Forest Wildlife Stewardship Plan
Hawthorn Lake Wildlife Management Area

Actively managing the forestlands owned by the Iowa DNR Wildlife Bureau are critical to improving habitat for a variety of wildlife species and improving the forest ecosystem structure and function. Stand maps, stand descriptions and work summary tables are provided to direct the forest management across acres of forested land at Hawthorn Lake Wildlife Management Area in Mahaska County, Iowa.

Plan developed by
Zach Nie, District Forester
Rodney Ellingson, Wildlife Biologist.

Table of Contents

INTRODUCTION

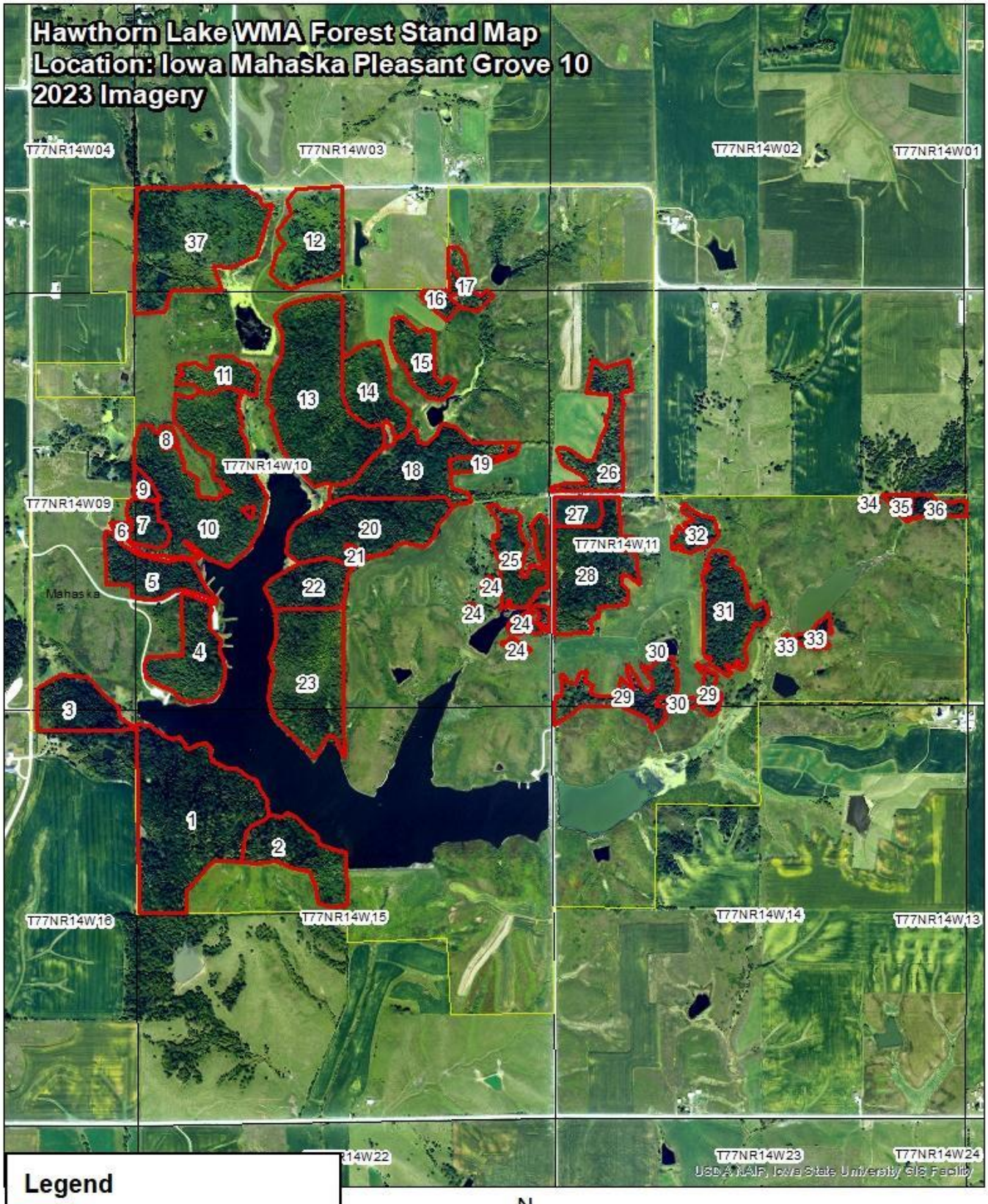
Conservation, preservation and enhancement of natural resources to ensure a legacy for future generations is the mission of the Iowa DNR. Within the DNR, the Wildlife Bureau manages more than 400,000 acres of land as wildlife management areas (WMAs) for a variety of public users. Many of these WMAs are either partially or mostly forest covered. These forests provide a unique opportunity for the DNR to carry out its mission by demonstrating science based management of these lands for enhancement and conservation of forest resources for the many species that depend on these habitats to survive.

The Wildlife Bureau recognizes the need for forest wildlife stewardship plans (FWSPs) to properly manage public forest resources. Forests, like all ecosystems, need management to sustain overall health. Although most forest management is more long term than other local ecosystems, it is still very important. 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 change requires managers to plan over the long term and create a detailed record of planning and work completed in the form of FWSPs.

Hawthorn Lake WMA is an 1800 acre WMA located in northeastern Mahaska County. The WMA consists of a variety of different habitats which includes acres of forested habitat. The forest habitat consists of approximately 568 acres of upland forest. Managing forests is essential to improve the area for wildlife and recreation.

This FWSP is a cooperative effort among DNR staff including the Iowa River Wildlife Unit and District Forester. Stand mapping was completed by the District Forester. Unique forest stands are identified by tree species, tree size, relative stand density, 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 objectives for the WMA. The forester's prescriptions are designed to manage each stand to reach the established goals and objectives for the WMA and to implement the goals and strategies of the 2020 Iowa Forest Action Plan as well as the 2015 Iowa Wildlife Action Plan.

Forest Stand Map of Hawthorn Lake WMA



CURRENT DISTRIBUTION OF TREE SIZE ON HAWTHORN LAKE WMA

The forest stands were cruised and mapped according to average tree size classes. Refer to the map on the following page 5. The following data is only representative of the areas being managed for woodland at Hawthorn WMA.

Tree Size Class	Acres	% of Total Area
Seedlings (<1" DBH)	0	0
Saplings (1-4" DBH)	2.7	1
Pole size (5-11" DBH)	323.9	57
Small sawlog size (12-18"DBH)	240.4	42
Sawlog size (≥18" DBH)	0	0
Total	567	100

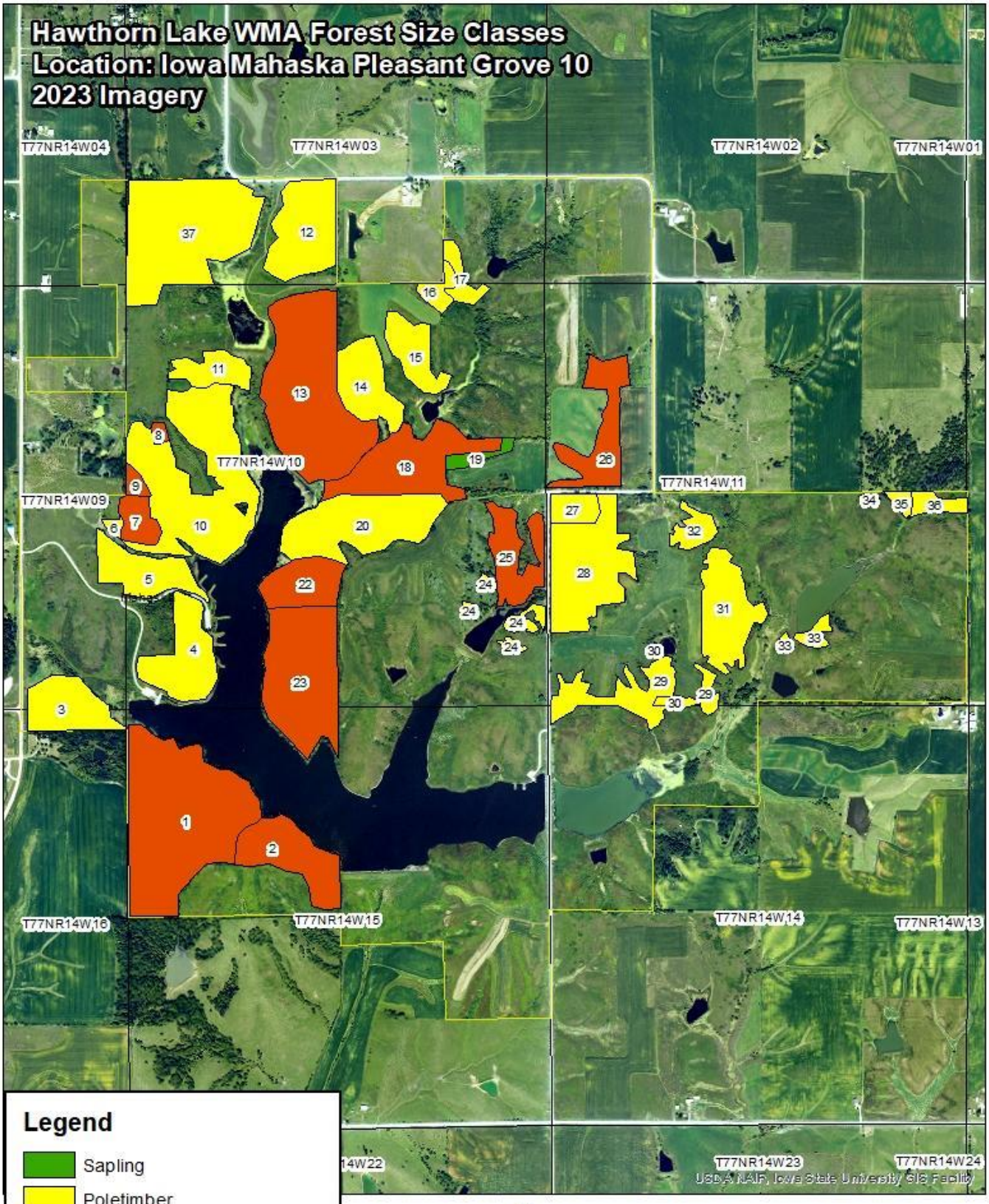
PROPOSED MANAGEMENT SYSTEMS FOR HAWTHORN LAKE WMA

Recommendations for each stand were based on whether the area will be managed to create early successional growth, 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, develop a diverse woodland landscape, protect fragile sites, improve water quality and increase the acres of early successional growth.

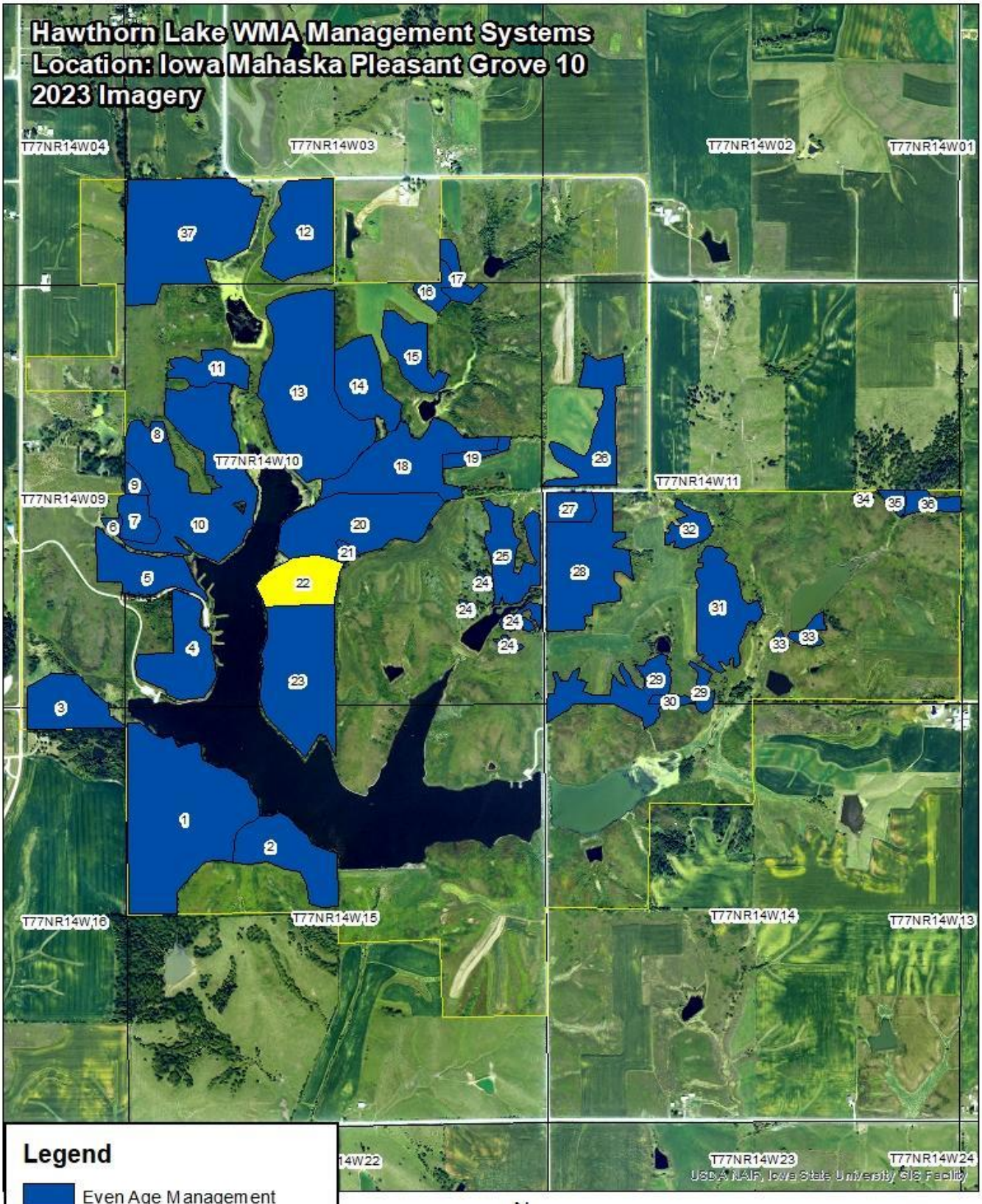
Based on recommendations for the areas, the acres under each management system are as follows. Refer to the map on the following page.

Management System	Acres	% of Total Area
Early Successional	0	0
Even Age	554.4	98
Uneven Age	12.6	2
Viewshed	0	**0**
Total	567	100

Map of Average Tree Sizes for Hawthorn Lake WMA



Map of Management Systems for Hawthorn Lake WMA



MANAGEMENT SYSTEMS

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 clearcut which results in the even age structure. This type of management creates excellent habitat for deer, turkey, squirrels and other game and nongame 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. The target rotation age for oak at Hawthorn lake WMA is 120 years.

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 successional 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 sized trees (20-60 years) tend to be used by canopy nesters such as scarlet tanagers 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 competition, insects, disease, etc. The dead and dying trees provide habitat for cavity nesters such as woodpeckers, nuthatches, titmice, and creepers. The state and federally endangered Indiana bat and federally threatened northern long-eared bat use loose barked live trees such as shagbark 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, clearcutting and shelterwood harvesting are the most common. Clearcutting is a practice that opens the stand all at once. Clearcutting also provides highly desired early successional habitat for the first 15-20 years until the tree canopy closes. Regeneration via clearcutting requires there be sufficient oak seedlings or advanced regeneration present. Minus these seedlings, bare root planting may be necessary following clearcutting.

Shelterwood harvests are one way of recruiting seedling production prior to a clearcut. Shelterwood harvests include several thinnings done prior to the final clearcut. If the shelterwood 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 15-20 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 clearcut to successfully regenerate the oak stand.

Crop tree release is discussed in this plan as a type of timber stand improvement. This practice is done most frequently when the trees are pole sized. The goal of the practice is to choose up to 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 crop tree to reach maximum growth potential, increase mast production, and improve forest health.

Thinning from below, also known as understory removal or weed tree removal is a practice also used in even age management. This practice involves removing trees that are below the main canopy to allow more sunlight to get to the forest floor. Ironwood, bitternut hickory, buckeye, elm, hackberry and other shade tolerant species warrant this practice when species like oak are desired in the future.

Prescribed fire is an effective and relatively inexpensive tool that has a long history of use, and continues to be studied, in managing oak stands. Occasional burning of the leaf litter in the woods will kill thin barked species that are less than

two-inches in diameter such as invasive shrubs, hackberry, hard maple, buckeye, 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. 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. Oak has a superior competitive advantage thanks to their strong root collar and ability to sprout. Most shade tolerant trees, such as elm, bitternut hickory, ironwood and hackberry do not possess strong resprouting capabilities.

Uneven Age Management

Uneven age management develops a stand of trees with all DBH size classes. 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 hackberry, hickory, hard maple and basswood. Sustainable harvest guidelines dictate the ability to selectively harvest mature and defective trees every 20 to 25-years in these stands.

Uneven age management will maintain blocks of woodland that will always have larger trees. This system is desirable where the overstory is lacking oaks, on steep slopes, and in areas where always having large trees is important.

Uneven age management areas will provide continuous tracts of woodland with infrequent disturbance. Large tracts of uneven age management will provide necessary habitat for Neotropical migratory bird species such as cerulean, hooded, Canada, and Kentucky warblers and is also important post-fledging habitat for songbirds that breed in early successional forest. 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. Large oaks that are healthy will be left to provide acorns and host caterpillars, important food sources for many wildlife species. Timber stand improvement and selective harvesting will create woody debris on the forest floor for reptiles and amphibians and small mammals.

Early Successional 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. Feathering and softening the edges may lessen nest parasitism of interior forest bird species by brown-headed cowbirds. The early successional management areas will be managed on a 15-year rotation. In other words, every 15-years the stands will be cut to create areas with high stem density. Shelterwood and clearcut harvesting in even age stands will also increase the overall early successional acreage on the WMA during certain periods of time.

Viewshed Management

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

Income from Timber Harvests

Income generated from timber harvesting operations must be reinvested into the WMA to promote oak regeneration and manage the forest for wildlife by thinning young stands, removing weed trees in the understory, providing conditions favorable to oak regeneration, and controlling invasive species. Without this reinvestment, there is little chance that the WMA annual budget will allow the recommendations in this plan to be implemented. Harvesting is not a significant 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 removing undesirable species to encourage regeneration of desirable oak species.

Invasive Species Management

Honeysuckle is an invasive species that is a widespread major forest health issue at Hawthorn Lake WMA. In order to manage honeysuckle in the woodland areas, fall aerial spraying is recommended. This is done with a helicopter or drone

by spraying after the native trees have lost their leaves, but the honeysuckle is still green and susceptible to herbicide. The typical window to do this is early to mid-November.

WORK PLAN FOR HAWTHORN LAKE WMA

The work plan for the Hawthorn Lake WMA is designed to aid foresters and natural resource managers in the implementation of forest management practices. It is written with the presumption 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: 59.7 ac
This stand consists of bur oak, black oak, hackberry, black cherry, bitternut hickory, elm, shagbark hickory, basswood, and white mulberry. The average size is 12" DBH (small sawtimber) but the trees range from poletimber to sawtimber. There is very heavy honeysuckle throughout.

Prescription: aerial Spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 2: 18.6 ac
This stand is somewhat similar to stand 1, but with less oak component. The dominant species are black cherry, elm, hackberry, and mulberry. The whole stand has very heavy honeysuckle.

Prescription: This stand should be aerial sprayed at the same time as adjacent stands. This stand is not a priority to TSI.

Stand 3: 14.3 ac
Species present are bitternut hickory, shagbark hickory, bur oak, black oak, black walnut. The average size is poletimber. The mid-story includes hackberry, elm, and bitternut hickory. There is very heavy honeysuckle present.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 4: 17.9 ac
Species present are honey locust, black cherry, black oak, bur oak, elm, bitternut hickory, black walnut, and hackberry. The average size is poletimber. The honeysuckle is very heavy.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 5: 13.9 ac
Species present are bur oak, black oak, black cherry, hackberry, black walnut, elm, shagbark hickory, honey locust, white oak, shagbark hickory. The average size is poletimber. The size is slightly larger in the eastern half of the stand. There is a small pocket on the west end with large bur oaks that have many sapling size shade tolerant species in the mid-story. Overall the honeysuckle is very heavy with it being slightly lighter in the west half.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 6: 1.0 ac
This is a tree planting that consists of red oak, white oak, bur oak with an average DBH of 6". The canopy has not closed yet due to wider spacing. The mid-story consists of dogwood, ninebark, and raspberry.

Prescription: No management needed. Evaluate in 2035 for thinning.

Stand 7: 5.7 ac
Species present are honey locust, black oak, bur oak, elm, black cherry, and hackberry. The average size is small sawtimber. The honeysuckle is very heavy.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 8: 1.1 ac
This area has 14" DBH black oak and bur oak. The honeysuckle is very heavy.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 9: 1.9 ac
This stand is small sawtimber bur oak, black oak, basswood in the overstory with hackberry and elm in the mid-story. The honeysuckle is medium severity. There is a significant amount of hackberry seedlings.

Prescription: Aerial spray should be done first, followed by thinning from below, and use fire every 3-5 years.

Stand 10: 52.2 ac
Predominant species in this stand are black cherry, elm, honey locust, hedge, white mulberry. Most of the trees are poletimber size with some being small sawtimber. The mid-story has elm, hawthorn, mulberry. There is a significant amount of buckthorn present in the southeastern portion of this stand. Honeysuckle is very heavy throughout.

Prescription: Aerial spray for honeysuckle at the same time as adjacent stands. Consider patch clearcuts and plant oak seedlings.

Stand 11: 8.0 ac
This area is honey locust, hedge and black cherry poletimber. There is very heavy honeysuckle throughout. Oriental bittersweet is present on the south boundary of this stand. It is growing along the trail.

Prescription: Eliminate the oriental bittersweet, and aerial spray for honeysuckle control when spraying adjacent stands.

Stand 12: 21.1 ac
This stand is being managed for open oak woodland or savanna. This area was thinned aggressively in 2019 and is now dominated by scattered pole size bur oaks and scattered large bur oaks. There are dense shrubs throughout including dogwood, sumac, honeysuckle, and autumn olive.

Prescription: Aerial spray for honeysuckle, and burn regularly.

Stand 13: 50.4 ac
The overstory is on average small sawtimber bur oak, shagbark hickory, black oak, and honey locust. The mid-story is elm, hackberry, hedge, black cherry, hawthorn, hickory, and some suppressed oaks. The honeysuckle is very heavy.

Prescription: Aerial spray should be done first, followed by thinning from below, and use fire every 3-5 years.

Stand 14: 14.5 ac
This area is elm, hedge, black cherry, honey locust, silver maple, and cottonwood poletimber. There is also a significant amount of plum, hawthorn, and invasive shrubs on the edge.

Prescription: Aerial spray for honeysuckle at the same time as adjacent stands. Consider patch clearcuts and plant oak seedlings.

Stand 15: 10.0 ac
This area is elm, hedge, black cherry, honey locust, silver maple, and cottonwood poletimber. There is also a significant amount of plum, hawthorn, and invasive shrubs on the edge.

Prescription: Aerial spray for honeysuckle at the same time as adjacent stands. Consider patch clearcuts and plant oak seedlings.

Stand 16: 3.5 ac
Trees present are elm, black cherry, bur oak, black oak, and shagbark hickory. The average size is poletimber. There is very heavy honeysuckle.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 17: 4.1 ac
This area is elm, hedge, black cherry, and honey locust poletimber. There is very heavy honeysuckle.

Prescription: Aerial spray for honeysuckle at the same time as adjacent stands. Consider patch clearcuts and plant oak seedlings.

Stand 18: 25.7 ac
This stand consists of small sawtimber bur oak, shagbark hickory, and hackberry in the overstory. The mid-story is hackberry, elm, and shagbark hickory. There is heavy honeysuckle on the forest floor. Some buckthorn is present in the southwest corner of the stand.

Prescription: Aerial spray should be done first, followed by thinning from below then follow up with prescribed fire every 3-5 years.

Stand 19: 2.7 ac
This area has very thick dogwood, hazelnut, plum, autumn olive, and honeysuckle. There are scattered poletimber size bur oak and black oak throughout.

Prescription: No management. Evaluate in 2035 for thinning.

Stand 20: 28.4 ac
This area has black cherry, bur oak, black oak, shagbark hickory, elm, honey locust, and hackberry. Poletimber is the average size and is overstocked with a basal area of 120 square feet per acre. The mid-story is mostly hackberry, honeysuckle, buckthorn, and hawthorn. The invasive shrubs, mostly honeysuckle, are very heavy.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 21: 0.9 ac
This is a small opening that at the time of recon appeared to be dominated by cool season grasses and has some woody encroachment of autumn olive. Based on its location being surrounded by woodland on three sides it may be a good area to establish oak.

Prescription: Potential tree planting area.

Stand 22: 12.6 ac
This stand consists of black cherry, honey locust, hackberry, and elm small sawtimber. There are very scattered large bur oak, and black oak. The mid-story is dense hackberry, black cherry, and elm poletimber. There is heavy honeysuckle.

Prescription: Aerial spray at same time as adjacent stands.

Stand 23: 34.8 ac
This stand consists of black cherry, elm, honey locust, box elder, hackberry, hedge, white mulberry, and hawthorn. The trees are small sawtimber on average. There is very heavy honeysuckle throughout. This stand has a small prairie opening on the west end near the lake. There are also a couple areas that are more open on the east end.

Prescription: Aerial spray for honeysuckle at the same time as adjacent stands. Consider patch clearcuts and plant oak seedlings.

Stand 24: 4.6 ac
This stand includes four small stands surrounded by prairie. These areas are mostly poletimber bur oak with a little bit of black walnut and aspen. 8” DBH is the average size.

Prescription: Perform CTR then follow up with prescribed fire every 3-5 years.

Stand 25: 13.8 ac
This stand is dominated by black walnut. The trees range from 8”- 18” DBH. The basal area is about 120 square feet per acre. There is a significant amount of honeysuckle present.

Prescription: Aerial spray for honeysuckle then perform a CTR.

Stand 26: 16.1 ac
Trees present are black walnut, elm, bur oak, hackberry, cottonwood, black cherry, silver maple, hedge, and honey locust. The average size class is poletimber. Shrubs present are dogwood, hazelnut, hawthorn, honeysuckle, and buckthorn.

Prescription: Aerial spray should be done first, CTR 2 years later.

Stand 27: 5.0 ac
This area is dominated by black locust. The size ranges from sapling to small sawtimber, but is poletimber on average.

Prescription: Consider patch clearcuts and plant oak seedlings.

Stand 28: 28.4 ac
This stand consists of black walnut, hackberry, shagbark hickory, elm, bur oak, black cherry, and mulberry. The average size is poletimber. This stand has excellent potential timber value in 40-50 years. The honeysuckle is very heavy.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 29: 16.4 ac
Stand 29 includes two areas which are overall low quality and consist of black cherry, elm, hackberry. The trees range from sapling to small sawtimber. There is very heavy honeysuckle and some buckthorn.

Prescription: Aerial spray for honeysuckle.

Stand 30: 1.7 ac
There are two areas that make up stand 30. They include 6” DBH bur oak with some black oak. There is very heavy honeysuckle and autumn olive.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 31: 18.7 ac
This stand consists of bur oak, black cherry, shagbark hickory, elm, hackberry, and mulberry. The average size is poletimber. The honeysuckle is very heavy.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 32: 4.8 ac
Species present are black cherry, bur oak, shagbark hickory, and mulberry. The average size is poletimber. The stand has a stocking rate of 93% with a basal area of 103 square feet per acre and an average size of 8.6” DBH. There is very heavy honeysuckle.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 33: 3.1 ac
There are two small areas that make up stand 33. They consist of bur oak and black cherry poletimber. There is a significant amount of sumac and dogwood present. The honeysuckle is very heavy.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 34: 0.4 ac
This stand has poletimber bur oak and black oak. The trees are 6" on average. There is dogwood, autumn olive, and honeysuckle present.

Prescription: Aerial spray should be done first, CTR 2 years later then follow up with prescribed fire every 3-5 years.

Stand 35: 1.7 ac
This stand consists of black cherry, elm shagbark hickory, cottonwood, mulberry, scattered bur oak, and black oak. The average size is poletimber. There is very heavy honeysuckle present.

Prescription: Aerial spray should be done first, CTR 2 years later.

Stand 36: 3.5 ac
This area is poletimber black cherry, elm, honey locust, hedge. The mid-story is hawthorn, honeysuckle, and autumn olive.

Prescription: Aerial spray for honeysuckle.

Stand 37: 46.7 ac
Species present are honey locust, elm, black cherry, and hedge. The trees range from sapling to small sawtimber. Honeysuckle and autumn olive are present in very heavy populations. The eastern portion of this stand will be cleared of invasive shrubs in favor of promoting prairie grass.

Prescription: Aerial spray for honeysuckle at the same time as adjacent stands. Consider patch clearcuts and plant oak seedlings.

SUMMARY OF STANDS

Stand #	Acres	Overstory	Size Class	Management	Prescriptions	Priority
1	59.7	Oak/Hickory	Small Sawtimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	H
2	18.6	Central Hardwoods	Small Sawtimber	Even Age	Aerial Spray	L
3	14.3	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	M
4	17.9	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	M
5	13.9	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	H
6	1.0	Oak Plantation	Poletimber	Even Age	Eval to thin 2035	
7	5.7	Oak/Hickory	Small Sawtimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	M
8	1.1	Oak/Hickory	Small Sawtimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	M
9	1.9	Oak/Hickory	Small Sawtimber	Even Age	Aerial Spray, Understory Removal, Prescribed Fire	H

Stand #	Acres	Overstory	Size Class	Management	Prescriptions	Priority
10	52.2	Central Hardwoods	Poletimber	Even Age	Aerial Spray, Stand Conversion	L
11	8.0	Central Hardwoods	Poletimber	Even Age	Oriental Bittersweet Control, Aerial Spray	L
12	21.1	Open oak woodland	Poletimber	Even Age	Aerial Spray, Prescribed Fire	M
13	50.4	Oak/Hickory	Small Sawtimber	Even Age	Aerial Spray, Understory Removal, Prescribed Fire	H
14	14.5	Central Hardwoods	Poletimber	Even Age	Aerial Spray, Stand Conversion	L
15	10.0	Central Hardwoods	Poletimber	Even Age	Aerial Spray, Stand Conversion	L
16	3.5	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	M
17	4.1	Central Hardwoods	Poletimber	Even Age	Aerial Spray, Stand Conversion	L
18	25.7	Oak/Hickory	Small Sawtimber	Even Age	Aerial Spray, Understory Removal, Prescribed Fire	H
19	2.7	Oak/Hickory	Saplings	Even Age	Eval to thin 2035	
20	28.4	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	H
21	0.9	Open Field		Even Age	Potential Tree Planting	L
22	12.6	Oak/Hickory	Small Sawtimber	Uneven Age	Aerial Spray	L
23	34.8	Central Hardwoods	Small Sawtimber	Even Age	Aerial Spray, Stand Conversion	L
24	4.6	Oak/Hickory	Poletimber	Even Age	Crop Tree Release, Prescribed Fire	M
25	13.8	Black Walnut	Small Sawtimber	Even Age	Crop Tree Release	L
26	16.1	Central Hardwoods	Small Sawtimber	Even Age	Aerial Spray, Crop Tree Release	M
27	5.0	Black Locust	Poletimber	Even Age	Stand Conversion	L
28	28.4	Central Hardwoods	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	H
29	16.4	Central Hardwoods	Poletimber	Even Age	Aerial Spray	L
30	1.7	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	M
31	18.7	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	H
32	4.8	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	M
33	3.1	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	M
34	0.4	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release, Prescribed Fire	M
35	1.7	Oak/Hickory	Poletimber	Even Age	Aerial Spray, Crop Tree Release	M
36	3.5	Central Hardwoods	Poletimber	Even Age	Aerial Spray	L
37	46.7	Central Hardwoods	Poletimber	Even Age	Aerial Spray, Stand Conversion	L

High Priority Projects

Management	Stand	Prescription	Acres
Invasive Species Control	1, 5, 9, 13, 18, 20, 28, 31	Aerial Spray	227.1
FSI	1	Crop Tree Release	59.7
FSI	5	Crop Tree Release	13.9
FSI	9	Thinning From Below	1.9
FSI	13	Thinning From Below	50.4
FSI	18	Thinning From Below	25.7
FSI	20	Crop Tree Release	28.4
FSI	28	Crop Tree Release	28.4
FSI	31	Crop Tree Release	18.7

THREATENED AND ENDANGERED SPECIES

While habitat management activities are intended to have an overall conservation benefit through habitat improvement, at times these activities may have unintended consequences for a variety of species. For this reason, prior to implementation, forest management activities described here will be reviewed internally to assess potential impacts to both state and federal species of concern. When protected species are known to occur in the management area or if suitable habitat for these species is present, management biologists implement conservation measures as described in the Operation and Management Plans; Management Plans for Wildlife Management Areas in the State along with recommendations from NAI staff for specific projects. Management activities are not initiated until this review has been completed and T/E comments/concerns have been addressed. The information included here represents the status of listed species at the time this plan was written. These lists continue to change and that updated references must be consulted before undertaking management actions recommended by the plan, in order to avoid and minimize impacts on listed species.

Guidelines for Protecting Northern Long-Eared Bat, Indiana Bat, and Tricolored Bat

The Indiana Bat (*Myotis sodalis*) is a federal (50CFR Part 17) and state (Code of Iowa, Chapter 481B) endangered species that occurs in southern Iowa as far north as Highway 30. The Northern Long-Eared Bat (*Myotis septentrionalis*) is a federally Endangered Species that can occur in any county of Iowa. The Tricolored Bat (*Perimyotis subflavus*) is a federally Proposed Endangered Species that can occur in any county in Iowa. All three bats can be active from April through September in forested areas. Female Indiana bat and Northern Long-Eared Bats may roost and rear young in standing trees 3" DBH and larger, either dead or alive, with loose, shaggy, or peeling slabs of bark, cavities in the trunk or large limbs, or large cracks or openings. Tricolored bats roost in similar forested habitat but roost within leaf clusters instead of under loose bark.

To protect summer habitat for all three species of bats, adhere to the following guidance:

- Avoid felling any dead standing or live trees 3" DBH and larger that contain cavities, cracks or crevices, or loose, platy, peeling, or shaggy bark from April 1st through September 30th.
  - Such trees meeting the above criteria may be felled beginning October 1 through March 31; however, in all forest management projects, retain a minimum of 9 suitable habitat trees per acre if present above this rate.
  - Live trees may be girdled any time of year to create habitat snags in Forest Stand Improvement operations.
- Avoid conducting prescribed burns in woodlands from May 15 - August 15.
- Avoid clearcuts, seed tree harvests, or site preparation projects larger than 10 acres that could negatively affect suitable habitat.

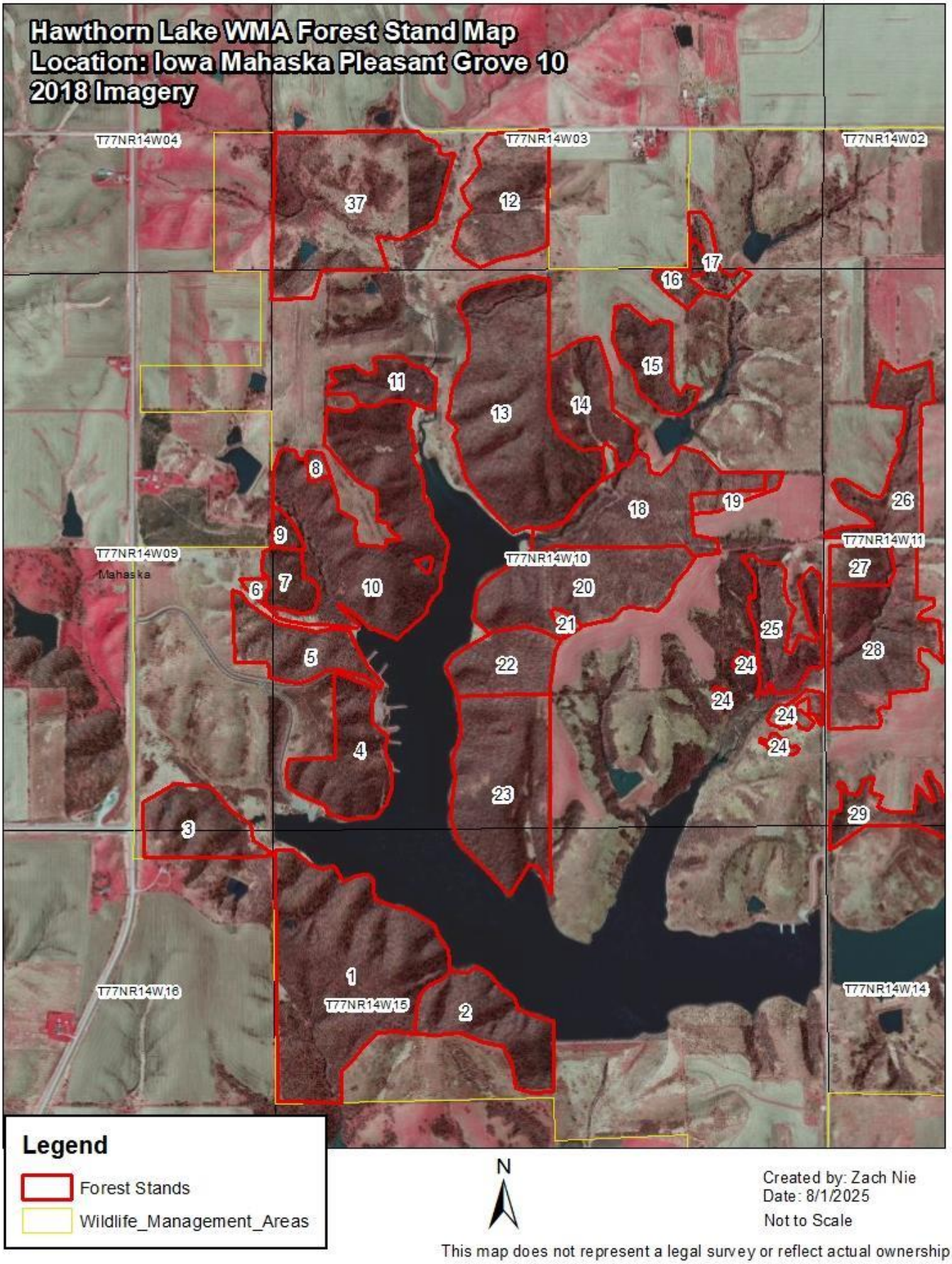
List of Endangered, Threatened & Special Concern Species in Mahaska county.

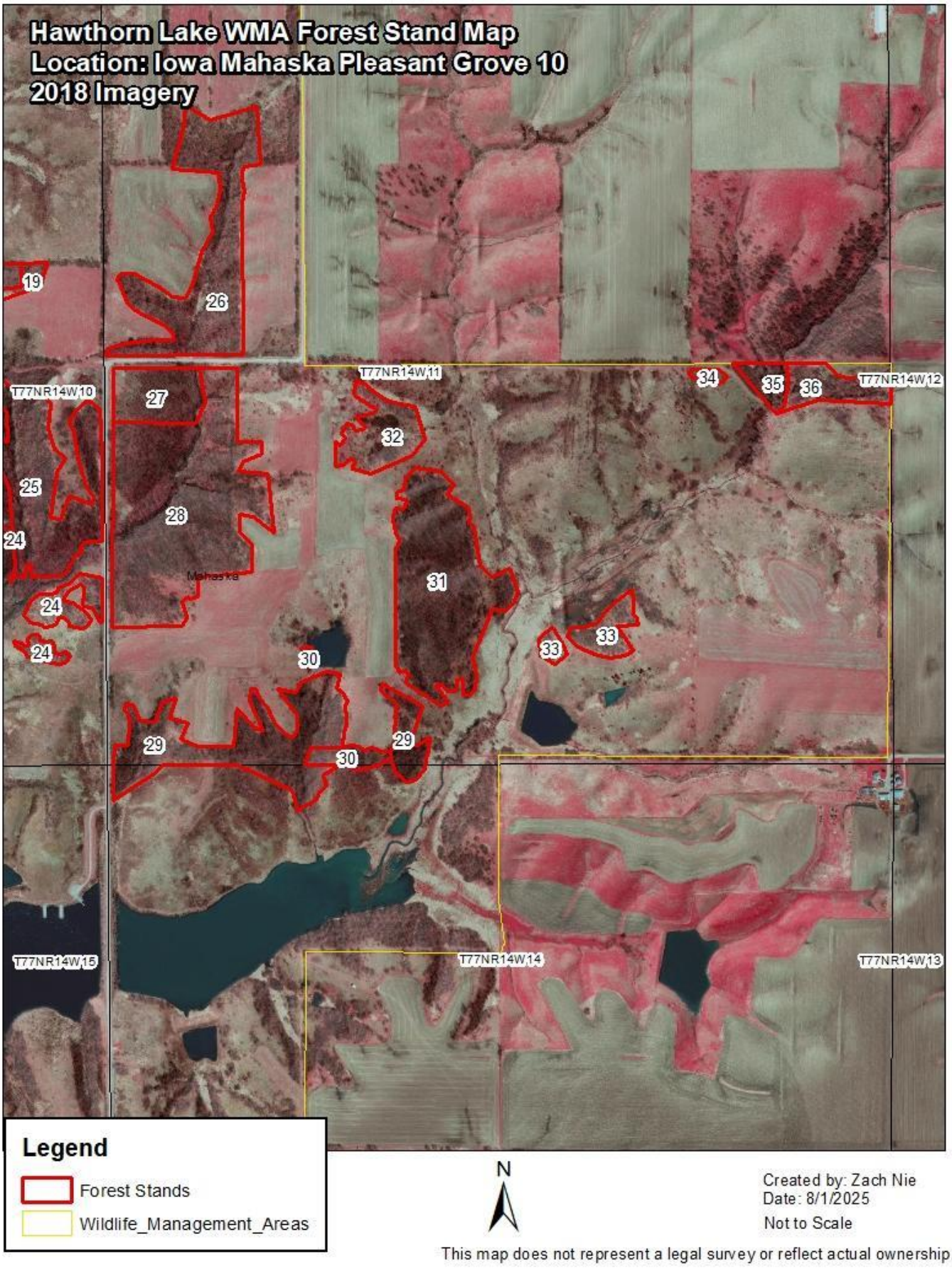
County	Common Name	Scientific Name	Class	State Status	Federal Status	Link To Species Profile
MAHASKA	Bald Eagle	Haliaeetus leucocephalus	BIRDS	S		Bald Eagle
MAHASKA	Barn Owl	Tyto alba	BIRDS	E		Barn Owl

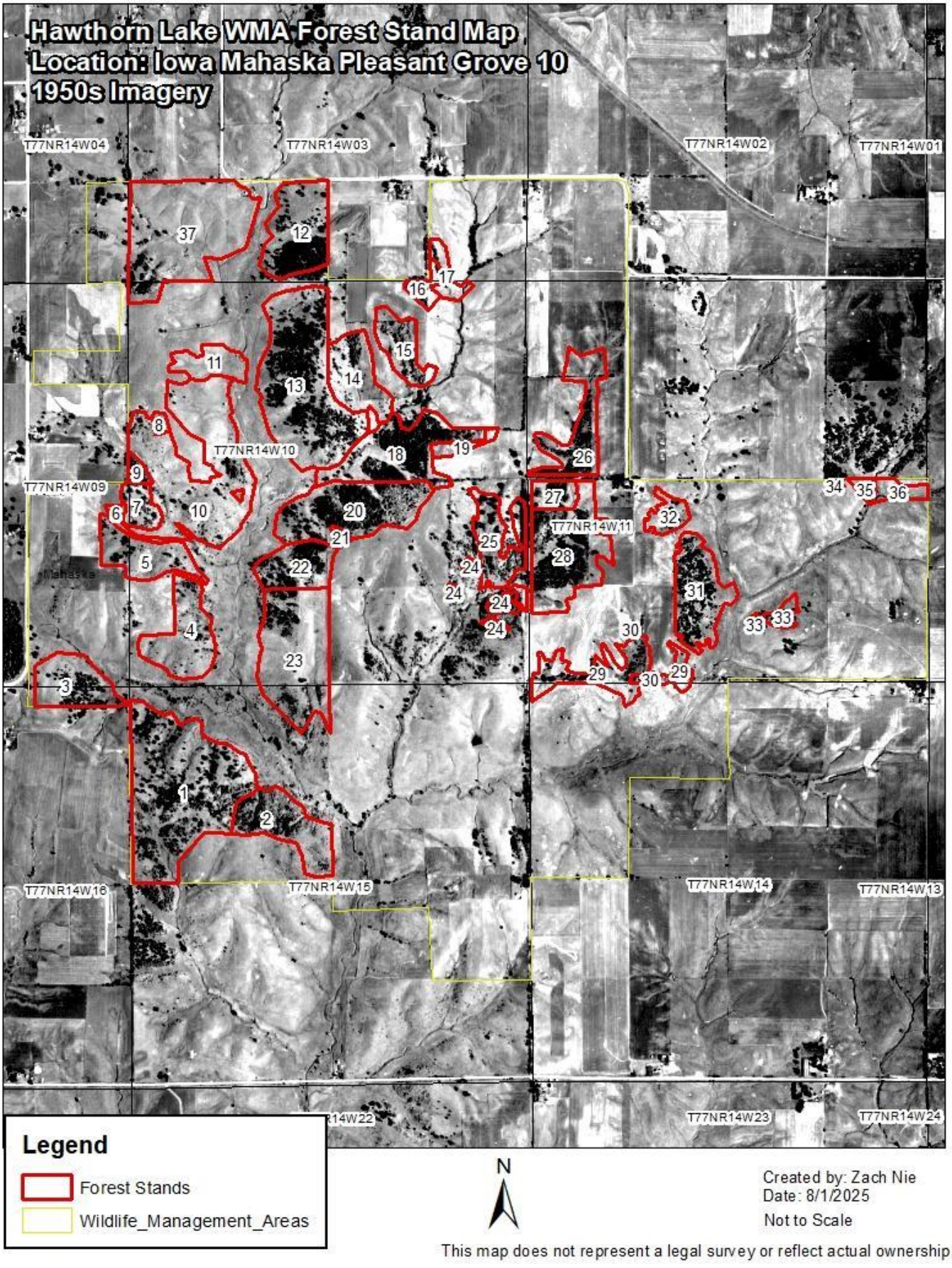
County	Common Name	Scientific Name	Class	State Status	Federal Status	Link To Species Profile
MAHASKA	Henslow's Sparrow	Ammodramus henslowii	BIRDS	T		Henslow's Sparrow
MAHASKA	Regal Fritillary	Speyeria idalia	INSECTS	S		
MAHASKA	Indiana Bat	Myotis sodalis	MAMMALS	E	E	Indiana Bat
MAHASKA	Northern Long-eared Bat	Myotis septentrionalis	MAMMALS		E	
MAHASKA	Southern Bog Lemming	Synaptomys cooperi	MAMMALS	T		Southern Bog Lemming
MAHASKA	Curved-pod Corydalis	Corydalis curvisiliqua ssp grandibracteata	PLANTS (DICOTS)	E		
MAHASKA	Downy Woodmint	Blephilia ciliata	PLANTS (DICOTS)	T		
MAHASKA	Earleaf Foxglove	Tomanthera auriculata	PLANTS (DICOTS)	S		
MAHASKA	Frost Grape	Vitis vulpina	PLANTS (DICOTS)	S		
MAHASKA	Hill's Thistle	Cirsium hillii	PLANTS (DICOTS)	S		
MAHASKA	Larkspur	Delphinium carolinianum	PLANTS (DICOTS)	S		
MAHASKA	Paw Paw	Asimina triloba	PLANTS (DICOTS)	S		
MAHASKA	Rough Bedstraw	Galium asprellum	PLANTS (DICOTS)	S		
MAHASKA	Rough Buttonweed	Diodia teres	PLANTS (DICOTS)	S		
MAHASKA	Roundstem Foxglove	Agalinis gattingeri	PLANTS (DICOTS)	T		
MAHASKA	Spring Avens	Geum vernum	PLANTS (DICOTS)	S		
MAHASKA	Winged Monkey Flower	Mimulus alatus	PLANTS (DICOTS)	T		
MAHASKA	Broom Sedge	Andropogon virginicus	PLANTS (MONOCOTS)	S		
MAHASKA	Bush's Sedge	Carex bushii	PLANTS (MONOCOTS)	S		
MAHASKA	Glomerate Sedge	Carex aggregata	PLANTS (MONOCOTS)	S		
MAHASKA	Meadow Bluegrass	Poa wolfii	PLANTS (MONOCOTS)	S		
MAHASKA	Oval Ladies'-tresses	Spiranthes ovalis	PLANTS (MONOCOTS)	T		
MAHASKA	Pale Green Orchid	Platanthera flava	PLANTS (MONOCOTS)	E		
MAHASKA	Shallow Sedge	Carex lurida	PLANTS (MONOCOTS)	S		
MAHASKA	Slender Ladies'-tresses	Spiranthes lacera	PLANTS (MONOCOTS)	T		
MAHASKA	Soft Rush	Juncus effusus	PLANTS (MONOCOTS)	S		
MAHASKA	Virginia Spiderwort	Tradescantia virginiana	PLANTS (MONOCOTS)	S		
MAHASKA	Crowfoot Clubmoss	Lycopodium digitatum	PLANTS (PTERIODOPHYTES)	S		
MAHASKA	Northern Adder's-tongue	Ophioglossum pusillum	PLANTS (PTERIODOPHYTES)	S		
MAHASKA	Bullsnake	Pituophis catenifer sayi	REPTILES	S		Bullsnake
MAHASKA	Smooth Green Snake	Liochlorophis vernalis	REPTILES	S		Smooth Green Snake

Legend:

E = Endangered
T = Threatened
S = Special Concern


Hawthorn Lake WMA Forest Stand Map
Location: Iowa Mahaska Pleasant Grove 10
2018 Imagery
T77NR14W04
T77NR14W03
T77NR14W02
T77NR14W09
Mahaska
T77NR14W10
T77NR14W11
T77NR14W16
T77NR14W15
T77NR14W14
37
12
17
16
15
11
13
14
8
18
19
26
9
27
6
7
10
20
21
25
5
22
24
28
24
24
4
24
23
29
3
1
2
Legend
Forest Stands
Wildlife_Management_Areas
N
Created by: Zach Nie
Date: 8/1/2025
Not to Scale
This map does not represent a legal survey or reflect actual ownership.


Hawthorn Lake WMA Forest Stand Map
Location: Iowa Mahaska Pleasant Grove 10
2018 Imagery
T77NR14W10
T77NR14W11
T77NR14W12
T77NR14W15
T77NR14W14
T77NR14W13
19
26
27
32
34
35
36
25
28
24
31
24
24
33
33
30
29
29
30
Mahaska
Legend
Forest Stands
Wildlife_Management_Areas
N
Created by: Zach Nie
Date: 8/1/2025
Not to Scale
This map does not represent a legal survey or reflect actual ownership.


Hawthorn Lake WMA Forest Stand Map
Location: Iowa Mahaska Pleasant Grove 10
1950s Imagery
T77NR14W04
T77NR14W03
T77NR14W02
T77NR14W01
T77NR14W10
T77NR14W09
T77NR14W11
T77NR14W16
T77NR14W15
T77NR14W14
T77NR14W13
T77NR14W23
T77NR14W24
Mahaska
Legend
Forest Stands
Wildlife_Management_Areas
N
Created by: Zach Nie
Date: 8/1/2025
Not to Scale
This map does not represent a legal survey or reflect actual ownership.