Forest Wildlife Stewardship Plan
Syracuse Wildlife Management Area

Clinton County

A plan that will increase the diversity of forest types & wildlife habitat





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LOCATION: T81-N R-1E, Sec 22
Clinton County

TOTAL FOREST ACRES: 709

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 410,000 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 will 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 high priority.

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.

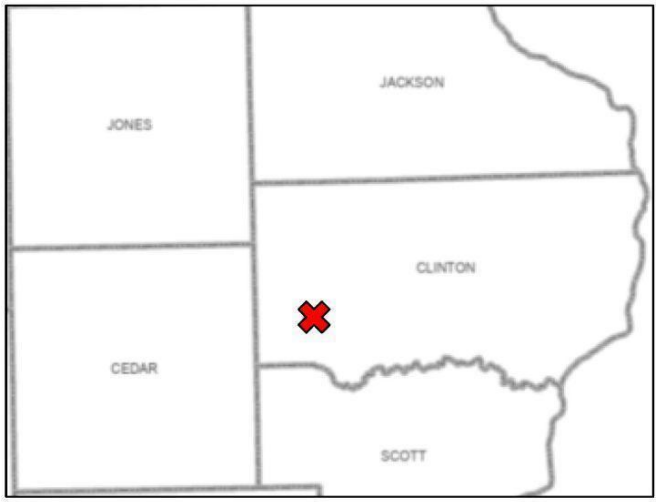
Description of Area

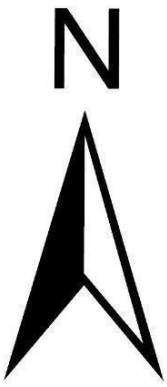
Syracuse WMA is located approximately 1.5 miles west of Calamus. The vast majority of the area is located in the floodplain of the Wapsipinicon (Wapsi) River, which makes up most of the western border of the WMA. Drainage ditch #12 flows through the area, emptying into a Wapsi river oxbow, that bisects the WMA. The topography of the majority WMA is generally very flat, with minor swales, backwater depressions and oxbows that are typical of large river

floodplains. The eastern portion of the area sharply rises to an upland forest. This riparian forest habitat supports unique Iowa wildlife such as yellow-throated warbler, red-shouldered hawk, Louisiana waterthrush, prothonotary warbler, Eastern screech-owl (SGCN), Indiana bat (federally endangered), northern long-eared bat (federally endangered), evening bat, silver-haired bat, swamp darner, midland clubtail, Blanchard's cricket frog, pickerel frog, spiny softshell turtle, Graham's crayfish snake, western ribbonsnake (SGCN), tadpole madtom (SGCN), great spangled fritillary, monarch butterflies (SGCN); mud (SGCN), blacknose (SGCN), banded, and blackside (SGCN) darters; and mucket (SGCN), pink papershell, and fatmucket (SGCN) mussels. The WMA is 784 total acres in size. With 709 acres in some form of woodland habitat, Syracuse WMA is 90% forested. The 709 forested acres addressed in this plan are divided into 9 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







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 forest 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:

- Maintain or create diverse, high quality forest habitats for the benefit of diverse wildlife populations
    - Increase species diversity and growing stock of oak
    - Proper distribution of age classes
    - Improve forest health
- 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/maintain habitat for game species such as deer, turkey, 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. Objectives address the habitat needs of a diverse array of wildlife species and the woodland condition of each area. 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.

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. In particular at this site, two federally endangered bat species (Indiana and Northern Long-eared) are present which will require that we follow harvesting guidelines to protect these species breeding habitat, and a number of SGCN fish and mussel species occur in the (River? Oxbow?) which will require that we consider how equipment operation, tree felling, or changes in canopy and resulting stream shading may impact these aquatic systems. One of the primary goals will be to maintain quality habitat that will support abundant and diverse wildlife populations.

Oak Management

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, thin stands to a more desirable stocking, or to achieve a diversity of tree size classes. Harvests are an essential tool for simulating natural disturbances and creating suitable growing conditions for desirable shade intolerant tree species. Harvests are scheduled based on an individual stand's rotation age. The rotation age is determined based on a variety of factors.

The forest type that is present influences the rotation age of the stand. There are a variety of forest types on any given area, with each forest type reaching biological maturity at different times. Biological maturity is the point at which a stand's volume reaches a plateau or starts to decline based on natural factors such as mortality, breakage or rotting. A species such as quaking aspen will reach biological maturity many years before a species such as white oak.

Along with forest type, site productivity influences the point of biological maturity. High site productivity will increase the growth rate, vigor, and health of the stand. This will likely extend the biological maturity of the stand.

Forest health can influence the point at which a stand is harvested. Insects, disease, and pathogens can infect a stand unexpectedly. An event like this can alter the rotation age of the stand.

Landscape level considerations also influence rotation age. Wildlife objectives may require certain age structures in targeted locations across the area due to how the stand fits in among the broader landscape. This may either increase or decrease the rotation age of the stand.

A variety of regeneration techniques will be used in this forest stewardship plan. Each of them has been selected to achieve a targeted outcome. The timing of and results of these techniques will influence the point at which a stand is harvested.

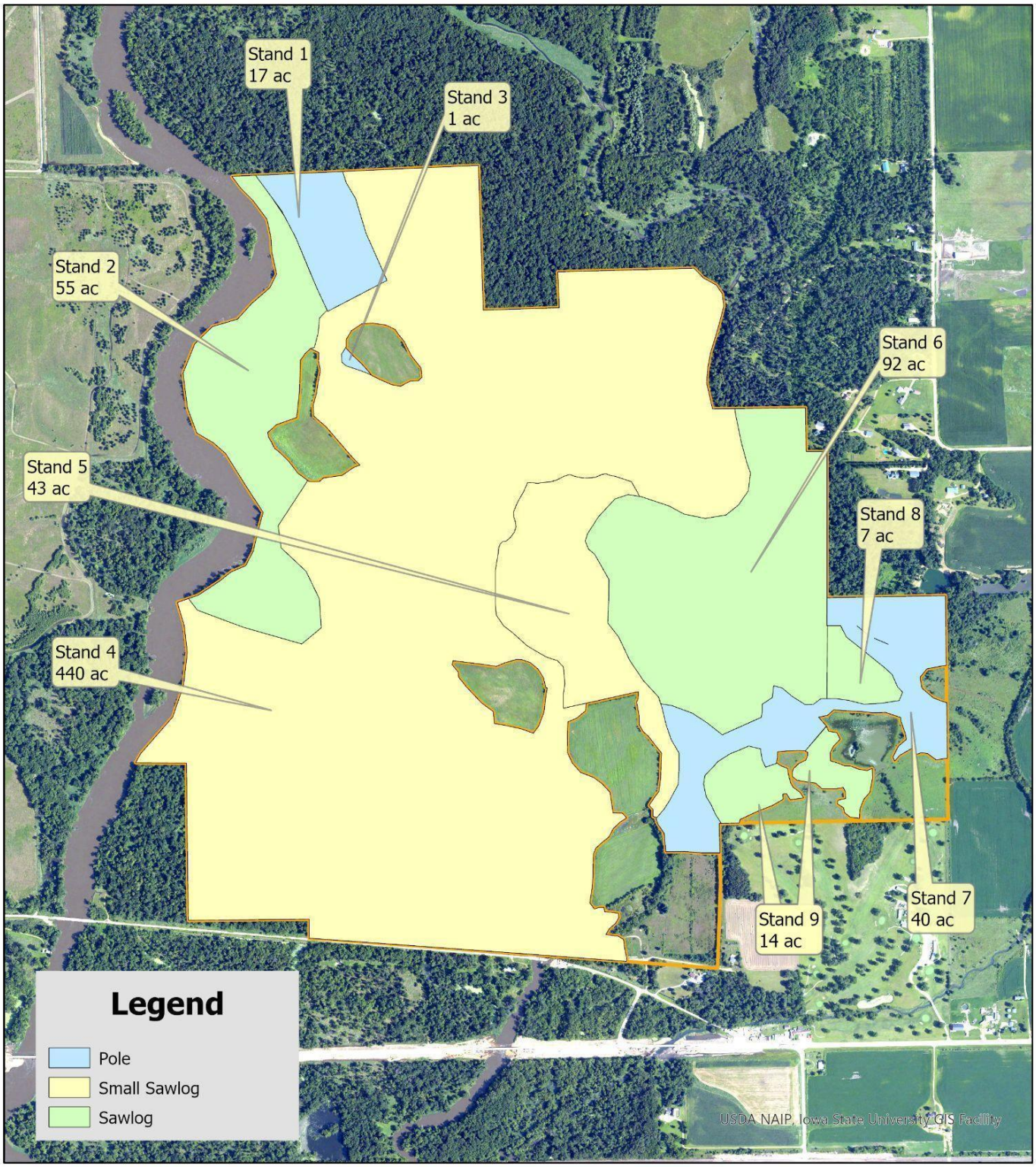
Economics and logistics can alter the timing, scope, and size of a harvest. A harvest is implemented based on a silvicultural prescription designed to reach a wildlife management or forest health objective. Any financial return is purely a byproduct of proper management and not a driving factor. Income from harvests will be reinvested into the area 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.

Sustainable forestry aims to manage a forest for maximum distribution of age and size classes and gives an indication of the acres or volume that can be harvested from a given geographical area periodically, without ever running out of volume or growing stock. Generally speaking, with even-aged management the sustainable harvest is the total acreage of the forest divided by the rotation age. Rotation ages for stands vary by the dominant species in each stand, but are generally set at the point of biological maturity. The majority of actively managed even-aged stands use a 120-year

rotation, on average. The rotation age calculations reflect only the annual allowable harvest. In actual practice, these figures will fluctuate over and under the allowable harvest periodically.

Stands managed under an uneven-aged system have no rotation age because regeneration in these systems is ever-present and different age classes occur within the same stand. Sustainable harvest volume is estimated by calculating the growth in volume over a period of time, generally 20 years.

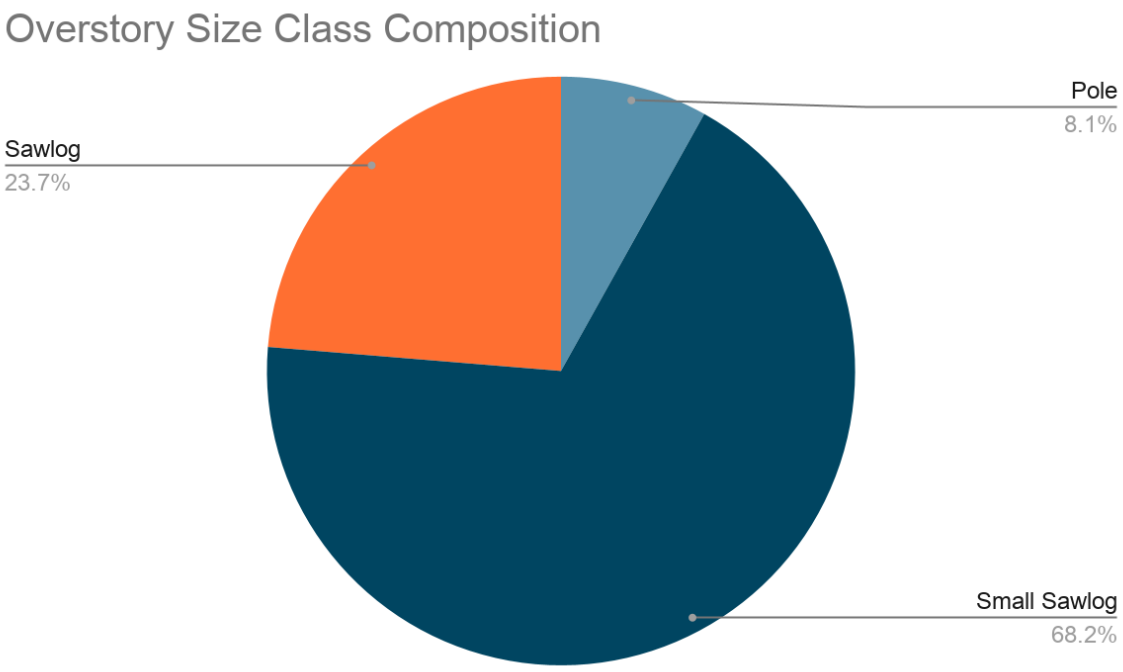
Syracuse
Size Class Distribution



Clinton Co.
T-81N R-1E
Sec 22

0 0.17 0.35 0.7 Miles

N



Size Class	Acres	Percent of Area (%)
Sapling (1-3" DBH)	0	0
Pole (4-12" DBH)	58	8.1
Small Sawlog (13-18" DBH)	483	68.2
Sawlog (18"+ DBH)	168	23.7

Proposed Management Systems for the Area

Recommendations for each stand were based on whether the stand 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 WMA to create diverse, high quality wildlife habitat and promote forest health. Important factors considered include improvement to structural cover, maintaining an oak component where feasible, developing a diverse woodland landscape, protecting fragile sites, and increasing the acres of early successional habitat.

The foresters and wildlife managers have recommended the following management systems for Syracuse WMA:

Management System	Acres	% Total
Even-Aged	709	100

Landscape Considerations

Forest wildlife management plans should take into consideration factors beyond the target property. Wildlife do not recognize property lines, and move freely to satisfy their life cycle needs. Land managers need to think on a broader scale to maximize benefits to local wildlife populations. Current and future conditions on surrounding properties may directly affect the planning and effective results of management actions carried out on the area.

The cumulative effect of the regeneration management (clearcuts) carried out over time on Syracuse WMA will create and maintain an ever-shifting patchwork of young forest that varies spatially and temporally. This mosaic will provide critically important habitat to a vast array of wildlife that depend on or prefer early successional forest types. Young forest is a habitat type that is often considered a limiting factor in forested landscapes in Iowa.

It is expected that surrounding forested lands will provide habitat types more consistent with uneven-aged management and viewshed management. The cumulative effect of those more selective or passive management regimes will ensure a portion of the broader landscape remains in relatively undisturbed, mature forest.

Even-Age Management

Even-age management is essential for wildlife species depending on oak/hickory forests. Even though large blocks of forest are needed for some wildlife species, each stage of an even-age stand provides habitat for wildlife. For example, regenerating stands (1-10 years old) benefit the same species of birds as do 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 indigo buntings and American Redstart. From age 20-60 years, pole to medium-sized trees tend to be used by canopy nesters such as the red-eyed vireo, 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, red-shouldered hawk, 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 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, the federally endangered 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. Maintaining or creating 6-10 snags per acre of varying sizes helps support a diversity of forest wildlife.

Even-age management involves growing a stand of trees which are close to the same age. At some point in the stand's life, the area is clearcut which creates the even-age structure. Even-age 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-age management.

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

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 sugar maple and basswood. 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 (4-12" DBH) stand of trees.

Prescribed fire can be 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 can combat invasive species such as garlic mustard and multiflora 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.

Syracuse WMA has 709 acres (100%) of all actively managed woodland acres that will be managed as even-aged. Applying sustainable forestry guidelines, approximately 7 acres could be clearcut every year assuming a 100-year rotation age.

Soils

Soil is the medium for plant growth and can dictate current and future forest composition. Soil type is a variable that is considered for all forest management decisions. The predominant soil type found on the bottomland portion of Syracuse WMA is the Fluvents-Ambraw series. The Fluvents-Ambraw series consists of soil formed recently (less than 500 years ago) in the floodplains by water-deposited sediments. There are generally stratified layers of sand, silt and clay. The landform is nearly level and has a range of excessively drained to poorly drained areas depending on the proportion of sand, silt and clay. The forested upland portion of this WMA is largely comprised of Sparta loamy sand, and Granby fine sand soil types. Other soil types found to a much lesser extent and scattered across the forested portion of the WMA include Finchford loamy sand, Wapsie variant loam, Chelsea loamy fine sand and Shaffton loam. All of these are typical of a forested floodplain. Elevation changes are very slight on a majority of this WMA, but a combination of a two-foot elevation change and a change from a clay soil to a sandy soil often creates significant differences in vegetation.

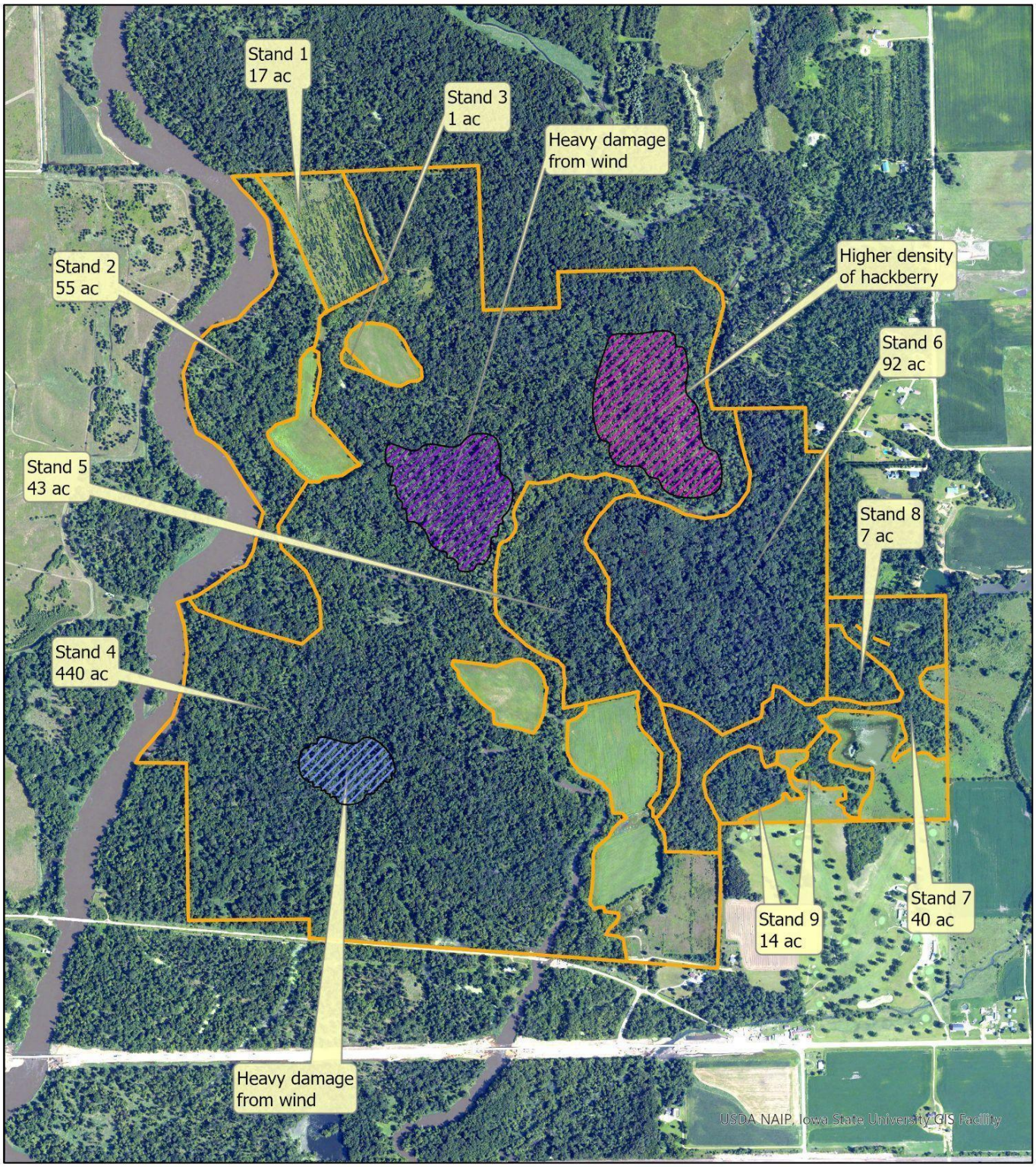
Work Plan for Syracuse WMA

This is the “working plan” designed to aid foresters, biologists, and technicians 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 of any prescribed harvests, the project plan will be reviewed internally to determine potential impacts to both state and federal threatened or endangered species. Harvests will not be initiated until this review has been completed and all T/E comments/concerns have been addressed.

The information included here represents the status of listed species at the time this plan was written. Managers understand that these lists continue to change and that updated references must be consulted before undertaking management actions recommended by the plan, in order to avoid and minimize impacts on listed species.

Syracuse
Wildlife Management Area



Clinton Co.
T-81N R-1E
Sec 22

0 0.17 0.35 0.7 Miles

N

Stand Information

Stand #	Acres	Overstory (species)	Size Class (overstory)	Stocking (overstory)	Intermediate (species)	Stocking (intermediate)	Understory (species)	Stocking (understory)	Management System	Prescription	Priority	Year	Comments
1	17		Pole	Moderate					Even-Aged	Next step will be to thin - stand stocking is not high enough	High	2030	Stand was weeded of cottonwood and other non-planted species in 2024
2	55	Silver maple	Sawlog	Moderate		N/A	Reed canarygrass		Even-Aged	Regenerate maple	Med	2029	
3	1	Oak (mixed), pecan, shellbark hickory, walnut		Moderate					Even-Aged				Old tree planting
4*	440	Bitternut hickory, silver maple, hackberry, bur oak, red oak, pin oak, locust, shagbark hickory	Small Sawlog	Moderate		N/A	Ash	Dense in patches	Even-Aged	Release pole size quality species. Regenerate stands with higher elevation, storm damage, poorly stocked, or poor species composition	High	2027	Split stand into manageme nt units.
5	43	Pin oak, bur oak, bitternut hickory, hackberry, some basswood + walnut	Small Sawlog	Under Stocked		N/A	Hackberry, bitternut hickory	Dense	Even-Aged	Release desirable trees	Med	2031	
6	92	White oak, red oak, bitternut hickory, hackberry, shagbark hickory, walnut, basswood	Sawlog	Moderate		N/A	Honeysuckle, bitternut hickory	Dense in patches	Even-Aged	Regeneration techniques such as clearcuts + shelterwoods.	High	2028	Prioritize areas with over mature red oak

Stand #	Acres	Overstory (species)	Size Class (overstory)	Stocking (overstory)	Intermediate (species)	Stocking (intermediate)	Understory (species)	Stocking (understory)	Management System	Prescription	Priority	Year	Comments
7	40	Shagbark hickory, white oak, red oak, pin oak, hackberry	Pole	Fully Stocked		N/A	Honeysuckle, gooseberry, multiflora rose	Dense in patches	Even-Aged	Release desirable trees	High	2027	High quality stand
8	7	Bur oak, shagbark hickory, hackberry, river birch, red oak, basswood	Sawlog	Under Stocked		N/A	Honeysuckle, multiflora rose, gooseberry	Very dense	Even-Aged	The understory must be address, then regeneration should be the highest priority	Low	2036	Grazed heavily
9	14	Shagbark hickory, bur oak	Sawlog	Under Stocked		N/A	Honeysuckle, gooseberry, multiflora rose	Very dense	Even-Aged	Savanna - address understory issues, continue to burn, remove undesirable species	Med	2030	East side has less desirable species

*Stand 4

This stand consists of bitternut hickory, silver maple, shagbark hickory, hackberry, bur oak, pin oak, red oak, and honey locust. There is an even distribution of these species throughout the stand. The topography is flat with light undulations. A couple of inches in elevation have drastic impacts on the species composition. This makes it very difficult to separate into different stands. The entire area was impacted by the 2020 derecho. Roughly 20% of the canopy was blown over by the storm, in a fairly uniform fashion. There are a couple pockets that received heavy wind damage and are labeled on the map. It seems that oak and shagbark hickory were disproportionately impacted by the storm. Fortunately, there is still a high density of oak and shagbark within the stand. One beneficial result of the storm is the stand stocking is now closer to B-line, although there are still many instances where large pole-sized oak and shagbark hickory are in heavy competition with other trees. Where this is occurring, crop trees should be identified and released. In other parts of the stand, the overstory is over-mature and needs to regenerate. I anticipate that regeneration techniques will need to be re-adjusted as we continue to understand the site and how it responds to treatments. Reed canarygrass can outcompete tree regeneration and will need to be considered when applying forest management treatments. Herbicide or shade from the overstory, or a combination of both, will be used to discourage the growth of reed canarygrass. In areas with extensive wind damage, it will need to be determined if replanting is feasible.