Forest Wildlife Stewardship Plan
Lake Sugema Wildlife Management Area

Van Buren County

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

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LOCATION: Sec. 1, 4-10, 14-18, 21-23 Des Moines Township, T68N, R10W & 11W, Van Buren County

TOTAL ACRES: 3,915

Introduction

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

The DNR is also the agency responsible for the stewardship of indigenous and migratory wildlife species found in the state. Many of these species live near and in WMA forests. The DNR recognizes the need for forest wildlife stewardship plans (FWSPs) to properly manage the forest resources. Forests are not static systems, even though changes occur relatively slowly over a long period of time. A hands-off or "preservation" philosophy will ensure that the forest of 100 years from now will be much different and likely 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 forests and will aid future managers with decision making.

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

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

Description of Area

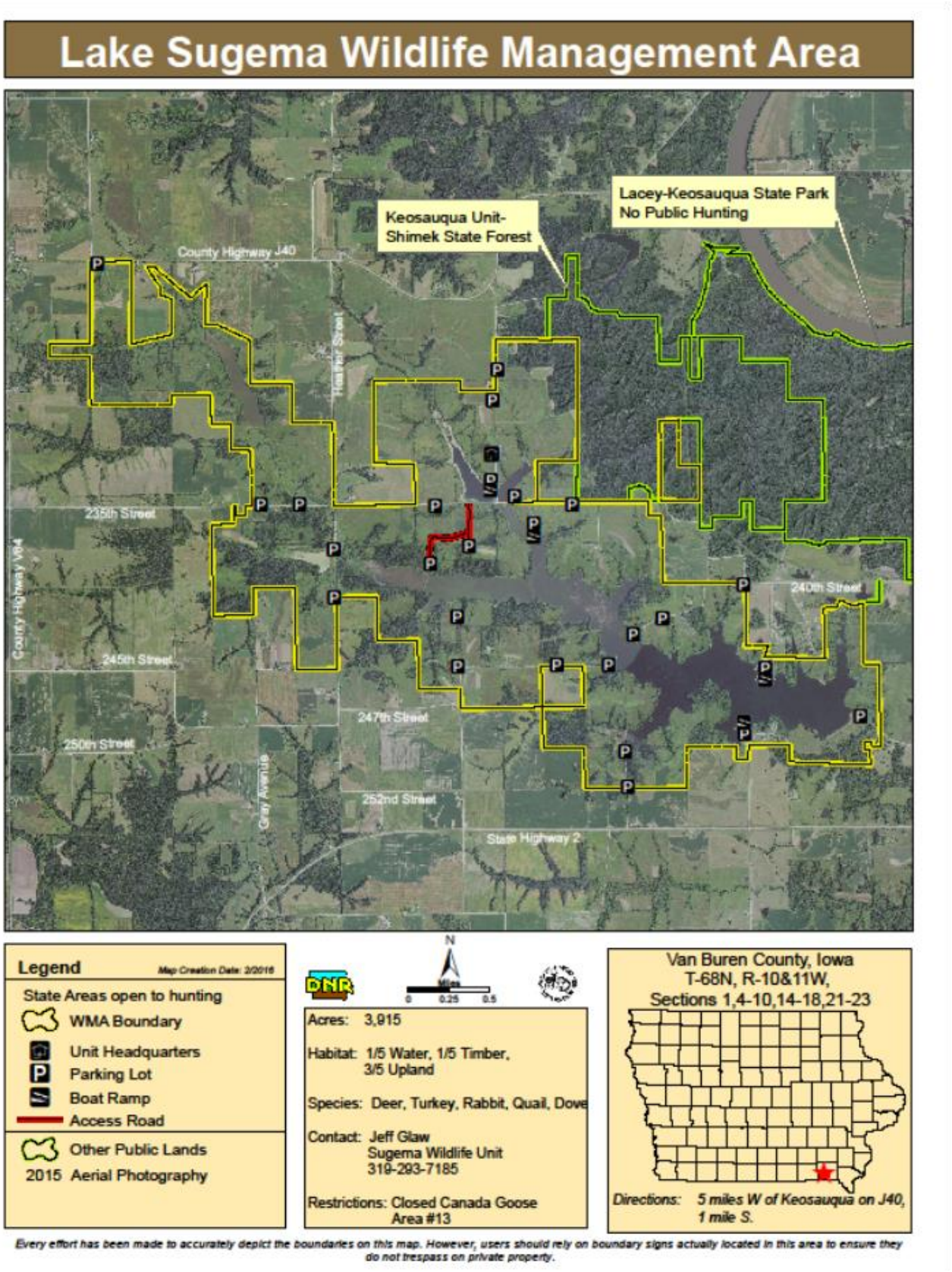
Lake Sugema WMA is located within the Southern Iowa Drift plain geographic region. Southern Iowa Drift Plain, was formed by Pre-Illinoian glaciers approximately 300,000 years ago. The topography of the area is heavily forested rolling hills and grasslands, interspersed with farmland, and has many tributaries flowing into the Des Moines River. This WMA is part of the Lake Sugema - Lacey-Keosauqua Bird Conservation Area.

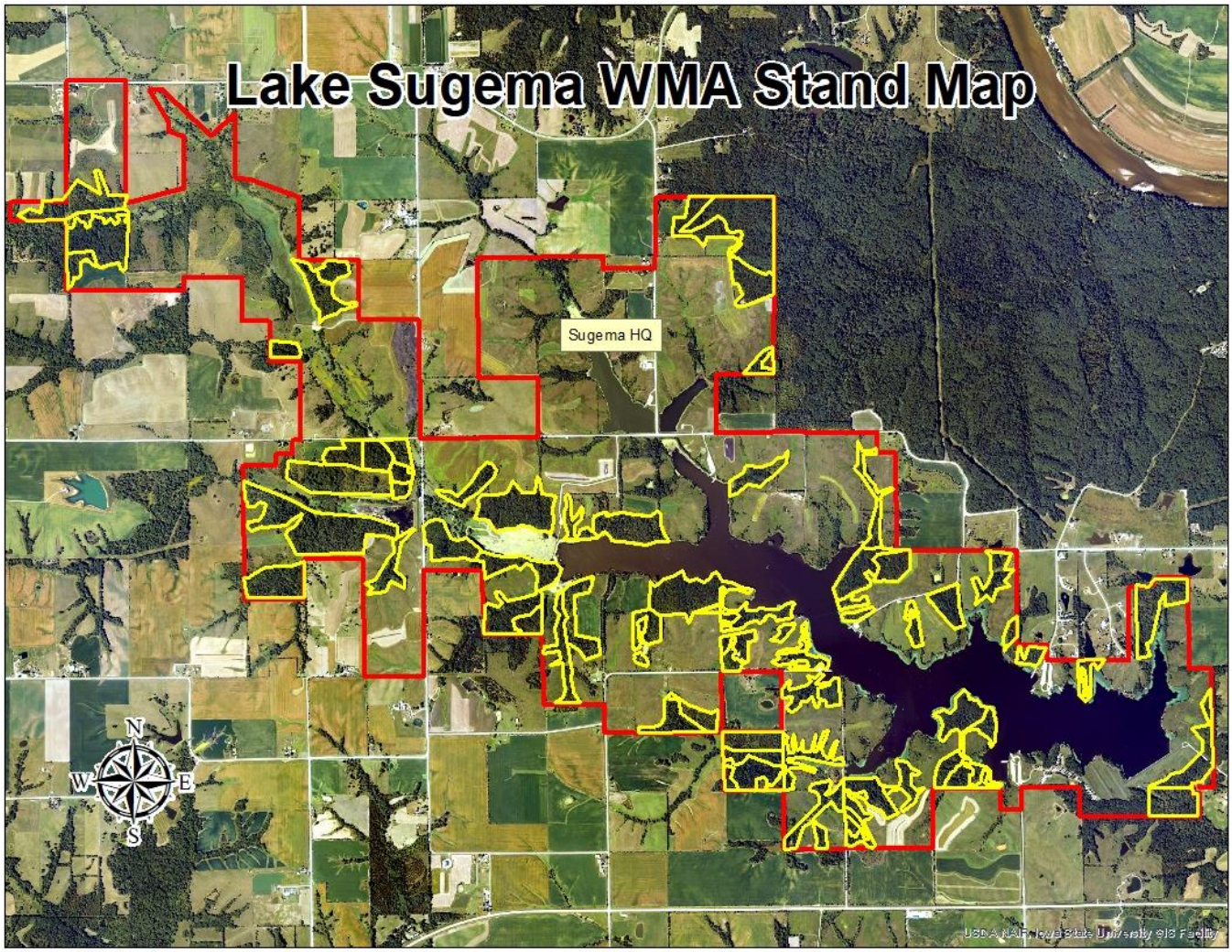
Lake Sugema WMA is comprised of approximately 3,915 total acres. The wildlife area includes 1,985 acres of grassland, 861 acres of woodland, 700 acres of lake and wetland, 370 acres of ag and other.

There are approximately 960 acres of woody habitat on the area, most of which is in small woodlots, narrow ravines, along intermittent streams, and along old fence lines. This woody cover is well distributed across the area with lots of edge between it and either cropland or grassland. This forest wildlife stewardship plan includes the stands that will

benefit the most from this management plan. The remaining woody habitat will be managed as early successional habitat. Bobwhite quail, cottontail rabbits, wild turkey and whitetail deer will benefit from this type of habitat.

861 forested acres addressed in this plan are divided into 80 different stands. Stands were delineated based on a combination of species composition, size class, topography, and management recommendations. Each stand is outlined in detail in this plan with forest management recommendations provided.





How the Forest Wildlife Stewardship Plan was Developed

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

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

Forest Management Objectives

The primary objectives for the wildlife area are as follows:

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

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

Funding for forest management administration and procurement, as well as a portion of the land acquisition costs of the WMAs addressed in this plan can be attributed almost exclusively to hunter-generated monies via license fees and excise taxes on sporting equipment. Consequently, a primary objective for management of the area is to improve habitat for game species such as deer, turkey, rabbit, squirrel and bobwhite quail. The DNR considers the effects of management actions on nongame species as well, particularly those that are threatened, endangered, or species of greatest conservation need. The DNR recognizes that it is difficult, if not impossible, to manage for all species at the same time on any given tract or WMA. However, this plan operates under the assumption that creating and maintaining diverse forest habitats will benefit the most wildlife species possible, regardless of their protective status. In other words, game and nongame species alike will benefit from good habitat management practices.

Oak Management

As stated in the introduction, oaks are a critical component to Iowa's forests. Iowa's wildlife species adapted, coexisted, and eventually became dependent on the benefits that oaks provided. The acorns of the oak provide a high level of fat and protein to wildlife at a time of year that food resources are low and high quality nutrients are critical. While the mast that oaks provide are a staple food source for many wildlife species, other characteristics of the oak are extremely beneficial as well. Some of those characteristics include deeply furrowed bark that host insects and invertebrates creating foraging opportunities for insect eating birds, reptiles, and mammals. The rigor and architecture of the branches provide structure for nesting, roosting, and perching. The leaves provide an important food source for many moths and butterflies, with oaks supporting higher diversity and richness of caterpillars than any other native tree family (Narango et al. 2020). Pollinators also benefit from the nectar and over wintering habitat provided by the oak. Because of the critical role that oak trees play in the ecosystem, they are emphasized heavily in this forest wildlife stewardship plan.

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

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

Harvests

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

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

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

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

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

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

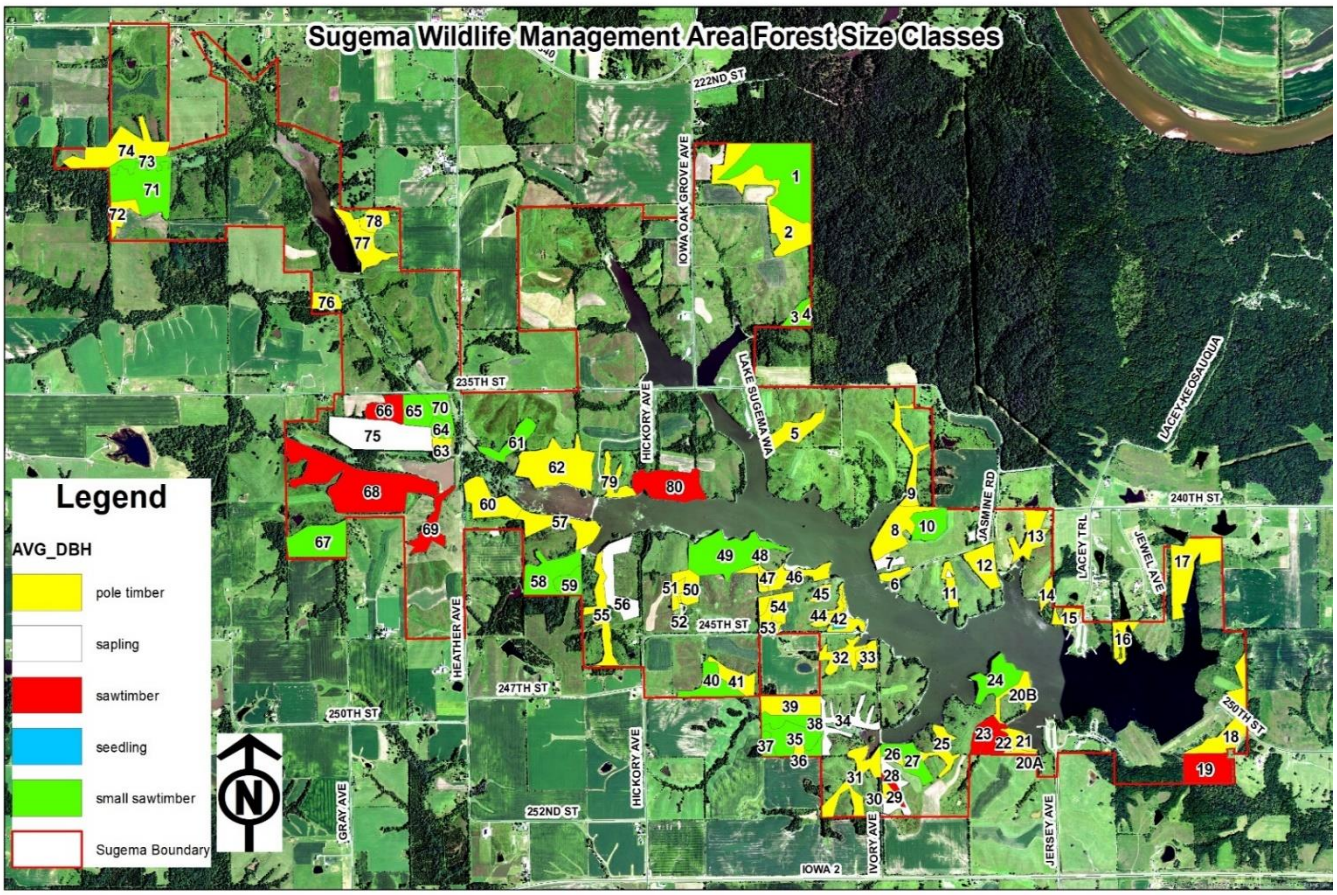
Economics and logistics can alter the timing, scope, and size of a harvest. A harvest is implemented based on a silvicultural prescription designed to reach a wildlife management or forest health objective. Any financial return is purely a byproduct of proper management and not a driving factor. Income from harvests will be reinvested into the WMA to complete the recommended projects within the plan. Those projects include: tree planting, thinning young stands, removing undesirable and invasive species, converting areas to more desirable species, and completing early successional cuts.

Sustainable forestry aims to manage a forest for maximum distribution of age and size classes and gives an indication of the amount of acreage or volume that can be harvested from a given geographical area periodically, without ever running out of volume or growing stock. Generally speaking, with even aged management the sustainable harvest is the total acreage of the forest divided by the rotation age (the period over which trees grow to maturity). Rotation ages for stands vary by the dominant species in each stand, but are generally set at the point of biological maturity. The majority of actively managed even-aged stands use a 120-year rotation, on average. The rotation age calculations reflect only the annual allowable harvest. In actual practice, these figures will fluctuate over and under the allowable harvest periodically.

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

Current Distribution of Forest Size Classes on Lake Sugema WMA
The forest stands were cruised and mapped according to average tree size classes. Refer to the map below.

Size Classes	No. of Stands	Acres (860.7 total)	Percent
Seedlings (<1” DBH)	1	0.8	<1%
Saplings (1-3” DBH)	5	67.5	7.8%
Pole size (4-11” DBH)	47	412.4	47.9%
Small sawlog size (12-17”DBH)	19	253.9	29.5%
Sawlog size (≥18” DBH)	8	126.1	14.7%

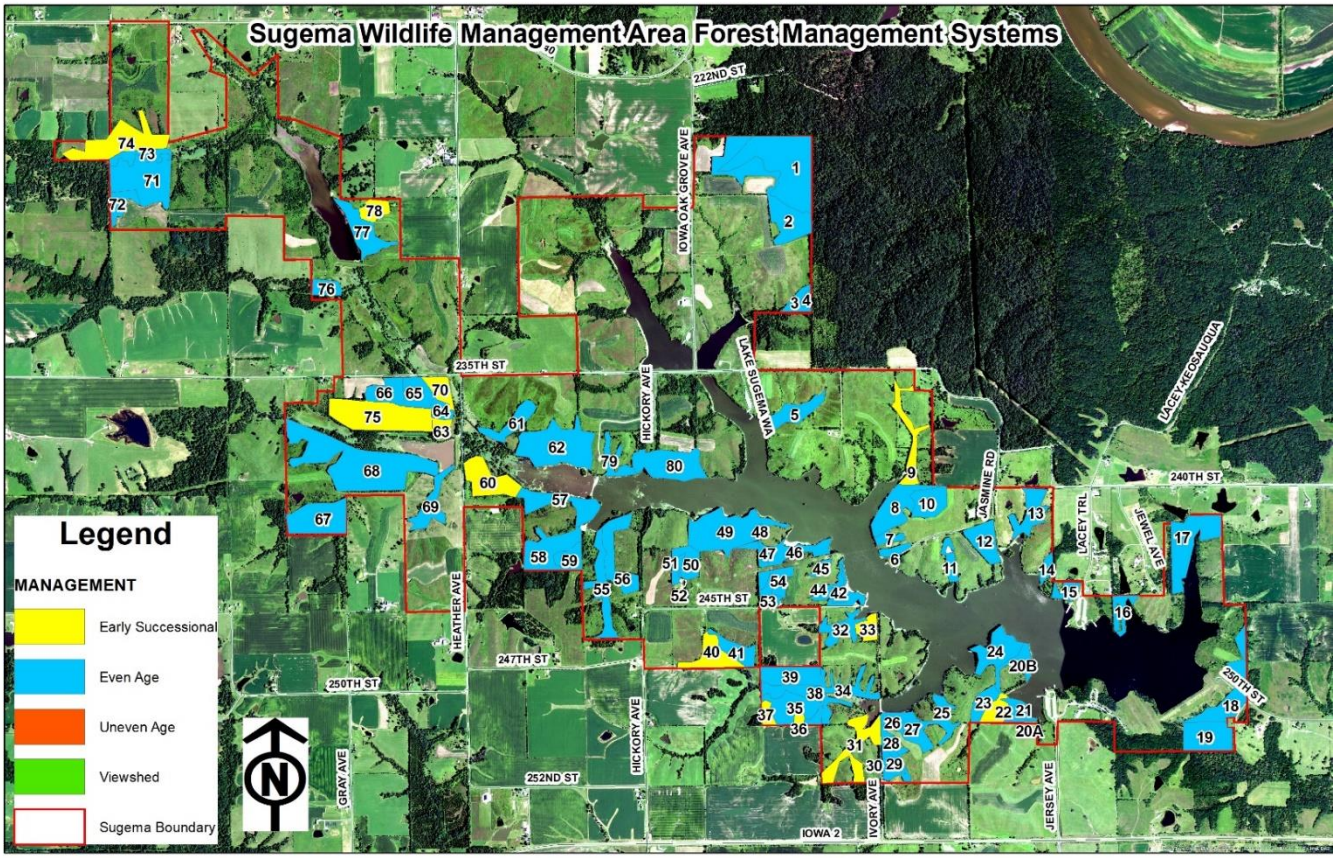


Forest Management Systems for Lake Sugema WMA

One of four management systems is specified for each of the 80 unique forest stands. This identifies the overall management system for that stand and designates the "road map" for what work will take place on the site in the future.

Recommendations for each stand were based on whether the area will be managed to create early successional growth, even age system, uneven age system, or as viewshed. The decision on what system will be used was based on the objectives for the area to maintain a healthy oak-hickory component, develop a diverse woodland landscape, protect fragile sites, improve water quality and increase the acres of early successional growth.

Based on recommendations for the areas, the acres under each management system are as follows. Refer to the map on the following pages. Please note that while 13 of the stands are labeled as Early Successional, many of the Even Aged stands will be early successional stands at varying points throughout the management cycle. Many of the eastern red cedar stands may be managed as early successional as well.



Size Classes	No. of Stands	Acres (860.7 total)	% of Total Area
Early Successional	14	139.3	16%
Even Age	66	721.4	84%
Uneven Age	N/A	N/A	
Viewshed	N/A	N/A	

Even Age Management

This involves growing a stand of trees which are close to the same age. At some point in a stand's life, the area is clearcut which results in the even age structure. This type of management creates excellent habitat for deer, turkey, squirrels and other game and nongame wildlife species. It is essential for regeneration of oak, which requires full sunlight. The only way that oak can be maintained as a component of the forest, over the long run, is by practicing some form of even age management.

Each stage or age class of an even age stand provides habitat for a suite of wildlife species. For example, regenerating stands are seedling size (1-10 years old) and benefit the same species as do early succession stands, i.e. blue-winged warblers, black-billed cuckoo, yellow-billed cuckoo, eastern towhee, as well as bobwhite quail and American woodcock.

Sapling to small pole size stands between 10-20 years old may be used by black and white, Kentucky, and worm-eating warblers. Pole size to medium size trees (20-60 years) tend to be used by canopy nesters such as scarlet tanagers and ground nesters such as ovenbirds and black and white warblers.

Mature stands of 60-125+ years of age are used by birds such as the wood thrush, Acadian flycatcher, ovenbird, worm eating warbler, and scarlet tanager.

As woodland stands age, they constantly lose trees to competition, insects, disease, etc. The dead and dying trees provide habitat for cavity nesters such as woodpeckers, nuthatches, titmice, and wood ducks. Over 30 species of Iowa

nesting birds nest in the cavities of trees. Iowa's seven species of woodpeckers (including two SGCN) are the primary cavity builders and nesters, and these woodpeckers are the keystone species that provide the cavities for so many other secondary nesting birds, as well as providing homes for flying squirrels, gray and fox squirrels, bats, and a host of other species. The federally endangered Indiana bat uses loose barked live trees such as shagbark hickory as well as the sloughing bark from dying trees for their maternity colonies. Retaining or creating 6-10 snags per acre of varying DBH can increase the diversity of birds and other wildlife that use an area. Large snags take decades to grow so retaining some large wolf trees (future snags) or girdling and leaving trees during harvest can increase forest structural diversity.

While there are many methods to open a stand to sunlight, clearcutting and shelterwood harvesting are the most common. Clearcutting is a practice that opens the stand all at once. Clearcutting also provides highly desired early successional habitat for the first 15-20 years until the tree canopy closes. Regeneration via clearcutting requires there be sufficient oak seedlings or advanced regeneration present. Minus these seedlings, bare root planting may be necessary following clearcutting.

Shelterwood harvests are one way of recruiting seedling production prior to a clearcut. Shelterwood harvests include several thinnings done prior to the final clearcut. If the shelterwood is done correctly, the trees left after the thinnings will provide seed and the forest will be open enough to allow sunlight to reach the forest floor. The trees left will also help provide shade that limits the growth of undesirable or invasive plant species. This method can take 15-20 years to create the next oak stand and may need mechanical or fire disturbance to keep out undesirable species. The complex forest structure of a shelterwood harvest after thinning and before final clearcuting supports a highly diverse wildlife community with both early-successional and mature forest species. After sufficient seedling or advanced regeneration is present, the stand needs to be clearcut to successfully regenerate the oak stand. Crop tree release provides an opportunity for girdling and leaving snags in a stand.

Crop tree release is discussed in this plan as a type of timber stand improvement. This practice is done most frequently when the trees are pole sized. The goal of the practice is to choose up to 50 trees per acre that are considered to have the best genetics. These trees are typically tallied and marked with paint, and then the trees that touch the canopy of the crop tree are killed to allow the crop tree to reach maximum growth potential, increase mast production, and improve forest health.

Thinning the understory or weed tree removal is a practice also used in even age management. This practice involves removing trees that are below the main canopy to allow more sunlight to get to the forest floor. Ironwood, bitternut hickory, buckeye, elm, hackberry, and other shade tolerant species warrant this practice when species like oak are wanted in the future.

Prescribed fire is an effective and relatively inexpensive tool that has a long history of use and continues to be studied in managing oak stands. Occasional burning of the leaf layer in the woods will top-kill thin barked species that are less than two inches' diameter such as hackberry, hard maple, buckeye, cherry, elm, bitternut hickory and ironwood. Fire will expose mineral soil and open up the ground to sunlight. These conditions favor the natural regeneration of oak. Depending on the extent of root system development, some oak seedlings will tolerate fire better than others, but as a whole, oaks tolerate fire better than other tree species. The top of an oak seedling often will die back following fire, but the roots will send up new growth soon thereafter. Oak has a superior competitive advantage thanks to their strong root collar and ability to sprout. Most shade tolerant trees, such as, elm, bitternut, ironwood, and hackberry do not possess strong re-sprout capabilities.

Lake Sugema WMA has 721.4 acres (84% of all woodland acres) that will be managed as even aged forest to regenerate oak. Applying sustainable Forestry guidelines, approximately 30 acres could be clearcut every 5 years assuming a 120 - year rotation age.

Uneven Age Management

This develops a stand of trees with all DBH size classes. 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 hackberry, hickory,

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 areas will provide continuous tracts of woodland with infrequent disturbance. Large tracts of uneven age management will provide necessary habitat for Neotropical migratory bird species such as cerulean, hooded, Canada, and Kentucky warblers, red-eyed vireo, and Acadian flycatcher. These stands also support species that require larger diameter trees and snags such as pileated woodpecker, red-shouldered hawk, great horned owl, and gray fox. Selective harvesting will create small openings in the canopy, which will increase ground cover, and enhance stand structure. Den trees will be left to provide cavities for wildlife such as woodpeckers, bats, and squirrels. Large oaks that are healthy will be left to provide acorns for many wildlife species. Timber stand improvement and selective harvesting will create woody debris on the forest floor for reptiles and amphibians.

Early Successional Management

This provides high density tree and shrub thickets with highly diverse forbs, sedges, and grasses. Many bird species such as bobwhite quail, American woodcock, blue- winged warbler, black-billed cuckoo, yellow-billed cuckoo, and eastern towhee are dependent on the early successional stages of woody growth for breeding. Many mature-forest birds also use early successional forests during the post-fledging and migratory periods and pollinators and bats forage in these areas. The high stem density of both trees and shrubs provides suitable foraging and/or nesting habitat, and protection from predators. The majority of early succession management prescribed in this plan is on the woodland edges during timber stand improvements. This work will "feather" the edges and make a gradual transition from the field edges to the larger trees. Feathering and softening the edges may lessen nest parasitism of interior forest bird species by brown-headed cowbirds. The early succession management areas will be managed on a 10-20-year rotation. In other words, every 10-20 years the stands will be cut to maintain areas with high stem density.

Lake Sugema WMA has 139.3 acres (16%) scheduled for early successional management. Applying sustainable forestry guidelines, 11 acres could be cut every 10 - 15 years.

Viewshed Management

These areas are typically areas with poor access, steep fragile slopes and areas along streams that are best left to naturally progress through succession. Viewsheds may also be used to protect areas for endangered species or be used to protect certain public use facilities.

Management can take place in these areas where desirable, especially invasive species control, but the major objective is to have minimal disturbance. Certain Neotropical migrants will benefit from the areas designated as viewshed.

Work Plan for Lake Sugema WMA

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

Before implementation of any prescribed harvests, the project plan will be reviewed internally to determine potential impacts to both state and federal threatened or endangered species. Harvests will not be initiated until this review has been completed and all T/E comments/concerns have been addressed.

Lake Sugema WMA Stand Summary & Recommendations

Stand	Acres	Timber Type	Size Class	Mgt System	Prescription	Priority
1	42	W.oak, r.oak, bl. oak, bur oak, shag & mockernut hickory	Sm. saw	Even age	CTR, Fire	High
2	30.3	W.oak, red oak, elm, shagbark hickory, cedar	Pole	Even age	CTR, Fire	High
3	4	Pin oak, hackberry, silver maple, walnut, honeysuckle	Sm. saw	Even age	CTR, Invasives	Low
4	1.5	Cedar, scotch pine, honeysuckle, autumn olive	Sm. saw	Even age	Invasives	Low
5	10.3	Walnut, black locust, bur & white oak, honeysuckle	Pole	Even age	CTR, Invasives	Medium
6	2.8	Bitternut hickory, hackberry, swamp white and shingle oak	Pole	Even age	CTR, Fire	Medium
7	3	Swamp white, red & shingle oak, multiflora rose, autumn olive	Sapling	Even age	Prescribed fire	Low
8	16.2	Shagbark hickory, walnut, bur oak red elm, hackberry, cedar, honey locust	Pole	Even age	CTR, Invasives	Medium
9	16.2	Walnut, hedge, bur oak, elm, honey locust, cedar, honeysuckle	Pole	Early Successional	CTR, Invasives	Medium
10	10.5	Cedar, walnut, honeysuckle	Sm. saw	Even age	Fire, Invasives	Low
11	5	Swamp white, bur, shingle oak, walnut, bitternut, shagbark hickory	Pole	Even age	CTR, Invasives	Low
12	10.4	Swamp white, bur & shingle oak, bitternut & shagbark hickory, black locust	Pole	Even age	CTR, Fire	High
13	11	Shingle oak, bitternut hickory, elm, walnut, cottonwood, autumn olive, honeysuckle, multiflora rose	Pole	Even age	CTR, Invasives	Low
14	3.1	Bitternut & shagbark hickory, shingle & red oak, autumn olive, multiflora rose	Pole	Even age	CTR, Invasives	Low
15	4.2	Pin, swamp white oak, elm, honeysuckle, white mulberry	Pole	Even age	CTR, Fire	Medium
16	5.3	Shagbark hickory, pin, oaks, red, shingle, swamp oak	Pole	Even age	CTR, Fire	Low
17	22.6	Black & honey locust, shingle oak, hedge, autumn olive, multiflora rose, honeysuckle	Pole	Even age	CTR, Fire, Invasives	Low
18	18.4	Bitternut & shagbark hickory, black, red, shingle & white oak, elm, honey locust, hedge and ash	Pole	Even age	CTR, Invasives	Low
19	15.7	Honey locust, silver maple, walnut, white oak, elm, hackberry	Lg. saw	Even age	SPNR	Medium
19A	16.6	Bitternut & shagbark hickory, bur, pin & shingle oak, honey locust, walnut	Lg. saw	Even age	CTR, Invasives	High
20A	1.9	Bur, pin, red, shingle & swamp white oak, bitternut and shagbark hickory	Lg. saw	Even age	CTR	Medium
20B	6.8	Bur, pin, red, shingle & swamp white oak, bitternut, shagbark and shellbark hickory	Pole	Even age	CTR	Low
21	3.9	Red cedar	Pole	Even age	Prescribed Fire	Low
22	5.8	Bitternut hickory, black oak, honey locust, elm and walnut	Lg. saw	Early Successional	Prescribed Fire	High
23	6.3	Black, bur & red oak, bitternut & shagbark hickory, elm, hedge, honey locust, walnut and cherry	Lg. saw	Even age	SPNR, Harvest	High
24	13.9	Bitternut, shagbark hickory, black, bur, red, shingle & swamp white oak, elm, hazelnut	Sm. saw	Even age	CTR, Fire	High
25	7.8	Black, bur, shingle & swamp white oak, walnut, honey locust, bitternut hickory, cedar	Pole	Even age	CTR, Fire	Low
26	0.7	Black locust	Pole	Even age	Fire	Low
27	11.4	Bitternut & shagbark hickory, bur, red, white & swamp white oak, basswood, honey locust,	Sm. saw	Even age	SPNR, Harvest	Low

Stand	Acres	Timber Type	Size Class	Mgt System	Prescription	Priority
28	7	Shingle and swamp white oak, bitternut hickory, hackberry, dogwood	Sapling	Even age	CTR, Fire	Low
29	2.4	Black & shingle oak, bitternut hickory, hackberry, elm and multiflora rose	Lg. saw	Even age	Fire	Low
30	2.2	Red Cedar	Pole	Early Successional	Prescribed fire	Low
31	15.3	Shingle oak, hedge, black locust, willow, elm, hackberry, bitternut hickory, cherry and walnut	Pole	Early Successional	Prescribed fire	Low
32	10.1	Shingle, swamp white oak, bitternut and shagbark hickory, walnut cherry and hedge	Pole	Even age	CTR	High
33	5.1	Black locust	Pole	Early Successional	CTR, Fire	Low
34	12.1	Shingle, swamp & white oak, bitternut hickory, hackberry and elm	Sapling	Even age	CTR	Low
35	13.5	White and red pine, elm hackberry, shingle oak, multiflora rose	Sm. saw	Even age	BA Thinning	Medium
36	1.3	Hackberry, shingle oak, white mulberry	Pole	Even age	Prescribed fire	Low
37	2.7	Black locust, shingle oak, hackberry and elm	Sm. saw	Even age	Fire, Invasives	Low
38	10.1	Pin oak, cottonwood, American & red elm, shingle oak, hedge, hackberry, multiflora rose	Sm. saw	Even age	Fire, Invasives	Low
39	12.5	Red cedar	Pole	Even age	Prescribed fire	Medium
40	11.2	Honey locust, elm, hackberry, shingle oak, walnut, multiflora rose	Sm. saw	Early Successional	Prescribed fire	Low
41	7.5	Red cedar	Pole	Even age	Prescribed fire	Low
42	8.0	Shingle & swamp white oak, shagbark hickory, walnut	Pole	Even age	CTR	Medium
43	.8	Swamp white oak, shingle oak, autumn olive	Sapling	Even age	Invasives	Low
44	1.9	Red cedar	Pole	Even age	Prescribed fire	Low
45	2.3	Bur, shingle & swamp white oak, cedar, cherry, basswood, bitternut hickory	Pole	Even age	CTR, Fire	Medium
46	9.9	Swamp white oak, bur oak, shingle & red oak, bitternut and shagbark hickory	Pole	Even age	CTR, Prescribed fire	Medium
47	3.8	Red cedar	Pole	Even age	Prescribed fire	Low
48	.6	White oak	Pole	Even age	CTR	High
49	29.4	Bitternut & shagbark hickory, bur, white & shingle oak, honey locust, elm hackberry, hedge, cedar, cherry basswood	Sm. saw	Even age	CTR, Fire, Invasives	Medium
50	9.0	Honey locust, walnut, black locust, multiflora rose	Pole	Even age	CTR, Fire, Invasives	Medium
51	1.3	Red cedar	Pole	Even age	CTR, Fire, Invasives	Low
52	1.3	Black locust, cedar, hedge and honey locust	Pole	Even age	Prescribed fire	Low
53	4.5	Walnut, hedge, hackberry, shingle oak, honey locust, boxelder, cedar, white mulberry, autumn olive, multiflora rose	Pole	Even age	CTR, Weed tree removal	Medium
54	6.9	Red cedar	Pole	Even age	Prescribed fire	Low
55	12.8	Walnut, shingle oak, cottonwood, hackberry, honey locust and elm	Pole	Even age	CTR	High
56	14.5	Shingle oak, walnut, bitternut & shagbark hickory, hackberry, elm, cedar, mixed oaks	Sapling	Even age	Prescribed fire	Low
57	14.8	Bitternut & shagbark hickory, shingle oak, hackberry, elm, honey locust, walnut	Pole	Even age	CTR, Prescribed fire	Low
58	16.9	Bitternut hickory, black locust, walnut, shingle oak, elm, honey locust, swamp white oak	Sm. saw	Even age	Prescribed fire	Medium

Stand	Acres	Timber Type	Size Class	Mgt System	Prescription	Priority
59	6.3	Red Cedar, honeysuckle	Sm. saw	Even age	Prescribed fire	Low
60	15.5	Bitternut hickory, honey locust, white oak, walnut	Pole	Early Successional	Fire, BA thinning	Low
61	8.7	Bitternut hickory, walnut, basswood, shingle oak, hackberry	Sm. saw	Even age	CTR	Low
62	30.9	Shingle oak, honey locust, bitternut & shagbark hickory, walnut and cedar	Pole	Even age	BA Thinning, Fire	Low
63	3.2	Honey locust, elm, shingle oak, bitternut& shagbark hickory, walnut, hedge	Pole	Early Successional	Prescribed fire	Low
64	4.2	Bitternut & shagbark hickory, bur, pin & post oak	Sm. saw	Even age	Prescribed fire	Medium
65	9.3	Pin oak, bitternut & shagbark hickory, walnut, cedar	Sm. saw	Even age	Fire, BA thinning	Medium
66	8.4	Bur, pin & post oak, hackberry and walnut	Lg. saw	Even age	CTR	High
67	19.8	Hackberry, bitternut & shagbark hickory, basswood, elm and multiflora rose	Sm. saw	Even age	Fire, BA thinning	Medium
68	56.2	Hackberry, bitternut hickory, pin and shingle oak, walnut	Lg. saw	Even age	Fire, Harvest	Low
69	10.2	Pin oak, cottonwood, walnut, hackberry, bitternut hickory, silver maple	Lg. saw	Even age	Prescribed fire	Low
70	6.5	Honey locust, walnut, elm, hackberry, boxelder	Sm. saw	Early Successional	Fire, Invasives	Low
71	27	Pin oak, bitternut & shagbark hickory, honey locust, elm and black cherry	Pole	Even age	BA Thinning, Fire	Low
72	6.1	Red cedar	Pole	Even age	Prescribed fire	Low
73	6.5	Silver maple, honey locust, box elder, pin oak	Pole	Even age	Fire, Invasives	Low
74	24.1	Cedar, pin & shingle oak, white mulberry, hedge, multiflora rose and honeysuckle	Sm. pole	Early Successional	Fire, Invasives	Low
75	30.9	Mixed & shingle oak, honey locust, hickory	Sapling	Early Successional	Prescribed fire	Medium
76	5	Silver maple, pin oak, bitternut hickory, hackberry, walnut	Sm. saw	Even age	Prescribed fire	Low
77	13.7	Walnut, bur & pin oak, hedge, black & honey locust, hackberry, cedar	Sm. saw	Even age	CTR, Fire	Medium
78	6	Black locust, walnut, elm and hackberry	Sm. saw	Early Successional	CTR	Low
79	6.4	Walnut, hackberry, bitternut hickory, elm, honey locust	Sm. pole	Even age	CTR	Medium
80	21.1	Black & shingle oak, bitternut & shagbark hickory, walnut	Pole	Even age	Prescribed fire	Medium

Sugema WMA Priority Stands

Stand	Acres	Prescription
1	42	CTR
2	30.3	CTR
12	10.4	CTR
22	5.8	CTR
23	6.3	CTR, SPNR
24	13.9	CTR
32	10.1	CTR
55	12.8	CTR
66	8.4	CTR

Threatened and Endangered Species

While habitat management activities are intended to have an overall conservation benefit through habitat improvement at times these activities may have unintended consequences for a variety of species. For this reason, prior to implementation, forest management activities described here will be reviewed internally to assess potential impacts to both state and federal species of concern.

When protected species are known to occur in the management area or suitable habitat is present, management biologists implement conservation measures as described in the Operations & Maintenance Plan for Wildlife Management Areas in the State along with recommendations from NAI staff for specific projects. Management activities are not initiated until this review has been completed and T/E comments/concerns have been addressed.

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

Special note on Northern Long-eared Bat, Indiana Bat and Tricolored Bat

The Indiana bat (Myotis sodalis) is a federal (50CFR Part 17) and state (Code of Iowa, Chapter 481B) endangered species that occurs in southern Iowa as far north as Highway 30. The Northern Long-Eared bat (Myotis septentrionalis) is a federally endangered species that can occur in any county in Iowa. The Tricolored Bat (Perimyotis subflavus) is a federally proposed endangered species that can occur in any county in Iowa. All three bats can be active April thru September in forested areas. Female Indiana bat and Northern Long-eared bats may roost and rear young in standing trees 3" dbh and larger, either dead or alive, with loose, shaggy or peeling slabs of bark, cavities in the trunk, large limbs, large cracks or openings.

To protect summer habitat for all three species of bats, adhere to the following guidance:

- Avoid felling any dead standing or live trees 3" DBH and larger that contain cavities, cracks or crevices or loose, platy, peeling or shaggy bark from April 1 through September 30th.
- Such trees meeting the above criteria may be felled beginning October 1 through March 31st; however, in all forest management projects, retain a minimum of 9 suitable habitat trees per acre if present above this rate.
- Live trees can be girdled any time of the year to create habitat snags in Forest stand improvement operations.
- Avoid conducting prescribed burns in woodlands from May 15 until August 15.
- Avoid clearcuts, seed tree harvests or site preparation projects larger than 10 acres that could negatively affect suitable habitat.

List of Endangered, Threatened & Special Concern Species in Van Buren County

County	Common Name	Scientific Name	Class	State Status	Federal Status
VAN BUREN	Central Newt	Notophthalmus viridescens	AMPHIBIANS	T	
VAN BUREN	Crawfish Frog	Rana areolata	AMPHIBIANS	E	
VAN BUREN	Bald Eagle	Haliaeetus leucocephalus	BIRDS	S	
VAN BUREN	Barn Owl	Tyto alba	BIRDS	E	
VAN BUREN	Henslow's Sparrow	Ammodramus henslowii	BIRDS	T	
VAN BUREN	Northern Harrier	Circus cyaneus	BIRDS	E	
VAN BUREN	Red-shouldered Hawk	Buteo lineatus	BIRDS	E	
VAN BUREN	Short-eared Owl	Asio flammeus	BIRDS	E	
VAN BUREN	Orangethroat Darter	Etheostoma spectabile	FISH	T	
VAN BUREN	Topeka Shiner	Notropis topeka	FISH	E	E
VAN BUREN	Butterfly	Ellipsaria lineolata	FRESHWATER MUSSELS	T	
VAN BUREN	Pistolgrip	Tritogonia verrucosa	FRESHWATER MUSSELS	E	
VAN BUREN	Edwards' Hairstreak	Satyrium edwardsii	INSECTS	S	

County	Common Name	Scientific Name	Class	State Status	Federal Status
VAN BUREN	Pipevine Swallowtail	Battus philenor	INSECTS	S	
VAN BUREN	Regal Fritillary	Speyeria idalia	INSECTS	S	
VAN BUREN	Zabulon Skipper	Poanes zabulon	INSECTS	S	
VAN BUREN	Indiana Bat	Myotis sodalis	MAMMALS	E	E
VAN BUREN	Northern Long-eared Bat	Myotis septentrionalis	MAMMALS	E	E
VAN BUREN	Northern Tri-Colored Bat	Perimyotis subflavus	MAMMALS	T	
VAN BUREN	Southern Bog Lemming	Synaptomys cooperi	MAMMALS	E	
VAN BUREN	Spotted Skunk	Spilogale putorius	MAMMALS	S	
VAN BUREN	Cream Violet	Viola striata	PLANTS (DICOTS)	S	
VAN BUREN	Creeping Bush-clover	Lespedeza repens	PLANTS (DICOTS)	T	
VAN BUREN	Downy Woodmint	Blephilia ciliata	PLANTS (DICOTS)	T	
VAN BUREN	Drummond St. John's Wort	Hypericum drummondii	PLANTS (DICOTS)	S	
VAN BUREN	Dwarf Sumac	Rhus copallina	PLANTS (DICOTS)	S	
VAN BUREN	Earleaf Foxglove	Tomanthera auriculata	PLANTS (DICOTS)	S	
VAN BUREN	False Loosestrife	Ludwigia peploides	PLANTS (DICOTS)	S	
VAN BUREN	Frost Grape	Vitis vulpina	PLANTS (DICOTS)	S	
VAN BUREN	Golden Corydalis	Corydalis aurea	PLANTS (DICOTS)	T	
VAN BUREN	Hortulan Plum	Prunus hortulana	PLANTS (DICOTS)	S	
VAN BUREN	Lance-leaf Ragweed	Ambrosia bidentata	PLANTS (DICOTS)	S	
VAN BUREN	Low Bindweed	Calystegia spithamaea	PLANTS (DICOTS)	S	
VAN BUREN	Northern Gooseberry	Ribes hirtellum	PLANTS (DICOTS)	S	
VAN BUREN	Paw Paw	Asimina triloba	PLANTS (DICOTS)	S	
VAN BUREN	Prairie-tea	Croton monanthogynus	PLANTS (DICOTS)	S	
VAN BUREN	Rough Buttonweed	Diodia teres	PLANTS (DICOTS)	S	
VAN BUREN	Sensitive Briar	Schrankia nuttallii	PLANTS (DICOTS)	S	
VAN BUREN	Slender Copperleaf	Acalypha gracilens	PLANTS (DICOTS)	S	
VAN BUREN	Smooth Black-haw	Viburnum prunifolium	PLANTS (DICOTS)	S	
VAN BUREN	Softleaf Arrow-wood	Viburnum molle	PLANTS (DICOTS)	S	
VAN BUREN	Spring Avens	Geum vernum	PLANTS (DICOTS)	S	
VAN BUREN	Waxyfruit Hawthorn	Crataegus pruinosa	PLANTS (DICOTS)	S	
VAN BUREN	White Evening Primrose	Oenothera speciosa	PLANTS (DICOTS)	S	
VAN BUREN	Winged Monkey Flower	Mimulus alatus	PLANTS (DICOTS)	T	
VAN BUREN	Broom Sedge	Andropogon virginicus	PLANTS (MONOCOTS)	S	
VAN BUREN	Bush's Sedge	Carex bushii	PLANTS (MONOCOTS)	S	
VAN BUREN	False Hellebore	Veratrum woodii	PLANTS (MONOCOTS)	T	
VAN BUREN	Glomerate Sedge	Carex aggregata	PLANTS (MONOCOTS)	S	
VAN BUREN	Meadow Bluegrass	Poa wolfii	PLANTS (MONOCOTS)	S	
VAN BUREN	Oval Ladies'-tresses	Spiranthes ovalis	PLANTS (MONOCOTS)	T	
VAN BUREN	Pale Green Orchid	Pale Green Orchid	PLANTS (MONOCOTS)	E	
VAN BUREN	Slender Ladies'-tresses	Slender Ladies'-tresses	PLANTS (MONOCOTS)	T	
VAN BUREN	Soft Rush	Soft Rush	PLANTS (MONOCOTS)	S	
VAN BUREN	Purple Cliff-brake Fern	Purple Cliff-brake Fern	PLANTS (PTERIODOPHYTES)	E	

County	Common Name	Scientific Name	Class	State Status	Federal Status
VAN BUREN	Southern Adder's-tongue	Southern Adder's-tongue	PLANTS (PTERIODOPHYTES)	S	
VAN BUREN	Copperhead	Copperhead	REPTILES	E	E
VAN BUREN	Diamondback Water Snake	Diamondback Water Snake	REPTILES	T	
VAN BUREN	Slender Glass Lizard	Slender Glass Lizard	REPTILES	T	
VAN BUREN	Speckled Kingsnake	Speckled Kingsnake	REPTILES	T	
VAN BUREN	Western Worm Snake	Western Worm Snake	REPTILES	T	

Legend: E =Endangered, T = Threatened, S = Special Concern