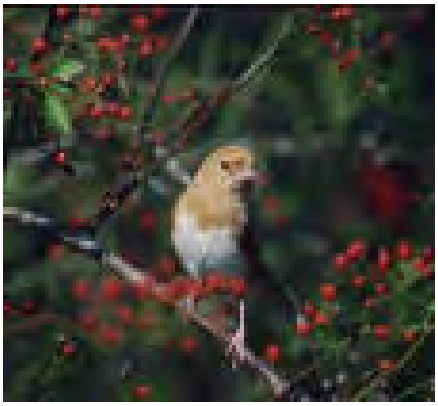
FOREST WILDLIFE STEWARDSHIP PLAN

FOR

SOUTH BEAR WILDLIFE AREA

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



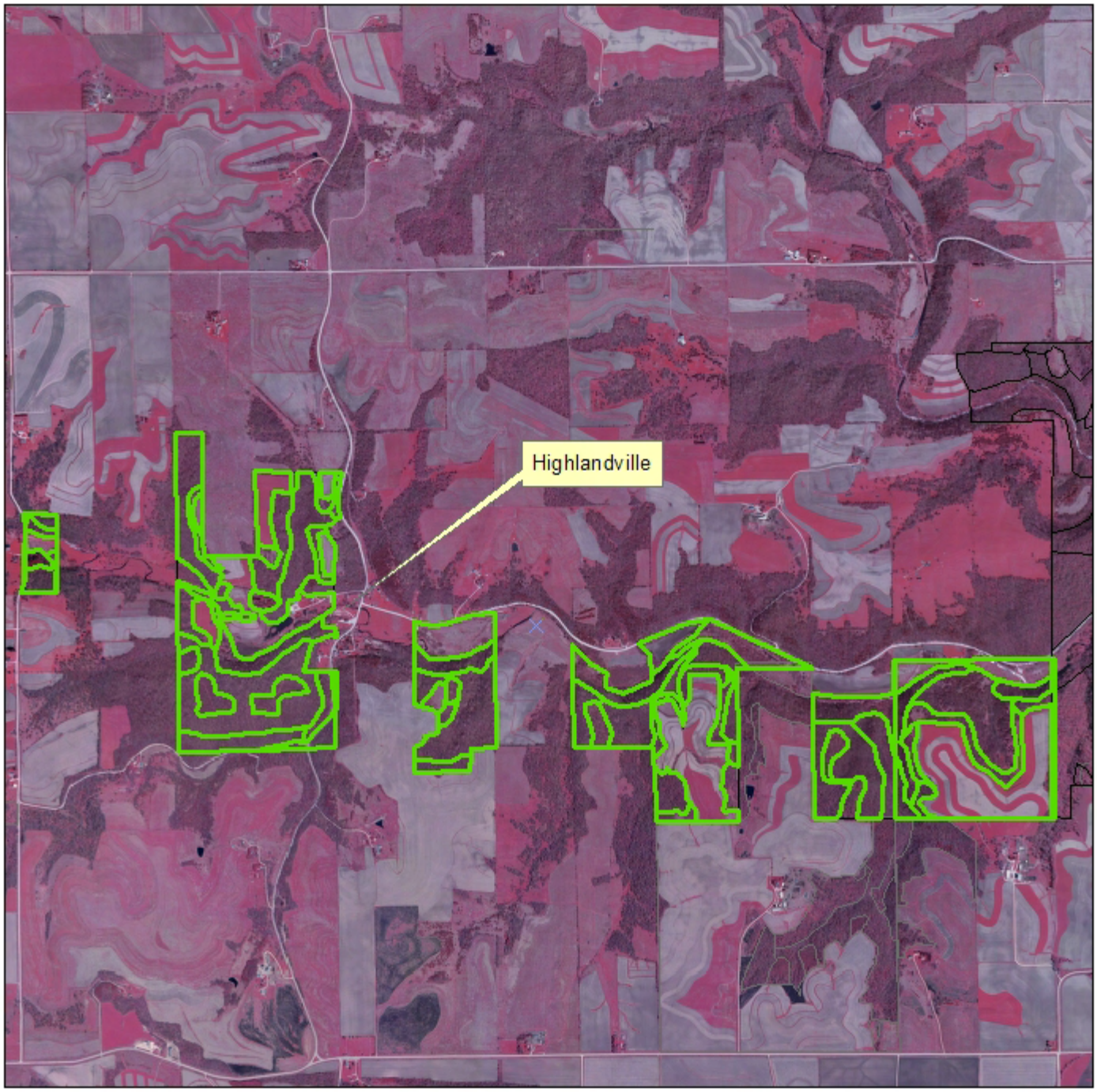
Developed by

Gary Beyer
District Forester

And

Terry Haindfield
Wildlife Biologist

FOREST STEWARDSHIP WILDLIFE PLAN
SOUTH BEAR WILDLIFE AREA
480 Acres Woodland



Sec. 28, 33, 34, 35, 36
Highlandville Twsp., Winneshiek Co.

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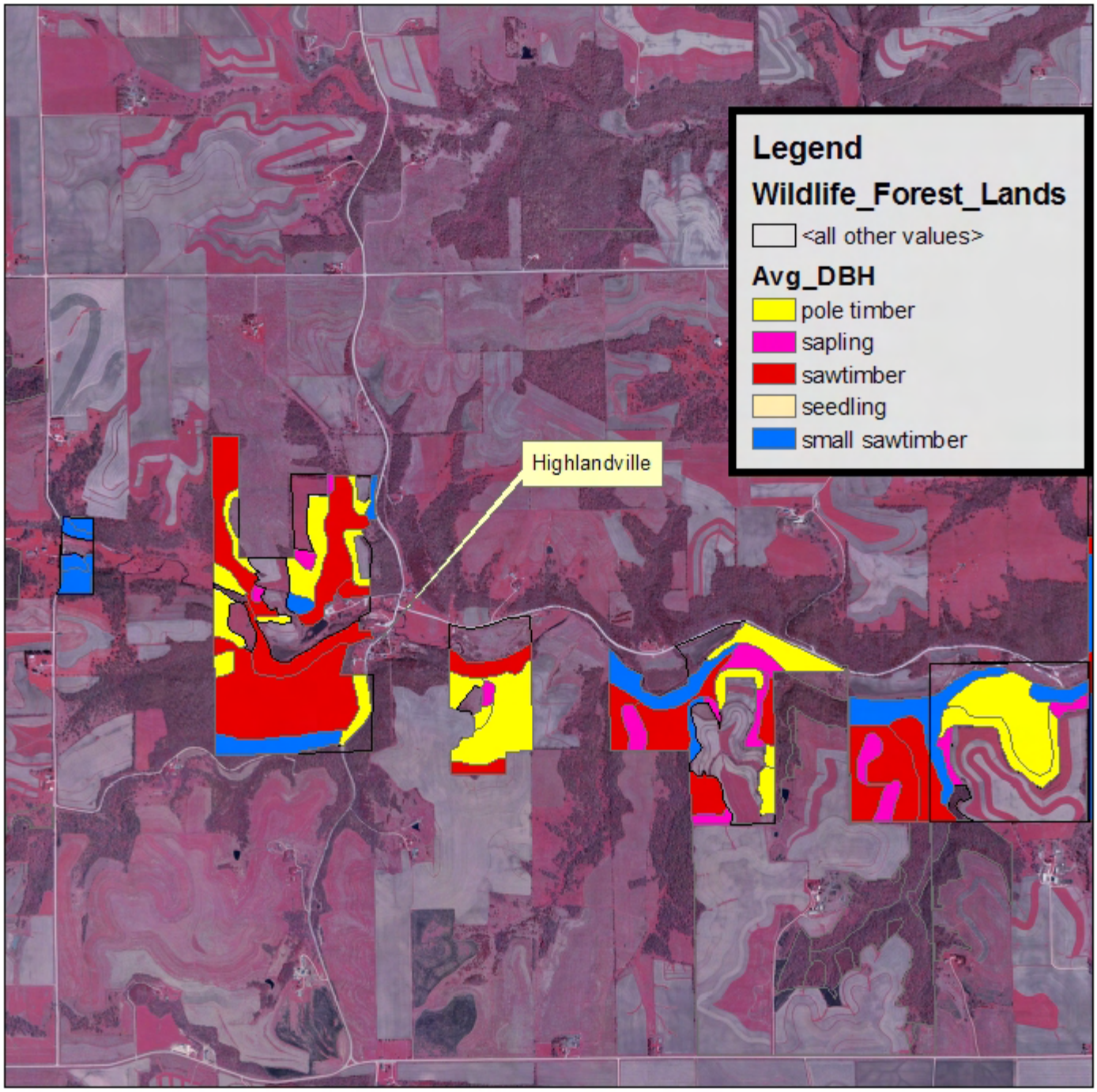
SOUTH BEAR WILDLIFE AREA
AVERAGE TREE SIZE



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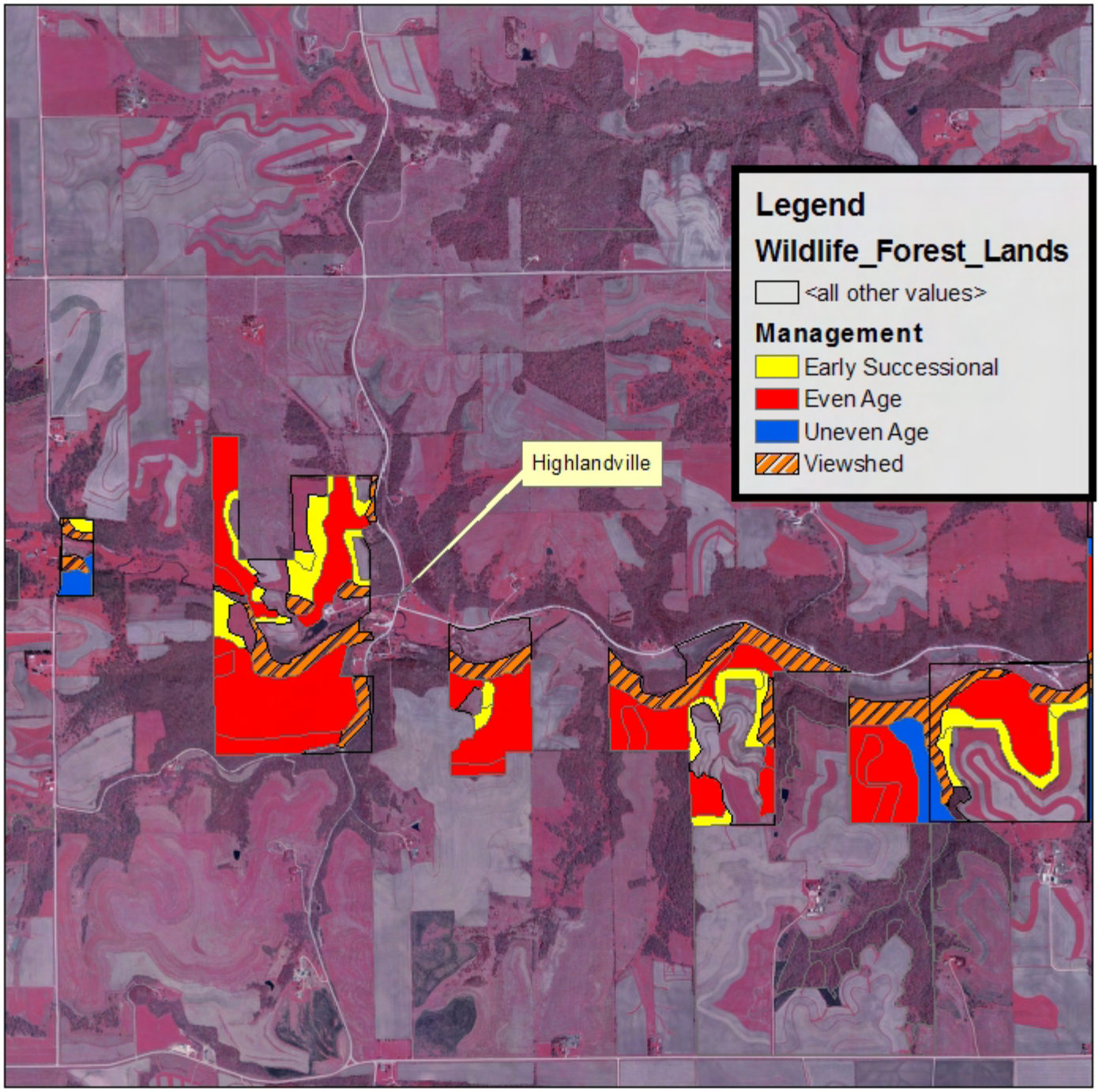
SOUTH BEAR WILDLIFE AREA
WOODLAND MANAGEMENT SYSTEMS



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HOW THE FOREST WILDLIFE STEWARDSHIP PLAN WAS DEVELOPED

The Wildlife Biologist is the manager of the area and determines the objectives for each wildlife area. Objectives address the habitat needs of "Species of Greatest Concern" and the woodland condition of each area. Seventy five per cent of the total area managed by the Wildlife Bureau is woodland. Managing woodland is essential to improve the areas for wildlife and recreation.

Management of wildlife areas is a cooperative effort by the wildlife and forestry bureaus to enhance state owned areas for a diversity of wildlife species. The property is walked by the biologist and forester. Stands are identified by tree species, tree size, topography, and management system. The biologist and forester discuss the options for each stand and how management of that stand will fit into the overall management for the area. Forester recommendations are designed to manage the stand to reach the goals and objectives of the biologist.

The Wildlife Biologist is the manager of the wildlife area. Foresters are assisting the Wildlife Bureau to implement woodland management practices.

One of four management systems are specified for each stand. This identifies the overall management system for that stand and designates the "road map" for what work will take place on the site in the future.

Each management system is described in detail in this plan. A brief description of each management system is as follows –

Early Successional **-**

Areas are clearcut every 15 years to maintain young, high stem density habitat. These areas are generally on the woodland edges to feather the edge.

Even Age **-**

Shade intolerant species such as oak and walnut require full sunlight to grow. Even age management involves a clearcut at some point to create the full sunlight condition. Even age stands are clearcut every 125 years. Clearcutting also creates early successional habitat for the first 15 years.

Uneven Age **-**

Uneven age management can be used to manage species that will grow in shade such as hard maple and basswood. Every 20 years, the stand can be selectively harvested to remove the mature and defective trees. The openings are filled with young maple and basswood, creating an all age or uneven age forest.

Viewshed **-**

These are steep slopes and buffers along the trout streams where no active management will take place.

DATE: 9/20/07

FOREST WILDLIFE STEWARDSHIP PLAN FOR SOUTH BEAR WILDLIFE AREA

MANAGER:

Terry Haindfield, Wildlife Biologist
2296 Oil Well Rd.
Decorah, Iowa 52101

TELEPHONE: 563/382-4895

LOCATION: Sec. 28, 33, 34, 35, and 36 Highlandville Twsp., Winneshiek County

TOTAL ACRES: 480

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 480 acres addressed in this plan are outlined on the attached aerial photo. The area is divided into 54 different areas or stands, labeled 1-54 on the map. Each area is described in this plan and recommendations outlined for woodland management.

The South Bear trout stream runs through the area is one of the most frequently fished trout streams in northeast Iowa. South Bear Wildlife area has steep slopes along the trout stream and upland ridges. 104 acres, or 22% of the woodland will be managed as viewshed to protect the trout stream and provide old growth forests.

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.

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. South Bear Wildlife area has many field edges and ridge tops conducive to intensive management that will be managed for early successional habitat, and even aged management to regenerate oak. There are not large blocks of woodland present that would provide suitable habitat for interior migratory bird species. Therefore, the major emphasis on South Bear is for early successional species and to maintain a good oak component on the landscape.

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
Sapling (<4" dbh)	41	8
Pole size (5-12" dbh.)	157	33
Medium Size (14-18" dbh.)	76	16
Large (>20" dbh)	206	43
Totals	480	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 in the trout stream, and increase the acres of early successional growth.

Based on my recommendations for South Bear Wildlife Area, the acres under each management system are as follows -

Management System	Acres	% of Total Area
Early Successional	75	16
Even Age	280	58
Uneven Age	21	4
Viewshed	104	22
Total	480	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 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.

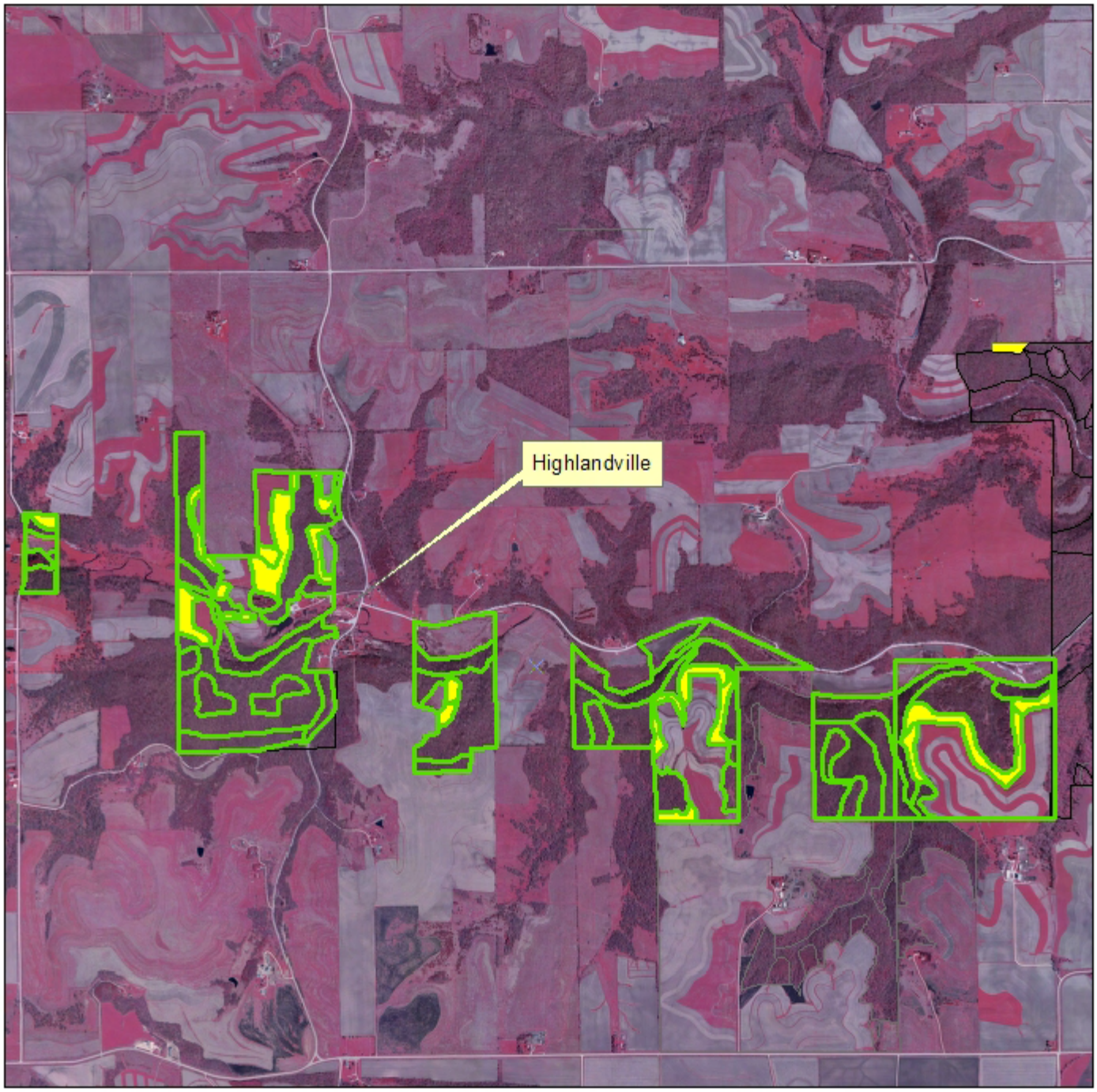
The majority of early successional management is on the woodland edges and aspen stands. This work will "feather" the edges and make a gradual transition from the field edges to the larger trees. Feathering or softening the edges results in less nest parasitism of interior forest bird species by brown-headed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

The early successional management areas will be managed on a 15-20 year rotation. In other words, every 15-20 years the area will be cut to rejuvenate the aspen and create areas with high stem density.

South Bear has 75 acres scheduled for early successional management. Applying sustainable forestry guidelines, 25 acres could be cut every 5 years.

SOUTH BEAR WILDLIFE AREA
EARLY SUCCESSIONAL MANAGEMENT
41 Acres



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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.

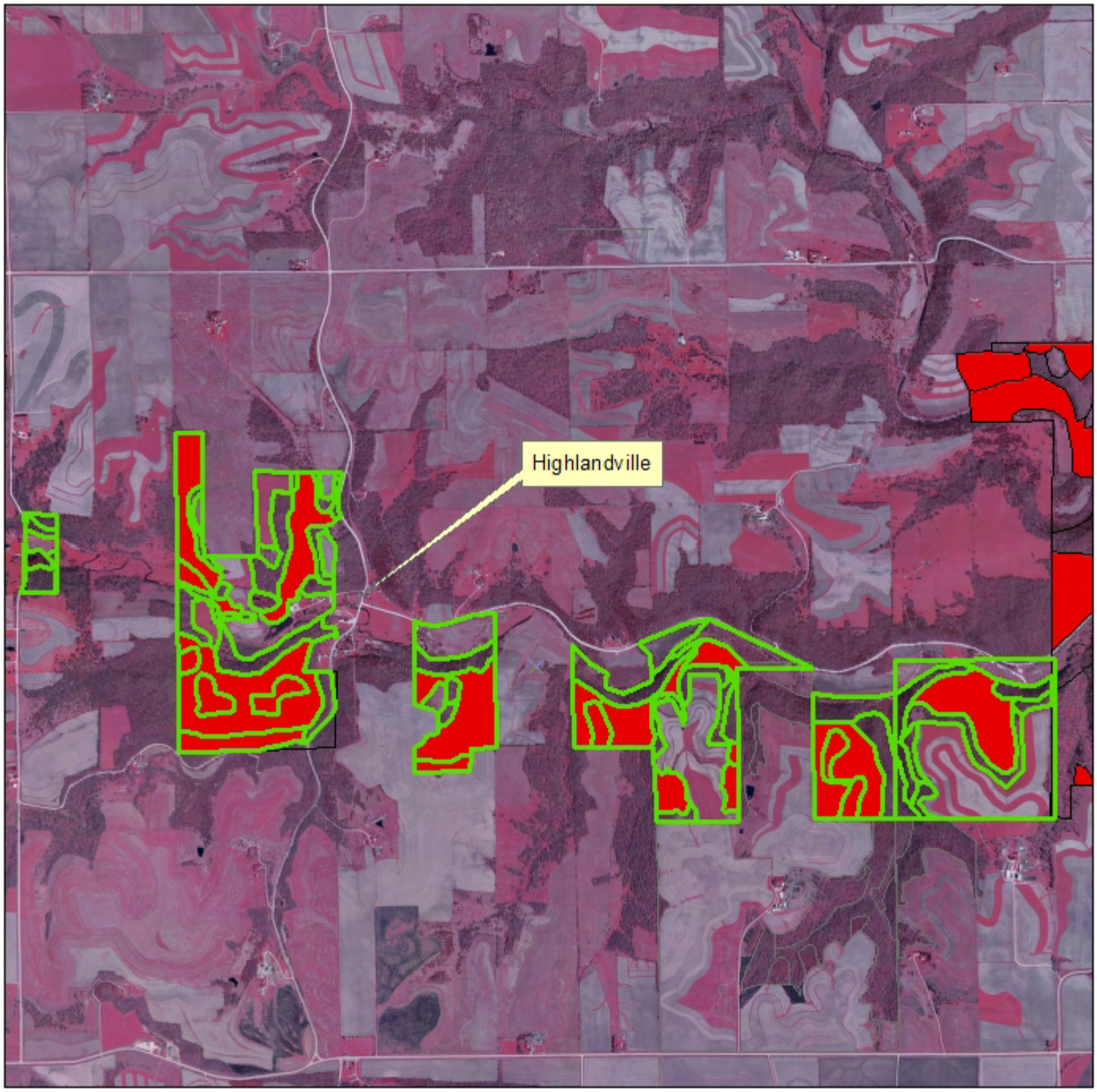
Shelterwood is a form of even-age management. The final cut is a clearcut, but several thinnings are done prior to the final cut. The large, healthy trees are left to provide seed for naturally reseeding the stand, and to create partial shade to inhibit the growth of weeds and brush until the desirable 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.

Fire is a tool in managing oak stands that is currently being studied. Frequent burning of the leaf layer in the woods will kill thin barked species such as hard maple, cherry, elm, bitternut hickory, and ironwood. Fire will expose mineral soil and open up the ground to sunlight. These conditions favor the natural regeneration of oak. Oak seedlings will tolerate light fires. The top will be killed by the fire, but the deep root systems survive and sprout. Fire will be utilized on a limited scale to encourage oak regeneration in oak stands. Once a good number of oak seedlings are present, these stands will have to be clearcut or the young oak will die from lack of sunlight.

There are 280 acres that will be managed as even aged woodlands to regenerate oak. Approximately 11 acres will be clearcut every 5 years.

SOUTH BEAR WILDLIFE AREA
EVEN AGE MANAGEMENT
280 Acres



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Uneven Age Management -

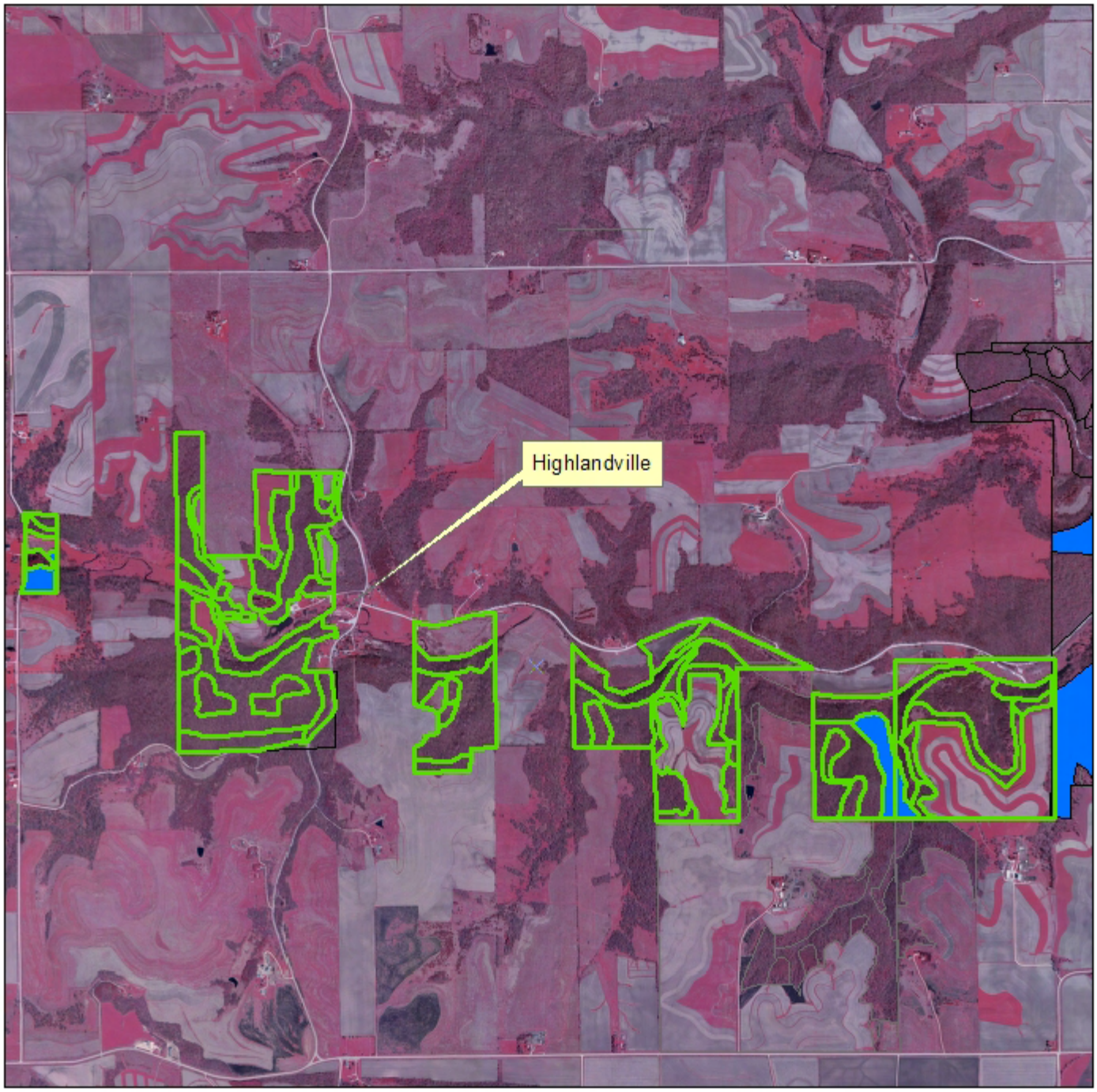
Uneven age management develops a stand of trees with all tree sizes represented. The stand structure is developed by selectively harvesting mature and defective trees, and removing unwanted small trees that are damaged or defective. Because uneven age stands always have large trees present, this system 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.

There are 21 acres that will be managed as uneven aged forests. The areas could be selectively harvested every 20 years.

SOUTH BEAR WILDLIFE AREA
UNEVEN AGE MANAGEMENT
21 Acres



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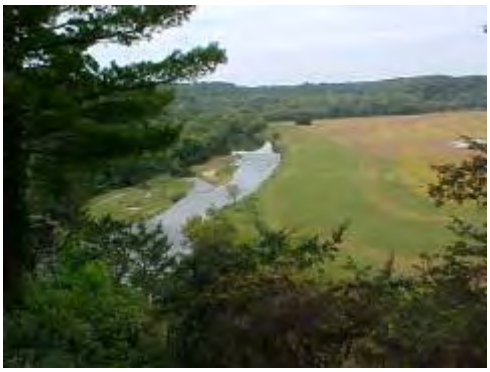
Viewshed Management -

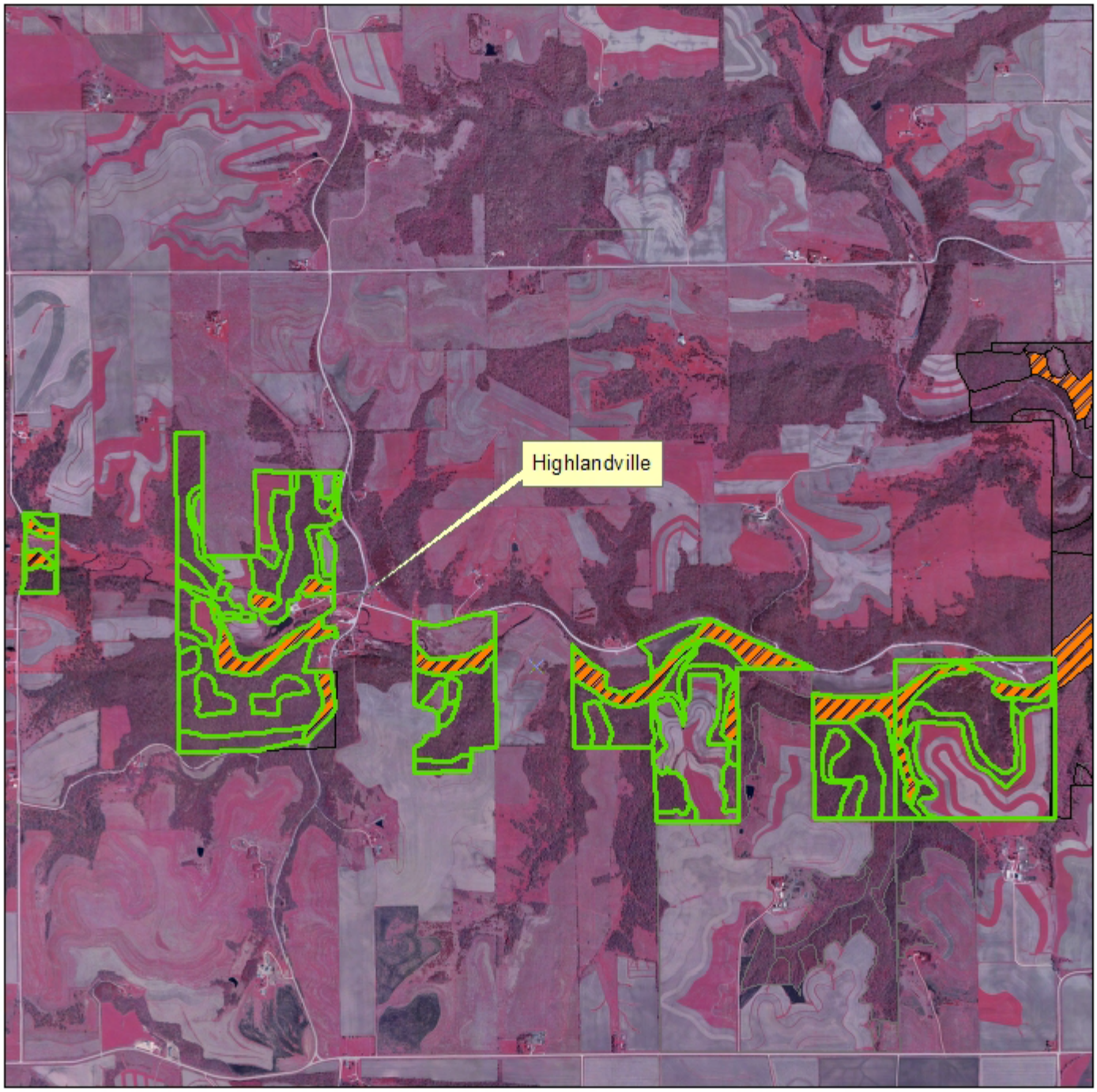
Viewshed areas are typically steep slopes and areas along streams which are fragile and are best left to naturally progress through succession. Areas where endangered plant or animal species exist will also be under viewshed management. Management can take place on these areas where desirable, but the 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 104 acres on the area, or 22% of the forest resource.

SOUTH BEAR WILDLIFE AREA
VIEWSHED MANAGEMENT
104 Acres



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SOILS

The bottomland has Dorchester and Chaseburg silt loams. These soils are moist, alluvial soils. They tend to be fertile, but are subject to periodic flooding.

The ridge tops and gentle slopes have Fayette, Palsgrove, Nordness, and Dubuque silt loams. Fayette, Palsgrove, and Dubuque are well drained, fertile loams. These are good sites for upland hardwood trees such as red oak, white oak, bur oak, walnut, hard maple, basswood, and cherry. Nordness is a shallow soil to limestone that is droughty and trees grow slowly.

The steep slopes have Nordness and steep, rock land. These steep slopes have shallow soils over limestone. Viewshed is recommended for much of this area.

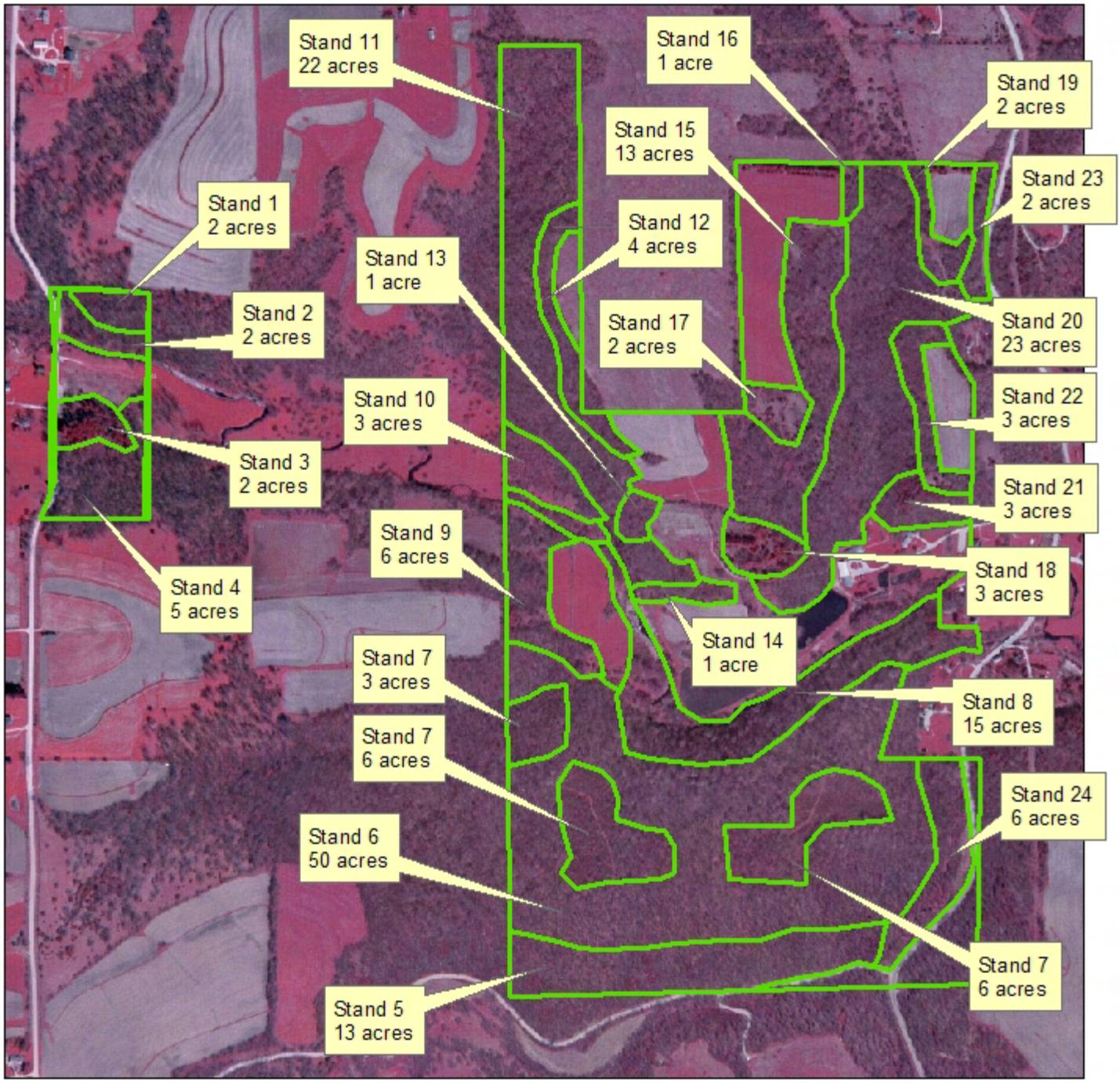
WORK PLAN

FOR

SOUTH BEAR WILDLIFE AREA

This is the "working plan" for South Bear is 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.

SOUTH BEAR WILDLIFE AREA
STANDS 1-24



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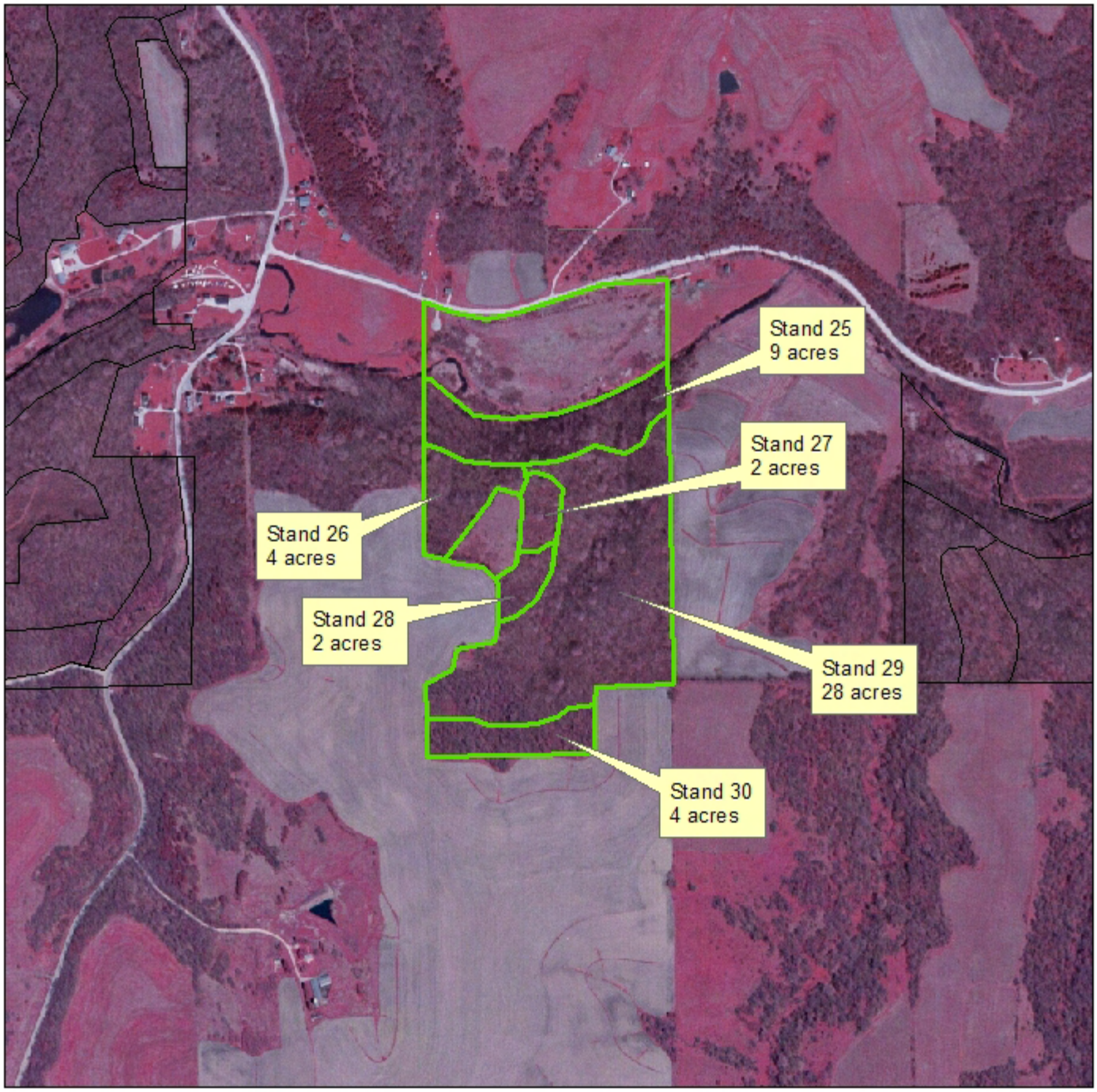
SOUTH BEAR WILDLIFE AREA
Stands 25-30



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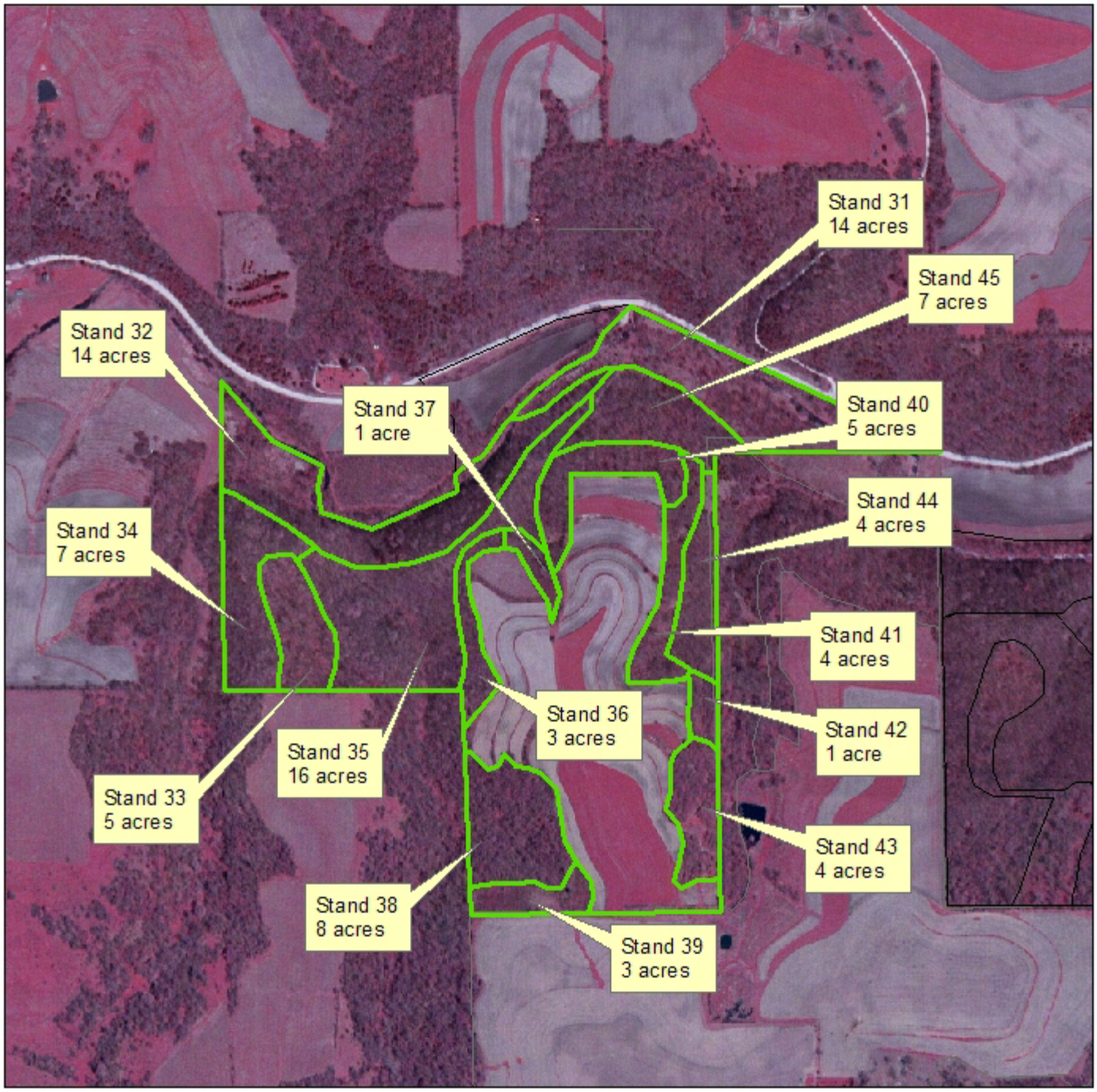
SOUTH BEAR WILDLIFE AREA
Stands 31-45



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Highlandville Twsp., Winneshiek Co.

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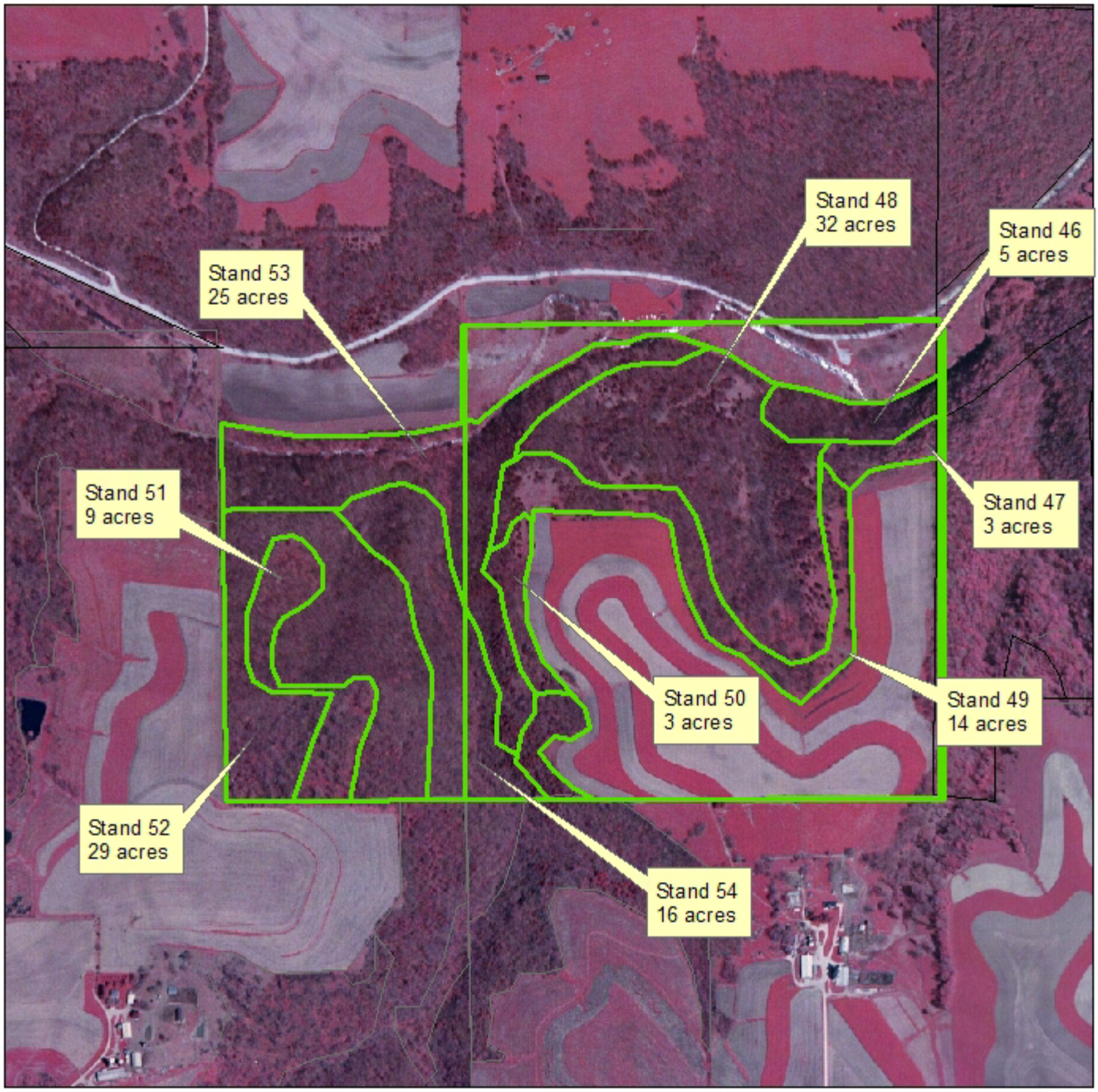
SOUTH BEAR WILDLIFE AREA
Stands 46 - 54



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DESCRIPTION AND RECOMMENDATIONS FOR INDIVIDUAL STANDS

Stand 1: 2 acres

Site Description -

South facing slope and ridgetop.

Woodland Description-

The area is medium sized (12-18" dia.) aspen, walnut, bur oak, and black oak. The understory is elm, hard maple, and gooseberry.

Management Recommendations – Early Successional

Clearcut the area to produce dense, young growth. The aspen will take over this area by root sprouting. The cut would be a commercial harvest.

Stand 2: 2 acres

Site Description –

South facing slope along the trout stream.

Woodland Descripton -

Medium sized (14-18" dia.) basswood, bur oak, walnut, and aspen. The understory is hard maple, ironwood, and elm.

Management Recommendations – Viewshed

Leave this area as is to provide a buffer along the trout stream. This slope is also very visible from the gravel road. There are a few walnut that are mature and could be harvested along with Stand 1.

Stand 3: 2 acres

Site Description –

North facing slope east of gravel road.

Woodland Description -

Medium sized (12-18" dia.) red pine, white pine, and scotch pine.

Management Recommendations – Viewshed

The scotch pine will die naturally, leaving the red pine and white pine. These trees can be left as is to provide winter color and winter wildlife habitat.

Stand 4: 5 acres

Site Description –

North facing slope with Nordness soils.

Woodland Description -

Medium sized (12-18" dia.) bur oak, black oak, elm, hard maple, and a few aspen. The understory is ironwood, hard maple, bitternut hickory, elm, black ash, boxelder, and cherry. There is dense regeneration of hard maple.

Management Recommendations – Uneven Age

In 15-20 years, the area could be selectively harvested to remove the mature and defective trees. Following the harvest, the undesirable species and damaged trees should be killed. The openings created will then fill in with hard maple.

Stand 5: 13 acres

Site Description -

South facing slope bordering the gravel road.

Woodland Description -

Medium size (12-18" dia.) bur oak and basswood. The understory is ironwood, red cedar, hackberry, basswood, gray dogwood, and hazel.

Management Recommendations – Even Age

In 10-15 years, 5-6 acres could be clearcut and planted. This will create early successional habitat for 10-15 years and establish young oak on the area.

Stand 6: 50 acres

Site Description -

Upland ridges with Fayette and Palsgrove silt loam soils.

Woodland Description –

Large white oak, black oak, and red oak. The understory is basswood, cherry, ironwood, elm, hard maple, and bitternut hickory. There is considerable wind damage to the older trees in this area. There is also a heron rookery in a patch of dead oak.

Management Recommendations – Even Age

Clearcut and plant 6-10 acres every 10 years. Plant 30 large oak seedlings per acre and protect each tree with a 4 ft. tall, vented tree shelter. Avoid harvesting adjacent to the heron rookery.

Stand 7: 15 acres

Site Description -

Ridge top and north facing slope.

Woodland Description –

Pole sized (5-10" dia.) elm, basswood, boxelder, hard maple, cherry, bitternut hickory, ash, aspen, and a few red and black oak. The oak are mainly from stump sprouts. The areas were clearcut from 1980 through 1992. Thinning was completed to release the oak in 1999.

Management Recommendations – Even Age

The areas need thinning now to provide more growing space for the desirable trees. Emphasis should be on providing optimum growing space for the young oak. Select a crop tree every 30-35 ft. apart. Remove trees with crowns that are touching or overtopping the crowns of your crop trees. Species to favor as crop trees are oak, black walnut, cherry, basswood, and hard maple.

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

Stand 8: 15 acres

Site Description -

Steep, north facing slope above the trout stream.

Woodland Description –

Large (20" and larger in diameter) red oak, white oak, basswood, and hard maple. The understory is hard maple, ironwood, elm, and black ash.

Management Recommendations – Viewshed

Leave these large trees to control erosion above the trout stream. This is also a popular stretch of the stream for fishing and this area will provide a nice visual buffer with great fall color. This also maintain a block of large trees for cerulean warblers.

Stand 9: 6 acres

Site Description –

East facing slope bordering crop field.

Woodland Description -

Pole sized (5-10" dia.) aspen, elm, boxelder, basswood, cherry, and bitternut hickory. The understory consists of gray dogwood, cherry, wild plum, and honeysuckle.

Management Recommendations – Early Successional

Clearcut this area to provide dense, young growth. There is a good aspen component which will expand through root sprouting. This would be a non commercial cut.

Stand 10: 3 acres

Site Description –

Bottomland with Dorchester silt loam soils.

Woodland Description -

Pole sized boxelder.

Management Recommendations – Even Age

Stand 10 could be converted to more beneficial species. Cut the boxelder and treat the stumps with Pathfinder II to prevent sprouting. Plant the area with bur oak and swamp white oak. Plant the trees 30 ft. apart, or 50 trees per acre. Place a 4 ft. tall, vented tree shelter over each tree to protect them from deer and rabbits. 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.

Competing vegetation should be controlled for a minimum of 3 years.

Stand 11: 22 acres

Site Description –

West facing slope with Dubuque silt loam soils and shallow, rocky soils.

Woodland Description -

Large bur oak, black oak, white oak, elm, basswood, cherry, and shagbark hickory.

Management Recommendations – Even Age

Clearcut 5-6 acres every 10-15 years. Plant the harvest area with 50 oak seedlings per acre. Protect each tree with a 4 ft. tall, vented tree shelter. Control competing vegetation around each tree by spot spraying Roundup and Princep herbicides.

Stand 12: 4 acres

Site Description -

Ridge top bordering a small, grass field.

Woodland Description –

Pole sized (5-10" dia.) elm, aspen, cherry, bitternut hickory, boxelder, and black oak. There are scattered, merchantable black oak, bur oak, basswood, cherry, and aspen.

Management Recommendations – Early Successional

Harvest the scattered, larger trees along with Stand 11. Following the harvest, fell all trees 1 inch and larger in diameter to create early successional habitat. Treat the stumps of elm, bitternut hickory, and boxelder with Pathfinder II to prevent sprouting. This will allow the aspen to expand through root sprouting.

Stand 13: 1 acre

Site Description -

South facing slope.

Woodland Description -

The area was clearcut in 2001. The stand is sapling aspen, cherry, and boxelder. This is good early successional habitat.

Management Recommendations – Early Successional

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

Stand 14: 1 acre

Site Description -

South facing slope along edge of crop field.

Woodland Description -

Pole sized (5-10" dia.) basswood, elm, cherry, and boxelder. The understory is honeysuckle, gray dogwood, and sumac.

Management Description – Early Successional

Clearcut this area in 5 years to feather the timber edge and create early successional habitat.

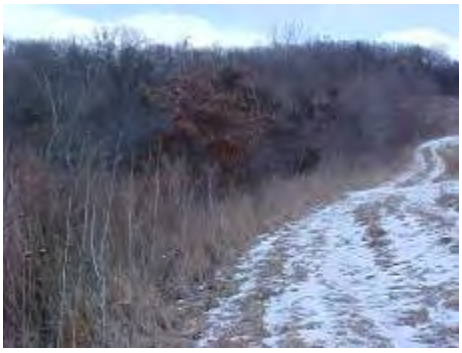
Stand 15: 13 acres

Site Description –

Ridge top and edge along crop field.

Woodland Description –

Pole sized elm, cherry, aspen, bitternut hickory, black oak, boxelder, and birch. The understory is bitternut hickory, cherry, elm, prickly ash, gray dogwood, and hazel. The north end was clearcut 10 years ago.



Management Recommendations – Early Successional

In 5 years, clearcut the stand to feather the edge and create dense, young, growth. The scattered, merchantable trees could be sold prior to the cutting of the smaller trees.

Stand 16: 1 acre

Site Description -

Ridge along crop field.

Woodland Description -

Sapling (1-4" dia.) aspen. The area was clearcut in 2002.

Management Recommendations – Early Successional

Clearcut the area again in 10 years to maintain young, high stem density habitat.

Stand 17: 2 acres

Site Description –

South facing slope with Dubuque silt loam soils.

Woodland Description -

Sapling aspen, red cedar, cherry, wild plum, and scattered apple trees. Portions of the area were cut in 2002.

Management Recommendations – Early Successional

Clearcut the area again in 10 years to maintain early successional habitat. Leave the red cedar and apple trees to provide winter habitat and food.

Stand 18: 3 acres

Site Description -

Gentle, south facing slope.

Woodland Description -

Medium sized (12-18" dia.) white pine and scotch pine.

Management Recommendations – Viewshed

Nothing is recommended for this area. Scotch pine is a short lived species and will gradually die. This will leave a nice scattering of white pine for winter cover.

Stand 19: 2 acres

Site Description -

Ridge along crop field.

Woodland Description –

Pole sized (5-10" dia.) bitternut hickory, shagbark hickory, elm, aspen, black oak, cherry, and a few walnut. The understory consists of elm, prickly ash, gray dogwood, and buckthorn.

Management Recommendations – Early Successional

In 5 years, the stand could be clearcut to create early successional habitat. Fell all trees 1 inch and larger in diameter. Treat the stumps of elm, ironwood, bitternut hickory, boxelder, and buckthorn with Pathfinder II to prevent sprouting.

Stand 20: 23 acres

Site Description -

Valley and east and west facing slopes.

Woodland Description -

Large (20" and larger in diameter) bur oak, black oak, red oak, white oak, cottonwood, and basswood. The understory is elm, bitternut hickory, cherry, ironwood, gray dogwood, and buckthorn.

Management Recommendations – Even Age

Stand 20 could be regenerated with oak under a "Shelterwood" system of management with prescribed burning. Burning the site will help eliminate shade tolerant species and control the buckthorn. Prescribed burning will destroy the abundant buckthorn seed that is in the ground.

Burn the site 2-3 times. The burns can be spaced 1-3 years apart. Once oak regeneration is present, kill the undesirable species in the understory. When there is a good stocking of young oak 3-4 ft. tall, portions of the stand should be clearcut to provide full sunlight for the young oak.

Stand 21: 3 acres

Site Description -

Steep, rocky, south facing slope.

Woodland Description –

Large bur oak with scattered red cedar. The understory is ironwood, cherry, elm, and buckthorn.

Management Recommendations – Viewshed

This site is not conducive to management and should be left as is.

Stand 22: 3 acres

Site Description -

Ridge top along crop field.

Woodland Description -

Pole sized elm, boxelder, cherry, and aspen. There are scattered, large bur oak.

Management Recommendations – Early Successional

In 5 years, clearcut this area to create early habitat and feather the woodland edge. Leave the scattered, large bur oak for acorn production.

Stand 23: 11 acres

Site Description -

Narrow, east facing slope bordering the gravel road.

Woodland Description –

Medium sized (14-18" dia.) hard maple, red oak, black oak, and aspen. The understory is ironwood, bitternut hickory, shagbark hickory, and buckthorn.

Management Recommendations – Viewshed

Leave this area as is to provide a visual buffer along the road.

Stand 24: 6 acres

Site Description -

Bottomland and east facing slope along blacktop leading into Highlandville.

Woodland Description -

Pole sized (5-10" dia.) hard maple, cherry, basswood, elm, and boxelder. There are scattered, large bur oak.

Management Recommendations – Viewshed

Leave this area as is to provide buffer along the road. People traveling to Highlandville enjoy the fall colors on the east facing slope.

Stand 25: 9 acres

Site Description -

Steep, north facing slope adjacent to the trout stream.

Woodland Description -

Large (20" dia. and larger) red oak, hard maple, bur oak, and basswood. There are scattered walnut on the west end. The understory is hard maple, ironwood, ash, and blue beech.

Management Recommendations – Viewshed

I recommend leaving this area as is to provide a buffer along the trout stream. Mature walnut can be harvested when adjacent stands are harvested.

Stand 26: 4 acres

Site Description -

North and east facing slopes.

Woodland Description -

Pole sized hard maple, cherry, ironwood, walnut, basswood, elm, and a few red oak. There is a good stocking of young walnut. There are scattered, medium sized walnut, white oak, and basswood.

Management Recommendations – Even Age

Stand 26 has a good stocking of mixed hardwood, pole sized trees. The scattered, larger trees could be harvested to create an even aged stand. In approximately 5 years, the stand could be thinned to provide optimum growing space for the best trees. The thinning will also increase hard mast production of walnut and oak.

Stand 27: 2 acres

Site Description -

Upland along grass field.

Woodland Description -

Sapling (1-4" dia.) aspen and elm. The area was clearcut in 2002.

Management Recommendations – Early Successional

Clearcut the area again in 10 years to maintain high stem density habitat.

Stand 28: 2 acres

Site Description -

Upland along grass field.

Woodland Description -

Pole sized aspen, basswood, cherry, elm, black oak, and red oak.

Management Recommendations – Early Successional

In approximately 5 years, the stand could be clearcut to create early successional habitat. Cut all trees 1 inch and larger in diameter. Cut the trees in the fall and winter to maximize aspen sprouting. Treat the stumps of elm, ironwood, and boxelder with Pathfinder II to prevent stump sprouting.

Stand 29: 28 acres

Site Description -

Upland with Fayette silt loams soils and steep, rocky land.

Woodland Description -

Pole sized red oak, black oak, cherry, basswood, hard maple, aspen, elm, shagbark hickory, and walnut. There are scattered, medium sized cherry, walnut, elm, hard maple, white oak, red oak, black oak, and walnut.

Management Recommendations – Even Age

The majority of merchantable trees can be harvested to create an even aged stand of pole sized trees. This stand was high graded 30 years ago and most of the larger trees are low quality. In 5 years, the stand could be thinned to provide optimum growing space for the best trees. This stand has a nice stocking of oak scattered throughout.

Stand 30: 4 acres

Site Description -

Gentle, north facing slope with Fayette silt loam soils.

Woodland Description -

Large black oak, white oak, shagbark hickory, and elm. The understory is elm and ironwood.

Management Recommendations – Even Age

Clearcut and plant with oak seedlings to establish young oak on the area. Following the harvest, fell all trees 1 inch and larger in diameter. Treat the stumps of undesirable species with Pathfinder II to prevent stump sprouting. Plant the area with 50 large oak seedlings per acre. Plant the trees 30 ft. apart. Protect each tree with a 4 ft. tall, 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 31: 14 acres

Site Description -

Bottomland along trout stream and bordering gravel road.

Woodland Description -

Pole sized walnut, boxelder, black ash, and butternut.

Management Recommendations – Viewshed

No intensive management is recommended for this area. This bottomland provides a nice buffer along the trout stream. The walnut with good form could be pruned and released. The walnut are scattered, so the thinning would have little impact on the area.

Stand 32: 14 acres

Site Description -

Steep, north facing slope with rocky soils.

Woodland Description -

Medium size (12-18" dbh) red oak, hard maple, and basswood. The understory consists of hard maple, ironwood, blue beech, and ash.

Management Recommendations – Viewshed

Leave this area as is for fall color and protection of the trout stream.

Stand 33: 5 acres

Site Description -

Upland with Fayette silt loam soils.

Woodland Description -

This area was clearcut in 2003. Oak were planted without protection. There are very few oak present. The stand is sapling hard maple, ironwood, bitternut hickory, aspen, cherry, and a few walnut and oak. The majority of oak are from stump sprouts.

Management Recommendations – Even Age

In 10 years, select 50 crop trees per acre and remove trees with crowns that are touching or overtopping the crowns of the crop trees.

Stand 34: 7 acres

Site Description -

West facing slope with shallow soils.

Woodland Description -

Large red oak, white oak, black oak, and walnut. Understory is ironwood, hard maple, and bitternut hickory.

Management Recommendations - Even Age

This stand will mature in 20 years. In 20 years, clearcut the stand and plant oak.

Stand 35: 16 acres

Site Description -

Valley and east and west facing slopes.

Woodland Description -

Large (20" and larger in diameter) red oak, white oak, bur oak, and black oak. The understory is ironwood, elm, hard maple, bitternut hickory, and cherry.

Management Recommendations – Even Age

In 5-10 years, clearcut 5-6 acres and plant oak. Plant large oak seedlings 30 ft. apart, or 50 trees per acre. Protect each tree with a 4 ft. tall, vented tree shelter. Control competing vegetation by spot spraying Roundup and Princep herbicides. Harvest the area on the west side of the valley first. This area has large red oak that are beginning to deteriorate.

Stand 36: 3 acres

Site Description -

Ridge along crop field.

Woodland Description -

Medium sized (12-18" dia.) cherry, black oak, and bur oak. The understory is elm, ironwood, hard maple, bitternut hickory, and aspen.

Management Recommendations – Early Successional

Clearcut the area to create early successional habitat and feather the edge of the woodland. Following the harvest, fell all remaining trees 1 inch and larger in diameter. Treat the stumps of ironwood, bitternut hickory, elm, and boxelder with Pathfinder II herbicide to prevent sprouting. This will expand the aspen on the site.

Stand 37: 1 acre

Site Description -

West slope.

Woodland Description -

Sapling aspen, ash, and cherry. The area was clearcut in 2000.

Management Recommendations – Early Successional

Clearcut the stand again in 10 years to maintain young, high stem density.

Stand 38: 8 acres

Site Description –

North and west facing slopes with mainly Dubuque silt loam soils.

Woodland Description –

Large black oak, white oak, walnut, elm, cherry, and aspen. The understory is elm, ironwood, hard maple, cherry, boxelder, and prickly ash.

Management Recommendations – Even Age

In 5 years, clearcut harvest the area and plant oak. After the harvest, fell all trees 1 inch and larger in diameter. Treat the stumps of undesirable species with Pathfinder II to prevent sprouting. Plant 50 large oak seedlings per acre and protect each tree with a 4 ft. tall, vented tree shelter.

Stand 39: 3 acres

Site Description –

Upland adjacent to crop field on private land.

Woodland Description –

Sapling (1-4" dia.) aspen, elm, boxelder, cherry, and walnut.

Management Recommendations – Early Successional

Clearcut this area in 5 years to create early successional habitat. This will be a non commercial cut.

Stand 40: 5 acres

Site Description -

Ridge along crop field.

Woodland Description -

Pole sized aspen, walnut, cherry, black ash, elm, and boxelder.

Management Recommendations – Early Successional

Clearcut to feather the edge and create dense, sapling growth. This will be a non commercial cut.

Stand 41: 4 acres

Site Description –

Ridge along the edge of the woods.

Woodland Description -

Sapling (1-4" dia.) aspen, ash, cherry, elm, black oak, and bitternut hickory. There are scattered, large white and black oak. Most of this area was cut to create early successional habitat 10 years ago.

Management Recommendations – Early Successional

Cut the area again in 2014 to maintain early successional habitat. The scattered, large oaks should be left for mast production.

Stand 42: 1 acre

Site Description -

East facing slope along the edge of the crop field.

Woodland Description -

Pole sized (5-10" dia.) boxelder, black oak, elm, cherry, and bitternut hickory.

Management Recommendations – Even Age

This stand could be thinned to release the crop trees. Select healthy black oak and cherry that are 30 ft. apart, or 50 trees per acre. Remove trees with crowns that are touching or overtopping the crowns of the selected trees. This will improve the vigor and growth of the best trees.

Stand 43: 4 acres

Site Description –

East facing slope with Dubuque silt loam soils.

Woodland Description -

This area is mainly pole sized boxelder and elm.

Management Recommendations – Even Age

This area could be converted to more desirable species. Fell all trees 1 inch and larger in diameter. Treat the stumps of undesirable species with Pathfinder II to prevent sprouting. Plant the area with large 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. Red and white oak are recommended.

Deer and rabbits will heavily browse oak seedlings. It is nearly impossible to establish oak without protection. Protect the seedlings with a 4 ft. tall, vented, plastic 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 44: 4 acres

Site Description –

East facing slope with rock outcroppings.

Woodland Description -

Large black oak, white oak, and bur oak. The understory is elm, ironwood, and black cherry.

Management Recommendations – Viewshed

This area is narrow and many of the trees lean over the property line. The area has many limestone outcrops. I suggest doing nothing with this site and maintaining an area with large oak trees as long as the trees will last.

Stand 45: 7 acres

Site Description -

North facing slope.

Woodland Description -

Sapling (1-4" dbh) black ash, cherry, hard maple, elm, and a few black oak. This area was underplanted with oak and clearcut in 2003.

Management Recommendations – Even Age

Thin the stand to release the crop trees in 10 years.

Stand 46: 5 acres

Site Description -

Very steep, north facing slope above trout stream.

Woodland Description -

Medium size (14-18" dia.) basswood, hard maple, red oak, and white pine.

Management Recommendations – Viewshed

This area is too steep for management and provides a great buffer along the trout stream.

Stand 47: 3 acres

Site Description -

Slight north facing slope along the crop field.

Woodland Description -

Sapling aspen, boxelder, elm, and cherry. The area was clearcut 6-7 years ago.

Management Recommendations – Early Successional

Clearcut the area in approximately 10 years to maintain dense, young growth along the woodland edge.

Stand 48: 32 acres

Site Description -

Shallow soils with valleys and east and west facing slopes.

Woodland Description -

Sapling to pole sized red cedar, red oak, black oak, bur oak, walnut, elm, cherry, ash, boxelder, and aspen. There are scattered, large oak, walnut, and cherry. This area has had a history of grazing and high grading.

Management Recommendations – Even Age

This area has a good stocking of young oak and walnut in areas. The scattered, large trees were left from past harvests due to lower quality. The scattered, large trees could be harvested to create an even aged stand. Some of the largest, wolf trees could be left to provide mast production.

In 10 years, the stand should be thinned to release the crop trees. At that time, the thinning will favor the oak and maintain a good oak component on the area.

Stand 49: 14 acres

Site Description –

Woodland edge along crop fields.

Woodland Description -

Pole sized elm, boxelder, red cedar, ash, walnut, and black oak. There are scattered, large oak and walnut.

Management Recommendations – Early Successional

Clearcut 1/3 of the area every 5 years to feather the woodland edge and create early successional habitat. All merchantable trees should be harvested along with Stand 48.

Stand 50: 3 acres

Site Description -

West facing slope along woodland edge.

Woodland Description -

Sapling aspen, birch, cherry, elm, and buckthorn. The area was cut 7-8 years ago to create early successional habitat.

Management Recommendations – Early Successional

Clearcut the area again in 10 years.

Stand 51: 9 acres

Site Description -

Ridge top with Dubuque silt loam soils.

Woodland Description -

Sapling (1-5" dia.) cherry, elm, ironwood, bitternut hickory and ash. The area was clearcut in 2003.

Management Recommendations – Even Age

In 10 years, thin the area to release the crop trees.

Stand 52: 29 acres

Site Description -

East and west slopes with Dubuque silt loam soils.

Woodland Description -

Large (20" and larger in dia.) white oak, red oak, black cherry, and elm. The understory is elm, ironwood, bitternut hickory, basswood, hard maple, and cherry.

Management Recommendations – Even Age

In 10 years, clearcut 5-10 acres to regenerate oak. Following the harvest, fell all trees 1 inch and larger in diameter. Treat the stumps of undesirable species with Pathfinder II to prevent sprouting. Plant the harvest area with 50 red and white oak seedlings per acre. Protect each tree with a 4 ft. tall, vented tree shelter.

Stand 53: 25 acres

Site Description -

Steep north and west facing slopes with shallow soils.

Woodland Description -

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

Management Recommendations – Viewshed

No management is recommended for this area. The slopes are very steep and most of the stand is above the trout stream.

Stand 54: 16 acres

Site Description -

North and east facing slopes.

Woodland Description -

Large white oak, red oak, basswood, and bur oak. The understory is ironwood, elm, hard maple, and basswood. There is a good stocking of hard maple and basswood.

Management Recommendations – Uneven age

The elm, ironwood, and boxelder could be killed now to encourage the development of young hard maple and basswood. Treat the stumps of the undesirable species with Pathfinder II to prevent sprouting. In addition, poor formed and damaged trees should be felled. Do not treat the stumps of desirable species with herbicide.

In 10 years, the stand could be selectively cut to remove the mature and defective trees. This will create a multi-layered, or uneven age stand.

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 75 acres designated for early successional management. The allowable cut is 5 acres per year (75 acres divided by 15 yrs.). With a working cycle of 5 years, approximately **25 acres could be cut every 5 years**.

Even Age Management Area –

There are 280 acres under even age management. Dividing 280 acres by 125 years, yields an allowable cut of 2.2 acres per year, or **11 acres every 5 years**.

Uneven Age Management Area –

Stands can be selectively harvested every 20 years to remove mature and defective trees. There are 21 acres under uneven age management. The allowable harvest is **5 acres of selective harvest every 5 years**.

HIGH PRIORITY PROJECTS

Open Tree Planting -

Stand #	Acres	Prescription
10	3	Kill boxelder and plant oak
43	4	Kill boxelder and elm and plant oak
Total	7	

Timber Stand Improvement – Crop Tree Release

Stand #	Acres
31	14
7	15
42	1
Total	30

Timber Stand Improvement – Weed Tree Removal

Stand #	Acres
4	5
54	16
Total	21

Early Successional Clearcuts – 15 yr. rotation

Stand #	Acres	Comments
1	2	Commercial timber sale
9	6	
12	4	Commercial timber sale
36	3	Commercial timber sale
40	5	
Total	20	

Even Age Clearcuts – 125 yr. rotation

Stand #	Acres	Prescription
6	5	Clearcut and plant
11	6	Clearcut and plant
26	4	Sell merchantable trees to create an even aged, pole sized stand
29	28	Sell merchantable trees to create even aged, pole sized stand
30	4	Clearcut and plant
Total	47	

Selective Harvest – 20 yr. cycle

No selective harvesting is recommended at this time. Stand 54, 16 acres, could be selectively harvested in 10 years.

Prescribed Burning to Encourage Oak Regeneration -

Stand	Acres
20	23

APPENDIX

SOUTH BEAR WILDLIFE AREA

SUMMARY OF WOODLAND STANDS

No.	Acres	Timber Type	TreeSize	Mngt. System	Prescription	Priority	Year Complete	Comments
1	2	Aspen Walnut Black Oak	Medium	Early Successional	Clearcut	High	2009	Commercial Sale
2	2	Basswood Bur Oak Walnut	Medium	View Shed				
3	2	Red, Scotch, White Pine	Medium	View Shed				
4	5	Bur Oak Black Oak Hard Maple	Medium	Uneven Age	TSI – Kill undesirable species	High	2009	Selective harvest in 20 years
5	13	Bur Oak Basswood	Medium	Even Age	Clearcut and plant	Medium	2019	
6	50	White Oak Red Oak Bl. Oak	Large	Even Age	Clearcut & plant	High	2009	Cut areas 5-6 acres in size
7	15	H. Maple Basswood Cherry	Pole	Even Age	TSI – Release crop trees	High	2009	
8	15	Oak Maple Basswood	Large	View Shed				
9	6	Aspen Elm Boxelder	Pole	Early Successional	Clearcut	High	2009	Non commercial
10	3	Boxelder	Pole	Even Age	Kill boxelder and plant oak	Medium	2014	
11	22	Bur Oak Bl. Oak	Large	Even Age	Clearcut and plant	High	2009	5-6 acres per work cycle
12	4	Elm Aspen Oak	Pole	Early Successional	Clearcut	High	2009	Sell scattered merchantable trees with Stand 11

No.	Acres	Timber Type	TreeSize	Mngt. System	Prescription	Priority	Year Complete	Comments
13	1	Aspen Cherry	Sapling	Early Successional	Clearcut	High	2019	Non commercial
14	1	Basswood Elm Cherry	Pole	Early Successional	Clearcut	High	2014	Non commercial
15	13	Elm Aspen Oak	Pole	Early Successional	Clearcut	High	2014	Commercial Sale
16	1	Aspen	Sapling	Early Successional	Clearcut	High	2019	
17	2	Aspen Cedar	Sapling	Early Successional	Clearcut	High	2019	
18	3	White, Scotch Pine	Medium	View Shed				
19	2	Aspen Bl. Oak Bitternut Hickory	Pole	Early Successional	Clearcut	High	2014	Non commercial
20	23	Bur Oak Black Oak Red Oak	Large	Even Age	Shelterwood with prescribed burning	Medium	2009	
21	3	Bur Oak Red Cedar	Large	View Shed				
22	3	Elm Boxelder Aspen	Pole	Early Successional	Clearcut	High	2014	Leave large oak
23	2	Hard Maple Red Oak	Medium	View Shed				
24	6	H. Maple Basswood Elm	Pole	View Shed				
25	9	Oak H. Maple Basswood	Large	View Shed				
26	4	Maple Basswood Walnut	Pole	Even Age	Sell merch. Trees TSI – CTR	High	2009 2014	Small sale of scattered trees
27	2	Aspen Elm	Sapling	Early Successional	Clearcut	High	2019	Non commercial
28	2	Aspen Elm	Pole	Early Successional	Clearcut	High	2014	Non commercial

No.	Acres	Timber Type	TreeSize	Mngt. System	Prescription	Priority	Year Complete	Comments
29	28	Oak Maple Basswood	Pole	Even Age	Sell merch. Trees Crop Tree Release	High	2009 2014	
30	4	Bl. Oak W. Oak S. Hickory	Large	Even Age	Clearcut and plant	High	2009	
31	14	Walnut Boxelder Ash	Pole	View Shed	Prune and release walnut	Medium	2009	
32	14	R. Oak Maple Bass	Medium	View Shed				
33	5	Maple B. hickory Cherry	Sapling	Even Age	TSI – Release crop trees	High	2019	
34	7	Red Oak White Oak Bl. Oak	Large	Even Age	Clearcut and Plant	High	2029	
35	16	Red Oak White Oak Bur Oak	Large	Even Age	Clearcut and Plant	High	2014	
36	3	Black Oak Bur Oak Cherry	Medium	Early Successional	Clearcut	High	2009	Commercial Sale
37	1	Aspen	Sapling	Early Successional	Clearcut	High	2019	Non Commercial
38	8	Bl. Oak W. Oak Walnut	Large	Even Age	Clearcut & Plant	High	2014	
39	3	Aspen Elm Boxelder	Sapling	Early Successional	Clearcut	High	2014	Non commercial
40	5	Aspen Cherry Elm	Pole	Early Successional	Clearcut	High	2009	Non commercial
41	4	Aspen Cherry	Sapling	Early Successional	Clearcut	High	2014	Non commercial Leave large oak
42	1	Boxelder Bl. Oak B. Hickory	Pole	Even Age	TSI – Release crop trees	High	2009	
43	4	Boxelder Elm	Pole	Even Age	Kill weed trees and plant oak	Medium	2009	
44	4	Bl. Oak W. Oak Bur Oak	Large	View Shed				

No.	Acres	Timber Type	Tree Size	Mngt. System	Prescription	Priority	Year Complete	Comments
45	7	Ash Cherry H. Maple	Sapling	Even Age	TSI – Release crop trees	High	2019	
46	5	Basswood H. Maple Red Oak	Medium	View Shed				
47	3	Aspen Boxelder Elm	Sapling	Early Successional	Clearcut	High	2019	
48	32	Cedar Oak Walnut	Pole	Even Age	Harvest merchantable trees Release crop trees	High	2014 2019	
49	14	Oak Boxelder Walnut	Pole	Early Successional	Clearcut 1/3 every 5 years	High	2014	Commercial Sale
50	3	Aspen	Sapling	Early Successional	Clearcut	High	2019	Non commercial
51	9	Cherry Elm B. Hickory	Sapling	Even Age	TSI – Release crop trees	High	2019	
52	29	W. Oak R. Oak Cherry	Large	Even Age	Clearcut & Plant	High	2019	Cut 5-10 acres per work cycle
53	25	Oak H. Maple Basswood	Medium	View Shed				
54	16	W. Oak Red Oak Basswood	Large	Uneven Age	TSI – Kill undesirable species Selective Harvest	High	2009 2019	

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.