Motion by: Nelson

Second by: Rankin

Dist.	Supervisor	Y	N	Absent
13	Alber			
18	Bailey			
12	Berndt			
3	Bloomer			
1	Caylor			
19	Fox			
10	Giese			
8	Krueger			
15	Lee			
16	Loka			
14	Lussow			
20	Meyer			
11	Mittelsteadt			
17	Nelson			
4	Pampuch			
22	Rankin			
7	Rusch			
5	Saal			
21	Simon			
2	Weaver			
6	Woller			
9	Zeitz			
	Totals			

Carried

Defeated

Amended

Voice vote

Roll call

STATE OF WISCONSIN)
) SS:
COUNTY OF LINCOLN)

I hereby certify that this resolution/ordinance is a true and correct copy of a resolution/ ordinance adopted by Lincoln County Board of Supervisors on Jan. 17, 2012

Sheila Pudelko

Sheila Pudelko, County Clerk

Resolution 2012-01-02
Title: Amendments to 15-Year Lincoln County Forest Comprehensive Land Use Plan

WHEREAS, The Lincoln County Board of Supervisors approved the 2006-2020 Lincoln County Forest Comprehensive Land Use Plan on October 18, 2005; and

WHEREAS, This 15-year plan is a working, dynamic document subject to amendments by the Lincoln County Forestry, Land and Parks Committee and the Lincoln County Board of Supervisors; and

WHEREAS, Plan amendments for the 2006-2020 Fifteen-Year Lincoln County Forest Comprehensive Land Use Plan have been prepared by the Lincoln County Forestry Committee and are submitted for approval before the Lincoln County Board of Supervisors;

NOW, THEREFORE BE IT RESOLVED, That the Lincoln County Board of Supervisors approves the attached amendments to Chapters 600, 800 and 900 (Appendix) of the 2006-2020 Lincoln County Forest Comprehensive Land Use Plan..

Dated this 17th day of January, 2012.

Introduced by: Forestry, Land and Parks Committee

Committee Action: Forestry, Land and Parks Committee;

Passed 5-0 on 12/12/11

Fiscal Impact: None

Drafted by: Kevin Kleinschmidt, Forest Administrator

610.3.1.7 Annosum Root Rot

Annosum Root Rot is among the greatest causes of damage to conifer forests throughout the world. The fungus that causes Annosum Root Rot is Heterobasidion annosum. This pathogen infects an area when spores of the fungus land in recent wounds, such as a freshly cut stump surface. Following stump colonization, the fungus spreads through interconnected root systems to attack other trees. Growth is reduced and trees eventually die. The pathogen persists for years in stumps and roots of killed trees, and can infect young trees planted in areas where the previous crop was affected. Control measures are directed towards preventing establishment of this root rot pathogen in new locations. Current control measures consist of applying a specific fungicide to freshly cut stumps. Lincoln County will require logging contractors to follow the Annosum Root Rot Prevention and Treatment guidelines as outlined in the Lincoln County Timber Sale Contract in areas where conifer management is the silvicultural objective.

810.1.6.2 Best Management Practices for Invasive Species

Forest Invasive species can pose a threat to forest ecosystems and forest productivity. Best Management Practices for Invasive Species can play an important role in slowing or controlling the spread of invasive species. The goal is to provide practices that reduce the impact of invasive species. Lincoln County will use Invasive Species BMP's 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 protection. Lincoln County will require all logging contractor's to comply with the general guidelines as described in "Wisconsin's Forestry Best Management Practices for Invasive Species" published by the Department of Natural Resources, publication Pub-FR-444-09, unless specifically provided otherwise.

810.1.11 Biomass Harvesting Guidelines

These guidelines focus on the sustainable harvest of woody biomass from forested areas within the context of generally accepted forestry practices, and provide considerations and recommendations applicable to stand and site-level management based on best available information. The guidelines address the impacts of increased biomass harvesting on biodiversity conservation, soil nutrient depletion, physical properties of soil, and water quality.

Lincoln County will require all logging contractor's to comply with the general guidelines as described in Wisconsin Forestland Woody Biomass Harvesting Guidelines" published by the Department of Natural Resources, publication Pub-FR-435-09, unless specifically provided otherwise.

810.1.12 Tree Retention on Timber Harvests

Silvicultural practices are designed to manipulate vegetation to achieve management objectives. Retention of some trees, both dead and alive, has associated ecological benefits. Lincoln County will implement tree retention guidelines consistent with the Lincoln County Forest Tree Retention Guidelines found in Chapter 900 (appendix).

8/8/11

Lincoln County Forest

GREEN TREE RETENTION GUIDELINES (GTR)

Reserve Trees

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

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

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

- Large size (tree height, diameter, crown dimensions) for the species and site.
  - If large trees are lacking, then potential future large trees can be selected.
- Older trees with large size and rough bark.
- A mix of vigorous and decadent trees.
  - Vigorous trees of long-lived species can enable long-term retention and potentially yield a variety of benefits.
  - Decadent trees can provide current and future cavity trees, as well as future snags and down coarse woody debris.
- A mix of species, including locally uncommon species and mast trees.

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

Generally, poor candidates for individual reserve trees include:

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

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

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

Benefits of Reserve Tree Retention

Silvicultural practices are designed to manipulate vegetation to achieve management objectives. At its foundation, silviculture is based on understanding and working with ecological processes. Silvicultural practices that more closely emulate natural disturbance and stand development processes are more likely to sustain a wide array of forest benefits. Most natural disturbance regimes and events retain compositional and structural legacies in heterogeneous patterns and create ecological complexity. Silvicultural practices that develop and maintain reserve trees in managed stands can enable the promotion of ecological complexity – composition, structure, and pattern.

The retention of reserve trees can provide a "lifeboat" function that contributes to the conservation of biological diversity (see preceding section). These structures facilitate the perpetuation of some biota (plant and animal species and genotypes) on site. They also perpetuate habitat for re-colonization and occupation. They can improve landscape connectivity, facilitating the movement of some organisms. Reserve trees influence reorganization and recovery processes in post disturbance ecosystems; they can sustain functional roles and modify the post-disturbance environment.

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

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

Potential Costs of Reserve Tree Retention

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

Some specific potential costs include:

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

Considerations for Reserve Tree Retention

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

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

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

Insect and disease issues and potential impacts on tree health should be another consideration in reserve tree selection and design. Regeneration methods are designed to foster the vigor of the regenerating stand. Although the imminent mortality of some reserve trees may be desirable or acceptable, typically some vigorous trees will be retained with the expectation of continued growth and survival (perhaps for a long time). When regenerating a stand and retaining reserve trees, potential risks to tree health should be evaluated, and methods implemented to reduce risks while achieving stand management objectives. In most cases, well designed regeneration and retention strategies can minimize risks; however, stand and site conditions may limit options in some cases. Refer to the cover type chapters in this handbook and forest pest management guidelines to appropriately consider and address insect and disease risks when selecting and designing regeneration methods and reserve tree retention for a specific stand and site.

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

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

Representation of reserve trees can range from none to many. If silviculture is to simulate, to some extent, natural disturbance processes, then most actively managed stands should include some level of structural retention. To accomplish general sustainable forestry goals that include multiple stand management objectives, recommended representation could typically range from 3-15% of stand area or crown cover. In some stands, particularly intensively managed single objective stands (e.g. maximize short-term economic returns, maximize pulp production, or maximize populations of wildlife species that prefer completely open, treeless habitat), landowners may choose to not retain reserve trees. In some stands, with appropriate species and site characteristics, where the optimization of tree vigor and timber quantity and quality is a minor concern, adaptive silvicultural practices that retain 20-60% cover could be considered by the landowner. It is recommended that sound reasons and expected impacts be documented when the decision is to retain reserve trees at less than or greater than the recommended level of 3-15% of stand area or crown cover.

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

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

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

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

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

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

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

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

Table 24.1 Patch sizes for retention and approximate dimensions (circular and square)

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

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

Figure 24-7. Reserve trees retained in patches.

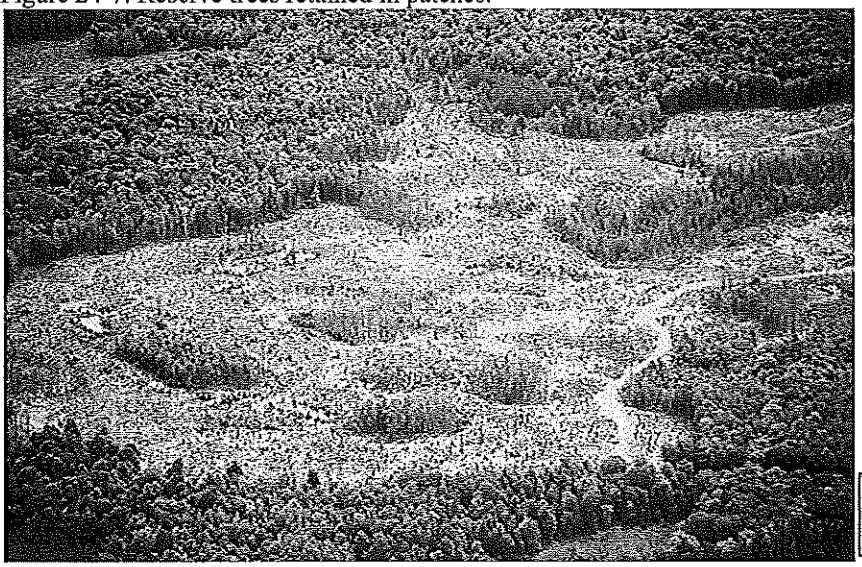

Photo by Jeff Martin, J-Mar Photography

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

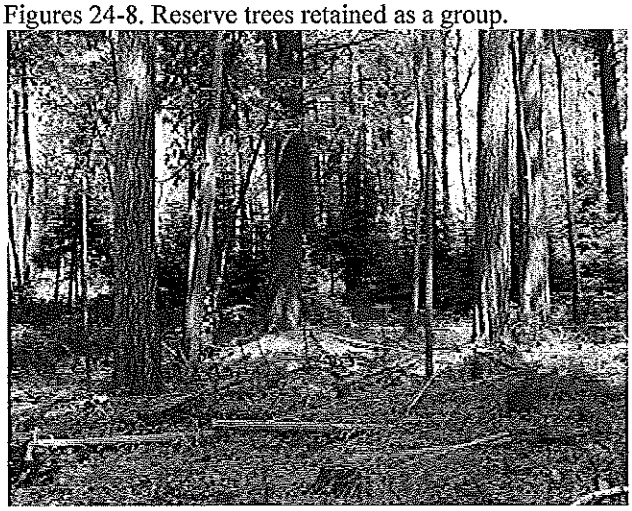

Photo by Joe Kovach

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

Photo by Joe Kovach

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

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

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

- Even-aged rotations
  - Retain ≥3 (if available), preferably large, snags per acre.
  - Retain reserve trees and/or patches at 3-15% crown cover or stand area, including large vigorous trees, mast trees, and cavity trees. Reserve tree retention is a generally recommended silvicultural practice for stands ≥10 acres. It is encouraged in smaller stands, but operational, shading, and other biological issues may limit application.
- Even-aged intermediate treatments
  - Retain ≥3 (if available), preferably large, snags per acre.
  - Retain ≥3 (if available), preferably large, cavity trees per acre.
  - Retain ≥3 (if available), preferably large, mast trees per acre.
  - If previously established, manage reserve trees and patches. Management may include timber harvesting or passive retention. Consider retaining ≥3 trees per acre to develop into large, old trees and to complete their natural lifespan. These trees may also satisfy cavity and mast tree recommendations. These trees will often become large snags and coarse woody debris.
- Uneven-aged systems
  - Retain ≥3 (if available), preferably large, snags per acre.
  - Retain ≥3 (if available), preferably large, cavity trees per acre.
  - Retain ≥3 (if available), preferably large, mast trees per acre.
  - Consider retaining ≥3 trees per acre to develop into large, old trees and to complete their natural lifespan. These trees may also satisfy cavity and mast tree recommendations. These trees will often become large snags and coarse woody debris.

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

When applying retention recommendations, be sure to consider:

- Retention will occur at the "Harvest Unit" level. Harvest Unit is defined as the stands within a timber sale. RMZ or Z prefix stands occurring within or adjacent to the Harvest Unit can provide retention opportunities. Retention will be encouraged in stands 10 acres in size or less that are managed as even-aged, but will not be required.
- Individual trees can provide multiple benefits and fulfill the intent of more than one of the above recommendations. For example, three large oak trees with cavities could satisfy the mast tree and cavity tree recommendations, as well as the large, old tree consideration.
- Retention of both vigorous and decadent trees will provide an array of benefits.
- In general, species diversity is encouraged when selecting trees to retain.
- Large trees and snags are >12 inches dbh, and preferably >18 inches dbh.
- Trees retained can be scattered uniformly throughout a stand or irregularly dispersed, as single trees, groups, and patches. The general recommended strategy is to retain irregularly distributed patches along with scattered groups and individuals.
- Retention in aggregated patches generally provides the most benefits for wildlife and biodiversity. Also, patches retained can satisfy multiple benefits; for example, at stand rotation, an internal or adjacent unharvested buffer along a stream (RMZ) could provide a portion of reserve tree retention as well as satisfy BMP (water quality) recommendations. Patches should be >0.1 acres and generally <2.0 acres, but can be larger; reserve tree patches, particularly large ones, should be documented as retention patches.
- Harvesting of reserve trees may occur in the future or may be foregone to achieve other benefits. Retain reserve trees for at least one-half the minimum rotation age of the new stand (e.g. retain reserve trees at least 20-25 years if regenerating aspen). Consider retaining some trees to develop into large, old trees and to complete their natural lifespan; these trees will often become large cavity trees, snags, and coarse woody debris.
- Retain as many snags as possible. Retention of snag diversity (species and size) can potentially provide the greatest array of benefits. Snags that are determined to be a threat to human safety can be cut and retained on site as coarse woody debris.
- Clearly designate, in writing and/or by marking, which trees should be retained prior to any cutting operations.