



## WOODLAND STEWARDSHIP PLAN

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Prepared for:

**Gerald Nelson**  
1447 - 140th Ln NW  
Andover, MN 55304

N1/2 NE1/4, SWNE, and E1/2SW of Section 28, Township 42N, Range 19W in Pine County, MN.

Total Acres: 200  
Stewardship Acres: 200  
2c – Managed Forest Land Acres: 190  
SFIA Acres: 197

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Prepared by:

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Date generated: July 15, 2014

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Gerald Nelson's forest stewardship goals for this property are:

- To improve wildlife habitat for deer, grouse, waterfowl, and other native wildlife
- To protect the wetland resources by following good forest management guidelines
- To improve tree species diversity by planting additional tree species
- To provide for recreational opportunities on the property
- To manage for revenue-generating opportunities in the future
- To make climate-informed management decisions for the future

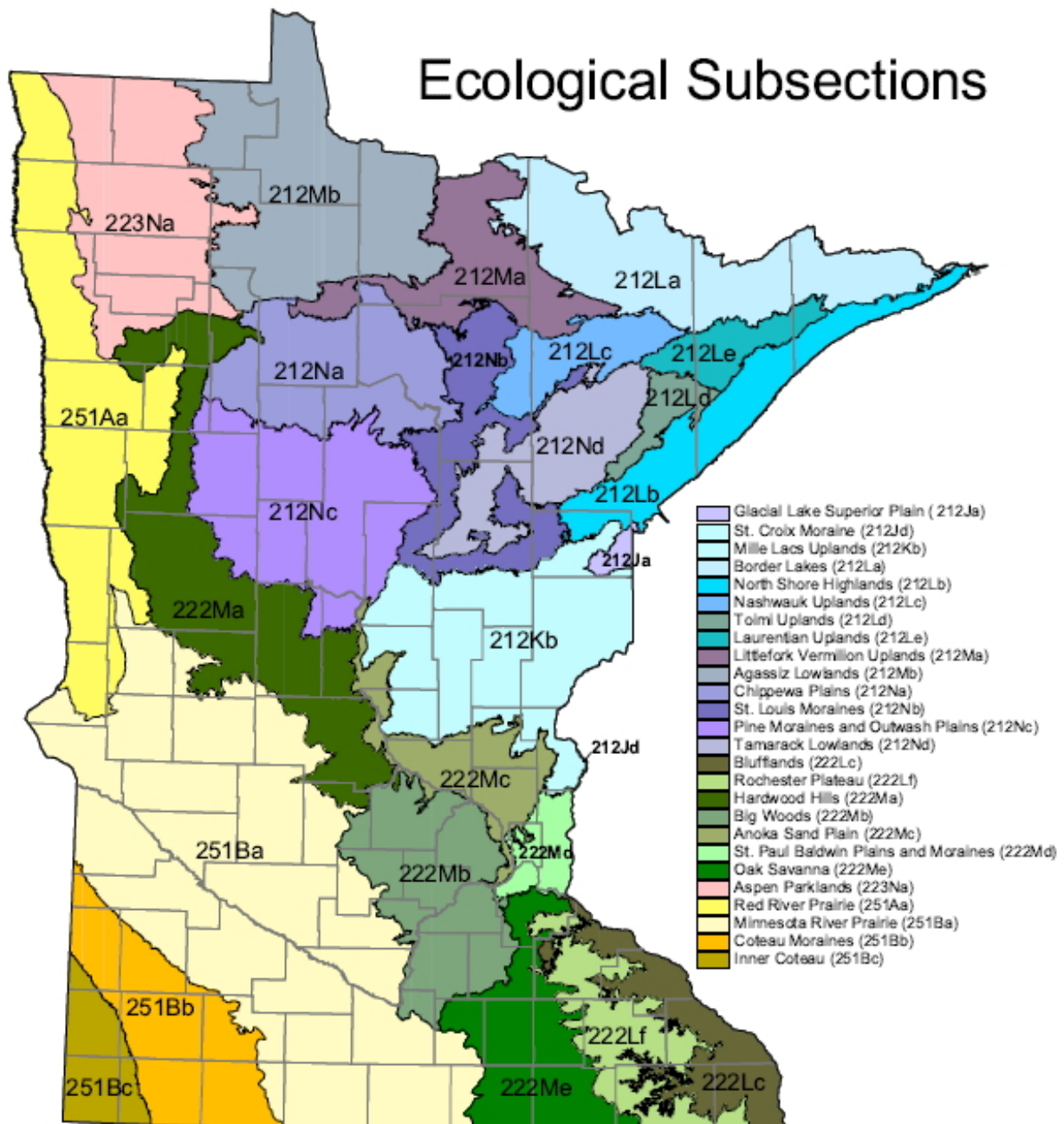
## PROPERTY DESCRIPTION: Landscape Region

The property falls within the **Mille Lacs Uplands** Ecological Subsection.

### General Description:

This subsection covers the large area of Superior Lobe ground moraines and end moraine in east-central Minnesota. Gently rolling till plains and drumlin fields are the dominant landforms in this ecoregion. The jewel of the region is Mille Lacs Lake, well known for walleye fishing.

Brown and red till forms the parent material. In the southern portion, upland hardwood forests consisting of northern red oak, sugar maple, basswood, and aspen-birch were common before settlement. Presently, forestry, recreation, and some agriculture are the most common land uses.



## **Landform:**

This subsection consists primarily of Superior lobe ground moraine, and includes the Brainerd-Pierz and Automba Drumlin Fields (Dept. of Soil Science, Univ. of Minnesota 1977, 1980b, Hobbs and Goebel 1982). The depressions between drumlin ridges contain peatlands with shallow organic material. There are also small areas of Des Moines lobe ground moraine in the southeastern portion of the subsection (Hobbs and Goebel 1982). A large end moraine in the center of the subsection forms the dam that created Mille Lacs Lake. In the northeast, there is another series of end moraines, which marked later advances and retreats of the Superior lobe.

## **Geology:**

Glacial drift ranges from 100 to 300 feet in depth over bedrock. Bedrock is locally exposed throughout the northern portion of the subsection, where depths are typically 100 feet or less (Olsen and Mossler 1982, Trotta and Cotter 1973). Bedrock consists of Middle to Late Archean and Early Proterozoic gneiss, amphibolite, undifferentiated granite, and metamorphosed mafic. At the southeastern edge of the subsection are Cretaceous marine shale, sandstone, and variegated shale (Morey 1976, Morey et al. 1982, Ostrom 1981).

## **Bedrock Geology:**

This subsection consists primarily of Superior lobe ground moraine, and includes the Brainerd-Pierz and Automba Drumlin Fields (Dept. of Soil Science, Univ. of Minnesota 1977, 1980b, Hobbs and Goebel 1982). The depressions between drumlin ridges contain peatlands with shallow organic material. There are also small areas of Des Moines lobe ground moraine in the southeastern portion of the subsection (Hobbs and Goebel 1982). A large end moraine in the center of the subsection forms the dam that created Mille Lacs Lake. In the northeast, there is another series of end moraines, which marked later advances and retreats of the Superior lobe.

## **Soils:**

At the eastern end of the subsection, the end moraines and ground moraines have loamy soils. Typically, there is dense glacial till underlying most soils in this subsection. This dense till impedes water movement throughout the soil profile. The soils are described as acid, stony, reddish sandy loams, silt loams, and loamy sands (Hole 1976, Hobbs and Goebel 1982). The parent material in the Grantsburg (Des Moines Lobe) portion of the subsection is more calcareous and finer textured than Superior Lobe sediments. It is underlain by Superior lobe drift which is locally exposed. The soils are classified as Boralfs (well-drained soils developed under forest vegetation) and Ochrepts (poorly developed soils formed under forest vegetation) on the moraines (Anderson and Grigal 1984).

## **Climate:**

This subsection has little moderation from Lake Superior. Total annual precipitation ranges from 27 inches in the west to 30 inches in the east, with growing-season precipitation ranging from 12 to 13 inches. Snowfall is relatively light- the location of the subsection, primarily southwest of Lake Superior, is not characterized by lake-effect snows (Albert 1993). Growing-season length is quite variable, ranging from 97 to 135 days, with the longest growing season in the south and the shortest on the outwash plains at the northern edge of the subsection (Dept. of Soil Science, Univ. of Minnesota 1977, 1980b).

## **Hydrology:**

Major rivers running through this subsection include the St. Croix, which forms part of the eastern boundary and the, Kettle, Snake, Rum, and Ripple rivers. The drainage network is young and undeveloped, with extensive areas of wetlands present. There are 100 lakes greater than 160 acres in size. Most occur on end moraines.

## **Pre-settlement Vegetation:**

The original vegetation consisted of a mosaic of forest types. Along the southern boundary, maple-basswood forests were prevalent. The rest of the subsection was a vast mix of conifer, hardwood and mixed conifer-hardwood forests. Peatland areas were inhabited by sedge-fen, black spruce-sphagnum, or white cedar-black ash communities.

## **Present Vegetation and Land Use:**

Agriculture is concentrated in the western and southern portions of this subsection. Forestry and recreation are the most important land uses in the central and eastern part. There are large areas in eastern Pine County that are still heavily forested and relatively undisturbed, although there are no significant examples of large white pine stands still present.

### **Natural Disturbances:**

Both fire and windthrow were important in determining the vegetation of the subsection. Because dense basal till is present at depths of 20 to 40 inches throughout most of the subsection, rooting depths for trees are shallow and windthrow is common.

### **Rare Animals and Plants:**

Bald Eagles are still being observed in the area, and a nesting site is listed in the Natural Heritage Database for the adjacent properties. Consider this fact when making forest management decisions in the future. The National and Minnesota Environmental Protection Acts prevent certain actions that would cause significant adverse impacts to the environment (including destruction of habitat for listed species) if there is a reasonable alternative to the proposed action.

If you are uncertain whether a proposed action may take Bald Eagles or their nests, or if you for any reason cannot follow the recommendations in the attached fact sheet, contact USFWS Ecological Services at 612-725-3548 (see attachment).

### **Conservation Concerns:**

Native American fishing and hunting rights are a major conservation issue that is going to be decided by the federal courts. Other conservation concerns include timber harvesting, old growth, and water quality

### **Climate Considerations:**

Ecosystems will be increasingly affected by a changing climate, and understanding the potential impacts is an important first step to sustaining healthy forests in the face of changing conditions. Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. The identification of vulnerable species and ecosystems is a critical step in long-term planning. Some forests may exhibit substantial and long-term declines in vigor and productivity as a result of climatic changes; these forests may be considered vulnerable even if they show some resilience in community composition. Other forests are more clearly vulnerable as ecosystem function or community composition is severely altered. Vulnerability assessments recognize that a system's vulnerability is a function of its exposure to climate change, its sensitivity, and its adaptive capacity.

By the end of the 21st century, the climate of northern Minnesota is generally projected to be hotter and more variable, with more moisture stress towards the end of the growing season and less characteristic winter weather. This could mean much warmer winters (4-12 degrees F), warmer growing seasons (2-12 degrees F), more frequent heavy precipitation events, longer growing season (more precipitation during winter and spring, less or equal during summer and fall), reduced and more variable snowpack resulting in less soil frost, and changes in successional trajectories as the result of altered disturbance regimes. These changes will also most likely amplify some threats that forests already face, such as insect pests and diseases, increased deer populations, and invasive plants.

Generally, characteristic boreal or northern species and forest types are projected to experience declines in suitable habitat, landscape level biomass, and productivity. Temperate or southern species may perform better across northern Minnesota. Overall, it is expected that forest systems that are adapted to a narrow range of conditions or that contain few species will be more vulnerable to changing conditions. Communities with higher diversity that are adapted to tolerate a wide range of conditions and disturbances have a greater chance of persisting under a range of plausible climates. The vulnerability determinations for individual forest systems are best interpreted as broad trends and expectations across northern Minnesota.

Even so, there are limitations and unknowns that make these determinations imperfect. It is essential to consider local characteristics such as management history, soils, topographic features, species composition, forest health issues, and recent disturbances when applying these general vulnerabilities to local scales. Some site-level factors may amplify these expected vulnerabilities, yet others may buffer the effects of climate change. Developing a clear understanding of climate-related vulnerabilities across relevant scales will then enable forest managers, landowners, planners, or other resource specialists to consider appropriate adaptation responses.

Confronting the challenge of climate change presents opportunities for forest managers and landowners to plan ahead, assess risk, and ensure that the benefits forests provide are sustained into the future. Landowners will have unique goals for their woods, and different opportunities and constraints for how they might respond to climate change risk. These factors will help determine the most appropriate actions to prepare for climate change. Different adaptation actions can be used to resist change, boost resilience, or encourage change. Choosing a range of actions may be appropriate for many landowners, depending on their values and site-specific risks or opportunities.

This plan made use of an “Adaptation Workbook” that has been produced to help forest managers and landowners incorporate climate change considerations into forest management ([www.forestadaptation.org/far](http://www.forestadaptation.org/far)). Adaptation strategies for climate-informed forest management might include:

- 1: Sustain fundamental ecological functions.
- 2: Reduce the impact of existing biological stressors.
- 3: Protect forests from severe fire and wind disturbance.
- 4: Maintain or create refugia.
- 5: Maintain and enhance species and structural diversity.
- 6: Increase ecosystem redundancy across the landscape.
- 7: Promote landscape connectivity.
- 8: Enhance genetic diversity.
- 9: Facilitate community adjustments through species transitions.
- 10: Plan for and respond to disturbance.

Handler, S.; Duveneck, M.J.; Iverson, L.; Peters, E.; Scheller, R.M.; Wythers, K.R.; Brandt, L.; Butler, P.; Janowiak, M.; Shannon, P.D.; Swanston, C.; Barrett, K.; Kolka, R.; McQuiston, C.; Palik, B.; Reich, P.B.; Turner, C.; White, M.; Adams, C.; D'Amato, A.; Hagell, S.; Johnson, P.; Johnson, R.; Larson, M.; Matthews, S.; Montgomery, R.; Olson, S.; Peters, M.; Prasad, A.; Rajala, J.; Daley, J.; Davenport, M.; Emery, M.R.; Fehring, D.; Hoving, C.L.; Johnson, G.; Johnson, L.; Neitzel, D.; Rissman, A.; Rittenhouse, C.; Ziel, R. 2014. **Minnesota forest ecosystem vulnerability assessment and synthesis: a report from the Northwoods Climate Change Response Framework**. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. Gen. Tech. Rep. NRS-133. Available at <http://www.treeseearch.fs.fed.us/pubs/45939>.

Swanston, C.W.; Janowiak, M.K. 2012. **Forest Adaptation Resources: Climate change tools and approaches for land managers** Gen. Tech. Rep. NRS-87. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. Available at <http://www.nrs.fs.fed.us/pubs/40543>.

## **PROPERTY DESCRIPTION: General Property Description**

This property is located nine miles east of Hinckley, MN on State Highway 48, five miles north of Cloverdale, MN on County Road 21, and 1.5 miles west on a private access road. Most of the property is accessed from a summer logging road that extends north along the west property boundary and ends at the state forest land to the north. A winter logging road provided access to the small block of land east of the large wetland, however the only summer access to this block is across the neighboring property. The terrain varies from level to gently rolling.

The soil in this area is Askov fine sandy loam and has developed from glacial till carrying sandstone ground up locally and deposited as moraines by the Patricia ice sheet. Rock fragments and boulders are common on the surface and throughout the soil mass. Wetland pockets are located throughout the property and a large wetland covers most of the northeast quarter of the section. The soil in these wetlands is peat. Unfortunately, Pine County does not have an updated soil survey containing more detailed information on these soils.

A check of the State Archeologist's inventory did not reveal any recorded historical features on your land. However, bald eagles have been observed flying over your land and an eagle's nest was discovered on the adjoining properties. You should consider this fact in any future management activities on your property. Natural Heritage or Cultural resources are of concern in forest management because many of them occur in Minnesota's forestlands and they can be damaged by some management activities. The DNR feels a landowner should at least be aware that heritage resources may be present on the property. Ideally a landowner would plan management activities to avoid damaging any heritage resources that are present. Such features may still exist on your property since neither this plan, nor the existing records are based on exhaustive inventories. If you believe your property might have some rare or historical features, please contact your plan preparer about the process of further survey work.

## **PROPERTY DESCRIPTION: Interaction with Nearby Properties**

Most of your property is surrounded by private and county tax forfeited land that is forested. The land to the west and south of your property is a mature aspen forest; however some of it is scheduled for harvest in the near future. Most of the mature aspen on your land and the private land to the east has already been harvested in the past, leaving a northern hardwoods overstory with aspen regeneration in the understory. The birch cover types that were left during the original harvest were recently harvested in early 2014. The state land to the north has already been harvested and is regenerating nicely to aspen. All species were harvested here with the exception of a few large pine trees.

The wetland in the northwest corner of your property is part of a large wetland that extends into the neighboring property to the east. Bear Creek is located less than a quarter mile to the west of your property and the entire property is part of the Bear Creek watershed.

# MANAGEMENT COVER TYPES

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## Cover Type: Aspen

**Cover Type Label (on map):** 1

**Acres:** 73

**Cover Type Description:** Trembling or large tooth aspen or paper birch; aspen predominating.

The topography in this cover type is gently rolling with small wetland pockets scattered throughout the landscape. The mature aspen in this type was harvested during the spring of 1997, leaving a northern hardwoods overstory. After harvesting, thousands of aspen suckers have sprouted from the parent root systems. Such high densities are desirable, however, since disease and competition between trees will result in a natural thinning. Only by starting with such a dense stand of suckers can you be assured of having a healthy, viable stand at maturity. Slash left on the ground did not hamper aspen sprouting and has decayed quickly, providing nutrients to the site over time. The landing areas and some skid trails have not regenerated as quickly because of soil compaction and root disturbance.

Managed aspen stands are predicted to have a moderate to high vulnerability to climate change in the future, however aspen is well adapted to disturbance and a wide range of sites. Ecosystem models project that aspen and birch will decrease by the end of the century, and that red maple, basswood, green ash, black cherry, and red oak could increase across a range of future climates. Anticipate possible declines of aspen and birch in the future by encouraging the growth of the less susceptible tree species. Promote diverse age classes in the aspen by gradually breaking up the age class distribution through harvesting a portion of the aspen every 10-15 years, favor and/or restore native species that are expected to better adapt to future conditions, and prioritize and protect sensitive or at-risk-species or communities.

Tree Summary Data	Estimated Volume/acre
<p><b>Age:</b> 17 Year(s)</p> <p><b>Growth Potential:</b> Good (Aspen SI = 65)</p> <p><b>Tree Density:</b> 2600 stems/acre, (BA = 60)</p> <p><b>Timber Quality:</b> Good</p>	<p><b>Species:</b> Aspen, Trembling 4 Cords/Acre, 1500 Stems/Acre</p> <p><b>Species:</b> Ash, Green 0.2 Cords/Acre, 100 Stems/Acre</p> <p><b>Species:</b> Cherry 0 Cords/Acre, 50 Stems/Acre</p> <p><b>Species:</b> Birch, Paper 2.8 Cords/Acre, 450 Stems/Acre</p> <p><b>Species:</b> Oak, Northern Red 0.9 Cords/Acre, 200 Stems/Acre</p> <p><b>Species:</b> Maple, Red 2.0 Cords/Acre, 300 Stems/Acre</p> <p><b>Species:</b> Basswood 0.4 Cords/Acre, 0 Stems/Acre</p>
<p><b>Timber Volume:</b> 10.3 Cords/Acre, 2600 Stems/Acre</p>	

**Cover Type Objective:** To maintain a healthy forest.

**Main Recommendation**

**Action:** No Action-Free to Grow

This stand will require little or no management activity during the next ten-year period. Allow the stand to grow and mature on its own while watching it for evidence on insect, disease, wind or other types of damage. While the stand is maturing it will provide excellent wildlife habitat and recreational opportunities in the form of hiking, camping, wildlife viewing, hunting, and cross-country skiing.

**Alternative Recommendation**

**Action:** Timber Stand Improvement

Timber stand improvement (TSI) is a broad term encompassing a wide variety of forest practices. The purpose of the practices is to improve the overall health, timber growing potential, aesthetics, wildlife habitat and/or quality of the trees being grown. There are four general categories of TSI practices. They are thinning, release, pruning, and protection. These practices, alone or in combination, can often add value to a forest type. Generally, thinning involves the removal of some trees for the betterment of others, release involves removing vegetation that is harmfully competing with crop trees or desirable trees, pruning is the removal of branches to improve wood quality, and protection involves practices that control or eliminate disease, insects, or animals that are harmful to the forests' health.

When thinning young sprouts, remove those that arise from the parent stump above the root collar (i.e. retain those that attach to the parent stump at the root collar), and reduce clumps to one or two vigorous stems, which should be well spaced and not connected to one another. Doing this work before stands are 20 years old is recommended (Campbell 1938).

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**Stewardship Binder References:** (for additional information)

<u>Chapter</u>	<u>Reference Name</u>
1.....	Forest Stewardship Plan Basics (p.3)
3.....	How Trees Grow (p.26)
4.....	Regenerating Woodland Stands (p.33)
5.....	Sapling and Pole-timber Stands (p.47)
6.....	Managing Important Forest Types (p.55)
7.....	Forest Health (p.91)
11.....	Wildlife and Forest Management (p.127)

## Cover Type: Aspen

**Cover Type Label (on map):** 2

**Acres:** 29

**Cover Type Description:** Trembling or large tooth aspen or paper birch; aspen predominating.

The mature aspen in this stand was harvested at the same time as cover type number one. This cover type also has a dense stocking of aspen regeneration as the result. However, this cover type has a larger residual component of red maple and is lacking the oak component of cover type number one. Ecosystem models project that aspen, birch, and white spruce will decrease by the end of the century, and that red maple, green ash, and red and white oak could increase across a range of future climates. Anticipate possible declines of aspen and birch in the future by encouraging the growth of the less susceptible tree species. In the future, promote age class diversity by gradually breaking up this cover type starting at 40 years of age and harvesting a portion of the aspen every 10-15 years. Encourage the projected increases in red and sugar maples, basswood, and northern red oak. Identify sites that have the best potential to retain aspen over the long term, perhaps sites that are buffered from temperature increases or droughty conditions such as lower sites or north-facing slopes. The terrain in this type is relatively level and gradually slopes off into the large wetland.

Tree Summary Data	Estimated Volume/acre
<p><b>Age:</b> 17 Year(s)</p> <p><b>Growth Potential:</b> Good (Aspen SI = 65)</p> <p><b>Tree Density:</b> Adequate (BA = 50)</p> <p><b>Timber Quality:</b> Good</p>	<p><b>Species:</b> Maple, Red 5.3 Cords/Acre, 300 Stems/Acre</p> <p><b>Species:</b> Ash, Green 1.7 Cords/Acre, 250 Stems/Acre</p> <p><b>Species:</b> Birch, Paper 3.3 Cords/Acre, 100 Stems/Acre</p> <p><b>Species:</b> Elm, Red 0.3 Cords/Acre, 0 Stems/Acre</p> <p><b>Species:</b> Aspen, Trembling 0.4 Cords/Acre, 1050 Stems/Acre</p> <p><b>Species:</b> Cherry, Black 0 Cords/Acre, 250 Stems/Acre</p>
<p><b>Timber Volume:</b> 11 Cords/Acre, 1950 Stems/Acre</p>	

**Cover Type Objective:** To maintain a healthy forest.

### Main Recommendation

**Action:** No Action-Free to Grow

This stand will require little or no management activity during the next ten-year period. Allow the stand to grow and mature on its own while watching it for evidence on insect, disease, wind or other types of damage. While the stand is maturing it will provide excellent wildlife habitat and recreational opportunities in the form of hiking, camping, wildlife viewing, hunting, and cross-country skiing.

### Alternative Recommendation

**Action:** Timber Stand Improvement

Timber stand improvement (TSI) is a broad term encompassing a wide variety of forest practices. The purpose of the practices is to improve the overall health, timber growing potential, aesthetics, wildlife habitat and/or quality of the trees being grown. There are four general categories of TSI practices. They are thinning, release, pruning, and protection. These practices, alone or in combination, can often add value to a forest type. Generally, thinning involves the removal of some trees for the betterment of others, release involves removing vegetation that is harmfully competing with crop trees or desirable trees, pruning is the removal of branches to improve wood quality, and protection involves practices that control or eliminate disease, insects, or animals that are harmful to the forests' health.

When thinning young sprouts, remove those that arise from the parent stump above the root collar (i.e. retain those that attach to the parent stump at the root collar), and reduce clumps to one or two vigorous stems, which should be well spaced and not connected to one another. Doing this work before stands are 20 years old is recommended (Campbell 1938).

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11.....	Wildlife and Forest Management (p.127)

## Cover Type: Birch

Cover Type Label (on map): 3

Acres: 15

**Cover Type Description:** Paper birch usually with aspen. Paper birch predominating.

These birch stands were recently harvested in early 2014, providing an excellent opportunity to plant new seedlings. There was very little understory vegetation prior to harvesting, so competition for newly planted seedlings will be minimal in the near future. The recent harvest did accomplish a few things that have adaptation benefits including maintaining a young and healthy paper birch stand, creating a new age class of paper birch, and providing the opportunity to introduce new species that may be more adaptive to the changing climate. Ecosystem models project that aspen and birch will decrease by the end of the century, and that red maple, basswood, green ash, black cherry, and red oak could increase across a range of future climates. Anticipate possible declines of aspen and birch in the future by encouraging the growth of less susceptible tree species, and by introducing species that will be better adapted to climate change after allowing one year for natural regeneration following the disturbance. The topography here is gently rolling.

Tree Summary Data	Estimated Volume/acre
<b>Age:</b> 0 Year(s) <b>Growth Potential:</b> Good (Birch SI = 75) <b>Tree Density:</b> N/A – recently harvested (BA = 0) <b>Timber Quality:</b> Good potential	N/A, recently harvested
<b>Timber Volume:</b> 0 Cords/Acre, 0 MBF/Acre	

**Cover Type Objective:** Increase the diversity of tree species and provide improved habitat for wildlife.

### Main Recommendation

**Action:** Planting: Hand Planting

Current levels of desirable natural regeneration are inadequate. Planting a variety of hardwood species would make sense here. Seedlings will need to be planted by hand due to the nature of the site (machine planting would be impractical). Planting would improve the stands' long-term timber value and would also improve the area as wildlife habitat. Consider planting such species as bur oak, white oak, black cherry, swamp white oak, hackberry, bitternut hickory, shagbark hickory, Ohio buckeye, and black walnut on the upland sites, and swamp white oak, tamarack, or hackberry in the low-lying areas. Protect the future-adapted regeneration from herbivory as needed. Also, consider using planting stock from more southern seed zones.

### Alternative Recommendation

**Action:** Planting: Softwoods

Seedlings may be planted using a planting bar (dibble), shovel, hoedad, or planting tube (containerized seedlings only). Seedlings may be planted without preparing the site but success is poor. For best results you should prepare the site mechanically by plowing a shallow furrow, disking, rock raking, or scalping a furrow where the trees are to be planted. Another option is to use herbicide to reduce competition for water and nutrients. Containerized stock gives great flexibility in planting. Whereas bare root stock has to be planted before they start to grow, the time frame for containers is much longer because the seedlings are actively growing and may be planted well into the summer or early fall. White pine has proved to be a fast grower on this soil, but deer browsing is a major problem.

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5.....	Sapling and Pole-timber Stands (p.47)
6.....	Managing Important Forest Types (p.55)
7.....	Forest Health (p.91)
11.....	Wildlife and Forest Management (p.127)
Appendix C.....	Climate Change Predictions for Individual Tree Species
Appendix C.....	Protect Pine Tree Seedling from Deer Browsing With Paper Bud Caps
Appendix C.....	Protect Oak Tree Seedling from Deer Browsing Using Balloons for Bud Caps
Appendix C.....	Bud Capping Hardwoods with Paper

## Cover Type: Black Ash

**Cover Type Label (on map):** 4

**Acres:** 3

**Cover Type Description:** A bottomland type composed of ash.

This stand contains mixed age classes of black ash trees ranging in size from small seedlings to larger parent trees up to 15 inches in diameter. Scattered elm trees and one large white spruce are also present in this stand. High quality ash trees are used for lumber and veneer. Lower quality trees provide good firewood. The small acreage of this stand on your property limits the potential for revenue. However, this forest type is of extreme importance to white-tailed deer serving as a wintering area as well as a migration corridor. Young stands provide abundant and nutritious browse for deer, moose, and snowshoe hares. This stand could be endangered when the Emerald Ash Borer (EAB) moves into this area of the state.

Tree Summary Data	Estimated Volume/acre
<p><b>Age:</b> Mixed ages</p> <p><b>Growth Potential:</b> Good (Ash SI = 50)</p> <p><b>Tree Density:</b> Adequate (BA = 70)</p> <p><b>Timber Quality:</b> Good</p>	<p><b>Species:</b> Ash, Black</p> <p>3 Cords/Acre, 600 MBF/Acre</p> <p><b>Species:</b> Elm, Red</p> <p>0.5 Cords/Acre, 0 MBF/Acre</p>
<p><b>Timber Volume:</b> 3.5 Cords/Acre, 600 MBF/Acre</p>	

**Cover Type Objective:** Maintain a diverse mixture of tree species and ages to provide habitat for wildlife.

### Main Recommendation

**Action:** No Action-Free to Grow

This bottomland black ash stand won't require management activity for the next ten year period. During that time, it will provide habitat for white-tailed deer, squirrels, frogs, and at least fifteen species of birds. Be sure to check the stand occasionally for evidence of trees damaged by wind, sawflies, flooding, or drought.

### Alternative Recommendation

**Action:** Timber Stand Improvement

Timber stand improvement (TSI) is a broad term encompassing a wide variety of forest practices. The purpose of the practices is to improve the overall health, timber growing potential, aesthetics, wildlife habitat and/or quality of the trees being grown. There are four general categories of TSI practices. They are thinning, release, pruning, and protection. These practices, alone or in combination, can often add value to a forest type. Generally, thinning involves the removal of some trees for the betterment of others, release involves removing vegetation that is harmfully competing with crop trees or desirable trees, pruning is the removal of branches to improve wood quality, and protection involves practices that control or eliminate disease, insects, or animals that are harmful to the forests' health.

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## Cover Type: Black Spruce-Lowland

Cover Type Label (on map): 5

Acres: 2

**Cover Type Description:** Swamp conifers with black spruce outweighing other species.

This stand is a small island of black spruce trees ranging in size from small seedlings to 20 foot high trees that are 60 years old. There is apparently a more favorable microclimate for tree growth at this location within the surrounding wetland type. The trees are growing in an area of sphagnum moss and Labrador Tea. Black spruce is a slow growing tree with great variation between sites. The primary value of this stand is for wildlife habitat. In very cold or stormy weather, deer and other wildlife species will seek out these areas for shelter. Black bears regularly select den sites in black spruce stands. The topography here is level.

Tree Summary Data	Estimated Volume/acre
<b>Age:</b> 60 Year(s) <b>Growth Potential:</b> Good (Black Spruce SI = 22) <b>Tree Density:</b> Adequate (BA = 50) <b>Timber Quality:</b> Poor	<b>Species:</b> Spruce, Black (0-3" diameter) 1500 Stems/Acre
<b>Timber Volume:</b> 1500 Stems/Acre	

**Cover Type Objective:** Maintain this stand for wildlife habitat.

### Main Recommendation

**Action:** No Action-Free to Grow

During the next ten years, your lowland black spruce stand won't require any management activity. Leave is free to grow during this period. The trees in this stand are on wet soils. This lowland area is important ecologically for water quality. You might even find some rare plant types in you stand. A winter's walk through you stand might turn up wildlife including boreal chickadees or great gray owls.

### Alternative Recommendation

**Action:** Thinning: Non-Commercial-Mechanical-Strip/Row

This practice is applied to plantations where trees were planted too close together or in natural stands that are overstocked. It involves using a brush saw, mower or other mechanical equipment to open up strips in the dense vegetation. This sets up a more uniform spacing and allows light to reach the trees and promote growth. The practice can also be applied in larger tree size class stands to minimize damage to the trees left. In this case, tractors, chain saws, and specialized logging equipment may be needed. Removing one or two rows and reserving the next two rows is the most common method used. A "shortwood processor" can remove every 5th row for access and can thin the 2 rows on each side with its 20 foot long cutting head arm. The pine thinning "Rule of Thumb" is to take no more than 30-40% of the stand at a given time, utilize trees to a 3-inch top to avoid bark beetle problems and to do thins 8-10 years apart to allow the trees time to become wind firm. Care must be taken to prevent root or stem damage of the remaining crop trees when doing the thin.

**Stewardship Binder References:** (for additional information)

<u>Chapter</u>	<u>Reference Name</u>
1.....	Forest Stewardship Plan Basics (p.3)
3.....	How Trees Grow (p.26)
4.....	Regenerating Woodland Stands (p.33)
5.....	Sapling and Pole-timber Stands (p.47)
6.....	Managing Important Forest Types (p.55)
7.....	Forest Health (p.91)
11.....	Wildlife and Forest Management (p.127)

## Cover Type: Lowland Brush / Lowland Grass

**Cover Type Label (on map):** 6

**Acres:** 77

**Cover Type Description:** A lowland brush area on potential commercial land, less than 10 percent stocked with a commercial tree species.

The wetland types on your property consist mostly of lowland grass with smaller amounts of lowland brush. The largest wetland has some small tamarack and black spruce trees scattered throughout parts of it, although most of it is free of trees. Some of the smaller pothole wetlands are predominantly lowland grass and others support more lowland brush. None of them are currently supporting trees. The lowland brush in some areas of the larger wetland was sheared off during the construction of the winter logging roads, and these areas have remained free of brush. The lowland grass areas would be classified as Type 2 (inland fresh meadows) wetlands. Type 2 wetlands are shallow depressions without standing water but waterlogged within at least a few inches of the surface during the growing season. Animal use in these areas includes 7 species of reptiles and amphibians, 10 species of mammals, and 47 species of birds. The lowland brush areas would be classified as Type 6 shrub swamps. The soil here is waterlogged or covered with as much as 6 inches of water during the growing season. Vegetation includes alders, willows, and dogwoods. Animal use in these swamps includes 12 species of reptiles and amphibians, 15 species of mammals, and 62 species of birds. The topography in these areas is level

**Cover Type Objective:** Maintain for wildlife habitat.

### **Main Recommendation**

**Action:** No Action-Free to Grow

This lowland brush type is actually an important wetland. This wetland cleans water, helps prevent flooding, and provides habitat for wildlife. You won't need to perform any type of management activity on this area for the next ten years. Look for species such as high-bush cranberry and dogwood on your land. In the winter, you can hike or snowshoe through this frozen wonderland.

### **Alternative Recommendation**

**Action:** Shearing

Shearing lowland sites is done in the winter with a large crawler tractor using a special blade called a "K-G" blade. It is sharp at the base so that it will cut trees and brush off at ground level. The debris is piled or windrowed. The piles may be burned if they are dry enough and conditions are safe. Shearing lowlands is used to clean up a site for planting, seeding, or to encourage resprouting of brush species for wildlife habitat improvement. Shearing is not recommended when the ground is not frozen due to the extreme amount of damage that can be done to the soil and the watershed.

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### **Stewardship Binder References:** (for additional information)

<u>Chapter</u>	<u>Reference Name</u>
11.....	Wildlife and Forest Management
Appendix C.....	Managing Your Woodland Wetland
Appendix C.....	Managing Your Brushland for Wildlife

## Cover Type: Permanent Water / Hunting Cabin

Cover Type Label (on map): 7

Acres: 1

**Cover Type Description:** Non-meandered lakes (bodies of water that do not have permanent traverse lines marking the high water mark of that permanent body of water), ponds and ditches which are managed for the primary purpose of containing water perpetually (during drought periods may be dry).

This cover type includes a pond that was constructed since the original plan was written, and an area cleared for a hunting cabin and wildlife opening. The pond construction was very successful and the banks have revegetated very well. The opening was seeded for wildlife following the construction of the hunting cabin. A large pole building was also constructed here providing great storage for all the equipment used to manage the property. Oak trees were reserved in this opening and are providing mast for the abundant wildlife observed around the pond. Wood duck boxes have also been installed along the pond as suggested in the previous plan. The topography here is mostly level.

**Cover Type Objective:** Maintain for wildlife habitat.

### Main Recommendation

**Action:** Wildlife Habitat-Nest Boxes

Wood ducks have made an amazing recovery in Minnesota in the last 30 years to where wood ducks are among the most abundant of waterfowl species in the state. Properly constructed and placed nest boxes will help continue this trend. Nest boxes should be constructed of wood that is strong and weather resistant, and should only be stained or painted on the outside. Nest boxes can be placed in woodland habitat up to one half mile from water, although shorter distances are better. Avoid placing nest boxes in aspen trees, since they are vulnerable to beavers. It is better to scatter nest boxes around an area than to concentrate them.

### Alternative Recommendation

**Action:** Wildlife Opening Maintenance

Wildlife openings of grass and shrubs provide an important component for many forest-dwelling species. To prevent the natural closure of the openings, it will be necessary to occasionally set back the encroachment of trees and shrubs. Burning, mowing and herbicides are all tools that could be used.

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## Stewardship Binder References: (for additional information)

<u>Chapter</u>	<u>Reference Name</u>
11.....	Wildlife and Forest Management
Appendix C.....	Managing Your Woodland Wetland

## FUTURE STEWARDSHIP PROJECTS

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Scheduled Year	Cover Type	Map Label	Project Prescription	Acres
Spring 2014	Aspen	1	No Action-Free to Grow	73
5-10 Years	Aspen	1	<b>Optional</b> - Timber Stand Improvement	73*
Spring 2014	Aspen	2	No Action-Free to Grow	29
5-10 Years	Aspen	2	<b>Optional</b> - Timber Stand Improvement	29*
Spring of 2015	Birch	3	Planting: Hand Planting: Hardwoods	15*
Spring of 2016	Birch	3	<b>Optional</b> - Planting: Softwoods	15*
Spring 2014	Ash	4	No Action-Free to Grow	3
5-10 Years	Ash	4	<b>Optional</b> - Timber Stand Improvement	3*
Spring 2014	Black Spruce-Lowland	5	No Action-Free to Grow	2
10-15 Years	Black Spruce-Lowland	5	<b>Optional</b> - Thinning: Non-Commercial-Mechanical-Strip/Row	2*
Spring 2014	Lowland Brush	6	No Action-Free to Grow	77
5-10 Years	Lowland Brush	6	<b>Optional</b> - Shearing	77*
Spring 2014	Permanent Water	7	Wildlife Habitat-Nest Boxes	1
1-5 Years	Permanent Water	7	<b>Optional</b> - Wildlife Opening Maintenance	1
2025	All	All	<b>Update Management Plan</b>	200

An asterisk\* indicates the entire cover type may not need treatment.

# PROPERTY-WIDE PROJECTS

## Recommended Management Activities:

Trails offer the opportunity for a variety of activities. They allow recreational access on foot, horseback, skis, or recreational vehicles. Multi-purpose recreational trails should have gentle curves to eliminate long views. The native soil base is often adequate. Trails should avoid wetlands and should be seeded to prevent erosion. To help prevent soil erosion on newly constructed or repaired trails, all disturbed areas exposing bare soil should be prepared and seeded with a grass mixture to stabilize the soil. The seedbed preparation may involve disking and/or dragging. The grass mixture should include clover to provide forage for wildlife.

The quality of a trail will depend largely on the maintenance it receives. The goal of maintenance is to continue to provide a safe and stimulating recreational experience and to prevent degradation of the trail environment. Trail maintenance includes trail bed stabilization, vegetation management, and weed control. Inspections of the trail should be done periodically to check the need for clearing of unwanted vegetation, repairing the trail bed, correcting erosion problems, and mowing.

These trails will also serve as important habitat for wildlife if properly maintained. Grassy, herbaceous openings are important to many species of wildlife, especially in heavily forested areas. Herb and forbs seeding involves improving wildlife habitat through the sowing of perennial and annual grasses and herbs. In most cases, the site should be prepared for the seeding in much the same way that a field is prepared before planting. Debris (such as logging slash) and competing vegetation should be removed and/or controlled. A seed mix that is suitable for the soil type and geographic area of the state should be used. Contact your forester or wildlife manager for details on site preparation and seed mixes.

Periodically check the aspen stands for forest health issues, decline, or dieback. Serious impacts may suggest the need for earlier entry into these stands or conversion to other forest cover types. Monitor regeneration in the recently harvested paper birch stand to identify areas where natural regeneration is lacking and where planting may be needed. Monitor the survival and growth of all planted seedlings at regular intervals. If the planted seedlings are from seed zones further south or west in Minnesota, compare their growth and survival to seedlings from within the local seed zone. Employ one or more herbivory deterrents (bud caps, tubes, spray repellants, etc.) and monitor the effectiveness of these methods.

## Stewardship Binder References: (for additional information)

<u>Chapter</u>	<u>Reference Name</u>
13.....	Recreational Trail Design (p.147)
Appendix C .....	Managing Your Woodland for Wild Turkeys
Appendix C .....	Managing Your Woodland for White-Tailed Deer
Appendix C .....	Managing Your Woodland for Ruffed Grouse
Appendix C .....	Wildlife Food Plots
Appendix C .....	Top 10 Forest Wildlife Habitat Tips
Appendix C .....	Buckthorn: What You Should Know. What You Can Do.
Appendix C .....	Bald Eagle Fact Sheet
Appendix C .....	Adaptation Workbook – Short Form
Appendix C .....	Adaptation Strategies and Approaches

## **PROPERTY TAX RELIEF FOR FOREST LANDOWNERS**

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Property taxes pay for important local government services. They also are a significant annual cost for you, the forest landowner. You may not fully recover costs, such as property taxes, associated with forest management, due to the 30 to 100 year time between harvests. In addition, your land provides wildlife habitat, watershed protection, aesthetics, and biodiversity that benefit all Minnesotans. Because of the public benefits your forest land provides, the Minnesota Legislature created the Sustainable Forest Incentive Act (SFIA) and 2c Managed Forest Land Classification (Class 2c).

### **The Sustainable Forestry Incentive Act (SFIA)**

This State of Minnesota program allows property owners to receive an annual tax incentive payment for their property (\$7/acre). A minimum of 20 acres is required for eligibility, as well as a current forest management plan. This program requires that a covenant be filed with the county stating that the acreage will not be developed for a minimum of 8 years. An application, with the plan preparer's signature and identification number, can then be submitted to the Records Office at the local county courthouse prior to September 30<sup>th</sup> of the application year and after the **management plan** has been written for the property. Once enrolled in the SFIA program, the landowner will still pay normal property taxes at the regular time of the year but will receive a tax incentive payment back in October of each year beginning in the year following the year of application.

The SFIA differs substantially from other forms of property tax relief in a number of ways. Take for instance the way tax relief is provided. Instead of seeing a credit on the property's tax bill, a landowner enrolled in the SFIA will annually receive a check (called an incentive payment) from the Department of Revenue (DOR) based on the number of acres enrolled in the program. No adjustments will appear on the forestland's property tax bill. In fact, the property tax bill will not even indicate the land is enrolled in the SFIA program. That is because of another unique feature regarding how the law is administered. Unlike nearly all property tax laws that are administered by local governments, the SFIA is administered entirely by the DOR. Local assessors will still assess forestland enrolled in the SFIA for tax purposes based on its highest and best use. Similarly, the local auditors will still calculate and assess property taxes owned on all SFIA forestland. However, assessors and auditors will not be involved in administering the SFIA.

### **2c Managed Forest Land Classification**

Minnesota Laws 2008, chapter 366 (House File 3149), creates a new property classification that provides qualifying land with a class rate of 0.65 percent. This classification is made available to un-platted property that is rural in character, not used for agricultural purposes, and not improved with a structure. (*A minor ancillary nonresidential structure does not disqualify the property.*)

A parcel must have at least 20 acres being enrolled in order to qualify for the classification, and total enrolled acreage is limited to 1,920 acres statewide per taxpayer. The property must have a qualifying **forest management plan** (forest stewardship plan) in place that was developed by an approved forest management plan writer within the last ten years. The forest management plan must meet the same requirements of forest management plans prescribed to property enrolled in the SFIA program.

No land can be enrolled in both programs at the same time. There are application procedures for both programs. For further information regarding these two property tax relief programs please visit the Department of Revenue website at [www.taxes.state.mn.us/](http://www.taxes.state.mn.us/) or visit [www.myminnesotawoods.umn.edu](http://www.myminnesotawoods.umn.edu) for information on property taxes as well as much more.

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**If you have any questions about this plan please contact:**

Tony Miller  
460 W. Maple St.  
Mora, MN 55051  
(320) 679-3683


Office hours are 8:00am-4:30pm M-F.  
The best time to contact someone is early or late in the day.

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# Woodland Stewardship Cover Types



0 370 740 1,480 Feet

 PFM - Cover Type Areas

- 1 Aspen
- 2 Aspen
- 3 Birch
- 4 Black Ash
- 5 Black Spruce
- 6 Wetland
- 7 Open Water / Hunting Cabin

**Gerald Nelson**  
 1447 - 140th Ave. NW  
 Andover, MN 55304  
 763-754-6607

**N1/2 NE1/4, SWNE, and E1/2SW of 28-42-19**  
**Pine County**

**Stewardship Acres: 200**  
**Ownership Acres: 200**



**Tony Miller**  
 MN DNR Forestry  
 460 W. Maple Ave.  
 Mora, MN 55051  
 320-679-3683  
 June 27, 2014

# Minnesota Department of Natural Resources

Mora, MN 55051(320) 679-3683



Gerald Nelson  
1447 - 140th Ln NW  
Andover, MN55304

July 15, 2014

Dear Gerald,

I enjoyed our recent visit. You have a splendid piece of property. Because of your strong concern for the environment and your desire to work with the land, I'm pleased to provide you this Woodland Stewardship Plan. The plan has three components. The first segment includes some brief information about the history of the Forest Stewardship Program. The second is your property management plan and offers management options and recommendations. It matches your goals with the potential of your land. The remainder is reference material which can include information you requested to learn more about a specific topic. Finally you will find the 2<sup>nd</sup> edition of the Woodland Stewardship publication. This publication was designed as a practical guide for landowners in the Midwest.

This plan offers mostly conceptual recommendations and alternatives. Should you decide to undertake specific activities, I will follow up with a short, but specific project plan. One of the first management opportunities I feel you should undertake is to introduce some new hardwood species by planting in the area that was recently harvested. Additional opportunities include timber stand improvement in the other cover types.

I am prepared to provide the field assistance needed to carry out your plan. (On some projects we may refer you to more appropriate professional support.) Financial assistance may be available for activities that do not generate revenue. Feel free to contact me if you have any questions or need additional information.

Soon you will receive an invoice for this plan. Please return payment according to instructions on the invoice. Once payment is received, your plan will be registered. Registration will allow you to apply for cost sharing and is necessary to be eligible for certain tax programs. As property owner and land steward, you have the opportunities and responsibilities of protecting, improving, using, and enjoying your woodland. I wish you well and look forward to working with you.

Yours for conservation,

Tony

P.S. I've enclosed a "field copy" of the plan in the front pocket.