FOREST WILDLIFE STEWARDSHIP PLAN

FOR

LANSING WILDLIFE AREA

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

Developed by

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District Forester

And

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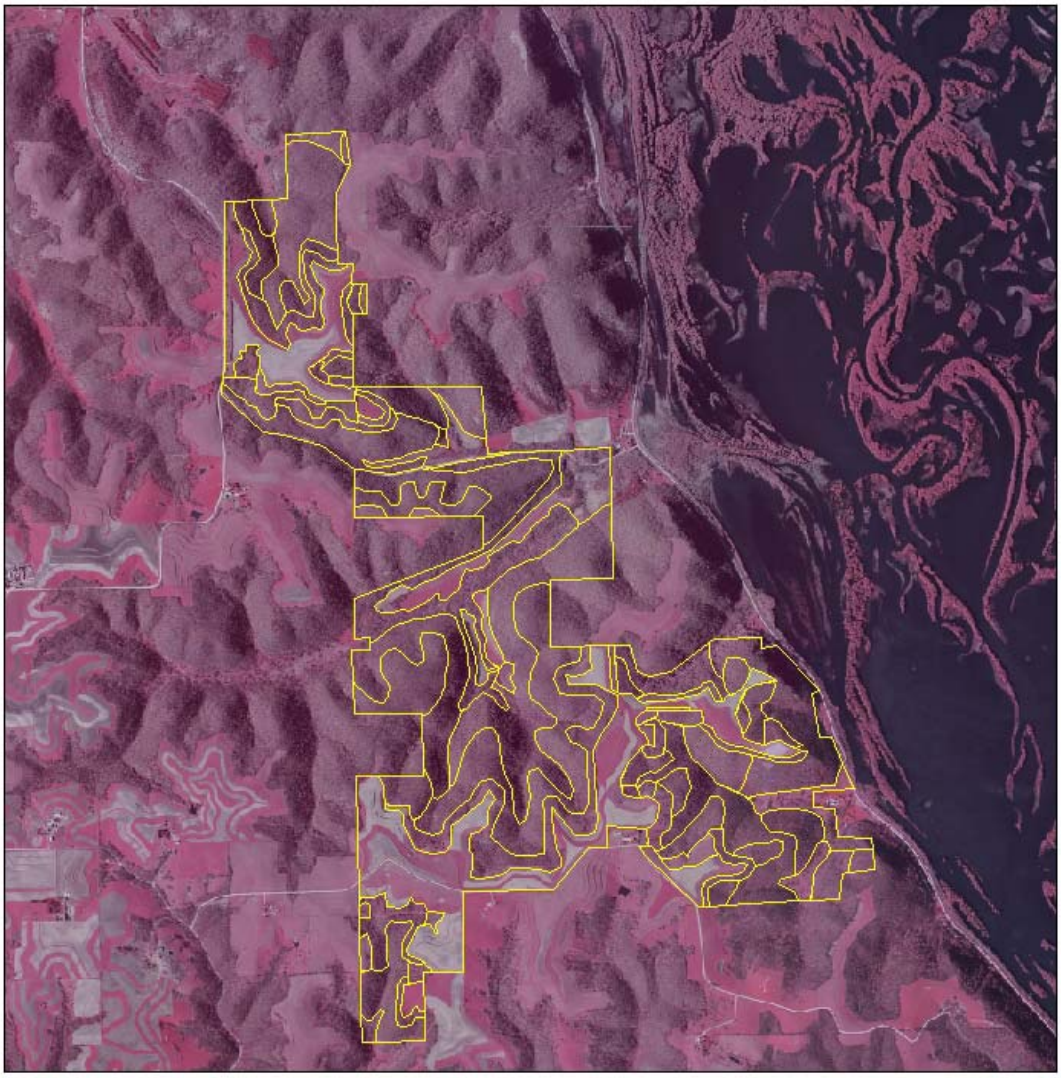
FOREST STEWARDSHIP PLAN
FOR LANSING WILDLIFE AREA



Sec. 2, 11, 12, 13, 14, & 23
Lansing Twsp., T99N-R4W,
Allamakee County

0 1,200 2,400 4,800 7,200 9,600 Feet

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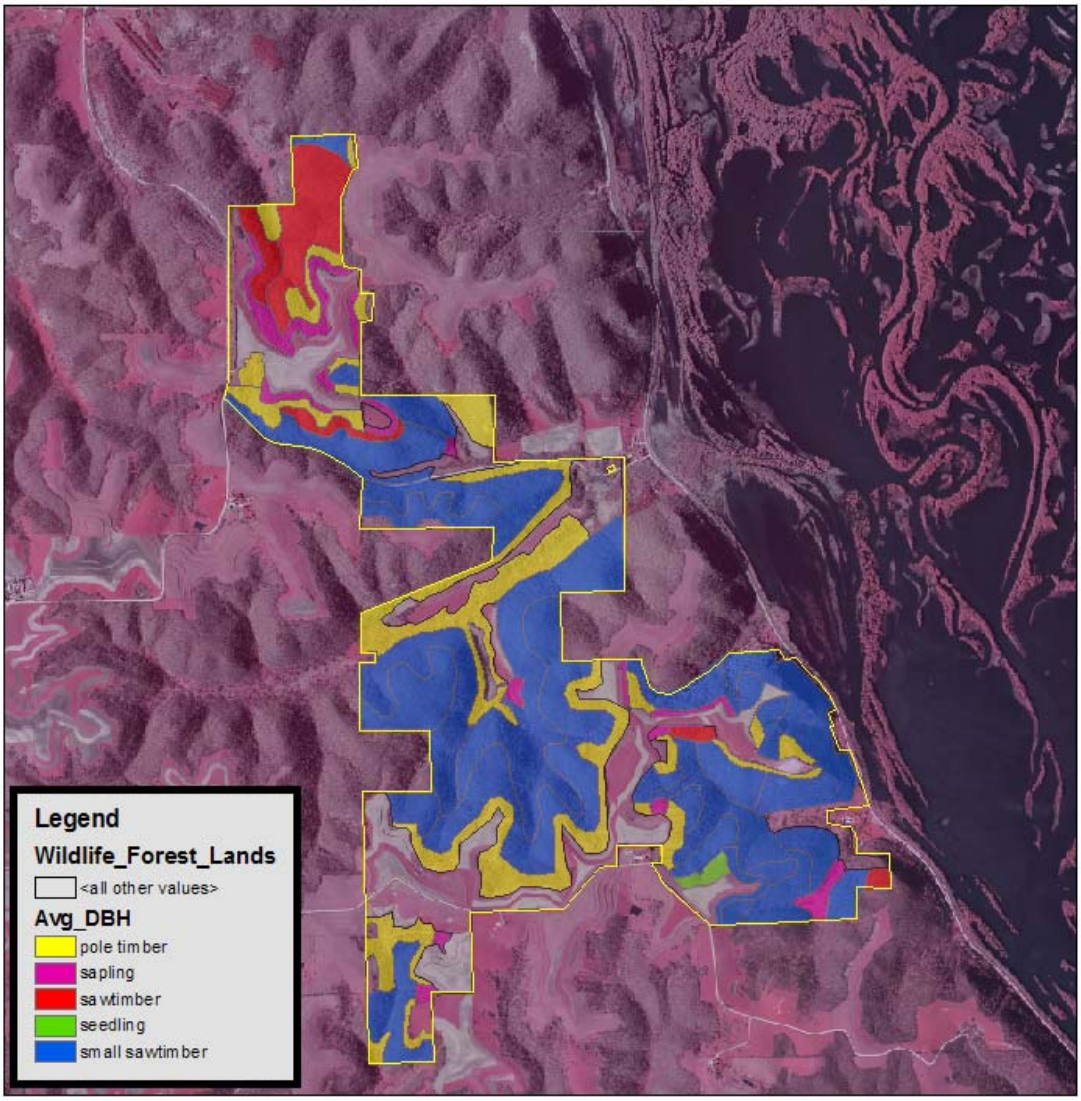
LANSING WILDLIFE AREA
AVERAGE TREE SIZE



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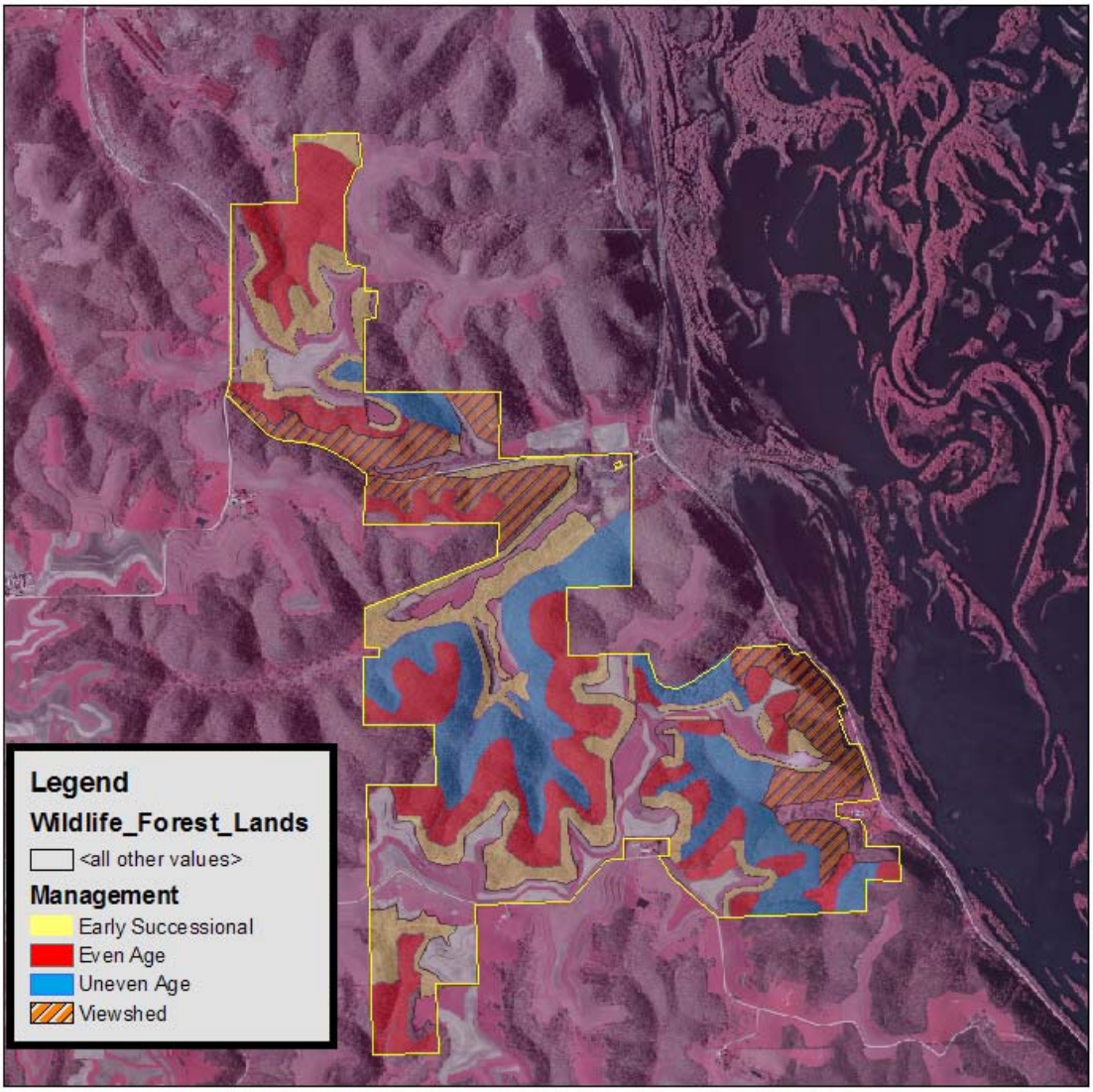
LANSING WILDLIFE AREA
FOREST MANAGEMENT SYSTEMS



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DATE: 2/24/06

FOREST WILDLIFE STEWARDSHIP PLAN
FOR
LANSING WILDLIFE AREA

MANAGER:

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LOCATION: Sec. 2, 11, 12, 13, 14, & 23 Lansing Twsp., T99N-R4W, Allamakee County

TOTAL ACRES: 1,418

INTRODUCTION

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 wildlife species.

Some wildlife species use all of 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 all of the above species and others as species of "greatest conservation needs". (Appendix – Tables 1-6).

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 the habitat needs of these wildlife species will be guiding factors to forest management decisions. Evaluations will be conducted to monitor the success of these management decisions. Forest and wildlife inventories will be conducted on each WMA and the information will be entered into a database. This database along with the "FWSP Definitions and Guiding Factors"(Appendix) will be used to make forest management decisions on the WMA's. The primary goal will be to maintain or increase populations of wildlife species of greatest conservation needs.

DESCRIPTION OF AREA

The 1,418 acres addressed in this plan are outlined on the attached aerial photo. The area is divided into 56 different areas or stands, labeled 1-56 on the map. Each area is described in this plan and recommendations outlined for woodland management.

Lansing Wildlife Area has large tracts of woodland. Most of the area was logged heavily before the State purchased the land 40-50 years ago. The woodland is a mixture of steep slopes, ridge tops, and stream valleys. The total area is 1,955 acres of which 73% 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:

Tree Size	Acres	% of Total Area
Seedling	13.5	1
Sapling (<4" dbh)	76.5	5
Pole size (5-12" dbh.)	319	23
Medium Size (14-18" dbh.)	897	63
Large (>20" dbh)	112	8
Totals	1,418	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 Lansing Wildlife Area, the acres under each management system are as follows -

Management System	Acres	% of Total Area
Early Successional	359	25
Even Age	474	34
Uneven Age	355	25
Viewshed	230	16
Total	1,418	100

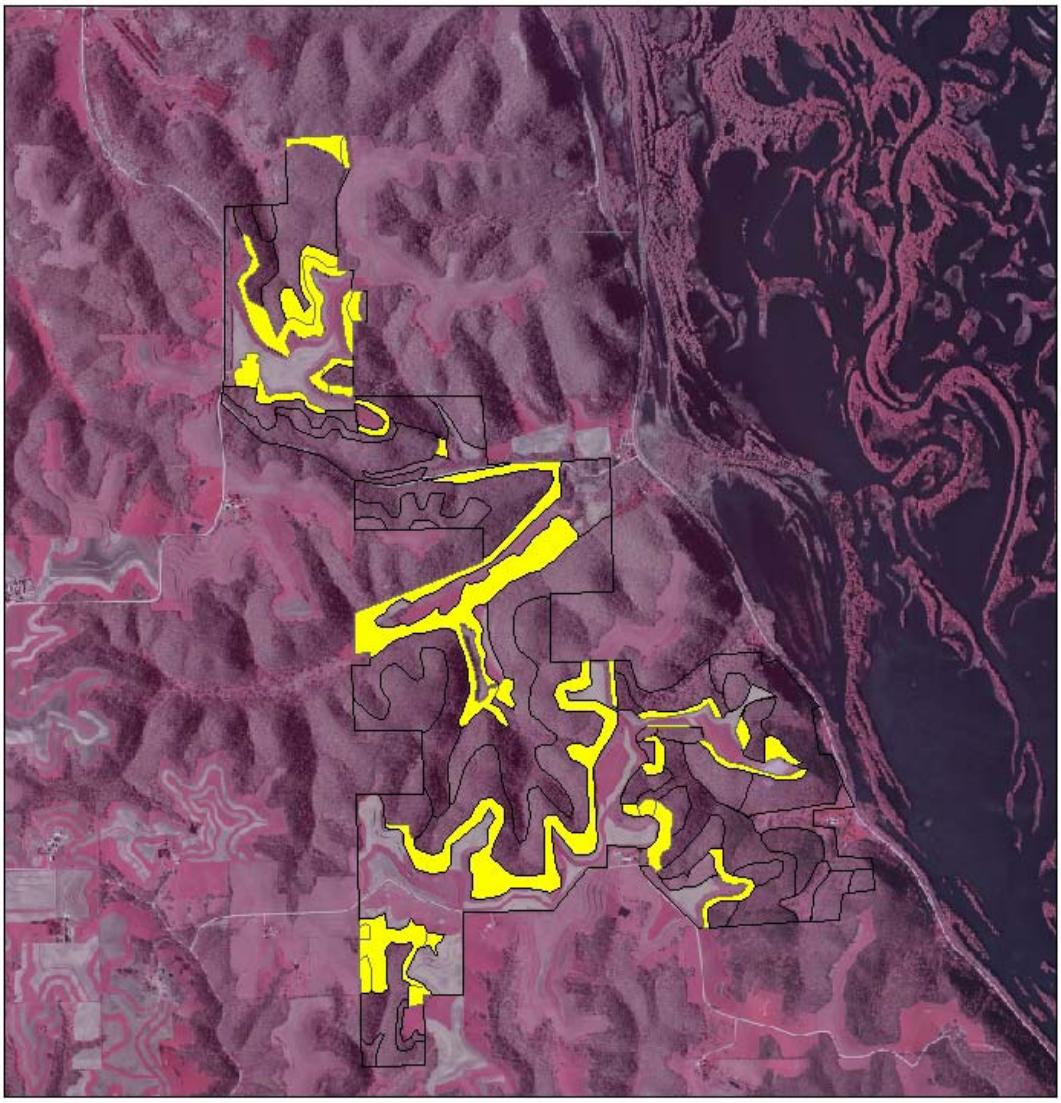
Early Successional Management -

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 spout 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.

LANSING WILDLIFE AREA
EARLY SUCCESSIONAL MANAGEMENT AREAS - 359 AC.



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Lansing Twsp., T99N-R4W,
Allamakee County

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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.

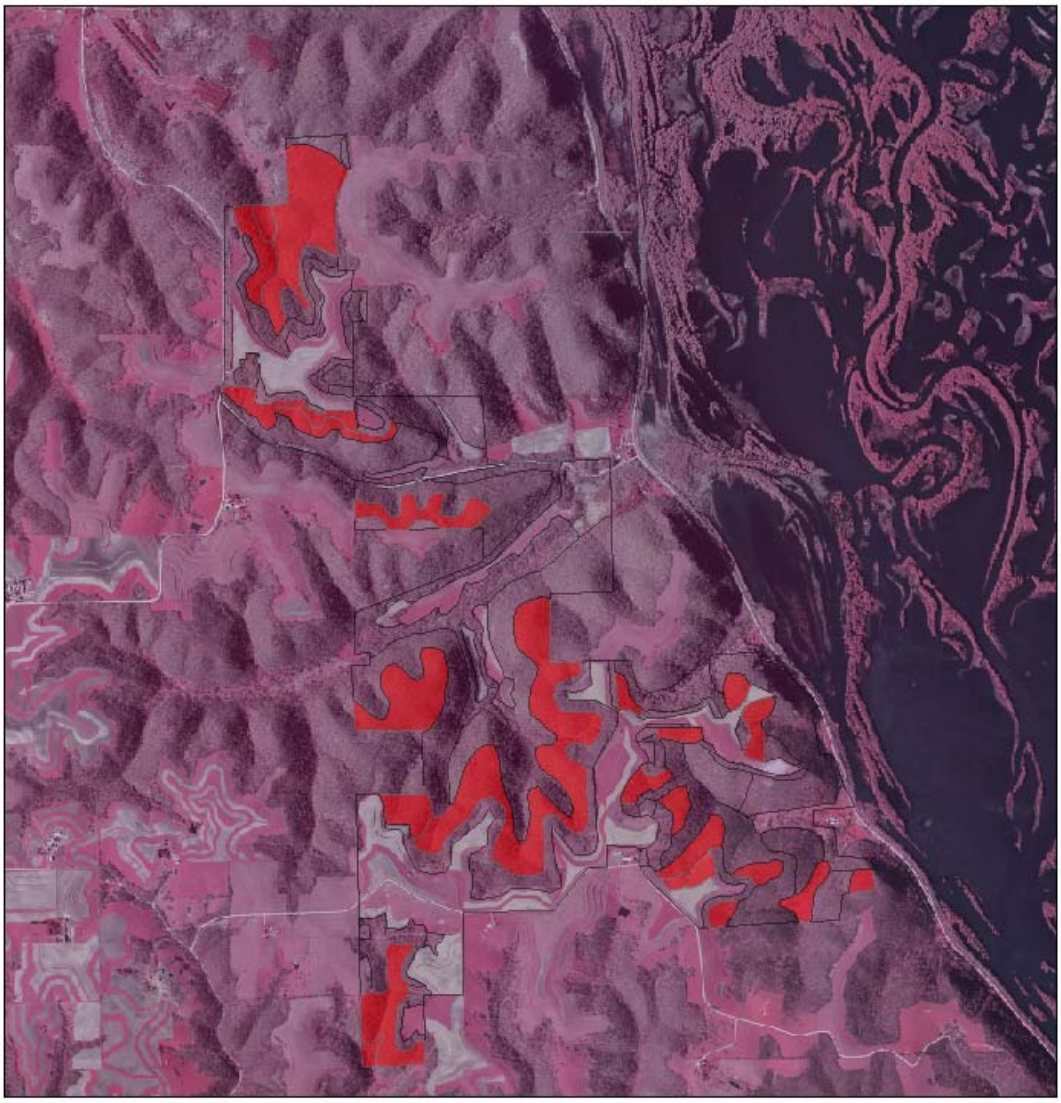
Even age management involves growing a stand of trees which are close to the same age. At some point in the stands life, the area is clearcut which creates the even age structure. Even age management creates excellent habitat for deer, turkey, and grouse and is essential for regeneration of oak which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

LANSING WILDLIFE AREA
EVEN AGE MANAGEMENT AREAS - 474 AC.



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Allamakee County

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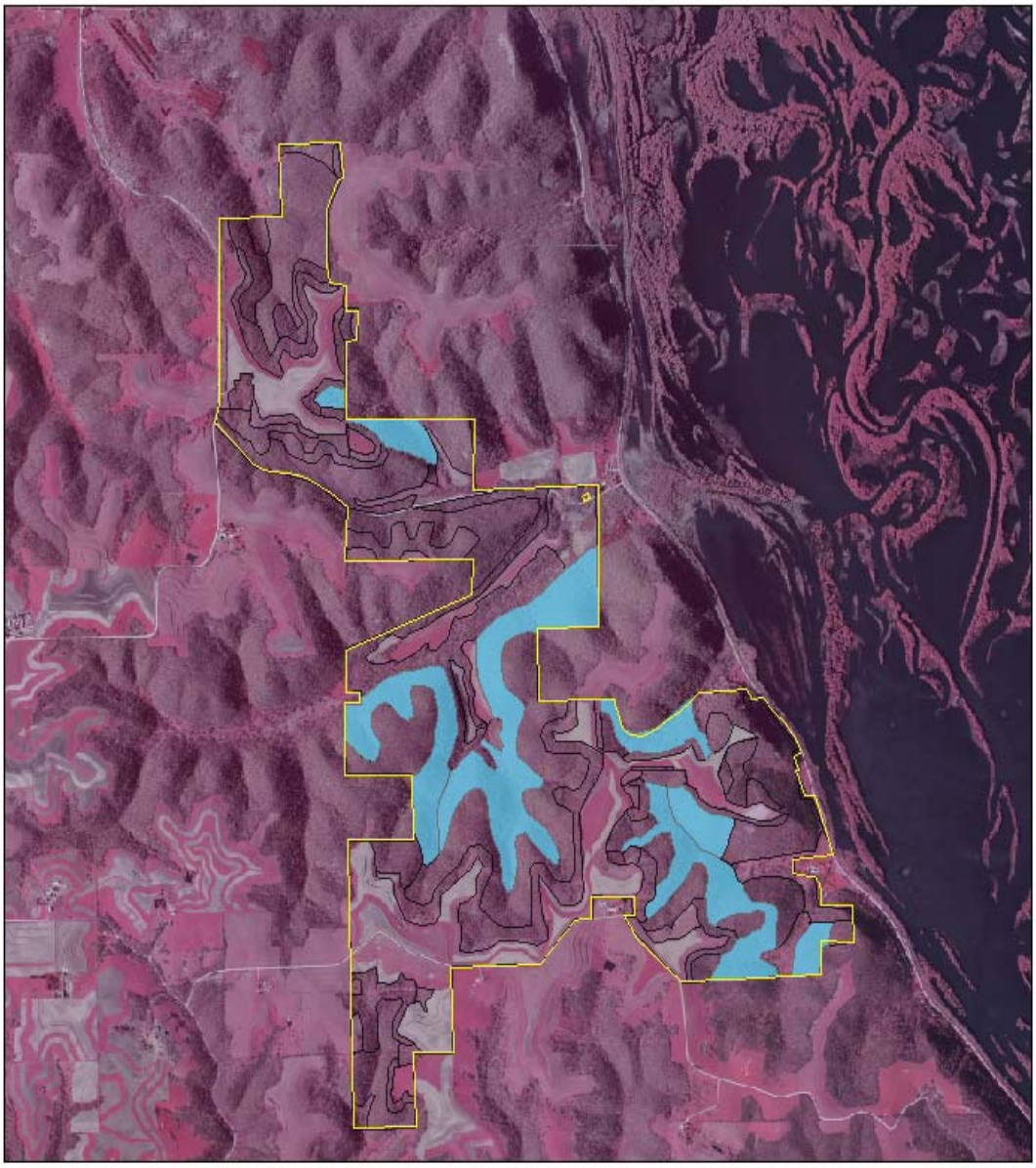
Uneven Age Management -

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.

LANSING WILDLIFE AREA
UNEVEN AGE MANAGMENT AREAS - 355 AC.



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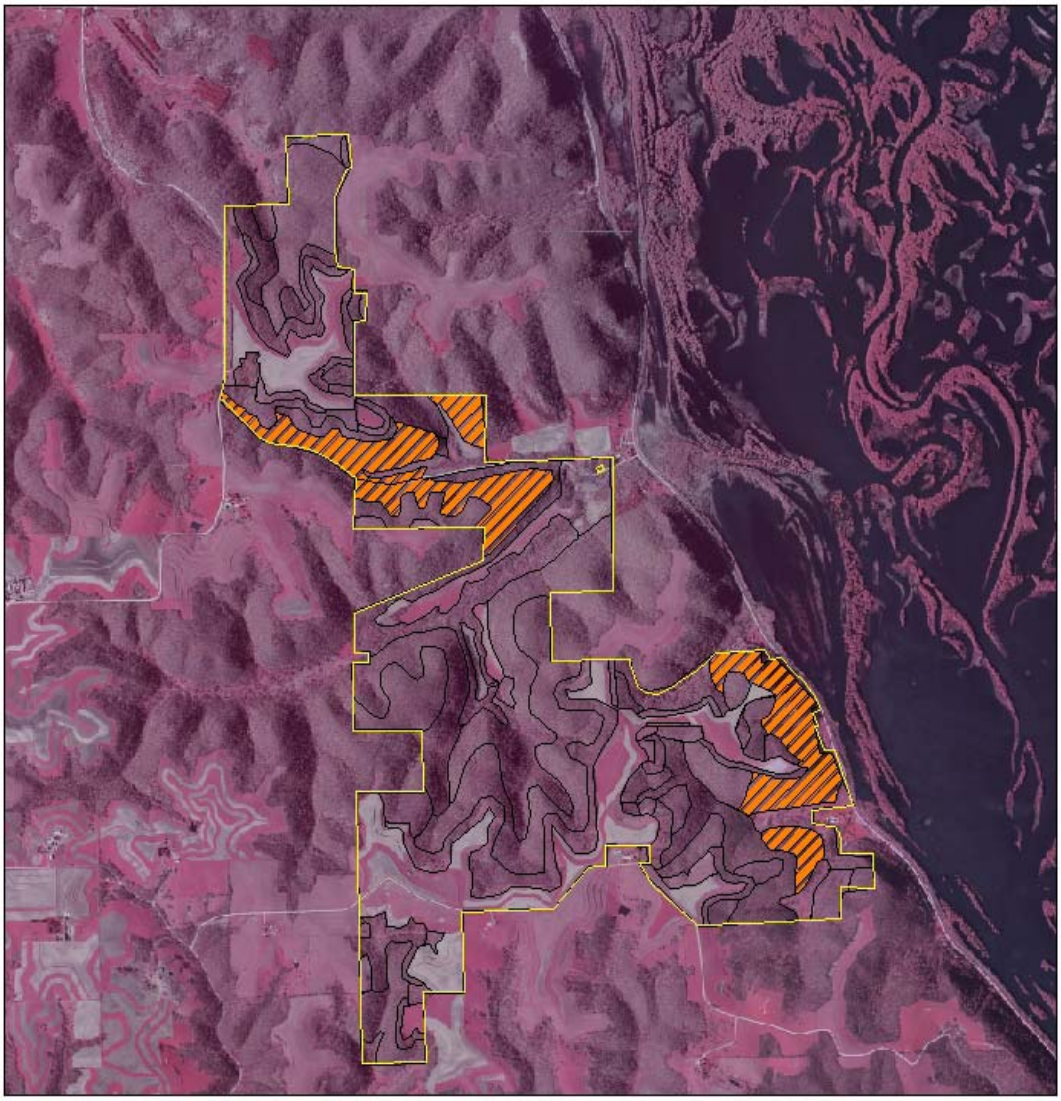
Viewshed Management -

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 maderate 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 230 acres on the area, or 16% of the forest resource.

LANSING WILDLIFE AREA
VIEWSHED MANAGEMENT AREAS - 230 AC.



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SOILS

The steep slopes have LaCrescent and Nordness soils. These soils are somewhat droughty and shallow to limestone. North and east facing slopes are cool and moist, while the south and west facing slopes are hot and dry.

The ridge tops have Paint Creek, Fayette, and Village silt loams. These soils are fertile, well drained loams. These areas are very suitable for the growth of upland, hardwood species.

The creek bottoms have Arenzvil, Volney, and Caneek silt loams soils. Arenzvil and Volney soils are well drained soils, but subject to periodic flooding. Caneek soils are poorly drained and the seasonable water table is within 1 foot of the surface.

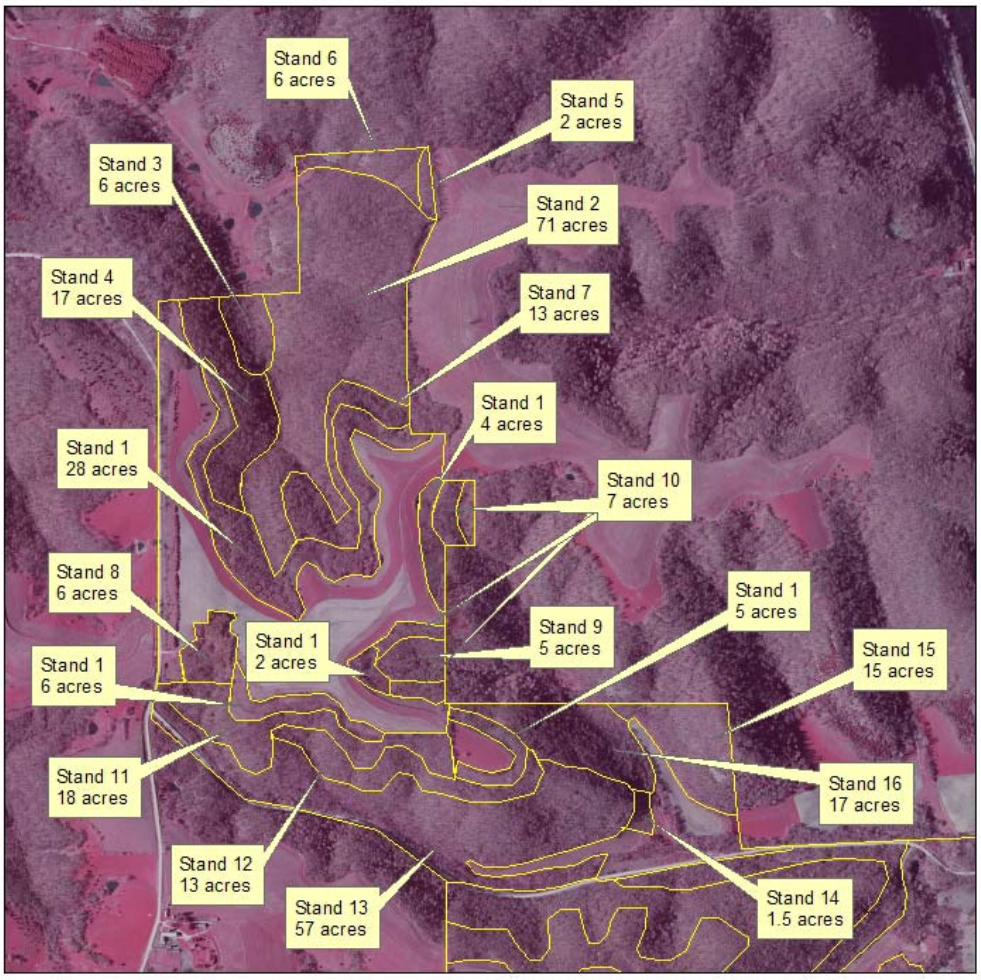
WORK PLAN

FOR

LANSING WILDLIFE AREA

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. Every detail has not been outlined in the plan because the plan would become too long to be of practical use. This plan is intended to get work accomplished on the ground.

LANSING WILDLIFE AREA
STANDS 1-16



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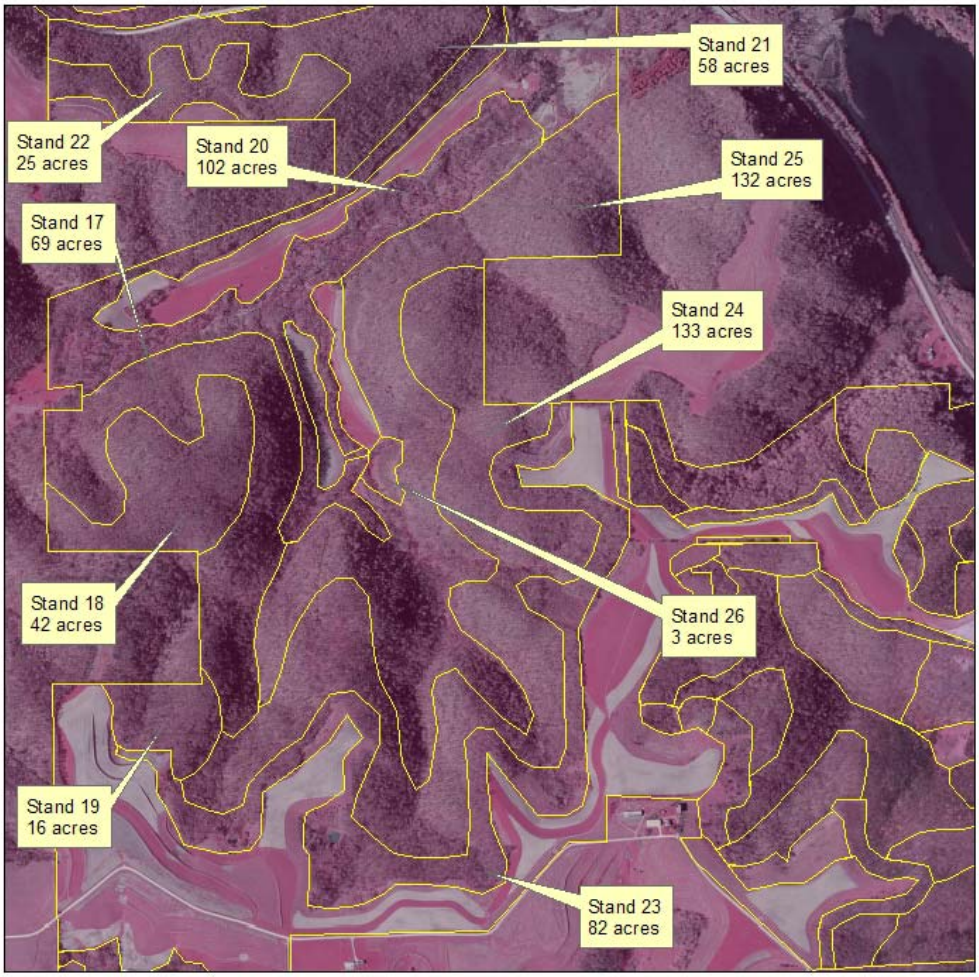
LANSING WILDLIFE AREA
STANDS 17-26



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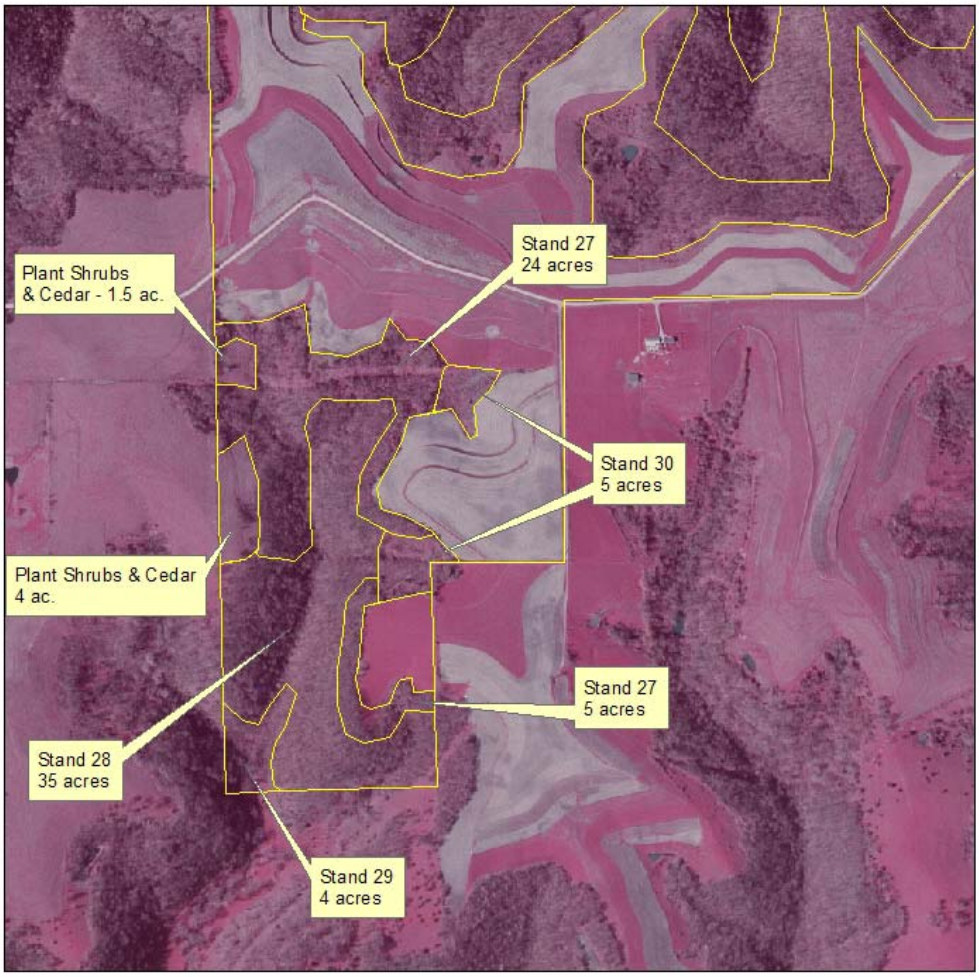
LANSING WILDLIFE AREA
STANDS 27-30



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Feet

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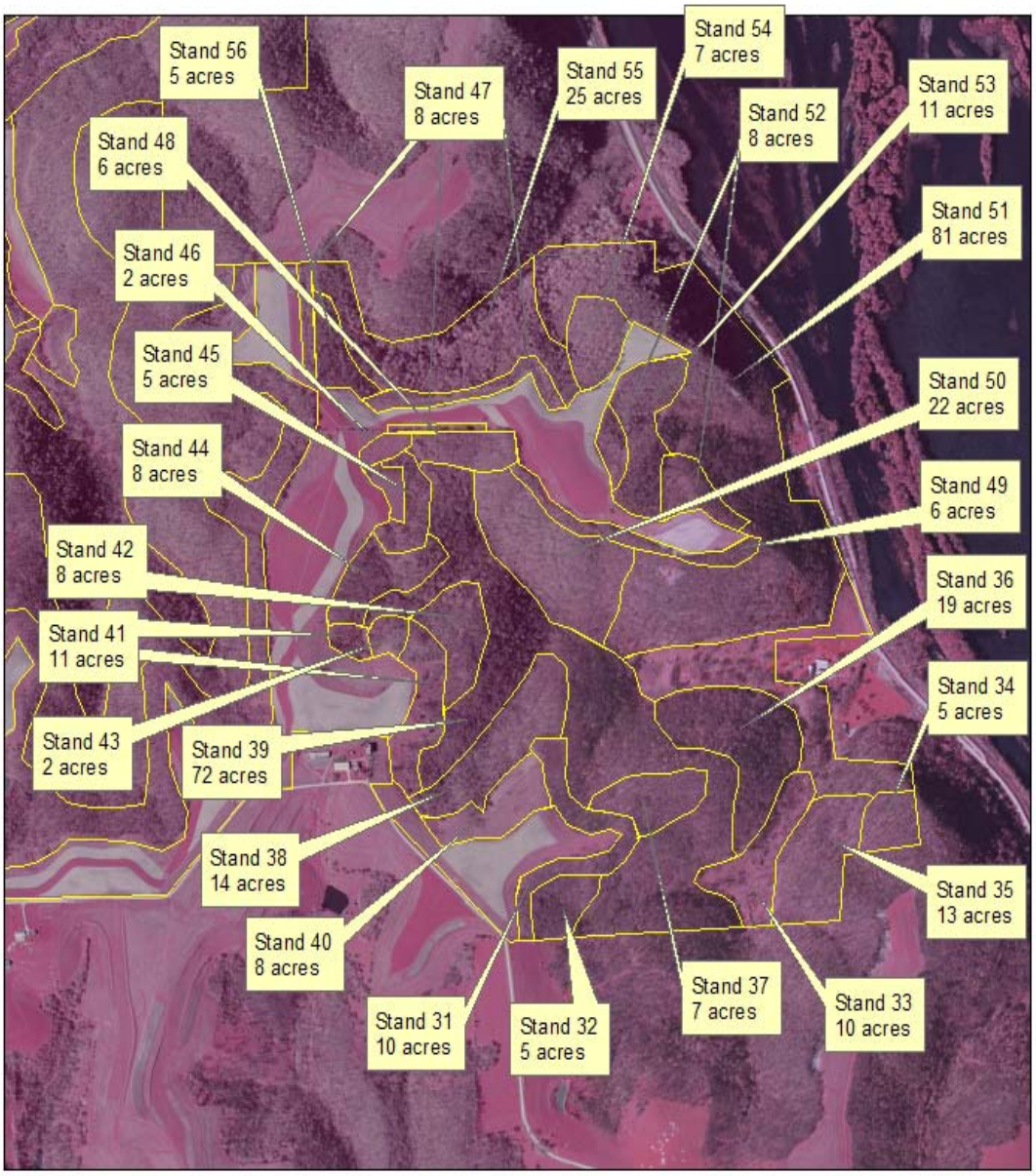
LANSING WILDLIFE AREA
STANDS 31 - 56



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0 500 1,000 2,000 3,000 4,000 Feet

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DESCRIPTION AND RECOMMENDATIONS FOR INDIVIDUAL STANDS

Stand 1: 45 acres

Site Description -

Edge of woodland along crop fields.

Woodland Description-

The majority of Stand 1 was clearcut 5-7 years ago as part of the ongoing edge enhancement work. The trees are sapling (1-4" dbh) aspen, elm, bitternut hickory, red oak, black oak, cherry, and boxelder. The understory is mainly shrubs such as sumac and raspberry. The majority of oak are from stump sprouts.

Management Recommendations – Early Successional

This area can be managed to maintain young, high stem densities along the edge of the woods. Approximately 1/3 of the edge could be clearcut every 5 years.

Stand 2: 71 acres

Site Description -

Ridge tops and valleys with Paint Creek, Fayette, and Village soils. Good sites for upland hardwoods.

Woodland Descripton -

Large red oak, white oak, and shagbark hickory. The understory is elm, shagbark hickory, bitternut hickory, and ash. There is a fair stocking of shagbark hickory, red oak, and white oak seedlings on the ground. This is an excellent area to manage to regenerate oak and hickory.

Management Recommendations – Even Age

Stand 2 can be managed on a "shelterwood" system of management to encourage the development of advanced oak and hickory reproduction. The undesirable species in the understory could be killed to allow more sunlight to reach the ground. 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 resprouting. 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.
In 5-7 years, areas 5-7 acres in size should be clearcut harvested to provide full sunlight for the young oak and hickory. These species may persist in the shade for a short period, but must have full sunlight to develop.

Stand 3: 6 acres

Site Description –

Valley with LaCrescent and Eitzen silt loams. These are good loams, but there is sand and gravel in the subsoil.

Woodland Description -

Pole sized (5-10" dbh) elm and boxelder, with scattered basswood and cherry. The majority of trees are elm and boxelder.

Management Recommendations – Even Age

Convert this stand to more desirable species. The area can be clearcut and replanted. Fell all existing trees over 1 inch in diameter. Treat the stumps of the undesirable species with Pathfinder II to prevent sprouting. Plant the area with bur oak, white oak, and red oak seedlings. Plant large stock which is 18-24" in height and at least 3/8" in caliper. Plant the trees 30 ft. apart, or 50 trees per acre.

Protect each seedling with a vented tree shelter with a wood stake. 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. At least 2 years of competition control will be required.

Stand 4: 17 acres

Site Description –

Gentle, east facing slopes with good, silt loam soils.

Woodland Description -

Large (20+" dbh) white oak, red oak, and shagbark hickory. There are aspen on the south end of the area. Understory is elm, shagbark hickory, boxelder, birch, gooseberry, and raspberry. There are very few desirable seedlings.

Management Recommendations – Even Age

Stand 4 could be managed on a shelterwood system, but underplanting of seedlings is recommended to establish desirable species. Kill the undesirable species such as elm, ironwood, bitternut hickory, and boxelder. Plant large seedlings throughout the area. Plant red oak, white oak, and black walnut on a 20 X 20 ft. spacing, or 100 trees per acre. No tree shelters will be needed. At this point, the main objective is to establish large root systems. Once the seedlings have a good root system established, 5-8 years, parts of the stand could be clearcut harvested to provide full sunlight for the young oak and walnut.

Stand 5: 2 acres

Site Description -

West facing slope with shallow soils over limestone.

Woodland Description -

Pole sized aspen.

Management Recommendations – Early Successional

Clearcut the area to create early succession habitat. The root systems of the aspen will sucker which will enlarge the aspen clump.

Stand 6: 6 acres

Site Description -

Steep, southwest facing slope with goat prairies, bur oak, black oak, and clumps of aspen. This is a very hot, droughty site.

Woodland Description –

Medium sized bur oak and black oak with scattered clumps of aspen. The understory is bur oak, black oak, bitternut hickory, elm, cherry, and shagbark hickory.

Management Recommendations – Early Successional

Remove trees around the goat prairies to encourage more prairie grasses and forbs. Clearcut clumps of aspen to create young, dense growth and expand the aspen clones.

Stand 7: 13 acres

Site Description -

Ridge top with good loam soils.

Woodland Description –

Pole sized bitternut hickory, elm, shagbark hickory, and aspen. There are a few red and white oak. The understory is elm and bitternut hickory.

Management Recommendations – Early Successional

Stand 7 has a good aspen component and could be added to Stand 1. Making the edge management cut wider will make the area better habitat for wildlife species that need early successional habitat. Widening the edge will make it more difficult for predators to kill ruffed grouse and woodcock. When this section of Stand 1 is ready for clearcutting, Stand 7 can be clearcut at the same time.

Stand 8: 6 acres

Site Description -

Area around old farm site and adjacent to parking lot on the area.

Woodland Description –

Pole sized silver maple, elm, and boxelder. The understory is gooseberry, honeysuckle, and elderberry. Because the stand is so dense, the understory is open.

Management Recommendations – Early Successional

Clearcut this area to create early successional habitat. The silver maple will sprout from the stumps and develop high stem density.

Stand 9: 5 acres

Site Description –

Deep ravine with steep side slopes.

Woodland Description -

Medium sized red oak, white oak, and cherry. There are very nice quality red oak. The understory is elm, bitternut hickory, and hard maple. Hackberry, bitternut hickory, ash, and hard maple seedlings are present.

Management Recommendations – Uneven Age

This area could be selectively harvested in approximately 20 years. Following the harvest, the undesirable species and damaged trees should be removed.

Stand 10: 7 acres

Site Description –

Ridge top on edge of woodland.

Woodland Description -

Pole sized elm, bitternut hickory, cherry, and boxelder. There are scattered, medium sized red oak and walnut. The understory is mainly gooseberry, raspberry, and sumac.

Management Recommendations – Early Successional

Clearcut this area to create a dense edge along the woodland. There are a few merchantable oak and walnut that could be harvested.

Stand 11: 18 acres

Site Description –

South facing slope.

Woodland Description -

Pole sized (5-10" dia.) red oak, walnut, elm, cherry, white oak, and shagbark hickory. There are scattered, large white oak, red oak, and walnut.

Management Recommendations – Even Age

Timber Stand Improvement (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.

Locate your good quality trees. Do not waste your time and money on poor quality trees. If there are no high quality trees present on an area, go on to an area with good trees. You can not create high quality trees. Either they are present or not. Be selective and work with only your best trees.

The trees to be removed can be felled or double girdled. No herbicide is necessary.

Stand 12: 13 acres

Site Description -

Steep, south facing slope with shallow soils.

Woodland Description –

Large white oak, red oak, and scattered walnut. The understory consists of elm, red oak, white oak, shagbark hickory, hard maple, and basswood. This area has good oak advanced regeneration.

Management Recommendations – Even Age

Shelterwood – Kill the undesirable species and coppice the poor formed trees now. This will maintain the oak and hickory in the understory. In 5-7 years, the stand could be clearcut harvested and regenerated with oak and hickory.

Stand 13: 57 acres

Site Description -

Very steep, south facing slopes with limestone, and a valley along the road.

Woodland Description -

Medium to large walnut, elm, basswood, red oak, and white oak. The understory is hard maple, elm, basswood, and bitternut hickory.

Management Recommendations – Viewshed

The majority of this area is very steep, and is visible from the gravel road. I suggest leaving the area as is. In 20 years, there will be walnut that are easily accessible that could be harvested. This will not impact the viewshed.

Stand 14: 1.5 acres

Site Description -

Gentle southeast facing slope. Area was clearcut 5 years ago.

Woodland Description -

Sapling (1-4" dia.) aspen. Area was clearcut 5 years ago to expand the aspen clone and create early successional habitat.

Management Description – Early Successional

This area could be clearcut again in 10-15 years.

Stand 15: 15 acres

Site Description –

Steep, west facing slope on shallow soils. Small goat prairie on the area.

Woodland Description –

Pole sized, stunted, red oak, bur oak, black walnut, and shagbark hickory. This is a very droughty area and the trees are old, but small in size. There are remnants of grass on the ground. This site was a large goat prairie at one time.

Management Recommendations – Viewshed

Remove trees and burn a small area to restore the goat prairie. This area can be enlarged as desired. A goat prairie on the area would be visible from the road and a point of interest for the public.

Stand 16: 17 acres

Site Description -

North and east facing slopes on shallow soils.

Woodland Description -

Medium sized red oak, walnut, basswood, shagbark hickory, cherry, bitternut hickory, elm, and white oak. The understory is elm, basswood, shagbark hickory, and ironwood. The regeneration consists of bitternut hickory and hard maple.

Management Recommendations – Uneven Age

Stand 16 has nice quality red oak and walnut. The stand could be selectively harvested within the next 15 years. Following the harvest, the undesirable species and damaged trees should be removed. This area will gradually convert to hard maple.

Stand 17: 69 acres

Site Description –

Steep east and north facing slopes on soils shallow to limestone.

Woodland Description -

Medium sized red oak, white oak, shagbark hickory, white ash, black ash, and scattered walnut. The understory consists of ash, basswood, ironwood, white oak, shagbark hickory, gray dogwood, and hard maple.

Management Recommendations – Uneven Age

The stand could be selectively harvested in 15-20 years.

Stand 18: 42 acres

Site Description -

Ridgetop with Village, Paint Creek, and LaCrescent soils.

Woodland Description -

Medium sized black oak, white oak, red oak, and shagbark hickory. There are scattered aspen, walnut, and cherry. The understory consists of elm, basswood, and hackberry.

Management Recommendations – Even Age

Clearcut areas 5-7 acres in size to regenerate oak. Plant large oak seedlings which are 18-24" in height and 3/8" in caliper. 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: 16 acres

Site Description -

Gentle slopes with Village and LaCrescent soils.

Woodland Description –

Medium size (12-18" dbh) red oak, white oak, aspen, basswood, and walnut. The understory is elm and basswood. There are several nice walnut that are 16-22 inches in diameter on the west 2/3 of the area.

Management Recommendations – Even Age

Clearcut and plant the west 8 acres in 1-5 years. Clearcut and plant the east 8 acres in 15-20 years. Plant the areas with large red and white oak seedlings. Plant the trees 30 ft. apart, or 50 trees per acre. Protect each seedling with a vented tree shelter.

Stand 20: 102 acres

Site Description -

Field edges and valley along the field edge. Some of this area is wet and always has woodcock migrating through in the spring and fall.

Woodland Description -

Pole sized (5-10" dbh) aspen, oak, elm, boxelder, hackberry, and bitternut hickory on the upland. Pole sized willow, elm, boxelder, and walnut on the bottomland. More open areas have a mixture of shrubs in the understory.

Management Recommendations – Early Successional

Clearcut 1/3 to ¼ of the area every 5 years to develop young, high density growth along the field edges and in the bottom. This will feather the woodland edge and limit nest parasitism of interior bird species by brown headed cowbirds. This is one of the larger blocks of early successional habiat, so this area has great potential for essential habitat for ruffed grouse, American woodcock, warblers, and eastern towhee.

Stand 21: 58 acres

Site Description -

Steep north and east facing slopes that are visible from the road.

Woodland Description –

Medium sized (12-18" dia.) red oak and bur oak. The understory is ironwood, elm, and hackberry.

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: 25 acres

Site Description -

South facing slopes with LaCrescent and Paint Creek soils.

Woodland Description -

Medium sized red oak, white oak, elm, and shagbark hickory. The understory is ironwood and elm.

Management Recommendations – Even Age

Stand 22 can be managed to regenerate oak. Because this is a droughty site, oak will be able to compete with other tree species. In 30-40 years, the stand could be clearcut harvested.

Stand 23: 82 acres

Site Description -

Ridgetop along the field edge.

Woodland Description –

Pole sized elm, aspen, white oak, shagbark hickory, basswood, and hackberry. There are scattered red oak, white oak, elm and walnut that are 14-20" in diameter.

Management Recommendations – Early Successional

This area can be clearcut to create a woodland edge with dense, young growth. 1/3 to ¼ of the area could be clearcut every 5 years. Some of the area will have larger trees that could be sold.

Stand 24: 133 acres

Site Description -

Ridge top and gentle slopes with Village, Paint Creek, and LaCrescent soils.

Woodland Description -

Medium sized (12-18" dbh) white oak, red oak, basswood, elm, and scattered walnut. The understory is elm, basswood, hackberry, shagbark hickory, and stunted white oak. Regeneration consists of elm, hackberry, bitternut hickory, and scattered, advanced oak regeneration.

Management Recommendations – Even Age

Clearcut 5-7 acre areas and plant oak seedlings. Plant 50 oak seedlings per acre and protect them with vented tree shelters. Prepare future clearcut sites by killing the undesirable species in the understory 7-10 years prior to harvesting (Shelterwood).

Stand 25: 132 acres

Site Description -

Steep north, east, and west facing slopes with LaCrescent soils.

Woodland Description -

Medium sized (12-18" dbh) basswood, elm, white oak, black oak, shagbark hickory, and red oak. The understory is elm, basswood, bitternut hickory, hackberry, ironwood, and hard maple. Much of the area was logged heavily 30 years ago.

Management Recommendations – Uneven Age

In 15-20 years, selective harvest parts of this stand and remove the undesirable species and poor formed trees. This slope will gradually convert to maple-basswood.

Stand 26: 3 acres

Site Description -

West facing base of slope. Borders field edge.

Woodland Description -

Sapling (1-4" dia.) aspen, black oak, walnut, cherry, and elm. The area was clearcut 5 years ago and has a good aspen component.

Management Recommendations – Early Successional

Clearcut this area again in 10 years and maintain in early successional habitat.

Stand 27: 29 acres

Site Description -

Gentle slopes with a valley running through the area.

Woodland Description -

Pole sized elm, boxelder, black oak, birch, shagbark hickory, walnut, and a few aspen. There are scattered apple trees.

Management Recommendations – Early Succession

Clearcut 1/3 of this area every 5 years.

Cedar & Shrub Plantings: 5.5 acres

Plant a mixture of red cedar and shrubs to provide good winter habitat. Plant the cedars on a 12 X 12 ft. spacing, or 300 trees per acre. Shrubs can be planted on the west border of the fields. Plant 2-3 rows of ninebark and hazelnut. Plant the shrubs on a 4 X 10 ft. spacing. Competing vegetation must be controlled for a minimum of 3 years. Before the trees are planted, spray a 4 ft. wide band down each row with Roundup and Pendulum herbicides. Apply 2 quarts of Roundup and 4 quarts of Pendulum per acre treated. Vegetation must be actively growing when the herbicides are applied.

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.

Stand 28: 35 acres

Site Description -

East and west facing slopes with shallow soils.

Woodland Description -

Medium sized shagbark hickory, white oak, red oak, and black oak, with scattered walnut and aspen. The understory is elm, cherry, hazel, ironwood, gray dogwood, and pole sized white oak and shagbark hickory.

Management Recommendations – Even Age

Clearcut harvest areas 5-7 acres in size to regenerate oak and walnut. The first cuts could be done in 15-20 years. There are enough pole sized oak and hickory that will sprout from the stumps that planting should not be necessary.

Stand 29: 4 acres

Site Description -

Valley in southwest corner of state property.

Woodland Description -

Pole sized elm and walnut.

Management Recommendations – Even Age

Timber Stand Improvement (Crop Tree Release) - Select 50 crop trees per acre and remove the competing trees. Prune walnut crop trees to promote veneer quality trees.

Stand 30: 5 acres

Site Description -

Ridge top along field edge.

Woodland Description -

The area was clearcut in 2000. The trees are sapling (1-4" dia.) aspen, elm, and boxelder, with scattered red cedar and apple trees.

Management Recommendations – Early Successional

Clearcut this area again in approximately 10 years.

Stand 31: 10 acres

Site Description -

Edge along crop field.

Woodland Description -

Medium sized (12-18" dia.) walnut, aspen, and white ash. The understory is white ash and prickly ash.

Management Recommendations – Early Successional

Clearcut an area approximately 100 ft. wide along the edge to create early successional habitat and feather the edge. There will be merchantable trees to harvest in this area.

Stand 32: 5 acres

Site Description -

East facing slope with LaCrescent soils.

Woodland Description -

Small sawtimber (12-18" dia.) walnut, aspen, white ash, and a few white oak. The understory is shagbark hickory, elm, and ironwood.

Management Recommendations – Even Age

Timber Stand Improvement (Basal Area Thinning) – Remove the poor formed and stunted trees to lower the basal area to 70 sq. ft. per acre. In approximately 20 years, the stand can be clearcut and regenerated with oak, hickory, and walnut.

Stand 33: 10 acres

Site Description -

Valley and side slopes.

Woodland Description -

Sapling ash, walnut, and hawthorne. The more open areas have clumps of raspberry and multiflora rose. This area was once an open meadow.

Management Recommendations – Even Age

This area has a nice stocking of walnut. In 15 years, the stand can be thinned to provide adequate growing space for the best trees.

Stand 34: 5 acres

Site Description -

Ridge top with good, silt loam soils.

Woodland Description -

Sawtimber (large) red oak and white oak. The understory is ironwood, elm, bitternut hickory, and hard maple. Ash, elm, and hard maple seedlings are present.

Management Recommendations - Even Age

Clearcut the stand and replant red and white oak seedlings. Plant 50 trees per acre and protect each tree with a vented tree shelter.

Stand 35: 13 acres

Site Description -

Steep, west facing slope with very shallow soils.

Woodland Description -

Medium sized red oak, white oak, basswood, hard maple, and aspen. The understory is elm, ironwood, bitternut hickory, and hard maple.

Management Recommendations – Uneven Age

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

Stand 36: 19 acres

Site Description -

Very steep, north and east facing slopes with rock outcrops.

Woodland Description -

Medium size red oak, hard maple, and basswood. The understory is ironwood and hard maple.

Management Recommendations - Viewshed

Leave area as is.

Stand 37: 7 acres

Site Description -

Ridge top and gentle east facing slopes.

Woodland Description -

Medium size (12-18" dbh) red oak, white oak, black oak, and walnut. The understory is elm and ironwood. There are hard maple seedlings in the stand.

Management Recommendations – Even Age

Shelterwood & Prescribed Burning – This would be a good area to burn to encourage the natural regeneration of oak. Oak is more tolerant of fire than other species, so repeated burning will eliminate the competing species, while the oak seedlings will survive and sprout. Burn the area once, then remove the undesirable species in the understory to create more sunlight on the ground. Burn the area 3-4 more times until adequate oak regeneration is established. When the young oak are 3-4 ft. tall, clearcut the stand to provide full sunlight so the oak seedlings will develop.

Stand 38: 14 acres

Site Description –

West facing slope.

Woodland Description -

Medium size red oak, white oak, aspen, and ash. The understory is ironwood, ash, and bitternut hickory.

Management Recommendations – Even Age

Shelterwood & Prescribed Burning – Manage Stand 38 the same as Stand 37.

Stand 39: 72 acres

Site Description –

Steep, north and east facing slopes.

Woodland Description –

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

Management Recommendations – Uneven Age

In 15-20 years, the stand could be selectively harvested. Following the harvest, the undesirable species and poor formed trees should be removed.

Stand 40: 8 acres

Site Description -

Semi open grass field on gentle west facing slopes.

Woodland Description -

Brome grass naturally reseeding with walnut, ash, and shagbark hickory. There are scattered, low quality walnut which are 14-16 inches in diameter.

Management Recommendations – Even Age

Plant the area with red oak and white oak seedlings. Plant 50 trees per acre and protect each seedling with a vented tree shelter. Spot spray around each tree with a combination of Roundup and Princep for 3 years.

Plant 1 row of ninebark and 2 rows of hazelnut along the field edge. Plant the shrubs 4 ft. apart within the row, and the rows 10 ft. apart. Spray a 4 ft. wide strip with Roundup and Pendulum before the shrubs are planted. Apply 2 qts. of Roundup and 4 qts. of Pendulum per acre. Apply Pendulum over the rows for two more years to establish the shrubs. Pendulum must be applied before any vegetation begins to grow in the spring.

Stand 41: 11 acres

Site Description –

Ridge top along woodland edge.

Woodland Description -

Pole sized birch, walnut, and aspen. There are good stands of walnut in areas.

Management Recommendations – Early Successional

Clearcut the area in approximately 5 years to create dense, young growth on the woodland edge. Clumps of good walnut can be left and thinned to grow the walnut.

Stand 42: 8 acres

Site Description -

Ridge top and northeast slopes.

Woodland Description -

Medium size walnut, white oak, shagbark hickory, and elm. The understory is elm, bitternut hickory, and prickly ash. Seedlings are ash and ironwood.

Management Recommendations – Even Age

Shelterwood & Prescribed Burning - Manage Stand 42 the same as Stands 37 and 38. Burn the area once or twice, then kill the undesirable species. Burn the area 4-5 times to eliminate the shade tolerant seedlings and establish a good stocking of oak seedlings. The stand can be clearcut when there are adequate oak seedlings 3-4 ft. tall. This may take 10-15 years.

Stand 43: 2 acres

Site Description –

Ridge along south side of woods.

Woodland Description -

Sapling aspen. The area was clearcut in 2000.

Management Recommendations – Early Successional

Clearcut the area again in 10-15 years.

Stand 44: 8 acres

Site Description –

East facing slopes with LaCrescent soils.

Woodland Description -

Medum sized (12-18" dbh) white oak, red oak, walnut, and shagbark hickory. The understory is bitternut hickory, shagbark hickory, and elm. The understory is brushy with prickly ash.

Management Recommendations – Even Age

Shelterwood & Prescribed Burning - Burn this area in the spring or fall. Following the first burn, kill the undesirable species such as elm and bitternut hickory. Cut the trees and treat the stumps with Pathfinder II to prevent sprouting. Burn the area another 4-5 times until the shade tolerant species are controlled and young oak are established. When there are adequate oak seedlings 3-4 ft. tall, clearcut the stand to regenerate the area to oak.

Stand 45: 5 acres

Site Description -

East facing slope along the woodland edge.

Woodland Description -

Pole sized elm, aspen, birch, and bitternut hickory. There is a good stocking of aspen. The area was clearcut 10 years ago.

Management Recommendations – Early Successional

Clearcut this area again in 5 years.

Stand 46: 2 acres

Site Description -

Open grass field that was planted with red cedar and white spruce 10 years ago.

Woodland Description -

Sapling red cedar and white spruce.

Management Recommendations – Early Successional

Thin the area in 5-7 years to remove every other tree. Thinning will develop full conifers that will keep their branches to the ground.

Stand 47: 8 acres

Site Description -

Ridge top and borders along the woodland.

Woodland Description -

The area was clearcut 3-4 years ago. The area is mainly sapling sized aspen.

Management Recommendations – Early Successional

Clearcut the area again in 10 years.

Stand 48: 6 acres

Site Description -

South facing slope with LaCrescent and Paint Creek soils.

Woodland Description -

Large (20"+ dbh) red oak, white oak, and white ash.

Management Recommendations – Even Age

Shelterwood & Prescribed Burning - Manage Stand 48 the same as Stands 37, 38, 42, and 44.

Stand 49: 6 acres

Site Description –

Edge along north side of woods.

Woodland Description -

Pole sized shagbark hickory, ash, elm, hackberry, and aspen. There are scattered walnut and red oak that are 16-22" in diameter.

Management Recommendations – Early Successional

Clearcut area to create dense, young growth along the edge of the woodland. There will be trees that are saleable as logs.

Stand 50: 22 acres

Site Description -

Steep south facing slope with LaCrescent soils.

Woodland Description -

Medium sized (12-18" dbh) red oak, white oak, shagbark hickory, basswood, and walnut. The understory is ash, elm, ironwood, and basswood. Ash is the most prevalent regeneration.

Management Recommendations – Uneven Age

In 15-20 years, 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: 81 acres

Site Description -

Steep east and southeast facing slopes with shallow soils. There are limestone outcrops along the river road.

Woodland Description -

Medium size red oak, bur oak, red cedar, and white oak. The understory is mainly ironwood and elm.

Management Recommendations – Viewshed

This area is steep with droughty soils. This stand is not conducive to management.

Stand 52: 8 acres

Site Description -

Gentle north and east facing slopes.

Woodland Description -

Pole sized cherry, birch, bitternut hickory, and aspen.

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.

Stand 53: 11 acres

Site Description -

Ridge top and east facing slopes.

Woodland Description -

Medium sized (12-18" dia.) red oak, white oak, basswood, and a few walnut. The understory is bitternut hickory, elm, ironwood, and cherry.

Management Recommendations – Even Age

Clearcut the stand in approximately 10 years, and replant the area with oak seedlings. Plant 50 trees per acre and protect each tree with a vented tree shelter.

Stand 54: 7 acres

Site Description -

Ridge and gentle north facing slope with Village, Paint Creek, and LaCrescent soils.

Woodland Description -

Medium size red oak, white oak, and white ash. The understory is ironwood and bitternut hickory. Regeneration consists of hard maple, ash, and bitternut hickory.

Management Recommendations – Even Age

Clearcut & Plant – Clearcut this area in approximately 10 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: 25 acres

Site Description –

Steep north facing slope with shallow soils.

Woodland Description -

Medium size (12-18" dbh) red oak, ash, hard maple, and basswood. The understory is mainly hard maple, with scattered elm and ironwood.

Management Recommendations – Uneven Age

In 10-15 years, Stand 55 could be selectively harvested.

Stand 56: 5 acres

Site Description -

East facing slope with Paint Creek soils.

Woodland Description -

Pole sized (5-10" dbh) bitternut hickory, basswood, and elm. There are scattered, sawtimber sized red oak, white oak, and walnut.

Management Recommendations – Even Age

Clearcut and plant this stand with oak seedlings. Sell all trees 14 inches and larger in diameter. Following the harvest, fell all remaining trees over 1 inch in diameter. Treat the stumps of undesirable species with Pathfinder II to prevent sprouting. Plant the area with red oak, white oak, and walnut seedlings. Plant 50 trees per acre and protect the oak seedlings with a vented tree shelter.

SUSTAINABLE FORESTRY GUIDELINES

Sustainable forestry is managing a forest to maximize the distribution of age classes on the property, and insure there is a balanced distribution of tree sizes. With even age management, the acres of even age management divided by the rotation age is the allowable cut per year. The target rotation age for the area is 125 years. This insures that large oaks will always be present on the area.

Early Successional Management -

The early successional areas will be managed on a 15 year rotation. There are 359 acres designated for early successional management. The allowable cut is 24 acres per year (359 acres divided by 15 yrs.). With a working cycle of 5 years, approximately 120 acres could be cut every 5 years.

Even Age Management Area –

There are 474 acres under even age management. Dividing 474 acres by 125 years, yields an allowable cut of 4 acres per year, or 20 acres every 5 years.

Uneven Age Management Area –

Stands can be selectively harvested every 20 years to remove mature and defective trees. There are 355 acres under uneven age management. The allowable harvest is 90 acres of selective harvest every 5 years.

HIGH PRIORITY PROJECTS

Tree Planting -

Stand #	Acres	Prescription
3	6	Noncommercial clearcut and plant.
4	17	Kill undesirable species and underplant shelterwood
19	8	Plant oak following clearcut
24	5	Plant oak following clearcut
34	5	Plant oak following clearcut
	5.5	Plant red cedar and shrubs in grass field.
40	8	Plant oak with shelters and 3 rows of shrubs along field edge
56	5	Plant oak following clearcut
Total	59.5	

Timber Stand Improvement – Crop Tree Release

Stand #	Acres
11	18
29	4
Total	22

Timber Stand Improvement – Weed Tree Removal

Stand #	Acres	Prescription
2	71	Kill undesirable species in shelerwood
12	13	Kill undesirable species in shelterwood
37	7	Kill undesirable species after prescribed burn.
38	14	Kill undesirable species after prescribed burn
42	8	Kill undesirable species after prescribed burn
44	8	Kill undesirable species after prescribed burn
48	6	Kill undesirable species after prescribed burn
Total	127	

Early Successional Clearcuts – 15 yr. rotation

Stand #	Acres	Comments
5	2	
6	3	Clear around goat prairie
8	6	
10	7	Commercial timber sale
20	34	
23	27	Commercial timber sale
27	10	
49	6	Commercial timber sale
Total	95	

Even Age Clearcuts – 125 yr. rotation

Stand #	Acres	Prescription
19	8	Clearcut and plant west 8 ac.
24	5	Clearcut and plant
34	5	Clearcut and plant
56	5	Clearcut and plant
Total	23	

Selective Harvest – 20 yr. cycle

Because of the history of high grade harvesting prior to the state purchasing the property, no stands are in need of selective harvesting at this time. Some selective harvesting in stands adjacent to the clearcut and early successional cuts that are scheduled would feather or soften the edge and be beneficial.

Prescribed Burning to Encourage Oak Regeneration -

Stand	**Acres**
37	7
38	14
42	8
44	8
48	6
Total	43

APPENDIX

LANSING WILDLIFE AREA

SUMMARY OF WOODLAND STANDS

No.	Acres	Timber Type	TreeSize	Mngt. System	Prescription	Priority	Year Complete	Comments
1	45	Aspen Elm Bitternut Hickory	Sapling	Early Successional	Clearcut 1/3 of area every 5 years.	High	20010	
2	71	Red Oak White Oak Hickory	Large	Even Age	Shelterwood System – kill weed trees	High	2007	
3	6	Elm Boxelder	Pole	Even Age	Clear and plant oak and walnut	Medium	2007	
4	17	Red Oak White Oak Hickory	Large	Even Age	Shelterwood – kill weed trees and underplant	High	2007	
5	2	Aspen	Pole	Early Successional	Clearcut	High	2007	
6	6	Bur Oak Black Oak	Medium	Early Successional	Clearcut to restore goat prairie	High	2007	Goat Prairie
7	13	Hickory Elm Aspen	Pole	Early Successional	Clearcut	High	2010	
8	6	Silver Maple Elm Boxelder	Pole	Early Successional	Clearcut	High	2007	
9	5	Red Oak White Oak	Medium	Uneven Age	Selective Harvest	Medium	2025	
10	7	Elm Hickory	Pole	Early Successional	Clearcut	High	2007	
11	18	Oak Walnut	Pole	Even Age	TSI – Crop Tree Release	High	2007	
12	13	Oak Walnut	Large	Even Age	Shelterwood – kill weed trees	High	2007	
13	57	Oak Basswood Elm	Medium	View shed				

No.	Acres	Timber Type	TreeSize	Mngt. System	Prescription	Priority	Year Complete	Comments
14	1.5	Aspen	Sapling	Early Successional	Clearcut	High	2015	
15	15	Bur Oak Hickory	Pole	View Shed	Restore goat prairie	High	2010	Goat Prairie
16	17	Oak Walnut Basswood	Medium	Uneven Age	Selective Harvest	Medium	2020	
17	69	Oak Hickory	Medium	Uneven Age	Selective Harvest	Low	2025	
18	42	Oak Hickory	Medium	Even Age	Clearcut & Plant	Medium	2020	
19	16	Oak Walnut	Medium	Even Age	Clearcut & Plant	High	West 8 ac. in 2007	
20	102	Aspen Elm Boxelder	Pole	Early Successional	Clearcut 1/3 of area every 5 yrs.	High	2007	
21	58	Red Oak Bur Oak	Medium	View Shed				
22	25	Oak Hickory	Medium	Even Age	Clearcut	Low	2040	
23	82	Oak Elm Aspen	Pole	Early Successional	Clearcut 1/3 of area every 5 yrs.	High	2007	
24	133	Oak Basswood	Medium	Even Age	Clearcut and plant areas 5-7 ac. in size	High	2007	
25	132	Oak Basswood	Medium	Uneven Age	Selective Harvest	Low	2025	
26	3	Aspen	Sapling	Early Successional	Clearcut	High	2015	
27	29	Elm Boxelder Hickory	Pole	Early Successional	Clearcut 1/3 every 5 yrs.	High	2007	
28	35	Oak Hickory	Medium	Even Age	Clearcut	Medium	2025	
29	4	Walnut Elm	Pole	Even Age	TSI – Release crop trees	Medium	2007	

No.	Acres	Timber Type	TreeSize	Mngt. System	Prescription	Priority	Year Complete	Comments
30	5	Aspen	Sapling	Early Successional	Clearcut	High	2015	
	5.5	Open grass field		Early Successional	Plant cedar and shrubs	High	2007	
31	10	Walnut Aspen Ash	Medium	Early Successional	Clearcut	High	2007	
32	5	Walnut Aspen Ash	Medium	Even Age	TSI – Basal Area Thinning	Medium	2010	
33	10	Ash Walnut Elm	Sapling	Even Age	TSI – Crop Tree Release	Medium	2020	
34	5	Red Oak White Oak	Large	Even Age	Clearcut and Plant	High	2007	
35	13	Oak Maple Basswood	Medium	Uneven Age	Selective Harvest	Medium	2025	
36	19	Oak Maple Basswood	Medium	View Shed				
37	7	Mixed Oak	Medium	Even Age	Shelterwood – Prescribe burn	High	2007	
38	14	Red Oak White Oak Ash	Medium	Even Age	Shelterwood – Prescribe burn	Medium	2010	
39	72	Oak Maple Basswood	Medium	Uneven Age	Selective Harvest	Medium	2020	
40	8	Walnut Ash Hickory	Seedling	Even Age	Plant oak and shrubs	Medium	2007	
41	11	Birch Walnut Aspen	Pole	Early Successional	Clearcut	High	2010	
42	8	Walnut White Oak Hickory	Medium	Even Age	Shelterwood – prescribe burn	High	2007	
43	2	Aspen	Sapling	Early Successional	Clearcut	High	2015	
44	8	Oak Hickory Walnut	Medium	Even Age	Shelterwood – prescribe burn	Medium	2007	
45	5	Aspen	Pole	Early Successional	Clearcut	High	2015	

No.	Acres	Timber Type	Tree Size	Mngt. System	Prescription	Priority	Year Complete	Comments
46	2	Cedar Spruce	Sapling	Early Successional	Thin to remove every other tree	Medium	2015	
47	8	Aspen	Sapling	Early Successional	Clearcut	High	2015	
48	6	Red Oak White Oak	Large	Even Age	Shelterwood – prescribe burn	High	2007	
49	6	Hickory Ash Elm	Pole	Early Successional	Clearcut	High	2007	Commercial Sale
50	22	Oak Hickory Walnut	Medium	Uneven Age	Selective Cut & Kill undesirable species	Low	2025	
51	81	Oak Cedar	Medium	View Shed				
52	8	Aspen Hickory	Pole	Early Successional	Clearcut	High	2010	
53	11	Oak Basswood Walnut	Medium	Even Age	Clearcut and Plant	Medium	2020	
54	7	Red Oak White Oak Ash	Medium	Even Age	Clearcut and Plant Oak	Medium	2020	
55	25	Oak Maple Basswood	Medium	Uneven Age	Selective Harvest	Medium	2020	
56	5	Hickory Elm	Pole	Even Age	Clearcut and Plant	Medium	2010	Scattered, large trees.

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

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

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

Common Name	Scientific Name
Golden-winged warbler	*Vermivora chrysoptera*
Canada warbler	*Wilsonia canadensis*

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

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

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

Common Name	Scientific Name
Cricket Frog	*Acris crepitans*
Northern Prairie Skink	*Eumeces septentrionalis*
Bullsnake	*Pituophis catenifer sayi*
Timber Rattlesnake	*Crotalus horridus*

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

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

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

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

FWSP 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 algific 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.

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.