

FOREST STEWARDSHIP MANAGEMENT PLAN



Name(s) and Address of Client:

**The City of Sheboygan Department of Public Works
Forestry Division
Evergreen Park
2026 New Jersey Ave.
Sheboygan, WI 53081**

County	Township	Section	Total Acreage	Plan Duration
Sheboygan	Sheboygan	9	117	25 Years

Drafted by:

Kimberly K. Destree, Consulting Forester
Destree Forestry Consulting, LLC
1773 Creek Vu Dr.
N. Fond du Lac, WI 54937
kimberly@destreeforestry.com
(920) 860-0374

Attached maps show the location of stewardship forest lands.

The purpose of a Forest Stewardship Plan is to encourage the growth of future commercial crops through sound forestry practices which recognize the objectives of individual property owner(s) for aesthetics, wildlife habitat, erosion control, protection of endangered or threatened plants and animals, compatible recreational activities, economic returns, etc. By state law, "forestry" means managing forest lands and their related resources, including trees and other plants, animals, soil, water and air. The following is a list of objectives identified by the landowner to guide the resource manager in fulfilling stewardship objectives.

City of Sheboygan Objectives for Management of Lands:

Evergreen Park is a 98-acre wooded city park that is popular due to the many amenities it offers like trails, playgrounds, and picnic areas all surrounded within a large forest canopy. A mile long road loops through the park and is open to the public, May through September and features a holiday light show around the Christmas season. A park forest management plan is needed to help guide the forest maintenance, especially regarding existing storm and emerald ash borer damage and make appropriate restoration efforts.

Hazardous trees (about 600 mostly dead) along the entire mile loop were identified and removed in the early part of 2026. Hazardous trees along trails and other high use areas were inventoried in May of 2026 (about 1000 trees) and included mostly ash and damaged white pine.

Key concerns identified by the City of Sheboygan for Evergreen Park:

- Recommendations for current storm damage debris
- Recommendations for remaining dead ash trees
- Recommendations on how and where to promote forest restoration
- Limiting invasive species establishment and spread
- Targeting replanting efforts with species suggestions.

****Funding for this project is provided by the Wisconsin Department of Natural Resources.**

Information needed for stands on which practices are scheduled:

1. List the stand number, acreage and the forest cover type symbol from the map. For example: Stand 1 (NH 5-11"), 15 acres.
2. Provide a brief description of the forest cover type in plain language.
3. State a silvicultural objective, i.e., the type of forest cover the forestry practices are meant to produce.

Examples: "Use individual tree selection in this northern hardwood stand to produce high quality sawlogs while maintaining continuous forest cover." "Maintain aspen on this site for pulpwood production and habitat for grouse and deer." "The objective for this mature bur oak natural area is to preserve the plant community (including prairie vegetation) for as long as possible through a program of controlled fires." "The objective on this site is to convert poor quality brush lands to red pine sawtimber." "Red and white oaks will be maintained on this site through planting, brush control and shelterwood harvests. For aesthetic and wildlife purposes, four large reserve trees may be left per acre."

4. List recommended practices. The year (or range of years with a minimal starting date) in which the work is to be completed will be provided along with measurable requirements, e.g., basal area residuals, number of trees per acre, species to be favored for removal or planting, percent crown closure, specific stocking levels.
5. Attach supplemental bulletins. If available, attach copies of published or locally written bulletins to the landowner's copy of the plan. Reference bulletins sent in the plan.

Key to Forest Cover Type Symbols:

Productive

<u>A</u>	Aspen
BH	Bottomland Hardwoods
BW	White Birch
C	Cedar
CH	Central Hardwoods, Locust
FS	Fir-Spruce, White Spruce
HH	Hemlock Hardwood
NH	Northern Hardwood
O	Oak
OX	Scrub Oak
PJ	Jack Pine
PR	Red Pine, Scotch Pine
PW	White Pine
SB	Black Spruce
SC	Swamp Conifer
SH	Swamp Hardwood
T	Tamarack, European Larch
W	Black Walnut

Non-Productive or Non-Forest,

F	Farmland
FG	Grazed Pasture
G	Grass
GH	Herbaceous Vegetation
GLS	Low Growing Shrubs
I	<u>Residential or Commercial</u>
IA	Parking Area
ICG	Campground
K	Keg
KB	Muskeg Bog
KEV	Emergent Vegetation
KG	Noncommercial Lowland Grass
KH	Noncommercial Herbaceous Vegetation
L	Lake
LB	Lowland Brush
LBAT	Tag Alder
LBBS	Bog Birch
LBDD	Dogwood
LBWS	Shrub Willow
LM	Minor Lake
LM	Minor Stream
ROW	Right of Way
UB	Unland Brush
Z	Rock Outcrop

Key to Size Classes (DBH - Diameter in inches):

0-5	Seedlings and Saplings
5-9 / 5-11	Pole-Timber (Conifers/Hardwoods)
9-15 / 11-15	Small Sawtimber
15+	Large Sawtimber

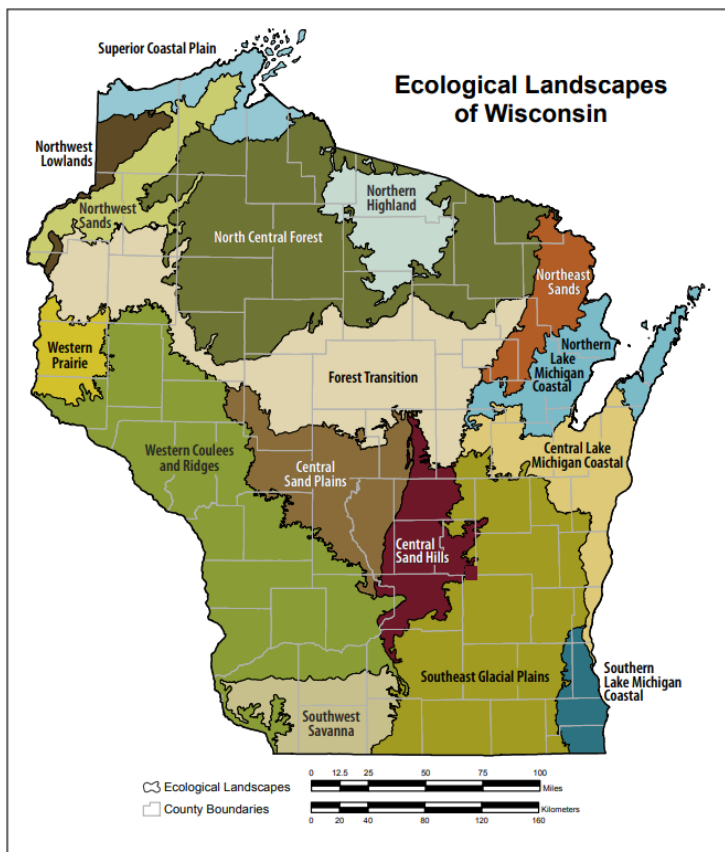
Key to Stocking Levels (shown by accent marks after the size class):

Natural Seedlings & Saplings				Poles & Sawtimber		
Code	Stocking	Seedlings	Saplings	Code	Stocking	Basal area Poles & Sawtimber
1	Low	200-600	100-300	1	Poor	10-30 sq ft
2	Medium	601-1500	301-900	2	Medium	31-70 sq ft
3	High	1500+	900+	3	Good	71-110 sq ft
				4	Very Good	111-150 sq ft
				5	Excellent	150+ sq ft

REGIONAL OVERVIEW:

This property is located within the City of Sheboygan about 1.5 miles from Lake Michigan. Evergreen Park is 98 acres in size and is connected to both Maywood Park and Jaycee Quarry Park via a trail system. The Pigeon River flows through all three parks to the east, Pigeon River Park, then eventually empties into Lake Michigan.

According to the Ecological Landscapes of Wisconsin publication, published by the WDNR, 16 different ecological landscapes are identified throughout the State of Wisconsin. Each landscape has different ecological attributes and management opportunities. These landscapes can be used to identify the best areas of the State to manage for different natural communities, key habitats, aquatic features, and native plants and animals from an ecosystem management perspective.



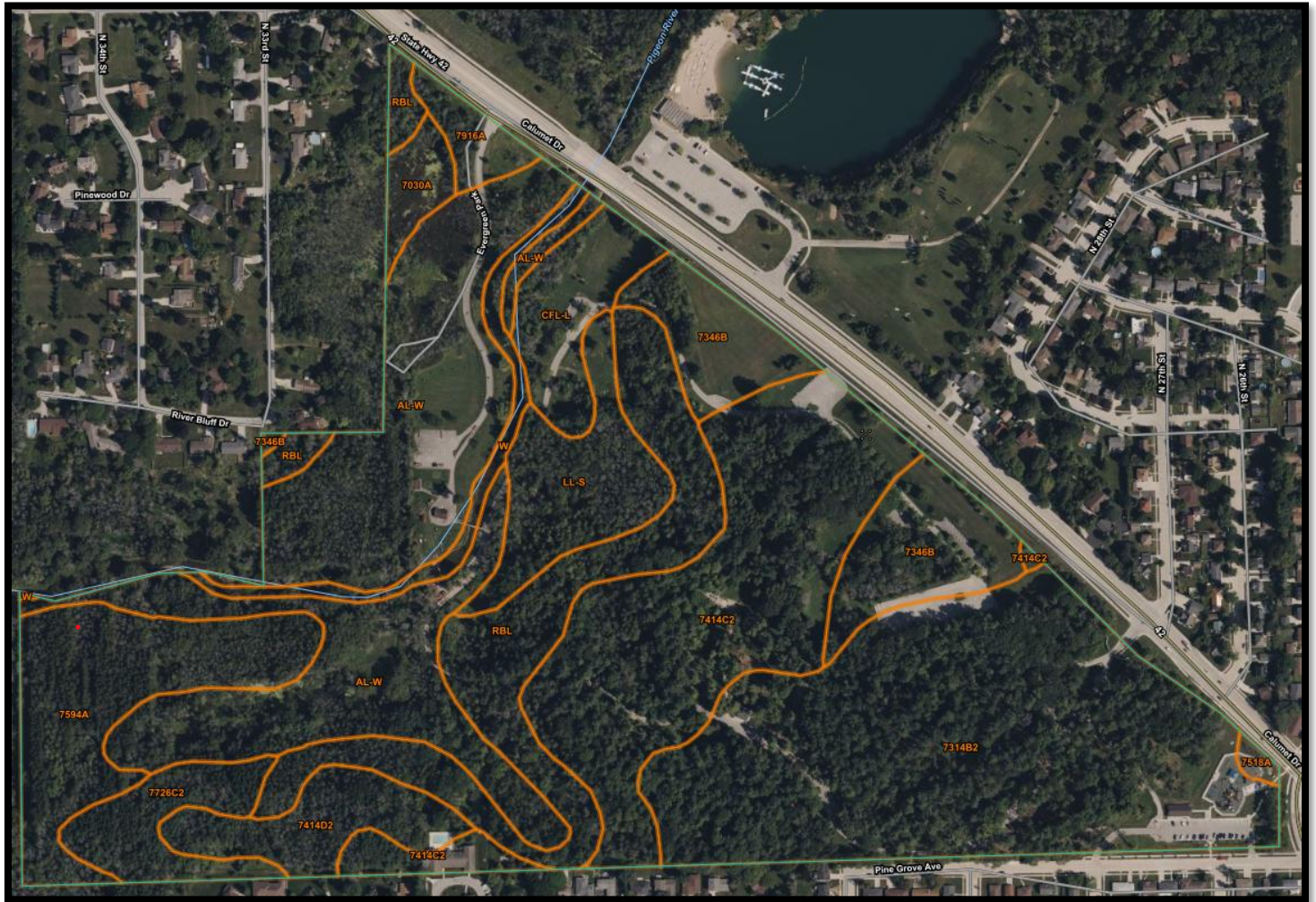
This property is located within the **Central Lake Michigan Coastal** Landscape. This landscape is summarized as having till plains and moraines, worked over by Glacial Lake Oshkosh to the west, and coastal ridge and swale complexes along the Lake Michigan shoreline. The soils are mostly productive, rich loams with high water holding capacity and land use is dominated by agriculture. The Lake Michigan coastline and Niagara Escarpment, a major bedrock feature running from northeast to southwest, are particularly significant features of this landscape harboring unique and rare regional plants, habitats, and highly specialized animals. Approximately 84% of this ecological landscape is non-forested compared to 96% forested historically. Fragmentation of upland areas is severe. This EL has the third highest percentage of farmland acreage in all the EL's.

Land cover maps of the mid 1800's in and around this property show it to have been heavily forested in beech, sugar maple, basswood, red oak, white oak and black oak.

Currently the land use in this EL is dominated by agriculture which is 69% of the land use. Forested upland, forested lowland, and non-forested wetland each make up another 7% of the landscape cover. Most large areas of upland forest have been cleared. The largest Floodplain Forest in eastern Wisconsin borders the Wolf River from just below Shawano and runs downstream. Other stands of hardwood swamp are the largest tracts of continuous forest in this landscape. Some of Wisconsin's oldest trees are the northern white cedar growing on the escarpment in Brown County.

SOILS:

There are 4 prominent soil descriptions across this property. The location, description and management considerations for the main soil types are found below:



Sheboygan County, Wisconsin

7314B2—Kewaunee silt loam, 2 to 6 percent slopes, eroded

Map Unit Setting

- *National map unit symbol:* 3074j
- *Landscape:* Till plains, uplands
- *Elevation:* 730 to 1,130 feet
- *Mean annual precipitation:* 29 to 34 inches
- *Mean annual air temperature:* 43 to 46 degrees F
- *Frost-free period:* 135 to 194 days
- *Farmland classification:* All areas are prime farmland

Map Unit Composition

- *Kewaunee, eroded, and similar soils*: 88 percent
- *Minor components*: 12 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Kewaunee, Eroded

Setting

- *Landscape*: Till plains, uplands
- *Landform*: Ground moraines
- *Landform position (two-dimensional)*: Backslope, summit
- *Landform position (three-dimensional)*: Interfluve
- *Down-slope shape*: Convex
- *Across-slope shape*: Convex
- *Parent material*: Loess over clayey till

Typical profile

- *Ap - 0 to 7 inches*: silt loam
- *Bt1 - 7 to 14 inches*: silty clay loam
- *2Bt2 - 14 to 22 inches*: silty clay
- *2BC - 22 to 28 inches*: silty clay loam
- *2Cd - 28 to 79 inches*: silty clay loam

Properties and qualities

- *Slope*: 2 to 6 percent
- *Depth to restrictive feature*: 26 to 40 inches to densic material
- *Drainage class*: Well drained
- *Capacity of the most limiting layer to transmit water (Ksat)*: Moderately low to moderately high (0.06 to 0.20 in/hr)
- *Depth to water table*: More than 80 inches
- *Frequency of flooding*: None
- *Frequency of ponding*: None
- *Calcium carbonate, maximum content*: 30 percent
- *Maximum salinity*: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
- *Available water supply, 0 to 60 inches*: Low (about 4.5 inches)

Interpretive groups

- *Land capability classification (irrigated)*: None specified
- *Land capability classification (nonirrigated)*: 2e
- *Hydrologic Soil Group*: D
- *Ecological site*: F095XB008WI - Clayey Upland with Carbonates
- *Forage suitability group*: Mod AWC, adequately drained (G095AY005WI)
- *Other vegetative classification*: Mod AWC, adequately drained (G095AY005WI)
- *Hydric soil rating*: No

Minor Components

Manawa

- *Percent of map unit*: 10 percent
- *Landscape*: Uplands
- *Landform*: Drainageways
- *Landform position (two-dimensional)*: Footslope
- *Landform position (three-dimensional)*: Base slope
- *Down-slope shape*: Linear
- *Across-slope shape*: Concave

- *Ecological site:* F095XB005WI - Moist Loamy or Clayey Lowland
- *Other vegetative classification:* Mod AWC, high water table (G095AY004WI)
- *Hydric soil rating:* No

Poygan, occasionally ponded

- *Percent of map unit:* 2 percent
- *Landscape:* Uplands
- *Landform:* Depressions
- *Landform position (two-dimensional):* Toeslope
- *Landform position (three-dimensional):* Base slope
- *Down-slope shape:* Concave
- *Across-slope shape:* Concave
- *Ecological site:* F095XB004WI - Wet Loamy or Clayey Lowland
- *Other vegetative classification:* High AWC, high water table (G095AY007WI)
- *Hydric soil rating:* Yes

7414C2—Kewaunee silty clay loam, 6 to 12 percent slopes, eroded

Map Unit Setting

- *National map unit symbol:* 2tjxw
- *Landscape:* Hills
- *Elevation:* 610 to 1,000 feet
- *Mean annual precipitation:* 31 to 37 inches
- *Mean annual air temperature:* 43 to 46 degrees F
- *Frost-free period:* 135 to 195 days
- *Farmland classification:* Farmland of statewide importance

Map Unit Composition

- *Kewaunee, eroded, and similar soils:* 90 percent
- *Minor components:* 10 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Kewaunee, Eroded

Setting

- *Landscape:* Hills
- *Landform:* Moraines
- *Landform position (two-dimensional):* Backslope
- *Landform position (three-dimensional):* Side slope
- *Down-slope shape:* Convex
- *Across-slope shape:* Linear
- *Parent material:* Clayey till and/or calcareous, dense clayey till

Typical profile

- *Ap - 0 to 7 inches:* silty clay loam
- *Bt - 7 to 23 inches:* clay
- *Cd - 23 to 79 inches:* silty clay loam

Properties and qualities

- *Slope:* 6 to 12 percent
- *Depth to restrictive feature:* 20 to 40 inches to densic material

- *Drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum content:* 30 percent
- *Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
- *Available water supply, 0 to 60 inches:* Low (about 3.1 inches)

Interpretive groups

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 3e
- *Hydrologic Soil Group:* D
- *Ecological site:* F095XA011WI - Clayey Upland
- *Forage suitability group:* Mod AWC, adequately drained (G095AY005WI)
- *Other vegetative classification:* Mod AWC, adequately drained (G095AY005WI)
- *Hydric soil rating:* No

Minor Components

Kewaunee, loam surface, eroded

- *Percent of map unit:* 5 percent
- *Landscape:* Hills
- *Landform:* Moraines
- *Landform position (two-dimensional):* Backslope
- *Landform position (three-dimensional):* Side slope
- *Down-slope shape:* Linear
- *Across-slope shape:* Convex
- *Ecological site:* F095XA011WI - Clayey Upland
- *Other vegetative classification:* Mod AWC, adequately drained (G095AY005WI)
- *Hydric soil rating:* No

Sisson, eroded

- *Percent of map unit:* 3 percent
- *Landscape:* Hills
- *Landform:* Moraines
- *Landform position (two-dimensional):* Backslope
- *Landform position (three-dimensional):* Side slope
- *Down-slope shape:* Linear
- *Across-slope shape:* Convex
- *Ecological site:* F095XB010WI - Loamy and Clayey Upland
- *Other vegetative classification:* Mod AWC, adequately drained (G095BY005WI)
- *Hydric soil rating:* No

Omro, eroded

- *Percent of map unit:* 2 percent
- *Landscape:* Hills
- *Landform:* Ground moraines
- *Landform position (two-dimensional):* Backslope
- *Landform position (three-dimensional):* Side slope
- *Down-slope shape:* Linear
- *Across-slope shape:* Concave
- *Ecological site:* F095XA011WI - Clayey Upland

- *Other vegetative classification:* Mod AWC, adequately drained (G095AY005WI)
- *Hydric soil rating:* No

AL-W—Alluvial land, wet

Map Unit Setting

- *National map unit symbol:* g71p
- *Landscape:* Plains
- *Elevation:* 600 to 1,200 feet
- *Mean annual precipitation:* 30 to 33 inches
- *Mean annual air temperature:* 37 to 55 degrees F
- *Frost-free period:* 145 to 165 days
- *Farmland classification:* Not prime farmland

Map Unit Composition

- *Alluvial land, wet:* 90 percent
- *Minor components:* 10 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Alluvial Land, Wet

Setting

- *Landscape:* Plains
- *Landform:* Flood plains
- *Landform position (three-dimensional):* Talf
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Loamy alluvium over sandy and gravelly alluvium

Typical profile

- *A1 - 0 to 8 inches:* loamy sand
- *C1,C2,C3 - 8 to 60 inches:* stratified sand to loamy fine sand

Properties and qualities

- *Slope:* 0 to 2 percent
- *Drainage class:* Poorly drained
- *Runoff class:* Negligible
- *Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)
- *Depth to water table:* About 0 to 8 inches
- *Frequency of flooding:* Occasional
- *Frequency of ponding:* Occasional
- *Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
- *Available water supply, 0 to 60 inches:* Low (about 5.0 inches)

Interpretive groups

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 6w
- *Forage suitability group:* Not suited, flooded or organics (G095AY010WI)
- *Other vegetative classification:* Not suited, flooded or organics (G095AY010WI)
- *Hydric soil rating:* Yes

Minor Components

Otter

- *Percent of map unit:* 5 percent
- *Landscape:* Plains
- *Landform:* Flood plains
- *Landform position (three-dimensional):* Dip
- *Down-slope shape:* Concave
- *Across-slope shape:* Linear
- *Ecological site:* F095XB002WI - Wet Floodplain
- *Hydric soil rating:* Yes

Elvers

- *Percent of map unit:* 3 percent
- *Landscape:* Plains
- *Landform:* Flood plains
- *Landform position (three-dimensional):* Rise
- *Down-slope shape:* Concave
- *Across-slope shape:* Linear
- *Ecological site:* F095XB002WI - Wet Floodplain
- *Hydric soil rating:* Yes

Alluvial land

- *Percent of map unit:* 2 percent
- *Landscape:* Plains
- *Landform:* Flood plains
- *Landform position (three-dimensional):* Rise
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Hydric soil rating:* No

RBL—Rough broken land

Map Unit Setting

- *National map unit symbol:* g73z
- *Elevation:* 600 to 1,200 feet
- *Mean annual precipitation:* 30 to 33 inches
- *Mean annual air temperature:* 37 to 55 degrees F
- *Frost-free period:* 145 to 165 days
- *Farmland classification:* Not prime farmland

Map Unit Composition

- *Rough broken land:* 100 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Rough Broken Land

Setting

- *Landform:* Outwash plains, Eskers, Kames
- *Down-slope shape:* Convex
- *Across-slope shape:* Linear

Typical profile

- *A1 - 0 to 8 inches:* silty clay loam
- *B1,B2 - 8 to 25 inches:* clay
- *C - 25 to 60 inches:* silty clay loam

Properties and qualities

- *Slope:* 12 to 45 percent
- *Drainage class:* Well drained
- *Runoff class:* Very high
- *Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.57 in/hr)
- *Depth to water table:* About 60 to 80 inches
- *Calcium carbonate, maximum content:* 30 percent
- *Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
- *Available water supply, 0 to 60 inches:* Moderate (about 8.7 inches)

Interpretive groups

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 7e
- *Forage suitability group:* Mod AWC, adequately drained with limitations (G095AY006WI)
- *Other vegetative classification:* Mod AWC, adequately drained with limitations (G095AY006WI)
- *Hydric soil rating:* No

Tables — Suitability for Hand Planting — Summary By Map Unit						
Summary by Map Unit — Sheboygan County, Wisconsin (WI117)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
7030A	Adrian muck, 0 to 2 percent slopes	Moderately suited	Adrian, muck (85%)	Wetness (0.50)	1.3	1.1%
			Houghton, muck (10%)	Wetness (0.50)		
7314B2	Kewaunee silt loam, 2 to 6 percent slopes, eroded	Moderately suited	Kewaunee, eroded (88%)	Stickiness (0.14)	26.8	23.0%
7346B	Hebron loam, 2 to 6 percent slopes	Well suited	Hebron (100%)		7.6	6.5%
7414C2	Kewaunee silty clay loam, 6 to 12 percent slopes, eroded	Poorly suited	Kewaunee, eroded (90%)	Stickiness; high plasticity index (0.75)	18.1	15.5%
			Kewaunee, loam surface, eroded (5%)	Stickiness; high plasticity index (0.75)		
			Omro, eroded (2%)	Stickiness; high plasticity index (0.75)		
7414D2	Kewaunee silty clay loam, 12 to 20 percent slopes, eroded	Poorly suited	Kewaunee, eroded (90%)	Stickiness; high plasticity index (0.75)	3.8	3.2%
			Kewaunee, loam surface, eroded (5%)	Stickiness; high plasticity index (0.75)		
			Omro, eroded (2%)	Stickiness; high plasticity index (0.75)		
7518A	Manawa silt loam, 0 to 3 percent slopes	Poorly suited	Manawa (85%)	Stickiness; high plasticity index (0.75)	0.3	0.2%
			Kewaunee (8%)	Stickiness (0.65)		
			Poygan, occasionally ponded (7%)	Stickiness; high plasticity index (0.75)		
				Wetness (0.50)		
7594A	Bellevue fine sandy loam, sandy subsoil variant	Well suited	Bellevue variant (85%)		8.3	7.1%
7726C2	Boyer loamy sand, 6 to 12 percent slopes, eroded	Well suited	Boyer, eroded (93%)		3.3	2.8%
			Casco, eroded (2%)			
7916A	Granby silt loam, gravelly variant	Moderately suited	Granby variant (90%)	Wetness (0.50)	1.4	1.2%

AL-W	Alluvial land, wet	Not rated	Alluvial land, wet (90%)		23.6	20.2%
			Otter (5%)			
			Elvers (3%)			
			Alluvial land (2%)			
CFL-L	Cut and fill land, loamy	Not rated	Cut and fill land (100%)		3.6	3.1%
LL-S	Loamy land, seeped	Not rated	Loamy land (100%)		5.1	4.3%
RBL	Rough broken land	Not rated	Rough broken land (100%)		11.6	9.9%
W	Water	Not rated	Water (100%)		2.0	1.7%
Totals for Area of Interest					116.9	100.0%

Table — Suitability for Hand Planting — Summary by Rating Value						
Summary by Rating Value						
Rating		Acres in AOI		Percent of AOI		
Moderately suited		29.6		25.3%		
Poorly suited		22.1		18.9%		
Well suited		19.2		16.4%		
Null or Not Rated		46.0		39.4%		
Totals for Area of Interest		116.9		100.0%		

Tables — Fencing, Post Depth 24 Inches or Less — Summary By Map Unit						
Summary by Map Unit — Sheboygan County, Wisconsin (WI117)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
7030A	Adrian muck, 0 to 2 percent slopes	Very limited	Adrian, muck (85%)	<24 inches to water table (1.00) >6 months with long or very long ponding duration (1.00) High potential frost action (0.50)	1.3	1.1%
			Houghton, muck (10%)	<24 inches to water table (1.00) >6 months with long or very long ponding duration (1.00) High potential frost action (0.50)		
7314B2	Kewaunee silt loam, 2 to 6 percent slopes, eroded	Very limited	Kewaunee, eroded (88%)	> 45% Clay (1.00) Shrink-swell (0.25)	26.8	23.0%
			Manawa (10%)	> 45% Clay (1.00) Shrink-swell (1.00) <24 inches to water table (1.00)		
			Poygan, occasionally ponded (2%)	> 45% Clay (1.00) Shrink-swell (1.00) <24 inches to water table (1.00) High potential frost action (0.50)		
7346B	Hebron loam, 2 to 6 percent slopes	Limited	Hebron (100%)	Shrink-swell (0.98) 18 to 45% Clay (0.78)	7.6	6.5%
7414C2	Kewaunee silty clay loam, 6 to 12 percent slopes, eroded	Very limited	Kewaunee, eroded (90%)	Shrink-swell (1.00) 18 to 45% Clay (0.93) >15% slope (0.04)	18.1	15.5%
			Kewaunee, loam surface, eroded (5%)	> 45% Clay (1.00) Shrink-swell (0.80) >15% slope (0.04)		
			Omro, eroded (2%)	> 45% Clay (1.00) Shrink-swell (1.00) >15% slope (0.04)		
7414D2	Kewaunee silty clay loam, 12 to 20 percent slopes, eroded	Very limited	Kewaunee, eroded (90%)	Shrink-swell (1.00) >15% slope (1.00) 18 to 45% Clay (0.93)	3.8	3.2%
			Kewaunee, loam surface, eroded (5%)	> 45% Clay (1.00) Shrink-swell (1.00) >15% slope (1.00)		
			Sisson, eroded (3%)	>15% slope (1.00) 18 to 45% Clay (0.20) Shrink-swell (0.00)		
			Omro, eroded (2%)	> 45% Clay (1.00) Shrink-swell (1.00) >15% slope (0.04)		

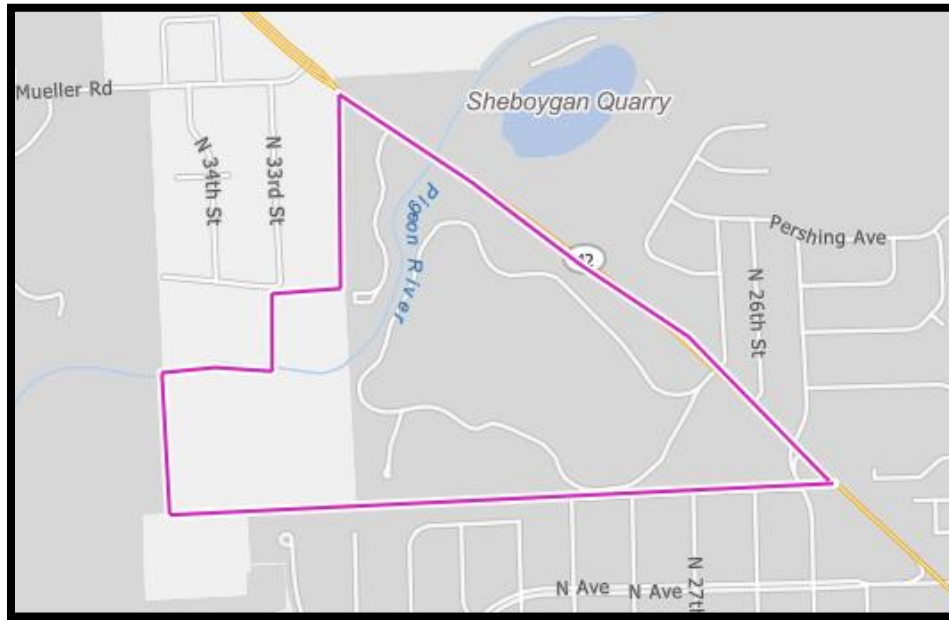
7518A	Manawa silt loam, 0 to 3 percent slopes	Very limited	Manawa (85%)	> 45% Clay (1.00)	0.3	0.2%
				Shrink-swell (1.00)		
				<24 inches to water table (1.00)		
			Kewaunee (8%)	> 45% Clay (1.00)		
				Shrink-swell (0.99)		
			Poygan, occasionally ponded (7%)	> 45% Clay (1.00)		
				Shrink-swell (1.00)		
				<24 inches to water table (1.00)		
				High potential frost action (0.50)		
7594A	Bellevue fine sandy loam, sandy subsoil variant	Very limited	Bellevue variant (85%)	<24 inches to water table (1.00)	8.3	7.1%
				Frequent Flooding (0.80)		
7726C2	Boyer loamy sand, 6 to 12 percent slopes, eroded	Limited	Boyer, eroded (93%)	>15% slope (0.04)	3.3	2.8%
				Plainfield (5%)		
				>15% slope (0.04)		
			Casco, eroded (2%)	Moderately sandy, >5 & <20% passing the #200 sieve (0.68)		
				18 to 45% Clay (0.22)		
				>15% slope (0.04)		
				Shrink-swell (0.01)		
			7916A	Granby silt loam, gravelly variant		
1 to 6 months with long or very long ponding duration (0.78)						
>25 & <50% by weight, 2mm to 3 inch fragments in 0-24 inches (0.76)						
Moderately sandy, >5 & <20% passing the #200 sieve (0.50)						
AL-W	Alluvial land, wet	Very limited	Alluvial land, wet (90%)	<24 inches to water table (1.00)	23.6	20.2%
				Occasional Flooding (0.60)		
				1 to 6 months with long or very long ponding duration (0.50)		
				Moderately sandy, >5 & <20% passing the #200 sieve (0.06)		
CFL-L	Cut and fill land, loamy	Not rated	Cut and fill land (100%)		3.6	3.1%
LL-S	Loamy land, seeped	Very limited	Loamy land (100%)	<24 inches to water table (1.00)	5.1	4.3%
				High potential frost action (0.50)		
				1 to 6 months with long or very long ponding duration (0.50)		
				>15% slope (0.37)		
RBL	Rough broken land	Very limited	Rough broken land (100%)	18 to 45% Clay (0.06)	11.6	9.9%
				> 45% Clay (1.00)		
				Shrink-swell (1.00)		
W	Water	Not rated	Water (100%)	>15% slope (1.00)	2.0	1.7%
Totals for Area of Interest					116.9	100.0%

Table — Fencing, Post Depth 24 Inches or Less — Summary by Rating Value

Summary by Rating Value		
Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	100.3	85.8%
Limited	10.9	9.3%
Null or Not Rated	5.7	4.9%
Totals for Area of Interest	116.9	100.0%

SURFACE WATER DATA VIEWER:

The following map is extracted from the DNR Surface Water Data Viewer website. This map shows the Pigeon River flowing through the property. It does not show two unnamed creeks that originate on the south end and flow north. One creek empties into the Pigeon River, the other into Stand 3.



TOPOGRAPHIC MAP:

The following is a topographic map of the parcel. The location of the two unmapped drainage creeks can be seen in the drop in the terrain on the south edge.



HISTORICAL FEATURES; RARE PLANTS AND ANIMALS; ARCHAEOLOGICAL, CULTURAL AND HISTORICAL FEATURES:

The Natural Heritage Inventory is a database responsible for maintaining data on the locations and status of rare species, natural communities and features throughout the State. This database was searched to determine whether any of these features were ever identified within or around your ownership. According to that database the following features were found to potentially occur on the property:

DNR Natural Heritage Inventory (NHI) Review (Detailed EO report available upon request)

Element Occurrence(s) within the search buffer for the project but not necessarily in the project area:

<u>Common name</u>	<u>Scientific name</u>	<u>Type¹</u>	<u>S status²</u>	<u>F status³</u>	<u>Group</u>
Hairy Beardtongue	<i>Penstemon hirsutus</i>	T	SC		Plant
American Goshawk	<i>Astur atricapillus</i>	T	SC/M		Bird
Ellipse	<i>Venustaconcha ellipsiformis</i>	A	THR		Mussel
Elktoe	<i>Alasmidonta marginata</i>	A	SC/P		Mussel
Rusty Patched Bumble Bee High Potential Zone	Rusty Patched Bumble Bee High Potential Zone	H	NA	HPZ	Bee

Please visit the DNR Biodiversity website at <http://dnr.wi.gov/topic/EndangeredResources/biodiversity.html> and click on the Rare Animals or Rare Plants window on the right and find the named species mentioned above. Information provided includes biological data and recommendations for management activities. Keep in mind the information provided are recommendations, and are not requirements except in cases of protected, threatened and endangered animal species.

After reviewing the species information, please determine if suitable habitat is present. State on the pertinent document if suitable habitat is present/not present in the project area.

Avoidance measures chosen from the "Species Guidance" for listed threatened and endangered species must be written on the pertinent document. **Do not** name the specific species on the cutting notice, just a broad category, for example: "a threatened bird species, or "an endangered mammal species"

This information is not subject to the open records law of Wisconsin. Delete this information as soon as the pertinent document is submitted.

This information is good for one year from date of search.

These features were either previously identified on this property, or within a mile of this property. Evergreen Park does have habitat to support hairy beardstongue, which could be found along the roadside right of way. American goshawk habitat is also present on this property, though nests were not noted during the field review. Ellipse and elktoe are both mussels associated with the Pigeon River. The property does not currently have habitat to support the Rusty Patched Bumble Bee.

In addition, the DNR conducted a search of archeological and historical features that may occur on your property. According to that search, no features were found to be recorded to occur on land covered under this forestry plan.



Figure 1: Example of a Native American mound.

DEER:

Deer are a cherished game and wildlife enthusiast species in Wisconsin. The deer hunting tradition is rich within some private forest land ownerships, other private forest landowners choose a preservationist goal to protect deer.

Herd numbers throughout the State have been a highly debated issue. Natural resource professionals can identify the immediate impact that high and low deer herds have on the land, both negative and positive. Landowners may have different objectives.

Though deer are a treasured sight to see, deer herd populations are excessively high in many parts of southern Wisconsin and are having a negative impact on woodlots resulting in a lack of tree regeneration and general understory diversity. Deer not only consume tree seedlings inhibiting the forest from regenerating, but they also browse on native wildflowers and shrubs, changing the forest ecosystem. Invasive plants tend to lack nutritional content; thus, invasive plants thrive in areas where deer populations have made native vegetation scarce.

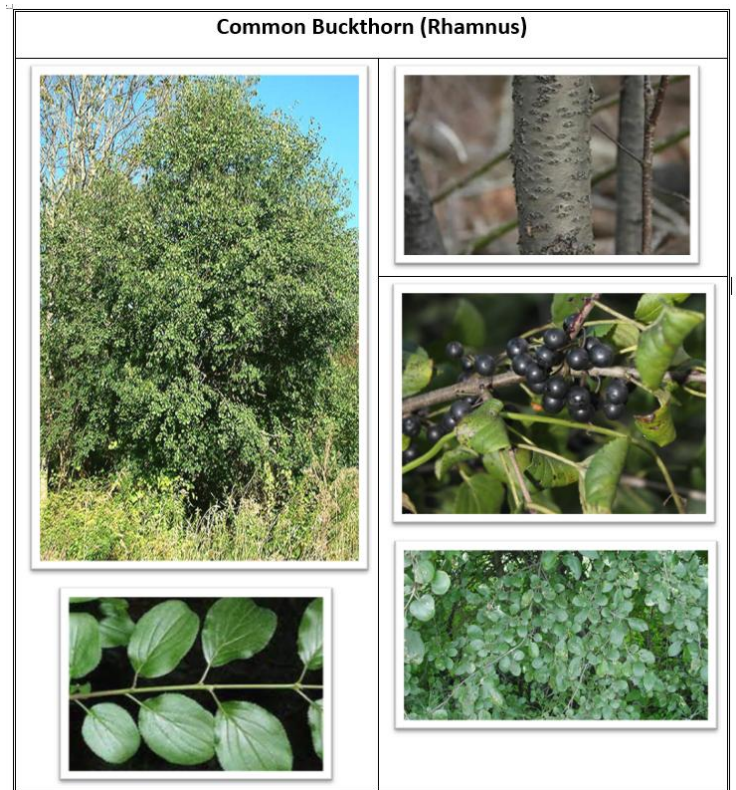
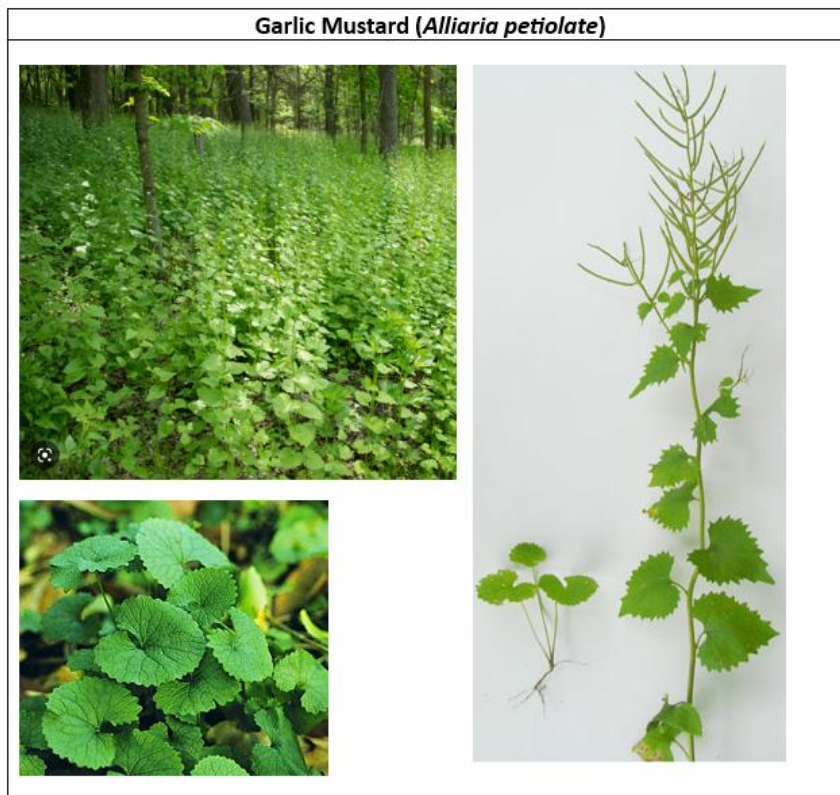
Where artificial or natural tree regeneration efforts are being conducted, tree protection measures will be necessary to ensure the successful establishment of young trees.

INVASIVE PLANTS:

Several species of invasive shrubs are present on the property including buckthorn, honeysuckle, Japanese barberry, autumn olive and multi-flora rose. Buckthorn is the most prevalent. All these shrubs are non-native, having been introduced from other countries, and are very aggressive in a wooded setting, choking out native ephemerals, shrubs and trees. These shrubs will dominate the forest understory, becoming a monoculture. This scenario can be observed in parts of Stand 7 where buckthorn thickets are present.

Garlic mustard is a vegetative plant that spreads across the forest floor and was noted in small amounts across the property. Reed canary grass is a wetland grass that behaves in the same manner, though more targeted in wetland settings. There is some research available to suggest garlic mustard does come into balance with the environment over time.

Teasel is an herbaceous plant that grows to between 2-6' tall. Teasel is introduced, and



invades open areas such as prairies, savannas, roadsides and disturbed areas.

A patch of Japanese knotweed found along the south property boundary is of particular concern. Japanese knotweed is a very difficult plant to control and is a great threat to wetlands across the U.S.

Invasive shrubs are not native to the local area, thus have a longer growing season than natives. Fall and spring are good times of the year to survey your property and identify where invasive shrubs are most prevalent. At these times of the year fewer native plants are green and identifying invasive shrubs is much easier. Garlic mustard is most notable in late May/early June when second year plants flower. The white flower stalk stands 1-3' tall and oftentimes overtops native plants, making identification very easy.

The recommended overall technique for addressing invasive plants is to eradicate scattered populations first and work toward the most infested parts of the property. In this manner, heavily infested areas are contained, and the seed source is removed from less infested areas.

Specific invasive species may also be identified as higher priority than others. On this property, Japanese knotweed is the highest priority specie to eradicate. There are professionals available who can conduct this work on your behalf.

AUTUMN OLIVE (*Elaeagnus umbellata*)



Japanese Barberry (*Berberis thunbergia*)



EXOTIC BUSH HONEYSUCKLE (*Lonicera* sp.)



Japanese Knotweed (*Reynoutria japonica*)



Teasel (*Dipsacus sp.*)



Multi-flora rose (*Rosa multiflora*)



DATA COLLECTION OVERVIEW:

This property was visited on August 10, 2026, by Kim Destree, Consulting Forester. During the field exam, vegetative plots were examined and observations made on the overall timber and vegetative condition. The property was divided into eight separate stands. A "stand" is an area with similar timber or vegetative conditions that are useful to describe and manage the area. The details of the current vegetation and the management recommendations are found under the stand headings. Data collection on each vegetative plot includes:

- The species, diameter at breast height (dbh measured at 4.5' above the ground), and merchantable volume of each tree greater than 5.1" at dbh for each tree that fell into the 10 factor prism basal area plot.
- A note of insect or disease issues; general forest health; timber quality; average dominant tree age and height (site index); growth rates; and immediate and future forest management needs.
- A 1/10 acre sample plot is assessed to record the number and species of tree seedlings and saplings located within that vegetative plot.
- Additional local observations include observable past harvesting practices, terrain, invasive plants, local hydrology, and other important features.
- Soil maps were consulted for data on the subsurface condition based on the NRCS Web Soil Survey. The DNR Surface Water Data Viewer tool was used to identify any surface water features of concern.



Figure 2: 1937 Aerial Photo



Figure 3: May 2026 Hazard Tree Inventory Map - Over 1000 hazard trees were mapped, mostly ash and damaged white pine.

Hazard Tree Clean-Up: The city of Sheboygan desires recommendations for hazard tree clean up. Hazardous tree location, species and abundance can be seen in figure 3. A hazardous tree is defined as a tree that may fall over the trail. Most are ash or white pine. The city has received some public feedback regarding the cleanup of all snapped off white pine, regardless of proximity to the trail system, however, they choose to focus on only those with risk of falling on the trail. White pine stubs can be left standing as future wildlife snags.

The most efficient and cost-effective way to cut hazard trees would be via a logger with tree harvester. A harvester can sever, cut to length, and pile material in an efficient manner. Logging equipment does require an 8' path to travel through. All trees and brush within this path would be either cut or run down.

Seasonality: Logging contractors are not abundant and busiest in the fall and winter. If this option were pursued, the Park, or portions of it, would need to be closed while operations are active for public safety. Spring and early summer would best suit Contractor availability, however public use may interfere with this timeline.

Unfortunately, invasive plants can also be tracked more easily via equipment operation when harvesting occurs under non-frozen conditions or outside of excessive snow cover. Requiring rubber-tired equipment vs tracked equipment would help limit spread.

Accessible vs. Non-accessible Parcels: Equipment operations would be limited to those areas that can be accessed by the machine. Drainage, terrain and creeks offer access challenges.

Four access points would be required for equipment to access all parts of the property without crossing navigable waterways. The Pigeon River and the two south drainage creeks divide the property into access parcels. The parcel northwest of the Pigeon River may be inaccessible altogether due to wet ground conditions. The parcel containing most of Stand 7 on the west side may also be inaccessible due to the drainage creek and adjacent development.

Crossing a stream is possible with logging equipment; however, a stream crossing permit must be obtained and timber mats or other crossing structures installed. This practice can be done but will add cost and may limit contractor interest as not all loggers have timber mats. Hazard tree removal units could be broken into those handled by a logger, the most accessible, and those handled by maintenance staff, most inaccessible.

Wet ground either requires excessively dry or frozen ground conditions to allow heavy equipment access. Requiring winter logging will likely result in lack of interest. When operating on steep terrain, equipment must travel either atop ridges; along the base of ridges; or navigate directly up and down hills. This will result in mountain bike trails in Stand 2 being traversed, tracked and brushed in.

Disposal of Debris: A timber harvester can efficiently sever identified trees and pile cut material. Ground impact is generally very minimal, though equipment operations would need to cease if ground conditions became wet.

Debris Remains Onsite: This is the easiest way to handle harvested material. A logging contractor could be directed to pick up, process and pile storm damage debris a certain distance from the trail to decrease aesthetic impact. Debris will remain but will not be directly adjacent to the trail.

Debris Removal Required: If the removal of cut material were desired, a second piece of equipment called a forwarder would be required. The forwarder has greater ground impact as it picks up stacks of cut material within the woods and hauls it to where a larger pile can be accessed by a log truck. The forwarder is heavier and there are greater operational restrictions after rain events for operation. Material being 4" in diameter on the small end or greater, and being a straight 8' piece, can be commercially marketed. On this site, large white pine would have no value and must remain in the woods. Trees are too damaged and/or dry for local markets. Dead ash could be sold as firewood. Material smaller than 4" in diameter; crooked, and rotten material has no market and would be left to lie in the woods but can be placed at a pre-determined distance from the trail.

Removal of large material could be handled in several ways. The logger could be required to truck material away. This would be limited to hardwood and would result in logging truck activity on interior roads. Loaded logging trucks can weigh as much as 98,000 pounds. If the City requires frozen ground conditions to truck material, and securing a logging contractor is limited to spring/early summer, this may result in cut material being stacked and left on site until the following winter to be hauled.

Alternatively, cut material could be stacked within proximity to the roadways and offered to the public for free firewood. This was done along the Devil's River Trail in a similar ash salvage operation in 2021. Ash and other hazardous trees were cut to 8' length and stacked in small piles along the trail. The intent was then to permit certain individuals to cut firewood. How well this system worked would need to be verified with Manitowoc Public Works.

Non-Commercial Debris: Debris less than 4-5” in diameter is referred to as ‘Woody Biomass’. When conducting a commercial timber sale on a private property, this material is usually left in the woods to deteriorate. In the mid to late 2000’s, markets began emerging for woody biomass to be used as fuel and concerns about the impact of biomass harvesting were raised. In 2009, the Wisconsin Department of Natural Resources published *Wisconsin’s Forestland Woody Biomass Harvesting Guidelines Field Manual* at the request of the Governor’s Council on Forestry. In 2013, this manual was re-reviewed and updated. The removal of woody biomass from the forest impacts biodiversity; contributes to soil nutrient depletion; affects the physical properties of soil; and can affect local water quality. This manual provided guidelines for biomass harvesting to ensure the reduction of forest impacts and consideration of various ecological factors.



Figure 4: Excerpt from Biomass Field Manual.

According to these guidelines, woody biomass harvesting should not occur on dry, nutrient-poor, sandy soils; soils where bedrock is within 20” of the surface; and certain wetland soils with high organic matter. The development of these guidelines and identification of restricted sites, highlighted the importance of allowing fine woody material to break down and return nutrients back to the site.

Coarse Woody Debris (CWD) is another category of woody material left on the forest floor to deteriorate. CWD is dead material found on the forest floor and in waterways, that is at least 4” in diameter. The field manual states that biomass harvests should not remove CWD to benefit wildlife habitat and biodiversity.

Though this property does not fall under any of the restrictive categories per the Field Manual, the benefit of decomposing fine woody material as well as large CWD should be considered when considering how to manage downed material along the trails. Should the City of Sheboygan decide to address woody biomass and CWD for aesthetic purposes, it could be chipped and left as mulch along the trail. However, retaining this material could increase public awareness as to the benefits of allowing the forest to evolve naturally.

Northern Goshawk: Habitat exists on this property to support the Northern Goshawk and there is record of this raptor occurring within 2 miles of the property. The actual location of nests is not provided. Goshawk nests must be protected by federal law. An avoidance period of February 1 – July 31 is recommended to avoid disturbance to nests during the nesting and brooding season. If cutting or disturbance will occur within that window, a no cut buffer of 660 feet around all nesting trees is required. This is a 31 acre buffer around each nest. One goshawk will have multiple nests in an area.

The potential presence of goshawks must be considered when planning this project. It is recommended a goshawk survey be conducted by a professional to determine whether goshawks are present on either this property, or the two adjacent parks. Depending upon the location of goshawk nests, and how that impacts where hazard tree removal is most needed, seasonality restrictions may be unavoidable.



Figure 5: Northern goshawk

Avoidance can be attained by scheduling activities outside the normal Northern Goshawk breeding season: February 1 to July 31. The following are measures that were used for known or recently found Northern Goshawk nesting areas on state-managed properties. These *Avoidance Measures* were developed to give property managers a tool to use for forest management activities near Northern Goshawk nest areas. They have been evaluated through field monitoring and appear suitable for protecting known nesting areas when all four are followed (Woodford 2009).

1. No-cut Area. In all forest types, establish a no-cut buffer around the active nest tree and any alternative nest trees; the area of no-cut depends on stand type, conifer density, topology, and distance to sale boundary. The recommended minimum no-cut radius is 660 feet around all nest trees. This distance provides a no-cut area of 31 acres for a territory with one nest tree. The no-cut buffer is designed to eliminate disturbance within the nest area and reduce the impact of weather on nesting birds. This reserve area also will reduce the likelihood of predation and interspecific competition from Red-tailed Hawks and Great Horned Owls. All these factors have been shown to negatively affect or eliminate nesting Northern Goshawks from established territories.
2. Residual Basal Area. In addition to the no-cut buffer, when uneven-aged harvests or thinnings are prescribed, maintain a residual basal area higher than is typical for these types of harvests within the nest stand area (i.e., 1000 ft radius of the nest tree or center of nest area). Currently the best available information is to retain 70% of the nest area's pre-harvest basal area. For example, a stand with pre-harvest basal area of 140 ft²/ac could be thinned to 98 ft²/ac basal area. The nest area size (i.e., a 1000-ft radius circle) is the mean nest area size (approximately 72 acres) of known Northern Goshawk territories in Wisconsin and is similar to the nest area size reported in Northern Goshawk studies elsewhere (see Finn et al. 2002).
3. Breeding Season Disturbances. Limit activities that could disrupt Northern Goshawks (e.g., marking, harvesting, loading, hauling, and road/trail building activities) within the nest area (i.e., 1000-ft radius) to periods that minimize disturbance to adults and nestlings. Prohibit these activities from March 20 to July 31, (March 20 to May 31 is most critical.) This guideline will protect nesting Northern Goshawks that are most susceptible to human-caused disturbance during the breeding season. Significant disturbance over a prolonged period will likely cause failure of a breeding attempt and may result in complete territory abandonment by adults.
4. Limit Disturbances to One Year. Restrict timber harvesting, loading, hauling, and road/trail building within the nest area (i.e., 1000-ft radius of the nest tree) to one year during a timber sale. This guideline is intended to limit the duration of human disturbance near Northern Goshawk nests. Telemetry studies have shown that breeding pairs in Wisconsin do not migrate, but instead remain in the general area of their territory year-round. Multiple years of disturbance in succession is likely to cause Northern Goshawks to abandon the nest area.

Strict adherence to all four of these *Avoidance Measures* will, in most cases, avoid any potential take of breeding adults, nestlings, and eggs. If these measures cannot be followed as prescribed, then contact the species expert (see *Contact Information*) to discuss other site-specific guidance.

Figure 6: Specific federal guidance to avoid take.

Stand 1 – Natural White Pine and Northern Hardwoods								
(PW 15 ⁺ /NH 11-15 ¹ /NH 0-5 ³) White Pine, Large Sawtimber, Very Good Stocking over Northern Hardwoods, Small Sawtimber, Poor Stocking over Northern Hardwoods, Seedlings, Good Stocking								30 Acres

Average Basal Area	Year of Origin	Site Index	Site Index Species	Site Index Tree Height	Dominant Soil Type	Average Diameter	Cords per Acre	Board Feet per Acre
151	1886	57	White Pine	103	7314B2	15	49	22402

Species	Seedlings (0" – 1" dbh)	Saplings (1" – 5" dbh)	Poletimber (5" – 11" dbh)	Sawtimber (11" + dbh)
White Pine	0 ft ² /acre	0 ft ² /acre	4 ft ² /acre	53 ft ² /acre
Sugar Maple	0 ft ² /acre	0 ft ² /acre	3 ft ² /acre	16 ft ² /acre
Red Oak	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	11 ft ² /acre
Norway Spruce	0 ft ² /acre	0 ft ² /acre	3 ft ² /acre	6 ft ² /acre
Basswood	0 ft ² /acre	0 ft ² /acre	3 ft ² /acre	6 ft ² /acre
Mixed Hardwoods	0 ft ² /acre	0 ft ² /acre	5 ft ² /acre	41 ft ² /acre
TOTAL:	0 ft²/acre	0 ft²/acre	18 ft²/acre	133 ft²/acre

This stand is found throughout the east half of the property. The main body of the stand to the south is located on generally flat terrain. To the north, terrain becomes rolling and steep in areas. In the years 2022 and 2024, significant storms swept through causing tree damage. The south half of Stand 1 sustained the most damage with many snapped white pine stubs remaining standing.

White pine is the dominant species throughout this stand, being about 40% of the total overstory species stocking. Sugar maple is the next most commonly occurring species comprising about 12% of the total overstory but occurring mostly in area 1a. Red oak is also present in the stand, though it occurs mostly in area 1b. Other species include Norway spruce, basswood, red maple, beech, green ash, black cherry, white oak, white cedar, balm of Gilead, American beech, hemlock and Norway maple.



Figure 7: In the fall sugar maple is a vibrant tree with high aesthetic value.

Norway maple is not a native tree species and is considered invasive in a wooded setting. Norway maple seeds heavily, seedlings are shade tolerant, aggressive and can dominate the forest floor in surrounding areas. Norway maple were observed south and southeast of the main parking lot in Stand 4 and were planted at one time.



Figure 8: A newly emerging white pine seedling alongside a black cherry seedling within Stand 1.

Two age classes of white pine were observed. The dominant age class originated in the late 1880's. A secondary age class originated around 1940 according to rings observed on a recently cut stump. Growth rings were very tight, indicating slow growth, and the stump was in a landscaped area within Stand 1 along the road. When reviewing figure 2, white pine rows are obvious, mostly in Stand 4, but white pine plantings may have extended southeast as well.

As the stand was traversed, seedlings were observed in abundance on the forest floor. Sugar maple and black cherry are most commonly occurring. White pine, basswood, red maple, mulberry, and box elder were also noted. Ash seedlings occurred in areas; however, ash is no longer considered a viable tree specie due to the presence of Emerald Ash Borer throughout the State.

Though seedling numbers are abundant, all seedlings below the deer browse line are 1-year old. Evergreen Park, and surrounding parks, harbor a heavy local deer population. Deer are inhibiting the forest floor from regenerating. Though seedlings are present, they are quickly browsed and eliminated due to limited local browse.

The presence of deer is valued by the public. Harvesting for purposes of creating an ecological balance to enhance forest diversity will likely not be favored in public opinion. Deer are, however, creating a barrier to forest regeneration and are inhibiting an aging forest from naturally regenerating and replacing itself.

Northern Hardwoods: Though this stand is dominated by white pine, northern hardwoods would be the future forest type if natural forest regeneration were released. The northern hardwoods timber type as defined in the DNR Silvicultural Handbook, is a species mixture of sugar maple, beech, basswood, white ash and yellow birch. Associated species include red maple, red oak, hemlock, white pine and balsam fir. Though not all the species found within this timber type are shade tolerant, many are. This high shade tolerance is a defining feature of the northern hardwoods timber type. This species mixture prefers deep, rich loam soils and grows high value timber species.

Sugar maple, beech and hemlock are very shade tolerant species. Seedlings of these species can be found on the forest floor growing beneath a closed canopy of overstory mature trees. Northern hardwoods can be managed using uneven aged management techniques. A combination of periodic thinning with the installation of small canopy gaps to encourage variable ages of young tree growth results in a multi-aged stand of trees. Though this type of management is the most aesthetically pleasing management applied to hardwoods, it does tend to gradually transition the stand to primarily sugar maple. Sugar maple has many positive attributes including high timber value, fall aesthetics, maple syruping and seed production. However, perpetuating a monoculture of only a few species of trees can set the site up for devastating effects should a species-specific exotic disease or insect be introduced into the US.

Oak Management: Oak management could occur in Area 1b once the oak have reached maturity. Oak is a mid-shade tolerant tree species that requires at least partial sun to reach the forest floor to successfully

regenerate. Oak will not establish itself and actively grow beneath a heavy forest canopy. The sun loving nature of oak can be seen along forest edges whereby the interior of the woodlot is dominated by old oak and forest edges, particularly south facing, have younger oak growth.

Oak can vary in its longevity depending upon the species of oak; the dominant soil type; and water availability. For example, black oak growing in sand with very little nutrient availability and water holding capacity, can be considered mature as young as 80 years old. Black oak growing atop loam is considered mature at 150-160 years old. White oak growing atop loam soils can reach upwards of 250-300 years old but can conversely show signs of decline as young as 130-150 years old on sandy, dry, nutrient poor sites. Three types of timber harvesting techniques are implemented in oak stands as they develop:

Intermediate Thinning: As an oak stand is actively growing, periodic thinning is conducted to remove suppressed, poor-quality trees and less desirable species, encouraging the most desirable species and highest quality trees. Once the oak stand reaches maturity, the process of beginning to recruit young tree growth via opening of the forest canopy should be conducted. On this site, when considering all these factors, the red oak are considered mature at around 140-150 years old. Oak are estimated to have originated in the 1920's.

Intermediate thinning is conducted in a stand of trees as the trees are actively growing. In an oak stand on a good site, trees can be thinned every 15 years or so, removing small diameter, poorly formed, diseased, and unwanted species. This continual 'tending' moves the forest to a higher quality forest of desirable tree species. As trees get older, growth slows. Once growth begins to slow, thinning frequency becomes longer or ceases altogether. The final cut is a regeneration harvest.

Overstory Removal: When the oak stand reaches maturity, the forest floor is assessed to determine whether oak advanced regeneration is present. Oak seedling populations sometimes build up on the forest floor beneath mature overstory oak. The density of these seedlings can be high, though they do not actively grow due to lack of sun. Foresters conduct a stocking survey in mature oak stands to determine whether the abundance of oak seedlings on the forest floor is enough to support a new stand of trees. If so, an overstory removal is conducted to release the young forest below to full sunlight. All overstory trees do not need to be removed when this cut occurs, though most must be cut to provide adequate sunlight to the forest floor. Many times, foresters will retain white pine, scattered white oak and trees harboring nesting cavities in the overstory for aesthetics, continued mast production, wildlife habitat, tree stands, and diversity.

Shelterwood Harvest: The second type of oak regeneration harvest is called a shelterwood harvest, which would likely be needed on this site. This is essentially a two-step harvest used to regenerate mid-shade tolerant species such as oak, hickory, red maple, white pine and cherry. The shelterwood harvest method is used when the forest floor is not stocked with desirable tree seedlings that can simply be released via overstory removal. This harvest is applied when the overstory trees are mature, but the forest floor is lacking in young tree growth.

The first cut removes all undesirable tree species, small diameter trees, shrubs and some large diameter trees. After the first cut, the oak stands is park-like. The goal is to retain large diameter, healthy, large-crowned trees of desirable species, and to remove all other trees and vegetation to open the forest floor to partial sunlight conditions, while retaining enough canopy cover to have an immediate seed source available. The post-first cut appearance when looking up at the tree canopy should be about 50% sky and 50% tree canopy.



Figure 9: Park-Like setting after the first cut of a shelterwood harvest.

Once the first cut of the shelterwood harvest is completed, ample sunlight is allowed to reach the forest floor, giving seeds and nuts that drop from the remaining seed trees the opportunity to germinate, capture sunlight, and actively grow. Shaded conditions do not allow this process to occur. Sometimes on sites with abundant invasive plants or native brush that will cause competition to young tree growth, intensive brush control efforts must occur prior to and after the first cut of the shelterwood harvest.

After this first harvest, the site is monitored to determine when the forest floor has repopulated adequately. Oak do not produce an abundance of acorns every year, so depending upon the acorn drop, it may take some time for the forest floor to become restocked. Stocking surveys are generally conducted 3-5 years after the first cut to assess the site.

Once the understory is well stocked with tree seedlings, most of the mature overstory trees are removed to allow full sunlight to the new forest below. This is the second cut of a shelterwood harvest and may not occur for 5-20 years after the first cut, depending upon how

long it takes for the forest floor to repopulate with tree seedlings. Having an immediate, live seed source is critical to generating volunteer forest regeneration. When considering how long it may take for a site to repopulate itself, waiting until the overstory is in a state of deterioration is not recommended. When the overstory removal cut is performed, some larger trees could be retained in the overstory, with the retention of white oak and white pine being recommended as they are longer lived.

If regenerating oak in this small area is an objective, it is recommended efforts to begin regenerating the site begin in the year 2055.

Deer Ex-closures: Excessive, chronic deer browse has become a major barrier to regenerating many species of trees favored by deer. In certain counties, successfully naturally regenerating trees has become nearly impossible without intervention to protect newly emerged seedlings. Perimeter fencing is one method to protect seedlings. Perimeter fencing is installed as a temporary barrier that is then removed once regeneration has grown above the browse line. This is the most practical option, installed in small units of several acres, to naturally regenerate the site back to trees. If perimeter fencing were installed, hand planting to enhance species diversity could also be conducted within the perimeter fence with no required tubing or caging. Perimeter fencing was attempted at Maywood Park.

Installing individual grow tubes or wire cages around naturally seeded trees is an alternative, however those cages/tubes must be at least 5 feet tall and secured with two 5' posts. When comparing the cost of ex-closure fencing to individual tree caging, ex-closure fencing has been found to be about 25% of the cost. Informational material regarding the installation and cost of ex-closure fencing is enclosed within this packet.

Forest Management Recommendations: The loss of overstory white pine to storm damage has opened the forest floor to greater amounts of sunlight. This condition is triggering tree seedlings, brush and undesirable vegetation to flush. Though tree seedlings are present, (see figure 7) they will never be given the opportunity to actively grow due to excessive local deer populations. Deer ex-closure fencing, either in the form of large-scale fencing or individual grow tubes, will be required for a period to get tree seedlings above the browse line.



Figure 10: Example of ex-closure fencing.

Overstory white pine are old and have reached a point of stagnation as far as growth, which was observed via tree rings on cut stumps throughout the property. White pine on this site can live to be as old as 200 years or more, but action should be taken to begin the process of recruiting new growth to the understory. This will develop forest structure; increase aesthetic quality; enhance wildlife habitat opportunities; and prepare for the future loss of white pine due to aging trees. This stand offers the best opportunity across the property to naturally regenerate desirable hardwoods. This is a rich site with an abundant seed source of desirable species. Strategically placed deer ex-closure fencing would not only assist the forest in regenerating to a wide mix of species but would also be an excellent opportunity for public education and awareness of the impact of deer on the forest ecosystem.

In addition to the stand having a variety of species present to regenerate, the trail system throughout this stand is not as complex as other stands. Mountain bike trails are compact and dense in other parts of the property, making deer ex-closure fencing more difficult and controversial.

Once ex-closure fencing is installed, supplemental tree planting within the ex-closure could also be conducted. With increasing global temperatures, planting southern species is recommended to assist in species migration northward. Shagbark hickory, bur oak, white oak, black walnut, bitternut hickory, red maple, red oak, and black oak could all be planted within the ex-closure fence to increase species diversity; prepare the site for warming global temperatures; and assist in faster reforestation of the site.



Figure 11



Figure 11



Figure 12

Figure 10 is a standing dead tree called a snag. Snags are important for wildlife as they offer nesting cavities, a food source (interior insects that thrive on decomposing wood); and as the snag breaks down it returns nutrients to the soil.

Figure 11 is Eutypella canker noted on a sugar maple in the southeast corner of the property, alongside Stand 5. Eutypella is a native fungal canker that creates a weak point in the tree making it susceptible to breakage. In addition, this canker can spread to surrounding sugar maple. Removal at the time of hazard tree removal for purposes of not only public safety, but also forest health is recommended.

Figure 12 is a white pine with multiple woodpecker holes along the bole of the tree. White pine are susceptible to red rot, particularly when growing atop rich soils. The interior of the tree hollows, and insect activity follows. Woodpeckers then become very active on these trees, drilling holes into the center to reach insects. Over time, holes are used as nesting cavities.

Invasive Plants: Buckthorn is the most commonly occurring invasive plant throughout Stand 1, though it is not overly abundant and heavy deer browse is keeping plants at ground level, preventing further seeding. Some tall buckthorn was noted within and around the drainage that originates from the south on the west side of this stand. A small amount of Japanese barberry, patches of garlic mustard and small patches of reed canary grass were also noted.

One patch of Japanese knotweed was identified on the south end of the property and is noted on the stand map. Japanese knotweed is a non-native plant introduced into the US in the late 1800's and to Wisconsin in the mid-1900's. It mostly spreads via shoot fragments or rhizomes (an underground plant stem that sends out roots and shoots from its nodes). An infestation can begin from a root fragment as small as a few inches.

Japanese knotweed poses a great threat to wetland ecosystems and can become a highly problematic plant to homeowners when near manmade structures such as buildings or roads. Underground rhizomes can push their way up through roadways; spread to neighboring properties beneath roadways; push through sidewalks; and have even been found to come up through the base of buildings. Knotweed is tolerant of shaded conditions, wetland conditions, drought and high salinity. Contact a licensed herbicide applicator who specializes in non-native invasive plants to get very specific recommendations for control.

Throughout 1b is an abundance of tall lilac. Tall lilac is not considered an invasive shrub but it is very prevalent in this area.

Site preparation for hazardous tree removal: To limit the spread of invasive plants via equipment operation, consider the following prior to the hazardous tree removal operation:

- Spray scattered reed canary grass patches and Japanese barberry, particularly within 50' of the trail. If other minor species such as autumn olive or honeysuckle are noted, eradicate as well. Continue to monitor these plants and spray seed origin plants. Buckthorn is widespread and immediate control is not likely.
- Cut all seed-bearing buckthorn down to ground level.
- Do not allow equipment passage within 75'-100' of the patch of Japanese knotweed.

MANAGEMENT OBJECTIVE

This stand will be managed to convert units to mixed hardwoods and pine over time via the installation of deer ex-closure fencing. Supplemental hand planting will increase species diversity; improve forest resilience to potential future insect or disease issues; prepare the site for increasing global temperatures and plant migration; and increase the aesthetic quality of the stand.

Hazard tree removal has been discussed and will be an immediate future action. Additionally, controlling invasive plants is an objective with immediate efforts focused on Japanese knotweed, reed canary grass and Japanese barberry as these plants are not as abundant and browse is not impacting their spread via either seed or rhizomes. Garlic mustard control may or may not be an objective.

COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Between the years 2027-2028, remove designated hazard trees from along the trail system.

Consider removing additional trees within ex-closure fencing area to clean up damaged tree saplings and poletimber; and to open the forest canopy further which will encourage mid-tolerant tree species as well as shade tolerant species. Sugar maple is very shade tolerant and tends to dominate over time.

In the year 2035, harvest trees within a second deer ex-closure unit, if needed, to further open the forest canopy and allow sun to penetrate to the forest floor. Follow the same preparatory guidelines listed below for the first ex-closure unit.

In the year 2055, complete the first cut of an oak regeneration harvest. If oak begin to show signs of early deterioration such as upper crown dieback, consider an early oak regeneration harvest.

NON- COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Forest Management Timeline:

Timing	Practice
2026-2028	Identify boundaries of future deer ex-closure fencing. Ex-closure should be at least 1 acre in size. 3-5 acres would be ideal. Where present, cut brush down to ground level within ex-closure fencing area to decrease future competition with tree seedlings. Spray competitive brush; buckthorn and other invasive plants; and areas of abundant ash seedlings within future ex-closure area.
2027-2028	Conduct hazard tree removal. Ensure perimeter of deer ex-closure fencing is clear of debris.
2028 and beyond	After hazard tree removal project is completed, install deer ex-closure fencing. Maintain ex-closure fencing. Deer will push through fencing and holes will require mending. Tree branches may also collapse on walls over time. Control brush competition as it emerges. Hand Plant Trees. Remove ex-closure once tree seedlings are well above the browse line.
2035	At this point the first unit should be well developed, and fence removal may be an option. Begin the process of selecting another deer ex-closure unit. If possible, wrap fencing off a similar current ex-closure boundary to reuse existing fencing.

Hand Planting: The density of hand planted trees is optional. The area is anticipated to fill in rapidly with sugar maple, black cherry and white pine. Other species could be planted at a rate of 400 trees/acre (10'X10' spacing), or less, to add sparsely distributed other species mentioned above.

Invasive Plant Control: The presence of invasive plants throughout this stand is a forest resource concern. Invasive plants respond aggressively to increased sunlight conditions to the forest floor. A priority list may be as follows:

- Eradicate the patch of Japanese knotweed.
- Cut all tall, berry producing buckthorn down to ground level.
- Spray small patches of reed canary grass to prevent further spread.
- Spray scattered Japanese barberry
- Garlic mustard control is optional. Unless garlic mustard control is a strong property-wide objective, and a volunteer base is high, garlic mustard control can be very difficult.
- Deer browse is keeping buckthorn low to the ground. If eradicating the presence of buckthorn altogether is an objective, spray buckthorn throughout once all large plants are down to ground level.

Stand 2 – White Pine and White Cedar on Hilly Terrain								
(PW 15+ ⁵ /C 9-15 ³ /C 5-9 ¹) White Pine, Large Sawtimber, Excellent Stocking over White Cedar, Small Sawtimber, Good Stocking over White Cedar, Poletimber, Poor Stocking								15 Acres

Average Basal Area	Year of Origin	Site Index	Site Index Species	Site Index Tree Height	Dominant Soil Type	Average Diameter	Cords per Acre	Board Feet per Acre
209	1886	57	White Pine	103	7414C2/RBL	18	52	23180

Species	Seedlings (0" – 1" dbh)	Saplings (1" – 5" dbh)	Poletimber (5" – 11" dbh)	Sawtimber (11" + dbh)
White Cedar	0 ft ² /acre	0 ft ² /acre	9 ft ² /acre	87 ft ² /acre
White Pine	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	45 ft ² /acre
Norway Spruce	0 ft ² /acre	0 ft ² /acre	8 ft ² /acre	16 ft ² /acre
Sugar Maple	0 ft ² /acre	0 ft ² /acre	4 ft ² /acre	1 ft ² /acre
Misc. Hardwoods	0 ft ² /acre	0 ft ² /acre	4 ft ² /acre	35 ft ² /acre
TOTAL:	0 ft²/acre	0 ft²/acre	25 ft²/acre	184 ft²/acre

Stand 2 is found on hilly, steep terrain located centrally and east of the drainage creek. White cedar is the most frequently occurring overstory species being about 50% of the total overstory species composition. White pine is the next most common species, about 25% of the overstory. Associated species include basswood, beech, Norway spruce, yellow birch, cottonwood, white birch, red oak, black cherry, red maple and sugar maple. This stand harbors some impressively large diameter red maple and sugar maple. White cedar becomes relatively pure to the north.

The understory is void of tree seedlings in areas and has dense black cherry and sugar maple seedlings in other areas. Similar to Stand 1, seedlings are 1 year old and are not actively growing due to continued browsing.

White Cedar Management: White cedar can grow on both lowland and upland sites. Best growth rates occur when cedar grows atop limestone rich soils. In lowlands, cedar quality increases with better drainage. White cedar is a preferred browse specie for both deer and snowshoe hare, so much so, that regenerating white cedar stands, particularly in lowlands, has become nearly impossible with the high deer populations that we see around the State. White cedar stands are also frequented by deer for winter thermal cover.

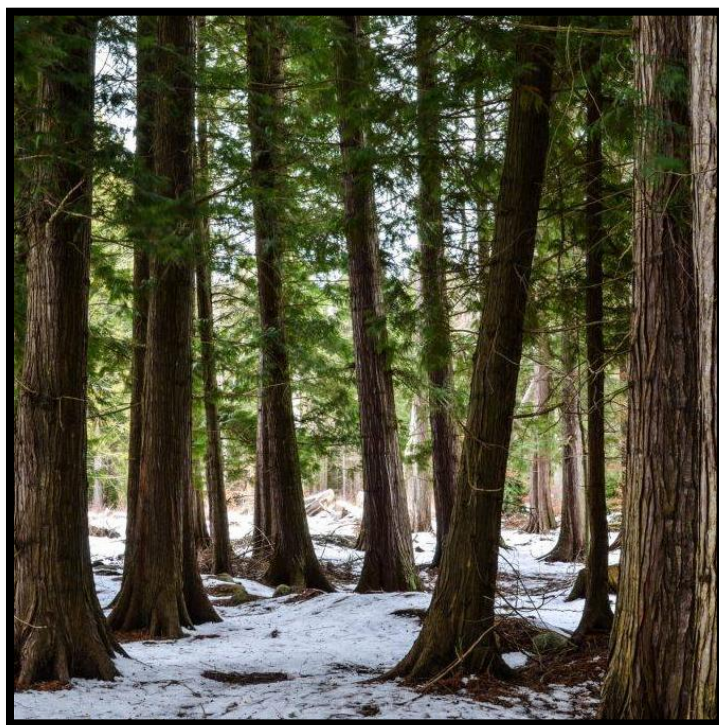


Figure 12: White cedar stands are often densely stocked with trees and aesthetically valued for this unique characteristic

White cedar is a shallow rooted specie subject to windthrow when growing on wet sites. Once small pockets of white cedar succumb to blowdown, it is common to see the expansion of these pockets over time and subsequent patches beyond the initial blowdown emerge. Once the canopy is opened, blowdown becomes a chronic issue in many lowland white cedar stands.

From a silvicultural standpoint, white cedar reach rotation age around 110 years old on sites such as this. The stand is generally one uniform age, and trees do not grow in perpetuity. White cedar and white pine were determined to have originated around 1870-1890. White pine and white cedar can live for several hundred years.

White cedar seedlings require at least partial sunlight conditions to reach the forest floor to become established and grow freely. In the management of cedar stands, openings are created to allow the penetration of sunlight to the forest floor while retaining a white cedar seed source along the edges of the opening to assist in the re-establishment of cedar to the opening. As previously stated, local deer populations have prevented white cedar regeneration harvests from being successful as cedar is a favored browse species by deer.

Cedar & White Pine Forest Management Recommendations: Though the stocking of trees within this stand is considered dense, active management within this stand is not an immediate property-wide priority. This stand provides winter thermal cover for deer; is a highly valuable aesthetic feature on the property; and has an extensive mounting biking trail system throughout. Many management practices are recommended for other parts of the property that are more urgent and would aid to meet the objectives of this ownership. No action is recommended within this stand other than invasive plant treatment currently.

If management were desired, group selection harvesting would be recommended to perpetuate shade tolerant species such as sugar maple, beech and black cherry to small openings created in the forest canopy to allow more sunlight to the forest floor. Openings can be made which place desirable regenerative species such as sugar maple, black cherry, oak, and beech along the edges to encourage natural seeding into the gap. Hand

planting could also be conducted to encourage species diversity. Openings need to be at least ¼ - ½ acre in size, and the bigger the better.

Once the opening is cut, deer ex-closure fencing must be erected to allow for natural regeneration to occur. See Stand 1 for a recommended timeline to prepare the site by spraying invasive plants and shrubs within the group selection unit; completing the cut; erecting fence; then hand planting.

Best Management Practices: According to Wisconsin's Best Management Practices for Water Quality manual, a stream with a width of greater than 3 feet has a Riparian Management Zone (RMZ) of 100' on both sides. RMZ's help to filter sediment and runoff; allow water to soak into the ground; stabilize stream banks and lakeshores; shade streams; and provide food and habitat for aquatic organisms.

Within the RMZ, forestry activity is limited to ensure continued protection of the stream corridor. Cutting of trees or shrubs within this zone is limited; equipment operation is

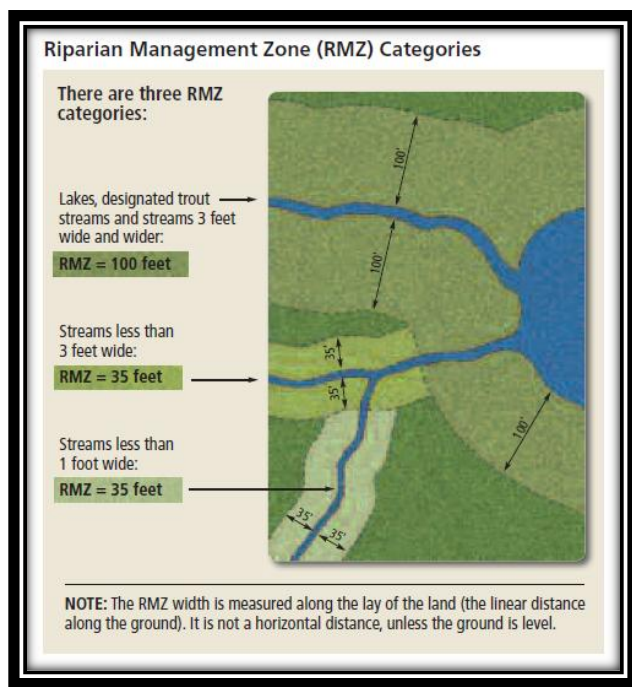


Figure 13: Excerpt from Wisconsin's BMP Manual

limited; fine woody material within 100' of the stream is to be retained; harvesting to promote long-lived species is encouraged; harvest intervals are lengthened; and large diameter tree growth is desired. All these actions work to protect the RMZ and, in turn, the stream and all the organisms that utilize it.

Aspen: Two patches of aspen were noted across the entire property, one being trembling aspen and the other bigtooth aspen. Aspen is a sun loving tree species that regenerates via dormant buds located on the root system. Once clearcut and full sun is allowed to reach the forest floor, these dormant buds will send up root suckers that are the new stand of aspen. Aspen grows very quickly and can reach upwards of 5-6 feet in a few years depending upon site conditions, tree vigor and local deer populations. It is an excellent wildlife species as well favored by deer, grouse and other birds for winter foraging. The low brush thickets created when aspen is regenerated and young also creates low forest structure sought out by different animals for cover.

Because aspen regenerates via the root system, aspen root suckers can repopulate area beyond the standing tree, reaching as far as the height of the tree, with root suckering being most prevalent nearest to the stump. This sprouting behavior is encouraged in circumstances whereby perhaps aspen is the most desirable species in an area and it is a goal to discourage other species such as ash or box elder. When clearcutting the entire area, the goal is to convert to aspen.



Figure 15: Aspen are valued aesthetically for its golden fall color and white/yellow bark.



Figure 14: Pileated woodpeckers oftentimes nest and raise their brood within hollowed aspen.

Aspen must be regenerated when the trees are alive and vigorously growing. Trembling aspen generally receives a clearcut at around 50 years of age and bigtooth aspen around 60-70 years old. 2a is a small patch on the far north end of the property with an understory of both native and invasive brush, including autumn olive and honeysuckle. This aspen clone is trembling aspen and is in a state of deterioration. If maintaining aspen patches across the property is an objective, this area should be clearcut soon to regenerate the species back to the site. The terrain to access this patch is steep and having a commercial operator cut the area is unlikely.

Alternatively, and perhaps most beneficially, understory brush could be

treated, then the area cut, but trees left to lie on site, creating a brushy barrier to discourage excessive deer browsing of root suckers. This scenario would be very aesthetically unpleasant as far as public perception, but may successfully regenerate aspen without the use of a commercial operator or deer ex-closure fencing.

The second patch of aspen is located north of Camp Evergreen, a building complex found on the south side of the property. This clone is bigtooth aspen estimated to have originated around 1970. Trees are healthy, decline was not observed, and this patch still has time before active management would be needed to maintain this clone on site.

Invasive Plants: A very minor amount of Japanese barberry and garlic mustard were noted in the understory. Though only these two plants were observed during the field review, other plants are also likely present, just did not occur within the sample line. Either way, the presence of invasive plants within this stand was minimal.

MANAGEMENT OBJECTIVE

This stand objective is to maintain the current species mixture for winter thermal cover for deer; aesthetics and recreation. Treating invasive plants is an overall objective throughout the park.

COMMERCIAL FOREST MANAGEMENT ACTIVITIES

None.

NON- COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Group Selection Harvesting Timeline:

Timing	Practice
2033-2034	Identify boundaries of group selection unit. Where present, cut brush down to ground level within unit to decrease future competition with tree seedlings. Spray competitive brush and other invasive plants.
2035	Cut all trees within the group selection unit. Ensure perimeter is clear of debris.
2035 and beyond	After harvest is complete, install deer ex-closure fencing. Maintain ex-closure fencing. Deer will push through fencing and holes will require mending. Tree branches may also collapse on walls over time. Control brush competition as it emerges. Hand Plant Trees Remove ex-closure once tree seedlings are well above the browse line.

Aspen Regeneration Harvest Timeline:

Timing	Practice
2026-2028	Cut brush down to ground level throughout 1 acre corner. Spray competitive brush and other invasive plants.
2028 and beyond	After brush has been effectively suppressed, cut all stems greater than 2" down within this 1-acre area except select reserve trees to include spruce and other non-aspen aspen, long lived species. Control brush competition as it emerges.

	Installing deer ex-closure fencing would be the best opportunity to ensure the success of this regeneration unit, however clearing the perimeter will be difficult due to felled debris.
Summer 2027 and beyond	Continue to address competitive brush and grass. Monitor newly regenerated trees for aggressive browse issues. If necessary, cage trees until they above the browse line or install perimeter fencing.
2033-2035	Suppress brush beneath and around the south aspen clone.
2035	Cut second aspen clone and install deer ex-closure fence around the area.

Hand Planting: The density of hand planted trees is optional. The area is anticipated to fill in rapidly with sugar maple, black cherry and white pine. Other species could be planted at a rate of 400 trees/acre (10'X10' spacing), or less, to add sparsely distributed other species. Other species that could be planted include shagbark hickory, bur oak, white oak, and white cedar.

Invasive Plant Control: The presence of invasive plants throughout this stand is a forest resource concern. Treat all invasive plants as they occur within the stand.

Stand 3 – Riparian Zone along the Pigeon River	
(BH 15+ ¹ /BH 11-15 ¹ /KG) Bottomland Hardwoods, Large Sawtimber, Poor Stocking over Bottomland Hardwoods, Small Sawtimber, Poor Stocking over Lowland Grass	26 Acres

Average Basal Area	Year of Origin	Site Index	Site Index Species	Site Index Tree Height	Dominant Soil Type	Average Diameter	Cords per Acre	Board Feet per Acre
47	1971	*80	Cottonwood	90	LLS/ALW	18	8	3618

*Site index tables not available for cottonwood. Aspen charts used for Site Index.

Species	Seedlings (0" – 1" dbh)	Saplings (1" – 5" dbh)	Poletimber (5" – 11" dbh)	Sawtimber (11" + dbh)
Willow	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	15 ft ² /acre
Cottonwood	0 ft ² /acre	0 ft ² /acre	1 ft ² /acre	9 ft ² /acre
Box Elder	0 ft ² /acre	0 ft ² /acre	3 ft ² /acre	3 ft ² /acre
White Cedar	0 ft ² /acre	0 ft ² /acre	1 ft ² /acre	5 ft ² /acre
Misc. Species	0 ft ² /acre	0 ft ² /acre	1 ft ² /acre	9 ft ² /acre
TOTAL:	0 ft²/acre	0 ft²/acre	6 ft²/acre	41 ft²/acre

This stand encompasses wetland across the west side of the property. It borders the Pigeon River on both sides; includes a lowland grass wetland just north of Stand 7 (3d); cattail marsh on the far north end; and an extension running southeast to include a spring fed wet draw (3e). 3e is rocky with rising terrain.

Ash was the dominant overstory species throughout much of this stand; however, all ash has died due to Emerald Ash Borer infestation. What remains are mostly large diameter, scattered, willow, cottonwood and box elder.

Areas 3a: Areas 3a are two lowland grass patches with the potential for a wet mesic prairie restoration, if the city were interested. These two areas are wet, but are not dominated by reed canary grass, though it is present. 3a alongside the road has an infestation of teasel that is spreading southward. Regardless of whether there would be interest in converting this area to wet-mesic prairie, or just leaving it grow naturally, controlling teasel should be an objective.

The wet-mesic prairie is characterized by tall prairie grasses and forbs, on mineral soils, in wetland complexes.

Wetland forbs such as yellow coneflower and stiff goldenrod are present, though the wet-mesic prairie is generally dominated by grasses. The site should be



Figure 16: Pigeon River



reviewed with a prairie professional prior to implementation of restoration activities to ensure it is indeed ideal for such a restoration project. A professional may take into consideration factors such as drainage, soil type, indicator plants, and otherwise, that may alter this recommendation slightly.

The following is a timeline developed via conversations with Natural Resource Conservation Service (NRCS) professionals who have experience in wetland

grassland restoration. The following timeline would require ongoing professional involvement, monitoring, and reaction to on-site conditions as the project progresses.

Figure 17: Wet-mesic prairie at Swan Lake State Wildlife Area

Spring/Summer of 2027:
Work with a prairie professional to identify the potential and boundaries of

the native grassland conversion project. When a wetland is dense with reed canary grass, undesirable brush, and other undesirable vegetation, the entire area will need to be sprayed. This site has some native vegetation, however for the greater good of the larger area, the entire site may be addressed and replanted. The most responsible path to restoration should be worked through with a professional in the coming years.

Fall/Winter of 2027/2028: Remove all trees from restoration areas. Ideally, work this activity into the hazard tree removal project. Fecon mow, basal bark or cut stump treat all larger brush throughout the conversion area. If the area is small, manually addressing brush is likely more practical. Additionally, the site is wet and access with a fecon mower may be an issue if the ground does not freeze that winter.

Spring/Summer of 2028 & 2029: Foliar application of the site. This may occur in patches or be widespread depending upon project planning. Where reed canary grass is present, spray patches 2-3 times throughout the growing season, beginning in May. This site preparation may need to continue through a third year depending upon a site assessment conducted in late summer 2028.

Fall of 2029 and beyond: Work with a professional to develop a timeline for reseeding and maintenance. Likely, a dormant seeding of cool season grasses or legumes would occur at this time. The wet-mesic prairie also contains warm season grasses

Areas 3b & 3c: These areas are riparian zones along the Pigeon River. Buckthorn is very dense in the understory in area 3b and reed canary grass is dominant throughout 3c. Reed canary grass (RCG) is a non-

native, invasive grass that dominates ground cover, inhibiting the growth of native herbaceous vegetation, sedges, grasses, shrubs and trees. Reed canary grass is very problematic, causing wetlands to become stagnant deserts with very little wildlife value. Where water flow is continuous in and out of the area, controlling this grass is very difficult as seed is continually re-introduced. In wooded settings with reed canary grass as an understory plant, the tree canopy is kept dense to suppress RCG. In situations such as this area, whereby tree cover has been lost and RCG control is not likely, tree and shrub planting would be the most logical path to restoration. Planted trees and shrubs would require either regular chemical release to keep the plant free of competition from RCG, or a maintained weed barrier, in addition to individual tree protection from deer browse. Planting in RCG can be very labor intensive.

Another alternative for 3c, where not directly adjacent to the river, is conversion to wet-mesic prairie. This recommendation stretches south and north through 8a and 8b as well. Trails paralleling both sides of the Pigeon River could be used as a barrier between grass restoration to the south and north, and reforestation between the river and the trail.

Tree/Shrub Planting: Throughout 3b, ash was dominant in the overstory, and the understory is generally inundated with buckthorn. Intervention will be required to restore forest cover. This intervention includes invasive plant suppression, hand planting, then protection of trees from deer browse. This is an intense undertaking that will require financial and physical input.

A. Buckthorn Control: First, buckthorn will need to be significantly suppressed over the course of several years. The first wave of suppression will target large plants that cannot be foliar sprayed with subsequent entries targeting small plants. The following are several ways to target large stems.

1. Conduct a basal bark treatment of stems being 1-4" in diameter. Spray the bottom 18" of the plant in fall with an approved, oil based herbicide mixture to kill the plant standing.

*For buckthorn greater than 4" in diameter, either cut the shrub down and paint the cut stem with the same mixture used for the basal bark treatment or girdle the stem and treat the girdle. Girdling a tree or shrub involves using a chainsaw to cut around the stem through the cambium layer, then applying an herbicide within the girdle to kill that plant standing. Girdling is used when a plant is so large that bark application may not penetrate the bark.



Figure 18: Tree Girdling

2. *Complete a cut stump treatment of all larger stems (greater than 4"). Cut larger stems down, then treat the severed stump immediately to kill the root system.
3. *Cut all large plants but don't treat the stump with the intention of treating the re-sprouts the following summer.

*The site will require several foliar applications of stump sprouts and seedbank origin buckthorn. If larger plants are cut down, this brush will be difficult to work around in the summer when the foliar application is conducted. The benefit of basal bark treatment and girdling, is that the plant can be left standing to die and deteriorate. If plants are cut down, brush should be chipped or removed from the

site.

A fecon mower is an effective way of eradicating large buckthorn stems. A fecon mower can mulch woody stems up to 6-8" in diameter. In this manner, all large buckthorn and other undesirable brush is mulched to ground level and the site is clean. Severed stems will re-sprout the following spring, but the site will be foliar sprayed regardless



Once large plants are addressed, either by chemical application or cut stump treatment, stump sprouts from large plants and seedbank origin plants will need to be addressed. Once the overstory buckthorn are removed, increased sunlight conditions to the forest floor will result in a flush of buckthorn seedlings. These seedlings are emerging from a heavy seedbank. This seedbank will need to be significantly depleted before hand planting can occur.

In early summer, once young buckthorn has reached 12-18" tall, complete a foliar application of the site. This generally occurs in late June, early July. The site could be re-reviewed in late summer with a possible second application in September if spots were missed or another flush occurs after the first flush. Watch for the invasion of additional invasive plants such as reed canary grass, teasel and honeysuckle. These will need to be addressed as well. Reed canary grass is the most likely to spread into this opening.

In early summer of the second year, complete another foliar application of seedbank origin buckthorn. This flush will also likely be quite heavy, though it should be less than the previous year. Again, a spot spray of additional re-sprouts could occur in late summer/early fall. Buckthorn retains its leaves late into the fall and can be sprayed effectively until early fall. If you shake a leafed-out buckthorn in the fall and leaves are beginning to fall off the plant, then it's too late to apply a foliar application effectively.

If the overstory ash were on a site whereby they could be salvaged by a commercial operator, this would be the time to have a logging Contractor come in and harvest the overstory ash, just prior to planting. Non-merchantable material such as topwood should be piled to the greatest extent possible. On this site, finding a Contractor to do this work is highly unlikely. This site will be underplanted with trees with the understanding that the overstory ash will just fall over time.

The following spring, hand planting could begin. One more year of buckthorn control could be conducted if you feel the site is still not significantly depleted.

B. Reed Canary Grass Control: Reed canary grass is dominant in the understory throughout 3c. Though treating reed canary grass with follow up tree planting is ideal to keep canary grass at bay while trees are developing, many landowners plant directly into canary grass with the long-term objective of a

closed canopy which will suppress RCG over time. Keeping RCG as suppressed as possible may be an objective to protect adjacent wet-mesic prairie restoration from invasion. RCG will continue to be an issue as seed will be continually swept downstream.

If possible, salvage ash throughout the replanting areas to reduce future damage from falling trees. Ash could simply be felled if a logging Contractor were either not interested in salvaging ash from these wet areas, or unable to at the time of hazard tree removal elsewhere.

Where RCG is dominant, broadcast spray the planting area with a wet site approved herbicide to kill grass. Herbicide work may be required for at least 2 years before tree planting can occur. The site should be assessed after the first growing season to determine whether it is clean enough to plant the following spring.

C. Hand Planting: In a plantation setting, 800 (7' X 8' spacing) to 900 (6' X 8' spacing) trees/acre are planted to fully stock the stand with the assumption of 25% loss. Select trees suitable to the site.

Plant tree species better adapted to wetland conditions such as *swamp white oak, silver maple, red maple, white birch, river birch, yellow birch, sycamore, cottonwood, willow & *tamarack.

*Different tree species have variable susceptibilities to deer browse. Trees with asterisks are less susceptible to browse than others. Though swamp white oak and tamarack are listed as less susceptible, that does not mean they are entirely resistant. If local deer populations are very heavy, deer will eat these species as well.

Wetland shrubs that could also be considered include winterberry, red osier dogwood, gray dogwood, tag alder and willow. These may also require fencing.

D. Tree Protection Measures & Maintenance: Once trees are planted, follow up maintenance to keep them free from brush competition and protected from deer browse will be necessary.

1. Continue to spot spray buckthorn as they emerge. Other invasive plants such as reed canary grass, honeysuckle and teasel may also invade as they are present on the property. These will need to be addressed as well. Protect planted trees from herbicide drift as you treat invasive plants within the restoration area.
2. Protect susceptible tree species from deer browse. This can be done through tree cages, tubes or perimeter fencing. Individual tree caging may be most appropriate for this site. If species are planted that may or may not be browsed, cage some specimens and leave other trees to grow freely. In this way deer browse potential can be monitored and future action planned accordingly.
3. Trees will require protection from deer until they are well established and above the deer browse line. At this point, invasive plant suppression could be abandoned as well if continued suppression is not a goal.

Areas 3d: These wetland patches are perpetually saturated. To the north, the site is dominated by cattails, which is an indicator species of very saturated conditions. To the south, native grasses, sedges, marsh marigold, skunk cabbage and iris were observed, in addition to reed canary grass.

Reed canary grass suppression could be the main objective within 3d south of Stand 8a. RCG suppression would not only keep the area in native plants, but also protect potential wet-mesic prairie restoration efforts to the north from continued seeding.

Area 3e: 3e is a stretch of ground that rises in elevation and is likely spring fed from the southeast. Centrally is a stretch of large rock, likely an old streambed, draining from the southeast into the Pigeon River. As the surrounding landscape has been developed, the water flow source has been altered.

Large green ash were prevalent but have since succumb to EAB infestation. Other species include white cedar, swamp white oak, basswood and white pine. Hand planting efforts could be conducted within this stretch to reforest open areas. See 3c for species recommendations.



Figure 19: Ground conditions in 3d. To the east the site is dominated by RCG.

MANAGEMENT OBJECTIVE

The stand objective is post-ash loss restoration. Immediate restoration considerations vary depending upon location but transitioning from invasive plants to native vegetative or forest cover is the overall goal.

COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Between the years 2027-2028, remove all trees from wet-mesic prairie restoration areas either via commercial logging equipment or manually. Ideally, remove ash from tree planting areas, if accessible.

NON- COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Area 3a:

Timing	Practice
Fall winter 2026-2027	Cut all brush and young trees throughout restoration unit(s). Fecon mowing may be most effective in areas.
Summers 2027 & 2028	Foliar spray brush re-sprouts, small trees, reed canary grass and other invasive plants
2027-2028	Harvest all trees.
2028 and beyond	Implement re-seeding recommendations.

***This timeline is an assumed timeline for prairie restoration. Work with a prairie professional to develop a plan before implementing step-by-step activities.**

Areas 3b, 3c, 3e:

Timing	Practice
Fall/Winter of 2026/2027	Basal bark, cut stump or fecon mow large buckthorn, box elder saplings & competitive brush.
Summer 2027	Foliar spray buckthorn re-sprouts, reed canary grass and other invasive plants. Hand plant trees in 3c if planting directly into RCG.
Fall/Winter 2027/2028	Salvage all ash.
Summer 2028	Foliar spray buckthorn re-sprouts, reed canary grass and other invasive plants
Spring 2029	Hand plant & cage trees – spot spray invasive plants.
2029 & beyond	Maintain the site to keep trees free from invasive plant competition and deer browse.

Area 3d: Summers of 2027 and 2028 - spray reed canary grass

Stand 4 – Wooded Recreational Area – White pine dominant with associated planted hardwood species.

(PW 15⁺/GG)

White Pine, Large Sawtimber, Good Stocking over Grass

7 Acres

Average Basal Area	Year of Origin	Site Index	Site Index Species	Site Index Tree Height	Dominant Soil Type	Average Diameter	Cords per Acre	Board Feet per Acre
110	1930	68	White Pine	102	7414C2	16	31	15,267

Species	Seedlings (0" – 1" dbh)	Saplings (1" – 5" dbh)	Poletimber (5" – 11" dbh)	Sawtimber (11" + dbh)
White Pine	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	83 ft ² /acre
Sugar Maple	0 ft ² /acre	0 ft ² /acre	3 ft ² /acre	7 ft ² /acre
Norway Maple	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	10 ft ² /acre
Mixed Species	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	14 ft ² /acre
TOTAL:	0 ft²/acre	0 ft²/acre	3 ft²/acre	107 ft²/acre

Stand 4 encompasses a central park area that is heavily wooded. When reviewing Figure 2, an aerial photo of the property from 1937, white pine were planted in this stand. What remains of that original plantation is mostly present in the west half. Large white pine are found throughout this part of the park. Top dieback was noted. Other species throughout this greenspace, most of which were planted, include sugar maple, Norway maple, white cedar, red oak, white birch, mulberry and hackberry.

Norway Maple: Norway maple was introduced from England in the 1700's. They were planted widely as urban trees in the 1970's and 1980's, following Dutch Elm Disease. Norway maples produce heavy seed crops; seedlings are very shade tolerant; and they easily become established in the shady understory of forests. Over time, young Norway maple will shade out native understory plants and decrease native species diversity. In addition, they release allelopathic chemicals that inhibit the growth of other plants.



Figure 20: Norway maple leaves have a milky interior when broken which aids in identification.

Norway maple can be distinguished from sugar maple by their yellow fall color; as opposed to sugar maple turning orange or red. Leaves are larger than sugar maple and if broken off, the sap is thick and white (figure 19). Sugar maple sap is clear.

Norway maple were noted in Stand 1, just south of the parking lot as well as within this stand. Though they are landscape trees, they will invade into Stand 1. With the objective being to regenerate native species within Stand 1, once maple begins to become established in the understory, action may need to be taken to eradicate Norway maple seedlings and encourage native sugar maple. Removing the seed source altogether is recommended.

Future Landscape Plantings: Future landscape plantings should be focused on native tree species that would add diversity to the property. Encouraging southern species to prepare for warming global temperatures is another consideration. If public education were an objective, planting a variety of Wisconsin native species as a sort of arboretum could be an objective. Small native trees including serviceberry, hackberry, Prairie crabapple or American plum would all be optimal wildlife trees. Hazelnut, highbush cranberry, dogwood and ninebark could be shrub options.

High Risk Trees: When the salvage is conducted 2027-2028, assess white pine throughout this stand and consider harvesting those trees with declining crowns. Norway maple could also be cut at this time, if desired.

Brush Strip: North of the parking lot is a strip of brush, being mostly buckthorn, box elder, ash, Norway maple and elm. This strip could be cleared following brush control recommendations listed under Stand 3, then replanted to native species. Fecon mow the area prior to the high-risk tree removal project, then harvest large trees as part of that activity. Follow up with tree and/or shrub plantings.

MANAGEMENT OBJECTIVE

This stand objective is to remove high risk trees for public safety; encourage native tree and shrub species; and discourage invasive plants.

COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Harvest declining white pine and large trees within the brush strip in 2027-2028.

NON-COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Forest Management Timeline:

Timing	Practice
Fall/Winter of 2026/2027	Basal bark, cut stump or fecon mow brush north of the parking lot.
Summer 2027	Foliar spray brush re-sprouts
2027-2028	Harvest large trees from brush strip. Harvest declining white pine and Norway maple.
Summer 2028	Foliar spray brush re-sprouts
Spring 2029	Hand plant trees & protect them from deer browse.
2029 and beyond	Keep this area free of invasive plants. Control competitive brush and it interferes with tree growth. Continue to protect trees from deer browse.

Hand Planting: The density of hand planted trees north of the parking lot is optional. In a plantation setting, 800 (7’X 8’ spacing) to 900 (6’ X 8’ spacing) trees/acre are planted to fully stock the area. A wide variety of upland species could be planted including red oak, white oak, bur oak, shagbark hickory, bitternut hickory, black cherry, basswood, American beech, hackberry, white birch or black walnut.

If black walnut is selected as a tree species to plant, do not plant within proximity to birch or conifers. Black walnut trees produce a chemical called juglone. This chemical is released through the buds, twigs, and roots of the tree and act as a natural herbicide, reducing surrounding competition. Birch and conifers such as cedar, spruce, and pine, are highly susceptible to juglone exposure, and eventually die over time. Crowns of adjacent

conifers tend to yellow and thin, then the tree eventually dies due to juglone exposure. Other shrubs and herbaceous plants are also susceptible to juglone. Walnuts also, once nut production begins, tend to spread to surrounding areas via squirrel distribution very readily.

Stand 5 – Open Grass, Picnic areas, Parking lots								
(GG) Grass and Scattered Landscape Trees								18 Acres

Average Basal Area	Year of Origin	Site Index	Site Index Species	Site Index Tree Height	Dominant Soil Type	Average Diameter	Cords per Acre	Board Feet per Acre
NA	NA	NA	NA	NA	7346B	NA	NA	NA

Stand 5 is the combination of open green space and high use areas. A variety of landscape trees have been planted throughout, but generally these areas are very open and mowed. These open spaces, particularly those directly adjacent to Calumet Drive, offer opportunities to manage for open, native, Wisconsin ecological landscapes. Converting these open areas to native vegetation would require significant up front cost and preparation, but once established, would be less maintenance; provide educational opportunities; provide aesthetic diversity; property diversity; and pollinator habitat.

Oak Opening/Oak Savannah Management: This landscape is characterized as having variable canopy closure ranging from 5% to 60%. Trees are generally short in stature and large in diameter, dominated by oak, and the sites were subject to nearly annual fires. The understory is a rich mix of grasses, sedges and forbs including little bluestem, big bluestem, Canada milkvetch, bastard toadflax, prairie coreopsis, veiny pea, prairie phlox and many others.

In parts of the state where the oak opening/oak savannah habitat type was historically present, most prairie flora has been destroyed by agricultural and pasturing practices. This is one of the rarest plant communities in the Midwest. Parts of this stand could be managed for this community as an option. This is a very long-term objective. If managed as an open oak forest, or oak savannah, the current vegetative structure would need to be entirely transitioned. This will require substantial inputs to cut and remove all current trees, including stump removal to allow for periodic mowing or fire for maintenance. Several years of herbicide application will be required to prepare the site for seeding. Scattered oak would then be planted to create the overstory forest structure and the site would be planted to prairie plants.

Where the oak opening ecological landscape would be managed for, the following action would need to be taken:

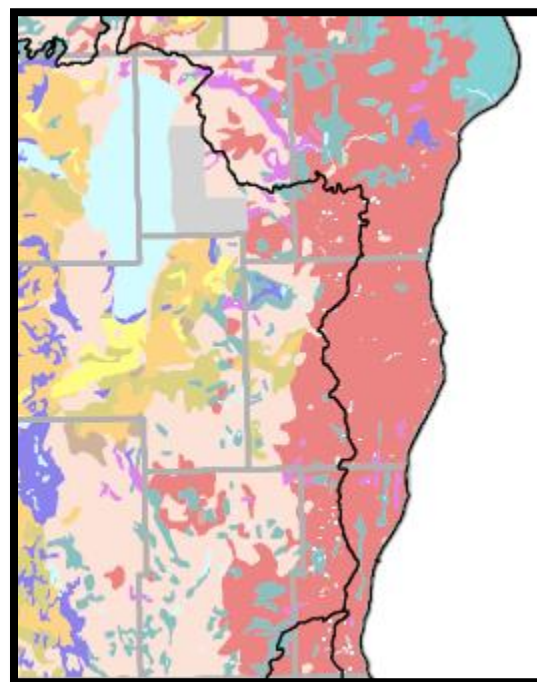


Figure 21: Yellow and orange areas in western Sheboygan County and Fond du Lac County were historically prairie and oak openings.

1. Cut all trees, remove stumps and level.
2. Herbicide the site to kill current vegetative structure.
3. Re-seed to desirable flora and grasses if recommended by a restoration specialist.
4. Plant scattered oak.
5. Maintain the site via burning or periodic mowing.

Prairie Restoration: The loss of pollinator habitat is a concern nationwide. These areas provide property diversity and opportunities for not only pollinators but other wildlife that use grass areas such as songbirds, meadow voles & snakes. This property is within the high potential range for the Rusty Patched Bumblebee (RPBB). This species was listed as endangered in 2017, being the first bee species in North America to be listed as endangered. A series of potential causes to its decline include habitat loss, pesticide use, climate change, and pathogens & diseases introduced from commercial bee rearing. Parts of this stand could be converted to prairie with the intent of providing habitat for pollinators and specifically RPBB.



Figure 22: Rusty Patched Bumblebee

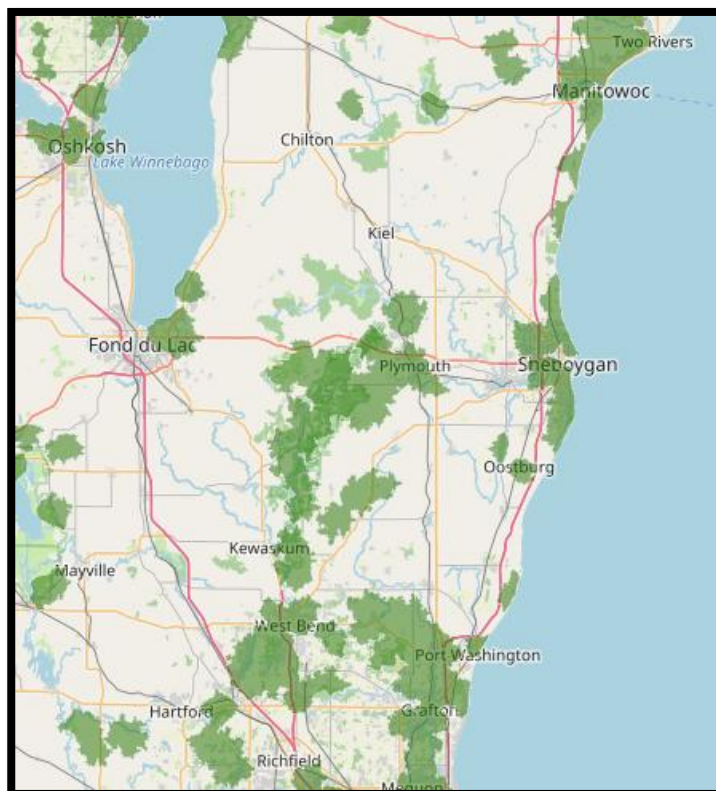


Figure 23: Historical range of RPBB in east-central Wisconsin



Declining White Pine: The southeast corner of the property, at the intersection of Calumet St. and Pine Grove Ave., is open recreational area with large white pine as landscape trees. Many were damaged by recent storms and some were removed. Of the remaining white pine, some crowns are declining and trees may be at risk of mortality in the coming years. When the high-risk tree removal harvest is conducted, review large white pine with thinning crowns for possible removal.

Figure 24: Declining white pine crown. White pine in the background, in the bottom right corner, have healthy crowns for comparison.

MANAGEMENT OBJECTIVE

The stand objective is to convert landscaped areas not actively used by the public to native ecological systems.

NON-COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Invasive Plant Control: The presence of invasive plants on the property is a forest resource concern. Eradicate any invasive plant identified within the stand.

Native Grassland Restoration: Work with a qualified prairie restoration professional to convert open, mowed grassland to native prairie or oak savannah.

Removal of Declining White Pine: Review declining white pine at the time of the high risk tree removal cut.

Stand 6 – Mature Pine Plantation								
(PW (S) 15+ ⁵ /CH 0-5 ²) White Pine & Norway Spruce, Large Sawtimber, Excellent Stocking over Black Cherry, Seedlings, Medium Stocking								2 Acres

Average Basal Area	Year of Origin	Site Index	Site Index Species	Site Index Tree Height	Dominant Soil Type	Average Diameter	Cords per Acre	Board Feet per Acre
190	1945	64	White Pine	102	7030A 7833B	18	77	38,400

Species	Seedlings (0" – 1" dbh)	Saplings (1" – 5" dbh)	Poletimber (5" – 11" dbh)	Sawtimber (11" + dbh)
White Pine	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	80 ft ² /acre
Norway Spruce	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	70 ft ² /acre
Red Pine	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	30 ft ² /acre
Black Cherry	0 ft ² /acre	0 ft ² /acre	0 ft ² /acre	10 ft ² /acre
TOTAL:	0 ft²/acre	0 ft²/acre	0 ft²/acre	190 ft²/acre

Stand 6 is separated from Stand 7, both of which are conifer plantations, as Stand 6 is much older, having been planted in the 1940's. Conifers are large sawtimber in size and evidence of past management was not observed.

Basal area is a measure used by foresters to determine the density of trees being 5" in diameter at chest height and greater. A large diameter white pine or spruce plantation with an average basal area of 190 ft²/acre or higher is considered too thick for optimum growth. The current stand density is at 190 ft²/acre. These plantation patches could be thinned to remove trees showing decline and better space out trees for future growth.

White pine can live to be several hundred years old. Spruce also have longevity, however Norway spruce are non-native to the US and life span can vary from 100-150 years old. Red pine have been found to begin declining as young as 60 years old in the central sands area and should be monitored for continued tree health. If a thinning were conducted, focus on the removal of red pine and spruce over white pine.



Figure 25: Declining HRD pocket in red pine. Lower left corner is an HRD fruiting body on an old stump.

Heterobasidion Root Disease: Heterobasidion Root Disease is a fungal disease that infects conifer trees. HRD is generally introduced via freshly cut stumps when harvesting operations are taking place. The root system of conifers is root grafted below ground and thus all interconnected. HRD spores land on a freshly cut stump and subsequent infection moves through the root system of the trees, killing conifers in a pocket. HRD can stay in the soil for many decades, inhibiting conifers from re-seeding into the stand. Treating freshly cut stumps during harvesting operations is the best way to prevent the introduction and spread of HRD.

HRD has been found in the Kettle Moraine State Forest. If a stand of conifers is being harvested within 25 miles of a known HRD site, it is recommended freshly cut stumps be treated to prevent the introduction of HRD. If future harvesting occurs on this site, review the most up to date information regarding HRD and follow DNR recommendations. Currently, if the stand is cut outside of December 1st – March 31st, it is recommended freshly cut stumps be treated with a fungicide within 24 hours of harvest to prevent the introduction and spread of HRD.

Invasive Plants: Both buckthorn and honeysuckle were noted in the understory. If thinning occurs and the understory is opened to greater amounts of sunlight, invasive plants capitalize on these conditions and spread rapidly. Currently, invasive plant levels are low and eradication within this stand would be very achievable.

MANAGEMENT OBJECTIVE

The primary objective is to manage for longevity as these plantation areas are highly visible by the public. Controlling invasive plants is an additional objective.

COMMERCIAL FOREST MANAGEMENT ACTIVITIES

In the year 2027-2028, complete a light thinning within this stand. Reduce stocking to between 150-160 ft²/acre. Remove red pine and spruce over white pine.

Review the most up to date Heterobasidion Root Disease standards at the time of harvest and take protective measures via harvest timing or fungicide application if recommended.

NON- COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Invasive Plant Control: The presence of invasive plants throughout this stand is a forest resource concern. Invasive plants respond aggressively to increased sunlight conditions to the forest floor. Active forest management will create ideal conditions for the seeding of invasive plants. Treat all invasive plants as they occur within the stand.

Stand 7 –Pine & Spruce Plantation								
(S 9-15 ⁴ /PW 9-15 ² /S 5-9 ²) Spruce, Small Sawtimber, Very Good Stocking over White Pine, Small Sawtimber, Medium Stocking over Spruce, Poletimber, Medium Stocking								14 Acres

Average Basal Area	Year of Origin	Site Index	Site Index Species	Site Index Tree Height	Dominant Soil Type	Average Diameter	Cords per Acre	Board Feet per Acre
166	1976	80	White Pine	89	7594A, 7726C2	12	40	10,255

Species	Seedlings (0" – 1" dbh)	Saplings (1" – 5" dbh)	Poletimber (5" – 11" dbh)	Sawtimber (11" + dbh)
Norway Spruce	0 ft ² /acre	0 ft ² /acre	31 ft ² /acre	47 ft ² /acre
White Pine	0 ft ² /acre	0 ft ² /acre	14 ft ² /acre	42 ft ² /acre
Red Pine	0 ft ² /acre	0 ft ² /acre	6 ft ² /acre	24 ft ² /acre
Elm	0 ft ² /acre	0 ft ² /acre	1 ft ² /acre	1 ft ² /acre
TOTAL:	0 ft²/acre	0 ft²/acre	52 ft²/acre	114 ft²/acre

Stand 7 is in the southwest corner of the property and was planted in the 1970's. Ground conditions are elevated to the south and east, and marginal to the north and west. Tree survival was dependent upon local drainage, with wet stretches of ground having greater plantation mortality. As a result, average stocking numbers are not representative of on-the-ground stocking throughout.

Norway spruce is the dominant tree species, being about 50% of the total overstory species composition. Other planted conifers include white pine and red pine. A drainage creek originating from the subdivision to the south flows through the east end of the stand and empties into 3d to the north.



Figure 26: Example of an overstocked, unmanaged red pine plantation.

Unmanaged Conifer Plantations: When planting a well-stocked conifer plantation (800-900 trees/acre) on a suitable site, with a good survival rate, the plantation should be ready for a first thinning around the age of 20-25 years old. At this point trees have become commercially marketable and competition is becoming intense. Subsequent thinning is then conducted about every 10-12 years thereafter until the trees start becoming more mature and growth rates slow. Tree growth tends to slow around 60-70 years old and at this point thinning entries are not as frequent.

When a stand of conifers is not thinned at regular intervals, the trees will continue to grow tall to capture sunlight, but size of the crown is generally small due to severe surrounding competition. Because of the lack of crown, the tree does not increase in diameter to compensate for height resulting in a tall, narrow bole. Trees become independently fragile and dependent upon one another for stability. When thinning in these overstocked stands, the first thinning is light to allow equipment passage but retain a high density of trees so as maintain the benefit of surrounding tree dependency, but to also thin lightly and give the residual trees the ability to respond to decreased competition; expand crowns; and increase diameter growth. The stand is then entered for a next thinning in a shorter duration of time and once again thinned lightly. Over time, diameter and crown growth can be obtained to produce a healthy stand of vigorously growing trees. If the stand is overthinned, remaining trees are subject to breakage from wind exposure and snow weight. Some stands have been so overstocked for so long that liquidation and transition is the best option.

When considering this plantation is 55 years old (at the time of drafting this plan in 2026), it should've been thinned at least 3 times at this point. A mixed white pine and spruce plantation with an average diameter of 12" is ready for thinning when stocking is at 160-170 ft²/acre. Current average tree stocking is 166 ft²/acre, however, within patches of trees where seedling survival was excellent, stocking levels are as high as 270-300 ft²/acre. This is very overstocked and falls into the category of the condition described above, whereby these areas are generally thinned very lightly to begin with to decrease surrounding competition, but to also maintain dense stocking for individual tree stability.

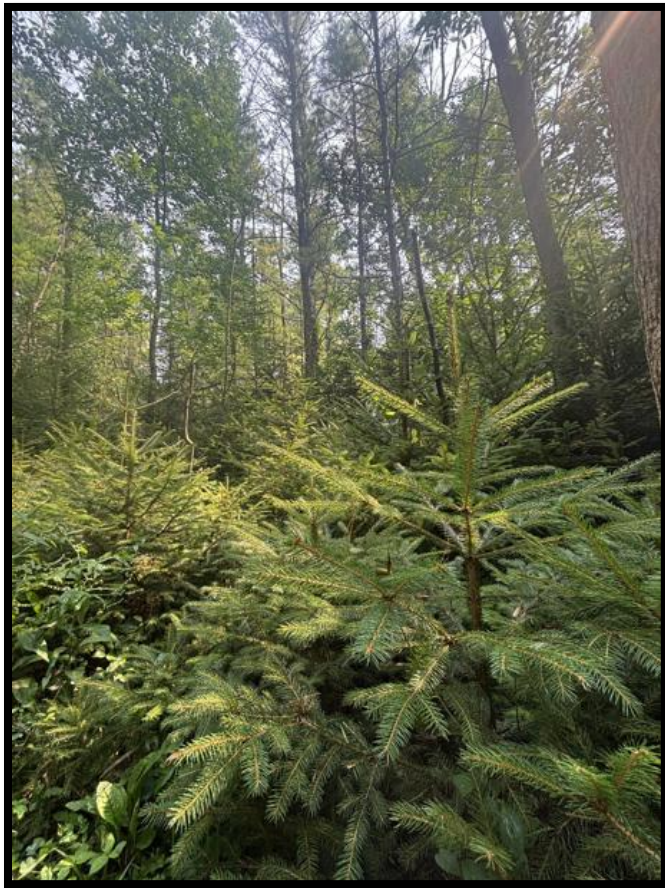


Figure 27: Spruce seedlings filling into the understory in area 7a.

The first thinning in a conifer plantation is a row thinning which removes every 3rd or 4th row of trees to allow equipment passage. Subsequent thinning then uses these access lanes for passage. Remaining rows are thinned to remove small diameter, poorly formed, and diseased trees; along with some better-quality trees to further reduce stocking. This stand would greatly benefit from a first thinning when the hazard/salvage tree harvest is conducted, however access is very poor and so many trees would be cut for thinning purposes, that removal of cut material would be necessary. The small drainage creek cuts off the main body of Stand 7 from potential access from Stand 2 and the parking lot of Camp Evergreen. This operation would require a second piece of equipment and an area to stack cut material near or on Camp Evergreen, where a log truck can access the pile and haul material away. The logistics of this operation may or may not be possible given the location of this property within a subdivision.

Understocked Areas: Between patches of dense trees are stretches of ground that are understocked, located on both high and low ground. Just east of the drainage, 7a is an area that was once dominated by ash with some planted white pine intermixed. Ash have died due to EAB infestation and the area is now open and has filled in with an abundance of buckthorn in addition to Japanese barberry. On a positive note, spruce seedlings

and saplings are also becoming established in areas (see Figure 26). Spruce is a shade tolerant species that is resistant to deer browse and seeds into surrounding areas as seed trees mature. Mountain bike trails run through this section.

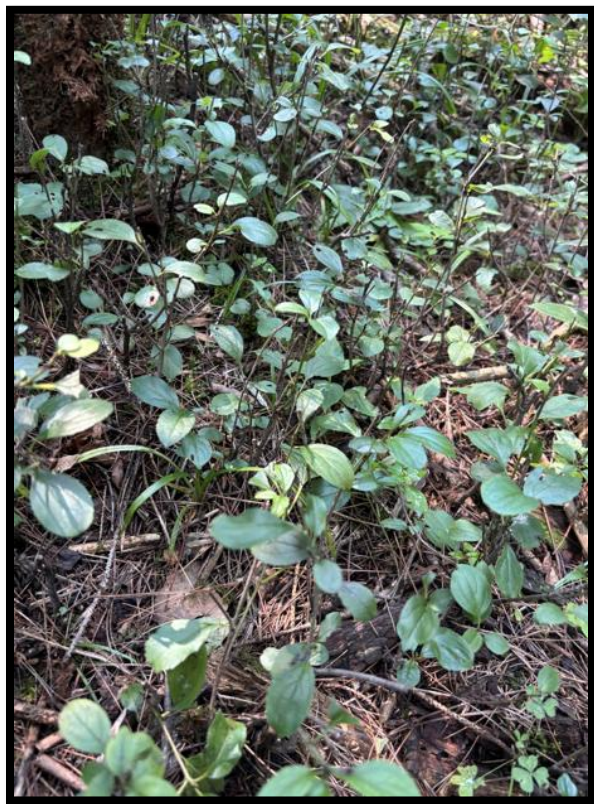


Figure 28: Dense buckthorn in 7a.

White pine blister rust: Blister rust is a rust fungus that causes mortality in white pine. Blister rust can appear as weeping, sunken, blackened areas of the tree trunk. It can also be identified on individual tree branches via needle yellowing and bark blistering. Factors that can lead to higher rates of loss to blister rust include a.) Sites where white pine is planted close to *Ribes* (gooseberries) as this is a host plant to the blister rust fungus. b.) Planting white pine in cooler areas where moist air collects and enhances lasting dew formation such as kettle holes or depressions. C.) Northern aspects of a hill or near pond/water edges.

Heterobasidion Root Disease: Heterobasidion Root Disease is a fungal disease that infects conifer trees. HRD is generally introduced via freshly cut stumps when harvesting operations are taking place. The root system of conifers is root grafted below ground and thus all interconnected. HRD spores land

Ash could be salvaged from this unit and invasive plants addressed to release established spruce seedlings and saplings. In addition, clearing out invasive plants may encourage additional seeding of spruce.

Along the west side of Stand 7, spruce were planted running north to south. Long stretches of ground were likely too wet for planted trees and mortality occurred, resulting in open grown conditions with abundant reed canary grass in the understory. Large autumn olive were noted throughout this stretch that should be treated. If desired, hand planting of native, wet site adapted species such as swamp white oak, silver maple, tamarack, white birch, and others mentioned under Stand 3 could be planted in open areas to better stock the stand and shade out reed canary grass.



Figure 29: Blister rust appears as dark, sunken, weeping areas on the bole of the tree.

on

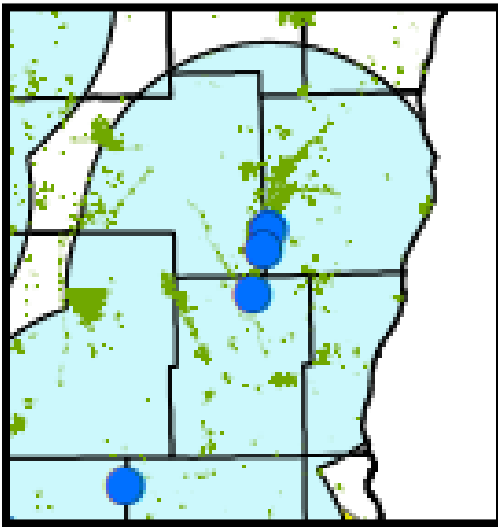


Figure 30: Known HRD sites as of 2021.

a freshly cut stump and subsequent infection moves through the root system of the trees, killing conifers in a pocket. HRD can stay in the soil for many decades, inhibiting conifers from re-seeding into the stand. Treating freshly cut stumps during harvesting operations is the best way to prevent the introduction and spread of HRD.

HRD has been detected in Sheboygan County. If this stand were harvested, it is recommended that the most up to date information regarding HRD be reviewed to determine whether this fungus could be a threat to this stand. If so, if the stand is cut outside of December 1st – March 31st, it is recommended freshly cut stumps be treated with a fungicide within 24 hours of harvest to prevent the introduction and spread of HRD.

Invasive Plants: Invasive plants noted throughout this stand include buckthorn, Japanese barberry, autumn olive, multi-flora rose, reed canary grass and garlic mustard. Treating all invasive shrubs is recommended to prevent further spread to other parts of the property. Garlic mustard treatment is an option.

MANAGEMENT OBJECTIVE

Recommendations for this stand focus on overall forest health. Intermediate thinning would benefit the growth and longevity of surrounding trees, and remove those anticipated to eventually die due to prolonged suppression. This stand is the most infested part of the property as far as invasive plants and is a hub for reseedling to other areas.

COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Between the years 2027-2028, complete a row thinning to reduce stocking by no more than 1/3. Harvest every third or fourth row of trees to allow equipment access. Remove small diameter, suppressed, poorly formed and blister rust infected trees within remaining rows. Remove dead ash.

In the years 2040, complete an additional thinning. This thinning would be an individually marked tree removal to cut small diameter, suppressed, poorly formed and blister rust infected trees. Better quality trees would be marked to improve spacing if additional stocking reduction is needed once obviously inferior trees have been removed. Harvest no more than 1/3 of stocking.

Review the most up to date Heterobasidion Root Disease standards at the time of harvest and take protective measures via harvest timing or fungicide application if recommended.

NON- COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Area 7a Management & Thinning site preparation:

Timing	Practice
Fall/Winter of 2026/2027	Basal bark, cut stump or fecon mow large buckthorn, Japanese barberry and other invasive plants in the understory.
Summer 2027	Foliar spray brush re-sprouts in 7a and elsewhere if needed.
2027-2028	Harvest all ash from 7a. Thin dense conifer patches if logistically possible
Spring 2028 and beyond	Continue to suppress invasive plants. Plant wet site adapted, native tree seedlings in open reed canary grass areas. A weed barrier or herbicide application will be required to suppress RCG in addition to individual tree caging. Plant upland species in 7a if desired.

Invasive Plant Control: The presence of invasive plants throughout this stand is a forest resource concern. Invasive plants respond aggressively to increased sunlight conditions to the forest floor. Active forest management will create ideal conditions for the seeding of invasive plants. Treat all invasive plants as they occur within the stand.

Stand 8 –Poorly stocked conifers on marginal ground.

(S 9-15²/S 5-9¹)

Spruce, Small Sawtimber, Medium Stocking over Spruce, Poletimber, Poor Stocking

5 Acres

Average Basal Area	Year of Origin	Site Index	Site Index Species	Site Index Tree Height	Dominant Soil Type	Average Diameter	Cords per Acre	Board Feet per Acre
60	1976	80	White Pine	89	ALW	10	13	3275

Species	Seedlings (0" – 1" dbh)	Saplings (1" – 5" dbh)	Poletimber (5" – 11" dbh)	Sawtimber (11" + dbh)
Norway Spruce	0 ft ² /acre	0 ft ² /acre	22 ft ² /acre	35 ft ² /acre
White Pine	0 ft ² /acre	0 ft ² /acre	3 ft ² /acre	0 ft ² /acre
TOTAL:	0 ft²/acre	0 ft²/acre	25 ft²/acre	35 ft²/acre

Stand 8 is in two separate areas being north and south of the Pigeon River on the west side of the property. Spruce and white pine were planted throughout, and ash naturally grew amongst planted trees, overtopping conifers in many areas as ash are better adapted to the site. All ash has since died and remaining conifers are poor quality, where formerly overtopped by ash, and sparse.

Management Recommendations: Most of this stand is located on ‘Alluvial’ land, meaning it’s within the floodplain of the Pigeon River. Ground conditions are not perpetually saturated but are generally wet. Acreage covered under this stand would be better adapted to supporting either native tree species that grow in alluvial plains or converted to a wet-mesic prairie. Area 3c has recommendations for transition to wet-mesic prairie. 8a is centrally located between 3c and 3d and would be a naturally obvious area to convert. Area 8b is also directly adjacent to 3c and combining the two into one management unit would make logistical sense, however, this conversion would be very labor intensive.

Conversion to wet-mesic prairie: Recommendations for conversion to wet-mesic prairie can be found under Stand 3. Ecological restoration would involve treating invasive plants; the removal of all trees within restoration areas; stump removal; intensive brush and vegetative control; then re-seeding to native prairie plants.

Tree/Shrub Planting: If encouraging native, floodplain adapted tree species is the objective, invasive shrub treatment would be needed, followed by hand planting, then protection of trees from deer browse. Swamp white oak, silver maple, red maple, hackberry, river birch, white birch, tamarack, cottonwood, willow and sycamore would all be good options.

Invasive Plants: Very large honeysuckle are present throughout the west half of 8a. Buckthorn, reed canary grass and garlic mustard are present throughout. Treating all invasive shrubs is recommended to prevent further spread to other parts of the property. Garlic mustard treatment is an option.

MANAGEMENT OBJECTIVE

Conversion to native, site adapted vegetation is the objective for this stand. Whether implemented management is geared toward prairie or tree growth, invasive shrub treatment should be a targeted objective.

COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Between the years 2027-2028, harvest all trees throughout the stand if conversion to prairie is the objective.

NON- COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Wet-Mesic Prairie Restoration:

Timing	Practice
Fall/Winter of 2026/2027	Basal bark, cut stump or fecon mow large honeysuckle and other large brush. .
Summer 2027	Foliar spray brush re-sprouts, reed canary grass and other invasive plants
2027-2028	Cut all trees.
Summer 2028	Foliar spray brush re-sprouts, reed canary grass and other invasive plants
Summer 2028 and beyond	Work with a qualified prairie restoration professional to re-seed the site to native plants.

Tree Planting:

Timing	Practice
Fall/Winter of 2026/2027	Basal bark, cut stump or fecon mow large honeysuckle and other large brush. .
Summers 2027 - 2028	Foliar spray brush re-sprouts, reed canary grass and other invasive plants
2027-2028	Cut high risk trees.
Spring 2028 or 2029	Following the high-risk tree removal, plant trees. A weed barrier or herbicide application will be required to suppress RCG in addition to individual tree caging.
2029 & beyond	Maintain the site to keep trees free from invasive plant competition and deer browse.

Invasive Plant Control: The presence of invasive plants throughout this stand is a forest resource concern. Treat all invasive plants as they occur within the stand.

Land Management Summary – Evergreen Park

Evergreen Park offers a unique natural experience right in the heart of Sheboygan. Parks and green spaces provide opportunities to the public to improve physical health, mental well-being, community connection and local environmental quality. Considering city parks may be the only exposure some community members have to a large natural area; parks can also act as a forum for public education and awareness where exposure elsewhere is unlikely.

Evergreen Park is very diverse. Each stand has a unique history, make up, and future potential. Management practices outlined within this plan are numerous and variable in required inputs, both monetary and physical. These inputs are the limiting factors to how much the City of Sheboygan can do within the Park. The opportunity for public education and awareness is expansive and could trigger interest and possibly volunteer opportunities and/or donations to assist in accomplishing some of the many objectives outlined within this plan. The following are a few ideas to increase public awareness:

- Dead and declining ash are a common sight in southeast Wisconsin, and it seems public awareness is high regarding Emerald Ash Borer (EAB). An interpretive sign in Stand 3 could highlight the compounded impact of ash loss. Reed canary grass, another invasive plant, has taken over wetland areas that were once forested and is inhibiting forest regeneration. RCG also chokes out wetland plants decreasing ground cover diversity; impacting rainwater runoff into the Pigeon River; and ceasing the natural evolution of the forest ecosystem. Trees are natural straws and the process of evapotranspiration has been disrupted, causing water levels in watersheds to rise, changing wetland vegetation.
- Japanese knotweed is a very destructive invasive plant and considering the location of the patch right along a trail, could be another opportunity for an interpretive sign, identifying why eradication of this plant is so important. Other plants noted throughout the property could also be highlighted.
- A small deer ex-closure in Stand 1 could demonstrate the impact the local deer herd is having on forest ecology. Public involvement via donations and volunteer opportunities could increase the abundance of ex-closures throughout Stand 1 where impacted by the storm, repopulating the forest with natural re-growth and improving forest health for future generations. These ex-closures are only temporary and having ex-closures erected over time to show short term and long-term impact would be an ideal visual.
- A small prairie restoration project could highlight the decline of the Rusty Patched Bumblebee and how Evergreen Park is within its historical natural range.

Immediate management activities likely to occur include storm damage debris clean-up along trails; tree planting within Stand 3; teasel eradication within Stand 3; and Japanese knotweed eradication within Stand 1. Though the storms that swept through this property may have had devastating effects, these events did generate public awareness and concern; and resulted in the development of this management plan. Perhaps this management plan and the activities to follow could act as an additional catalyst to public awareness and further land management action.

ACTIVITIES SUMMARY

SCHEDULED COMMERCIAL FOREST MANAGEMENT ACTIVITIES			
Stand #	Silvicultural Application	Acres Treated	Year of Practice
All	Hazard Tree Removal	75	2027 - 2028
3	Remove ash in prairie restoration and tree planting areas.	20	2027 - 2028
4, 5	Harvest declining white pine & Norway maple.	1+	2027 - 2028
6, 7	Intermediate Thinning	16	2027 - 2028
8	Harvest all merchantable trees if wet-mesic prairie conversion is an objective	5	2027-2028
1	Harvest trees within a second deer ex-closure unit.	2+	2035
2	Harvest trees within a group selection unit and/or regeneration the second aspen patch.	2+	2035
7	Intermediate Thinning	14	2040
1	Harvest trees within a third deer ex-closure unit.	2+	2040
1	Conduct an oak regeneration harvest.	2	2053

SCHEDULED NON-COMMERCIAL FOREST MANAGEMENT ACTIVITIES

Stand #	Management Activity	Acres Treated	Year of Practice
1	Identify boundaries of deer ex-closure fencing. Control brush, invasive plants, and ash seedlings. Conduct hazard tree removal cut.	2+	2026-2028
1	Work to eradicate Japanese knotweed. Treat minor infestation, at a minimum, within 50' of the trail system.	1	2026+
3, 8	Site preparation for future restoration efforts. Fecon mow, brush and RCG spraying and tree harvesting.	25	2026-2028
4	Fecon mow brush strip north of parking lot	1	2026-2027
7	Fecon mow 7a. Spray re-sprouts in the summers of 2027 & 2028. Address scattered plants throughout Stand 7.	14	2026-2028
3c, 8	After high risk tree removal cut, hand plant trees. If planting directly into RCG install a weed barrier being at least 6' in diameter or spray RCG around planted trees. Cage trees.	8	2028+
3a, 3c, 8	Seed Prairie	7+	2028+
7	Plant wet site adapted trees to open wet areas.	2+	2028+
4	Summer 2027&2028: Spray undesirable vegetation. Cut large trees. 2029: Plant native trees and/or shrubs.	1	2027-2029
5	Conversion of open grassland to pollinator habitat.	4	2027-2029
1	Install and maintain deer ex-closure fence. Control invasive plants as they emerge within the ex-closure. Hand plant trees if desired.	2+	2028 and beyond
3c, 3b	Plant and cage trees.	2	2029
1	Begin site preparation recommendations to install a second deer ex-closure unit.	2+	2033-2035
2	Begin site preparation recommendations to complete a group selection cut and/or regenerate the southern aspen clone, if desired.	2	2033-2035

ALL STANDS – GENERAL INFORMATION & RECOMMENDATIONS

Assistance & Responsibilities

1. Forestry professionals, private, State and Federal, are available to assist in the implementation or establishment of forest stewardship practices outlined in your plan. It is highly recommended that landowners seek the assistance of a professional forester before cutting any harvestable timber, both to assure that the timber is cut within sound management guidelines and to protect the landowner's financial interests.
2. Property lines should be marked and regularly maintained.
3. Follow Wisconsin's Forestry Best Management Practices (BMP's) when conducting forest management operations within wetlands and along streams and rivers to prevent soil erosion and maintain water quality.

Wildlife, Roads & Trails

1. Developing and maintaining access roads and trails is encouraged for forest management operations and various recreational uses. This property has a trail system throughout, though it has not been maintained in recent years.
2. Level, smooth, reshape, contour, mulch, and seed log landings, roads, turnouts, and trails with a mix of clover and grasses that will benefit wildlife species and help stabilize soil surfaces. Mow these areas every 3-5 years to maintain the grass component and discourage encroachment by woody vegetation.



3. Dead, down and obviously defective trees may be used for firewood. Two to four snag (dead) and live den (hollow) type trees per acre should be left throughout the stand for use by wildlife.
4. Woody debris can be used to construct brush piles for use as wildlife shelters.



5. Existing large diameter woody debris on the ground could be retained for wildlife to use as nesting, shelter, food storage, drumming, sunning, and preening sites.

Wildfire Prevention and Planning: Every year in Wisconsin, thousands of wildfires occur, destroying dozens of structures and threatening to burn hundreds more. An increasing number of people living and recreating in Wisconsin's wildland-urban interface is creating a growing need for fire prevention and planning for fires that will inevitably occur.

Because of their proximity to forested lands, there is the potential for homes and property to be at significant risk of damage or destruction in the event of a wildfire. As part of the landscape planning process, it is important to determine the level of danger to properties and learn how to mitigate those dangers.

You can take action to reduce the exposure of your home or property to fire. Use fire resistant building materials, incorporate fuel breaks into the landscape, and know the local burning restrictions.

For more information on fire danger and burning permit restrictions, go to dnr.wisconsin.gov and search 'Fire'. For more information on making your home and property more survivable in the event of a wildfire, go to dnr.wisconsin.gov and search 'Firewise'.

Forest Carbon: Forests are a significant piece of the global carbon cycle because of their ability to absorb and sequester carbon dioxide. Learn how your forest adds to the global carbon balance and be aware of the rules affecting your participation in forest carbon markets. For more information, visit the US Forest Service website: www.na.fs.fed.us/ecosystemservices/carbon/.