

NORTH SHORE FOREST COLLABORATIVE

North Shore Forest Restoration: Plan, Projects and Outreach

January 31, 2015



This project was funded in part by the Coastal Zone Management Act, by NOAA's Office of Ocean and Coastal Resource Management, in cooperation with Minnesota's Lake Superior Coastal Program & by a grant from the Duluth Superior Area Community Foundation

The North Shore Forest Collaborative is:

All of us...anyone committed to restoring the North Shore Coastal Forest.

The following are some of the member organizations or those who have provided support to the Collaborative and its mission to restore the North Shore Forest.



Flute Reed Watershed	Nadarra Forestry LLC	Private Landowners	Encampment Forest
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Minnesota Land Trust

North Shore Forest Collaborative Restoration Plan

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Note: “The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of NOAA’s Office of Ocean and Coastal Resource Management, Minnesota Department of Natural Resources or Minnesota’s Lake Superior Coastal Program.”

Introduction

The need for action and a plan: Today, the birch along the North Shore are dying in part because they are short-lived trees, and this is being accelerated by recurring droughts, insects and disease, changes in land use, and the effects of climate change. The native conifer forest is not returning primarily because of the absence of a seed source, exotic insects and diseases, competition from grasses and invasive plants, and high numbers of whitetail deer which feed heavily on young trees.

The North Shore Collaborative Project Area for restoration treatment is defined as the coastal forest of Lake Superior along a narrow band from the Lake Superior shore to approximately 3.5 miles inland, generally following ecological boundaries. The area extends from the Lake County line near Knife River, MN to the Canadian border, encompassing approximately 270,000 acres.

Landowners and land managers in the landscape include federal, state and county agencies and tribal governments, cities and towns, non-profits, local businesses, private landowners, and others. While publicly-owned land makes up a large portion of Cook and Lake Counties, private landowners are the largest landowner group within the NSFC project area.

Table 1: Landownership acres within the North Shore Collaborative Area

Landowner	Acres	Percent
Privately Owned	105,558	38.9
State	48,358	17.8
Federal	48,175	17.7
Tribal	30,369	11.2
Lake County	30,294	11.2
Municipal	3,456	1.3
Cook County	1,220	0.5
Unknown	3,664	1.3
Total	271,094	

The North Shore Forest Collaborative was formed in 2011 as a coordinated effort between local, state and federal land management agencies as well as public and private organizations and individuals who desire to work together to assure a healthy forest environment along Lake Superior’s North Shore. Participation is voluntary and members can include any organization that has management, assessment, or regulatory function within the area, or any entity or individual that owns land within or near the collaborative area.

Mission, Goals and Objectives

Mission - The mission of the North Shore Forest Collaborative is to revitalize and maintain a healthy and functioning ecosystem along the North Shore of Lake Superior with emphasis on restoring and maintaining native trees and associated forest communities.

Goal 1: RESTORATION: Reestablish and Maintain a Diverse and Thriving Forest along the North Shore of Lake Superior.

- **Objective A:** Restore lost components of Native Plant Communities on 1,000 acres per year. Current target tree species are: white cedar, white pine, white spruce across the landscape, and

yellow birch, tamarack, jack pine, basswood, elm, black and green ash, and red oak where ecologically appropriate. These species may be adjusted as needed, such as climate change. Retention of paper birch in the ecosystem will also be pursued.

- **Objective B:** Identify focus areas for restoration across the landscape by 2015.
- **Objective C:** Establish a network of implementers (foresters, timber harvest contractors, site prep contractors, planting contractors, etc.) that would be willing to work across all property owners.
- **Objective D:** Minimize the introduction and spread of invasive species.
- **Objective E:** Minimize forest fragmentation
- **Objective F:** Utilize project monitoring to measure progress in restoring ecosystem health and achieving project objectives.

Goal 2: COLLABORATION: Promote cooperative restoration efforts on all ownerships.

- **Objective A:** Increase private landowner engagement in the NSFC and restoration activities.
- **Objective B:** Secure multi-year funding for core operations of the NSFC

Goal 3: EDUCATION: Share expertise and knowledge about restoration.

- **Objective A.** Increase support from private landowners, public agencies, general public and political spheres for ecosystem restoration of the North Shore.
- **Objective B:** Offer ongoing internal and external education.

Landowner Engagement Strategy

Private landowners make up the largest ownership group in the collaborative area. They are a diverse group, including year-round residents, seasonal residents, and landowners not living on their property. The group also includes businesses, resorts, and large companies such as Minnesota Power. Ownership size varies from less than one acre to thousands of acres. Landowner objectives and short and long-term expectations for their lands are equally diverse. Restoration of the North Shore Coastal Forest depends upon successfully identifying, contacting, engaging, motivating and assisting private landowners in the restoration of their lands and encouraging them to work with neighboring lands, both private and publicly owned.

Key facets of Engaging Landowners

- Identifying, prioritizing and contacting private landowners
- Training in engagement
- Implementing peer-to-peer learning
- Effective Communications Strategies

Six Potential Activities for Landowner Engagement and Peer to Peer Learning

- **Appreciative Inquiry** - A meeting that focuses key questions and encourages listening to bring about imagination, ideas and commitment to action.
- **Learning Network** - A meeting of a small group of neighbors over coffee etc, to share stories experiences, ideas and problems with caring for a wooded property
- **Social Media** - An electronic forum to engage landowners in the sharing of ideas, questions and stories.

- **Walk in the Woods** – Landowner opens their woodland for guided tour/discussion of the property.
- **Study Circles** - Multiple groups discuss a specific topic or work to solve a specific problem and then meet as a whole group to share what they learned.
- **Speaker Bureaus** – Present information/presentations at regular meetings of other organizations holding meetings along the North Shore.

List of Potential Projects

Projects are tied directly to the Goals, Objectives and Strategies. This project list will be dynamic. Projects will be reviewed, added, dropped or modified as the need arises. Some projects are currently being implemented and others are potential future projects. Projects were developed by Collaborative members, the Executive Committee of the Collaborative, and presented for review at public meetings.

Project No.	Project Title
Projects that address Goal 1 – RESTORATION	
1A1	Develop and Maintain Calendar of On-going and planned Restoration Projects
1A1a	Superior National Forest North Shore Restoration Project
1A1b	Cascade River and Spruce Creek Watershed Restoration
1A2	Work to ensure genetically appropriate planting stock and adequate supply for restoration efforts
1A3	Develop Ecological Desired Future Conditions and Objectives for Split Rock Land Type Association
1A3a	NRCS - Develop Ecological Site Descriptions of North Shore Highlands
1B1	Map currently identified areas of high ecological integrity and areas with most impacted ecosystems (NNIS, Soil erosion, off-site species)
1B2	Identify priority sites on which to plan and implement restoration activities
1C1	Develop and Maintain list of Contractors
1C2	Employ North Shore Forest Collaborative Project Manager
1D1	Coordinate with Cook and Lake County Invasives Team
1D3	Provide links to Invasive Species Info on Website
1E1	Participate in County Planning with regard to forest fragmentation
1F1	Develop monitoring strategies
Projects that address Goal 2 - COLLABORATION	
2A1	Develop a database of private forest landowners
2A2	Develop a “Restoration Recognition Program” to acknowledge restoration programs on private property
2A2b	Develop initial and follow-up contact materials for landowners
2A4	Encourage Neighbors helping neighbors program
2A6	Cluster/Consolidate Stewardship Plans on Private lands
2A8	Increase Emphasis on Stewardship Plans for private landowners
2B1&2	Secure funding for NSFC coordinator and project manager
2B3&4	Develop on-going list and calendar of grant and funding opportunities
Projects that address Goal 3 – EDUCATION	
3A1	Develop Communications Plan
3A3	Host a “Day at the Capitol”
3A6	Develop interpretive signs at demonstration projects
3B1	Host workshops
3B2	Distribute instructive materials on restoration
3B3	Develop and distribute a yearly summary of accomplishments
3B4	Develop opportunities for youth to participate in restoration

Historical and Existing Situation

The Forests of the Past

Native Americans and the first settlers in Northeastern Minnesota would have seen a dense, coastal forest dominated by evergreens (conifers). Fire was infrequent, and large fires that could kill most of the trees in an area were very rare, occurring only once every 600 to 1,000 years.

Logging and homesteading at the turn of the 20th century removed much of the mature conifer forest and large slash fires burned what remained. The forest that grew back was primarily birch and aspen. These species, which are the first to move in after a disturbance, are relatively short-lived. In the natural cycle, they are followed by other longer lived species, including spruce, fir, pine, and cedar, which can live for centuries.



Problems of Today



Today, the birch along the North Shore are dying in part because they are short-lived trees, and this is being accelerated by recurring droughts, insects and disease, changes in land use, and the effects of climate change.

The native conifer forest is not returning for a number of reasons, primarily: The absence of older conifers to provide a seed source, exotic insects and diseases like white pine blister rust, competition from grasses and invasive plants, and high numbers of whitetail deer, which replaced the native caribou and feed heavily on young trees.

A Solution for Tomorrow

Without active restoration, ecologists believe the North Shore forest will most likely be an open one, dominated by shrubs instead of the familiar evergreens. Some of the expected impacts are:

- Increased soil erosion into streams and Lake Superior,
- Reduced habitat for migrating and nesting birds and other wildlife,
- Warmer stream temperatures that will affect habitat for coldwater fish like trout, and
- Loss of North Shore scenic and recreational qualities beloved by all Minnesotans.

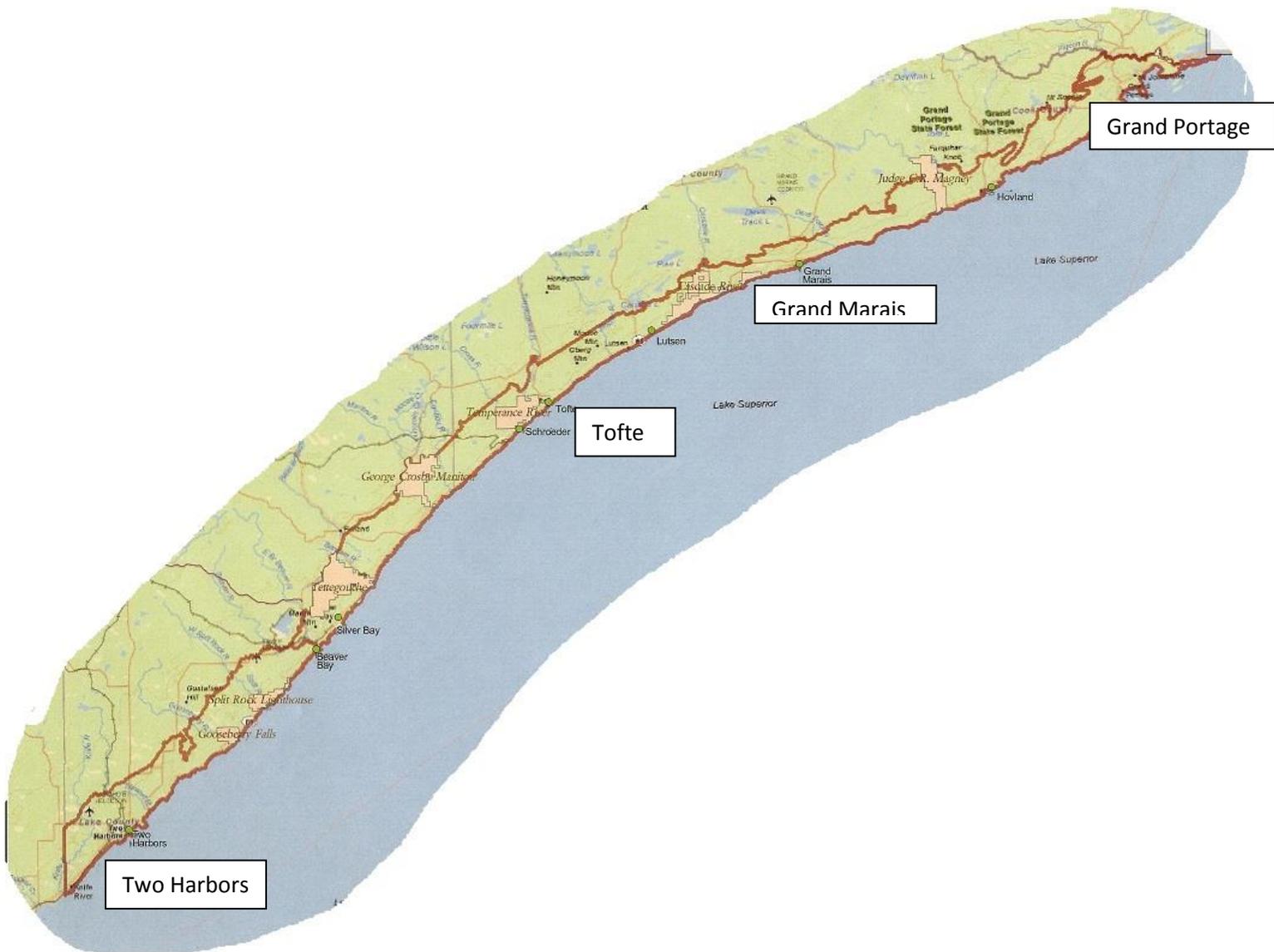
Restoring the coastal forest is critical to supporting a healthy North Shore ecosystem that sustains wildlife, residents, and visitors alike.



The North Shore Forest Collaborative (NSFC) area

The project area for restoration treatment is defined as the coastal forest of Lake Superior along a narrow band from the Lake Superior shore to approximately 3.5 miles inland, generally following ecological boundaries. The area extends from the Lake County line near Knife River, MN to the Canadian border, a distance of approximately 140 miles and encompasses approximately 270,000 acres or 422 square miles.

Figure 1. North Shore Collaborative Planning Area



Land Ownership and Land Managers in the NSFC Landscape

The variety of landowners and land managing agencies and organizations within the NSFC project area provides an outstanding pool of knowledge, professional expertise, organizational support, and resource management guidance. It greatly increases the opportunities coordination on landscape projects to help restore the forests along the North Shore of Lake Superior.

Land managers include federal, state and county agencies and tribal governments, cities and towns, non-profits, local businesses, private landowners, and others. While publicly-owned land makes up a large portion of Cook and Lake counties, private landowners are the largest landowner group within the NSFC project area.

Table 1: Landownership acres within the North Shore Collaborative Area

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Municipal	3,456	1.3
Cook County	1,220	0.5
Unknown	3,664	1.3
Total	271,094	

Publicly-owned lands

Federal – 48,175 acres (17.7%)

USDA Forest Service, Superior National Forest
National Park Service, Grand Portage National Monument

Tribal – 30,369 acres (11.2%)

Grand Portage Band of Minnesota Chippewa
Note: Grand Portage Band and 1854 Authority (representing Fond du Lac and Bois Forte bands) have hunting, fishing and gathering rights within the 1854 Ceded Territory)

State of Minnesota - 48,358 acres (17.8%)

Minnesota Department of Natural Resources, State Parks, State Forests, State Trails & Waterways, Wildlife Management Areas, Scientific and Natural Areas.
Minnesota Department of Transportation – Right of way along Highway 61

County Government

Lake County – 30,294 acres (11.2%)
Cook County – 1,220 (0.5%)

City/Town Governments 3,456 acres (1.3%)

Privately-owned lands - 105,558 acres (38.9%)

Non-Governmental Organizations and Non-Profits

Sugarloaf: The North Shore Stewardship Association
Wolf Ridge Environmental Learning Center
The Nature Conservancy

Private Businesses – large and smaller landowners

Minnesota Power (approximately 1,700 acres near Schroeder)
Various resorts and businesses

Private landowners

Full time residents
Part time residents
Land owners without a dwelling on property

Unknown ownership – 3,664 acres (1.3%)

Formation of the North Shore Forest Collaborative

The North Shore Forest Collaborative was formed in 2011. The Collaborative is a coordinated effort between local, state and federal land management agencies as well as public and private organizations and individuals who desire to work together to assure a healthy forest environment along Lake Superior's North Shore.

Participation is voluntary and members can include any organization that has management, assessment, or regulatory function within the area, or any entity or individual that owns land within or near the collaborative area. However, any interested person is welcome to attend meetings, participate in working groups and assist the collaborative in carrying out its mission.

The Collaborative maintains a mailing list of organizations and individuals that have participated and/or expressed interest in North Shore restoration efforts.

Summary of Actions to Date

Since its formation in 2011, some of the key accomplishments of the Collaborative have been:

- Hosting Annual Landowner Workshops in 2012, 2013 and 2014
- Developing Ecological Desired Future Conditions and Objectives for the North Shore Till Plain Land Type Association (LTA)
- Establishing a website at www.northshoreforest.org to make restoration information available for landowners.
- Helping to securing Minnesota State funding to do work in the Cascade River and Spruce Creek watersheds

- Hosting periodic meetings of all collaborative members. Presentations at meetings have included topics such as North Shore deer population history and management, and effects of vegetation cover on peak water flows.
- Working with University of MN Forestry Extension to host workshops on engaging private landowners.
- Developing organization structure and documents for the Collaborative, including a charter, membership policy, and working committees.
- Participating in and supporting member efforts such as Sugarloaf Community Tool shed for treating invasive species and the Forest Service restoration project.
- Participating in the planning and implementation teams of the MN Forest Resource Council's Northeast Landscape Plan.

Need for a Strategic Plan for Implementing Restoration on the North Shore

As can be seen by the above information, there is a great need to address the existing condition of the forest resources along the North Shore. The Collaborative has been actively pursuing its mission and laying the groundwork for a long-term restoration effort on the North Shore.

However, there was a need to step back and take a comprehensive look at the situation, assess the strengths and needs of the organization, to develop goals, objectives, strategies and actual projects that would work toward the end result of restoring the North Shore Forest. The Collaborative needed to identify ways to involve landowners, make information available, seek funding for projects, and support each member's individual efforts.

This Plan for Restoration of the North Shore Forest lays the foundation and serves as a guide for future operations and actions to be taken.

This planning effort was funded, in part by the Coastal Zone Management Act of 1972, as amended, by the NOAA's Office of Ocean and Coastal Resource Management, in conjunction with Minnesota's Lake Superior Coastal and from the Duluth Superior Area Community Foundation.

Mission

Revitalize and maintain a healthy and functioning ecosystem along the North Shore of Lake Superior with emphasis on restoring and maintaining native trees and associated forest communities.

Goals, Objectives and Strategies

Goal 1: RESTORATION: Reestablish and Maintain a Diverse and Thriving Forest Along the North Shore of Lake Superior.

Objective A: Restore lost components of Native Plant Communities (on 1000 acres per year)

- S1. Develop and/or support multiple restoration projects throughout the area. Facilitate multiple landowners restoring their lands in a similar timeframe to promote landscape level treatments.
- S2. Secure/improve planting stock available for restoration efforts.
- S3. Develop ecologically based, restoration desired conditions and ecological site descriptions.

Objective B: Identify focus areas for restoration across the landscape.

- S1. Analyze landscape data to identify areas to focus and prioritize restoration activities based on ecological need. For example, maintain or sustain areas ranked as High and Outstanding Biodiversity Significance by MN DNR Biological Survey.
- S2. Identify at least three sites from focus areas and plan and implement restoration activities.

Objective C: Assist Landowners with Finding Contractors willing to conduct restoration activities on their properties.

- S1. Establish a network of foresters, loggers, site preparation and planting contractors willing to work across all properties.

Project 1 Develop a list of contractors who are interested in restoration work and get their minimum scale of work.

Project 2 Hire a North Shore Forest Collaborative project manager to strategically utilize contractors to accomplish restoration work on a meaningful scale (i.e. coordinate between small private landowners with other small landowners, government agencies, or larger landowners to increase incentives for contractors).

Objective D: Minimize the introduction and spread of invasive species.

S1. Work with County Invasive teams to prioritize and implement invasive species control in the collaborative area.

S2. Include invasive species control or minimization in every restoration project.

S3. Incorporate invasive species education or information in NSFC materials (See strategies under Goal 3).

Objective E: Minimize forest fragmentation

S1. Provide input to county land use planning activities e.g. land use plan revision in Cook County, county planning and zoning committees to minimize forest parcelization and fragmentation, emphasizing consolidated development and minimizing conversion of forest to non-forest.

S2. Raise awareness of how private landowners contribute or mitigate fragmentation of forests and habitat. (see education strategies).

Objective F. Utilize project monitoring to measure progress in restoring ecosystem health and achieving project objectives.

S1. Develop monitoring strategies

Goal 2: COLLABORATION: Promote cooperative restoration efforts on all ownerships.

Objective A: Increase private landowner engagement in the NSFC and restoration activities.

S1. Identify and contact private landowners within the NSFC area within two years.

S2: Provide informational materials and incentives for landowners

S3. Develop a cadre of people for making initial on-site contacts with landowners, based on landowner interests.

S4. Promote peer-to-peer associations and relationships among landowner groups.

S5. Identify opportunities to cluster work on private lands.

S6. Consolidate restoration projects from Stewardship plans on private property to improve economies of scale.

S7. Develop a “restoration program” for acknowledging restoration efforts on private property.

S8. Promote stewardship plans for private landowners.

Objective B: Secure multi-year funding for core operations of the NSFC

- S1. Secure funding for NSFC coordinator.
- S2. Secure funding for NSFC project manager.
- S3. Apply for grants.
- S4. Explore other funding sources.

Goal 3: EDUCATION: Share expertise and knowledge about restoration.

Objective A. Increase support from private landowners, public agencies, general public and political spheres for ecosystem restoration of the North Shore.

- S1. Develop a communication plan with strategies to communicate our mission and further our goals to the public.
- S2. Distribute briefing paper/brochure that tells the story about the need for restoration to key contacts and public (This is a project)
- S3. Ensure local politicians and state senators and representatives are fully informed about NSFC efforts.
- S4. Form alliances with other forestry/resource organizations to gain broader understanding and support (including financial support). Use their relationship to work with legislators and others for the benefit of North Shore restoration.
- S6. Utilize restoration demonstration projects across the area suitable for interpreting ecosystem conditions and restoration techniques to many audiences.

Objective B: Offer ongoing internal and external education.

- S1. Host workshops on forest restoration topics. Examples of topics: installing and maintaining deer enclosures, what species are suitable for which sites, how to regenerate birch.
- S2. Develop information and instructive materials (methods, procedures, and techniques) for those attempting restoration. Develop materials for restoration options for private landowners.
- S5. Manage an up-to-date and effective web site.
- S3. Report monitoring results and collaborative accomplishments.
- S4. Involve youth in restoration activities such as reaching out to classrooms

Importance of Engaging Private Landowners in Restoration Effort

As was shown in Chapter 1, at nearly 40 percent of landownership, private landowners make up the largest ownership group in the collaborative area. They are also a most diverse group, including year-round residents, seasonal residents, and landowners not living on their property. Also in the privately-owned category are businesses, resorts, and even large companies such as Minnesota Power. Ownership size varies from less than an acre, to thousands of acres. And equally diverse are landowner objectives and their expectations for their lands, both short and long-term.

Restoration of the North Shore Coastal Forest therefore depends upon successfully identifying, contacting, engaging, motivating and assisting private landowners in the restoration of their lands and encouraging them to work with neighboring lands, both private and publicly owned.

There are thousands of individual landowners on the North Shore and a concerted effort and strategy is necessary to communicate with and engage them in the restoration effort. The North Shore Forest Collaborative will use a multi-faceted approach in doing so.

Identifying, Prioritizing and Contacting Private Landowners

The collaborative has acquired property tax information, which includes names, addresses, acreage and some spatial data. That information will continue to be refined and categorized to make it more user friendly and able to reach out to landowners based upon their location, interests, and property size.

To this end, we are/will be working on the following projects:

- Work with MN DNR Private Forest Management Program to acquire information on North Shore landowners with current or expired stewardship plans, and encourage those landowners to implement or update their plans.
- Continue to refine and categorize property tax information to make it more useful for outreach purposes. To this end, we are applying to programs that will help finance U of MN graduate students to do data and spatial analysis, as well as developing creative ways to utilize that analysis.
- Maintain contacts and seek out new contacts with other collaboratives having similar objectives to learn from their experience. We have spoken with the American Forest Foundation about their strategy and techniques for engaging landowners on restoration projects in Wisconsin and Alabama. Also become more active in the Great Lakes Stewardship Network.
- Applicable Projects from Project List (Chapter 4)
 - Project 2A1: Develop a database of private forest landowners
 - Project 2A2a: Develop initial and follow-up contact materials for landowners
 - Project 2A6: Cluster/Consolidate Stewardship Plans on Private lands
 - Project 2A8: Increase Emphasis on Stewardship Plans for private landowners
 - Project 3B1: Host Workshops
 - Project 3B2: Distribute instructive materials on restoration

Landowner Engagement Training Workshop and Peer-to-Peer Learning

To gain a better understanding of who the Northshore Landowners are, their desires for their land, and how to best engage the various spectrum of landowners, the Collaborative worked with the University of Minnesota Forestry Extension on a two-part landowner engagement training. The first session, held in December of 2014 focused on defining our audience:

- What do you expect to happen as a result of engaging landowners?
- Who is a landowner and where do they spend their time?
- Why might your audience be interested?
- What is the geographic area of interest? How does the target audience and the geographic area overlap?
- Who will implement or carry out the educational and outreach education

Each workshop attendee was assigned the task of interviewing 2 or more private landowners prior to the second session to determine their situation, their feelings for their land and their actions and interest in restoration activities.

The second session was held in January 2015 and used the information from the first session to focus on how to effectively reach that audience and how to encourage and facilitate peer-to-peer learning. In addition to presentations on landowner engagement, perspectives gained from the interviews, and handouts of resource materials on effective outreach tools and engagement strategies, the session also consisted of small group exercises on actions to take to engage private landowners.

Attendance was limited to approximately 18 people for each session, and attendees included Collaborative members, including the executive committee, partners, and private landowners. As a result of the two training sessions, we developed a menu of approaches to take, based upon an individual situation.

Table 2: Brief summary of Potential Actions to Take for Landowner Engagement and Learning.

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Activity to bring people together	What is it?	What works?	Role of NSFC
Appreciative inquiry	A meeting that focuses key questions encourages listening to bring about imagination, ideas and commitment to action	This process can help identify and highlight options other landowners have taken to address the dying birch or deer	Facilitation of the process and identification of key questions.
Local neighbor's meeting, learning network, kitchen table	A meeting of a small group of neighbors over coffee etc, to	This process includes an informal atmosphere. Ideally	Identify the "spark plugs" that will host the meetings. This

Activity to bring people together	What is it?	What works?	Role of NSFC
meeting or coffee klatche (IAP2, 2006)	share stories experiences, ideas and problems with caring for a wooded property	initiated by a landowner inviting a small group of people over for fun, and sharing of stories or ideas.	might include discussion topics, a question and answer area of the website and more.
Facebook or other social media	An electronic forum to engage landowners in the sharing of ideas, questions and stories.	Provides an opportunity to engage with on a regular basis people who live away from the NS.	Set up facebook or other social media sites, support the site through a twitter feed and link to website of NSFC
Open woodland, Walk in the Woods	Landowner opens their woodland for guided tour of the property.	Provides opportunity to learn by seeing what different landowners are doing.	Identification of areas of the North Shore to focus on. Promoting the meeting and providing speakers to discuss key topics.
Study circles	Multiple groups discuss a specific topic or work to solve a specific problem and then meet as a whole group to share what they learned.		NSFC can create the focus questions, find the key local people who will host the small groups and convene and facilitate the larger group.
Ask organizations with regular meetings held along the NS of Lake Superior.			Set up speaker bureau and promote the presentations available.

IAP2 International Association for Public Participation (2006). The IAP2 Public Participation Toolbox: Techniques to Shore Information. Downloaded from, http://c.ymcdn.com/sites/www.iap2.org/resource/resmgr/imported/06Dec_Toolbox.pdf

In addition to the above potential landowner engagement techniques, the following projects from Project List (Chapter 4) may apply.

- Project 2A4: Encourage Neighbors helping neighbors program
- Project 3B1: Host Workshops
- Project 3B4: Develop opportunities for youth to participate in restoration

Explanation of Projects

This project list will be dynamic. Projects will be reviewed, added, dropped or modified as the need arises. These projects were developed over a course of time. Some are in the process of being implemented and others are listed for potential implementation in the future. Projects were developed by Collaborative members, the Executive Committee of the Collaborative, and presented for review at the public meetings held in January of 2015.

Projects are tied directly to the Goals, Objectives and Strategies identified in Chapter 2 of this plan. For example, Project 1A1 addresses Goal 1, Objective A, and Strategy 1 under that objective. Where there are multiple projects under a specific strategy a small letter is also used. (Project 1A1a, 1A1b, etc). Although many of the projects may address more than one goal, strategy or objective, they have been grouped under the category most relevant. Note: Most, but not all strategies have a project tied to them at this time.

In addition, each project is classified as either an Administrative, Operations, or On-the Ground project.

- Administrative – those projects needed to efficiently and effectively manage the restoration program.
- Operations – those projects that lay the groundwork for on-the-ground projects.
- On-the-Ground – As the name indicates. Those projects that involve physical restoration activities.

Each project contains the following information

- Title – descriptive name identifier of project
- Number – numbering tied to goals, objectives and strategies
- Type – Administrative, Operations, or On-the-Ground
- Summary – a short, descriptive paragraph describing the project
- Task Duration: estimate of length of project
- Who involved: agencies, groups or individuals (where known)
- Partnering Organizations: potential partners for the project
- Estimated Cost: (where known)
- Potential Funding Sources: likely funding sources (or actual, where known)
- Units: acres, items, events, etc.
- Measures of success: How will we gauge success?
- Primary Contact: Who to contact for information (where known)

Projects related to Goal 1- RESTORATION: Reestablish and Maintain a Diverse and Thriving Forest along the North Shore of Lake Superior.**Project Title: Develop and Maintain Calendar of On-going and planned Restoration Projects.****Project Number: 1A1****Project addresses:**

- **Objective A:** Restore lost components of Native Plant Communities
- **Strategy 1:** Develop and/or support multiple restoration projects throughout the area. Facilitate multiple landowners restoring their lands in a similar timeframe to promote landscape-level treatments.

Project Type: Administrative

Project Summary: Several restoration and forest management projects are currently ongoing and planned in the NSFC area, both large governmental projects (USFS restoration projects, DNR timber sales, NNIS treatments) and small operations on private lands (planting, harvesting or treating NNIS on small acreages). With its distance to markets and many small landowners, it is often difficult to interest contractors (loggers, planting/tsi crews, etc.) in small sized project areas. With scattered, isolated, and sometimes unknown projects being implemented, landscape effectiveness is not maximized. By keeping a calendar of ongoing and planned restoration activities and their implementation schedule, better coordination can improve both operability and effectiveness of restoration treatments. This task will require regular updating to maintain useful data and timeframes of projects.

Task Duration: 1 year, but ongoing updates required.**Who involved:** NSFC members, NSFC Project Coordinator**Partnering Organizations:** DNR, USFS, NRCS, Sugarloaf, Consulting Foresters, Private Landowners**Estimated Cost:** To be determined**Potential Funding Sources:** Grant Opportunities**Units:** Annually updated list of planned and completed projects.**Measures of success:** Increased coordination among landowners, improved project operability.**Primary Contact:** NSFC Project Coordinator**Project Title: Superior National Forest North Shore Restoration Project.****Project Number: 1A1a****Project Addresses:**

- **Objective A:** Restore lost components of Native Plant Communities
- **Strategy 1:** Develop and/or support multiple restoration projects throughout the area. Facilitate multiple landowners restoring their lands in a similar timeframe to promote landscape-level treatments.

Project Type: On-the-Ground

Project Summary: Project involves restoring native vegetation communities, improving wildlife habitat, and improving watershed health. Actions include underplanting, site preparation and exclosures. Project is located on National Forest System lands that extend from Grand Portage Reservation to Schroeder, within North Shore Forest Collaborative Boundary.

Task Duration: 2014 to 2029

Who involved: USDA Forest Service, contract loggers, planters, tsi and invasive treatment crews.

Partnering Organizations:

Estimated Cost: \$1.7 million

Potential Funding Sources: Grant Opportunities.

Units: XXX acres proposed to be treated.

Comments: Forest Service seeks to partner with any other landowner or land manager.

Measures of success: Acres successfully treated, regenerated to desired species.

Primary Contact: USFS, Becky Bartol

Project Title: Cascade River and Spruce Creek Watershed Restoration

Project Number: 1A1b

Project Addresses:

- **Objective A:** Restore lost components of Native Plant Communities
- **Strategy 1:** Develop and/or support multiple restoration projects throughout the area. Facilitate multiple landowners restoring their lands in a similar timeframe to promote landscape-level treatments.

Project Type: On-the-Ground

Project Summary: Restore forest on USFS and DNR lands by planting trees and protecting them from deer.

Task Duration: 2014 to 2017

Who involved: MN DNR

Partnering Organizations: Sugarloaf, USFS,

Estimated Cost: \$400,000

Potential Funding Sources: CPL grant

Units: 997 acres proposed to be treated.

Measures of success: Acres successfully treated, regenerated to desired species.

Primary Contact: Sugarloaf

Project Title: Work to ensure genetically appropriate planting stock and adequate supply for restoration efforts.

Project Number: 1A2

Project Addresses:

- **Objective A:** Restore lost components of Native Plant Communities
- **Strategy 2:** Secure/improve planting stock available for restoration effort.

Project Type: Operations

Project Summary: Currently available species for planting may not be appropriate (wrong geno- or phenotype) and not available in enough quantity for North Shore restoration efforts. For an effective restoration effort, it is important to have good quality stock with the genetic makeup consistent with those individuals that established and thrived in the environment of the North Shore forest. Planting stock with resistance to diseases such as white pine blister rust is vital to the restoration effort. Working with the Minnesota Tree Improvement Collaborative (MITC), the U of MN Forestry Department, DNR nurseries and local landscape businesses will help ensure that planting stock acquired by either the collaborative or by individual landowners will be appropriate and best suited for restoration efforts. Providing information to local planting businesses will help them provide both an appropriate product

and useful information when selling stock and providing advice to local landowners. This may be a good opportunity for a University of MN graduate student to head up this effort.

Task Duration: 2 years

Who involved: Univ. of MN grad student working with partner organizations

Partnering Organizations: MITC, U of MN Forestry, DNR

Estimated Cost: To be determined

Potential Funding Sources: Univ. of MN, DNR, Legacy Funds.

Measures of success: Availability of appropriate planting stock.

Primary Contact: NSFC Technical Committee

Project Title: Develop Ecological Desired Future Conditions and Objectives for Split Rock Land Type Association

Project Number: 1A3

Project Addresses:

- **Objective A:** Restore lost components of Native Plant Communities
- **Strategy 3:** Develop ecologically based, restoration desired conditions and ecological site descriptions.

Project Type: Operations

Project Summary: Area-specific Desired Future Conditions (DFCs) and Objectives are needed to guide the restoration process. Such ecological information has been developed by the NSFC technical team for the North Shore Till Plain Landtype Association (northeastern area), but remains to be done for the Split Rock Till Plain LTA (southwestern area). Development of such direction takes knowledge of ecological principle and their feasibility of application. Without such information, efforts at restoration will be more haphazard and progress will be difficult to address. DNR Native Plant community classes and types will be used in developing DFCs and Objectives. Document will assist in developing specific guidance and checklists for resource professionals (consulting foresters, etc.) as well as more basic information and guidance for landowners.

Task Duration: 6 -12 months

Who involved: NSFC Technical Committee

Partnering Organizations: DNR, USFS, Pvt. Landowners, Grand Portage Tribe, Consulting Forester

Estimated Cost: To be determined

Units: 1 Document covering XXX acres.

Measures of success: Document (approved by NSFC executive committee). Readability, understandability and usability of document for other resource professionals.

Primary Contact: NSFC Technical Committee

Project Title: NRCS - Develop Ecological Site Descriptions of North Shore Highlands

Project Number: 1A3a

Project Addresses:

- **Objective A:** Restore lost components of Native Plant Communities
- **Strategy 3:** Develop ecologically based, restoration desired conditions and ecological site descriptions.

Project Type: Operations

Project Summary: Complete a minimum of two Ecological Site Descriptions per year for the dominant soils and plant communities of the region. Starting in FY 2015, we will begin focusing on the North Shore Till Plain LTA and associated degraded FDn43 plant communities. To date, we have been working on that, but have mostly worked on the highlands above the lake.

NRCS is working with the NSFC Technical Committee to help guide the development of products. They are also partners with the soils and ecology staff on the Superior National Forest as well as the USFS Region 9 office. They have also worked with various DNR County Biological Survey staff.

Task Duration: Ongoing

Who involved: NRCS Soil Science Division

Partnering Organizations: DNR, USFS, NSFC Technical Committee

Estimated Cost: to be determined.

Units: 1 document

Measures of success: Document (approved by NSFC executive committee). Readability, understandability and usability of document for other resource professionals.

Primary Contact: Kyle Steele, Kyle.Steele@mn.usda.gov 920-574-1772

Project Title: Map currently identified areas of high ecological integrity and areas with most impacted ecosystems (NNIS, Soil erosion, off-site species)

Project Number: 1B1

Project Addresses:

- **Objective B:** Identify focus areas for restoration across the landscape.
- **Strategy 1:** Identify areas to focus and prioritize restoration activities based on ecological need.

Project Type: Operations

Project Summary: By identifying both the high quality areas and negatively impacted areas (which sometimes overlap), we can begin to prioritize areas for restorative treatment. Without good geographic data, it is difficult to determine where to be most effective with restoration treatments and which should receive the highest priority. The North Shore area contains many areas of high ecological integrity and unique ecosystems. County Biological Survey has identified areas of significant natural areas and rare plants, and habitats. Scientific and Natural Areas (SNA's), State Parks, Research Natural Areas and other special ecological designations exist within the area. In addition, non-native invasive species, off-site and dying species, and soil erosion impact many areas with the north shore. .

Task Duration: 6 months

Who involved: GIS specialist, NNIS specialist, silviculturist

Partnering Organizations: DNR, USFS, NRCS, University

Estimated Cost: To be determined

Potential Funding Sources:

Primary Contact: Silviculturist

Project Title: Identify priority sites on which to plan and implement restoration activities.**Project Number:** 1B2**Project Addresses:**

- **Objective B:** Identify focus areas for restoration across the landscape.
- **Strategy 2:** Identify at least three sites and plan and implement restoration activities

Project Type: Administrative

Project Summary: This project will use the results of Project 1B1 along with other information to help determine which areas should receive the highest priority for restoration treatments. While the objective is to restore a large percentage of the north shore ecosystem, it is important to focus on those areas most in need of restoration and of sufficient size to be effectively implemented. Note: MN DNR Forest Stewardship program has identified areas where a concentration of private landowners has stewardship plans that need updating. These may be areas that factor into the prioritization equation.

Task Duration: 6 months, following completion of Task 1B1.**Who involved:** NSFC Executive Committee**Partnering Organizations:** DNR, NRCS, USFS, Sugarloaf Cove,**Estimated Cost:** To be determined**Potential Funding Sources:** DNR Stewardship Plans,**Units:** Acres, No. of Landownerships**Measures of success:** Restored acres.**Primary Contact:** NSFC Coordinator**Project Title: Develop and Maintain list of Contractors****Project Number:** 1C1**Project Addresses:**

- **Objective C:** Assist landowners with finding contractors willing to conduct restoration activities on their property.
- **Strategy 1:** Establish a network of foresters, loggers, site preparation and planting contractors willing to work across all property owners.

Project Type: Operations

Project Summary: This project will meet with contractors to determine their availability and willingness and their minimum scale of work. It will then develop a list of contractors and make that information available to private landowners. This project is tied to 1C2, which involves a NSFC Project Manager to coordinate restoration work.

Due to the relative remoteness of the North Shore area, distance to markets, and small project size of many private landowner projects it is difficult to interest forest management contractors in projects north of Two Harbors, MN. In order to implement restoration activities, it is important to have an available team of contractors who are willing to perform the work.

Task Duration: 6 months**Who involved:** Local contractors, NSFC Project Manager**Partnering Organizations:** Local contractors, NRCS, DNR, MN Contract Loggers Association, University Extension**Estimated Cost:** To be determined.

Potential Funding Sources:**Units:** One list**Measures of success:** List is distributed and successfully used by landowners.**Primary Contact:** NSFC Project Manager**Project Title: Employ North Shore Forest Collaborative Project Manager****Project Number:** 1C2**Project Addresses:**

- **Objective C:** Assist landowners with finding contractors willing to conduct restoration activities on their property.
- **Strategy 1:** Establish a network of foresters, loggers, site preparation and planting contractors willing to work across all property owners.

Project Type: Operations

Project Summary: Hire and fund an NSFC project manager to strategically utilize contractors to accomplish restoration work on a meaningful scale (i.e. coordinate between small private landowners with other small landowners, government agencies, or larger landowners to increase incentives for contractors).

Due to the relative remoteness of the North Shore area, distance to markets, and small project size of many private landowner projects it is difficult to interest forest management contractors in small projects north of Two Harbors, MN. This project is tied to 1C1, developing a list of contractors.

Task Duration: 3 years**Who involved:** NSFC Project Manager, local contractors, local landowners**Partnering Organizations:** NRCS, Local contractors**Estimated Cost:** \$100,000**Potential Funding Sources:** NRCS, Grants, Others?**Units:** 1 person**Measures of success:** Implementation of coordinated projects.**Primary Contact:** NSFC Project Manager**Project Title: Coordinate with Cook and Lake County Invasives Team****Project Number:** 1D1**Project Addresses:**

- **Objective D:** Minimize the introduction and spread of invasive species.
- **Strategy 1:** Prioritize and implement invasive species control in the collaborative area

Project Type: Operations

Project Summary: Background: Closely coordinate with existing County teams on identification and prioritization of non-native, invasive species problem areas and treatments. In addition to restoring conifers to the North Shore ecosystem, another objective of restoration is to limit the spread and control the existence of non-native invasive species in the collaborative area. The goal of restoration of the ecosystem cannot be achieved unless we address both the reintroduction of desired species (conifers and others) and limiting the spread and controlling the existence of unwanted invasive species.

Task Duration: Ongoing**Who involved:** Cook and Lake County Invasives Teams

Partnering Organizations: Counties, DNR, USFS, Non-profits, private landowners

Estimated Cost: To be determined.

Potential Funding Sources: Great Lakes Restoration Funds

Units: Acres treated

Measures of success: Reduction of acres impacted.

Primary Contact: County Invasives Coordinator

Project Title: Provide links to Invasive Species Info on Website

Project Number: 1D3

Project Addresses:

- **Objective D:** Minimize the introduction and spread of invasive species.
- **Strategy 1:** Incorporate invasive species education and information in NSFC materials

Project Type: Operations

Project Summary: The NSFC will be updated and maintained to provide links to the most recent information about identification and treatment of invasive species, including links to other websites such as the Cook County Invasives Team and to treatment assistance opportunities such as the community shed at Sugarloaf Cove.

Because treatment of invasive species is a vital part of ecological restoration, it is important that informational material provided by the collaborative include invasive species identification and treatment. Much information already has been developed and exists, but local landowners must be able to access that information.

Task Duration: On-going, with 3 days to locate relevant sites and provide links.

Who involved: NSFC Coordinator

Partnering Organizations: Cook and Lake County Invasives Teams

Estimated Cost: minimal

Potential Funding Sources: none

Measures of success: Info available to landowners; Reduction of acres impacted

Primary Contact: NSFC Coordinator

Project Title: Participate in County Planning with regard to forest fragmentation

Project Number: 1E1

Project Addresses:

- **Objective E:** Minimize forest fragmentation
- **Strategy 1:** Provide input to county land use planning activities to minimize forest parcelization and fragmentation, emphasizing consolidated development and minimizing conversion of forestland to non-forest.

Project Type: Administrative

Project Summary: NSFC Partners (representing their own organizations) will participate in county planning and zoning efforts. The role of the Collaborative is not to take specific stands in county planning, rather it is to raise the issue of forest fragmentation and provide information about the effects of fragmentation to county planners.

Restoration of the forest involves returning vegetation composition and structure toward a more natural arrangement. While there may be relatively little that can be done with regard to areas already fragmented, it is desirable to try to limit any further fragmentation to the extent practicable, as a fragmented forest is more susceptible to invasive species, as well as degradation of habitat for certain species.

Task Duration: As needed, when Counties address planning and zoning.

Who involved: NSFC members

Partnering Organizations: Cook and Lake County

Estimated Cost: none

Potential Funding Sources: none

Measures of success: The extent to which forest fragmentation is address in County plans.

Primary Contact: NSFC Coordinator

Project Title: Develop monitoring strategies

Project Number: 1F1

Project Addresses:

- **Objective E:** Utilize project monitoring to measure progress in restoring ecosystem health and achieving objectives.
- **Strategy 1:** Develop monitoring strategies.

Project Type: Operations

Project Summary: Develop an overall strategy for monitoring, making use of existing efforts by other agencies and organizations to the extent possible. Build off monitoring plans and efforts of Minnesota Forest Resource Council's NE landscape committee. While effective monitoring is difficult to accomplish and to fund, using monitoring that is already being conducted by partner organizations and tracking project implementation can provide some insights with reasonable efforts.

A well-designed monitoring program will determine whether restoration actions were designed and implemented properly, determine whether the projects' restoration objectives were met, and provide new information on the restoration action and the ecosystem functions and processes that it was intended to affect. Without at least some base level of monitoring and tracking of project implementation, progress toward ecosystem restoration will be difficult to gauge.

Task Duration: 1 year to develop strategies, then ongoing to implement monitoring

Who involved: NSFC members

Partnering Organizations: All partners in the collaborative, Univ. of MN, MFRC landscape committee

Estimated Cost: To be determined.

Potential Funding Sources:

Units: Acres treated

Measures of success: Projects implemented, Effectiveness of treatments.

Primary Contact: NSFC Coordinator

Projects related to Goal 2 - COLLABORATION: Promote Cooperative Restoration Efforts on All Ownerships**Project Title: Develop a database of private forest landowners****Project Number: 2A1****Project Addresses:**

- **Objective A:** Increase private landowner engagement in the NSFC and restoration activities.
- **Strategy 1:** Identify and contact private landowners within the NSFC area.

Project Type: Administrative**Project Summary:** An accurate database of private forest landowners within the NSFC area will be developed using tax records and other data.

The Collaborative area has thousands of private landowners. Some are full-time residents; others are seasonal residents and live elsewhere most of the year. Still others own undeveloped lands that they may visit often, or only during hunting season. The area also has many resort properties, some large and corporately run and others small mom and pop operations. Industry and land management companies manage some lands for commercial timber production. It is important to reach out to all of these owners to enlist them in the restoration effort.

Task Duration: 2 months, then ongoing updates**Who involved:** Sugarloaf**Partnering Organizations:** University of Minnesota**Estimated Cost:** \$1000**Potential Funding Sources:** Duluth Superior Area Community Foundation, U of MN**Units:** 1 database**Comments:** This project is currently being completed, but may be expanded upon with further refinements**Measures of success:** A useful database**Primary Contact:** Molly Thompson, Sugarloaf**Project Title: Develop a “Restoration Recognition Program” to acknowledge restoration programs on private property.****Project Number: 2A2****Project Addresses:**

- **Objective A:** Increase private landowner engagement in the NSFC and restoration activities.
- **Strategy 2.** Provide informational materials and incentives for landowners.

Project Type: Operations**Project Summary:** Develop and implement a program to formally recognize that a landowner property is participating in the North Shore Forest Restoration Program. Such a program would help recognize and incentivize landowners for their restoration work and help publicize the restoration effort. (Similar to the Tree Farm program) Restoration efforts, such as the visibility of planted conifers, can take many years to become visible and other landowners and North Shore visitors. May not be aware of restoration efforts already accomplished without a process to recognize and publicize landowner accomplishments.

Task Duration: 1 year to establish, then ongoing.

Who involved:

Partnering Organizations: Extension, Sugarloaf, NRCS, SWC

Estimated Cost: To be determined

Potential Funding Sources: Coastal Program, Johnson Foundation, Other foundations

Units: Acres and number of landowners recognized.

Measures of success: Numbers of private landowners participating in program

Primary Contact:

Project Title: Develop initial and follow-up contact materials for landowners

Project Number: 2A2a

Project Addresses:

- **Objective A:** Increase private landowner engagement in the NSFC and restoration activities.
- **Strategy 2.** Provide informational materials and incentives for landowners.

Project Type: Operations

Project Summary: Engaging private landowners during initial and follow-up contacts requires well prepared materials for delivery in person, via media and mail. This project will develop materials that will inform and engage private landowners in the restoration effort, as well as address the efficient and economic delivery of such information.

Task Duration: 1 year

Who involved: NSFC Communication Committee

Partnering Organizations: Extension

Estimated Cost: to be determined.

Potential Funding Sources: Johnson Foundation, Other foundations, NFWF

Units: Contact documents and materials

Measures of success: Numbers of private landowners participating in Collaborative

Primary Contact: NSFC Communication Committee

Project Title: Encourage Neighbors helping neighbors program

Project Number: 2A4

Project Addresses:

- **Objective A:** Increase private landowner engagement in the NSFC and restoration activities.
- **Strategy 4.** Promote peer-to-peer associations among landowners.

Project Type: On-the-Ground

Project Summary: This project will foster the development of peer-to-peer relationships and facilitate a communications and help network among landowners. Often, neighbors are most effective at getting others involved in restoration work, or in helping neighbors with techniques and activities. Neighbors often know best what the person next door needs or wants for their property, or how to best get them involved. This project would require identifying some key people in various communities and providing them with training, and contact materials.

Task Duration: Ongoing,

Who involved: Individual landowners, U of MN Extension Service, NSFC members

Partnering Organizations: U of MN Extension Service

Estimated Cost: to be determined

Potential Funding Sources: Grants, Extension Service

Measures of success: Increase in private landowner participation in program.

Primary Contact: NSFC Landowner Committee

Project Title: Cluster/Consolidate Stewardship Plans on Private lands

Project Number: 2A6

Project Addresses:

- **Objective A:** Increase private landowner engagement in the NSFC and restoration activities.
- **Strategy 6.** Consolidate restoration projects on private property to improve economies of scale during implementation.

Project Type: Operations

Project Summary: In the Collaborative area, there are approximately 270 participants in the stewardship program managed by the MN DNR. Many of these are small and scattered, but mapping those plans that are due for updating shows two clusters of properties. By focusing on these clusters, it may be possible to achieve some economies of scale in terms of operability of any restoration activities.

Task Duration: 1 year.

Who involved: MN DNR – Stewardship Plans

Partnering Organizations:

Estimated Cost: to be determined.

Potential Funding Sources: MN DNR

Units: Number of Plans

Measures of success: Increase in implementation of Plans.

Primary Contact: MN DNR

Project Title: Increase Emphasis on Stewardship Plans for private landowners

Project Number: 2A8

Project Addresses:

- **Objective A:** Increase private landowner engagement in the NSFC and restoration activities.
- **Strategy 8:** Promote stewardship plans for private lands

Project Type: Operations

Project Summary: Increase emphasis on reaching out to private landowners in the Collaborative Area through the DNR and NRCS programs for stewardship and management plans. Many of the private lands on the North Shore have no plans for management and owners are not aware of the programs available. A recent effort by NRCS with the objective of managing for golden winged warbler was successful in involving more landowners in getting a management plan developed for their properties.

Task Duration: On-going

Who involved: MN DNR, NRCS

Partnering Organizations:

Estimated Cost: to be determined

Potential Funding Sources: MN DNR, NRCS

Units: Number of Plans

Primary Contact: Roger Nelson, MN DNR, Will Bomier, NRCS

Project Title: Develop on-going list and calendar of grant and funding opportunities**Project Number: 2B 1-4****Project Addresses:**

- **Objective B:** Secure multi-year funding for core operations of NSFC
- **Strategy 1-4:** Secure funding for NSFC Coordinator, NSFC Project Manager, Apply for grants, and explore other funding opportunities.

Project Type: Administrative

Project Summary: Having a robust list and calendar of funding opportunities would help the collaborative apply for funding in a timely and successful manner. Identifying and obtaining a more long-term funding source is critical for an effective and efficient organization and the Collaboratives mission and getting projects implemented on the ground.

Consistency and continuity in running the collaborative has been problematic without a consistent and longer-term funding source for a coordinator position. The Coordinator position has been funded solely through grants that are project based, with the Coordinator working primarily on the project and leaving little time for actual coordination, facilitation, and administrative duties that are very necessary toward smooth operations of the collaborative.

Task Duration: 2 months**Who involved:** Sugarloaf, USFS, NSFC Coordinator**Partnering Organizations:** Granting organizations, USFS**Estimated Cost:** to be determined.**Potential Funding Sources:** USFS**Units:** 1 list**Measures of success:** Availability of relevant grants and funding; successful applications**Primary Contact:** NSFC Coordinator & Molly Thompson

Projects related to Goal 3 - EDUCATION: Share expertise and knowledge about restoration**Project Number: 3A1****Project Title: Develop Communication Plan**

- **Objective A:** Increase support from private landowners, public agencies, public and political spheres for ecosystem restoration of the North Shore.
- **Strategy 1:** Develop a communication plan and strategies to communicate the mission and goals to the public.

Project Type: Operations**Project Summary:** Identify who, what, when and where for communications and public relations.**Task Duration:** One month for initial plan, revisit annually.**Who involved:** Communication Committee**Partnering Organizations:****Estimated Cost:** to be determined.**Potential Funding Sources:****Measures of success:** Increased information level of public, agencies, funding sources, legislators, etc.**Primary Contact:** Chair of Communications Committee**Project Title: Host a Day at the Capitol****Project Number: 3A3****Project Addresses:**

- **Objective A:** Increase support from private landowners, public agencies, general public and political spheres for ecosystem restoration of the North Shore.
- **Strategy 3:** Ensure local politicians and state senators and representatives are fully informed about the Mission and Restoration goals for the North Shore Forest Collaborative.

Project Type: Operations**Project Summary:** A day spent with local state legislators to provide them information about the existing situation on the North Shore, and the mission, goals and projects of the Collaborative and the participating organizations. The purpose of the Day at the Capitol is solely to provide information about NSFC and its activities

Just as local landowners need to be informed about the need for and activities leading to restoration of the north shore, local legislators also need this information, as it affects both the citizens and the land within their districts. Without the legislature being knowledgeable of the mission and efforts of the NSFC, they will not understand or appreciate the problems with the existing situation, nor the importance of the efforts at restoration.

Task Duration: One week to plan, 1 day to deliver**Who involved:** Communication Committee**Partnering Organizations:****Estimated Cost:** to be determined.**Potential Funding Sources:****Measures of success:** Informed legislators**Primary Contact:** Chair of Communications Committee

Project Title: Develop Interpretive signs at demonstration projects**Project Number: 3A6****Project Addresses:**

- **Objective A:** Increase support from private landowners, public agencies, general public and political spheres for ecosystem restoration of the North Shore.
- **Strategy 6:** Utilize restoration demonstration projects across the area suitable for interpreting ecosystem conditions and restoration techniques to many audiences.

Project Type: On-the-Ground

Project Summary: Develop and install interpretive signs located in highly visible areas (along well-travelled routes) to help publicize restoration projects and successes as well as educate local landowners and visitors.

Because restoration efforts are often not noticeable to the casual viewer for many years, people may not be aware of restoration projects or their objectives. It is important for people to see and understand on-the-ground restoration projects that are completed or on-going.

Task Duration: Ongoing**Who involved:** NSFC Exec. Committee.**Partnering Organizations:** Dependent upon location of demonstration project.**Estimated Cost:** Should be built into each project's funding request**Potential Funding Sources:****Units:** number of signs erected**Measures of success:****Primary Contact:** NSFC Executive Committee**Project Title: Host Workshops****Project Number: 3B1****Project Addresses:**

- **Objective B:** Offer ongoing internal and external education.
- **Strategy 1:** Host workshops on forest restoration

Project Type: Operations

Project Summary: Host educational and hands-on workshops of various types and to reach the various private landowners. For the past 3 years, the collaborative has hosted landowner workshop to share information and provide education on forest restoration. These have been well attended. Sugarloaf: The North Shore Stewardship Association has sponsored the Lost Forest workshops in cooperation with Univ. of MN Extension. These workshops consists of approximately 12 sessions on restoration topics, including field visits to landowner's properties.

Task Duration: 1 to several days.**Who involved:** NSFC Exec. Committee.**Partnering Organizations:** Univ. of MN Extension, Soil and Water Conservation Districts**Estimated Cost:** to be determined**Potential Funding Sources:** Lake Superior Coastal Program, other grant programs**Units:** number of workshops, number of attendees**Measures of success:****Primary Contact:** NSFC Coordinator

Project Title: Distribute instructive materials on restoration**Project Number: 3B2****Project Addresses:**

- **Objective B:** Offer ongoing internal and external education.
- **Strategy 2:** Develop and distribute materials (methods, procedures, techniques) for those attempting restoration.

Project Type: Operations

Project Summary: Work with partners to gather materials, determine if new or additional direction is needed specific to the North Shore, and then distribute materials to those attempting restoration on their lands. Many instructive materials already exist for restoration activities (proper planting techniques, invasive treatment, etc.)

Some landowners wish to perform restoration activities on their lands, but are not knowledgeable of the techniques to be used. Well prepared and readily available instructive material can help address this need.

Who involved: NSFC Technical and Communications Committees**Partnering Organizations:** DNR, CCIT/LCIT, Sugarloaf**Estimated Cost:** to be determined**Potential Funding Sources:****Measures of success:** Number and types of materials distributed.**Primary Contact:** NSFC Technical Committee**Project Title: Develop and distribute a yearly summary of accomplishments****Project Number: 3B3****Project Addresses:**

- **Objective B:** Offer ongoing internal and external education.
- **Strategy 3:** Report monitoring results and collaborative accomplishments

Project Type: Operations

Project Summary: Prepare and distribute a yearly summary of accomplishments. This information is important in showing funding organizations, local partners, private landowners and local legislators that restoration of the North Shore is being accomplished. Demonstrating progress and success toward accomplishing the goal of restoration lends credibility to the program. .

Task Duration: Ongoing, Annual summary.**Who involved:** NSFC Coordinator, Technical and Communications Committees**Partnering Organizations:** All NSFC members**Estimated Cost:** to be determined**Potential Funding Sources:****Units:** Report document**Primary Contact:** NSFC Coordinator

Project Title: Develop opportunities for youth to participate in restoration**Project Number: 3B4****Project Addresses:**

- **Objective B:** Offer ongoing internal and external education.
- **Strategy 4:** Involve youth in restoration activities

Project Type: On-the-ground

Project Summary: Develop a toolbox of activities and opportunities that enable youth to be involved in the planning and implementation of restoration activities. This could include school programs, field days, scout activities, and restoration activities specifically geared toward youth.

Youth need to be knowledgeable of and involved in forest restoration activities because in many cases, it is their generation that will see the accomplishment and benefits of the restored forest. Their stewardship of the forest is needed now and far into the future.

Task Duration: Ongoing**Who involved:** Invasive Species Coordinator**Partnering Organizations:** USFS, DNR, County Lands, Sugarloaf, Wolf Ridge**Estimated Cost:** to be determined**Potential Funding Sources:** SWCD**Units:** Number of events**Measures of success:****Primary Contact:** Invasive Species Coordinator

Tie to Other Planning Efforts

Because the NSFC seeks to coordinate across a broad landscape and its members are composed of a variety of organizations, agencies, governments and individuals, it is important to investigate and consider the land management plans that provide guidance applicable within the NSFC project area.

There is a great variety of land managing organizations within Northeast Minnesota and within the NSFC project area. Their management plans are equally varied. Some are broad and apply across an entire landscape. Others are quite specific and apply to specific management areas or ecological subunits. Some Plans provide guidance for all managers and are voluntary. Other plans provide guidance that only applies to a single agency or the land they manage, but the information and guidance can be valuable to other managers.

The NSFC Plan was developed to be as consistent as practicable with existing management plans of others within the landscape so as to coordinate as closely as possible with ongoing land management. The following excerpts from select land management plans are provided to both highlight those consistencies and similarities with other land management plans, as well as to provide additional information to be used in project planning and developing further collaborative efforts when mutually beneficial goals can be achieved.

Note that these are select excerpts from other plans and do not reflect the entire management direction provided in those plans. Web links to the entire documents are listed so that further detail can be obtained. The Collaborative will continue to seek out the management plans of other organizations and add them to this list.

Great Lakes Restoration Initiative Action Plan II (GLRI II) (2014)

<http://greatlakesrestoration.us/actionplan/pdfs/glri-action-plan-2.pdf>

Because the NSFC project area extends from the shore of Lake Superior to approximately 3.5 miles inland, it can play a significant role in helping with the Great Lakes Restoration and it ties to several key aspects of the GLRI Action Plan II.

Major Focus Areas

- Control established invasive species
- Develop invasive species control technologies and refine management techniques
- Protect, restore and enhance habitats to help sustain healthy populations of native species
 - Protect, restore and enhance Great Lakes coastal wetlands
 - Promoting near shore health.
- Maintain, restore and enhance populations of native species
 - Promote the recovery of priority federally-listed endangered, threatened and candidate species
 - Promote self-sustaining populations of GLRI-targeted native non-threatened and non-endangered species
- Ensure climate resiliency of GLRI-funded projects
 - Develop and incorporate climate resiliency criteria in project selection processes
- Educate the next generation about the Great Lakes ecosystem

Lake Superior Lakewide Management Plan (LaMP) (2008)

http://epa.gov/greatlakes/lamp/lis_2008/index.html

Bordering Minnesota's northern shore of Lake Superior and extending 3.5 miles inland, the NSFC Project Area can directly address several of the strategic outcomes and help implement goals of the LaMP, especially the following:

Strategic Outcome #1: Diverse, healthy and self-sustaining native plant and animal communities exist in the Lake Superior basin.

Goal 1. Identify and restore native communities where they are degraded.

- Inventory and assess impacts to degraded habitats and communities.
- Develop and distribute GIS information on ecosystem types, conditions and trends, including coastal wetlands and riparian acres, and identify where restoration can occur.
- Restore or protect 25% of riparian conifer forest acres in the Lake Superior basin.

Goal 2. Identify and protect a system of representative, high quality ecosystems.

- Complete comprehensive, systematic biological surveys in the watershed to identify remaining high-quality natural communities.
- Engage landowners as partners in protecting important habitat.

Goal 3. Maintain existing genetic diversity and population integrity.

Goal 4. Manage the harvest of plant and animal resources to ensure diverse, healthy, and self-sustaining native plant and animal communities.

Strategic Outcome #4: No further extirpation of native species occurs in the Lake Superior basin.

Goal 4. Encourage the appropriate use of native species for all projects requiring vegetation restoration.

- Develop sources of native plants and seeds in an ecologically appropriate manner throughout the Lake Superior basin for use in vegetation restoration.
- Establish standards of native species propagation and use as well as definitions of seed zones.
- Develop a list of critical native species that are regionally / habitat specific and ecologically appropriate.
- Educate citizens in the Lake Superior basin about the importance and appropriate use of local native plants in restoration and landscaping projects.

Strategic Outcome #5: No new non-native species will be introduced into the Lake Superior basin.

Goal 2. Develop a guidance document for agencies' vegetation restoration for projects in the Lake Superior basin.

Strategic Outcome #6: Partnerships among natural resource management agencies, environmental agencies, and non-agency stakeholders are strengthened and broadened.

Goal 1. Develop information and educational material to assist local land use decision makers in implementing Binational Program goals through land use planning.

- Have an educator on staff to present material to local governments and decision makers highlighting linkages between land use and ecosystem health. C
- Support appropriate public and technical fora to provide opportunities for researchers, resource managers and the public to exchange information.
- Inform and educate senior decision makers about how their actions move the Lake Superior basin toward "A Vision for Lake Superior."
- Develop a communications plan.

- Implement the communications plan.

Strategic Outcome #7: Human activities in the Lake Superior basin mitigate the contribution of greenhouse gases to the environment. Ongoing climate change adaptive management strategies are pursued in the Lake Superior basin.

Goal 1. Understand the impacts of climate change and the limits to the ability to predict and model these impacts on specific ecosystems and local regions

- Continue to refine climate change models so as to develop specific predictions for the Lake Superior basin.
- Predict changes to terrestrial and aquatic ecosystems based on climate change predictions.
- Develop predictions of the impacts of climate change on keystone biota in the lake and the basin as a whole.

Goal 2. Review and revise Conservation and Restoration Plans in the basin as required based on the climate scenarios developed in the goal above. 1

Goal 3. Help Lake Superior basin stakeholders adapt to climate change impacts.

- Help stakeholders to adapt to climate change impacts by facilitating assessment

Strategic Outcome #9: Management in the Lake Superior basin is organized and implemented at appropriate watershed scales.

Goal 1. Support the development and implementation of ecologically based integrated watershed management plans for priority watersheds within the Lake Superior basin.

- Work with local governments/groups to develop watershed plans for 25% of the highest priority watersheds in need of a new or revised plan.

Great Lakes Ecological Assessment (GLA)

<http://www.ncrs.fs.fed.us/gla/>

While not a strategic or management plan, the GLA provides a good (although in some instances dated) source of information and data on ecological classification, geology, soils, climate gradients, historic and existing vegetation, natural disturbance, rivers, lakes and streams, rare biotic communities and threatened, endangered and sensitive species.

Minnesota Forest Resources Council, Northeast Landscape Plan (2014)-

http://mn.gov/frc/documents/council/landscape/NE%20Landscape/NE_Revision%202014/2nd%20Gen%20Plan%20Docs/NE-Landscape-Plan_Public-Comment-Draft.pdf

The purpose of the plan is to provide a detailed framework that allows landowners, local officials, resource managers and other stakeholders to work together to voluntarily implement landscape strategies to effectively sustain the forests of Minnesota.

The MFRC NE Landscape Plan provides broad, umbrella voluntary management direction for those land managers within the NE Landscape. Several members of the NSFC participated in the development of the NE Landscape Plan to ensure a solid tie between the broader NE Plan and the more specific NSFC Plan.

Key guidance relating to vegetation in the NSFC area:

Select Overall Guidance

- Maintain, Restore, and Enhance Native Biodiversity, Including Wildlife Habitat and Populations.(goal)
- Manage for a Mix of Forested Native Plant Community Growth Stages.(objective)
- Manage for Structural Within-Stand and Between-Stand Diversity (objective)
- Create, Manage, Maintain, or Increase Large Contiguous Forest Patches (objective)
- Control forest pests and invasive species that negatively affect forest health and ecology. (objective)

For FDn43**Long Term Goals:**

- FDn43a: White-Red Pine Forest
 - o Increase the white and red pine component.
 - o Increase the mature and old growth stage of red and white pine.
- FDn43b: Aspen-Birch Forest
 - o Increase the white pine and white spruce component. .
- Increased private land stewardship plans and cross-boundary implementation.

Strategies:

- Retain adequate conifers on harvest sites to ensure continued presence of conifers.
- Plant a mix of long-lived conifers post-harvest where sites and costs allow.
- Manage the young (0-35 yrs) and first transitional (35-55 yrs) growth stages for short-lived species to provide perpetuation of the aspen/birch community. Reduce aspen in the mature and old growth stages.
 - Identify and manage a portion of the mature (55-95 yrs) growth stage for structural features found in the old (> 115 yrs) growth stage.
- Encourage the development of private forestland stewardship plans and plan implementation through cross-ownership forest management.
- Develop collaborative efforts to reduce hydrologic impacts in the Lake Superior North and Lake Superior South watersheds.

For MHn45**Long Term Goals:**

- Increase and/or maintain the white pine, yellow birch, paper birch, white spruce, and white cedar components.
- Expand or favor mesic hardwood forest types.
- Improve maple timber health and quality.
- Maintain critical habitats such as upland cedar.
- Increased private land stewardship plans and cross-boundary implementation.

Strategies:

- Encourage the use of silviculture systems that support the range of species and structural diversity characteristic of this native plant community.
- Apply uneven-aged management in the first transitional growth stage to increase characteristics of the multi-aged mature and old growth stages.
- Apply even-age management in the first transitional growth stage to maintain younger age classes.
- Use residual cedar and old forest remnants as reserve patches.
- Encourage the development of private forestland stewardship plans and plan implementation through cross-ownership forest management.
- Utilize techniques that recognize and adjust for deer browsing issues.

- Maintain an adequate amount of canoe-quality paper birch.

B. Superior National Forest Plan (2004)

http://www.fs.usda.gov/detail/superior/landmanagement/planning/?cid=fsm91_049716

The Superior National Forest Plan provides management direction only for National Forest System lands managed by the USDA Forest Service. However, such information is valuable and can be utilized by other land managers within the landscape. Management guidance is provided through overall direction and two allocation processes, Landscape Ecosystem direction (more ecologically based) and Management Area Direction (more socially based).

Select overall guidance:

- Vegetation conditions that have been degraded or greatly diminished in quality or extent on the landscape by past land use are restored to conditions more representative of native vegetation communities
- Integrated pest management approaches are used to avoid epidemics and infestations of undesirable native or nonnative invasive species.(desired condition)

Landscape Ecosystem Direction

Landscape Ecosystem management guidance is too extensive to be reprinted here, it can be found on pages 2-55 through 2-78 of the SNF Forest Plan. In summary, the main LE's contained within the NSFC area are Mesic Aspen-Birch-Spruce-Fir, and Sugar Maple. (Others?) Management direction for LEs is provided in three categories: Desired percentage of forest type, desired percentage of age class and tree species diversity objectives within an LE expressed in a table showing the desired relative direction (increase, decrease or maintain) of number of specific tree species within stands in the LE.

Brief Summary of Landscape Ecosystem Direction:

Mesic Aspen-Birch-Spruce Fir Landscape Ecosystem, Vegetative Composition Long Term Goal:

- increase white pine, red pine, jack pine and spruce-fir forest types
- decrease in northern hardwood, aspen and birch forest types

Within-stand Diversity Objectives

- increase white pine, white spruce, white cedar, red pine, tamarack and paper birch
- decrease balsam fir, aspen, and northern hardwoods.
-

For the Sugar Maple Landscape Ecosystem

Vegetative Composition Long Term Goal:

- increase northern hardwood, white pine, spruce-fir, and paper birch forest types
- decrease red pine and aspen forest types.

Within-stand Diversity Objectives

- increase white pine, white spruce, white cedar, yellow birch, balsam fir, tamarack and black spruce.
- Decrease red maple, sugar maple, aspen, and black ash

Management Area Direction

The NSFC area is entirely within the Recreation Use in a Scenic Landscape management area.

Theme - area emphasizes land and resource conditions that provide a scenic landscape for recreational activities in natural-appearing surroundings. This area also provides wildlife habitat to enhance recreational wildlife watching opportunities. Concentrated recreation use is common.

Vegetative Desired Future Conditions - Vegetation Management

- Ecosystems are managed to provide a predominantly natural-appearing landscape that may be slightly modified by forest management activities. This management area emphasizes a large tree and old forest character. Vegetation management generally maintains or enhances older vegetative growth stages.
- Management activities such as timber harvest and management-ignited fire may be used to achieve Landscape Ecosystem objectives. Recreation and scenic integrity objectives guide the appearance of timber harvest, management-ignited fire, tree planting, and other management techniques.

Lake County Forest Plan (2007)

http://www.co.lake.mn.us/document_center/2_A47E02FB_5E76_429A_BC92_4F0BEAD02C18_PDF

Select Planning Goals and Strategies

- Manage by Native Plant Community – Forest management options will consider native plant communities. Management activities will be implemented to move the lands towards the range of natural variability (RNV) of our native plant communities. Importance will be given to increasing the quantity of absent or limited species within communities during management activities and providing a representative distribution of vegetation growth stages within each native plant community. Forest management activities will provide a variety of age classes across the landscape.
- Pest Management - Lake County's strategy for controlling plant and insect pests is to actively meet with our Region's lead agencies including the Forest Service, DNR, St. Louis County, MN Dept of Agriculture and the Nature Conservancy to identify forest pests and invasive species and to coordinate funds and management strategies to actively deal with common threats.
- The Forestry Department will continue to utilize its tax forfeit Biophysical Inventory information, to manage its Northern Hardwoods, to determine off site aspen stands for possible conifer conversion and to aid in other future special projects

Mesic Aspen Birch

Long-term Goals:

- Increase the 81+ multi-aged conifer growth stage.
- Increase the white pine, white spruce, and tamarack component.

Northern Hardwoods

Long-term Goals:

- Increase the white pine, yellow birch, white spruce and white cedar components.
- Move every growth stage toward RNV over the next 150 years.

Select Specific Type Management**Northern White Cedar**

- All cedar stands within 1 mile of Lake Superior will not be managed. Most cedar stands on tax forfeit lands will not be managed. Some cedar will be under-planted within hardwood stands.

Pine and Spruce

- There has been and will be an effort to increase pine and spruce on tax forfeit lands. Pine and spruce will be retained on most productive aspen and birch sites and may be planted on unproductive hardwood sites. Pine will be under planted on hardwood sites.

Yellow Birch

- Yellow Birch will be under planted within some hardwood sites and encouraged whenever possible.

Cook County Comprehensive Local Water Management Plan (2014)

http://www.co.cook.mn.us/images/stories/Soil_Water/Final%20Plan%202014-24.pdf

Lake County Water Management Plan (2005)

http://www.co.lake.mn.us/document_center/2005_Lake_County_Local_Water_Management_Plan_Update_Amended_Nov_2012doc.pdf

Flute Reed River Watershed Guide (Draft) (2007)

<http://www.northshoremanagementboard.org/documents/flute%20reed%20guide%20draft.pdf>

Minnesota State Forest North Shore Area Management Direction (2004)

http://files.dnr.state.mn.us/forestry/subsection/northshorearea/general_direction.pdf

While the majority of designated State Forests lie outside of the NSFC project area, portions of the Grand Portage and Finland State Forests are within the area. In addition, other scattered state forest lands occur throughout the area within 5 miles of the Lake Superior Shoreline.

The MN DNR completed a management plan for these lands in 2004, with management direction extending until 2014. The DNR is currently in the process of updating the management plan, with a new plan for the entire Duluth Superior Uplands section expected to be completed around the end of calendar year 2014. The management guidance listed below is excerpted from the 2004 North Shore Subsection document and contains only a small sample of guidance relevant to the area.. The actual guidance is far more specific. View the plan at the website listed above for more complete information.

Goal, Direction, Strategy Statement 1B - Forest cover type composition on state lands moves closer to the range of cover type composition that historically occurred within the ecosystems found in these three subsections

DFFC Goal: Move toward the desired cover type acreage goals recommended in this plan.

- This plan will move these subsections toward more conifer cover type acreage in upland areas.
- Cover type increases will occur primarily in red (Norway) pine, white pine, jack pine, white spruce, and white cedar (upland). Some minor increases in oak and northern hardwoods are desired. Cover type decreases will occur primarily in the aspen, birch, and balsam fir cover types.

Strategy - Follow specific cover type management recommendations in Chapter 4 such as:

- Allow some stands to convert through natural succession to long-lived conifer cover types without harvest. Emphasize this in stands with adequate advanced regeneration of long-lived conifer species.
- Artificially convert some stands through mechanical site preparation, prescribed burning, planting, or seeding.

- Selectively harvest some stands to move toward the desired cover type and within-stand composition.

Strategy - Increase mixed forest conditions in some stands in all cover types.

- The strategy to achieve this is to favor species found in native plant communities appropriate to the site, especially tree species that have significantly declined from historic levels such as white pine, red pine, white cedar (upland), white spruce, tamarack (upland), and yellow birch

Goal, Direction, Strategy Statement 1C - Patch management in these subsections maintains existing large patches and increases the average patch size on state lands over time, with consideration of natural spatial patterns.

Minnesota State Park Management Direction

There are 8 state parks, 5 state waysides, a state multi-use trail, state water trail and many state water access sites to Lake Superior within the NSFC project area. Management guidance for State Parks and Trails is contained in several documents. Two of these are broader documents applying to all state parks and two management plans for specific state parks within the NSFC project area are completed and available on the DNR website.

The relevant vegetation management guidance from these documents is summarized below. Although the management plans for Tettegouche and Cascade River State Parks are the only two available, it can be assumed that vegetation management guidance for the other 6 state parks would be similar.

Parks and Trails Strategic Plan (2012)

http://files.dnr.state.mn.us/input/mgmtplans/parks/strategic/0212_pat_strategic_plan.pdf

Strategy 1. Accelerate DNR and citizen efforts to control the spread of harmful invasive species and work to prevent the introduction of new ones. Bring together public and non-governmental organizations and individuals with a goal of minimizing harm to native species and communities. Greatly increase funding and efforts.

Strategy 3: Transform non-native plant communities to native plant communities, in units with statutory mandates and selected sites in other units, excluding use areas or sites planned for development.

Strategy 4: Adapt management programs and operations to effectively respond to changes in climate and energy markets. Help plant and animal communities adapt to climate change, and support existing/emerging energy markets where doing so also promotes the conservation of natural resources and reduces our carbon footprint

Parks and Trails Directions for the Future (2011)

http://files.dnr.state.mn.us/input/issues/directions_for_future.pdf

Core Area – Natural and Cultural Resources

Goal A. Protect, perpetuate, and restore natural and cultural resources in division-managed units.

Strategies:

- Document, preserve and perpetuate rare species.

- Manage existing native plant communities to meet or exceed a high quality condition rank as defined by DNR Ecological Resources.
- Manage invasive species to prevent their introduction and spread in division-managed units.
- Transform non-native plant communities to native plant communities, in units with statutory mandates and selected sites in other units, excluding use areas or sites planned for development.

Goal D. D. Cooperate with outside groups, other state agencies, and other units of government on natural and cultural resource efforts to achieve division and department goals.

Goal E. Address impacts of climate change on the division's natural resource responsibilities.

Strategies:

- Participate in applied research concerning climate change impacts to natural resources in Minnesota
- Monitor climate change-related ecosystem impacts to native communities and species in division-managed units.
- Evaluate and implement resource management activities to minimize and mitigate impacts of climate change to natural resources in division-managed units.

Tettegouche State Park Management Plan (2007)

http://files.dnr.state.mn.us/parks_trails/mgmtplans/tettegouche_plan.pdf

Natural Resource Management

Objective 1. Sustain a variety of healthy natural communities.

- Perpetuate and increase uncommon forest types or components. White cedar, white pine, and yellow birch are examples of important forest tree species that are becoming less common on the landscape. As aspen and birch stands begin to age and decline in health, there may be opportunities to encourage less common species in these stands.
- Identify and protect old growth forest stands in accordance with DNR's Old Growth guidelines. Develop management plans for Old Growth stands.
- Implement research that will improve our ability to manage natural communities.

Objective 2. Encourage the development and maintenance of older forests, late successional forests and large contiguous forest blocks so that landscape-scale diversity is maintained.

- Forests around Tettegouche are generally younger and more fragmented than those in the park. This is a trend that will become more pronounced as time goes on.

Objective 3. Sustain healthy and diverse native plant communities.

- Work with DNR's Section of Wildlife to achieve and maintain relatively low numbers of deer in the park. Observations at Tettegouche strongly suggest that deer are having a significant negative impact on forest species, including white pine and white cedar. We will work to reach deer population levels that are low enough to allow forest regeneration, including white pine and white cedar.
- Use native species and genotypes in landscaping and habitat restoration.

Cascade River State Park Management Plan (2003)

http://files.dnr.state.mn.us/parks_trails/mgmtplans/cascade_river_plan.pdf

Principles and Values

- Preservation and/or restoration of the natural and ecological integrity of forest communities found within the park and their associated plant and animal communities. As much as possible, these communities should be representative of pre-European settlement conditions

Summary of Natural Resource Recommendations

- Protect threatened, endangered, rare, and/or significant plant and animal species.
- Continue forest management activities that perpetuate and expand forest diversity to be representative of pre-settlement conditions, including areas of Old Growth cedar and white pine.
- Recommend general deer hunting season be allowed within a park expansion area.
- Protect and/ or restore the Cascade River Corridor natural community, and other river and stream resources within the park.
- Remove or control exotic species, monitor progress of non-native vegetation along corridors of disturbance including trails, roadways and power lines, and develop strategies for control.
- Continue to expand natural resource inventories and data.

Meetings for landowner input into the NSFC Plan

January 28 & 29, 2015

Jan. 28 Location: Gunflint Ranger District Office, Grand Marais, Cook County, MN.

Time: 6:00 PM until 7:30 PM

Attendance: 18 landowners, 5 members of NSFC

Jan. 29 Location: County Courthouse Conference Room, Two Harbors, Lake County, MN.

Time: 6:00 PM until 7:30 PM

Attendance: 20 landowners, 3 members of NSFC

Agenda (for both meetings)

- 20 minute presentation (need for action, mission, goals and objectives of NSFC, potential projects, how landowners can be involved.)
- Handouts on potential projects, types of assistance available, how landowners can be involved.
- One hour open discussion with landowners on how they can become involved, their ideas on projects, landowner-to-landowner involvement, filling out volunteer forms.
- One-on-one discussion with individuals following the meeting.

Publicity for meeting:

- News Release published in Duluth News Tribune, Lake County News Chronicle, Northland Smart Shopper, and Cook County News Herald.
- News Release also covered by WDIO TV and WTIP radio.
- Paid Ads in Lake County News Chronicle, Northland Smart Shopper & Cook County News Herald.
- Two Harbors meeting was filmed in its entirety by Two Harbors Cable Access TV and news coverage and film of the meeting ran on all Duluth TV News stations.

News Release and Advert run in Cook County News-Herald.

Similar release ran in Duluth News-Tribune, Northland Shopper & Lake County News Chronicle.

Ad that ran in Lake County News Chronicle

December 5, 2014 and January 27, 2015

Landowner Engagement Training with U of M Extension Service (Parts 1 & 2)

Location: Tettagouche State Park Visitor Center, Silver Bay, MN

Time: 10 AM until 3:30 PM

Purpose:

Session 1 - Learn how who our landowners are, and how to more effectively engage them in the collaborative, and with each other.

Session 2 – Focus on Landowner to Landowner peer learning.

Attendance:

December: 14 participants, 3 instructors/facilitators

January: 16 participants, 3 instructors/facilitators

October 24, 2014

North Shore Forest Collaborative – Fall General Meeting

Location: Recreation building, Silver Bay, MN

Purpose: Update on NSFC Activities for members, including presentation about NSFC Plan development

Attendance: 15

June 13, 2014

Landowner Workshop

Location: Wolf Ridge Environmental Learning Center, Finland, MN

Time: 12 Noon until 3:30 PM

Purpose: Instructional info for landowners. Part of the meeting was small group interaction by geographic location for landowners to talk about their needs and desires for their lands, including how NSFC can be of greater help to landowners.

Attendance: 40 landowners, 12 presenters

The following postcard was sent to over 700 north shore landowners. A news release was also sent to Duluth and North Shore news media and WTIP radio.



3rd Annual North Shore Landowner Workshop

Friday, June 13, 2014
12-4:30 pm

Wolf Ridge ELC, Finland, MN

- Do you want to learn more about managing and restoring your land?
- Do you want to borrow equipment to plant trees or control invasive plants?
- Would you like to sit down with a professional and discuss your plans for your property?

Whatever your interest or size of your property, join the North Shore Forest Collaborative for an educational and fun workshop designed specifically for private landowners on the North Shore. **Free.** Pre-registration is requested.

For more information and to register visit sugarloafnorthshore.org or call 218-525-0001.

Funded in part by the Duluth Superior Area Community Foundation and the Lake County SWCD

Additional Contacts Regarding Landowner Involvement

Summary of Discussion on Private Landowner Engagement
Chris Ewing of American Forest Foundation and Duane Lula, NSFC

On August 29th, 2014 I had an approximately 45 minute phone conversation with Chris Ewing of the American Forest Foundation. They have a private forest landowner engagement project going in the Cumberland area of Alabama. While their project is far larger than ours, it has several similarities with the NSFC projects, and they have used some interesting methods of contacting and engaging landowners.

Change in emphasis of private landowner objectives: Chris mentioned that past efforts have focused on stressing the economic aspects (primarily timber) of managing private forestlands. He says that recent studies have shown that the income objective has dropped from being the #1 priority in past years, to the 5th priority today. Nature, wildlife, and a healthy forest are far more important today.

In the past, they would send a forester out to a landowner and they delivered primarily a timber management message. They realized that this did not leave a very good impression, and they got relatively little response or call back based on that first forester contact.

Today, they ask them to accept a package of information in the mail. They have all their collaborative partners put their logo on the info package. This helps build credibility as they have a large and varied partner involvement. Next, they follow-up with an offer to send someone out to the property for a one-on-one visit with the landowner. This is often a peer, sometimes a neighbor, but it also may be a biologist or a forester.

In making contacts by mail during a campaign to grow their certified acres, they initially sent out 10 thousand mailings and they received only 100 responses. (1% response rate) Now, they do a series of repeated mailings. They only send out 4 thousand, but they follow it up with 2 or 3 additional mailings with more information. They include information about wildlife and recreation in addition to timber. They found the response rate increases and peaks after sending out the 3rd info packet. They achieved a 13% response rate with this method.

They also communicate with their contacts on a monthly basis.

For those landowners who express interest, they have two ways to approach landowners.

1. They have 20 foresters/professionals who have volunteered to make a 1st on-the-ground visit for free. After that initial visit, there would be a charge. The foresters give their notes from this first visit back to the collaborative.
2. On another project, they actually have a paid forester on their staff plus they have some consultants that do a first visit for free.

Things to consider: What is our plan for an individual when we get a response from a contact?

Also, there is another AFF collaborative forest project in the driftless area of Wisconsin and one along the south shore of Lake Superior. Jerry Greenberg is the contact person. Duane will attempt to contact and talk with him as well.

Note: This is a list of projects that are either ongoing or planned by private landowners, non-profit organizations, and agencies. This project list was developed in response to a survey issued by the North Shore Forest Collaborative in the autumn of 2014. It should not be considered a complete list of all restoration-related projects on the North Shore, but can serve as an example of the types of projects that landowners and others are undertaking to promote restoration on their lands. It can also serve as a foundation for further collaboration among parties.

Agency: Private

Name: Michael

Project Name: Property Re-forest

Project Status: Ongoing

Project Location: **Anticipated Cost:** \$200 annual out-of-pocket cost (labor donated)

Funding Source/Agency: Personal

Project Objectives and Key Components: My woods were 80-90% birch in 1990. As they die off, I am fighting to transition to a mixed forest dominated by conifers and a lesser mix of hardwoods. I am fighting deer and a very grassy understory making natural regeneration only marginally successful.

Partners and Participants in Project: Just me, and occasional friends

Expected Duration of Project: Ongoing

Agency: Private

Name: Meredith

Project Name: White Pine Restoration/Adaptation forestry

Project Status: Ongoing

Project Location: Fredenberg Twp.

Anticipated Cost:

Funding Source/Agency: Private

Project Objectives and Key Components: produce/manage for a resilient, diverse forest ecosystem. (80 acres)

Partners and Participants in Project: None yet!

Expected Duration of Project: A lifetime

Agency: Private

Name: Jim

Project Status: Completed

Project Location: Cook County, Hall Road

Anticipated Cost: \$2000

Funding Source/Agency: NRCS

Project Objectives and Key Components: Planted spruce in 30 acres of hazel brush

Partners and Participants in Project:

Expected Duration of Project: 2003-2005

Agency: Private

Name: Kurt

Project Name: Home Restoration

Project Status: Ongoing

Project Location: Cook County

Anticipated Cost: (in-kind cost)

Funding Source/Agency: Personal time

Project Objectives and Key Components: Shearing brush and planting white pine and spruce on 10 acres surrounding homestead.

Partners and Participants in Project: None

Expected Duration of Project: 2014-2016

Agency: Private

Name: Marty

Project Name:

Project Status: Planning

Project Location: 80 acres

Anticipated Cost: Unknown

Funding Source/Agency: Self-funded

Project Objectives and Key Components: Begin restoration of selected portions of property. Our property is losing black ash, birch, and poplars due to drought, deer, etc. We have spoken to USFS because they are going to do a timber sale adjacent to us. Have consulted with them to see if we could coordinate.

Partners and Participants in Project: USFS?

Expected Duration of Project: Unknown

Agency: Wolf Ridge ELC

Name: John Kohlstedt

email: john.kohlstedt@wolf-ridge.org

Phone: 218-353-7414

Project Name: Forest Plan for Wolf Ridge

Project Status: Ongoing

Project Location: 2000 acres at Wolf Ridge

Anticipated Cost: \$5,000

Funding Source/Agency: NRCS/Wolf Ridge

Project Objectives and Key Components: Matt Tyler conducting a comprehensive forest inventory and plan. (2,000 acres)

Partners and Participants in Project: NRCS, Matt Tyler, Wolf Ridge

Expected Duration of Project: Expect completion in spring of 2015

Agency: Wolf Ridge ELC

Name: John Kohlstedt

email: john.kohlstedt@wolf-ridge.org

Phone: 218-353-7414

Project Name: Cranberry Road Reforestation

Project Status: Ongoing

Project Location: Six acres along Cranberry Road

Anticipated Cost: \$200 for labor and fencing

Funding Source/Agency: Nature Conservancy/Wolf Ridge

Project Objectives and Key Components: Continuation of protecting white pine seedlings, basswood, red oak using tubes and fencing and budcaps on approximately 100 white pine, 25 basswood, and 25 red oak. (6 acres total).

Partners and Participants in Project: Wolf Ridge and The Nature Conservancy
Expected Duration of Project: 5 more years of fencing and maintenance

Agency: Sugarloaf: The North Shore Stewardship Association

Name: Molly Thompson

email:

Phone: 218-525-0001

Project Name: Lost Forest

Project Status: Planned

Project Location: North Shore Collaborative Area

Anticipated Cost:

Funding Source/Agency: Coastal Program grant funds

Project Objectives and Key Components: Teach landowners about forest restoration thru a series of workshops taught in partnership with U Of MN Extension.

Partners and Participants in Project: Extension

Expected Duration of Project: 2015

Agency: Sugarloaf: The North Shore Stewardship Association

Name: Molly Thompson

Phone: 218-525-0001

Project Name: Restoration at Sugarloaf Cove – Invasive Removal

Project Status:

Project Location: Sugarloaf Cove property, Cook County

Anticipated Cost:

Funding Source/Agency:

Project Objectives and Key Components: Treat and remove invasives on Sugarloaf Cove property

Partners and Participants in Project:

Expected Duration of Project:

Agency: Sugarloaf: The North Shore Stewardship Association

Name: Molly Thompson

Phone: 218-525-0001

Project Name: Community Shed at Sugarloaf Cove

Project Status:

Project Location: Sugarloaf Cove Property, Cook County

Anticipated Cost:

Funding Source/Agency:

Project Objectives and Key Components: Install, equip and maintain shed and tree planting and invasive removal equipment.

Partners and Participants in Project:

Expected Duration of Project:

Agency: Encampment Forest Association

Name: John Bathke

email: john@b-green.us

Phone: 218-834-7075

Project Name: Forest Management

Project Status: Ongoing

Project Location: Encampment Forest Area – between the tunnels.

Anticipated Cost: \$25,000 per year

Funding Source/Agency: Endowment

Project Objectives and Key Components: Restore white pine and white cedar plus other species and attempting to deal with invasives.

Partners and Participants in Project: The Nature Conservancy

Expected Duration of Project: Ongoing

Agency: The Nature Conservancy

Name: Mark White, Chris Dunham

email: mark_white@tnc.org cdunham@tnc.org

Phone: 218-727-6119

Project Name: North Shore Forest Restoration, Climate Change Research

Project Status: Ongoing

Project Location: Various locations in Lake and Cook Counties

Anticipated Cost: ?

Funding Source/Agency: CPL, Private, Wildlife Conservation Society

Project Objectives and Key Components: Restore long-lived conifer, experimental planting of white pine, increase species diversity in north shore forests.

Partners and Participants in Project: TNC, Lake County, Superior National Forest, DNR-Forestry

Expected Duration of Project: 10 years

Agency: Grand Portage Band of Lake Superior Chippewa

Name: Tim Miller

email: tpmiller@boreal.org

Phone: 218-475-2033

Project Name: Birch Restoration – Inventory, Planning, Projects

Project Status: Ongoing

Project Location: On the Grand Portage Reservation in birch stands that are deteriorating

Anticipated Cost: \$300-\$600/acre

Funding Source/Agency: Agency and Grants

Project Objectives and Key Components: Restore birch and create species diversity for maintaining healthy forests in the throngs of climate change. Stand exam, site prep (raking), planting low density conifers.

Partners and Participants in Project: Mostly tribal, but may include DNR and NRCS.

Expected Duration of Project: Continuing

Agency: Minnesota DNR - Wildlife

Name: Dave Ingebrigtsen

email:

Phone:

Project Name: North Shore Diversity planning

Project Status: Ongoing

Project Location: Lutsen, MN

Anticipated Cost:

Funding Source/Agency: DNR, Lessard-Sams OHF

Project Objectives and Key Components: Diversify tree species on 36 acres. Plant and protect yellow birch, white pine and white cedar. Recently (2014) released these species along with white spruce from competition.

Partners and Participants in Project: CCM, DNR-Forestry

Expected Duration of Project: May need continued maintenance for bud capping, other protection or subsequent release.

Agency: USDA-NRCS

Name: Will Bomier

Phone: 218-343-5607

Project Name:

Project Status: Ongoing

Project Location: North Shore Collaborative Area

Anticipated Cost:

Funding Source/Agency: Farm Bill Funds

Project Objectives and Key Components:

Meeting with landowners in collaborative area;

Providing Conservation Assistance/Planning

Met with 5 landowners this summer, approx. 35 acres total

Partners and Participants in Project: Soil & Water Conservation District

Expected Duration of Project: Ongoing

Agency: MN DNR - Forestry

Name: Roger Nelson

email: roger.a.nelson@state.mn.us

Phone: 218-735-3954

Project Name: Private Land Management

Project Status: Ongoing

Project Location: Two Harbors to Grand Marais and 3.5 miles inland.

Anticipated Cost: 200 hours

Funding Source/Agency: DNR Salary

Project Objectives and Key Components:

ECS Comparison Chart, eg FDn43 vs MHn44 (Developing it with help from John Almendinger);

Produce maps of existing stewardship plans (done with help of St. Paul staff);

Review of existing stewardship plans for recommended projects (Roger to do)

Compile projects in an access database (intern?)

Apply for a Landscape Grant to complete projects with cost-sharing (coordinate with SWCD)

Partners and Participants in Project: NRCS and Soil & Water Conservation District

Expected Duration of Project: Plan reviews and database this winter

Agency: USDA-NRCS Soil Science Division

Name: Kyle Steele

email: Kyle.Steele@mn.usda.gov

Phone: 920- 74-1772

Project Name: Ecological Site Descriptions of the North Shore Highlands

Project Status: Ongoing

Project Location: North Shore Highlands Subsection

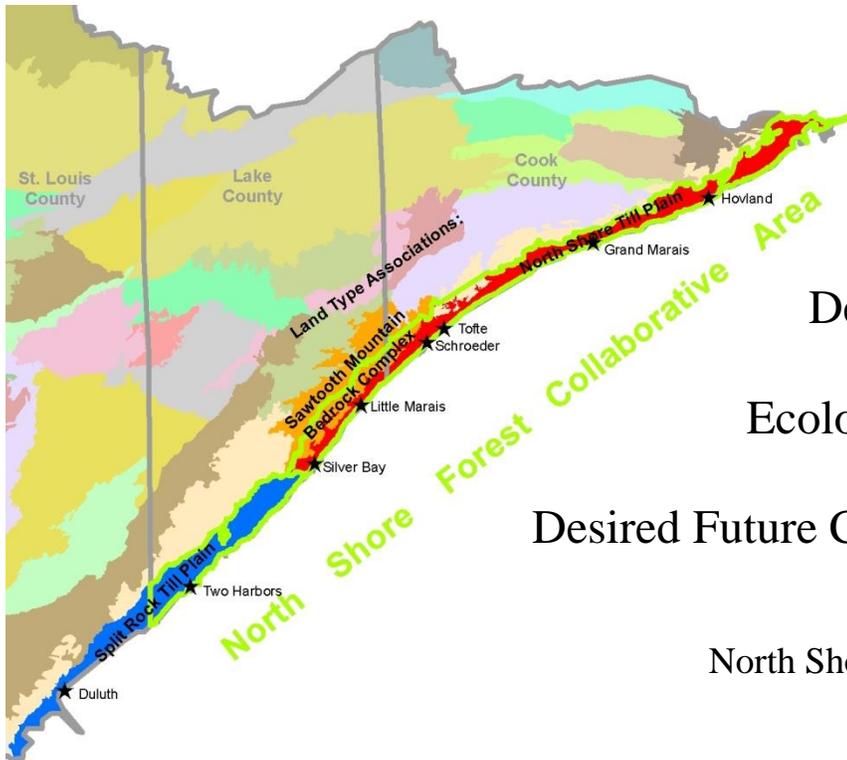
Anticipated Cost:

Funding Source/Agency: Agency

Project Objectives and Key Components: Complete a minimum of two Ecological Site Descriptions per year for the dominant soils and plant communities of the region. Starting in FY 2015, we will begin focusing on the North Shore Till Plain LTA and associated degraded FDn43 plant communities. To date, we have been working on that, but have mostly worked on the highlands above the lake.

Partners and Participants in Project: We are working with the NSFC Technical Committee to help guide the development of our products. We are also partners with the soils and ecology staff on the Superior National Forest as well as the USFS Region 9 office. We have worked with various DNR County Biological Survey staff.

Expected Duration of Project: Indefinite



Development of
Ecological Landscape
Desired Future Conditions/Goals/Objectives
developed for
North Shore Forest Collaborative

by Chel Anderson, Lissa Grover, Dave Ingebrigtsen & Myra Theimer

Project Purpose

The Desired Future Conditions (DFCs) were developed by the Collaborative's technical working group in response to a need to focus our efforts on the most important components of forests and forest habitat to restore. While there are areas where much forest restoration work is needed, there are other areas where a great bounty of natural resources in functioning ecosystems need to be sustained. The Collaborative has developed DFCs and Objectives to address both needs.

Background

The North Shore Till Plain Land Type Association (LTA) is a level to rolling landscape with a climate modified by Lake Superior. Soil parent materials are predominantly clayey sediments from Glacial Lake Duluth and lake-modified clayey till. Coarse, sandy loam Superior lobe till is present at higher elevations. There is a considerably range in soil depth and prominent outcrops of North Shore Volcanic bedrock, typically isolated except along the Superior shore, are common in the LTA. There are 1.17 miles of streams per square mile. Inland lakes occupy less than 1% of the LTA. The zone of Lake Superior's climate influence generally corresponds with the upper extent of clayey lake sediments.

North Shore vegetation is recovering from a sequence of events following large-scale conifer logging in the early 1900s. Logged-over areas with abundant slash burned hot during a period of years with drought and excessive heat. The resulting young forest was different from the forest that had developed under a disturbance regime of stand-replacing and surface fires. Drought and excessive temperatures in the 1930's and lack of seed trees produced areas of forest with less biodiversity, and dominated by birch and aspen.

According to analysis of Public Land Survey Bearing Trees compared to modern forest inventory data (see Appendix), the North Shore Till Plain's white pine (-97%), white spruce (-77%), balsam fir (-53%) and white cedar (-49%) have declined; while paper birch (+45%) and aspen (+511%) have increased. Since the early 1900s, growth stage distribution as well as size and distribution of forest patches were altered by the large fires and pulses in logging activity as the stands have matured.

Issues that affect the modern-day forest include lack of seed source, fire disturbances have been eliminated by suppression, selective browsing by a burgeoning deer population and changes in climate. These factors have affected the successional pathways of the native plant communities. Resulting forest stands may not have the capacity to sustain themselves or the wildlife dependent on their habitat. For example, some of the relatively monotypic birch stands that resulted from the slash fires are now declining. Lack of seed source and deer browsing control the amount and opportunity for other tree species to succeed the birch.

Consideration of Driving Factors

Changes in the climate will drive natural processes that determine the North Shore's vegetation and habitat. The best scientific projections have been considered when assessing the future forest and the desired future conditions were developed to encourage resilience of the forest in the Collaborative Area to potential climate change effects.

The NE Landscape Plan has considered the social and economic factors that affect the whole region. In the North Shore Collaborative Area, the Collaborative has agreed to work within the recommendations of the NE Plan, but will make recommendations that emphasize the unique qualities of the North Shore. These qualities include outstanding recreational, scenic and economic opportunities as well as the unique and even rare natural resources. The whole Collaborative Area is in the Lake Superior watershed and contains abundant clean water, trout streams and wetlands.

Guiding Principles for Developing DFCs for the North Shore Till Plain

- Determine plant species location and density:
 - Per system, class, and type
 - Per growth stage
- Determine appropriate plant community management options in order to:
 - Maintain and increase the composition of all native species.
 - Protect structure.
 - Provide coarse woody debris: 2-5 downed logs greater than 12 inches in diameter, per acre, if possible.
 - Maintain existing quality, maintain rare species and enhance native species diversity.
 - Control invasive species.
- Consider climate change when determining treatment options.
- Minimize and reduce fragmentation and maintain and improve landscape scale connections (Goal 1, Obj. C; North Shore Forest Collaborative 2011).
- "Any DFC statements will be based on the Range of Natural Variability (RNV)" (North Shore Forest Collaborative 2011).

Table 1. North Shore Till Plain Tree Species

Tree Species	BT %	FIA %	Comparison of BT to FIA
Balsam Fir	29.6	14	Decline, 2 to 3-fold
Paper Birch	22.6	32.7	Some increase
White Spruce	18.4	4.3	Decline, 3 to 5-fold
White Cedar	16.6	8.4	Some decline
Quaking Aspen	3.8	23.2	Increase, 5 to 10-fold
White Pine	3.1	0.1	Decline, > 10-fold
Tamarack	1.6	0	Rare as bearing tree
Yellow Birch	1.4	1	Rare as bearing tree
Black Ash	1.4	3.3	Rare as bearing tree
Basswood	0.5	0.5	Rare as bearing tree
Black Spruce	0.4	1.3	Rare as bearing tree
Sugar Maple	0.3	6.5	Rare as bearing tree
Balm Of Gilead	0.2	3.3	Rare as bearing tree
Red Maple	0	0.4	Rare as bearing tree
Red Pine	0	0.2	Rare as bearing tree
Jack Pine	0	0.8	Rare as bearing tree
Cherry	0	0.2	Rare as bearing tree
American Elm	0	0	Rare as bearing tree
Ironwood	0	0	Rare as bearing tree
Red Oak	0	0	Rare as bearing tree
Bur Oak	0	0	Rare as bearing tree
Box Elder	0	0	Rare as bearing tree

Restoration Guidance for North Shore Till Plain LTA -DRAFT

Scope of the Endeavor

The initial restoration goal for the North Shore Till Plain LTA section of the North Shore Forest Collaborative area is to manipulate the vegetation on 75,500 acres which is 50% of the ~150,667 acres in this section (figures rounded).

Ecosystem Element	Desired Future Condition	Objectives
Native Plant Communities (NPC's)	<ul style="list-style-type: none"> • There is an ecologically distributed proportion of high-quality, representative native plant communities, and native plant community associations. • High quality, representative native plant communities and rare native plant communities are sustained or enhanced. • Lands are managed or restored according to the forest system (e.g. MH, FD) defined in the Native Plant Community classification System. • Native plant communities occur at patch sizes sufficient for self maintenance and integrity. 	<p>See Table 2 and 3 for desired conditions of individual native plant communities.</p> <ul style="list-style-type: none"> •NPCs are associated with appropriate ecological settings (use Field Guide to NPCs of MN, Laurentian Mixed Forest Province and NPC mapping within MBS Sites ranked Outstanding or High as reference). • Species composition and structure of native plant community types is as described in Field Guide to NPCs of MN, Laurentian Mixed Forest Province. • Native plant communities with an S-Rank of S1(“Critically Imperiled”) or S2 (“Imperiled”) rare to the LTA are protected or restored. • Native plant communities with an S-Rank of S3 to S5 that are rare or unique in the LTA are sustained or enhanced.
Forest Continuum	<ul style="list-style-type: none"> • Forest is continuous and connectivity is maintained between Lake Superior and inland reaches of LTA and adjacent LTA's. • Large patches of contiguous forest dominate the landscape. • Plant communities are minimally fragmented by ownership boundaries, development and unnatural disturbances. • Older forest stands are larger and more spatially contiguous. 	<ul style="list-style-type: none"> • Increase the 81+ multi-aged conifer growth stage (MFRC NE Landscape Committee 2003). • Group project sites that have similar goals in respect to growth stages. • Plan and accomplish work on large acreages where possible.
Age Distribution of Forest Community	<ul style="list-style-type: none"> • Succession combined with the restored tree diversity has resulted in multiaged stands and most stands are in advanced growth stages. • MHn and WFn53 forests are older on average than FDn forests. • Woody debris and snags have a greater presence, in both harvested and aging stands. 	<ul style="list-style-type: none"> • Most restored stands in the LTA will be managed or allowed to succeed to older NPC growth stages with old forest characteristics. Restored stands include the native long lived species (e.g. white pine, white cedar, and sugar maple) which are maintained, restored, and protected to reestablish old-growth potential and the diversity of the Range of Natural Variability (RNV).

Ecosystem Element	Desired Future Condition	Objectives
Tree Species Diversity	<ul style="list-style-type: none"> • All native tree species have been restored to the North Shore and their presence, proportion, and distribution is roughly similar to their occurrence before white settlement. However, some species are being favored by climate changes, others are not; some species are easier to foster than others; some native species are expanding their range; and some new species are becoming part of the mix. So, the mix and balance of species is continually changing. The species that have been restored over the widest area are: white cedar, white spruce, white pine, tamarack, and yellow birch. Species restored to scattered locations are American elm, basswood, jack pine, red oak, and black and green ash (assuming ash can be brought through the EAB invasion). • White cedar has been increased by planting, natural regeneration, and protection and is a minor or better component of all appropriate sites on all projects in upland and lowland plant communities. (This assumes the acreage goal as displayed in the "Scope of the Endeavor" above, or something similar) • White spruce has been increased by planting and natural regeneration and is found on most project sites, in areas outside of project sites, and often is the most common species in any stand. • White pine has been increased by planting, natural regeneration, and protection and is a minor or better component on all appropriate sites on all projects in upland plant communities. (This assumes the acreage goal as displayed in next column or something similar) • Tamarack has been increased by planting, natural regeneration, and protection on many appropriate sites on many projects in upland and some lowland plant communities. 	<ul style="list-style-type: none"> • Project areas will consider LTA DFCs and achieve or exceed DFCs where the site conditions are conducive. <i>Note: "Priority" below relates to area of restoration for that particular species - the relative acreage on which that species should be restored as compared to the other emphasized species. In all cases, the restoration objective for the species below is an increased frequency as individual trees, small groups of trees, or small patches depending on the species and location in the LTA.</i> • White cedar is the highest priority to manage for increase. It has also been much reduced from its original distribution and it can be maintained as the climate warms in lowlands and on uplands with groundwater seeps. Decimating effects from herbivory can be modified by protection. White cedar will have an increased presence on most upland sites; its presence will be restored and/or maintained on lowland sites. • White spruce is the 2nd highest priority to manage for restoration, because its presence has declined so much. It will regenerate naturally over time, given a seed source. And it is not likely to be browsed by deer and hare. However, it is predicted to face some stress under climate change. • White pine is the 3rd highest priority to manage for increase. Its numbers and distribution have decreased markedly from presettlement and it has a good chance to adapt to climate change. Decimating effects from herbivory and blister rust can be modified by management. White pine will have an increased presence on most project sites. • Tamarack and yellow birch are the 4th level priority to manage for restoration, as their presence has declined significantly. Tamarack will be the harder to reestablish, primarily because of its susceptibility to Eastern Larch Beetle and Larch Sawfly. Both will be planted and natural regeneration encouraged through scarification; seedlings and saplings will be protected.

Ecosystem Element	Desired Future Condition	Objectives
Tree Species Diversity Continued	<ul style="list-style-type: none"> • Yellow birch has been increased by planting, natural regeneration, and protection on many appropriate sites on many projects in upland plant communities. • American elm has been returned by planting and protection to scattered, typically terrace forest sites on some project areas. • Basswood, red oak, black and green ash, and jack pine have been maintained where they occurred in 2013, and have been planted on appropriate sites to retain native diversity. • Red pine presence has been maintained as a component in some project areas. • Paper birch has been maintained through natural regeneration and protection as a component of many stands in most project areas. It has also been maintained as the dominant species in stands to provide birch forest aesthetics at strategic sites. • Red maple occurs in different NPC throughout the LTA. Sugar Maple is found at higher elevations; and maples in general now occupy more sites through natural regeneration. 	<ul style="list-style-type: none"> • Balsam fir is ubiquitous and will remain so. It is a short-lived tree and will fluctuate on the landscape. It does not need restorative management. • Paper birch and quaking aspen have increased significantly beyond historic levels. Their presence will be maintained, but they will be managed to reduce their dominance on the landscape. • American elm (and possibly red oak) has declined since white settlement (elm because of introduced disease). These will be restored mainly by planting and protecting in appropriate ecological settings. • Basswood and green ash should be maintained where it occurs. • Jack pine presence will be maintained in scattered, ecologically appropriate locations. Protection may be sufficient. • Red pine currently occurs at 0.2 % of the total plant community which is a greater acreage than under RNV. Its proportion may be reduced or maintained, not expanded; and the stands should be diversified considering species best fit for expected climate changes. • Black ash is common in wet sites, often indicating strong subsurface drainage. It can benefit from browse protection. More important is the impending threat of the nonnative invasive Emerald Ash Borer. Strategies to save and restore this species may be developed and become very important within the decade. Sugar and red maple, balsam poplar, and black spruce are not in need of restoration. Sugar maple has increased since white settlement. Both maples will likely benefit from climate changes. Balsam poplar is common in wet sites. Black spruce was and is similar to white spruce in distribution. It is also typical on wet sites where historically tamarack and white cedar were also coinhabitants. It should be considered an important conifer in the native mix, but will likely maintain itself with no restorative management. Stresses from climate change will likely reduce black spruce presence in several decades.
Tree Species Diversity Continued		<ul style="list-style-type: none"> • Bur oak and ironwood may be among those species that expand into the N.S.T.P. LTA after several decades of climate change. Additionally, they can benefit from browse protection.
Nonnative Species	Native species are dominant and invasive species are limited in extent; new populations are being controlled.	<ul style="list-style-type: none"> • Maintain natives. Projects will be conducted to reduce the potential for spreading and introducing invasive species. • Projects are monitored to identify new populations of nonnative species during and for three years after project completion; prioritize for elimination/control. • State and county officials will coordinate to eliminate or control nonnative invasive species populations; prioritize based on risk assessment. • State and federal authorities can provide direction, recommendations, and assistance to prevent introduction of nonnative invasive species. • The Collaborative contributes by disseminating information and educating the public.

Ecosystem Element	Desired Future Condition	Objectives
	<p>Suggested restoration goal for the Split Rock Till Plain LTA:</p> <ul style="list-style-type: none"> - Manipulate vegetation on 30,000 acres which is 40% of the ~74,000 ac. LTA/Collaborative area. Note to consider when writing the Split Rock table: Bearing tree information suggests there were more Am. elm, red pine, tamarack, yellow birch, and considerably more white pine in the Split Rock Till Plain LTA. -Basswood supposedly was as minimally likely on both LTA's, and it may be present in the same proportion today according to the FIA data. It seems, however, it could be more probable in the Split Rock LTA and could be added to this list in the Split Rock LTA. -More red pine is appropriate in the Split Rock LTA. 	