

820.2.1 Upland Non-Forest

Upland Non-Forest areas of the County Forest include:

Grass openings – consists of upland grasses, such as brome, quack, bluegrass, timothy, big and little bluestem.

Herbaceous vegetation - ground cover predominated by herbaceous species with bracken fern, upland aster and goldenrod being common.

Shrub openings - primarily upland sites less than 10% stocked with tree species but having 50% or more of the area stocked with taller growing, persistent shrubs. This includes, but is not limited to, shrubs such as hazel, gray dogwood, juneberry, blueberry, huckleberry and winterberry.

Rock outcrops and sand banks - rock outcrops include rocky tallus, and bedrock material.

820.2.2 Wetlands

Wisconsin State Statutes define a wetland as “an area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or

hydrophytic vegetation, and which has soils indicative of wet conditions." Wetland communities are recognized to be a complex association of plants and animals, soils and water levels having special natural values. They are fragile systems that undergo rapid degradation when affected by incompatible uses and unskilled management. Wetlands provide many functional values including shoreline and flood protection, water quality protection, groundwater recharge, and animal and plant habitat. Therefore, it is the policy of Wood County to reserve, protect and manage the wetlands under its jurisdiction in a manner that recognizes the natural values of wetlands and their importance in the environment. To this end the County will:

1) Recognize wetland values in management plans, taking reasonable steps to minimize harmful effects.
2) Cooperate with the DNR in wetland inventories and in preparation of essential wetland information.
3) Maintain control of vital wetlands under its jurisdiction when to relinquish such control would risk substantial site alteration and subsequent degradation of wetland values vital to the area and the state.
4) Minimize adverse changes in the quality or quantity of the flow of waters that nourish wetlands.
5) Cooperate with local, state and national agencies and citizens to increase understanding of the importance of wetlands and the need for land and water stewardship in guiding development decisions.
6) Cooperate with the DNR in wetland management activities that would enhance the quality and diversity of wetlands in the county and the region.

Wetlands are the transitional habitats between upland and aquatic systems where the water table is usually at or near the surface, or where the land is covered by shallow water. They presently make up a total of 20% of the County Forest. Wetlands are made up of 15 descriptive types (adapted from PUBL-WZ-029-94). They include:

Shallow, open water – wetlands characterized by submergent, floating and floating-leaved aquatic vegetation such as pondweed, water lilies, water milfoil, and duckweed. Water depths are generally less than 6.6 feet.

Deep marshes - wetlands characterized by emergent vegetations such as cattails and pickerel weed and floating leaved plants such as white and yellow water lily and watershield. Water depths of 6 feet are typically found on deep marshes.

Shallow marshes - wetlands characterized by persistent emergent vegetation such as cattails and pickerelweed, etc., and water depths to 1.5 feet.

Sedge meadow - wetlands characterized by sedges and cattails. Surface water depths to 6 inches in winter and early spring, and exposed saturated soil surface in summer.

Fresh (wet) meadow – wetlands dominated by grasses, such as red-top grass and the invasive, non-native, reed canary grass, and by forbs such as giant golden rod growing on saturated soils.

Low prairie – wetlands with open, herbaceous plant communities covered by low-growing plants. They are dominated by native grasses and forbs associated with prairies, such as prairie cordgrass, big bluestem, and New England aster.

Calcareous fen – rarest wetland plant community in Wisconsin. They are found in wet, seepage sites that have an internal flow of groundwater that is rich in chemical compounds and creates harsh, alkaline soil. Species like the shrubby cinquefoil, Ohio golden rod, and sterile sedge are characteristic.

Open bog – wetlands that are composed of living sphagnum moss growing over a layer of acid peat. Herbs and low shrubs colonize the mat and immature or stunted trees of black spruce and/or tamarack may be scattered through the area.

Coniferous bog – wetlands similar to open bogs, except that mature black spruce and/or tamarack trees are the dominant species growing on the sphagnum moss mat. Black spruce and heath family shrubs are characteristics only of acid peats, whereas tamarack can grow in calcareous peats, such as those of northern white cedar swamps.

Shrub-Carrs – wetlands composed of tall deciduous shrubs growing on saturated to seasonally flooded soils. They are usually dominated by willows or red-osier dogwood. Non-native shrub species invade shrub-carrs, especially where drainage and pasturing have disturbed the area. In particular, honeysuckle and buckthorn can invade quickly.

Alder thicket – wetlands similar to shrub-carrs, but dominated by speckled alder. It can also include other shrub species like high bush cranberry and sweet gale.

Lowland hardwood swamp – wetlands dominated by deciduous hardwood trees. Soils are saturated during much of the growing season, and may be inundated by as much as a foot of standing water. Species include black ash and red maple.

Coniferous Swamp – wetlands dominated by lowland conifers, primarily tamarack. Soils are saturated during much of the growing season and may be inundated by as much as a foot of standing water. Soils are usually organic. A sphagnum moss mat is not present.

Floodplain forest – wetlands dominated by mature, deciduous hardwood trees growing on alluvial soils associated with riverine systems. These wetlands often occur in the backwaters and depressions of rivers, which retain water for a long

period into the growing season. Typically they include northern and southern wet-mesic hardwood forest associations. Floodplain forests support diverse plant and animal species because they serve as migration corridors.

Seasonally flooded basin – wetlands in poorly drained, shallow depressions that may have standing water for several weeks of each year, but are usually dry for much of the growing season. Typical species include smartweeds, beggarsticks, and wild millet. These basins often support an abundance of plant seeds and invertebrates, which make them ideal feeding and resting areas for migrating waterfowl and shorebirds.

820.2.3 Open Water Habitats

Open water habitats are permanently flooded lands below the deep-water boundary of wetlands. Water is generally too deep to support emergent vegetation. Presence of these aquatic habitats within a forest landscape greatly increases the number of wildlife species that can potentially occur. They include rivers, lakes, and streams and occur on 2% of the forest landscape. They are broken down into:

Lakes - lakes, ponds, and flowages in excess of 40 acres in an area; or rivers in excess of 1/8 of a mile in width.

Streams - intermittent or permanent watercourses with slow water velocities and are usually defined as being less than 1/8 mile in width.

Rivers - wetlands and deep-water habitats contained in a channel through which the water flows and associated with forested riparian zones.

830 PLANT COMMUNITIES MANAGEMENT

Wood 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 to encourage, specific species or communities is complex. It includes an understanding of:

- Objectives of the County Forest.
- Integration of the National Hierarchical Framework of Ecological Units (NHFEU - landforms, soils, climate, vegetation classification at multiple scales).
- Application of habitat type classification to identify ecological potentials and silvicultural alternatives.
- Past, present, and future desired condition.
- Surrounding ownership patterns and their generalized objectives.
- Socio-economic needs.

830.1 SILVICULTURE

Plant communities are normally managed within the guidelines found in the *Wisconsin Department of Natural Resources. Silviculture and Forest Aesthetics Handbook 2431.5*. Silviculture is the practice of controlling forest composition, structure, and growth to maintain and enhance the forest's utility for any purpose. Typically, silvicultural guidelines are written to encourage a stand to contain the greatest quality and/or quantity of timber under either an even-, or uneven-aged system.

A summary of management of the common timber types found on the Wood County Forest is described as follows:

830.1.1 Aspen Management

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 these conditions for stand replacement is through the use of 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 bulk of the County Forest revenue is generated through the management of aspen.

The extent of this vital resource is declining to a degree. The chief reason for the decline has been a lack of harvest as stands reach maturity. Sixty percent of Wood County's forested acreage is in the aspen forest type with most of that acreage originating from fires in the 1930's and 1940's. As a result, Wood County has been faced with a large acreage of stands that have matured at the same time. Over the last ten to fifteen years, Wood County has focused on regenerating mature and over-mature aspen stands. Even with this harvest emphasis, Wood County anticipates that the amount of aspen on the forest by the end of this planning period will likely decrease by at least five percent for a number of reasons. Some stands decline to the point where aspen regeneration is no longer possible (these stands typically succeed to red maple, oak and/or white pine). Other stands present opportunities to encourage other valuable species, such as oak, which are not as abundant on the forest. Also, acreage reductions occur as recon updates fine tune the data base. Red maple and oak are the most common species replacing aspen along with white pine.

Wood County is committed to maintaining as much of its aspen acreage as possible and will accomplish this by regenerating the mature aspen stands through the use of clearcuts. Aesthetic concerns can be mitigated by retaining pine and/or hardwood tree species on the sites, limiting the size of harvests, and creating irregularly shaped sale boundaries. With the emphasis on maintaining aspen forests for their economic and wildlife values, harvests of remaining older stands tend to be larger in size (75 to 100 acres commonly) in order to maintain aspen on

the landscape. Harvest size modifications will be more easily implemented during the next rotation.

830.1.2 Oak Management

Oak forests comprise 17% of the forested acreage and include pin oak/black oak stands on the sand soils and red oak stands on the loamy soils. Northern red oak stands are found in the Hiles block, in the Hemlock Creek bottoms of the Hemlock Creek block and in the northern edge of Owl Creek block. Pin oak and black oak are more common and are found in all blocks of the forest.

Management of red oak forests to date has been primarily limited to improvement thinnings designed to increase the growth and future value of the oak resource. Regeneration harvests in many stands are projected in this planning cycle as stands reach 80 to 100 years and beyond in age. Red oak stands are managed on an even-aged basis using clearcut harvests, shelterwood harvests and group selection harvests depending on stand conditions. Wood County will strive to maintain or expand the red oak forest wherever it is found.

The pin and black oak stands are found primarily on the sandier soils. These stands are managed for pulpwood, firewood and low grade sawlogs. Because of the low value of these stands for sawtimber production, they are not generally thinned during their life cycle and are typically managed with one harvest at maturity. Regeneration harvests are scheduled between the ages of 60 and 80 years using clearcuts, shelterwood harvests, and occasionally seed tree harvests. Oak wilt is a management problem with the pin oak forest type (white oaks are encouraged wherever they are found on the forest for long-term protection against oak wilt). Clearcutting and conversion to pine are options for stands severely infected with oak wilt. Wood County does not anticipate any significant loss of pin oak acreage as losses are offset by gains from pine and aspen stands that convert to oak.

830.1.3 Red and White Pine Management

Red and white pine forests account for 14% of the forested acreage. Much of this acreage is in plantations (92% of the red pine acreage is plantation while 72% of the white pine acreage is planted). Pine management consists of a series of thinnings, beginning around age 25 and continuing every 7-10 years to maturity. First thinnings generally remove every third or every other row. Subsequent thinnings are marked, improvement thinnings of approximately one-third of the trees at each entry. In the central sands area of the state, many red pine plantations begin to experience health problems between ages 45 and 60 which is dictating the maturity age. Red pine pocket mortality (see chapter 600 for more info. on pocket mortality) is the most common problem in planted red pine stands on Wood County in this age range. Because of this condition, some plantations are experiencing mortality rates that are significantly impacting annual stand growth. Where this is occurring, Wood County plans to conduct regeneration harvests to limit further timber losses.

Mature red pine stands are commonly regenerated using a clearcut harvest followed by replanting of nursery stock. Wood County may use this method for regenerating red pine but also is trying scarification with shelterwood harvests in an attempt to encourage natural red pine seeding. In many red pine stands, the site conditions are more favorable for white pine; Wood County is introducing white pine to these areas using direct seeding and planting. In some cases, mature red pine stands will be allowed to convert to oak and maple following the final harvest, depending on stand location, size, and configuration.

White pine stands are managed similar to red pine with intermediate thinnings beginning at age 25 and continuing every ten years or so. White pine does not suffer from the decline facing red pine stands and white pine stands will be managed to 100-120 years in age on the Wood County Forest. White pine regenerates naturally very well in this area; Wood County anticipates that

shelterwood harvests, or clearcut harvests with reserve trees depending on advance regeneration, will be sufficient to regenerate mature white pine stands.

Over time, Wood County anticipates an increase of white pine acreage of 78% compared to its current level. Red pine is expected to decrease by 21%. Overall, total pine acreage is expected to increase by 21% from current levels. Most of this is due to natural regeneration of white pine that is occurring on the landscape wherever a white pine seed source exists.

830.2 LOCALLY UNCOMMON TREES

The presence or lack of a particular plant species is dependent on the land's capabilities, climate, and natural (e.g. fire, browsing) and/or man-caused (e.g. logging, farming) disturbances. The present scarcity of the listed species makes them a source of concern.

The following are considered uncommon on the Forest and perhaps to some extent across the regional landscape:

830.2.1 *American Elm (Ulmus americana) is scarce primarily due to mortality caused by the introduction of Dutch elm disease. On Wood County Forest, elm is primarily found in small numbers in bottomland hardwood forests [healthy elm will normally be left uncut in hopes that they may continue in the landscape as potential resistant seed source individuals.]*

830.3 TREES LOCALLY DIFFICULT TO REGENERATE

There are certain tree species whose home ranges are within the County Forest that are difficult to regenerate. In many cases this difficulty is related to the exclusion of fire from the environment. In other cases this may be due to browsing by deer. The following species, normally found within the county, are found to be difficult to regenerate:

830.3.1 *Northern red oak*

The red oak type is more abundant in the Hiles block of Wood County Forest. Red oak grows best on sites that are also suitable for other hardwoods, especially maples. On many sites, normal thinning practices tend to promote these other species and in many cases, regeneration in red oak stands tends towards red maple. Over time, this shade tolerant seral stage will replace the red oak. The difficulty in regenerating red oak on these sites appears to be related to lack of soil disturbance with the removal of fire from the landscape

Red oak has very high wildlife value due to its mast production and tendency to produce cavities that are suitable for wildlife dens. It also has very high timber value in sawlog-sized timber. Because of these factors, Wood County will work to retain and promote red oak on the forest.

Silvicultural trials using prescribed burns coupled with shelterwood harvests appear to be successful. However, conducting these burns on a large scale has proven difficult. Scarification and other methods will continue to be investigated. (See also, Oak Management discussion in section 830.1.2.)

830.4 EXOTIC PLANT SPECIES OF CONCERN

Exotic or non-indigenous invasive plant species can cause significant ecological and economic damage to the Forest. Some invasive species, such as common and glossy buckthorn, eliminate not only wildflowers but also limit the regeneration of tree species. Keeping them from dominating the understory is critical to the long-term health and economic viability of the forest. Currently, Wood County Forest has few significant infestations of invasive plants. With training, vigilance, and control efforts, new infestations can be managed or eliminated. There are many highly invasive plants that are threatening to invade much of the northern forests in Wisconsin.

830.5 LEGALLY PROTECTED PLANT SPECIES

There are some plants in Wisconsin that are afforded protection under the Federal Endangered Species Law, the State Endangered and Threatened Species Law (s. 29.604 Wis. Stats. and NR 27 Wis. Adm. Code), or both. Under Wisconsin State Law, no one may possess or sell any wild plant that is listed without a valid endangered or threatened (ET) species permit. On public lands or lands one does not own, lease or have permission of the landowner, one may not cut, root up, sever, injure, destroy, remove, transport, or carry away a listed plant without an ET species permit. There is an exemption on public lands for forestry, agriculture and utility activity under the state law.

In the Natural Heritage Inventory (NHI) program the DNR tracks information on these species in the State. A list of legally protected plants known to occur in Wood County (on or near the County Forest) is found in Chapter 900 (900.8).

830.6 OTHER PLANT SPECIES AND NATURAL COMMUNITIES OF CONCERN – NHI

The NHI program at the DNR also tracks information on rare species and natural communities, in addition to legally protected species.

830.6.1 Special Concern Plants

Special Concern Species are those species in 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 NHI list referenced above in Chapter 900.8 also shows Special Concern plant species known to occur in Wood County (on or near the county forest).

830.6.2 Natural Communities

Similarly, specific records of natural communities are also tracked. See the NHI list in Chapter 900.8 for natural communities have been recorded in Wood County (on or near the County Forest).

840 WILDLIFE SPECIES MANAGEMENT

840.1 BACKGROUND

For the purpose of this plan, wildlife will include all native birds, mammals, fish, amphibians, reptiles, and insects with a strong focus on the natural communities in which they live. Wildlife biologists will emphasize habitat management that interrelates and benefits wildlife, and complements sound forestry practices. Concerns about the biological diversity of the County Forest and how it fits into the regional, and continental perspective, may cause wildlife management to place increased emphasis on segments of the forest community. Practices such as old growth, early successional forests, snag and den tree management, access management, oak management, and aspen maintenance, can be priorities in the dynamics of forest management. The primary goal of wildlife management on the Wood County Forest lands is to provide a diversity of healthy ecosystems necessary to sustain native populations for their biological, recreational, cultural and economic values.

840.1.1 Technical Planning

Planning will be a cooperative effort of the administrator, DNR liaison forester and wildlife biologist in formulating management plans and utilizing wildlife management techniques for the overall protection and enhancement of the forest community, of which wildlife is a key component.

840.1.2 Guidelines

DNR manual codes on Endangered and Threatened Species Permits Issue (1724.5), Feasibility Studies and WEPA Analyses for Establishing or Modifying Property Project Boundaries (2105.1), Guidelines for Defining Forest-Wildlife Habitat Management (2112), Forest Opening Maintenance and Construction (2112.1), and the Public Forest Lands Handbook (2460.5), are important references and guidelines in wildlife planning efforts.

840.1.3 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.

840.2 RESOURCE MANAGEMENT AND AREAS OF FOCUS

In applying this Plan to the forest, the following areas of focus were identified in achieving Plan objectives:

840.2.1 General Management Policies

Forest management practices may require modification to benefit wildlife and biodiversity in certain situations. The following will be considered in forest management planning:

1) Even-aged regeneration harvests (clearcuts) should vary in size and shape.
2) A diversity of stand age, size and species.
3) Mast-bearing trees, shrubs, den trees, and a variety of snags in conjunction with adequate numbers.
4) Cull trees (future snag or den trees) not interfering with specific high value trees.
5) Timber types, habitat conditions and impacts on affected wildlife.
6) Access management.
7) Best management practices for water quality (BMP's).

840.3 HABITATS OF IMPORTANCE

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:

840.3.1 *Aspen*

Aspen is recognized as providing important habitat values to the greatest diversity of wildlife species. This type will continue to be regenerated, with consideration given to reserving scattered den, mast-producing trees, and conifers in the process.

840.3.2 *Jack pine*

Jack pine and its associated plant understory provide a vital mix of breeding and winter habitat for many wildlife species. This type will become increasingly important as conversion to other tree species occurs on private lands. Jack pine forests are not abundant on the Wood County Forest but will be maintained where possible.

840.3.3 *Forest openings*

Permanent grass openings are essential to well-balanced wildlife habitat. Openings will be maintained where they naturally exist or need to be developed.

840.3.4 *Lowland conifer*

Lowland conifers on the forest consist of tamarack swamps. While this forest type does not provide quality winter cover compared to cedar, hemlock, and balsam fir, tamarack does provide cover for some species. This forest types is generally not managed on Wood County for timber production due to the small acreage and the isolated location of tamarack stands.

840.3.5 *Oak*

The oak type is important to wildlife because of its cavity-forming potential and mast production. Future management will focus on protecting and regenerating this type.

840.3.6 Forest Game Species

The management of forest game animals (white-tailed deer, ruffed grouse, black bear, turkey, snowshoe hare, and numerous furbearers) is centered on maintaining early successional species such as aspen, jack pine, white birch, and scrub oak; with aspen and oak being the primary species of importance.

Manual Code 2112 is a Wisconsin DNR document that establishes guidelines for measuring forest game habitat. It has been used like a barometer to measure changes in forest wildlife habitat. While the scope of Manual Code 2112 can be narrow (deer habitat units compared with landscapes and eco-regions) by today's management standards, the impacts are broad.

Foresters, in concert with wildlife biologists, will continue to monitor forest game species and adjust land management prescriptions where appropriate.

840.3.7 Forest Non-Game Species

Efforts will be made with the DNR to inventory existing populations, identify needs, and maintain valuable habitat types. Over the past several years, Wood County has conducted surveys for raptors (Northern Goshawk/Red Shouldered Hawk) and wolves. These studies, funded through the Wildlife Habitat Improvement Program, are intended to help Wood County identify the use of the forest by these animals. As further studies are conducted, results will be used to modify forest management guidelines if appropriate.

840.3.7.1 Neotropical Migrant Birds

Neotropical migrant birds (NTMB) are songbirds that breed in North America and winter in Central and South America. There are over 120 species of NTMBs that

spend a portion of each year in Wisconsin. Different NTMBs utilize a wide variety of habitats including forests, shrubs, and grasslands. Warblers, tanagers, vireos, thrushes, swallows, blue-winged teal and hummingbirds are just some examples of NTMBs. In addition, these species play an important role in forest health by consuming large amounts of insects, including forest pest species such as gypsy moths and forest tent caterpillars.

In recent years, several neotropical species have experienced significant declines in population. These declines likely reflect a reduction in suitability, or a loss of habitat where these species breed, overwinter and/or migrate. Grassland birds seem to be experiencing the most precipitous declines range wide, due to a loss of habitat both in North America and on the wintering grounds in South America. However, species that nest in forests or shrublands, such as the cerulean warbler, golden-winged warbler, and veery are also declining nationwide.

In some cases these declines may be tied to forest fragmentation. There are really two forms of forest fragmentation, each with different impacts on forest birds. One form of forest fragmentation occurs when portions of a forest are converted into non-forest cover types (urbanization and agricultural). This is permanent fragmentation and poses the greatest threat to all forest wildlife. The second type is the fragmentation of habitat or cover type. This habitat fragmentation occurs naturally due to local geological features or can be a result of human activity (harvest activity). Both kinds of forest fragmentation have impacts on neotropical birds including changes in competition for resources, predation rates, and perceived quality of habitat. Each species of NTMB respond to forest disturbance differently. Since there are so many neotropical migrants that utilize a wide variety of habitats and successional stages it's difficult to make generalizations as to the impacts of forest management on the health of certain bird populations. Species such as chestnut-sided warblers and mourning warblers benefit from early successional species produced by clearcutting. Species that rely on more mature forests or interior forests, such as ovenbirds or black-throated blue warblers, will

be negatively impacted by intensive forest management. To assure a rich diversity of NTMBs in Wisconsin's forests, emphasis should be placed on forest management guidelines that promote habitat for NTMBs with the most specialized habitat needs.

Forests and associated wetlands of the western Great Lakes, including Wisconsin, support some of North America's highest densities and most diverse assemblages of breeding birds (Howe et al. 1996). While some forest/shrub species mentioned above are decreasing, according to the Federal Breeding Bird Survey (BBS), the majority of forest/shrub species that breed in Wisconsin are increasing. Wisconsin's private, County, State, and National Forests are still relatively intact and have regained much of their structural and compositional diversity that was once reduced in the big "Cutover" in the early 1900's.

As habitat is lost and fragmented by development on private lands, Wisconsin's County Forests continue to provide increasingly important habitat to numerous NTMB species that occur in a wide variety of forest types and age classes.

840.4 LEGALLY PROTECTED ANIMAL SPECIES

The Federal Endangered Species Act of 1973 and the Lacey Act together provide for the protection of wild animals threatened with extinction. The State Endangered and Threatened Species Law also requires that the State assume responsibility for conserving wild animals by restricting and regulating the taking, possession, transportation, processing, or sale of endangered or threatened wild animals within its jurisdiction. Further, the Federal Migratory Bird Act and the Eagle Protection Act provide additional protection for certain species of birds. Because animals usually travel freely from one property to another, they belong to everyone. Therefore, if a species is legally protected, it is protected anywhere it occurs in Wood County. The NHI listing in Chapter 900.8 shows protected animals known to exist in Wood County.

*Key- *Federal Status*: LE- listed endangered, LT- listed threatened, LT,PD- listed threatened, proposed for de-listing, LE-LT- listed endangered in part of its range, threatened in another part, C- candidate for future listing

**Key- *State Status*: END- endangered, THR- threatened, SC- special concern SC/P- fully protected, SC/N- no laws regulating use, possession or harvesting, SC/H- take regulated by establishment of open/closed seasons, SC/FL- federally protected as endangered or threatened, but not designated by WDNR, SC/M- fully protected by federal and state laws under the Migratory Bird Act

840.5 OTHER ANIMALS OF SPECIAL CONERN – NHI

Just as with plants, the DNR tracks information on rare animal species when some problem of abundance or disturbance 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 list of Special Concern animal species known to occur in Wood County (on or near the County Forest) is included on the NHI list previously referenced in Chapter 900.8.

In addition to NHI a statewide list of Species of Greatest Conservation Need can be found at: http://dnr.wi.gov/org/land/er/cwcp/SGCN_ID.pdf

840.6 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.

840.6.1 Technical Planning

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.

840.6.2 Water Surveys

Comprehensive lake and stream surveys on the County forest will be conducted by the DNR fisheries biologist as required. The publication, "Surface Water Resources of Wood County", contains additional information relative to these waters.

840.6.3 Population Surveys

Surveys of fish populations in waters within the County Forest will be conducted by the DNR as required and will generally run concurrently with water surveys. Fish management programs will be guided by these surveys.

840.6.4 Lake Management

Management of lakes within the County Forest will be consistent with the capability of the resource and any unique aspects associated with that resource.

840.6.5 Stream Management

Trout streams on the County Forest will be managed to protect and enhance their quality. Streams containing warm water or cool water species will be managed to perpetuate their inherent qualities. Corresponding land and water use practices will be consistent with this policy. A map showing the surface waters of the county is found in Chapter 900 (900.12).

840.6.6 Best Management Practices for Water Quality

Protection of water resources in the county will be consistent with the "Wisconsin Forestry Best Management Practices (B.M.P.s) for Water Quality". Examples of these protective measures are:

1. Riparian Management Zones
2. Erosion control measures

3. Stream bank protection

840.6.7 Shoreland Zoning

The Wood County Shoreland Zoning Ordinance will be followed on all management activities that occur on the Forest. The ordinance can be found in Chapter 900 (905.2.3).

840.6.8 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.

840.6.9 Important Water Resources

Management activities adjacent to these water resources, or in areas with sensitive soils or severe slopes, should consider measures above and beyond the customary BMP practices. County staff may work with their 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 from DNR Water staff for the County. Important water resources on the Wood County Forest include:

Dexter Lake/Yellow River
Hemlock Creek
East Fork Black River

850 LANDSCAPE MANAGEMENT

850.1 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. It also refers to ecological structures, functions, and processes that occur in ecosystems to sustain

the system as viable entities. The forest landscape, a mosaic of plants and animals of various sizes and ages, are in constant flux due to succession from both natural and planned events.

Opportunities to manage Wood County Forest lands toward these ends will be continued and improved provided they are deemed to be in the public's best interest by the Committee and within the framework of the County Forest Law (s.28.11 Wis. Stats.).

850.2 HABITAT FRAGMENTATION

The adoption of management plans and strategies developed cooperatively with neighboring forest owners and managers will help to consider fragmentation on a landscape level. A continued program of encouraging land acquisition within the forest blocking will decrease negative impact of forest fragmentation by land uses other than forestry.

850.3 HIGH CONSERVATION VALUE FORESTS / AREAS (HCVF) AND EXCEPTIONAL RESOURCES

850.3.1 Areas High in Locally, Regionally or Nationally Significant Biodiversity Values.

850.3.1.1 Wisconsin State Natural Areas (see Ch. 900.10 and Ch. 3000 for more detailed information on each State Natural Area)

Red Oak Bottoms

Goal: Manage the site as a floodplain forest with a heavy red oak component, rare bird habitat, and an ecological reference area. Natural processes will primarily determine the structure of the forest. The stand will be managed passively in the near term to develop old-growth characteristics. In the long-term, if natural disturbances of flood and wind throw do not create conditions for red oak regeneration, then patchy harvests

would be conducted to regenerate the red oak. The site will be used as a reference area to compare management techniques on other similar cover type stands to assess retention of species diversity, differences in regeneration and other important ecological values.

Permitted management activities: removal of invasive exotic plant species, non-manipulative research, educational activities, hunting and trapping, low-impact recreation, access to suppress fires, harvests to meet natural area regeneration objectives (see above), salvage of trees after a major wind event, management to prevent and suppress insect or disease infestations using best available scientific knowledge and in consultation with the DNR Bureau of Endangered Resources and maintenance of any existing facilities.

Prohibited activities: motorized vehicles off designated trails, permanent hunting stands, mountain bikes, horse-based recreation, and alteration of the hydrology.

Other activities may occur pending discussion and consultation with partners, NAPC and science experts.

Owl Creek Fen Savanna

Goal: Manage the site as a central poor fen reserve, unique wet aspen fen savanna habitat, and an ecological reference area. Natural processes will primarily determine the structure of the forest. The sparse, scattered, and off site trees will be managed passively. Small stands of more productive wetland forest and the more easily accessible islands may be managed

to enhance regeneration of the tree species while providing diversity in rare bird habitat.

Permitted management activities: removal of invasive exotic plant species, non-manipulative research, educational activities, hunting and trapping, low-impact recreation, access to suppress fires, harvests to meet natural area aspen regeneration objectives (see above), salvage of trees after a major wind event, management to prevent and suppress insect or disease infestations using best available scientific knowledge and in consultation with the DNR Bureau of Endangered Resources and maintenance of any existing facilities.

Prohibited activities: motorized vehicles off designated trails (except winter access across ice roads to conduct timber harvest on adjacent uplands), permanent hunting stands, mountain bikes, horse-based recreation, and alteration of the hydrology.

Other activities may occur pending discussion and consultation with partners, NAPC and science experts.

Hiles Wetlands Natural Areas

Goal: Manage the site as a northern sedge meadow, tamarack poor fen, wet meadow and central poor fen reserve and an ecological reference area. Natural processes will primarily determine the structure of the wetlands. The sparse, scattered, and off site trees will be managed passively. Stands of more productive wetland forest on the edge may be managed to enhance regeneration of the tree species while providing

diversity. Some trees may be removed from the wetlands to maintain an open landscape character.

Permitted management activities: removal of invasive exotic plant species, non-manipulative research, educational activities, hunting and trapping, low-impact recreation, access to suppress fires, salvage of trees after a major wind event, management to prevent and suppress insect or disease infestations using best available scientific knowledge and in consultation with the DNR Bureau of Endangered Resources and maintenance of any existing facilities.

Prohibited activities: motorized vehicles off designated trails (except winter access across ice roads to conduct timber harvest on adjacent uplands), permanent hunting stands, mountain bikes, horse-based recreation, and alteration of the hydrology.

Other activities may occur pending discussion and consultation with partners, NAPC and science experts.

Skunk Creek Woods Natural Area

Goal: Manage the site as a representative example of the widespread white pine – oak forests of central Wisconsin, and an ecological reference area. Natural processes will primarily determine the structure of the forest. The stand will be managed to enhance old-growth characteristics in the near term which may include removal of competing red maple and aspen. In the long-term, harvest to regenerate the white pine – oak forest will be necessary. The site will be used as a reference area to compare management techniques on other

similar cover type stands to assess retention of species diversity, differences in regeneration and other important ecological values.

Permitted management activities: removal of invasive exotic plant species, non-manipulative research, educational activities, hunting and trapping, low-impact recreation, access to suppress fires, harvests to meet natural area objectives (see above), salvage of trees after a major wind event, management to prevent and suppress insect or disease infestations using best available scientific knowledge and in consultation with the DNR Bureau of Endangered Resources and maintenance of any existing facilities.

Prohibited activities: motorized vehicles off designated trails, permanent hunting stands, mountain bikes, horse-based recreation, and alteration of the hydrology.

Other activities may occur pending discussion and consultation with partners, NAPC and science experts.

850.3.2 Rare, threatened, or endangered ecosystems

850.3.2.1 Natural origin pine relics

Scattered natural origin red and white pines can be found in the Owl Creek Block, Hemlock Creek Block, Dexter Block, Hiles Block and the South Bluff Block. As a general rule, Wood County will maintain these pine relics on the landscape.

850.3.2.2 Habitat for species identified as rare, threatened, endangered or of greatest conservation need (e.g. Karner blue butterfly areas, important bird areas, etc.)

Wood County conducts annual surveys for Karner blue butterfly. To date, there is one population identified on the forest. The county is cooperating with the DNR to promote this population through shifting mosaic management of the surrounding forest.

Habitat for bird species of high conservation need as been identified in the Owl Creek Fen Savanna. See the information on this State Natural Area in section 530.1.3 and 850.3.1.1.

850.3.2.3 Rare & geographically restricted natural communities (e.g. mesic cedar forest, boreal rich fen, calcareous fen, dry prairie, felsenmeer, etc)

- South Bluff - this area contains open cliffs and rare species habitat.
- Remington Pines – this site contains pine-oak forest and barrens species.
- Hemlock Creek – this floodplain forest contains a similar mix of unusual species as the Red Oak Bottoms.

Additional information on these sites can be found in section 530.

850.3.3 Culturally significant sites

850.3.3.1 Burial mounds / cemeteries

There is one known grave site on Wood County Forest. This site is associated with a logging camp site from the late 1800s.

850.3.3.2 Logging camps – see above

850.3.3.3 Native American Sites

There are a number of Native American cultural sites located on the forest. County personnel have worked with the Ho-Chunk tribe to identify these sites and take appropriate measures to protect the sites when conducting management activities.

Note: specific location information may be confidential and the county reserves the right to withhold information as provided under applicable laws.