FOREST WILDLIFE STEWARDSHIP PLAN

FOR

RAM HOLLOW
WILDLIFE MANAGEMENT AREA

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

Developed by:

Alex Hoffman, District Forester
Trent Stuchel, Forestry/Wildlife Tech 2
Curt Kemmerer, Wildlife Biologist

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WILDLIFE MANAGEMENT AREA

MANAGER: Wildlife Biologist
Maquoketa Wildlife Unit
18670 63rd St.
Maquoketa, IA 52060
563-357-2035

LOCATION: Sec. 1, 2, 10, 11, 12, Colony Township, T90N-R3W, Delaware County
Sec. 7, Liberty Township, T90N-R2W, Dubuque County

TOTAL ACRES: 803.6

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 390,000 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.

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 dominant 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.

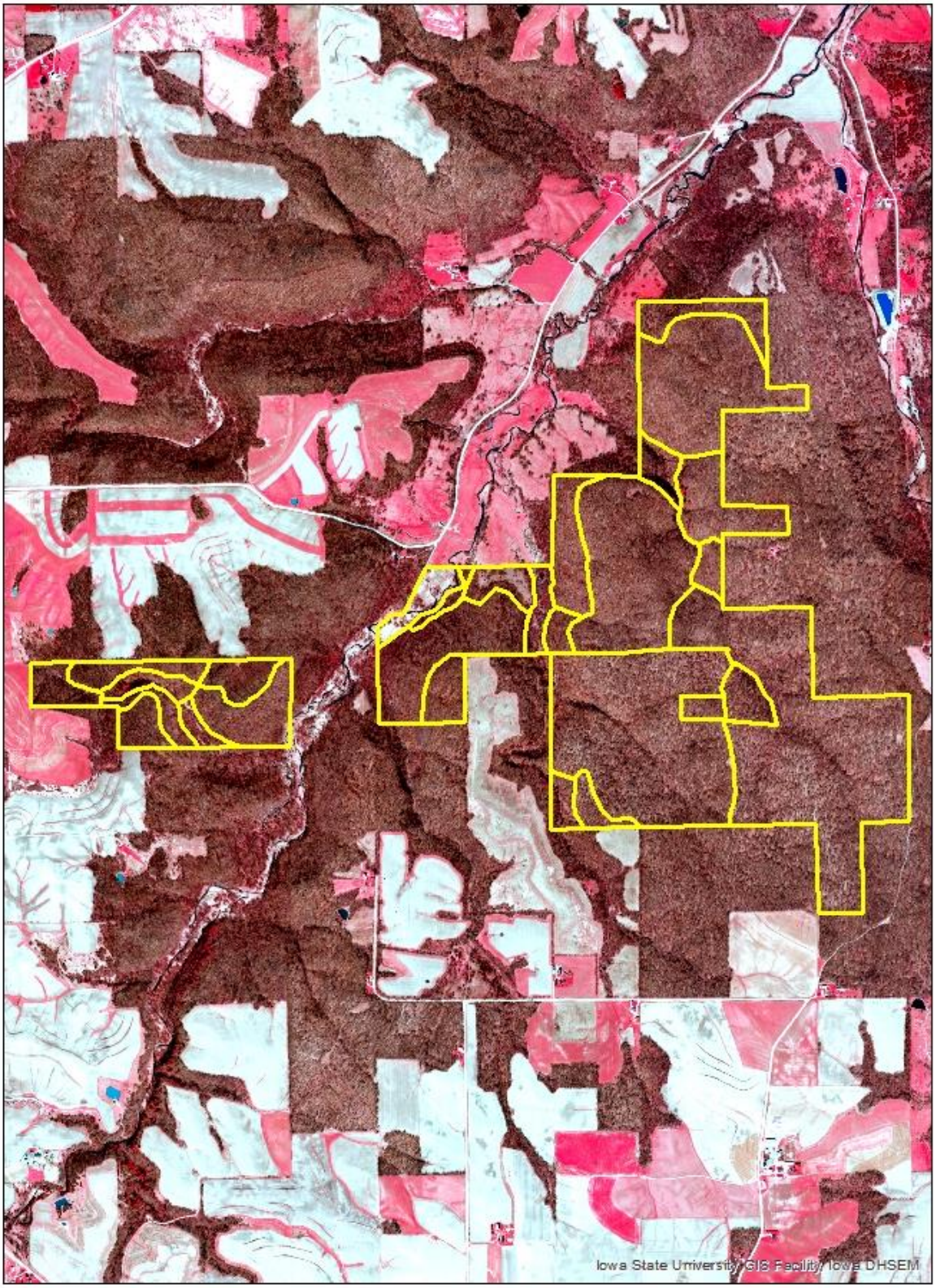
The Wildlife Bureau manages forests for the greatest diversity of forest wildlife. The FWSP will be the guiding document that prioritizes management activities to meet the needs of forest wildlife species. The DNR's comprehensive Iowa Wildlife Action Plan identifies wildlife "species of greatest conservation need" (SGCN). 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 AREA

Ram Hollow WMA is 819 acres in total. The area consists of two distinct tracts, with the west tract (100 acres) being isolated from the main body of the WMA (719 acres) and landlocked by private land. The area is almost completely forested, with only 15 acres in non-forested cover types. Ram Hollow is located within the geographic region known as the *Driftless Area*, which is characterized by karst topography that features steep bluffs and ravines, rocky outcrops, numerous large sinkholes, springs and coldwater streams. Much of the WMA features this steep, rocky terrain. The Little Turkey River and its valley separate the two tracts of the WMA, and several smaller creek valleys and drainage ravines bisect the flatter upland ridges. This WMA is part of an impressive expanse of forested landscape in the immediate vicinity. The 803.6 acres addressed in this plan are divided into 26 different stands. 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.

Landscape Position

Ram Hollow WMA
Stand Map



Sec. 1, 2, 10, 11, 12 / Colony Twsp.
T-90N R-3W / Delaware Co.
Sec. 6 / Liberty Twsp.
T-90N R-2W / Dubuque Co.

0 0.25 0.5 1 Miles

N

HOW THE FOREST WILDLIFE STEWARDSHIP PLAN WAS DEVELOPED

The wildlife biologist and the wildlife unit team are the managers of the WMA and determine 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 area are as follows:

- Maintaining diverse, high quality forest habitats for the benefit of diverse wildlife populations
  - Emphasis on oak management
  - Emphasis on diversity of age classes
  - Emphasis on promoting SGCN habitats

- Promote a more diverse native herbaceous layer component on the forest floor
  - Emphasis on using prescribed fire as a regular management practice to combat invasive species and increase opportunity for diversity of native plants
  - Introduce more sunlight to the forest floor through prescribed silvicultural practices

- Promote high quality wildlife-dependent recreational opportunities

Funding for forest management administration and procurement, as well as 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, squirrel and trout. 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 benefits that oaks provided. 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 source for many moths and butterflies, with oaks supporting higher diversity and richness of caterpillars than any other native tree family (Narango et al. 2020). 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.

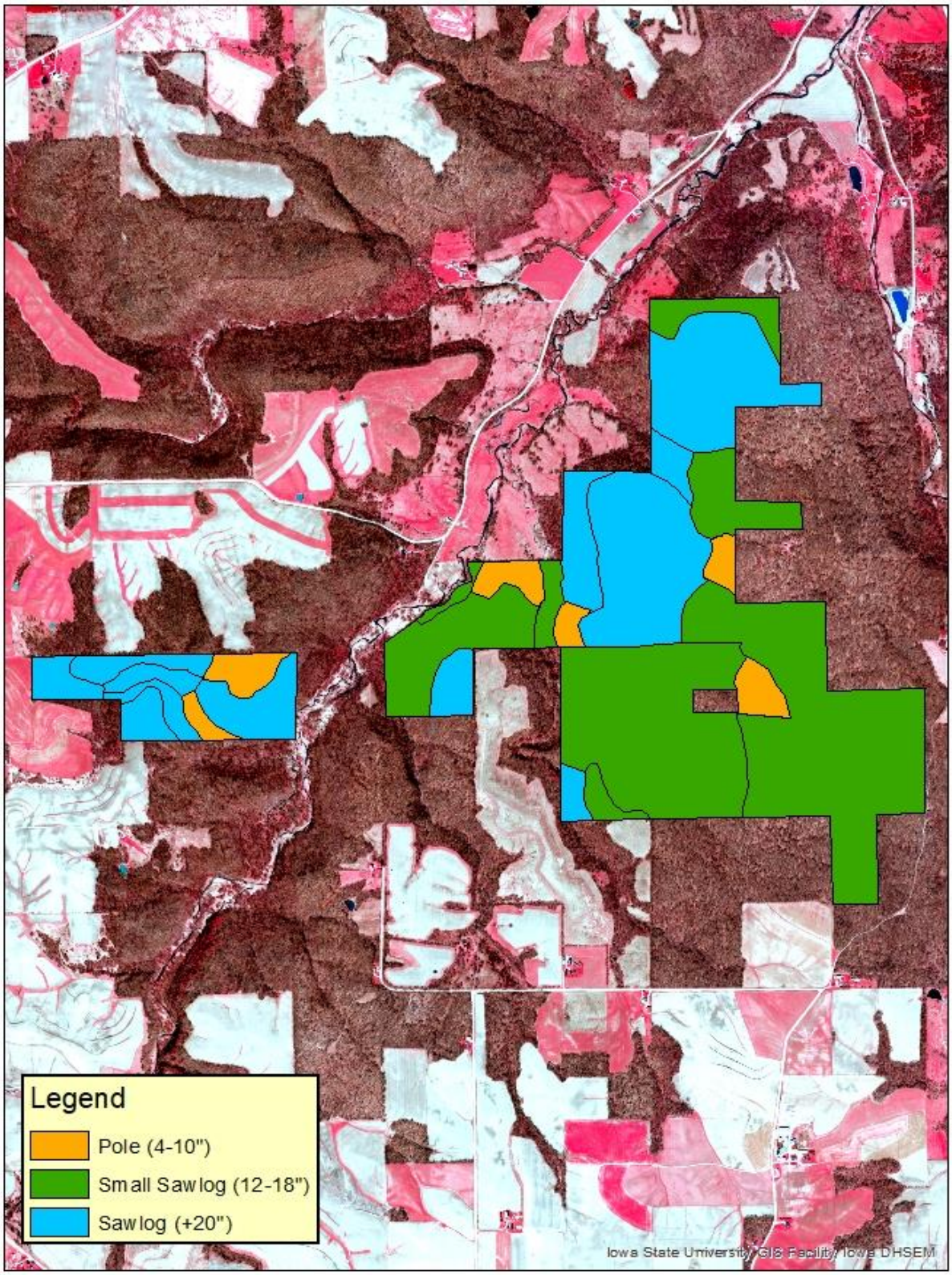
HARVESTS

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 and invasive species, converting areas to more desirable species, and completing early successional cuts.

Current Distribution of Tree Size on the WMA
***dbh = diameter at breast height**

Tree Size	Forested Acres	% of Total Area
Sapling (<4" dbh)	0	0%
Pole (4-10" dbh.)	54.7	6.8%
Small Sawlog (12-18" dbh.)	443.7	55.2%
Sawlog (>20" dbh)	305.2	38%
Totals	803.6	100%

Ram Hollow WMA
Diameter Distribution



Sec. 1, 2, 10, 11, 12 / Colony Twsp.
T-90N R-3W / Delaware Co.
Sec. 6 / Liberty Twsp.
T-90N R-2W / Dubuque Co.

0 0.25 0.5 1 Miles

N

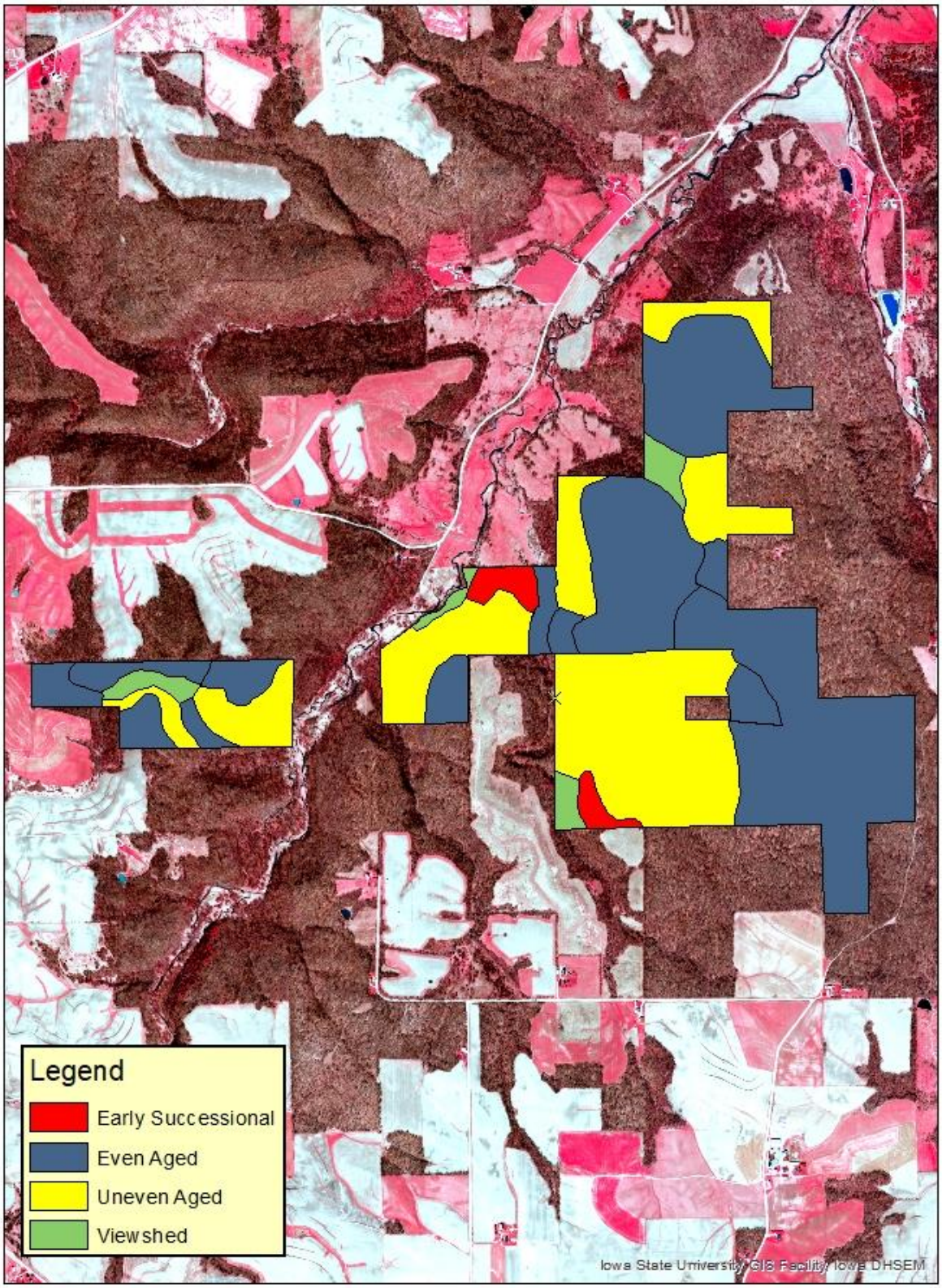
PROPOSED MANAGEMENT SYSTEMS FOR THE AREA

Recommendations for each stand were based on whether the area will be managed to create early successional growth, an even aged system, an uneven 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 Ram Hollow WMA, the acres under each management system are as follows:

Management System	Acres	% of Total Area
Early Successional	19.2	2.4%
Even aged	454.2	56.5%
Uneven aged	300.3	37.4%
Viewshed	29.9	3.7%
Total	803.6	100%

Ram Hollow WMA
Management Systems



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0 0.25 0.5 1 Miles

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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 by cutting 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.

Ram Hollow has 19.2 acres (2.4% of all woodland acres) scheduled for early successional management. Applying sustainable forestry guidelines, 6.4 acres could be cut every 5 years.

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 (4-10" dia.) stand of trees.

Prescribed fire is 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.

Fire is also an important tool in promoting a more diverse herbaceous plant community on the forest floor. The conditions that favor oak regeneration also favor many native plants that thrive on periodic disturbance. Fire will combat invasive species such as garlic mustard and multifora rose that crowd out desirable native plants. Periodic fire, coupled with the practices to provide more sunlight through the canopy, will set the stage for more diversity across even aged stands. It has become apparent that fire is not used frequently enough in many upland forests. It seems to be a novelty practice that is used more as a singular event or for promotional status than as a routine part of forest management. Fire should be used, if feasible, wherever invasive species occur in significant number and roughly every five years throughout the even aged stands.

Ram Hollow has 454.2 acres (56.5% of all woodland acres) that will be managed as even aged forest to regenerate oak (120-year rotation). Applying sustainable forestry guidelines, approximately 19 acres could be clearcut every 5 years, or 3.8 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 sugar maple and basswood.

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

Uneven aged management areas will provide continuous tracts of forest with minimal disturbance. Large tracts of uneven aged management will provide necessary habitat for nesting Neotropical migratory bird species such as eastern wood-pewee, Acadian flycatcher, wood thrush, cerulean warbler, worm-eating warbler, Kentucky warbler, and for migrant 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) whenever possible and 6-10 snags per acre 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, amphibians and small mammals along the riparian corridor.

Ram Hollow has 300.3 acres (37.4% of all forest acres) that will be managed as uneven aged forest. Applying sustainable forestry guidelines, approximately 75 acres can be selectively harvested (single tree or group selection) every 5 years, or

15 acres could be cut every year. Selective harvests may be used on this area (in conjunction with other management practices) as an important step in the process of creating more species diversity in the forest stand.

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. Such management typically includes lower impact practices such as prescribed fire and invasive species control. Managers will monitor these stands and may choose to implement these practices when they integrate with management of surrounding stands or when degradation threatens the entire stand or surrounding areas.

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.

Ram Hollow has 29.9 acres (3.7% of all woodland acres) that will be managed as viewshed forests.

SOILS

All forested acres of this plan are located within the Paleozoic Plateau landform. This landform is dominated by rock outcroppings, deep narrow valleys and coldwater streams. The native vegetation of this landform is mostly forested.

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 Fayette and Nordness series.

The Fayette series consists of very deep, well drained soils formed in loess. These soils are on convex crests, interfluves and side slopes on uplands and on treads and risers on high stream terraces. Slope ranges from 0 to 60 percent.

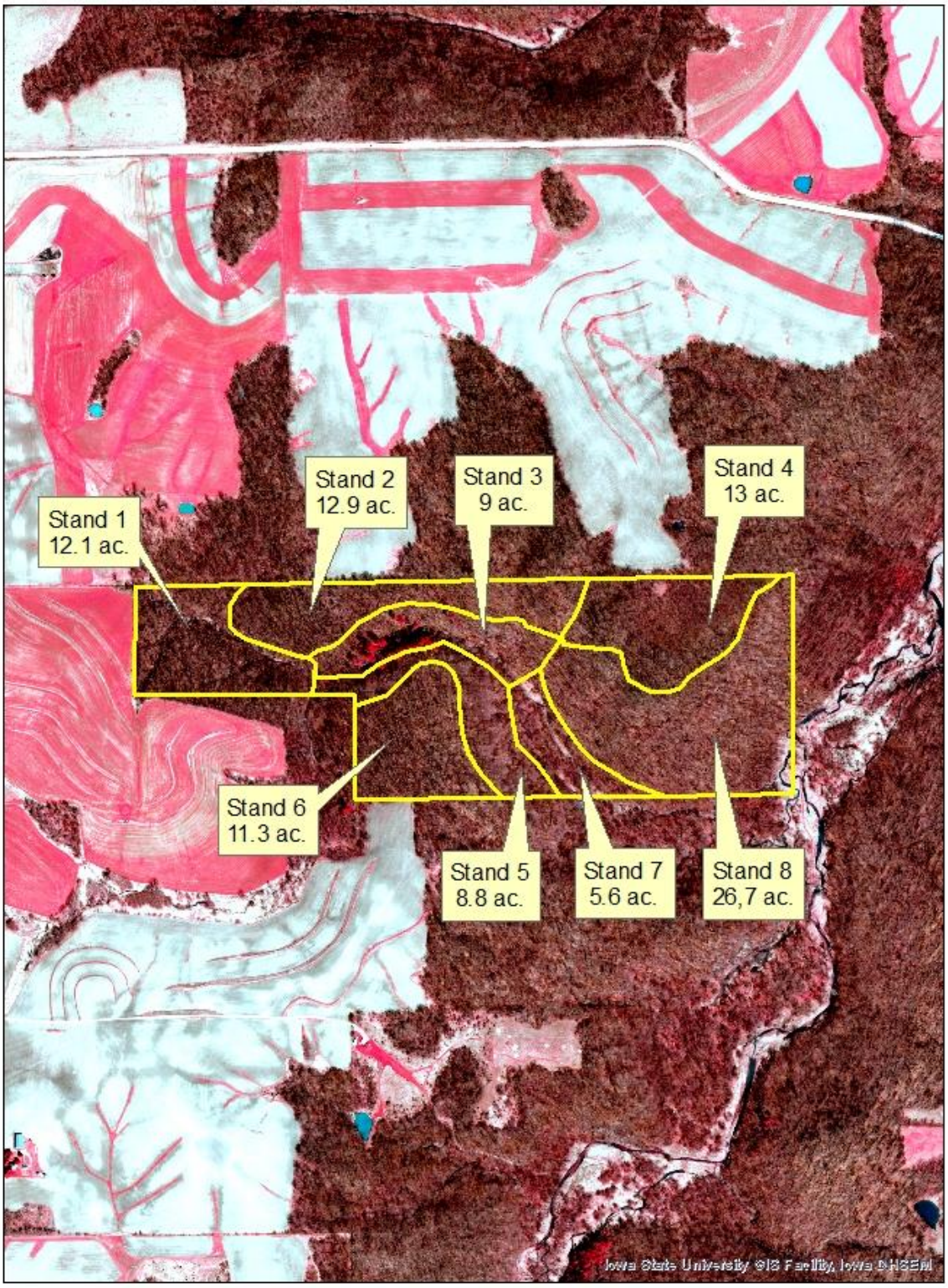
The Nordness series consists of shallow, well drained soils formed in loamy or silty material and a paleosol over limestone bedrock. These soils are on high structural benches, crests, and convex side slopes on uplands

WORK PLAN FOR RAM HOLLOW WMA

This is the "working plan" for the Ram Hollow Wildlife Management Area 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.

Ram Hollow WMA
Stands 1-8



Sec. 10 and 11 / Colony Twsp.
T-90N R-3W
Delaware County

0 0.125 0.25 0.5 Miles

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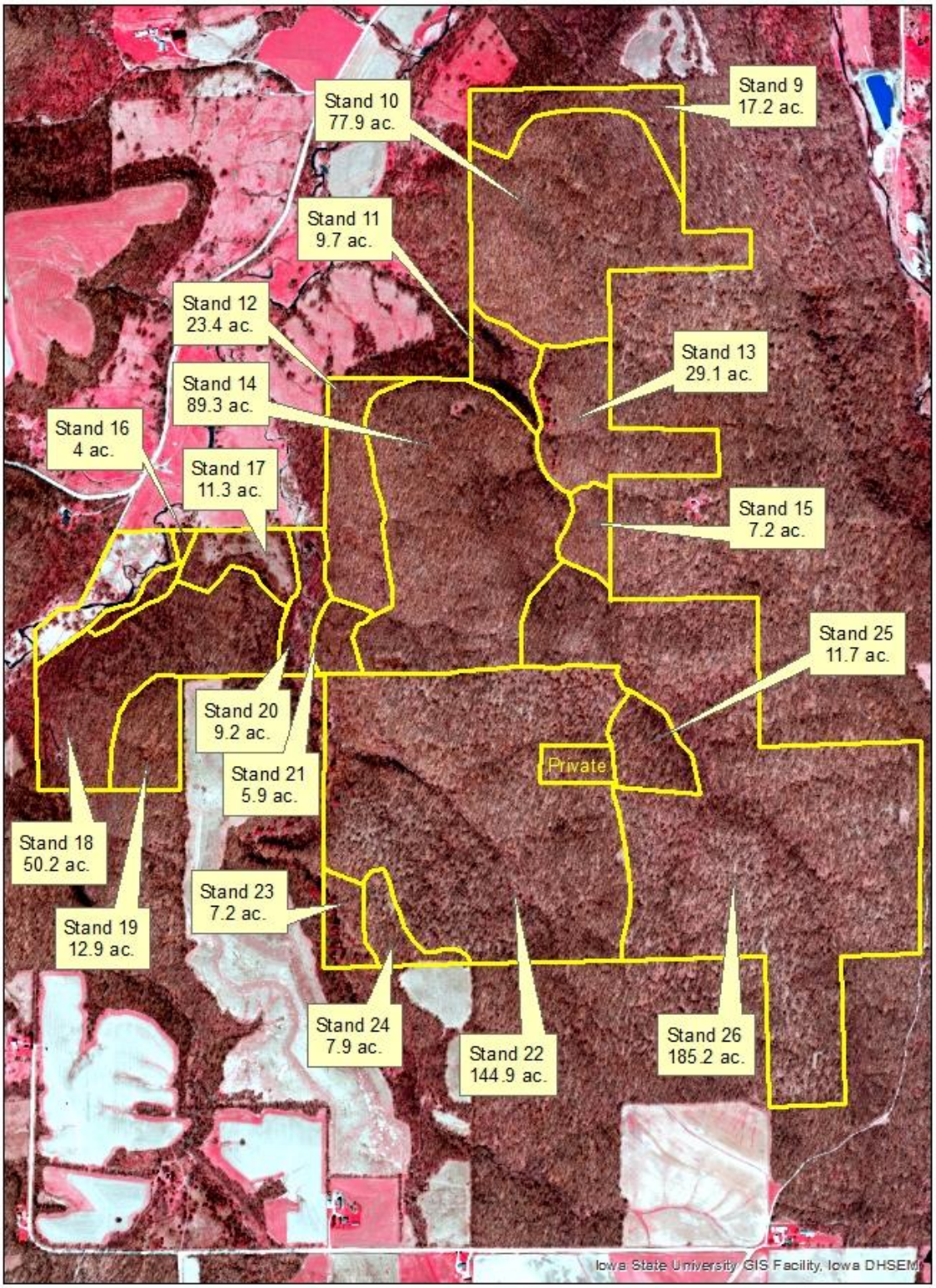
Ram Hollow WMA
Stands 9-26



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T-90N R-3W / Delaware Co.
Sec. 6 / Liberty Twsp.
T-90N R-2W / Dubuque Co.

0 0.125 0.25 0.5 Miles

N

STAND SUMMARIES & RECOMMENDATIONS

Stand	Acres	Overstory	Intermediate/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
1	12.1	White oak, red oak, ash, cherry, basswood, elm	Ironwood, bitternut hickory, elm, cherry, shagbark hickory	Sawlog	Even aged	Underplant, clearcut	High	2023	Overstory oak dying/dead
2	12.9	White oak, red oak, chinkapin oak, shagbark hickory, aspen, cherry, ash, sugar maple	Sugar maple, ironwood, bitternut hickory	Sawlog	Even aged	Weed tree removal, prescribed burn	High	2023	
3	9	Bur oak, chinkapin oak, red oak, basswood, elm, white pine	Basswood, elm	Sawlog	Viewshed				
4	13	Red oak, black oak, walnut, aspen, bitternut hickory, ash, sugar maple, cherry, ironwood	Ironwood	Pole	Even aged	Crop tree release	High	2022	
5	8.8	Sugar maple, ash, red oak, basswood, shagbark hickory	Ironwood, musclewood, elm, bitternut hickory, sugar maple	Sawlog	Uneven aged	Weed tree removal	Low	2035	Steep
6	11.3	Red oak, white oak, shagbark hickory, walnut, sugar maple, basswood, ash, elm	Ironwood, sugar maple, ash, elm	Sawlog	Even aged	Weed tree removal, prescribed burn	High	2022	Some standing dead red oak, surrounding trees appear healthy. Monitor for oak wilt
7	5.6	Elm, mulberry, walnut, boxelder	Boxelder, elm, elderberry	Pole	Even aged	Weed tree removal, planting	Low	2035	
8	26.7	Red oak, white oak, walnut, sugar maple, basswood, shagbark hickory	Sugar maple, elm, ironwood, ash, musclewood, cherry, bitternut	Sawlog	Uneven aged	Selective harvest, weed tree removal	Low	2030	
9	17.2	Sugar maple, basswood, ash, aspen, cottonwood, red oak, white oak, bitternut hickory	Sugar maple, ironwood, musclewood, bitternut hickory	Small sawlog	Uneven aged	Selective harvest	Low	2037	
10	77.9	Red oak, white oak, sugar maple, basswood, ash, aspen, cherry	Sugar maple, bitternut hickory	Sawlog	Even aged	Weed tree removal, prescribed burn, shelterwood harvest	High	2025	Some red oak mortality
11	9.7	Sugar maple, basswood, red oak	Sugar maple	Sawlog	Viewshed				
12	23.4	Sugar maple, red oak, white oak, basswood, walnut, aspen, cherry, ash	Sugar maple	Sawlog	Uneven aged	Selective harvest	Medium	2028	
13	29.1	Sugar maple, ash, basswood, cherry, red oak, white oak	Sugar maple, ash, basswood, ironwood	Small sawlog	Uneven aged	Selective harvest	Low	2037	

Stand	Acres	Overstory	Intermediate/ Understory	Size Class	Management System	Prescription	Priority	Year	Stand Comments
14	89.3	Red oak, basswood, sugar maple, ash, cherry, bitternut hickory, cottonwood	Sugar maple, basswood	Sawlog	Even aged	Commercial thinning	High	2023	Current high stocking may lead to oak wilt
15	7.2	Aspen, red oak, elm, sugar maple, basswood, cherry		Pole	Even aged	Crop tree release	High	2022	
16	4	Walnut, sugar maple, bur oak, elm, cherry, ash	Sugar maple	Small sawlog	Viewshed				
17	11.3	Cherry, bitternut hickory, ash, wild plum, aspen, sugar maple, basswood boxelder, walnut, white oak, red oak	Boxelder, bitternut hickory, ironwood	Pole	Early successional management	Clearcut	Medium	2028	Leave oak
18	50.2	Walnut, bitternut hickory, elm, basswood, sugar maple, bur oak	Sugar maple, ironwood, elm, bitternut hickory	Small sawlog	Uneven aged	Weed tree removal	Low	2032	
19	12.9	Red oak, white oak, sugar maple, basswood, aspen, elm, ash	Sugar maple, basswood	Sawlog	Even aged	Weed tree removal, prescribed burn	High	2023	
20	9.2	Walnut, cottonwood, sugar maple	Elm, boxelder, sugar maple	Small sawlog	Even aged	Weed tree removal	Low	2028	Reed canarygrass
21	5.9	Red oak, cherry, aspen, ash, musclewood, ironwood, sugar maple, walnut		Pole	Even aged	Crop tree release	Medium	2026	Old clearcut, almost all stump sprouts
22	144.9	Sugar maple, basswood, bitternut hickory, red oak	Sugar maple, basswood, elm, bitternut hickory	Small sawlog	Uneven aged	Selective harvest	Low	2040	Previous diameter limit cut. Break into smaller harvest units.
23	7.2	White pine, sugar maple, ironwood	Sugar maple, ironwood	Sawlog	Viewshed				
24	7.9	Aspen, white oak, red oak, shagbark hickory, sugar maple, bitternut hickory	Sugar maple, ironwood, cherry, bitternut hickory, shagbark hickory, ash	Small sawlog	Early successional management	Clearcut	Medium	2026	Leave oak and shagbark hickory
25	11.7	Sugar maple, basswood, walnut, red oak, white oak, cherry, bitternut hickory	Sugar maple, basswood, ironwood, ash	Pole	Even aged	Crop tree release	High	2022	
26	185.2	Sugar maple, basswood, bitternut hickory	Sugar maple, basswood, ironwood	Small sawlog	Even aged	Underplant, clearcut	Low	2050	Previous diameter limit cut. Break into smaller harvest units.

THREATENED AND ENDANGERED SPECIES

Animals:

Common Name	Scientific Name	State Status	Federal Status
Northern Long-eared bat*	Myotis septentrionalis	--	T
Indiana bat*	Myotis sodalis	E	--

*Documented at nearby White Pine Hollow State Preserve

No threatened or endangered land snails have been documented at Ram Hollow WMA. However, Ram Hollow WMA does have Algific Talus Slopes, which are a rare ecologic community known to support several species of listed land snails on nearby sites.

Plants: N/A