WOODLAND STEWARDSHIP PLAN

Prepared for:

Daniel Nelson
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612-245-4580

N 1/2 of NW ¼ of Section 28, Township 42N, Range 19W in Pine County, MN.

Total Acres: 80
Stewardship Acres: 80
2c – Managed Forest Land Acres: 80
SFIA Acres: 80

Prepared by:

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Date generated: July 15, 2014

Daniel 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 folllwing good forest management guidlelines
- 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

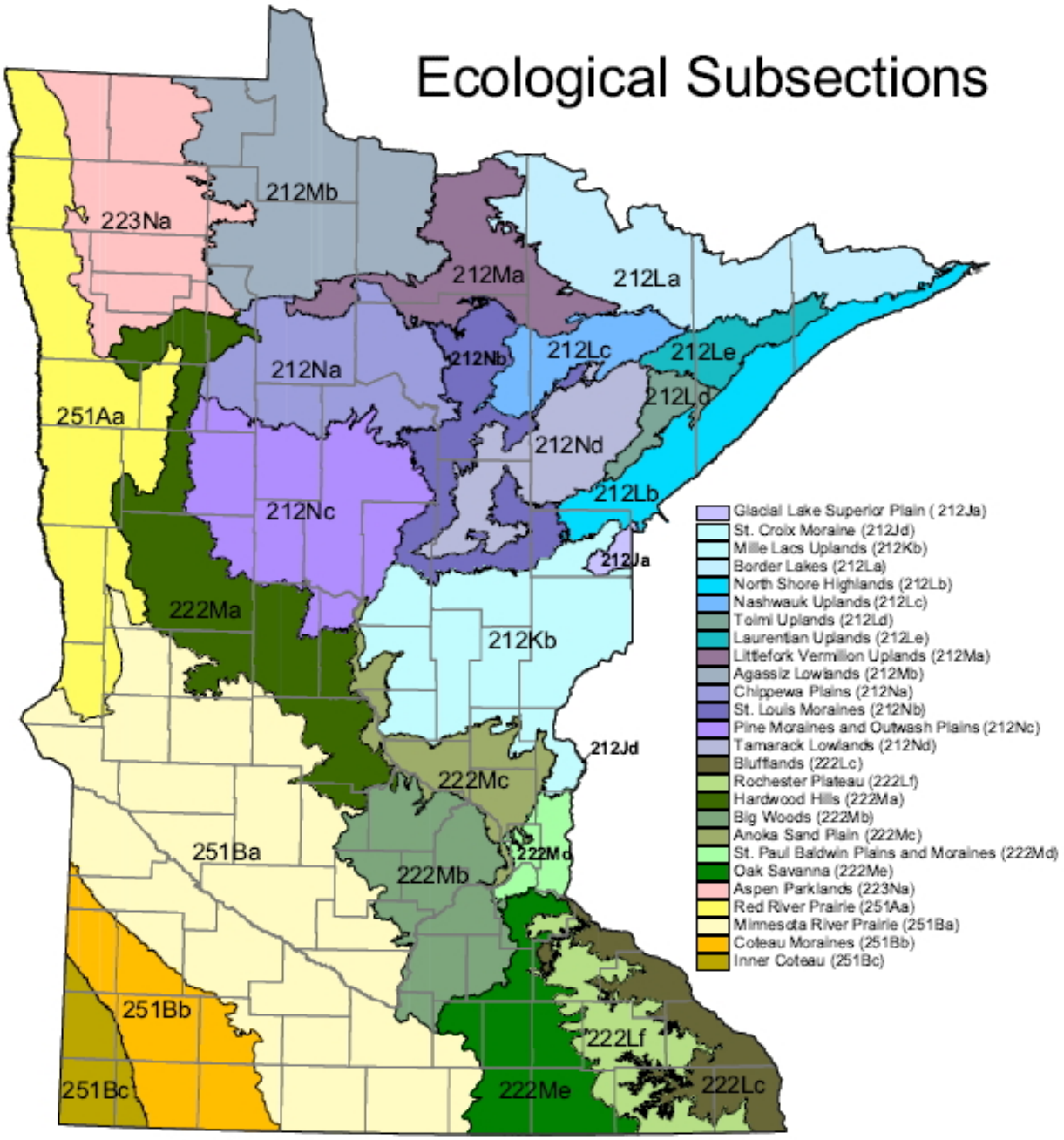
PROPERTY DESCRIPTION: Landscape Region

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 l98l).

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 DNR Natural Heritage Database for the adjacent properties. Consider this when making forest management decisions in the future. The National and Minnesota Environmental Protection Acts prevent certain actions which 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 affect Bald Eagles or their nests, or if you for any reason cannot follow the recommendations in the document that is attached to this plan, please contact USFWS Ecological Services at 612-725-3548.

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). 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.; Fehringer, 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.treesearch.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 and six miles north of Cloverdale, MN on Pine County Road 21. This 80-acre parcel lies one half mile west of County Road 21. The cover types include northern hardwood forest, aspen forest, lowland brush and lowland grass. The topography ranges from gently rolling in the upland areas to mostly level in the wetlands. Soils on the property include Askov fine sandy loam on the high grounds and peat in the lowlands.

Askov fine sandy loam soil developed when glacial till carrying sandstone material was 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. In Sandstone Township, many farms are on this soil, but only about 15% of the total area is cleared and cultivated. About 75% of the rutabagas grown in the county are produced on this soil. Wetland pockets are located throughout the area, and the soils here are peat. Peat is formed in wet depressions from the remains of plants that grew and died on the spot. 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 has been observed on the adjoining 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 local DNR office about the process of further survey work.

PROPERTY DESCRIPTION: Interaction with Nearby Properties

This property is adjoined by private properties on the west, south, and east sides, and State land to the north. Land uses in the area include forestry, agriculture, and recreation. This property includes part of a wetland that extends north, east, and south of the proeprty. Bear Creek is located one mile to the west. Upland access to the property is through a mutual agreement with the farmer to the south. No permanent easement has been secured. Winter access is possible across the Gerald Nelson property to the west. The landowner has recently had portions of the property harvested by a logging company.

MANAGEMENT COVER TYPES

Cover Type: Northern Hardwoods

Cover Type Label (on map): 1

Acres: 13

Cover Type Description: Northern or upland hardwood species.

This cover type is a northern hardwoods stand that is regnerating following a harvet operation in 2007. All of the aspen, birch, maple, and basswood were harvested, leaving a red oak and ash residual. The shrub layer consists of a moderate density of hazel and the ground cover consists of common forbes. The topography is mostly level to gently rolling. A small lowland grass wetland is located in the center of this cover type. Ecosystem models project that aspen and birch will decrease by the end of the century, and that red maple, basswood, green ash, 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 tree species that are projected to increase with the changing climate.

Tree Summary Data	Estimated Volume/acre
Age: 7 Year(s) **Growth Potential:** Good (Aspen SI = 70) **Tree Density:** Adequate regeneration (residual BA = 20) **Timber Quality:** Good potential	**Species:** Birch, Paper 0 Cords/Acre, 200 Stems/Acre **Species:** Oak, Northern Red 0.76 Cords/Acre, 0 MBF/Acre **Species:** Maple, Red 0 Cords/Acre, 400 Stems/Acre **Species:** Basswood 0 Cords/Acre, 100 Stems/Acre **Species:** Aspen, Trembling 0 Cords/Acre, 1500 Stems/Acre **Species:** Ash, Green 0.24 Cords/Acre, 0 MBF/Acre
Timber Volume: 1 Cords/Acre, 2200 Stems/Acre	

Cover Type Objective: 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 of 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. Monitor the forest for changes that might be related to climate change.

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.

Stewardship Binder References: (for additional information)

Chapter	Reference Name
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: Northern Hardwoods

Cover Type Label (on map): 2

Acres: 12

Cover Type Description: Northern or upland hardwood species.

This cover type was dominated by paper birch before being harvested in 2007, with smaller amounts of aspen, maple, basswood, red oak, and ash. All species were harvest except for the red oak and ash. All harvested species have regenerated adequately from either stump sprouts or root suckers. Red oak, white oak, and white spruce seedlings were planted throughout the harvested area during the spring of 2008 where natural regeneration was lacking. Seedling survival was very good, however deer browsing is now becoming evident on the hardwood species. The shrub layer consists of a light density of hazel, choke cherry, and dogwood, and a moderate density of raspberry. The ground cover consists of common forbes. This stand islocated on a gently rolly knob in the landscape that slopes off on three sides into the surrounding wetlands. 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 tree species that are projected to increase with the changing climate. The recent harvest and planting have already provided adaptation benefits by maintaining young and healthy paper birch, by creating a new age class, and by maintaining and restoring native tree species diversity.

Tree Summary Data	Estimated Volume/acre
Age: 6 Year(s) **Growth Potential:** Good (Birch SI = 65) **Tree Density:** Adequate regeneration (residual BA = 0) **Timber Quality:** Good potential	**Species:** Oak, White 0 Cords/Acre, 67 Stems/Acre **Species:** Birch, Paper 0 Cords/Acre, 667 Stems/Acre **Species:** Maple, Red 0 Cords/Acre, 400 Stems/Acre **Species:** Aspen, Trembling 0 Cords/Acre, 800 Stems/Acre **Species:** Oak, Northern Red 0.68 Cords/Acre, 67 Stems/Acre **Species:** Spruce, White 0 Cords/Acre, 67 Stems/Acre **Species:** Ash, Green 0.32 Cords/Acre, 0 MBF/Acre
Timber Volume: 0 Cords/Acre, 2067 Stems/Acre	

Cover Type Objective: Timber stand improvement.

Main Recommendation

Action: Release: Mechanical-Manual

Uses hand tool such as a brush axe, axe, or other tool to manually cut and remove unwanted trees or shrubs from desirable vegetation. This can be effective on smaller vegetation less than two or three inches in diameter. Apply this practice to the hardwood stump sprouts, favoring only the best stems.

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).

Protect the desired future tree species, both planted and natural, from deer browsing where possible.

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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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	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: Aspen

Cover Type Label (on map): 3

Acres: 27

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

This cover type is a regenerating aspen stand resulting from a timber harvest in 1994. Natural regeneration has resulted in an adequately stocked young aspen stand. The shrub layer consists of a light to moderate density of choke cherry, hazel, and ironwood. The ground cover consists of common forbes. The topography is gently rolling. Managed aspen is predicted to have a moderate to high vulnerability to climate change in the future, however aspen is also 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 tree species that are projected to increase with the changing climate. Promote diverse age classes in the aspen in the future 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
Age: 20 Year(s) **Growth Potential:** Good (Aspen SI = 70) **Tree Density:** Adequate (BA = 60) **Timber Quality:** Good	**Species:** Cherry 0.5 Cords/Acre, 0 MBF/Acre **Species:** Ash, Green 1.5 Cords/Acre, 150 Stems/Acre **Species:** Aspen, Trembling 7.5 Cords/Acre, 700 Stems/Acre **Species:** Maple, Red 1.5 Cords/Acre, 400 Stems/Acre **Species:** Birch, Paper 1 Cords/Acre, 0 MBF/Acre **Species:** Basswood 1 Cords/Acre, 0 MBF/Acre
Timber Volume: 13 Cords/Acre, 1250 Stems/Acre	

Cover Type Objective: To maintain a healthy forest.

Main Recommendation

Action: No Action-Free to Grow

Regeneration after the aspen harvest was very good for aspen and oak. In order to achieve maximum regeneration such as this you would need full sunlight. Typically in this area aspen matures at approximately 55 years and will deteriorate rapidly after that. An indicator of deterioration is Hypoxylon canker which indicates heart rot. An excellent web site titled, “Managing Aspen in the Lake States,” is located at: www.extension.umn.edu/distribution/naturalresources/DD3473. This is a very informational web site explaining the ecology of aspen and how it benefits wildlife.

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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11	Wildlife and Forest Management (p.127)

Cover Type: Lowland Brush

Cover Type Label (on map): 4

Acres: 27

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

This cover type is part of a large Type 6 alder swamp that extends outside of the property boundaries. The soil here is waterlogged or covered with as much as 6 inces of water during the growing season. Vegetation includes alders, willows, and dogwoods. Animal use includes 12 species of reptiles and amphibians, 15 species of mammals, and 62 species of birds. This cover type separates the three forested types on this property from each other.

Cover Type Objective: To 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.

Stewardship Binder References: (for additional information)

Chapter	Reference Name
11	Wildlife and Forest Management
Appendix C	Managing Your Woodland Wetland
Appendix C	Managing Your Brushland for Wildlife

Cover Type: Lowland Grass

Cover Type Label (on map): 5

Acres: 1

Cover Type Description: A lowland grass area capable of supporting a commercial forest.

This cover type is a small Type 2 inland fresh meadow (sedge swamp) that is located in the center of cover type #1. This shallow depression is without standing water but is waterlogged within at least a few inches of the surface during the growing season. Vegetation includes grasses, sedges, and rushes. Animal use includes 7 speceis of reptiles and amphibians, 10 species of mammals, and 47 species of birds. The topography here is level.

Cover Type Objective: To maintain for wildlife habitat.

Main Recommendation

Action: No Action-Free to Grow

During the next ten years or longer, you won't need to actively manage this area. This lowland grass type is very important to your land. It is cleaning water, helping to prevent floods, and providing food and cover for wildlife. The soil is probably wet much of the year. In the fall, the sedges, rushes, and grasses will turn shades of brown, rust, and gold, making this a very scenic area.

Alternative Recommendation

Action: Prescribed Burn

Prescribed burning is a site preparation technique that is used to control or eliminate some types of undesirable vegetation and to remove debris from a harvest or other vegetation management operation. The burn is conducted under such conditions so that the size and intensity of the fire is no greater than necessary to achieve the desired goal. The goals might be slash removal, seed bed improvement, fire hazard reduction, or wildlife habitat improvement. The timing of the burn can also be very crucial when vegetation control is the goal. Certain species of trees and shrubs respond to burning better than others. The location of natural and manmade fire breaks, the size, density, and amount of fuels, the local weather conditions, and surrounding timber types must all be taken into account. This practice should not be undertaken without the guidance of a professional.

Stewardship Binder References: (for additional information)

Chapter	Reference Name
11	Wildlife and Forest Management
Appendix C	Managing Your Woodland Wetland

FUTURE STEWARDSHIP PROJECTS

Scheduled Year	Cover Type	Map Label	Project Prescription	Acres
Spring 2014	Northern Hardwoods	1	No Action-Free to Grow	13
5-10 Years	Northern Hardwoods	1	**Optional -** Timber Stand Improvement	13*
1-5 Years	Northern Hardwoods	2	Release: Mechanical-Manual	12
5-10 Years	Northern Hardwoods	2	**Optional** - Timber Stand Improvement	12*
Spring 2014	Aspen	3	No Action-Free to Grow	27
5-10 Years	Aspen	3	**Optional** - Timber Stand Improvement	27*
Spring 2014	Lowland Brush	4	No Action-Free to Grow	27
1-10 Years	Lowland Brush	4	**Optional** - Shearing	27
Spring 2014	Lowland Grass	5	No Action-Free to Grow	1
1-10 Years	Lowland Grass	5	**Optional** - Prescribed Burn	1
2025	All	All	**Update Management Plan**	80

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 deterents (bud caps, tubes, spray repellants, etc.) and monitor the effectiveness of these methods.

Stewardship Binder References: (for additional information)

Chapter	Reference Name
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

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 a flat annual tax incentive payment of $7/acre for their property. 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 Recorders Office at the local county courthouse prior to September 30th 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.

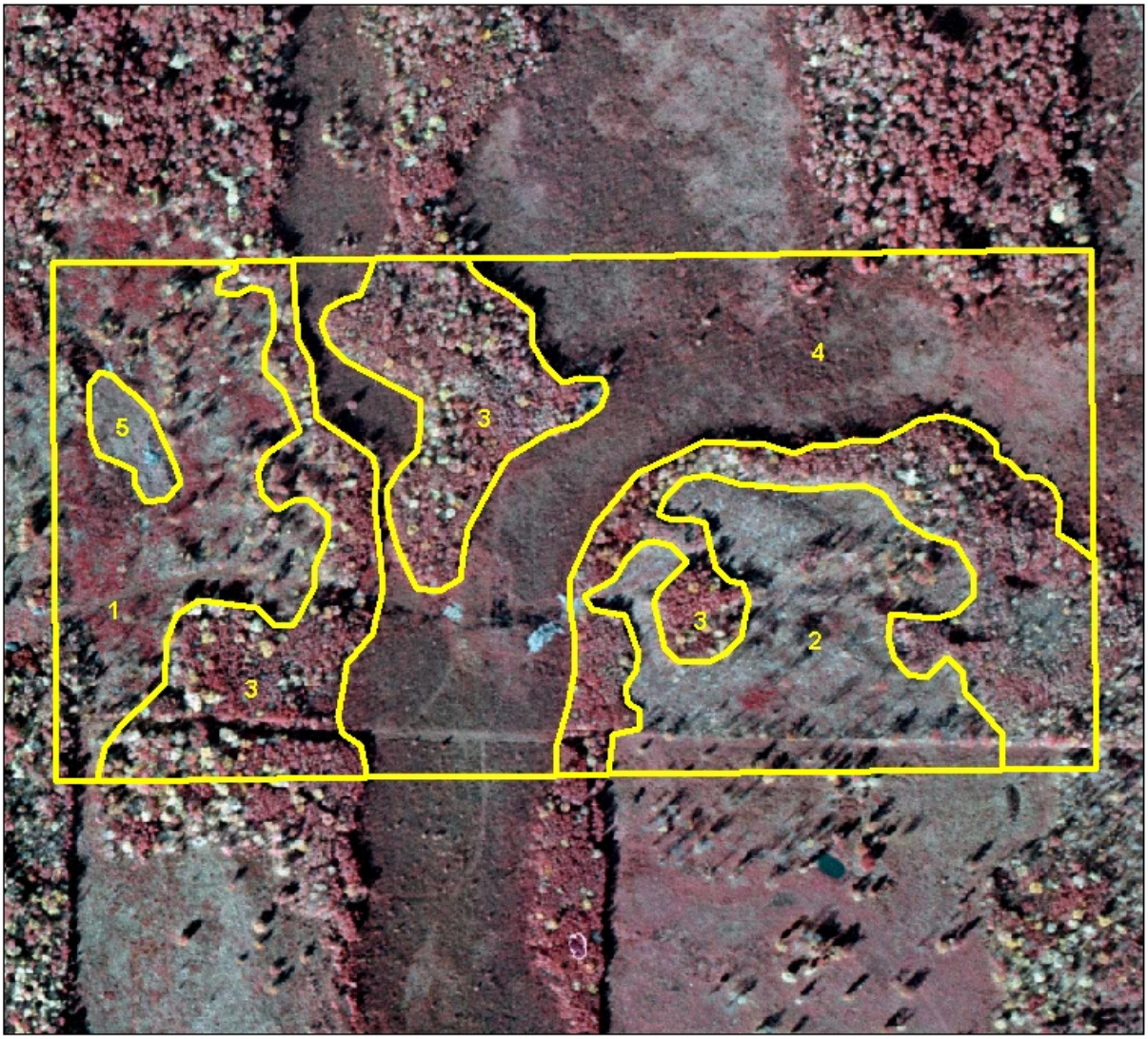
No land can be enrolled in both programs at the same time. There are application procedures for both programs. For further information regarding these two property tax relief programs please visit the Department of Revenue website at www.taxes.state.mn.us/ or visit www.myminnesotawoods.umn.edu for information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

If you have any questions about this plan please contact:

Tony Miller
460 W. Maple Avenue
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.

Woodland Stewardship Cover Types



0 155 310 620 Feet

PFM - Cover Type Areas

1	Northern Hardwoods
2	Northern Hardwoods
3	Aspen
4	Lowland Brush
5	Lowland Grass

Daniel Nelson
1678 - 146th Ave. NW
Andover, MN 55304
612-245-4580

N 1/2 of NW ¼ of 28-42-19
Pine County, MN.

Stewardship Acres: 80
Ownership Acres: 80

N

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

June 27, 2014

Minnesota Department of Natural Resources

460 W. Maple Avenue
Mora, MN 55051

(320) 679-3683

Daniel Nelson
1678 - 146th Ave. NW
Andover, MN55304

July 15, 2014

Dear Daniel,

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 2nd 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 release the stump sprouts by favoring the best stems. Additional opportunities include protecting the newly planted seedlings from deer browsing.

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 registering 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.