Forest Wildlife Stewardship Plan (FWSP)
Redbird Farms (WMA)

Johnson County

Developed by
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Introduction

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Redbird Farms WMA is located in central Johnson County approximately 6 miles southwest of Iowa City. This 464-acre property was acquired in 1995. Old Man's Creek flows through the eastern portion of the property. The majority of this property (279 acres) is comprised of wooded habitat. These 279 acres will be the focus of this plan with individual stands being described and recommendations provided for each.

The terrain for this property consists mostly of rolling or steep slopes with a small amount of bottomland acreage as well. The existing forests of the Redbird Farms tract are composed of mostly upland hardwoods, and a few bottomland areas.

The area is home to a wide variety of wildlife species such as deer, turkey, rabbit, squirrel, coyote, raccoon, bobcat, mink, beaver, muskrat, at least 13 species of frog, turtle, and snakes, and over 130 bird species. The forest wildlife stewardship plan will provide managers with a plan on how to best manage the forest resources on this WMA in order to provide forest health and the highest quality wildlife habitat for all of the previously mentioned species.

Reconnaissance surveys were conducted on the area in the winter of 2023/2024. From this, the property was divided into 21 stands. Each stand represents a homogeneous unit of land which will be managed in a specific way. Stand maps with descriptions and management recommendations were developed after discussions with the WMA Biologist and other DNR staff.

The Redbird Farms WMA 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.

Forest Resource Description

This plan contains forest management recommendations for 279 forested acres. The forest management areas have been divided into 21 total stands for management purposes. See Figure 1 of this plan for specific forest management stand locations. Looking at the 1930's aerial photo of the property (Figure 2) there were approximately 11 stands on the site that had a little less, to significantly less, tree cover then compared to the present.

Out of the 21 forested stands on this property there are seven that are classified as bottomland hardwoods. The soils in these stands are either a Lawson or Nodaway silt loam along the creek system (0-2% slopes) that range from well to somewhat poorly-drained. There are 10 upland stands classified as central hardwoods, 3 as oak-hickory, and 1 as black

walnut. The topography in the uplands ranges from 5-25% slopes and the soils are a mix of Clinton and Fayette silt loams that range from moderately well to well-drained (Figure 3).

Current Conditions of Redbird Farms WMA Woodlands

The District Forester walked the forest cover of the property in the winter of 2023/2024 and recorded data that would help classify and describe the woodland on a stand-by-stand basis. 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.

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 Redbird Farms WMA is as follows (Figure 4):

- **Central Hardwoods**
  48% Mixed upland deciduous forest where no single species dominates. Common species include bitternut hickory, hackberry, shagbark hickory, black cherry, basswood, white oak, black/red oak, and black walnut
- **Oak-Hickory**
  21% Mixed oak and hickory are dominant along with some other scattered hardwood species
- **Bottomland Hardwoods First Bench**
  15% Silver maple, cottonwood, green ash, boxelder, willow, black walnut, river birch, etc. *Most of the ash has died
- **Bottomland Hardwoods Second Bench**
  12% Bitternut hickory, black walnut, hackberry, ash, silver maple, honey locust, bur oak, etc. *Most of the ash has died
- **Black Walnut**
  4% Mostly black walnut along with some other mixed hardwoods

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 WMA, 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 such as oak wilt.

In Redbird Farms WMA, 47% of the forest is larger than 18 inches in diameter at breast height (sawtimber), 44% of the forest is between 13 and 18 inches in diameter (small sawtimber), and the remaining 9% of the forest is pole-sized trees (5-12 inches in diameter). This means that close to 50% of the overstory cover is generally mature, and less than 10% of the forest cover would be considered younger (Figure 5).

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, and bitternut hickory is becoming common also. This means hackberry and bitternut hickory 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 shrub honeysuckle is present in the understory of all forest stands. This species is becoming dense in a number of stands, and other non-native invasive shrubs such as multiflora rose, Japanese barberry, and autumn olive are starting to be introduced into the woodland cover of the property. Having a dense understory with non-native invasive species can be detrimental to the rusty patched bumble bee (*Bombus affinis*) (federally endangered species (50 CFR Part 17)) that can potentially be found on this property.

Forest Management Goals

The primary management goals for the Redbird Farms WMA 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 minimizing understory non-native invasive species within the woodland cover which will improve understory wildlife habitat and allow property managers an opportunity to promote some oak-hickory habitat and open oak-hickory habitat long term in selected locations
3. Maximize forest health by promoting long-term diversity which will strengthen its resiliency in the face of new pests & diseases
4. Ensure high quality recreational opportunities for hunting, mushroom hunting, birdwatching, and other outdoor activities
5. Maintain and enhance other societal benefits provided by forests including watershed protection, outdoor recreation, air quality, carbon sequestration, aquatic habitat, diversification of the rural economy, jobs and more.

Management Systems

The decision on what specific silvicultural activities are prescribed for each stand are based on overall management goals for the WMA 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 and black walnuts which require 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. Approximately 49 acres of crop tree release has been completed on this WMA in the last 18 years.
- 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.
- Periodic controlled understory burning is prescribed to improve wildlife ground cover and to help control unwanted and invasive shrub species in forest understories or along forest edges.
- Shelterwood, clearcutting, and group selection tree harvest systems, with or without additional tree planting, are recommended as the only suitable harvest systems for regenerating oaks. The Shelterwood system is really a two-cut harvest system that is often used to help develop a population of desirable tree seedlings on the ground before the final overstory removal cut.
- Savannas and stands composed of coppiced (sprout origin) hardwoods are also types of even-aged management systems.

➢ There are eleven stands totaling 181.5 acres designated for Even-aged management on a 120-year rotation. The majority of these stands are in upland areas (Figure 6).

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 20-25 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.

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. 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. Where/whenever possible, retaining live loose bark tree species (e.g., shagbark hickory), 6-10 snags per acre is beneficial to bats. 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 and small mammals.

- No forest stands at the Redbird Farms WMA 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.

- Ten stands totaling 97.5 acres are designated for Viewshed management. The majority of these stands are along the creek system on the property and a few are adjacent to parking lots. Management of non-native invasive woody species will be a focus in these areas.

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 the young, dense woody growth. High stem densities of trees and shrubs provide suitable nesting habitat and protection from predators. 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 Redbird Farms WMA are designated for early successional management.

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.

- There are currently no stands designated for savanna management.

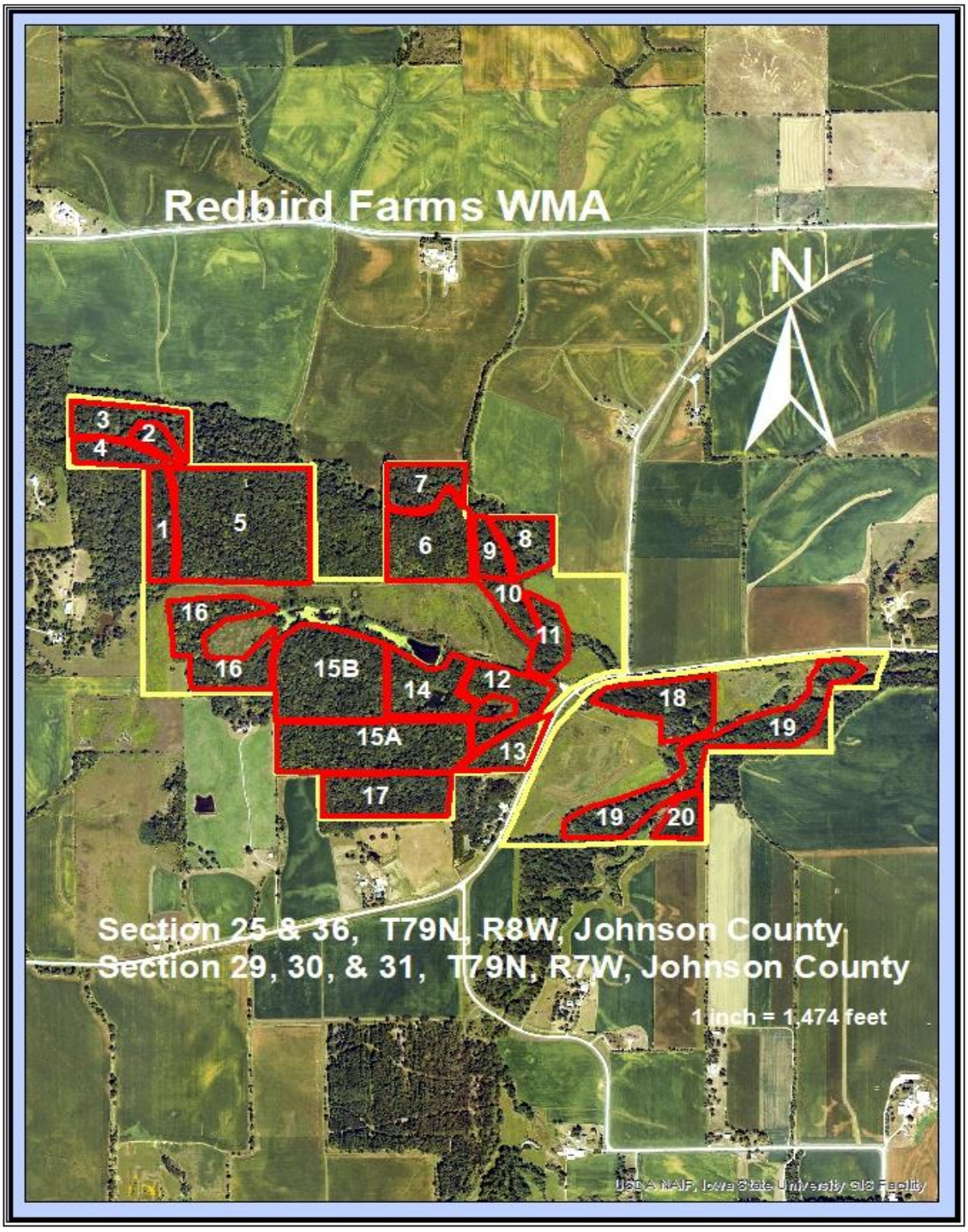

Figure 1. Aerial photo showing woodland cover in 2023 for stands 1 through 20

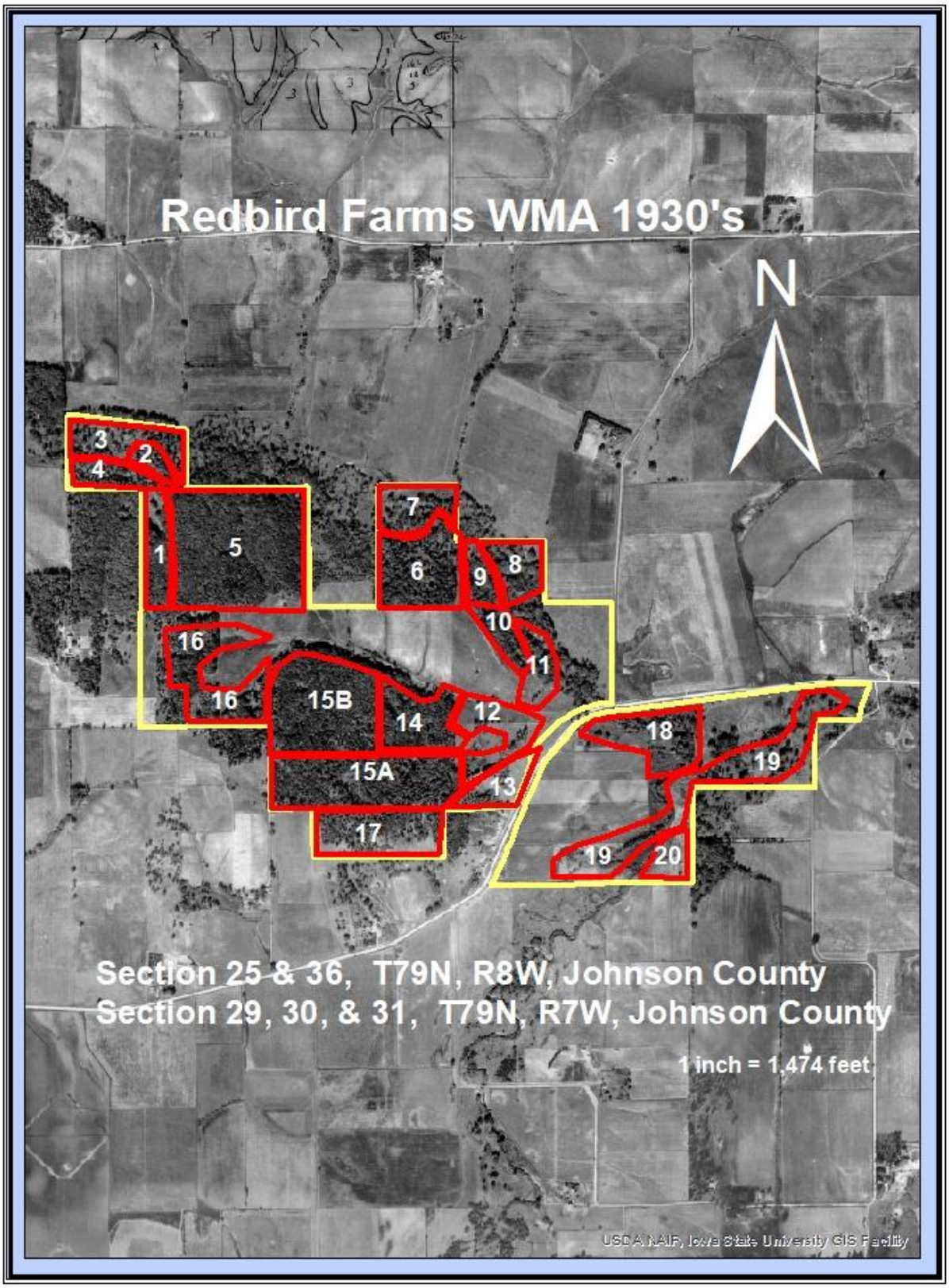

Figure 2. Aerial photo showing woodland cover in the 1930's for stands 1 through 20

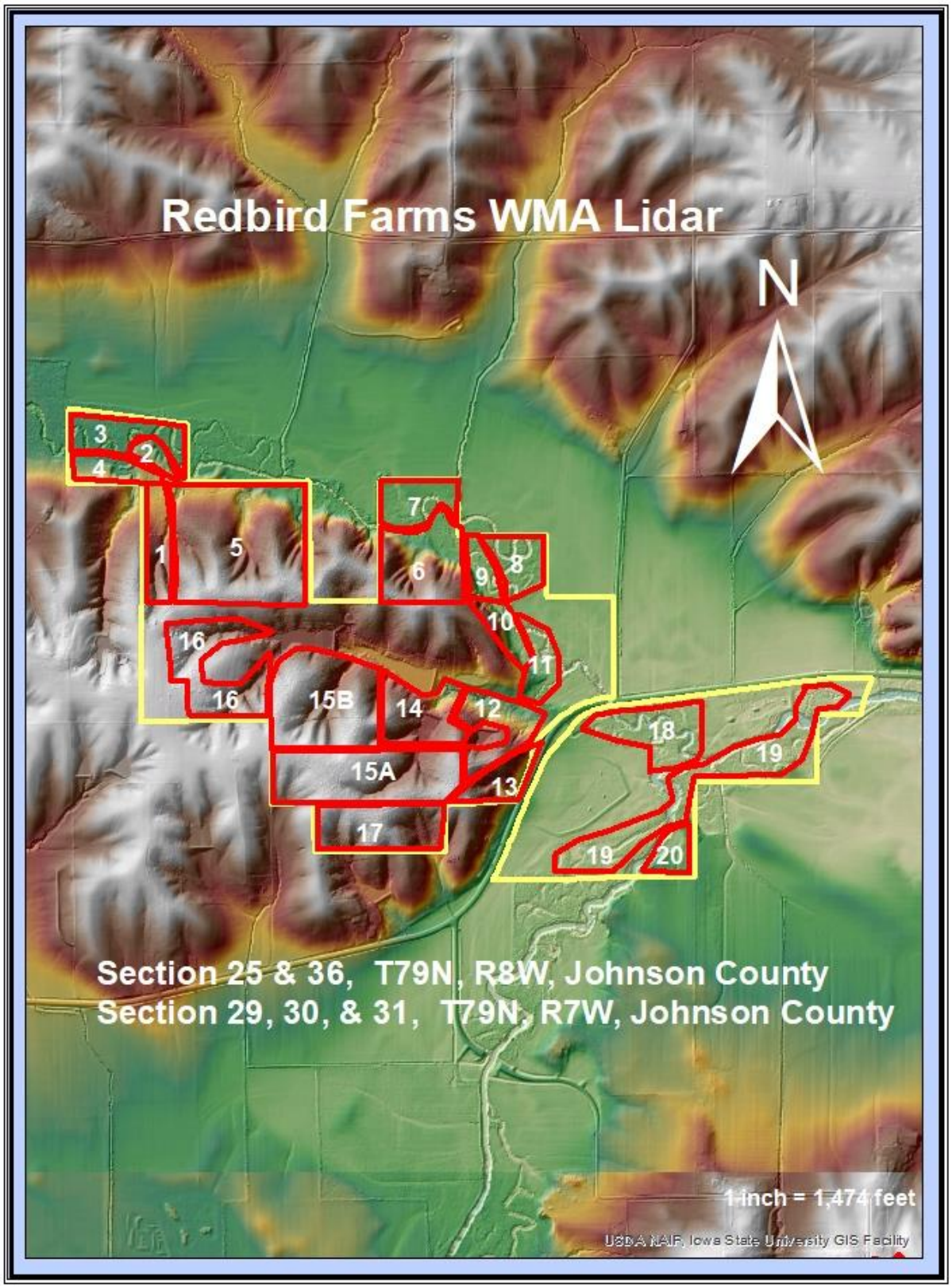

Figure 3. Lidar aerial photo showing topography for stands 1 through 20

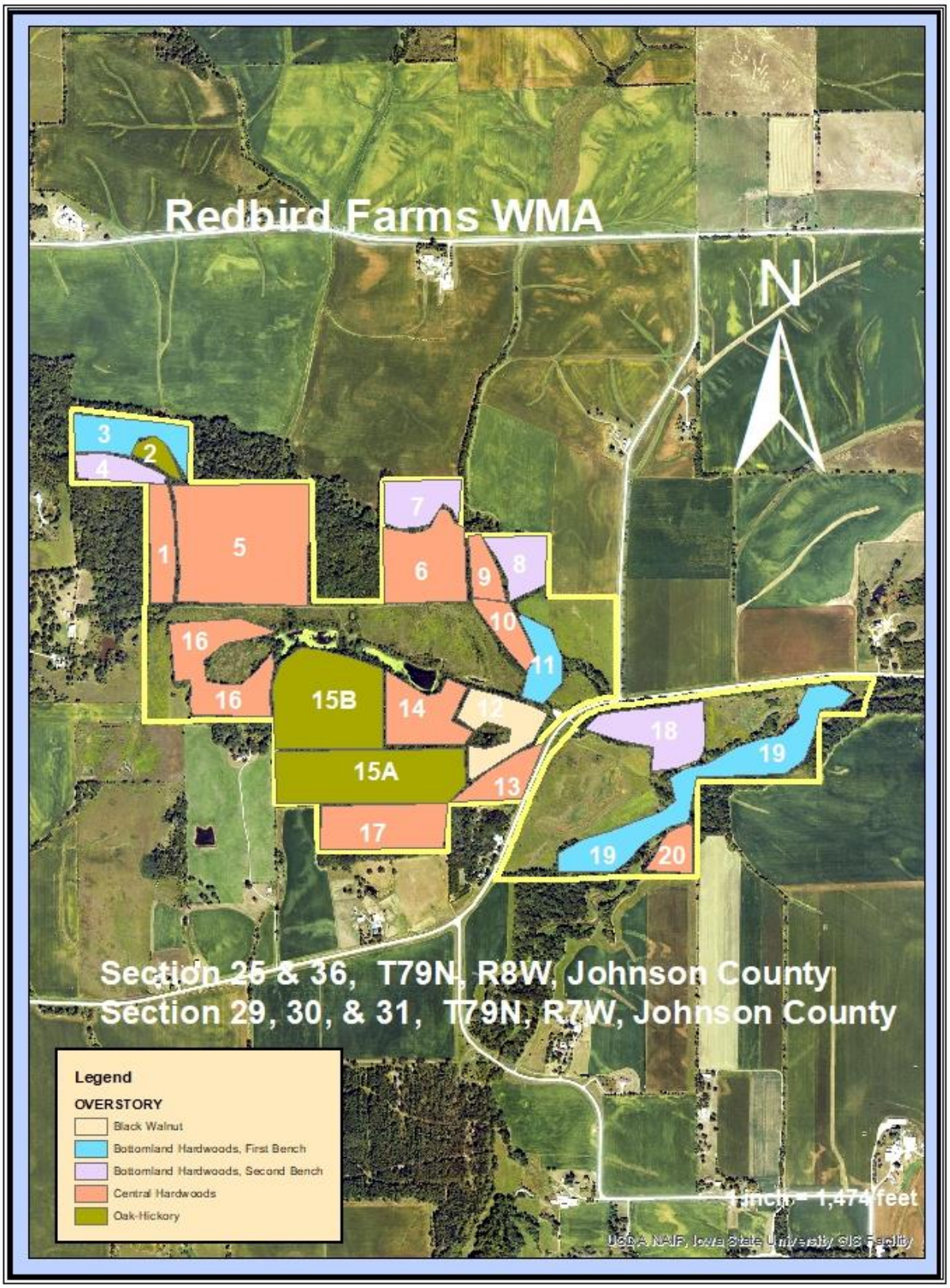

Figure 4. Forest type of overstory layer for stands 1 through 20

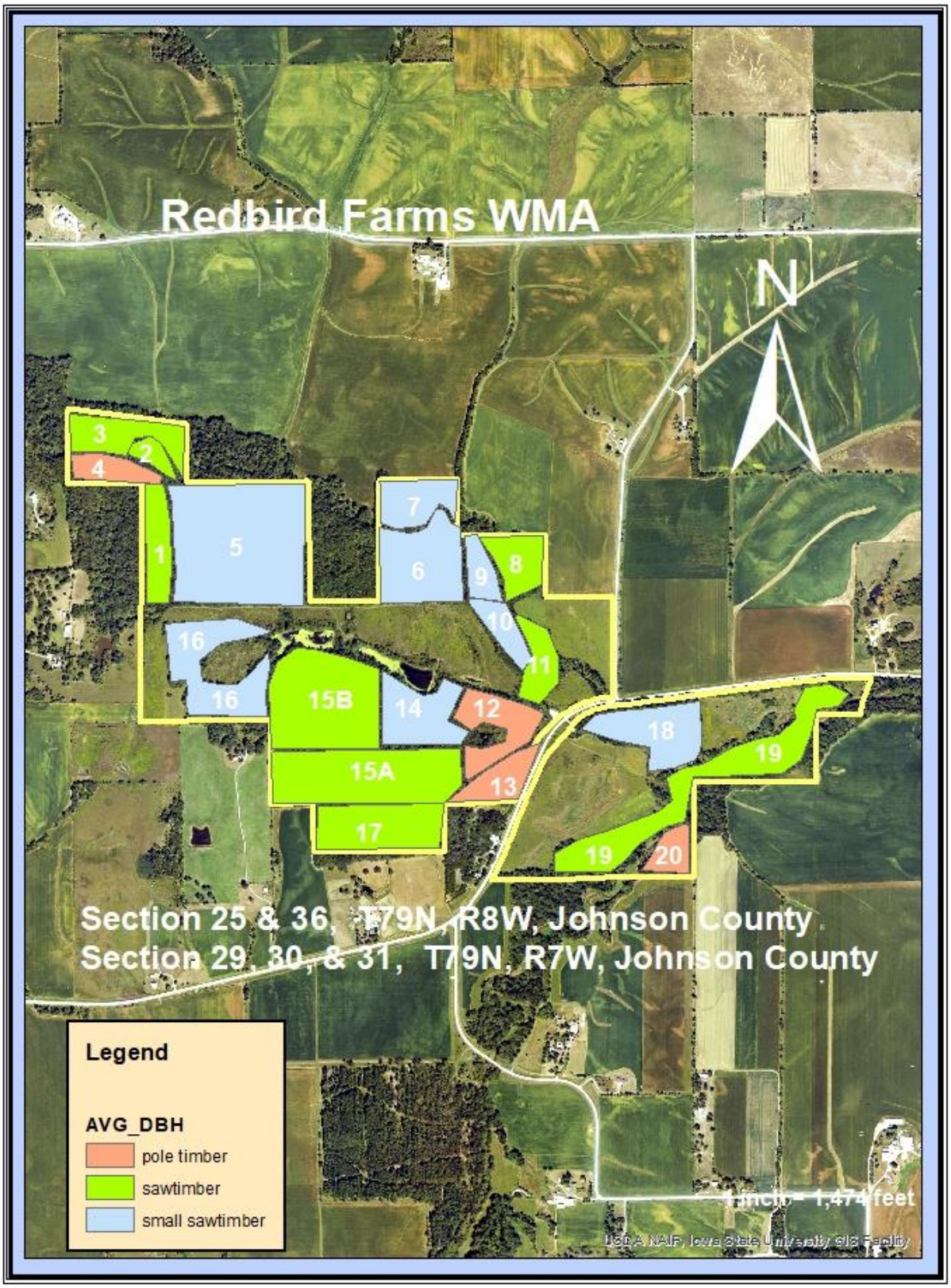

Figure 5. Average tree diameter for overstory trees for stands 1 through 20

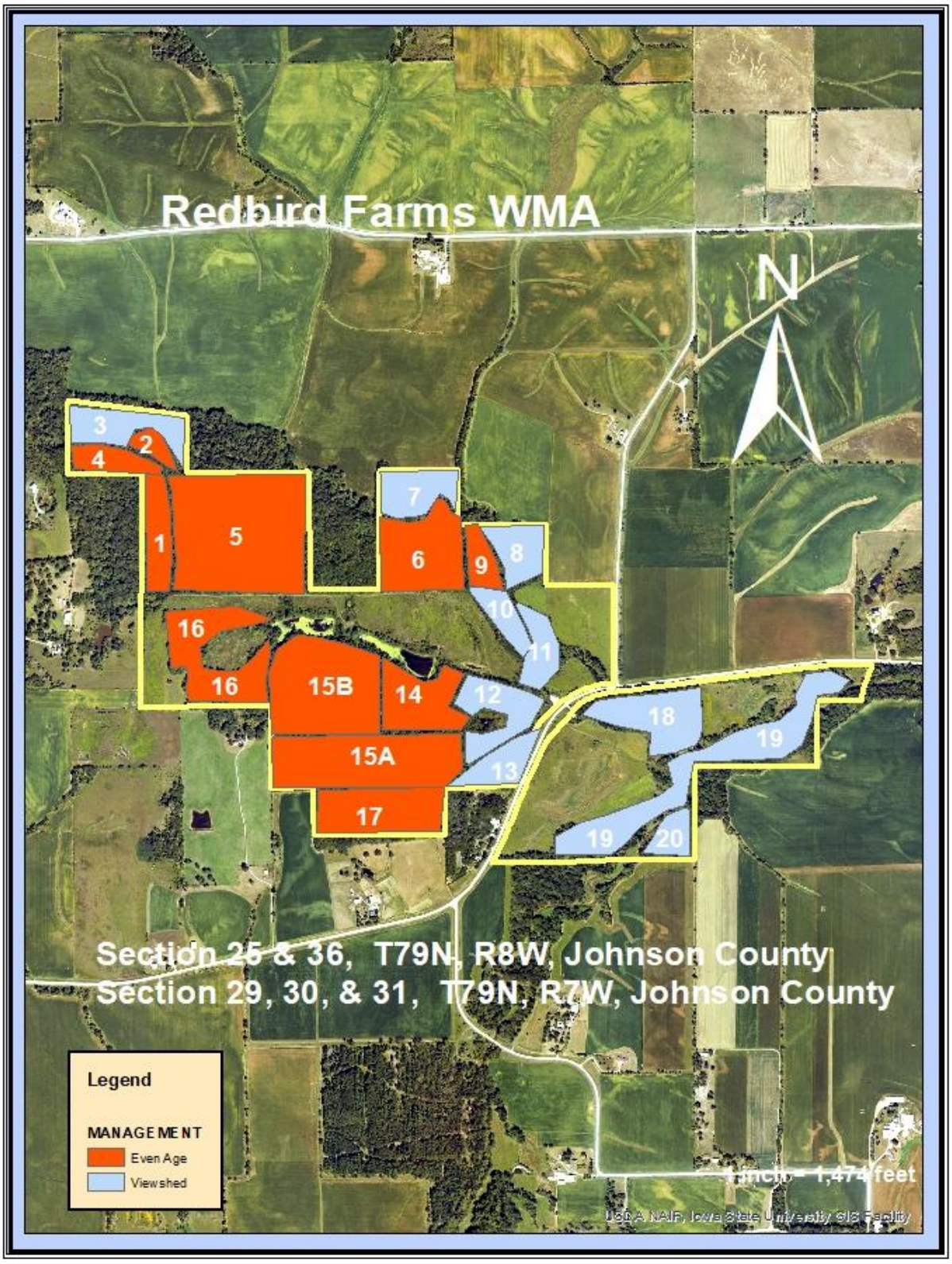

Figure 6. Management systems for stands 1 through 20

Descriptions & Recommendations for Individual Stands

The following section contains narrative descriptions of each of the 21 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 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 diameter), sapling-sized (1-4 inches in diameter measured at breast height (DBH) 4.5 feet off the ground), pole-sized (5-12 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: 8
The overstory consists of mixed large-sized red and white oak, pole to large-sized hackberry, and pole-sized bitternut and shagbark hickory. The understory consists of scattered seedling to sapling-sized hackberry, and the non-native invasive shrub honeysuckle.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle with registered herbicide.

Stand 2
Acres: 2.7
The overstory consists of scattered large-sized white, red, and bur oak, a few pole to large-sized black walnut, and a few pole-sized bitternut hickory. There are a few dead white oak. The understory consists of scattered seedling to sapling-sized bitternut hickory, and the non-native invasive shrubs honeysuckle and multiflora rose.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.
3. Use a spring or fall Rx burn (i.e. every 3-5 years) to minimize woody invasives.
4. Use weed tree removal to eliminate non-oak seedling to pole-sized trees and create open oak woodland area. Treat stumps with a registered herbicide.

Stand 3
Acres: 9.7
This stand is on the bottomland along the first bench of the creek. The overstory consists of scattered small sawtimber to large-sized silver maple, and scattered pole to large-sized ash and honey locust. The ash is infested by the Emerald Ash Borer (EAB) and is dead or dying. The understory consists of the non-native invasive shrubs honeysuckle and multiflora rose.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.

Stand 4
Acres: 5.2
This is a bottomland stand that is located on the second bench of the creek. The overstory consists of scattered to moderately dense groups of pole to a few small sawtimber-sized bitternut hickory, pole to small sawtimber-sized black walnut, and scattered pole to small sawtimber-sized ash and honey locust. The ash is infested by the (EAB) and is dead or dying. The understory consists of scattered sapling-sized bitternut hickory, and the non-native invasive shrubs honeysuckle and multiflora rose.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle and multi-flora rose with a registered herbicide.

Stand 5
Acres: 43.2
The overstory consists of mixed hardwoods pole to large-sized bitternut hickory, red oak, black cherry, basswood, pole to small sawtimber-sized shagbark hickory, and small sawtimber to large-sized white oak and black walnut. The understory consists of scattered sapling to pole-sized hackberry and elm, and sapling-sized bitternut hickory. The non-native invasive shrubs honeysuckle and multiflora rose are also present in this lower layer.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees or hand cut invasives or aerial application of registered herbicide in the fall.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.
3. Use a spring or fall Rx burn (i.e. every 3-5 years) to minimize woody invasives in areas with good oak and hickory leaf litter.
4. Use light crop tree release where needed to provide some crown release for quality oak, black walnut, and hickory. Double girdle competing trees (no herbicides).

Stand 6
Acres: 17.6
The overstory consists of mixed hardwoods pole to small sawtimber-sized bitternut and shagbark hickory, small sawtimber to large-sized hackberry, pole to large-sized black walnut, and large-sized red and white oak. The understory consists of scattered seedling to sapling-sized bitternut hickory and hackberry. The non-native invasive shrubs, honeysuckle and multiflora rose and the herbaceous non-native invasive plant garlic mustard are also present in this lower layer. Some work has been started on woody understory invasive shrubs but more follow-up is needed.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives or aerial application of registered herbicide in the fall.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.
3. Use a spring or fall Rx burn (i.e. every 3-5 years) to minimize woody invasives in areas with good oak and hickory leaf litter.
4. Use light crop tree release where needed to provide some crown release for quality oak, black walnut, hickory, and hackberry. Double girdle competing trees (no herbicides).

Stand 7
Acres: 8.5
This is a bottomland stand that is located on the second bench of the creek. The overstory consists of scattered small sawtimber to large-sized hackberry, large-sized silver maple and honey locust, pole to large-sized black walnut, pole-sized bitternut hickory, large-sized bur oak, and pole to large-sized ash. The ash is infested by the (EAB) and is dead or dying. The understory consists of scattered sapling to pole-sized hackberry and the non-native invasive shrubs honeysuckle and multiflora rose.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.

Stand 8
Acres: 7.4
This is a bottomland stand that is located on the second bench of the creek. The overstory consists of scattered pole to large-sized hackberry, black walnut, ash, bitternut hickory, and large-sized silver maple. The ash is infested by the (EAB) and is dead or dying. The understory consists of the non-native invasive shrubs honeysuckle and multiflora rose.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.

Stand 9

Acres: 4.5

The overstory consists of scattered pole to large-sized basswood and red oak, and pole to small sawtimber-sized hackberry and bitternut hickory. The understory consists of scattered sapling to pole-sized bitternut hickory and the non-native invasive shrub honeysuckle.

Prescription:

1. Hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle with a registered herbicide.

Stand 10

Acres: 5

The overstory consists of scattered pole to small sawtimber-sized hackberry, basswood, black walnut, pole-sized bitternut hickory, black cherry, ash, pole to large-sized red oak, a few large-sized white oak, and a small pocket of pole-sized red pine on the south end of the stand. The ash is infested by the (EAB) and is dead or dying. The understory consists of scattered to moderately dense pockets of seedling-sized hackberry, and scattered seedling to sapling-sized bitternut hickory. The non-native invasive shrubs honeysuckle and multiflora rose are also present in this lower layer.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.

Stand 11

Acres: 6.5

This stand is on the bottomland along the first bench of the creek. The overstory consists of scattered small sawtimber to large-sized silver maple, scattered pole to large-sized ash, black walnut, hackberry, and a few large-sized cottonwood. The ash is infested by the (EAB) and is dead or dying. The understory consists of scattered seedling to sapling-sized hackberry and the non-native invasive shrubs honeysuckle and multiflora rose.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.

Stand 12

Acres: 10.5

The overstory consists of scattered pole to large-sized black walnut and honey locust. The understory consists of scattered seedling to sapling-sized hackberry, and the non-native invasive shrubs honeysuckle and multiflora rose.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.

Stand 13
Acres: 6.5
The overstory of this stand consists of scattered pockets of pole-sized ash which is infested with the (EAB), elm, black cherry, eastern red cedar, bitternut hickory, small sawtimber to large-sized black oak, pole to large-sized honey locust, pole to large-sized shagbark hickory, and a few small sawtimber to large-sized white oak. The understory (lower layer) of this stand consists of scattered seedling-sized honey locust, sapling-sized hawthorn, seedling to sapling-sized hackberry and elm, and a few sapling-sized bur oak. The native shrubs dogwood and prickly ash, non-native invasive shrubs honeysuckle and multiflora rose, and the non-native invasive herbaceous plant garlic mustard are also present in this lower layer. Some work has been started on woody understory invasive shrubs but more follow-up is needed.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives or aerial application of registered herbicide in the fall.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.
3. Use a spring or fall Rx burn (i.e. every 3-5 years) to minimize woody invasives in areas with good oak and hickory leaf litter.

Stand 14
Acres: 12.4
The overstory of this stand consists of scattered large-sized white oak, pole and some small sawtimber-sized bitternut hickory, black cherry, hackberry, and shagbark hickory. The understory (lower layer) consists of scattered seedling-sized hackberry, and the non-native invasive shrubs honeysuckle and multiflora rose.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives or aerial application of registered herbicide in the fall.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.
3. Use a spring or fall Rx burn (i.e. every 3-5 years) to minimize woody invasives in areas with good oak and hickory leaf litter.

Stand 15 A & 15 B
Acres: 27.3 & 27.7
The overstory of these two stands consists of mixed large-sized white oak, pole to large-sized red oak, pole to large-sized shagbark hickory, pole to large-sized bitternut hickory, pole to small sawtimber-sized hackberry and some small sawtimber to large-sized basswood. The mid-story consists of scattered pole-sized hackberry, bitternut hickory, black cherry, and shagbark hickory. The understory consists of scattered seedling to sapling-sized hackberry, elm, and bitternut hickory. The native shrubs gooseberry, dogwood, prickly ash, and non-native invasive shrubs honeysuckle and multiflora rose and the herbaceous non-native invasive plant garlic mustard are also present in this lower layer.

Prescription:
1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives or aerial application of registered herbicide in the fall.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.
3. Use a spring or fall Rx burn (i.e. every 3-5 years) to minimize woody invasives where burnable.
4. Use weed tree removal to eliminate non-oak seedling to pole-sized trees and create open oak woodland areas immediately around spots of mature oak. Treat stumps with a registered herbicide.

Stand 16
Acres: 17.6
The overstory of this stand consists of scattered large-sized white oak, pole to large-sized red and black oak and honey locust, pole to small sawtimber-sized black cherry and hackberry, small sawtimber to large-sized shagbark hickory, and some large-sized cottonwood. The understory (lower layer) consists of scattered sapling to pole-sized hackberry and white

mulberry (a non-native invasive species) and the non-native invasive shrubs honeysuckle, autumn olive, and multiflora rose. The herbaceous non-native invasive plant garlic mustard is also present in this lower layer.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives. Eliminate the white mulberry with cut and treat method.
2. Spray stumps and re-sprouts of honeysuckle, autumn olive, and multiflora rose with a registered herbicide.

Stand 17

Acres: 15.1

The overstory of this stand consists of scattered large-sized white oak, pole and large-sized red and black oak, shagbark hickory, and honey locust, small sawtimber to large-sized white and red elm, and a few large-sized bur oak and hackberry. The understory (lower layer) consists of scattered seedling to sapling-sized hackberry, sapling-sized elm and the non-native invasive shrubs honeysuckle, Japanese barberry, and multiflora rose. The herbaceous non-native invasive plant garlic mustard is also present in this lower layer.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives or aerial application of registered herbicide in the fall.
2. Spray stumps and re-sprouts of honeysuckle, Japanese barberry, and multiflora rose with a registered herbicide.
3. Use a spring or fall Rx burn (i.e. every 3-5 years) to minimize woody invasives where burnable.

Stand 18

Acres: 13.3

This stand is on the bottomland along the second bench of the creek. The overstory consists of scattered pole to large-sized black walnut, ash, pole to small sawtimber-sized bitternut hickory, small sawtimber to large-sized honey locust and large-sized silver maple. The ash is infested by the (EAB) and is dead or dying. The understory consists of scattered seedling to sapling-sized hackberry, bitternut hickory, sapling-sized white mulberry and the non-native invasive shrub honeysuckle.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives. Eliminate the white mulberry with cut and treat method.
2. Spray stumps and re-sprouts of honeysuckle with a registered herbicide.

Stand 19

Acres: 25.9

This stand is on the bottomland along the first bench of the creek. The overstory consists of scattered small sawtimber to large-sized silver maple, a few large-sized honey locust, pole to large-sized ash, and pole to large-sized black walnut. The ash is infested by the (EAB) and is dead or dying. The understory consists of scattered pole-sized hackberry and sapling to pole-sized white mulberry, and the non-native invasive shrubs honeysuckle and multiflora rose.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives. Eliminate the white mulberry with cut and treat method.
2. Spray stumps and re-sprouts of honeysuckle and multiflora rose with a registered herbicide.

Stand 20

Acres: 4.2

The overstory consists of scattered to moderately dense pockets of sapling to pole-sized black walnut, ash, honeylocust, pole to small sawtimber-sized bur oak, and small sawtimber to large-sized red oak. The ash is infested by the (EAB) and is dead or dying. The understory consists of scattered seedling to sapling-sized bitternut hickory and the non-native invasive shrub honeysuckle.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees and native shrubs or hand cut invasives.
2. Spray stumps and re-sprouts of honeysuckle with a registered herbicide.

Application of Herbicide for Honeysuckle Management in Mixed Hard/Oak-Hickory Stands Management Alternative

In stands 5, 6, 13, 14, 15A, 15B, and 17 an alternative to managing non-native invasives such as honeysuckle with a Fecon/brush mower and spot spraying regrowth is the use of aerial applicators such as a helicopter or drone to apply a registered herbicide over the crowns of these forest stands in the late fall after the trees have gone dormant and the honeysuckle is still actively growing. If funding is limited target stands 15A, 15B, 17, 14, and 13 first and if funding is available include stand 5 & 6. Keys to this method are: Temperatures can't drop below mid-20s before spray or after spray for a couple days, typically small window after red oak leaves have fully turned brown, and prescribed fire must be used within a year or two after treatment to minimize re-sprouts (follow-up prescribed burning every 3-4 years for site maintenance). The procedures outlined in "Procedure for Aerial Management-Invasive Species (2021, Harr)" will be followed during this activity to promote management efficiency, safety, and to protect WMA site users.

Stand Summaries

Stand Label	Acres	Overstory	Avg DBH	Prescription	Mgmt	Regen Year	Notes
1	8	Central Hardwoods	sawtimber	invasive spp mgmt	Even Age		ACP 2030-40
2	2.7	Oak-Hickory	sawtimber	invasive spp mgmt, Rx burn, Weed Tree	Even Age		ACP 2026
3	9.7	Bottomland Hardwoods, First Bench	sawtimber	invasive spp mgmt	Viewshed		Add Caps project (ACP) 203-40
4	5.2	Bottomland Hardwoods, Second Bench	pole timber	invasive spp mgmt	Even Age		ACP 2030-40
5	43.2	Central Hardwoods	small sawtimber	invasive spp mgmt., Light CTR, Rx burn	Even Age		ACP 2028
6	17.6	Central Hardwoods	small sawtimber	invasive spp mgmt., Light CTR, Rx burn	Even Age		ACP 2029
7	8.5	Bottomland Hardwoods, Second Bench	small sawtimber	invasive spp mgmt	Viewshed		ACP 2030-40
8	7.4	Bottomland Hardwoods, Second Bench	sawtimber	invasive spp mgmt	Viewshed		ACP 2030-40
9	4.5	Central Hardwoods	small sawtimber	invasive spp mgmt	Even Age		ACP 2030-40
10	5	Central Hardwoods	small sawtimber	invasive spp mgmt	Viewshed		ACP 2030-40
11	6.5	Bottomland Hardwoods, First Bench	sawtimber	invasive spp mgmt	Viewshed		ACP 2030-40
12	10.5	Black Walnut	pole timber	invasive spp mgmt	Viewshed		ACP 2030-40
13	6.5	Central Hardwoods	pole timber	invasive spp mgmt., Rx burn	Viewshed		ACP 2030-40
14	12.4	Central Hardwoods	small sawtimber	invasive spp mgmt., Rx burn	Even Age		ACP 2030-40
15A	27.3	Oak-Hickory	sawtimber	invasive spp mgmt., Rx burn, Weed Tree	Even Age	Eval 2030	Caps project2026
15B	27.7	Oak-Hickory	sawtimber	invasive spp mgmt., Rx burn, Weed Tree	Even Age	Eval 2030	ACP 2027
16	17.6	Central Hardwoods	small sawtimber	invasive spp mgmt	Even Age		ACP 2030-40
17	15.1	Central Hardwoods	sawtimber	invasive spp mgmt., Rx burn	Even Age		ACP 2028
18	13.3	Bottomland Hardwoods, Second Bench	small sawtimber	invasive spp mgmt	Viewshed		ACP 2030-40
19	25.9	Bottomland Hardwoods, First Bench	sawtimber	invasive spp mgmt	Viewshed		ACP 2030-40
20	4.2	Central Hardwoods	pole timber	invasive spp mgmt	Viewshed		ACP 2030-40

Proposed Project Completion Schedule

Year	Stand(s)	Description
2025	13, 15A & B, 2, 6	Prescribed fire fall or spring dormant season
2026	15A	Caps project forestry mow or hand cut invasives and spot treat sprouts and plants less than 4 feet
2026	5, 14, 17	Prescribed fire fall or spring dormant season
2027	15B	Caps project forestry mow or hand cut invasives and spot treat sprouts and plants less than 4 feet
2028	15A, 2	Caps project weed tree removal
2028	5, 17	Caps project forestry mow or hand cut invasives and spot treat sprouts and plants less than 4 feet
2028	13, 15A & B, 2, 6	Prescribed fire fall or spring dormant season
2029	15B	Caps project weed tree removal
2029	5, 14, 17	Prescribed fire fall or spring dormant season
2029	6	Caps project light CTR and weed tree removal
2030	5	Caps project light CTR and weed tree removal
2031	13, 15A & B, 2, 6	Prescribed fire fall or spring dormant season
2032	5, 14, 17	Prescribed fire fall or spring dormant season
2030-40	1,3,4,7,8,9,10,11,12,13, 14,16,18,19,20	Caps projects forestry mow or hand cut invasives and spot treat sprouts and plants less than 4 feet

Long-term harvest/regeneration cycles

Stands	Year	Rotation Average of 1.5 acres per year when started
15A and B	Evaluate 2030 for potential of harvest schedule	120 Years
1, 5, 6, & 17	Evaluate 2032 for potential of harvest schedule	120 Years

General Management Considerations

Risk Tree Management

Risk trees carry a risk of structural failure coupled with the potential to cause property damage or personal injury. To be considered a risk, 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 building, picnic table, parking lot, campsite, bench, high use trail, etc. Risk tree management, especially in and adjacent to “high use” areas should be conducted continuously in accordance with DNR policy to lessen or eliminate potential danger to WMA users. In general, trees will not be girdled for management reasons if there is potential to fall onto a road, parking lot, high-use trail or other feature that draws frequent & prolonged use.

Rare, 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 threatened or endangered species are known to occur in the management area or if suitable habitat for these species is present, management biologists implement conservation measures as described in the Operation & Maintenance Plan for Wildlife Management Areas in the State along with recommendations from Natural Area Inventory (NAI) staff. Management activities are not initiated until this review has been completed and T/E comments/concerns have been addressed. There are specific management activities in this plan such as invasive species management that are being used to potentially open up and improve understory habitat for the rusty patched bumble bee. The rusty patched bumble bee (*Bombus affinis*) is a federally endangered species (50

CFR Part 17) that occurs in Iowa, and potentially on this WMA or adjacent areas. The rusty patched bumble bee overwinters in forested areas.

Best Management Practices for Soil, Wetland, and Water Quality Protection
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, firm, or dry. This reduces compaction and rutting 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 are to be applied in the appropriate dosage and at the proper time, according to product label
- Access trails and forest roads shall be carefully situated on stable slopes with erosion control measures such as waterbars installed
- Protect sensitive areas like stream banks and pond shores (riparian areas) by leaving forested buffer strips from 50-150 feet wide (depending on stream width and topography) next to streams. Management in these areas should be limited to woodland understory and midstory tree manipulation and selective overstory harvesting. Always try to maintain a minimum of 70% overstory canopy cover in riparian areas
- If bare soil areas are created or existing trails are not properly constructed, use soil stabilization practices to minimize the existing erosion hazard. These may include mulching, seeding, and building sediment control structures

All other considerations and best practices for protecting water & soil resources are discussed in Iowa's Forestry Best Management Practices manual, available on the Iowa DNR's website.

Aesthetics & Recreation
The woodlands of Redbird Farms WMA are popular for outdoor recreation and enjoyment. Forest management activities can negatively impact these qualities in the short term. Trees and tops left after thinning and harvest operations are seen by some as unsightly "brush" and prescribed burning leaves the ground bare and black scorch marks and char on the trees & downed wood. Some of this must be dealt with by educating WMA users on what they are seeing and why it is being done for long-term ecological benefits. Beyond that, the following measures are meant to help minimize the impact of forest management to the aesthetic beauty and recreation capacity of Redbird Farms WMA:

- Limit the frequency of clearcutting through rotational even-aged management at 120-year intervals for stands under this form of management.
- Either remove, pile, or break down slash from thinning/invasive plants control operations to fall flush to the ground and decompose. Maintain clean trails and roads at all times. Do not leave risk snags within striking distance of trails or infrastructure.
- Require stumps from thinning operations be left flush to the ground or no higher than 3" above the top of the root flare

Forest Health & Integrated Pest Management
Forest ecosystem health is best maintained by using management practices that promote maximum diversity of native species, environments, and habitats throughout the area. This will help buffer major, catastrophic losses to pests such as spongy (formerly gypsy) moth, emerald ash borer (EAB), oak wilt and others. Patch regeneration tree plantings and natural regeneration are extremely important to diversifying the age structure of the forest population and prevent catastrophic storm damage.

Limiting all or most management work to the dormant season helps minimize soil disturbance and injury to non-target plants & trees, and reduces the incidence of invasive pests, insects, and diseases. For instance, to prevent and hasten the spread of oak wilt, most tree cutting activities are to be done between November and March.

Incidental tree damage by harvesting and thinning activities is to be minimized by timing these activities to occur during the dormant season and through the requirement of careful selective felling practices. Machinery must be kept to skid trails and roads to minimize physical injury to the other trees.

The use of pesticides will be minimized by using silvicultural practices that promote native species when possible (e.g., prescribed burning), and using selective cut-stump application methods at the appropriate timing and rates, according to label instructions.

Important Cultural, Archeological, or Ecological Sites

Every effort will be made to identify and protect natural resource and man-made "special sites" before and during forest management work. Sites that are historical and cultural resources include such things as buildings and structures of historical significance, human burial sites, special land features and artifacts. If such things are ever observed or discovered, those sites will be located, preserved, and avoided when implementing forest management activities. Human remains that are discovered or accidentally uncovered must be reported to local law enforcement officials. This reporting is required by Iowa Code 558.69. Discovered artifacts or structures of suspected historical significance will be reported to the State Archaeologist and the discovery will be protected.

No excavation of stumps or earthwork is being proposed by this plan. The following are practices that will help minimize the chances of accidentally destroying items of cultural or historical significance when doing forest management work:

- Thoroughly inspect a project area before working. Look for unusual looking areas such as obvious mounds or groups of mounds, or square and rectangular shaped depressions or extrusions.
- Minimize ground disturbance when tree planting, logging, and doing forest stand improvement work. Cut trees and use heavy equipment only when the ground is frozen, dry, or firm.
- Be especially careful of disturbing soil around streams, lakes, and riparian (stream bank) areas.
- Locate trails and management access roads along natural land contours.

Monitoring

Monitoring the long-term results of forest management decisions, including the decision to do nothing in a specific stand or area, is important in order to document successes and failures and ensure that the desired effects are being had on native flora and fauna. Ideally, monitoring should be an interdisciplinary effort that includes foresters, wildlife biologists, botanists, and ecologists, and it should be founded on science-based methodology and should be ongoing to capture long-term effects. Historically, limited staff and funding have constrained the amount of monitoring that can be done. Thus, every effort will be made by DNR staff to collaborate internally to measure and assess the effects of forest management subject to resource availability.

Public Forestry Field Days

Workshops that showcase and demonstrate land stewardship and conservation to the public in ways that are easy to understand and apply are a very effective way to reach out to adjacent landowners. As improvement projects get underway, wildlife and forestry staff from both public and private land backgrounds should coordinate and hold tours of project sites and invite expert guest speakers for public education and promotion of good conservation practices.

Species of Greatest Conservation Need

The Iowa DNR's *Iowa Wildlife Action Plan (IWAP*) identifies certain wildlife species as species of "greatest conservation need". Management activities must always take into consideration these Species of Greatest Conservation Need, and also to "keep common species common."

Common Name	Scientific Name	Habitat Preference
Amphibians and Reptiles		
Tiger Salamander	*Ambystoma tigrinum*	Generalist
Prairie Kingsnake	*Lampropeltis calligaster*	Open grassland and woodland edge
Bull Snake	*Pituophis catenifer sayi*	Tallgrass prairie and savannah
Smooth Earth Snake	*Virginia valeriae*	Moist wooded areas and stream valleys

Common Name	Scientific Name	Habitat Preference
Northern Prairie Skink	*Plestiodon septentrionalis*	Open grassland with loose/gravely soils and rocky areas – tends to choose habitat adjacent to wetlands
Smooth Green Snake	*Opheodrys vernalis*	Moist grassy areas/prairies or grassland surrounding lakes/impoundments
Smallmouth Salamander	*Ambystoma texanum*	Woodland pools and open woods
Western Wormsnake[T]	*Carphophis amoenus*	Rocky woodland
Butterflies & Bumble Bees		
Zabulon Skipper	*Poanes zabulon*	Riparian zones, oldfield, woodland edge
Reakerts Blue	*Echinargus* (*Hemiargus*) *isola*	Tallgrass prairie
Byssus Skipper[T]	*Problema byssus*	Tallgrass prairie
Monarch	*Danaus plexippus*	Open areas and edges
Rusty Patched Bumble Bee	*Bombus affinis*	Grassland, edges and forest
Odonates		
Slaty Skimmer	*Libellula incesta*	Backwater
Sulphur-tipped Clubtail	*Gomphus militaris*	Lake/pond
Spangled Skimmer	*Libellula cyanea*	Lake/pond
Vesper Bluet	*Enallagma vesperum*	Lake/pond
Mammals		
Northern Long Eared Bat [T]	*Myotis septentrionalis*	Forest
Spotted Skunk[E]	*Spilogale putorius*	Grassland, savanna, forest, and farmsteads
Woodland Vole	*Microtus pinetorum*	Forest
Gray Fox	*Urocyon cinereoargenteus*	Forest/woodland
Franklin's Ground Squirrel	*Spermophilus franklinii*	Tallgrass prairie, savanna, roadsides
Prairie Vole	*Microtus ochrogaster*	Upland prairie
Plains Pocket Gopher	*Geomys bursarius*	Warm season herbaceous grassland, herbaceous wetland, savanna, roadsides
Indiana Bat[E]	*Myotis sodalis*	Forest
Grassland-shrub nesting birds		
Northern Bobwhite	*Colinus virginianus*	
Loggerhead Shrike	*Lanius ludovicianus*	
Bell's Vireo	*Vireo bellii*	
Field Sparrow	*Spizella pusilla*	
Brown Thrasher	*Toxostoma rufum*	
Woodland-Shrub nesting birds		
American Woodcock	*Scolopax minor*	
Yellow-billed Cuckoo	*Coccyzus americanus*	
Black-billed Cuckoo	*Coccyzus erythropthalmus*	
Common Yellowthroat	*Geothlypis formosus*	
Forest Nesting Birds		
Red-shouldered hawk[E]	*Buteo lineatus*	
Broad-winged hawk	*Buteo platypterus*	
Eastern Whip-poor-will	*Caprimulgus vociferus*	
Chimney Swift	*Chaetura pelagica*	
Acadian Flycatcher	*Empidonax virescens*	

Common Name	Scientific Name	Habitat Preference
Wood Thrush	*Hylocichla mustelina*	
Kentucky Warbler	*Geothlypis formosus*	
Red-headed Woodpecker	*Melanerpes erythrocephalus*	
Eastern Screech-owl	*Otus asio*	
Northern Flicker	*Colaptes auratus*	
Eastern Wood-Pewee	*Contopus virens*	
Eastern Kingbird	*Tyrannus tyrannus*	
Baltimore Oriole	*Icterus galbula*	

State-listed species (Code of Iowa, Chapter 481B): Threatened (T), and Endangered (E)