

The North Shore Forest Collaborative

Restoring Lake Superior's Coastal Forest

Dave Ingebrigtsen
DNR Wildlife

MFRC NE Landscape Committee
17 March 2017

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The North Shore Forest Collaborative

Restoring Lake Superior's Coastal Forest

- Who we are & what we do
- Our Desired Future Conditions
- Next steps

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The North Shore Forest Collaborative

Restoring Lake Superior's Coastal Forest

Mission, Plans, Projects

Who we are

Meetings & Presentations

Get Involved

Resources

Contact Us



Why are the birch
dying?

Learn more



2017 Tree Fencing
Program



Resources for
Private
Landowners



In the News: Can
old growth forests
be restored?

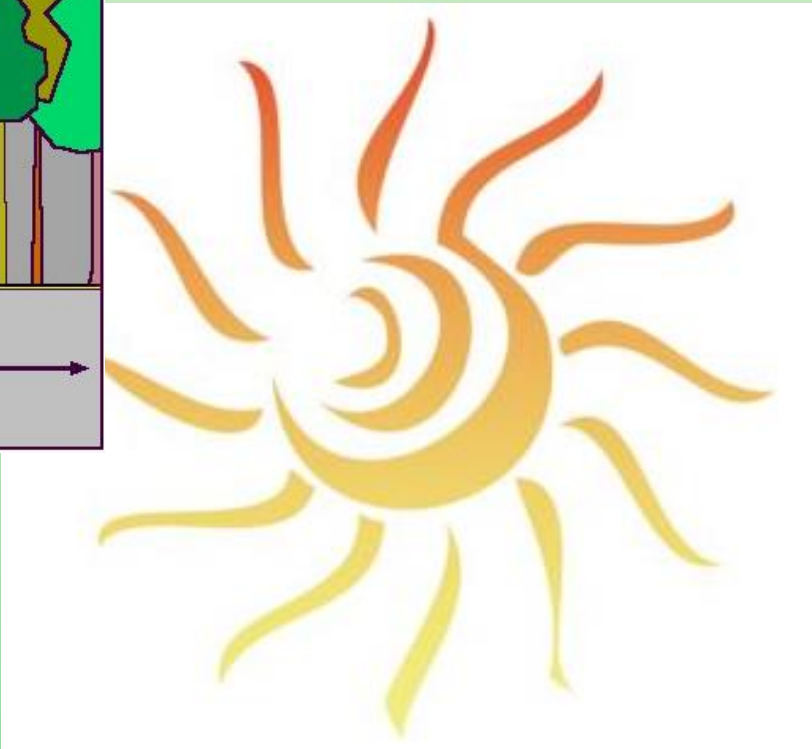
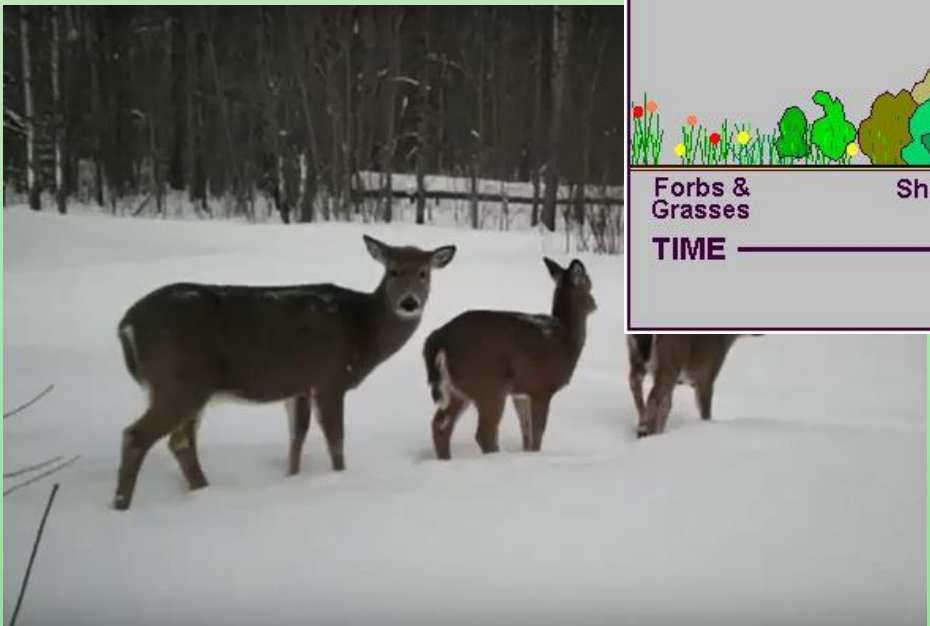
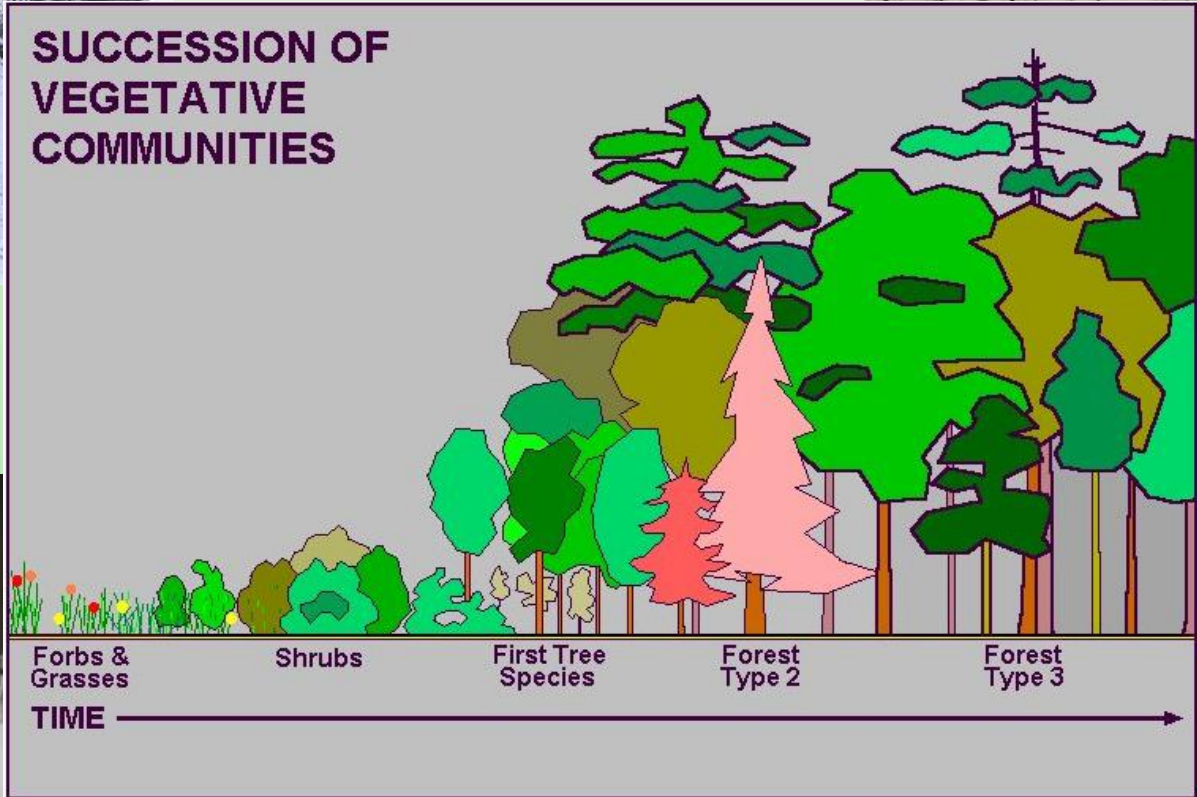
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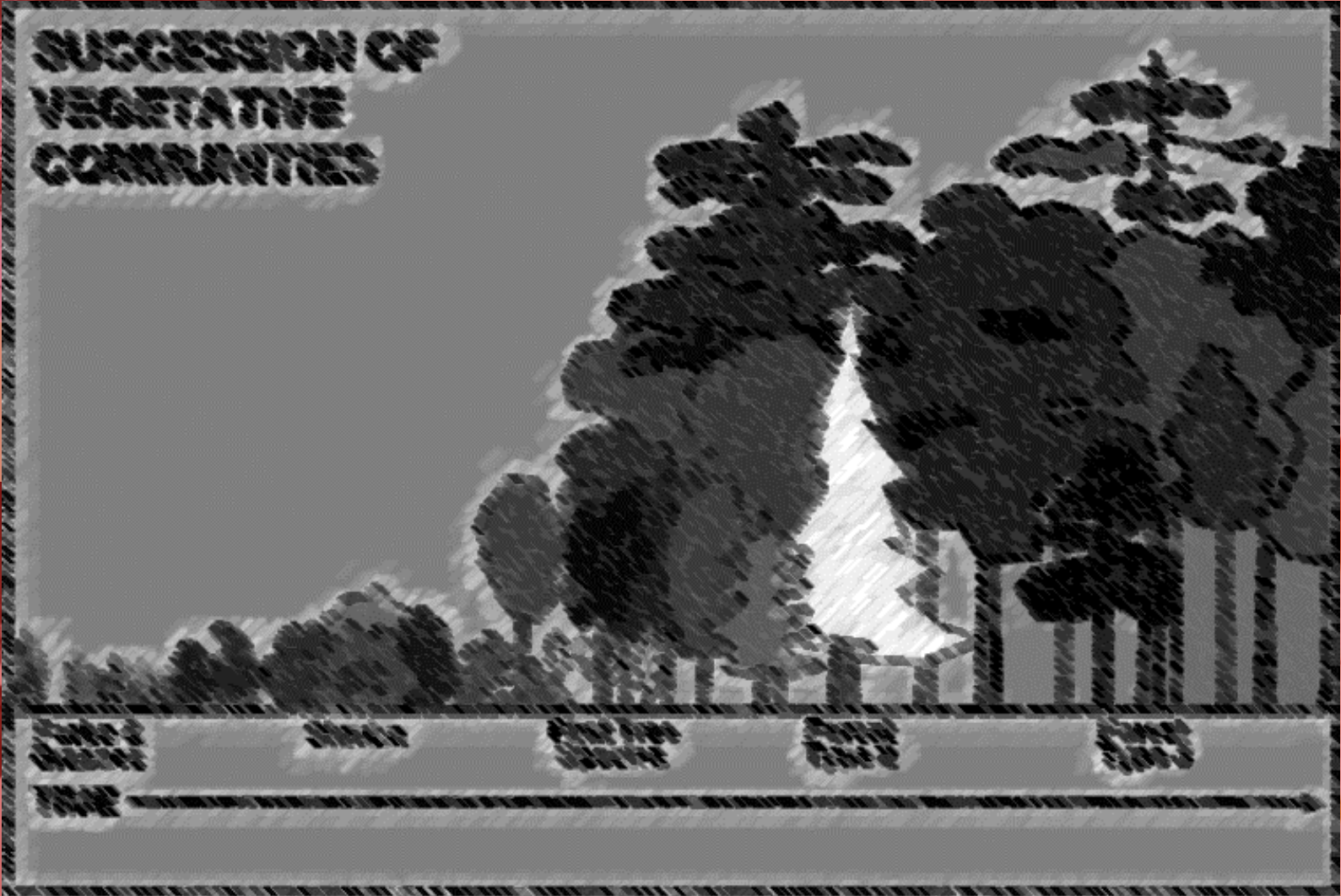


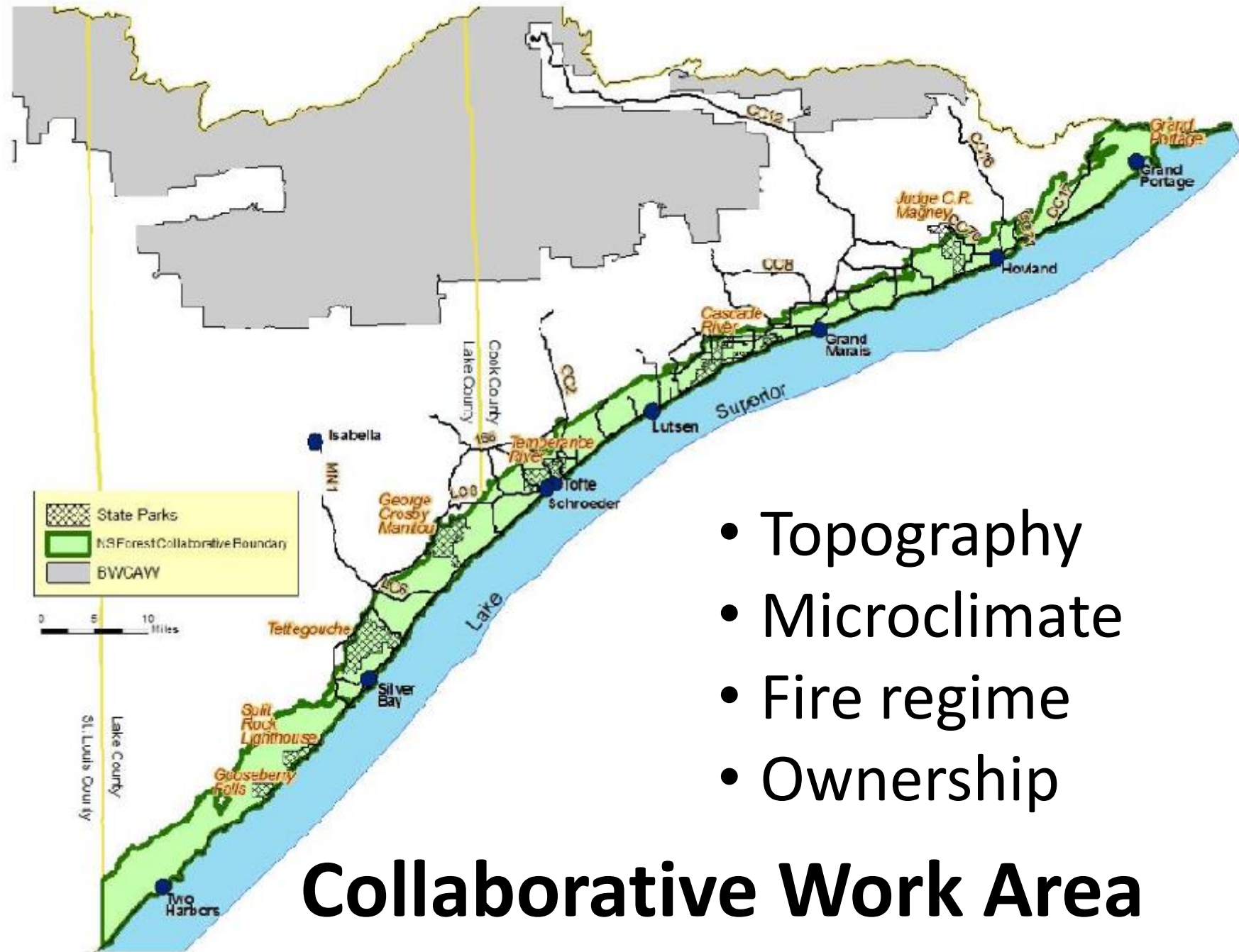
SUCCESSION OF VEGETATIVE COMMUNITIES





SUCCESSION OF VEGETATIVE COMMUNITIES





- Topography
- Microclimate
- Fire regime
- Ownership

Collaborative Work Area



North Shore Forest Collaborative

- Cook County
- Lake County
- Private Landowners
- MN Department of Natural Resources (DNR)
- USDA Natural Resources Conservation Service (NRCS)
- Sugarloaf: The North Shore Stewardship Association
- The Nature Conservancy
- USDA Forest Service – Superior National Forest
- Wolf Ridge Environmental Learning Center
- University of Minnesota Extension
- Grand Portage Band of Lake Superior Chippewa
- Cook County Soil & Water Conservation District
- Arrowhead Invasives Team
- Lake County Soil & Water Conservation District
- MN Forest Resource Council
- Minnesota Power
- Encampment Forest Association
- Minnesota Fire-wise Program
- MN Department of Transportation (DOT)
- Consulting Foresters
- MN Land Trust
- MN Environmental Partnership
- Flute Reed Watershed

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North Shore Forest Collaborative

- **3-4 Executive Committee Meetings/Year**
 - Strategy
 - Business
- **Spring Annual Landowner Workshop**
 - Hands-on demonstrations
 - Field Trips
 - Presentations from Resource Personnel
- **Fall Annual General Membership Meeting**
 - Speakers
 - Interaction/discussion
 - Workshops

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North Shore Forest Collaborative

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.

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North Shore Forest Collaborative

i.e. Native Forest Restoration



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What does the Collaborative do?

- Targets specific reforestation projects
- Promotes invasive species control
- Compliments & supports member goals
- Shares knowledge & educates
- Seeks to engage all landowners

Promoting a Healthy Forest on
the North Shore of Lake Superior

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North Shore Forest Collaborative Goals

- 1. To re-establish & maintain a diverse & healthy forest along the North Shore of Lake Superior.*
- 2. To expand cooperation, planning, and management efforts along the corridor.*
- 3. To share expertise and knowledge learned through Collaborative and member projects.*



North Shore Forest Collaborative

Restoration activities accomplished by NSFC and members in 2015:

- Invasive Species treated – 550 hours of volunteer time, with a total of more than 53 acres treated.
- Trees planted and/or protected – many thousands of trees (mostly white pine, white cedar, red oak, and red maple)planted across a total of approximately 1000 acres.
- Site preparation for planting - 78 acres treated for planting in 2016
- Strategic Management Plans – 2 completed, 2 underway
- Programs offered –field tours, landowner workshops, training sessions, public meetings and educational presentations.
- Assistance to private landowners – hired forester, 6 contracts, 176 ac. evaluated, 18 landowners assisted, 15 people trained/treated invasives.

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Resources for Private Landowners

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In the News: Can old growth forests be restored?

[Read more](#)



Email



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Coordination made possible by:

The USDA Forest Service.

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Restoring Lake Superior's Coastal Forest

Mission, Plans, Projects


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Why are the birch dying?

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Resources for Private Landowners



In the News: Can old growth forests be restored?

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Landownership

OWNER	ACRES	%
Private	105,588	39
USA	48,175	18
State	48,358	18
Tribal	30,369	11
Lake County	30,294	11
Municipal	3,456	1
Cook County	1,220	>0.5
Unknown	2,971	1

\$25 for 4
exclosures
(\$70 value)

Individual Tree Exclosure -6'

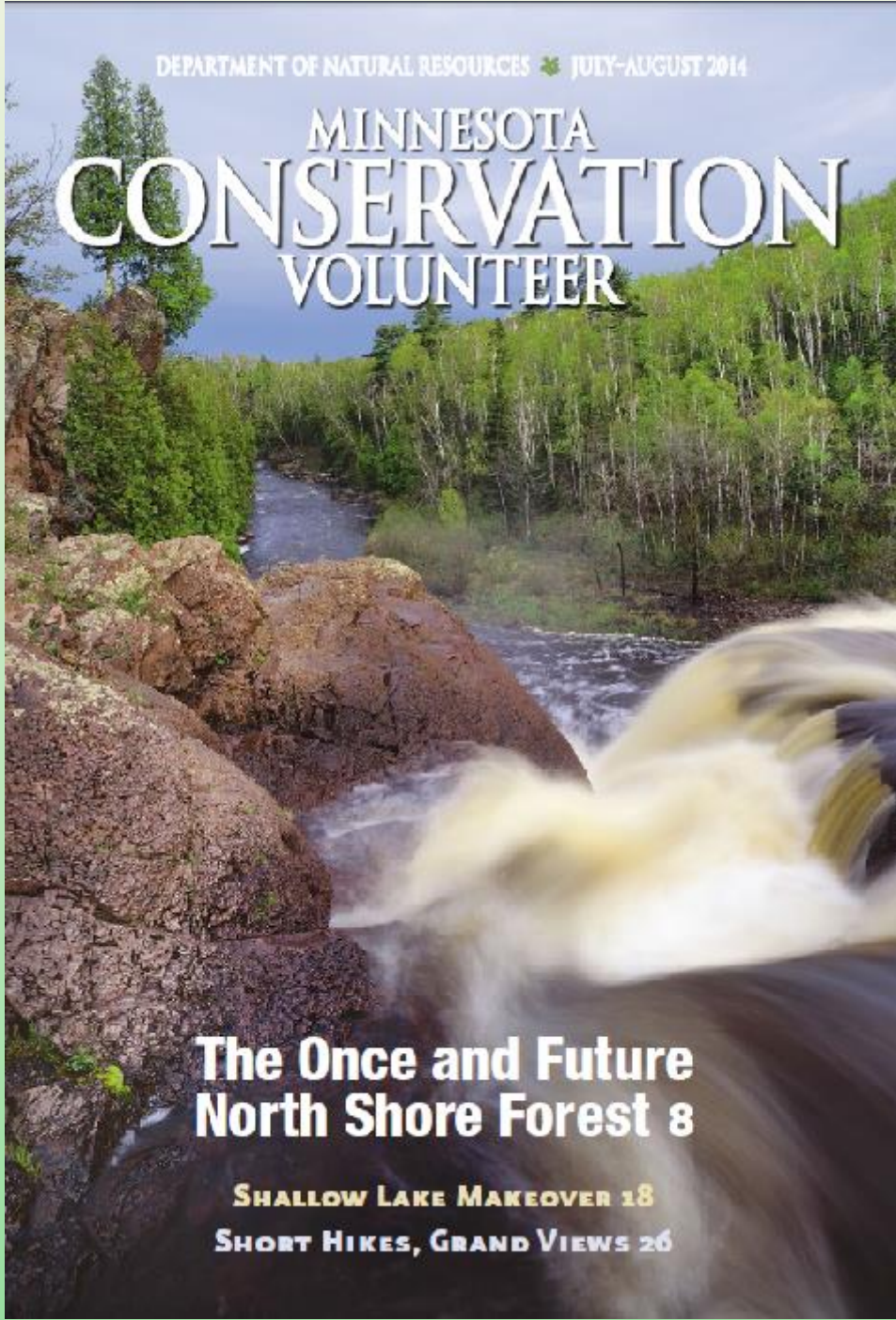


Materials:

Fence (2"x4" or 4"x4" mesh, 14 ga., 72" high, 10' long)		\$11.00
Posts (6.77' long – can cut 20' rebar into thirds)	2@ \$2.50 ea.	\$ 5.00
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Tree (\$0.20 to \$1.00 depending on size)		\$ 0.50
Total		\$17.70

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By **John Myers**

New Vision for the

Once dominated by conifers, then birches, this iconic Minnesota landscape is the focus of a growing reforestation effort.

WE were driving up the North Shore, my future wife and I, on the way to Grand Marais. The coho salmon were hitting in Lake Superior, and we had left Duluth before dawn, eager to get fishing. Somewhere near Gooseberry Falls State Park, the sun peeked over the big lake and shone through the windshield. As I turned briefly away, toward the forest that sprawls up the hill away from the lake, I first noticed them: Hundreds of dead birch trees with no leaves, branches missing, their stark white trunks contrasted against a sea of tall grass. The scene didn't look natural, didn't look right. It looked like the forest was dying. We saw more dead birch, and not many young trees, all along the way. That trip was in the summer of 1989. Later I learned that much of the North Shore forest was

A white pine seedling grows beneath a mature white pine like those that were once abundant along the North Shore.



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How do we get everyone on the same page?



Desired Future Condition...

North Shore Forest Collaborative “Technical Team”

- **Chel Anderson (DNR Plant Ecologist)**
- **Becky Bartol (SNF Environmental Coordinator)**
- **Dave Ingebrigtsen (DNR Wildlife Manager)**
- **Wayne Russ (Retired SNF Wildlife Ecologist)**

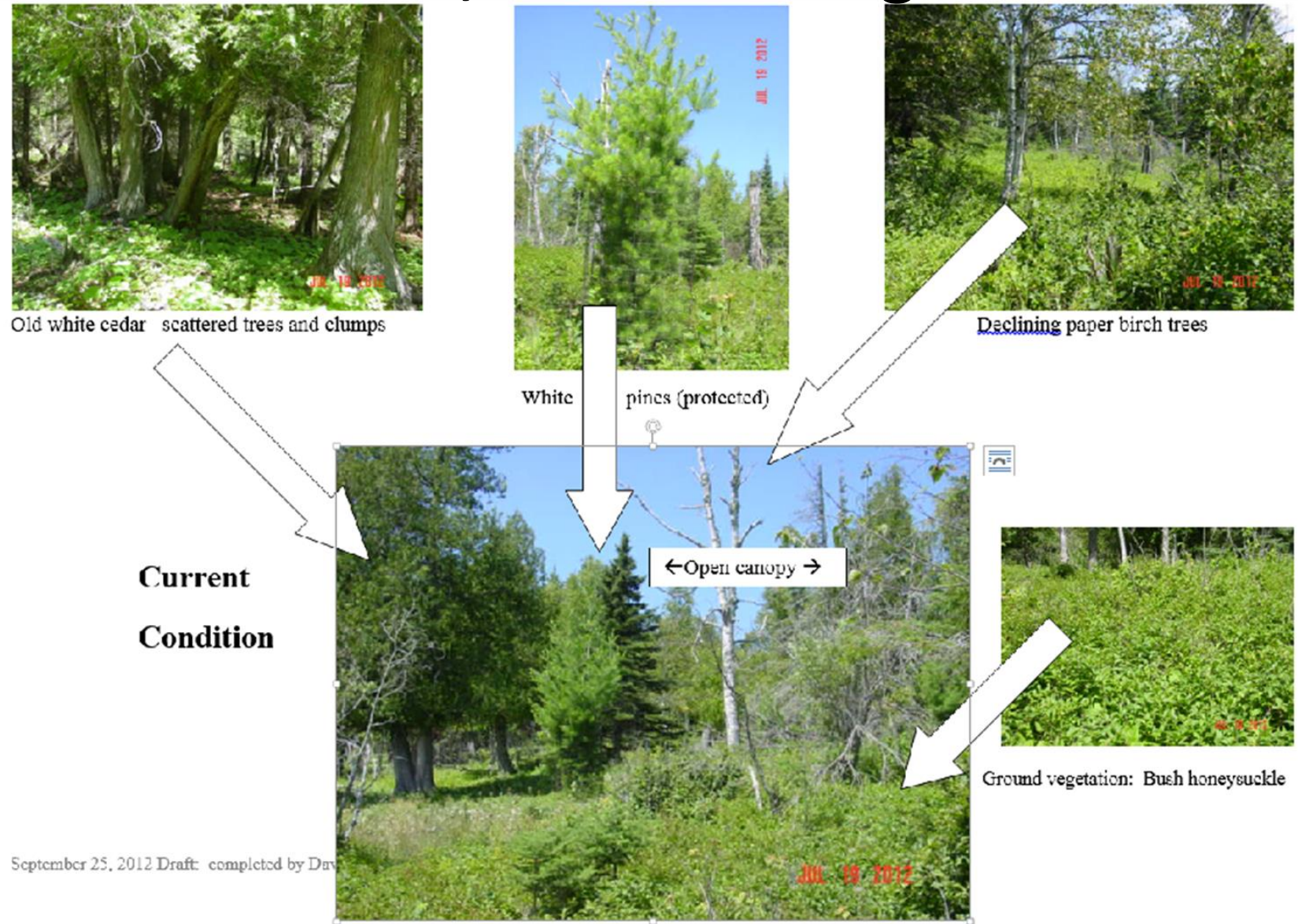
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Developing DESIRED FUTURE CONDITIONS for NPCs

First: where have we been.... and, how did we get here?

- Past timber harvesting
- Severe wildfires
- Lack of seed source
- Fire suppression
- Deer browsing
- Invasive plants
- Effects of climate change



Desired Future Condition...

NSFC's Guidance: *The (broad overarching) DFC is to restore the biodiversity appropriately. The DFC is self sustaining.*

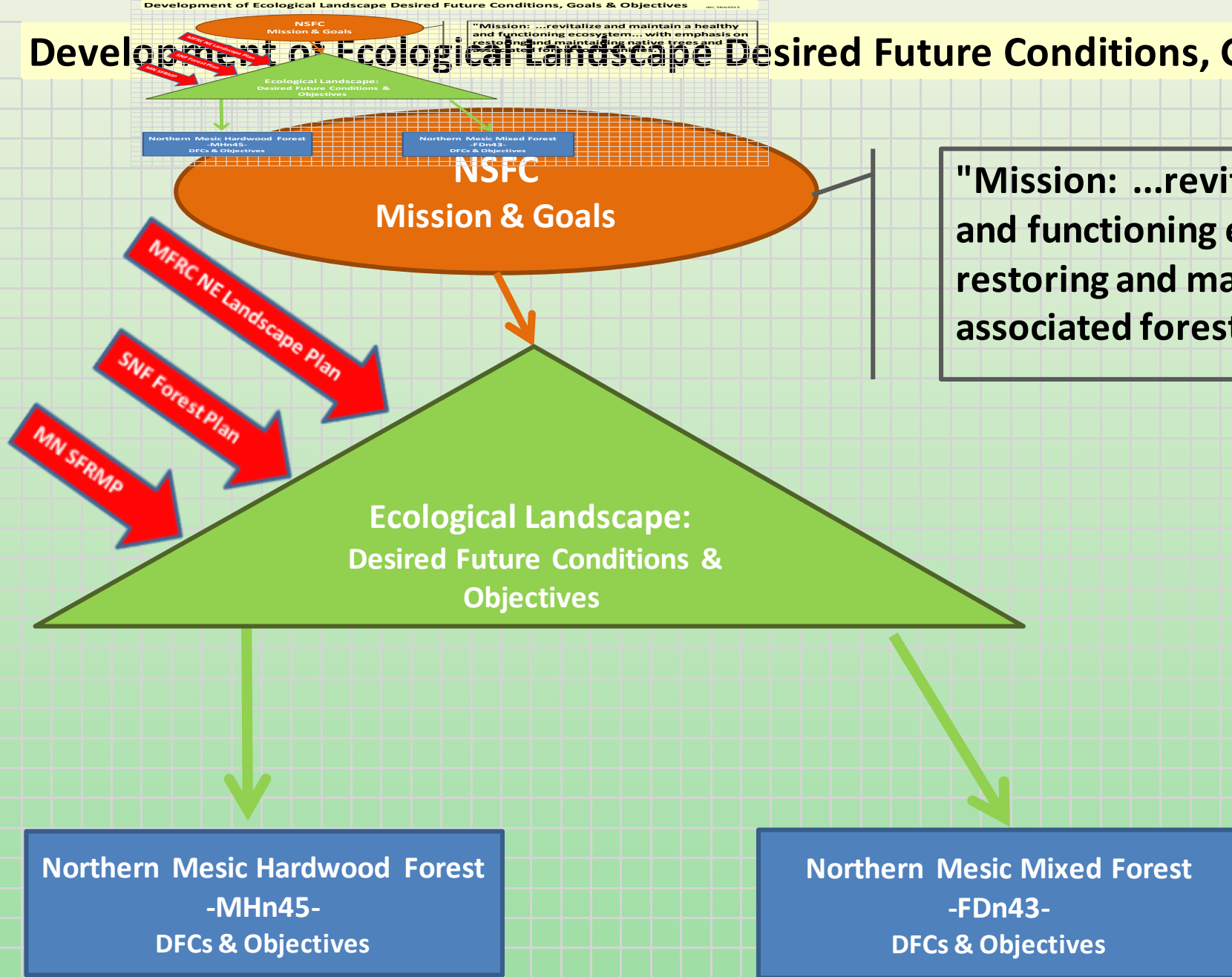
Subunit DFC will explain for a smaller geographic area such as watershed, diversity site, what is desired condition (i.e. white pine here, white spruce there)

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Development of Ecological Landscape Desired Future Conditions, Goals & Objectives

dki; 3feb2013



"Mission: ...revitalize and maintain a healthy and functioning ecosystem... with emphasis on restoring and maintaining native trees and associated forest communities."

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Desired Future Condition...

DFCs are also informed by:

- Disturbance regime in each LTA.**
- Forest System (e.g. FDn or MHn).**



Desired Future Condition...

Section 8 Goals, Objectives and Actions ...Relating to NPCs...



A. Ecological Resources

Goal 1. Promote Sustainable Forest Management.

Objective 1: Utilize Native Plant Classification Systems to Inform Management. Support the use and application of Ecological Classification System (ECS) and Native Plant Community (NPC) concepts and principles by resource managers and landowners throughout the region to ensure site appropriate native species are growing across the landscape.

Action Items:

1. Use NPC to Achieve Cover Type Goals. Use NPC information to determine which sites are best suited for conversion to another cover type.

Goal 2. Maintain, Restore, and Enhance Native Biodiversity, Including Fish & Wildlife Habitat & Populations.

Objective 1: Manage for a Mix of Forest Cover Types Approximating Native Plant Communities. Manage forests to ensure tree species are appropriate for the site and anticipated future conditions at abundances that are appropriate for the native plant community. Increase diversity of the forest to better reflect the potential tree composition per native plant community and to manage risk across the range of anticipated future conditions in northeastern Minnesota.

Action Items:

1. Identify Areas for Conversion. Using the NPC system, identify and prioritize sites for conversion to a mix of site appropriate tree species.

Objective 2: Manage for Age and Structural Diversity. Manage within- and between-stand vegetation conditions to promote a diversity of structural, spatial, and age patterns necessary for the range of native species found in northeastern Minnesota.

B. Economic Resources

Goal 1: Enhance Forest Health and Productivity.

Objective 1: Manage for a Mix of Site Appropriate Forest Cover Types. Support a diverse and robust forest-based economy by utilizing native plant community information to reflect potential tree composition and diversity across the range of anticipated future conditions. Manage for site appropriate tree species to increase stand quality, manage risk, and attain productivity goals.

Action Items:

1. Use NPC to achieve cover type goals. Use NPC information to determine which sites are best suited for conversion to another cover type.

Objective 4: Reduce Forest Mortality. Recognize the natural cycles and time horizons of natural outbreaks or disturbances and look for opportunities to collaborate on cross boundary projects to reduce forest mortality issues.

Action Items:

1. Integrate NPC information into site planning. Use NPC data to ensure site appropriate species are encouraged.

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The Foundation: Native Plant Communities

Focus is on NPCs and their growth stages. These are documented, well described and some have been mapped.

- *All forest habitat should be managed with ecological silviculture principles,*
- *based on ECS/NPC information, and*
- *strive to attain levels of biodiversity consistent with the described growth stages.*
- *Maximizing diversity will make NPCs more resilient to climate change.*



Desired Future Condition...

We have existing data that can inform desired plant species, stand structure, CWD:

- **NPC class growth stage information**
- **Bearing tree data**
- **Releve's (representative plant communities)**

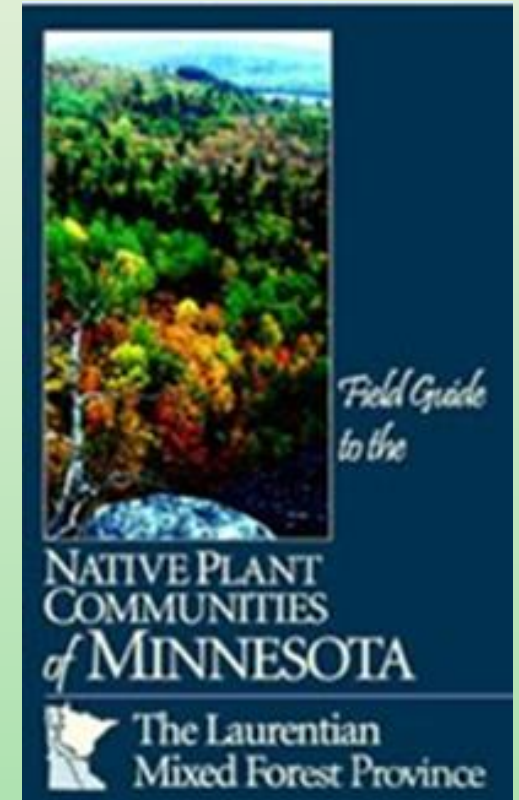


Desired Future Condition...

Native Plant Communities of Minnesota

Description of FDn43 Growth Stages

- *0-35 years—Young forests recovering from fire, dominated by quaking aspen with less jack pine and paper birch.*
- *35-55 years—A transition period where aspen and jack pine decline and are replaced by paper birch, white pine, red pine, and balsam fir. White spruce seedlings become established during this period.*
- *55-95 years—Mature forests with a mixed canopy of paper birch and white pine with less balsam fir and red pine and some old aspen. White spruce saplings are present in the understory.*
- *95-115 years—A transition period marked by a significant increase in white spruce and the decline of paper birch, red pine, and quaking aspen.*
- *>115 years—Old forests dominated by white pine and white spruce with modest amounts of balsam fir and paper birch.*

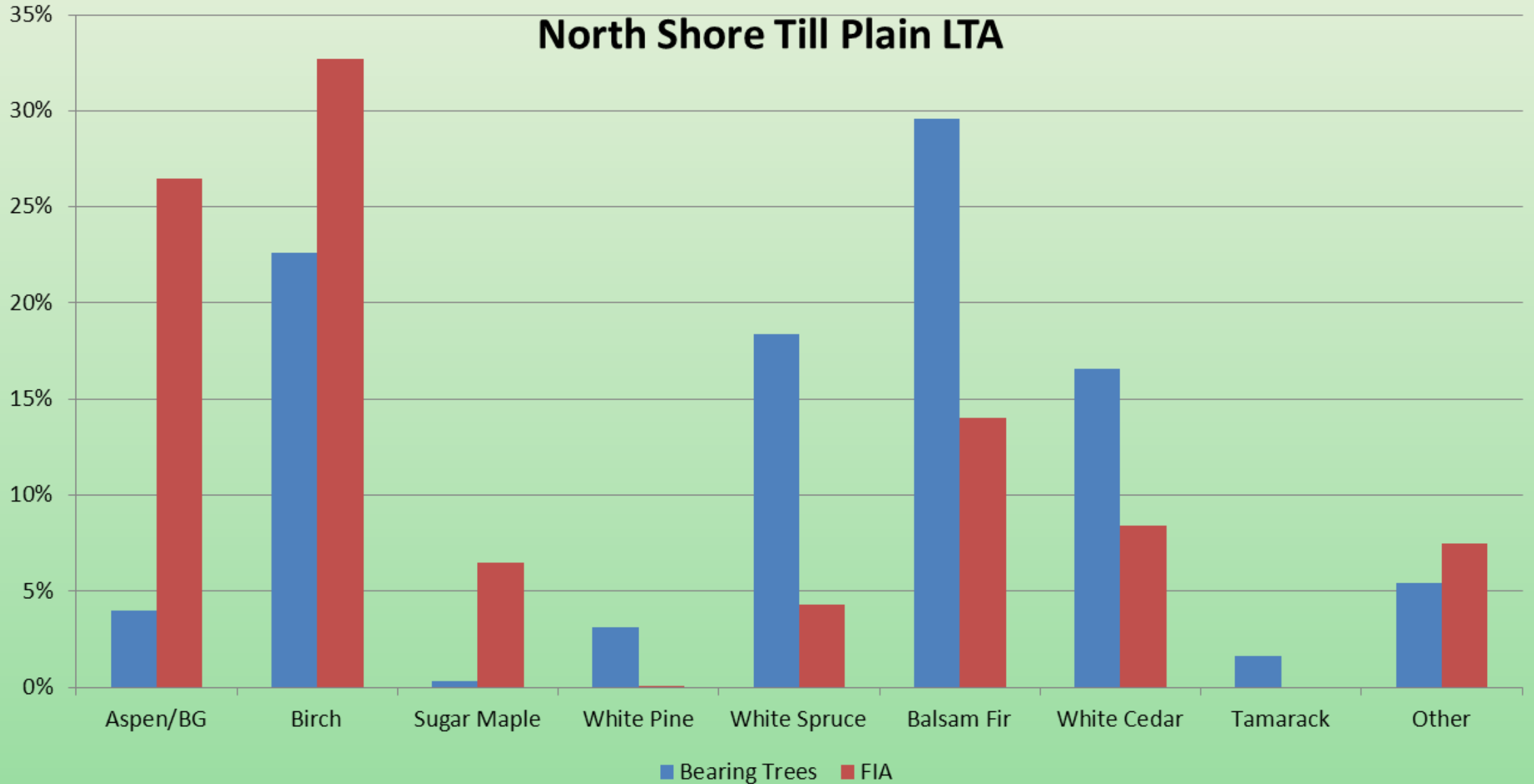


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Developing DESIRED FUTURE CONDITIONS for NPCs

Bearing tree data



Developing DESIRED FUTURE CONDITIONS for NPCs

Releve's (representative plant communities)



Desired Future Condition...

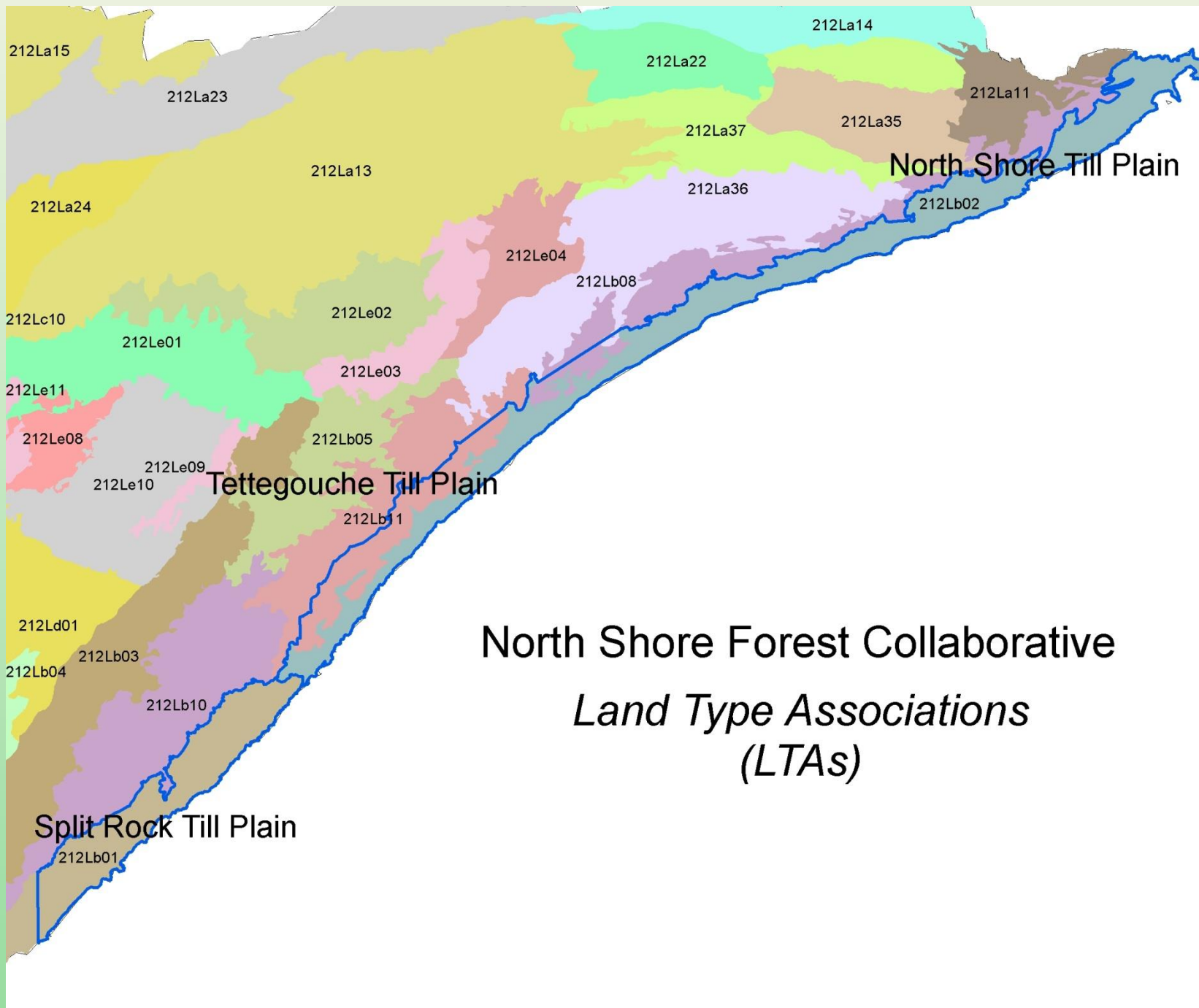
DFC informed by: Landscape Planning - a matter of scale

- **North Shore Till Plain LTA had a 250-1000 year stand replacement fire regime.**
- **Compare to the 70-150 year stand replacement fire regime in the inland birch-aspen ecosystem.**

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2 LTAs



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*Land Type Associations
(LTAs)*

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Desired Future Condition...

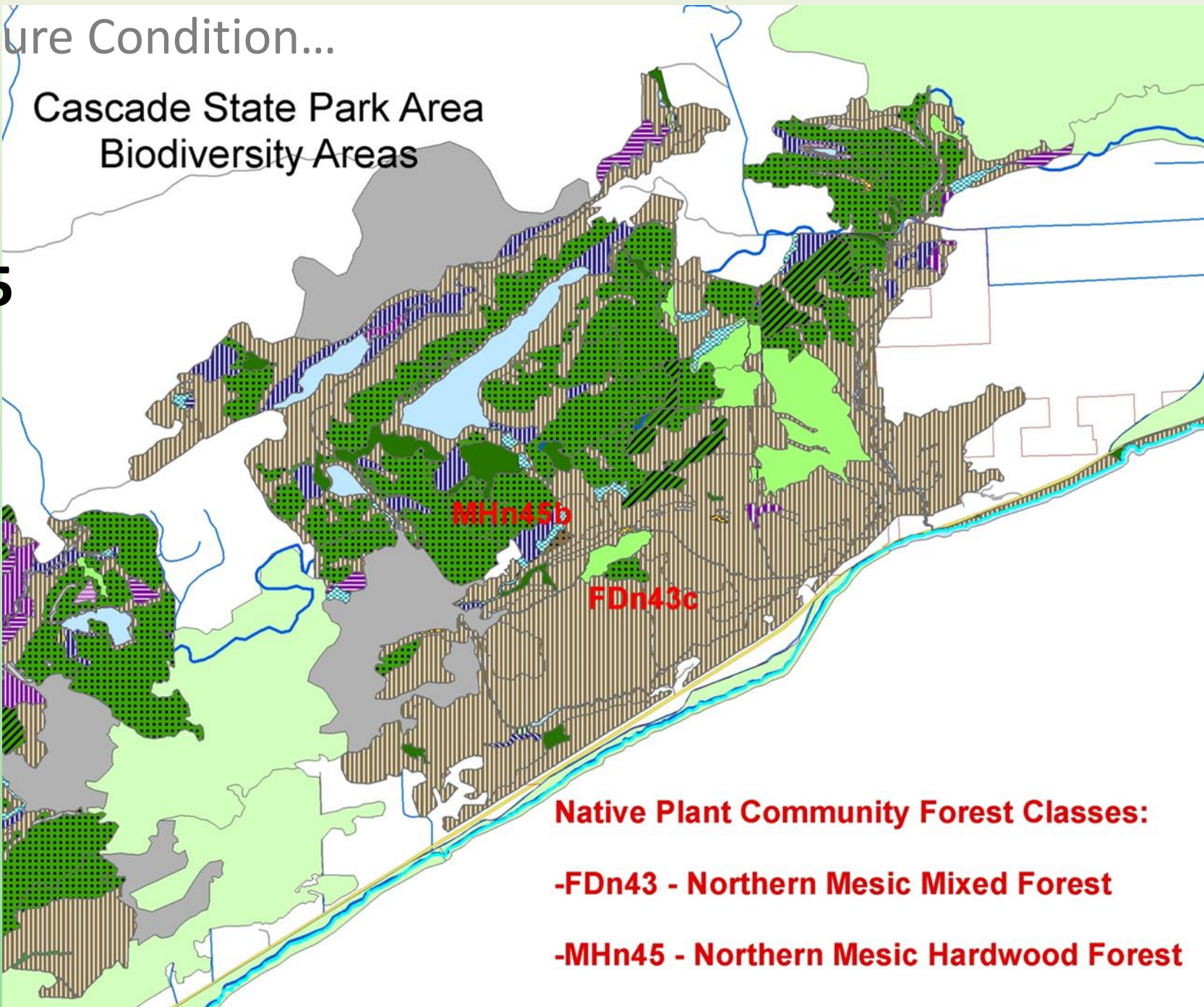
- **Guiding principles for LTA-scale DFCs:**
- *All forest types would move toward the Range of Natural Variation for this LTA.*
- *Lands will be managed or restored according to the forest system (e.g. MH, FD) defined in the Native plant community classification System.*

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Desired Future Condition...

- **FDn43**
- **MHn45**



Desired Future Condition...

DFCs developed for 2 LTAs with 2 NPCs

North Shore Till Plain LTA

- **FDn43**
- **MHn45**

Split Rock Till Plain LTA

- **FDn43**
- **MHn45**

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Desired Future Condition...N S Till Plain

LTA Ecosystem Elements (DFCs and Objectives)

- Native plant communities**
- Forest continuum**
- Age distribution of forest**
- Tree species diversity**
- Non-native species**

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Desired Future Condition...N S Till Plain -- FDn43

For each LTA Ecosystem Element (North Shore & Split Rock)

- **Desired Future Condition**
- **Objectives**

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Desired Future Condition...N S Till Plain

N S Till Plain LTA EE: Native plant communities

- DFC:** **Ecologically distributed**
High quality, protect rare NPCs
Restored to proper NPC
Proper patch sizes
- Obj.** **(Specifies species composition/structure)**
Rare NPCs protected

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Desired Future Condition...N S Till Plain

Ecosystem Elements (DFCs and Objectives)

- Native plant communities
- Forest continuum
- Age distribution of forest
- Tree species diversity
- Non-native species

And, so on...



Desired Future Condition...N S Till Plain

NPC Ecosystem Elements (DFCs and Objectives)

- Vegetation structure & composition**
- Growth stages**
- Tree species diversity**
- Native/non-native species**
- Rare communities**
- Forest/landscape connectivity**

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Desired Future Condition...N S Till Plain -- FDn43

For each NPC Ecosystem Element (FDn43 & MHn45)

- **Desired Future Condition**
- **Objectives**



Desired Future Condition...N S Till Plain...FDn43


FDn43 NPC EE: Vegetation Structure & Composition

- DFC:**
- Conifer dominated forests**
 - Canopy irregular & broken**
 - All FDn43 types occur in appropriate places**
 - Species composition/structure per NPC description**
- Obj.**
- Increase cedar, spruce, white pine & tamarack**
 - Planting primary means of restoration**
 - Protection of trees necessary**

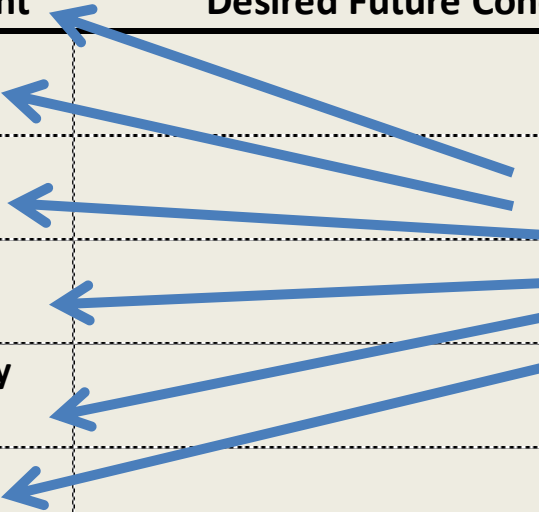
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Desired Future Condition...

DESIRED FUTURE CONDITIONS AND OBJECTIVES		
	<u>FDn43</u>	
<i>...Format and some content of Desired Future Condition and Objectives developed by North Shore Forest Collaborative...</i>		
Ecosystem Element	Desired Future Condition	Objectives
Vegetation Structure and Composition		
Growth Stages		
Forest/Landscape connectivity		
Tree Species Diversity		
Native & Nonnative Species		
Rare communities		

Repeat for all Ecosystem elements



Desired Future Condition...

We have DFCs for 2 LTAs with 2 NPCs:

North Shore Till Plain LTA

- **FDn43**
- **MHn45**

Split Rock Till Plain LTA

- **FDn43**
- **MHn45**



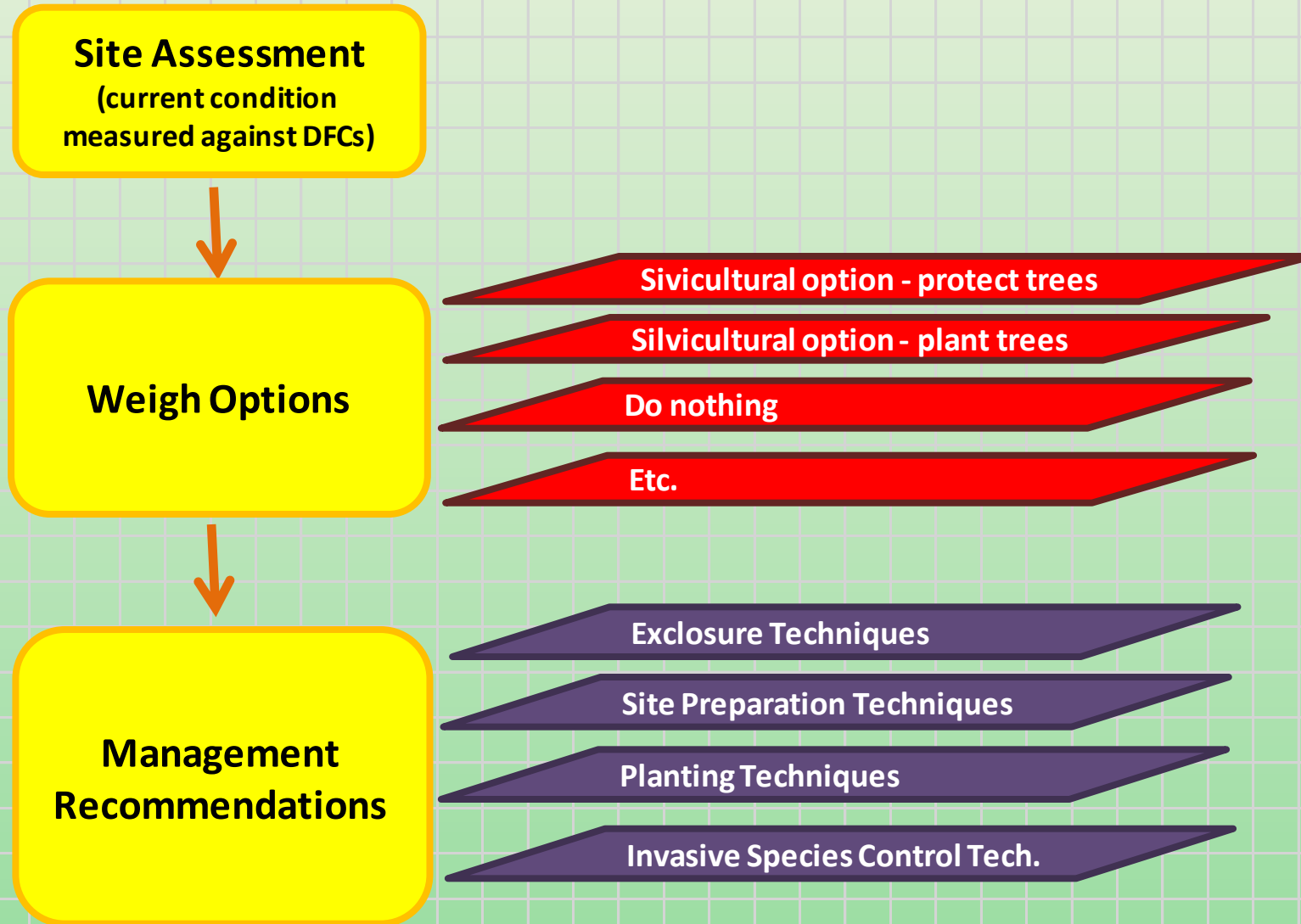
Where do we go from here?



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What is the Operational Plan to Transfer Knowledge?



WOODLANDS OF MINNESOTA

Landowner

HANDBOOK

Chippewa Plains
and Pine Moraines-
Outwash Plains



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Individual Tree Exclosure -6'



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Total		<u>\$17.70</u>

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Information Needs of Collaborative to Accomplish Mission

- More tools to successfully regenerate conifers and other native species
- Determine best seed sources
- Ensure best genetics get restored
- Assess landscape to determine priority restoration areas





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