

# ***FOREST WILDLIFE STEWARDSHIP PLAN***

**FOR**

## **SNY MAGILL-NORTH CEDAR WILDLIFE AREA**



*Developed by Gary Beyer  
District Forester  
621 Beck Street  
Charles City, Iowa 50616*

*641/228-6611*

# IOWA DEPARTMENT OF NATURAL RESOURCES WILDLIFE BUREAU

## FOREST STEWARDSHIP PLAN

*A plan that will increase the diversity of forest wildlife and prioritize species of greatest concern.*

In Iowa, the Department of Natural Resources (IDNR) is the government agency responsible for the stewardship of indigenous and migratory wildlife species found in the state. Many of these species live near and in IDNR Wildlife Management Area (WMA) forests. Forests are a relatively slow-changing landscape with some stands reaching maturity after a period of 100 years. This time span may extend through the careers of several wildlife managers. The longevity factor emphasizes the need for a Forest Wildlife Stewardship Plans (FWSP) in order to wisely manage our WMA forests.

There are 3 primary factors emphasizing the need for FWSP's for WMA's:

- 1) The continued succession of many forest stands past the oak-hickory stage to the shade tolerant stands of maple and basswood.
- 2) The loss of early successional forest stands and associated wildlife species.
- 3) The lack of proper management to secure mature forest stands with proper overstory and understory tree species for associated forest-interior species.

Some wildlife species use all the forest age classes but others have very specific needs where one or two of particular forest age classes are needed to survive. Although the over-all change in forest succession is relatively slow, changes in the early stages of forest succession occur relatively fast. For example, some populations of indigenous and migratory bird species, dependent on these short-lived forest age classes, are experiencing dramatic declines.

In Iowa, they include the indigenous game bird, the ruffed grouse and the migratory game bird the American woodcock. Nation-wide declines of both species have been detected. Many migratory non-game birds including the gold-winged warbler, blue-winged warbler, black-billed cuckoo, yellow-billed cuckoo and eastern towhee are also dependent on this early stage of forest growth. Each of these species is showing populations declines.

Conversely, some species of Neotropical migratory birds are dependent upon mature, undisturbed woodlands. The Acadian flycatcher, Cerulean warbler, and the veery are some examples of bird species needing mature forests. Management objectives will attempt to either protect these types of sites or include needed management to secure these necessary habitats for the future.

The IDNR Wildlife Bureau's, State Comprehensive Wildlife Conservation Plan, identifies these species and others as species of "greatest conservation needs".

Generally, the Wildlife Bureau manages state-owned forest for the greatest diversity of forest wildlife and esthetic value. The IDNR Wildlife Bureau's FWSP will

prioritize the “species of greatest conservation needs,” and will utilize habitat factors to benefit species of declining populations. Forests land inventory will be conducted on each WMA and the information will be entered into a database. This database along with the following FSP definitions and guiding factors will be use to make forest management decisions on the WMA’s.

## **FOREST STEWARDSHIP PLAN DEFINITIONS AND GUIDING FACTORS**

***Upland Forest Wildlife*** – Representative tree species include oak, hickory, hard maple, cherry, elm, walnut, ash, and red cedar. This habitat factor will provide habitat for wildlife such as ruffed grouse, woodcock, songbirds and woodpeckers, deer, turkey, raptors, owls, squirrels, and associated furbearing predators.

***Floodplain Forest Wildlife*** –Characterized by species such as silver maple, cottonwood, walnut, green ash, elm, hackberry and willows. This habitat factor will benefit wildlife such as songbirds and woodpeckers, furbearers, raptors, reptiles and amphibians on relatively level areas inundated by water from time to time.

***Woodland Edge*** – An area of habitat transition that consists of vegetation (herbaceous and woody) of different heights and densities. This habitat factor will favor early successional vegetation for wildlife benefiting from edge cover.

***Conifer/Wildlife Plantation*** – A conifer or tree/shrub planting designed for wildlife habitat. This habitat factor will provide nesting sites, food and cover for wildlife. Conifers are also important to wildlife during the winter providing thermal benefits and areas of decreased snow depths.

***Restoration*** – A new planting of seedlings, direct seeding, or regeneration of roots. This habitat factor will create new forest habitat that will be of higher quality for wildlife.

***Conversion*** – An existing shade tolerant forest stand converted to nut and fruit bearing species of trees and shrubs to provide more food and cover. This habitat factor is a timber stand improvement increasing the forest quality. It will begin forest succession from early stages to old growth.

***Riparian Buffer*** – Woodland next to streams, lakes, and wetlands that is managed to enhance and protect aquatic resources from adjacent fields. This habitat factor will provide a woody cover buffer to enhance soil and water conservation while providing wildlife habitat.

***Old Growth*** – Natural forests that have developed over a long period of time, generally at least 120 years, without experiencing severe, stand-replacing disturbance---a fire, windstorm, or logging. This habitat factor will provide necessary wildlife habitat for species requiring mature woodlands.

***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. Viewshed's are a habitat factor that will be primarily a "hands-off" area for aesthetics, proper soil and water conservation, along with providing special wildlife habitats.

***Unique Natural Sites*** – Sites that contain unusual or rare natural components that should be preserved for their unique characteristics, such as algalic slopes. This habitat factor will identify these uncommon sites for management considerations.

***Preserve Status*** – An area of land or water formally dedicated for maintenance as nearly as possible in its natural condition though it need not be completely primeval in character at the time of dedication or an area which has floral, fauna, geological, archeological, scenic, or historic features of scientific or educational value. This habitat factor will recognize the quality of preserve sites and apply proper maintenance to protect its integrity.

***Recreation*** –Leisure activities involving the enjoyment and use of natural resources. This habitat factor will favor hunting activities while taking into consideration secondary activities such as wildlife watching, mushroom picking, photography, and hiking.

***Special Restrictions*** – Certain limitations or conditions on the use or enjoyment of a natural resource area. This habitat factor will take into consideration these limitations or conditions to select proper management.

**NORTH CEDAR-SNY MAGILL  
WILDLIFE AREA  
1,462 Ac. Woodland**



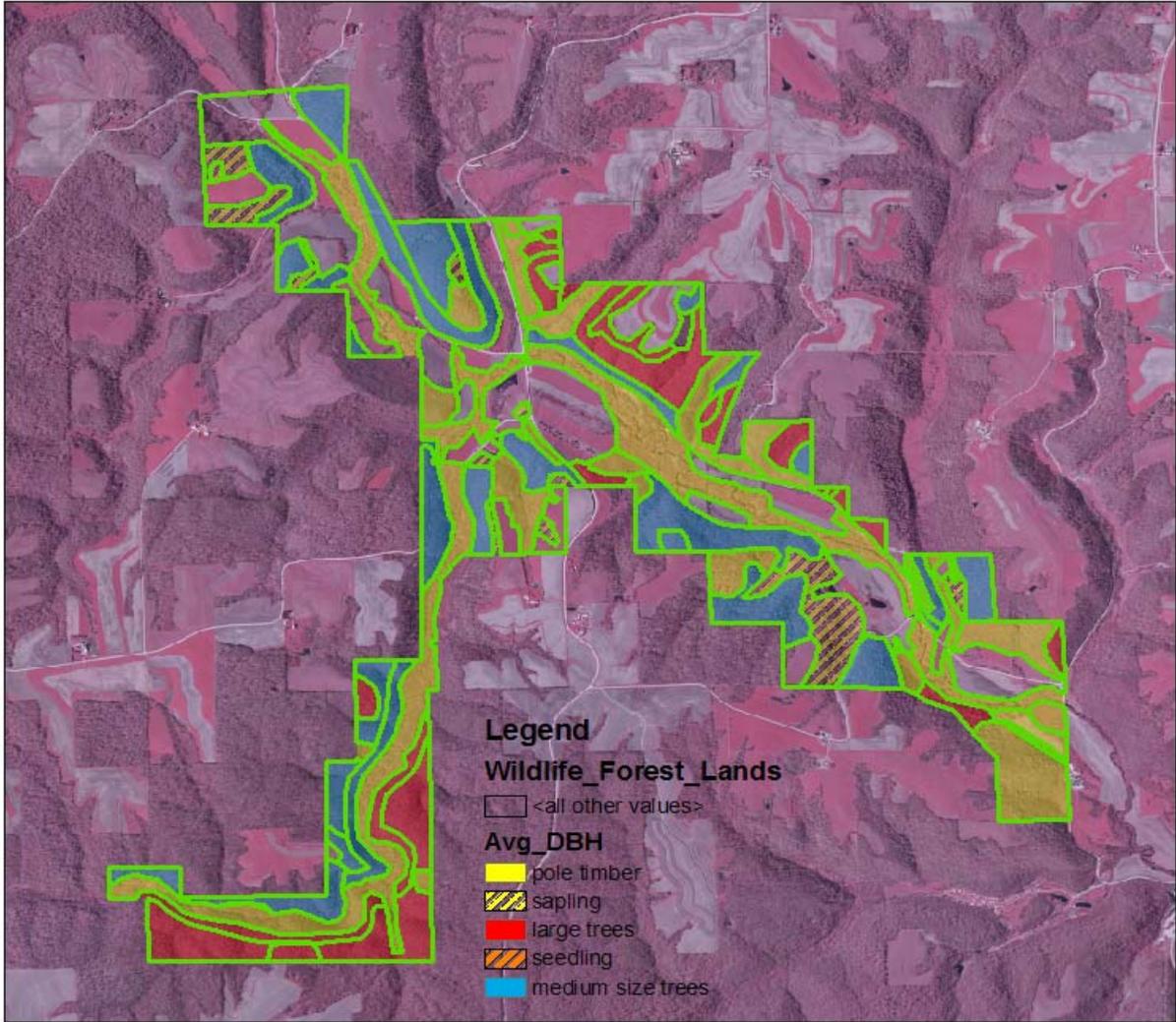
CLAYTON CO.

N

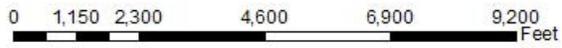


0 1,150 2,300 4,600 6,900 9,200 Feet

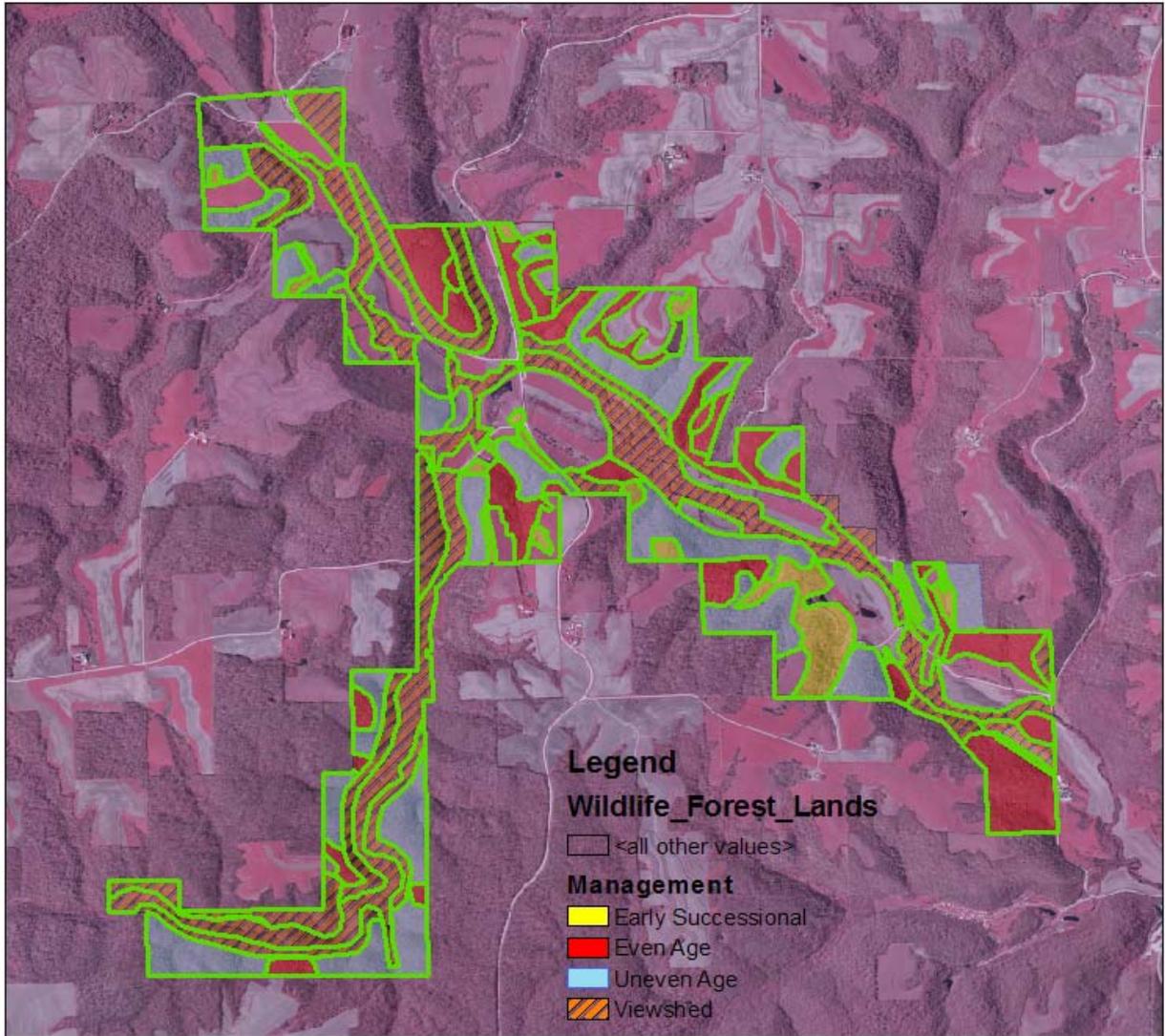
# NORTH CEDAR-SNY MAGILL AVERAGE TREE SIZES



CLAYTON CO.



# NORTH CEDAR-SNY MAGILL WILDLIFE AREA WOODLAND MANAGEMENT SYSTEMS



CLAYTON CO.



0 1,150 2,300 4,600 6,900 9,200  
Feet

**DATE: 12/2/2005**

# **FOREST STEWARDSHIP PLAN FOR NORTH CEDAR-SNY MAGILL WILDLIFE AREA**

Prepared by Gary Beyer, District Forester  
621 Beck St., Charles City, IA. 50616  
641/228-6611

**MANAGER:**

Jim Jansen  
Iowa DNR – Wildlife  
22693 205<sup>th</sup> Ave.  
Manchester, Iowa 52057

**TELEPHONE:** 563/927-3276

**LOCATION:** Sec. 7 & 8 Mendon Twsp., T94N-R3W, and Sec. 15, 16,  
17, 18, 19, 21, and 22 Clayton Twsp., T94N-R3W, Clayton County

**TOTAL ACRES:** 1,465

## **DESCRIPTION OF AREA**

The 1,465 acres addressed in this plan are outlined on the attached aerial photo. The area is divided into 78 different areas or stands, labeled 1-78 on the map. Each area is described in this plan and recommendations outlined for woodland management.

A trout stream runs through the North Cedar–Sny Magill Wildlife Area. The woodland is a mixture of steep slopes, ridge tops, and stream valleys. The total area is 1,795 acres of which 82% is forested.



### ***Objectives -***

The primary objectives for the area are improving wildlife habitat for a variety of wildlife species, recreation, water quality, and protecting endangered species. This Forest Wildlife Stewardship Plan strives to develop a forest ecosystem that has a diversity of tree sizes and species. Developing a diverse forest will benefit the widest variety of wildlife species. Wildlife species have diverse habitat requirements. Even on a Wildlife Management Area, what is productive habitat for one species may be unproductive for another.

Oak acorns are an important food source for many species of wildlife. Maintaining large oak trees and regenerating young stands of oak to replace the older trees are a major focus of the recommendations. Oak is by far the most important tree for a variety of wildlife species. Ruffed grouse, woodcock, and Eastern Towhee populations in northeast Iowa are declining due to a lack of early successional growth. Neotropical migratory birds dependent on early successional growth are also declining.

Clearcutting or Shelterwood cutting are even age management techniques to regenerate oak and provide early successional growth. Areas suitable for even age management will be managed to create stands with an oak component. Although clearcutting is planned for even age stands, the next harvest would not occur for 125 years. Some current even age stands may not be harvested for 60 to 80 years. Even age management is the only forest management system that will regenerate stands with an oak component.

Uneven age management develops of forest with all tree sizes, from seedlings to large trees, present. Uneven age management will gradually convert areas to hard maple and basswood, because these species are able to grow in shade. As older trees are selectively harvested or die, species that are able to survive in the shade will fill in the openings.

Fragile sites and areas that are important for their visual impact will be left as viewshed or old growth forests to provide areas where natural beauty, stream protection, and erosion control are the primary focus.

### ***Income from Timber Harvests -***

Harvesting is conducted to regenerate stands to desirable species and to achieve a diversity of tree sizes and species. Income from timber harvesting operations will be reinvested into the area to plant trees, thin young stands, and convert areas to more desirable species, and cut the early successional cuts. Harvesting is a very minimal portion of this plan. The majority of work recommended is to thin young stands so that the oak is not shaded out by other trees, remove undesirable species to encourage natural regeneration of desirable trees, complete the early successional work, and tree planting.

### ***Current Distribution of Tree Size on the Area -***

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

<b><u>Tree Size</u></b>	<b><u>Acres</u></b>	<b><u>% of Total Area</u></b>
Sapling (<4" dbh)	107	7
Pole size (5-12" dbh.)	651	45
Medium Size (14-18" dbh.)	400	27
Large (>20" dbh)	304	21
Totals	1,462	100

### **Proposed Management Systems for the Area -**

Recommendations for each stand were based on whether the area will be managed to create early successional growth, or on an even age system, uneven age system, or as 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, improve water quality, and increase the acres of early successional growth.

Based on my recommendations for North Cedar–Sny Magill Wildlife Area, the acres under each management system are as follows -

<b><u>Management System</u></b>	<b><u>Acres</u></b>	<b><u>% of Total Area</u></b>
Early Successional	103	7
Even Age	339	23
Uneven Age	431	30
Viewshed	589	40

## ***Early Successional Management -***

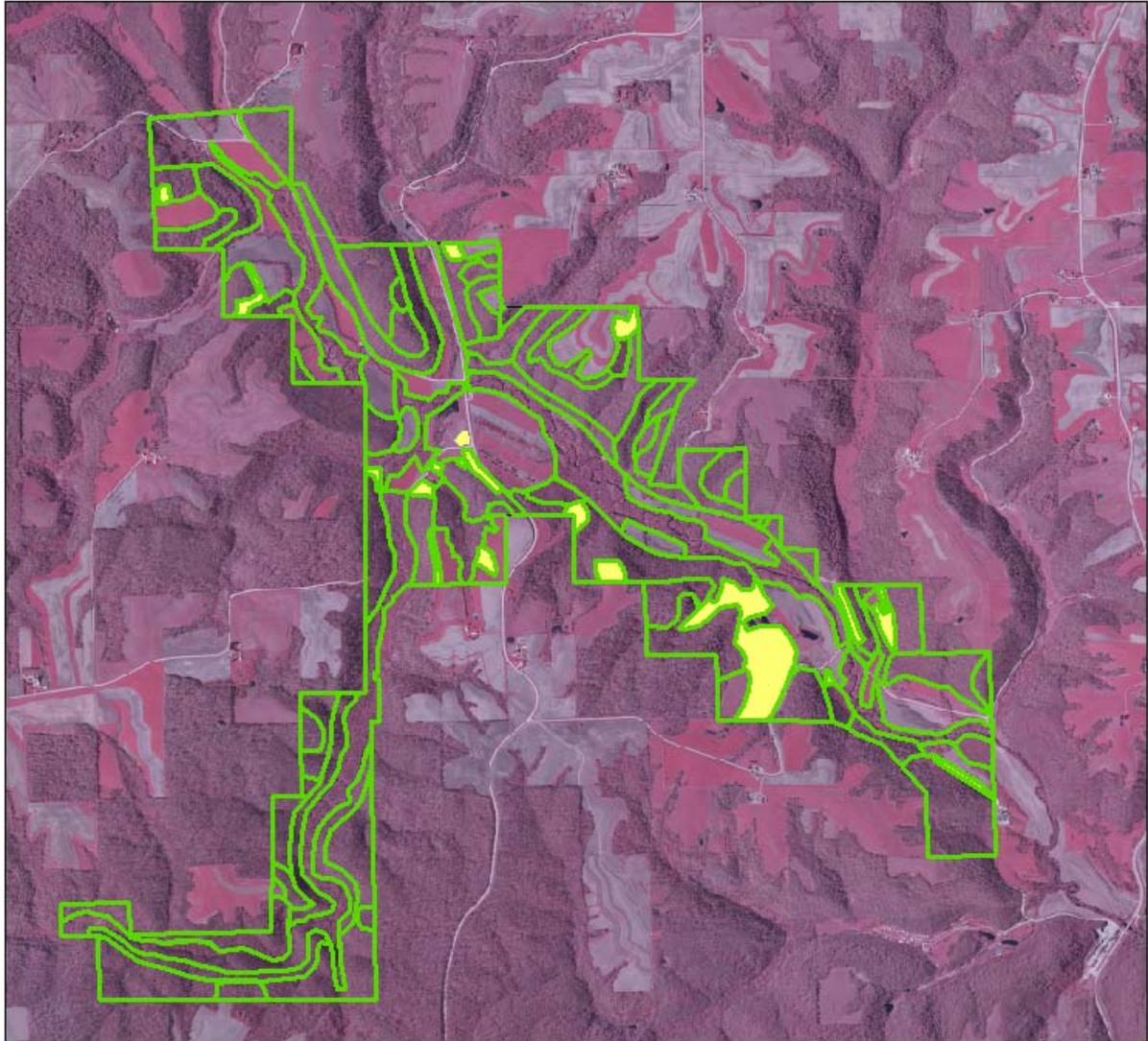
Many species of birds such as ruffed grouse, American woodcock, gold winged warbler, blue winged warbler, black billed cuckoo, yellow billed cuckoo, and eastern towhee are dependent on the early stages of woody growth. The high stem density of both trees and shrubs provides suitable nesting habitat and protection from predators. Because aspen will sprout from the roots when the parent tree is cut, aspen is an excellent species to create the dense growth needed by these species. Aspen also is a short lived tree species, and cutting the aspen will rejuvenate and expand the aspen stands through root sprouting.

The majority of early successional management is on the woodland edges and aspen stands. This work will “feather” the edges and make a gradual transition from the field edges to the larger trees. Feathering or softening the edges results in less nest parasitism of interior forest bird species by brown-headed cowbirds.

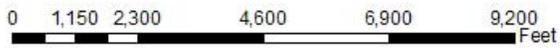


Aspen provides critical habitat for ruffed grouse. Aspen is most easily regenerated by root suckering. Once aspen is allowed to become over mature, its ability to root sucker is decreased. The best method to maintain aspen and expand the aspen clone is to cut the stand while the trees are in a healthy condition. Ideally, 1/3 of the aspen would be sapling size (1-4” dia.), 1/3 pole sized (5-10” dia.), and 1/3 medium sized (12-16” dia.). Big tooth aspen will grow to 16-20” in diameter, but small tooth aspen generally begins to die at 14-16” in diameter.

**NORTH CEDAR-SNY MAGILL  
WILDLIFE AREA  
EARLY SUCCESSIONAL MANAGEMENT - 103 AC.**



CLAYTON CO.



## ***Even Age Management -***

Even age management is essential for wildlife species depending on oak/hickory forests. Even though large blocks of forest are needed on some Wildlife Management Areas for some wildlife species, each stage of an even age stand provides habitat for wildlife. For example, regenerating stands (1-10 years old) benefit the same species of birds as does early successional stands, golden-winged warbler, blue-winged warbler, black-billed cuckoo, yellow-billed cuckoo, Eastern towhee, along with ruffed grouse and American woodcock.

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

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

Even age management involves growing a stand of trees which are close to the same age. At some point in the stands life, the area is clearcut which creates the even age structure. Even age management creates excellent habitat for deer, turkey, and grouse and is



essential for regeneration of oak which require full sunlight. The only way that oak can be maintained as a component of the forest is by practicing some form of even age management.

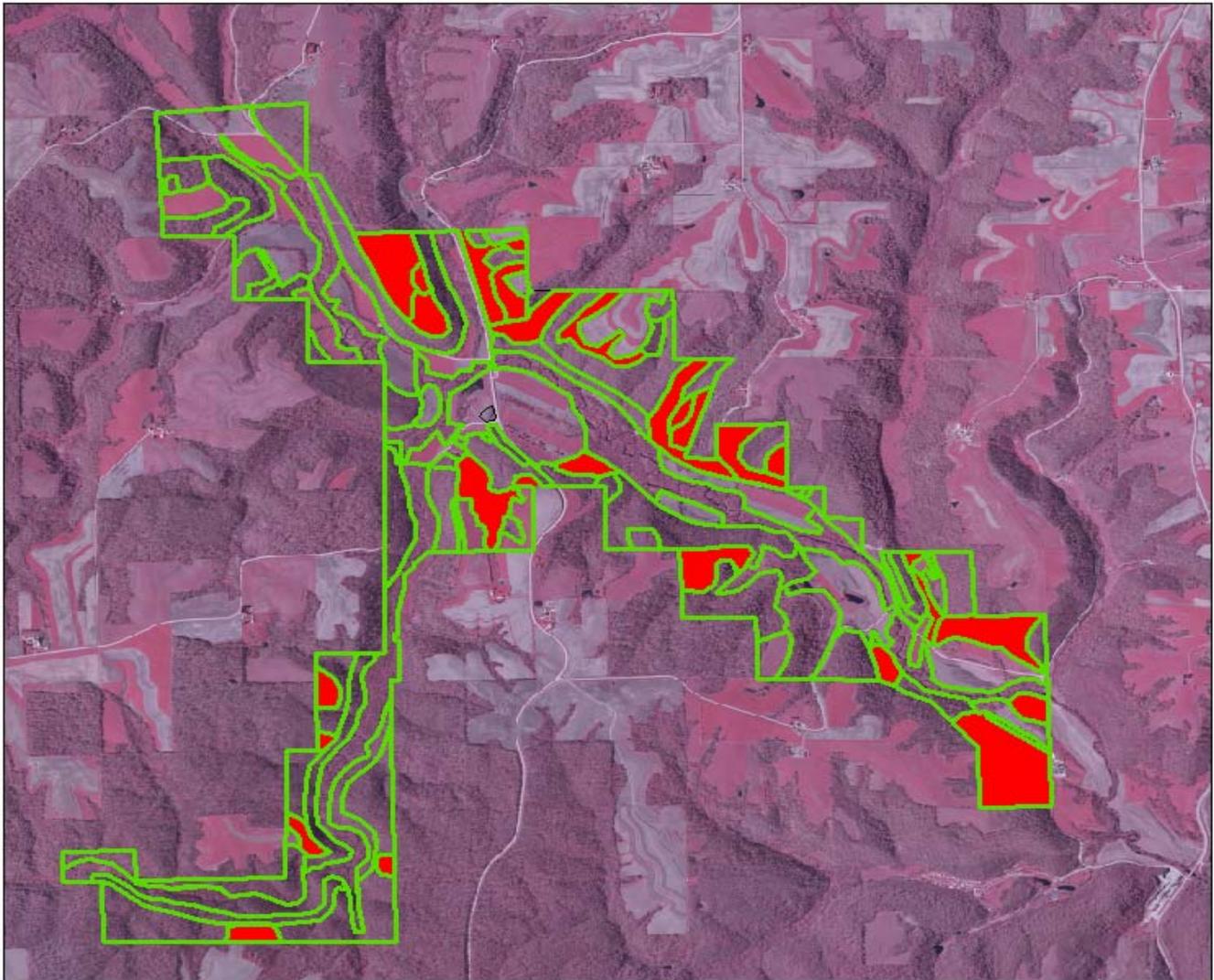
Even age management involves clearcutting and planting, clearcutting with regeneration already established, or a shelterwood system to develop desirable seedlings on the ground.

Shelterwood is a form of even-age management. The final cut is a clearcut, but several thinnings are done prior to the final cut. The large, healthy trees are left to provide seed for naturally reseeding the stand, and to create partial shade to inhibit the growth of weeds and brush until the desirable seedlings are well established. The final cut or clearcut is normally done when there are a sufficient number of desirable trees that are 3-5 ft. tall. The shelterwood system can take many years to develop a good stocking of desirable young trees. You may have to kill the undesirable species several times to favor the species you want. The final clearcut should not be made until you are satisfied with the stocking of desirable young trees.



Clearcutting to create full sunlight is essential at some point in the stands life to successfully regenerate oak. If stands are not clearcut, the oak component of the forest will be lost to shade tolerant species. Clearcuts also provide additional early successional habitat in the early stages. The area is in the brushy stage for a very short period, normally 10-15 years. After that time, the trees will totally shade the ground, and the area becomes a pole sized (5-10" dia.) stand of trees.

**NORTH CEDAR-SNY MAGILL  
WILDLIFE AREA  
EVEN AGE MANAGEMENT - 339 AC.**



CLAYTON CO.



0 1,150 2,300 4,600 6,900 9,200  
Feet

## ***Uneven Age Management -***

Uneven age management develops a stand of trees with all tree sizes represented. The stand structure is developed by selectively harvesting mature and defective trees, and removing unwanted small trees that are damaged or defective. Because uneven age stands always have large trees present, this system favors species that will grow in shade such as hard maple and basswood.

Uneven age management will maintain blocks of woodland that will always have larger trees. Uneven age management is desirable where the understory is mainly hard maple, on steep slopes, and on areas where always having large trees is important.

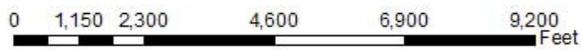
Uneven age management areas will provide continuous tracts of woodland with minimal disturbance. Large tracts of uneven age management will provide necessary habitat for neotropical migratory bird species such as cerulean, hooded, Canada, and Kentucky warblers. Selective harvesting will create small openings in the canopy, which will increase ground cover, and enhance stand structure. Den trees will be left to provide cavities for wildlife such as woodpeckers, bats, and squirrels, including the Northern myotis and red squirrel, species of greatest conservation need. Timber stand improvement and selective harvesting will create woody debris on the forest floor for reptiles and amphibians.



**NORTH CEDAR-SNY MAGILL  
WILDLIFE AREA  
UNEVEN AGE MANAGEMENT - 431 ACRES**



CLAYTON CO.



## **Viewshed Management -**

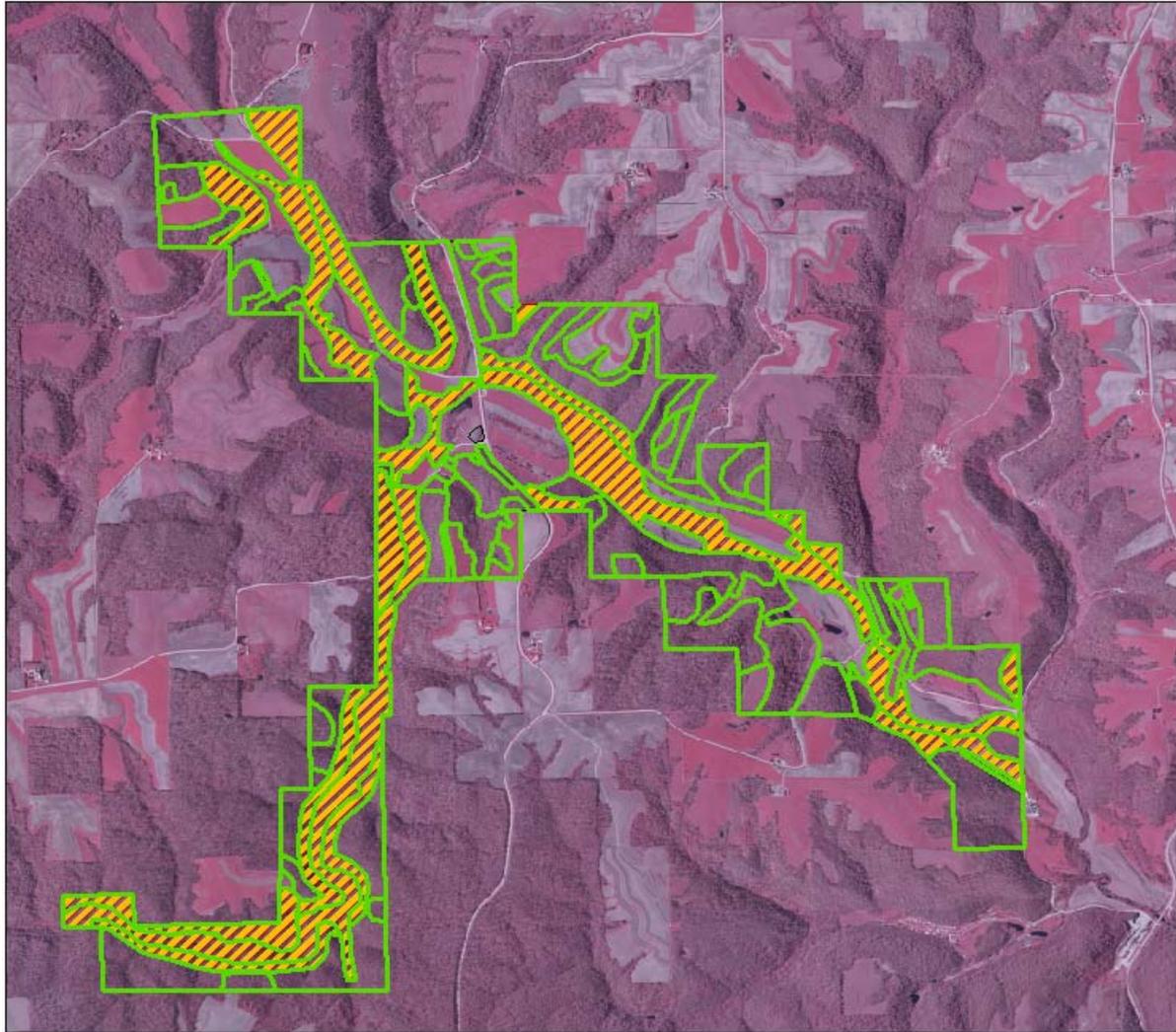
Viewshed areas are typically steep slopes and areas along streams which are fragile and are best left to naturally progress through succession. Areas where endangered plant or animal species exist will also be under viewshed management. Management can take place on these areas where desirable, but the major objective is to have very minor disturbance if any.

Many neotropical birds will benefit greatly from the areas designated as viewshed. Algific slopes and moderate slopes will be under viewshed management which will protect 8 species of land snails listed as species of greatest conservation need.

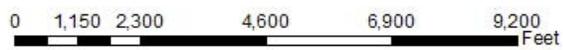


Viewshed management is designated for 589 acres on the area, or 40% of the forest resource.

**NORTH CEDAR-SNY MAGILL  
WILDLIFE AREA  
VIEWSHED MANAGEMENT - 589 ACRES**



CLAYTON CO.



## SOILS

North Cedar-Sny Magill has a large valley running through the center of the area. The soils in the valley are Dorchester, Zwingle, Caneek, and Volney. These soils are somewhat poorly drained to moderately well drained. These areas are subject to flooding and best suited for bottomland species such as cottonwood, silver maple, green ash, hackberry, bur oak, and swamp white oak.

The majority of the woodland area is on steep slopes. The predominant soils are Nordness with rock outcroppings. These soils are fragile and shallow to limestone. The north and east facing slopes are cooler and mixed, upland hardwoods will grow on these areas. The south and west facing slopes are droughty. Bur oak, white oak, chinkapin oak, and shagbark hickory have a competitive advantage on these dry sites.

The ridge tops and gentle slopes have Fayette and Dubuque soils. Fayette is a very productive soil for all tree species. Dubuque has limestone closer to the surface, but upland hardwoods will grow well on these sites.

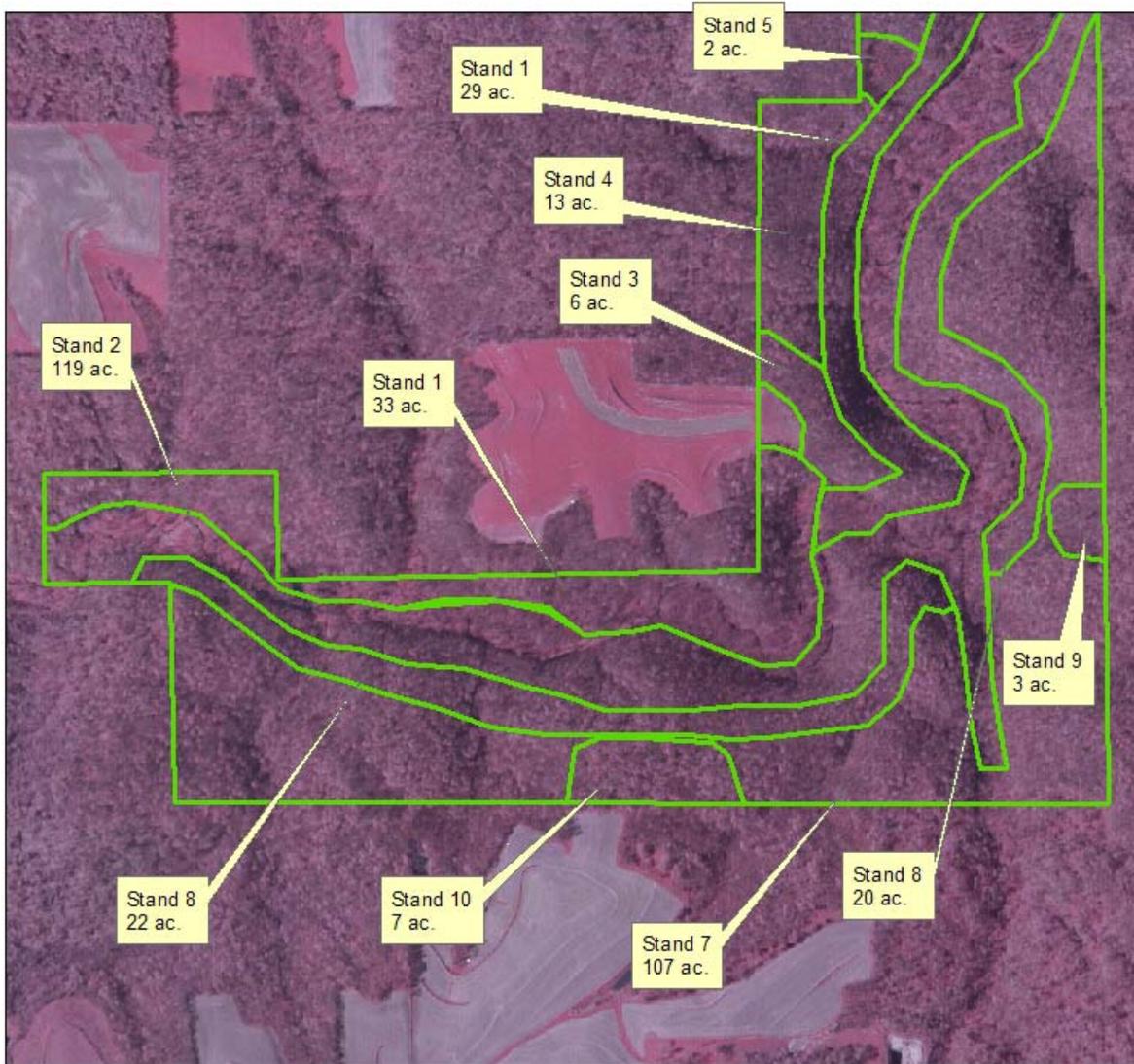
# **WORK PLAN**

## **FOR**

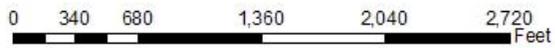
### **NORTH CEDAR – SNY MAGILL**

**This is the “working plan” for Sny Magill designed to aid professional biologists 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. I have not tried to put in print every detail because the plan would become too long to be of practical use. This plan is intended to get work accomplished on the ground.**

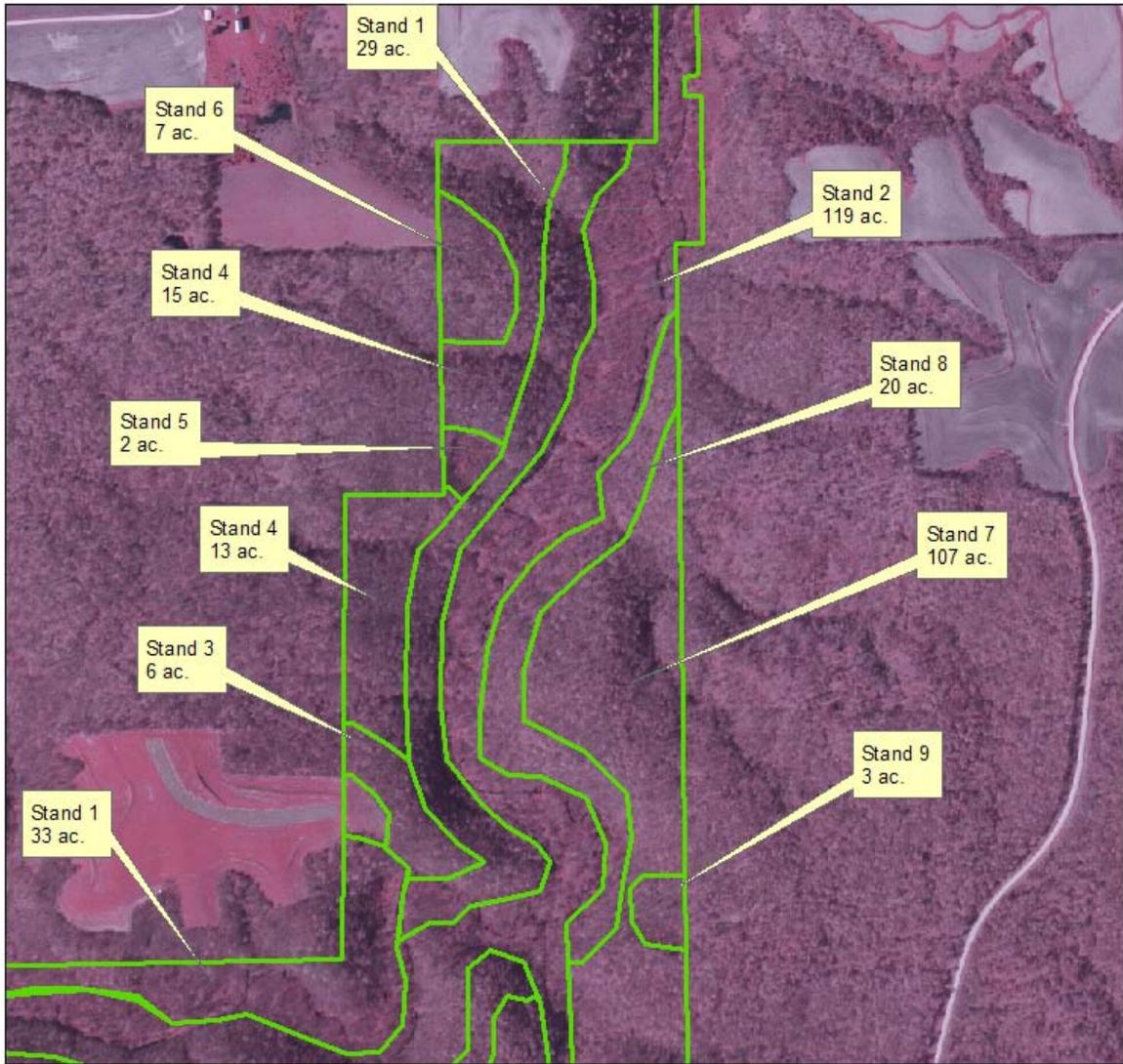
**NORTH CEDAR-SNY MAGILL  
NORTH CEDAR - SOUTH END  
STANDS 1-10**



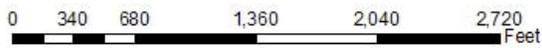
CLAYTON CO.



**NORTH CEDAR-SNY MAGILL  
NORTH CEDAR (Stands 1 - 9)**



CLAYTON CO.



**NORTH CEDAR-SNY MAGILL**  
**Stands 11-19, 65, 66**



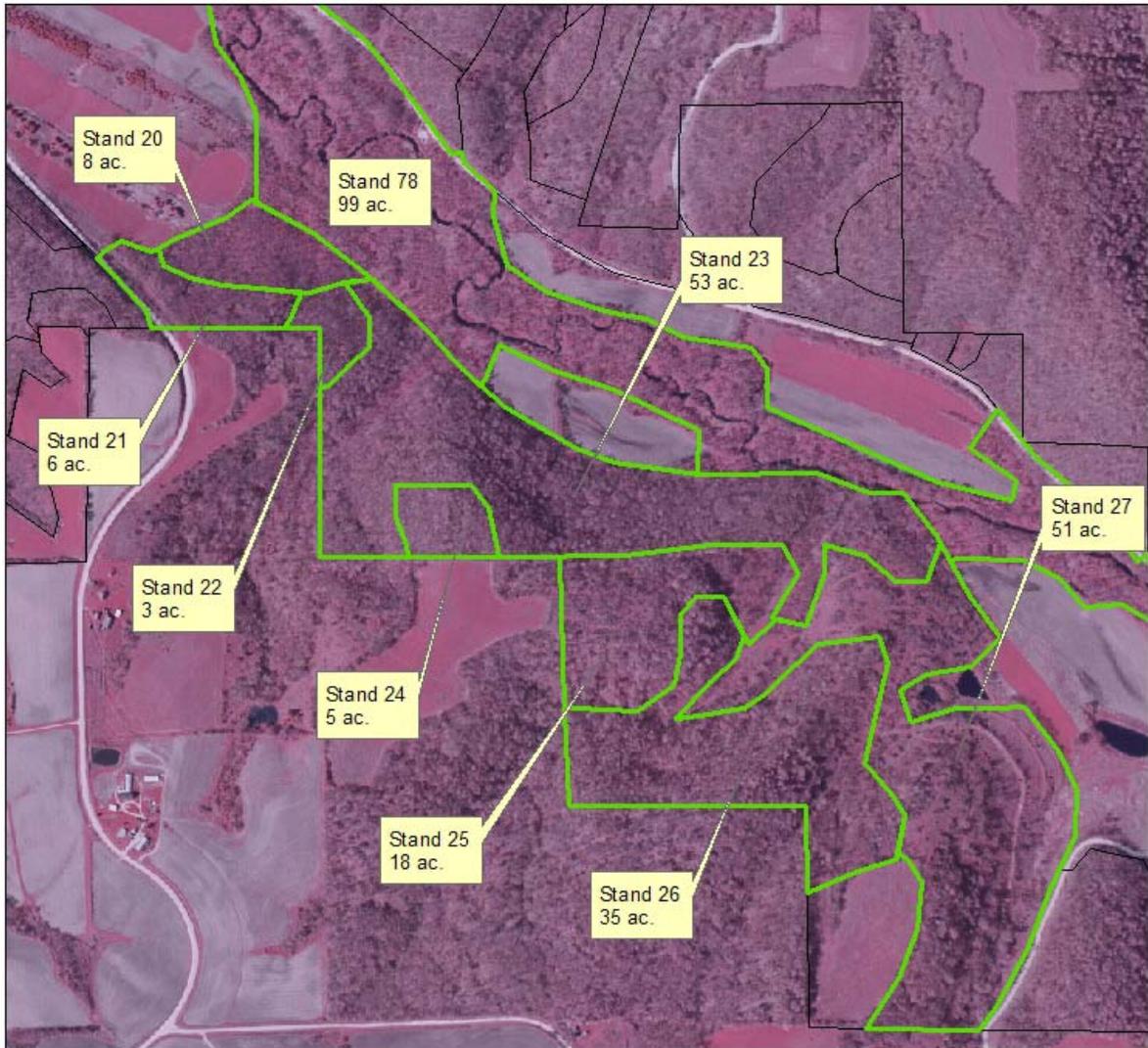
CLAYTON CO.

N

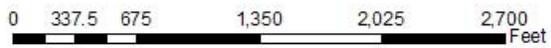


0 340 680 1,360 2,040 2,720 Feet

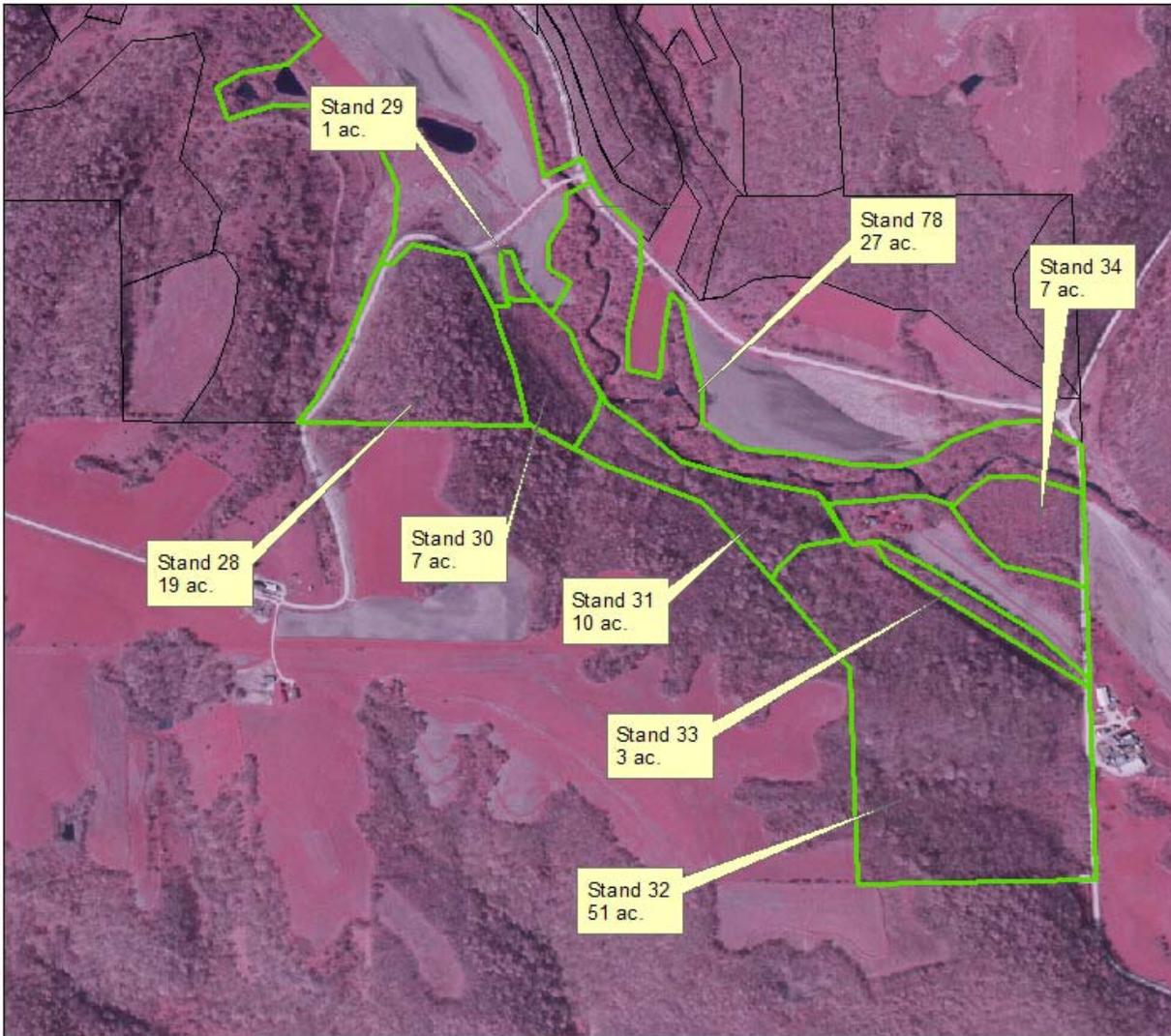
**NORTH CEDAR-SNY MAGILL  
STANDS 20-27, 78**



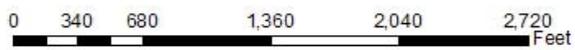
CLAYTON CO.



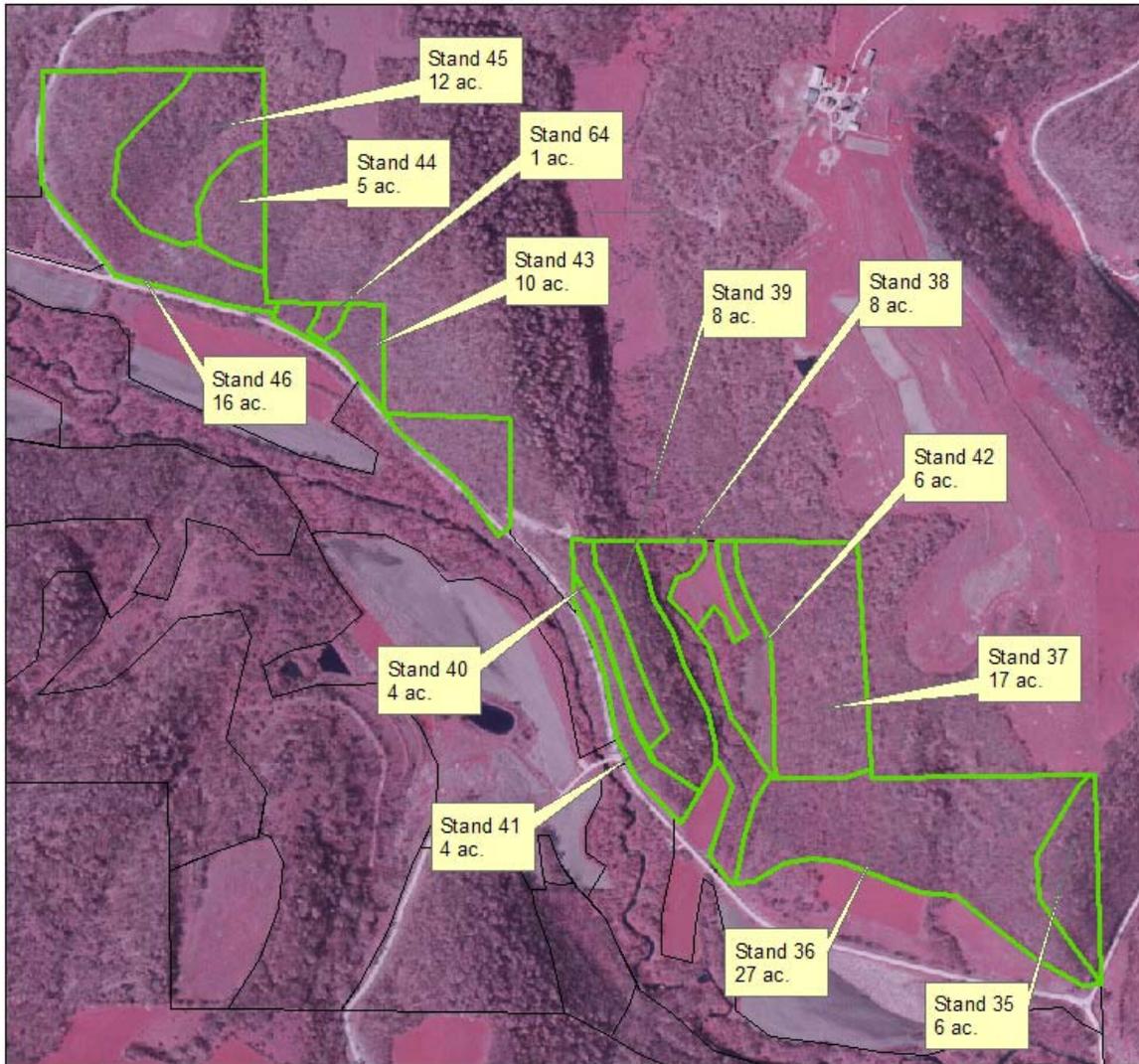
**NORTH CEDAR-SNY MAGILL  
STANDS 28-34, 78**



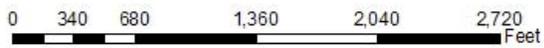
CLAYTON CO.



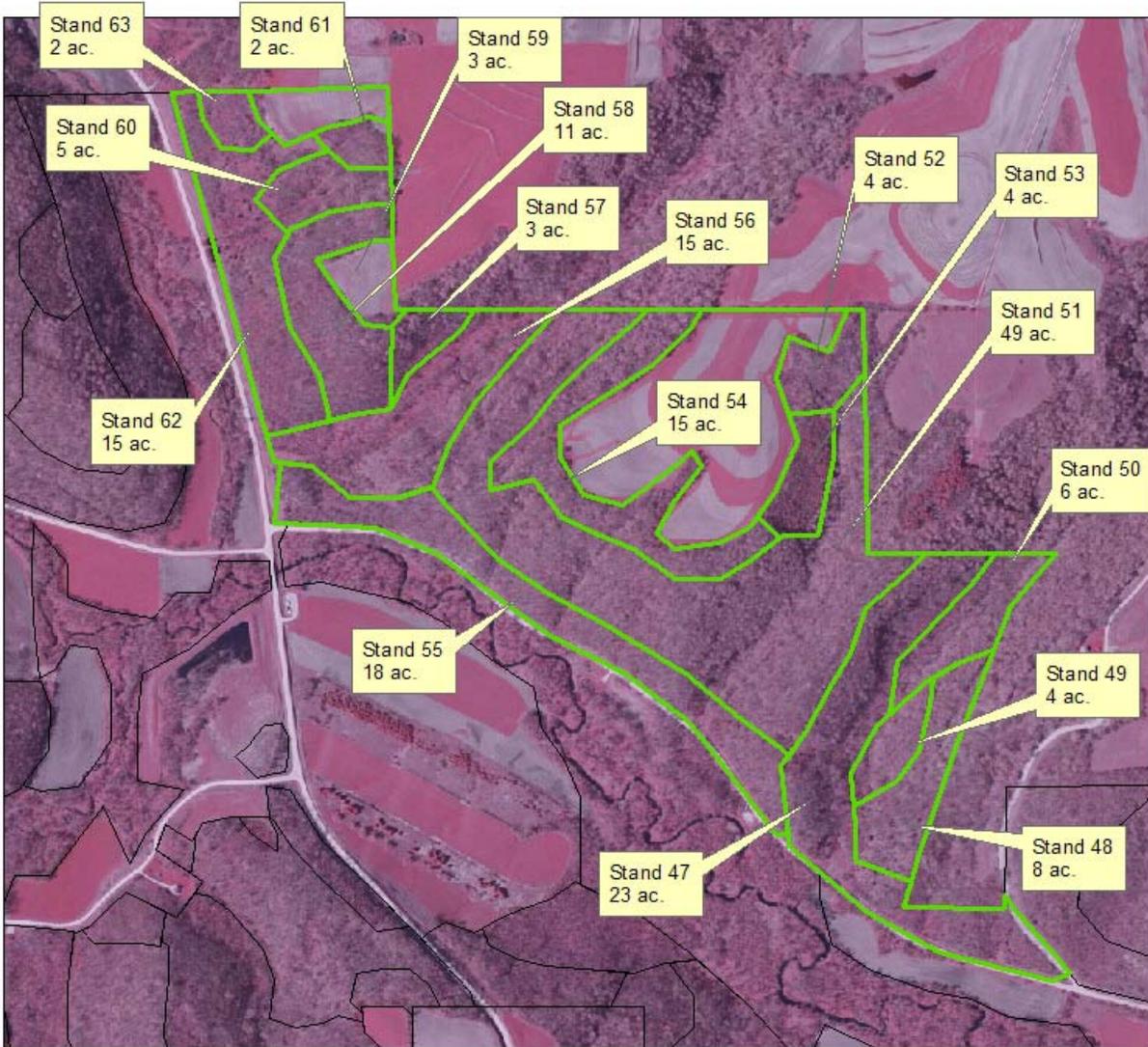
# NORTH CEDAR-SNY MAGILL STANDS 35-46



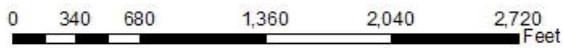
CLAYTON CO.



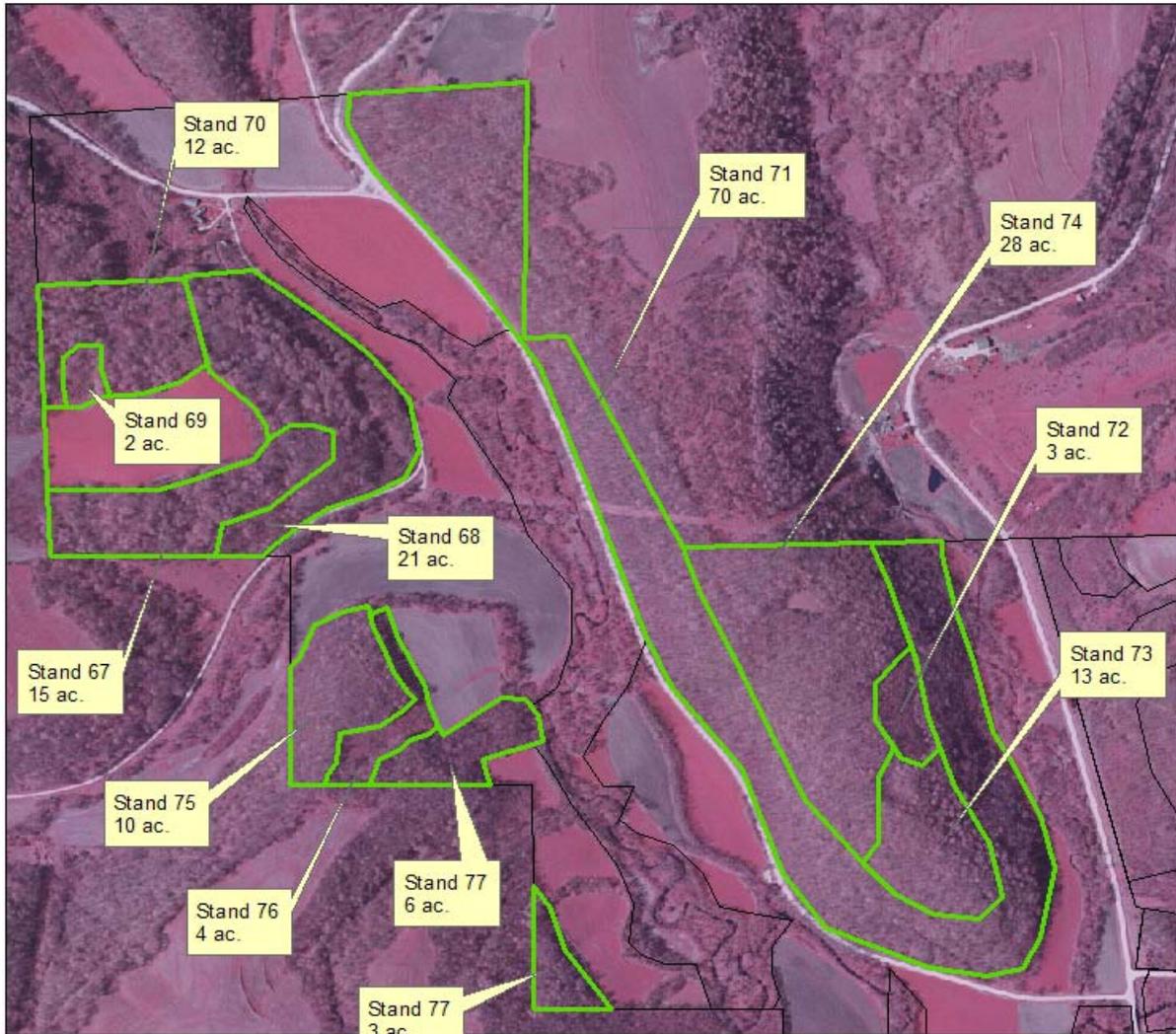
# NORTH CEDAR-SNY MAGILL WILDLIFE AREA - STANDS 47-63



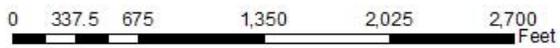
CLAYTON CO.



# NORTH CEDAR-SNY MAGILL WILDLIFE AREA - STANDS 67-77



CLAYTON CO.



## **DESCRIPTION AND RECOMMENDATIONS FOR INDIVIDUAL STANDS**

### **Stand 1: 90 acres**

#### ***Site Description -***

Steep slopes above trout stream on the North Cedar area. Soils are mainly Nordness with rock outcrops.

#### ***Woodland Description-***

Stand 1 is medium sized (12-18" dia.) red oak, white oak, hard maple, and basswood. The understory is hard maple, elm, ironwood, and prickly ash. Hard maple and ash seedlings are present. This area has garlic mustard throughout.

#### ***Management Recommendations - Viewshed***

This area can be managed as view shed to minimize erosion and disturbance above the trout stream.

### **Stand 2: 119 acres**

#### ***Site Description -***

Bottomland along the trout stream in the North Cedar area. Soils are mainly Dorchester silt loam.

#### ***Woodland Descripton -***

Pole to medium size cottonwood, elm, boxelder, hackberry, walnut, and black maple. The north end is mainly elm and boxelder, but there is a better mix of species on the south end.

#### ***Management Recommendations - Viewshed***

Stand 2 can be managed as view shed to maintain a good buffer along the trout stream. Small areas of the elm and boxelder could be converted to more desirable species on the north end. The elm and boxelder could be cut or killed standing. Pathfinder II should be applied to the cut surface to prevent sprouting. The areas could then be planted with swamp white oak, bur oak, and hackberry. Plant the trees 20 ft. apart, or 100 trees per acre. The oak should be protected with vented shelters.

### **Stand 3: 6 acres**

#### ***Site Description –***

Ridgetop adjacent to open field. Soils are Nordness silt loam.

#### ***Woodland Description -***

Medium sized (12-18" dbh) white oak, white ash, aspen, hard maple, and red oak. The understory is ironwood and hard maple.

#### ***Management Recommendations – Even Age***

Stand 3 could be clearcut and regenerated with oak in roughly 30 years

### **Stand 4: 45 acres**

#### ***Site Description –***

East facing slopes with shallow soils and rock outcrops.

#### ***Woodland Description -***

Medium sized (12-18" dbh) white oak, red oak, hard maple, aspen, and basswood. Understory is ironwood and hard maple. Garlic mustard is prevalent throughout the area.

#### ***Management Recommendations – Uneven Age***

Stand 4 could be selectively harvested in 10-15 years. Following the harvest, the undesirable species should be killed. Desirable species that are poor formed or damaged should be coppiced.

### **Stand 5: 2 acres**

#### ***Site Description -***

East facing slopes with shallow soils over limestone.

#### ***Woodland Description -***

Area was clearcut 20 years ago. Pole sized (5-10" dbh) hard maple, elm, aspen, red oak, basswood, and cherry. The oak are from stump sprouts.

#### ***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree Release) – Locate 50 crop trees per acre and remove competing trees. Oak should be the top priority for crop tree selection.



## **Stand 6: 7 acres**

### ***Site Description -***

Ridge top with Fayette and Nordness silt loam soils.

### ***Woodland Description –***

Large (20”+ dia.) red oak, white oak, basswood, and aspen. The aspen is on the north end of the stand. The understory is hard maple, ironwood, and bitternut hickory. Oak wilt fungus is present in the red oak.

### ***Management Recommendations – Even Age***

Clearcut & Plant - Clearcut the stand and plant oak. The area contains 6,000 to 7,000 board feet per acre. Following the harvest, fell all remaining trees. Treat the stumps of undesirable species with Pathfinder II to prevent sprouting. Plant the area with red oak, white oak, and walnut. Plant the trees 30 ft. apart or 50 trees per acre. Protect each tree with a vented shelter.



## **Stand 7: 107 acres**

### ***Site Description -***

North and west facing slopes. Soils are mainly Nordness with rock outcroppings.

### ***Woodland Description –***

Medium to large (14-24” dia.) red oak, white oak, basswood, hard maple, white ash, and clumps of aspen. The understory is ironwood, hard maple, bitternut hickory, and blue beech.

### ***Management Recommendations – Uneven Age***

The area could be selectively harvested. I suggest harvesting approximately 1/3 of the area every 10 years. The harvest should remove the mature and damaged trees. Following each harvest, the undesirable species and damaged trees should be felled. The stumps of undesirable species should be treated with Pathfinder II to prevent sprouting. Gradually, this area will convert to predominantly hard maple.

## **Stand 8: 42 acres**

### ***Site Description -***

Steep, rocky slopes adjacent to trout stream in North Cedar.

### ***Woodland Description -***

Medium to large (14-24" dia.) mixed hardwoods. The major species are red oak, white oak, chinkapin oak, hard maple, and basswood. The understory is ironwood, hard maple, blue beech, and bitternut hickory.

### ***Management Recommendations - Viewshed***

Nothing is recommended for this area. The steep slopes can be left as is to protect the trout stream from sedimentation.

## **Stand 9: 3 acres**

### ***Site Description -***

Ridgetop and west facing slope.

### ***Woodland Description -***

Stand was clearcut 20 years ago. The trees are pole sized elm, basswood, ash, hard maple, bitternut hickory, cherry, and a few walnut and red oak.

### ***Management Recommendations - Even Age***

Timber Stand Improvement (Crop Tree Release). Select 50 crop trees per acre and remove competing trees. Remove trees with crowns that are touching the crowns of the crop trees. Favor the few oak and walnut that are present.

## **Stand 10: 7 acres**

### ***Site Description –***

Ridgetop adjacent to crop field and south property line. Soils are Fayette silt loams, which are excellent soils for oak and walnut.

### ***Woodland Description -***

Large (20"+ dbh) hard maple, red oak, white oak, basswood, ash, and cherry. The understory is hard maple and basswood.

### ***Management Recommendations – Even Age***

Clearcut & Plant – Harvest all merchantable trees. The stand contains 6,000 to 7,000 board feet per acre. Following the harvest, fell all remaining trees over 1 inch in diameter. Treat the stumps of unwanted species with Pathfinder II to prevent sprouting. Plant the area with large oak and walnut seedlings. Planting large stock is essential for the trees to compete with the competition and grow above deer browsing height. The trees should be a minimum of 18-24" in height and 3/8" in caliper. Plant the trees 30 ft. apart, or 50 trees per acre. Protect each tree with a vented tree shelter. Control competing vegetation by spot spraying a combination of Roundup and Princep 4L herbicides. Protect the seedling from the spray and spray an area 4 ft in diameter around each tree. Apply 2 quarts of Roundup and 4 quarts of Princep 4L per acre treated. The herbicides must be applied when the vegetation is actively growing.

## **Stand 11: 3 acres**

### ***Site Description –***

West slope along the edge of a hayfield.

### ***Woodland Description -***

Sapling (1-4" dbh) elm, ironwood, hard maple, bitternut hickory, cherry, hackberry, and basswood. The area was clearcut 6 years ago.

### ***Management Recommendations – Early Succession***

Maintain this area is dense, young growth by clearcutting every 15years. This area could be clearcut again in 5-10 years.



## **Stand 12: 17 acres**

### ***Site Description -***

Steep, west facing slope with rock outcroppings.

### ***Woodland Description –***

Medium sized (12-18” dia.) red oak, white oak, hard maple, basswood, and a few chinkapin oak and shagbark hickory. The understory is ironwood, hard maple, blue beech, hackberry, and prickly ash. The regeneration is ash and hard maple. There are patches of garlic mustard.

### ***Management Recommendations – Uneven Age***

Stand 12 has large, old red oak that are deteriorating. This stand could be selectively harvested within the next 10-15 years. Following the harvest, the undesirable species should be killed, and the desirable species that are damaged should be coppiced.

## **Stand 13: 2 acres**

### ***Site Description -***

North facing slope adjacent to the gravel road.

### ***Woodland Description -***

Sapling (1-4” dbh) walnut, aspen, ash, and red oak. The oak are from stump sprouts. This area was clearcut in 1999.

### ***Management Recommendations – Early Succession***

Stand 13 can be maintained as an aspen stand by clearcutting every 15 years. This will also keep the area in dense, young growth. This stand should be clearcut again in 10 years.

## **Stand 14: 24 acres**

### ***Site Description -***

Valley and side slopes with Nordness soils.

### ***Woodland Description -***

Pole sized (5-10" dbh) hard maple, bitternut hickory, elm, red oak, walnut, and cherry. There is a group of apple trees on the west side of the area. Stand 14 has a good stocking of young oak and walnut.

### ***Management Description – Even Age***

Timber Stand Improvement (Crop Tree Release) – Select 50 crop trees per acre and remove the competing trees. This will increase the health and vigor of the young oak, walnut, maple, and cherry. The apple trees can be treated as crop trees. Remove trees with crowns that are touching or overtopping the crowns of the crop trees.

## **Stand 15: 3 acres**

### ***Site Description –***

Small drainage leading from crop field to woodland. Soils are Nordness and Fayette silt loams.

### ***Woodland Description –***

Sapling (1-4" dbh) cherry, ironwood, walnut, aspen, hard maple, and wild plum. Area was clearcut in 2000.

### ***Management Recommendations – Early Succession***

Maintain this area in dense, young growth. The site could be clearcut again in 10 years.

## **Stand 16: 3 acres**

### ***Site Description -***

Three areas on upland that were clearcut for grouse habitat.

### ***Woodland Description -***

Sapling (1-4" dbh) aspen. The areas were clearcut in 1999.

### ***Management Recommendations – Early Succession***

Maintain these three areas in dense, aspen growth. Aspen root sprouts after the parent tree is cut. Cutting increases the vigor of the trees and expands the aspen clone. These areas could be clearcut again in 10 years.

## **Stand 17: 4 acres**

### ***Site Description –***

Gentle east slope adjacent to the gravel road. Soils are Nordness silt loams.

### ***Woodland Description -***

Pole sized (5-10" dbh) aspen, elm, cherry, ash, and hard maple. There is a good component of aspen. The understory is ironwood and elm.

### ***Management Recommendations – Early Succession***

Many of the aspen are reaching the size where they will begin to die. Cutting the trees before they become too old results in a stand of young, vigorous aspen. Clearcutting aspen is the best way to maintain and expand the aspen clone. The root systems will sprout vigorously. Even though this area is next to the road, I recommend managing this area on a 15 year rotation to maintain in early succession growth. The stand could be clearcut within the next 5 years. Placing a sign on the road next to this area explaining the merits of clearcutting aspen for grouse, woodcock, and some migratory bird species would help educate the public concerning the forest management work on state wildlife areas.

## **Stand 18: 2 acres**

### ***Site Description -***

Ridgetop adjacent to a field edge with Fayette, Dubuque, and Nordness soils.

### ***Woodland Description -***

Sapling (1-4" dbh) hard maple, ironwood, and scattered aspen. This stand was partially clearcut in 2000. There are scattered, pole sized maple that were not cut.

### ***Management Recommendations – Even Age***

The clearcut should be completed on this area. Fell all trees over 2" in diameter. Treat the stumps of undesirable species with Pathfinder II to prevent sprouting. There are openings that could be planted with oak. Plant large oak seedlings in areas lacking dense hard maple saplings. Plant the trees 30 feet apart and protect them with a vented tree shelter.

Control competing vegetation by spot spraying a combination of Roundup and Princep 4L herbicides. Protect the seedling from the spray and spray an area 4 ft in diameter around each tree. Apply 2 quarts of Roundup and 4 quarts of Princep 4L per acre treated. The herbicides must be applied when the vegetation is actively growing.

## **Stand 19: 18 acres**

***Site Description -***

Northeast facing slope with Nordness soils.

***Woodland Description –***

Medium size (12-18” dbh) red oak, hard maple, basswood, and white oak. The understory is hard maple and ironwood.

***Management Recommendations – Uneven Age***

Timber Stand Improvement & Selective Harvest - In roughly 10 years, the undesirable species and poor quality trees could be removed to encourage the natural regeneration of maple. In 15-20 years, the stand will be ready for a selective harvest.

**Stand 20: 8 acres**

***Site Description -***

East slope and bench above trout stream with Fayette silt loam soils.

***Woodland Description -***

Pole sized (5-10” dbh) walnut, black ash, and elm. The understory is elm, hard maple, and bitternut hickory. Stand 20 has a good stocking of nice walnut.

***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree Release) - In pole-sized stands, potential crop trees can be selected and released. At maturity, there is room for 35-50 trees per acre. Now you can select the trees you want to comprise your future stand of mature trees and thin around them to give them more growing space. Select a crop tree every 30-35 ft. apart. Remove trees with crowns that are touching or overtopping the crowns of your crop trees. Crop trees can be selected based on criteria that meets your objectives. Normally, the crop trees will be a desirable species, show good form without large side limbs, and be free of major defects. Species normally favored are black walnut, red oak, white oak, white ash, basswood, cherry, and hard maple. The trees to be removed can be felled or double girdled. No herbicide is necessary.

## **Stand 21: 6 acres**

### ***Site Description -***

East facing slope along the gravel road. Soils are Nordness silt loam.

### ***Woodland Description -***

Large (20"+ dbh) red oak, basswood, walnut, and white ash. The understory is elm, bitternut hickory, ironwood, and a few hard maple.

### ***Management Recommendations - Viewshed***

This area has nice, large trees along the road. I suggest leaving this area as a scenic buffer and so the public will have large trees to view.

## **Stand 22: 3 acres**

### ***Site Description -***

East facing slope on rock outcrop soils.

### ***Woodland Description -***

Pole size (5-10" dbh) aspen, cherry, ash, bitternut hickory, and hard maple. Aspen is the dominant species. The stand was clearcut for grouse roughly 15 years ago.

### ***Management Recommendations - Early Succession***

This is a nice stand of aspen that could be maintained as aspen by clearcutting every 15 years. The stand should be clearcut again within the next 5 years.

## **Stand 23: 53 acres**

### ***Site Description -***

Steep north and northeast slopes with Nordness soils and rock outcroppings. This area has some large limestone outcroppings.

### ***Woodland Description -***

Medium sized (12-18" dbh) red oak, hard maple, and basswood. The understory is hard maple, ironwood, and bitternut hickory.

### ***Management Recommendations - Uneven Age***

In 20 years, the stand could be selectively harvested and the undesirable species and damaged trees removed. Hard maple will dominate this area.

## **Stand 24: 5 acres**

***Site Description -***

Ridge top along a field edge with Nordness and Fayette silt loam soils.

***Woodland Description -***

Medium sized (12-18" dbh) aspen, red oak, and basswood. The understory is hard maple and ironwood.

***Management Recommendations – Early Successional***

The aspen component of this stand could be enhanced by clearcutting. In 10 years, the stand could be clearcut harvested. Following the harvest, all remaining trees over 1 inch in diameter should be felled. Treat the stumps of ironwood and elm with Pathfinder II herbicide to prevent sprouting.

**Stand 25: 18 acres**

***Site Description -***

Ridgetop and east facing slope. The stand was pastured roughly 25-30 years ago. The soils are Dubuque and Nordness silt loams.

***Woodland Description -***

Pole sized (5-10" dbh) walnut, elm, ash, hard maple, red oak, bitternut hickory, ironwood, aspen, cherry, and scattered apple trees. The understory is ash, bitternut hickory, elm, and hard maple. Garlic mustard is present.

***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree Release) – In 5-10 years, thin the stand to release the crop trees. Favor the oak, walnut, and apple trees as crop trees.

## **Stand 26: 35 acres**

### ***Site Description -***

Steep north and northeast facing slopes with Nordness soils and rock outcroppings.

### ***Woodland Description -***

Medium sized (12-18" dbh) red oak, hard maple, and white oak. The understory is hard maple, ironwood, muscle wood, and bitternut hickory.

### ***Management Recommendations – Uneven Age***

Timber Stand Improvement (Weed Tree Removal) - The undesirable species such as elm, ironwood, bitternut hickory, and boxelder could be killed. The trees should be cut off or girdled. Pathfinder II should be applied to the cut surface to prevent sprouting. This work can be done anytime except spring during heavy sap flow. Remove undesirable species that are 1" and larger in diameter. In addition, desirable species that are poor formed or damaged should be coppiced. This is cutting the trees at ground level so the stumps will sprout. No herbicide should be used on the stumps of desirable species.

Selective Harvest – In 15-20 years the stand could be selectively harvested to remove the mature and defective trees.

## **Stand 27: 51 acres**

### ***Site Description -***

Steep north and east facing slopes with Nordness and Dubuque soils. The stand was heavily grazed 20 years ago.

### ***Woodland Description -***

Much of the area is semi open with scattered sapling to pole size (1-10" dia.) elm, walnut, red oak, aspen, red cedar, and ironwood. There are patches of prickly ash, multiflora rose, hazel, and raspberry. There are scattered, large red oak and shagbark hickory. Small areas south of the pond were planted with scotch pine and walnut. The walnut are sod bound and growing slowly.

### ***Management Recommendations – Early Succession***

This area has good early growth now. The area could be enhanced with the following work –

Cedar Planting (2 acres) - Plant red cedar on the areas colored green on the map. Plant the trees on a 12 X 12 ft. spacing, or 300 trees per acre. 600 red cedar could be planted on the area. Control competing vegetation by spot spraying a combination of Roundup and Princep 4L herbicides. Protect the seedling from the spray and spray an area 4 ft in diameter around each tree. Apply 2 quarts of Roundup and 4 quarts of Princep 4L per acre treated. The herbicides must be applied when the vegetation is actively growing.



Clearcut Older Aspen Clumps - Locate the older stands of aspen and clearcut them to create dense, young aspen growth.

Oak & Walnut Release – Locate the young oak and walnut and remove trees with crowns that are overtopping or touching the crowns of the young oak and walnut. The walnut that are larger than 4 inches in diameter could be pruned to improve their quality.

## **Stand 28: 19 acres**

### ***Site Description -***

Ridge and east facing slope with shallow soils to limerock. Stand adjoins gravel road.

### ***Woodland Description -***

Nice quality, uneven age, mixed hardwoods. Medium size (12-18" dbh) red oak, white oak, hard maple, basswood, aspen, ash, and shagbark hickory. Understory is ironwood, muscle wood, and hard maple.

### ***Management Recommendations – Uneven Age***

Timber Stand Improvement (Weed Tree) – kill the undesirable species and coppice the poor formed trees in 5-10 years.

Selective Harvest - In 15-20 years, harvest the mature and defective trees.

## **Stand 29: 1 acre**

### ***Site Description -***

Narrow finger of woods on Fayette silt loam soils.

### ***Woodland Description -***

Pole sized elm and boxelder. Understory is chokecherry, gray dogwood, hard maple, gooseberry, and raspberry.

### ***Management Recommendations – Early Succession***

Clearcut this area to create a dense corridor with a good shrub component. Treat the stumps of the elm and boxelder with Pathfinder II to prevent sprouting.

## **Stand 30: 7 acres**

### ***Site Description -***

Bench and east facing slope with Fayette and Dorchester soils.

### ***Woodland Description -***

Pole sized (5-10" dbh) walnut, hard maple, and elm. There are a few red oak on the south end of the area.

### ***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree Release) - At maturity, there is room for 35-50 trees per acre. Now you can select the trees you want to comprise your future stand of mature trees and thin around them to give them more growing space. Select a crop tree every 30-35 ft. apart. Remove trees with crowns that are touching or overtopping the crowns of your crop trees. Crop trees should be a desirable species, show good form without large side limbs, and be free of major defects. Species normally favored are black walnut, red oak, white oak, white ash, basswood, cherry, and hard maple. The trees to be removed can be felled or double girdled. No herbicide is necessary.

Walnut trees that are 2-12" in diameter can be pruned to promote veneer quality trees. You should prune during the dormant season. Limbs less than 1 inch in diameter are providing foliage which produces food for the tree and should be left. When the limbs approach 1 1/2 to 2" in diameter, they should be removed. Do not remove over 1/3 of the live crown in any one year. At least 50% of the total height of the tree should be maintained in live crown.

## **Stand 31: 10 acres**

### ***Site Description -***

Steep northeast facing slope along the trout stream.

### ***Woodland Description -***

Large (20"+ dbh) red oak, hard maple, and white oak. Understory is hard maple, ironwood, and muscle wood.

### ***Management Recommendations - Viewshed***

Leave this area as is for protection of the slope along the trout stream.

## **Stand 32: 51 acres**

### ***Site Description -***

North and east facing slopes with Fayette and Nordness soils.

### ***Woodland Description -***

Area was logged and grazed 30-40 years ago. The current stand is pole sized hard maple, ironwood, bitternut hickory, cherry, red oak, elm, white oak, basswood, black oak, ash, and walnut. There are scattered, large red oak, white oak, hard maple, and shagbark hickory. These trees are low quality and were left by the previous loggers.

### ***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree) – Select a crop tree every 30 ft. apart and remove trees with crowns touching or overtopping the crowns of the crop trees. The trees to be removed can be felled or double girdled. Leave the large, scattered oak and hickory for mast production.

## **Stand 33: 3 acres**

### ***Site Description -***

Narrow strip of woods below the power line. Soils are Fayette silt loam.

### ***Woodland Description -***

Pole sized (5-10" dbh) bitternut hickory, hard maple, walnut, red oak, boxelder, and cherry. There are scattered, large red oak and elm. The understory is mainly prickly ash.

### ***Management Recommendations – Early Succession***

Clearcut Stand 33 to create dense, young growth along the edge. Treat the stumps of the boxelder and elm with Pathfinder II. Leave the few large oak for mast production.

## **Stand 34: 7 acres**

### ***Site Description -***

Bottomland along the trout stream with Dorchester silt loam soils. This area is subject to periodic flooding.

### ***Woodland Description -***

Pole sized (5-10" dbh) boxelder with small sawtimber (14-16" dbh) cottonwood along the road.

### ***Management Recommendations - Even Age***

Stand 34 can be converted to more desirable species. The cottonwood could be left along the road to provide a buffer for the area. The following steps are suggested to convert the stand to more desirable species.

1. Fell ½ of the boxelder to create roughly 50% sunlight to the ground. This will help to suppress the growth of nettles and ragweed. Treat the stumps with Pathfinder II to prevent sprouting.
2. Plant 50 hackberry, 25 bur oak, and 25 swamp white oak per acre. Plant the trees roughly 20 ft. apart. Control competing vegetation for 2 years by spot spraying a combination of Roundup and Princep 4L herbicides. Protect the seedling from the spray and spray an area 4 ft in diameter around each tree. Apply 2 quarts of Roundup and 4 quarts of Princep 4L per acre treated. The herbicides must be applied when the vegetation is actively growing.
3. When the planted trees have a good root system established in 4-5 years, kill the remaining boxelder to provide full sunlight for the planted seedlings.

## **Stand 35: 6 acres**

### ***Site Description -***

Steep, southeast facing slope with very shallow soils.

### ***Woodland Description -***

Mature red oak and basswood, with a few walnut. The understory is pole sized hard maple, basswood, and ironwood.

### ***Management Recommendations - Viewshed***

This area is very steep and visible from the road. This would be a good area to leave in large trees.

## **Stand 36: 27 acres**

### ***Site Description -***

Predominantly south facing slopes with Nordness soils and rock outcrops.

### ***Woodland Description -***

Pole sized (5-10" dbh) red oak, black oak, chinkapin oak, walnut, elm, hard maple, ash, ironwood, and bitternut hickory. Stand 36 has a good stocking of oak due to the droughty conditions of the site. There are scattered, large bur oak, red oak, and hard maple.

### ***Management Recommendations -***

Timber Stand Improvement (Crop Tree) – Select 50 crop trees per acre and remove the competing trees. Favor a mixture of oak for crop trees. Some of the large maple could be girdled to release the young oak, but all of the large oak should be left for mast production.

## **Stand 37: 17 acres**

### ***Site Description -***

West facing slope with Nordness soils.

### ***Woodland Description -***

Medium size (12-18" dbh) red oak, white oak, red elm, hard maple, white elm, and basswood. The understory is mainly hard maple. There are scattered, mature trees and several of the large oak have wind damage.

### ***Management Recommendations – Uneven Age***

Selective Harvest & TSI - Harvest the merchantable elm and damaged trees. Following the harvest, kill the undesirable species and coppice trees that are damaged or poor formed.

## **Stand 38: 8 acres**

### ***Site Description –***

Bottomland along small drainage with Dorchester silt loam soils.

### ***Woodland Description -***

Pole sized (5-10" dbh) black locust, boxelder, and elm. There are scattered, young walnut towards the north end, and scattered medium sized (14-18" dbh) cottonwood along the drainage.

### ***Management Recommendations – Even Age***

Stand 38 could be converted to more desirable species. The walnut and clumps of cottonwood could be left. The following work is suggested for Stand 38 -

1. Cut elm, boxelder, and black locust. Treat the stumps of the elm and boxelder with Pathfinder II herbicide to prevent sprouting. Treat the stumps of the black locust with a 5% solution of Transline in Bark Oil EC.
2. Interplant 50 hackberry, 25 bur oak, and 25 swamp white oak per acre. Plant the trees 20 ft. apart. Protect the oak with a vented, 4 ft. tall tree shelter.
3. Control competing vegetation around each tree for 2 growing seasons by spot spraying a combination of Roundup and Princep 4L herbicides. Protect the seedling from the spray and spray an area 4 ft in diameter around each tree. Apply 2 quarts of Roundup and 4 quarts of Princep 4L per acre treated. The herbicides must be applied when the vegetation is actively growing.

## **Stand 39: 8 acres**

### ***Site Description –***

East facing slope with Nordness soils and rock outcrops.

### ***Woodland Description –***

Medium size (12-18" dbh) red oak, hard maple, basswood, shagbark hickory, and ash. The understory is ironwood, hard maple, and shagbark hickory.

### ***Management Recommendations – Uneven Age***

In 10-15 years, the stand could be selectively harvested. Following the harvest, the undesirable species and poor formed trees should be removed.

## **Stand 40: 4 acres**

### ***Site Description -***

Narrow ridge top with shallow soils.

### ***Woodland Description -***

Sapling to pole sized (1-8" dbh) ironwood, elm, aspen, hard maple, and a few walnut. The understory is hazel and prickly ash.

### ***Management Recommendations – Early Succession***

Clearcut the ridge top to create a dense area with aspen and shrubs. Treat stumps of elm and ironwood with Pathfinder II to prevent sprouting.

## **Stand 41: 4 acres**

### ***Site Description –***

Steep south facing slope with limestone close to the surface. This area borders the gravel road.

### ***Woodland Description -***

Medium size (12-18" dbh) red oak, bur oak, shagbark hickory, hard maple, and basswood. Understory is ironwood, hard maple, and shagbark hickory.

### ***Management Recommendations - Viewshed***

Nothing is recommended for this area. This is a steep slope above the road that should be left as it is.

## **Stand 42: 6 acres**

### ***Site Description -***

Gentle west slope with Dubuque silt loam soils.

### ***Woodland Description -***

Area was planted with Crandon Hybrid Poplar in 1997. One half of the area was clearcut in 2005.

### ***Management Recommendations – Early Succession***

Clearcut the remaining area in 2015.

### **Stand 43: 10 acres**

#### ***Site Description –***

Steep south facing slopes along the road with shallow soils.

#### ***Woodland Description -***

Large (20"+ dbh) red oak, white oak, bur oak, shagbark hickory, and scattered walnut. Understory is elm, ironwood, bitternut hickory, maple, basswood, and a few oak.

#### ***Management Recommendations - Viewshed***

This area is best left as is to have large trees next to the gravel road.

### **Stand 44: 5 acres**

#### ***Site Description –***

South and southwest facing slope with Nordness soils.

#### ***Woodland Description -***

Medium sized (12-18" dbh) bur oak, chinkapin oak, red oak, and walnut. The understory is chinkapin oak, walnut, ironwood, elm, hackberry, and bitternut hickory.

#### ***Management Recommendations – Even Age***

Clearcut area in 2010. Following the harvest, fell all trees 2 inches and larger in diameter. Treat the stumps of all undesirable species. In addition, kill all undesirable species larger than 1 inch in diameter. Due to the number of young oak in the understory, planting will not be necessary.

### **Stand 45: 12 acres**

#### ***Site Description -***

Steep, southeast facing slope with Nordness soils and rock outcroppings.

#### ***Woodland Description -***

Large (20"+ dbh) red oak, hard maple, basswood, walnut, and white oak. The understory is ironwood and hard maple.

#### ***Management Recommendations – Uneven Age***

Selective harvest to remove the mature walnut, basswood, elm, and hard maple. Following the harvest, kill the undesirable species and coppice the damaged, desirable species.

### **Stand 46: 16 acres**

***Site Description -***

Southeast and east facing slopes with Nordness soils.

***Woodland Description -***

Pole sized (5-10" dbh) walnut, bitternut hickory, black oak, hard maple, ash, honeylocust, white oak, cherry, aspen, shagbark hickory, red oak, and basswood. There is a good stocking of oak and walnut. There are scattered, mature walnut in the stand.

***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree Release) – Select a crop tree every 30 ft. apart and remove the competing trees. Trees to be removed can be felled or double girdled.

The scattered, large walnut could be sold along with the selective harvest in Stand 45.

**Stand 47: 23 acres**

***Site Description -***

East slope and valley. Soils are Dubuque silt loam on the side slopes and Dorchester silt loam in the valley.

***Woodland Description -***

Pole sized (5-10" dia.) red oak, black oak, hard maple, bitternut hickory, chinkapin oak, walnut, elm, ash, and honeylocust.

***Management Recommendations – Even Age***

Timber Stand Improvement & Walnut Pruning – Select 50 crop trees per acre and remove trees with crowns that are touching or overtopping the crowns of the crop trees. Trees to be removed can be felled or double girdled. Walnut trees selected as crop trees should be pruned to promote veneer quality trees.

**Stand 48: 8 acres**

***Site Description -***

West facing slope with Dubuque and Nordness soils.

***Woodland Description -***

Large (20"+ dbh) shagbark hickory, walnut, hard maple, red oak, and white oak. Understory is walnut, honeylocust, cherry, red cedar, red oak, elm, hard maple, and sumac. Regeneration consists of multiflora rose, prickly ash, red oak, hard maple, and elm. This area has a good stocking of young oak in the understory.

***Management Recommendations – Even Age***

Harvest all of the merchantable trees to create an even age stand of sapling to small pole sized trees. In approximately 10 years, the stand will be ready for a noncommercial thinning to release the crop trees.

### **Stand 49: 4 acres**

#### ***Site Description –***

Bench and gentle west slopes with Nordness and Dubuque soils.

#### ***Woodland Description -***

Large (20"+ dbh) red and white oak. The understory is ironwood and hard maple. There are very few desirable seedlings present.

#### ***Management Recommendations – Even Age***

Clearcut & Plant – Harvest all merchantable trees along with Stand 48. Following the harvest, fell all remaining trees 1 inch and larger in diameter. Treat the stumps of undesirable species with Pathfinder II herbicide. Plant the site with red and white oak seedlings. Planting large stock is essential for the trees to compete with the competition and grow above deer browsing height. The trees should be a minimum of 18-24" in height and 3/8" in caliper. Plant the trees 30 ft. apart, or 50 trees per acre.

Deer and rabbits will heavily browse oak seedlings. It is nearly impossible to establish oak without protection. You can protect the seedlings with a vented, plastic shelter which is 4 ft. tall.

### **Stand 50: 6 acres**

#### ***Site Description -***

West and northwest facing slopes with Nordness soils and rock outcroppings.

#### ***Woodland Description -***

Medium sized (12-18" dbh) red oak, white oak, hard maple, basswood, and walnut. The understory is ironwood and hard maple.

#### ***Management Recommendations – Uneven Age***

Selective harvest to remove the mature and damaged trees. Following the harvest, kill the undesirable species and coppice desirable species that are poor formed or damaged.

## **Stand 51: 49 acres**

### ***Site Description -***

Steep east and southeast facing slopes with shallow soils.

### ***Woodland Description -***

Large (20"+ dbh) red oak, hard maple, basswood, white oak, chinkapin oak, and ash. The understory is ironwood, hard maple, basswood, chinkapin oak, and prickly ash.

### ***Management Recommendations – Uneven Age***

In approximately 20 years, the stand could be selectively harvested.

## **Stand 52: 4 acres**

### ***Site Description -***

Narrow drainage with Dubuque silt loam soils.

### ***Woodland Description -***

Medium sized (12-18" dbh) aspen, walnut, and red oak. The understory is hard maple.

### ***Management Recommendations – Early Succession***

This area could be clearcut to create dense, young growth along the edge of the field. There is a good aspen component that will expand from root suckers following clearcutting. Treat the stumps of elm, ironwood, and hard maple with Pathfinder II to encourage the site to regenerate to aspen.

There are nice walnut and red oak in the area that should be commercially harvested.

## **Stand 53: 4 acres**

### ***Site Description -***

Steep, east facing slope with Dubuque soils.

### ***Woodland Description -***

Pole sized (5-10" dbh) hard maple, cherry, aspen, elm, ash, bittersweet hickory, and basswood. There are a few red and chinkapin oak. This area was clearcut 20 years ago.

### ***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree) – thin the stand to release the crop trees. Select 50 trees per acre and remove the competing trees. This area has very few oak so it is low priority.

## **Stand 54: 15 acres**

***Site Description -***

Ridge along field edge with Fayette and Nordness soils.

***Woodland Description -***

Large (20"+ dbh) red oak, hard maple, ash, and basswood. There are scattered walnut and aspen along the edge. The understory is ironwood, hard maple, ash, prickly ash, gooseberry, and scattered walnut pole sized trees.

***Management Recommendations – Even Age***

Clearcut & Plant – Clearcut 5-6 acres of this area every 15 years. Following the harvest, fell all remaining trees 1" and larger in diameter. Treat the stumps of undesirable species with Pathfinder II herbicide. Plant the clearcut area with red and white oak. Plant the trees 30 ft. apart, or 50 trees per acre. Plant large stock and protect each seedling with a 4 ft. tall shelter.

**Stand 55: 18 acres**

***Site Description –***

Steep southwest facing slope along the road. Soils are shallow over limestone.

***Woodland Description -***

Medium size (12-18" dbh) chinkapin oak, bur oak, and shagbark hickory. The understory is hazel, gray dogwood, ironwood, and hard maple.

***Management Recommendations - Viewshed***

Leave this area as is for a nice buffer along the road.

**Stand 56: 15 acres**

***Site Description -***

Bottomland and side slopes with Dubuque silt loam soils.

***Woodland Description -***

Pole sized (5-10" dbh) boxelder, elm, walnut, red oak, and black oak. This area has numerous walnut, but many of the walnut are poor quality.

***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree Release) – Identify the good quality walnut and the oak. Remove trees with crowns that are touching or overtopping the crowns of your crop trees. Prune the walnut crop trees to improve their potential value.

**Stand 57: 3 acres**

***Site Description -***

Very steep, rocky, east facing slope.

***Woodland Description -***

Large (20"+ dbh) hard maple, basswood, red oak, white oak, and bur oak. The understory is hard maple, basswood, elm, and ironwood.

***Management Recommendations - Viewshed***

This area is very steep and not conducive to woodland management. I suggest leaving this area as is.

**Stand 58: 11 acres**

***Site Description -***

Mainly south and southwest facing slopes. Nordness and Dubuque silt loam soils.

***Woodland Description -***

Large (20"+ dbh) bur oak, red oak, shagbark hickory, white oak, walnut, ash, hackberry, and basswood. The understory is ironwood, blue beech, and cherry. There are a few walnut, hard maple, ash, and hackberry.

***Management Recommendations – Even Age (Shelterwood & Burning)***

Stand 58 would be a good site to manage as a “Shelterwood” to encourage the natural regeneration of oak. The first step is to kill the undesirable species now to open up the ground to sunlight. Kill the ironwood, blue beech, and elm. The area could be burned for 3-5 successive years to kill the thin barked species and encourage oak regeneration. The stand could be clearcut harvested once there are an adequate number of oak 3-5 ft. tall.

**Stand 59: 3 acres**

***Site Description -***

Field that was direct seeded with oak, walnut, and ash in 2003. Soils are Dubuque and Fayette silt loams.

***Recommendations – Early Succession***

There are very few oak present in the direct seeding. Scattered walnut are present among the goldenrod, ragweed, and thistles. I suggest starting over and planting this area to a mixture of red cedar and shrubs.

Mow the area in July to August. Broadcast spray the site with Roundup herbicide in August to September. Plant the area with strips of red cedar and shrubs.

Recommended shrubs are hazelnut, wild plum, and ninebark. The strips could consist of 4 rows of red cedar with 3 rows of shrubs on each side of the cedars. Plant the cedars on

a 10 X 10 ft. spacing. Leave 20 ft. between the cedar row and the adjoining shrub row. Plant the shrubs on a 4 X 10 ft. spacing. Two strip plantings could be planted across the field.

Control competing vegetation for a minimum of 3 years. After the trees are planted and before any vegetation emerges, spray a 4 ft. wide band down each row with Pendulum herbicide. Apply 4 quarts of Pendulum per acre treated.

Each spring before any vegetation emerges, apply Pendulum again for the next season's weed control. The area between the rows should be mowed 2-3 times per year.

A couple of post emergents that can be used if the pre-emergents aren't effective are transline and fusilade. Transline can be applied over the trees while they are actively growing to control broadleaf problems. Apply Transline at a rate of 0.5 pints/ac. Fusilade can be applied over the trees while they are actively growing to control grass problems. Apply Fusilade at a rate of 1 pint/ac plus a non-ionic surfactant. Both herbicides need to be applied when the vegetation is 8" or less.

### **Stand 60: 5 acres**

#### ***Site Description -***

Ravine and side slopes with Nordness soils.

#### ***Woodland Description -***

Large (20"+ dbh) white oak, walnut, red oak, hard maple, and basswood. The understory is ironwood, cherry, walnut, hard maple, ash, bitternut hickory, elm, and basswood.

#### ***Management Recommendations – Uneven Age***

Due to the steepness of the area, the stand could be managed on an uneven age system. The undesirable species could be killed in 2010. In 2020, the stand could be selectively harvested.

### **Stand 61: 2 acres**

#### ***Site Description -***

Ridge top with Dubuque silt loam soils.

#### ***Woodland Description -***

Large (20"+ dbh) walnut, red oak, and white oak. The understory is ironwood and hard maple. There are several nice walnut in this area.

***Management Recommendations – Even Age***

Clearcut & Plant – Sell all merchantable trees. Following the harvest, fell all trees 1” and larger in diameter. Treat the stumps of undesirable species with Pathfinder II to prevent sprouting. Plant the area with large white and red oak seedlings. Plant the trees 30 ft. apart or 50 trees per acre. Protect the trees with 4 ft. tall vented shelters.

**Stand 62: 15 acres**

***Site Description -***

West facing slope with Nordness soils.

***Woodland Description –***

Pole sized (5-10” dbh) bur oak, elm, cherry, walnut, red oak, black oak, ironwood, bitternut hickory, and hackberry. There is a good stocking of oak and walnut.

***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree) – Locate 30 crop trees per acre and remove the competing trees. Prune the walnut that are selected as crop trees. Favor the oak and walnut in the selection of crop trees.

**Stand 63: 2 acres**

***Site Description –***

Southwest facing slope with Nordness soils.

***Woodland Description -***

Pole sized (5-10” dbh) walnut, elm, and aspen. Walnut are poor formed.

***Management Recommendations – Early Succession***

Clearcut the area to expand the aspen clump. Treat the stumps of the elm with Pathfinder II herbicide.

## **Stand 64: 1 acre**

### ***Site Description -***

Steep south facing slope with Nordness soils and rock outcroppings.

### ***Woodland Description -***

Sapling (1-4" dbh) red oak, bitternut hickory, hard maple, aspen, and hackberry. The area was clearcut in 1999.

### ***Management Recommendations – Early Succession***

The area could be clearcut again in 10 years to maintain the site in dense, young growth. This will also encourage the aspen component in the stand to increase.

## **Stand 65: 2 acres**

### ***Site Description -***

Lower slope and bottom with Dorchester and Nordness soils.

### ***Woodland Description -***

Medium sized (12-18" dbh) aspen, walnut, and hard maple. There are scattered, larger walnut. The understory is hard maple.

### ***Management Recommendations – Early Succession***

Clearcut the area to expand the aspen component in this stand. This would be a commercial sale with several merchantable walnut and hard maple.

## **Stand 66: 11 acres**

### ***Site Description -***

Ridgetop and north, east, and south facing slopes. Soils are Nordness with rock outcroppings.

### ***Woodland Description -***

Scattered, medium sized (12-18" dbh) bur oak, red oak, and walnut. The understory is hard maple, bitternut hickory, ironwood, hackberry, basswood, and elm.

### ***Management Recommendations – Uneven Age***

Timber Stand Improvement (Weed Tree) – Kill the bitternut hickory, ironwood, and elm. Fell the trees and cut the stumps with Pathfinder II herbicide to prevent sprouting. In addition, coppice desirable species that are poor formed or damaged.

The stand could be selectively harvested in 25 years.

## **Stand 67: 15 acres**

### ***Site Description -***

South facing slope with Nordness soils and rock outcroppings.

### ***Woodland Description -***

Mainly sapling (1-4" dbh) elm, hard maple, cherry, black ash, and ironwood. Scattered medium sized basswood, walnut, red oak, white oak, and chinkapin oak. The stand was logged heavy 15-20 years ago.

### ***Management Recommendations – Uneven Age***

Timber Stand Improvement (Weed Tree) – Kill the undesirable species such as ironwood and elm. Fell the trees and treat the stumps with Pathfinder II to prevent sprouting. This will help to develop a hard maple forest.

## **Stand 68: 21 acres**

### ***Site Description –***

Steep east and southeast facing slopes with shallow soils to limestone.

### ***Woodland Description -***

Sapling (1-4" dbh) hard maple, elm, cherry, black ash, and ironwood. There are scattered basswood, walnut, red oak, and white oak that are 14-22" in diameter.

### ***Management Recommendations - Viewshed***

This area borders the road and is very steep. I suggest leaving this area as it is with no further management.

## **Stand 69: 2 acres**

### ***Site Description -***

North facing slope with Nordness and Fayette soils.

### ***Woodland Description -***

Semi open area with scattered, small elm.

### ***Management Recommendations – Early Succession***

Remove the elm and plant red cedar for winter cover. Cut the elm and treat the stumps with Pathfinder II to prevent sprouting. Plant red cedar on a 10 X 10 ft. spacing. Control competing vegetation for 2 years. Control competing vegetation by spot spraying a combination of Roundup and Princep 4L herbicides. Protect the seedling from the spray and spray an area 4 ft in diameter around each tree. Apply 2 quarts of Roundup and 4 quarts of Princep 4L per acre treated. The herbicides must be applied when the vegetation is actively growing.

## **Stand 70: 12 acres**

### ***Site Description -***

North facing slope with Nordness soils.

### ***Woodland Description -***

Sapling (1-4" dbh) ironwood, elm, bitternut hickory, ash, and hard maple. There are scattered hard maple, basswood, elm, and oak which are 14-20" in diameter.

### ***Management Recommendations – Uneven Age***

Timber Stand Improvement (Weed Tree) – Kill the ironwood, elm, and bitternut hickory to encourage the natural regeneration of desirable trees.

## **Stand 71: 70 acres**

### ***Site Description -***

Steep west, south, and east facing slope. Shallow soils with rock outcroppings.

### ***Woodland Description -***

Pole to medium size (5-18" dbh) red oak, white oak, and hard maple. The understory is hard maple and basswood.

### ***Management Recommendations - Viewshed***

Leave this area as is to provide a buffer and erosion control on the steep slopes.

## **Stand 72: 3 acres**

### ***Site Description -***

East facing slope and ridge top with Dubuque and Nordness soils.

### ***Woodland Description -***

Sapling (1-4" dbh) hard maple, bitternut hickory, ash, cherry, and basswood. There are a few oak stump sprouts. This area was clearcut 10-15 years ago.

### ***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree Release) – In 5-10 years, this area could be thinned to favor the growth of oak, cherry, hard maple, and basswood. Select 50 crop trees per acre and remove trees with crowns that are touching or overtopping the crowns of the crop trees.

### **Stand 73: 13 acres**

#### ***Site Description -***

Gentle, west facing slope with Nordness soils.

#### ***Woodland Description -***

Pole sized (5-10" dbh) white oak, red oak, basswood, ash, and elm. This is a nice stand of pole sized trees with a good component of oak.

#### ***Management Recommendations – Even Age***

Timber Stand Improvement (Crop Tree Release) – Select 50 crop trees per acre and remove the competing trees. Trees with crowns that are touching or overtopping the crowns of the crop trees should be felled or double girdled.

### **Stand 74: 28 acres**

#### ***Site Description -***

Ridge top and west facing slope with Fayette and Dubuque soils.

#### ***Woodland Description -***

Medium sized (12-18" dbh) white oak, walnut, ash, and red oak. There are patches of aspen. The understory is hard maple, basswood, ash, and bitternut hickory.

#### ***Management Recommendations – Even Age***

In approximately 15-20, 6-7 acres of the stand could be clearcut harvested. Target areas with an aspen component to regenerate the aspen.

### **Stand 75: 10 acres**

#### ***Site Description -***

North and northwest facing slopes with Nordness soils and rock outcroppings.

#### ***Woodland Description -***

Medium sized (12-18" dbh) white oak and red oak. The understory and regeneration is hard maple.

#### ***Management Recommendations – Uneven Age***

Because of the abundance of hard maple that is established in this stand and the steep slopes, this area can best be managed on an uneven age system. In 20 years, the stand could be selectively harvested and the undesirable species removed.

## **Stand 76: 4 acres**

### ***Site Description -***

South and east facing slopes with Nordness soils.

### ***Woodland Description -***

Sapling (1-4" dbh) aspen, cherry, ash, hard maple, and basswood. The area was clearcut in 1999.

### ***Management Recommendations – Early Succession***

Clearcut this area again in 7-10 years to maintain the area in young, dense growth.

## **Stand 77: 9 acres**

### ***Site Description -***

North and east facing slopes with Dubuque, Fayette, and Nordness soils.

### ***Woodland Description -***

Medium sized (12-18" dbh) hard maple and black cherry. The understory is hard maple.

### ***Management Recommendations – Uneven Age***

Selective harvest the stand in 30 years.

## **Stand 78: 211**

### ***Site Description -***

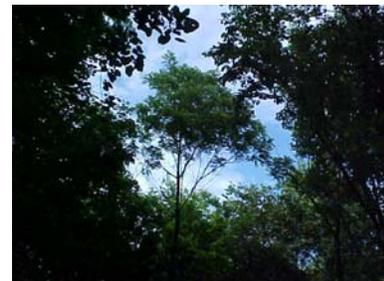
Bottomland along the trout stream. The major soil type is Dorchester silt loam.

### ***Woodland Description -***

Pole sized (5-10" dbh) boxelder, elm, and willow. There are scattered, large cottonwood. Sapling to pole sized (1-10" dbh) hackberry and walnut are scattered throughout the area.

### ***Management Recommendations - Viewshed***

The main focus of this area should be to maintain tree cover along the trout stream. The scattered hackberry, walnut and other desirable species could be located and released. This would improve the diversity of species.



## HIGH PRIORITY PROJECTS

### *Tree Planting -*

<u>Stand #</u>	<u>Acres</u>	<u>Prescription</u>
6	7	Plant oak following clearcut
10	7	Plant oak following clearcut
18	2	Fell all trees and interplant oak
27	3	Plant open areas with red cedar
59	3	Plant cedars and shrubs
69	2	Plant red cedar
Total	24	

### *Timber Stand Improvement – Crop Tree Release*

<u>Stand #</u>	<u>Acres</u>
5	2
9	3
14	24
20	8
30	7
32	51
36	27
46	16
47	23
62	15
73	13
Total	189

***Timber Stand Improvement – Weed Tree Removal***

<b><u>Stand #</u></b>	<b><u>Acres</u></b>
12	17
7	30
26	35
37	17
45	12
50	6
Total	117

***Early Successional Clearcuts – 15 yr. rotation***

<b><u>Stand #</u></b>	<b><u>Acres</u></b>
22	3
27	10
29	1
40	4
52	4
63	2
65	2
Total	26

***Even Age Clearcuts – 125 yr. rotation***

<b><u>Stand #</u></b>	<b><u>Acres</u></b>
6	7
10	7
Totals	14

*Selective Harvest – 20 yr. cycle*

<b>Stand #</b>	<b>Acres</b>
7	30
37	17
45	12
50	6
Totals	65

# APPENDIX

**Table 1. Forest Breeding Birds of Greatest Conservation Need in NE Iowa**

<b>Common Name</b>	<b>Scientific Name</b>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Broad-winged hawk	<i>Buteo platypterus</i>
Peregrine falcon	<i>Falco peregrinus</i>
Ruffed grouse	<i>Bonasa umbellus</i>
American woodcock	<i>Scolopax minor</i>
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Long-eared owl	<i>Asio otus</i>
Whip-poor-will	<i>Caprimulgus vociferus</i>
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
Acadian flycatcher	<i>Empidonax virescens</i>
Willow flycatcher	<i>Empidonax traillii</i>
Least flycatcher	<i>Empidonax minimus</i>
Brown creeper	<i>Certhia americana</i>
Veery	<i>Catharus fuscescens</i>
Wood thrush	<i>Hylocichla mustelina</i>
Blue-winged warbler	<i>Vermivora pinus</i>
Cerulean warbler	<i>Dendroica cerulea</i>
Black-and-white warbler	<i>Mniotilta varia</i>
Prothonotary warbler	<i>Protonotaria citrea</i>
Worm-eating warbler	<i>Helmitheros vermivorus</i>
Louisiana waterthrush	<i>Seiurus motacilla</i>
Kentucky warbler	<i>Oporornis formosus</i>
Hooded warbler	<i>Wilsonia citrina</i>
Eastern towhee	<i>Pipilo erythrophthalmus</i>

**Table 2. Forest Migratory Birds of Greatest Conservation Need in NE Iowa**

<b>Common Name</b>	<b>Scientific Name</b>
Golden-winged warbler	<i>Vermivora chrysoptera</i>
Canada warbler	<i>Wilsonia canadensis</i>

**Table 3. Forest Mammals of Greatest Conservation Need in NE Iowa**

<b>Common Name</b>	<b>Scientific Name</b>
Northern myotis	<i>Myotis septentrionalis</i>
Red squirrel	<i>Tamiasciurus hudsonicus</i>
Woodland vole	<i>Microtus pinetorum</i>
Spotted skunk	<i>Spilogale putorius</i>
Southern Flying Squirrel	<i>Glaucomys volans</i>

**Table 4. Forest Reptiles and Amphibians of Greatest Conservation Need in NE Iowa**

<b>Common Name</b>	<b>Scientific Name</b>
Cricket Frog	<i>Acris crepitans</i>
Northern Prairie Skink	<i>Eumeces septentrionalis</i>
Bullsnake	<i>Pituophis catenifer sayi</i>
Timber Rattlesnake	<i>Crotalus horridus</i>

**Table 5. Forest Land Snails of Greatest Conservation Need in NE Iowa  
(Restricted to Algific Talus Slopes and Maderate Slopes)**

<b>Common Name</b>	<b>Scientific Name</b>
Iowa Pleistocene Snail	<i>Discus macclintocki</i>
Frigid Ambersnail	<i>Catinella gelida</i>
Minnesota Pleistocene Succinea	<i>Novasuccinea n. Sp. Minnesota a</i>
Iowa Pleistocene Succinea	<i>Novasuccinea n. Sp. Minnesota b</i>
Briarton Pleistocene Snail	<i>Vertigo brierensis</i>
Hubricht's Vertigo	<i>Vertigo hubrichti</i>
Iowa Pleistocene Vertigo	<i>Vertigo iowaensis</i>
Bluff Vertigo	<i>Vertigo occulta</i>

**Table 6. Forest Butterflies of Greatest Conservation Need in NE Iowa**

<b>Common Name</b>	<b>Scientific Name</b>
Pepper and Salt Skipper	<i>Amblyscirtes hegon</i>
Sleepy Duskywing	<i>Erynnis brizo</i>
Dreamy Duskywing	<i>Erynnis icelus</i>
Columbine Duskywing	<i>Erynnis lucilius</i>
Silvery Blue	<i>Glaucopsyche lygdamus</i>
Hickory Hairstreak	<i>Satyrium caryaevorum</i>
Edward's Hairstreak	<i>Satyrium edwardsii</i>
Striped Hairstreak	<i>Satyrium liparops</i>



No.	Acres	Timber Type	TreeSize	Mngt. System	Prescription	Priority	Year Complete	Comments
14	24	Oak Walnut B. Hickory	Pole	Even Age	TSI – Release Crop Trees	High	2005	Scattered Apple Trees
15	3	Aspen	Sapling	Early Successi onal	Clearcut	High	2015	
16	3	Aspen	Sapling	Early Successi onal	Clearcut	High	2015	
17	4	Aspen	Pole	Early Successi onal	Clearcut	High	2010	
18	2	Maple Ironwood	Sapling	Even Age	Fell all trees and plant oak	Medium	2006	
19	18	Oak Maple	Medium	Uneven Age	TSI – Kill Weed Trees Selective Cut	Medium Medium	2015 2025	
20	8	Walnut Ash Elm	Pole	Even Age	TSI – Release Crop Trees	Medium	2005	
21	6	Oak Walnut	Large	View Shed				
22	3	Aspen	Pole	Early Successi onal	Clearcut	High	2005	
23	53	Oak Maple Basswood	Medium	Uneven Age	Selective Cut	Medium	2025	
24	5	Aspen Red Oak	Medium	Early Successi onal	Clearcut	High	2015	
25	18	Upland Mixed Hdws.	Pole	Even Age	TSI – Release Crop Trees	High	2010	
26	35	Oak Maple	Medium	Uneven Age	TSI – Weed Tree Removal Selective Cut	Medium Medium	2005 2020	
27	51	Cedar Hdws.	Sapling	Early Successi onal	Clearcut Aspen Stands & Plant Cedars in openings	High	2005 2006	
28	19	Maple Basswood Oak	Medium	Uneven Age	TSI – Kill weed trees Selective Cut	Medium Medium	2010 2020	
29	1	Boxelder Elm	Pole	Early Successi onal	Clearcut	High	2005	

No.	Acres	Timber Type	TreeSize	Mngt. System	Prescription	Priority	Year Complete	Comments
30	7	Walnut Elm Maple	Pole	Even	TSI – Release Crop Trees	High	2005	
31	10	Oak Hard Maple	Large	View Shed				
32	51	Oak Walnut	Pole	Even Age	TSI – Release Crop Trees	High	2005	
33	3	H. Maple Boxelder B.Hickory	Pole	Early Successi onal	Clearcut	High	2010	
34	7	Boxelder	Pole	Even Age	Kill boxelder and plant desirable species	High	2010	
35	6	Red Oak Basswood	Large	View Shed				
36	27	Mixed Hdwds.	Pole	Even Age	TSI – Crop Tree Release	High	2005	
37	17	Oak Maple Basswood	Large	Uneven Age	Selective Harvest TSI – Kill weed trees	High	2006	
38	8	Boxelder Elm	Pole	Even Age	Stand Conversion	Low	2015	
39	8	Red Oak Maple Basswood	Medium	Uneven Age	TSI – Kill weed trees Selective Cut	Medium	2020	
40	4	Ironwood Elm	Pole	Early successio nal	Clearcut	High	2005	
41	4	Oak Maple Basswood	Medium	View Shed				
42	6	Aspen	Sapling	Early Successi onal	Clearcut	High	2015	
43	10	Oak Hickory	Large	View Shed				
44	5	Oak Walnut	Medium	Even Age	Clearcut	Medium	2010	
45	12	Oak Maple Basswood	Large	Uneven Age	Selective Cut	High	2006	
46	16	Oak Walnut Mixed Hdwds.	Pole	Even Age	TSI – Crop Tree Release	High	2005	

No.	Acres	Timber Type	Tree Size	Mngt. System	Prescription	Priority	Year Complete	Comments
47	23	Oak Walnut	Pole	Even Age	TSI – Crop Tree Release	High	2005	
48	8	Oak Hickory	Large	Even Age	Clearcut	High	2010	
49	4	Red, White Oak	Large	Even Age	Clearcut and plant oak	High	2010	
50	6	Oak Mixed Hdws.	Medium	Uneven Age	Selective Cut & Kill undesirable species	Medium	2006	
51	49	Oak Maple Basswood	Large	Uneven Age	Selective Cut	Medium	2025	
52	4	Oak Walnut Aspen	Medium	Early Successional	Clearcut	High	2006	
53	4	Mixed Hdws.	Pole	Even Age	TSI – Crop Tree Release	Low	2010	
54	15	Oak Maple Basswood	Large	Even Age	Clearcut and Plant Oak	High	2015	
55	18	Oak Hickory	Medium	View Shed				
56	15	Oak Walnut	Pole	Even Age	TSI – Crop Tree Release	Medium	2010	
57	3	Oak Maple Basswood	Large	View Shed				
58	11	Oak Hickory	Large	Even Age	Shelterwood Mngt. – TSI – kill weed trees.	Medium	2010	
59	3	Open Ground			Plant red cedar and shrubs	Medium	2006	
60	5	Oak Maple Basswood	Large	Uneven Age	TSI – kill weed trees Selective Cut	Medium	2010 2020	
61	2	Oak Walnut	Large	Even Age	Clearcut and Plant	High	2010	
62	15	Oak Walnut	Poles	Even Age	TSI – Release Crop Trees	High	2005	
63	2	Walnut Elm Aspen	Pole	Early Successional	Clearcut	High	2005	

No.	Acres	Timber Type	Tree Size	Mngt. System	Prescription	Priority	Year Complete	Comments
64	1	Aspen	Sapling	Early Successional	Clearcut	High	2015	
65	2	Aspen	Medium	Early Successional	Clearcut	High	2006	Scattered Commercial Walnut
66	11	Maple Basswood	Pole	Uneven Age	TSI – Kill weed trees	Medium	2015	
67	15	Mixed Hdwds.	Sapling	Uneven Age	TSI – Kill weed trees	Low	2015	
68	21	Mixed Hdwds.	Medium	View Shed				
69	2	Elm Shrubs	Sapling	Early Successional	Plant red cedar	High	2006	
70	12	Maple Basswood Oak	Sapling	Uneven Age	TSI – kill undesirable species	Low	2015	
71	70	Oak Maple	Pole	View Shed				
72	3	Maple Basswood	Sapling	Even Age	TSI – Release Crop Trees	Medium	2015	
73	13	Oak Basswood	Pole	Even Age	TSI – Release Crop Trees	High	2005	
74	28	Oak Basswood Aspen	Medium	Even Age	Clearcut	Medium	2025	
75	10	White Oak Red Oak	Medium	Uneven Age	Selective Harvest	Low	2025	
76	4	Aspen	Sapling	Early Successional	Clearcut	High	2010	
77	9	Hard Maple Cherry	Medium	Uneven Age	Selective Cut	Low	2030	
78	193	Elm Boxelder	Pole	View Shed	TSI – Release scattered crop trees	Low	2020	

## **EXPLANATION OF TIMBER MANAGEMENT PRACTICES:**

### **Timber Stand Improvement:**

Timber stand improvement (TSI) is the removal of undesirable or low value trees. Removing these unwanted trees will provide more space and sunlight for desirable trees to grow. Timber stand improvement is a “weeding” to increase the growth of your forest.

### ***Weed Tree Removal-***

In older timber, the undesirable species can be killed to encourage the natural reseeding of desirable species. The removal of the “weed” trees allows sunlight to reach the ground so that seedlings can become established. The undesirable species can be killed standing by cutting flaps in the trunk and applying Tordon RTU or Pathway into the cuts. The cuts must be in a circle around the trunk and overlapping. The trees can also be cut off and the stumps treated with Tordon RTU or Pathway to prevent resprouting. Wet the outer rim of freshly cut stumps. The work can be done anytime except spring during heavy sap flow.

Desirable trees that are poor formed or damaged should also be removed. These trees should not be treated with herbicide. The stumps will resprout and produce another tree. Cut the stumps close to the ground so that the sprout will originate near the ground.

### ***Crop-Tree Release-***

In pole-sized stands (4-10” dia.), potential crop trees can be selected and released. At maturity, there is room for 35-50 trees per acre. Now you can select the trees you want to comprise your future stand of mature trees and thin around them to give them more growing space. Select a crop tree every 30-35 ft. apart. Remove trees with crowns that are touching or overtopping the crowns of your crop trees. Crop trees can be selected based on criteria that meets your objectives. Normally, the crop trees will be a desirable species, show good form without large side limbs, and be free of major defects. Species normally favored are black walnut, red oak, white oak, white ash, basswood, cherry, and hard maple.

### ***Walnut Pruning-***

Walnut trees that are 2-12” in diameter can be pruned to promote veneer quality trees. You should prune during the dormant season. Limbs less than 1 inch in diameter are providing foliage which produces food for the tree and should be left. When the limbs approach 1 1/2 to 2” in diameter, they should be removed. Do not remove over 1/3 of the live crown in any one year. At least 50% of the total height of the tree should be maintained in live crown.

## **Harvest:**

### ***Uneven-Age Management:***

Uneven-age management can be implemented to manage shade tolerant species. The timber is selectively harvested to remove mature, damaged, and defective trees. Because large trees are always present in the timber, only species that can grow in the shade can reproduce. Hard maple and basswood can be managed on an uneven-age system of management. Uneven-age management involves maintaining a good distribution of all tree sizes in your timber. It is critical that following a selective harvest, the smaller trees are thinned to remove the trees damaged by logging, poor formed trees, and low value species. The thinning following the harvest insures that you have high quality trees ready to replace the older trees as they are harvested.

### ***Even-Age Management:***

Even-age management involves a clearcut at some point in the stands rotation. Clearcutting creates full sunlight to the ground. All trees 2" and larger in diameter are felled. Oak, ash, hickory, and walnut require full sunlight to grow. Even-age management must be applied to successively manage these species. Clearcutting creates stands of trees all the same age. The trees compete equally for sunlight and are forced to grow straight and tall, resulting in high quality timber. Clearcutting also provides excellent browse and cover for wildlife.

### ***Shelterwood:***

Shelterwood is a form of even-age management. The final cut is a clearcut, but several thinnings are done prior to the final cut. The large, healthy trees are left to provide seed for naturally reseeding the stand, and to create partial shade to inhibit the growth of weeds and brush until the desirable seedlings are well established. The final cut or clearcut is normally done when there are a sufficient number of desirable trees that are 3-5 ft. tall.

The first thinning can be a killing of the undesirable species such as ironwood, elm, bitternut hickory, and boxelder. This removes the seed source for the undesirable species and opens up the ground to sunlight.

The mature and defective trees can be harvested if additional sunlight is needed for the development of desirable seedlings. The harvest should be light, removing the trees that are deteriorating and leaving the high quality trees for seed.

The shelterwood system can take many years to develop a good stocking of desirable young trees. You may have to kill the undesirable species several times to favor the species you want. The final clearcut should not be made until you are satisfied with the stocking of desirable young trees.