

COUNTY FOREST COMPREHENSIVE LAND USE PLAN

TABLE OF CONTENTS

**CHAPTER 600**

**PROTECTION**

<b><u>Section</u></b>	<b><u>Subject</u></b>	<b><u>Page</u></b>
<b>600</b>	<b>PROTECTION</b> .....	<b>3</b>
<b>605</b>	<b>FIRE CONTROL</b> .....	<b>3</b>
605.1	COOPERATION WITH THE DEPARTMENT OF NATURAL RESOURCES.....	3
605.1.1	Personnel.....	3
605.1.2	Equipment .....	4
605.1.3	Fire Detection .....	4
605.1.4	Forest Fire Prevention.....	4
605.2	DEBRIS BURNING.....	4
605.3	CAMPING FIRES.....	4
605.4	PRESCRIBED BURNING .....	4
605.5	COUNTY FOREST FIRE HAZARD AREAS .....	5
<b>610</b>	<b>CONTROL OF FOREST PESTS &amp; PATHOGENS</b> .....	<b>5</b>
610.1	DETECTION.....	5
610.2	PEST SURVEYS .....	5
610.3	SPECIFIC PESTS AND PATHOGENS OF CONCERN .....	5
610.3.1	Specific Pests of Interest .....	6
610.3.1.1	Gypsy Moth .....	6
610.3.1.2	Jack Pine Budworm.....	7
610.3.1.3	Oak Wilt.....	7
610.3.1.4	Forest Tent Caterpillar .....	8
610.3.1.5	Two-lined Chestnut Borer.....	8
610.3.1.6	Emerald Ash Borer.....	9
610.3.1.7	HRD.....	9
610.3.1.8	Eastern Larch Beetle.....	10

610.3.2	Funding .....	11
610.3.4	Special Projects .....	11
610.4	DEER BROWSE .....	11
610.5	INVASIVE PLANT SPECIES .....	11
610.5.1	Funding and Partnerships .....	12
610.5.2	Best Management Practices.....	12
610.5.3	Current Plant Invasives.....	13
610.5.3.1	Buckthorn.....	13
610.5.3.2	Garlic Mustard.....	13
610.5.3.3	Honeysuckle.....	14
610.5.3.4	Spotted Knapweed.....	14
610.5.3.5	Japanese Barberry.....	15
610.5.3.6	Japanese Knotweed.....	15

## **600 PROTECTION**

### **OBJECTIVE**

To protect and manage the resources of the forest from preventable losses resulting from fire, insects, diseases and other destructive elements including those caused by people. Protective methods shall include proper silvicultural methods.

The DNR provides statewide technical guidance that will be used to inform local decisions. This guidance will be referenced to make decisions at the county level.

## **605 FIRE CONTROL**

Damage to the forest caused by uncontrolled fire can create an important challenge in the management of the forest. Loss of resource values caused by fire will be minimized through organized prevention, detection and suppression methods. Maintaining a healthy forest is key to fire management. The DNR is responsible for all matters relating to the prevention, detection and suppression of forest fires outside the limits of incorporated villages and cities, as stated in s. 26.11(1), Wis. Stats. The DNR works cooperatively with local fire departments in all fire control efforts. The Lincoln County Forest is part of the intensive Forest Fire protection area. The Fire Management Handbook No. 4325.1 and the Area Operations Plan shall serve as the guidelines for fire control activities.

### **605.1 COOPERATION WITH THE DEPARTMENT OF NATURAL RESOURCES**

Pursuant to s. 26.11(4) and s. 28.11(4)(f), Wis. Stats., and of the Lincoln County Forest Ordinance, the county may cooperate with the DNR in the interest of fire prevention, detection and suppression on the County Forest. This is accomplished through agreements authorizing the DNR to use County Forest land or to utilize county personnel and equipment for fire protection activities.

#### **605.1.1 Personnel**

County Forest personnel, upon request from the DNR, shall be made available for forest fire control efforts within the county in accordance with an established memorandum of understanding (MOU). The DNR is responsible for training and directing the activities of county personnel in accordance with the rules identified in the Fire Management Handbook,

No. 4325.1.

#### 605.1.2 Equipment

County Forest equipment, upon request and as identified in the MOU, shall be available for forest fire control suppression. During periods of high fire hazard, all County Forest vehicles and/or crews should be equipped with one or more backpack cans, axes or shovels, appropriate personal protective equipment, mobile communication and any other equipment deemed essential by the MOU. All hand tools shall be maintained and provided by the DNR.

#### 605.1.3 Fire Detection

Fire detection is the responsibility of the DNR. County Forestry personnel may assist and report any wild fires to the DNR, local Fire Department or 911 Dispatch.

#### 605.1.4 Forest Fire Prevention

DNR fire control personnel are authorized by the county to place fire prevention signs at recreational areas and other strategic locations within the forest. The County conducts and controls all operations (including harvesting) on the forest in a manner designed to prevent forest fires. The use of the county forest during high fire danger periods may be restricted. These restrictions may include, but are not limited to, recreation and logging.

### 605.2 DEBRIS BURNING

Unauthorized burning of debris will not be permitted on County Forest Lands pursuant to s. 26.12(5), Wis. Stats.

### 605.3 CAMP FIRES

Adequate fireplaces will be provided at designated recreation sites. During periods of high fire danger, use of campfires may be restricted.

### 605.4 PRESCRIBED BURNING

All prescribed burning on County Forest lands will follow the DNR recommendations. See

Prescribed Burn Handbook No. 4360.5 for details. Prescribed fire may be an effective management tool on the County Forest.

#### 605.5 COUNTY FOREST FIRE HAZARD AREAS

The DNR's primary emphasis will be placed on fire control efforts in pine areas. Maps of these areas are available at the local DNR field office. The County will cooperate with DNR Fire Control in providing for firebreaks or access ways. Existing access roads, firebreaks and water access points will be maintained as deemed necessary. Secondary emphasis will be placed on hardwood areas with no firebreaks developed or maintained. However, access roads will be maintained as defined in Chapter 700 of this plan.

### **610 CONTROL OF FOREST PESTS & PATHOGENS**

#### 610.1 DETECTION

Damage to the forest caused by insects, other pests and diseases can adversely affect management of the forest resources. Losses to resource values impacted by forest pests will be minimized through integrated pest management methods, with emphasis on silvicultural prescriptions (timber sales). The detection and control of pest problems will be accomplished by county and DNR personnel in cooperation with other agencies.

#### 610.2 PEST SURVEYS

Pest surveys are conducted under the direction of the DNR's forest health specialists. The County may cooperate by providing personnel and equipment to assist in these operations.

#### 610.3 SPECIFIC PESTS AND PATHOGENS OF CONCERN

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 efficient and socially acceptable.”*

The integrated pest management control and methodology shall be determined jointly by the County Forest Administrator, and DNR liaison forester in consultation with the DNR district Forest Health Specialist. Suppression of forest pests may include the following:

1. Silvicultural prescriptions, including timber sales.
2. Biological control.
3. Chemical control.

### 610.3.1 Specific Pests of Interest

#### 610.3.1.1 Gypsy Moth

The Lincoln County Forest has a wide variety of forest cover types and species, some of which are susceptible to defoliation by gypsy moths, particularly aspen, birch, basswood and oak.

Aspen stands can withstand defoliation relatively well because of a large interconnected root system that can supply nutrients and energy for re-flushing leaves. Often moth population's rise and fall very quickly in aspen areas so consecutive years of defoliation are uncommon. Populations crash because of natural diseases affecting caterpillars when they run out of food.

Northern red oaks are often associated with northern hardwoods stands which will not support large populations of gypsy moths therefore these areas are relatively low risk for defoliation. Oaks are more susceptible to mortality because of other agents that attack oaks after they have been stressed by defoliation. Oak dominated stands are more likely to have consecutive years of defoliation due to moths becoming somewhat resistant to natural diseases due to tannic acid in oak leaves they eat.

Birch is another preferred food species. Birch is often found as a component of northern hardwood stands. Stands that are dominated by birch often have understories of northern hardwood species so defoliation will not result in total loss of a stand.

Basswood is another species that can be affected by gypsy moth. Basswood, typically a component of northern hardwoods stands, would support low populations resulting in isolated areas of defoliation.

The Lincoln County Forestry, Land and Parks Department's strategy to combat this defoliating insect will focus on using silvicultural techniques to maintain and improve forest vigor to reduce the effects of defoliation. Suppression spraying

with approved insecticides may be considered in high recreational areas and areas of the forest containing a high percentage of susceptible, high valued timber such as red oak.

#### 610.3.1.2 Jack Pine Budworm

Jack pine budworm, *Choristoneura pinus*, is a native needle-feeding caterpillar that is generally considered the most significant pest of jack pine. Red, Scotch and white pine, and spruce, can also be defoliated and suffer top-kill and mortality by jack pine budworm. Vigorous, young jack pine stands are less likely to be damaged during outbreaks. The most vigorous stands are well stocked, evenly spaced, fairly uniform in height, and less than 45 years old. Stands older than 45 years that are growing on very sandy sites and suffering from drought or other stresses are very vulnerable to damage. Tree mortality and top-kill are more likely to occur in these stands. In addition, stressed stands are more susceptible to attack by Ips bark beetle. Mortality from Ips can occur for 2-3 years after the jack pine budworm outbreak collapses. This mortality and top-kill create fuel for intense wildfires.

It will be Lincoln County's strategy to harvest at the appropriate rotation age, maintain high stand densities (without overcrowding), and use good site selection for jack pine. This will be an effort to help avoid budworm-caused tree mortality and reduce the threat of damaging wildfires while still providing suitable conditions for jack pine regeneration. Prompt salvage following an outbreak will also help reduce the possibility of wildfire. Aesthetic strips and/or islands should not be used. Leaving these aesthetic strips/islands can prolong the outbreak by giving the budworm areas for breeding. Use of insecticides is not warranted in combating this forest pest on the County Forest.

#### 610.3.1.3 Oak Wilt

Oak wilt, *Bretziella fagacearum*, is a destructive disease of oak trees. It is responsible for the death of thousands of oak trees in forests, woodlots, and home landscapes each year. Oak wilt is caused by a fungus that invades and impairs the

tree's water conducting system, resulting in branch wilting and tree death. Trees in both the red oak group and white oak group are affected. There is no known cure once a tree has oak wilt. Prevention of new oak wilt infection centers is the best management option and involves avoiding injury to healthy trees and removing dead or diseased trees. Counties should use the [Oak Harvesting Guidelines to Reduce the Risk of Introduction and Spread of Oak Wilt](#) for management guidance. If pruning is necessary or damage is incurred from April 15 to July 15, e.g. through construction activities or storms, the wounds should be painted immediately with a wound paint. It will be Lincoln County's policy to remove infected trees and debark or chip them when located in a high intensive use area. Once chipped or debarked, the materials shall be covered with plastic for a period of six months to kill the fungus and any insects in the material. A vibratory plow, or similar implement, will also be used to sever root grafts on isolated pockets where feasible. Timber harvest of red oak within stands containing a significant oak component will be restricted between April 15 and July 15.

#### 610.3.1.4 Forest Tent Caterpillar

Forest tent caterpillar, *Malacosoma disstria*, can be found throughout the United States and Canada wherever hardwoods grow. The favored hosts in Wisconsin are aspen and oak. This native insect causes region-wide outbreaks at intervals from 10 to 15 years; outbreaks usually last 2 - 5 years in the Lake States. Severe and repeated defoliation can lead to dieback and/or reduced growth of affected trees, which in some instances may be significant. Populations are often controlled by natural enemies, helping the population crash. Aerial spraying of insecticides can be an option for control as well. It will be Lincoln County's strategy to employ sound silvicultural practices to combat this cyclic pest.

#### 610.3.1.5 Two-lined Chestnut Borer

The two-lined chestnut borer, *Agrilus bilineatus*, is a common secondary pest in trees which have been severely defoliated several years in a row. Oaks that are



under stress from drought and/or defoliation by insects such as gypsy moth (*Lymantria dispar*), fall cankerworm (*Alsophila pometaria*), and forest tent caterpillar (*Malacosoma disstria*) can be infested and killed by two-lined chestnut borer. Prevention of two-lined chestnut borer through sound silvicultural practices is the best management option. Postponing management activities in stressed stands for two years after severe drought and/or defoliation have ended will provide time for trees to recover and reduce their susceptibility to two-lined chestnut borer attack. Infestations should be salvaged promptly. Lincoln County will strive to maintain healthy trees through sound silvicultural practices to discourage infestation.

#### 610.3.1.6 Emerald Ash Borer

The emerald ash borer, *Agrilus planipennis*, was accidentally introduced to North America from Asia in 2002. Emerald ash borer (EAB) infestations in Wisconsin have resulted in widespread mortality to *Fraxinus* species including green, white, and black ash. It is expected that 99% of the ash trees in Wisconsin will die as a result of EAB. Ash comprises a significant component in the northern hardwood timber type and can be found in nearly pure stands in some lowland areas. Adult EAB beetles feed on foliage but it is the larvae that cause mortality by feeding on the phloem and outer sapwood of the ash trees.

The [Emerald Ash Borer Silviculture Guidelines](#) are available to help resource managers make informed stand-level decisions to manage forests that are not yet infested by EAB, as well as implement salvage harvests and rehabilitation in stands that have already been impacted by EAB.

It is Lincoln County's policy to follow the Emerald Ash Borer Silviculture Guidelines.

#### 610.3.1.7 HRD

Heterobasidion root disease (HRD, previously called annosum root rot), is caused by the fungus, *Heterobasidion irregulare*. It is a serious disease that causes pine and spruce mortality in Wisconsin, but over 200 woody species have been

reported as hosts. Red and white pine trees are most commonly affected in plantation-grown stands subjected to thinning. The disease was first confirmed in Wisconsin in 1993 and has since been found in a number of counties throughout Wisconsin. Diseased trees, including overstory trees and understory seedlings and saplings, will show fading, thin crowns with tufted foliage, and eventual mortality. Currently there are no curative treatments to eliminate the HRD pathogen from a stand once it is infested, so preventing disease introduction is the best approach. Infection most often occurs when HRD spores land and germinate on a freshly cut stump. The pathogen then grows into the root tissue and progresses underground from tree to tree through root contact. As the pathogen spreads, and trees decline and die, an ever-expanding pocket of mortality is formed. HRD fruit bodies, or conks, may be found at the base of dead trees and old stumps. Fruit bodies are most commonly observed in the fall but can be found any time of the year.

[Guidelines for stump treatment to reduce the risk of introduction and spread of Heterobasidion root disease in Wisconsin](#) should be used by the county forests.

The HRD guidelines are designed to help property managers and landowners determine whether the preventive pesticide treatment should be used to reduce the risk of introduction and spread of HRD at the time of harvest in a pine and/or spruce stand.

It is Lincoln County's policy to follow the *Guidelines for stump treatment to reduce the risk of introduction and spread of Heterobasidion root disease in Wisconsin*.

#### 610.3.1.8 Eastern Larch Beetle

The Eastern Larch Beetle, *Dendroctonus simplex*, is a native bark beetle that feeds on the vascular tissue underneath the bark of Tamarack trees. The Eastern Larch Beetle (ELB) targets tamarack that are currently under stress and can cause significant mortality. Stressors that make tamarack trees more susceptible to ELB infestation include drought, high water, storm damage, defoliation by other insects and old age. Once established in a stand ELB can spread to healthy trees causing further mortality. The Lincoln County Forestry, Land and Parks Department's

strategy to battle ELB will focus on using silvicultural techniques to improve forest health and to reduce the spread of existing ELB populations.

#### 610.3.2 Funding

The County Forest will make all reasonable efforts to secure funding for control efforts, through county funds, or other state, federal or private funding sources.

#### 610.3.3 Special Projects

The County may cooperate with other agencies in forest pest research.

### 610.4 DEER BROWSE

Forest regeneration and reproduction is critical to sustain both timber production and wildlife habitat and the overall health of the deer herd. As a keystone species, deer can affect forest regeneration, long-term forest production, and forest sustainability. Balancing deer numbers with habitat capacity is a concern for all interested in forest production. Lincoln County Forest may monitor herbivory impacts during forest reconnaissance.

### 610.5 INVASIVE PLANT SPECIES

Invasive plants can cause significant negative impacts to the forest through displacement of native plants and hindering forest regeneration efforts. Preventing invasives from dominating habitats is critical to the long-term health of the forest. There are a number of invasive plant species in varying densities on the Lincoln 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. Lincoln 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. Invasive plant locations on the county forest are identified and recorded within the county Geographic Information System. Control treatments to invasive species are conducted and documented annually.

#### 610.5.1 Funding and Partnerships

Grant opportunities for invasive species control funding can be found on the [Financial Assistance webpage](#) of the Wisconsin Invasive Species Council. The number of grants for local governments and county forest is limited, especially for terrestrial invasive plant control. Some grants, such as the Department of Natural Resource's [turkey stamp program](#), support invasive plant control as part of larger efforts to promote certain outcomes and might be applicable.

The Department of Natural Resources promotes the formation of cooperative invasive species management areas (CISMAs) through its [Weed Management Area – Private Forest Grant Program](#). While activities funded by this grant are restricted to non-industrial private forests, CISMAs are encouraged to partner with other groups in their area and some can provide technical support to county forests. The CISMA's of Wisconsin can be found on this [map](#).

#### 610.5.2 Best Management Practices

In 2009, the Department of Natural Resources and many stakeholder groups approved a series of Best Management Practices (BMPs) for minimizing the spread of forest invasive plants. The full text of the [BMPs](#) is found on the Wisconsin Council on Forestry website. Voluntary use of the BMPs during forestry stewardship activities reduces the spread of invasive plants that can impede forest regeneration in county forests.

BMPs used before, during and after a harvest promote forest regeneration. Reasonable efforts to clean vehicles, equipment, footwear and other clothing helps reduce the spread of seeds and plant fragments to un-infested forests. Planning the sequence and timing of stewardship activities to reduce contact with invasive plants during forestry operations is another helpful strategy. Similarly, controlling populations of invasive plants before logging reduces the risk of spreading them. Follow-up monitoring of disturbed stands can detect populations of invasive plants while they are still small and more easily managed.

### 610.5.3 Current Plant Invasives

#### 610.5.3.1 Buckthorn

Two species of invasive buckthorn impact Wisconsin's forests. Common buckthorn, *Frangula cathartica*, is more often found growing on well-drained soils while glossy buckthorn, *Frangula alnus*, favors wetter soils. Both species grow in shade or sun, quickly form dense, even-aged thickets that shade out understory plants, including tree seedlings, and hinder forest regeneration. Their dark colored fruits are eaten by birds who disperse them long distances. Both buckthorns green-up before native plants and remain green after the natives drop their leaves.

Buckthorn can be controlled by taking advantage of the longer period in which they retain their leaves. Foliar applications of herbicide applied when buckthorn has leaves and the natives are leafless will minimize damage to native plants. Other control options include mowing the shrubs and then treating re-sprouts with foliar herbicide, basal bark herbicide applications, and cut stump herbicide applications.

#### 610.5.3.2 Garlic Mustard

Garlic mustard, *Alliaria petiolate*, is an herbaceous, biennial, native to Europe. During the first year a basal rosette of only leaves develops. The second year, several stems from 1 – 4 feet tall grow from the basal rosette. The leaves have a distinct garlic fragrance when crushed. From the stems grow several small white flowers. Each plant can produce 100's of tiny seeds inside long, narrow capsules. Garlic mustard can quickly colonize disturbed forests as it often follows corridors such as game trails or man-made roads/paths. As garlic mustard spreads, it quickly displaces native plants and is known to radiate chemicals into the soil that disrupt associations between mycorrhizal fungi and native plants. Small populations can be hand pulled, while larger populations are better controlled with prescribed fire and/or herbicide. All pulled plant materials should be bagged and removed from the forest as seeds have been

known to mature on dead plants left on site. Treatment should be repeated until the seed bank is depleted, which takes multiple years. Garlic mustard sites should be monitored annually, until no plants are discovered for several years.

#### 610.5.3.3 Honeysuckle

Bush Honeysuckles (*Lonicera maackii*, *L. tatarica*, *L. morrowii*, *L. X bella*) were introduced from Eurasia as ornamentals, wildlife cover and soil erosion control. Bush honeysuckles are upright deciduous shrubs, ranging from 5 - 12 feet tall with gray shaggy bark. The leaves are opposite, simple, oval and untoothed and can be smooth to velvety depending on species. Flowers are fragrant and tubular ranging in colors of white, red and pink. They bloom May through June and then form red to yellow berries that are found as pairs on the leaf axils. Honeysuckles replace native forest shrubs and herbaceous plants by inhibiting growth of understory plants due to early leaf-out which shades out herbaceous ground cover and depletes soil moisture. Control options include hand pulling small infestations and prescribed burning which kills seedlings and top kills mature shrubs. Herbicide options include cut stump treatment and foliar spraying. With all control efforts repeated monitoring is needed.

#### 610.5.3.4 Spotted Knapweed

Spotted knapweed, *Centaurea stoebe*, is an herbaceous, short-lived perennial native to Eurasia that can grow 2 – 4 feet tall. This plant first appears as a basal rosette of somewhat silvery leaves and may persist this way for several years before developing pink-purple flowers on long spreading stems. The flowers are thistle-like with many petals and stiff bracts. Knapweed invades dry-upland areas including disturbed sites such as forest trails and openings. The roots exude an allelopathic chemical which inhibits establishment of other plants; hindering forest regeneration. Small populations can be hand pulled provided the entire tap root is removed. Gloves, long sleeves and pants should be worn when handling this plant as it may cause skin irritation. Chemical control should be applied directly to plants or broadcast across large areas of infestation.

Biological control is also available as part of an integrated pest management plan.

#### 610.5.3.5 Japanese Barberry

Japanese barberry, *Berberis thunbergii*, was introduced from Japan around 1875 and now ranges across most of North America. It is a compact, spiny, deciduous shrub with arching branches of dense foliage. It commonly grows 2 - 3 feet tall and has been known to reach heights of 6 feet. Japanese barberry regenerates by seed, creeping roots and branches that root freely when they touch the ground; which increases its overall spread. Small, rounded, smooth edged leaves are clustered in tight bunches close to the spiny branches and small yellow flowers bloom through May forming red oblong berries that mature in mid-summer and persist into winter. This plant is highly adapted to growing in young forests where it forms thorny thickets that shade out and limit the growth of native plants and spreads easily under the shade of established forests. The primary method of mechanically controlling barberry is hand pulling or digging early before seed set in areas where there are only a few plants. It has shallow roots but re-sprouting may occur if the entire root system is not removed. Larger populations may be controlled by herbicides with a cut stump treatment and repeated monitoring for both seedlings and roots re-sprouting.

#### 610.5.3.6 Japanese Knotweed

Japanese knotweed, *Polygonum cuspidatum*, are herbaceous perennials that may reach 9' in height and form dense colonies. The semi-woody stems are hollow and upright with large, simple dark green leaves. Typically found on forest edges, wetlands, and other open areas knotweed spread vegetatively through tough rhizomes that can break through pavement or pieces of stems that become buried. Seed viability is variable. Control methods include repeated mowing to deplete energy stores or cutting with herbicide application to the stump or new foliage.