



Interim Forest Management Plan Greenwood Wildlife Area

Property Identifiers

Property Name: Greenwood Wildlife Area

Property Designation or Type: Wildlife Area

DNR Property Code(s): 7580

Forestry Property Code: 7030

Property Location - County: Waushara

Property Acreage: 1438 acres

Master Plan Date: September 25, 1980

Property Manager: Jacob Fries

Property Assessment

Ecological Landscape description and property context: Greenwood Wildlife Area lies within the Central Sand Hills Ecological Landscape. The Central Sand Hills EL is located in central Wisconsin at the eastern edge of what was once Glacial Lake Wisconsin. The landforms in this ecological landscape are a series of glacial moraines that were later partially covered by glacial outwash. The area is characterized by a mixture of farmland, woodlots, wetlands, small kettle lakes, and cold water streams, all on sandy soils. The mosaic of glacial moraine and pitted outwash throughout this ecological landscape has given rise to extensive wetlands in the outwash areas, and the headwaters of cold water streams that originate in glacial moraines. The growing season is long enough for agriculture but the sandy soils limit agricultural productivity somewhat.

Historic upland vegetation consisted of oak-pine forest, oak savanna, and tall-grass prairie. Fens were common in this ecological landscape and occurred along with wet-mesic prairie, wet prairie, and rare coastal plain marshes. Current vegetation is composed of more than one-third agricultural crops, and almost 20% grasslands with smaller amounts of open wetland, open water, shrubs, barren, and urban areas. The major forested type is oak-hickory, with smaller amounts of white-red-jack pine, maple-basswood, lowland hardwoods, aspen-birch, and spruce-fir. Black spruce is a component of the Corning-Weeting lakes wetland complex in the northwestern corner of Columbia County. This is one of the southernmost locations for black spruce in the Upper Midwest.

General property description Greenwood Wildlife Area is located in east-central Waushara County. State acquisition of the property began in 1949. The property lies 3 miles northeast of Coloma and 1 mile southeast of Hancock. The wildlife area encompasses roughly 1438 acres located on the edge of an open, pitted outwash plain, resulting in flat, sandy topography and a moraine that is wooded and hilly. Approximately 600 acres of the property, formerly under



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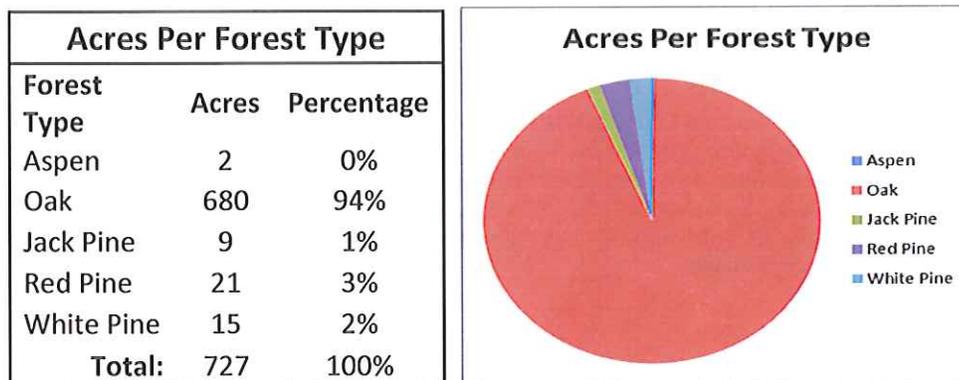
cultivation, have been restored to a native grassland habitat type. An additional 100 acres remain under cultivation and are farmed through a sharecropping agreement. The remaining 700 plus acres of the property are forested, with oak being the dominant cover type.

Historically, Greenwood Wildlife Area was heavily used by giant Canada geese during the fall and winter. This wintering flock of geese used the wildlife area as secure feeding and resting area and heavily relied on the Mecan Springs, located 2 miles to the south, to satisfy their needs for open water. Because of this unique pattern of property use by Canada geese, portions of the wildlife area were designated as a wildlife refuge. Prior to state ownership, the state leased some of the present ownership and about 10 acres were purchased annually for goose feed. From 1949 - 1953 several hundred acres of state land were cropped by the UW Experimental Station at Hancock. The Department of Natural Resources took over the entire farming operation in 1954 and initiated a Soil Conservation Service farm plan to control wind erosion and increase soil fertility. Farm operations had been conducted by area farmers since 1960 under sharecrop agreements directed by the property manager. As the giant Canada goose population increased statewide, it became apparent the refuge was no longer needed. In 1994, with financial support from the "Wisconsin Chapter of the National Wild Turkey Federation" and Turkey Stamp Funding, an effort to restore the area to native prairie and savanna began. This provides important habitat for grassland dependent species. The refuge status has been eliminated and hunting is open during the appropriate seasons.

Timber management has always occurred on the moraine portion and continues to this day. About half of Greenwood's vegetative cover is forested. Within the properties heavily forested areas there has been an ongoing study of oak regeneration. Another portion surrounded by the prairie has been slowly converted into savanna type habitat to coincide with the grassland management.

Recognition of the diversity of glacial formations within the wildlife area led to the designation of an alternate route of the Wisconsin Ice Age Trail. The trail traverses the southern and eastern borders, with a new segment through the grasslands. Additionally, a snowmobile trail exists through a portion of the southern property. There is ample parking on all sides of the wildlife area.

Current forest types, size classes and successional stages





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Significant cultural or archeological features: No known Archeological sites have been identified by the Wisconsin State Historical Society. Prior to any management activities, the Wisconsin State Historical Society database shall be reviewed to ensure no 'new' known Archeological sites have been identified.

Invasive species: Although a formal survey has not been conducted, the following invasives species are known to be present within the property: common and glossy buckthorn, non-native honeysuckle, Japanese barberry, black locust, and spotted knapweed.

Existing State Natural Areas (SNA) designations/natural community types limited in the landscape:

There are no designated SNA's found within the boundaries of Greenwood Wildlife Area. Fire-dependent communities were once common and widespread in the Central Sand Hills. Although today's examples are mostly small remnants, there are excellent opportunities to manage for fire-dependent and fire-adapted communities such as oak forest, oak woodland, oak savanna, tallgrass prairie, sedge meadow and fen. Remnant savannas, both [Oak Barrens](#) and [Oak Openings](#), occur on dry and dry-mesic sites scattered throughout the Central Sand Hills. All of these communities have high potential to support rare plants, invertebrates and reptiles.

Dry forests of white, black and bur oak are common, though forest management at large scales is constrained by ownership patterns and small tract size and current land uses. Management of oak forests and woodlands could be integrated with management of oak savanna, prairie and wetlands. This would be especially appropriate on public and private lands managed mostly for conservation purposes. Mixed forests of pine and oak are locally common, and the Central Sand Hills is one of two ecological landscapes where good examples of the Central Sands Pine-Oak Forest community have been documented.

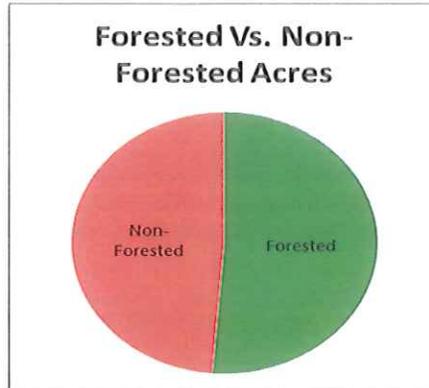
Primary public uses (recreation): Primary public uses include hunting, trapping, hiking and nature study. The Ice Age Trail and a snowmobile trail that is connected to a regional network of trails also traverse the property.

Biotic Inventory Status: None available

Deferral/consultation area designations: Not applicable

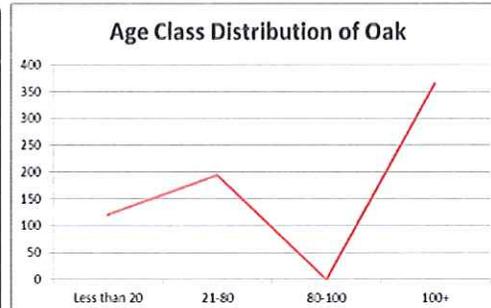


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Forested Vs. Non-Forested Acres		
	Acres	Percentage
Forested	727	51%
Non-Forested	692	49%
Total:	1419	100%

Age Class Distribution of Oak		
	Acres	Percentage
Less than 20	121	18%
21-80	194	29%
80-100	0	0%
100+	365	54%
Total:	680	100%



NHI: Endangered, threatened, Special Concern species, Species of Greatest Conservation Need (SGCN): Based on a Natural Heritage inventory (NHI) search and a 1 mile buffer around Greenwood Wildlife Area there are 2 butterflies (1 federally listed), 2 birds, 2 plants, 2 natural community types, associated with the property. NHI screening protocols will be conducted and species guidance protocols will be followed prior to and during any future management activities.

Wildlife Action Plan Conservation Opportunity Areas (COA): Greenwood Wildlife Area falls within the Comstock Bog and Germania Marsh Conservation Opportunity Area in the Central Sand Hills Ecological Landscape. This COA is of upper Midwest significance and includes restorable upland sites featuring a mosaic of dry forest and oak savanna including Central Pine Oak Forest, Southern Dry Forest, Sand Prairie and Oak Barrens.



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IFMP components

Management Objectives:

Sustainably manage the forest and non-forest resources to:

- Maintain and enhance, as practicable, oak forests, oak woodlands, oak savanna or oak barrens, and restored native grassland community types.
- Maintain and enhance habitat for Karner blue butterfly
- Seek additional opportunities to maintain and create oak savanna and oak woodlands.
- Promote native tree species, such as black oak, northern pin oak, red oak, bur oak, white oak, aspen, jack pine, and white pine.
- Promote the expansion of aspen and jack pine through even age management.
- Even age management of red pine.
- Protect, maintain and enhance water quality, air quality, and wetland habitat types.
- Identify threatened and endangered species and protect/provide habitat for a variety of game and non-game wildlife species.
- Identify invasive species and implement practices to eliminate/minimize impact to the property.
- Provide opportunities for outdoor recreation to include hunting, trapping and nature study
- Continue to maintain stakeholder's interests. Stakeholders include:
 - UWSP oak research site project
 - Division of Forestry's Reforestation Program jack pine seed orchard
 - Ice Age Trail
 - Snowmobile trail

Property Prescriptions

Entire Property

- Utilize BMP's for invasive species to help limit the introduction and spread of invasive species when conducting timber sales.
- Utilize BMP's for water quality when conducting timber sales.
- Activities including control of invasive plants and animals, maintenance of existing facilities, development of firebreaks, logging access lanes (if necessary), log landings and access to suppress wildfires will occur.
- Salvage of trees after a major wind event can occur.
- Eliminate miscellaneous conifers (scotch pine and various Christmas tree species) and miscellaneous deciduous (black locust, box elder) forest types and convert to non-forest type or native forest types, such as oak or oak savanna
- All stands - Retain reserve/legacy trees as groups or individuals throughout the property within harvested stands.
- Endangered Resources Species Guidance documents will be consulted (ERCOMMON\\Species_Guidance\\Species_Docs) and the management guidance and avoidance sections will be used to determine how and if timber management can occur.



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Oak Savanna/Oak Barrens

- Use variable density harvesting to reduce canopy closure (0-60 percent target range post-harvest) and/or basal area (10-60BA post-harvest); targeting non-white oak species for removal
- Augmentation of the ground layer will only add species that historically are associated with oak savanna, using seeds or plugs from local genetic material when available
- Suppress regeneration through prescribed burning, mechanical and herbicide treatments. Promote replacement trees to maintain canopy densities.

Oak Woodland

- Maintain a canopy closure of 50-80%. Favor dominant tree species of this community type: white oak, bur oak, black oak, sometimes mixed with red oak and shagbark hickory.
- Several large vigorous trees, decadent trees, snags, and downed logs will be retained to enhance structural complexity and provide specialized habitat for numerous species.
- Restore ground layer composition by removing invasive shrubs and augmenting the ground layer with oak woodland species (legumes, grasses and composites). Frequent (annual) fires of low intensity, in conjunction with browsing, will be crucial in maintaining this community type (limiting regeneration, to prevent succession into an oak forest). Under this fire regime, shrub and sapling representation in oak woodlands would be minimal. The herbaceous layer will convert to legumes, grasses, composites and other forbs that are best adapted to light conditions of high filtered shade.

Oak Forest

- Maintain oak stands through even aged management techniques appropriate for the stand and site conditions. Techniques include intermediate treatments, such as release or crown thinning, to develop young stands and improve composition and timber quality; clearcutting, overstory removal and shelterwood harvest to promote natural regeneration.
- Artificial regeneration from seed or seedlings may be used to establish oak regeneration prior to or after timber harvests when natural regeneration is not adequate.
- Other management techniques that may be used to help regenerate oak stands include soil scarification, prescribed burning, mowing, or herbicide treatment.
- The following table from the Oak Chapter of the WI DNR Silviculture Handbook indicates the anticipated rotation lengths for oak. Site specifics will dictate the actual rotation length for individual stands however 20% of the oak cover type will be managed into extended rotation in order to establish snags and den trees for critical wildlife habitat

Habitat Type	Black/Northern Pin Oak	Red Oak	White Oak
Dry	70-90-110	70-100-120	80-110-150
Dry Mesic	80-110-140	80-120-150	80-140-250
Mesic	90-120-150	100-140-200	100-160-300

- Maintain oak in a variety of age classes with 15% in 0-20 years 40% in 21-80 years, 25% in 81-100 years and 20% in 101 plus years.
 - Continue to create diversity within the property, following natural features found within the property.



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Aspen

- Maintain aspen cover type by regenerating the stand using a simple coppice system.
- Rotation age is generally 40 - 50 years.
- Aspen will generally be managed using even-aged silvicultural systems to promote opportunities for early-successional wildlife species and to maintain the aspen type on the landscape.

Jack Pine

- Maintain jack pine cover type by regenerating the stand using clear cut, seed tree or overstory removal systems.
- Rotation age is generally 45 - 60 years.
- Jack Pine will generally be managed using even-aged silvicultural systems to promote opportunities for early-successional wildlife species and to maintain the jack pine type on the landscape.
- Management techniques that may be used to help regenerate jack pine stands include soil scarification and prescribed burning.

Red and White Pine

- Thin plantations through normal silvicultural order of removal.
- Rotation age range can vary from 65 – 120 years for red pine and 80 – 180 years for white pine depending on soil type.
- The Pine plantation found in the NENW sec 25: maintain the oak component during thinnings to achieve the long term goal of conversion to grassland or oak savannah. Where possible, do not retain white pine trees.
- The Pine plantation found in the NWNE and NENE sec 25: where applicable, maintain the oak and white pine component, during thinnings to achieve the long term goal of natural conversion to white pine and/or oak forest.

Grasslands

- Utilize prescribed burning to maintain upland grass areas.
- Phase out sharecropping and convert cultivated areas to restored native prairie.
- Conduct grassland management activities in accordance with the Karner Blue Butterfly Habitat Conservation Plan.

Other

- Jack pine seed orchard
 - The Reforestation Program will maintain the understory in grass to facilitate access and limit competition from other woody vegetation
 - The Reforestation Program will utilize the established trees for potential seed collection, scion wood procurement, potential breeding and other seed producing activities.
- Ice Age Trail
 - Utilize developed guidance for properties with trail segments when planning and administering forest management activities.
<http://intranet.dnr.state.wi.us/int/land/div/InterimPlanning/pdfs/IFMPStateTrails.pdf>



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Summary of Public Involvement and Comments Received

Maps

- A. Property Boundary and ownership Maps
- B. Forest Cover Type Map
- C. Topographic Map of Property

PREPARED BY:

Jacob Fries 05.23.2016
Property Manager - Jacob Fries Date

APPROVED:

Ellen Barth May 27, 2016
Area Program Supervisor - Ellen Barth Date

REVIEWED BY:

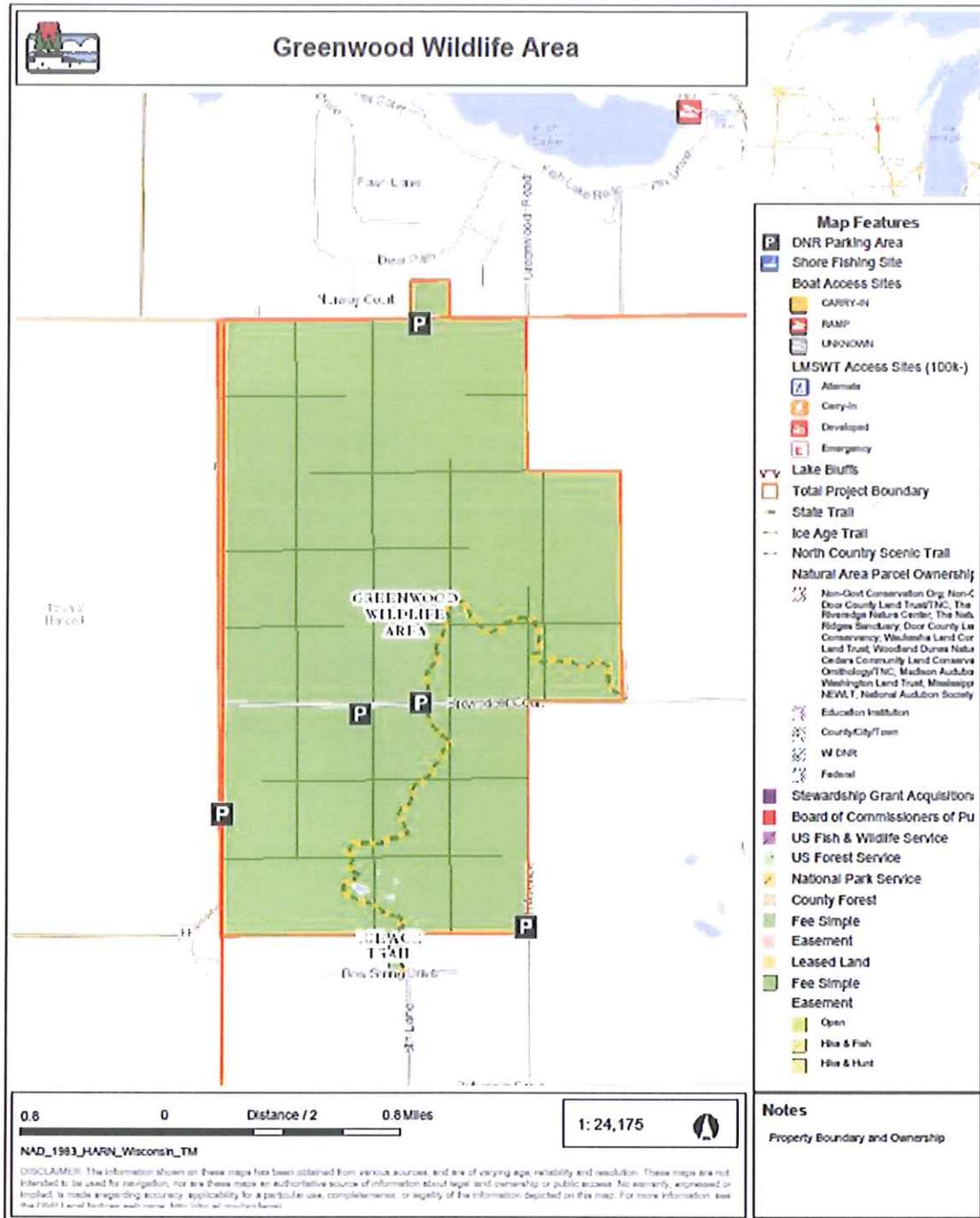
Mack Siglinsky 6/6/16
Forester - Mackenzie Siglinsky Date

Jon Robaidek 6/9/16
District Ecologist - Jon Robaidek Date



Interim Forest Management Plan Greenwood Wildlife Area

Map A: Property Boundary and Ownership





Interim Forest Management Plan Greenwood Wildlife Area

Map C: Topographic map of property

