FOREST STEWARDSHIP PLAN

FOR

ELDON WILDLIFE MANAGEMENT AREA

Developed by:
Ray Lehn
Iowa DNR Forester
Jeff Glaw
Iowa DNR Biologist
Dave Whittlesey
National Wild Turkey Federation Biologist

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Forest Stewardship Plan

For

Eldon Wildlife Management Area

Manager: Jeff Glaw

Telephone: 319-293-7185

Location: T70N, R12W, Sections 4, 5, 9, 10, 14, 15
Davis County, Iowa

Acres: 1290 total acres
243 acres cropland
977 acres timber
35 acres idle
30 acres grassland
5 acre public use facilities

Introduction

The IDNR is the state government agency whose vision is to lead Iowans in caring for their natural resources. Conservation and enhancement of natural resources to ensure a legacy for future generations is part of the IDNR's mission. Within the IDNR, the wildlife bureau manages more than 350,000 acres of land as wildlife management areas (WMA's) for a variety of public users. Many of these WMA's especially in southern and northeast Iowa are either partially or mostly forest covered. These forests, if properly managed, provide a unique opportunity for the IDNR to carry out its mission by demonstrating to the public the wise use (conservation) and enhancement of these valuable resources for wildlife.

In recent years, the wildlife bureau has recognized and acted on the need for forest wildlife stewardship plans (FWSP's) to properly manage their forest resources. Forests are not static systems, even though changes occur over a long period of time. A hands-off or "preservation" philosophy will insure that the forest of 100 years from now will be much different and likely lower quality than the forest of today. Some forest stands may take more than 120 years to mature, a time span that may extend through the careers of several managers. This slow but relentless change requires managers to plan over the long term and

leave a written record of these plans in the form of FWSP's. Since Iowa has no old growth forests remaining this component should be considered in some areas whenever possible. Old growth forest is known to support unique species that are not supported by younger forests and can increase the diversity of the forest that is part of the focus of these forest stewardship plans.

Objectives

Because the Eldon WMA is a **wildlife management area**, the primary focus of the FWSP will be to provide habitat for a wide variety of forest wildlife species. Unfortunately there is no one type of forest stand that can provide all of the requirements for all forest wildlife species. Wildlife species require different (and sometimes quite specific) forest types and ages classes. For example, some wildlife species require an abundance of forest edge while others need relatively large blocks of un-fragmented forest.

Funding for the acquisition and management of the Eldon WMA has been almost exclusively hunter generated monies, i.e. license fees and excise taxes on sporting equipment. Consequently, a primary objective for management of the area is to improve habitat for hunted species such as deer, turkey, squirrels, and bobwhite quail. On the other hand, the IDNR is obligated to consider the effects of its management actions on non-hunted species as well, particularly those that are threatened, endangered, or species of special concern. Iowa's "State Comprehensive Wildlife Conservation Plan" identifies those species it considers in "greatest conservation need" (refer to page 41). Recognizing that it is difficult if not impossible to manage for all of these species at the same time and on one tract, this list does, however, provide an important guideline by which management strategies and decisions will be made.

Management Considerations

There are several considerations that have entered into the formulation of this FWSP for the Eldon WMA:

1. The decline of many forest interior bird species such as Acadian flycatchers, veerys, wood thrushes, cerulean and Kentucky warblers and other neotropical migrants. Forest fragmentation, declining forest health and associated cowbird parasitism are considered among the factors causing declines in some of these species. Iowa is a state with exceptionally fragmented forests where addressing the needs of some of these large-block, interior nesting species is particularly difficult, if not impossible. The Eldon WMA, however, is part of a relatively large block (by Iowa standards) of public and private timber. It is important to consider the habitat components of this larger landscape when making land management decisions and every attempt should be made to

minimize fragmentation of this forest when designing and implementing silviculture practices.

2. There has been a loss of early succession forest stands and associated wildlife species throughout much of southern Iowa. Many of the disturbance factors such as fire, grazing, and cutting have dramatically decreased over the past 40 years. As a result, much of the upland forest in this vicinity has progressed beyond the early succession stage. While this may have been beneficial to those wildlife species requiring more mature forests, it has probably been a negative for species such as bobwhite quail, woodcock, black-billed and yellow-billed cuckoos, and blue-winged warblers.
3. There has been a steady decline and projected future decline in oak forest throughout Iowa caused by continuous succession of forest stands to the more shade tolerant species such as maple, basswood, ironwood, and bitternut hickory. Oak-hickory forests are extremely important for a wide variety of wildlife species in Iowa. Oak-hickory woodlands also provide critical habitat for canopy-dwelling birds as well as nesting sites for both birds and mammals that occupy cavities. Mast from these species provides an important food resource for many mammal and bird species. The eventual replacement of oak forest with more shade tolerant species such as basswood, elm, hickory or hackberry to name a few species would undoubtedly have a severe negative effect on a huge variety of wildlife species.

This FWSP starts with the assumption that it is very important to maintain an oak-hickory forest to the extent possible. The maintenance of oak-hickory forest on public land becomes even more important in light of likely future trends on privately held forest. Much of this private forest has been subdivided and sold to sportsmen and small acreage holders, many of whom will probably be resistant to implementing the forestry practices necessary to regenerate oak. If this occurs, much of the forest landscape in Iowa will eventually convert to shade tolerant species at the expense of oak.

Management Strategies

Several management strategies will need to be used to implement the objectives of the plan within the management considerations mentioned above:

1. Natural oak regeneration requires sunlight to give the oak seedlings a competitive edge over shade tolerant species. Clear cuts and shelter-wood cuts (described under Proposed Management Systems) are the typical systems used for regenerating oak. To prevent any potential negative effects on interior nesting species, clear-cuts should be kept as small as possible (3-10 acres) while still large enough to achieve oak regeneration and be economically feasible. To achieve economic feasibility with small clear-cuts, sales may need to be piggy-backed with other sales on public land in the vicinity. Subdividing larger stands will be necessary to keep clear-cuts as small as possible.

2. Early succession stages and mature stages of forest both tend to be more productive for a variety of wildlife than the intermediate crowded pole-size stage. Practices such as basal area thinning and crop tree release can be used to minimize the time a stand must spend in this intermediate stage. Basal thinning will result in greater sunlight for the entire forest, including desirable grasses, forbs and sedges. More sunlight to the forest floor will mean more flowering plants which will attract insects for forest birds.
3. While there is no feasible way of extending the early succession stage of a forest stand, the mature stage of succession may be able to be extended significantly beyond the typical 100 or 120 year rotation age. While this may result in some decline in timber quality and economic return, the trade-off value for certain wildlife species may make it worth it. The longer rotation should tend to postpone the amount of fragmentation needed to regenerate the stand. The limiting factor may be how long the rotation can be extended without jeopardizing natural oak regeneration. Natural regeneration is preferred and planting should be avoided if at all possible.
4. Some interior nesting bird species seem to select for large spreading "wolf trees" within a given stand. When clear cuts and shelter-wood cuts are marked, these trees should be left especially since they typically have little economic value. Many wildlife species require dead or dying trees to provide insects for food and cavities for nesting. When clear cuts and shelter-wood cuts are marked for harvest, provisions should be made to leave 6 -7 cull trees per acre, snags, and cavity trees to provide this component for the future stand.
5. It is probable that Indiana bats use this area during the summer, in particular the riparian forest adjacent to Eldon and its tributary creeks. Cutting on any stands described in this FWSP must be done in a manner that does not disturb potential bat maternity trees during the breeding season.
6. This FWSP should be updated regularly as more information becomes available on wildlife use and on the efficacy of various silvicultural/management procedures. If funding is available, wildlife surveys should be done to determine species use to help evaluate success of management decisions.

Description of the Area

The Eldon WMA was purchased in six parcels over a fifty year period. The initial parcel of 622 acres was purchased in 1943. Additional purchases in 1967, 1968 and 1971 brought the total land area to 925 acres. In 1993 and 1994, 365 acres was added as part of a land trade which brought the total land acres to 1290.

The WMA is primarily upland forest with some bottomland timber along Soap Creek and the main drainages. There are two hundred sixty eight acres that are managed as part of

agricultural lease to provide cover, food and nesting habitat for upland game and forest wildlife species.

For purposes of this FWSP, the Eldon WMA forested land was divided into 88 stands shown in the photo (refer to page 36). Each stand is described in this plan and recommendations are outlined for woodland management by stand. A priority level has been established for each stand recommendation to assist in management decisions.

Income from Timber Harvest:

It should be emphasized that income generation is not the goal behind FWSP's. Harvesting is conducted to regenerate stands to desirable species and to achieve a desirable diversity of tree sizes and species. However, any income generated from timber harvesting operations should be reinvested into the forest management in Iowa to thin young stands, convert areas to more desirable species and otherwise manage the forest for wildlife, and invest in surveys and/or research to evaluate success of management decisions and help direct future management. Without this reinvestment, there is little chance that the WMA annual budget will allow the recommendations in this plan to be implemented. Harvesting is a very minimal portion of this plan. The majority of work recommended is directed at thinning or burning young stands so the oak is not shaded by other trees and at removing undesirable species to encourage regeneration of desirable trees.

Current Distribution of the Tree Size on the area:

The woodland was stand mapped according to the average tree size as follows:

Tree Size (dbh)		Acres	% of Forested Area
Sapling	1-4"	62.7	6.4%
Pole	5-10"	272.3	27.9%
Small Saw	12-18"	431.4	44.1%
Sawlog	> 20"	211.0	21.6%
Total		977.4	100%

Proposed Management Systems for the area:

Recommendations for each stand were based on whether the area will be managed to create an even age system, early successional, or as a viewshed. The decision on what system would be used was based on the objectives for the area to maintain an oak component where feasible, develop a diverse woodland landscape, protect fragile sites.

The management recommendations for Eldon WMA are shown in the table below:

Management System	Acres	% of Forested Area
Early Successional	135.2	13.8%
Even Age	738.7	75.6%
Viewshed	103.5	10.6%
Total	977.4	100%

Early Succession Management –

Many bird species such as bobwhite quail, American woodcock, blue-winged warbler, black-billed cuckoo, yellow-billed cuckoo, and eastern towhee are dependent on the early successional stages of woody growth. The high stem density of both trees and shrubs provides suitable nesting habitat and protection from predators.

The majority of early succession management prescribed in this plan is on the woodland edges. This work will "feather" the edges and make a gradual transition from the field edges to the larger trees. Feathering and softening the edges may lessen nest parasitism of interior forest bird species by brown-headed cowbirds.

The early succession management areas will be managed on a 15-20 year rotation. In other words, every 15-20 years the stands will be cut to create areas with high stem density. Eldon WMA has 135.2 acres scheduled for early succession management. Applying sustainable forestry guidelines, about 18 - 20 acres could be cut every 10 – 15 years

Many of the timber edges contain narrow bands of sapling to pole size trees that were not identified as stands to be managed for early successional management. The number of acres to manage for early succession could be increased from the 135.2 acres identified if desired for management purposes.

Even Age Management –

Even age management involves growing a stand of trees which are close to the same age. At some point in a stand's life, the area is clear cut which results in the even age structure. This type of management creates excellent habitat for deer, turkey, squirrels and a wide variety of other wildlife species. It is essential for regeneration of oak, which requires full sunlight. The only way that oak can be maintained as a component of the forest over the long run is by practicing some form of even age management.

Each stage or age class of an even age stand provides habitat for a suite of wildlife species. For example, regenerating stands (1-10 years old) benefit the same species as do early succession stands, i.e. blue-winged warblers, black-billed cuckoo, yellow-billed cuckoo, eastern towhee, as well as bobwhite quail and American woodcock.

Sapling to small pole size stands between 10-20 years old may be used by black and white, Kentucky, and worm-eating warblers. Pole size to medium size trees (20-60 years) tend to be used by canopy nesters such as scarlet tanagers, wood thrushes, and ground nesters such as ovenbirds and Kentucky warblers.

Mature stands of 60-125+ years of age are used by birds such as the wood thrush, Acadian flycatcher, ovenbird, worm eating warbler, and scarlet tanager.

As woodland stands age, they constantly lose trees to shading, insects, disease, etc. The dead and dying trees provide habitat for cavity nesters such as woodpeckers, nuthatches, titmice, and creepers. The federally endangered Indiana bat uses loose barked live trees such as hickory as well as the sloughing bark from dying trees for their maternity colonies. These trees should be maintained at a level of 6 -8 per acre or more.

Thus, even age management has the potential to provide a large variety of age classes that can meet the needs of a variety of wildlife species.

While there are many methods to open a stand to sunlight, clear cutting and shelter wood harvesting are the most common. Clear cutting is a practice that opens the stand all at once. Regeneration using clear cutting requires there to be sufficient oak seedlings or advanced regeneration present. Without these seedlings, planting may be necessary following a clear cut.

Shelter wood harvests are one way of encouraging seedling production prior to a clear cut. Shelter wood harvests include several thinnings done prior to the final clear cut. If the shelter wood is done correctly, the trees left after the thinnings will provide seed and the forest will be open enough to allow sunlight to reach the forest floor. The trees left will also help provide shade that limits the growth of undesirable or
invasive plant species. This method can take many years to create the next oak stand and may need mechanical or fire disturbance to keep out undesirable species. After sufficient seedling or advanced regeneration is present, the stand needs to be clear cut to successfully regenerate the oak stand.

Crop tree release is discussed in this plan. This practice is done most frequently when the trees are pole sized. The goal of the practice is to choose no more than 50 trees per acre that are considered to have the best genetics. All trees that touch the canopy of the crop tree are killed to allow the tree to reach maximum growth potential.

Thinning the understory is a practice also used in even age management. This practice involves removing trees that are below the main canopy to allow more sun light to get to the forest floor. Ironwood, sugar maple, and other shade tolerant species warrant this practice if species like oak are wanted in the future.

Fire is an effective and inexpensive tool that has a long history of use and continues to be studied in managing oak stands. Occasional burning of the leaf layer in the woods will kill thin barked species such as hard maple, cherry, elm, bitternut hickory and iron wood. Fire will expose mineral soil and open ~~up~~ the ground to sunlight. These conditions favor the natural regeneration of oak. Depending on the extent of root system development, some oak seedlings will tolerate fire better than others, but as a whole, oaks tolerate fire better than other tree species. The top of an oak seedling often will die back following fire, but the roots will send up new growth soon thereafter.

There are 724.0 acres on this area that will be managed as even aged woodlands to regenerate oak. The eventual acreage requiring clear cutting every 5 years depends on the rotation age used for the stand. With a typical 125 year rotation, approximately 36 acres would need to be clear cut every 5 years. If the rotation age can be extended significantly without jeopardizing the ability to regenerate oak, the acres of clear cutting every 5 years can be reduced correspondingly.

Viewshed Management –

Viewshed areas are typically steep fragile slopes and areas along streams that are best left to naturally progress through succession. Viewsheds may also be used to protect areas for endangered species or be used to protect certain public use facilities. Management can take place on these areas where desirable, but the major objective is to have minimal disturbance.

Certain Neotropical migrants will benefit from the areas designated as viewshed. On the Eldon WMA, the riparian corridor along Soap Creek will be mostly in viewshed to protect potential Indiana bats as well as provide habitat for Neotropical migrants such as the Acadian flycatcher. There will be 103.5 acres that will be managed as viewshed.

Monitoring Forest & Wildlife Response to Management Practices –

Knowledge of vegetation and wildlife response to silviculture practices (e.g. oak regeneration, SGCN use of managed stands), will assist managers in developing future FWSP's to reach the goals of SGCN as well as keeping common wildlife common. It will also help build public acceptance of silviculture practices which are not always viewed favorably by the public. Information from monitoring will allow public and private forest managers to ensure that proper silviculture techniques are being used in early successional habitat creation to meet the wildlife and vegetation goals of the plan. A detailed forest and wildlife monitoring plan will be developed as an addendum to this forest stewardship plan that will outline procedures, species monitoring to be conducted and timetable.

WORK PLAN
FOR
ELDON WILDLIFE MANAGEMENT AREA

The work plan for Eldon Wildlife Management Area is designed to aid officials and foresters in the implementation of forest management practices. It is written with the understanding that these professionals have a basic understanding of forest management principles and techniques. Every detail has not been outlined in the plan because the plan would become too long to be of practical use. This plan is intended to get work accomplished on the ground.

Stand 1 : 2.9 acres

Woodland Description –

The overstory is composed of pole size hickory, black oak, ash and shingle oak with some red oak
and white oak scattered throughout. Understory is mostly gooseberry, elm, ash and hickory with some
areas of oak regeneration.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release (CTR) is recommended, Crop trees will be desirable species with good form and lack of significant defect. Trees with crowns touching or
over topping the crown of the crop trees will be killed by felling or double girdling. Species normally selected as crop trees are walnut, white oak and red oak. Species diversity is encouraged in selecting crop trees.

Stand 2: 5.8 acres

Woodland Description –
The overstory consists primarily of pole to small sawlog size hickory, black oak, shingle oak and ash with lesser amounts of white oak and cherry. There are scattered larger trees throughout. Understory is primarily elm, hickory, ash and ironwood.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release is recommended. Crop trees will be desirable species with good form and lack of significant defect. Trees with crowns that are touching or overtopping the crown of the crop trees will be killed by felling or double girdling. Species normally selected as crop trees are walnut, white oak and red oak. Species diversity is encouraged in selecting crop trees. Selective harvest of some of the most mature trees could be beneficial if harvesting is occurring in adjacent area.

Stand 3: 1.3 acres

Woodland Description –
This is a small stand of sapling to small pole sized white oak with hickory, elm and other oak. There is some elm, hickory and oak in the understory.

Management Recommendations –
Since there are few areas with this size class of oak on this WMA, this stand should be given high priority for thinning to provide optimum growth and survival. Non-oak, particularly hickory and elm should be weeded out of this stand to give the oak adequate growing space.

Stand 4: 15.4 acres

Woodland Description – The overstory is comprised of pole to small sawlog size black oak, shingle oak, hickory and ash with some bur oak, red oak, white oak and elm. Understory is composed of ironwood, ash and elm.

Management Recommendations –
This area should receive crop tree release to give the best trees adequate growing space.

Stand 5: 0.5 acres

Woodland Description –
This small area contains mostly pole size trees with a few larger trees and is composed primarily of ash, elm, and honey locust with a few walnut. Understory is composed primarily of ash and elm.

Management Recommendations –
This area is low priority but would benefit from limited CTR to give the few walnuts and oaks adequate growing space.

Stand 6: 3.4 acres

Woodland Description –
This edge area is composed primarily of dogwood, blackberry, and sapling elm, locust, and red cedar with a good number of mixed oak, cherry, and walnut saplings throughout.

Management Recommendations –
This area could be cut back periodically to maintain early successional vegetation. If no cutting back is done over the next ten to fifteen years, this area could be considered for CTR to release the oak, walnut, and cherry.

Stand 7: 1.0 acres

Woodland Description –
This area is composed primarily of pole size locust, elm, and ash. Understory is primarily dogwood, elm, ash, and locust.

Management Recommendations –
This area could be cut back every 10 – 15 years to maintain early successional vegetation.

Stand 8: 12.9 acres

Woodland Description –
This area contains dogwood and sapling to pole size locust, elm, ash, shingle oak, and cedar with occasional walnut and other mixed oaks.
Management Recommendations –
This area could be cut back on a 10 – 15 year rotation to maintain early successional vegetation. The west part of this area contains more mixed oak and could be considered for CTR in about 10 years.

Stand 9: 11.1 acres

Woodland Description –
This area is composed primarily of pole to small sawlog size red oak, black oak, and ash, with some hickory, locust, shingle oak, and white oak. Understory is composed of ash, elm, hickory, ironwood, and cherry with some sporadic oak regeneration.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release is recommended as there is a significant proportion of oak in this stand.

Stand 10: 6.4 acres

Woodland Description –
This area along a drainage is composed primarily of small sawlog size bitternut and shagbark hickory, elm, and basswood with some sawlog size cottonwood and basswood along the edge of the creek. There are some pole size elm, ash, and hickory and occasional mixed oak in the understory along with gooseberry and multiflora rose. There are a couple of small sawlog size walnuts along the edge of the creek also.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and walnut but is low priority because of the low number of good quality crop trees.
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Stand 11: 24.9 acres

Woodland Description –
This stand is composed primarily of pole to small sawlog size shagbark hickory with more bitternut hickory on the west side. There are occasional oak mixed throughout and some scattered larger locust and ash. Understory is relatively open with gooseberry, ironwood, hickory, elm, and ash reproduction. There is a small area containing some walnut on the west side.

Management Recommendations –

Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and walnut, but is low priority because of the low number of good quality crop trees.

Stand 12: 7.9 acres

Woodland Description –
This stand is primarily pole size hickory and ash with some white oak, black oak, and red oak, especially on the east side. Understory is mostly ironwood with ash and hickory regeneration along with limited oak regeneration.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak but is low priority because of the low number of good quality crop trees.

Stand 13: 2.6 acres

Woodland Description –
This stand is primarily sapling to pole size ash, elm, and hickory with occasional mixed oak. Understory is relatively open and composed of gooseberry with ash, elm, and hickory regeneration.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and walnut but is low priority because of the low number of good quality crop trees. Another option could be to cut this area periodically to maintain early successional habitat.

Stand 14: 5.6 acres

Woodland Description –
This stand is primarily pole to small sawlog size red oak and black oak with some walnut, white oak, and bur oak as well ash and elm. Understory is relatively open with some ash, ironwood, and elm with very little natural regeneration.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and walnut but is low to medium priority because of the relatively low number of good quality crop trees. This stand would be a good candidate for controlled burning.

Stand 15: 2.8 acres

Woodland Description –
This area is mostly pole size trees with saplings along the edges and some sawlog size trees along the draw. Elm, ash, black oak, and red oak are primary species with some swamp white oak. Understory is predominantly elm and ash.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and walnut but is low priority because of the low number of good quality crop trees.

Stand 16: 5.3 acres

Woodland Description –
This stand is primarily pole size with sawlog trees along the draw. Primary species are Red oak, Basswood, elm, and hickory with ash and elm in the understory.

Management Recommendations –
Selective harvest of the larger, mostly lower value trees along the draw would benefit the pole size oak as would application of CTR.

Stand 17: 3.7 acres

Woodland Description –
This stand is composed primarily of pole size walnut, ash, and mixed oak with some ash and hickory. Understory is primarily ironwood and ash.

Management Recommendations –
This stand would benefit from applying CTR to release the oak and walnut and should be medium priority. Removal of ironwood would be appropriate.

Stand 18: 7.0 acres

Woodland Description –
This stand is primarily hickory and ash pole size trees with some scattered mixed oak. There are a few large sawlog swamp white oak at the west side. Understory is mostly ironwood and elm.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak but is low priority because of the low number of good quality crop trees. Ironwood removal.

Stand 19: 8.0 acres

Woodland Description –
This stand is pole to small sawlog size and is composed mostly of black oak, red oak, hickory and ash with lesser amounts of white oak, bur oak, and elm. Understory is mostly ironwood, hickory and ash with ash and hickory regeneration.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and walnut and should be medium priority because of the fairly good number of quality crop trees.

Stand 20: 3.1 acres

Woodland Description –
The overstory of this stand is mostly large sawlog white oak of relatively poor quality. Understory is mostly hickory and ironwood with some ash with some hickory and ash regeneration.

Management Recommendations –
This area would benefit from Site Preparation for Natural Regeneration (SPNR) to get oak established in the understory. Burning the area would also enhance natural regeneration of the oak. This area could also be managed as savannah with repeated burns.

Stand 21: 3.5 acres

Woodland Description –
This stand is mostly small pole size shingle oak, black oak, hickory, cherry, elm and ash on the upper slope with small sawlog size hickory, ash, and some mixed oak along the draw. Understory and regeneration are
composed of hickory, ash, and elm.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and walnut but is low priority because of the low number of good quality crop trees. Waiting 10 to 20 years is recommended.

Stand 22: 55.4 acres

Woodland Description –
This fairly large area of abandoned cropland/pasture is composed of sapling size trees with mostly dogwood, cedar, elm, cherry, locust, shingle oak, and ash, along with multiflora rose and blackberries. There are some scattered oak and walnut.

Management Recommendations –

This area could be cut periodically to manage as early successional habitat. Controlled burning would be a good option too.

Stand 23A: 1.4 acres

Woodland Description –
This is a pole to small sawlog size stand of mostly black oak, red oak, and hickory with some cherry and ash. Understory is mostly hickory and ironwood with some ash and prickly ash.

Management Recommendations –
This area would benefit from CTR to release the oak and high quality cherry. There are good numbers of quality crop trees and this would be medium priority.

Stand 23B: 6.3 acres

Woodland Description –
Same as 23A.

Management Recommendations –
CTR, same as 23A.

Stand 24A: 11.6 acres

Woodland Description –
This stand is composed primarily of high quality small to large sawlog white oak with some ash, hickory, and red oak. Understory is composed primarily ironwood and hickory with some hackberry and prickly ash. There is very little desirable regeneration.

Management Recommendations –
This tract will be considered to be viewshed. SPNR could be applied to enhance natural regeneration of oak.

Stand 24B: 38 acres

Woodland Description –
This stand is similar to 24A but has slightly larger trees. There are also more ash and hickory along the main draw with some hackberry.

Management Recommendations –
SPNR with shelterwood harvest should be fairly high priority.

Stand 25: 1.3 acres

Woodland Description –
This stand is mostly pole size cedar with black oak, red oak, hickory, ash and elm mixed throughout. Understory and regeneration are mostly ash, elm, and hickory.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and any walnut but is low priority because of the low number of quality crop trees.

Stand 26: 8.0 acres

Woodland Description –
This area is mostly pole to small sawlog size red oak with some black oak, hickory, ash, and cherry. There are some larger red oak in the NE part. Understory and regeneration is mostly hickory, elm, and ash.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and walnut and is medium priority because of the good number of quality crop trees, primarily red oak. Some of the larger red oak could be selectively harvested if a harvest is taking place in adjacent stand.

Stand 27: 14.9 acres

Woodland Description –
This is a narrow stand of lower quality sawlog size trees along a major draw and its tributaries. Species include mixed oak, hickory, ash, locust and elm. Understory is mostly ash, hickory, and mixed shrubs.

Management Recommendations –
A limited amount of CTR or weed tree removal could be applied to give the best trees room to grow, but this would be low priority.

Stand 28A: 10.1 acres

Woodland Description –
This is a stand of pole to small sawlog size black oak, red oak, ash, and shingle oak with some hickory, white oak, and elm. Understory is ironwood, ash, and elm.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and any walnut and is medium priority because of the good number of quality crop trees.

Stand 28B: 9.2 acres

Woodland Description –
Same as 28A

Management Recommendations –
Same as 28A

Stand 29: 15.5 acres

Woodland Description –
This pole to small sawlog size stand is composed mostly of black oak, white oak, red oak, and hickory with some larger trees along the draw. Understory is composed of ironwood, hickory, and elm with some oak regeneration along the edge. Similar to stand 28 but more white oak and less shingle oak.

Management Recommendations –

Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and any walnut and is medium priority because of the good number of quality crop trees.

Stand 30A: 32.6 acres

Woodland Description –
This stand is mostly small sawlog white oak with red oak, black oak, ash, and hickory. There are larger sawlog trees along the draw. Understory and regeneration are mostly ironwood, hickory, and elm.

Management Recommendations –
This stand would benefit from CTR to release the oak and any walnut, and should be medium to high priority because of the abundance of nice white oak. A selective harvest of some of the larger red oak, black oak, and hickory would be beneficial to the remaining white oak.

Stand 30B: 10.8 acres

Woodland Description –
This stand is similar to 30A but has more red oak and black oak. There are some small oak wilt pockets in this stand.

Management Recommendations –
Management will be the same as 30A.

Stand 31: 8.1 acres

Woodland Description –
This stand is mostly large sawlog trees with some smaller sawlog trees. White oak is the primary component of the overstory with some hickory and ash as well as scattered larger sawlog red and black oak, especially along the draw. Understory is primarily hickory, ash, and prickly ash.

Management Recommendations –
This stand should be fairly high priority to manage for oak regeneration. SPNR should be applied along with a shelterwood harvest to enhance natural regeneration of oak.

Stand 32: 11.0 acres

Woodland Description –
This stand is mostly small sawlog size with some pole size trees. Primary species present are red oak, black oak, shingle oak, and hickory with some ash. Understory is primarily hickory, ash, and elm with some multiflora rose.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and any walnut but is low priority because of the relatively low number of quality crop trees.

Stand 33: 2.8 acres

Woodland Description –
This stand is mostly small sawlog size and is composed primarily of hackberry, hickory, red oak, and ash with occasional larger cottonwood and silver maple along the drainage. Understory is mostly hackberry, hickory, and ash. There are a few scattered walnut and swamp white oak poles.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak and any walnut but is low priority because of the low number of quality crop trees.

Stand 34: 0.8 acres

Woodland Description –
This is a small stand next to the road is composed of sawlog size white pine with pole size black locust around the edge. Understory is mostly ash, hickory, elm, and dogwood with hickory, elm, and ash regeneration.

Management Recommendations –

Weed tree removal should be applied to remove any hardwoods competing with the pine.

Stand 35: 10.1 acres

Woodland Description –
This is a stand of pole size trees composed of ash, black oak, and red oak along the edge with some small sawlog red oak, black oak, white oak, and ash along the draw. Understory and regeneration are composed of elm, hickory, ironwood, and ash.

Management Recommendations –
Timber Stand Improvement in the form of Crop Tree Release could be applied to release the oak but is low priority because of the low number of quality crop trees. Some of the larger trees in the draw could be harvested if a harvest occurs in an adjacent stand.

Stand 36: 12.1 acres

Woodland Description –
This is a stand of small to large sawlog trees composed primarily of white oak with some red oak, black oak, and hickory. Understory is mostly elm, hickory, ash, and ironwood.

Management Recommendations –
This stand should be fairly high priority to manage for oak regeneration. SPNR should be applied along with a shelterwood harvest to enhance natural regeneration of oak.

Stand 37: 10.7 acres

Woodland Description –
This abandoned cropland/pasture has grown up to a fairly dense stand of pole size black oak, red oak, cherry, shingle oak, ash and elm on the east side. The west side is more open with more cedar, elm, and dogwood with mixed hardwoods. Understory is elm, ash, cherry, hickory, and dogwood.

Management Recommendations –
This tract will be considered to be viewshed. CTR or weed tree removal could be applied to enhance the growth of high quality hardwoods but this should be low priority.

Stand 38: 9.0 acres

Woodland Description –
This large sawlog size stand along a draw and predominantly north facing slope is composed of a mix of red oak, black oak, hickory, white oak, ash, and walnut with some basswood. Understory is predominantly ironwood, hickory, and elm.

Management Recommendations –

This stand should be medium to high priority to manage for high quality hardwood regeneration. SPNR should be applied along with a shelterwood harvest to enhance natural regeneration of oak and walnut.

Stand 39A: 19.0 acres

Woodland Description –
This abandoned cropland/pasture area is similar to stand 37 only with slightly larger trees. Primary species present are black oak, red oak, and ash with larger trees along the draws. Understory is elm, ash, hickory with
mixed shrubs. There are some areas that are more open with cedar and dogwood along with mixed hardwoods.

Management Recommendations –
CTR or weed tree removal could be applied to enhance the growth of high quality hardwoods but this should be low priority for the immediate future. The more open areas could be cut periodically to manage as early successional habitat.

Stand 39B: 29.4 acres

Woodland Description –
Same as 39A

Management Recommendations –
Same as 39 A

Stand 40: 14.8 acres

Woodland Description –
This small sawlog size stand is composed primarily of white oak, black oak, hickory and some scattered walnut. Understory is primarily ironwood, hickory, and elm.

Management Recommendations –
This area should receive crop tree release to give the best trees adequate growing space. Removal of locust is recommended.

Stand 41: 3.0 acres

Woodland Description –
This small sawlog stand has walnut as one of the primary components along with hickory, locust, ash, hickory, hackberry, and some mixed oak. Understory is primarily hickory and hackberry

Management Recommendations –

This area should receive CTR to give the best walnut and oaks adequate growing space. This should be a high priority stand due to the potential value of the walnut.

Stand 42A: 4.8 acres

Woodland Description –
This abandoned cropland/pasture has grown up to a stand of pole to small sawlog size ash, basswood, hickory, and mixed oak with occasional walnut. A Kentucky coffee tree was noticed in this stand. Understory is composed of ash, basswood, elm, and hickory.

Management Recommendations –
This tract will be considered to be viewshed. CTR and weed tree removal could be applied to enhance the growth of high quality hardwoods in the future but will be a low priority.

Stand 42B: 15.0 acres

Woodland Description –
This abandoned cropland/pasture has grown up to a stand of pole to small sawlog size ash, basswood, hickory, and mixed oak with occasional walnut. Understory is composed of ash, basswood, elm, and hickory.

Management Recommendations –
This tract will be considered to be viewshed. This area may receive CTR to give the best trees adequate growing space.

Stand 43: 5.3 acres

Woodland Description –
This small sawlog size stand is composed primarily of white oak, red oak, and hickory with occasional ash, basswood, and cherry. Understory is mostly ironwood and ash with ash regeneration.

Management Recommendations –
This tract will be considered to be viewshed. This area may receive CTR to give the best trees adequate growing space.

Stand 44: 7.8 acres

Woodland Description –
This larger sawlog size stand is composed of basswood, ash, and some mixed oak with occasional hickory and walnut. Understory is composed of ironwood, ash, and hickory with ash, hickory, and basswood regeneration

Management Recommendations –

This stand should be medium to high priority to manage for high quality hardwood regeneration. SPNR should be applied along with a shelterwood harvest to enhance natural regeneration of oak and walnut.

Stand 45: 4.9 acres

Woodland Description –

This pole to small sawlog size bottomland stand is composed of hackberry, hickory, river birch, walnut, and some mixed oak. There are scattered larger sawlog trees. Understory is mostly elm, ash, and hickory.

Management Recommendations –

This area will be considered to be viewshed. Some CTR could be considered in a future years.

Stand 46: 13.0 acres

Woodland Description –

This sawlog size stand is composed primarily of red oak and white oak with some ash and hickory. Understory is mainly ironwood, elm, and hickory with ash and hickory regeneration.

Management Recommendations –

This stand should be medium priority to manage for high quality hardwood regeneration. SPNR should be applied along with a shelterwood harvest to enhance natural regeneration of oak and walnut. This stand would be a good candidate for controlled burning after harvest.

Stand 47: 8.6 acres

Woodland Description –

This small sawlog size stand is composed of mostly white oak with some red oak and hickory and occasional walnut. Understory is mostly hickory, ironwood, and prickly ash with some hickory regeneration

Management Recommendations –

This area should receive CTR to give the best trees adequate growing space.

Stand 48: 3.5 acres

Woodland Description –

This sawlog size stand is composed primarily of red oak and white oak with some ash and hickory. Understory is mainly ironwood, elm, and hickory with ash and hickory regeneration.

Management Recommendations –

This stand should be medium priority to manage for high quality hardwood regeneration. SPNR should be applied along with a shelterwood harvest to enhance natural regeneration of oak and walnut.

Stand 49: 9.7 acres

Woodland Description –

This stand is composed of black oak, white oak, red oak, and ash with some bur oak. Many of the trees are in the 16 to 20 inch diameter class with scattered larger trees.

Management Recommendations –

A light CTR would be beneficial along with selective harvest of some of the larger trees if harvesting in an adjacent area. The best alternative may be to wait ten years and apply SPNR along with a shelterwood harvest.

Stand 50: 5.2 acres

Woodland Description –

This bottomland area along a creek is composed primarily of pole to sawlog elm and river birch with cherry, hackberry, hickory, and occasional walnut and red oak mixed throughout. There are a few scattered large sawlog red oak and walnut. Understory and regeneration is primarily elm and hickory.

Management Recommendations –

CTR could be applied to release the oak and walnut but would be low priority due to the low number of good crop trees. Selective harvest of the larger trees is recommended if harvesting in an adjacent stand.

Stand 51: 3.6 acres

Woodland Description –

This pole to small sawlog size stand is composed of ash, hickory, black oak, red oak, and some white oak. Understory is elm, ash, hickory, ironwood, and dogwood with elm and ash regeneration.

Management Recommendations –

This area should receive CTR to give the best trees adequate growing space.

Stand 52: 24.1 acres

Woodland Description –

This is a small sawlog size stand of white oak with some black oak and hickory and occasional walnut. Understory is ironwood and hickory with ash and hickory regeneration.

Management Recommendations –

This area should receive CTR to give the best trees adequate growing space and should be fairly high priority because of the good quality white oak.

Stand 53: 5.4 acres

Woodland Description –
This sawlog size stand is composed of black oak, red oak, hickory, and some white oak. Understory is mostly ironwood and hickory with hickory regeneration.

Management Recommendations –
This stand should be medium priority to manage for high quality hardwood regeneration. SPNR should be applied along with a shelterwood harvest to enhance natural regeneration of oak and walnut.

Stand 54: 17.3 acres

Woodland Description –
This small sawlog size stand is composed primarily of white oak, black oak, and hickory with occasional red oak and walnut. There are scattered larger sawlog trees along the draws, especially black oak. Understory is
mostly ironwood and hickory. Selection harvest of some of the larger trees would be beneficial if harvesting in an adjacent stand.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space and should be fairly high priority because of the good quality oak.

Stand 55: 30.6 acres

Woodland Description –
Similar to stand 55, this small sawlog size stand is composed primarily of white oak, black oak, and hickory with occasional red oak and walnut. There are scattered larger sawlog trees along the draws, especially black oak. Understory is mostly ironwood and hickory.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space and should be fairly high priority because of the good quality oak. Selective harvest of some of the larger trees would be beneficial if harvesting in an adjacent stand.

Stand 56: 3.8 acres

Woodland Description –
This larger sawlog size stand is composed of white oak, black oak, hickory, and some red oak. Understory is composed of ironwood and hickory with hickory regeneration.

Management Recommendations –
This stand should be medium to high priority to manage for high quality hardwood regeneration. SPNR should be applied along with a shelterwood harvest to enhance natural regeneration of oak and walnut.

Stand 57: 5.5 acres

Woodland Description –
This predominantly small sawlog stand is composed of black oak, ash, and hickory with occasional white oak and cherry. Understory is mostly ironwood and hickory with ash and hickory regeneration.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space but should be low priority.

Stand 58: 9.0 acres

Woodland Description –
This small sawlog size stand is composed of red oak, black oak, white oak, and walnut, with some hickory. Understory is mostly ironwood and hickory

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space and should be high priority because of the good quality oak and walnut.

Stand 59: 14.0 acres

Woodland Description –
This pole to small sawlog size stand is composed mostly of hickory and ash with scattered mixed oak and occasional walnut. Understory is ironwood and elm with elm and hickory regeneration.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space but should be fairly low priority.

Stand 60: 4.5 acres

Woodland Description –
This is a pole size stand of black locust. Understory is mostly coralberry and blackberry, with some hickory, cherry, and scattered oak.

Management Recommendations –
This area could be cut periodically to manage as early successional habitat.

Stand 61: 3.3 acres

Woodland Description –
This pole to small sawlog size stand is primarily ash, mixed oak, and hickory with walnut scattered throughout. Understory is elm, hickory, and ironwood with hickory and ash regeneration.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space and should be fairly high priority because of the nice walnut and oak.

Stand 62: 65.0 acres

Woodland Description –
This small sawlog size stand is predominantly white oak with black oak, hickory, and occasional walnut. Understory is ironwood, elm, hickory with some elm and hickory regeneration.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space and should be fairly high priority because of the good quality oak and walnut.

Stand 63: 3.4 acres

Woodland Description –
This pole size stand is predominantly black oak and hickory. Understory and regeneration composed of hickory and elm.
Management Recommendations –
This area should receive CTR to give the best trees adequate growing space but should be fairly low priority.

Stand 64: 14.7 acres

Woodland Description –
This narrow stand along a drainage is composed primarily of sawlog size white oak and red oak with some hickory. Understory and regeneration is mostly ironwood and hickory.
Management Recommendations –

This tract will be considered to be viewshed. This stand at some point could use CTR to manage for high quality hardwood trees.

Stand 65: 7.3 acres

Woodland Description –
This stand is primarily white oak with some red oak, black oak, hickory, and ash. There are scattered larger trees along the draws. Understory is ironwood with ash and hickory regeneration.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space and should be fairly high priority because of the good quality oak.

Stand 66: 3.2 acres

Woodland Description –
This small sawlog size stand is primarily red oak with some black oak, ash, and white oak. Understory is ironwood with ash and hickory regeneration.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space and should be medium to high priority because of the good quality oak.

Stand 67: 31.2 acres

Woodland Description –
This stand is primarily white oak with some red oak, black oak, hickory, and ash. There are scattered larger trees along the draws. Understory is ironwood with ash and hickory regeneration.

Management Recommendations –
This tract will be considered to be viewshed. At some point it should receive CTR to give the best trees adequate growing space and should be medium priority because of the good quality oak.

Stand 68: 20.0 acres

Woodland Description –
This pole to small sawlog size stand is primarily hickory with some mixed oak, ash, and elm. There are some scattered larger trees throughout. Understory is primarily ironwood and multiflora rose with hickory, elm, and ash regeneration.

Management Recommendations –

This tract will be considered to be viewshed. This area could receive CTR to give the best trees adequate growing space but should be low priority.

Stand 69: 38.5 acres

Woodland Description –
This pole to small sawlog size stand is composed of a mix of species including ash, black oak, hickory, cherry, elm, locust, and cedar. Understory is elm, hickory, and mixed shrubs with elm, ash, and hickory regeneration.

Management Recommendations –
This area could receive CTR to give the best trees adequate growing space but should be low priority.

Stand 70: 18.9 acres

Woodland Description –
This sawlog size stand is composed of white oak, hickory, red oak, and elm with some basswood and ash, and occasional walnut. Many of the trees are fairly low quality with multiple stems. Ironwood and ash in the understory.

Management Recommendations –
This stand should be low priority to manage for high quality hardwood regeneration. SPNR should be applied along with a shelterwood harvest to enhance natural regeneration of oak and walnut.

Stand 71: 20.0 acres

Woodland Description –
The overstory of this bottomland stand is a mix of sawlog locust, maple, and cottonwood with small sawlog river birch, elm, and hackberry with scattered walnut and oak. Understory is elm and multiflora rose with elm and hackberry regeneration.

Management Recommendations –
Selective harvest of some of the larger trees along with light CTR to release the few oak and walnut would be beneficial, although this would be low priority.

Stand 72: 9.2 acres

Woodland Description –
This small sawlog size bottomland stand has a mix of species similar to stand 71 but has a higher percentage of walnut and oak.

Management Recommendations –

This area should receive CTR to give the best trees adequate growing space.

Stand 73: 7.0 acres

Woodland Description –
This pole size stand is primarily black locust with some black oak and ash. Understory is mixed shrubs and ash.

Management Recommendations –
This area could be cut periodically to manage as early successional habitat.

Stand 74: 3.3 acres
Woodland Description –
This is a stand of pole to small sawlog red pine with elm, ash, and other hardwoods. Understory of elm and ash.

Management Recommendations –
Weed tree removal to eliminate the poor quality hardwoods would benefit the pine.

Stand 75: 8.0 acres

Woodland Description –
This is a pole size stand composed primarily of ash, black oak, and locust with some scattered walnut. Understory is elm, ash, and dogwood with elm and ash regeneration.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space.

Stand 76: 5.6 acres

Woodland Description –
This pole to small sawlog size stand is composed primarily of black oak and ash with some white oak and red oak. There are scattered larger trees. Understory and regeneration are composed of elm and ash.

Management Recommendations –
This area should receive CTR to give the best trees adequate growing space.
Stand 77: 2.5 acres

Woodland Description –
This is a sawlog size stand composed mostly of white oak, red oak, and hickory. Understory and regeneration are hickory, elm, and ash.

Management Recommendations –

This stand should be medium priority to manage for high quality hardwood regeneration. SPNR should be applied along with either a shelterwood or clearcut harvest to enhance natural regeneration of oak and walnut.

Stand 78: 23.8 acres

Woodland Description –
This is an area of small to medium sawlog size mixed bottomland hardwoods with some areas of pole size trees. Species include silver maple, cottonwood, ash, elm, hackberry and river birch with occasional walnut and oak. Understory and regeneration are primarily ash, elm, and hackberry.

Management Recommendations –
Selective harvest of some of the larger trees along with light CTR to release the few oak and walnut would be beneficial, although this would be low priority.

Stand 79: 3.0 acres

Woodland Description –
This pole to small sawlog size stand is composed of hickory, hackberry, and elm, with some walnut and mixed oak. Understory and regeneration is composed mainly of elm and Hackberry.

Management Recommendations –
This area is medium priority and should receive CTR to give the limited number of oak and walnut adequate growing space.

Stand 80: 5.5 acres

Woodland Description –
This pole size stand is composed mainly of silver maple with some ash, elm, and hackberry and occasional walnut. Understory is elm and ash.

Management Recommendations –
This area is low priority receive CTR to give the limited number of oak and walnut adequate growing space.

Stand 81: 3.5 acres

Woodland Description –
This bottomland stand has scattered small to medium sawlog size silver maple and river birch mixed with pole size elm, ash, and hackberry and occasional walnut.

Management Recommendations –

This area is low priority receive CTR to give the limited number of high quality hardwoods adequate growing space.

Stand 82: 3.9 acres

Woodland Description –
This stand has scattered large ash, locust, and cottonwood mixed with pole to small sawlog size swamp white oak, walnut, and ash. Understory is mostly elm, ash, and hackberry.

Management Recommendations –
This area is fairly high priority to receive CTR to give the good number of oak and walnut adequate growing space.

Appendix

Eldon WMA Summary of stands

Stand #	Acres	Timber type	Tree size	Management system	Prescription	Priority
1	2.9	Hickory, Bl oak, ash, shingle oak	pole	Evenage	CTR	low
2	5.8	Hickory, ash, bl oak	Pole –sm. saw	Evenage	CTR	low
3	1.3	hickory, w oak	Pole-sapling	Evenage	Weed tree	**high**
4	15.4	Bl oak, Hickory, sh oak, ash	Pole-sm saw	Evenage	CTR	med
5	0.5	Ash, elm, locust,	pole	Evenage	CTR	low
6	3.4	Elm, cedar, dogwood, cherry	sapling	Early succession		med-hi
7	1.0	Locust, elm, ash	Pole	Early succession		med-hi
8	12.9	Locust, Ash, elm, sh oak	Pole-sapling	Early succession		med-hi
9	11.1	Red oak, bl oak, ash, hickory	Pole-sm saw	Evenage	CTR	med-hi
10	6.4	hickory, bass, cotton, elm	Sm saw	Evenage	CTR	low
11	24.9	Hickory occasional walnut	Pole-sm saw	Evenage	CTR	low
12	7.9	Hickory, ash, w oak, bl oak	Pole	Evenage	CTR	low
13	2.6	Ash, elm, hickory, occasional oak	Sapling-pole	Early Succession		med-hi
14	5.6	Red oak, bl oak, occ. Wal, w. oak	Pole-sm saw	Evenage	CTR	low
15	2.8	Red oak, elm, ash	Small Pole	Evenage	CTR	low
16	5.3	Red oak, bassw., ash	Pole, occ. Lg saw	Evenage	CTR, possible select harvest	low
17	3.7	Walnut, ash, mixed oak	pole	Evenaged	CTR	med
18	7.0	ash, hickory, sw. w. oak	Pole-sm saw	Evenage	CTR	low
19	8.0	Bl oak, red oak, hickory, ash	Pole-sm saw	Evenage	CTR	med.
20	3.1	White oak	Lg. Saw	Evenage	SPNR	low
21	3.5	Mixed oak, hickory, ash	Pole-sm saw	Evenage	CTR	low
22	55.4	Cedar, elm, dogwood, locust	sapling	Early succession		med-hi
23A	1.4	Bl oak, red oak, hickory, cherry	Pole-sm saw	Evenage	CTR	med
23B	6.3	Bl. oak, red oak, hickory, cherry	Pole-sm.saw	Evenage	CTR	med.
24A	11.6	White oak, some hickory, red oak	Sm saw-lg saw	Viewshed	CTR	low
24B	38	White oak some ash, hic, r oak	Lg saw	Evenage	SPNR and shelterwood	**high**
25	1.3	Cedar, bl oak, red oak, ash	Pole-sm saw	Evenage	CTR	low
26	8	R oak, bl oak, hic, ash, cherry	Pole-sm saw	Evenage	CTR	med
27	14.9	Mixed oak, hic, ash	Sm saw –lg saw	Evenage	Weed tree removal	low
28A	10.1	Mixed oak, ash, hickory	Pole-sm saw	Evenage	CTR	med
28B	9.2	Mixed oak, ash, hickory	Pole-sm. saw	Evenage	CTR	med
29	15.5	Bl oak, w oak, r oak, hic	Pole-sm saw	Evenage	CTR	med
30A	32.6	W oak, some r aok ash, hic	Sm saw	Evenage	CTR possible select harvest	med-hi
30B	10.8	W oak, some r oak, bl oak	Sm saw-lg saw	Evenage	CTR possible select harvest	med-hi
31	8.1	W oak, some red oak, ash	Lg saw	Evenage	SPNR & shelterwood	med-hi
32	11	R oak, bl oak, hic, sh oak	Pole-sm saw	Evenage	CTR	low
33	2.8	Hackberry, r oak, hic, occ. Cotton,	Sm saw	Evenage	CTR	low
34	0.8	White pine, Bl locust	Saw	Evenage	Weed tree	low
35	10.1	Ash, bl oak, red oak	Pole	Evenage	CTR	low
36	12.1	W oak, some red oak, hickory	Sm saw to lg saw	Evenage	SPNR & shelterwood	med-hi
37	10.7	Bl Oak, R Oak, cherry, ash, Sh oak	Pole	Viewshed	none	low
38	9	R oak, Bl oak, W oak, Walnut	Saw	Evenage	Shelterwood	med
39A	19	Bl oak, R oak, ash, cedar, hickory	Pole-sm saw	Early succession		med-hi
39B	29.4	Bl oak, R oak, ash, cedar, hickory	Pole-sm.saw	Early succession		med-hi
40	14.8	W oak, Bl oak, hick, occ Walnut	Sm saw	Evenage	CTR	med
41	3	Walnut, hick, locust, ash	Sm saw	Evenage	CTR	**high**
42A	4.8	Ash, bass, occ mixed oak, walnut	Pole	Viewshed	none	low
42B	15	Ash, bass, occ mixed oak, walnut	Pole	Viewshed	none	low
43	5.3	W oak, R oak, occ bass, cherry	Sm saw	Viewshed	none	low
44	7.8	Mixed oak, bass, ash, occ walnut	Saw	Evenage	SPNR & harvest	med-hi
45	4.9	Hackberry, hic, walnut, R birch	Pole-sm saw	Viewshed	none	low
46	13	R oak, W oak, some ash	Saw	Evenage	SPNR & harvest	med
47	8.6	W oak, some R oak, hick, walnut	Sm saw	Evenage	CTR	med-hi
48	3.5	W oak, R oak, some ash	Saw	Evenage	SPNR & harvest	med-hi
49	9.7	Bl oak, W oak,ash, some bur oak	Sm saw- lg saw	Evenage	Select harvest	med
50	5.2	Elm, r birch, some hachberry, hic, R oak, walnut	Pole –saw	Evenage	CTR, select harvest	med
51	3.6	Ash, hick, Bl oak, R oak, some W	Pole-sm saw	Evenage	CTR	med

		oak, cherry				
52	24.1	W oak, some hick, Bl oak	Pole –sm saw	Evenage	CTR	med-hi
53	5.4	Bl oak, R oak, Hick, W aok	Saw	Evenage	SPNR & harvest	med
54	17.3	W oak, R oak, hick, occ. Walnut	Sm saw	Evenage	CTR	med-hi
55	30.6	W oak, R oak, Hick, occ. Walnut	Sm saw	Evenage	CTR	med-hi
56	3.8	W oak, Red oak	Lg saw	Evenage	SPNR & harvest	med-hi
57	5.5	Bl oak, ash, hic, occ W oak chery	Sm saw	Evenage	CTR	low
58	9	R oak, Bl oak, W aok, Walnut	Sm saw	Evenage	CTR	high
59	14	Hick, ash, occ. Oak, walnut	Pole-sm saw	Evenage	CTR	med
60	4.5	Bl Locust	Pole	Early succession		med-hi
61	3.3	Ash, mixed oak, hic, occ walnut	Pole-sm saw	Evenage	CTR	med-hi
62	65	W oak, some bl oak, hic, walnut	Sm saw	Evenage	CTR	med-hi
63	3.4	Bl oak, hickory	Pole-sm saw	Evenage	CTR	low
64	14.7	W oak, R oak	Saw	Viewshed	none	low
65	7.3	W oak, some R oak, Bl oak, Hic	Sm saw	Evenage	CTR	high
66	3.2	R oak, Bl oak, some W oak, ash	Sm saw	Evenage	CTR	med
67	31.2	W oak, some R. oak, Bl. Oak, hic	Sm. Saw	Viewshed	CTR	low
68	20	Hickory, some mixed oak, ash	Pole-sm saw	Viewshed	none	low
69	38.5	Ash, Bk oak, hic, cherry elm, locus	Pole-sm saw	Evenage	CTR	low
70	18.9	W oak hic, some R oak, elm	Sm saw –saw	Evenage	SPNR & harvest	low
71	20	Locus, maple, cotton, occ walnut	Sm saw- saw	Evenage	Select harvest	low
72	9.2	Cotton, maple, some oak & walnut	Sm saw	Evenage	CTR, select harvest	med
73	7	Bl locust	Pole	Early succession		med-hi
74	3.3	Red Pine	Pole-sm saw	Evenage	CTR	low
75	8	Ash, bl. Oak, locust, occ. walnut	Pole	Evenage	CTR	low
76	5.6	Bl. Oak w/ ash, some R.oak, W.oak	Pole-sm saw	Evenage	CTR	med
77	2.5	W. oak, R. oak, Hickory	Lg. saw	Evenage	SPNR & harvest	med-hi
78	23.8	Maple, cotton, ash, some walnut	Sm saw-saw	Evenage	CTR, select harvest	low
79	3	Hickory, elm, hackberry, walnut	Sm saw	Evenage	CTR	med
80	5.5	Maple, some ash, elm, walnut	Pole	Evenage	CTR	low
81	3.5	Maple, birch, elm, hackberry	Sm saw	Evenage	CTR	low
82	3.9	Ash, locust, sw. w. oak, walnut	Sm. Saw	Evenage	CTR	med-hi

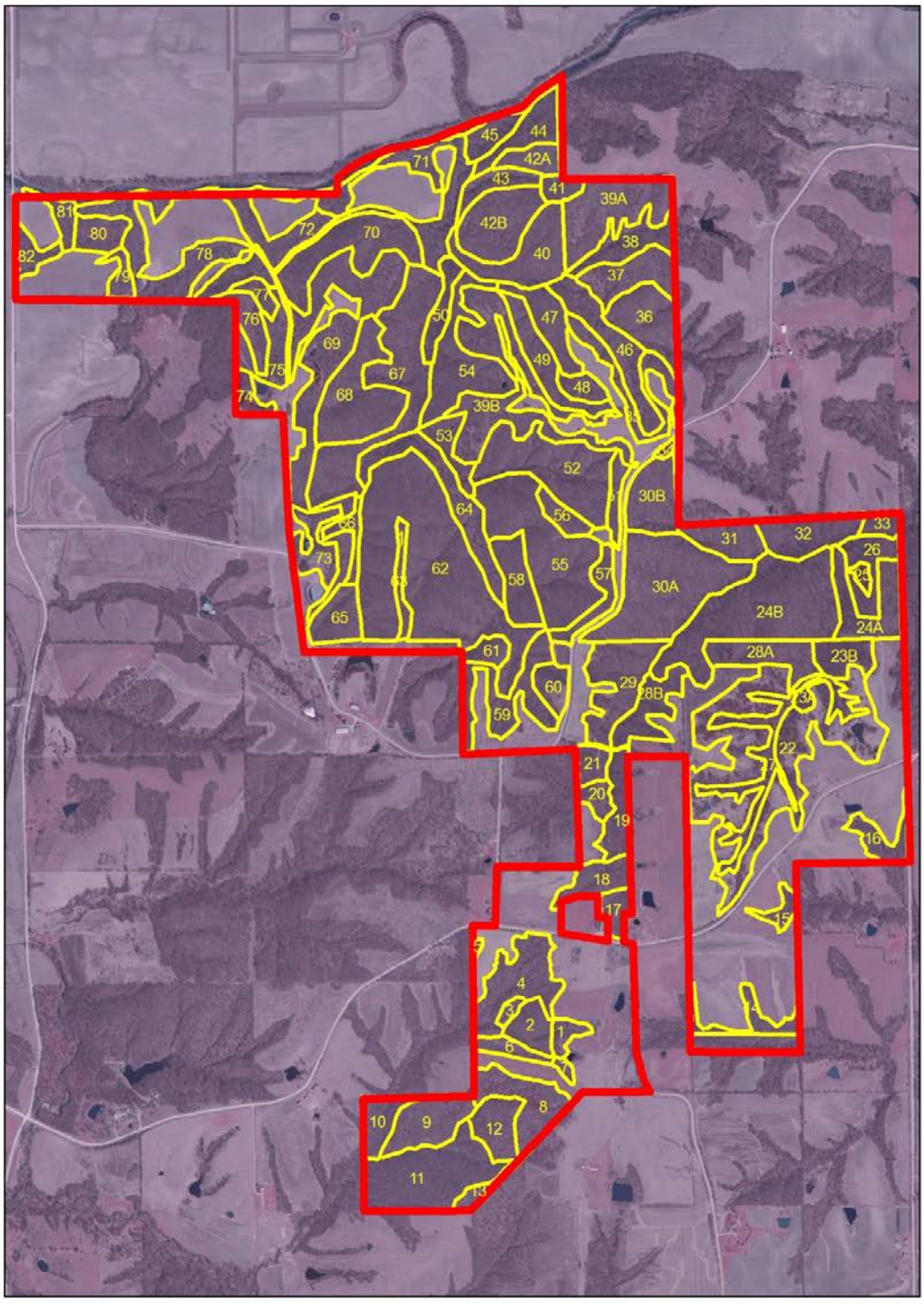
ELDON WMA HIGH PRIORITY PROJECTS (draft 7/10/12)

Stand #	Acres	Prescription
3	1.3	Weed Tree Removal
9	11.1	Crop Tree Release
30A	32.6	Crop Tree Release and Selective Harvest
30B	10.8	Crop Tree Release and Selective Harvest
41	3.0	Crop Tree Release
47	8.6	Crop Tree Release
52	24.1	Crop Tree Release
54	17.3	Crop Tree Release
55	30.6	Crop Tree Release
58	9.0	Crop Tree Release
61	3.3	Crop Tree Release
62	65.0	Crop Tree Release
65	7.3	Crop Tree Release
67	31.2	Crop Tree Release
82	3.9	Crop Tree Release
	259.1	

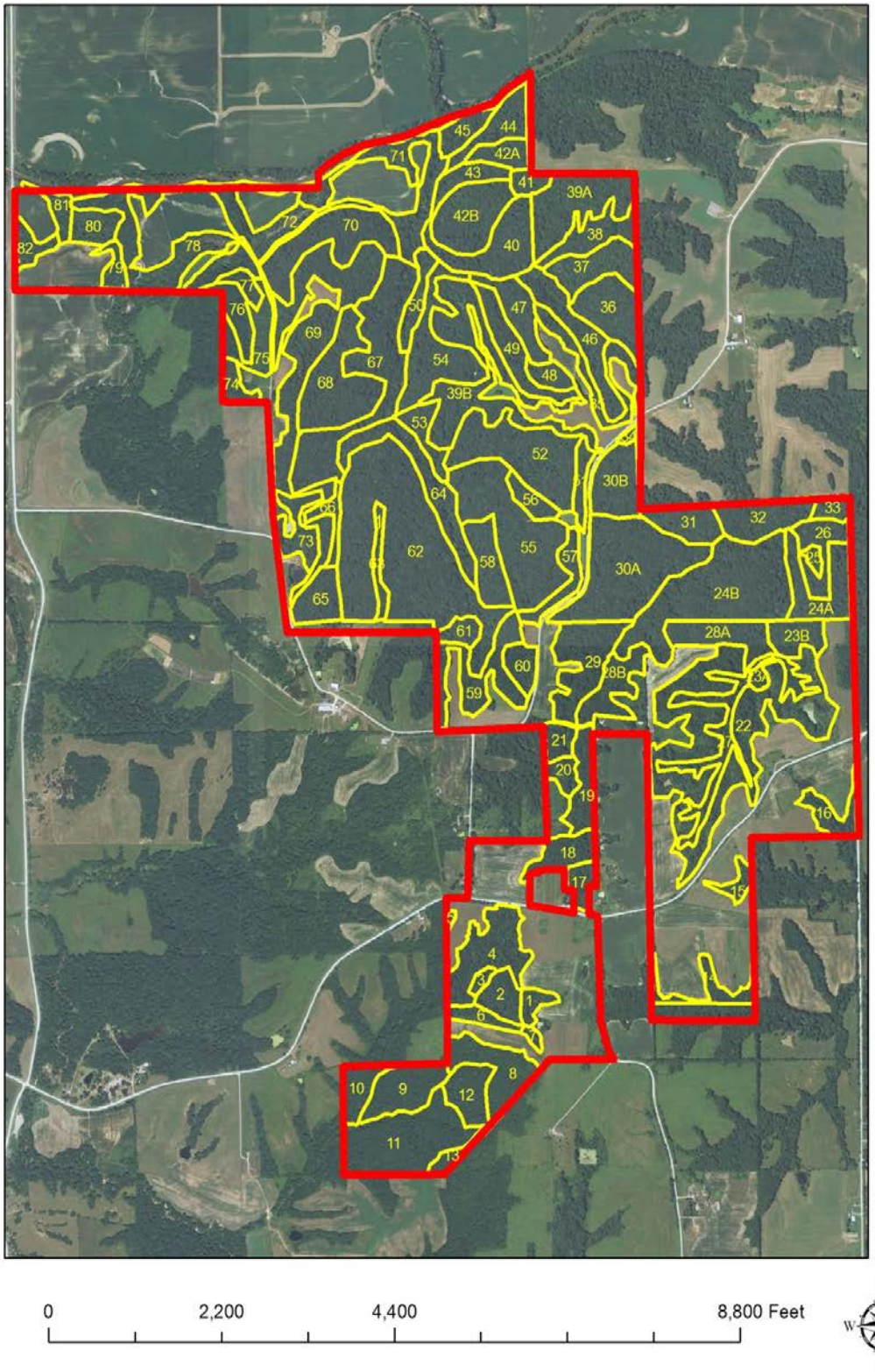
Shelterwood Harvest -

Stand #	Acres	Prescription
24B	38.0	SPNR and Shelterwood Harvest
31	8.1	SPNR and Shelterwood Harvest
36	12.1	SPNR and Shelterwood Harvest
44	7.8	SPNR and Shelterwood Harvest
48	3.5	SPNR and Shelterwood Harvest
56	3.8	SPNR and Harvest
77	2.5	SPNR and Harvest
	75.8	

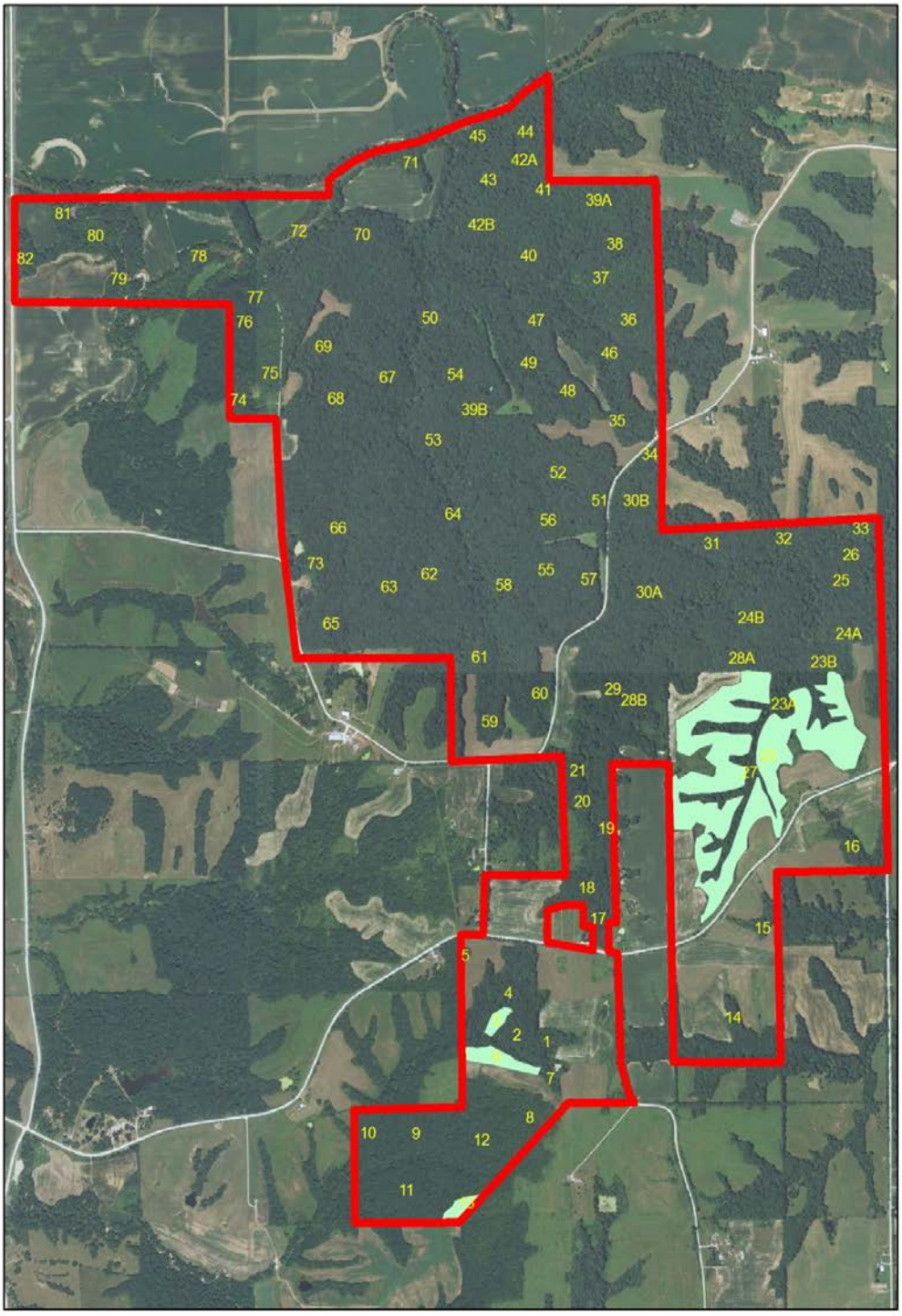
Eldon WMA 2002 photo



Eldon WMA 2011 photo



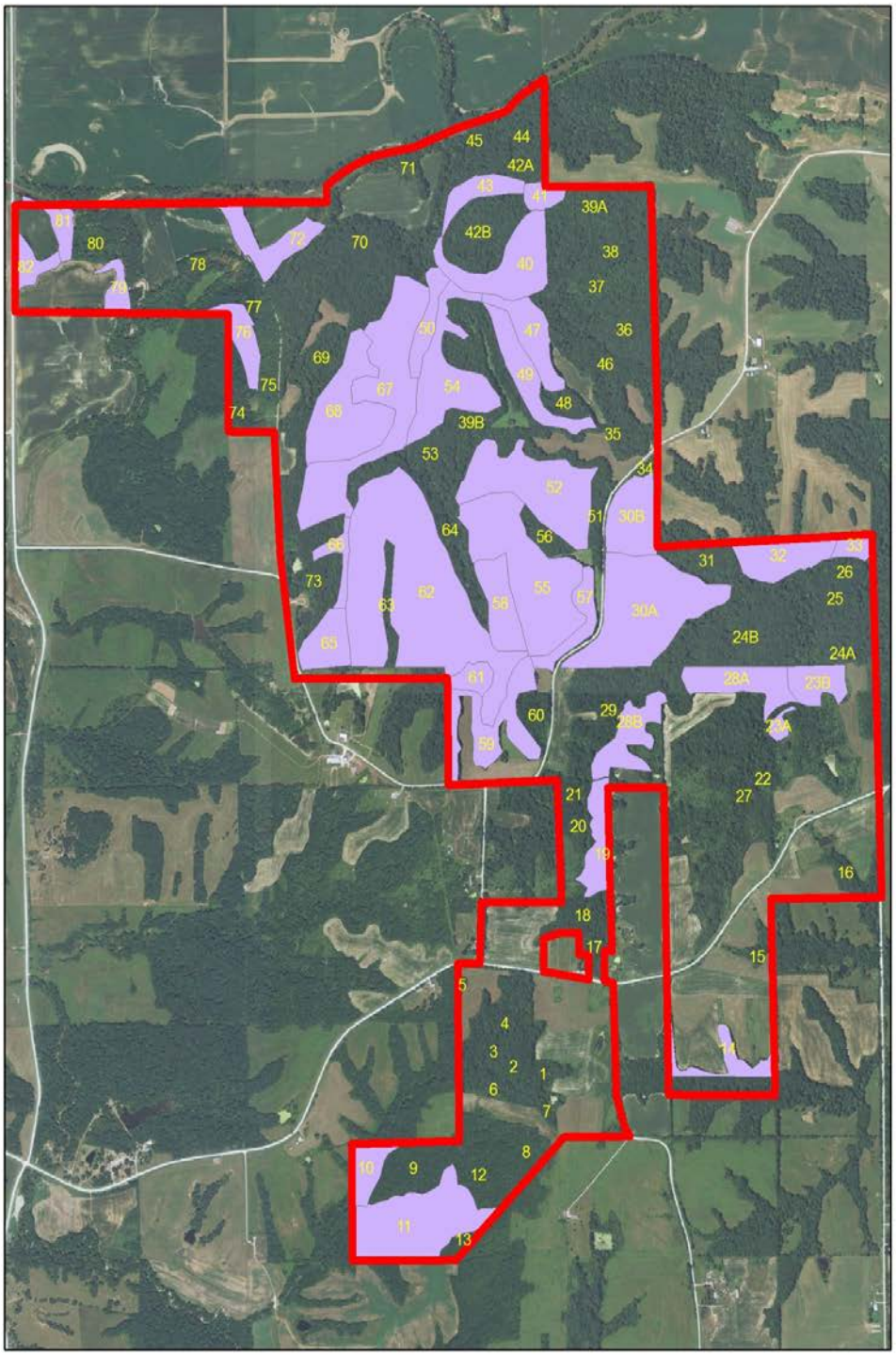
Eldon WMA Sapling Size Stands



0 2,200 4,400 8,800 Feet

N W E S

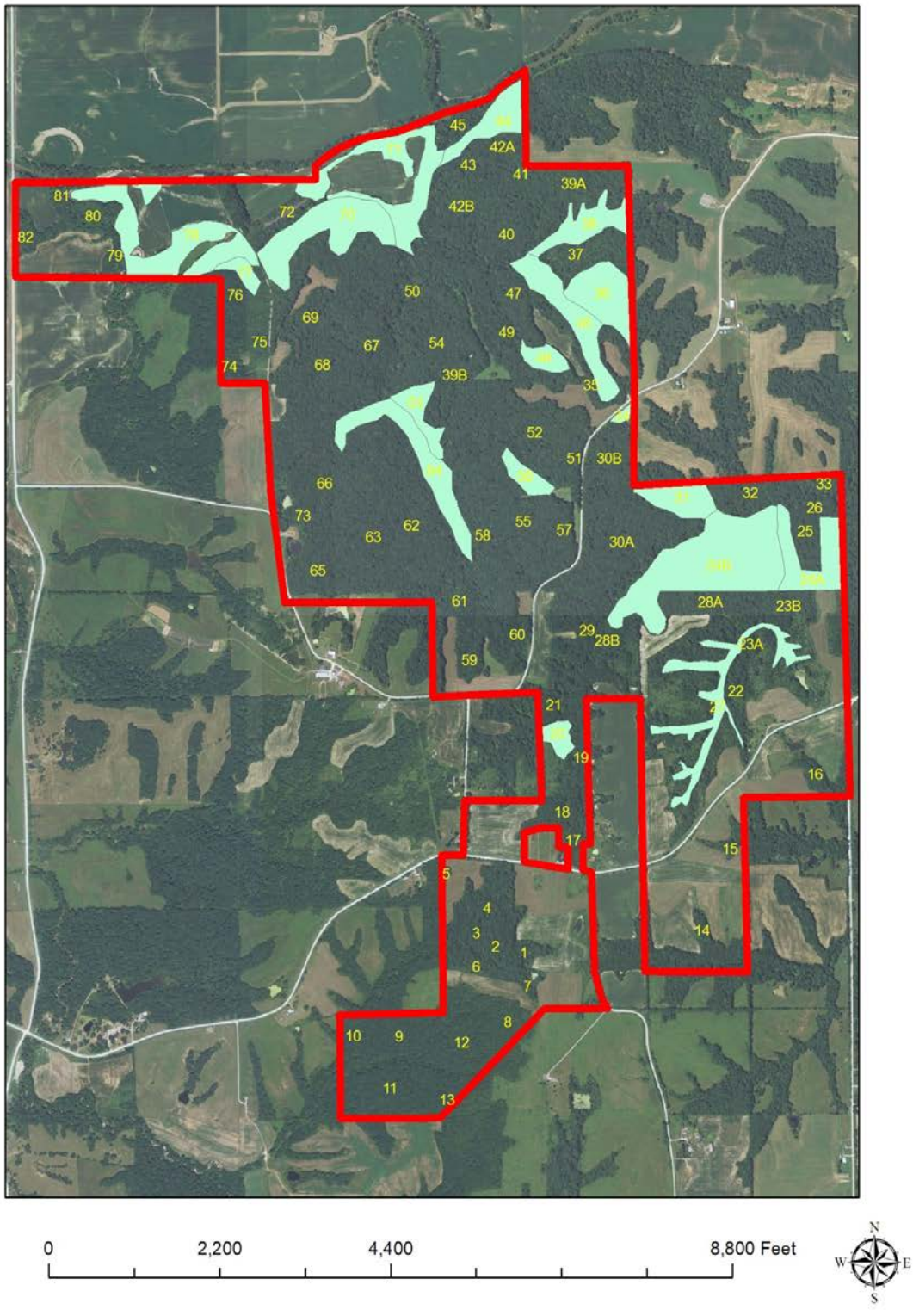
Eldon WMA Small Sawlog Size Stands



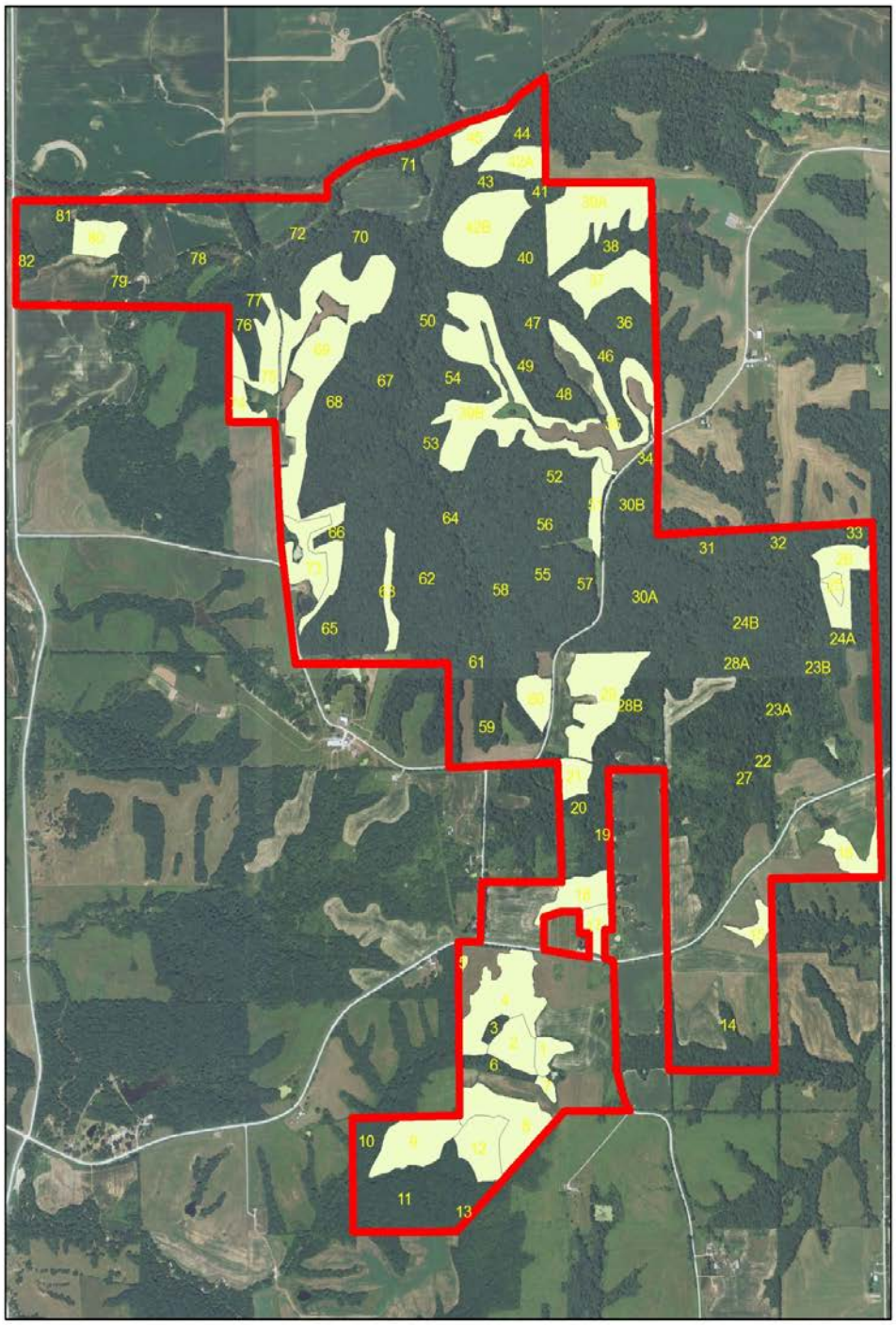
0 2,200 4,400 8,800 Feet

N W E S

Eldon WMA Sawlog Size Stands



Eldon WMA Pole Size Stands



0 2,200 4,400 8,800 Feet

N W E S

Species of Greatest Conservation Need

Table 1. Forest Birds of Greatest Conservation Need Potentially Breeding in Eldon Drainage

Bald Eagle	*Haliaeetus leucocephalus*
Northern Bobwhite Quail	*Colinus virginianus*
Red-shouldered hawk	*Buteo lineatus*
Broad-winged hawk	*Buteo platypterus*
American woodcock	*Scolopax minor*
Black-billed cuckoo	*Coccyzus erythropthalmus*
Yellow-billed cuckoo	*Coccyzus americanus*
Long-eared owl	*Asio otus*
Chuck-will's widow	*Caprimulgus carolinensis*
Whip-poor-will	*Caprimulgus vociferous*
Red-headed woodpecker	*Melanerpes erythrocephalus*
Acadian flycatcher	*Empidonax virescens*
Willow flycatcher	*Empidonax traillii*
Least Flycatcher	*Empidonax minimus*
Brown creeper	*Certhia americana*
Bewick's wren	*Thryomanes bewickii*
Veery	*Catharus fuscescens*
Wood thrush	*Hylocichla mustelina*
White-eyed vireo	*Vireo griseus*
Blue-winged warbler	*Vermivora pinus*
Chestnut-sided warbler	*Dendroica pensylvanica*
Cerulean warbler	*Dendroica cerulea*
Black-and-white warbler	*Mniotilta varia*
Prothonotary warbler	*Protonotaria citrea*
Worm-eating warbler	*Helmitheros vermivorus*
Louisiana waterthrush	*Seiurus motacilla*
Kentucky warbler	*Oporornis formosus*
Hooded warbler	*Wilsonia citrina*
Yellow-breasted chat	*Icteria virens*
Eastern towhee	*Pipilo erythrophthalmus*

Table 2. Potential Forest Migrant Birds of Greatest Conservation Need in Eldon Drainage

Golden-winged warbler	*Vermivora chrysoptera*
Canada warbler	*Wilsonia canadensis*
Rusty blackbird	*Euphagus carolinus*
Olive-sided flycatcher	*Contopus cooperi*

Table 3. Potential Forest and Forest Edge Mammals of Greatest Conservation Need in Eldon Drainage

Short-tailed Shrew	*Sorex haydeni*
Least Shrew	*Cryptotis parva*
Evening Bat	*Nycticeius humeralis*
Indiana Bat	*Myotis sodalist*
Northern Myotis	*Myotis septentrionalis*
Southern Flying Squirrel	*Glaucomys volans*
Southern Bog Lemming	*Synaptomys cooperi*
Woodland Vole	*Microtus pinetorum*
River Otter	*Lutra canadensis*
Bobcat	*Lynx rufus*

Table 4. Potential Forest and Forest Edge Reptiles and Amphibians of Greatest Conservation Need in Eldon Drainage

Smallmouth Salamander	*Ambystoma texanum*
Crawfish Frog	*Rana areolata*
Cricket Frog	*Acris crepitans*
Slender Glass Lizard	*Ophisaurus attenuatus*
Smooth Earth Snake	*Virginia valeriae*
Western Worm Snake	*Carphophis amoenus*
Prairie Kingsnake	*Lampropeltis calligaster*
Speckled Kingsnake	*Lampropeltis getulus*
Bullsnake	*Pituophis catenifer sayi*
Timber Rattlesnake	*Crotalus horridus*

Table 5. Potential Forest and Forest Edge Butterflies of Greatest Conservation Need in Eldon Drainage

Pipevine Swallowtail	*Battus philenor*
Wild Indigo Duskywing	*Erynnis baptisiae*
Sleepy Duskywing	*Erynnis brizo*
Zebra Swallowtail	*Eurytides marcellus*
Silvery Blue	*Glaucopsyche lygdamus*
Zabulon Skipper	*Poanes zabulon*
Hickory Hairstreak	*Satyrium caryaevorum*
Edward's Hairstreak	*Satyrium edwardsii*
Striped Hairstreak	*Satyrium liparops*
White M Hairstreak	*Parrhasius m-album*

IOWA DEPARTMENT OF NATURAL RESOURCES

GUIDELINES FOR PROTECTION OF INDIANA BAT SUMMER HABITAT
(Revised June 2007)

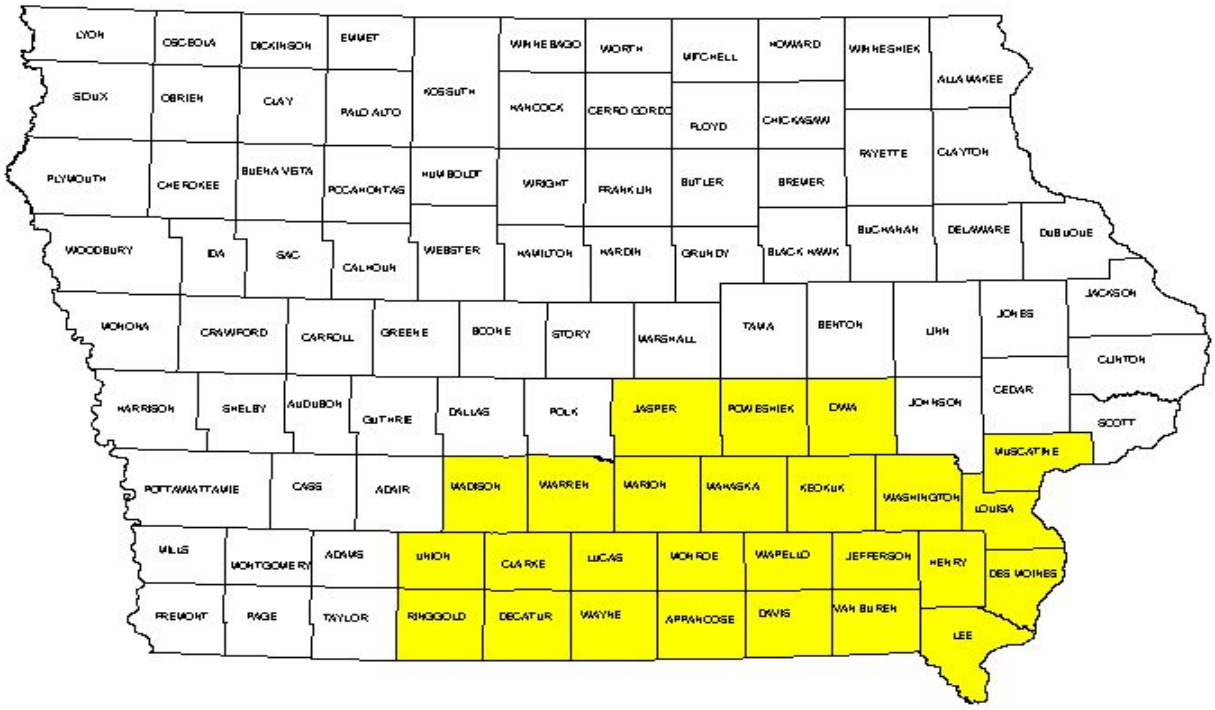
These guidelines were prepared to provide information about the Indiana bat and its summer habitat requirements in Iowa and to prevent inadvertent harm to the species through various human activities. This update of the guidelines is in response to changes in the U.S Fish and Wildlife Service requirements for protecting this endangered species. The changes include:

- No cut dates changed to April 15 through September 15
- Drop the requirement for the number of roost trees/acre
- Use the U.S. Fish and Wildlife Service guidelines for mist net surveys

The Indiana bat is a federal (50 CFR Part 17) and state (Code of Iowa, Chapter 481B) listed endangered species that occurs in southern Iowa from May through August.

Female Indiana bats have their young beneath the loose or peeling bark of trees. Most nursery colonies have been found beneath the bark of standing dead trees on the trunk or large branches. Dead trees that retain sheets or plates of bark and which provide space beneath the bark such as red oak, post oak, and cottonwood are potential roost trees. Live trees such as shagbark and shellbark hickory are also used at times for roosting. The nursery colonies are located along streams and rivers or in upland forest areas. Riparian areas are also important feeding areas for this species. Indiana bats have been captured on the edge of urban areas. It is likely that the bats would be using only areas on the edge of the town or city and only if there is suitable habitat such as a greenbelt or a large park with a natural forest component that would have the below listed requirements. This would exclude city parks that are maintained as mowed areas.

Counties affected
Summer Range in Iowa:
Appanoose, Clarke, Davis, Decatur, Des Moines, Henry, Iowa, Jasper, Jefferson, Keokuk, Lee, Louisa, Lucas, Madison, Mahaska, Marion, Monroe, Muscatine, Poweshiek, Ringgold, Union, Van Buren, Wapello, Warren, Washington, and Wayne.
The U.S. Fish and Wildlife Service considers all counties south of Interstate 80, including those portions of Dallas, Polk, Jasper, Poweshiek, Iowa, Johnson, Muscatine, and Scott counties south of Interstate 80, as being within the potential range of the species in Iowa.



Summer Habitat Requirements for the Indiana bat

Essential summer habitat in Illinois was considered to be 30% or greater deciduous forest cover within a 6/10 mile radius, permanent water within a 6/10 mile radius, and suitable roost trees within a 3/10 mile radius. Areas of as low as 5% deciduous forest cover provided suitable habitat as long as water and roost trees were within the listed distances in Illinois. In Iowa, records for the Indiana bat have occurred in areas of 15% or greater forest cover and near permanent water. Tree species that have been identified as roost trees from studies in other states are shagbark and shellbark hickory that may be alive or dead and dead, bitternut hickory, American elm, slippery elm, eastern cottonwood, silver maple, white oak, red oak, post oak, and shingle oak with slabs or plates of loose bark.

Suitable summer habitat in Iowa is considered to have the following within a ½ mile radius of a location:

1) Forest cover of 15% or greater
2) Permanent water
3) One or more of the listed tree species 9 inches dbh or greater
4) The potential roost trees ranked as moderate or high for peeling or loose bark

Glossary

Acre: An area of land containing 43,560 square feet. A *forty* of land contains 40 acres and a *section* of land contains 640 acres.

Annual ring: Trees in climates where growths stops or slows during portion of the year will form annual rings which can be read to determine tree age and growth rate. Annual rings are highly visible in species that form less dense wood during favorable growing conditions early in the season and denser wood during less favorable conditions later in the year. In some tree species this differentiation does not occur and annual rings are difficult to see. In tropical species growth never, or seldom, ceases and annual rings may not be apparent.

Bark: The outer layer of the stems, limbs and twigs of woody plants. Often bark is characteristic of the species and can be used for identification.

Basal area: The cross-sectional area of the base of any object. In forestry, it is the cross sectional area of a tree at 4.5 feet above the ground, expressed in square feet. The sum of all the trees on an acre is a measure of the density of the trees growing on the acre and is useful for making forest management decisions. Basal area can be calculated from tree diameter or can be easily measured with an angle gauge when certain relationships are known. Basal area will commonly range from 20 to 70 square feet per acre for poorly stocked stands to more than 200 square feet per acre for dense stands of conifers.

Biodiversity (biological diversity): The variety and abundance of species, their genetic composition and the communities and landscapes in which they occur, including the ecological structures, functions and processes occurring at all of those levels.

Board foot: A unit of measure of wood 1" thick and 1 foot on each side equaling 1/12 cubic foot of wood.

Bole: The stem or trunk of a tree; usually thought of as being that part without limbs- the merchantable part of the stem.

Clearcut: A method of regenerating a forest in which all trees on a given area are cut. Clearcutting results in conditions which allow the greatest amount of sunlight to reach the forest floor, a desirable condition for the regrowth of certain valuable tree species which need a lot of sunlight to grow, such as oak and walnut. Clearcutting also can create certain benefits for wildlife.

Competition: The struggle between trees to obtain sunlight, nutrients, water and growing space. Every part of the tree, from the roots to the crown, competes for space and food.

Conversion: A change though forest management from one tree species or association to another within a forest stand or site.

Cover type: Expressed as the tree species having the greatest representation in a forest stand. A stand where the major species is oak would be called an oak cover type.

Crop: The vegetation growing on a forest area, more particularly the major woody growth having commercial value.

Crop tree release (CTR): Crop tree release is the practice of selecting the individual trees that are to remain in the stand until maturity and then removing the trees competing with them. Crop trees could be selected on the basis of any of the values associated with trees such as aesthetics, wildlife or economic values. Selected trees should be straight with long, clear boles, dominant or co-dominant and should be the trees bringing the best returns upon maturity.

Crown: Refers to that part of the tree consisting of limbs, branches, twigs and leaves.

Cruise: A survey of forest land to identify timber and estimate its species composition, products, size, quality or other characteristics.

Cull: Refers to a tree having no commercial value, usually from having rot, holes, large knots or being crooked. It is important to note that a cull, though having no commercial value, may have wildlife, aesthetic or other values.

Cultural practice: The manipulation of vegetation to meet objectives of controlling stand composition or structure such as site improvement, forest stand improvement, increased regeneration, increased growth or insect and disease control measures.

D.B.H.: Stands for Diameter at Breast Height. Always taken at 4.5 feet above the ground.

Den tree: A tree that has a hole in its stem that can be used as shelter by wildlife.

Disturbance: Any event, either natural or human induced, that alters the structure, composition or functions of an ecosystem. Examples include forest fires, insect infestations, windstorms and timber harvesting.

Dominant (trees): Individuals or species of the upper layer of the forest canopy.
Early successional forest: The forest community that develops immediately following the removal or destruction of vegetation in an area. Plant succession is the progression of plants from bare ground (e.g., after a forest fire or timber harvest) to mature forest. Succession consists of a gradual change of plant and animal communities over time. Early succession forests commonly depend on and develop first following disturbance events. Each stage of succession provides different benefits for a variety of species.
Endangered species: A plant or animal species that is threatened with extinction throughout all, or a significant portion, of its native range.
Even-aged stand: A stand of trees composed of a single age class.
Forest: A forest is an ecosystem, an association of plants and animals. Trees are its dominant feature. They provide many benefits including habitat, water quality improvement, recreation, climatic amelioration and wood products. The plants and animals that make up a forest are interdependent and often essential to its integrity.
Forester: A professional engaged in the science and profession of forestry; foresters are commonly accredited by states or other certifying bodies (e.g., the Society of American Foresters) and may be licensed, certified or registered indicating specific education and abilities.
Forest cover: All trees and other plants occupying the space in a forest, including any ground cover.
Forest fire: An uncontrolled fire on lands covered wholly or in part by timber, brush, grass, grain or other flammable vegetation.
Forest floor: The accumulated organic matter at the soil surface, including litter and unincorporated humus.
Forest inventory: A set of objective sampling methods designed to quantify the spatial distribution, composition and rates of change of forest parameters within specified levels of precision for the purposes of management.
Forest management: The practical application of biological, physical, quantitative, managerial, economic, social and policy principles to the regeneration, management, utilization and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest. Forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products and other forest resource values.
Forest stand: A stand may loosely be defined as a contiguous group of trees sufficiently uniform in species composition, arrangement of age classes and general condition to be a homogeneous and distinguishable unit. A stand is usually treated as a basic silvicultural unit, but it seldom represents a natural ecological unit. Its composition and structure are most strongly affected by management, other disturbances and chance factors affecting seed distribution, germination and seedling survival.
Forest Stand Improvement (FSI): A practice in which the quality of a residual forest stand is improved by removing less desirable trees to achieve the desired stocking of the best quality trees or to improve the reproduction, composition, structure, condition and / or volume growth of a stand.
Fully-stocked stand: A forest stand in which all growing space is effectively occupied but having ample space for development of crop trees.
Game species: Game species include those terrestrial species that are hunted and trapped.
Geographic Information System (GIS): Computer software used to manipulate, analyze and visually display inventory and other data.
Group selection: A process of harvesting patches of selected trees to create openings in the forest canopy and to encourage reproduction of uneven-aged stands.
Hardwood: Hardwoods are generally defined as the woods of deciduous trees (i.e., trees which shed their leaves in the winter).
Landform: Any physical, recognizable form or feature of the earth's surface having a characteristic shape and produced by natural causes. Examples of major landforms are plains, plateaus and mountains. Examples of minor landforms are hills, valleys, slopes, eskers and dunes. Together, landforms make up the surface configuration of the earth.
Landscape: A general term referring to geographic areas that are usually based on some sort of natural feature or combination of natural features. They can range in scale from very large to very small.
Leave trees: Live trees selected to remain on a site to provide present and future benefits, such as shelter, resting sites, cavities, perches, nest sites, foraging sites, mast and coarse woody debris.
Management goals: Overall purpose for managing the composition and structure of forest land. For example: to protect land from erosion, to maintain wildlife habitat, to control insect and disease outbreaks, etc.

Management objectives: Defined conditions for the property, or segments of property (e.g. stands or management units), that will achieve management goals.
Management plan: A plan outlining the objectives for individual management units and describing steps for achieving them. Silvicultural procedures are identified in broad terms, but detailed prescriptions are developed in the field.
Mast: Nuts, seeds, catkins, flower buds and fruits of woody plants that provide food for wildlife.
Mature tree: A tree that has reached the desired size or age for its intended use. Size or age will vary considerably depending on the species, intended uses and site conditions.
Merchantable timber: Trees or stands having the size, quality and condition suitable for marketing under a given economic condition.
Multiple use: Using and managing a forested area to provide more than one benefit simultaneously. Common uses may include wildlife, timber, recreation and improvement of water quality.
Native plant community: A group of native plants that interact with each other and with its environment in ways not greatly altered by modern human activity or by introduced organisms. Native plants communities are classified and described by physiognomy, hydrology, landforms, soils and natural disturbance regimes (e.g., wild fires, wind storms, normal flood cycles).
Natural disturbances: Disruption of existing conditions by natural events such as wildfires, windstorms, droughts, flooding, insects and disease.
Natural regeneration: The growth of new trees from one of the following ways: (a) seeds naturally dropped from trees or carried by wind or animals, (b) seeds stored on the forest floor or (c) stumps that sprout or roots that sucker.
Non-forest land: Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses such as crops, pasture, residential areas, city parks, improved roads and power line clearings.
Non-game species: Non-game species include amphibians, reptiles, and those mammal and bird species that are not hunted or trapped.
Old-growth forests: Forests defined by age, structural characteristics and relative lack of human disturbance. These forests are essentially free from catastrophic disturbances, contain old trees (generally over 120 years old), large snags and downed trees.
Overstory: The canopy in a stand of trees.
Plantation: A stand composed primarily of trees established by planting or artificial seeding.
Pole or pole timber: A young tree or stand of young trees between 3.5 inches and 12.9 inches dbh.
Prairie: An extensive tract of level or rolling land that was originally treeless and grass covered. A prairie is generally characterized by deep fertile soil and regular disturbance, usually by fire.
Prescribed burn: To deliberately burn wild lands in either their natural or their modified state under specified environmental conditions, which allows the fire to be confined to a predetermine area and produces the intensity and spread required to attain planned resource management objectives.
Pruning: The practice of removing tree limbs so that a straight bole, free of limbs, will develop. Pruning can be a component of FSI.
Recreation: Leisure activities involving the enjoyment and use of natural resources.
Recreation facility: The improvements within a developed recreation site offered for visitor's enjoyment.
Regeneration: The act of renewing tree cover by establishing generation usually maintaining the same forest type forest that was removed. Regeneration may be artificial (direct seeding or planting) or natural (natural seeding or planting).
Release (release operation): A treatment designed to free young trees from undesirable, usually over-topping, competing vegetation.
Restoration: A new planting of seedlings, direct seeding or regeneration of roots. This creates new habitat that will be of higher quality for wildlife.
Riparian: Related to, living or located in conjunction with a wetland, river, stream or lake.
Riparian buffer: Woodland next to streams, lakes and wetlands that are managed to enhance and protect aquatic resources. Buffers provide woody cover that will enhance soil and water conservation while providing wildlife habitat.

Rotation age: The period of years between when a forest stand is established and when it receives its final harvest. This time period is an administrative decision based on economics, site conditions, growth rates and other factors.
Salvage cut: A harvest made to remove trees killed or damaged by fire, wind, insects, disease, or other agents. The purpose of salvage cuts is to use available wood fiber before further deterioration occurs to recover value that otherwise would be lost.
Sanitation cut: A cutting made to remove trees killed or injured by fire, insects, disease or other injurious agents (and sometimes trees susceptible to such injuries).
Sapling: A young tree larger than a seeding but smaller than a pole (dbh < 3.5 inches).
Sapwood: The wood found closest to the bark or outside of the bole and usually distinguished from heart wood by being lighter in color.
Saw log: A log large enough to produce lumber or other products that can be sawed. Its size and quality vary with the utilization practices of the region.
Sawtimber: Trees that yield logs suitable in size and quality for the production of lumber.
Scarify: To break up the forest floor and topsoil preparatory to natural regeneration or direct seeding.
Seedling: A baby plant. In forestry the term usually used to refer to young trees that have grown beyond the stage where they have just emerged from the soil up to the point that they become saplings.
Seed tree: Any tree that bears seed; specifically, a tree left standing to provide the seed for natural regeneration.
Seed tree method: The harvest of all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class. Seed trees are usually removed after regeneration is established.
Selective harvest: Removal of single scattered trees or small groups of trees at relatively short intervals. The continuous establishment of reproduction is encouraged and an all-aged stand is maintained. A management option used for shade-tolerant species.
Shade tolerance: Relative ability of a tree species to reproduce and grow under shade. The capacity to withstand low-light intensities caused by shading from surrounding vegetation.
Shelterwood: A method of regenerating a forest whereby a portion of the stand is harvested and the rest of the stand is evenly distributed over the area to protect the site and provide seed to regenerate the area. After the new stand is well established, the residual trees are harvested. This method is used to regenerate shade intolerant species.
Shelterwood harvest: A harvest cutting in which trees in the harvest area are removed in a series of two or more cuttings to allow the establishment and early growth of new seedlings under partial shade and protection of older trees. Produces an even-aged forest.
Silvics: The study of the life history and general characteristics of forest trees and stands, with particular reference to environmental factors, as basis for the practice of silviculture.
Silviculture: The art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.
Silvicultural prescription: Specific steps prescribed to achieve specific management objectives.
Single tree selection: Individual trees of all sizes classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration; synonym: individual tree selection.
Site index: A measure of the productive quality of an area where trees grow. Site index is based on the height of dominant and co-dominate trees at age 50. That is to say, if the average height of dominant and co-dominate trees on a site was 70 feet at age 50, 70 would be the site index. Graphs are developed to enable determination of site index over a range of tree ages.
Site potential: Collective physical resources (e.g., soil moisture, nutrients, light, heat) available for plant growth. Different potentials facilitate growth of some species and limit growth of others. Consequently, site potential has a strong effect on plant community development.
Slash: The non-utilized and generally unmarketable accumulation of woody material in the forest, such as limbs, tops, cull logs and stumps that remain in the forest as residue after timber harvesting.
Snag: A snag tree is a dead tree; commonly a tall, limbless tree. Though of little or no commercial value, they are a very valuable wildlife resource.
Softwood: Generally considered to be the wood of conifers.
Stand: A contiguous group of trees similar in age, species composition, structure and growing on a site of similar quality. One stand will usually have characteristics that will distinguish it from other stands. Differences could include species, average diameter, density and location.

Succession: The natural replacement, over time, of one plant community with another.
Sucker: A shoot rising from below ground level from a root.
Suppressed: The condition of a tree characterized by low growth rate and low vigor due to competition from overtopping trees or shrubs.
Sustainability: Protecting and restoring the natural environment while enhancing economic opportunity and community well-being. Sustainability addresses three related elements: the environment, the economy and the community. The goal is to maintain all three elements in a healthy state indefinitely. Meeting the needs of the present without compromising the ability of future generations to meet their needs.
Thinning: A silvicultural treatment made to reduce the density of trees within a forest stand; primarily used to improve growth, enhance forest health or recover potential mortality. *Row thinning* is where selected rows are harvested, usually the first thinning, which provides equipment operating room for future selective thinning. *Selective thinning* is where individual trees are marked or specified (e.g., by diameter, spacing, or quality) for harvest. *Commercial thinning* is thinning after the trees are of merchantable size for timber markets. *Pre-commercial thinning* is done before the trees reach merchantable size, usually done in overstocked stands to provide more growing space for crop trees.
Threatened species: A plant or animal species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its native range.
Tolerance (shade tolerance): A plant's ability to tolerate conditions under a forest canopy.
Normally thought of as tolerance to low light conditions, but other understory conditions, such as root competition for water and nutrients, are also factors.
Two-aged stand: A stand with trees of two distinct age class separated in age by more than 20 percent of the rotation age.
Under plant: The planting of seedlings under an existing canopy or overstory.
Under-stocked: A stand of trees so widely spaced that even with full growth potential realized, crown closure will not occur.
Understory: The shorter vegetation (shrubs, seedlings, saplings, small trees) within a forest stand that forms a layer between the overstory and the herbaceous plants of the forest floor.
Uneven-aged stand: A stand with trees of three or more distinct age classes, either mixed or in small groups.
Uneven-aged management: A planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes. Uneven-aged (selection) methods will maintain a multi-aged structure by removing some trees in all sizes classes either singly, in small groups or in strips: synonym: all-aged method.
Viewshed: A physiographic area composed of land, water, biotic and cultural elements which may be viewed from one or more viewpoints and which has inherent scenic qualities and/ or aesthetic values as determined by those who view it. Viewsheds are a habitat factor that will be primarily a "hands-off" area for aesthetics and proper soil and water conservation, along with providing special wildlife values.
Volume: Refers to the amount of wood in a tree or log. Expressed as board feet, cords or other measures.
Well-stocked: The situation in which a forest stand contains trees spaced widely enough to prevent competition yet closely enough to utilize the entire site.
Wolf tree: A generally predominant tree with a broad, spreading crown that occupies more growing space than its neighbors.
Woodland: A plant community in which, in contrast to a typical forest, the trees are often small, characteristically short-boled relative to their crown depth, and forming an open canopy with intervening area occupied by lower vegetation, commonly grass.
Woodland edge: An area of habitat transition that consists of vegetation (herbaceous and woody) of different heights and densities. Edge can favor early successional wildlife species.