FOREST WILDLIFE STEWARDSHIP PLAN

FOR

UPPER WAPSI CORRIDOR

WILDLIFE MANAGEMENT AREAS

A plan that will increase the diversity of forest habitats and wildlife

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LOCATION: Sec. 34 Jefferson Twsp., T93N-R12W, Bremer County

TOTAL ACRES: 2,007

INTRODUCTION

The Iowa Department of Natural Resources (DNR) 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 DNR's mission. Within the DNR, the Wildlife Bureau manages more than 380,000 acres of land as wildlife management areas (WMAs) for a variety of public users. Many of these WMAs are partially or mostly forest covered. These forests, if properly managed, provide a unique opportunity for the DNR to carry out its mission by publicly demonstrating sustainable forest management and the enhancement of these valuable resources for wildlife.

The DNR is also the agency responsible for the stewardship of indigenous and migratory wildlife species found in the state. Many of these species live near and in WMA forests. The DNR recognizes the need for forest wildlife stewardship plans (FWSPs) to properly manage the forest resources. Forests are not static systems, even though changes occur relatively slowly over a long period of time. A hands-off or "preservation" philosophy will ensure that the forest of 100 years from now will be much different and likely lower quality than the forest of today. These changes will negatively impact wildlife species. 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 constant change requires managers to plan over the long term and leave a written record

of these plans in the form of FWSPs. This process will help ensure the wise management of our WMA forests and will aid future managers with decision making.

There is no single type of forest stand that can provide all of the requirements for all forest wildlife species. Different species require different (and sometimes quite specific) forest types and age classes. Some generalist wildlife species use all of the forest age classes, while some specialist species have such specific requirements that only one or two particular forest types are needed to survive. This dependency on specific habitat types is evident in many migratory nongame birds including the blue-winged warbler, black-billed cuckoo, yellow-billed cuckoo and eastern towhee. These bird species are dependent on the early stage of forest succession. Conversely, some species of neotropical migratory birds are dependent upon mature, undisturbed forests. The Acadian flycatcher, cerulean warbler, and the veery are some examples of species dependent on older forests.

Oak forests are indisputably important in Iowa. The pre-settlement forests across the state were dominated by a mixture of oak species. Wildlife species adapted to the oak forests and thrived amidst their diversity. Today, the forests of Iowa are changing at alarming rates. It is estimated that Iowa loses approximately 5,800 acres of oak forest each year. These losses are due to several factors, including both natural and human controlled. This pronounced loss of oak leads to a reduction in the quality of habitat and food sources available to wildlife, as well as the economic value and quality of the forest. The importance of managing forests for oak cannot be overstated, and the Iowa DNR has made this a priority across much of the state.

The Wildlife Bureau manages forests for the greatest diversity of forest wildlife. The FWSP will be the guiding document that prioritizes management activities to meet the needs of forest wildlife species. The DNR's comprehensive Iowa Wildlife Action Plan identifies wildlife "species of greatest conservation need" (SGCN) (Appendix tables 1-6). Habitat needs of these wildlife species will be considered when determining forest management decisions. The primary goal will be to maintain quality habitat that will support abundant and diverse wildlife populations.

DESCRIPTION OF AREAS

The wildlife management areas included in this plan total 5,922 acres in size. These areas contain a variety of habitat types including prairies, wetlands, and forests. This plan addresses the 2,007 acres of forested land located within Bremer and Chickasaw counties as displayed on the map below. Most of the acres addressed are found along the Wapsipinicon River and the East Fork Wapsipinicon River. The area is very flat with little topographical variations. Although, minute differences in elevation have drastic effects on the forest composition. Flooding creates a constant, and sometimes major, disturbance throughout most of the Upper Wapsi Corridor complex.

The 2,007 acres addressed in this plan are divided into 5 different WMAs and delineated into 77 different stands. The combination of all 5 WMAs described in this plan make up the Upper Wapsi Corridor complex. The 2,007 acres are dispersed across 2 counties. Due to their close proximity, they will be managed as a complex.

Forested acres on the WMA's-

Aldo Leopold WMA- 313 acres
Heffernan WMA- 145 acres
Sweet Marsh WMA (Miller Tract) – 275 acres
Sweet Marsh WMA- 980 acres
Upper Wapsi WMA- 220 acres
Wapsi Flats WMA- 74 acres

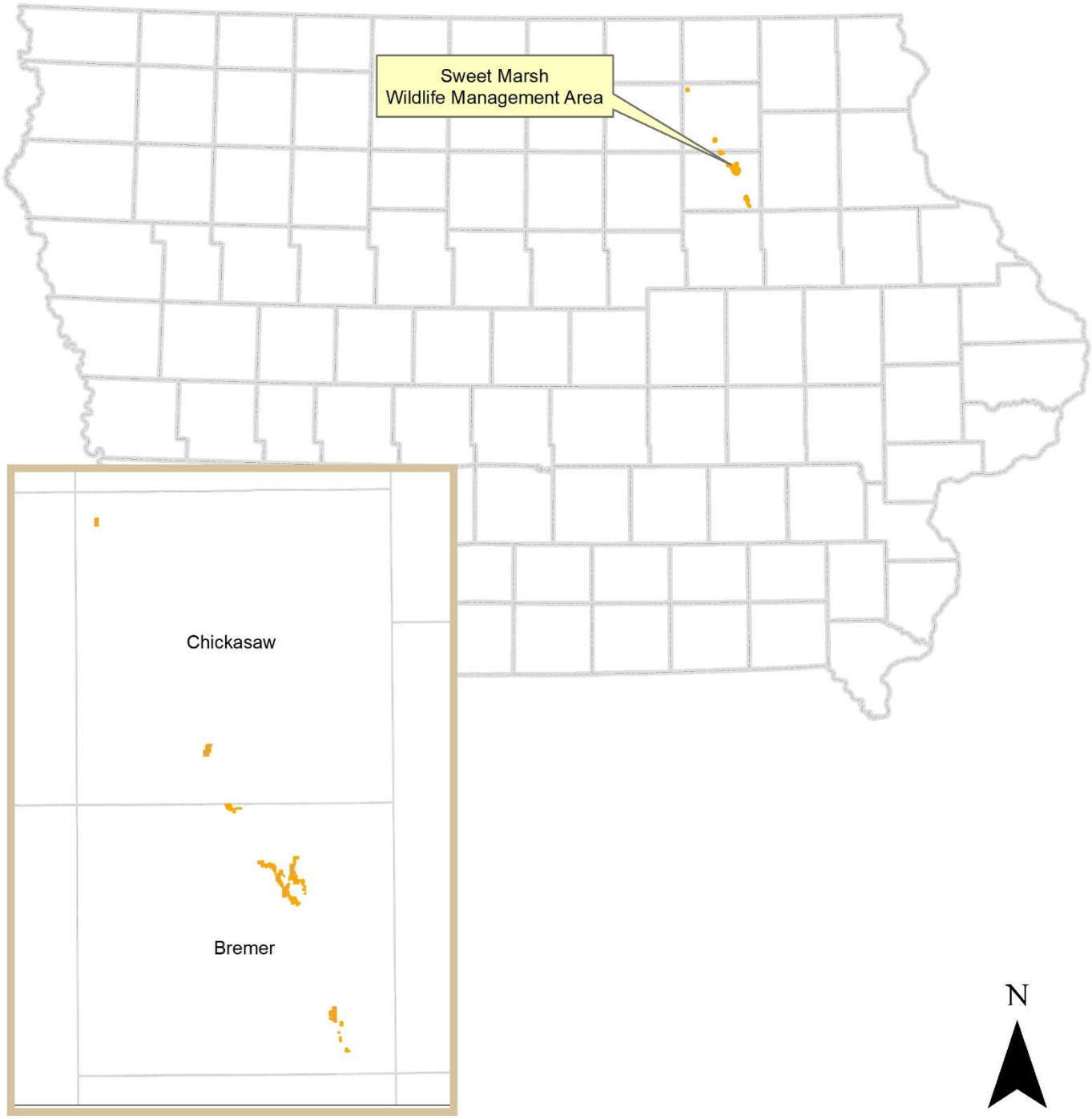
Through on the ground inventory, 77 different stands were identified. Stands were delineated based on a combination of species composition, size class, topography, and management recommendations. Each stand is outlined in detail in this plan with forest management recommendations provided.

Development of the WMAs began in the 1940s when land acquisition in the floodplain was first initiated. The WMAs addressed in this plan contain a complex of habitats with many of them being aquatically associated such as marshes, low land depressions, and flooded forest. Because waterfowl hunters are a large user group of the areas, waterfowl production and harvest are a high priority. In 2007 the Aldo Leopold, Heffernan, and Sweet Marsh WMA's were designated as Bird Conservation Areas. These areas are known to support over 50 breeding bird SGCN including many riparian forest birds. Over 230 bird species have been documented at Sweet Marsh alone. Because of this, bird habitat is a priory of the area. Additionally, because of the unique ecosystem features the Upper Wapsi Corridor possesses, management for two federally-threatened species occurs; the eastern massasauga rattlesnake, and the northern long-eared bat, as well as the state-threatened central newt.

Historically, the 2,007 acres addressed in this plan contained many fewer trees per acre. This was caused by agricultural disturbance. Natural succession and tree plantings have aided to

reforest the areas once the disturbance ceased. However, much of the natural succession that took place created a cohort of species that do not provide the wildlife habitat required to reach the objectives set forth by this plan. Many of the current desirable trees are nearing the end of their life span and mortality is present. This plan was created to address this and other issues on the areas.

Landscape Position



HOW THE FOREST WILDLIFE STEWARDSHIP PLAN WAS DEVELOPED

The wildlife biologist and the wildlife unit team are the managers of the WMA and determines the objectives for the areas. Objectives address the habitat needs of a diverse array of wildlife species and the woodland condition of each area. Approximately one-third of the total land area managed by the Wildlife Bureau across the state is classified as forest. Forest management is essential to the long-term conservation of the native plant communities occurring on these areas. Actively managing the forest is also critical to improving these areas for wildlife and wildlife-related recreation.

Management of forested wildlife areas is a cooperative effort between the wildlife unit and foresters. All of the forested land on the WMA is walked by the biologist and forester. Stands are identified by tree species, tree size, topography, and management system. The biologist and forester discuss the options for each stand and how management of that stand will fit into the overall management for the WMA. Forester recommendations are designed to manage the stand to reach the goals and objectives determined by the biologist, while utilizing strategic and sound forest management practices.

FOREST MANAGEMENT OBJECTIVES

The primary objectives for the wildlife areas are as follows:

- Create and maintain quality wildlife habitat for a wide variety of wildlife species, both game and nongame
- Promote desirable tree species, create a calculated diversity of size classes, and improve forest health in order to enhance a variety of wildlife habitats
- Promoting quality outdoor recreational opportunities
- Protect SGCN and promote water quality in all of the associated aquatic ecosystems

Funding for forest management administration and procurement, as well a portion of the land acquisition costs of the WMAs addressed in this plan can be attributed almost exclusively to hunter-generated monies via license fees and excise taxes on sporting equipment. Consequently, a primary objective for management of the area is to improve habitat for game species such as deer, turkey, rabbit and squirrels. The DNR considers the effects of management actions on nongame species as well, particularly those that are threatened, endangered, or species of greatest conservation need. The DNR recognizes that it is difficult, if not impossible, to manage for all species at the same time on any given tract or WMA. However, this plan operates under the

assumption that creating and maintaining diverse forest habitats will benefit the most wildlife species possible, regardless of their protective status. In other words, game and nongame species alike will benefit from good habitat management practices.

Oak Management-

As stated in the introduction, oaks are a critical component to Iowa's forests. Iowa's wildlife species adapted, coexisted, and eventually became dependent on the oaks benefits to wildlife. The acorns of the oak provide a high level of fat and protein to wildlife at a time of year that food resources are low and high quality nutrients are critical. While the mast that oaks provide are a staple food source for many wildlife species, other characteristics of the oak are extremely beneficial as well. Some of those characteristics include deeply furrowed bark that host insects and invertebrates creating foraging opportunities for insect eating birds, reptiles, and mammals. The rigor and architecture of the branches provide structure for nesting, roosting, and perching. The leaves provide an important food sources for many moths and butterflies. Pollinators also benefit from the nectar and over wintering habitat provided by the oak. Because of the critical role that oak trees play in the ecosystem, they are emphasized heavily in this forest wildlife stewardship plan.

Iowa's oak forests are faced with many threats. There are a variety of factors that contribute to the decline of oak forests. Native and non-native pests, pathogens, and diseases contribute to the mortality of oak. The succession of shade-tolerant species creates a shaded forest floor that is not conducive to the regeneration of shade intolerant oak seedlings. Fragmentation of the landscape and invasive species also play a role in the degradation of our oak forest. In order to combat these circumstances, active forest management is essential.

The even aged management of oak described in this plan is used to promote the ecological niche in which oaks thrive. Oak trees use a specific strategy to regenerate that requires full sunlight. This is why harvest techniques that provide high levels of sunlight to the forest floor such as shelterwoods or clearcuts are used to promote the successful regeneration of oak. These harvest techniques simulate natural disturbances that occurred on the landscape historically such as forest fires and windstorms

Harvests-

Harvesting is conducted primarily to regenerate stands of desirable species and to achieve a diversity of tree size classes. Secondarily, income from timber harvesting operations is the primary source of funding for on-going forest management. Harvests are an essential tool for simulating natural disturbances and creating suitable growing conditions for desirable shade intolerant tree species. Income from harvests will be reinvested into the WMAs to complete the recommended projects within the plan. Those projects include: tree planting, thinning young

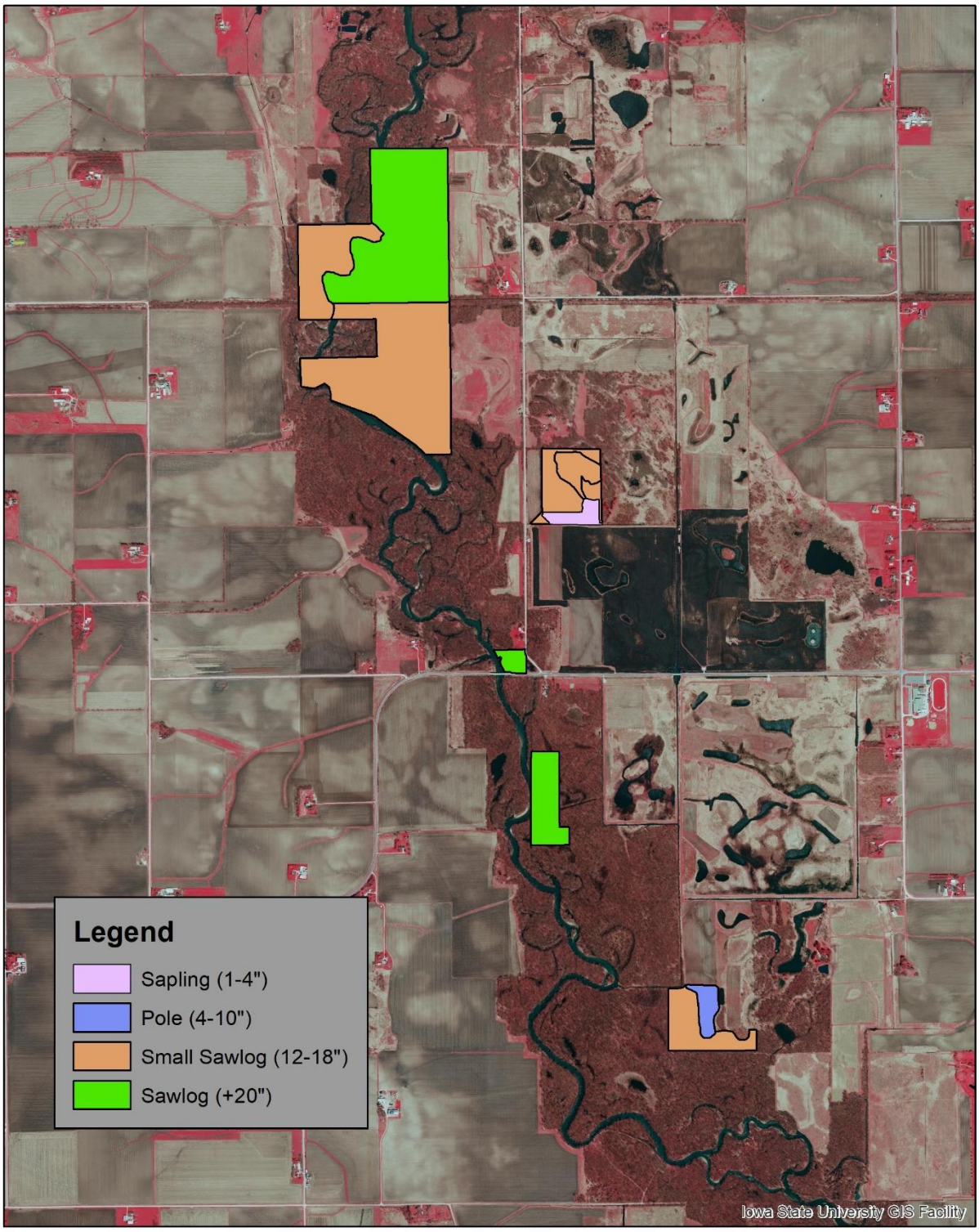
stands, removing undesirable species, converting areas to more desirable species, and completing early successional cuts.

Current Distribution of Tree Size on the WMAs -

Tree Size	Forested Acres	% of Total Area
Sapling (<4" dbh)	21.2	1%
Pole (5-12" dbh.)	311.8	16%
Small Sawtimber (14-18" dbh.)	615.6	32%
Sawtimber (>20" dbh)	978.8	51%
Totals	1,927.4	100%

Note: 79.6 acres of open fields are to be planted to trees. These acres are not included in the table above.

Aldo Leopold WMA
Size Class Distribution

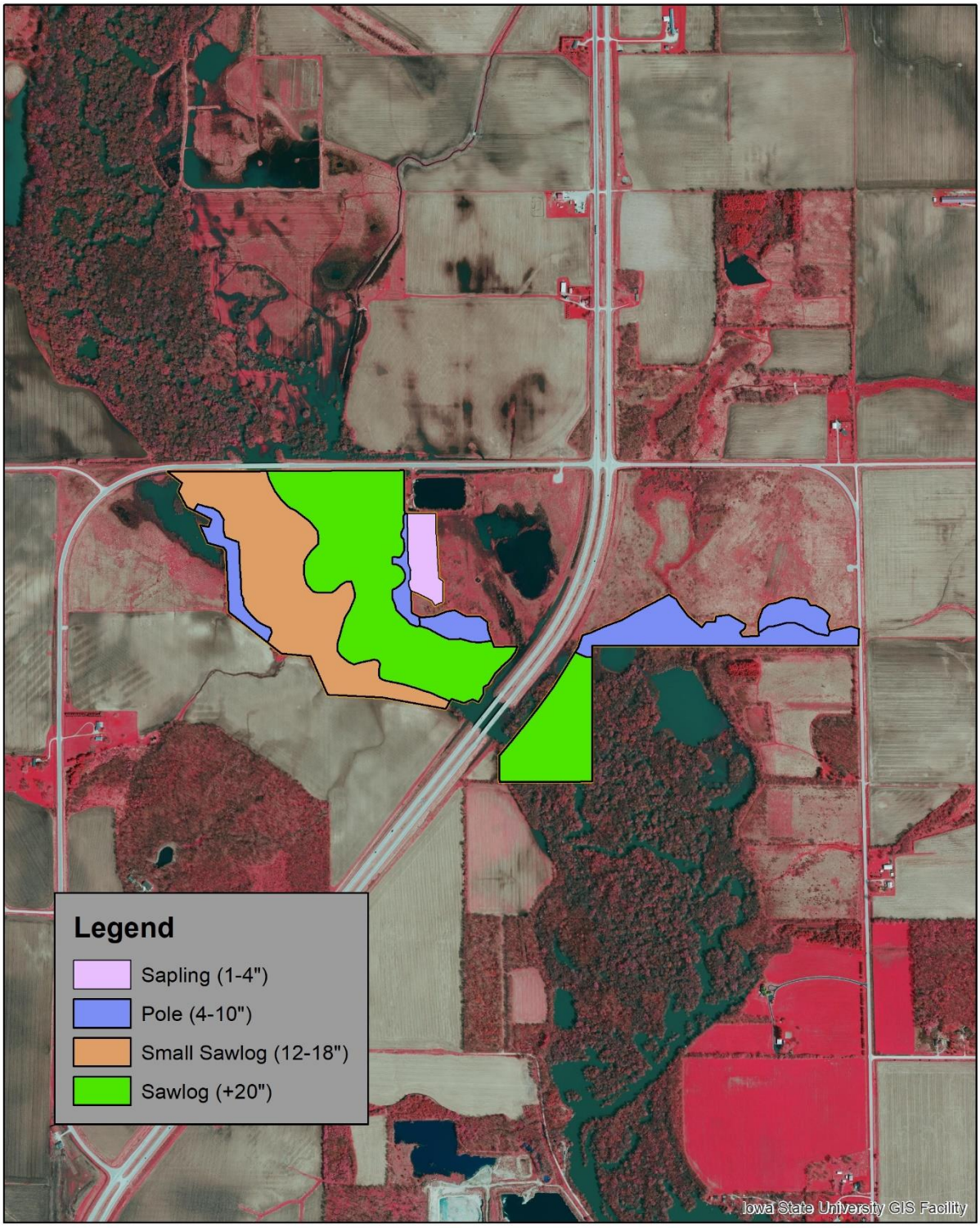


Sec. 7, 8, 17, 20, 28 Franklin Twsp.,
T-91N R-11W
Bremer County

0 0.325 0.65 1.3 Miles

N

Heffernan WMA
Size Class Distribution



Sec. 1,6 Frederika Twsp.,
T-93N R-12W
Bremer County

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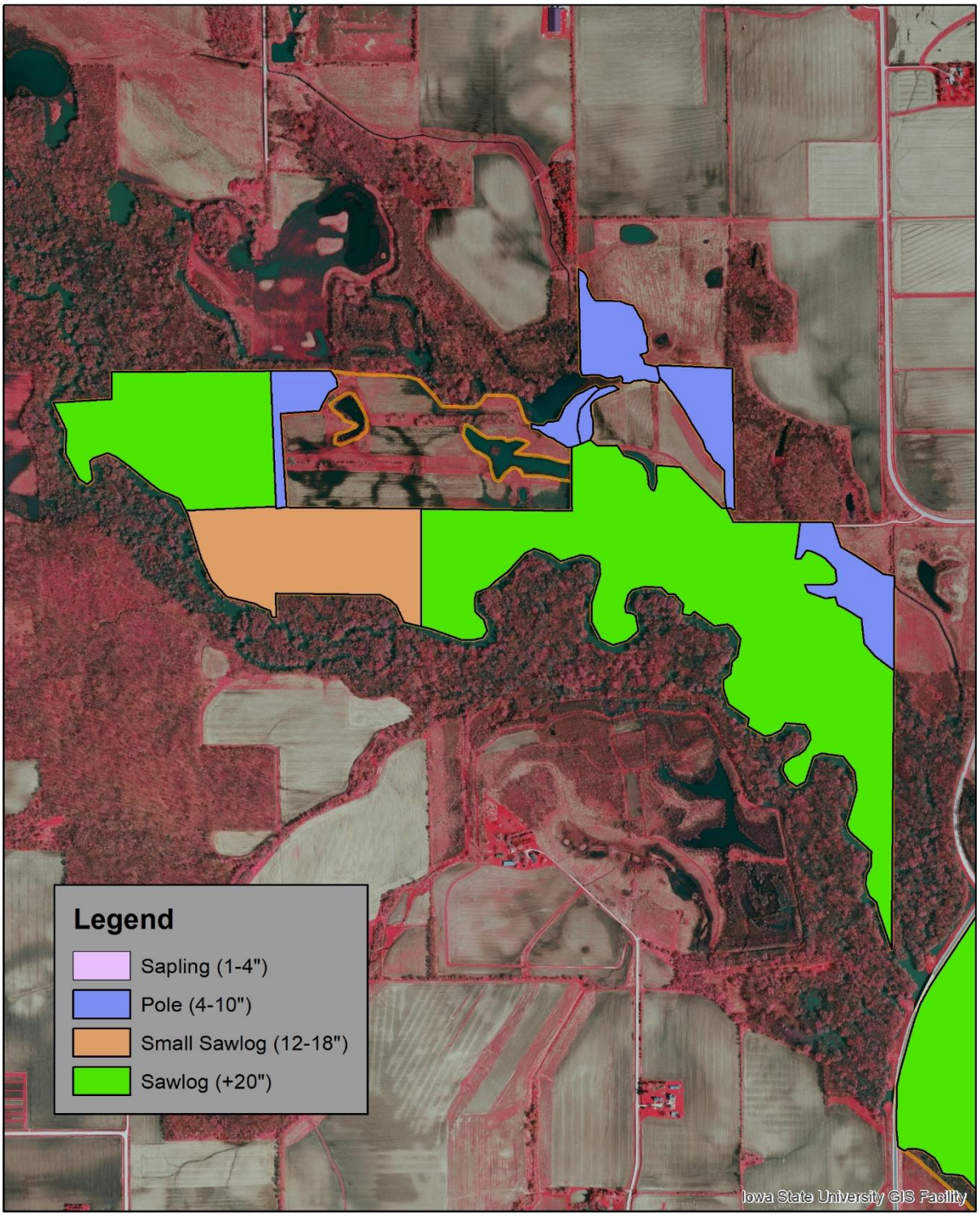
N

Sweet Marsh WMA (Miller Tract)
Size Class Distribution



Sec. 21, 28 Frederika Twsp.,
T-93N R-12W
Bremer County

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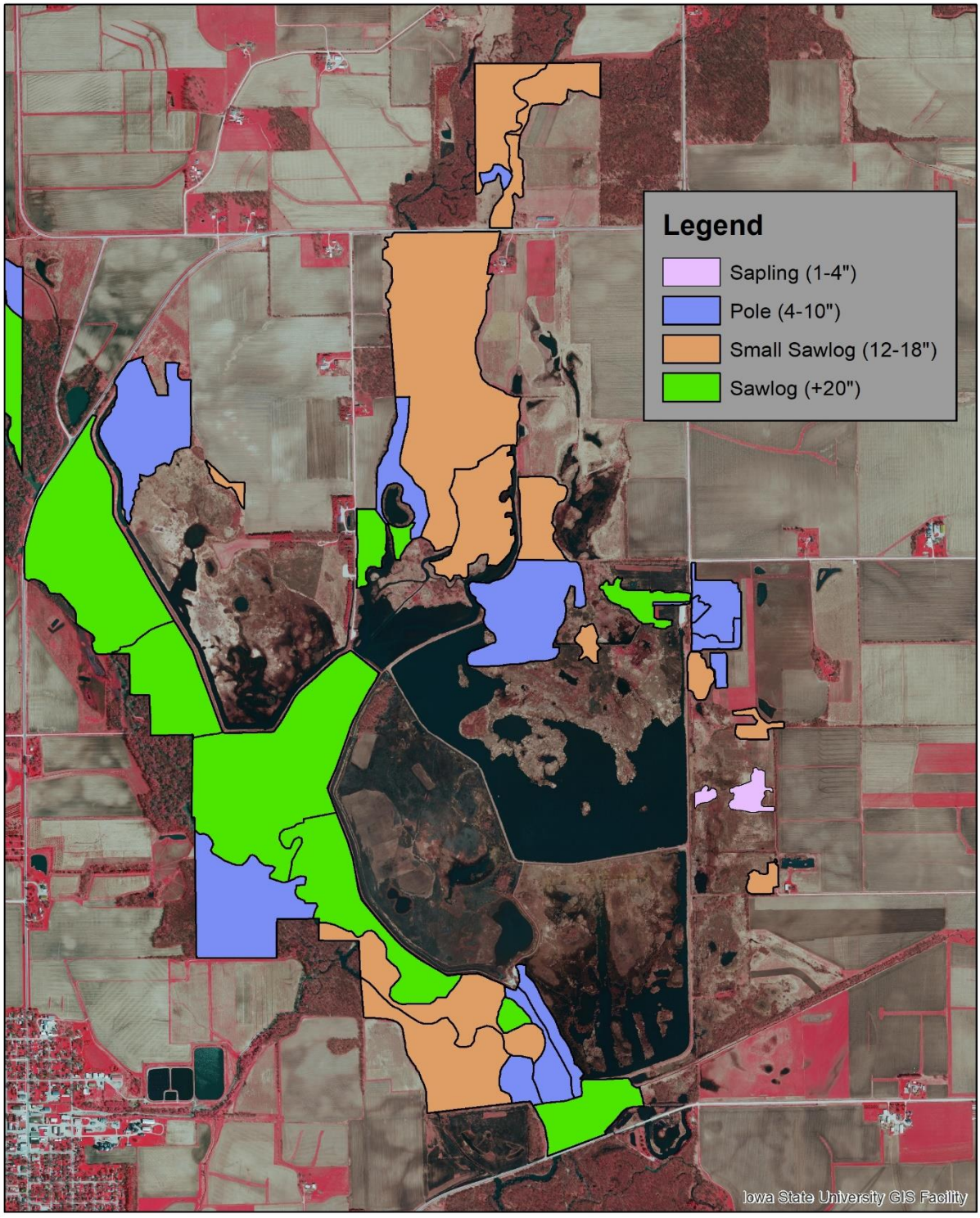
Sweet Marsh WMA
Size Class Distribution

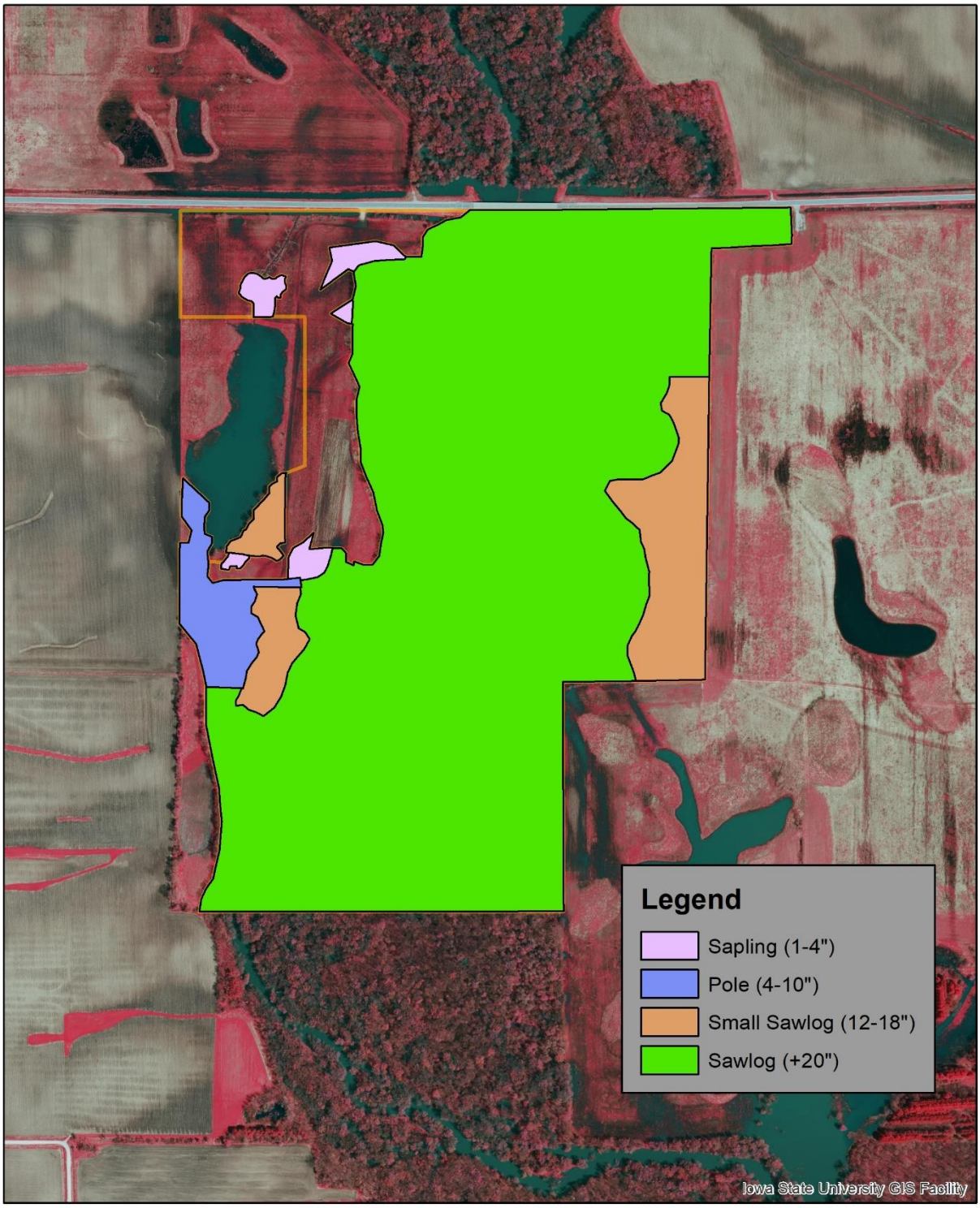


Sec. 26, 35 & 2 Frederika Twsp.,
T-93N R-12W
Bremer County

0 0.275 0.55 1.1
Miles

N

Upper Wapsi WMA
Size Class Distribution

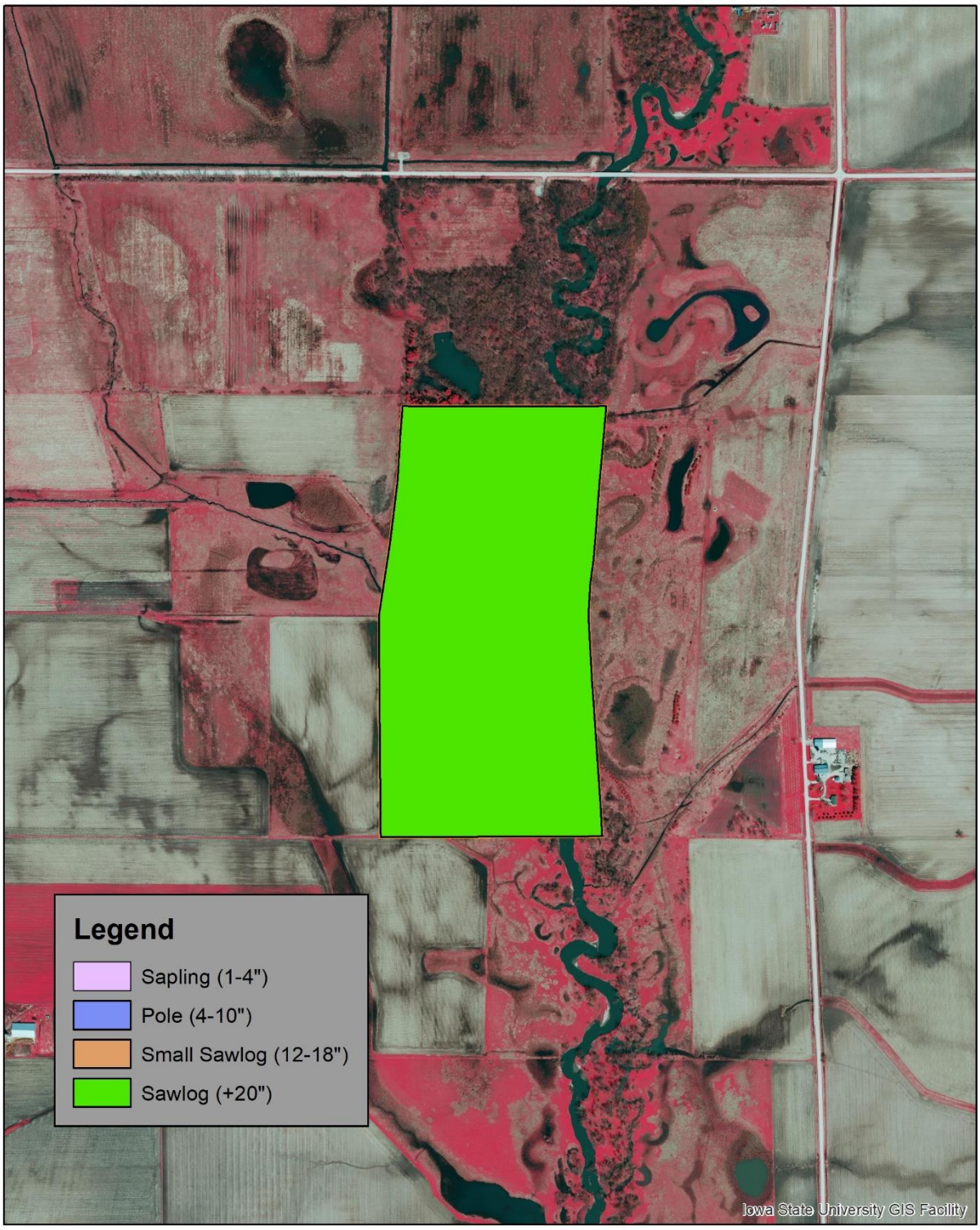


Sec. 14, 15 Richland Twsp.,
T-94N R-13W
Chickasaw County

0 0.1 0.2 0.4 Miles

N

Wapsi Flats WMA
Size Class Distribution



Sec. 20, 29 Washington Twsp.,
T-97N R-14W
Chickasaw County

0 0.1 0.2 0.4 Miles

N

PROPOSED MANGEMENT SYSTEM FOR THE AREAS

Recommendations for each stand were based on whether the area will be managed to create early successional growth, an even aged system, an even aged system, or viewshed. The decision on which management system would be used was based on the objectives for the area to create a certain structural cover, maintain an oak component where feasible, develop a diverse woodland landscape, protect fragile sites, and increase the acres of early successional growth.

Based on forester recommendations for the Upper Wapsi WMAs, the acres under each management system are as follows:

Management System	Acres	% of Total Area
Early Successional	99.6	5%
Even aged	1872.8	93%
Uneven aged	0	0%
Viewshed	34.6	2%
Total	2,007	100%

Early Successional Management-

Many species of birds such as American woodcock, blue-winged warbler, black-billed cuckoo, yellow-billed cuckoo, and eastern towhee are dependent on the early stages of woody growth for breeding. Many mature-forest birds also use early successional forests during the post-fledging and migratory periods. The high stem density of both trees and shrubs provides suitable foraging and/or nesting habitat, and protection from predators. One way that this habitat can be created is bycutting a stand and allowing all of the desirable species to re-sprout. Many tree and shrub species stump sprout vigorously after being cut, especially when cut at a younger stand age.

The majority of early successional management is recommended for the woodland edges adjacent to open habitats. Keeping the woody species growth “low and dense” in these areas will create more attractive habitat for shrubland and “edge” wildlife species. This will “feather” the edges and make a gradual transition from the grassland/agricultural field edges to the larger trees. Feathering or softening the woodland edges creates attractive cover for many species and often results in less nest parasitism of interior forest bird species by brown-headed cowbirds.

The early successional management areas will be managed on a 10-15 year rotation. In other words, every 10-15 years the area will be cut to rejuvenate the desirable species and create areas with high stem density.

The Upper Wapsi Corridor has 99.6 acres (5% of all woodland acres) scheduled for early successional management. Applying sustainable forestry guidelines 33.2 acres could be cut every 5 years, or 6.4 acres could be cut each year.

Even aged Management-

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

Sapling to small pole-sized stands between 10 and 20 years old, may be used by species such as the Kentucky warbler. From age 20-60 years, pole to medium-sized trees tend to be used by canopy nesters such as the scarlet tanager, and ground nesters such as the ovenbird. Mature stands of 60 to 125 years of age are used by birds such as the wood thrush, Acadian flycatcher, ovenbird and scarlet tanagers. All size classes are important for many game species such as bobcat, deer, squirrel, and wild turkey.

As forest stands age, they constantly lose trees to shading, insects, disease and other factors. The dead and dying trees provide habitat for cavity nesters such as wood ducks, woodpeckers, nuthatches and titmice. Over 30 species of Iowa nesting birds nest in the cavities of trees. Iowa's seven species of woodpeckers (including two SGCN) are the primary cavity builders and nesters, and these woodpeckers are the keystone species that provide the cavities for so many other secondary nesting birds, as well as providing homes for flying squirrels, gray and fox squirrels, bats, and a host of other species. In northeast Iowa federally threatened northern long-eared bats use loose barked live trees such as shagbark hickory as well as the sloughing bark from dying trees for their maternity colonies.

Even aged management involves growing a stand of trees which are close to the same age. At some point in the stands life, the area is clearcut which creates the even aged structure. Even aged management creates excellent habitat for deer and turkey, and is essential to the regeneration of oak which require full sunlight. The only way that oak can be maintained as a component of the forest is by practicing some form of even aged management.

Common forms of even aged management in Iowa include clearcutting and planting, clearcutting with regeneration already established, or a shelterwood system to develop desirable seedlings on the ground.

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

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

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

The Upper Wapsi Corridor has 1872.8 acres (93% of all woodland acres) that will be managed as even aged forest to regenerate oak (125-year rotation). Applying sustainable forestry guidelines, approximately 74.9 acres could be clearcut every 5 years, or 15 acres could be cut every year.

Uneven aged Management-

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

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

Uneven aged management areas will provide continuous tracts of woodland with minimal disturbance. Large tracts of uneven aged management will provide necessary habitat for nesting SGCN neotropical migratory bird species such as eastern wood-pewee, Acadian flycatcher, wood thrush, cerulean warbler, worm-eating warbler, Kentucky warbler, and for migrant SGCN neotropical migratory species such as golden-winged warbler, bay-breasted warbler, and Canada warbler. 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, raccoons and squirrels. Retaining live loose bark tree species (e.g., shagbark hickory) and snags whenever possible will benefits bats (and other wildlife). Timber stand improvement and selective harvesting, along with allowing some natural tree mortality, will create woody debris on the forest floor that will serve as important habitat for reptiles and amphibians, and small mammals.

The Upper Wapsi Corridor will have 0 acres that will be managed as uneven aged forest. The lack of uneven aged management is due to the frequent disturbance regime caused by the Wapsipinicon River. The constant flooding drives an even aged system that is comprised of shade intolerant tree species that benefit from even aged management. The lack of shade tolerant species makes uneven aged management unsound.

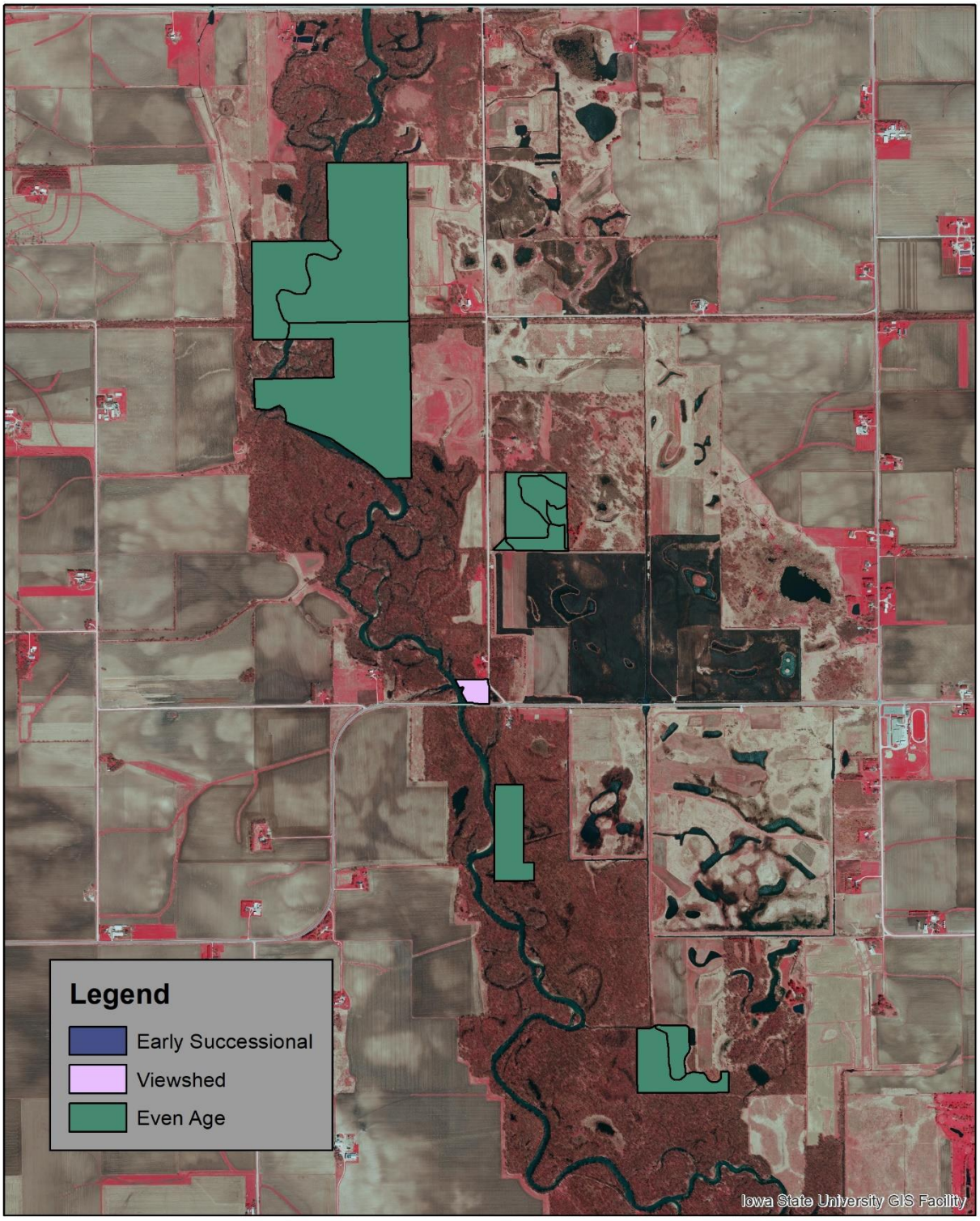
Viewshed Management-

Viewshed areas are typically steep slopes, areas along streams which are fragile and are best left to naturally progress through succession, or other particularly sensitive sites (ecologically or socially). Areas where endangered plant or animal species exist may also be under the viewshed system of management. Management can take place on these areas where desirable, but the primary objective is to have very minor disturbance if any.

Viewshed management is an important component of the overall forest management in many localized areas in Iowa. Some landform regions, such as the Paleozoic plateau, experience a greater need for this system of management than do other regions. Like uneven aged forest management, viewshed areas provide an important core area of relatively stable natural habitat. Many neotropical birds benefit greatly from the areas designated as viewshed. Algific slopes and moderate slopes under viewshed management protect several of Iowa's rarest species and SGCN.

The Upper Wapsi Corridor has 34.6 acres (2% of all woodland acres) that will be managed as viewshed forests.

Aldo Leopold WMA
Management System

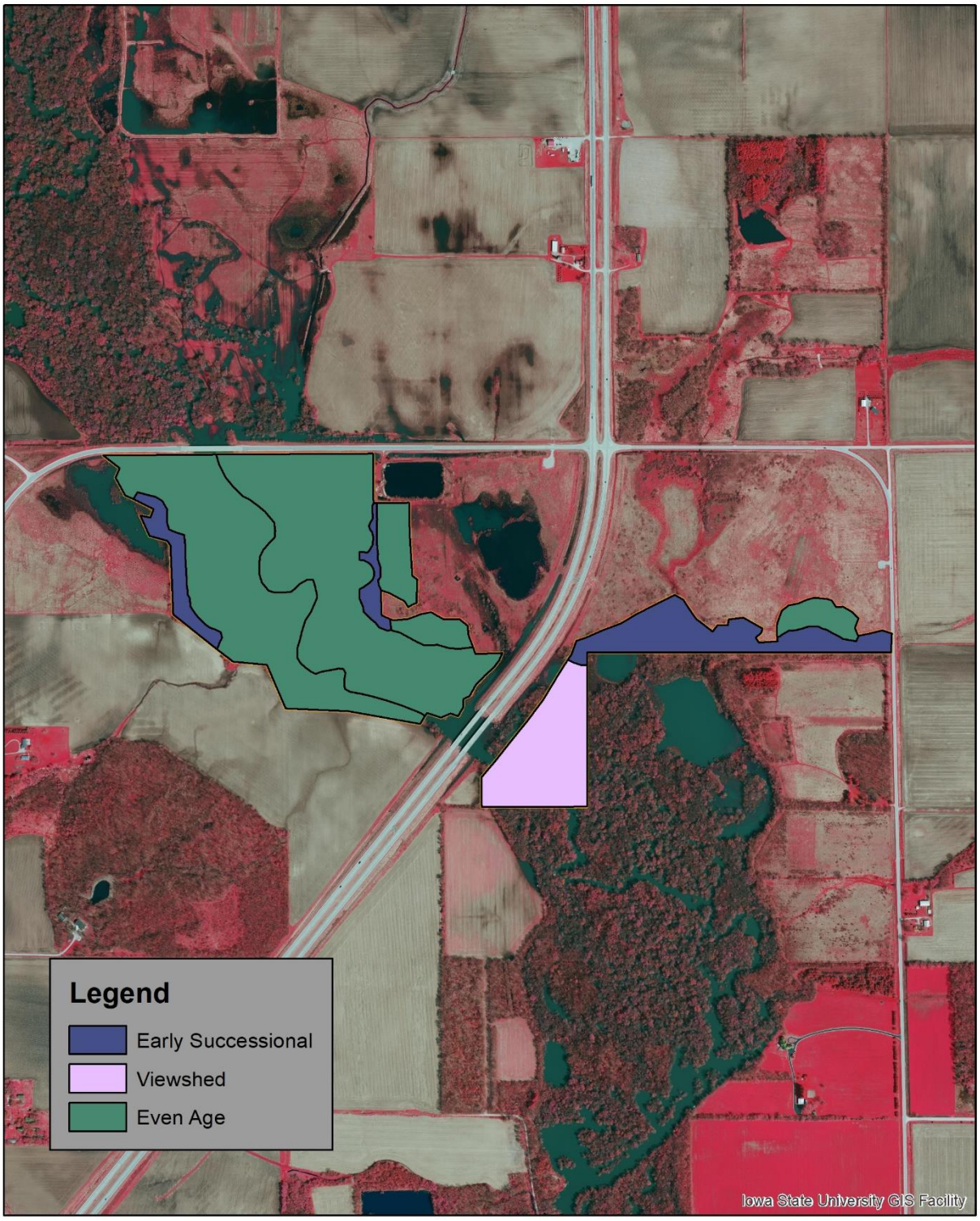


Sec. 7. 8, 17, 20, 28 Franklin Twsp.,
T-91N R-11W
Bremer County

0 0.25 0.5 1 Miles

N

Heffernan WMA
Management System



Sec. 1, 6 Frederika Twsp.,
T-93N R-12W&13W
Bremer County

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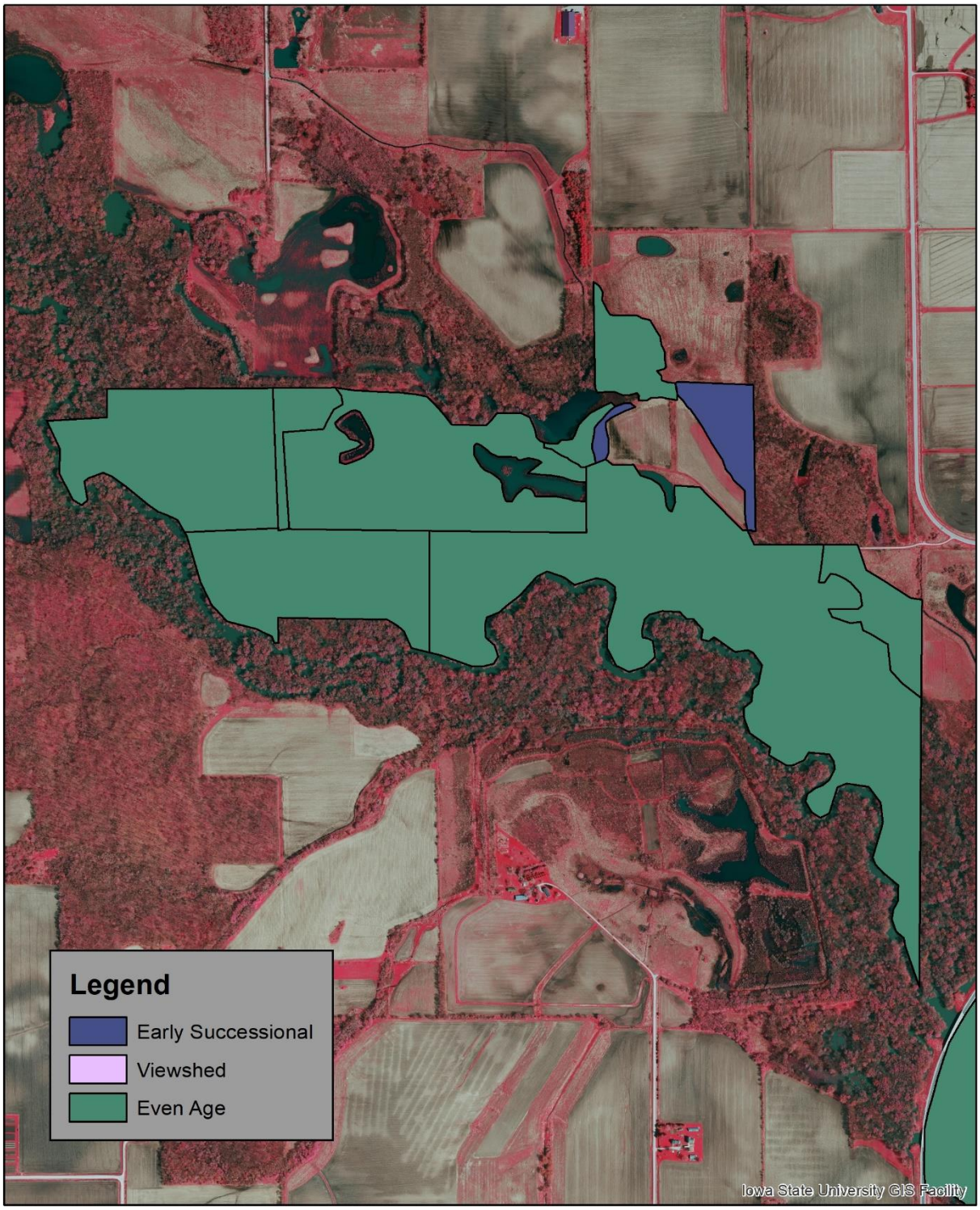
N

Sweet Marsh WMA (Miller Tract)
Management System

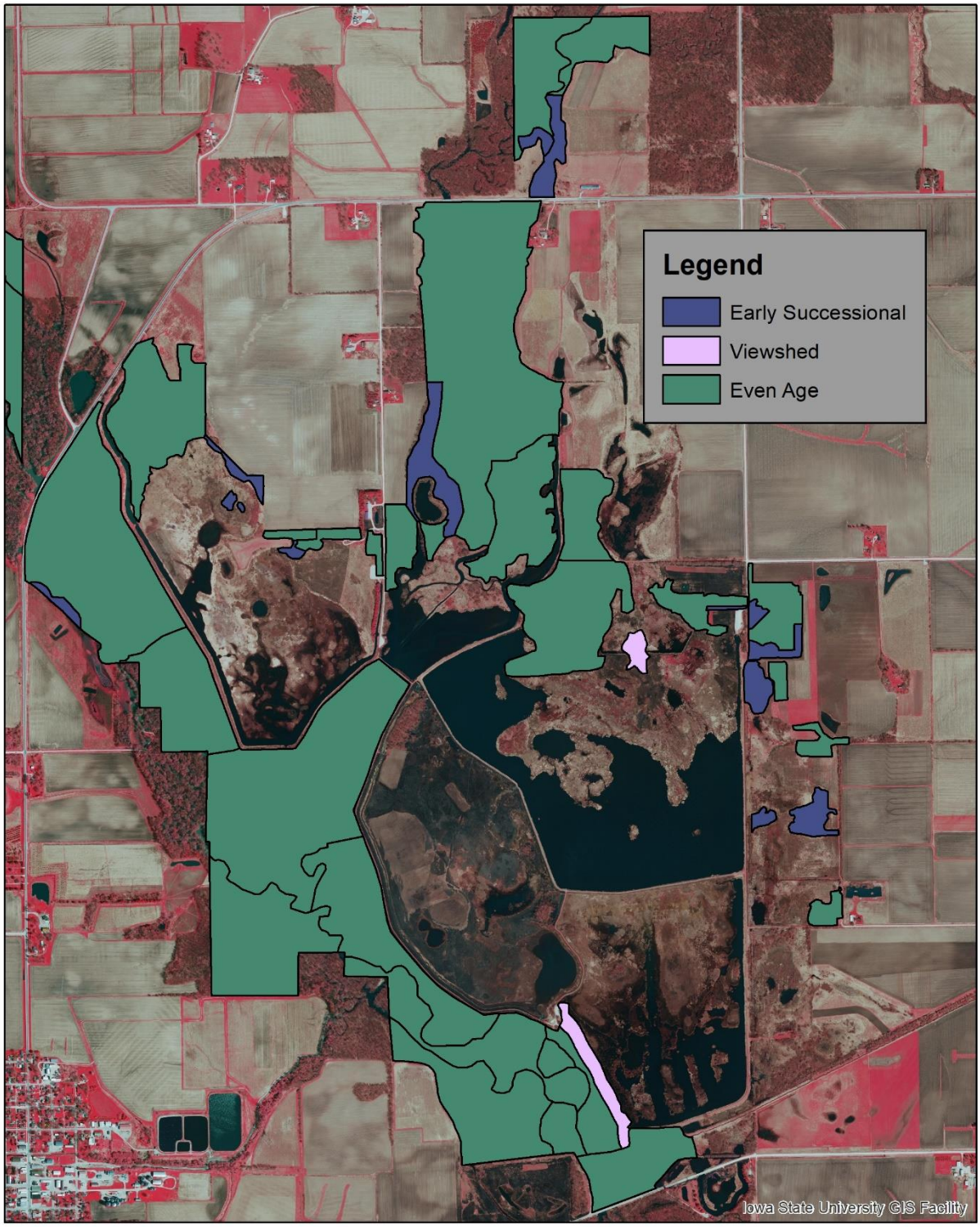


Sec. 21 & 28 Frederika Twsp.,
T-93N R-12W
Bremer County

0 0.125 0.25 0.5 Miles

N

Sweet Marsh WMA
Management System

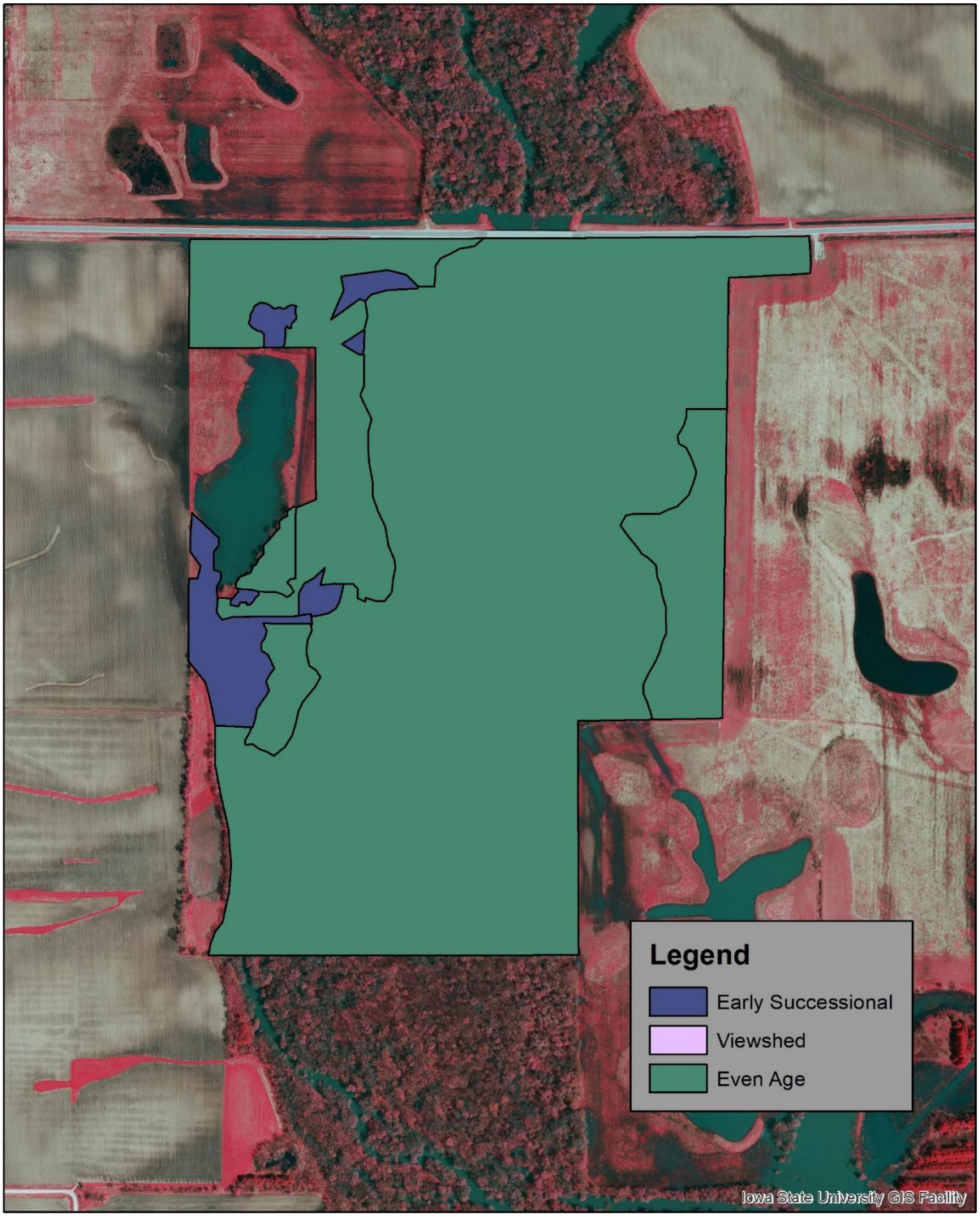


Sec. 26, 35 & 2 Frederika Twsp.,
T-93N R-12W
Bremer County

0 0.225 0.45 0.9
Miles

N

Upper Wapsi WMA
Management System



Sec. 14, 15 Richland Twsp.,
T-94N R-13W
Chickasaw County

0 0.075 0.15 0.3 Miles

N

Wapsi Flats WMA
Management System

Sec. 20, 29 Washington Twsp.,
T-97N R-14W
Chickasaw County

0 0.05 0.1 0.2
Miles

N

SOILS

All forested acres of this plan are located within the Iowan Surface Landform. The topography of this landform used to look very similar to the Southern Iowa Drift Plains with gentle rolling hills. The landscape that we see today started to form 21,000 to 16,500 years ago. It was a very windy, cold climate in this time period. The intensive cold weather caused a high mortality of plant life. With very little plant roots to hold soil in place, accelerated weathering and erosion took place. Strong winds and the freeze thaw action of soil materials caused the sediment from the hill tops to move downslope. This event created the more flattened landscape that we see today.

Soil is the medium for plant growth and can dictate current and future forest composition. Soil type is a variable that is taken into account for all forest management decisions. The common soil types found in this forest management plan are Sigglekov, Coland-Spillville Complex, and Sparta.

Sigglekov- Consists of very deep, somewhat poorly drained soils that formed in sandy alluvium. This series is found on floodplains. Clay (0-15%) Sand (45-100%). Native vegetation is mixed timber and prairie grasses.

Coland-Spillville Complex- Consists of very deep, moderately well drained to poorly drained. Found on floodplains to footslopes. Clay (18-35%) Sand (15-60%). Native vegetation is prairie grasses.

Sparta- Consists of very deep, excessively drained soils found on stream terraces in river valleys. Clay (1-8%) Sand (80-95%). Native vegetation is prairie grasses and oak savannah.

WORK PLAN

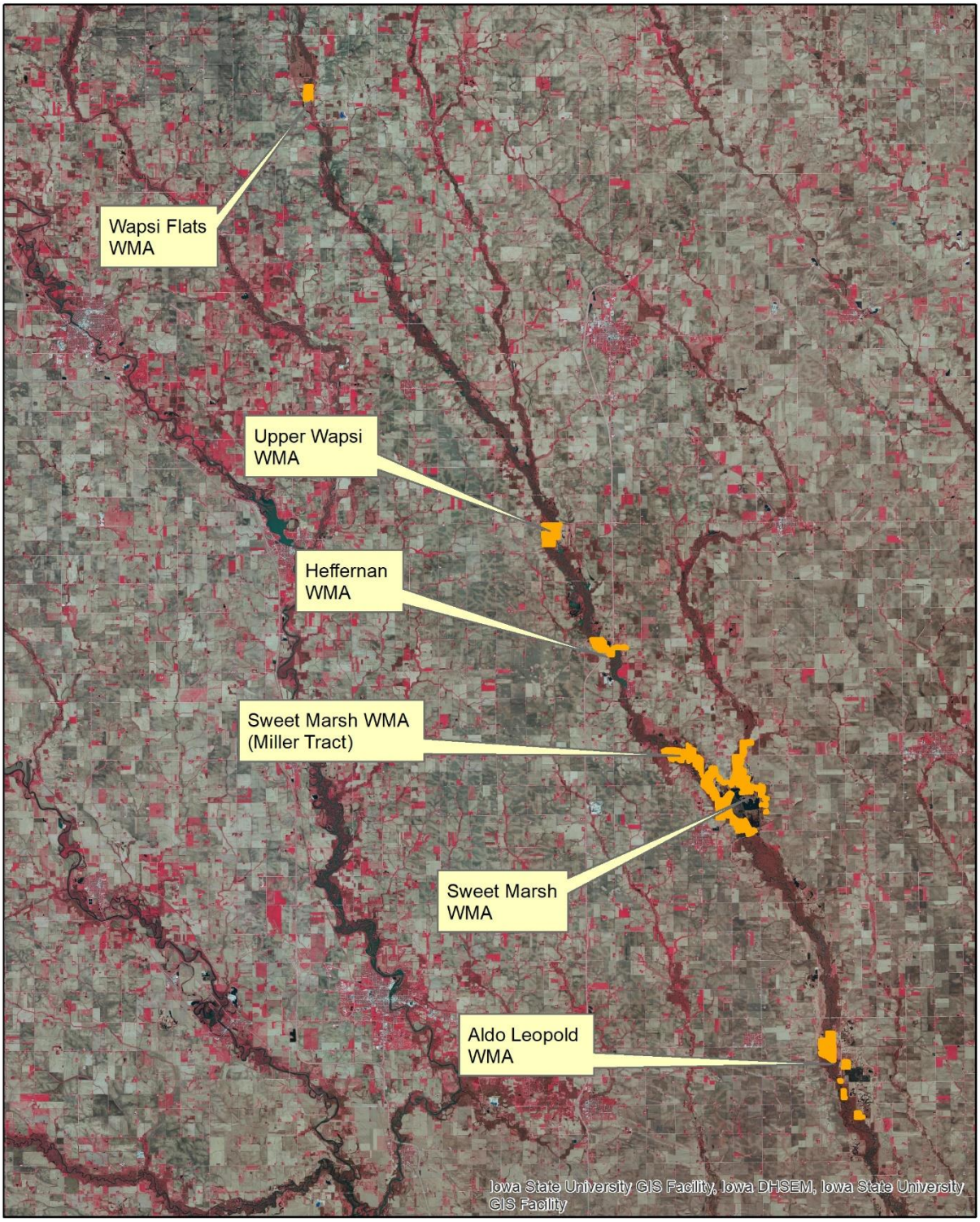
FOR

UPPER WAPSI CORRIDOR WMAs

This is the "working plan" for the Upper Wapsi Corridor Wildlife Management Areas designed to aid professional biologists and foresters in the implementation of forest management practices. It is written with the understanding that these professionals have a basic understanding of forest management principles and techniques. Every detail has not been outlined in the plan because the plan would become too long to be of practical use. This plan is intended to get work accomplished on the ground.

Before implementation, the forest management activities described here will be reviewed internally to determine potential impacts to both state and federal threatened or endangered species. Project descriptions accompanied by aerial photos will be provided to the Natural Areas Inventory Program staff for T/E review and comment. Management activities will not be initiated until this review has been completed and all T/E comments/concerns have been addressed.

WMA Map
(Bremer & Chickasaw County)

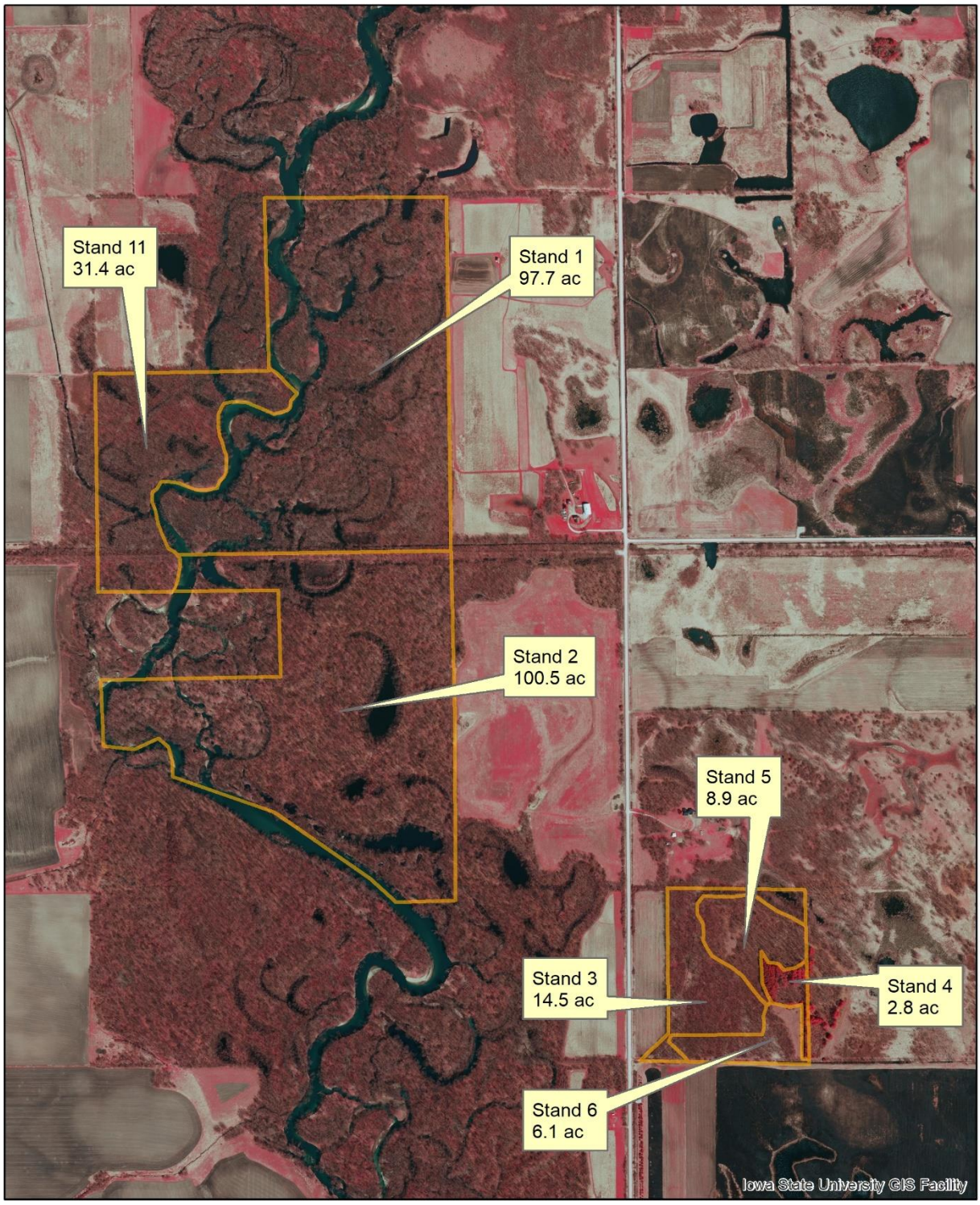


Sec. 21 & 28 Frederika Twsp.,
T-93N R-12W
Bremer County

0 3.5 7 14 Miles

N

Aldo Leopold WMA
Stands 1-6, 11

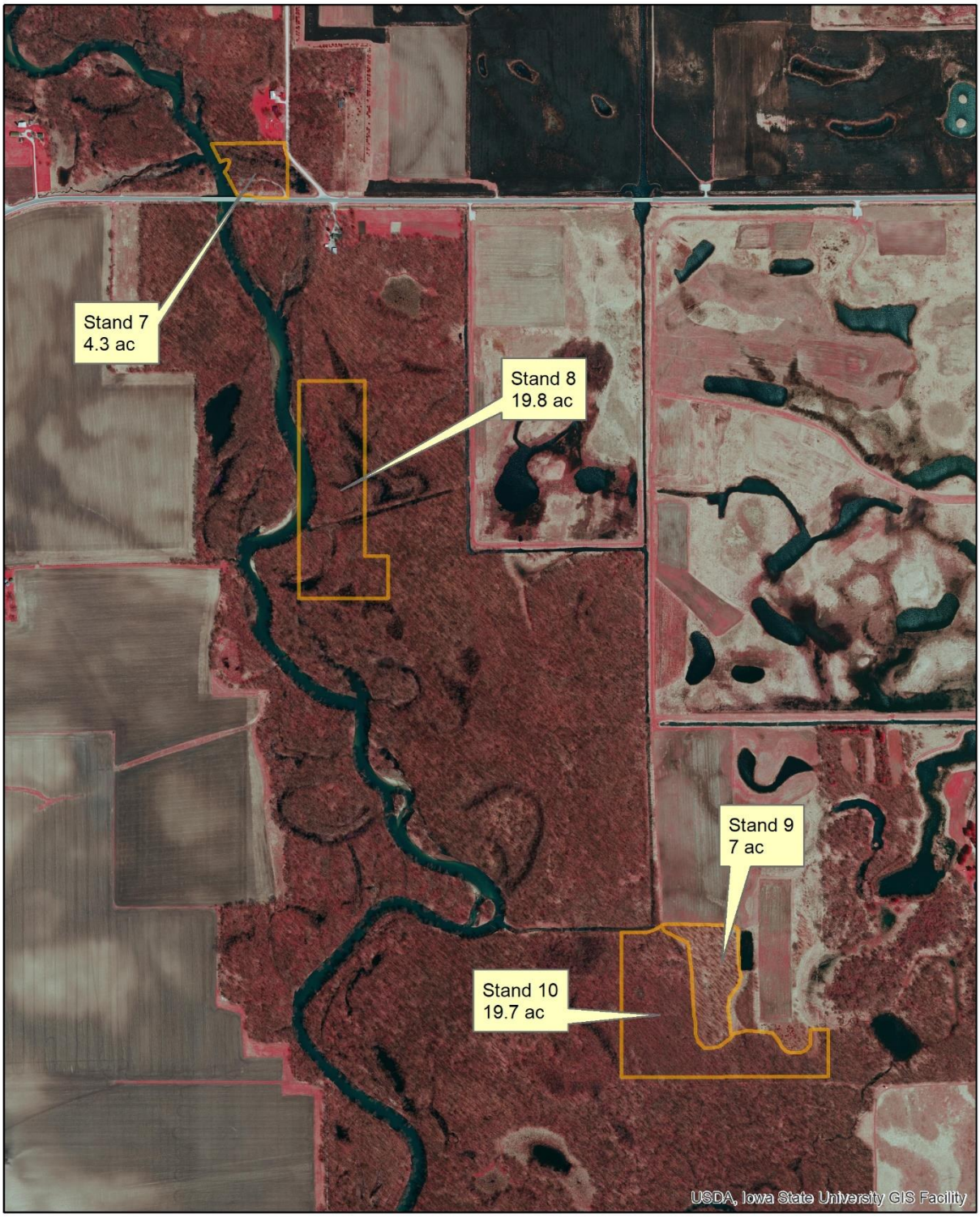


Sec. 7, 8 Franklin Twsp.,
T-91N R-11W
Bremer County

0 0.125 0.25 0.5 Miles

N

Aldo Leopold WMA
Stands 7-10



Sec. 17, 20, 28 Franklin Twsp.,
T-91N R-11W
Bremer County

0 0.125 0.25 0.5 Miles

N

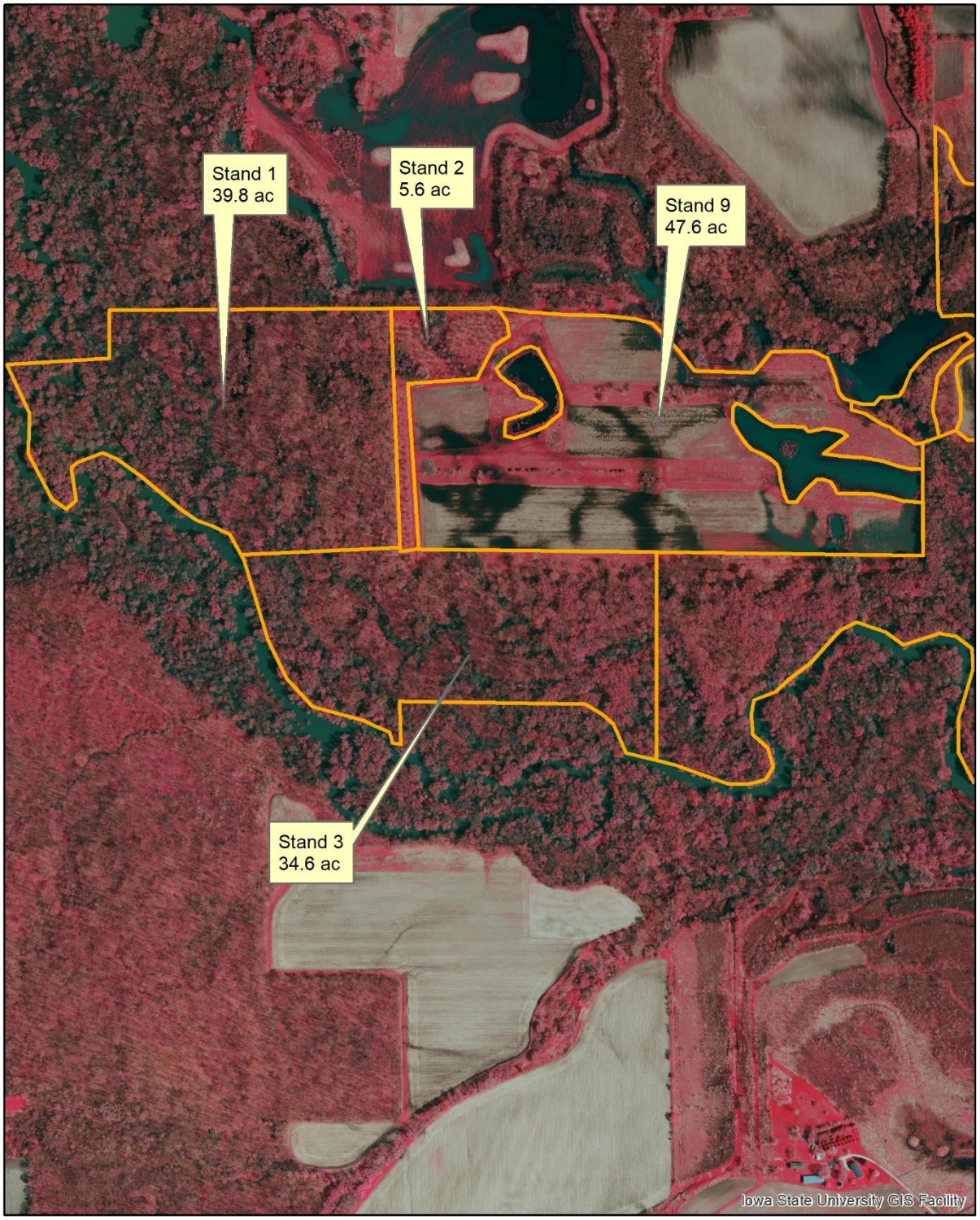
Heffernan WMA
Stands 1-8

Sec. 1,6 Fredricka Twsp.,
T-93N R-12W&13W
Bremer County

0 0.125 0.25 0.5 Miles

N

Sweet Marsh WMA (Miller Tract)
Stands 1-3, 9

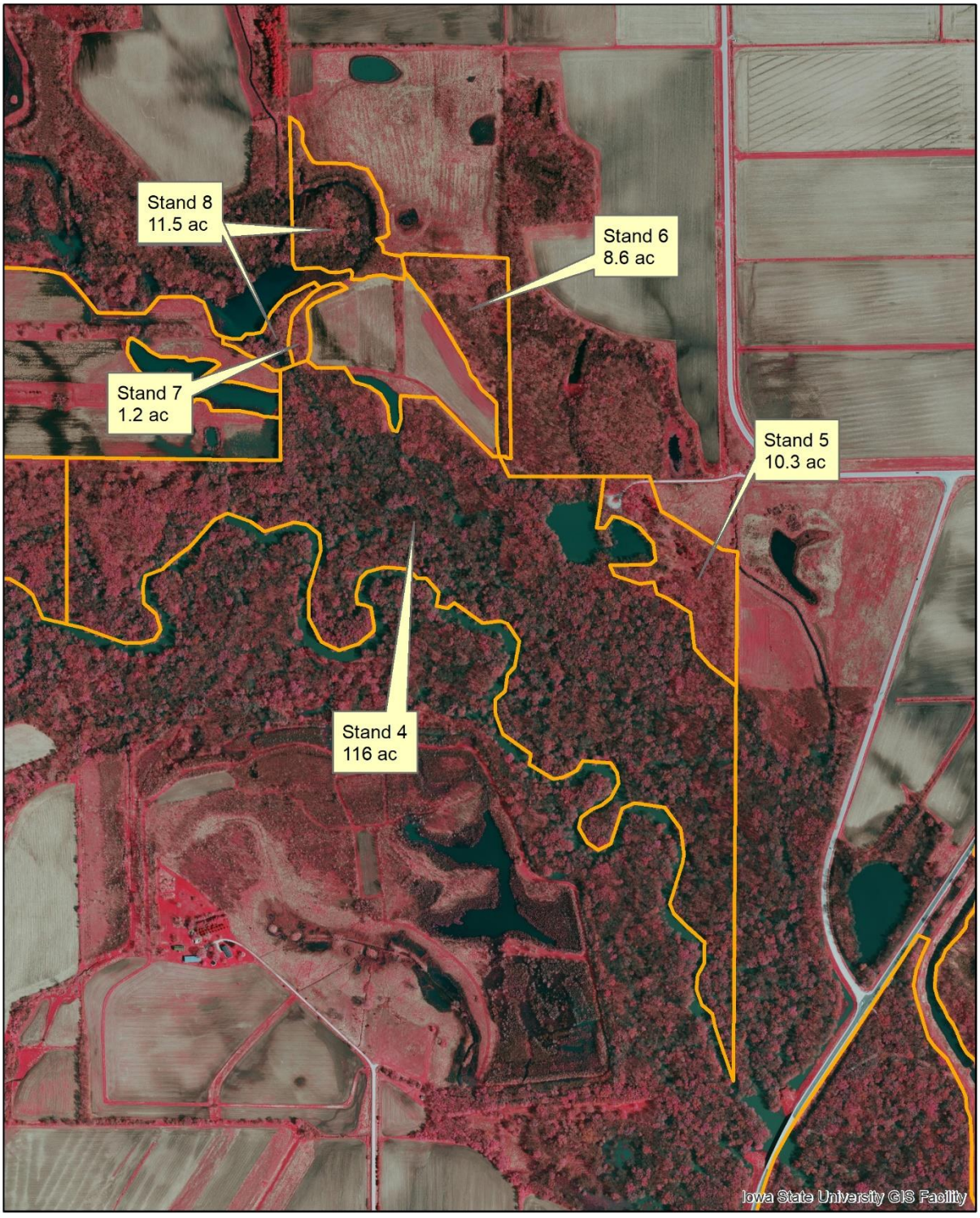


Sec. 21 & 28 Frederika Twsp.,
T-93N R-12W
Bremer County

0 0.075 0.15 0.3 Miles

N

Sweet Marsh WMA (Miller Tract)
Stands 4-8

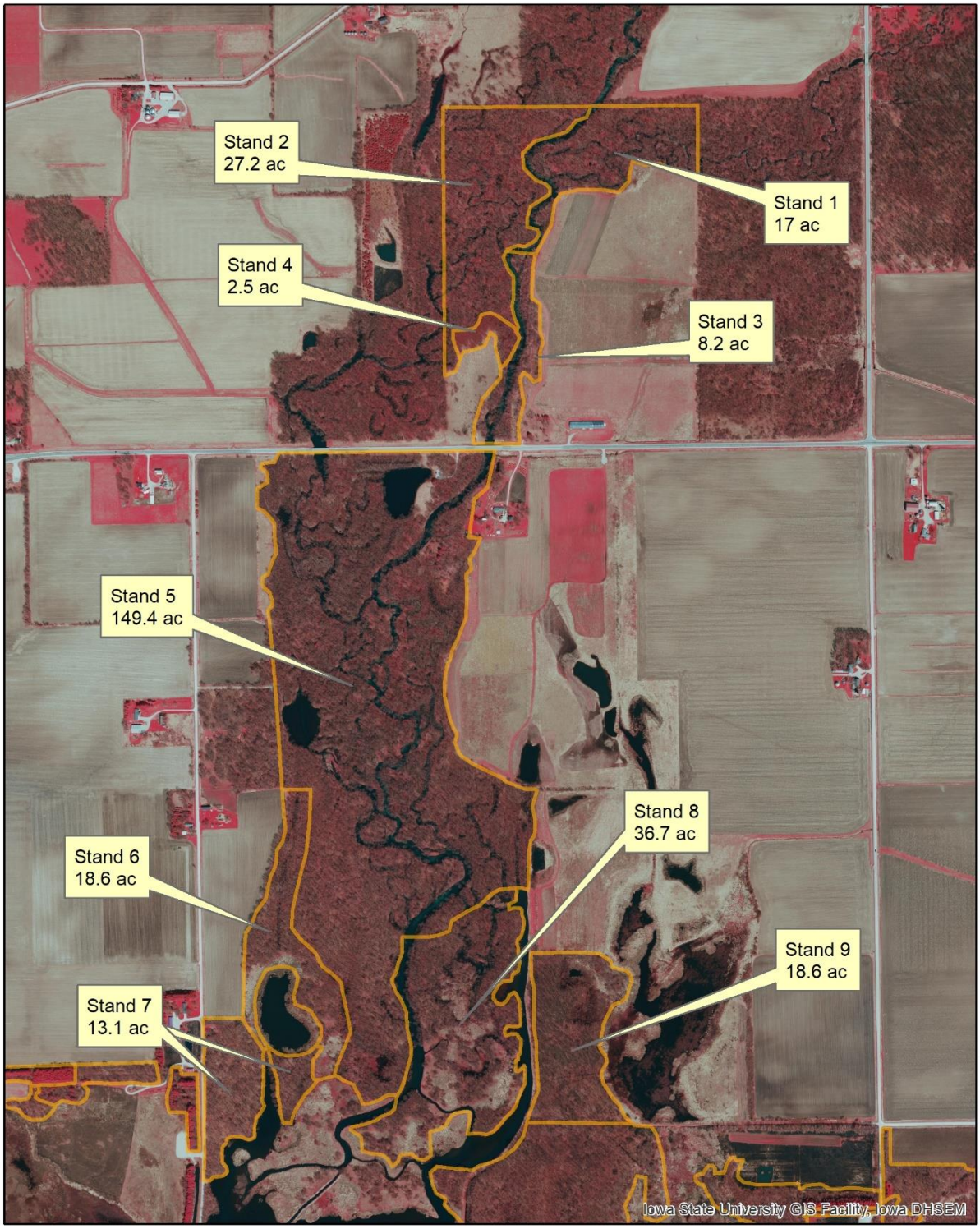


Sec. 21 & 28 Frederika Twsp.,
T-93N R-12W
Bremer County

0 0.1 0.2 0.4 Miles

N

Sweet Marsh WMA
Stands 1-9



Sec. 23,26,35 Fredricka Twsp.,
T-93N R-12W
Bremer County

0 0.15 0.3 0.6 Miles

N

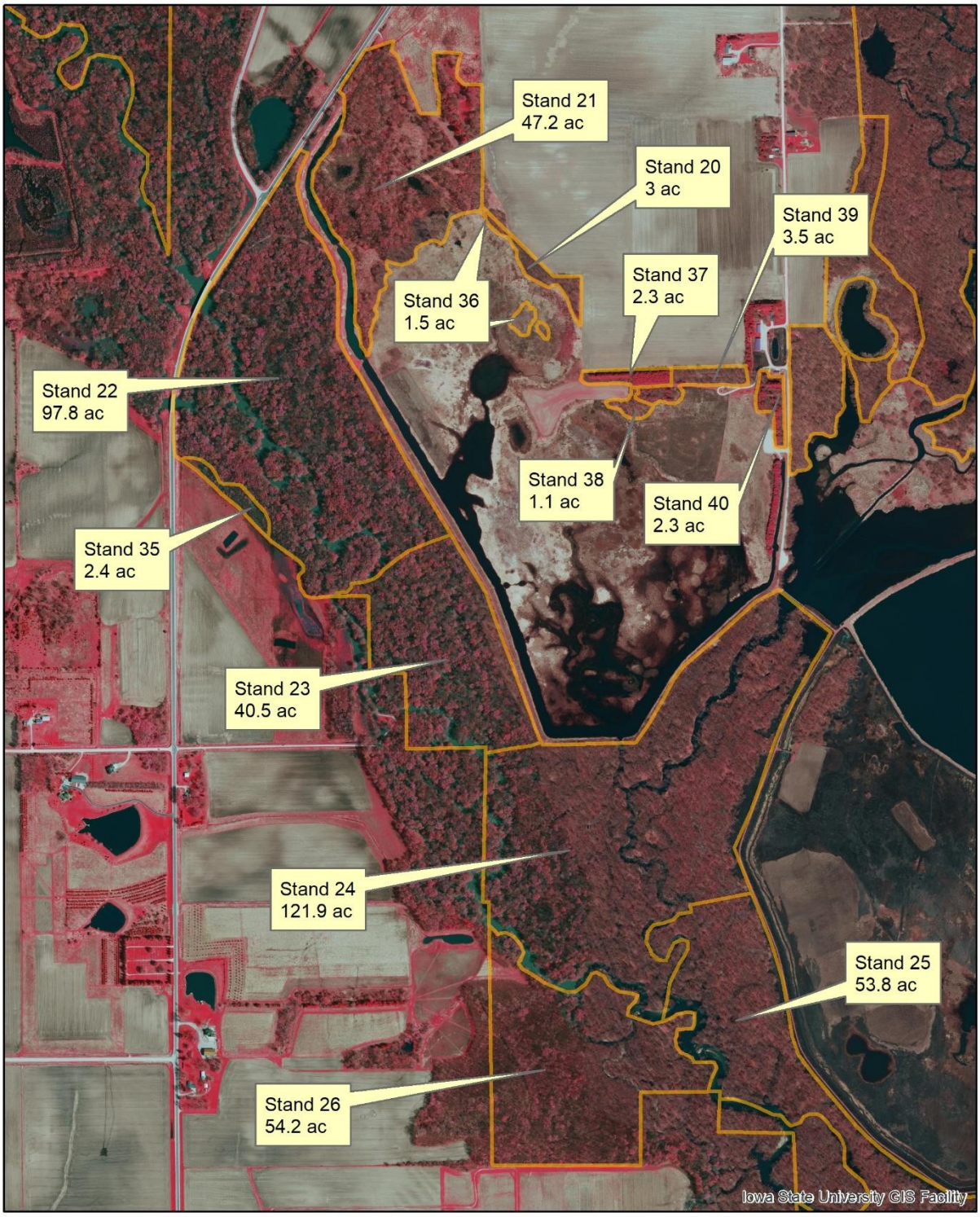
Sweet Marsh WMA
Stands 10-19, 34

Sec. 35 Fredricka Twsp.,
T-93N R-12W
Bremer County

0 0.1 0.2 0.4 Miles

N

Sweet Marsh WMA
Stands 20-26, 35-40



Sec. 34, 35 Fredricka Twsp.,
T-93N R-12W
Bremer County

0 0.125 0.25 0.5 Miles

N

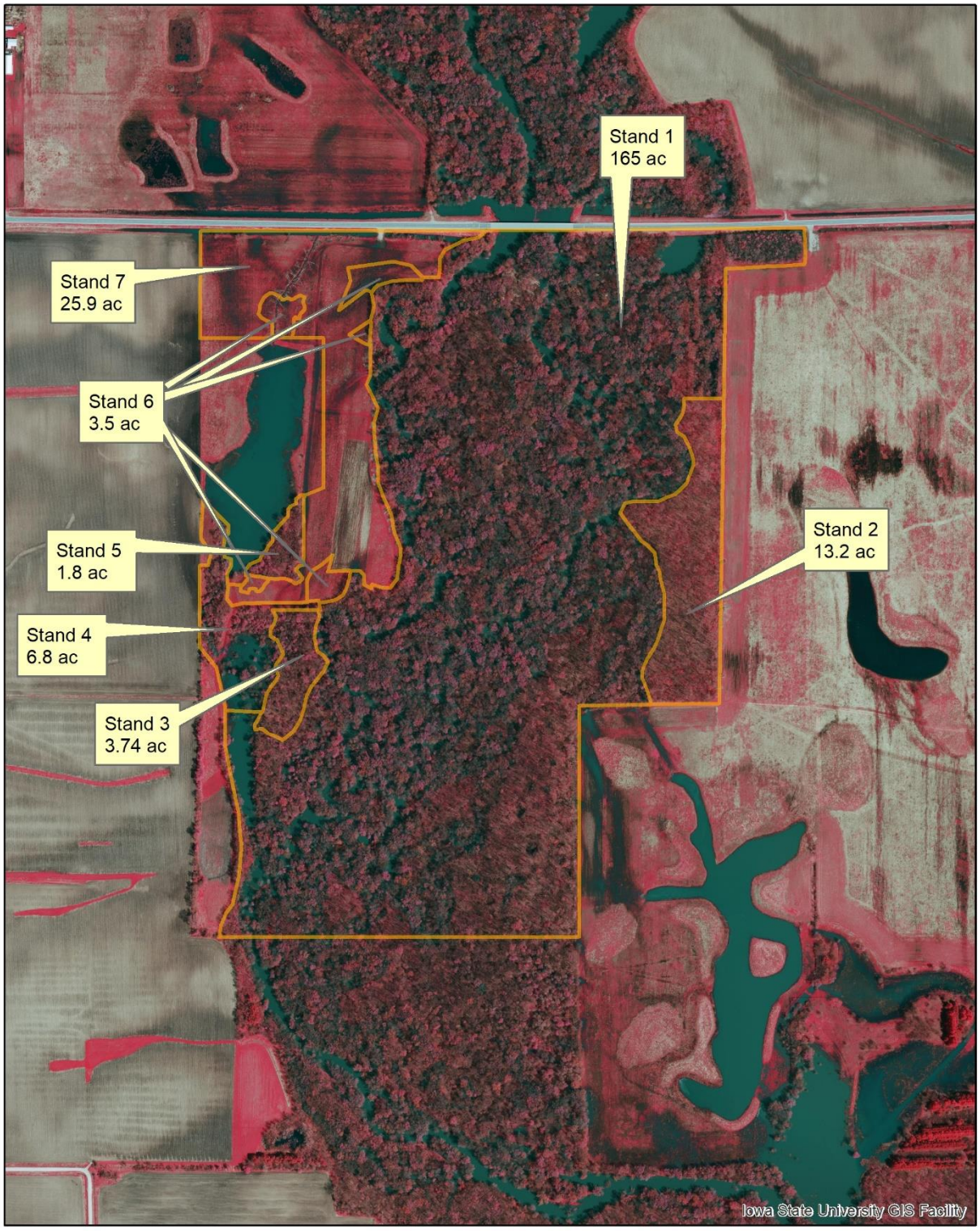
Sweet Marsh WMA
Stands 27-33

Sec. 34, 35 Fredricka Twsp.,
T-93N R-12W
Bremer County

0 0.125 0.25 0.5 Miles

N

Upper Wapsi WMA
Stands 1-7



Sec. 14, 15 Richland Twsp.,
T-94N R-13W
Chickasaw County

0 0.125 0.25 0.5 Miles

N

Stand Summaries & Recommendations

Stand	Acres	WMA	Overstory	Codominant/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
1	97.7	Aldo Leopold	swamp white, bur oak, silver maple	shagbark, elm, walnut	Sawtimber	Even aged	Shelterwood	High	2035	under plant large root stock
2*	100.5	Aldo Leopold	shagbark, elm, basswood, black oak, red oak, ash	raspberry, brushy	Small Sawtimber	Even aged	Crop Tree Release	Med	2030	previously harvested, BA 80, release pole-sized trees
3	14.5	Aldo Leopold	river birch, silver maple, black oak	honeysuckle	Small Sawtimber	Even aged	Under Plant-remove overstory	High	2026	underplant, compare to open field planting in stand 6
4	2.8	Aldo Leopold	white, Scots, jack pine		Small Sawtimber	Even aged	Crop Tree Release	Low	2035	
5	8.9	Aldo Leopold	black oak, cherry		Small Sawtimber	Even aged	Crop Tree Release	High	2025	pockets of oak
6	6.1	Aldo Leopold	Shrubs and grasses			Even aged	Plant Seedlings	High	2026	stand was clearcut by unit in 2017
7	4.3	Aldo Leopold	silver maple, scattered oak		Sawtimber	Viewshed				
8	19.8	Aldo Leopold	swamp white, bur, pin oak	elm, river birch	Sawtimber	Even aged	Shelterwood	High	2040	high quality timber, looks healthy
9	7	Aldo Leopold	pin, swamp white, bur oak		Pole Timber	Even aged	No Action	Low		spacing is adequate for maturity
10	19.7	Aldo Leopold	river birch		Small Sawtimber	Even aged	Clearcut-Plant seedlings	Med	2028	all river birch, soil type same as stand 9, although may be wetter

***Stand numbers marked with an asterisk (*) will have additional recommendations explained in further detail in the section titled, "Additional Stand Information".**

Stand Summaries & Recommendations

Stand	Acres	WMA	Overstory	Codominant/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
11	31.4	Aldo Leopold	silver maple, scattered oak		Sawtimber	Even aged	Clearcut-Plant seedlings	low	2035	access is flood prone
1	44.9	Heffernan	river birch, silver maple, black oak	hawthorn	Small Sawtimber	Even aged	Clearcut-Plant seedlings	Med	2040	difficult access
2	48.7	Heffernan	silver maple, ash, swamp white oak		Sawtimber	Even aged	Clearcut - Plant seedlings	Med	2035	mostly flooded
3	2.3	Heffernan	silver maple, river birch, black oak		Pole Timber	Early Successional	Early Successional Cut	High	2031	site is a little higher
4	3.3	Heffernan	red, bur, swamp white oak		Pole Timber	Even aged	Crop Tree Release	High	2030	planted in 2006
5	16.8	Heffernan	Silver maple, river birch		Sawtimber	Viewshed				
6	14.9	Heffernan	black oak, river birch, aspen		Pole Timber	Early Successional	Early Successional Cut	High	2026	coppice oak and aspen
7	3.7	Heffernan	swamp white, red, bur oak		Pole Timber	Even aged	No Action			tree spacing is adequate for maturity
8	4.7	Heffernan	river birch		Pole Timber	Early Successional	Early Successional Cut	High	2031	plant shrubs in areas with no river birch
9	5.4	Heffernan	swamp white, bur, red oak	grasses	Sapling	Even aged	Remove cages/posts	High	2022	planted in 2006

***Stand numbers marked with an asterisk (*) will have additional recommendations explained in further detail in the section titled, "Additional Stand Information".**

Stand Summaries & Recommendations

Stand	Acres	WMA	Overstory	Codominant/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
1*	39.8	Sweet Marsh (Miller tract)	bur, white, red oak		Sawtimber	Even aged	Shelterwood	High	2021	many dead oaks, underplant seedlings
2	5.6	Sweet Marsh (Miller tract)	pin oak, swamp white		Pole Timber	Even aged	Crop Tree Release	High	2030	planting of oaks in early 2000's
3	34.6	Sweet Marsh (Miller tract)	black, pin, bur oak		Small Sawtimber	Even aged	Crop Tree Release	Med	2026	size class varies greatly, BA 100-110
4	116	Sweet Marsh (Miller Tract)	swamp white, bur oak	elm, bitternut	Sawtimber	Even aged	Shelterwood	High	2026	underplant large root stock after weed tree removal
5	10.3	Sweet Marsh (Miller tract)	black oak, cherry, silver maple, elm	buckthorn, honeysuckle	Pole Timber	Even aged	Crop Tree Release	Med	2026	release scattered oaks, oaks dense on N edge
6	8.6	Sweet Marsh (Miller tract)	black oak, aspen, river birch	scattered buckthorn	Pole Timber	Early Successional	Early successional Cut	High	2031	
7	1.2	Sweet Marsh (Miller tract)	sapling oak, aspen, river birch		Pole Timber	Early Successional	Early successional Cut	High	2026	do not cut sapling oak
8	11.5	Sweet Marsh (Miller tract)	river birch, silver maple, pin, black oak		Pole Timber	Even aged	Crop Tree Release	Med	2026	BA 90-130, upper part of stand is frequently flooded
9	47.6	Sweet Marsh (Miller tract)	idle field, scattered trees	reed canary grass		Even aged	Tree Planting	High	2023	plant to shrubs and hardwoods w/ buffer around wetlands

***Stand numbers marked with an asterisk (*) will have additional recommendations explained in further detail in the section titled, "Additional Stand Information".**

Stand Summaries & Recommendations

Stand	Acres	WMA	Overstory	Codominant/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
1	17	Sweet Marsh	black, bur oak, silver maple, shagbark	river birch	Small Sawtimber	Even aged	Crop Tree Release	Med	2027	scattered desirable trees
2	27.2	Sweet Marsh	pin, black oak, silver maple, shagbark, walnut	river birch	Small Sawtimber	Even aged	Crop Tree Release	High	2024	scattered desirable trees
3	8.2	Sweet Marsh	Siberian elm	honeysuckle	Small Sawtimber	Early Successional	Clearcut - Plant shrubs	High	2023	elm is seeding into grassland, remove seed source
4	2.5	Sweet Marsh	river birch		Pole Timber	Early Successional	Early Successional Cut	High	2026	
5	149.4	Sweet Marsh	silver maple, river birch, swamp white, scattered bur oak	elm	Small Sawtimber	Even aged	Clearcut - Plant seedlings	Med	2030	
6	18.6	Sweet Marsh	river birch, silver maple, black oak		Pole Timber	Early Successional	Early Successional Cut	High	2031	
7*	10.2	Sweet Marsh	bur, red, swamp white oak, river birch, aspen, ash	Honeysuckle, buckthorn	Sawtimber	Even aged	Invasive control, establishment cut, planting		2025	
8*	36.7	Sweet Marsh	silver maple, river birch, swamp white oak		Small Sawtimber	Even aged	Weed Tree Removal		2023	very wet, open up stand by removing all trees except oaks

***Stand numbers marked with an asterisk (*) will have additional recommendations explained in further detail in the section titled, "Additional Stand Information".**

Stand Summaries and Recommendations

Stand	Acres	WMA	Overstory	Codominant/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
9*	18.6	Sweet Marsh	shagbark hickory	Elm	Small Sawtimber	Even aged	Commercial thinning	Med	2030	almost all shagbark, release best trees using harvest
10	49.4	Sweet Marsh	river birch, hickory, oak		Pole Timber	Even aged	Weed Tree Removal	High	2025	remove river birch, birch competing with desirable trees
11	3.7	Sweet Marsh	black willow, silver maple		Small Sawtimber	Viewshed				
12	10.4	Sweet Marsh	bur oak, white pine	honeysuckle, buckthorn	Sawtimber	Even aged	Invasive control, Clearcut	High	2025	
13	14.1	Sweet Marsh	black oak, silver maple, birch		Pole Timber	Even aged	Crop Tree Release	Med	2026	buckthorn thick in some areas
14	6.4	Sweet Marsh	aspen, river birch, black oak		Pole Timber	Early Successional	Early Successional Cut	High	2026	high density aspen in areas
15	5.5	Sweet Marsh	silver maple, aspen, oak, river birch		Small Sawtimber	Early Successional	Early Successional Cut	Med	2031	
16	2.9	Sweet Marsh	eastern red cedar		Pole Timber	Even aged	Basal Area Thinning	Low	2035	cedar planting
17	4.6	Sweet Marsh	white, Scots pine, river birch		Small Sawtimber	Even aged	Crop Tree Release	Low	2030	
18	6.7	Sweet Marsh	aspen, sandbar willow, white, Scots pine	redosier dogwood	Sapling	Early Successional	Early Successional Cut	High	2031	
19	4.2	Sweet Marsh	silver maple, white pine		Small Sawtimber	Even aged	Clearcut - Plant seedlings	Med	2050	

***Stand numbers marked with an asterisk (*) will have additional recommendations explained in further detail in the section titled, "Additional Stand Information".**

Stand Summaries & Recommendations

Stand	Acres	WMA	Overstory	Codominant/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
20	3	Sweet Marsh	black oak, silver maple		Small Sawtimber	Early Successional	Early Successional Cut	Med	2026	
21	47.2	Sweet Marsh	black oak, silver maple, river birch	dogwood, buckthorn, honeysuckle	Pole Timber	Even aged	Crop Tree Release	Med	2026	scattered forest types
22	97.8	Sweet Marsh	silver maple, scattered bur, swamp white oak	river birch, elm	Sawtimber	Even aged	Clearcut - Plant seedlings	Med	2035	
23	40.5	Sweet Marsh	swamp white, bur oak, silver maple	river birch, elm	Sawtimber	Even aged	Clearcut - Plant seedlings	High	2027	higher density of oaks than stand 22
24	121.9	Sweet Marsh	silver maple, river birch		Sawtimber	Even aged	Clearcut - Plant seedlings	Low	2035	
25	53.8	Sweet Marsh	swamp white, bur, black oak, silver maple		Sawtimber	Even aged	Shelterwood	High	2025	high density of <2 ft. tall oak regen in areas
26	54.2	Sweet Marsh	oak, hickory	burning bush, honeysuckle, buckthorn, barberry	Pole Timber	Even aged	Crop Tree Release	Med	2030	invasives are readily present
27	41.6	Sweet Marsh	silver maple, river birch		Small Sawtimber	Even aged	Clearcut - Plant seedlings	Med	2040	

***Stand numbers marked with an asterisk (*) will have additional recommendations explained in further detail in the section titled, "Additional Stand Information".**

Stand Summaries and Recommendations

Stand	Acres	WMA	Overstory	Codominant/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
28	47.4	Sweet Marsh	silver maple, river birch, swamp white oak, shagbark	elm	Small Sawtimber	Even aged	Clearcut-Plant seedlings	Med	2035	
29	4.4	Sweet Marsh	swamp white, bur oak		Sawtimber	Even aged	Shelterwood	High	2028	
30	13.1	Sweet Marsh	black oak, pin oak, shagbark		Pole Timber	Even aged	Crop Tree Release	High	2023	discontinue burning
31	9.8	Sweet Marsh	white pine, pin oak	black cherry	Pole Timber	Viewshed				
32	26.2	Sweet Marsh	red, pin, swamp white oak, silver maple, ash	elm	Sawtimber	Even aged	Shelterwood	High	2028	good area for shelterwood
33	8.4	Sweet Marsh	shagbark, black oak, silver maple, river birch		Pole Timber	Even aged	Crop Tree Release	High	2023	light thinning
34	1.7	Sweet Marsh	aspen		Sapling	Early Successional	Early Successional Cut	High	2031	Stand was cut in 2018, aspen has regenerated well
35	2.4	Sweet Marsh	river birch		Sapling	Early Successional	Early successional cut	High	2031	stand was coppiced in 2020
36	1.5	Sweet Marsh	aspen		Sapling	Early Successional	Early successional cut	High	2031	Aspen was coppiced in 2020
37	2.3	Sweet Marsh	white pine	honeysuckle, dogwood	Small Sawtimber	Even aged	Basal Area Thinning	Low	2040	

***Stand numbers marked with an asterisk (*) will have additional recommendations explained in further detail in the section titled, "Additional Stand Information".**

Stand Summaries and Recommendations

Stand	Acres	WMA	Overstory	Codominant/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
38	1.1	Sweet Marsh	Aspen, oak, boxelder	honeysuckle	Small Sawtimber	Early Successional	Early Successional Cut	High	2026	coppice aspen, leave oaks
39	3.5	Sweet Marsh	Boxelder, ash, oak	honeysuckle	Pole Timber	Even aged	Underplant, remove overstory	Low	2040	
40	2.3	Sweet Marsh	Mixed conifers	honeysuckle	Small Sawtimber	Even aged	Stand conversion	Low	2040	
1	165	Upper Wapsi	bur, swamp white oak, ash, silver maple	hawthorn	Sawtimber	Even aged	Clearcut - Plant seedlings	Med	2031	30% oak canopy
2	13.2	Upper Wapsi	white, red oak, ash, elm, shagbark	bitternut, buckthorn	Small Sawtimber	Even aged	Crop Tree Release	High	2031	selectively cut oak for thinning in harvest with stand 1
3	3.7	Upper Wapsi	ash, boxelder, bitternut hickory	elderberry	Small Sawtimber	Even aged	Underplant, overstory removal	High	2024	
4	6.8	Upper Wapsi	boxelder, river birch	Reed canary grass	Pole Timber	Early Successional	Early Successional Cut	Low	2026	
5	1.8	Upper Wapsi	ash		Pole Timber	Even aged	Underplant, overstory removal	High	2024	mostly all ash, monitor EAB damage to time planting
6	3.5	Upper Wapsi	river birch, sandbar willow	grass	Sapling	Early Successional	Early Successional Cut	High	2031	cut willow and birch on 10-15 yr rotation to keep high stem density

***Stand numbers marked with an asterisk (*) will have additional recommendations explained in further detail in the section titled, "Additional Stand Information".**

Stand Summaries & Recommendations

Stand	Acres	WMA	Overstory	Codominant/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
7	25.9	Upper Wapsi		Reed canary grass		Even aged	Open field planting	High	2023	
1*	74.1	Wapsi Flats	ash, silver maple, cottonwood		Sawtimber	Even aged	Plant seedlings	High	2023	competition control for reed canary

***Stand numbers marked with an asterisk (*) will have additional recommendations explained in further detail in the section titled, "Additional Stand Information".**

Additional Stand Information

Aldo Leopold- Stand 2

The area was selectively harvested prior to DNR acquisition. The northern portion of the stand has a higher density of pole-sized trees. The southern portion of the stand has larger diameter trees, with pockets of pole-sized trees. Ash mortality is present and will help to naturally thin the stand. In approximately 2030, the stand will need an additional targeted thinning to release pole-sized trees.

Sweet Marsh (Miller Tract) - Stand 1

Oak density is greatest on the east part of the stand. There has been a high mortality of both red and bur oak in recent years. As sunlight increases to the forest floor, an influx of undesirable species will become established unless forest management is initiated. Plant the understory with hardwood seedlings prior to harvest. Set up a shelterwood-like harvest where only healthy, desirable species are left as a seed source.

Sweet Marsh- Stand 7

The species composition is mixed with aspen, red, bur, and swamp white oak, river birch, and ash. Mortality of trees is present, creating a non-contiguous canopy. Honeysuckle is readily present in the understory. With mortality occurring in the overstory, a regeneration strategy is needed to achieve a desirable species composition in the future. Basal bark spray the honeysuckle in the late summer/fall. Plant seedlings in the understory once the honeysuckle has been controlled. Perform a selective harvest of undesirable trees to set up a shelterwood-like harvest.

Sweet Marsh- Stand 8

This is an area that is frequently flooded. The species composition includes silver maple, river birch and small, scattered swamp white oak. This stand will be opened up to encourage more use by waterfowl by reducing tree canopy over water. Increased sunlight to the forest floor will also promote herbaceous vegetation and increase nesting cover for waterfowl. This will be done by removing all overstory trees except any oaks that are present. Acorn mast is an important food source for waterfowl and many other species so retaining them will be beneficial.

Sweet Marsh- Stand 9

The dominant tree species in the stand is 10-14” shagbark hickory. Elms are established in a codominant to intermediate canopy class, with some large, scattered bur and swamp white oak. Wait until the shagbark hickories are at a merchantable size class and release the highest quality trees through a merchantable thinning.

Wapsi Flats- Stand 1

The forested area at Wapsi Flats has a mature, scattered overstory with dense reed canary grass ground cover. In order to increase the diversity and wildlife value of this area, hard mast producing trees should be planted. The dense reed canary growth poses a challenge to tree establishment but with seasonal herbicide application, establishment should be successful. Specific planting areas will be determined through collaboration between the forester and biologist at the time of project initiation.

APPENDIX

Wildlife Species of Greatest Conservation Need

For NE Iowa Forest Lands

*The species lists do not necessarily indicate presence on the Aldo Leopold, Heffernan, Sweet Marsh, Upper Wapsi, or Wapsi Flats WMAs

(E=Endangered, T=Threatened, SC=Special Concern)

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

Common Name	**Scientific Name**	State Status	Federal Status
Bald eagle	*Haliaeetus leucocephalus*	SC	--
Red-shouldered hawk	*Buteo lineatus*	E	--
Broad-winged hawk	*Buteo platypterus*	--	--
Peregrine falcon	*Falco peregrinus*	SC	--
Eastern screech owl	*Otus asio*	--	--
Ruffed grouse	*Bonasa umbellus*	--	--
American woodcock	*Scolopax minor*	--	--
Black-billed cuckoo	*Coccyzus erythropthalmus*	--	--
Yellow-billed cuckoo	*Coccyzus americanus*	--	--
Long-eared owl	*Asio otus*	T	--
Eastern Whip-poor-will	*Caprimulgus vociferus*	--	--
Eastern wood-pewee	*Contopus virens*	--	--
Red-headed woodpecker	*Melanerpes erythrocephalus*	--	--
Acadian flycatcher	*Empidonax virescens*	--	--
Brown creeper	*Certhia americana*	--	--
Veery	*Catharus fuscescens*	--	--
Wood thrush	*Hylocichla mustelina*	--	--

Cerulean warbler	*Dendroica cerulea*	--	--
Prothonotary warbler	*Protonotaria citrea*	--	--
Worm-eating warbler	*Helmitheros vermivorus*	--	--
Kentucky warbler	*Oporornis formosus*	--	--
American kestrel	*Falco sparverius*	--	--
Common nighthawk	*Chordeiles minor*	--	--
Bewick's wren	*Thryomanes bewickii*	--	--
Belted kingfisher	*Megaceryle alcyon*	--	--
Northern flicker	*Colaptes auratus*	--	--
Eastern kingbird	*Tyrannus tyrannus*	--	--
Bell's vireo	*Vireo bellii*	--	--
Brown thrasher	*Toxostoma rufum*	--	--
Common yellowthroat	*Geothlypis trichas*	--	--
Field sparrow	*Spizella pusilla*	--	--
Baltimore oriole	*Icterus galbula*	--	--

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

Common Name	**Scientific Name**	**State Status**	**Federal Status**
Golden-winged warbler	*Vermivora chrysoptera*	--	--
Canada warbler	*Wilsonia canadensis*	--	--
Olive-sided flycatcher	*Contopus cooperi*	--	--
Bay-breasted warbler	*Setophaga castanea*	--	--
Harris's sparrow	*Zonotrichia querula*	--	--
American tree sparrow	*Spizelloides arborea*	--	--

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

Common Name	**Scientific Name**	**State Status**	**Federal Status**
Northern Long-eared bat	*Myotis septentrionalis*	--	T
Indiana bat	*Myotis sodalis*	E	E
Silver-haired bat	*Lasionycteris noctivagans*	--	--
Evening bat	*Nycticeius humeralis*	--	--
Tri-colored bat	*Perimyotis subflavus*	--	--
Woodland vole	*Microtus pinetorum*	--	--
Spotted skunk	*Spilogale putorius*	E	--
Southern Flying Squirrel	*Glaucomys volans*	--	--
Gray fox	*Urocyon cinereoargenteus*	--	--
Bobcat	*Lynx rufus*	--	--
Ermine	*Mustela erminea*	--	--

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

Common Name	**Scientific Name**	**State Status**	**Federal Status**
Cricket Frog	*Acris crepitans*	--	--
Eastern Gray treefrog	*Hyla versicolor*	--	--
Cope's Gray treefrog	*Hyla chrysoscelis*	--	--
Tiger salamander	*Ambystoma tigrinum*	--	--
Northern Prairie Skink	*Eumeces septentrionalis*	--	--
Bullsnake	*Pituophis catenifer sayi*	SC	--
(Prairie) Ringneck Snake	*Diadophis punctatus*	--	--
Eastern Hognose Snake	*Heterodon platirhinos*	--	--
Fox Snake	*Pantherophis ramspotti*	--	--
Black Rat Snake	*Pantherophis obsoletus*	--	--

Timber Rattlesnake	*Crotalus horridus*	--	--

Table 5. Forest Land Snails of Greatest Conservation Need in NE Iowa

Common Name	**Scientific Name**	**State Status**	**Federal Status**
Iowa Pleistocene Snail	*Discus macclintocki*	E	E
Frigid Ambersnail	*Catinella gelida*	--	--
Minnesota Pleistocene Succinea	*Novasuccinea n. Sp.* *Minnesota a*	E	--
Iowa Pleistocene Succinea	*Novasuccinea n. Sp.* *Minnesota b*	E	--
Briarton Pleistocene Snail	*Vertigo brierensis*	--	--
Hubricht's Vertigo	*Vertigo hubrichti*	T	--
Iowa Pleistocene Vertigo	*Vertigo iowaensis*	--	--
Bluff Vertigo	*Vertigo occulta*	E	--

(Restricted to Algific Talus Slopes and Moderate Slopes)

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

Common Name	**Scientific Name**	**State Status**	**Federal Status**
Pepper and Salt Skipper	*Amblyscirtes hegon*	SC	--
Sleepy Duskywing	*Erynnis brizo*	SC	--
Dreamy Duskywing	*Erynnis icelus*	SC	--

Columbine Duskywing	*Erynnis lucilius*	SC	--
Silvery Blue	*Glaucopsyche lygdamus*	T	--
Hickory Hairstreak	*Satyrium caryaevorum*	SC	--
Edward's Hairstreak	*Satyrium edwardsii*	SC	--
Striped Hairstreak	*Satyrium liparops*	SC	--

FOREST HEALTH THREATS AND CONCERNS

Iowa's woodlands today face unprecedented levels of forest health threats in the forms of non-native invasive species, climate extremes, insect pests (some exotic), pathogens, urbanization, and more.

DISEASES

Oak Wilt

Oak wilt is caused by the fungus *Ceratocystis fagacearum*. Oak wilt is a major player in the decline of oaks, especially red oaks, as it can kill large overstory trees rapidly and can spread via root systems from tree to tree. The trees in Iowa most commonly impacted by oak wilt are species such as red and black oak, but it can infect white and bur oak as well. If red, northern pin, or black oak are infected by the fungus that causes this disease they usually die within the summer they are infected. White oak and bur oak can often take a number of years before they succumb to this disease after infection. One way to avoid the potential transfer of the fungus that causes oak wilt problems is to not prune, remove, or wound oaks between March 1 and November 1 each year. When planning any type of forest stand improvement activities that might wound residual oaks be sure to target those activities during the dormant season.

Browning and Wilting Symptoms (Oak Wilt)

Thousand Cankers Disease

There is an emerging disease called Thousand Cankers Disease that is being found on black walnut trees in the Eastern U.S. Currently this disease has been very destructive to eastern black walnut in the Western U.S. This disease has not been found in Iowa at this point, but it is a critical one to watch for. Managers should attempt to monitor the overall health of walnut trees over time. See the following site for specific information.
http://na.fs.fed.us/pubs/palerts/cankers_disease/thousand_cankers_disease_screen_res.pdf

INVASIVE PLANT SPECIES

Exotic (non-native) plant species that are introduced to an ecosystem without the benefits of co-evolution can become invasive and disruptive to the balance of the natural ecosystem. Such is the case with a suite of non-native invasive species common to Iowa. Species such as honeysuckle, Oriental bittersweet, common buckthorn, autumn olive, multi-flora rose, garlic mustard, barberry, white mulberry, black locust, and tree-of- heaven are some notable examples. These different non-native species have the ability to out-compete native species and subsequently cause a decline in biodiversity and ecosystem health. Invasive species typically provide little in the way of benefits to wildlife. Currently, honeysuckle is the most prevalent plant throughout the property. If an aggressive/consistent effort is not started many of these non-native plants will continue to reduce the bio-diversity, increase the potential of site erosion, and reduce the recreational accessibility on the property in the near future.

INSECT PESTS

Emerald Ash Borer

The Emerald Ash Borer continues to rapidly spread across Iowa, so this pest will most likely start to impact ash trees on this property in the next 5 to 10 years. Emerald Ash Borer attacks and kills any and all species of ash. The presence of this pest will likely lead to the extirpation of ash in the forest community.

Gypsy Moth

The Gypsy Moth has been a pest in the Eastern U.S. for over a century and is finally making its way into Iowa (northeast). It causes heavy defoliation of oak, maple, and other hardwoods during the early summer months and degrades recreational and aesthetic uses of the forest. Repeated defoliation can cause decline and death of mature trees.

Walnut Twig Beetle

The Walnut Twig Beetle is not yet known to exist in Iowa, but has the potential to cause very serious harm to the state's black walnut population. It vectors the recently discovered "Thousand Cankers Disease" which has caused walnut mortality in 9 western and 5 eastern states.

FWSP DEFINITIONS AND GUIDING FACTORS

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

Floodplain Forest Wildlife –Characterized by species such as silver maple, cottonwood, walnut, green ash, elm, hackberry and willows. This habitat factor will benefit wildlife such as

songbirds and woodpeckers, furbearers, raptors, reptiles and amphibians on relatively level areas inundated by water from time to time.

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

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

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

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

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

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

Viewshed – A physiographic area composed of land, water, biotic, and cultural elements which may be viewed from one or more viewpoints and which has inherent scenic qualities and/or aesthetic values as determined by those who view it. Viewsheds are a habitat factor that will be primarily a "hands-off" area for aesthetics, proper soil and water conservation, along with providing special wildlife habitats.

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

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

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

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

EXPLANATION OF FOREST MANAGEMENT PRACTICES

Timber Stand Improvement

Timber Stand Improvement (TSI) encompasses a variety of silvicultural techniques that are used to improve the quality, health, productivity, vigor, stocking, and species composition of a forest. Some of the common techniques that are used in this plan are described below.

Weed Tree Removal-

Weed Tree Removal involves the removal of undesirable trees. Weed trees are generally selected based upon species. Undesirable species are removed from the site. Removal can be obtained by felling, girdling, or by mechanical means such as a forestry mulcher. Herbicide is then applied to the fresh stump or girdle. This practice can be used to reach a variety of objectives such as: creating more growing space for desirable tree species, increasing fuel loads and manipulating sunlight to the forest floor to increase success of desirable natural or artificial regeneration.

Crop Tree Release-

Crop tree release involves selecting desirable trees (crop trees) that will encompass your future forest stand. The purpose of this technique is to favor the development of selected crop trees to assist in meeting the objectives set forth in this plan. A crop tree is selected based on a variety of characteristics such as: species, crown class, quality, and health. At maturity, there is room for 35-50 trees per acre. The number of crop trees selected per acre is based upon the current stocking of desirable trees and the average diameter class. A release will be performed that provides crop trees with adequate light and growing space, by releasing their crowns from competing trees. This practice will affect a variety of dynamics within the stand, as well as characteristics of the individual crop tree such as: species composition, nutrient availability, bole quality, diameter, and crown width.