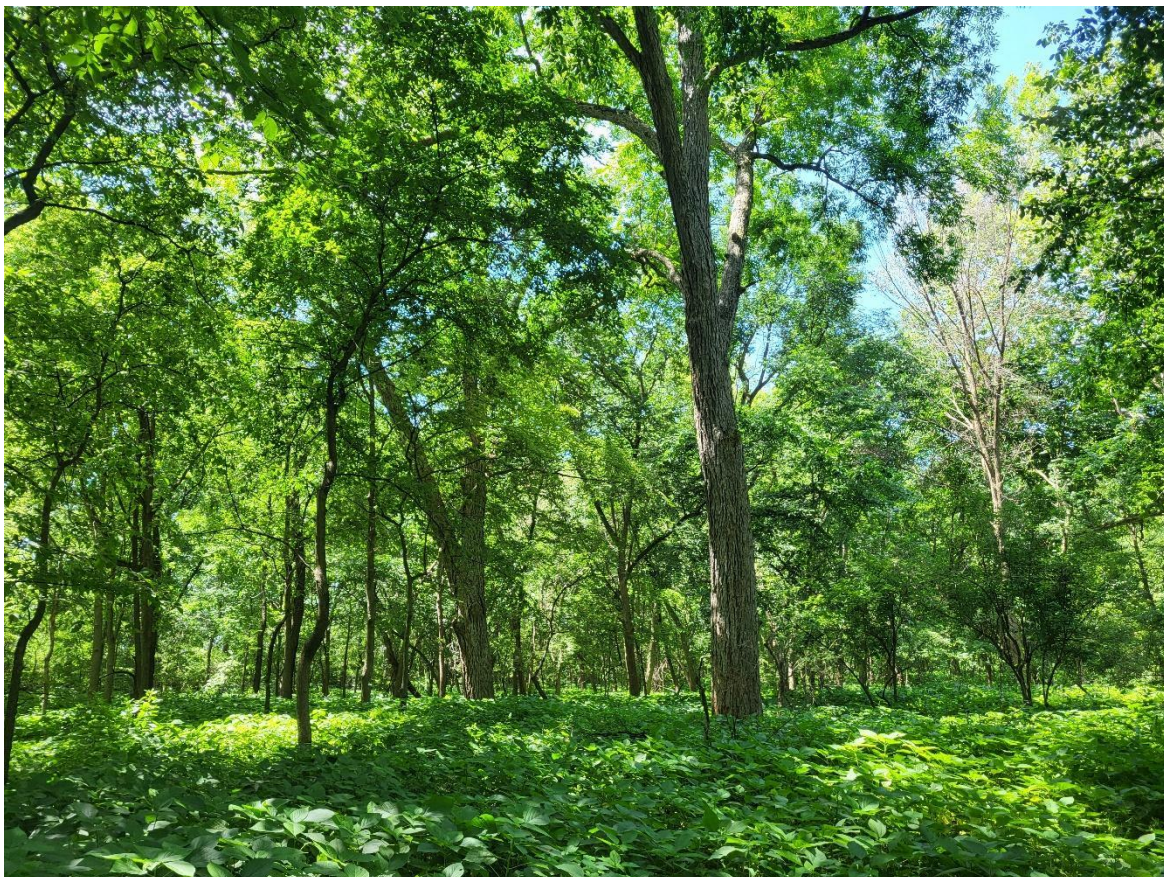


Forest Wildlife Stewardship Plan (FWSP)

Pecan Grove State Preserve

Muscatine County



Developed by:
Mark Vitosh, District Forester
Andy Robbins, Wildlife Biologist

Plan Completion Date: June 17, 2026



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LOCATION: 1 mile SW of Muscatine, Iowa
Section 8, T76N R2W, Fruitland Township, Muscatine County

TOTAL ACRES: 23.7 acres

Introduction

The Iowa Department of Natural Resources (DNR) is the state government agency whose vision is to lead Iowans in caring for their natural resources. Conservation and enhancement of natural resources to ensure a legacy for future generations is part of the DNR's mission. Within the DNR, the Wildlife Bureau manages more than 390,000 acres of land as wildlife management areas (WMAs) including many State Preserves for a variety of management goals. Many of these areas are partially or mostly forest covered. These forests, if properly managed, provide a unique opportunity for the DNR to carry out its mission by publicly demonstrating sustainable forest management and the enhancement and preservation of these valuable resources, including their benefits to wildlife.

The DNR recognizes the need for forest wildlife stewardship plans (FWSPs) to properly manage the forest resources. Forests are not static systems, even though changes occur relatively slowly over a long period of time. A hands-off or "preservation" philosophy will ensure that the forest of 100 years from now will be much different and likely less diverse than the forest of today. These changes will negatively impact wildlife species. Some forest stands may take more than 120 years to mature, a time span that may extend through the careers of several managers. This slow but constant change requires managers to plan over the long term and leave a written record of these plans and management activities in the form of FWSPs. This process will help ensure the wise management of our WMA and State Preserve forests and will aid future managers with decision making.

There is no single type of forest stand that can provide all of the requirements for all forest wildlife species. Different species require different (and sometimes quite specific) forest types and age classes. Some generalist wildlife species use all of the forest age classes, while some specialist species have such specific requirements that only one or two particular forest types are needed to survive.

Pre-settlement floodplain forests in the Mississippi River Valley once had a significant northern pecan component, but this species is now uncommon in Iowa. Pecan Grove State Preserve is a tiny remnant of what once existed at that time. The reason for the designation of this preserve was for the long-term protection of this forest resource. The importance of managing this preserve for the stewardship of native northern pecans cannot be overstated.

The Wildlife Bureau typically manages forests for the greatest diversity of forest wildlife. The FWSP will be the guiding document that prioritizes management activities to meet the needs of forest wildlife species. The DNR's comprehensive Iowa Wildlife Action Plan (IWAP) identifies wildlife "species of greatest conservation need" (SGCN). Habitat needs of these wildlife species will be considered when determining forest management decisions. However, the primary focus of this plan will be the health and regeneration of native northern pecans.

Description of Area

Pecan Grove State Preserve is located within the geographic region known as the *Mississippi Alluvial Plain*, which is characterized by flat topography with silty and sandy floodplain soils. The preserve is located along Muscatine Slough, which was a natural side channel of the Mississippi River prior to settlement. The eventual development of levee and drainage districts cut off Muscatine Slough from the natural flow of the river. Drainage district improvements in the 1950s re-routed a portion of the Muscatine Slough channel, essentially turning the area now known as Pecan Grove Preserve into an island by surrounding it with drainage ditches. A bridge was put into place so that the landowners at that time could still access the area. With a bridge in place, the history of grazing continued on this site. There are stories of local families coming to the site for picnics in the fall to enjoy fresh pecans.

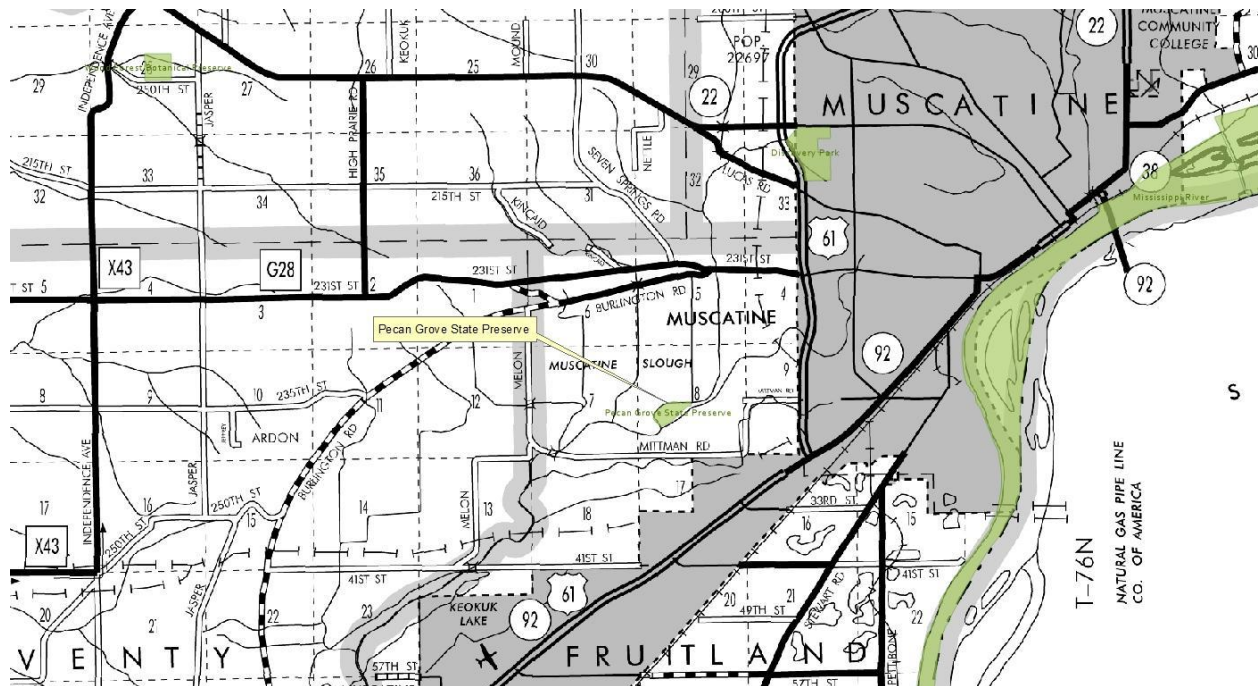
The preserve was acquired by the State of Iowa in 1973 and dedicated as a state preserve in 1978. The primary access to the preserve has been through the adjacent landowner, across a bridge that was present during acquisition. The bridge fell into disrepair over the years and was eventually removed by the drainage district during ditch maintenance. There is currently no public access to the site and it is also closed to public hunting.

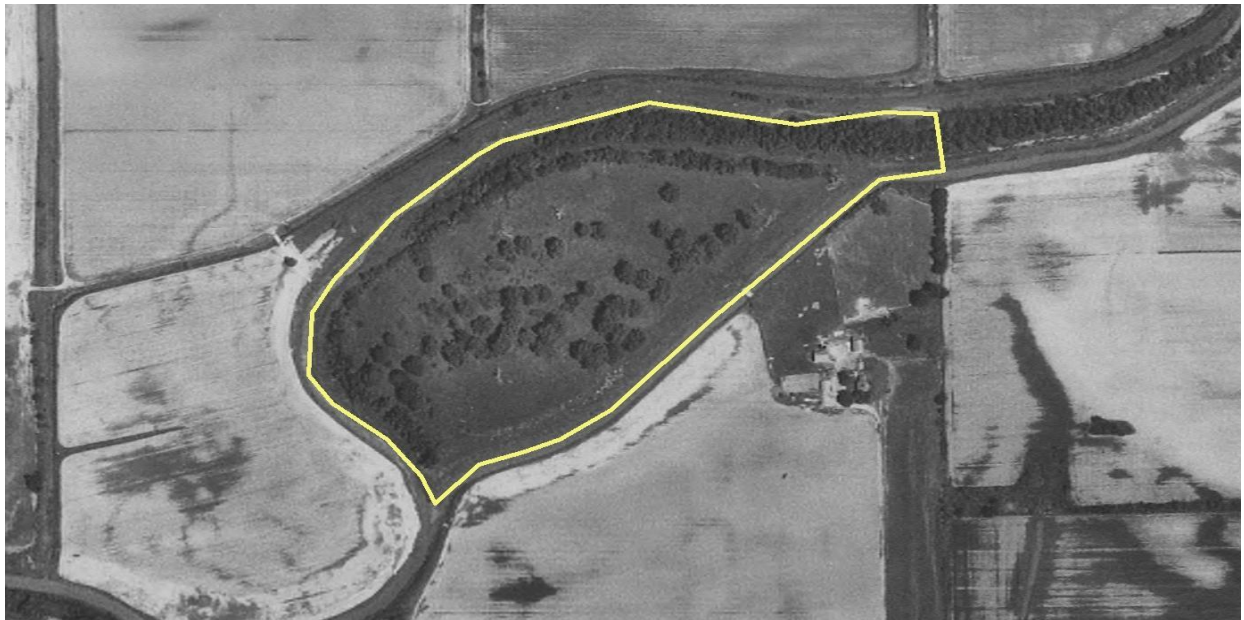
Due to the challenges regarding access to reach the preserve, very little management by DNR staff (other than occasional boundary sign posting) has occurred since acquisition. Some light Forest Stand Improvement work (weed tree removal; i.e., boxelder and honey locust) was completed in the mid-1980s. A site visit and forest inventory was conducted by Odessa Wildlife Unit staff and the DNR District Forester in 2025. With the cooperation and assistance of the adjacent neighbor, access was gained through to the drainage ditch and a canoe and ladder was utilized to cross the ditch and climb the steep ditch banks to reach the preserve. During this 2025 visit, a reconnaissance survey was completed on the area. From this, the property was divided into 2 main areas. The first area is the vegetation that has developed on the dredge spoils in a ring on the edges of the preserve, and the second area is the main preserve area where no additional soil has been added during dredging activities.

The Pecan Grove State Preserve FWSP is a generalized guideline for recommended management work. Detailed silvicultural prescriptions will be developed immediately prior to doing scheduled or recommended management practices in order to consider unique stand conditions and more specific targeted wildlife habitat needs. These prescriptions will be in the form of detailed practice/project plans developed with collaboration between the DNR District Forester and Wildlife Biologist.

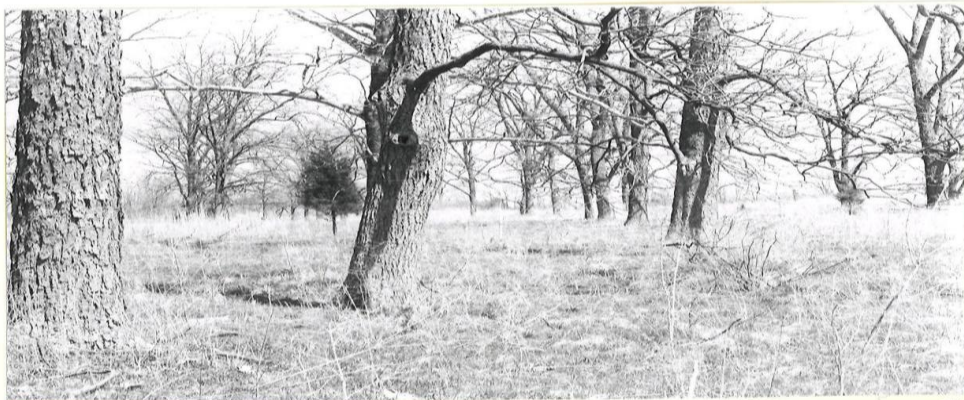
A record of completed management activities will be kept on file at the area manager's office so that practice evaluations can be made and compared to determine if management objectives are being met and proper practice follow-up is done to determine if and when more management is needed.

Location Maps

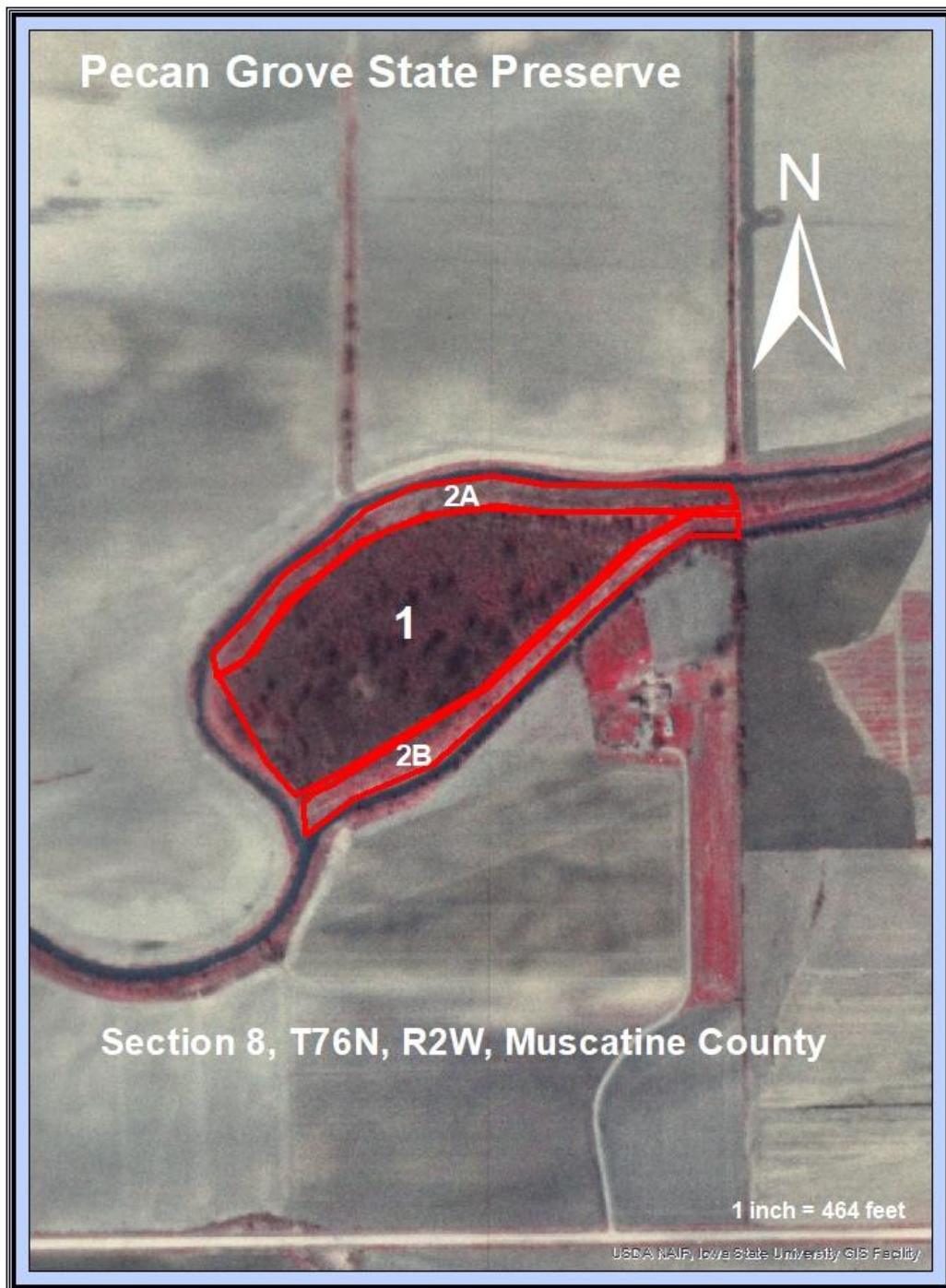




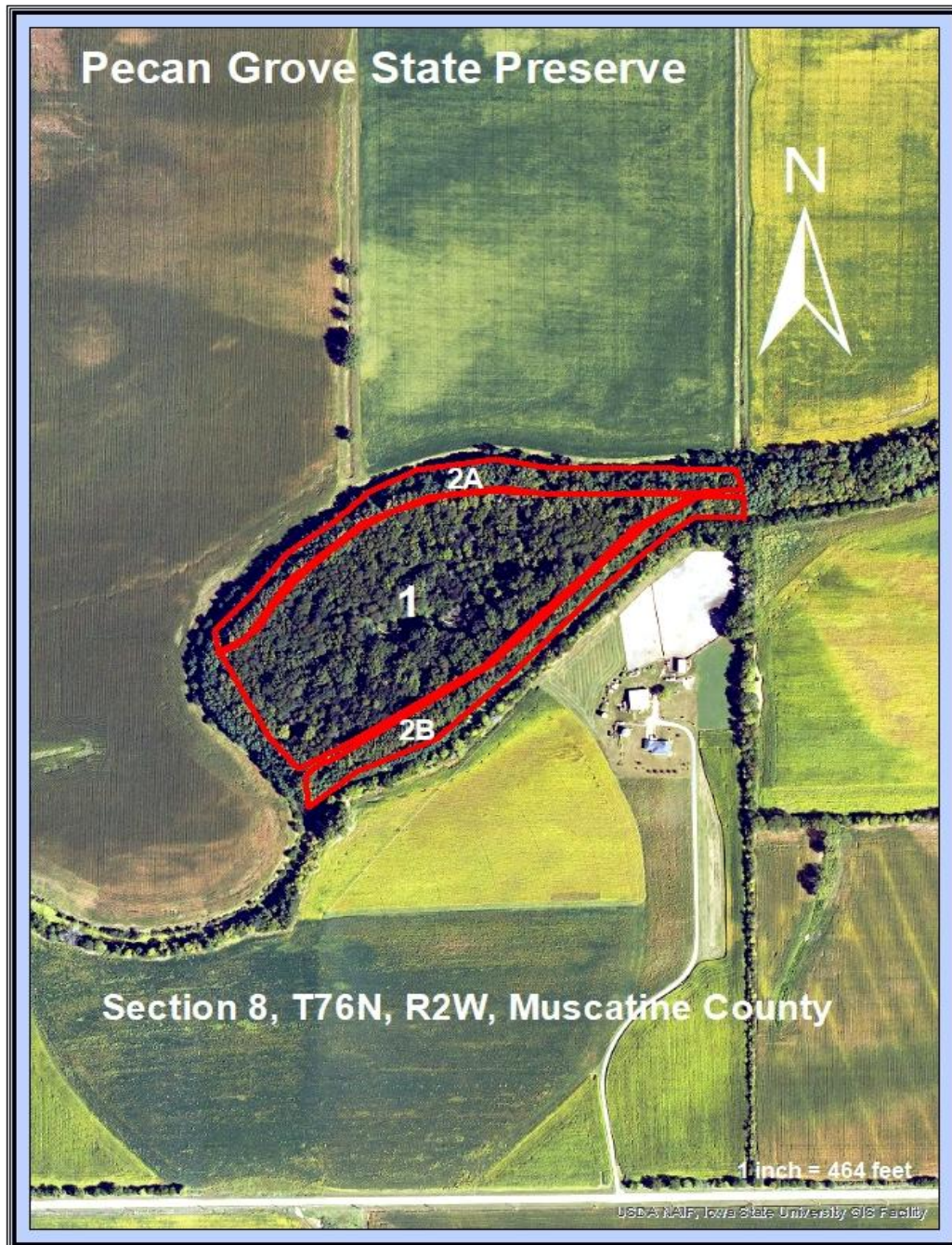
1970s Aerial Photo of site



1973 Photo of Site



1980s Aerial Photo of Site



2025 Aerial Photo of Site

Current Conditions of Pecan Grove State Preserve Woodlands

The District Forester and the Wildlife Biologist walked the forest cover of the property in June of 2025 and recorded data that would help classify and describe the woodland on the property. Information collected included mean tree diameter, species composition of the overstory canopy and understory layers, presence of invasive species and pests that could affect forest health and more. This information was then entered into a Geographic Information System and is summarized below.

This plan contains forest management recommendations for 23.7 forested acres. The forest management areas have been divided into 3 stands for management purposes. See the 2025 map of the site of this plan for specific forest management stand locations. Looking at the 1970s and 1980s aerial photos of the property there was very limited tree cover between the mature northern pecan compared to now.

Overstory Species

The species composition of the woodland reflects the most dominant species in the overstory canopy layer, which are typically the largest and oldest trees. The current breakdown of forest type for Pecan Grove State Preserve is as follows: Bottomland Hardwoods Second Bench: The majority of this woodland is scattered northern pecan, honey locust, hackberry, black walnut, Kentucky coffeetree, sycamore, cottonwood, and dead ash.

Size Class

The size class of the dominant overstory (upper layer) trees indicates the relative age and successional stage of the forest. This metric is useful for understanding the overall diversity of wildlife habitat as well as forest health threats throughout the Preserve, because these are both influenced by stand age and structure. For instance, older forests are generally considered to be a more complex ecosystem than younger forests, but they are also more at risk for catastrophic wind/tornado damage and diseases.

In Pecan Grove State Preserve there are scattered mature northern pecan, black walnut, hackberry, cottonwood, sycamore, and honey locust larger than 18 inches (large-sized) in diameter at breast height (DBH), and the remainder of the stand is scattered pole-sized trees (5 to 12 inches in DBH) hackberry, pecan, and elm. This means the large pecan are mature and showing some decline in health, but there are spots of younger pecan scattered in spots in the stand.

Understory Species/Regeneration

The understory of a woodland is that canopy layer which exists at eye level, under the shade of the larger overstory trees. The trees in this layer are critically important to identify because they represent the future species composition of the forest, and its subsequent value for wildlife and all other benefits of the woodland. Across this property in general hackberry is the most common understory tree. This means hackberry could be a significant component long-term in the future overstory of this property without any management to promote more diversity. Also, the non-native invasive shrubs honeysuckle and multiflora rose are present in the understory of all forest stands. Honeysuckle is most significant along the dredging spoils and this species is spreading inward across the whole area.

Forest Management Goals

The primary management goals for Pecan Grove State Preserve are as follows:

1. Maintain and improve overall wildlife habitat for both game and nongame species in alignment with Iowa's Wildlife Action Plan
2. Focus on promoting the health and regeneration of northern pecan by minimizing the presence of competitive species such as hackberry, elm, boxelder, and honey locust.
3. Minimizing understory non-native invasive species such as honeysuckle and multiflora rose and mid-story species such as white mulberry and catalpa within the woodland cover which will improve understory wildlife habitat and allow property managers an opportunity to promote future pecan regeneration in selected locations
4. Maximize forest health by promoting long-term diversity by allowing some black walnut, sycamore, and Kentucky coffee trees to remain which will strengthen its resiliency in the face of new pests & diseases.

Management Systems

The decision on what specific silvicultural activities are prescribed for each stand are based on overall management goals for the Preserve and which long-term forest management system is selected: Even-aged, Uneven-aged, Viewshed, or Early Successional. These long-term systems set the big picture framework in place which then helps clarify what short-term activities are recommended.

Even-Aged

Even-aged stands are characterized as having an overstory canopy of trees that are all nearly the same age, even though diameter classes may be different due to stocking levels and individual tree species growth rates.

Even-aged management, when applied at the appropriate scale, can have positive effects on improving habitat for many wildlife species. Larger stands can be divided into smaller stands or blocks to provide for age class diversity when needed. Even-aged management creates stages of excellent habitat for deer, turkeys, and other wildlife species and is

essential for the regeneration of oaks, hickories, black walnuts, and in this case northern pecan; which all prefer full sunlight.

Management practices included with even-aged management:

- Periodic overstory thinning to reduce crowded stands to the proper stocking levels. Usually, specific practices include basal area thinning, crop tree release thinning, and weed tree removal. These practices improve crop tree diameter growth rates, mast production, and improve overall forest health and vigor to help minimize forest insect and disease problems. These practices create a more open forest structure which typically supports increased bird species diversity and bat foraging opportunities.
- Periodic suppressed canopy tree removal is prescribed to improve forest understory light conditions; usually in pole-sized tree stands to improve understory cover for wildlife. For stands being considered for sawtimber harvesting, suppressed canopy tree removal and weed tree removal are necessary pre-harvest or post-harvest treatments to help make conditions favorable for the establishment of desirable tree species, both natural and planted.

There are two age classes of northern pecan (mature [large-sized] and young [pole-sized]) across Stand 1. The pole-sized northern pecan trees are in individual pockets in between the mature northern pecans. To promote long-term northern pecan along this stand even-aged management practices will be used across Stand 1 (16.7 Acres).

Uneven-Aged

Uneven-aged management develops a stand of trees with all tree sizes represented. The stand structure is developed by selectively harvesting mature and defective trees, and removing unwanted small trees that are damaged or defective. Because uneven age stands always have large trees present, this system favors species that will grow in shade such as hard maple and basswood. Sustainable harvest guidelines dictate the ability to selectively harvest mature and defective trees every 20 to 25 years in these stands.

Uneven age management will maintain blocks of woodland that will always have larger trees. This system is desirable where the understory is mainly hard maple, on steep slopes, and in areas where always having large trees is important. Mature forest obligates like tufted titmouse, pileated woodpecker, red-shouldered hawk, and summer tanager tend to respond positively to this management system.

No forest stands at the Pecan Grove State Preserve are designated for Uneven-Aged management systems.

Viewshed

Viewshed areas are typically steep slopes and areas along streams and lakes which can be fragile sites, or sites that enhance the aesthetic recreational quality of the area by creating visual screens between natural areas and use areas such as roads and parking lots. Mostly, these sites are best left to naturally progress through succession or only receive light, less invasive management. Areas having observed and documented endangered plant or animal species present are also candidates for viewshed management.

No forest stands at the Pecan Grove State Preserve are designated for Viewshed management.

Early Successional

Species of birds such as ruffed grouse, American woodcock, golden-winged warbler, blue-winged warbler, black-billed cuckoo, yellow-billed cuckoo, and eastern towhee are dependent on early successional (ES) habitat with its young, dense woody growth. High stem densities of trees and shrubs provide suitable nesting habitat and protection from predators. These areas also provide nectar and soft-mast food resources for wildlife, support bat foraging, and are important post-fledging and migratory stopover habitat for birds, especially when adjacent to more mature forest stands. These stands are usually associated with aspen stands, but in the absence of aspen can be any hardwood stand of mixed or pure species that will be managed for 15-20-year rotations by clearcutting and allowed to re-sprout.

Edge feathering is a type of ES management along forest/field edges where tree cover is periodically cut (felled) to promote a transition of weedy, brushy cover between forest and field cover. This typically benefits bobwhite quail and sometimes woodcock.

No forest stands at the Pecan Grove State Preserve are designated for ES management, but due to drainage district easements, it is likely that some ES habitat could be created incidentally in stands 2A & 2B due to future drainage ditch maintenance operations.

Savanna

The savanna management system is used to restore or create a forest overstory component that is less than 50% canopy cover, usually oaks or oaks and hickories, and an understory composed of native prairie plants and shrubs. The savanna understory is periodically managed by controlled burning to maintain and improve native understory plant diversity.

Since the main goal on this property is to maintain a component of northern pecan there will be areas surrounding established mature large-sized northern pecan that will be re-opened using weed tree removal to create a savanna/open tree habitat similar to what portions of stand 1 looked like in the 1970s.

Descriptions & Recommendations for Individual Stands

The following section contains narrative descriptions of each of the 3 forest stands with accompanying management recommendations. The forest stands will be divided into three different layers: overstory (upper level of the forest), mid-story (middle layer), and understory (lower level) when they are present. The density of each layer will be defined in three possible ways: dense, moderately dense, or scattered. Trees in each stand will be put into five possible size categories: seedling-sized (less than 1 inch in DBH), sapling-sized (1 to 4 inches in DBH), pole-sized (5 to 12 inches DBH), small sawtimber-sized (13 to 18 inches DBH), and large-sized (≥ 19 inches DBH). Shrub and non-woody vegetation will also be listed when found in significant populations.

Stand 1

Acres: 16.7 Acres

Historically before the early 1970s this was an open pecan grove with scattered large-sized pecan that was mowed at times and used for cattle pasture, and the locals would picnic on the location in the fall and collect pecans. At some point before the early 1970s the grazing stopped and a variety of woody vegetation began to establish on the site. Since being identified as an interesting site around 1972 some of the large mature pecan trees have been referenced as being in declining overall health. Currently, the overstory consists of scattered pole to large-sized pecan, large-sized black walnut and cottonwood, small sawtimber to large-sized honey locust, pole to large-sized hackberry, black locust along the outside rim of the area, some dead pole to large-sized ash, and a large-sized Kentucky coffeetree and sycamore or two. Some of the large-sized pecans have thinning crowns and at least two have been snapped off by wind at ~4 feet off the ground. The understory consists of scattered seedling to sapling-sized hackberry, sapling to pole-sized catalpa (non-native invasive) and white mulberry (non-native invasive), and pole-sized elm along the stand edges. The native shrub coralberry and the non-native invasive plants honeysuckle, multiflora rose, and garlic mustard are also present in this lower layer.



Large-sized mature pecan 2025



Young developing pole-sized pecan

Prescription:

1. Use weed tree removal to eliminate all hackberry, elm, cottonwood, white mulberry, catalpa, black locust, and honey locust trees and create open pecan habitat areas. Remove all weed trees 8 inches in diameter and less and treat the stumps with a registered herbicide. All trees dropped will have the tree crown broken down to or below 4.5 feet off the ground. All weed trees greater than 8 inches in diameter will be killed standing with a single chainsaw girdle at a convenient height and the girdle will be treated with a registered herbicide. Refer to the photo below for an example of this prescription at another location.



Before



After

2. Hand cut invasives (i.e. honeysuckle and multiflora rose) 4 feet and taller and treat the stumps with a registered herbicide. Spot treat with a foliar application of a registered herbicide all honeysuckle and multiflora rose up to 4 feet tall when plants are actively growing.

Stand 2 A & B

Acres: 7.0 Acres

These areas consist mostly of dredging spoils immediately adjacent to the drainage ditch that encircles the preserve. The overstory consists of scattered trees to pockets of pole to small sawtimber-sized black locust, cottonwood, honey locust, sapling to pole-sized white mulberry (non-native invasive species), and a few elm. The understory consists of developing areas of the non-native invasive shrubs such as honeysuckle and multiflora rose.



Dredge Spoil Areas

Prescription:

1. Hand cut invasives (i.e. honeysuckle and multiflora rose) 4 feet and taller and treat the stumps with a registered herbicide. Spot treat with a foliar application of a registered herbicide all honeysuckle and multiflora rose up to 4 feet tall when plants are actively growing.
2. Use weed tree removal to eliminate all white mulberry and black locust trees standing. All listed weed trees will be killed standing with a single chainsaw girdle or hatchet cuts at a convenient height and the girdle cut(s) will be treated with a registered herbicide.

Stand Summaries

STAND LABEL	AC.	OVERSTORY	AVG_DBH	Prescription	MGMT	REGEN YR	Notes
1	16.7	Bottomland Hardwoods	Large-Sized	Weed Tree Removal Invasive Species Management	Even Age	NA	ACP 2026 or 2027
2A	4	Dredge Spoils Pioneer Species	Pole	Weed Tree	NA		ACP 2027 or 2028
2B	3	Dredge Spoils Pioneer Species	Pole	Invasive Spp. Mgmt.	NA		ACP 2027 or 2028

Proposed Project Completion Schedule

Year	Stand(s)	Description
2026 or 2027	1	Contract FWSI project for weed tree removal management
2026 or 2027	1	Contract FWSI project to hand cut invasives (i.e. honeysuckle and multiflora rose) greater than 4 feet tall and spot treat sprouts and plants below 4 feet tall
2027 or 2028	2A & B	Contact FWSI project hand cut invasives (i.e. honeysuckle and multiflora rose) greater than 4 feet tall and spot treat sprouts and plants below 4 feet tall.
2027 or 2028	2A & B	Contract FWSI project for weed tree removal management

Potential Impacts to Threatened and Endangered Species

Due to constantly changing listings, priorities, etc., the forest management activities described in this plan will be reviewed internally prior to implementation to determine potential impacts to both state and federally listed threatened or endangered species.

The current guidance for Pecan Grove Preserve's known woodland dependent T&E species are as follows:

- Pecan Grove Preserve is within the summer range for the federally endangered Indiana bat (also state endangered) and the federally endangered northern long-eared bat. Both species forage and roost in floodplain and upland forests. They form maternity colonies in trees with loose exfoliating bark, cracks, crevices, and/or cavities (e.g., live shagbark hickory or dying trees of other species). Management activities that benefit bats (and other wildlife like the southern flying squirrel) include retaining trees with these characteristics and 6-8 snags per acre whenever possible. In areas of suitable habitat, current guidelines allow for tree removal activities and woodland burns outside of the maternity and nesting season (Sept 30-April 1).
- Known T&E reptiles and amphibians (referred to as "herptiles" or "herps") potentially found on this preserve are not woodland dependent species, so any impacts to those species would be minimal to non-existent. Also, the active periods for most herps generally align with the tree removal avoidance guidelines for bats, so if current T&E bat guidance is followed, forest management impacts to herps would also be similarly avoided.
- The state endangered red-shouldered hawk or special concern bald eagle could also potentially nest in this area. Nest sites have a tendency to be near streams/wetlands in large tracts of bottomland forest. Pecan Grove is a very small tract of floodplain forest. However, due to its isolation and close proximity to the Mississippi River, zones of planned management activities should be checked for nests and management activities planned to avoid the breeding period (mid-March through mid-August for red-shouldered hawk, January through August for bald eagle) if present to reduce disturbance/stress.
- Known populations of T&E plant species will be avoided by forestry management practices.

Potential Threatened and Endangered Species list

Table 1. Threatened and Endangered species potentially found at Pecan Grove/Mississippi River drainage based on NAI data and MSIM reports.

Group	Scientific Name	Common Name	T&E Status
Plant	NA	NA	NA
Bird	<i>Haliaeetus leucocephalus</i>	Bald eagle	Special Concern
	<i>Buteo lineatus</i>	Red-shouldered hawk	State Endangered
	<i>Asio otus</i>	Long-eared owl	State Threatened
Mammal	<i>Myotis septentrionalis</i>	Northern long-eared bat	Federally Endangered
	<i>Myotis sodalis</i>	Indiana bat	State & Federally Endangered
	<i>Glaucomys volans</i>	Southern flying squirrel	Special concern
Herptiles	<i>Regina grahami</i>	Graham's crayfish snake	State Threatened