Red Haw State Park
Forest Stewardship Plan
2020-2035

Developed by:
Jessica Flatt, Area Forester, Iowa DNR
Mike Schrader, Park Manager, Iowa DNR
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PURPOSE OF A FOREST STEWARDSHIP PLAN

The purposes for developing a forest stewardship plan for Red Haw State Park are to ensure that state lands are managed sustainably for future generations and that the mission and vision of the Iowa Department of Natural Resources are reflected in the management of this park. This plan is a working document and will be revised as needed to address the challenges of managing resources that are constantly changing.

Management decisions are based on current knowledge of land capability, inventory data, sustainable forestry practices, responsible land stewardship, available financial and personnel resources, and public demands and use of the park.

The Mission and Vision of the Iowa Department of Natural Resources are as follows:

Mission
To conserve and enhance our natural resources in cooperation with individuals and organizations to improve the quality of life in Iowa and ensure a legacy for future generations.

Vision
Leading Iowans in caring for our natural resources.

Management Goals
Establishing the goals of natural resource management helps guide and prioritize the work to be completed. There are five main goals identified for Red Haw State Park forest stewardship plan:

- Remove non-native/invasive species and encourage native species to improve wildlife habitat, sustainability, and aesthetics of the park.
- Promote growth, health, and regeneration of trees, especially oak species, through active forest management.
- Preserve, maintain, and enhance habitat for species of greatest conservation need, threatened and endangered species, as well as rare or unusual plants and animals.
- Protect the lake watershed by decreasing overland flow and preserving soil health.
- Provide high quality, safe recreational space and opportunities for all park users.

Methodology
An inventory of park resources was initiated in 2014 by District Forester Jeremy Cochran and finalized during the spring and summer of 2018 by Area Forester Jessica Flatt. The resulting data was analyzed after inventory completion. From this, the property was divided into stands (Figure 1). Each stand represents a unit of land which will be managed in a specific way. Management recommendations were developed after discussions with the Park Manager and other stakeholders.

HISTORY & OVERVIEW

Mike Schrader, Park Manager Red Haw State Park
24550 US Hwy 34
Chariton, IA 50049
Phone: 641-774-5631
Red_Haw@dnr.iowa.gov

Historical Account
Red Haw State Park is located one mile east of the city of Chariton, Iowa just off Highway 34. The park was originally named Red Haw Hill State Park in 1937 with much of the park infrastructure being built by the Civilian Conservation Corp (CCC) and Works Progress Administration (WPA) in the mid 1930's. Red Haw State Park encompasses 420 acres with an additional 229 acres south of park that is managed by the Iowa DNR Wildlife Bureau that is classified as a game management area.

The city of Chariton was home to a Civilian Conservation Corps camp from 1933 to 1937. Crews from this CCC camp did much of the early work on the park, several projects in Chariton, and in the nearby Stephens State Forest. Projects they

completed included building the lake dam, planting trees, and building the Stone Shelter. The Stone Shelter was built in 1939 with stone quarried near Osceola and logs harvested from Stephens State Forest.

Soils

The U.S. Department of Agriculture (USDA) completed soil survey work in Lucas County, IA in 1956 (updated in 1999). Most of the soils within the park fall under the Gara-Pershing-Armstrong association. It has been determined that the soils within this association developed under a mix of native tallgrass prairie and deciduous trees. Gara soils are well-drained to moderately well-drained. This soil information is being used to inform natural resource management decisions.

Recreational Resources

Red Haw State Park offers many recreational opportunities and facilities. The 70 acre electric trolling motor only lake is a very popular fishing location and has two boat ramps. There are several picnicking areas along with five shelters, including the large CCC-built Stone Shelter, all of which can be reserved online or used on a first-come, first-serve basis. A paved road winds through the majority of the park allowing for easy vehicle access.

There is a five mile multi-use marked grass trail that follows along the lake shore, weaving in and out of the surrounding forest. This trail can be utilized by hikers, bikers, and snowmobiles. There are several benches and lake shore access available along the trail.

The shady campground offers 76 campsites (62 of those having electrical hookups), modern restrooms with showers, and a RV dump station. There is also a playground area for children and easy access to one of the boat ramps from the campground.

NATURAL RESOURCES MANAGEMENT CONCERNS

Invasive Species

Non-native plant species introduced into an ecosystem can become invasive and disruptive to the balance of a natural ecosystem. Exotic plant and animal species have the ability to out-compete native species and subsequently can cause a decline in biodiversity and ecosystem health. Such is the case with a host of non- native invasive species within Red Haw State Park including: bush honeysuckle, autumn olive, multiflora rose, black locust, Japanese barberry, Chinese lespedeza, and reed canary grass along with several others. Many of these species make it difficult to regenerate desirable tree and plant species and can make areas unusable by park visitors. Areas that have heavy infestations of non-native species also do not offer quality wildlife habitat due to reduced diversity of native flora. Invasive species are listed as a medium to very high threat to terrestrial wildlife in the Iowa Wildlife Action Plan (IWAP).

Trends in Forest Composition

There are a couple of negative statewide trends in forest composition that are also represented in the forest area of Red Haw State Park. Due to lack of active forest management, there is low oak seedling recruitment. This is especially troubling when coupled with the increases in non-native invasive species, increases in shade tolerant species, and the higher incidence of oak mortality due to age and disease issues. With no active management to set back the encroachment of competing shade tolerant species and/or non-native invasive species, oak species do not persist and are replaced by shade tolerant trees such as hackberry, ash, bitternut hickory, and elm. These tree species have relatively lower wildlife value compared to oak.

Another issue that is concerning on our forested state land is the distribution of age classes over the forest area. In a healthy, managed forest there is representation from all age classes. There is a lack of younger forest stands at Red Haw State Park. A full range age distribution is beneficial to wildlife as there is “something for everyone” and it is important to the sustainability of the forest. The breakdown of the size classes of trees represented at Red Haw State Park is discussed in more detail later in this plan.

Forest Health

There are several forest health issues that plague Iowa's forests and many are present at Red Haw State Park as well. Tree disease and insect outbreaks can cause decline and even death of many different tree species. The prominent forest health issues that affect the trees at Red Haw State Park are described below.

- **Oak Wilt** is a systemic vascular wilt disease of oak trees caused by the fungus *Ceratocystis fagacearum*. Oaks in the red oak group, like northern red oak, pin oak, and black oak, are highly susceptible to this disease. Oaks in the white oak group, such as white oak, bur oak, chinquapin oak, and swamp white oak, can get this disease but tend to be more resistant to it. Most trees (especially those in the red oak group) will die within the year in which they first show symptoms. Sap feeding *Nitidulid* beetles are the primary vector that spreads the disease from sick trees to healthy ones. Once established in a tree, the disease can spread to nearby trees via tree-to-tree root grafts. Root grafting can only occur between trees within the same species. As the disease spreads it can form pockets of mortality. Oak wilt tends to be more of a problem in stands with older red oak trees - similar to the stand of mature red oak near the campground.
- **Emerald Ash Borer (EAB)** is a small non-native beetle that kills all ash (*Fraxinus* ssp.) trees. EAB was confirmed in Lucas County in 2014 and has since spread throughout the county. The ash trees in Red Haw State Park started showing decline symptoms in 2016 and currently, many have severe dieback or have succumbed to the beetle. There are several methods of controlling EAB, including insecticides and biological controls, but these methods are only successful when the infestation levels are low and tree decline is still at a minimum. The ash trees in Red Haw State Park are well beyond the point that any control method can be utilized successfully. Park staff will remove infected trees in areas where they pose a risk to visitors or facilities.
- **Other Forest Health Issues** to consider while natural resource planning is being completed include pine decline, bur oak blight, and Thousand Cankers Disease. The stand of white pine near the entrance to the park is showing signs of decline. This is most likely from salt application along the roadway. There is not a large representation of bur oak in Red Haw State Park currently but bur oak blight continues to be an issue statewide. Another disease that area managers will monitor for is Thousand Cankers Disease on black walnut. There are several stands in Red Haw State Park where the majority of the overstory canopy consists of black walnut.

Hazard Tree Management

Hazard trees carry a higher risk of structural failure which could cause property damage or personal injury. To be considered hazardous, a tree must have the following: 1) major structural defect(s) that make it more prone to failure and 2) a nearby target that it could land on such as a park user, building, picnic table, parked car, campsite, bench, high use trail, etc. Park staff will remove hazard trees as soon as feasible once identified. Due to high mortality from EAB, over 200 hazard trees have been removed in 2018.

CURRENT CONDITIONS AT RED HAW STATE PARK

Red Haw State Park has 271 acres that are classified as forest; that is 64% of the park's total 420 acres. To assess the current conditions of the forested acres at Red Haw State Park, data was collected to help describe and classify that resource. Information collected included species of trees (overstory, mid-story, and understory); average tree diameter per stand; regeneration present and species of regeneration; average stocking level per stand; and notes on invasive species, forest health and/or pests and disease issues. This information was entered into a GIS database and analyzed (Figure 2).

Size Class

Size class of the dominant overstory trees can indicate the relative age and successional stage of a stand. This measurement can help understand health, age diversity across the park, habitat capabilities, and assist in identifying potential management recommendations.

At Red Haw State Park, the majority (60%) of the forested acres are in the small sawtimber category (12-14" average dbh). The pole size category makes up about 24% of the forested acres and sawtimber (16"+ dbh) makes up the final 16% (Figure 3).

Size Class	Acres	Percentage
6-10”	64	24 %
12-14”	164	60 %
16”+	43	16 %
Totals	271 Acres	100 %

It is ideal to have an even distribution of size classes across a property; this ensures a diversity of habitat and age classes. There are no stands on the property classified in the 2-4” size class, although there are several areas classified as woody successional. These woody successional areas are typically made up of woody stems less than 1” dbh with thousands of stems per acre. This habitat type is very important to certain species of wildlife, but unfortunately, many of these areas are infested with invasive species. It would be ideal to improve the native plant diversity of these areas while maintaining the high stem count. This could be achieved by the use of prescribed burning or other management practices.

Species Composition

The species composition of the wooded acres reflects the dominant tree species found in the overstory. Here is the breakdown of the species composition of the 271 wooded acres of Red Haw State Park:

Overstory Association	Acres	Percentage
Mixed Upland Hardwoods with Walnut	84	31 %
Oak Associations	142	52 %
Mixed Bottomland Hardwoods with Walnut	42	16 %
Pine	3	1 %
Totals	271 Acres	100 %

The mixed upland hardwood with walnut associations have an overstory that includes a mix of walnut, green ash, elm, mixed oak, along with various other species.

The oak associations group contains stands that have an overstory of mostly oak species. Within this association, some stands are categorized further in the stand descriptions as dominated by red oak, bur oak, oak/elm/ash, or pin oak. These stands were grouped together for the purposes of this classification because they will be managed in a similar manner.

The mixed bottomland hardwoods with walnut associations have an overstory that includes a mix of walnut, cottonwood, silver maple, hackberry, sycamore, green ash, pin oak, and various other species.

Invasive Species Occurrence

As discussed previously, invasive species are a major concern at this park and on most state-owned areas. Virtually every stand in this park has at least one invasive species that was noted in the inventory. Natural resource management recommendations will focus and prioritize controlling invasive species. This will be achieved through several methods including mechanical removal, chemical control, and prescribed burning.

Many of the stands that have heavy infestations of invasive species have a walnut overstory which is not conducive to prescribed burning for a couple of reasons. First, the walnut leaf litter does not typically carry a fire well and second, walnut is a high value commercial species and prescribed fire can damage the tree and dramatically reduce any future value. These stands will have to rely more on mechanical and chemical controls. Any chemical chosen will be applied per label directions and consideration will be given to the lake watershed. In stands where oak is the dominant overstory

species, prescribed fire, along with mechanical removal, will be utilized more frequently. Oaks are fire adapted species and will thrive under a carefully managed burning regime.

MANAGEMENT SYSTEMS

Natural resource management systems are ways of establishing big picture, long-term management goals and objectives that will be placed on stands so that appropriate short-term and long-term management activities can be determined. What follows is a brief description of the management systems that will be used within the park (Figure 4).

Active Management

Activities on the forested stands in this system will involve even-aged management techniques. Forest stand improvement methods will be used to reduce competition, improve species composition, increase tree growth, and/or enhance wildlife values. Harvesting may also be utilized as a regeneration tool when a stand has reached physiological maturity or in stands with forest health issues. Invasive species control will also be utilized in this system.

This system also includes the prairie restoration areas. These areas may be maintained with prescribed burning as well as removal of woody species when necessary.

There are 299 **acres** designated for active management, which equals approximately **71 %** of the park's acres.

Park Development Areas

Park development areas include parking areas, mowed grass, campgrounds, roads, buildings, shelters, park residence, sediment ponds, and the lake. These stands will be maintained as recreation areas with a focus on the park user and aesthetics.

There are **121 acres** of park development areas, which equals approximately **29%** of the total park acres.

MANAGEMENT PRESCRIPTIONS

After stand data was analyzed and resources were considered, a management prescription was written for each stand. The recommendations for Red Haw State Park are primarily focused on invasive species control. Complete eradication of invasive species is not possible, but invasive plants can be controlled to a level where natural ecological processes can be maintained and native plant species can thrive. Although invasive species control is laborious and costly, it is also important to get control of the non-native invasive species before other forest management techniques are applied. Many silvicultural practices, like forest stand improvement, open up the canopy and let more sunlight into the stand. This can cause invasive species issues to worsen. No type of harvest should take place either (unless it's a salvage situation) until invasive species are at controllable levels. This is due to the fact that oak and walnut seedlings are shade intolerant and will not grow under the heavy shade and competition from invasive species.

The following paragraphs describe prescribed management techniques and potential future techniques to be applied to the forest areas of Red Haw State Park.

Invasive Species Control

The primary invasive species present at Red Haw State Park is bush honeysuckle. This woody shrub spreads quickly, especially along forest edges and openings. The invasive species control methods explained here will focus on how to control woody shrubs and trees. Severity of infestation for each stand will be described on a scale High, Medium, and Low.

Invasive species control may include the following methods: mechanical, chemical, and/or prescribed burning. For control of most invasive species (especially woody shrubs and trees), two control methods will have to be utilized in combination (i.e. mechanical followed by chemical). Mechanical methods of removal include brush saws, mowers, chainsaws, and hand tools. Chemical methods can include foliar, cut stump, or basal bark applications of herbicide. Prescribed burning is also a great tool to control woody invasive species as many of them have thin bark and are easily top-killed by fire, especially those less than 2" stump diameter.

Forested stands that have an overstory of mixed hardwoods and walnut will utilize a combination of mechanical and chemical methods as there will not be enough leaf litter to carry a prescribed burn. In these types of stands, two major methods can be utilized: (1) cut stump application of herbicide directly after mechanical removal or (2) mowing followed up by chemical treatment of sprouts. Stands that are predominantly oak can utilize a combination of mechanical removal and prescribed burning. Prescribed burning follow up should be completed soon after mechanical removal (within the next year) to kill any sprouts.

Forest Stand Improvement

Forest stand improvement (FSI) is the silvicultural practice that removes less desirable trees to increase growth of residual trees, improve species composition, decrease competition, and/or improve forest health conditions. FSI is an intermediate thinning treatment typically applied in young or middle-aged stands. There are several types of forest stand improvements that could be utilized at Red Haw State Park including crop tree release, weed tree removal, or basal area thinning.

Crop tree release (CTR) is the method of selecting your desired "crop" trees and removing trees that are in direct competition with that crop tree. Crop tree release is utilized in stands where there may not be uniform size or tree quality spread evenly throughout the stand. The number of crop trees to be released is based on stocking levels and can vary widely. Crop trees must be dominant or co-dominant in the canopy. Other factors for choosing a crop tree include: species, form, health, wildlife value, or timber value. A four-sided release should be utilized in stands with an average stand diameter less than or equal to 10" dbh, with a two- to three-sided release being acceptable in stands with an average stand diameter of more than 10" dbh. Crop trees can be chosen to support various outcomes including, but not limited to, improving habitat, increasing growth and vigor, improving species composition over the stand, decreasing forest health issues, and increasing mast production.

Weed tree removal is useful in stands where there are undesirable species that are present in the stand. This can include non-native, invasive species or native species that are less desirable because of species, health, or canopy position. Weed tree removal can be a useful technique for improving species composition or improving conditions to regenerate desirable species, such as oak.

Basal area thinning is a silvicultural technique that uses the current stocking level of stand to determine the level of thinning needed and spacing between residual trees. Basal area thinning is typically used in stands that are more uniform in species, size, and quality. This thinning method is applied over the whole stand, rather than to individual trees like CTR. This is typically more labor intensive but does apply the practice more evenly throughout the stand.

Prescribed Burning

Prescribed burning is utilizing fire under certain weather conditions, timing, and firing techniques to meet management objectives. Prescribed fire can be utilized in a forest setting to decrease invasive species issues and encourage native species that are fire-adapted. Prescribed fire can also be utilized in prairie restoration to improve the plant diversity, discourage woody species, and invigorate native species. Prescribed burning has been utilized on Red Haw State Park in several areas, with most of the focus thus far being on prairie restoration areas. All prescribed burning on state parks will follow the Iowa DNR Prescribed Fire Policy.

Harvest Methods

The forest areas of Red Haw State Park will be managed under an even-aged management system because the majority of the desirable tree species are shade intolerant species like oak and walnut. There are two main types of harvest methods that are utilized in even-aged management systems - shelterwood harvests and clearcut harvests.

A shelterwood harvest is a multi-stage clearcut and is utilized in stands where regeneration of desirable species is not at an adequate level. The first entry into the stand will remove lower quality, smaller trees to open up the forest floor to more sunlight. The residual trees serve as 'seed' trees and are kept until regeneration of desirable species is at an appropriate level. Then, when adequate regeneration levels have been achieved, the residual trees are cut. There can be several entries into the stand including pre-harvest treatments, post-harvest treatments, and/or multiple commercial cuts before the final cut is completed. These decisions are based on species, competition, seed abundance, among various other factors.

A clearcut harvest removes all the merchantable trees in one entry. This method is utilized where regeneration of desirable species are already at adequate levels. There can also be pre- and post-harvest treatments along with a clearcut. For example, this is often applied to oak forests when oak regeneration exceeds 5,000 seedlings per acre.

Tree Planting

Tree planting can occur for several different reasons in a park like Red Haw. Individual trees can be planted and maintained in the park development areas to beautify and add shade for campsites, picnic areas, shelters, and other recreation areas. Species chosen should be appropriate for the soil and site; diversity should also be a consideration.

Tree planting can also be utilized to help supplement forest management work in forested stands. A method called underplanting can be used in areas where desirable tree species are currently lacking. This is typically done via handplanting. Tree planting can also be coupled with harvest techniques, especially when a salvage harvest takes place and proper regeneration is not present at the time of removal. Tree planting can also occur on open sites where there are not currently trees. This can be utilized to cut back on mowing, increase forested acres, decrease fragmentation, or create habitat.

OTHER MANAGEMENT CONSIDERATIONS

Aesthetics and Recreation

Forest management activities can impact the aesthetics of an area in the short term. Care will be given to stands near high use areas such as the campground, picnic shelters, and along the main roadway to ensure that visual impacts are limited (the individual stands are identified as "high use / visibility" in the stand descriptions). Utilizing signage or hosting forestry field days can assist in educating the public to forest management techniques and their benefits. Along with public outreach, the following measures can minimize negative effects to the aesthetics of the forested areas when completing management near high use areas:

- Slash and brush from harvests, thinning, and/or invasive removal will be cut down to within four feet of the ground and will be removed as quickly as feasible from roadways, trails, and mowed areas.
- Thinning operations should not leave snags, girdled trees, or hangers within striking distance of trails, roads, or infrastructure.
- Stumps from forest stand improvement projects or harvests shall be no higher than six inches.
- Skid trails and landing locations will be strategically placed to minimize visual impact and will be seeded after logging operations end.

Iowa Code

The Iowa Code Title XI Natural Resources Chapter 461A governs the way that any timber sold on state parks must be administered. The 2019 Code of Iowa 461A.31A states "If the estimated quantity of timber grown in a state park or a preserve to be sold by the department in a sixty-day period is ten thousand board feet or more or if the estimated value of the timber grown in a state park or a preserve to be sold by the department during the same period of time is five thousand dollars or more, the department shall conduct a public hearing on the proposed sale. Notice of the hearing shall be published as provided in section 331.305. After the public hearing, the department may proceed with the sale of the timber."

Wildlife Considerations

One of the many reasons the public visits Red Haw State Park is to enjoy interactions with wildlife. Wildlife and bird watching are very popular activities with park visitors. The lake also offers high quality fishing opportunities.

Natural resource management activities such as timber stand improvement, invasive species removal, prescribed burning, timber harvesting, and tree planting can have both beneficial and/or detrimental effects to wildlife. The conscious decision to do 'no management' (i.e., *hands off* management) can also affect wildlife. Such tradeoffs can be hard to quantify and understand due to the complexity of natural ecosystems. Currently, the Iowa Wildlife Action Plan (available at www.iowadnr.gov) identifies 405 Species of Greatest Conservation Need (SGCN) which are species that are rare, threatened, endangered, or declining in numbers in the state. Before any activities described in the plan are implemented, they will be reviewed by DNR Wildlife Diversity and Natural Areas Inventory staff to determine potential impacts to currently listed state and federal threatened and endangered species and those species identified as SGCN in the IWAP. Management activities will not be initiated until the environmental review staff is satisfied that threatened and endangered species will not be negatively impacted. The activities recommended in this plan are meant to optimize the overall diversity and quality of wildlife habitat for both common wildlife species as well as those that are in need of habitat protection and restoration.

The park itself is a game refuge so no public hunting is allowed within the park boundaries. The Red Haw Wildlife Management Area to the south of the park does allow public hunting. This does cause the deer herd within the park to fluctuate depending on the time of year. This is a consideration when planning for tree regeneration or planting.

Threatened, Endangered, and SGCN Flora and Fauna

Lucas County is located within the range of the state- and federally-Endangered Indiana bat (*Myotis sodalis*) and the federally-Threatened Northern long-eared bat (*Myotis septentrionalis*). Forest management actions such as creation and retention of snags and invasive species control (e.g., controlled burns in the forest) can be done to have a potentially beneficial effect for these and other species. However, precautions must be taken to ensure forest management activities do not threaten the potential for habitat of these species. In consideration of these factors, all activities which require tree felling will only be done outside of the summer maternity season, which is defined as April 1 - September 30, where appropriate, trees that have been identified to be killed in forest stand improvement projects will be girdled and left standing to provide beneficial habitat. Trees identified as a potential hazard to visitor safety and exhibiting suitable habitat for the Indiana Bat may be removed outside of the winter hibernation period (after September 30 and before April 1) under certain circumstances. If a suitable tree must be removed outside of the winter period, and time allows (e.g., a nonemergency situation), it should be determined whether the tree is occupied by bats before removal. If one or more bats are observed or heard, then coordinate/consult with the DNR Endangered Species Coordinator. If a hazard tree appears to provide bat roosting habitat and does not pose an imminent danger to human safety or property, then felling should occur during winter (the bat hibernation period) as defined above.

Other protected species that have been reported in Red Haw State Park in the Iowa Natural Areas Database include the barn owl, false loosestrife, multi-flowered mud plantain, and the following butterflies: Henry's elfin, byssus skipper, Melissa blue, regal fritillary, salt and pepper skipper, and wild indigo dusky wing.

Soil and Water Resources

Protection of soil and water resources is of utmost importance. Forest management and timber harvesting activities have the potential to negatively impact these qualities, but with careful timing and best management practices these impacts can be made negligible. Timber harvests and any work involving heavy equipment will only be done during times when the ground is frozen or dry. This prevents compaction of the soil and also protects the fragile herbaceous plants of the forest floor. No logging slash or debris is to be left in streams or flow pathways. Pesticides used for invasive species control will be applied in the appropriate dosage and at the proper time, according to product label. All other considerations and best practices for protecting water and soil resources during forest management activities are discussed in Iowa's Forestry Best Management Practices manual, available online at www.iowadnr.gov.

MAPS

Figure 1. Red Haw State Park stand boundaries and labels (2016 Airphotos).

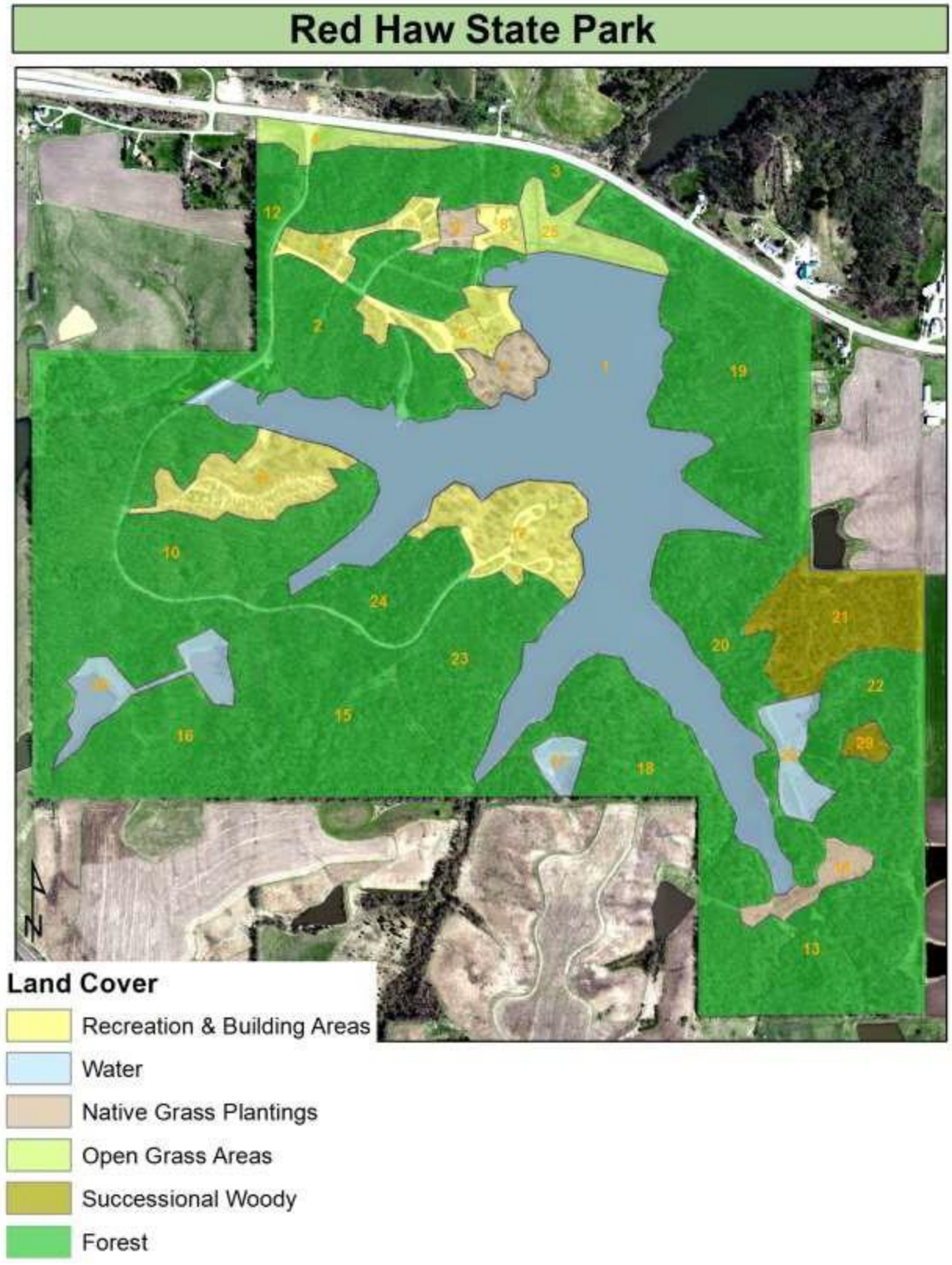


Figure 2. Red Haw State Park current landcover (2016 Airphotos).

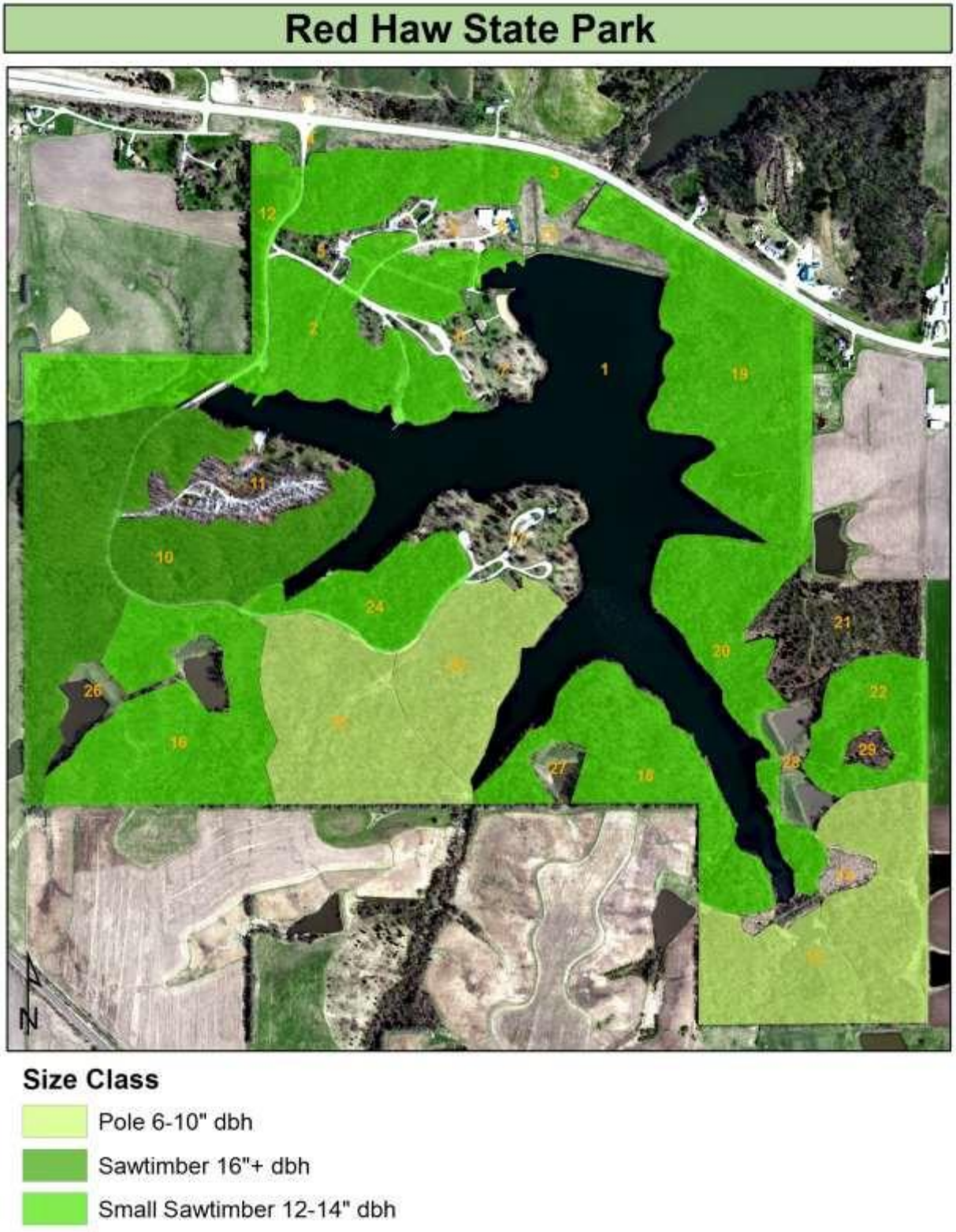


Figure 3. Red Haw State Park size class distribution (2016 Airphotos).

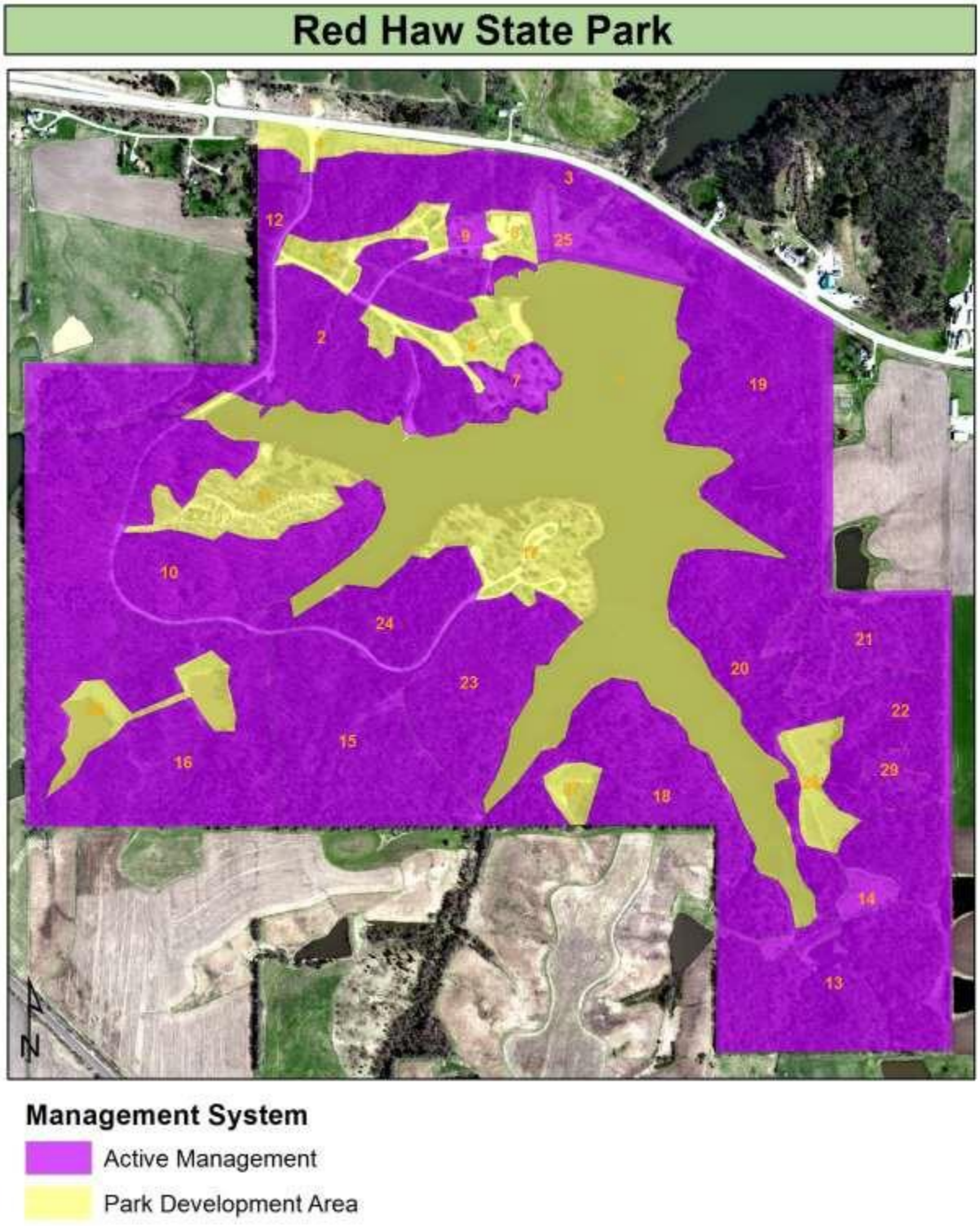


Figure 4. Red Haw State Park management systems (2016 Airphotos).

STAND DESCRIPTIONS & RECOMMENDATIONS

Stand 1: 76 acres

Stand Description: Red Haw Lake
Management System: Park Development Area
Management Objective(s):
Recommendations/Prescriptions: Monitor and maintain water quality and aquatic habitat.

Stand 2: 32 acres

Stand Description: Stand 2 includes high use, wooded areas south and east of the shop and park residence down to the beach and lake shore near the main boat ramp. The Lake Loop Trail meanders through a good portion of this stand and other facilities adjacent to this stand include roads, parking areas, the Ranger shelter, two pit latrines, as well as the beach area and beach house. The overstory is mostly black walnut and green ash with scattered red oak, honeylocust, and cottonwood. There is a small area of bigtooth aspen near the boat ramp. Midstory species include redbud, green ash, Osage orange, wild plum, and mulberry. There are several invasive species present in this stand: bush honeysuckle, autumn olive, black locust, garlic mustard, and multiflora rose. The bush honeysuckle is medium-high in severity. Park staff began honeysuckle control south of the residence in the early 2000s. The green ash in this stand are rapidly declining from EAB. *HIGH USE/VISABILITY AREA*
Avg. DBH: 12”
BA: 80 sq. ft. / ac
Stocking: 65%
Management System: Active Management
Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics.
Recommendations/Prescriptions: Continue invasive species control through mechanical and chemical means. This is a medium-high priority area as it is highly visible because it is near the park entrance and has several recreational facilities adjacent to it. Once the honeysuckle is at a controllable level, reevaluate for walnut release.

Stand 3: 15 acres

Stand Description: This stand includes the wooded area north of the shop and park residence. The overstory is black walnut and green ash with pockets of black locust. There are several high quality sawlog black walnut trees in this stand. Midstory species include redbud, green ash, and hackberry. There are several invasive species present in this stand: bush honeysuckle, autumn olive, and black locust. The bush honeysuckle is medium-high in severity. The ash are declining from EAB. *HIGH USE/VISABILITY AREA*
Avg. DBH: 12”
BA: 90 sq. ft. / ac
Stocking: 75%
Management System: Active Management
Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics.
Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium-high priority area as it is highly visible because of its proximity to the highway and park entrance. Once the honeysuckle is at a controllable level, re-evaluate for walnut release.

Stand 4: 3 acres

Stand Description: Open grassy area, park entrance sign.
Management System: Park Development Area
Management Objective(s): Keep open for sign visibility and for safety.
Recommendations/Prescriptions: Monitor for invasive species. Continue to maintain with mowing or plant to native grasses and forbs to create pollinator habitat and improve aesthetics.

Stand 5: 4 acres

Stand Description: Park residence, shop, YACC (Young Adult Conservation Corps) bunk house/research lab, bulk fuel tanks, and storage.
Management System: Park Development Area

Management Objective(s):
Recommendations/Prescriptions: Maintain with mowing and monitor health of landscape trees and shrubs.

Stand 6: 5 acres
Stand Description: Beach Shelter, beach, pit latrines, and parking areas.
Management System: Park Development Area
Management Objective(s):
Recommendations/Prescriptions: Maintain with mowing and monitor health of landscape trees.

Stand 7: 3 acres
Stand Description: Prairie restoration area with osprey tower. This stand is south of the beach area and west of the Youth Shelter. There are several scattered trees in the stand that include honeylocust, silver maple, oak, hackberry, Osage orange, and redbud. There is also scattered honeysuckle. In 2010 a prairie seeding was completed on the site. Prescribed burns were completed in spring 2014 and fall 2017. An area east of the Beach Shelter was frost-seeded in 2018 with a pollinator seed mix. *HIGH USE/VISABILITY AREA*
Management System: Active Management
Management Objective(s): To increase native forb and grass diversity, improve habitat for pollinators, and discourage invasive species and woody species from encroaching.
Recommendations/Prescriptions: Use prescribed fire at regular intervals (every 3-5 years) to encourage native species and discourage woody and invasive plants. Monitor species composition and utilize native seed mixes to increase diversity if necessary.

Stand 8: 2 acres
Stand Description: Research Station and shops.
Management System: Park Development Area
Management Objective(s):
Recommendations/Prescriptions: Maintain with mowing and monitor health of landscape trees.

Stand 9: 1.5 acres
Stand Description: Small but diverse prairie restoration area near the research station. This prairie was burned in 2012 and 2014. There is some honeysuckle and other woody species starting to encroach. *HIGH USE/VISABILITY AREA*
Management System: Active Management
Management Objective(s): To increase native forb and grass diversity, improve habitat for pollinators, and discourage invasive species and woody species from encroaching.
Recommendations/Prescriptions: Use prescribed fire at regular intervals (every 3-5 years) to encourage native species and discourage woody and invasive plants. Monitor species composition and utilize native seed mixes to increase diversity if necessary. Use caution when burning as there is a utility pole nearby.

Stand 10: 43 acres
Stand Description: This stand includes the wooded area surrounding the campground. The overstory is mature red oak and ash with a few bur oaks. A small portion along the lake shore also has mature sycamore, silver maple, and scattered walnut. Midstory species include redbud, mulberry, hackberry, and elm. There is very little oak regeneration present due to heavy shade. This is a concern due to the health, overstocking, and the age of the red oak. There are several invasive species present in this stand: bush honeysuckle, black locust, garlic mustard, and multiflora rose. The bush honeysuckle is low-medium in severity. The ash are declining from EAB. There is some evidence of oak wilt in the red oak west of the main roadway. Several red oak and ash have been removed as hazard trees from this stand along the roadway. The Lake Loop Trail winds through this stand. *HIGH USE/VISABILITY AREA*
Avg. DBH: 16”
BA: 160 sq. ft. / ac
Stocking: >110%
Management System: Active Management
Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Improve conditions for

oak to regenerate.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium-high priority area as it is highly visible because of its proximity to the campground. The use of prescribed burning could improve the conditions for oak regeneration and control invasive species, use at a 1-5 year interval. This stand should be monitored closely for oak wilt as the majority of the canopy is red oak. Once invasive species are at a controllable level, re- evaluate for pre-harvest treatment and shelterwood harvest or commercial thinning.

Stand 11: 9 acres

Stand Description: Campground, shower house, playground, boat ramp, latrine, check-in station, parking area, and open grassy hill with trees along lakeshore.

Management System: Park Development Area

Management Objective(s):

Recommendations/Prescriptions: Monitor the red oak closely for disease, remove risk trees when necessary, and maintain with mowing. Could seed a portion of the hill to native grasses and forbs to reduce mowing and add habitat.

Stand 12: 3.5 acres

Stand Description: This is a white pine stand along the west side of the road near the entrance to the park. The mid-story contains redbud, mulberry, ash, hackberry, and elm. There is honeysuckle present. The white pine is declining along the roadway, probably due to salt application during the winter. Park staff completed honeysuckle control projects in this stand in 2016 and 2018. *HIGH USE/VISABILITY AREA*

Avg. DBH: 14”

BA: 200 sq. ft. / ac

Stocking: 80%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Maintain health of stand.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium to high priority due to its proximity to the entrance. Monitor for insect and disease issues.

Stand 13: 28 acres

Stand Description: This is a mixed upland hardwood stand on the southeast corner of the park. The overstory includes mixed oak, ash, elm, honeylocust, Osage orange, and walnut. The area is very shrubby with a heavy infestation of honeysuckle. There is also autumn olive, multiflora rose, and prickly ash. Midstory includes redbud, hawthorn, and dogwood.

Avg. DBH: 6”

BA: 80 sq. ft. / ac

Stocking: 80%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Improve conditions for oak to regenerate and encourage mast-producing species.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium-low priority area. The use of prescribed burning could improve the conditions for oak and help to control the invasive species. Once the invasive species are at a controllable level, re-evaluate for crop tree release with a focus on mast-producing species. If prescribed burning is utilized, implement a 1-5 year interval.

Stand 14: 3 acres

Stand Description: Open prairie areas and sediment dam. These two small prairie areas are quite diverse. A prescribed burn was completed on the east side in 2016. There is a small patch of lespedeza and teasel that will need to be eradicated. Along the dam, there are many woody shrubby species, including wild plum and hazelnut. These woody species are beneficial for wildlife.

Management System: Active Management

Management Objective(s): To increase native forb and grass diversity, improve habitat for pollinators, and discourage invasive species and woody species from encroaching.

Recommendations/Prescriptions: Use prescribed fire at regular intervals (every 3-5 years) to encourage native species and discourage woody and invasive plants. Use chemical controls to eradicate the lespedeza and teasel.

Stand 15: 21 acres

Stand Description: This stand has an overstory of pole size walnut, elm, and honeylocust with scattered open areas containing walnut, cottonwood, hawthorn, raspberry, and redbud. There are also several small old plantations of sycamore, mixed conifers and other species that were originally planted as a nursery to grow trees for use in the park. The stand does have prickly ash, autumn olive, black locust, and multiflora rose. The stand is south of the road and surrounds the area of the "bone yard." A recreational trail makes up the eastern boundary of the stand. *HIGH USE/VISABILITY AREA*

Avg. DBH: 8"

BA: 90 sq. ft. / ac

Stocking: 85%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Maintain openings for wildlife and encourage hawthorn and raspberry.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium priority area. Once the invasive species are at an acceptable level, re-evaluate for crop tree release.

Stand 16: 25 acres

Stand Description: This stand has an overstory of large scattered bur oak, red oak, and walnut. The midstory contains redbud, scattered hawthorn, and hackberry. There is also honeysuckle, black locust, and Japanese barberry in this stand. Old records indicate that a timber stand improvement project was completed on the walnut in 1988. Many of those crop trees may have been removed during the construction of the sediment ponds. *HIGH USE/VISABILITY AREA*

Avg. DBH: 12"

BA: 80 sq. ft. / ac

Stocking: 65%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Encourage oak regeneration.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a high priority area. Utilize prescribed burning at a 1-5 year interval to encourage oak and control invasive species.

Stand 17: 10 acres

Stand Description: Youth Shelter, Stone Shelter, parking, and scattered trees in grassy opening. Low infestations of honeysuckle and autumn olive. A mix of native grasses and forbs was seeded west of the Youth Shelter in 2010.

Management System: Park Development Area

Management Objective(s):

Recommendations/Prescriptions: Maintain as a PDA by mowing or seed to native grasses and forbs.

Stand 18: 20 acres

Stand Description: This stand has an overstory of pin oak, walnut, hackberry, red oak, ash, honeylocust, basswood, and mulberry. The midstory is elm, dogwood, hawthorn, redbud, hackberry, and hazelnut (along trail). There is honeysuckle, multiflora rose, black locust, and prickly ash present in the stand. The Lake Loop Trail and lake shore make up the west, north, and east boundary of the stand. Honeysuckle removal was started in 2013.

Avg. DBH: 14"

BA: 100 sq. ft. / ac

Stocking: 80%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Encourage oak

regeneration and mast producing species.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium to high priority area. Utilize prescribed burning at a 1-5 year interval to encourage oak regeneration and control invasive species. After invasive species are under control, re-evaluate for crop tree release.

Stand 19: 32 acres

Stand Description: This stand runs north of the lake dam, along Highway 34, and makes up a large portion of the northeast side of the park. The Lake Loop Trail runs through the stand. The overstory is walnut, ash, honeylocust, few pin oak, and basswood. North of the dam also includes large cottonwood and silver maple. Midstory species include redbud, hackberry, elm, and mulberry. The walnuts on top of the ridge are starting to decline. This decline is most likely from the walnut growing on an upland site. There are several invasive species in this stand including honeysuckle (medium to high severity), prickly ash, multiflora rose, garlic mustard, and autumn olive. Records show that a walnut thinning was competed in 1988 in this stand.

Avg. DBH: 12”

BA: 70 sq. ft. / ac

Stocking: 60%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium to high priority area. After invasive species are under control, re- evaluate for crop tree release of walnut and any scattered oak.

Stand 20: 16 acres

Stand Description: This stand has an overstory of pin oak, walnut, hackberry, Osage orange, honeylocust, basswood, and cottonwood. The midstory is redbud, pin oak, mulberry, hackberry, elm, and ash. Invasive species in this stand include honeysuckle (medium to high severity), multiflora rose, Japanese barberry, and vinca vine (near bench along lake shore). The Lake Loop Trail winds through this stand. There are large pin oaks in this stand along with several nice pole size pin oaks as well.

Avg. DBH: 12”

BA: 90 sq. ft. / ac

Stocking: 75%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Encourage oak regeneration and mast producing species.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium to high priority area. Prescribed burning could be utilized on this stand at an interval of 1-5 years but this stand does have scattered, good quality walnut stems so only utilize prescribed fire to control invasive species if necessary.

Stand 21: 13 acres

Stand Description: This area is a brushy opening with some native species and non-native, invasive species present. Invasive species present include Japanese barberry, autumn olive, and honeysuckle (medium to high severity). There are also some native grasses and forbs found in the openings. The area was cleared with a forestry mower in 2012, a prescribed burn was completed in 2016, and more brush removal was completed in 2017. The Lake Loop Trail bisects this stand.

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics.

Recommendations/Prescriptions: Implement invasive species control through mechanical means along with prescribed burning at a 1-5 year interval. This is a medium to high priority area. Maintain this area as woody successional habitat with frequent use of prescribed fire and/or regular removal of woody stems over 2” dbh.

Stand 22: 10 acres

Stand Description: This stand has an overstory of large pin oak, cottonwood, and hackberry. The midstory includes elm, Osage orange, pin oak, ash, hackberry, and mulberry. There is multiflora rose, prickly ash, and honeysuckle present in low densities in the stand. The Lake Loop Trail meanders through the edge of this stand.

Avg. DBH: 14"

BA: 80 sq. ft. / ac

Stocking: 60%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Encourage oak and mast producing species.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium to high priority area. Utilize prescribed burning to encourage oak on this stand. Re-evaluate for crop tree release once invasive species are under control.

Stand 23: 15 acres

Stand Description: This stand is south of the stone shelter area and has the Lake Loop Trail along its west and south boundary. The overstory is walnut, hackberry, pin oak, ash, cottonwood, honeylocust, and mulberry. The midstory is redbud, Osage orange, elm and mulberry. The honeysuckle infestation is medium to low and there is multiflora rose present as well. There are high quality walnut and pin oak stems in this stand. *HIGH USE/VISABILITY AREA*

Avg. DBH: 10"

BA: 90 sq. ft. / ac

Stocking: 80%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Encourage oak and mast producing species.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium to high priority area. Re-evaluate for crop tree release once invasive species are under control. Crop tree release should focus on oak and walnut stems.

Stand 24: 10 acres

Stand Description: This stand is north of the roadway and west of the stone shelter area. The Lake Loop Trail runs through the north side of the stand. The overstory is walnut, hackberry, mulberry, pin oak, cottonwood, ash, honeylocust, and elm. The midstory is redbud, mulberry, black cherry, and fragrant sumac. There are several invasive species present in this stand: honeysuckle (medium to high density), autumn olive, and black locust. *HIGH USE/VISABILITY AREA*

Avg. DBH: 12"

BA: 80 sq. ft. / ac

Stocking: 65%

Management System: Active Management

Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics. Encourage oak and hard mast producing species.

Recommendations/Prescriptions: Implement invasive species control through mechanical and chemical means. This is a medium to high priority area. Re-evaluate for crop tree release once invasive species are under control.

Stand 25: 5 acres

Stand Description: Red Haw Lake dam.

Management System: Park Development Area

Management Objective(s):

Recommendations/Prescriptions: Maintain with mowing to discourage woody and non-native species on the dam or seed with native grasses and forbs and maintain with prescribed fire.

Stand 26: 6 acres

Stand Description: Sediment ponds built in 2014.

Management System: Park Development Area
Management Objective(s):
Recommendations/Prescriptions: Keep woody and non-native species off dams.

Stand 27: 6 acres
Stand Description: Sediment pond built in 2014.
Management System: Park Development Area
Management Objective(s):
Recommendations/Prescriptions: Keep woody and non-native species off dam.

Stand 28: 4 acres
Stand Description: Sediment ponds built in 2014.
Management System: Park Development Area
Management Objective(s):
Recommendations/Prescriptions: Keep woody and non-native species off dams.

Stand 29: 1 acres
Stand Description: This area is a brushy opening with some native species (elm, sumac, cedar, and oak) and non-native, invasive species present. Invasive species present include autumn olive and honeysuckle (medium to high severity). There are also some native grasses and forbs found in the opening. The area was cleared with a forestry mower in 2012. The Lake Loop Trail runs along the western edge of this opening.
Management System: Active Management
Management Objective(s): Control invasive species to improve wildlife habitat and aesthetics.
Recommendations/Prescriptions: Implement invasive species control through mechanical means along with prescribed burning at regular intervals (3-5 years). This is a medium priority area.

APPENDIX

Proposed Project Schedule

Stand	Acres	Description	Management System	Management Prescription	Year
9	1.5	Prairie (Research Station)	Active	Prescribed Burning	2020
29	1	Brushy opening	Active	Prescribed Burning	2020
14	3	Prairie (south end)	Active	Prescribed Burning	2020
10	43	Red Oak (near campground)	Active	Invasive Species Removal	2020-2021
7	3	Prairie (beach point)	Active	Prescribed Burning	2021
21	13	Successional Woody (east side)	Active	Prescribed Burning	2021
10	43	Red Oak (near campground)	Active	Prescribed Burning	2022
12	3.5	White Pine	Active	Invasive Species Removal	2022
21	13	Successional Woody (east side)	Active	Invasive Species Removal	2022
16	25	Bur Oak (southwest corner)	Active	Invasive Species Removal	2022-2023
9	1.5	Prairie (Research Station)	Active	Prescribed Burning	2024
29	1	Brushy opening	Active	Prescribed Burning	2024
14	3	Prairie (south end)	Active	Prescribed Burning	2024
3	15	Walnut (along highway)	Active	Invasive Species Removal	2024
16	25	Bur Oak (southwest corner)	Active	Prescribed Burning	2024
2	32	Walnut (south of residence)	Active	Invasive Species Removal	2024-2025
7	3	Prairie (beach point)	Active	Prescribed Burning	2025
21	13	Successional Woody (east side)	Active	Prescribed Burning	2026

Stand	Acres	Description	Management System	Management Prescription	Year
18	20	Mixed Hardwoods (south central)	Active	Invasive Species Removal	2026
10	43	Red Oak (near campground)	Active	Prescribed Burning	2027
20	16	Pin Oak (east side)	Active	Invasive Species Removal	2027
18	20	Mixed Hardwoods (south central)	Active	Prescribed Burning	2028
9	1.5	Prairie (Research Station)	Active	Prescribed Burning	2028
29	1	Brushy opening	Active	Prescribed Burning	2028
14	3	Prairie (south end)	Active	Prescribed Burning	2028
22	10	Pin Oak (southeast side)	Active	Invasive Species Removal	2028
24	10	Walnut (west of Stone Shelter)	Active	Invasive Species Removal	2028
16	25	Bur Oak (southwest corner)	Active	Prescribed Burning	2029
7	3	Prairie (beach point)	Active	Prescribed Burning	2029
23	15	Walnut (south of Stone Shelter)	Active	Invasive Species Removal	2029
19	32	Mixed hardwoods (northeast corner)	Active	Invasive Species Removal	2029-2030
22	10	Pin Oak (southeast side)	Active	Prescribed Burning	2030
21	13	Successional Woody (east side)	Active	Prescribed Burning	2031
15	21	Old plantation site	Active	Invasive Species Removal	2031
9	1.5	Prairie (Research Station)	Active	Prescribed Burning	2032
29	1	Brushy opening	Active	Prescribed Burning	2032
14	3	Prairie (south end)	Active	Prescribed Burning	2032
10	43	Red Oak (near campground)	Active	Prescribed Burning	2032
13	28	Mixed hardwoods (south end)	Active	Invasive Species Removal	2032-2033
18	20	Mixed Hardwoods (south central)	Active	Prescribed Burning	2033
7	3	Prairie (beach point)	Active	Prescribed Burning	2034
13	28	Mixed hardwoods (south end)	Active	Prescribed Burning	2034
10	43	Red Oak (campground)	Active	Re-assess for thinning or shelterwood	2034-2035
16	25	Bur Oak (southwest corner)	Active	Prescribed Burning	2035
22	10	Pin Oak (southeast side)	Active	Prescribed Burning	2035

Glossary

Acre: An area of land containing 43,560 square feet.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Early successional forest: The forest community that develops immediately following the removal or destruction of vegetation in an area. Plant succession is the progression of plants from bare ground (e.g., after a forest fire or timber harvest) to mature forest. Early succession forests commonly depend on and develop first following disturbance events. Each stage of succession provides different benefits for a variety of species.

Endangered species: A plant or animal species that is threatened with extinction throughout all, or a significant portion, of its native range.

Even-aged stand: A stand of trees composed of a single age class.

Forest: A forest is an ecosystem, an association of plants and animals. Trees are its dominant feature. They provide many benefits including habitat, water quality improvement, recreation, climatic amelioration and wood products. The plants and animals that make up a forest are inter-dependent and often essential to its integrity.

Forester: A professional engaged in the science and profession of forestry; foresters are commonly accredited by states or other certifying bodies (e.g., the Society of American Foresters) and may be licensed, certified or registered indicating specific education and abilities.

Forest cover: All trees and other plants occupying the space in a forest, including any ground cover.

Forest inventory: A set of objective sampling methods designed to quantify the spatial distribution, composition and rates of change of forest parameters within specified levels of precision for the purposes of management.

Forest management: The practical application of biological, physical, quantitative, managerial, economic, social and policy principles to the regeneration, management, utilization and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest. Forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products and other forest resource values.

Forest stand: A stand may loosely be defined as a contiguous group of trees sufficiently uniform in species composition, arrangement of age classes and general condition to be a homogeneous and distinguishable unit. A stand is usually treated as a basic silvicultural unit, but it seldom represents a natural ecological unit. Its composition and structure are most strongly affected by management, other disturbances and chance factors affecting seed distribution, germination and seedling survival.

Forest Stand Improvement (FSI): A practice in which the quality of a residual forest stand is improved by removing less desirable trees to achieve the desired stocking of the best quality trees or to improve the reproduction, composition, structure, condition and / or volume growth of a stand.

Fully-stocked stand: A forest stand in which all growing space is effectively occupied but having ample space for development of crop trees.

Geographic Information System (GIS): Computer software used to manipulate, analyze and visually display inventory

and other data.

Group selection: A process of harvesting patches of selected trees to create openings in the forest canopy and to encourage reproduction of uneven-aged stands.

Hardwood: Hardwoods are generally defined as the woods of deciduous trees (i.e., trees which shed their leaves in the winter).

Management goals: Overall purpose for managing the composition and structure of forest land. For example: to protect land from erosion, to maintain wildlife habitat, to control insect and disease outbreaks, etc.

Management plan: A plan outlining the objectives for individual management units and describing steps for achieving them. Silvicultural procedures are identified in broad terms, but detailed prescriptions are developed in the field.

Mast: Nuts, seeds, catkins, flower buds and fruits of woody plants that provide food for wildlife.

Mature tree: A tree that has reached the desired size or age for its intended use. Size or age will vary considerably depending on the species, intended uses and site conditions.

Merchantable timber: Trees or stands having the size, quality and condition suitable for marketing under a given economic condition.

Midstory: The shorter vegetation (shrubs, seedlings, saplings, small trees) within a forest stand that forms a layer between the overstory and the herbaceous plants of the forest floor.

Multiple use: Using and managing a forested area to provide more than one benefit simultaneously. Common uses may include wildlife, timber, recreation and improvement of water quality.

Native plant community: A group of native plants that interact with each other and with its environment in ways not greatly altered by modern human activity or by introduced organisms. Native plants communities are classified and described by physiognomy, hydrology, landforms, soils and natural disturbance regimes (e.g., wild fires, wind storms, normal flood cycles).

Natural disturbances: Disruption of existing conditions by natural events such as wildfires, windstorms, droughts, flooding, insects and disease.

Natural regeneration: The growth of new trees from one of the following ways: (a) seeds naturally dropped from trees or carried by wind or animals, (b) seeds stored on the forest floor or (c) stumps that sprout or roots that sucker.

Non-forest land: Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses such as crops, pasture, residential areas, city parks, improved roads and power line clearings.

Non-game species: Non-game species include amphibians, reptiles, and those mammal and bird species that are not hunted or trapped.

Overstory: The canopy in a stand of trees.

Plantation: A stand composed primarily of trees established by planting or artificial seeding.

Pole or pole timber: A young tree or stand of young trees between 4 inches and 10 inches dbh.

Prairie: An extensive tract of level or rolling land that was originally treeless and grass covered. A prairie is generally characterized by deep fertile soil and regular disturbance, usually by fire.

Prescribed burn: To deliberately burn wild lands in either their natural or their modified state under specified environmental conditions, which allows the fire to be confined to a predetermine area and produces the intensity and spread required to attain planned resource management objectives.

Pruning: The practice of removing tree limbs so that a straight bole, free of limbs, will develop. Pruning can be a component of FSI.

Recreation: Leisure activities involving the enjoyment and use of natural resources.

Recreation facility: The improvements within a developed recreation site offered for visitor's enjoyment.

Regeneration: The act of renewing tree cover by establishing generation usually maintaining the same forest type forest that was removed. Regeneration may be artificial (direct seeding or planting) or natural (natural seeding or planting).

Release (release operation): A treatment designed to free young trees from undesirable, usually over-topping, competing vegetation.

Restoration: A new planting of seedlings, direct seeding or regeneration of roots. This creates new habitat that will be of higher quality for wildlife.

Riparian: Related to, living or located in conjunction with a wetland, river, stream or lake.

Rotation age: The period of years between when a forest stand is established and when it receives its final harvest. This time period is an administrative decision based on economics, site conditions, growth rates and other factors.

Salvage cut: A harvest made to remove trees killed or damaged by fire, wind, insects, disease, or other agents. The purpose of salvage cuts is to use available wood fiber before further deterioration occurs to recover value that otherwise would be lost.

Sanitation cut: A cutting made to remove trees killed or injured by fire, insects, disease or other injurious agents (and sometimes trees susceptible to such injuries).

Sapling: A young tree larger than a seeding but smaller than a pole (dbh < 3.5 inches).

Saw log: A log large enough to produce lumber or other products that can be sawed. Its size and quality vary with the utilization practices of the region.

Sawtimber: Trees that yield logs suitable in size and quality for the production of lumber.

Seedling: In forestry the term usually used to refer to young trees that have grown beyond the stage where they have just emerged from the soil up to the point that they become saplings.

Seed tree: Any tree that bears seed; specifically, a tree left standing to provide the seed for natural regeneration.

Selective harvest: Removal of single scattered trees or small groups of trees at relatively short intervals. The continuous establishment of reproduction is encouraged and an all-aged stand is maintained. A management option used for shade-tolerant species.

Selection harvest: A method of harvesting whereby individual trees are selected for harvest. A characteristic is that the form and appearance of the forest is maintained and the site is not exposed to sunlight and weathering. This scheme favors a tree species which tolerate shading such as maple and basswood.

Shade tolerance: Relative ability of a tree species to reproduce and grow under shade. The capacity to withstand low-light intensities caused by shading from surrounding vegetation.

Shelterwood harvest: A harvest cutting in which trees in the harvest area are removed in a series of two or more cuttings to allow the establishment and early growth of new seedlings under partial shade and protection of older trees. This method is used to regenerate shade intolerant species and produces an even- aged forest.

Snag: A snag tree is a dead tree; commonly a tall, limbless tree. Though of little or no commercial value, they are a very valuable wildlife resource.

Softwood: Generally considered to be the wood of conifers.

Stand: A contiguous group of trees similar in age, species composition, structure and growing on a site of similar quality. One stand will usually have characteristics that will distinguish it from other stands. Differences could include species, average diameter, density, management, and/or location.

Succession: The natural replacement, over time, of one plant community with another.

Suppressed: The condition of a tree characterized by low growth rate and low vigor due to competition from overtopping trees or shrubs.

Sustainability: Protecting and restoring he natural environment while enhancing economic opportunity and community well-being. Sustainability addresses three related elements: the environment, the economy and the community. The goal is to maintain all three elements in a healthy state indefinitely. Meeting the needs of the present without compromising the ability of future generations to meet their needs.

Thinning: A silvicultural treatment made to reduce the density of trees within a forest stand; primarily used to improve growth, enhance forest health or recover potential mortality. *Row thinning* is where selected rows are harvested, usually the first thinning, which provides equipment operating room for future selective thinning. *Selective thinning* is where individual trees are marked or specified (e.g., by diameter, spacing, or quality) for harvest. *Commercial thinning* is thinning after the trees are of merchantable size for timber markets. *Pre-commercial thinning* is done before the trees reach merchantable size, usually done in overstocked stands to provide more growing space for crop trees.

Threatened species: A plant or animal species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its native range.

Tolerance (shade tolerance): A plant's ability to tolerate conditions under a forest canopy. Normally thought of as tolerance to low light conditions, but other understory conditions, such as root competition for water and nutrients, are also factors.

Under plant: The planting of seedlings under an existing canopy or overstory.

Under-stocked: A stand of trees so widely spaced that even with full growth potential realized, crown closure will not occur.

Uneven-aged stand: A stand with trees of three or more distinct age classes, either mixed or in small groups.

Volume: Refers to the amount of wood in a tree or log. Expressed as board feet, cords or other measures.

Woody Successional: A type of early successional habitat; typically shrub thickets or young forest. Without management will eventually transition to forest.

MSIM Information

Species Identified at Red Haw State Park during Multiple Species Inventory Monitoring (MSIM).

Taxa	Scientific Name	Common Name
Bird	*Calidris melanotos*	Pectoral sandpiper
Bird	*Catharus guttatus*	Hermit thrush
Bird	*Empidonax traillii*	Willow flycatcher
Bird	*Meleagris gallopavo*	Wild turkey
Bird	*Pheucticus ludovicianus*	Rose-breasted grosbeak
Bird	*Cyanocitta cristata*	Blue jay
Bird	*Chaetura pelagica*	Chimney swift
Bird	*Melospiza melodia*	Song sparrow
Bird	*Eremophila alpestris*	Horned lark
Bird	*Calidris minutilla*	Least sandpiper
Bird	*Pooecetes gramineus*	Vesper sparrow
Bird	*Dendroica striata*	Blackpoll warbler
Bird	*Unknown Bird*	Unknown Bird Sp.
Bird	*Anas crecca*	Green-winged teal
Bird	*Columba livia*	Rock pigeon
Bird	*Accipiter cooperii*	Cooper's hawk
Bird	*Vireo bellii*	Bell's vireo
Bird	*Passer domesticus*	House sparrow
Bird	*Aythya affinis*	Lesser scaup
Bird	*Ammodramus savannarum*	Grasshopper sparrow
Bird	*Setophaga ruticilla*	American redstart
Bird	*Phalacrocorax auritus*	Double-crested cormorant
Bird	*Vireo olivaceus*	Red-eyed vireo
Bird	*Mimus polyglottos*	Northern mockingbird
Bird	*Bombycilla cedrorum*	Cedar waxwing
Bird	*Lanius excubitor*	Northern shrike
Bird	*Riparia riparia*	Bank swallow
Bird	*Sturnella neglecta*	Western meadowlark
Bird	*Dendroica dominica*	Yellow-throated warbler
Bird	*Accipiter striatus*	Sharp-shinned hawk
Bird	*Dendroica petechia*	Yellow warbler
Bird	*Dendroica palmarum*	Palm warbler
Bird	*Butorides virescens*	Green heron
Bird	*Passerella iliaca*	Fox sparrow
Bird	*Buteo platypterus*	Broad-winged hawk
Bird	*Anas discors*	Blue-winged teal
Bird	*Carpodacus mexicanus*	House finch

Taxa	Scientific Name	Common Name
Bird	*Ardea herodias*	Great blue heron
Bird	*Sturnella sp.*	Unknown Meadowlark
Bird	*Unknown Swallow*	Unknown Swallow
Bird	*Anas platyrhynchos*	Mallard
Bird	*Aythya collaris*	Ring-necked duck
Bird	*Agelaius phoeniceus*	Red-winged blackbird
Bird	*Ceryle alcyon*	Belted kingfisher
Bird	*Strix varia*	Barred owl
Bird	*Colaptes auratus*	Northern flicker
Bird	*Pelecanus erythrorhynchos*	American white pelican
Bird	*Cardinalis cardinalis*	Northern cardinal
Bird	*Picoides pubescens*	Downy woodpecker
Bird	*Quiscalus quiscula*	Common grackle
Bird	*Anas strepera*	Gadwall
Bird	*Junco hyemalis*	Dark-eyed junco
Bird	*Haliaeetus leucocephalus*	Bald eagle
Bird	*Archilochus colubris*	Ruby-throated hummingbird
Bird	*Anas clypeata*	Northern shoveler
Bird	*Thryothorus ludovicianus*	Carolina wren
Bird	*Charadrius vociferus*	Killdeer
Bird	*Seiurus*	Northern waterthrush
	noveboracensis	
Bird	*Parus atricapillus*	Black-capped chickadee
Bird	*Unknown Shorebird*	Unknown Shorebird
Bird	*Scolopax minor*	American woodcock
Bird	*Dumetella carolinensis*	Gray catbird
Bird	*Zonotrichia leucophrys*	White-crowned sparrow
Bird	*Empidonax sp.*	Unknown Empidonax Species
Bird	*Unknown Woodpecker*	Unknown Woodpecker Sp.
Bird	*Calcarius pictus*	Smith's longspur
Bird	*Hirundo rustica*	Barn swallow
Bird	*Picoides villosus*	Hairy woodpecker
Bird	*Sitta carolinensis*	White-breasted nuthatch

Taxa	Scientific Name	Common Name
Bird	*Buteo jamaicensis*	Red-tailed hawk
Bird	*Aquila chrysaetos*	Golden eagle
Bird	*Melospiza lincolnii*	Lincoln's sparrow
Bird	*Pandion haliaetus*	Osprey
Bird	*Melanerpes erythrocephalus*	Red-headed woodpecker
Bird	*Tyrannus tyrannus*	Eastern kingbird
Bird	*Empidonax minimus*	Least flycatcher
Bird	*Null Data*	Null Data
Bird	*Sayornis phoebe*	Eastern phoebe
Bird	*Tachycineta bicolor*	Tree swallow
Bird	*Colinus virginianus*	Northern bobwhite
Bird	*Larus delawarensis*	Ring-billed gull
Bird	*Stelgidopteryx serripennis*	N. Rough-winged swallow
Bird	*Carduelis tristis*	American goldfinch
Bird	*Cistothorus palustris*	Marsh wren
Bird	*Zonotrichia albicollis*	White-throated sparrow
Bird	*Anser caerulescens*	Snow goose
Bird	*Passerina cyanea*	Indigo bunting
Bird	*Sturnus vulgaris*	European starling
Bird	*Branta canadensis*	Canada goose
Bird	*Fulica americana*	American coot
Bird	*Spizella arborea*	American tree sparrow
Bird	*Euphagus carolinus*	Rusty blackbird
Bird	*Toxostoma rufum*	Brown thrasher
Bird	*Icterus galbula*	Baltimore oriole
Bird	*Anas cyanoptera*	Cinnamon teal
Bird	*Spizella passerina*	Chipping sparrow
Bird	*Larus pipixcan*	Franklin's gull
Bird	*Sturnella magna*	Eastern meadowlark
Bird	*Podilymbus podiceps*	Pied-billed grebe
Bird	*Circus cyaneus*	Northern harrier
Bird	*Molothrus ater*	Brown-headed cowbird
Bird	*Falco sparverius*	American kestrel
Bird	*Gavia immer*	Common loon
Bird	*Troglodytes aedon*	House wren
Bird	*Geothlypis trichas*	Common yellowthroat
Bird	*Bucephala albeola*	Bufflehead

Taxa	Scientific Name	Common Name
Bird	*Vermivora ruficapilla*	Nashville warbler
Bird	*Turdus migratorius*	American robin
Bird	*Aix sponsa*	Wood duck
Bird	*Dolichonyx oryzivorus*	Bobolink
Bird	*Bartramia longicauda*	Upland sandpiper
Bird	*Seiurus aurocapillus*	Ovenbird
Bird	*Phasianus colchicus*	Ring-necked pheasant
Bird	*Parula americana*	Northern parula
Bird	*Melospiza georgiana*	Swamp sparrow
Bird	*Passerculus sandwichensis*	Savannah sparrow
Bird	*Ardea albus*	Great egret
Bird	*Icterus spurius*	Orchard oriole
Bird	*Unknown Emberizidae*	Unknown Blackbird
Bird	*Polioptila caerulea*	Blue-gray gnatcatcher
Bird	*Sialia sialis*	Eastern bluebird
Bird	*Hirundo pyrrhonota*	Cliff swallow
Bird	*Coccyzus americanus*	Yellow-billed cuckoo
Bird	*Catharus ustulatus*	Swainson's thrush
Bird	*Parus bicolor*	Tufted titmouse
Bird	*Pipilo erythrophthalmus*	Eastern towhee
Bird	*Calcarius lapponicus*	Lapland longspur
Bird	*Vireo flavifrons*	Yellow-throated vireo
Bird	*Spiza americana*	Dickcissel
Bird	*Spizella pusilla*	Field sparrow
Bird	*Dendroica coronata*	Yellow-rumped warbler
Bird	*Cathartes aura*	Turkey vulture
Bird	*Contopus virens*	Eastern wood-pewee
Bird	*Melanerpes carolinus*	Red-bellied woodpecker
Bird	*Corvus brachyrhynchos*	American crow
Bird	*Vireo gilvus*	Warbling vireo
Bird	*Ammodramus henslowii*	Henslow's sparrow
Bird	*Bubo virginianus*	Great horned owl
Bird	*Piranga rubra*	Summer tanager
Bird	*Zenaida macroura*	Mourning dove
Bird	*Cistothorus platensis*	Sedge wren
Bird	*Myiarchus crinitus*	Great crested flycatcher

Red Haw Wildlife Management Area Information & Plan
10 year - WILDLIFE MANAGEMENT AREA PLAN FY 2018 - FY 2028

General information

Name of Area: Red Haw
County: Lucas
Assigned Unit: Rathbun Wildlife Unit
Location: *See Appendix A: Area Map
Legal Description:
County: Lucas
Township name: Lincoln
T 72N **R** 21W **Sections** 33
Type of Area: This area is an upland, grassland habitat complex. The primary habitat type is diverse native grassland reconstructions. Row crops and tree plantings are present on the area. The primary emphasis is on maintaining a diverse grassland complex.
Topography: Moderately rolling upland landscape
Current Acreage and Quantity by Cover Type: 233 total acres
*See Appendix B: Cover Type Map
Grassland: 81 Total Acres; 34% of Total Area
Cover Type
High Quality Native Remnant: 0 Acres; Quantity 0 Native Remnant: 0 Acres; Quantity 0
Planted Natives: 78.5 Acres; Quantity 33%
Planted Non-Natives: 2.5 Acres; Quantity 1%
Non-Natives: 0 Acres; Quantity 0
Wetland: 6 Total Acres; 3 % of Total Area
Cover Type
T1 Temporary: 0 Acres; Quantity Enter 0
T2 Seasonal: 0 Acres; Quantity Enter 0 T3 Semi-permanent: 0 Acres; Quantity 0
T4 Permanent: 0 Acres; Quantity 0
T5 Permanent: 0 Acres; Quantity 0
Riverine: 0 Acres; Quantity 0
Oxbow: 0 Acres; Quantity 0
Sub-impoundments: 0 Acres; Quantity 0
Artificial (Pond, Quarry, etc.): 7 Acres; Quantity 3%
Wooded Habitat: 21.8 Total Acres; 9% of Total Area
Cover Type
Forest: 0 Acres; Quantity
Woodland: 11.2 Acres; Quantity 5%
Savanna: 0 Acres; Quantity 0
Shrubland: 7.0 Acres; Quantity 3%
Tree/Shrub Planting:3.6 Acres; Quantity 1%
Orchard: 0 Acres; Quantity 0
Agricultural: 113.1 Total Acres; 49 % of Total Area Cover Type; Quantity
Old Field Successional: 0 Total Acres; 0% of Total Area Cover Type; Quantity 0

Streams and Rivers

Name of Stream/River	Length (miles)	Flow (Intermittent or Permanent)
None		

Sovereign Lakes

Name of Lakes	Acres	Shoreline Length
None		

History of Area

Tract/Seller Name	Year	Acres	Owner	Amount	Funding Source
All/Charles Hilliard	1997	233	DNR		REAP

*See Tract Map

Habitat Developments	Year	Comments
5 ponds	1997	
78 acres native grass	2000	

Area Management

Management Objectives

Primary: Upland gamebird production and harvest - primarily quail and pheasant, achieved by maintaining a healthy and diverse grassland ecosystem

Secondary: Promote wildlife diversity and sustainability (deer, turkey). Provide pond fishing opportunities.

SGCN Considerations (list species):

Public Use Facilities and Infrastructure Tracking

*See Appendix A, or WMA files at Unit Headquarters (including GIS files)

- Infrastructure will be monitored continually and maintenance will be performed as needed/as available, or as required by law. Functionality and public safety will be the most important considerations.
- Signs and parking lots will be continually maintained.

Special Regulations/ Provisions: None

Type	Description/History/Comments
Refuge	One - 27 acres established in 1997 to solve problems with neighbors complaining of shooting within 200 yards of buildings.
Dog Trial Area	None
Shooting Range	None

*See Appendix A, Area Map

Legal Control - Acres

233 Owned in fee title
0 Of sovereign land
0 Managed for USFWS under Memorandum of Understanding
0 Leased from
0 Leased to
Lease/Agreement Expiration Date: N/A

Drainage/Levee Districts: None

Easements:

Agreements:

Management Problems: Railroad runs through property. Adjacent neighbors on south side of area originally complained about hunting on the area. No shooting 200 yards from buildings signs were posted on the area and a 27-acre refuge was established at the request of the Parks Bureau. New neighbors have replaced the ones that complained and no problems have occurred since.

Management Needs: Additional land acquisition needed to provide adequate winter cover, food sources, and water source development; as well as to meet a desired increase in nesting and brooding cover for upland birds and for public hunting access. Edge feathering and hinge cutting will be completed in the woodland that runs up from Red Haw Park to provide winter cover for upland birds and reduce perching sites for avian predators. Establish additional shrub plantings, once established, these will be bush hogged and/or burned periodically.

Special Habitat Needs/Considerations: No rare or protected status species of plants or animals are known to be present on this area or in the immediate vicinity. There are no special habitat needs or considerations at this time.

Management plans

Operational (Indicate on Area Work Map)

1. **Wetlands/Water:** Five ponds are located on the property with one being constructed in 2014 on the east side of the area as part of a watershed project. Some of the ponds provide fishing opportunities. (See cover-type GIS file for more detailed habitat information)
2. **Agricultural Lands (Crop Rotation):** *Agricultural lands are designated as such to provide specific wildlife and habitat benefits. These benefits may include: additional food sources and cover types, seedbed preparation, controlling succession or invasive plants, limiting depredation on surrounding private lands, and providing hunting opportunities. These lands are managed according to a Habitat Management Lease (see Unit files). Any revenues generated from the lease are reinvested into wildlife management activities on DNR lands.

   Crop rotation operations on this WMA are limited to 90.5 acres in 4 fields. The fields are maintained in a no-till corn-soybean rotation as the foundation of a habitat management lease in which food plot services are rendered by the tenant. The fields will most likely continue to remain in a row crop rotation as the basis of that habitat management lease. Beginning in FY18, the two larger row crop fields northerly of the railroad tracks will be managed in a staggered soybean-corn-idle-idle rotation. A cover crop (e.g., wheat) will be aerially seeded into the fields when they are in corn. This will put additional early successional habitat on the area for upland birds and enhance the nesting and brood rearing capabilities of the property.
3. **Grasslands** (See cover-type GIS file for more detailed habitat information)
   a. **Native Grasses:** Maintaining native grassland habitat is the primary objective of the management of this area. Most of the native prairie reconstructions have become well-established and require minimal maintenance. Reconstructions that have struggled to become established properly may require more intense management. Mowing, haying, disking, or grazing may be utilized as a management tool to deter undesirable species, promote or sustain desirable native species, and to address grass density issues that may arise. New seeding will be monitored and mowed as needed until well-established. Spot mowing will be performed as needed. Haying will occur between August 1 and 30 (when available). Prescribed fire will be the primary management tool used to sustain healthy grasslands on this WMA. In general, prescribed burns will be conducted every four years on any given burn unit. Prescribed burns will most often be conducted in late spring, but attempts should be made to burn during different times of year (spring-summer-fall) in order to realize the benefits that the different burn seasons might provide. Keeping a healthy native forb component in the diverse seeding is a priority, so burn timing will be an adaptive management process. Forbs might need to be supplemented in some areas and this may attempted following a disturbance (e.g., burning, disking, mowing, grazing) rather than attempt a complete reseeding. Resurgence of opportunistic weed species (i.e., Canada thistle, musk thistle) is also a concern following a burn, and should be kept in mind during the planning of prescribed fires. Restoring native grasslands should be the primary focus for any future acquisitions to the WMA.
   b. **Cool Season (Tame) Grasses:** Non-native cool season grasses, clover and alfalfa will remain a minor component on this WMA. The alfalfa in Area 5 of the cover type map (Appendix B) and some of Areas 3 have developed a musk thistle problem and are currently in a soybean-corn rotation. Once the thistle problem is resolved, this area will be restored into a diverse prairie seeding. Currently, these areas do not appear to be encroaching on adjacent native seeding, and did offer some diversity for wildlife. These areas will be included in the prescribed burn rotation.
4. **Forest:** (See cover-type GIS file for more detailed habitat information or the Forest Wildlife Stewardship Plan) Forest cover is a minor component on this area. Edge feathering and hinge cutting will be completed in the woodland that runs up from Red Haw Park to provide winter cover for upland birds.
5. **Provisions for food:** There are currently 2-3 annual food plots on the WMA, totaling about 6 acres that are associated with the habitat lease. In addition, DNR staff will create an additional 3-5 acres of food plots dependent upon management needs (which for some years will include cropping to address invasive species). It is anticipated that each individual food plot will retain its designation as either a “dove” plot or a “winter” plot due to their desirable locations and layouts, but the specific crop within each plot will be rotated on an annual or biennial basis. Winter plots may remain standing for two years; thus considered “idle” the second year, which meets the biennial rotation criteria. Dove plots may consist of sunflowers, wheat, barley, flax, millet, or other

similar small grain crops. At least one dove plot on the area will be sunflowers each year. Winter plots will primarily consist of corn or sorghum, but may include other crops that are intended to benefit quail and pheasants. Food will also be created utilizing grassland disturbance to periodically set back succession.

6. **Idle Lands:** Idle land rotations are worked into the cropping rotation for this area.
7. **Tree and Shrub Plantings:** One hardwood planting put in by parks in 1997 will be maintained. The planted Osage orange hedgerow will be cut over and allowed to regrow. Additional shrub plantings will be established at selected locations with a goal of one per 20-30 acres. Once established, these shrub plantings will be bush hogged and/or burned periodically to maintain the health and vigor of the patch and to keep it in an earlier successional stage.
8. **Public Use Facilities:** Public use facilities on this WMA are limited to one parking lot. Current parking lot is adequate for current public use of the area. Parking lot will be maintained on a yearly basis through mowing and/or spraying. Rock needs will also be monitored on a continual basis and addressed as needed. As new tracts are acquired, each site will be evaluated for its facility needs.

Other needs

Additional Land Acquisition: Opportunities to expand the WMA on adjacent lands needs to be continually explored.
New Development: None at this time.

****

Report Prepared and Submitted by: _____ **Date:** 4/2/2018

Revision Dates: _____

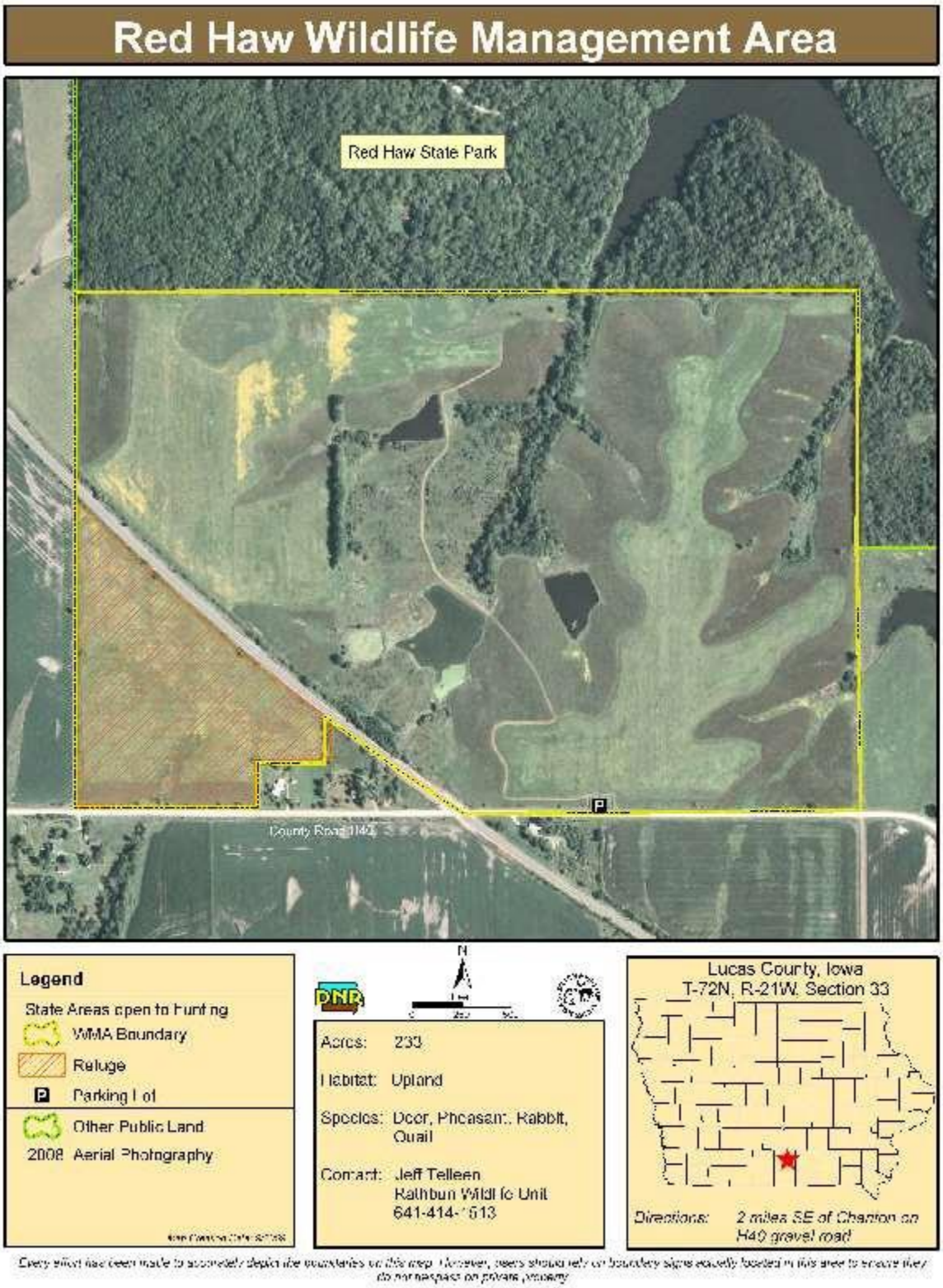
By: _____

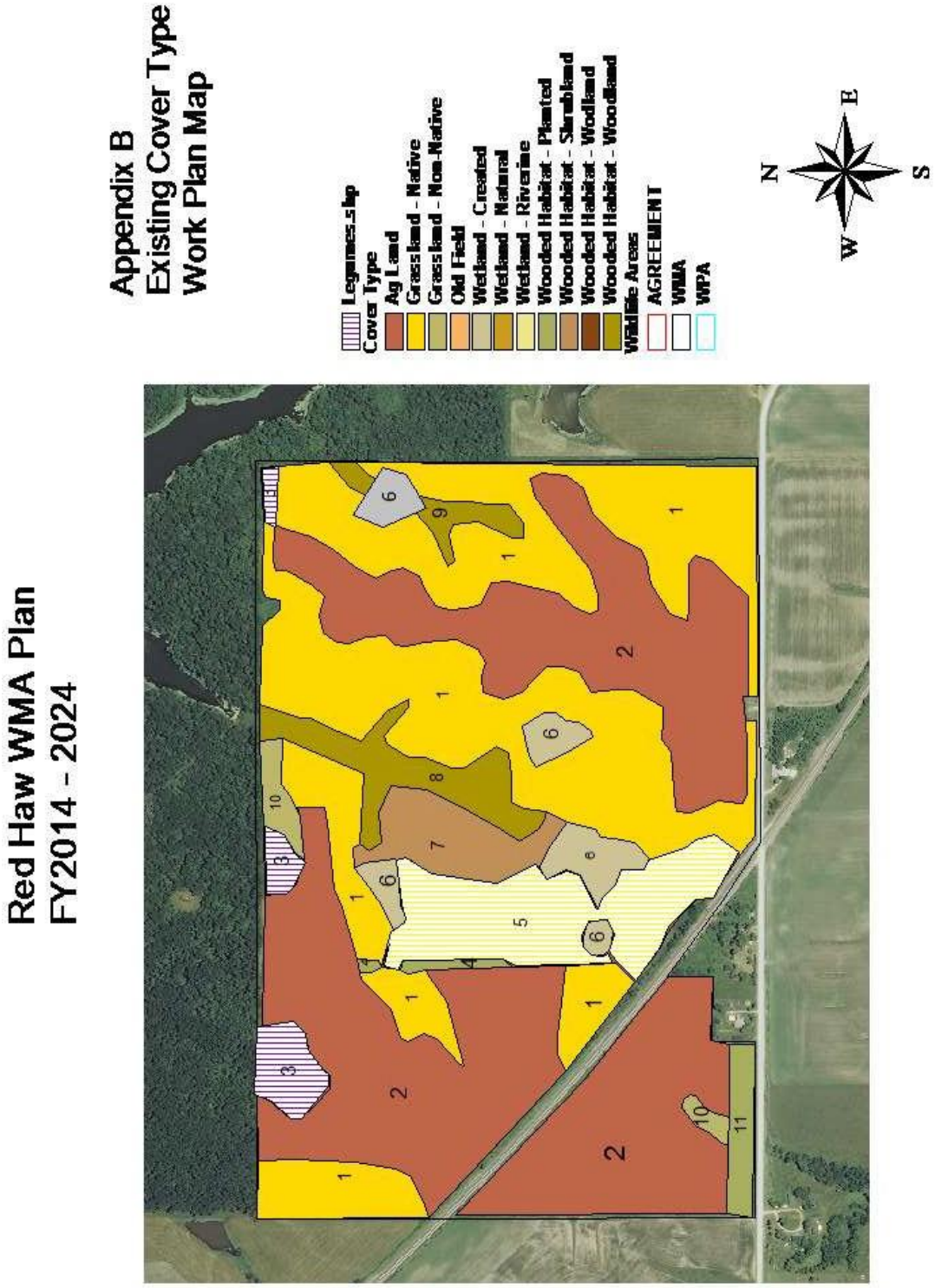
Revision Dates: _____

By: _____

(Note: All revisions should be delineated in the plan)

Appendix A


Red Haw Wildlife Management Area
Red Haw State Park
P
County Road H40
Legend
State Areas open to Hunting
WMA Boundary
Refuge
Parking Lot
Other Public Land
2008 Aerial Photography
DNR
N
Acres: 233
Habitat: Upland
Species: Deer, Pheasant, Rabbit, Quail
Contact: Jeff Telleen
Rathbun Wildlife Unit
641-414-1513
Lucas County, Iowa
T-72N, R-21W, Section 33
Directions: 2 miles SE of Chariton on H40 gravel road
Every effort has been made to accurately depict the boundaries on this map. However, users should rely on boundary signs exactly located in the area to ensure they do not trespass on private property.


Red Haw WMA Plan
FY2014 - 2024
Appendix B
Existing Cover Type
Work Plan Map
Legend
Cover Type
Ag Land
Grassland - Native
Grassland - Non-Native
Old Field
Wetland - Created
Wetland - Natural
Wetland - Riverine
Wooded Habitat - Planted
Wooded Habitat - Shrubland
Wooded Habitat - Woodland
Wooded Habitat - Woodland
Wildlife Areas
AGREEMENT
WMA
WPA
N
E
S
W

Cover Type & Work Plan

Block #	Current Cover Type	Goal Cover Type	Future Management Comments
1	Planted prairie forbs and grass	Planted prairie forbs and grass	Maintain vigor of prairie planting through prescribed fire, mowing or spraying.
2	Row Crop in lease	Row crop	Crop rotation (B-C-Idle)
3	Clover & row crop plot	Native planting	Originally clover plots; musk thistle establishment is currently being addressed.
4	Osage Orange Hedge	Osage Orange Hedge	Cut posts out of hedge and allow to regrow.
5	Alfalfa /row crop	Native planting	The alfalfa developed musk thistle problems which are currently being addressed.
6	Ponds	Ponds	None
7	Shrubland	Shrubland	Maintain in early succession with chain saws
8	Woodland	Shrubland	Edge feather and hinge cut to promote thick early successional growth
9	Woodland	Pond and shrubland	Pond will be constructed. Shrubs will be planted around
10	Grassland - brome	Grassland - brome	Retain brome waterways and firebreaks for grassland diversity and ease of burning.
11	Hardwood planting	Woodland	Maintain for erosion control and diversity