FOREST STEWARDSHIP PLAN

FOR

SOAP CREEK WILDLIFE MANAGEMENT AREA

Developed by:
Ray Lehn
Iowa DNR Forester
Chuck Steffen
Iowa DNR Biologist
Dave Whittlesey
National Wild Turkey Federation Biologist
Aaron Lumley
Iowa DNR Forester

Contents

Forest Stewardship Plan..... 3
Introduction..... 3
Objectives..... 4
Management Considerations 4
Management Strategies 5
Description of the Area..... 6
Size Class Map..……10
Management System Map……..……11
Work Plan for Soap Creek WMA…….……12
Appendix..... Error! Bookmark not defined.
Summary of stands 24
Species of Greatest Concern 31
Guidelines for Protection of Indiana Bat Summer Habitat..... 33
Glossary 35

Forest Stewardship Plan

For

Soap Creek Wildlife Management Area

Manager:	Jeff Glaw - Wildlife Management Biologist
Telephone:	319-293-7185
Location:	T-70N, R-15W, Sections 8, 17, 18 Davis County, Iowa
Acres:	517 total acres 52 acres cropland 382.4 acres upland timber 35 acres bottomland timber 35 acres wetland 11.6 acres idle 1 acre public use facilities

Introduction

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

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

Objectives

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

Funding for the acquisition and management of the Soap Creek WMA has been almost exclusively hunter generated monies, i.e. license fees and excise taxes on sporting equipment. Consequently, a primary objective for management of the area is to improve habitat for hunted species such as deer, turkey, squirrels, and bobwhite quail. On the other hand, the IDNR should be obligated to consider the effects of its management actions on non-hunted species as well, particularly those that are threatened, endangered, or species of special concern. The wildlife bureau's "State Comprehensive Wildlife Conservation Plan" identifies those species it considers in "greatest conservation need" (refer to page 29). Recognizing that it is difficult if not impossible to manage for all of these species at the same time and on one tract, this list will, however, provide an important guideline by which management strategies and decisions will be made.

Management Considerations

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

1. The decline of many forest interior bird species such as Acadian flycatchers, veerys, wood thrushes, cerulean and Kentucky warblers and other neotropical migrants. Forest fragmentation and associated cowbird parasitism are considered among the factors causing declines in some of these species. Iowa is a state with exceptionally fragmented forests where addressing the needs of some of these large-block, interior nesting species is particularly difficult, if not impossible. The Soap Creek WMA, however, is part of a relatively large block (by Iowa standards) of public and private timber. It is important to consider the habitat components of this larger landscape when making land management decisions and every attempt should be made to minimize fragmentation of this forest when designing and implementing silviculture practices.
2. There has been a loss of early succession forest stands and associated wildlife species throughout much of southern Iowa. Many of the disturbance factors such as fire, grazing, and cutting have dramatically decreased over the past 40 years. As a result, much of the upland forest in this vicinity has progressed beyond the early succession stage. While this may have been beneficial to those wildlife species requiring more mature forests, it has probably been a negative for species

such as bobwhite quail, woodcock, black-billed and yellow-billed cuckoos, and blue-winged warblers.

3. There has been a steady decline and projected future decline in oak forest throughout Iowa caused by continuous succession of forest stands to the more shade tolerant species such as maple, basswood, ironwood, and bitternut hickory. Oak-hickory forests are extremely important for a wide variety of wildlife species in Iowa. Mast from these species provides an important food resource for many mammal and bird species. The eventual replacement of oak forest with shade tolerant species such as maple would undoubtedly have a severe negative effect on a huge variety of hunted and non-hunted species.

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

Management Strategies

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

1. Natural oak regeneration requires sunlight to give the oak seedlings a competitive edge over shade tolerant species. Clear cuts and shelter-wood cuts (described under Proposed Management Systems) are the typical systems used for regenerating oak. To prevent any potential negative effects on interior nesting species, clear-cuts should be kept as small as possible Clear-cuts should be kept as small as possible (3-10 acres) while still large enough to achieve oak regeneration and be economically feasible. To achieve economic feasibility with small clear-cuts, sales may need to be piggy-backed with other sales on public land in the vicinity. Subdividing larger stands will be necessary to keep clear-cuts as small as possible.
2. Early succession stages and mature stages of forest both tend to be more productive for a variety of wildlife than the intermediate crowded pole-size stage. Practices such as basal area thinning and crop tree release can be used to minimize the time a stand must spend in this intermediate stage.
3. While there is no feasible way of extending the early succession stage of a forest stand, the mature stage of succession may be able to be extended significantly beyond the typical 100 or 120 year rotation age. While this may result in some decline in timber quality and economic return, the trade-off value for certain wildlife species may make it worth it. The longer rotation

should tend to reduce the amount of fragmentation needed to regenerate the stand. The limiting factor may be how long the rotation can be extended without jeopardizing natural oak regeneration. Natural regeneration is preferred and planting should be avoided if at all possible.

4. Some interior nesting bird species seem to select for large spreading "wolf trees" within a given stand. When clear cuts and shelter-wood cuts are marked, these trees should be left standing, especially since they typically have little economic value.
5. Many wildlife species require dead or dying trees to provide insects for food and cavities for nesting. When clear cuts and shelter-wood cuts are marked for harvest, provisions should be made to leave a number of cull trees, snags, and cavity trees to provide this component for the future stand.
6. It is probable that Indiana bats use this area during the summer, in particular the riparian forest adjacent to Soap Creek and its tributary creeks. Cutting on any stands described in this FWSP must be done in a manner that does not disturb potential bat maternity trees during the breeding season.
7. This FWSP should be updated regularly as more information becomes available on wildlife use and on the efficacy of various silvicultural/management procedures. If funding is available, wildlife surveys should be done to determine species use to help evaluate success of management decisions.

Description of the Area

The Soap Creek WMA was purchased in 1983 with wildlife habitat stamp monies cost shared with Pittman-Robertson funds. The area totals 519 acres and is adjacent to compartment 6 of the Unionville Unit of Stephen's State Forest.

The WMA is primarily upland forest with approximately 100 acres of bottomland crop fields and former crop fields associated with Soap Creek. In the 1990's, 3 wetlands were built on some of these crop fields with federal PL-560 funds appropriated through the Soap Creek Watershed project. These wetlands can be manipulated with drawdown structures and total approximately 35 acres.

For purposes of this FWSP, the Soap Creek WMA forested land was divided into 25 stands shown in the photo (refer to page 25). Each stand is described in this plan and recommendations are outlined for woodland management by stand. A priority level has been established for each stand recommendation to assist in management decisions.

Income from Timber Harvest:

It should be emphasized that income generation is not the goal behind FWSP's. Harvesting is conducted to regenerate stands to desirable species and to achieve a desirable diversity of tree sizes and species. However, any income generated from timber

harvesting operations should be reinvested into the area to thin young stands, convert areas to more desirable species and otherwise manage the forest for wildlife, and invest in surveys and/or research to evaluate success of management decisions and help direct future management. Without this reinvestment, there is little chance that the WMA annual budget will allow the recommendations in this plan to be implemented. Harvesting is a very minimal portion of this plan. The majority of work recommended is directed at thinning young stands so the oak is not shaded by other trees and at removing undesirable species to encourage regeneration of desirable trees.

Current Distribution of the Tree Size on the area:

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

Tree Size	Acres	Percent of Total Area
Pole (5-12" dbh)	215.1	56
Medium (14-18" dbh)	117.6	31
Large (>20" dbh)	49.7	13
Total	382.4	100

Proposed Management Systems for the area:

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

The management recommendations for Soap Creek WMA are shown in the table below-

Management System	Acres	% of Total Area
Even Age	318.9	83
Early Successional	23.1	6
Viewshed	40.4	11
Total	382.4	100

Early Succession Management –

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

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

The early succession management areas will be managed on a 15-20 year rotation. In other words, every 15-20 years the stands will be cut to create areas with high stem density. Soap Creek WMA has 23 acres scheduled for early succession management. Applying sustainable forestry guidelines, about 6-8 acres could be cut every 5 years.

Even Age Management –

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

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

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

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

As woodland stands age, they constantly lose trees to shading, insects, disease, etc. The dead and dying trees provide habitat for cavity nesters such as woodpeckers, nuthatches, titmice, and creepers. The federally endangered Indiana bat uses loose barked live trees such as hickory as well as the sloughing bark from dying trees for their maternity colonies.

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

While there are many methods to open a stand to sunlight, clear cutting and shelter wood harvesting are the most common. Clear cutting is a practice that opens the stand all at once. Regeneration via clear cutting requires there be sufficient oak seedlings or advanced regeneration present. Minus these seedlings, planting may be necessary following clear cutting.

Shelter wood harvests are one way of encouraging seedling production prior to a clear cut. Shelter wood harvests include several thinnings done prior to the final clear cut. If the shelter wood is done correctly, the trees left after the thinnings will provide

seed and the forest will be open enough to allow sunlight to reach the forest floor. The trees left will also help provide shade that limits the growth of undesirable or invasive plant species. This method can take many years to create the next oak stand and may need mechanical or fire disturbance to keep out undesirable species. After sufficient seedling or advanced regeneration is present, the stand needs to be clear cut to successfully regenerate the oak stand.

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

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

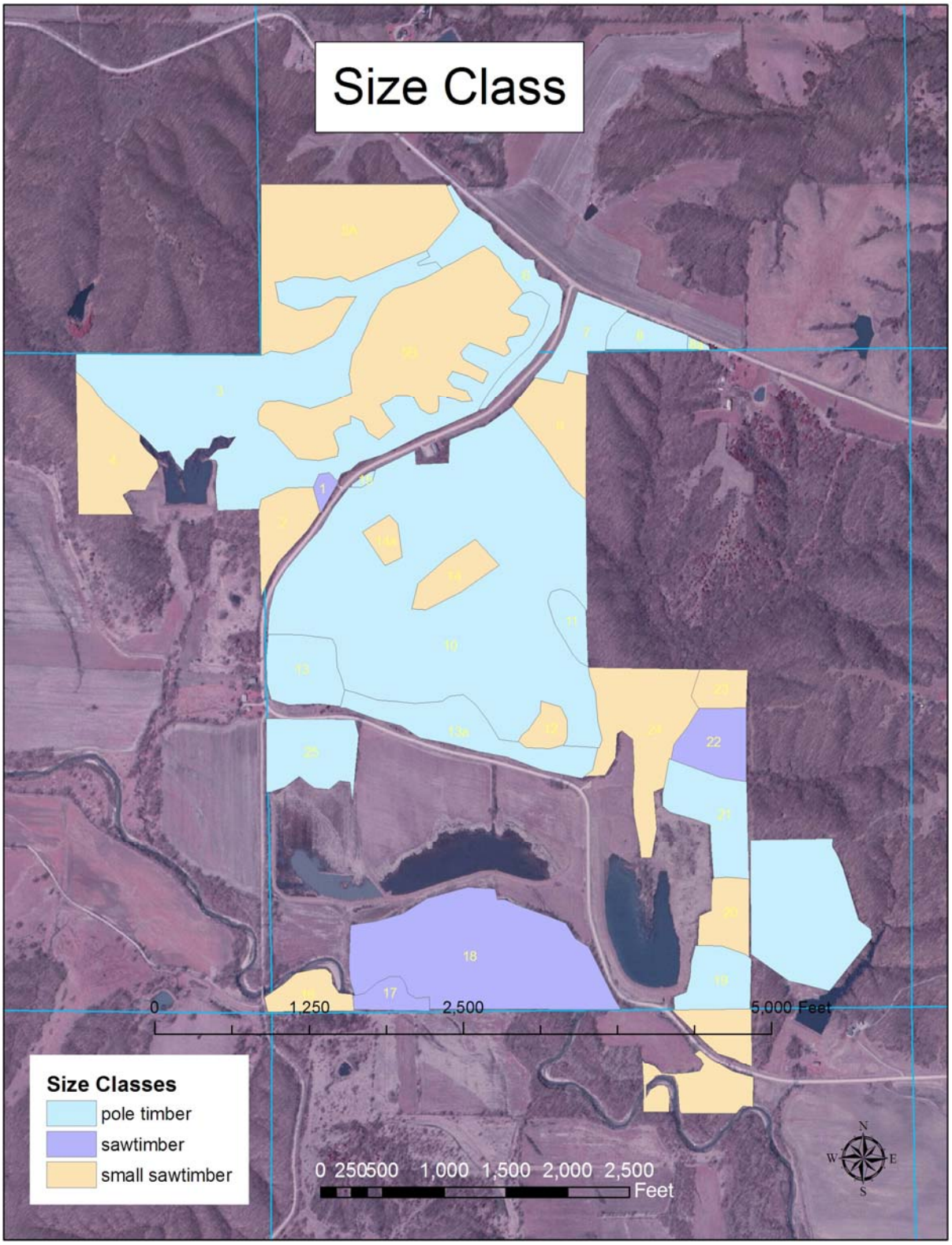
Fire is an effective and inexpensive tool that has a long history of use and continues to be studied in managing oak stands. Occasional burning of the leaf layer in the woods will kill thin barked species such as hard maple, cherry, elm, bitternut hickory and iron wood. Fire will expose mineral soil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

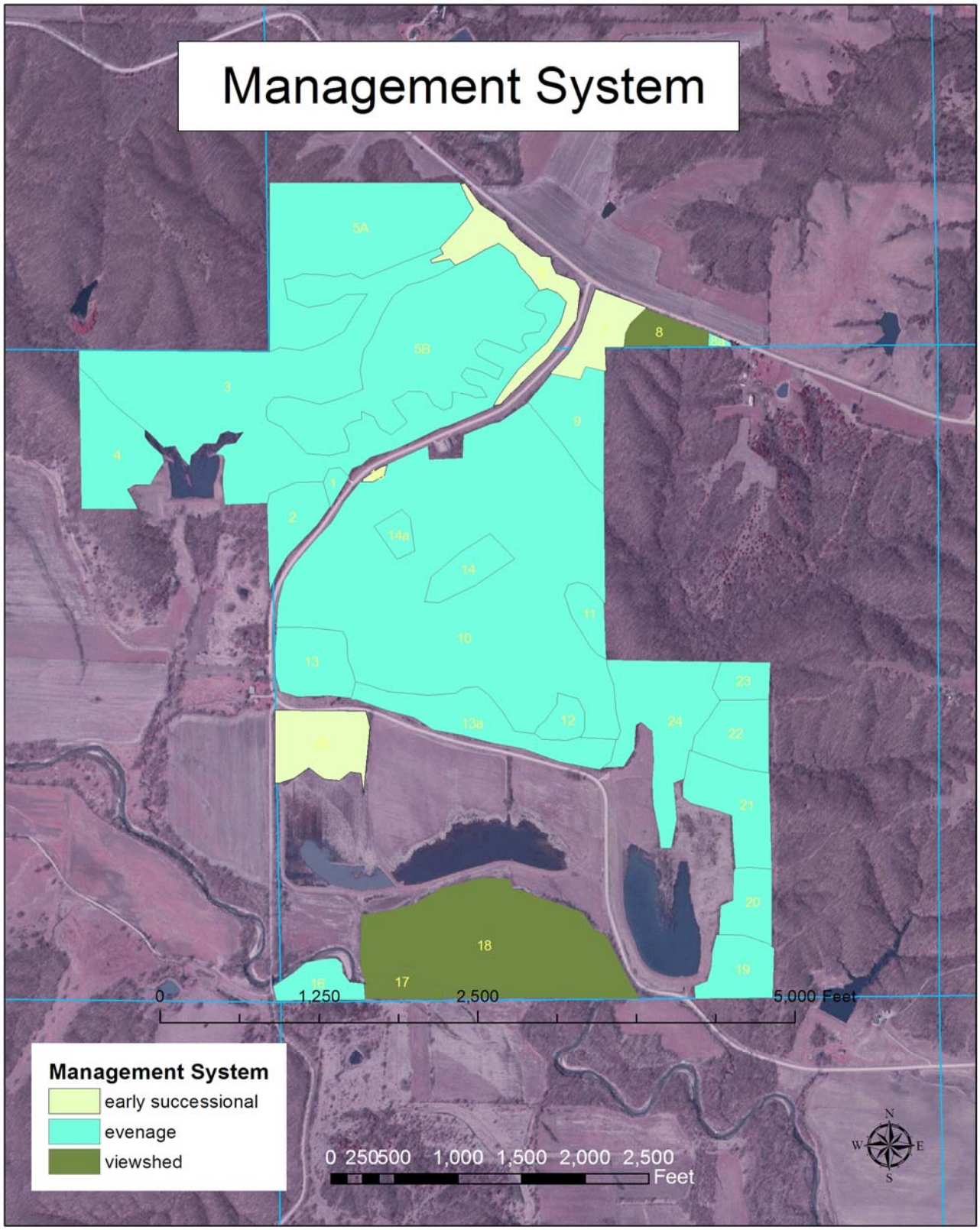
There are 319 acres on this area that will be managed as even aged woodlands to regenerate oak. The eventual acreage requiring clear cutting every 5 years depends on the rotation age used for the stand. With a typical 125 year rotation, approximately 13 acres would need to be clear cut every 5 years. If the rotation age can be extended significantly without jeopardizing the ability to regenerate oak, the acres of clear cutting every 5 years can be reduced correspondingly.

Viewshed Management –

Viewshed areas are typically steep fragile slopes and areas along streams that are best left to naturally progress through succession. Viewsheds may be used to protect areas for endangered species. Management can take place on these areas where desirable, but the major objective is to have very minor, if any, disturbance.

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


Size Class
0
1,250
2,500
5,000 Feet
Size Classes
pole timber
sawtimber
small sawtimber
0 250500 1,000 1,500 2,000 2,500
Feet
N
W
E
S


Management System
5A
5B
8
3
9
4
1
2
14a
14
11
10
13
23
13a
12
24
22
21
20
18
19
16
17
0
1,250
2,500
5,000 Feet
Management System
early successional
evenage
viewshed
0 250500 1,000 1,500 2,000 2,500
Feet
N
W
E
S

WORK PLAN FOR

SOAP CREEK

WILDLIFE

MANAGEMENT AREA

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

Stand 1: 1 acre

Site Description –

This stand is at the edge of woods near a road and parking area.

Woodland Description –

The overstory is composed primarily of large sawlog size white oak with elm, bitternut hickory, ash, and locust in the understory. Regeneration is mostly elm and bitternut hickory with some shingle oak and white oak.

Management Recommendations –

Weed tree removal & prescribed burning. This would be a good area to burn to establish a savanna. The area should be burned once, and then undesirable species killed in the understory. Periodic burning will be required to maintain savanna.

Stand 2: 5.3 acres

Site Description –

South and west facing slope between road and west boundary

Woodland Description –

The overstory is composed of small sawlog white oak, ash, and hickory with some red oak and scattered larger trees. Understory is mostly elm, ash, and hickory with some areas of oak regeneration. A pocket of oak wilt was detected in this stand.

Management Recommendations –

A shelterwood system of management to encourage the development of advanced oak regeneration is recommended. Overmature and lower quality trees in the overstory would be harvested and undesirable trees in the understory would be killed and treated with herbicide to prevent sprouting. This should allow adequate sunlight to the forest floor to enhance natural regeneration and development of oak in the understory. In 5 to 7 years the overstory in areas with good oak regeneration would be clearcut to provide full sunlight to the young oak, which can persist in partial shade for a short period but which need full sunlight for optimum growth and survival.

Stand 3: 56.7 acres

Site Description –

This area is primarily ridgetops and upper slopes but also contains some of the lower slopes in the western part of the stand.

Woodland Description –

The overstory consists primarily of pole size black oak, hickory, red oak, elm, and honey locust with lesser amounts of walnut, white oak, and ash. There are scattered larger trees throughout. Understory is primarily elm, hickory, ash, and ironwood.

Management Recommendations –

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

Stand 4: 10.6 acres

Site Description –

This stand is on a ridge and side slopes at the west boundary of the area.

Woodland Description –

The overstory is composed primarily of small sawlog size white oak, red oak, and hickory with elm, hickory, basswood, and ironwood understory and very little desirable regeneration.

Management Recommendations –

A shelterwood system of management to encourage the development of advanced oak regeneration is recommended. Overmature and lower quality trees in the overstory would be harvested and undesirable trees in the understory would be killed and treated with herbicide to prevent sprouting. This should allow adequate sunlight to the forest floor to enhance natural regeneration and development of oak in the understory. In 5 to 7 years the overstory in areas with good oak regeneration would be clearcut to provide full sunlight to the young oak, which can persist in partial shade for a short period but which need full sunlight for optimum growth and survival.

Stand 5: 63.5 acres

Site Description –

This stand covers many small ridges and valleys and is split into A and B by a large ridge running through the middle.

Woodland Description –

The overstory is composed primarily of small sawlog size white oak, red oak, and hickory with quite a few larger scattered trees. Understory is composed primarily of elm, hickory, and ironwood with limited oak regeneration.

Management Recommendations –

A shelterwood system of management to encourage the development of advanced oak regeneration is recommended. Overmature and lower quality trees in the overstory would be harvested and undesirable trees in the understory would be killed and treated with herbicide to prevent sprouting. This should allow adequate sunlight to the forest floor to enhance natural regeneration and development of oak in the understory. Stand 5 B will be divided into thirds and each third will be managed as a shelterwood but the cutting will be done in different years (5-10 years apart.)

Stand 6: 8.5 acres

Site Description –

This area is along the woodland edge and the road.

Woodland Description –

This stand is composed primarily of pole size ash, black oak, and elm along the edge of the timber and the road, extending a short way along a main ridge. Understory regeneration is composed of ash, black oak, and shingle oak. There are some native grasses along the edge.

Management Recommendations –

With early successional management, this area could be clearcut to create a woodland edge with dense, young growth. Prescribed burning could be applied to encourage native grasses along the edge.

Stand 7: 5.4 acres

Site Description –

This is an old farmstead near the road.

Woodland Description –

Overstory is sapling to small pole size ash and elm with ash, elm, hackberry, and mulberry understory. There are some scattered oak and walnut saplings in the understory. There are a few small sawlog bur oaks on the corner.

Management Recommendations –

With early successional management, this area could be clearcut to create a woodland edge with dense, young growth. Clearcutting 1/3 of the area every 5 years will maintain dense stem growth.

Stand 8: 3.2 acres

Site Description –

This area along the road has a south aspect sloping away from the road.

Woodland Description –

The overstory is primarily pole size ash and bitternut hickory with scattered mature white oak and some red oak. Understory is composed of ash, elm, and ironwood. There is some oak regeneration on the south facing slope.

Management Recommendations –

This area could be maintained as a viewshed with no management activity.

Stand 8A: .3 acres

Site Description –

This is a small ridge along the road at the corner of the property.

Woodland Description –

The overstory is primarily sapling and pole size oak and hickory with ironwood and abundant oak in the understory. There are some red cedars that can be found along the road.

Management Recommendations –

Weed tree removal should be applied to give the young oak adequate growing space. Any elm, ash, locust, and most hickory should be removed. The cedar should be left along the road.

Stand 9: 8 acres

Site Description –

This area includes a valley and side slopes along the east boundary

Woodland Description –

Overstory is predominantly small sawlog white oak with some hickory, red oak, ash, and occasional walnut. Understory is mainly ironwood with little desirable regeneration.

Management Recommendations –

Weed tree removal along with a shelterwood system of management to encourage the development of advanced oak regeneration is recommended. Overmature and lower quality trees in the overstory would be harvested and undesirable trees in the understory would be killed and treated with herbicide to prevent sprouting. This should allow adequate sunlight to the forest floor to enhance natural regeneration and development of oak in the understory. In 5 to 7 years the overstory in areas with good oak regeneration would be clearcut to provide full sunlight to the young oak, which can persist in partial shade for a short period but which need full sunlight for optimum growth and survival.

Stand 10: 96.5 acres

Site Description –

This large area of timber covers several valleys and ridges.

Woodland Description –

Overstory is composed mostly of pole size white oak, hickory, and ash, with some cherry and red oak. There are some scattered larger trees. Understory is mostly elm, hickory, prickly ash and gooseberry.

Management Recommendations –

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

Stand 11: 2.8 acres

Site Description –

This area is a valley on the east side of the property.

Woodland Description –

This is mostly pole size mixed hardwoods consisting of walnut, red oak, white oak, ash, hickory, and locust. There are scattered sawlog size trees. Understory is primarily ash and hickory with ash regeneration.

Management Recommendations –

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

Stand 12: 2.3 acres

Site Description –

This is a stand of large white oak near the southern boundary.

Woodland Description –

Overstory is composed of large sawlog size white oak with cherry, hickory, elm, and hazelnut in the understory.

Management Recommendations –

Weed tree removal & prescribed burning. This would be a good area to burn to establish a savanna. The area should be burned once; any surviving undesirable species should be killed in the understory. Periodic burning will be required to maintain savanna.

Stand 13: 7.2 acres

Site Description –

This is a south and west facing slope along the road.

Woodland Description –

Overstory is mostly sapling and small pole size locust, walnut, shingle oak, swamp white oak, black oak, and hickory with elm and hickory regeneration.

Management Recommendations –

Timber Stand Improvement in the form of Crop Tree Release is recommended. Crop trees will be desirable species with good form and lack of significant defect. Trees with crowns that are touching or overtopping the crown of the crop trees will be killed by felling or double girdling. Species normally selected as crop trees are walnut, white oak, and red oak. Species diversity is encouraged in selecting crop trees. The abundant walnut makes this a fairly high priority for TSI.

Stand 13A: 10.7 acres

Site Description –

This is a south facing slope along the road.

Woodland Description –

Overstory is small pole size shingle oak, black oak, and elm with some red cedar along the road. There are some scattered walnut, red oak, and white oak and a few scattered larger trees.

Management Recommendations –

Crop Tree Release could be applied but would be lower priority because of relatively low numbers of high quality crop trees. Early successional management may be desirable to maintain dense young growth for wildlife.

Stand 14: 6 acres

Site Description –

This is two separate but similar areas of small sawlog white oak on ridgetops and upper slopes surrounded by mostly pole size trees.

Woodland Description –

Overstory is composed of small sawlog size white oak and hickory with an understory of ash, ironwood, elm, and prickly ash. There is some oak regeneration along with bitternut hickory and ironwood.

Management Recommendations –

Weed tree removal to encourage the development of advanced oak regeneration is recommended. Undesirable trees in the overstory and understory would be killed and treated with herbicide to prevent sprouting. This should allow adequate sunlight to the forest floor to enhance natural regeneration and development of oak in the understory.

Stand 15: .3 acres

Site Description –

This is a small stand on the edge of the woodlands along a road.

Woodland Description –

This is a small pole size stand of shingle oak, black oak, hickory, elm, and some red oak with an understory of ironwood.

Management Recommendations –

With early successional management, this area could be clearcut to create a woodland edge with dense, young growth.

Stand 16: 4 acres

Site Description –

This stand is bottomland along Soap Creek on the southwest part of the property.

Woodland Description –

Overstory is mostly small sawlog walnut, hackberry, elm, and cottonwood with some larger cottonwood and silver maple along the creek and some larger pole size walnut scattered throughout. Understory is mostly elm, buckeye, and Reed canary grass with hackberry and buckeye regeneration.

Management Recommendations –

Crop Tree Release possibly combined with a selective harvest of the largest trees would help release some of the nice young walnut for increased growth.

Stand 17: 2.6 acres

Site Description –

This stand is bottomland along Soap Creek on the south part of the property.

Woodland Description –

Overstory is primarily sawlog size cottonwood, bitternut hickory, red oak, swamp white oak, and occasional walnut with an understory of Hackberry, buckeye, and Reed canary grass. There is some hackberry and buckeye regeneration.

Management Recommendations –

This area could be maintained as a viewshed with no management activity.

Stand 18: 34.6 acres

Site Description –

This stand is bottomland along Soap Creek on the south part of the property.

Woodland Description –

Overstory is composed primarily of sawlog size silver maple, cottonwood, walnut, swamp white oak, and ash with occasional cherry. Understory is mostly buckeye and elm with Reed canary grass. There is some buckeye and elm regeneration. Evidence of Pileated woodpecker was noted. Walnut up to 26".

Management Recommendations –

This area could be maintained as a viewshed with no management activity.

Stand 19: 5.6 acres

Site Description –

This is a south and west facing hillside on the east boundary.

Woodland Description –

Overstory is primarily pole size shingle oak, black oak, walnut, and elm with an understory of elm, ash, buckeye, and gooseberry. There is elm, ash, and limited oak regeneration.

Management Recommendations –

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

Stand 20: 4.6 acres

Site Description –

This is a west facing slope along the east boundary.

Woodland Description –

Overstory is composed primarily of small sawlog to pole size shingle oak, walnut, elm, hickory, locust, white oak, and red oak. Understory is composed of elm, hackberry, and gooseberry. There is some oak regeneration, especially around the more open area along the boundary.

Management Recommendations –

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

Stand 21: 9 acres

Site Description –

This stand encompasses a couple of ridges and valleys along the east boundary.

Woodland Description –

Overstory is primarily pole size shingle oak, ash, white oak, red oak, and locust with occasional walnut. Understory is mainly elm and ash with limited desirable regeneration.

Management Recommendations –

Timber Stand Improvement in the form of Crop Tree Release is recommended, although low priority because of relatively few high quality crop trees. Crop trees will be desirable species with good form and lack of significant defect. Trees with crowns that are touching or overtopping the crown of the crop trees will be killed by felling or double girdling. Species normally selected as crop trees are walnut, white oak, and red oak. Species diversity is encouraged in selecting crop trees.

Stand 22: 6.2 acres

Site Description –

This is a ridge and hillsides along the east boundary.

Woodland Description –

Overstory is primarily sawlog size white oak and ash with an understory of hickory, ash, and white oak poles along with ironwood. Regeneration composed of elm and ironwood.

Management Recommendations –

Weed tree removal along with a shelterwood system of management to encourage the development of advanced oak regeneration is recommended. Overmature and lower quality trees in the overstory would be harvested and undesirable trees in the understory would be killed and treated with herbicide to prevent sprouting. This should allow adequate sunlight to the forest floor to enhance natural regeneration and development of oak in the understory. In 5 to 7 years the overstory in areas with good oak regeneration would be clearcut to provide full sunlight to the young oak, which can persist in partial shade for a short period but which need full sunlight for optimum growth and survival.

Stand 23: 3 acres

Site Description –

This is a ridge and hillsides along the east boundary.

Woodland Description –

Overstory is primarily sawlog size hickory, white oak, basswood, ash, and red oak with occasional walnut. Understory and regeneration composed of ironwood, ash, and elm.

Management Recommendations –

Weed tree removal along with a shelterwood system of management to encourage the development of advanced oak regeneration is recommended, the same as Stand 22.

Stand 24: 15.6 acres

Site Description –

This stand is mostly lower slopes along a couple of drainages.

Woodland Description –

Overstory is mostly pole to small sawlog size trees with scattered larger trees. Primary species include shingle oak, locust, elm, and black oak with occasional walnut. There are some large cottonwood trees along the drainage. Understory is elm, hickory, and multiflora rose.

Management Recommendations –

Weed tree removal to kill locust and Timber Stand Improvement in the form of Crop Tree Release is recommended. Crop trees will be desirable species with good form and lack of significant defect. Trees with crowns that are touching or overtopping the crown of the crop trees will be killed by felling or double girdling. Species normally selected as crop trees are walnut, white oak, and red oak. Species diversity is encouraged in selecting crop trees.

Stand 25: 8.9 acres

Site Description–

This stand overlooks the wetlands and has slight slope to the south. There is a parking lot in this stand as well.

Woodland Description–

There is a mix of cedars, cherry, mulberry, honey locust, and black locust in this stand. Autumn Olive and multiflora rose are present in the understory along with some ash, shingle oaks, and black walnut regenerating. Signs that this could have some potential to a prairie are present; including partridge pea and black eyed susan in fairly large numbers.

Management Recommendations–

Since this site has a lot of invasive plants and has some possibility for prairie it should have a burning schedule to help improve the site. Some mechanical removal of the invasive plants may have to occur. Over time this area could be used as early successional habitat.

Summary of stands

Stand No.	Acres	Timber type	Tree size	Management system	Prescription	Priority	Year complete
1	1	White oak	Large saw	Evenage	Weed Tree & prescribed burn	High	2011
2	5.3	White oak, ash, hickory	Small saw	Evenage	Shelterwood	Medium	2018
3	56.7	Red/Black oak, hickory, elm, locust	Pole	Evenage	Crop Tree Release	Medium	2020
4	10.6	White oak, Red oak, Hickory	Small Saw	Evenage	Shelterwood	High	2012
5a	29.9	White oak, Red oak, Hickory	Small Saw	Evenage	Shelterwood	High	2015
5b	33.6	White oak, Red oak, hickory	Small Saw	Evenage	Shelterwood	Medium	2020
6	8.5	Ash, Black oak, elm	Pole	Early successional	Overstory removal	High	2012
7	5.4	Ash, elm, hackberry	Pole	Early successional	Overstory removal	Medium	2013
8	3.2	Ash, elm, hickory	Pole	Viewshed	None	Low	
8a	.3	Oak, hick, ironwood	Pole	Evenage	Weed tree	High	2012
9	8	White oak, hickory	Small Saw	Evenage	Shelterwood	High	2012
10	96.5	White oak, hickory, ash	Pole	Evenage	Crop Tree Release	Medium	2018
11	2.8	Walnut, oak, ash, hick	Pole	Evenage	Crop Tree Release	High	2012
12	2.3	White oak	Large Saw	Evenage	Weed Tree & prescribed burn	High	2011
13	7.2	Locust, walnut, oak	Pole	Evenage	Crop Tree Release	High	2012
13a	10.7	Shingle oak, black oak, elm	Pole	Evenage	Crop Tree Release	Low	
14	6	White oak, hickory	Small Saw	Evenage	Weed tree	Med	2018
15	.3	Mixed oak, hickory, elm	Pole	Early successional	Overstory removal	Low	
16	4	Walnut, hackberry, elm, cottonwood	Small Saw	Evenage	Crop Tree Release	High	2015
17	2.6	Cottonwood, hickory, Red oak, Swamp white oak	Large saw	Viewshed	None	Low	
18	34.6	Maple, cottonwood, walnut, Swamp white oak, ash	Large saw	Viewshed	None	Low	
19	5.6	Shingle oak, walnut, elm	Pole	Evenage	Crop Tree Release	Low	
20	4.6	Shingle oak, walnut, elm, black oak, red oak, hickory	Small Saw	Evenage	Crop Tree Release	Med	2020
21	9	Shingle oak, ash	Pole	Evenage	Crop Tree Release	Low	
22	6.2	White oak, ash	Large saw	Evenage	Shelterwood, weed tree	Low	

					removal		
23	3	Hickory, white oak, basswood, ash, red oak	Large saw	Evenage	Shelterwood & weed tree removal	Low	
24	15.6	Shingle oak, locust, elm, black oak	small saw	Evenage	Weed tree	Low	
25	8.9	Eastern Red Cedar, Locust	pole	Early successional	Weed Tree	Medium	2015

HIGH PRIORITY PROJECTS

Timber Stand Improvement -

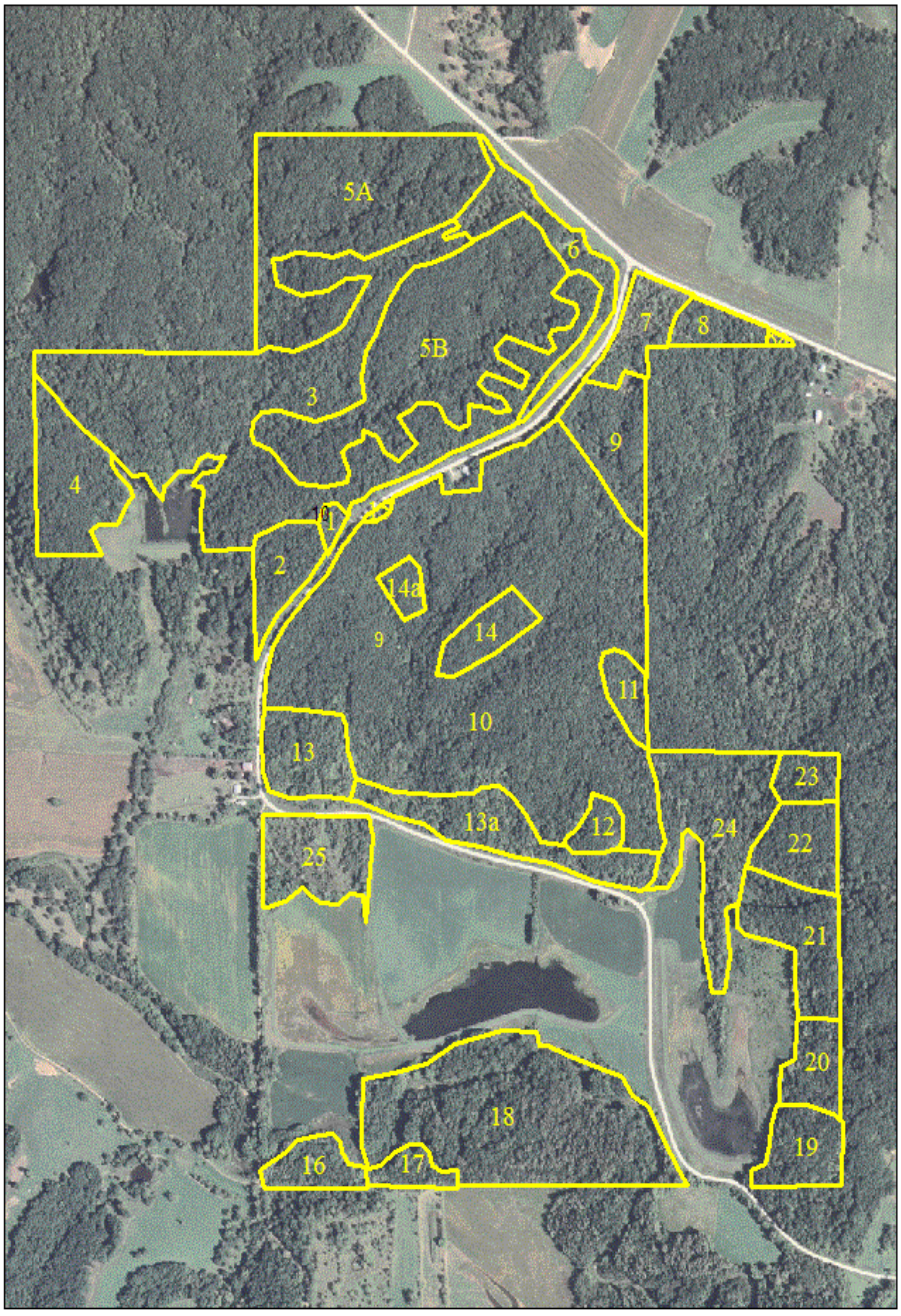
Stand #	**Acres**	**Prescription**
1	1.0	Weed tree eradication and prescribed burn
8a	0.3	Weed tree eradication
11	2.8	Crop tree release
12	2.3	Weed tree eradication and prescribed burn
13	7.2	Crop tree release
16	4.0	Crop tree release
	17.6	

Early Successional Management -

Stand #	**Acres**	**Prescription**
6	8.5	Overstory removal

Shelterwood harvest -

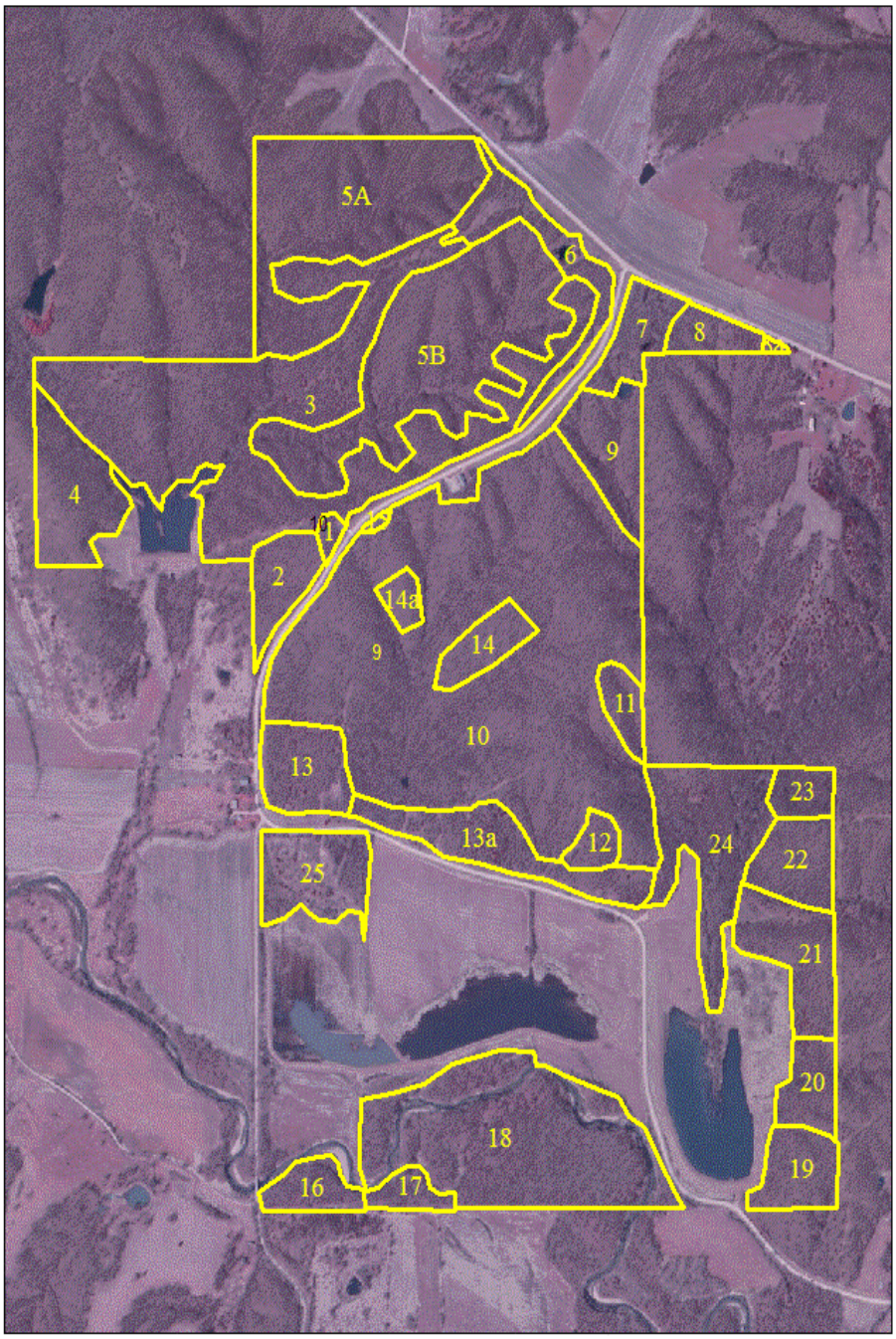
Stand #	**Acres**	**Prescription**
4	10.6	Shelterwood harvest and Weed tree removal
5a	29.9	Shelterwood harvest and Weed tree removal
9	8.0	Shelterwood harvest and Weed tree removal
	38.5	



2006 Photo of Soap Creek WMA

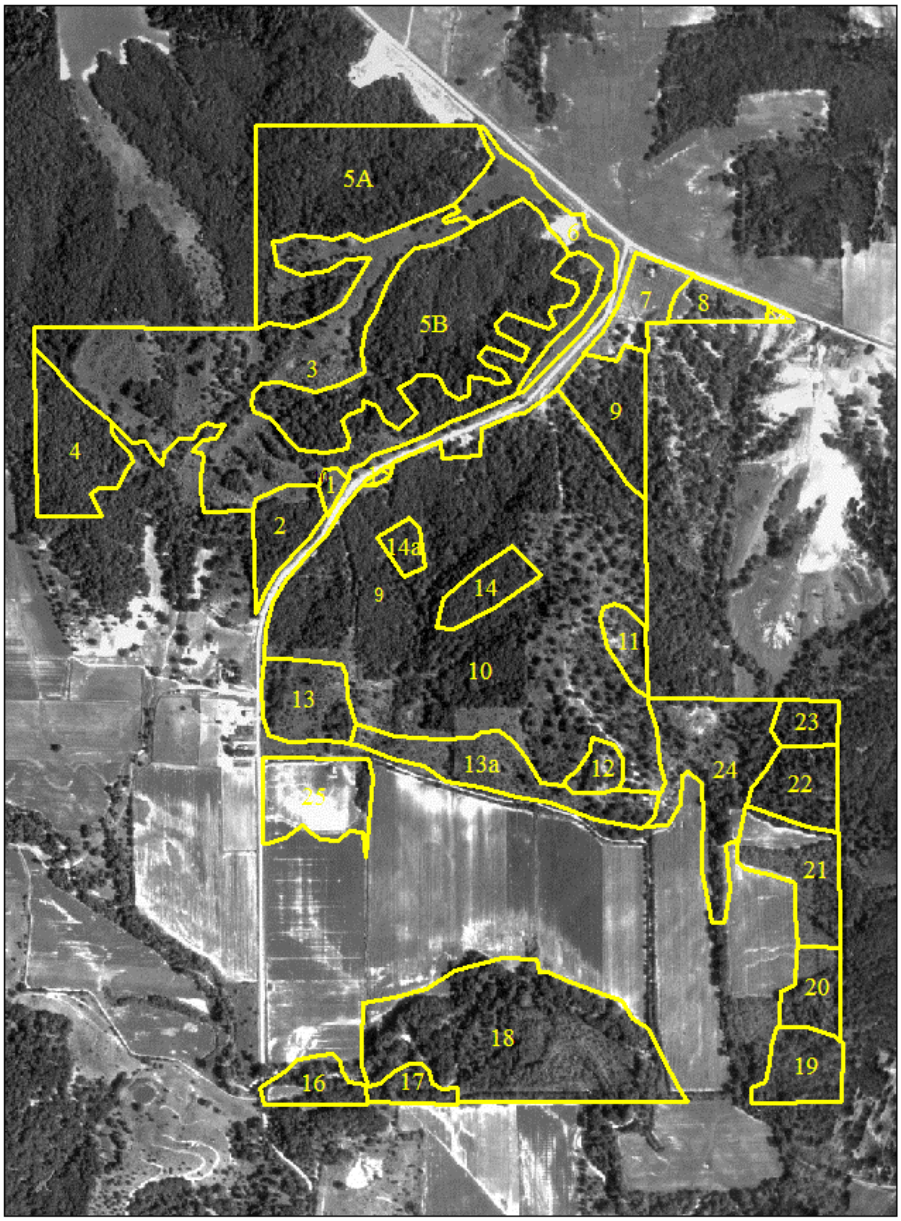
0 1,200 2,400 4,800 Feet

N W E S



2002 Photo of Soap Creek WMA

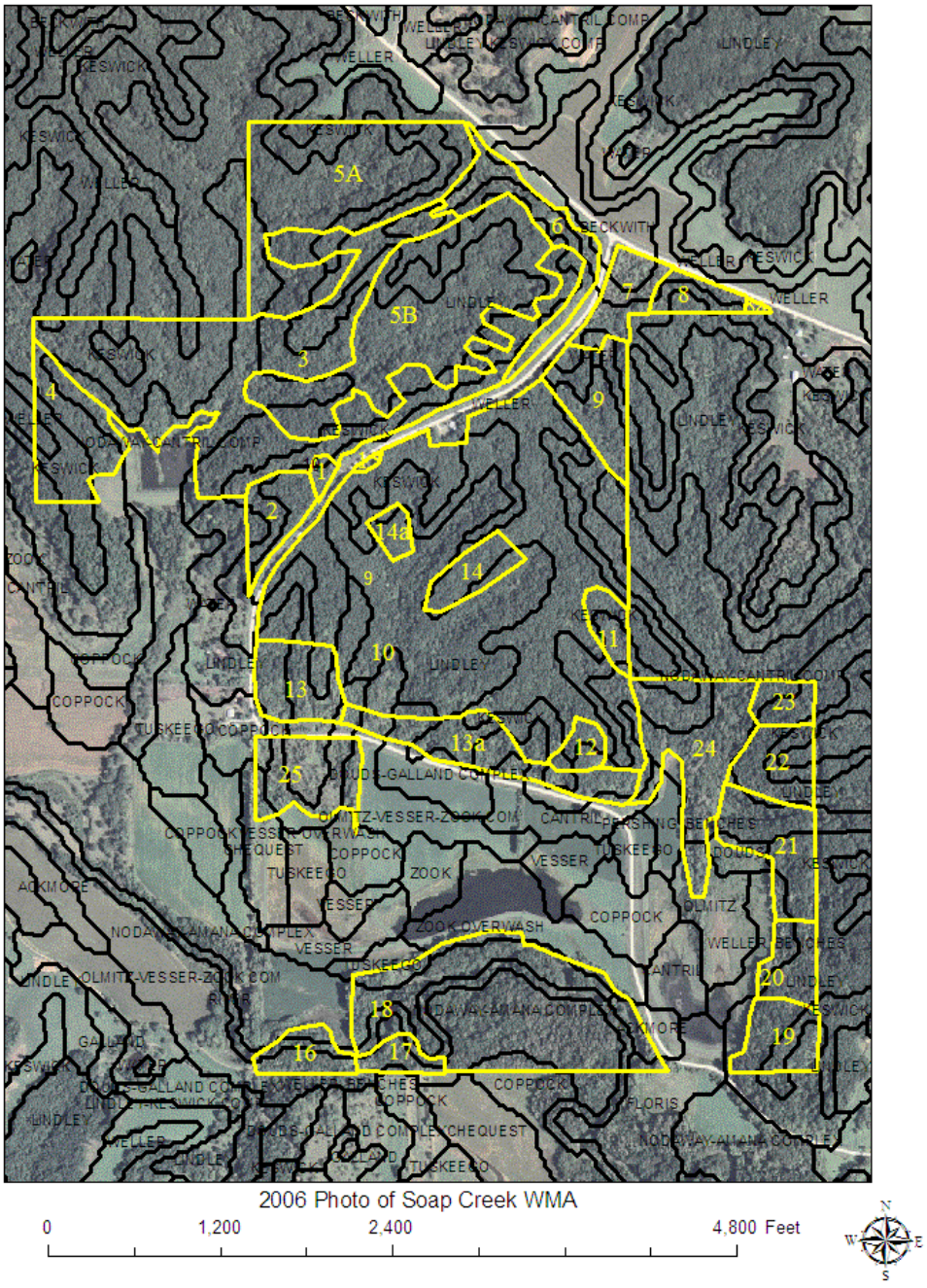
0 1,200 2,400 4,800 Feet



1950's Photo of Soap Creek WMA

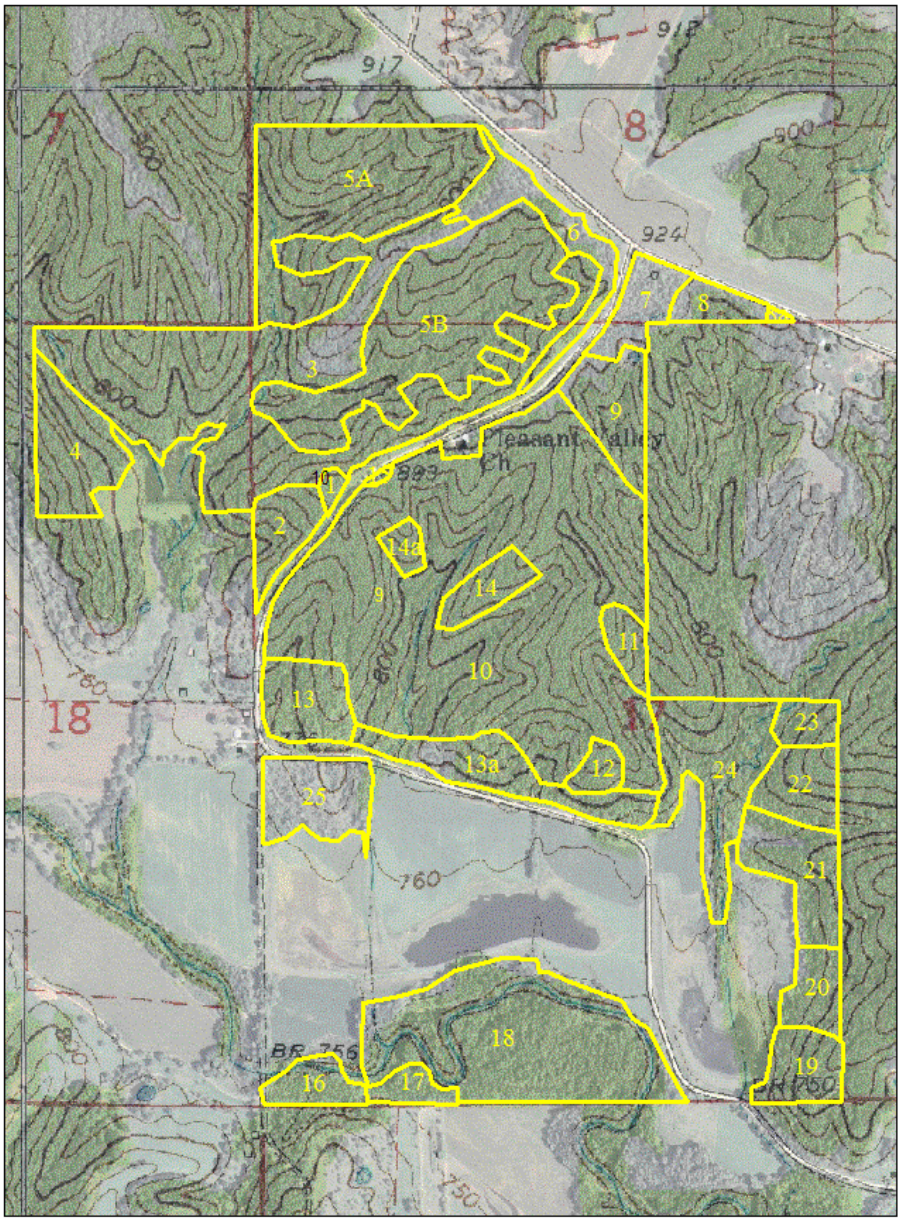
0 1,200 2,400 4,800 Feet

N W E S



2006 Photo of Soap Creek WMA

Soils



Topography of Soap Creek WMA

0 1,200 2,400 4,800 Feet

Species of Greatest Concern

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

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

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

Golden-winged warbler	*Vermivora chrysoptera*
Canada warbler	*Wilsonia Canadensis*
Rusty blackbird	*Euphagus carolinus*

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

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

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

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

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

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

IOWA DEPARTMENT OF NATURAL RESOURCES

GUIDELINES FOR PROTECTION OF INDIANA BAT SUMMER HABITAT

(Revised June 2007)

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

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

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

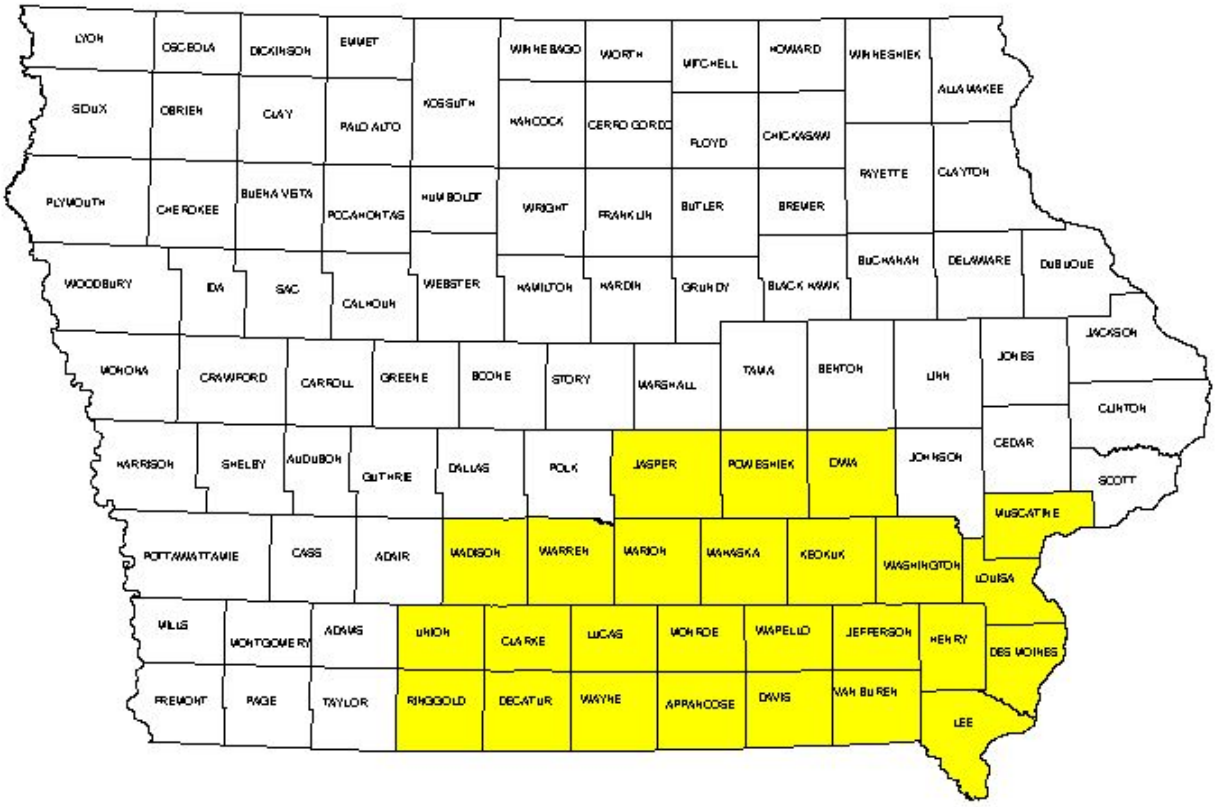
Female Indiana bats have their young beneath the loose or peeling bark of trees. Most nursery colonies have been found beneath the bark of standing dead trees on the trunk or large branches. Dead trees that retain sheets or plates of bark and which provide space beneath the bark such as red oak, post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

Counties affected

Summer Range in Iowa:

Appanoose, Clarke, Davis, Decatur, Des Moines, Henry, Iowa, Jasper, Jefferson, Keokuk, Lee, Louisa, Lucas, Madison, Mahaska, Marion, Monroe, Muscatine, Poweshiek, Ringgold, Union, Van Buren, Wapello, Warren, Washington, and Wayne.

The U.S. Fish and Wildlife Service considers all counties south of Interstate 80, including those portions of Dallas, Polk, Jasper, Poweshiek, Iowa, Johnson, Muscatine, and Scott counties south of Interstate 80, as being within the potential range of the species in Iowa.



Summer Habitat Requirements for the Indiana bat

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

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

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

Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Dominant (trees): Individuals or species of the upper layer of the forest canopy.

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

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

Sapling: A young tree larger than a seeding but smaller than a pole (dbh < 3.5 inches).
Sapwood: The wood found closest to the bark or outside of the bole and usually distinguished from heart wood by being lighter in color.
Saw log: A log large enough to produce lumber or other products that can be sawed. Its size and quality vary with the utilization practices of the region.
Sawtimber: Trees that yield logs suitable in size and quality for the production of lumber.
Scarify: To break up the forest floor and topsoil preparatory to natural regeneration or direct seeding.
Seedling: A baby plant. In forestry the term usually used to refer to young trees that have grown beyond the stage where they have just emerged from the soil up to the point that they become saplings.
Seed tree: Any tree that bears seed; specifically, a tree left standing to provide the seed for natural regeneration.
Seed tree method: The harvest of all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class. Seed trees are usually removed after regeneration is established.
Selective harvest: Removal of single scattered trees or small groups of trees at relatively short intervals. The continuous establishment of reproduction is encouraged and an all-aged stand is maintained. A management option used for shade-tolerant species.
Shade tolerance: Relative ability of a tree species to reproduce and grow under shade. The capacity to withstand low-light intensities caused by shading from surrounding vegetation.
Shelterwood: A method of regenerating a forest whereby a portion of the stand is harvested and the rest of the stand is evenly distributed over the area to protect the site and provide seed to regenerate the area. After the new stand is well established, the residual trees are harvested. This method is used to regenerate shade intolerant species.
Shelterwood harvest: A harvest cutting in which trees in the harvest area are removed in a series of two or more cuttings to allow the establishment and early growth of new seedlings under partial shade and protection of older trees. Produces an even-aged forest.
Silvics: The study of the life history and general characteristics of forest trees and stands, with particular reference to environmental factors, as basis for the practice of silviculture.
Silviculture: The art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.
Silvicultural prescription: Specific steps prescribed to achieve specific management objectives.
Single tree selection: Individual trees of all sizes classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration; synonym: individual tree selection.
Site index: A measure of the productive quality of an area where trees grow. Site index is based on the height of dominant and co-dominate trees at age 50. That is to say, if the average height of dominant and co-dominate trees on a site was 70 feet at age 50, 70 would be the site index. Graphs are developed to enable determination of site index over a range of tree ages.
Site potential: Collective physical resources (e.g., soil moisture, nutrients, light, heat) available for plant growth. Different potentials facilitate growth of some species and limit growth of others. Consequently, site potential has a strong effect on plant community development.
Slash: The non-utilized and generally unmarketable accumulation of woody material in the forest, such as limbs, tops, cull logs and stumps that remain in the forest as residue after timber harvesting.
Snag: A snag tree is a dead tree; commonly a tall, limbless tree. Though of little or no commercial value, they are a very valuable wildlife resource.
Softwood: Generally considered to be the wood of conifers.
Stand: A contiguous group of trees similar in age, species composition, structure and growing on a site of similar quality. One stand will usually have characteristics that will distinguish it from other stands. Differences could include species, average diameter, density and location.
Succession: The natural replacement, over time, of one plant community with another.
Sucker: A shoot rising from below ground level from a root.
Suppressed: The condition of a tree characterized by low growth rate and low vigor due to competition from overtopping trees or shrubs.
Sustainability: Protecting and restoring he natural environment while enhancing economic opportunity and community well-being. Sustainability addresses three related elements: the environment, the economy and the community. The goal is to maintain all three elements in a healthy state indefinitely. Meeting the needs of the present without compromising the ability of future generations to meet their needs.

Thinning: A silvicultural treatment made to reduce the density of trees within a forest stand; primarily used to improve growth, enhance forest health or recover potential mortality. *Row thinning* is where selected rows are harvested, usually the first thinning, which provides equipment operating room for future selective thinning. *Selective thinning* is where individual trees are marked or specified (e.g., by diameter, spacing, or quality) for harvest. *Commercial thinning* is thinning after the trees are of merchantable size for timber markets. *Pre-commercial thinning* is done before the trees reach merchantable size, usually done in overstocked stands to provide more growing space for crop trees.
Threatened species: A plant or animal species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its native range.
Tolerance (shade tolerance): A plant's ability to tolerate conditions under a forest canopy. Normally thought of as tolerance to low light conditions, but other understory conditions, such as root competition for water and nutrients, are also factors.
Two-aged stand: A stand with trees of two distinct age class separated in age by more than 20 percent of the rotation age.
Under plant: The planting of seedlings under an existing canopy or overstory.
Under-stocked: A stand of trees so widely spaced that even with full growth potential realized, crown closure will not occur.
Understory: The shorter vegetation (shrubs, seedlings, saplings, small trees) within a forest stand that forms a layer between the overstory and the herbaceous plants of the forest floor.
Uneven-aged stand: A stand with trees of three or more distinct age classes, either mixed or in small groups.
Uneven-aged management: A planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes. Uneven-aged (selection) methods will maintain a multi-aged structure by removing some trees in all sizes classes either singly, in small groups or in strips: synonym: all-aged method.
Viewshed: A physiographic area composed of land, water biotic and cultural elements which may be viewed from one or more viewpoints and which has inherent scenic qualities and/ or aesthetic values as determined by those who view it. Viewsheds are a habitat factor that will be primarily a "hands-off" area for aesthetics and proper soil and water conservation, along with providing special wildlife values.
Volume: Refers to the amount of wood in a tree or log. Expressed as board feet, cords or other measures.
Well-stocked: The situation in which a forest stand contains trees spaced widely enough to prevent competition yet closely enough to utilize the entire site.
Wolf tree: A generally predominant tree with a broad, spreading crown that occupies more growing space than its neighbors.
Woodland: A plant community in which, in contrast to a typical forest, the trees are often small, characteristically short-boled relative to their crown depth, and forming an open canopy with intervening area occupied by lower vegetation, commonly grass.
Woodland edge: An area of habitat transition that consists of vegetation (herbaceous and woody) of different heights and densities. Edge can favor early successional wildlife species.