FORESTRY STEWARDSHIP PLAN

Name(s) and Address of Landowner(s):

Town of St. Germain
PO Box 7
St. Germain, WI 54558

County: **Vilas** Town Name: **St. Germain**

Township: **40N**; Range **7E**; Section(s) **24 & 25**
Township: **40N**; Range **8E**; Section(s) **15 & 28**

Total Plan Acreage: **341**

Attached maps show the location of Forest Lands.

Landowner Objectives for Management of the Enrolled Lands:

The Town of St. Germain's primary objective is to manage for public recreational opportunities, while maintaining a healthy forest for wildlife habitat and ecological purposes.

The following pages include descriptions of related vegetative or physical areas called "stands." Recommended forestry practices are listed. Landowners are encouraged to actively complete the practices recommended. The plan may be revised with consent of both the landowner and the Department.

"Forest Stewardship" means managing the forest environment for all of its resources. Good forest stewardship begins with YOU, the owner. YOU can realize your forest land as a source of personal enjoyment, invest in your forest as a source of potential income and leave a legacy for future generations. This management plan is a first step toward meeting your objectives for your land.

Key to Forest Cover Type Symbols

Productive

A	Aspen
BH	Bottomland Hardwoods
BW	White Birch
C	Cedar
CH	Central Hardwoods, Locust
FB	Balsam Fir
H	Hemlock
MC	Miscellaneous Conifers
MD	Miscellaneous Deciduous
MR	Red Maple
NH	Northern Hardwoods
O	Oak
OX	Scrub Oak
PJ	Jack Pine
PR	Red Pine, Scots Pine
PW	White Pine
SB	Black Spruce
SH	Swamp Hardwood
SW	White Spruce
T	Tamarack
W	Black Walnut

Non-Productive or Non-Forest

F	Farmland/Cropland
FG	Grazed Pasture
G	Grass
GG	Non-native Grasses
GH	Herbaceous vegetation
GLS	Low growing shrubs
GP	Native/Prairie Grasses
I	Developed or Residential
IA	Parking Area
ICG	Campground
IP	Day Use or Picnic Area
ITH	Hiking or Nature Trail
ITM	Motorized Vehicle Trail
ITS	Snowmobile or Horse Trail
K	Keg or Marsh
KB	Muskeg or Bog
KEV	Emergent Vegetation
KG	Lowland Grass
KH	Lowland Herbaceous Vegetation
L	Lake or Pond
LB	Lowland Brush
LBA	Tag Alder
LBB	Bog Birch
LBD	Red Dogwood
LBW	Shrub Willow
LM	Minor Lake
LMS	Minor Stream
LMS	Minor Stream
O/	Other Ownership
R	Recreational
ROW	Right of Way
X	Non-Productive (prefix)
UB	Upland Brush
Z	Excluded from Management (prefix)

Key to Size Classes in DBH (Diameter in inches at Breast Height)

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

Key to Stocking Levels (shown by superscripts after the size class)

Symbol	Density (Basal Area or Trees Per Acre)		
	Pole timber and Sawtimber	**Seedlings**	**Saplings**
1	10-30 ft^2 / acre	200-600 stems / acre	100-300 stems / acre
2	31-70 ft^2 / acre	601-1500 stems / acre	301-900 stems / acre
3	71-110 ft^2 / acre	1501+ stems / acre	901+ stems / acre
4	110-150 ft^2 / acre		
5	150+ ft^2 / acre		

General Property Overview

This property is located in south-central Vilas County in the Town of St. Germain. There are two distinct parcels – one in Section 15 on Highway 155 that contains 75 acres, and one in Section 28 near the intersection of Highway 70 and Highway 155 that contains approximately 266 acres.

A large portion of the Section 28 parcel (231 acres) was acquired in 2014 with the help of a Knowles-Nelson Stewardship Grant. As a condition of this grant, activities conducted on this parcel must protect, enhance, and restore wildlife habitat and natural communities, as well as enhance outdoor recreation opportunities.

Approximately half of the Section 15 parcel (37 acres) was purchased by the Town in 2017 from the Wisconsin Department of Natural Resources. As a condition of the purchase, this parcel must be open to the public in perpetuity for fishing, hunting, trapping, hiking, and cross-country skiing.

Nearby properties consist of primarily residential, municipal, business, and forested lands. Soils are primarily sands and sandy loams with a moderate potential productivity for tree growth.

The property supports many important habitat requirements for a wide variety of wildlife species due to its location near highly-developed areas and near water sources like Big St. Germain Lake, Lake Content, Lost Lake, and Found Lake. Because these parcels are a part of large wooded areas in close proximity to highly developed areas, many wildlife species rely on the parcels for habitat. Large, contiguous tracts of forest are increasingly important in Wisconsin and in other areas across the country as urban areas expand and forested areas are fragmented and developed.

Recreational use of the area is moderate to high. Snowmobile and ATV trails bisect both parcels and both have trail systems which have been established on the parcels for hiking, cross-country skiing, and snowshoeing. The Fern Ridge property also has established mountain biking trails.

This property was inventoried between June 2017 and June 2019. The parcels were classified into seven stands. A "stand" is an area with similar timber conditions that is useful to describe and manage the area. The details of the current vegetation and the management recommendations are found under the stand headings.

Northern Highland Ecological Landscape

All parcels lie primarily within the Northern Highland Ecological Landscape, which is characterized by expansive forests and peatlands with pitted outwash plains and kettle lakes. Management opportunities include protecting kettle lakes, increasing red and white pine components, and the protection of the hemlock-hardwood forest.

The purpose of providing this landscape region information is to help assemble a picture of how this land and proposed activities fit into the larger landscape. The actual boundaries of the landscape are not as sharp as the lines might imply. In fact, there can be islands of one landscape region inside another. There are basic ecological differences, however, between the units. More details on this and other ecological landscapes can be found on the DNR Website at http://dnr.wi.gov, keyword ‘Ecological Landscapes’.

Threatened and Endangered Species

Natural Heritage Inventory (NHI) searches determine if this plan may affect endangered, threatened, or special concern animals, plants, or plant communities. To learn about rare plants, animals, and natural plant communities in Wisconsin visit http://dnr.wi.gov and search 'NHI'.

The NHI database review lists fourteen elemental occurrences on or near the property – ***a federally protected bird, a state special concern migratory bird, three state special concern plants, a protected state special concern mussel, a state special concern caddisfly, a state threatened reptile, and five natural communities***. Mitigation measures might be necessary to protect these occurrences during management activities.

The lack of other endangered and threatened species on the property today does not mean that they do not exist, however. These resources may migrate onto the property or be visible on future site visits. Should this occur, changes to this management plan might be needed to enhance and protect their habitat.

Archaeological and Historical Resources

State Historical Society records searches determine if this plan may affect archaeological and historical sites. These sites require protection from disturbance, including road building, grading, or gravelling. Contact a local WDNR Forester for additional information on archaeological and historical sites.

The Archaeological and Historical Resources Inventory lists no archaeological or historical resources within this property.

Invasive Plant Species

Invasive plants may decrease the productivity, regeneration, wildlife habitat, and recreational value of the property. It is essential to identify and control small populations of invasive plants to minimize their spread. The individual stand descriptions list any invasive plant species identified on this property. For information on invasive plant control, consult the Wisconsin Council on Forestry's *Forestry Best Management Practices (BMPs) for Invasive Species*, or go to http://dnr.wi.gov and search 'Forest Management' to review all BMPs for invasive species.

Best Management Practices (BMPs) for Water Quality

To protect the water quality in Wisconsin's lakes, streams, and wetlands and to prevent soil erosion, implement *Wisconsin's Forestry Best Management Practices for Water Quality* during all forest management activities, such as road building or timber harvesting. Water regulations permits to cross wetlands and streams may be required. Please go to http://dnr.wi.gov and search 'Forest Management' to review all BMPs for water quality.

Forest Health

Over time, this forest may suffer from insects, disease, windstorm, fire, flooding, or drought, etc. These problems may alter proposed management prescriptions. If there are concerns about forest health, please contact a local WDNR Forester or go to http://dnr.wi.gov and search 'Forest Health'.

Oak Wilt

Oak wilt is a deadly fungal disease that affects oak trees. The fungus that causes oak wilt is introduced into an area by sap-feeding beetles that carry oak wilt spores to fresh wounds on trees. Once established in the area, oak wilt can spread from tree to tree through interconnected (grafted) root systems. Many of the areas described in this management plan are either classified as oak stands or contain significant amounts of oak.

Implementing oak wilt restrictions when harvesting is *strongly recommended*. Harvesting during the highest-risk time period of April 15 to July 15 should *not* be permitted to reduce the risk of introducing oak wilt into these parcels. For more information, please contact a local WDNR Forester or go to http://dnr.wi.gov and search 'Oak Wilt'.

STAND #1: O 15+[3] / NH 5-11[1] / FB 0-5[2]

Red Oak Sawtimber with Northern Hardwood Poletimber and Balsam Fir Seedlings and Saplings

Stand Acres: 55

Stand Description:

This stand comprises the vast majority of the Section 15 parcel and is dominated by oak and a mixture of trees referred to as “northern hardwoods” – sugar maple, red maple, yellow birch, white birch, and hemlock. White pine can also be found scattered throughout this stand, as well as a couple small pockets of big-tooth aspen in the southwestern portion of the stand. Most the trees are sawtimber-sized, but some sugar maple and red maple poletimber trees are also present in the stand. Regeneration consists of scattered balsam fir seedlings and saplings that range from 1 to 6 feet in height. The overstory oak trees are approximately 80 to 90 years old.

The current density of trees 5 inches in diameter and greater averages 101 ft^2 of basal area per acre. Basal area is the cross-sectional area of a tree stem at breast height (4-1/2 feet above the ground). It is an integrated expression of numbers of trees and their sizes and is used to quantify the density of the forest. The optimum density for an oak/northern hardwood stand such as this is between 80-120 ft^2 of basal area per acre, and depends on the size of the trees.

Two invasive plant species – Canada Thistle and Spotted Knapweed – were observed during the site visits. These species were predominately found on old woods roads and trails, especially near the brush dump site in the eastern portion of the stand. Soils are classified as Padus sandy loams (PaB, PaC, PaD) and Sayner-Rubicon complex (SaD). Topography is rolling to steep – especially in western portions of the stand.

The western part of this stand was part of a parcel that the Town of St. Germain acquired in 2017 from the Wisconsin Department of Natural Resources (WDNR). While under WDNR ownership, this part of the stand underwent a harvest in 2005 that removed poor-quality, defective trees to create better growing conditions for the remaining trees in the stand.

Habitat Type: AVVb – Acer saccharum/Vaccinium angustifolium-Viburnum acerifolium (Sugar maple/Blueberry-Maple-leaved viburnum)

Historically, stands in these habitat types were dominated by red and white pine in the pre-logging era. In the absence of forest management or other disturbances (e.g. wind events, fires), this stand will likely become dominated by sugar maple, red maple, and balsam fir. Red oak and white pine are also potential associates, but not as common in stands like these. Soil conditions will marginally support sugar maple, but growth and yield of sugar maple is typically suboptimal.

Stand Objective:

The objective for this stand is to maintain the oak cover type and manage for forest health while improving or enhancing wildlife habitat.

Maintaining oak on the landscape is especially important for wildlife. Many species of wildlife including deer, turkey, small mammals, songbirds, and raptors utilize oak for food and habitat. Deer and turkeys consume acorns for food, and small mammals, songbirds, and raptors use trees for nesting and roosting. While alive, oak trees benefit wildlife by providing vertical structure and, as they decline and begin to die out, will eventually become snag trees used by a plethora of birds and small animals.

STAND #1: O 15+[3] / NH 5-11[1] / FB 0-5[2] (continued)

Recommended Practices:

Completion Date	*Activity*
	In order to maintain oak in this stand, a **two-stage oak regeneration harvest should be implemented when the stand reaches 110-120 years old.** The following practice will help to maintain a similar oak and northern hardwood composition to what is currently found in the stand.
2043	**Shelterwood Regeneration Harvest – Seeding Cut**. Based on tree ages and expected growth rates, **this stand should undergo the first stage of a regeneration harvest in 2043.** Harvest all trees greater than 1-inch in diameter except those needed to regenerate the stand. Retain approximately 40% crown closure of desirable trees (primarily oak, but can include a few yellow birch or white pine too) that are well-spaced and vigorous with large crowns to produce seed to reforest the stand. If possible, implement a fall harvest coinciding with a good acorn crop. It may be necessary to scarify the site to expose enough mineral soil to create a good seedbed for the acorns to germinate. This can sometimes be done with harvesting equipment, but often other equipment (like an anchor chain or root rake) is needed in order to effectively expose mineral soil.
2046	**Shelterwood Regeneration Harvest – Overstory Removal.** Once adequate oak regeneration becomes established (usually after about 3-5 years), remove the remainder of the overstory trees in the stand to allow enough sunlight to reach the seedlings and saplings on the forest floor. Feel free to retain a few larger oak or pine – either widely scattered throughout the stand or in a few small groups – for wildlife habitat and structural diversity. As a general rule, about 1000-2000 seedlings that are about 1-2 feet tall should be present in the understory before removing the trees in the overstory.

Alternate Recommended Practices:

Completion Date	*Activity*
	If management practices to maintain oak are not implemented, this stand will naturally convert to northern hardwoods. Oak may still be a small component of the stand, but sugar maple and red maple will become even more prevalent than they are now. In order to promote and develop northern hardwood species, uneven-aged management techniques could be implemented.
2028	**Selection Harvest – Conversion from Even-aged to Uneven-aged Stand Conditions**. Based on tree ages and expected growth rates, **this stand will likely be ready for a harvest in 2028.** At that time, reduce the stand density to about 80-90 ft^2 per acre using the following order of removal. 1. Cut high-risk trees (e.g. defective, diseased) that will not likely survive until the next harvest. 2. Release crop trees by harvesting poorer-quality trees with crowns competing with the crop tree. 3. Harvest low vigor trees that are slower growing, weakened, or lower quality. 4. Harvest poorly-formed or defective trees. 5. Harvest undesirable species (e.g. you may want to harvest a red maple or balsam fir instead of a sugar maple or oak. 6. Harvest trees to improve spacing. In addition, create several canopy gaps per acre with each selection harvest to ensure regeneration of replacement seedlings. One larger 60 to 75 foot diameter gap and two 30 to 40 foot diameter gaps per acre can be created to regenerate approximately 10% of the stand area during the harvest. Larger gaps will provide growing conditions that favor shade intolerant species (like oak), while smaller gaps lend themselves better to shade tolerant species (like sugar maple). All stems greater than 1-inch in diameter within the gaps must be harvested to create adequate openings for seedling establishment and development.

STAND #1: O 15+[3] / NH 5-11[1] / FB 0-5[2] (continued)

This type of harvest should be done every 15 to 20 years and will encourage the development of the understory layer in the stand (both shrubs and tree regeneration). During each entry, approximately 10-15% of the stand area should be regenerated using canopy gaps with the remaining areas undergoing a selection harvest.

No Management Alternative:

Under ideal conditions, individual red oak trees can live to be 400 years old. It is expected, however, that the red oak in this stand may start to decline and die out at approximately 140 to 150 years old. As mentioned above in the Habitat Type section, red oak and white pine can be potential associates, but they are far less common in late-successional stands on this habitat type. In the absence of forest management or other disturbances (e.g. wind events, fires), sugar maple, red maple, and balsam fir are likely to be the dominant trees in late successional stands.

STAND #Z2: (PW) PR 15+[2] / T 5-9[1] / SB 0-5[3]

Red and White Pine Sawtimber with Tamarack Poletimber and Black Spruce Saplings

Stand Acres: 3

Stand Description:

Located in the northwestern corner of the Section 15 parcel, this lowland stand is composed of tamarack and black spruce with scattered large-diameter red and white pine trees. The tamarack is generally poletimber-sized, and the black spruce is beginning to move from saplings into poletimber size. The understory layer generally consists of wetland bog shrubs like Labrador tea and leatherleaf with moss and cinnamon ferns. Tamarack and black spruce trees appear to be about 60-70 years old, but the pine components are likely older (90 to 100 years old).

No invasive plant species were observed during the site visit. Soils are predominately classified Loxley and Dawson peats (Lo). Topography is generally flat, but the stand is surrounded by steep ridges of higher ground (Stand #3).

Habitat Type: Hydric (Specific classifications for these types are currently under development.)

Stand Objective:

Maintain or enhance wildlife habitat by allowing the area to naturally develop. Due to the small size of this stand, it may be difficult to manage for other purposes, and therefore it's recommended to allow this area to naturally develop for wildlife habitat. However, a timber harvest may be feasible if combined with other activities in nearby stands (see Alternate Recommended Practices below).

Recommended Practices:

Completion Date	***Activity***
	None recommended. Unique features such as this lowland conifer area can be left to develop naturally. Tamarack and black spruce will begin to decline and die out of the stand around 90-100 years of age. The area will likely convert to an open bog area with scattered black spruce and tamarack regeneration.

STAND #3: PW 15+[2] / (FB) NH 5-9[2] / FB 0-5[3]

White Pine Sawtimber with Balsam Fir and Northern Hardwood Poletimber and Balsam Fir Seedlings and Saplings

Stand Acres: 12

Stand Description:

This stand is located in the western portion of the Section 15 parcel and contains large-diameter, natural-origin white and red pine trees with a dense balsam fir and northern hardwood poletimber and seedling/sapling component. The southern portion of this stand also contains a few small pockets of big-tooth aspen. Overstory red and white pine trees are approximately 90-110 years old.

Like Stand #1, this stand was part of a parcel formerly owned by the Wisconsin Department of Natural Resources and underwent a harvest in 2005 that removed poor-quality and defective trees.

The current density of trees 5 inches in diameter and greater averages 130 ft^2 of basal area per acre. The optimum density for a pine stand such as this is between 140-150 ft^2 of basal area per acre, and depends on the size of the trees.

No invasive plant species were observed during the site visit. Soils are classified as Sayner-Rubicon complex (SaD). Topography is rolling to steep.

Habitat Type: PArVAa – Pinus strobus-Acer rubrum/Vaccinium angustifolium-Aralia nudicaulis (White Pine-Red Maple/Blueberry-Wild sarsaparilla)

Management for jack pine, red pine, and white pine is particularly well-suited to this habitat type, but aspen and white birch management can also be successful. Red oak grows moderately well on sites like these but has higher growth potential on richer soil types.

Stand Objective:

The objective for this stand is to maintain the white pine and northern hardwood cover type while maintaining forest health and improving or enhancing wildlife habitat.

Recommended Practices:

Completion Date	*Activity*
2028	In order to maintain the white pine component in this stand, **a two-stage white pine regeneration harvest should be implemented in this stand when the overstory pine reach approximately 110-130 years old.** Due to disease concerns, red pine cannot be reliably regenerated naturally, therefore the following prescription focuses on obtaining white pine regeneration. Even though white pine could remain in the stand for 130-150+ years, red pine typically will begin to die out from the stand after about 100-120 years. A regeneration harvest is recommended at approximately 110-130 years old in order to salvage the red pine before they die out of the stand. **Shelterwood Regeneration Harvest – Seeding Cut**. Based on tree ages and expected growth rates, **this stand should undergo the first stage of a regeneration harvest in 2028.** Harvest all trees greater than 1-inch in diameter except those needed to regenerate the stand. Retain approximately 50% crown closure of desirable trees (primarily white pine, but can include a few oak, red pine, and yellow birch) that are well-spaced and vigorous with large crowns to produce seed to reforest the stand. It may be necessary to scarify the site to expose enough mineral soil to create a good seedbed for the pine to germinate. This can sometimes be done with harvesting equipment, but often other equipment (like an anchor chain or root rake) is needed in order to effectively expose mineral soil.

STAND #3: PW 15+[2] / (FB) NH 5-9[2] / FB 0-5[3] (continued)

2031 **Shelterwood Regeneration Harvest – Overstory Removal.** Once adequate pine regeneration becomes established (usually after about 3-5 years), remove the remainder of the overstory trees in the stand to allow enough sunlight to reach the seedlings and saplings on the forest floor. Feel free to retain a few larger pine – either widely scattered throughout the stand or in a few small groups – for wildlife habitat and structural diversity. As a general rule, about 1000-2000 seedlings that are about 1-2 feet tall should be present in the understory before removing the trees in the overstory.

Alternate Recommended Practices:

Completion Date ***Activity***

If management practices to maintain pine are not implemented, this stand will naturally convert to low-quality northern hardwoods and balsam fir. White pine will still be a component of the stand, but sugar maple, red maple, and balsam fir will become even more prevalent than they are now. In order to promote and develop northern hardwood species, uneven-aged management techniques could be implemented.

2028 **Selection Harvest – Conversion from Even-aged to Uneven-aged Stand Conditions**. Based on tree ages and expected growth rates, **this stand will likely be ready for a harvest in 2028.** At that time, reduce the stand density to about 80-90 ft2 per acre using the following order of removal.

1. Cut high-risk trees (e.g. defective, diseased) that will not likely survive until the next harvest.
2. Release crop trees by harvesting poorer-quality trees with crowns competing with the crop tree.
3. Harvest low vigor trees that are slower growing, weakened, or lower quality.
4. Harvest poorly-formed or defective trees.
5. Harvest undesirable species (e.g. you may want to harvest a red maple or balsam fir instead of a sugar maple or oak.
6. Harvest trees to improve spacing.

In addition, create several canopy gaps per acre with each selection harvest to ensure regeneration of replacement seedlings. One larger 60 to 75 foot diameter gap and two 30 to 40 foot diameter gaps per acre can be created to regenerate approximately 10% of the stand area during the harvest. Larger gaps will provide growing conditions that favor shade intolerant species (like oak), while smaller gaps lend themselves better to shade tolerant species (like sugar maple). All stems greater than 1-inch in diameter within the gaps must be harvested to create adequate openings for seedling establishment and development.

This type of harvest should be done every 15 to 20 years and will encourage the development of the understory layer in the stand (both shrubs and tree regeneration). During each entry, approximately 10-15% of the stand area should be regenerated using canopy gaps with the remaining areas undergoing a selection harvest.

No Management Alternative:

White pine is a long-lived species with individual trees often reaching 200+ years, and sometimes as old as 450 years under ideal growing conditions. However, stands can decline rapidly after about 200 years on even the richest soil types, with dieback likely occur sooner than that (about 150 to 175 years old) on a dry to dry mesic site such as this.

White pine trees can reliably regenerate without forest management or other disturbances but will typically be less vigorous and poorer quality than if grown in open, full sunlight conditions. Late successional stands on this habitat type are expected to contain white pine with red maple, red oak, balsam fir, and white spruce associates.

STAND #4: I/GH/G

Developed Area with Herbaceous Vegetation and Grass (Brush Dump Area)

Stand Acres: 5

Stand Description:

This stand lies in the eastern portion of the Section 15 parcel at the end of Forest Lane and currently contains the Town Brush Dump, although there are proposals to convert the area to more recreational-dominated uses. There are a couple small areas of white pine, red pine, and balsam fir saplings that have become established along the edges dump site. Besides the brush dump site, two snowmobile/ATV trails intersect within this stand.

Four non-native, invasive plant species – Canada Thistle, Spotted Knapweed, Butter and Eggs, and Oxeye Daisy – were observed during the site visits. These species are fairly widespread throughout the stand, but were especially prevalent along old woods roads and trails. Soils are classified as Padus sandy loams (PaB) and Sayner-Rubicon complex (SaD). Topography is rolling to steep.

Stand Objective:

The objective for this stand is to develop recreational opportunities.

Recommended Practices:

Completion Date	*Activity*
	None recommended - Leave As Is. In addition to benefiting the Town as a brush dump and providing future recreational opportunities, this site is also providing some great wildlife habitat just as it is. Some open grassland is important for nesting, travel, escape cover, and to produce insects and forage for food.

STAND #P5: (PR) PW 9-15[4] / (PW) FB 0-5[3]

Red and White Pine Small Sawtimber Plantation with White Pine and Balsam Fir Seedlings and Saplings

Stand Acres: 15

Stand Description:

Located in the Section 28 parcel, this stand is largely comprised of planted red pine trees with occasional natural-origin white pine. Overstory trees are predominately small sawtimber-sized, but a few poletimber trees and large sawtimber-sized trees are also present. Trees are estimated to have been planted sometime in the mid-late 1950s. Regeneration consists of white pine and balsam fir seedlings and saplings.

The current density of trees 5 inches in diameter and greater averages 153 ft^2 of basal area per acre. The optimum density for a pine stand such as this is between 110-120 ft^2 of basal area per acre and depends on the size of the trees.

The largest area of this stand contains a small pocket (approximately ½-1 acre) of red pine trees that are showing signs of mortality. This is likely due to *Red Pine Pocket Mortality* – a complex of insects and fungi that cause dieback and mortality in red pine plantations. Infected trees will have reduced height and diameter growth, and will eventually attract bark beetles that kill the trees.

No invasive plant species were observed during the site visit. Soils are classified as Keweenaw-Karlin complex (KeB), Karlin loamy fine sand (KaB), and Rubicon sand (RoB). Topography is level to gently rolling.

Habitat Type: PArVAa – Pinus strobus-Acer rubrum/Vaccinium angustifolium-Aralia nudicaulis (White Pine-Red Maple/Blueberry-Wild sarsaparilla)

Management for jack pine, red pine, and white pine is particularly well-suited to this habitat type, but aspen and white birch management can also be successful. Red oak grows moderately well on sites like these but has higher growth potential on richer soil types.

Stand Objective:

The objective for this stand is to maintain the pine cover type while providing for outdoor recreation opportunities, improving or enhancing wildlife habitat, and maintaining or improving forest health.

<u>Recommended Practices:</u>

Completion Date	***Activity***
2020 **2032** **2044**	Based on the density and expected growth rate, **this stand should undergo an intermediate thinning in 2020 and again in 2032 and 2044**. The target density of the residual stand will vary based on the size of the trees present. In 2019, the stand should be reduced to about 110-120 ft^2 of basal area per acre (but no more than 1/3 of the total density). In subsequent harvests, the target density will likely be about 130-140 ft^2 of basal area per acre. Harvest trees according to the standard order of removal for pine stands: 1. Risk – Remove trees likely to die prior to the next harvest (10 to 15 years). This would include the pocket of trees affected by Red Pine Pocket Mortality as well as 30-75 foot buffer surrounding dead and fading red pine trees within that pocket. 2. Release Crop Trees – Cut trees with crowns touching a crop tree. Crop trees have a well-developed, vigorous crown, consistent with its diameter; a relatively straight trunk, free of wounds, major defects, and persistent limbs for the first 16 feet; and are free of major forking in the lower crown. 3. Vigor – Remove trees that are suppressed, slower growing, or have poor crown condition. 4. Form and Quality – Remove trees that have poor form, mechanical or structural problems, and low potential to improve future quality.

STAND #P5: (PR) PW 9-15[4] / (PW) FB 0-5[3] (continued)

5. Species – Retain good-quality red and white pine and remove other species (e.g. balsam fir) to eliminate seed sources.
6. Spacing – Remove trees to improve spacing for remaining trees.

This thinning is designed to improve the growth and health of established trees that are not at maturity. Pine thinnings such as this do not need to address the environmental needs of seedlings. Concerns about seedling establishment and growth should be addressed when the stand reaches the rotation age (which for this stand is about 110-120 years).

No Management Alternative:

Red pine is a long-lived species with individual trees reaching ages of 350+ years under ideal growing conditions. Fully stocked stands can live to be 200 years old, but likely will exhibit declining tree vigor, increasing mortality rates, and declining stand yield. On a dry to dry mesic habitat type such as this, trees will likely decline well before that – probably closer to 140-160 years.

Red pine is shade intolerant and requires full sunlight for young trees to grow vigorously. In addition, red pine does naturally regenerate reliably due to the fungal diseases *Sirococcus* and *Diplodia* that spread from mature red pine trees to young seedlings growing beneath them. As mentioned in the stand description, *Red Pine Pocket Mortality* will continue to spread within the largest portion of the stand, and will likely increase red pine mortality if left unmanaged.

Late successional stands on this habitat type are expected to be dominated by white pine with red maple, red oak, balsam fir, and white spruce associates. In the absence of forest management or other disturbances like fire, red pine will likely only be a very minor component of future stands.

STAND #6: PW 15+[3] / MR 5-11[1] / PW 0-5[3]

White Pine Sawtimber with Red Maple Poletimber and White Pine Seedlings and Saplings

Stand Acres: 172

Stand Description:

The large stand comprises the majority of the Section 28 parcel and is dominated by large-diameter, natural-origin white and red pine trees that are approximately 80-90 years old. Red maple, red oak, white birch and balsam fir can also be found in this stand, especially along the edges of the stand that border Stand #8 (the oak and red maple stand). Regeneration consists primarily of white pine, but dense pockets of balsam fir regeneration also exist within the stand. Small pockets of aspen and red maple saplings can be found in scattered throughout the stand.

A small wetland keg area can be found on the eastern property line just north of the Town Shop.

The current density of trees 5 inches in diameter and greater averages 125 ft^2 of basal area per acre. The optimum density for a pine stand such as this is between 140-150 ft^2 of basal area per acre, and depends on the size of the trees.

No invasive plant species were observed during the site visit. Soils are predominately classified as Rubicon sand (RoB), with smaller areas of Karlin loamy find sand (KaB), Pence sandy loam (PnC, PnD), and Keweenaw-Karlin complex (KeB). Topography is level to rolling.

Habitat Type: PArVAa – Pinus strobus-Acer rubrum/Vaccinium angustifolium-Aralia nudicaulis (White Pine-Red Maple/Blueberry-Wild sarsaparilla)

Management for jack pine, red pine, and white pine is particularly well-suited to this habitat type, but aspen and white birch management can also be successful. Red oak grows moderately well on sites like these but has higher growth potential on richer soil types.

Stand Objective:

The objective for this stand is to maintain the pine cover type while providing for outdoor recreation opportunities, improving or enhancing wildlife habitat, and maintaining or improving forest health.

Recommended Practices:

Completion Date	***Activity***
2020	Based on the density and expected growth rate, **denser areas of this stand could undergo an intermediate thinning in 2020**. The target density of the residual stand will vary based on the size of the trees present, but should be about 140 ft^2 of basal area per acre (but no more than 1/3 of the total density). Harvest trees according to the standard order of removal for pine stands outlined in Stand #P5. Only one intermediate thinning should be implemented prior to this stand reaching “rotation age” (the age at which the regeneration process should begin). The primary reason for this is to allow the canopy of the stand to close and shade out understory competition that may inhibit new regeneration to become established. Once the stand reaches 140-150 years old, the process to regenerate the stand should begin using the two-step regeneration process outlined in Stand #3.
2069	**Shelterwood Regeneration Harvest – Seeding Cut.**
2072	**Shelterwood Regeneration Harvest – Overstory Removal.**

STAND #6: PW 15+[2] / MR 5-11[1] / PW 0-5[3] (continued)

Alternate Recommended Practices:

Completion Date	***Activity***
	Instead of implementing the shelterwood regeneration harvest all at one time, consider breaking up the stand into three or four sections and regenerate them at 10- to 15-year intervals to create some age-class diversity and to minimize the visual effects of a large regeneration harvest. This option could begin as early as 2020 – ¼ of the stand could undergo a regeneration harvest while the remainder of the stand undergoes an intermediate thinning.

No Management Alternative:

White pine is a long-lived species with individual trees often reaching 200+ years, and sometimes as old as 450 years under ideal growing conditions. However, stands can decline rapidly after about 200 years on even the richest soil types, with dieback likely occur sooner than that (about 150 to 175 years old) on a dry to dry mesic site such as this.

White pine trees can reliably regenerate without forest management or other disturbances but will typically be less vigorous and poorer quality than if grown in open, full sunlight conditions. Late successional stands on this habitat type are expected to be dominated by white pine with red maple, red oak, balsam fir, and white spruce associates.

STAND #7: O 15+[3] / (MR) FB 5-11[1] / FB 0-5[3]

Red Oak Sawtimber with Red Maple and Balsam Fir Poletimber and Balsam Fir Seedlings and Saplings

Stand Acres: 79

Stand Description:

Also located in the Section 28 parcel, this stand is dominated by large-diameter red oak with red maple, white pine, white spruce, red pine, and white birch associates. Oak trees are approximately 90-100 years old, and at the time of inventory were in very good condition. The understory consists primarily of balsam fir seedlings and saplings.

The current density of trees 5 inches in diameter and greater averages 106 ft^2 of basal area per acre. The optimum density for an oak stand such as this is between 75-120 ft^2 of basal area per acre, and depends on the size of the trees.

No invasive plant species were observed during the site visit. Soils are classified as Pence sandy loams (PnC, PnD) and Karlin loamy fine sand (KaB), and Keweenaw-Karlin complex (KeB), with small inclusions of Rubicon sand (RoB) and Croswell sand (CrA). Topography is level to rolling.

Habitat Type: PArVAa – Pinus strobus-Acer rubrum/Vaccinium angustifolium-Aralia nudicaulis (White Pine-Red Maple/Blueberry-Wild sarsaparilla)

Management for jack pine, red pine, and white pine is particularly well-suited to this habitat type, but aspen and white birch management can also be successful. Red oak grows moderately well on sites like these but has higher growth potential on richer soil types.

Stand Objective:

The objective for this stand is to maintain the oak cover type while providing for outdoor recreation opportunities, improving or enhancing wildlife habitat, and maintaining or improving forest health.

Recommended Practices:

Completion Date	*Activity*
	In order to maintain oak in this stand, a **two-stage oak regeneration harvest should be implemented when the stand reaches 120 to 130 years old.** Using the dates below, follow the guidelines for oak regeneration harvest outlined in Stand #1.
2039	**Shelterwood Regeneration Harvest – Seeding Cut.**
2043	**Shelterwood Regeneration Harvest – Overstory Removal.**

Alternate Recommended Practices:

Completion Date	*Activity*
	Instead of implementing the shelterwood regeneration harvest all at one time, consider breaking up the stand into two sections and regenerate them 15- to 20-years apart in order to create some age-class diversity and to minimize the visual effects of a large regeneration harvest. This option could begin as early as 2019, with the remainder occurring closer to 2039.

No Management Alternative:

Under ideal conditions, individual red oak trees can live to be 400 years old. It is expected, however, that the red oak in this stand may start to decline and die out at approximately 130 to 140 years old due to the dry-dry mesic soil types. In the absence of forest management or other disturbances (e.g. wind events, fires), white pine is expected to become the dominant timber type, but red oak will still remain a component of the stand, along with red maple, balsam fir, and white spruce.

Addendum:

Because the Town of St Germain is not looking for monetary gain from the forest stands at both Awassa Trail and Fern Ridge Recreation Area, passive management will be employed, giving these parcels a great appeal to recreational users. A passive approach to forest management allows forests continue to mature naturally which has the following inherent values.

- One of the rarest habitats in Wisconsin is old growth forest, defined as a forest which has never been cleared or highly disturbed by humans. These forests have a unique multi-layered structure of vegetation, and provide particularly high-quality habitat for some wildlife species. Old growth conditions can only develop with time, usually after 200–300 years. While both Awassa and Fern Ridge have many years to return to that stage in development, allowing them to be passively managed gives them time to naturally, slowly reach that state. In addition, there are certain low impact, active management options that help the stands reach old growth qualities more quickly if the town desires to employ them in the future.
- Forests that retain dead or dying trees provide important habitat for many animal species. Natural treefall also enriches our soils and giving new habitat for fungi and young plants, as well as shelter for a wide variety of animals.
- Active management does disturb soil, and brings in the opportunities for introduction of invasive plant species, as well as disease through cut stumps and damaged standing trees. Forest openings can be produced in less intensive ways through tree girdling and individual tree fall as a way to allow for regeneration of tree species that require more light.
- As forest managers and scientists study the various benefits and implications of active forest management, it is important to have untouched sites for comparison. A majority of public lands in Vilas County are under active management, therefore Awassa and Fern Ridge will be quite unique in the public landscape.
- New research on the connections of the overstory trees with the fungal networks in the soil, indicate the importance retaining mature 'hub' trees in these mycorrhizal relationships. The mycorrhizal fungi are vital to the establishment of seedlings and promoting the health of the existing trees. Passive management can allow for better understanding of these interactions.
- Passive management gives the forest an aesthetic quality that is appealing to recreational users. If you read the details in the stewardship plan about the "no management" option, in most of the stands the resulting tree diversity will closely match the resulting stand after timber harvests, but we would retain the mature forest stand rather than starting over from scratch. The mature forest offers shelter from sun and heat for our trail users in the summer, and prevents drifting that occurs on recreational trails in cleared forest land in winter. Trails through mature forests attract far more users than those in areas that have been cleared of the overstory. In addition, for those who wish to recreate or hunt off-trail, a mature forest allows for much easier accessibility.
- Maintaining a mature forest, without machinery used in active management also retains the plants, fungi, and animals that currently inhabit the forest and forest floor without disturbance or drastic change. Flora of a cleared forest varies considerably from that in a mature forest. The intense sun resulting from heavy management can be uninhabitable for many plants, fungi and sensitive animals like amphibian species. The forest stands that currently can be found at Fern Ridge and Awassa sustain a wide array of wildlife, including deer, grouse, many song birds, coyotes, foxes, pine martins, salamanders, and many others.
- In the Forest Stewardship Plan, the Town of St Germain will employ the "No Management Alternative" for stands #1, 3, P5, 6, and 7.
- Each of the above-mentioned stands will be monitored by Non-Motorized Trails Committee on an annual basis for diseased or dangerous trees, as well as invasive species. If any of these are noted upon inspection, arborists or forest ecologists should be consulted for needed action.

The owner hereby agrees to this Forest Stewardship management plan. The landowner further agrees to proceed diligently to accomplish his/her stated objectives.

To be signed by the individual landowners (or legal agent, if any) as listed on the deed or other instrument of title.

Signature	Date Signed
Signature	Date Signed
Signature	Date Signed

(Attach additional signature pages, if needed.)

State of Wisconsin - Department of Natural Resources

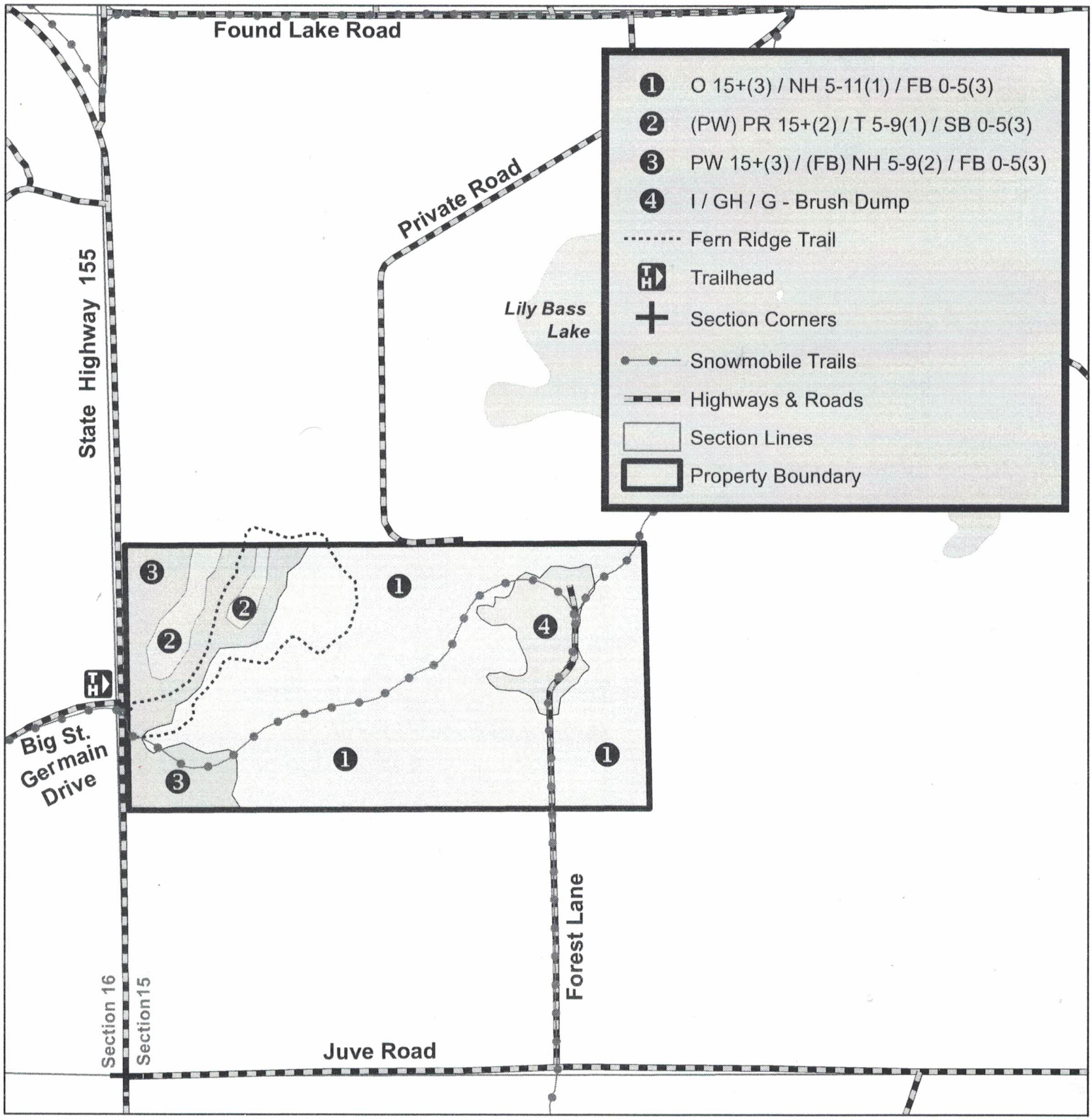
FOREST STEWARDSHIP PLAN MAP

Owner Name:		*Municipality Name:*	*County:*
TOWN OF ST. GERMAIN		**ST. GERMAIN**	**VILAS**
Township: **40 North**	*Range:* **08 East**	*Section(s):* **15**	*Acres:* **75**

Scale: 8 inches = 1 mile

Prepared By: Jill Nemec

Date: August 5, 2019



State of Wisconsin - Department of Natural Resources

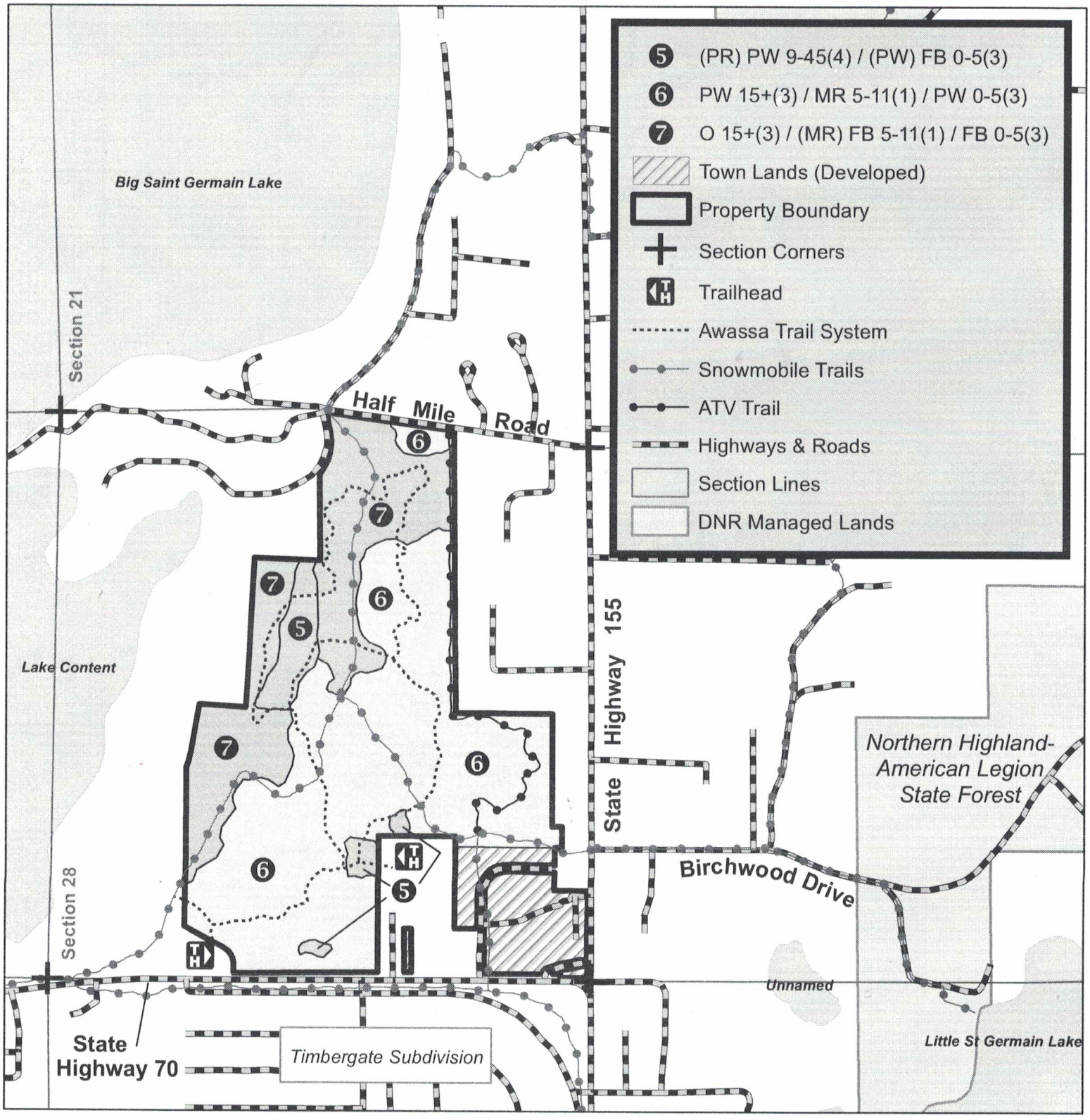
FOREST STEWARDSHIP PLAN MAP

Owner Name:		Municipality Name:	County:
TOWN OF ST. GERMAIN		ST. GERMAIN	VILAS
Township: 40 North	Range: 08 East	Section(s): 28	Acres: 266

Scale: 4 inches = 1 mile

Prepared By: Jill Nemec

Date: August 5, 2019



FORESTRY STEWARDSHIP PLAN

Summary Schedule of Practices by Year			
Year	*Stand #*	*Acres*	*Recommended Practices*
2020	P5, 6	15, 172	Intermediate Thinning
2025	9, 10	37, 36	Shelterwood Harvest – Seeding Cut
2028	3	12	Shelterwood Harvest – Seeding Cut
2028	9, 10	37, 36	Shelterwood Harvest – Overstory Removal
2031	3	12	Shelterwood Harvest – Overstory Removal
2032	P5	15	Intermediate Thinning
2039	7	79	Shelterwood Harvest – Seeding Cut
2043	1	55	Shelterwood Harvest – Seeding Cut
2044	P5	15	Intermediate Thinning
2043	7	79	Shelterwood Harvest – Overstory Removal
2046	1	55	Shelterwood Harvest – Overstory Removal
2069	6	172	Shelterwood Harvest – Seeding Cut
2072	6	172	Shelterwood Harvest – Overstory Removal

Provide the name, address, and telephone number of the preparer of this plan:
Jill Nemec, Forester
Wisconsin Dept. of Natural Resources
1861 US Highway 45 North
Eagle River, WI 54521
(715) 479-4771

The owner hereby agrees to this Forest Stewardship management plan. The landowner further agrees to proceed diligently to accomplish his/her stated objectives.

To be signed by the individual landowners (or legal agent, if any) as listed on the deed or other instrument of title. If a corporation, must be signed by the President and Secretary.

Signature _____ Date Signed _____

Signature _____ Date Signed _____

Signature _____ Date Signed _____

(Attach additional signature pages, if needed.)

Approved for the Department of Natural Resources by:

Signature of DNR Forester _____ Date Signed _____