Turin Preserve WMA Forest
Wildlife Stewardship Plan

September 2024

Developed by Sarah Bell, District 9 Forester,
in coordination with the Missouri River Wildlife Unit

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FOREST WILDLIFE STEWARDSHIP PLAN OBJECTIVES

The primary objective of this forest wildlife stewardship plan is to promote sound forest management practices to achieve a native, diverse, and resilient forest that provides habitat for game species and species of greatest conservation need while maintaining recreational opportunities for public users. This plan also aims to recognize the importance of both the forest and prairie ecosystems present on Turin Preserve WMA. Specific management objectives include:

- Bur oak regeneration to ensure the legacy of oaks on the landscape
- Restoration of historic ecological components including sunlight to the understory and periodic fire
- Invasive species and eastern red cedar control

WMA DESCRIPTION

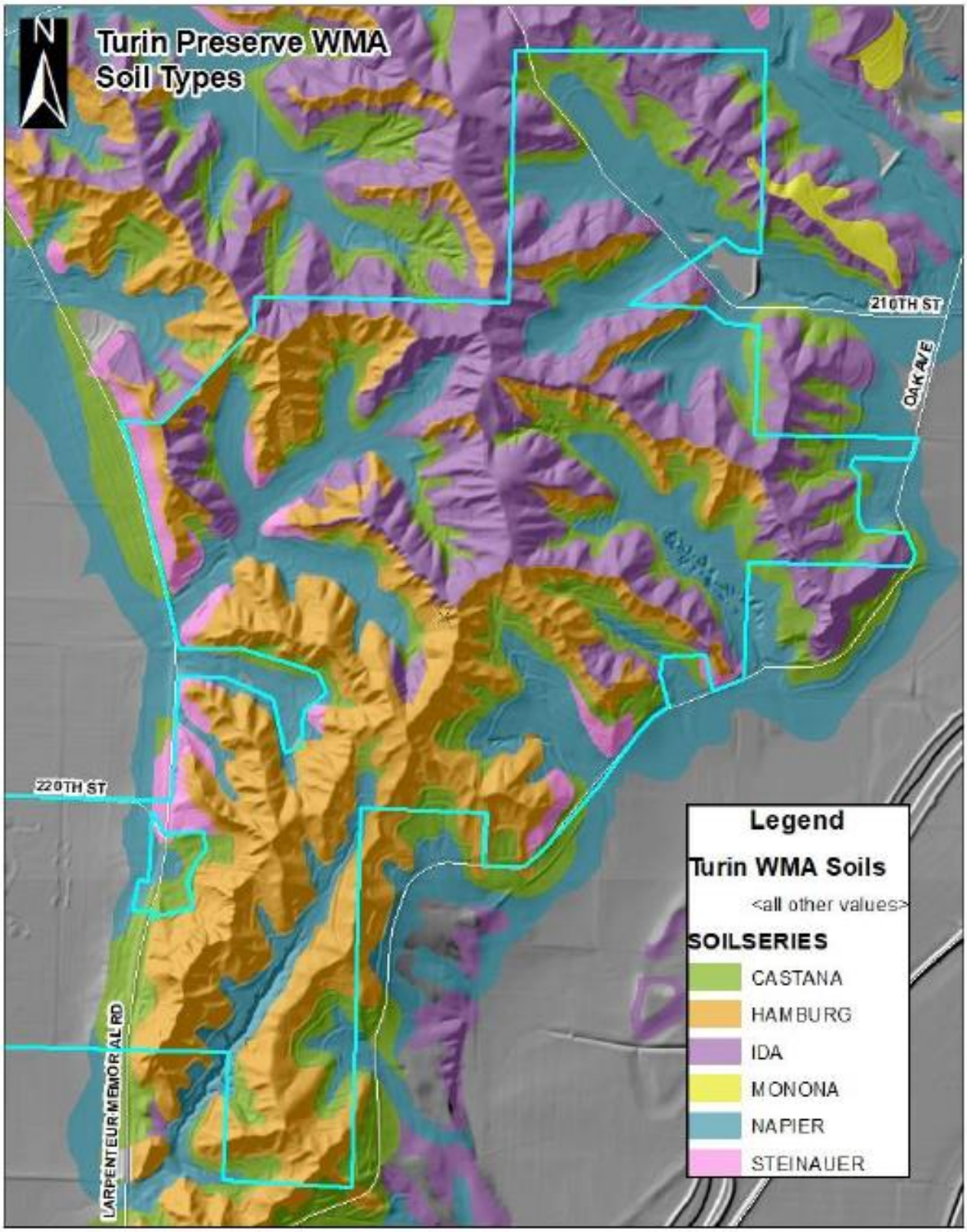
Location: Kennebec Twp Sec 27, 33, 34, 35 & Belvidere Twp Sec 3, 4
Plan Acres: 519.9

Turin Preserve is 1107 acres and is located directly north of Turin, IA in Monona County. It is a popular location for public recreation including hunting, trapping, hiking, bird watching, target shooting, and foraging. Turin Preserve lies on the Loess Hills Landform which is reflected in the vegetation, topography, and soil types present. Vegetation includes upland timber, dense stands of eastern red cedar, remnant and restored prairie, and agricultural fields.

The topography is characterized by exposed and tree-encroached ridges that drop steeply into wooded upland draws. The WMA consists of one large, main ridge system extending from the north that splits into several smaller ridge systems. The west side of the main ridge system drains toward the channelized Little Sioux River while the east side drains toward the Maple River. There is limited flat ground which is used primarily for agricultural fields and the 70 acre reconstructed wetland on the west side of Larpenteur Memorial Road. There are five main soil types:

*Site index is a measure of how well a site can grow trees. Trees that grow on sites with a low site index are generally short and often gnarly in appearance (ridgetop bur oaks), while trees on sites with a high site index are usually tall and straight (drainage walnuts).

- **Castana** soils are associated with Ida and Hamburg soils. They are well drained, formed in alluvium (water-deposited sediments) and colluvium (gravity-deposited sediments), and are located on foot slopes. The native vegetation is prairie and the site index for hardwood tree productivity is low.
- **Hamburg** soils are somewhat excessively drained and formed in calcareous loess. They are located on steep slopes characterized by natural terraces or ‘catsteps.’ The natural vegetation type is prairie and some hardwood tree cover (especially on north and east-facing aspects). The site index for tree productivity is low.
- **Ida** soils are well drained and formed in windblown sediments high in calcareous loess. They are located on upland ridges and side slopes. The native vegetation type is prairie and the site index for hardwood tree productivity is low.
- **Napier** soils are dark, well drained, silty soils formed in alluvium. They are located on footslopes and in upland drainageways. The native vegetation type is prairie. Though prone to gully erosion, these soils are incredibly fertile and the site index for hardwood trees is very high.
- **Steinauer** soils are well drained and formed in calcareous glacial till. They are located mainly along valley sideslopes and occasionally on upland ridgetops. The native vegetation is prairie and the site index for tree productivity is low to moderate.



Kennebec & Belvidere Townships, Monona County, IA
Map created by Sarah Bell, DNR Forester

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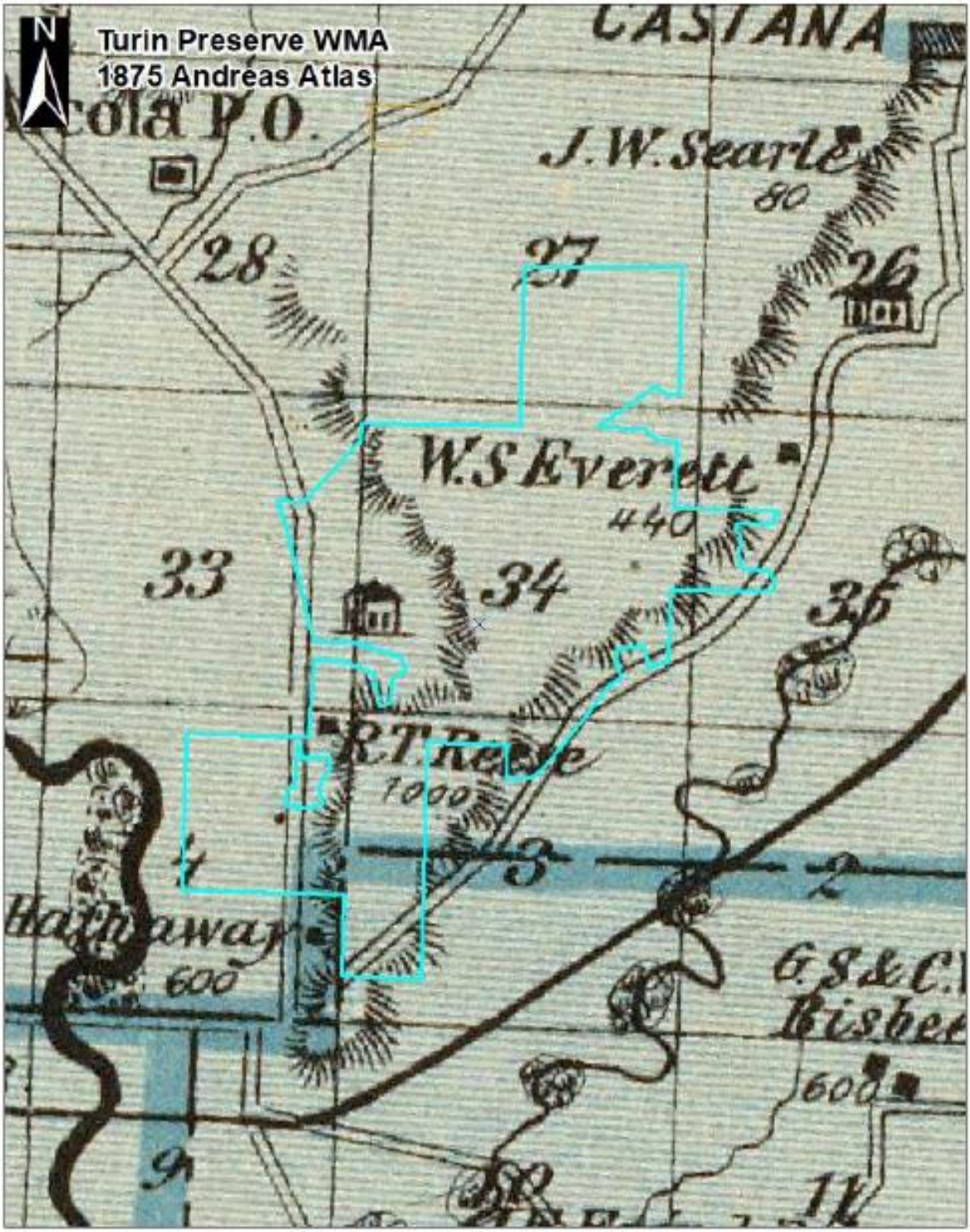
SITE HISTORY

Historically, ecosystems of the Loess Hills such as prairie and oak woodlands were maintained by ecologic processes like large mammal grazing (bison and elk), wildfires, and prescribed fires utilized by Native Americans. With European settlement in the mid-1800s, these regimes were quickly lost and the native ecosystems began to change. Forests grew too dense, cedars and other woody species encroached into native prairies, and non-native and invasive species were introduced. All of these situations are present at Turin Preserve WMA. While we can never fully reverse these changes, we can vastly improve the health, vigor, resiliency, and ecological benefits of the prairies and forests now by reintroducing some of the ecological factors that were lost, like fire and sunlight, and by controlling invasive and undesirable species.

The 1875 Andreas Atlas does not indicate forest cover in the area of Turin Preserve WMA, though it is likely at this time that there was some forest which was limited to north and east-facing slopes, drainages, and moister, shaded draws. Aerial photography records show the changes that have taken place on the landscape over the last 90 years:

- **1930:** Forest cover is mainly limited to the landscape positions noted above. All other landscape positions are completely void of forest cover. The flattest areas are used for ag fields.
- **1950:** The better contrast in this imagery indicates that in forested areas, the trees are much more scattered than present day. The densest forest cover is located in the center of the WMA.
- **1970:** Forest cover has been cleared in some areas, likely for pasture or agriculture. In most areas, forest cover has grown denser and is spreading. Many terraces and doodle dams have been constructed around the WMA.
- **1980:** Cedars are scattered across the prairie.
- **2002:** Dense stands of cedars have established across the WMA. The prairie ridges and slopes have become severely encroached with forest cover.
- **Present:** Dense cedar stands now dominate a significant portion of the WMA. Hardwood forests have grown dense and encroached into formerly prairie-vegetated landscape positions.



Kennebec & Belvidere Townships, Monona County, IA
Map created by Sarah Bell, DNR Forester

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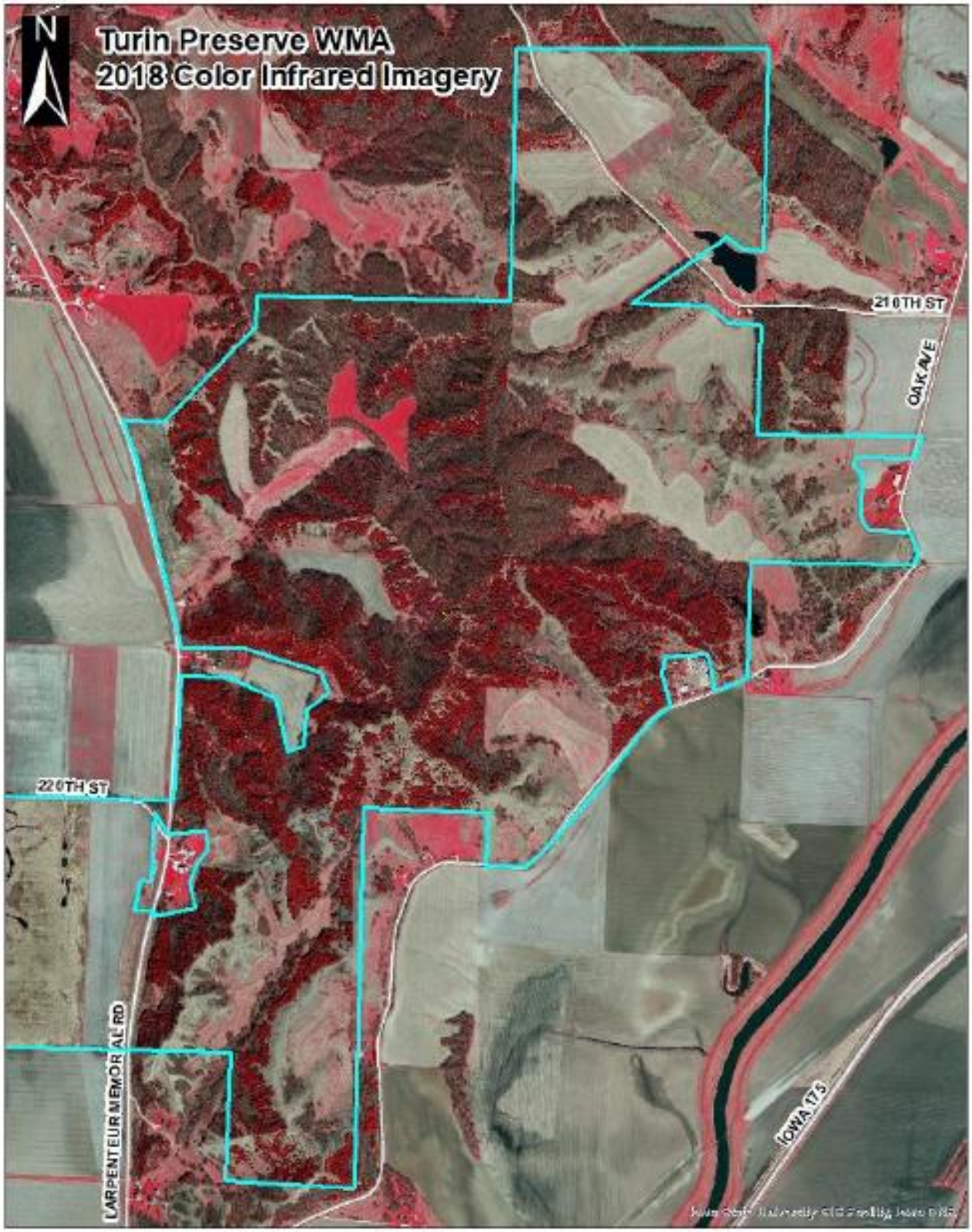

Kennebec & Belvidere Townships, Monona County, IA
Map created by Sarah Bell, DNR Forester

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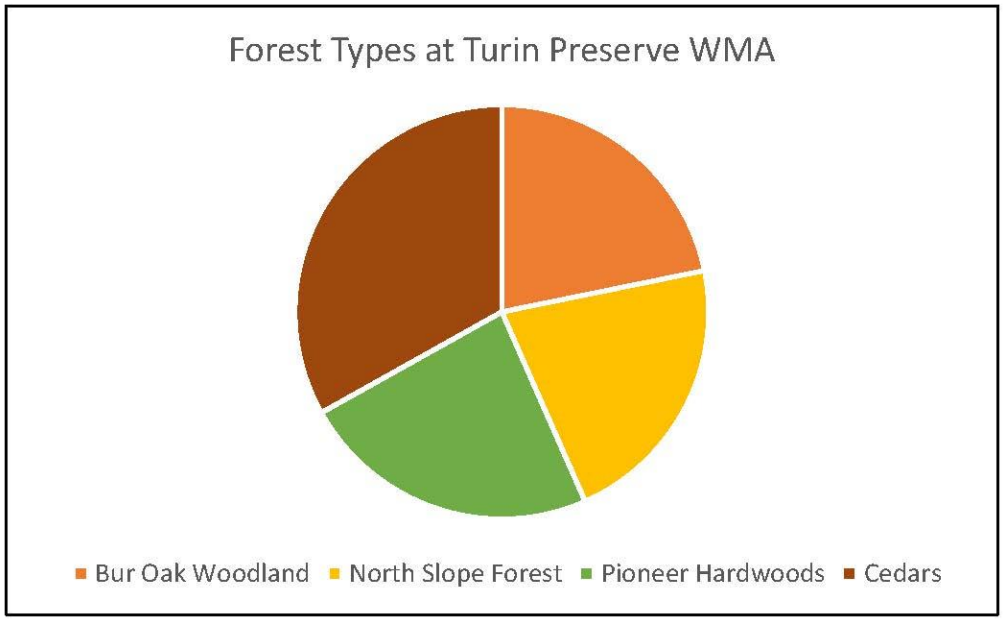
CURRENT CONDITIONS AND RECOMMENDED MANAGEMENT

The forested areas have been classified as the following 4 stands:

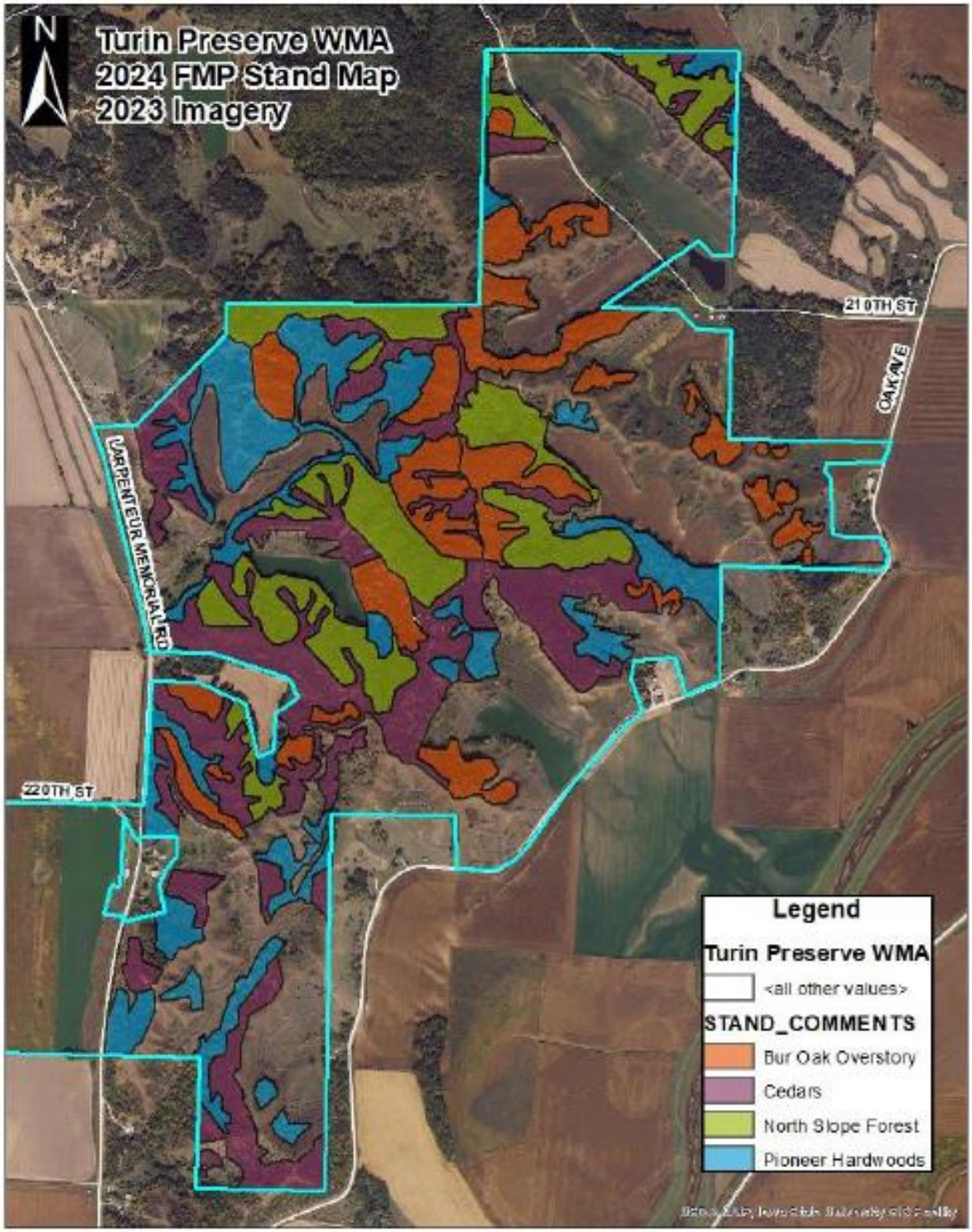
- Bur Oak Woodland: 113.2 acres or 21.8% of forest cover
- North Slope Forest: 112.2 ac or 21.6% of forest cover
- Early Successional/Pioneer Hardwoods: 122.2 ac or 23.5% of forest cover
- Cedars: 172.3 ac or 33.1% of forest cover



A 'stand' is a community of trees with similar characteristics. Management recommendations are based on the species and successional stage of each particular stand. Succession refers to where the woodland is in terms of its age and progression towards a climax vegetation type (is it a shrubby field or a stand of poles or old growth timber, etc). Trees will be classified according to size:

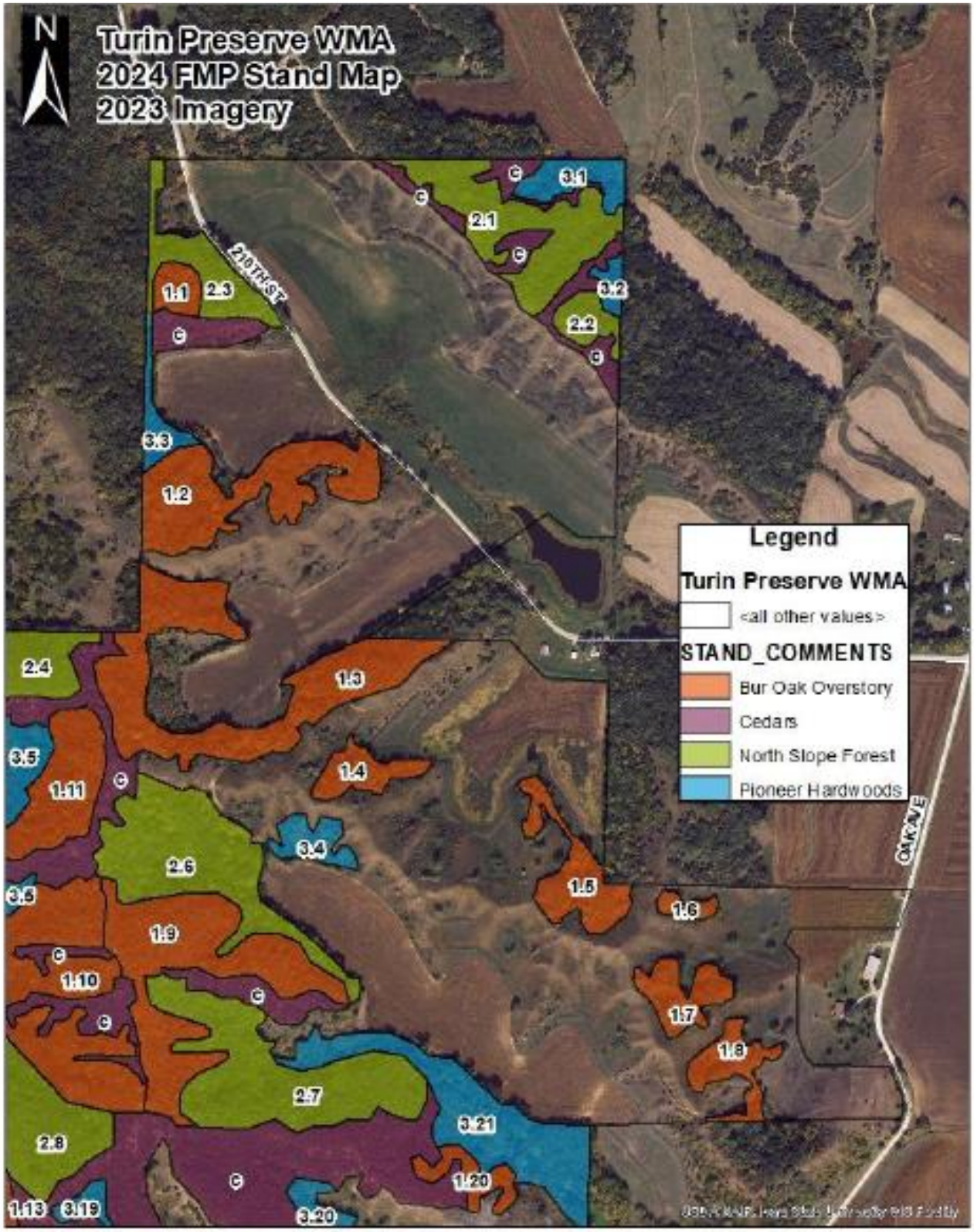
- Seedling - <1" in diameter, and less than 4.5 feet tall
- Sapling - 1-5" in diameter, and greater than 4.5 feet tall
- Pole - 5 to 12" in diameter at breast height (dbh)
- Small sawtimber - 12-18" dbh
- Large sawtimber - 18"+ dbh

Stand Maps



Kennebec & Belvidere Townships, Monona County, IA
Map created by Sarah Bell, DNR Forester

Forest Stands: North Third of WMA



Kennebec & Belvidere Townships, Monona County, IA
Map created by Sarah Bell, DNR Forester

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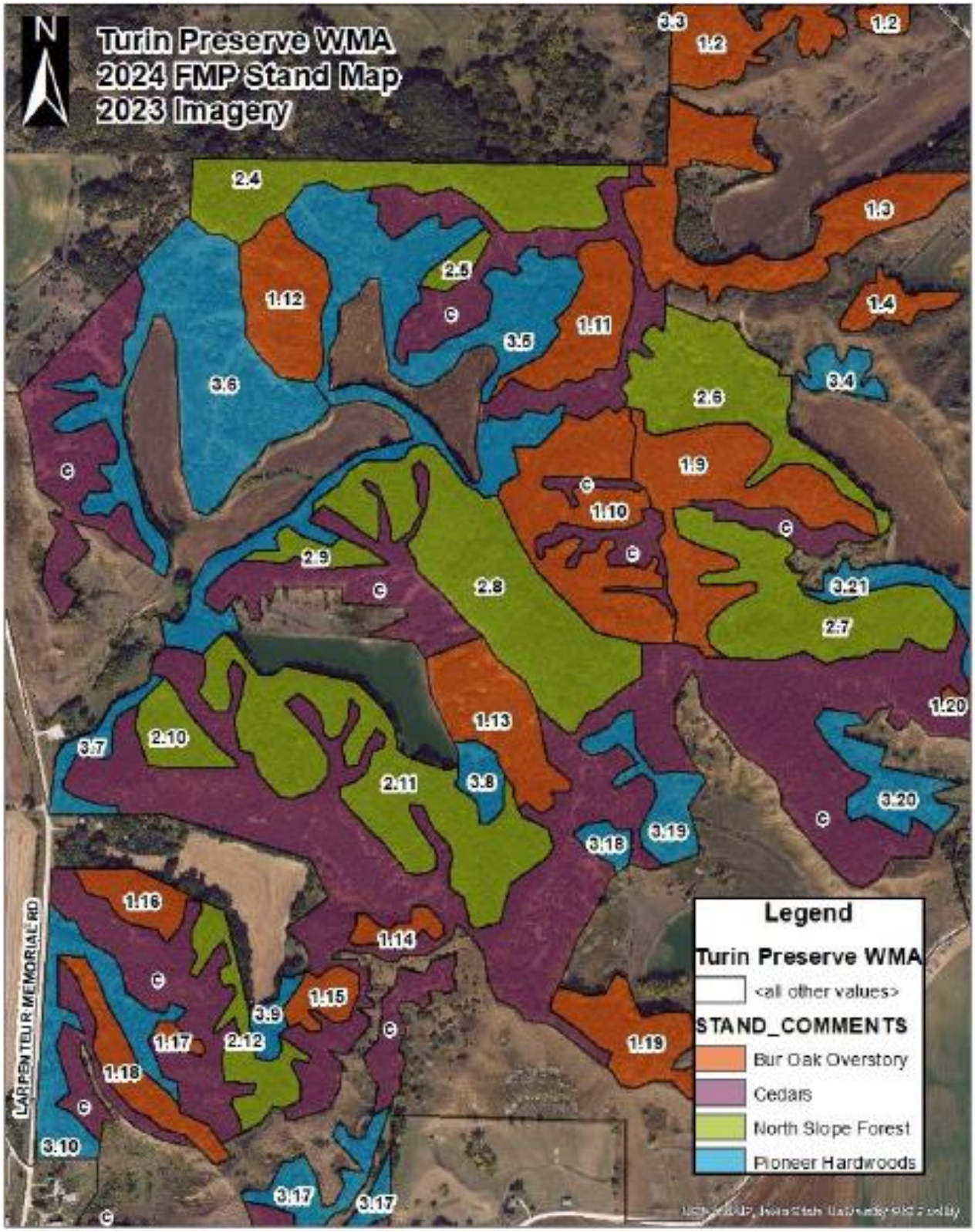

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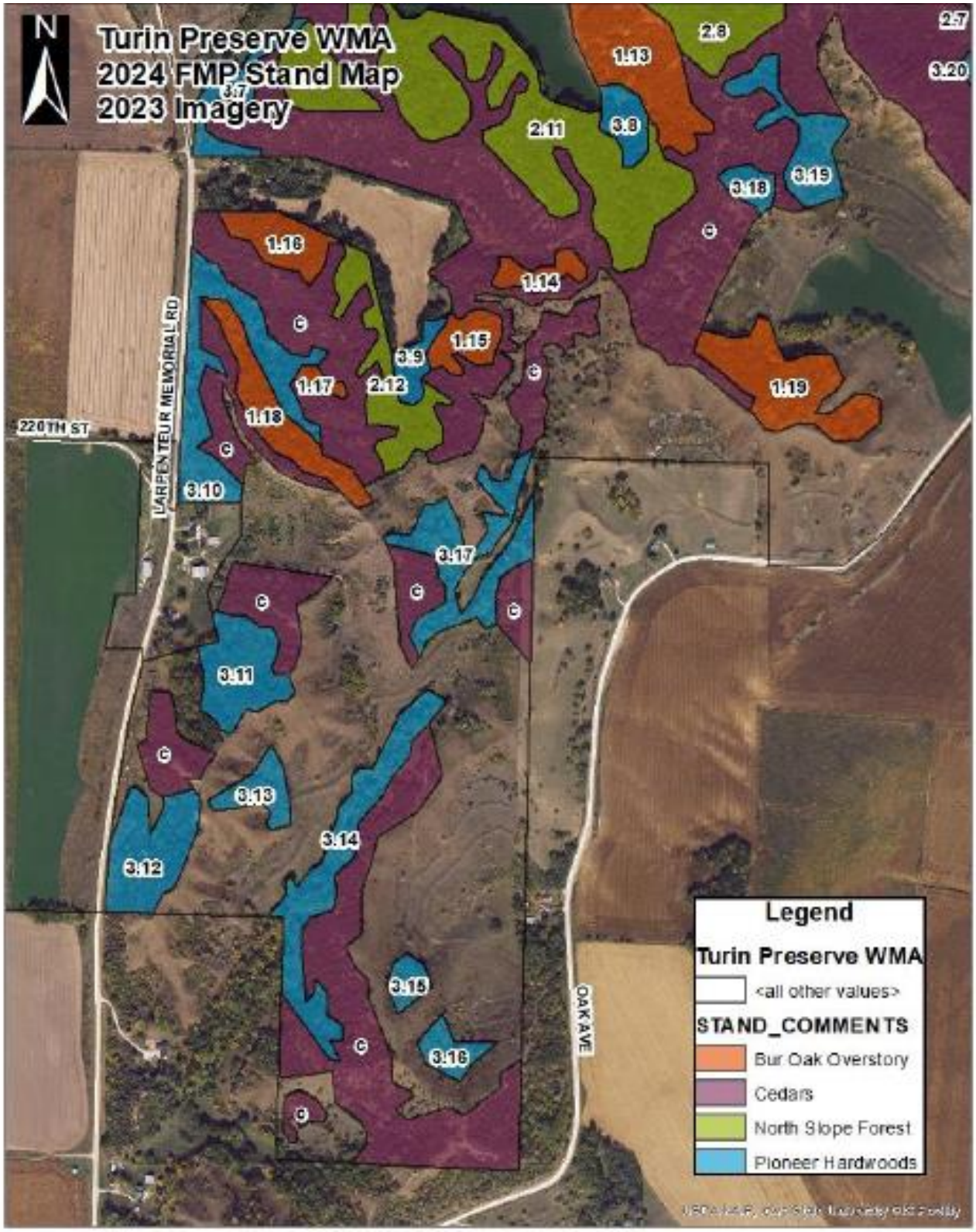

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Stand 1: Bur Oak Overstory
Overstory: Small to large sawtimber-sized mature bur oak

Midstory: Sapling to pole-sized ironwood, hackberry, green ash, American elm, Eastern red cedar

Understory: Shade-tolerant seedlings of the midstory species, Virginia waterleaf, leaf litter

Stand Description/Health: This stand lies primarily on Ida and Hamburg soils with a low site index for hardwood tree production. The overstory is dominated by mature bur oak. There is variation across the units of the stand from large diameter, first-growth oaks to small diameter, second-growth (previously-harvested) oaks. On north and east aspects, the overstory trees are generally denser (like a forest) while on south and west aspects they are generally less dense and more open grown (like a woodland or savanna). In all units of the stand, the spaces between and under the oaks have filled in with the species listed above. Currently, the stand is dense and the understory shaded which is the cause of the main forest health concerns of the stand at this time: Bur oak blight is present and seems to afflict suppressed trees the most. Bur oak regeneration is very sparse and limited to edges and pockets of higher light levels within the stand.

Stand 1: An open-grown bur oak swallowed by cedars and ironwoods

Management Recommendations: Without management, the current trajectory of the stand is apparent, the stand will not persist as an oak dominated forest. As overstory bur oaks die due to the many stressors that affect them including overcrowding, disease, severe drought, and herbicide drift, they will be replaced by the current midstory species including hackberry, elm, ironwood, and cedar. Invasive species may also become established. The gradual change from drought resistant, fire-adapted oaks to shade-tolerant hardwoods is a process known as “mesophication.” In this process, the entire ecosystem shifts to favor shade tolerant species rather than oaks. The leaf litter becomes less conducive to carrying fire, the understory is perpetually shaded, and eventually the legacy of oaks is lost and can only be restored by stand conversion.

Midstory Removal: To restore the legacy of bur oak in this stand, a new generation of oaks must be established. This can be encouraged by restoring ecological factors that oaks rely on including sunlight and periodic fire. To restore sunlight to the understory, all non-oak species should be killed in the midstory. This is often called midstory removal or weed tree

removal.

Trees can be killed by girdling or injection (hack and squirt) and left standing to reduce heavy fuel loading on the forest floor and to provide woodpecker habitat. For the best chances of achieving advanced oak regeneration, the midstory removal should ideally occur the same year as, or within a few years after, an acorn mast year. If adequate oak regeneration is not present at the time of midstory removal, it will be even more difficult to naturally recruit oak seedlings due to the response of other understory species that will increase competition for oaks.

Prior to midstory removal, other treatments can be implemented during a mast year to improve acorn germination. Removal of leaf litter by prescribed fire will help to reduce rodent predation of acorns as well as fungal and insect attacks of germinated seedlings. Scarification of the understory may also help to improve germination by facilitating seed-soil contact.

Overstory Thinning/Removal: Because a midstory removal only has a minor to moderate effect on sunlight transmittance to the understory, additional management such as overstory thinning or removal will eventually be necessary to further increase light levels for oak seedlings. This can be done as a commercial harvest if the trees are merchantable. Potential harvesting techniques used to regenerate even-aged stands (like oaks) include clearcutting, shelterwood, or seed-tree. Oak seedlings residing under the canopy of mature bur oaks may live 5-10 years after germination without increased sunlight but will lose vigor over time. This timeframe is much shorter if the midstory is also intact. The overstory should not be removed until a new age class of oaks is already present in the understory unless artificial regeneration will soon be established.

Artificial Regeneration: Even after efforts to increase sunlight levels and implement prescribed fire, it may be difficult to establish a sustainable crop of oak seedlings for a variety of reasons. The optimum seed bearing age of bur oaks is 75-150 years old. Much of the overstory bur oaks in the Loess Hills started growing at the time of settlement in the mid to late-1800s (due to suppression of fire and large mammal grazing) which means they are approximately 150-175 years old and are near or past the optimum seed bearing age. Further, mast years may be unreliable and infrequent due to the stressed conditions of the overstory bur oaks (healthy bur oaks can have mast years every 2-3 years) which may complicate the ability to effectively time seed bed preparation treatments.

Artificial regeneration is one way to ensure the presence of oak seedlings in project areas. Bareroot seedlings of ecologically appropriate species can be planted at a rate of 25 trees per acre for 'woodlands' on south and west facing slopes (units (1.)10, 11, 13-15, 17) and 50-100 trees per acre for 'forests' on north and east facing slopes (units (1.)1-9, 12, 16, 18-20). Trees should be protected with a 5' tall white plastic vented tree tube and a 6' fiberglass or metal rebar stake. Seedlings can be planted after midstory removal but no sooner than 1-2 years before overstory thinning/removal.

Competition Control: Competition from undesirable species may pose the biggest challenge in establishing a new generation of oaks. Prior to the presence of adequate oak regeneration, understory competitors can be set back using mechanical/chemical treatments and prescribed fire. Once oak seedlings are established, prescribed fire must be excluded for a period of time until the oak seedlings have ideally reached ¼" in diameter (approximately the same diameter as a No. 2 pencil). When the oaks have reached this size, a "release burn" can be implemented to top kill all seedlings in the understory. Most trees will sprout back, but because of their robust root system oaks will have an edge over non fire-adapted competitors and sprout back vigorously. Regular monitoring should occur in oak regeneration project areas to determine appropriate treatments to set back competition.

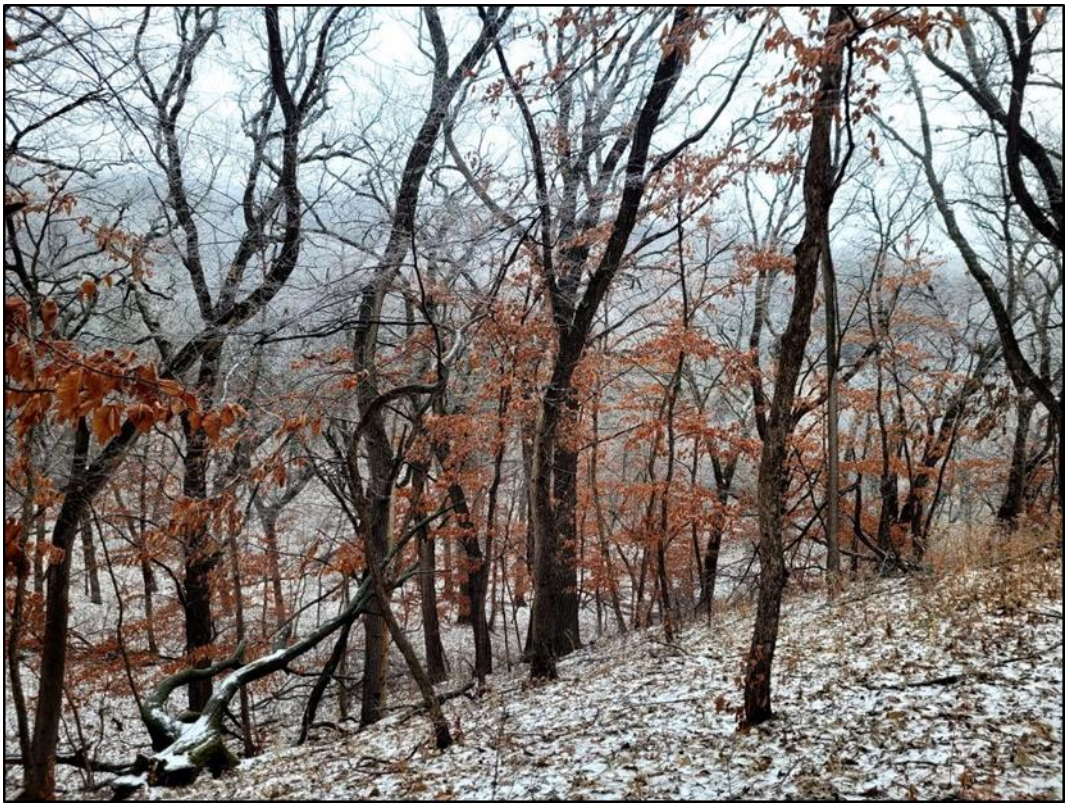
Stand 2: North Slope Forest - 12 Units, 112.2 acres
Overstory: Small to large sawtimber-sized bur oak, black walnut, Kentucky coffee tree, American and red elms, hackberry, basswood, Siberian elm

Midstory: Sapling to pole-sized American elm, hackberry, ironwood, bitternut hickory, green ash, Eastern red cedar, white mulberry (invasive), Siberian elm

Understory: Shade-tolerant seedlings of the midstory species; native shrubs including gooseberry, coralberry, choke

cherry, and bladdernut; native herbaceous species including sedges, white snakeroot, Dutchman's breeches, and trout lily; thin leaf litter

Stand Description/Health: This stand occurs on north and east-facing aspects and draws across Turin Preserve WMA. The main soil types are Ida, Hamburg, and Castana. Generally, oaks are more prominent on the high slope positions while the other overstory species listed above are more prominent on the mid and low slope positions. The understory is heavily shaded and ranges from bare soil and low-growing ephemerals to very dense pockets of hackberry or ironwood regeneration. The higher quality portions of the stand contain good native diversity in all levels of the forest while lower quality portions have become established with invasive or undesirable species like white mulberry and Siberian elm.



Stand 2: Mixed overstory hardwoods with a dominantly-ironwood midstory and shaded understory

Management Recommendations: The moister, cooler north and east aspects of the Loess Hills are conducive to growing diverse, native hardwood forest ecosystems. It is recommended to preserve the native diversity of this ecosystem by first removing invasive species including Siberian elm and white mulberry. This can be accomplished using cut stump treatment, girdling, hack and squirt, or basal bark spraying.

Diversity of both native species and age classes can further be encouraged by creating openings in the canopy and interplanting them with bareroot seedlings. Clearcutting pockets of trees to establish openings is a silvicultural practice known as group selection which is intended to create an uneven-aged stand (a stand with 3 or more age classes). A group selection harvest will create the opportunity to introduce ecosystem-appropriate species that do not currently grow at Turin Preserve WMA but grow in surrounding counties such as red oak, black cherry, shagbark hickory, and Eastern wahoo. Bareroot seedlings should be interplanted at a rate of 50-100 trees per acre on approximately 30 x 30' spacing. They should also be protected with a 5' tall white plastic vented tree tube and a 6' fiberglass or metal rebar stake.

On the higher slopes where bur oak is more dominant, midstory removal can be implemented to encourage oak regeneration. Periodic prescribed fire should also be implemented. When deep leaf litter is present fall (or early spring if conditions are favorable) fire should carry readily from prairie ridges down into the oak-dominated portions of the north slope. When conditions are drier and windier, fire could also be run upslope from the lower landscape positions. Fire is

likely to be patchier and harder to carry in the lower landscape positions which will encourage a mosaic of native species and conditions.

Stand 3: Early Successional/Pioneer Hardwoods - 21 Units, 122.2 acres
Overstory: Small to large sawtimber-sized Siberian elm, American elm, black walnut, Kentucky coffee tree, green ash, hackberry, cottonwood, white poplar (unit 3.5)

Midstory: Sapling to pole-sized Siberian elm, white mulberry, Kentucky coffee tree, hackberry, green ash, black locust (unit 3.7)

Understory: White mulberry, hackberry, and ash seedlings; gray dogwood and Amur honeysuckle

Stand Description/Health: This stand is located on former prairie slopes, field/forest edges, and in areas were terraces were constructed in the mid-1900s. The stand consists mostly of pioneer or early successional species that are quick to populate disturbed or unmanaged areas. It is generally lower in quality due to the higher concentration of invasive species. The terraced areas in particular are very scrubby and populated with invasives. Units 3.14 and 3.21 contain steep, fertile drainages that are more heavily populated with cottonwoods.

Stand 3 (foreground): Mixed pioneer species growing in a shallow draw

Management: There are several ways in which the stand can be managed. On former prairie slopes, all woody species should be removed/chemically treated and prescribed fire implemented to restore prairie vegetation. This includes units (3.)4-7, 10-13, and 15-20. This can be accomplished by machine (such a skid loader with a shearing attachment) in accessible areas but will need to be done by hand on very steep sites. Cut vegetation should be piled and burned in tall, tight piles rather than mulched on site. Mulching can create a very thick layer of woody debris that burns very hot and smothers desirable vegetation. Scattered oaks may be left where desired on these sites. Expected/historical landscape positions for bur oaks in a prairie landscape include slight north aspects and small protected draws where the slight topographical change is more favorable for trees.

As noted above, the stand also serves as a natural “feathered edge” or transition from ag field to mature forest in units

(3.)1, 3, 5, 8, 9, and 21. The smaller stem diameter and high stem density of edge habitat provides valuable cover for several wildlife species including bobwhite quail, songbirds, and rodents. The quality of the feathered edge can be improved by removing invasive species including Siberian elm, white mulberry, and Amur honeysuckle. This can be done by hand where invasives are sparser, but in areas with dense infestations machinery will be more feasible for removing the undesirable vegetation. Several mechanical and chemical treatments are likely to be necessary to achieve adequate invasive control. To maintain the small stem diameter and high stem density of the feathered edge, the vegetation can be mowed off close to ground level and allowed to resprout (invasive species should be treated at or before the time of mowing). If done periodically, this will help to establish several different age and size classes throughout the stand to offer greater habitat diversity for wildlife.

Finally, certain units or portions of units within this stand fall on the Napier soil type which is incredibly fertile and conducive to hardwood tree production. This includes units (3.)1, 5, 8-10, 14, 17, 20, and 21. The fertile soils in these units would be suitable for a direct hardwood/shrub seeding or bareroot seedling plantation which would promote the establishment of a new age class of desirable hardwoods. Potential planting sites will need to be cleared of most of the existing tree cover to ensure adequate sunlight levels, which can be done as a commercial harvest if the trees are merchantable. Bareroot seedlings can be planted at a rate of 50-100 trees per acre and protected with a 5’ plastic tree tube with a 6’ fiberglass or metal rebar stake.

Stand 4: Cedars - 21 Units, 172.3 acres

Stand Description: This stand occurs primarily on the Hamburg, Ida, and Castana soil types. It makes up one third of the forest cover at Turin Preserve WMA and consists of densely-grown Eastern red cedars and occasional hardwoods. According to aerial photography records, cedars were scattered across the landscape by the 1980s and rapidly colonized the prairie over the next few decades. Currently, the cedars grow so densely that they are nearly impossible to navigate and only bare soil exists underneath them. Small openings within the cedar stands are often vegetated by remnant prairie.

Stand 4: A dense stand of cedars

Recommended Management: Eastern red cedar is western Iowa’s only native conifer and plays a role in the ecosystem by providing year-round cover and habitat for certain wildlife species. Historically, cedar was kept in check on the landscape by wildfires and prescribed fires set by Native Americans. With European settlement in the mid to late-1800s, fire was suppressed and cedars no longer had any natural systems to keep them from encroaching on the landscape, leading to the dense stands of cedars today.

In the Loess Hills and at Turin Preserve WMA, cedars have suppressed countless acres of native prairie and continue to encroach at a steady pace. It is recommended to continue efforts to clear the cedars by machinery on accessible sites

and by hand on inaccessible sites. Cedars should be piled and burned in tight, tall piles. Periodic prescribed fire should also be implemented to kill small cedars and slow their spread. Cedars that are scattered in forested areas do not need to be cleared unless they interfere with desired forest understory species.

MANAGEMENT TABLE

Stand	Recommended Management	Priority	Timing
1 - Bur Oak Overstory	Seed bed preparation by Rx fire or scarification	Moderate	Rx fire should occur in spring (or fall if timing allows), scarification should occur as close to acorn drop as possible (before or after)
	Midstory removal	High - Oak recruitment cannot occur with an established midstory	Mid-summer through leaf turn is ideal for girdling/hack and squirt; can also occur in winter
	Overstory thinning/removal	High once regeneration is present - Oaks will need the increased sunlight to grow	Mid-summer through winter if girdling trees Fall (after trees are dormant) through winter if harvesting, to protect residual trees and soil
	Artificial regeneration (plant seedlings)	High if adequate natural regeneration does not occur after midstory removal and before desired timing for overstory thinning/removal	Spring (after ground thaw) through the end of May
2 - North Slope Forest	Kill invasive species including Siberian elm, white mulberry, and any honeysuckle	Moderate - The shade in this stand is helping to suppress spread of invasive species, though they should still be removed as feasible	Mid-summer through leaf turn is ideal for girdling/hack and squirt; can also occur in winter
	Group selection harvest to create openings for interplanting	Low	Harvesting should occur in fall (after trees are dormant) through winter
	Midstory removal/Rx fire in oak-dominated areas on high slope positions	Moderate - While oak regeneration efforts should be focused in Stand 1, this type of management can be paired with efforts to restore prairie adjacent to Stand 2	Rx fire should occur in spring (or fall if timing allows) Mid-summer through leaf turn is ideal for girdling/hack and squirt; can also occur in winter
3 - Pioneer Hardwoods	Clear and maintain with Rx fire on sites where prairie is desired	High on sites with remnant prairie potential	Clearing should occur when ground is frozen or dry to protect soil. Rx fire will most effectively control woody resprouts in spring or summer
	Remove invasive species	Moderate - This stand is the primary source of invasives at TP WMA; however, it is also holding acres from more aggressive invasive spp like tree of heaven and black locust. Easily-maintainable sites should take priority.	Mid-summer through leaf turn is ideal for hand methods; can also occur in winter. Machine clearing should occur when ground is frozen or dry; susbsequent resprouts will need to be sprayed in the growing season
	Mow/shear existing vegetation to maintain and establish early successional cover	Moderate - Early successional habitat is valuable for many wildlife species	Outside of nesting season

Stand	Recommended Management	Priority	Timing
	Clear and replant in areas with existing undesirable composition	Low	Clearing should occur when ground is frozen or dry to protect soil. Seedlings should be planted spring (after ground thaw) through the end of May
4 - Cedars	Clear and maintain with Rx fire to promote prairie	High on sites with remnant prairie potential	Clearing should occur when ground is frozen or dry to protect soil. Rx fire will most effectively control woody resprouts in spring or summer

MANAGEMENT CONSIDERATIONS

Soil and Water

The silt loam soils of the Loess Hills are extremely fragile. When these soils are disturbed, they should be re-vegetated as quickly as possible to reduce potential erosion and invasive species colonization. For timber management, machinery should only be operated when soil conditions are frozen or dry. This will avoid the detrimental effects of compaction and erosion. Iowa Forestry Best Management Practices for logging roads, access roads, and associated soil work should be followed at all times.

Water quality can be protected by adhering to the soil conservation measures above. In addition, herbicides should be used in accordance with Iowa Forestry BMP practices. Improper use of chemicals can lead to surface and ground water contamination as well as collateral damage to desirable plants and wildlife.

Historical and Cultural

There are no known historical or cultural features on Turin Preserve WMA. Project areas should be further investigated to determine if historical or cultural features are present.

Aesthetic Quality and Recreation

Certain treatments can temporarily negatively impact recreational opportunities in project areas. Negative impacts to aesthetics and recreation can be mitigated by treating smaller units, selecting project areas across the entire WMA (and not all in one location), and by varying treatments at any given time.

Biological Diversity

Native tree, shrub, and herbaceous plant species should be retained wherever feasible. Reforestation and restoration projects should only incorporate native or ecologically appropriate species that are suited to the unique soils and microclimate of the Loess Hills and of the project area. Invasive species control should also be prioritized to promote native biological diversity.

Threatened and Endangered (T&E) 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.

T&E plant and wildlife species and their habitats should be protected when conducting natural resources management. The Northern Long-Eared bat (*Myotis septentrionalis)* is a federally endangered species that can occur in any county of Iowa. The Indiana bat is a federally endangered species that occurs in the eastern portion of Iowa, but was detected on the adjacent Loess Hills WMA. The Tricolored bat (*Perimyotis subflavus)* is a federally proposed endangered species that can occur in any county of Iowa. These species can be active from April through September in forested areas. Female 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 or large limbs, or large cracks or openings. Tricolored bats roost in

similar forested habitat but roost within leaf clusters instead of under loose bark. To protect summer habitat for these bat species:

- 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 - September 30
  - Such trees meeting the above criteria may be felled beginning October 1 through March 31; however, in all forest management projects, retain a minimum of 9 suitable habitat trees per acre if present above this rate
  - Live trees may be girdled any time of year to create habitat snags
- Avoid conducting prescribed burns in woodlands from April 1 through September 30
  - If prescribed burning operations must take place during this time, then protect trees 9" DBH and larger that meet the description above
- Avoid clearcuts, seed tree harvests, or site preparation projects larger than 10 acres that could negatively affect suitable habitat
- Do not remove suitable roost trees within 0.25-miles of a known hibernaculum.

The following Federally threatened/endangered and State threatened/endangered/special concern, and SGCN species have been found on or adjacent to Turin WMA through the Multi-Species Inventory & Monitoring (MISM) program, Natural Areas Inventory (NAI) records, and staff observations:

Common Name	Scientific Name	Status
Wild indigo duskywing	*Erynnis baptisiae*	Special concern
Regal Fritillary	*Speyeria idalia*	SGCN
Southern Cloudywing	*Thorybes bathyllus*	SGCN
Little Glassywing	*Pompeius verna*	SGCN
Monarch	*Danaus plexippus*	SGCN
Common Roadside Skipper	*Amblyscirtes vialis*	SGCN
Pawnee skipper	*Hesperia leonardus pawnee*	Special concern
Ottoe skipper	*Hesperia ottoe*	Special concern, SGCN
Blanchards cricket frog	*Acris crepitans*	SGCN
Northern leopard frog	*Rana pipiens*	SGCN
Great plains toad	*Bufo cognatus*	SGCN
Woodhouses toad	*Bufo woodhousii woodhousii*	SGCN
Eastern gray treefrog	*Hyla versicolor*	SGCN
Snapping turtle	*Chelydra serpentina*	SGCN
Six-lined racerunner	*Cnemidophorus sexlineatus*	SGCN
Prairie ringneck snake	*Diadophis punctatus*	SGCN
Bullsnake	*Pituophis catenifer sayi*	Special concern, SGCN
Eastern hognose snake	*Heterodon platirhinos*	SGCN
Northern lined snake	*Tropidoclonion lineatum*	SGCN
Northern prairie skink	*Plestiodon septentrionalis*	SGCN
Northern redbelly snake	*Storeria occipitomaculata*	SGCN
Plains garter snake	*Thamnophis radix*	SGCN
Western fox snake	*Pantherophis ramspotti*	SGCN
Plains pocket mouse	*Perognathus flavescens*	State endangered, SGCN
Northern Long-eared Bat	*Myotis septentrionalis*	Federally endangered, SGCN
Evening Bat	*Nycticeius humeralus*	SGCN
Tri-colored Bat	*Perimyotis subflavus*	SGCN
Silver-haird Bat	*Lasionycteris noctivagans*	SGCN

Common Name	Scientific Name	Status
Indiana Bat	*Myotis sodalis*	Federally endangered, SGCN
Henslow's sparrow	*Ammodramus henslowii*	State threatened, SGCN
Grasshopper sparrow	*Ammodramus savannarum*	SGCN
Chimney swift	*Chaetura pelagica*	SGCN
Sedge wren	*Cistothorus platensis*	SGCN
Yellow-billed cuckoo	*Coccyzus americanus*	SGCN
Common yellowthroat	*Geothlypis trichas*	SGCN
Bald eagle	*Haliaeetus leucocephalus*	SGCN
Dickcissel	*Spiza americana*	SGCN
Field sparrow	*Spizella pusilla*	SGCN
Broad-winged hawk	*Buteo platypterus*	SGCN
Whip-poor-will	*Caprimulgus vociferus*	SGCN
Northern flicker	*Colaptes auratus*	SGCN
Northern bobwhite	*Colinus virginianus*	SGCN
Eastern wood-pewee	*Contopus virens*	SGCN
Black-billed cuckoo	*Coccyzus erythropthalmus*	SGCN
Wood thrush	*Hylocichla mustelina*	SGCN
Baltimore oriole	*Icterus galbula*	SGCN
Red-headed woodpecker	*Melanerpes erythrocephalus*	SGCN
Brown thrasher	*Toxostoma rufum*	SGCN
Eastern kingbird	*Tyrannus tyrannus*	SGCN
Prairie tea	*Croton monanthogynus*	Special concern
Prairie moonwort	*Botrychium campestre*	State endangered
Blue mud-plantain	*Heteranthera limosa*	Special concern

SGCN= species of greatest conservation need

Forest Health and Invasive Species

Numerous insects, diseases, and invasive species impact Iowa's forests. Turin Preserve WMA should be regularly monitored for new or unusual impacts to forest health: The following forest health concerns were identified at Turin Preserve WMA:

- Amur honeysuckle
- Autumn olive
- Siberian elm
- White mulberry
- Black locust - Unit 3.7
- Tree of Heaven - one seedling was found and killed north of Unit 3.7; more are likely to come
- Bur oak blight

LITERATURE CITED

Johnson, Paul S. *Bur Oak.* https://www.srs.fs.usda.gov/pubs/misc/ag_654/volume_2/quercus/macrocarpa.htm

EXTERNAL REVIEWS

Fri, Jun 27, 6:34 PM
Litchfield, Tom tom.litchfield@dnr.iowa.gov
to me

Hello Doug,
This was a very clean and easy-to-read plan. I liked how similar "sub-stands" were grouped together under a larger, overarching stand(s). It saves time and plan length and makes it easier/more enjoyable to read (way less repetition too). I just found a few typos and asked a few questions/comments.

If all goes as planned, the file with my edits/comments will be attached the same way as yours was to me (it looks like it worked!)

I hope you have/had a good weekend!

Take Care,
Tom

Historically, eastern redcedar was never capitalized since it refers to a general area and "red cedar" was one word. I can find it both ways now online (eastern redcedar and eastern red cedar. I usually use the USDA website for common names.

We will use eastern red cedar throughout the document.

"encroached prairie ridges"?
Changed to "tree-encroached prairie ridges"

I would move this to the end of the soil type descriptions as a footnote. I have added a "*" to Castana.
Stylistic opinion, no change.

I notice on the soil type map that there is a "Monona" soil in the legend. The map indicates there is very little of it on the WMA, should it be described?
Chose not to describe Monona soil because there is an insignificant amount.

Move so visible. (3X in reference to titles on north, middle, and south stand maps)
Fixed formatting.

Anchor to photo.
Formatting opinion. No change.

I don't know if this is necessary, I thought it might help clarify for general public. Referring to adding, "(hand or mechanical planting)".
Redundant, not necessary.

Maybe start this at the top of a new page? (Referring to Management Table).
Table starts at top of a new page.

Probably best not to split blocks within the same prescription narrative if that is possible so it doesn't "dangle" between the two pages. (Referring to mgmt table).
Formatting rectified.

Add "subsequent" resprouts.

Redundant. No change.

No mention of the Indiana in this section bat it is listed in the table below as occurring on or adjacent to the WMA.
US Fish & Wildlife Services range map indicates the WMA should be west of its known range.
https://www.fws.gov/species/indiana-bat-myotis-sodalis/map
Indiana bat was detected by MSIM on the adjacent Loess Hills WMA, and yes it is out of the known range of Indiana bat.
The regulatory restrictions on tree cutting dates are the same for both the northern long-eared bat and the Indiana bat.

Wed Jun 18, 2025
Schmidt, Megann megann.schmidt@dnr.iowa.gov

Hey Doug!
I got a chance to review the plan this morning, and I learned A TON! Overall, I think you and Sarah did a great job of developing a solid science based plan for this site that takes into account wildlife habitat, invasive species, forest health, and overall conditions of the property. Below are a few comments/questions that I had organized by page number.

- **All:** I thought the maps showing soils, historic imagery, and the stands onsite were very impressive. They were very detailed but still really easy to read and understand, and they were super helpful to reference as I reviewed the rest of the plan. I also enjoyed the pie chart on page 10 - it really helped me to visualize how much of each habitat type there was onsite. I also really enjoyed the photos included of each habitat type - they really added to the plan and helped me to visualize what we are working with.
- **Page 6:** The summary of the site history was very well done. It reads like a story while still being very informative and scientific.
- **Page 16:** This is more of a question than a comment, but reading through the midstory removal section got me thinking about if there is any way to predict a good mast year? If there are any sort of predicting factors, it might be helpful to include those in this section just to help inform timing of management. Additionally, do individual trees typically have good mast years simultaneously or will they be different? If individual trees seem to differ, maybe it's best just to plan management when it works best for staff/funding knowing that we could hopefully catch at least a few trees in a mast year.
- **Page 17:** In the "Competition Control" section, I'm wondering if there is anything we can do during the fire exclusion period (until oaks are 1/4 in in diameter) to limit competition? Do we have the need and the time/capacity to do basal bark treatment or mechanical control on competition trees? I'm not sure how necessary the additional competition control would be or if we have the time or capacity to do it, but I was just wondering about it as an option if we are trying to focus on oak regeneration in these areas.
- **Page 19:** In the last paragraph, the common after the "(or early spring if conditions are favorable)" should be removed. Fixed.
- **Page 24:** The table lists removal of invasive species on the Pioneer Hardwoods stands as moderate, which makes sense to me given the fact that it is holding acres from more aggressive species. However, knowing that Unit 3.7 is where we have identified both black locust and tree-of-heaven, I wonder if at least this unit should be of high priority for invasive control to prevent the spread of these more aggressive invases elsewhere in the property. Good point.

I hope at least some of these comments are useful to you guys! Like I said before, I really enjoyed reviewing this document and learned a lot in the process!

Thanks!

On Mon, Oct 7, 2024 at 8:41 AM
Hickman, Brian <brian.hickman@dnr.iowa.gov>

Sarah,

Really well done. Super impressed.

I only have one comment and it was about the herbicide damage. I have zero issue with it being included if you are seeing herbicide damage. If we aren't but its one of the "could be" then I think we should clarify that.

Brian

Tue, Jul 1, 12:08 PM
Wallace, Ben ben.wallace@dnr.iowa.gov
to me

Doug,

I've had a chance to review this and it all looks good to me. No comments.

Jun 13, 2025, 7:49 AM
Barney, Lindsey lindsey.barney@dnr.iowa.gov
to me, Sarah

Good Morning,
I just finished, and the plan looks really good. Sarah, I also like the way you mapped the stands, it is very clear and easy to distinguish.

Other notes that I really appreciated:

- keeping some of the early successional/old field cover for "edge feathering", I think this habitat type is very underrated
- being open to planting fertile valley bottoms to diverse tree/shrub planting - I think this is a good solution to "capture" the site and plant the things you want before the things you don't want move in (eh hem, Tree of heaven!)
- Did you find areas of super mature cedar trees on your recon (like down in coves or deep canyons)? Could these really old areas be retained in minimal amounts for our owl friends? I have been reading that several of our less common owls (some of which are T&E in my counties) like "old rank" conifer stands near prairie, such as the long-eared owl (which would use your part of the world in the winter), or eastern screech, or northern saw whet (winters in your zone).

Good job! I should have you edit my plans Sarah, I saw no typos! Lindsey

- Keeping "old rank" cedars that were not a native component of the loess hills ecosystem would cause adverse, unintended negative consequences despite being beneficial for some species. The source of cedars in the loess hills is likely from planted windbreaks around building sites.

Aug 18, 2025, 11:06 AM
Poole, Kelly kelly.poole@dnr.iowa.gov
to me

Hi Doug,
I'm cleaning up "to-do" list that's been on hold due to other administration priorities (EO10 - updates to the state TE list). I looked this over when you sent it. I don't see that I responded. I'm sorry about that! One general comment I have (if there's an opportunity to include it.

Since the plans are intended to be a long-term planning document, I suggest using the following paragraph in the plan. It mirrors the information and process outlined in the Operations and Management Plan (that Monica writes for the management grant) This provides for more flexibility (e.g., if species status changes or conservation measures update).

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.

Hope the summer has been good to you. I'm looking forward to fall!

- Suggested text added.

Jul 14, 2025, 3:28 PM
Fullin, Katy katy.fullin@dnr.iowa.gov
to me

Hi Doug,

Thanks for the opportunity to review the Turin WMA Forest Stewardship Plan. Overall I think it's really a good plan, very clearly articulating all the considerations and recommendations. I only have a couple questions. Also I'm sorry it took me so long to get back to you on this!

Questions/Comments
- Page 26-27 - I like that you have a table of SGCN documented there by MSIM, NAI, and staff. However, the timing is a little awkward because we will soon have an updated list of SGCN, a new T&E species list, and probably no longer have a "Special Concern" designation. So, this could be mentioned in the caption> Or, you could leave the table out, which would kind of be a bummer because it's informative. Not sure what to suggest. We will run with the current information until the next revision and we can update it at that time.
- Page 28 - is EAB not an issue there? Not to imply that it needs to be included even if it is present, I'm mostly just curious. Yes, EAB has run its course in Monona county and will likely to continue to limit the size and age ash will attain on Turin WMA.

Katy

Jul 7, 2025, 10:08 AM
Mark Leoschke (via Google Drive) drive-shares-dm-noreply@google.com
to me, sarah.bell

Mark Leoschke shared an item
Mark Leoschke (mark.leoschke@dnr.iowa.gov) has shared the following item:

Turin WMA FWSP DC.pdf

Somewhere in this plan you mentioned planting red oak and perhaps other native species not currently present on the WMA. As a botanist I feel uncomfortable adding species that are not already present even if they are native - where do you draw the line?
We have used the native range on species to include in this plan. While red oak doesn't occur currently in Monona County, it is in all surrounding counties from BONAP. No change.

I am glad to see the definitions
Great.

Formed in windblown sediments?
Yes, Hamburg soils are windblown sediments. No change.

The catsteps may have been created or enhanced by cattle.
Catsteps as the geologic formation are formed by slump. Yes, cattle trailing can also occur but will not be in parallel repeated formations perpendicular to the slope like catsteps. No change.

Glad to see this resource cited here
(In reference to the 1875 Andreas Atlas)

Define this term (referencing "doodle dam").
This term refers to small earthen dams created to reduce erosion.

How? (referencing fire will reduce predation of acorns by rodents).
Removal of leaf litter reduces rodents by removing where they hide and exposes rodents to predation.

Such as a skidloader.
No change, redundant.

Will need to be sprayed.
Edited as suggested.

Tue, Jul 1, 10:34 AM
Wilson, Riggs riggs.wilson@dnr.iowa.gov
to me, Karen

Hi Doug,
Thank you for the opportunity to review the Turin FWSP. You and Sarah have done a great job with this, the plan is very well put together and thorough. You also included some really great photos! Karen and I have both reviewed the plan and I have attached a Word Document with our combined comments and recommendations by page number.

Thanks again,
Riggs

Comments:

- **Page 12-14** - numbers in the figures - are those acres? Stand numbers? This should be explained in the figure or on the figure page. What does 'c' mean? You may want to remove "<all other values>" from the legend.
  The title clearly states Stands. C is for cedars. No change.
- **Page 12** - stand label text is repeated twice above figure.
  Formatting fixed.
- **Page 13** - stand label text is cut off by map.

Formatting fixed**.**

- **Page 14** - stand label text is cut off by map.
  Formatting fixed
- **Page 15 - that is a really cool photo!**
  thanks
- **Page 16** - An additional benefit of leaving standing dead midstory trees would be an increase in woodpecker foraging area.
  Added.
- **Page 16** - While the trajectory may be apparent to a forester, these are posted on-line for the public, suggest adding something to the end of the sentence….” … trajectory of the stand is apparent - it will not persist as a bur-oak savanna’ or something like that.
  Added as suggested.
- **Page 16 -** if possible, include a citation for the shorturl - it looks to be a USDA FS webpage?
  Citation added.
- **Pages 17, 19, and 21**, All tree tubes should be fitted with fine mesh exclusion netting over the top opening to prevent entrapment of songbirds and other wildlife with the netting only being removed when the seedling gets a few inches from the top of the tube and then replaced once it is a few inches above the top of the tube. Mark Vitosh sent an email about this which was forwarded to DNR wildlife all by Bryan Hellyer on Nov 5, 2024 if you need more info.
  Exclusion netting is standard BMP.
- **Page 22** - probably need to list out which wildlife species you are trying to favor with the red cedar?
  Cedars were not naturally occurring in the loess hills and will be cut despite the benefits they may have to individual species. Unintended negative consequences of
- **Page 25-26,** As per the USFWS, add to description for Northern Long-eared Bats to not remove suitable roost trees within 0.25-miles of a known hibernaculum (although we don’t know where those are, but is good to mention).
  Added
- **Page 25-26**, Due to the recorded presence of Federally and State listed species on this property, you should include somewhere in this section that any forest management activities will be reviewed internally and that staff will consult data from the Iowa DNR’s Natural Areas Inventory program (NAI) to assess any potential impacts on protected species. If protected species are present within a proposed management area or if there is suitable habitat present, Iowa DNR NAI staff will be consulted. If the endangered bat records are confirmed records you could potentially also state, “Should management practices be needed which are expected to impact federally listed T&E species beyond the Sect. 7 agreement, USFWS will be consulted.”
  Additional consultation and review language was added (from Kelly Poole’s review).
- **Page 26**, narrative should directly address potential impacts of management practices on the State endangered plains pocket mouse. Since this is primarily a grassland species there is a lower chance of negative impacts from forest management but this should be stated in the plan. Breeding occurs from May-September so prescribed fire in grassland areas should fall outside this time window. Additionally, areas of unburned vegetation should be left to provide refugia and burns in any given area should be timed a minimum of 3 years apart. Managing the eastern red cedar woody encroachment and other invasive species and increasing the amount of sparse prairie area through proposed actions in this plan may be beneficial to local plains pocket mouse populations.
  This Forest Wildlife Stewardship plan will not elaborate on the grassland management actions on Turin WMA.
- **Page 26**, The Monarch is proposed for listing under the ESA. This should be reflected in the table with “SGCN, Federally Proposed Threatened”. While forest management may not be very applicable to this species, management for eastern red cedars and prairie has the potential to have a positive impact by creating more prairie habitat on the landscape. Monarch butterflies need habitat disturbance to maintain milkweed on the landscape which can be accomplished through several land management practices, including the prescribed fire practices proposed in this plan. Burning should not be done between May and September. You may want to include brief management recommendations, especially for prescribed fire in prairies, in the narrative section on page 26. Though you don’t mention grazing or mowing management in the plan, I have included some information on grazing and mowing below in case you want some additional information. Light grazing should not have many negative impacts if done outside the May-September time period. Mowing can have a positive

impact, especially if only 1/3 to 1/2 of a field is mowed at a time and if it is done in late June/early July or after September 15.
This Forest Wildlife Stewardship plan will not elaborate on the grassland management actions on Turin WMA.

- **Page 27**, Henslow's Sparrow is currently a State Threatened species and should be listed as this in the table.
Corrected.
- **Page 27**, Regal Fritillary is currently a State Special Concern species and Federally Proposed Threatened and should be listed as this in the table. While forest management may not be very applicable to this species, management for eastern red cedars and prairie has the potential to have a positive impact by creating more prairie habitat on the landscape, especially if *Viola pedata* or *Viola pedatifida* are present. In prairie areas where Regals are known to occur the recommended prescribed fire return interval is between every 4 and 5 years and it is recommended to maintain sufficient unburned refugia through burning 1/4 to 1/3 of the highest quality prairie habitat at a time. You may want to include brief management recommendations, especially for prescribed fire in prairies where regals are present, in the narrative section on page 26. Though you don't mention grazing or mowing management in the plan, I have included some information on grazing and mowing below in case you want some additional information. Grazing has the potential to have a negative impact on Regals and any grazing that is done should be light or limited from an entire field. Mowing can have a positive impact but should only be done on 1/3 of a field at a time and done in July/August.
This Forest Wildlife Stewardship plan will not elaborate on the grassland management actions on Turin WMA.
- **Page 27**, "Gopher snake" should be labeled as "Bullsnake" in the table as that is how it is named in the Iowa Administrative Code in regards to its classification as a Special Concern species. You may also want to include a brief recommendation on land management practices for this species in the narrative section on page 26. Bullsnakes need large contiguous areas of grassland and are impacted by tree and invasive species encroachment so may benefit from the planned removal of invasive species and eastern red cedars. Burning from April-October should be avoided to minimize impact on Bullsnakes.
Changed.
- **Page 27**, I don't see any records for any of the bat species listed in the table in the NAI or MSIM databases. Where are these records from? If they are acoustic records you should notate in the table that they are through acoustic monitoring with no confirmation yet.
- **Page 27**, The Tri-colored Bat is proposed for listing under the ESA. This should be reflected in the table with "SGCN, Federally Proposed Endangered". https://ecos.fws.gov/ecp/species/10515
The table is a list of the current T, E, and SCGN. No change.
- **Page 27**, the following SGCN species are missing within the species table from these data sources:
  - Iowa Breeding Bird Atlas 2 (the survey block for IA BBA2 describes the area as Turin/Loess Hills Area but shows the map location very near Turin WMA):
    - American Kestrel - SGCN
    - Belted Kingfisher - SGCN
    - Eastern Wood-pewee - SGCN
    - Acadian Flycatcher - SGCN
    - Horned Lark - SGCN
    - Bank Swallow - SGCN
    - Bobolink - SGCN
    - Western Meadowlark - SGCN

    Breeding Bird Atlas species lists are not used for species documentation in this FWSP.
  - NAI
    - No additional species
  - MSIM
    - Northern Prairie Skink - SGCN

    Added.