Future Forests REIMAGINED Workshop Series

Future Forests Reimagined Initiative

Building Resilience for Ecological Recovery and Community Wellbeing

Nancy Patch: 2C1Forest, Champlain Adirondack Biosphere Network, Cold Hollow to Canada RCP
Christine Laporte: Wildlands Network

Co-Sponsored by Two Countries One Forest, Wildlands Network
Support from University of VT and the Gund Institute, Canadian Parks and Wilderness, Vermont Department of Forest, Parks and Recreation. Leadership for the Ecozoic

Two Countries One Forest | Deux Pays Une Forêt

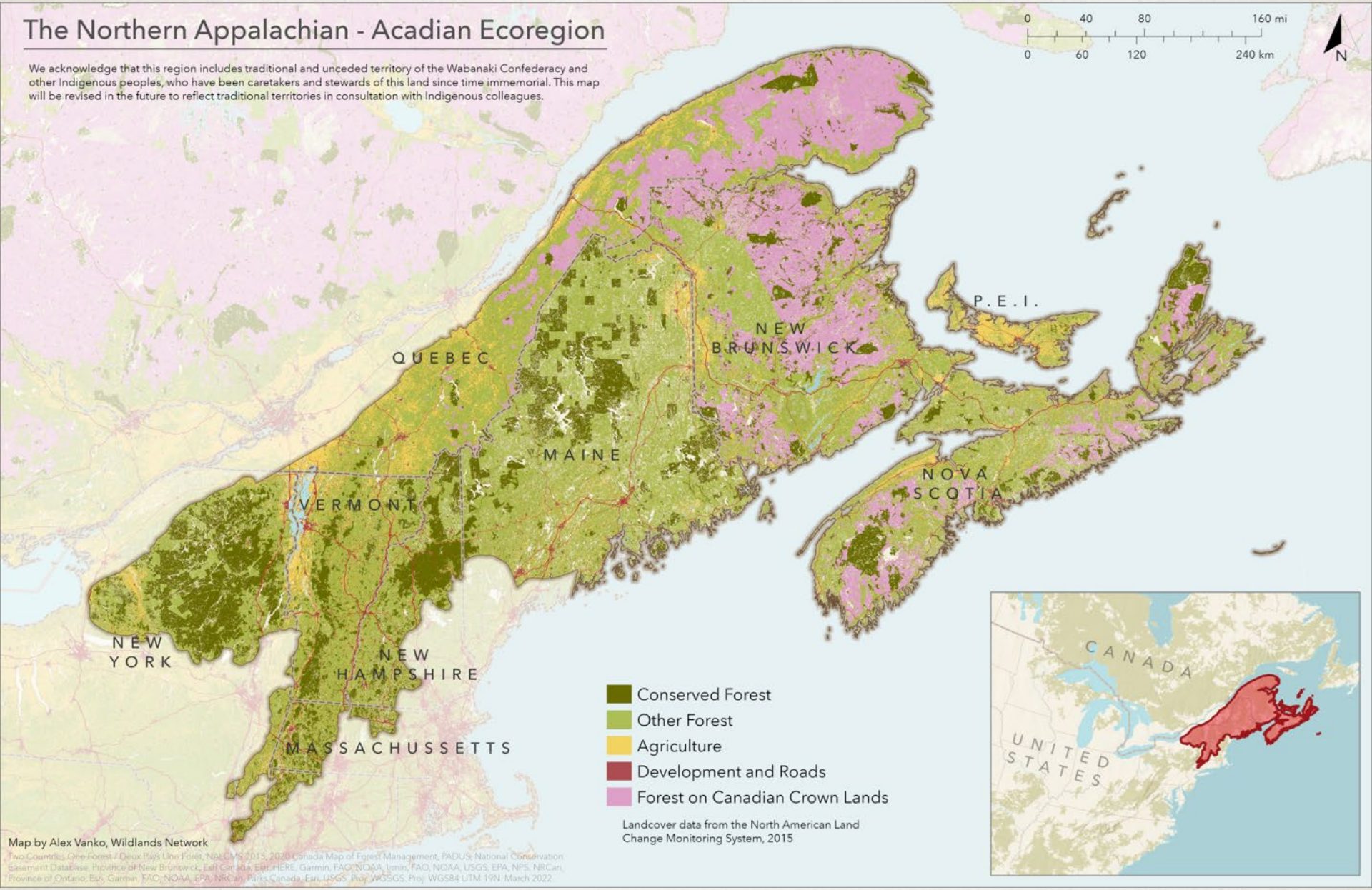
Leadership for the ECOZOIC

THE UNIVERSITY OF VERMONT GUND INSTITUTE FOR ENVIRONMENT

CPAWS CANADIAN PARKS AND WILDERNESS SOCIETY NEW BRUNSWICK CHAPTER

SNAP SOCIÉTÉ POUR LA NATURE ET LES PARCS DU CANADA SECTION NOUVEAU-BRUNSWICK

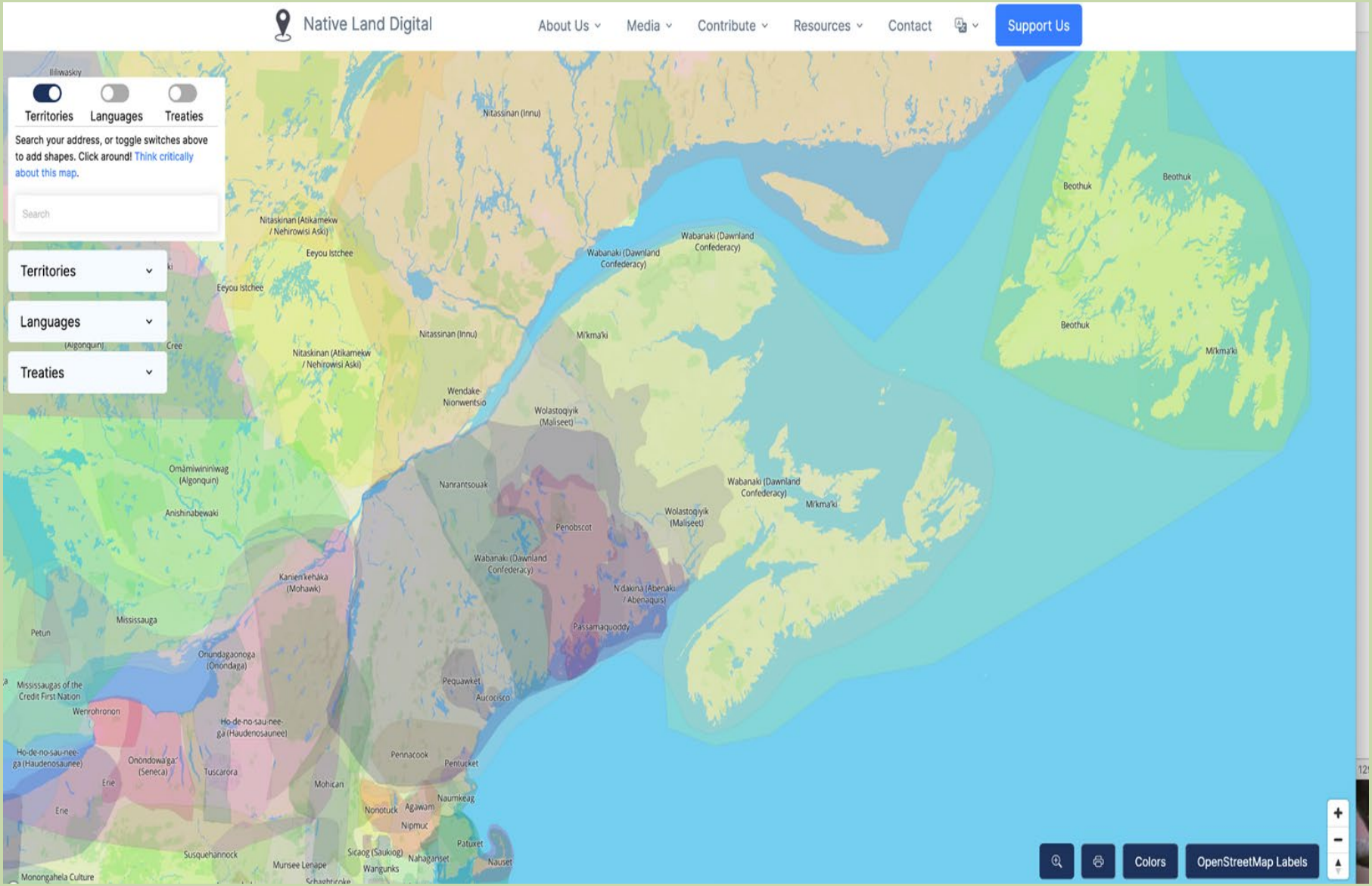
Wildlands NETWORK



Map (Wildlands Network)

Native Lands Digital Atlas

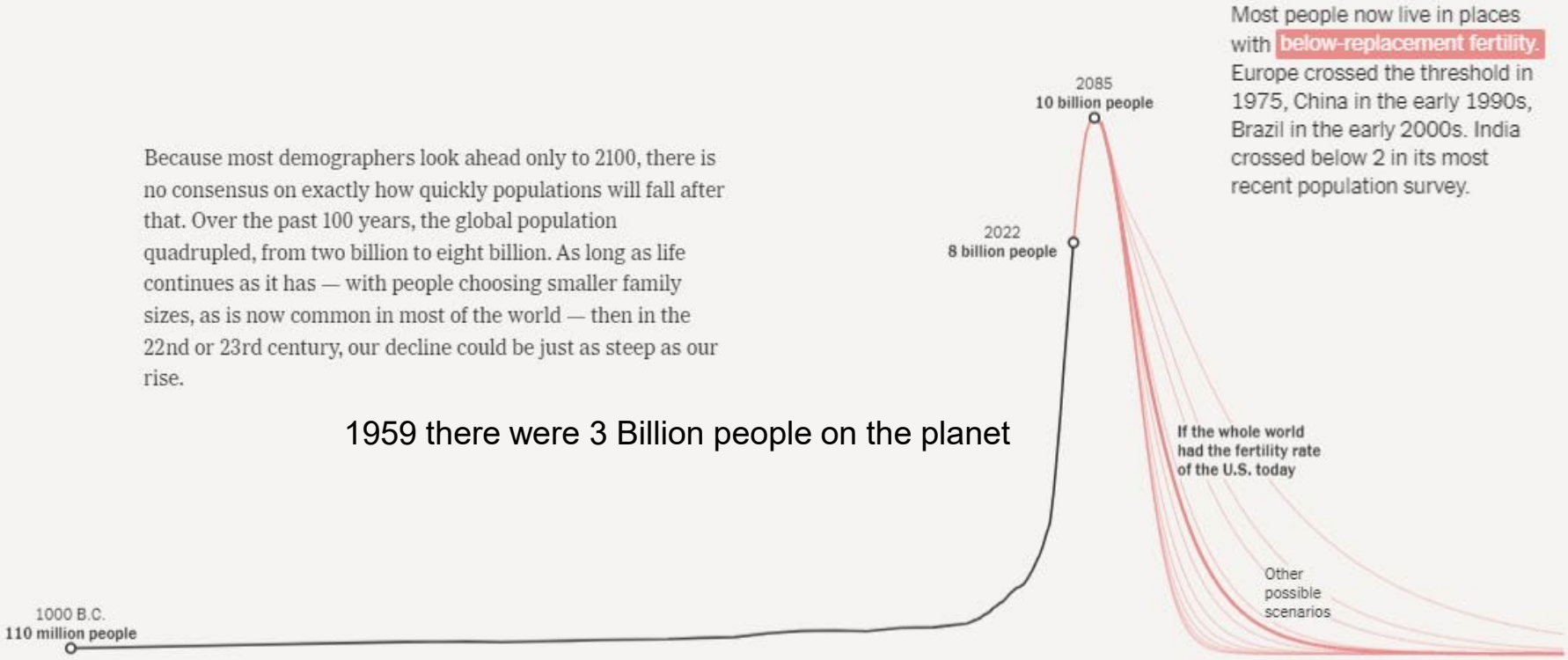
(https://native-land.ca/)



CONTEXT: Going way back to look forward

Because most demographers look ahead only to 2100, there is no consensus on exactly how quickly populations will fall after that. Over the past 100 years, the global population quadrupled, from two billion to eight billion. As long as life continues as it has — with people choosing smaller family sizes, as is now common in most of the world — then in the 22nd or 23rd century, our decline could be just as steep as our rise.

1959 there were 3 Billion people on the planet



LANDSCAPE HISTORY

Pre-European settlement
ca. 1700

Harvard Forest, Harvard University

Height of forest clearing and agriculture – ca. 1830

100 years later: Forests of Today or Tomorrow ?????

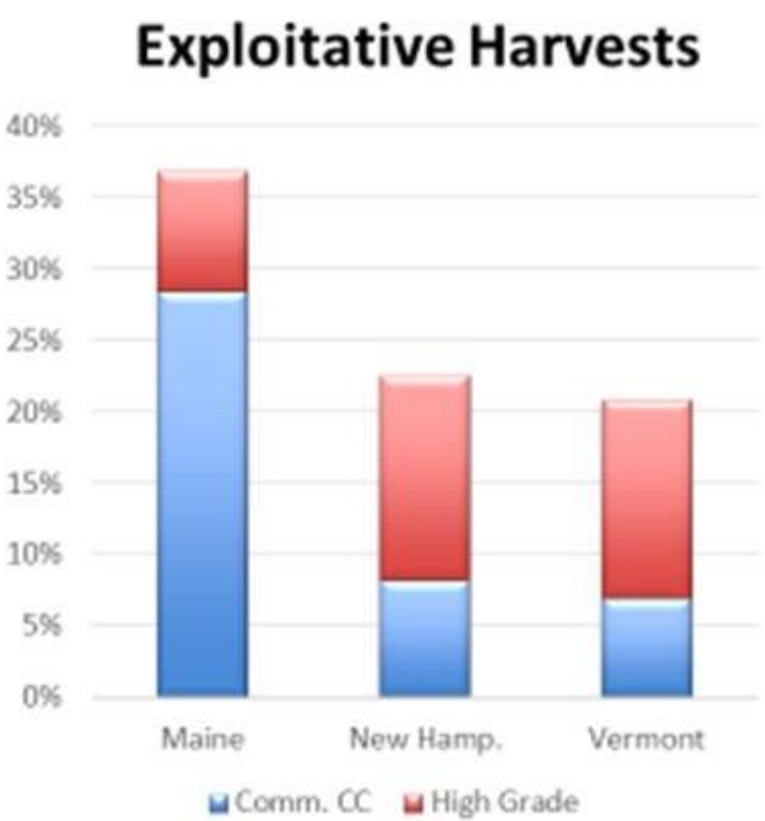
What is Different

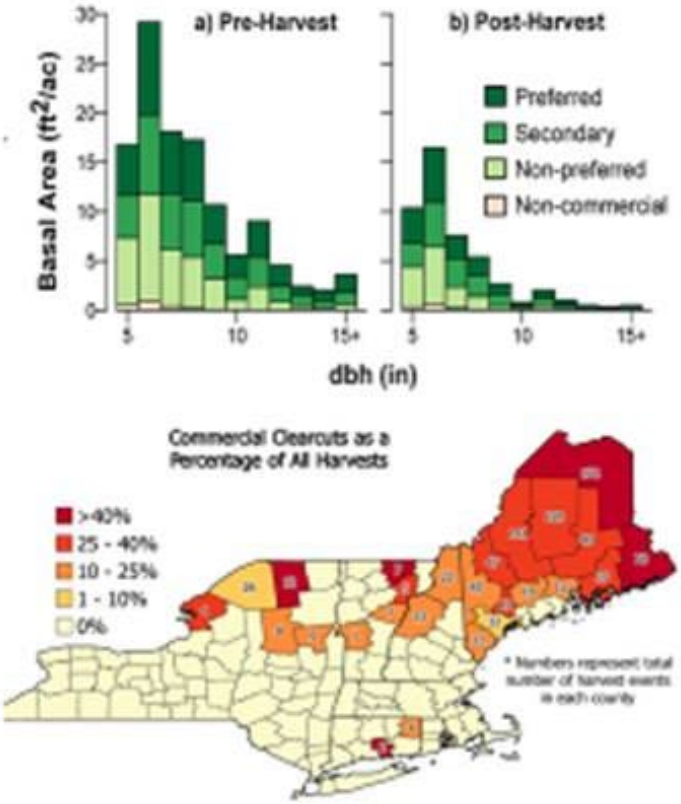
- Climate change
- Acid deposition
- Mercury deposition
- Loss of soil

- Planet Population at 8 Billion
  Impacts in the region

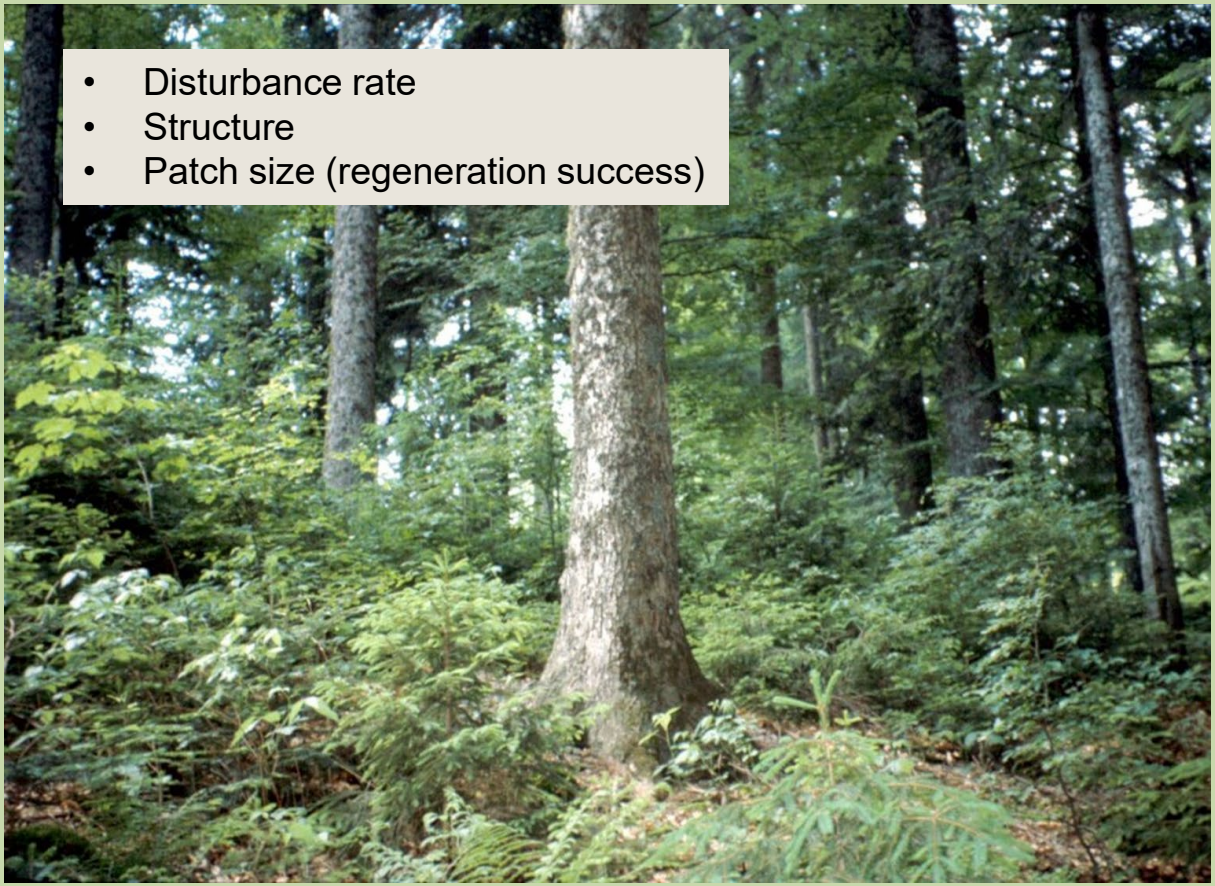
i. Habitat Fragmentation
ii. Development
iii. Consumer Demand

Belair & Ducey
J. of Forestry, 2018





Resilient Forests and Scientific Progress



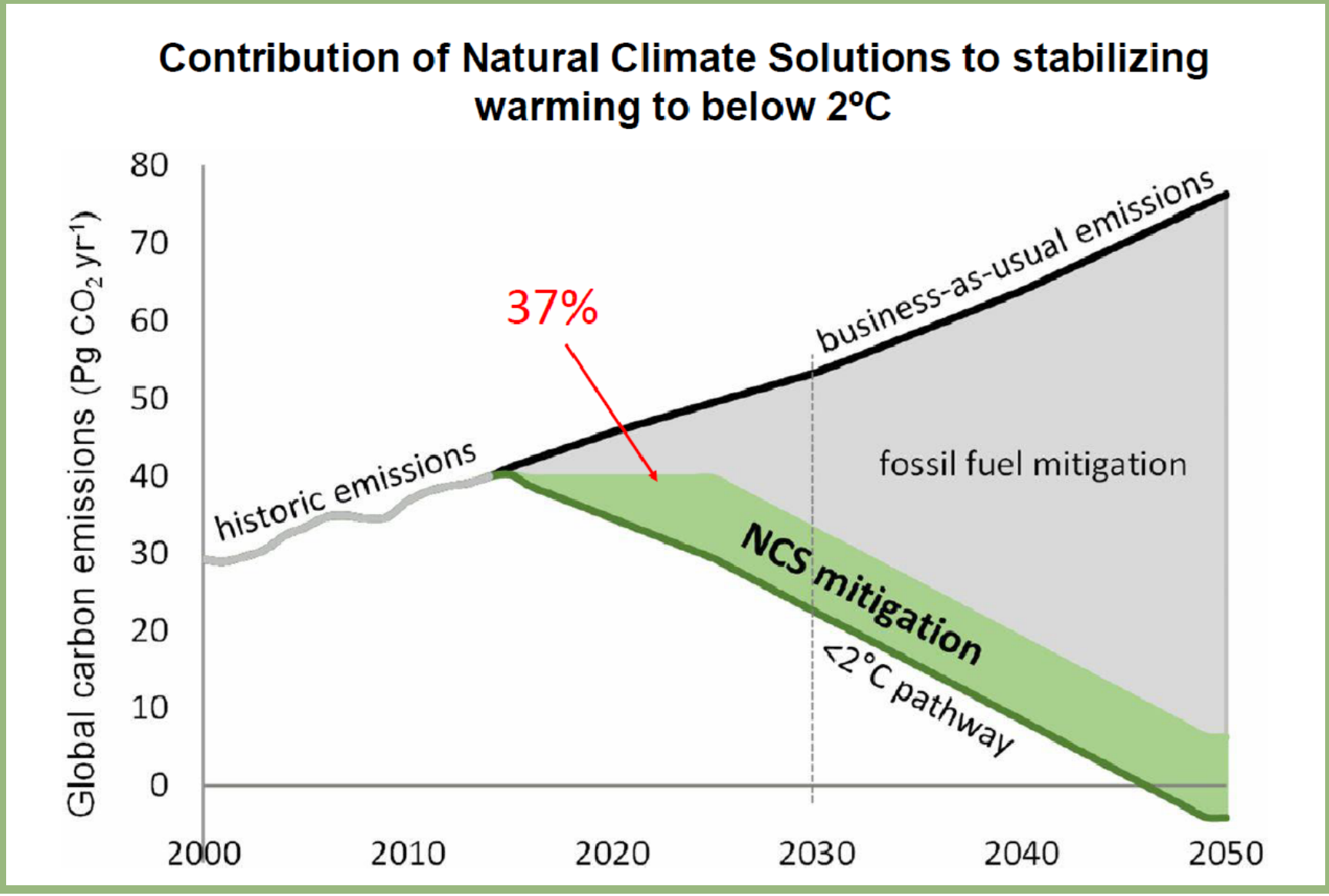
Managing forests to
- Increase ability to recover from disturbances and deal with climate change stress.

- Adapt, reorganize (novel forest), and evolve to a configuration that is better prepared for climate change impacts,

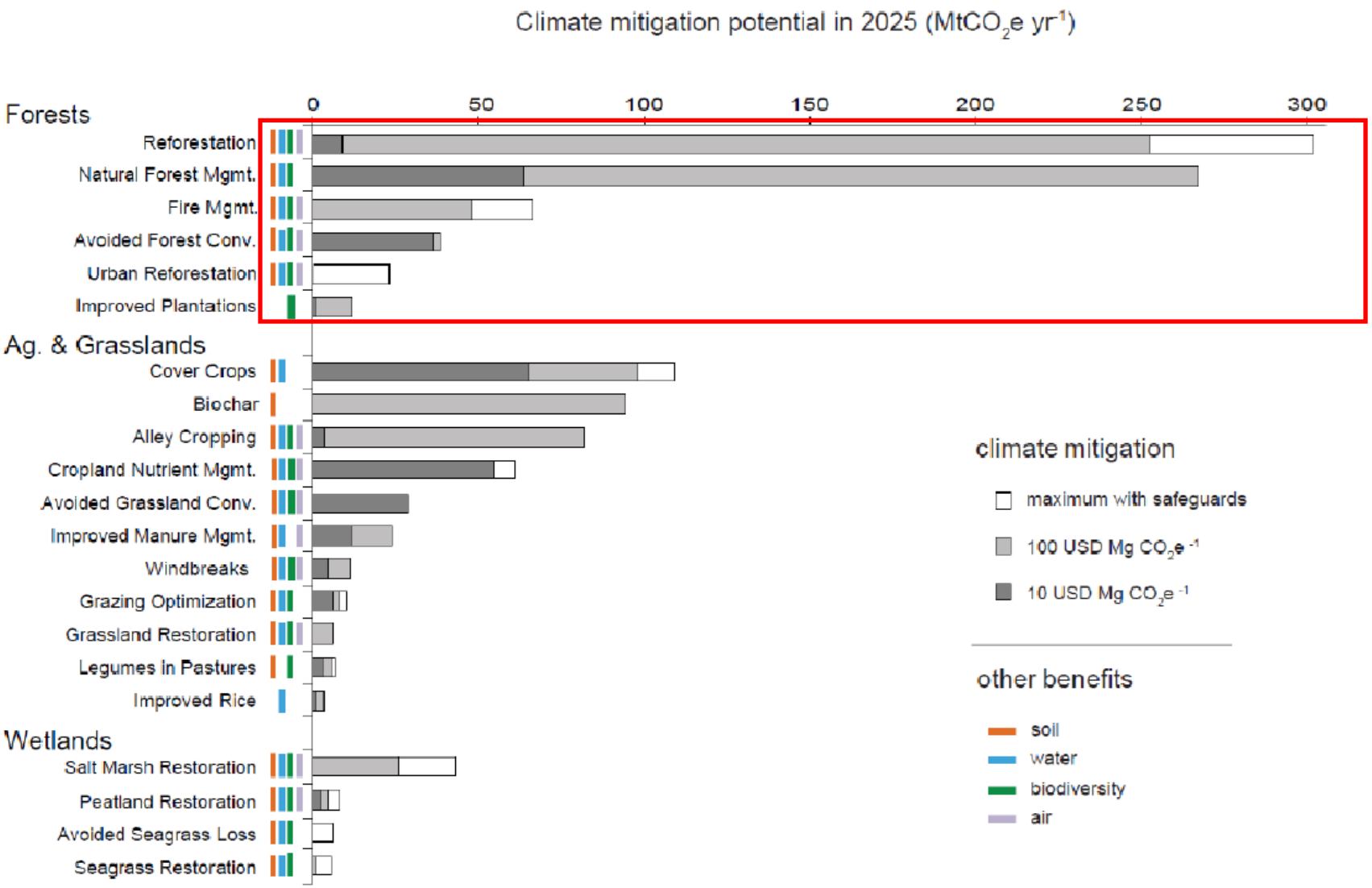
-

Recent Publications:
Managing for Old Growth Characteristics (2024; Catanzaro and D'Amato)
https://www.umass.edu/arboretum/documents/restoring-old-growth-characteristicspdf
Ecological Silviculture (2021; Palik et al)
Ecology and Recovery of Eastern Old Growth Forests (2018, Keeton et al)

Natural Climate Solutions

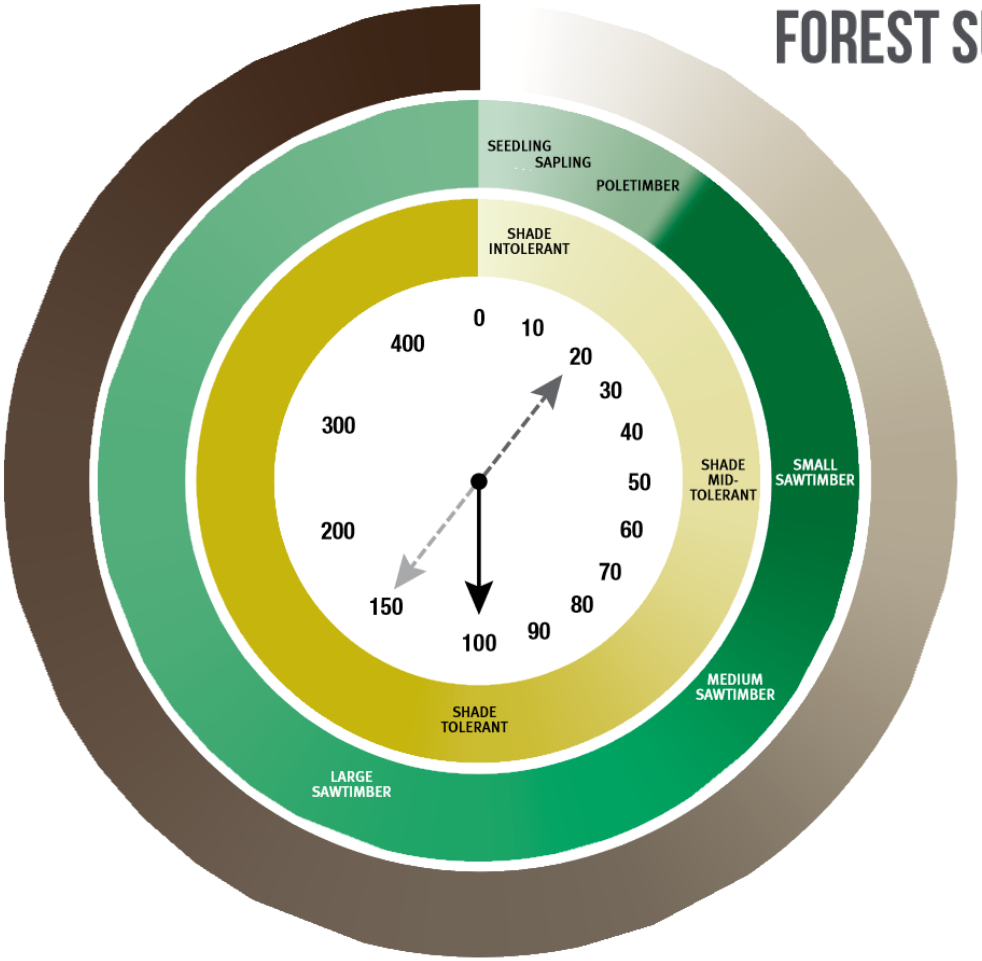


Natural Climate Solutions in the US



Source: Fargione et al., submitted

FOREST SUCCESSION & DEVELOPMENT CLOCK



LEGEND

0–400 Age of the forest in years

Changes in carbon storage over time. The darker the brown, the more carbon storage.

Changes in carbon sequestration over time. The darker the green, the more forest level carbon sequestration.

Changes in tree species shade tolerance over time. The darker the yellow, the more likely shade-tolerant trees (e.g., hemlock, sugar maple, and beech) are to be competitive.

D'Amato, A.W.; Catanzaro, P.C. Forest Carbon: An essential natural solution for climate change.; University of Massachusetts: Amherst, MA, USA, 2019.

Future Forests Reimagined Initiative

Phase 1: 2022 Workshop Series- 5 days over 3 months

Goals

- **Identify and Protect Remaining Old Forest**
- **Accelerate the Restoration of Wildland Forest**
- **Increase the Area of Ecologically Managed Forests**

What Makes this Initiative Different?

Outcomes: 248 participants, (157 U.S., 89 Canada), and 24 Indigenous leaders (presenters and advisors) Summary: “Building Resilience for Ecological Recovery and Community Well-being” (https://www.wildlandsnetwork.org/newsroom/future-forests-reimagined?rq=future%20forests)

Indigenous Knowledge

Re-Indigenization Principles for Biodiversity Conservation

"Awakening the Sleeping Giant". M'sit No'kmaq et al. 2021

- Embrace Indigenous Worldview
- Learn From Indigenous Languages of the Land
- Recognize Natural Laws and *Netukulimk (the right of every living thing)*
- Honour Correct Relationships
- Engage Total Reflection and Truth
- Respect *Etuaptmumk-"two-eyed seeing"*
- Practice "Story-telling/Story-listening"

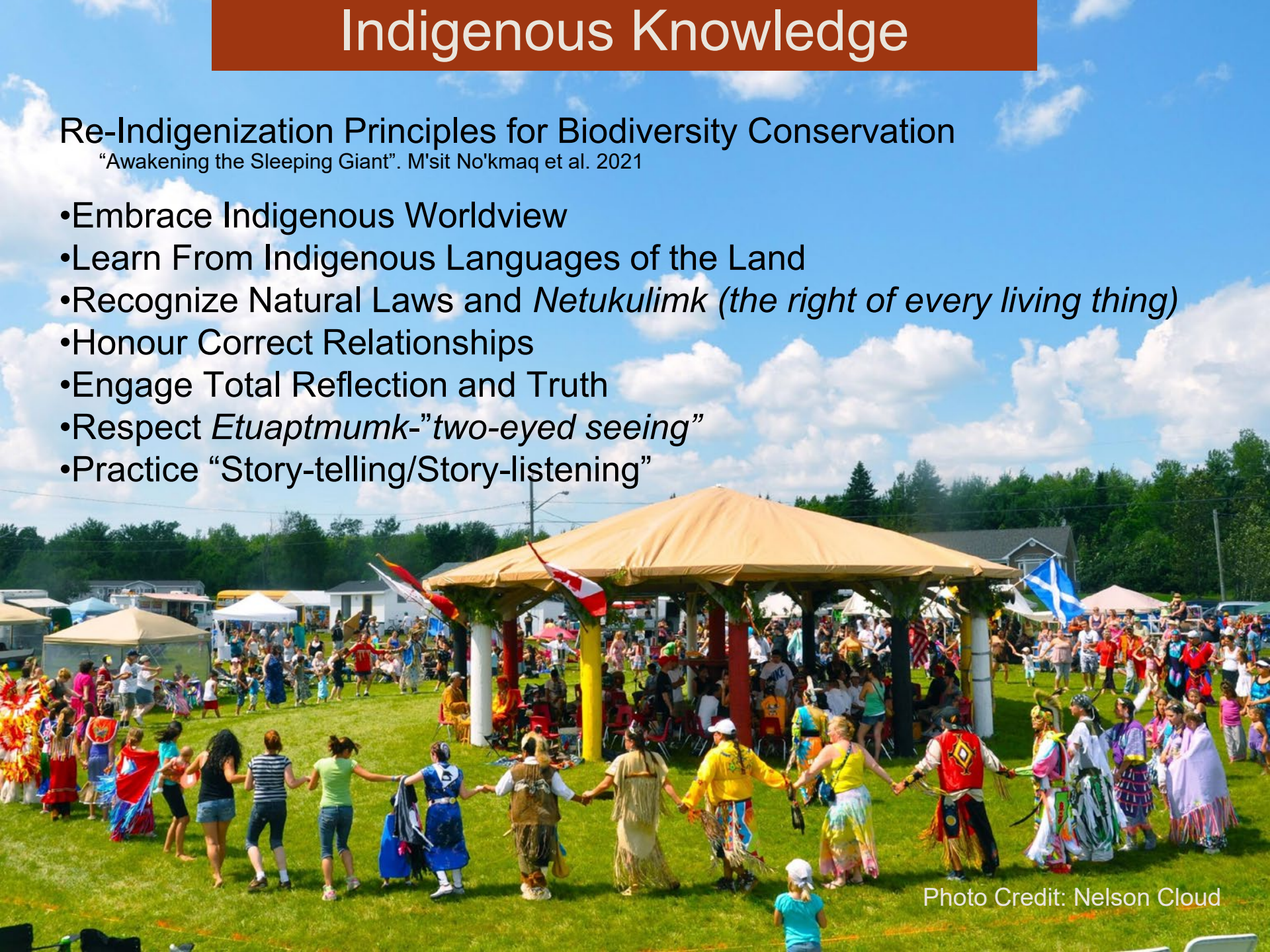


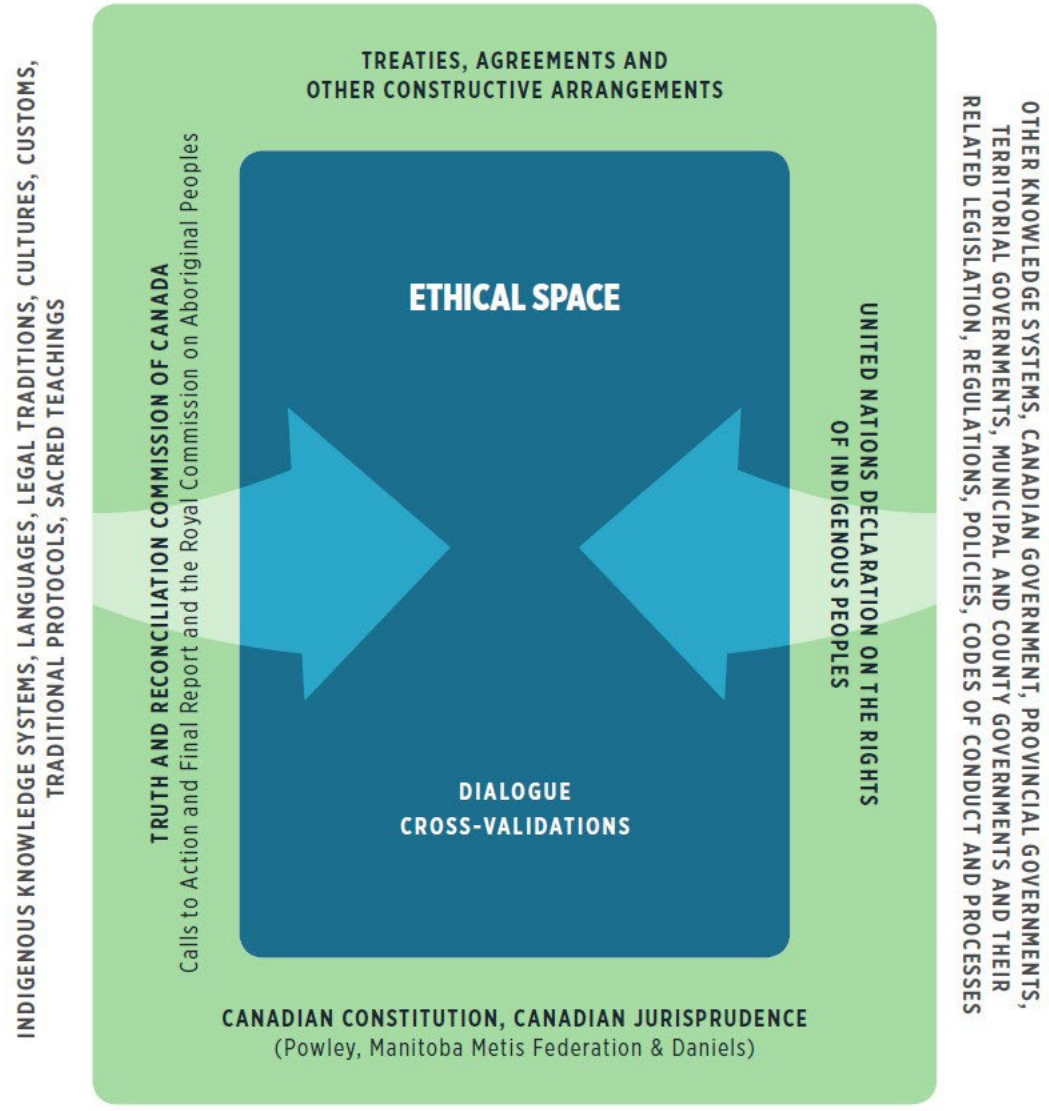
Photo Credit: Nelson Cloud

We Rise Together

Achieving Pathway to Canada Target 1 through the creation of Indigenous Protected and Conserved Areas in the spirit and practice of reconciliation

Ethical Space

As the below image shows, in an ethical space, relationships should be nurtured on multiple levels —not just on a political level—and founded on the principles that define our understanding of the space.



Relearn
Recenter
Return

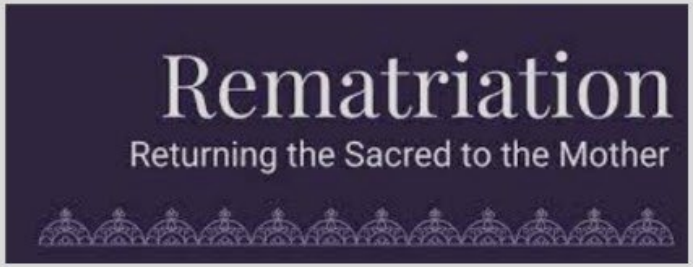
Rematriation and #LandBack, Defined:

Each Centers "Right Relationships" with humans and non-humans

#LandBack emphasizes a return of everything stolen from Indigenous Peoples: Land, Language, Ceremony, Medicines, Kinship, etc.

Why Rematriation?

1. Center women and tradition, not men and property
2. Self conscious shift against status quo—healing relationships.

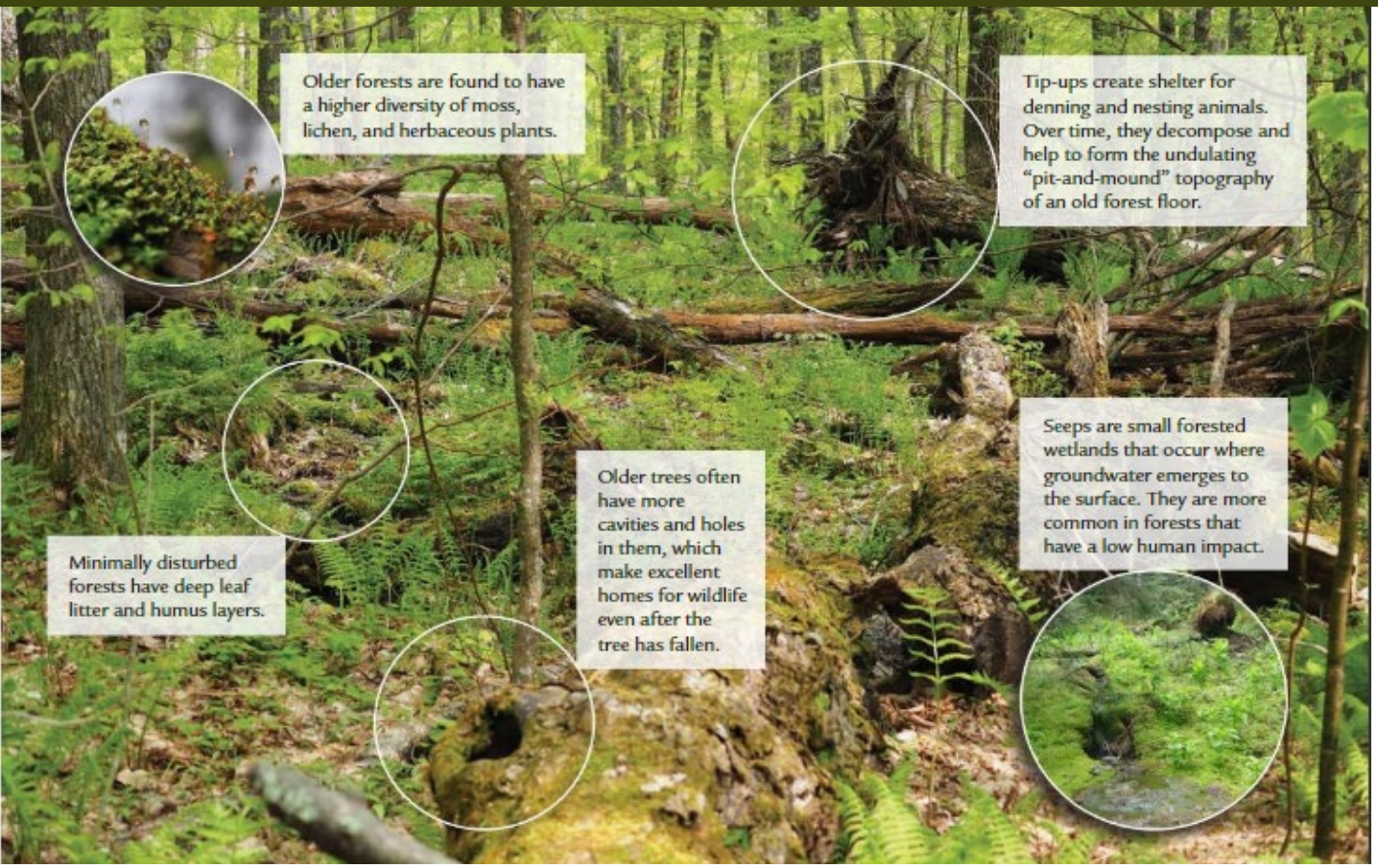


Goal #1
Identify and Protect Old Forest

Biologically mature forests with minimal human disturbance where natural disturbance prevails

Structure and Complexity

McMahon J. 2021. Biodiversity the Language of Wilderness



Checklist

Space with Nooks/Crannies

Materials for building

Privacy/Quiet for nest/dens

Safety from predators

Food: Bugs & Berries

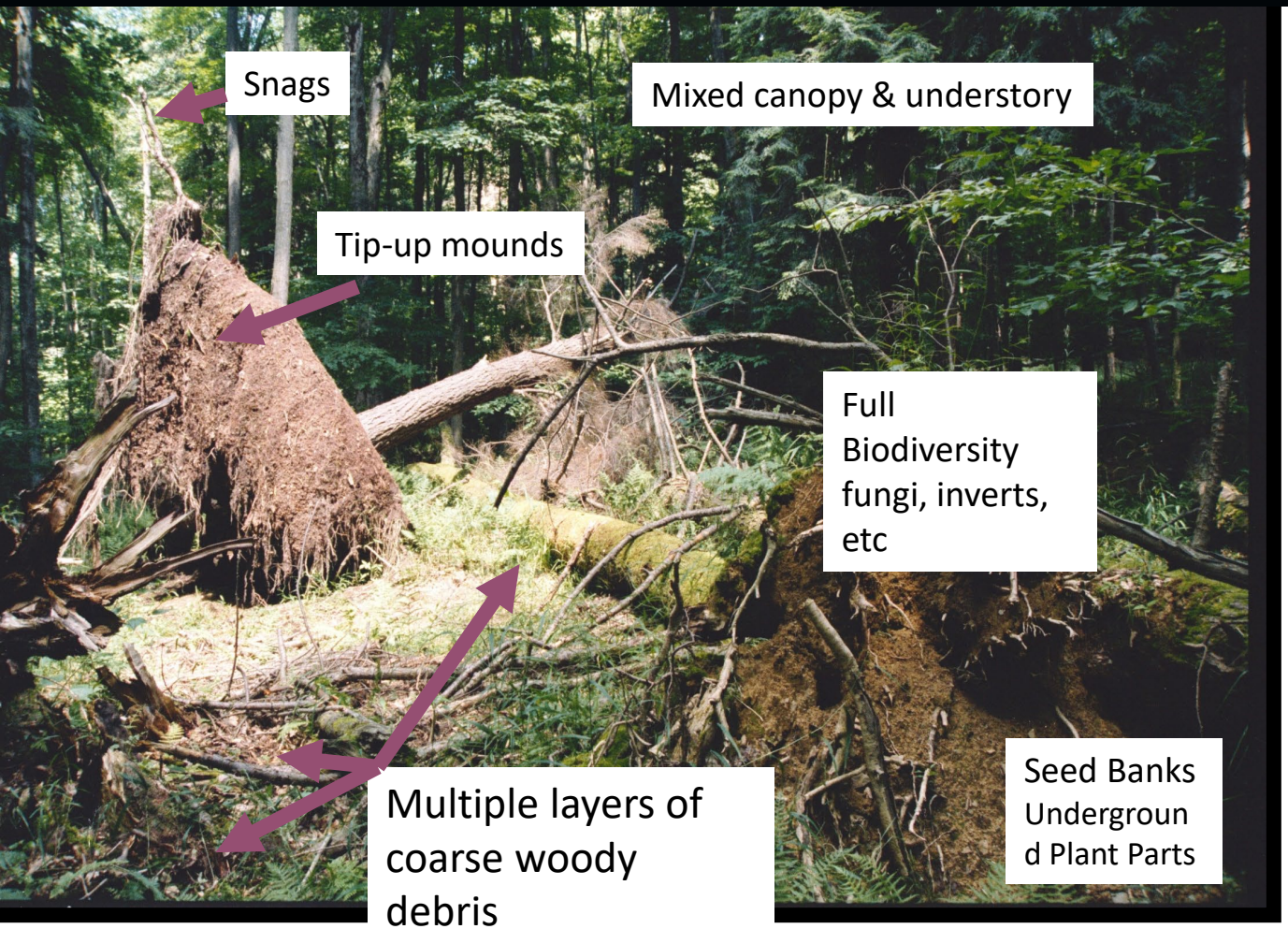
Clean water

Social network /Others

Offspring stay nearby

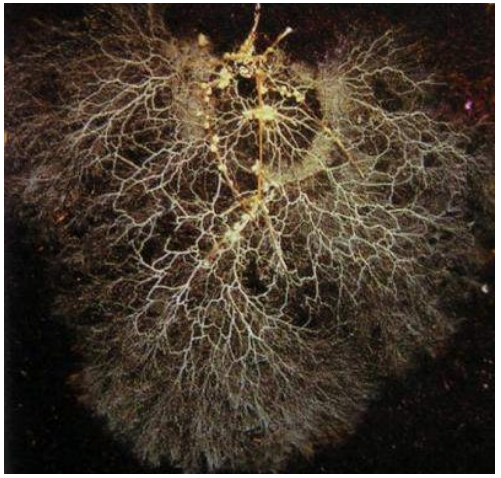
Partner: Northeast Wilderness Trust

Forests build Legacies, Legacies build Resilience



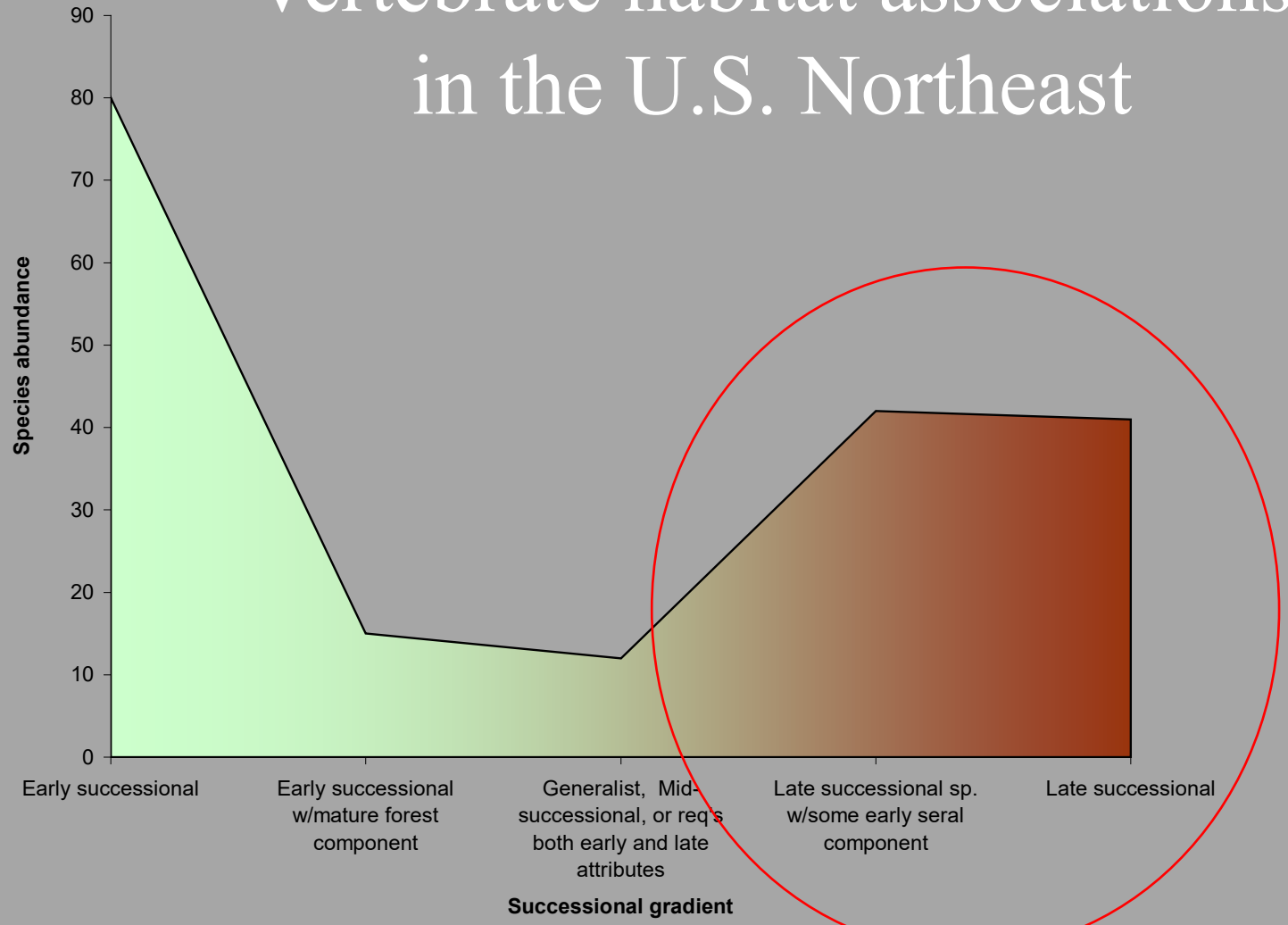
Saturated mossy logs

Intact Mycorrhizal Network



Partner: Northeast Wilderness Trust

Vertebrate habitat associations in the U.S. Northeast



From Keeton et al. 2018. Island Press

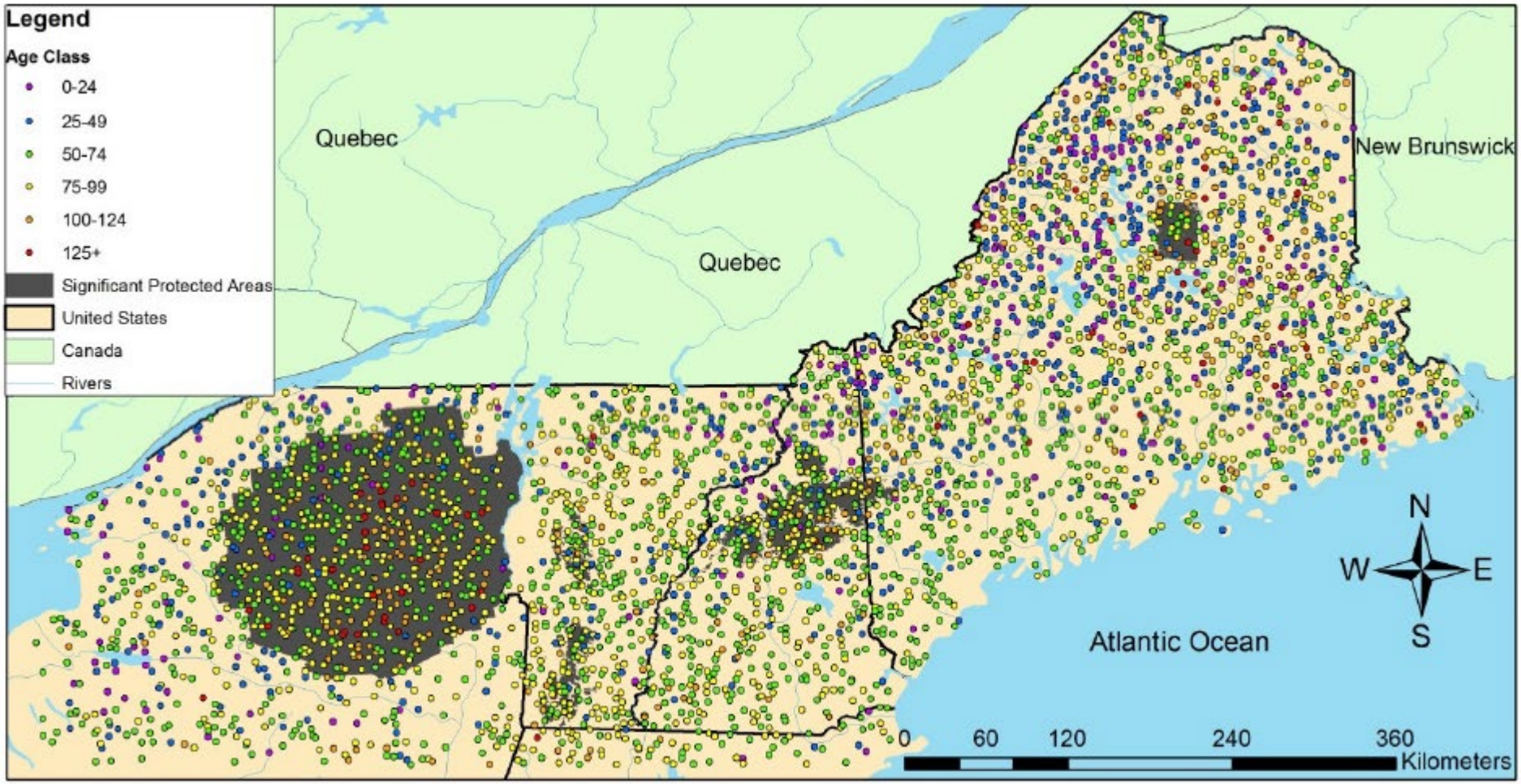
forests
ISSN 1999-4907
www.mdpi.com/journal/forests

Article

Late-Successional and Old-Growth Forests in the Northeastern United States: Structure, Dynamics, and Prospects for Restoration

Mark J. Ducey [1,*], John S. Gunn [2,3] and Andrew A. Whitman [3]

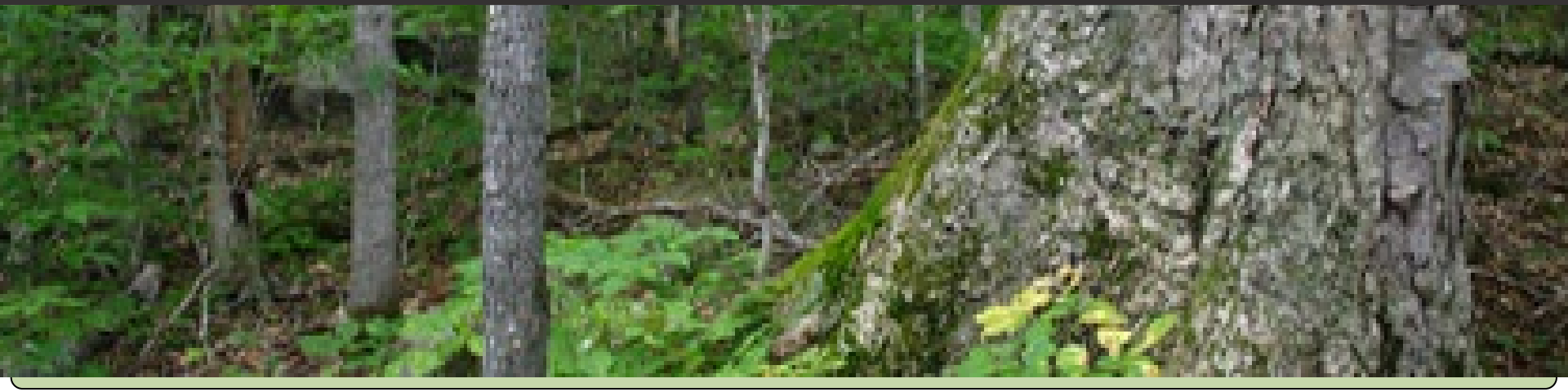
Spatial distribution of FIA plots by forest age



Goal #2

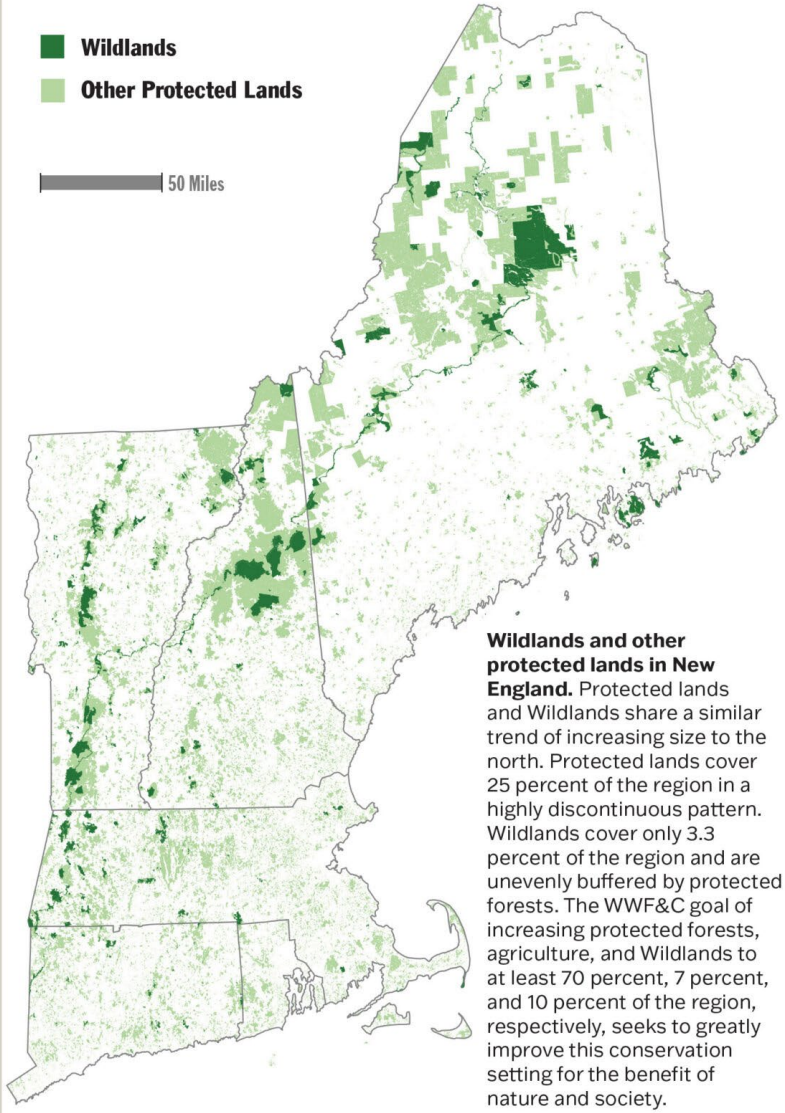
Accelerate the restoration of Wildland Forests

includes non-commercial Indigenous Subsistence Use
(hunting, foraging, cultural and spiritual activities)



Indigenous use (cultural and subsistence)

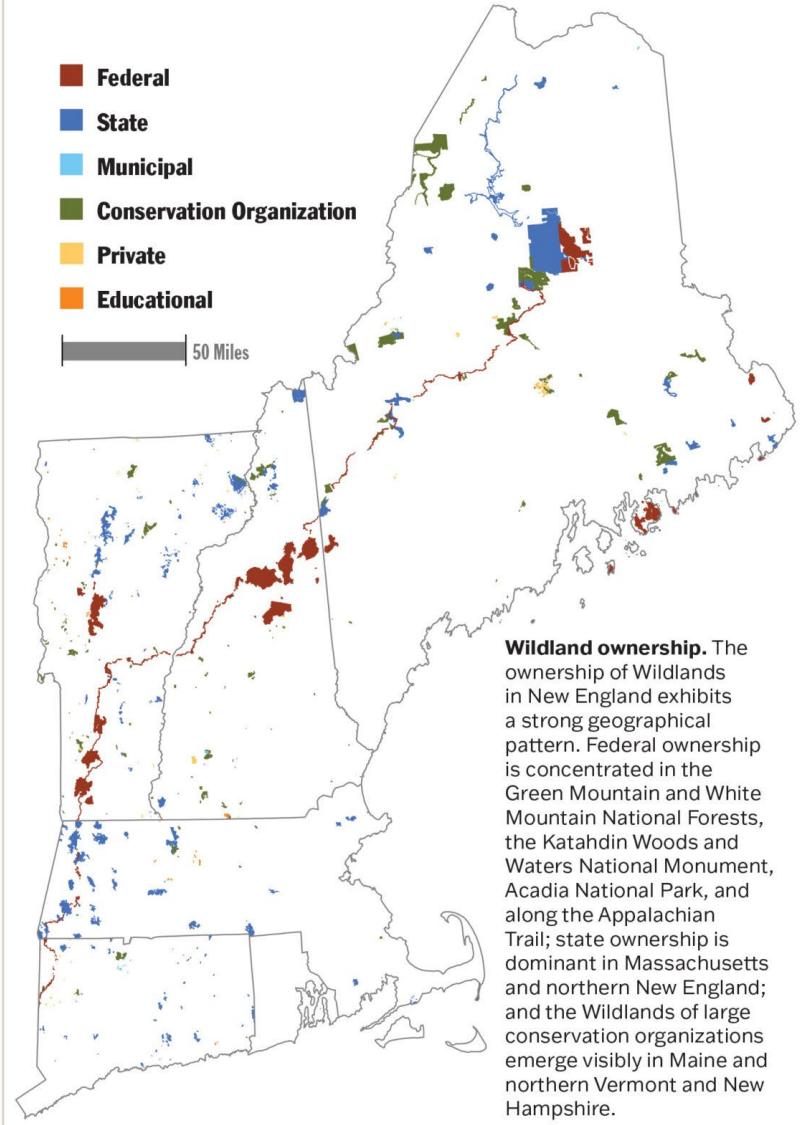
Wildlands and Other Protected Lands in New England



Wildlands and other protected lands in New England. Protected lands and Wildlands share a similar trend of increasing size to the north. Protected lands cover 25 percent of the region in a highly discontinuous pattern. Wildlands cover only 3.3 percent of the region and are unevenly buffered by protected forests. The WWF&C goal of increasing protected forests, agriculture, and Wildlands to at least 70 percent, 7 percent, and 10 percent of the region, respectively, seeks to greatly improve this conservation setting for the benefit of nature and society.

Source: *Foster, D. et al.* Wildlands in New England: Past, Present, and Future. *Figure 3. Harvard University. Download full report at wildlandsandwoodlands.org/wildlands-in-new-england*

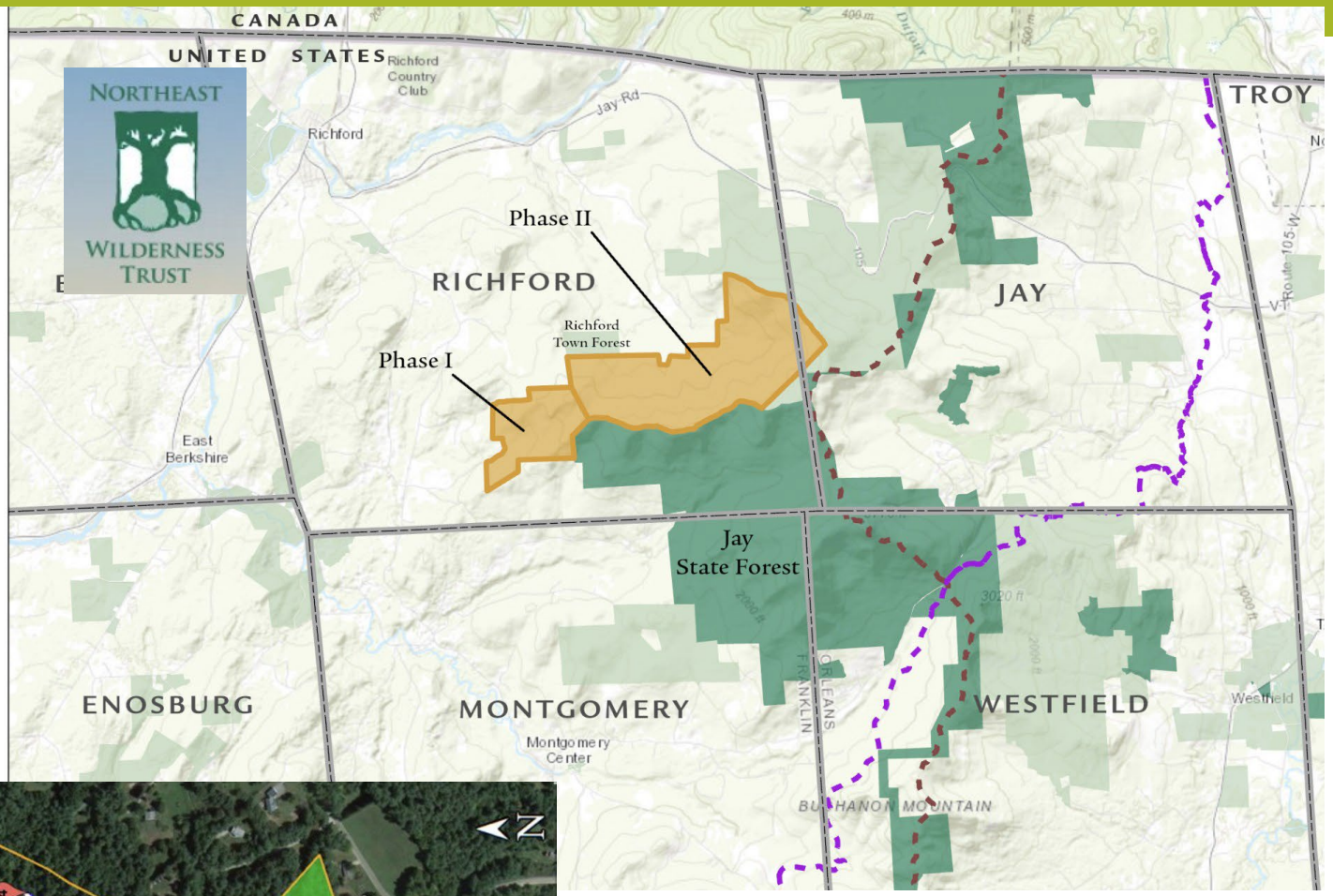
Wildland Ownership



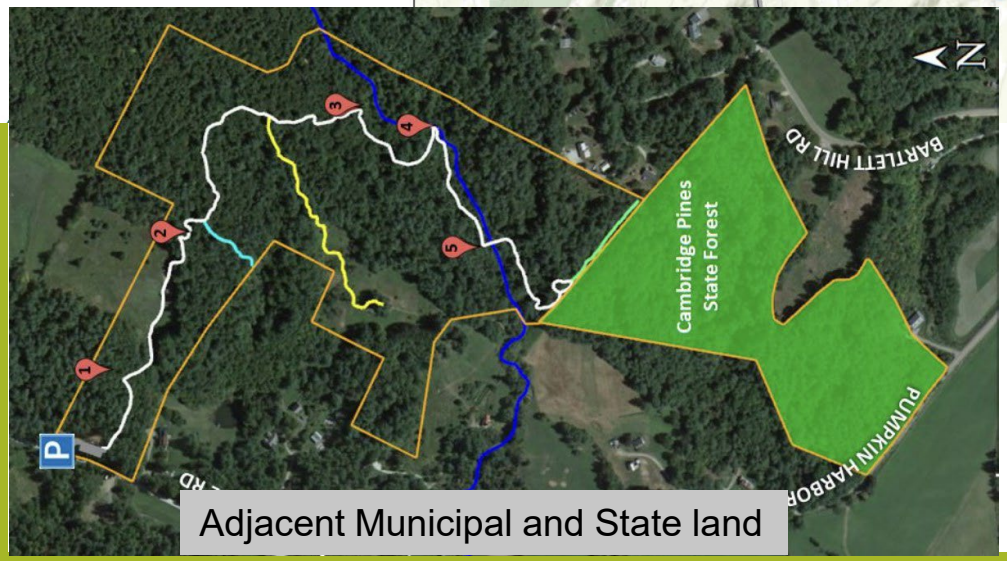
Wildland ownership. The ownership of Wildlands in New England exhibits a strong geographical pattern. Federal ownership is concentrated in the Green Mountain and White Mountain National Forests, the Katahdin Woods and Waters National Monument, Acadia National Park, and along the Appalachian Trail; state ownership is dominant in Massachusetts and northern New England; and the Wildlands of large conservation organizations emerge visibly in Maine and northern Vermont and New Hampshire.

Source: *Foster, D. et al.* Wildlands in New England: Past, Present, and Future. *Figure 4. Harvard University. Download full report at wildlandsandwoodlands.org/wildlands-in-new-england*

Proposed Bear's Nest Wilderness Preserve
~2,830 acres



- Proposed Preserve
- State Lands
- Other Conserved Lands
- Long Trail
- Catamount Trail



Adjacent Municipal and State land

Wildlands Partnerships

- State and Federal Agencies
- Non-Profits
- Municipalities
- Indigenous Communities

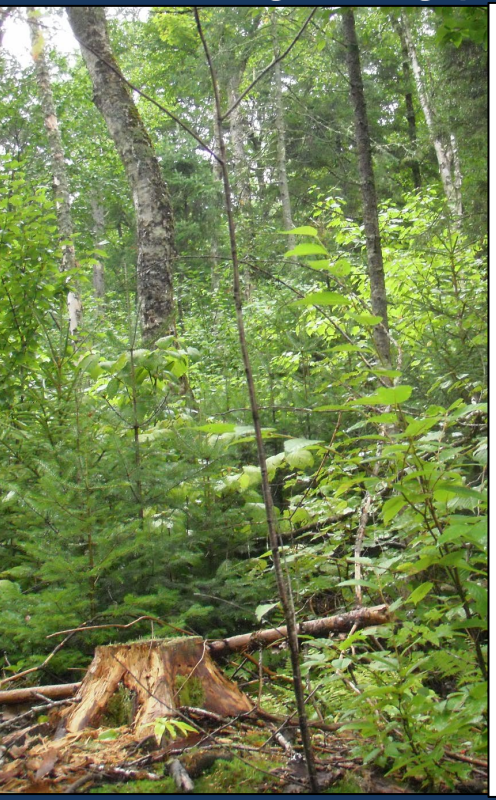
Goal #3
Expand Ecological Forestry (silviculture)

Management approach that applies an understanding of the structure, function and dynamics of natural forest ecosystems including old forest characteristics to achieve integrated environmental, economic and social outcomes.

- Based on Natural Stand Dynamics: ecosystems not timber
- Continuity: defined by what one leaves rather than what one takes
- Complexity/Diversity:
- Timing of treatment:
- Context: landscape scale impacts, all developmental stages
- Humility: Maintain multiple options to address the unknown

The prevailing divide

Ecological forestry still includes removal of trees to produce forest products; however, guiding principles are different from timber-focused model



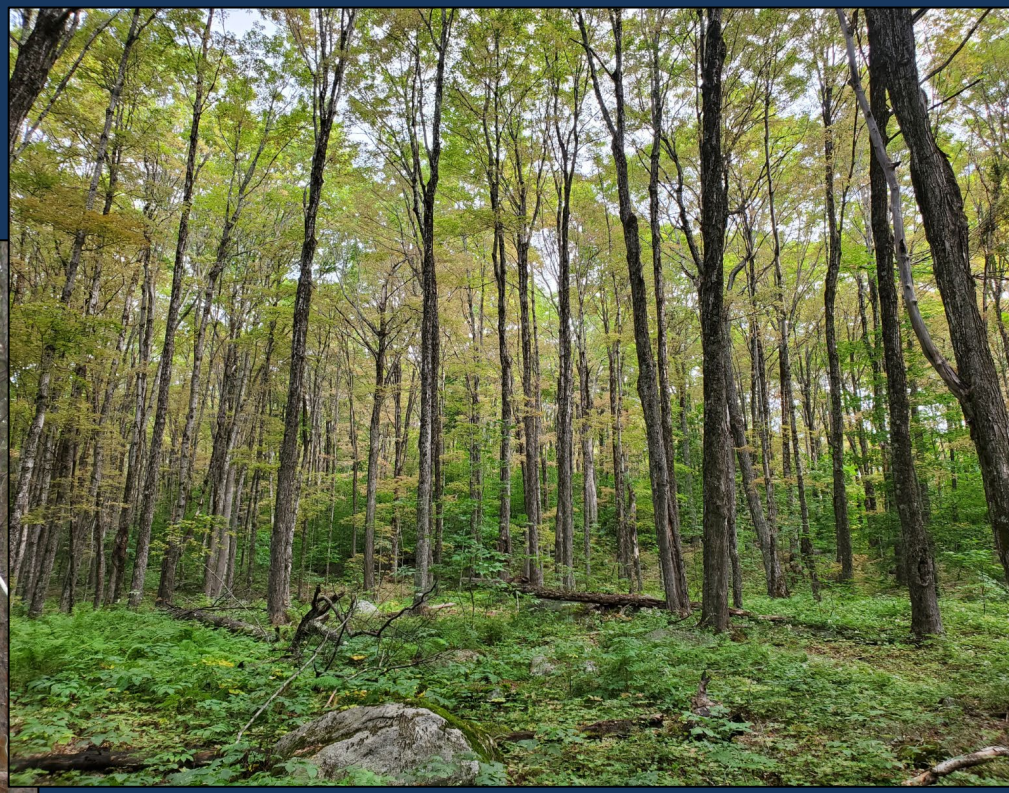
Ecological Forestry	Timber-Focused Forestry
Maintains ecosystems and their array of structures, functions (processes), and biota	Maintains a subset of ecosystem structures, functions, and biota consistent with economic goals
Uses natural stand development models, including effects of disturbances, as the basis for silvicultural prescriptions	Based on agronomic models, e.g., plant spacing, weeding, fertilization, as the bases for silvicultural prescriptions
Values complexity and heterogeneity of ecosystem attributes	Values simplicity and homogeneity of structure and composition
Emphasizes ecosystem diversity and resilience to reduce major disruption risks	Emphasizes optimizing growth of crop species to reduce risks

Palik et al. (2020)

Timber focused: Command and control to maximize the forest crop

Agronomic model

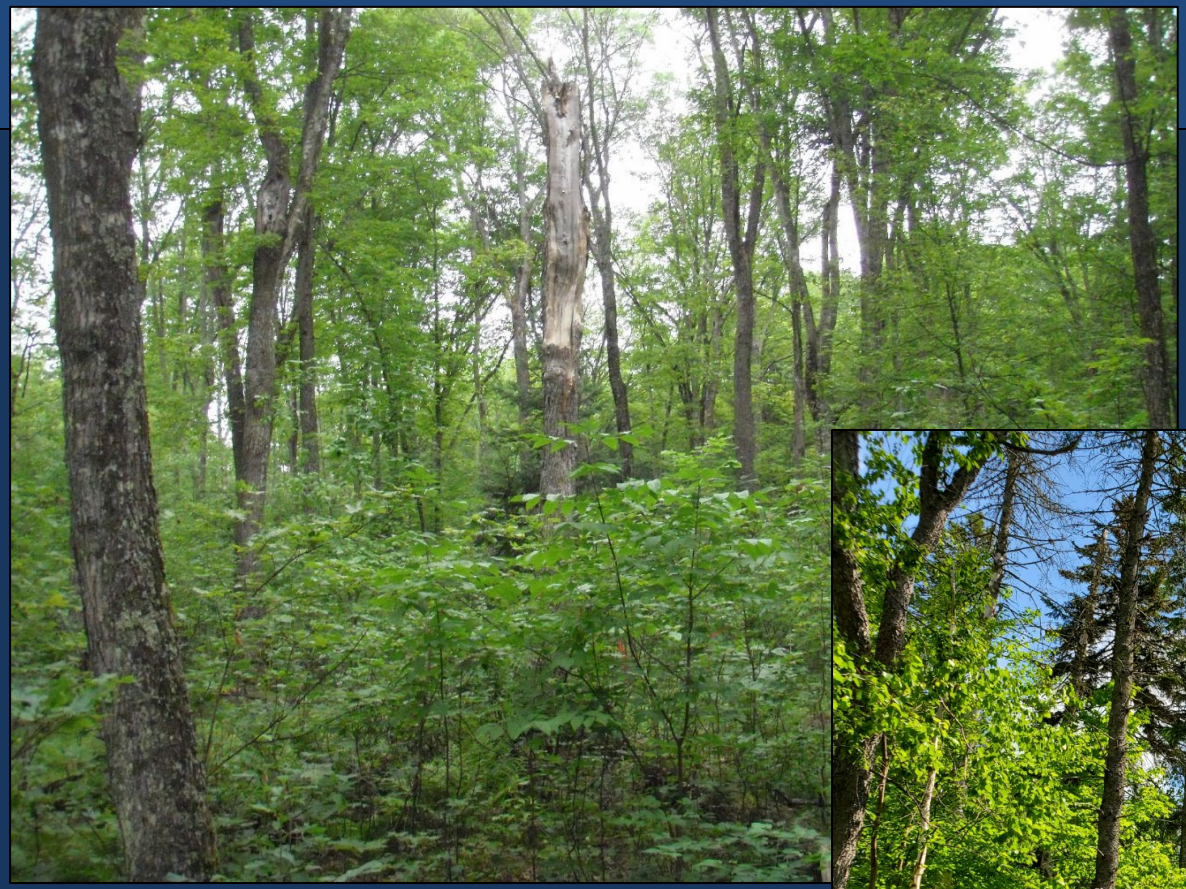
Yield



Simplified age and structure

Short Rotations

Ecosystem Focus: Ecological Forestry



Complexity

Resilience

Natural Stand Dynamics

Multi-age including Legacy (trees that live out their biological life span)

Where does Forestry Education Fit In?

Professional Education

- The application of ecological silviculture to achieve social and ecological objectives is no longer constrained by lack of training, long-term studies, or manager experience, **We Got It! Now to implement it!**

Photos: Dr. Anthony D'Amato

Where does Forestry Education Fit In?

Extension and RCP Forestry Education

- Biggest bottlenecks to widespread adoption are economics and eroding social acceptance of forestry of any kind (when in eyesight) **NIMBY**

What Landowners say:

"I don't know enough to take action."

Change is hard work.

"There are so many options. Which are right for me?"

"I'm all alone."

Where does Forestry Education Fit In?

Changing climate
Changing ecological needs

New policies
New programs
New funding / opportunities

Where does Forestry Education Fit In?

Where Does Policy Fit In?

Partnerships

- Non-Profit Initiatives
- Government Policy
- University Research and Policy
- Indigenous Leadership
- International Exchange

COLD HOLLOW TO CANADA

STAYING CONNECTED INITIATIVE

Wildlands Woodlands Farmlands & Communities

WESTWOOD LAB
Natural resource management & science policy at Dalhousie University

Ecological Forestry Research Initiative

Future Forests REIMAGINED

CHAMPLAIN ADIRONDACK BIOSPHERE NETWORK
ESTD 1989 NY VT CABN

VERMONT FISH & WILDLIFE

FORESTS, PARKS & RECREATION VERMONT
AGENCY OF NATURAL RESOURCES

NORTHEAST WILDERNESS TRUST

NEG ECP
GN-A PMEC

Resolution 45-2, adopted September 2024

RESOLUTION 40-3

RESOLUTION ON ECOLOGICAL CONNECTIVITY, ADAPTATION TO CLIMATE CHANGE, AND BIODIVERSITY CONSERVATION

Leadership for the ECOZOIC

THE UNIVERSITY OF VERMONT GUND INSTITUTE FOR ENVIRONMENT

CPAWS
CANADIAN PARKS AND WILDERNESS SOCIETY NEW BRUNSWICK CHAPTER

SNAP
SOCIÉTÉ POUR LA NATURE ET LES PARCS DU CANADA SECTION NOUVEAU-BRUNSWICK

Wildlands Network

Management context in Québec, Canada

- 90% of forests are public
- 2010: Ecosystem-based management (EBM) becomes the norm with the bill A-18.1 *"Sustainable Management of Forested Land"*
- Goal: maintaining biodiversity and ecosystems viability by reducing the gap between managed and natural forests

EBM Management framework

Aims to manage a landscape with target proportions of stands in regeneration, intermediate, mature and old-growth classes

- Ex: preindustrial mixedwood forest in western Qc (Boucher et al. 2011)

Regeneration
< 15 yr

Intermediate
16-80 yr

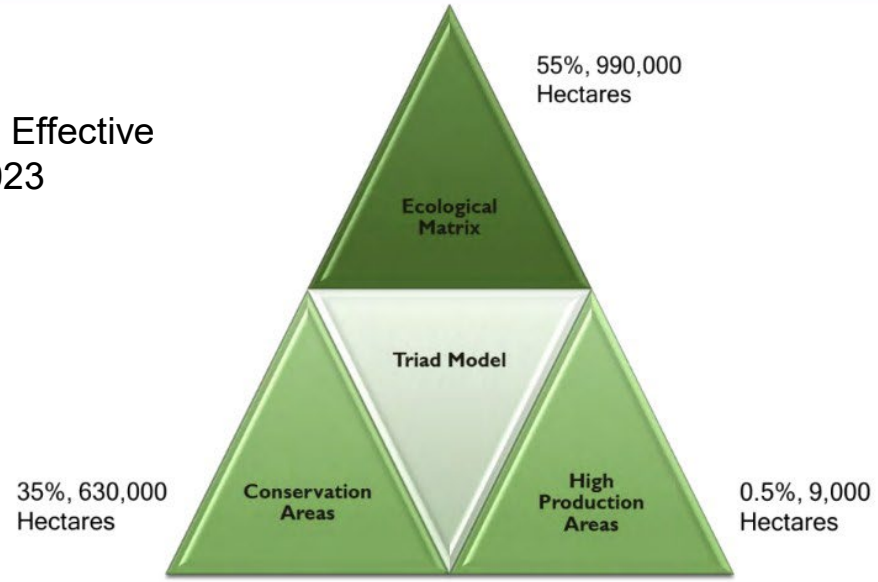
Mature
81-200 yr

Old-growth
>200 yr

1/3 of preindustrial proportions on 80% of the land

NOVA SCOTIA CURRENT TRIAD MODEL ON CROWN LAND

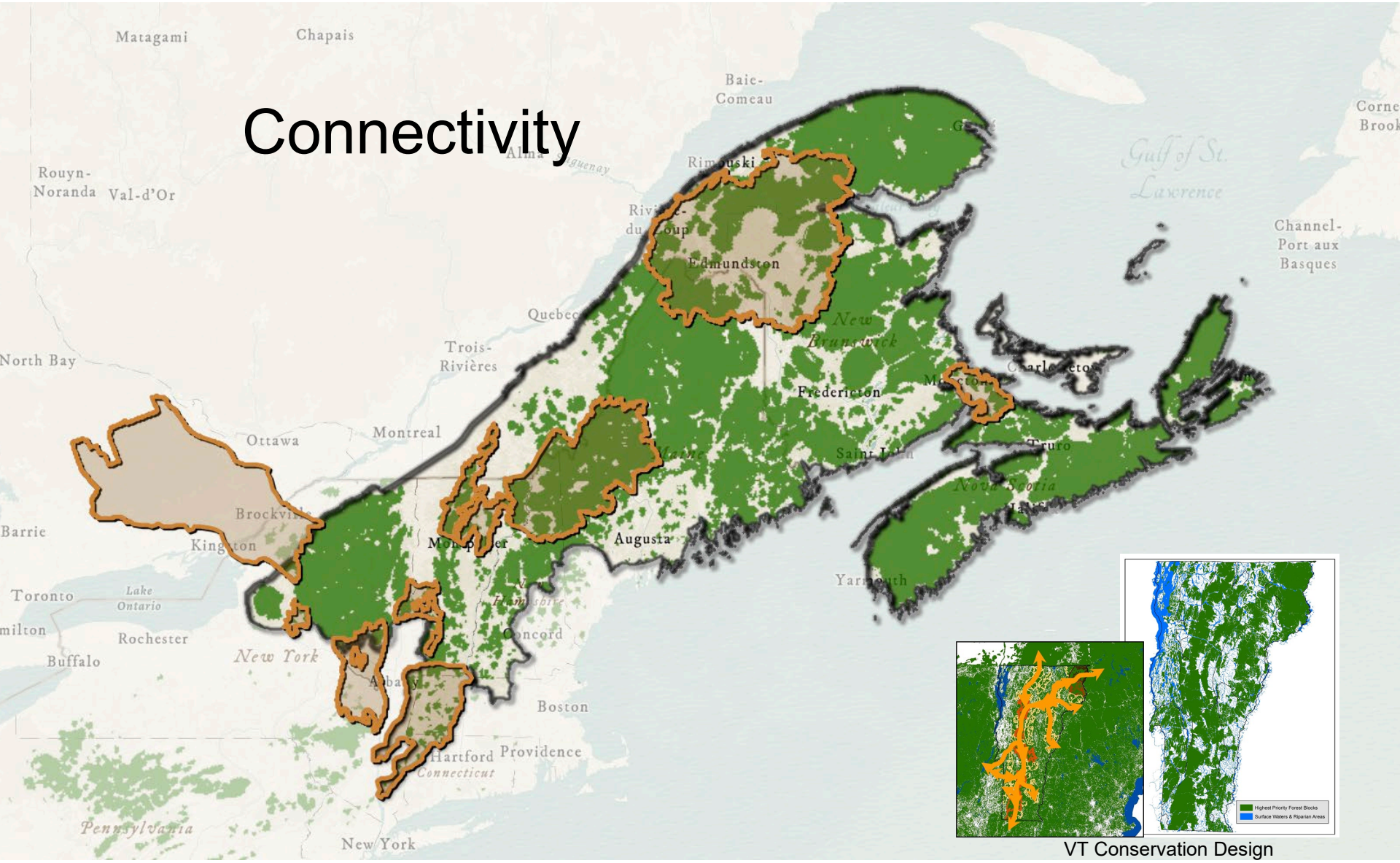
Implementation Effective January 17, 2023



NOVA SCOTIA FORESTRY INNOVATION TRANSITION TRUST (FITT)

"The Forestry Innovation Transition Trust is a $50 million fund focused on accelerating new opportunities within the Nova Scotia Forestry Sector to enhance environmental, social and economic values and adoption of new ecological forestry practices."

Connectivity

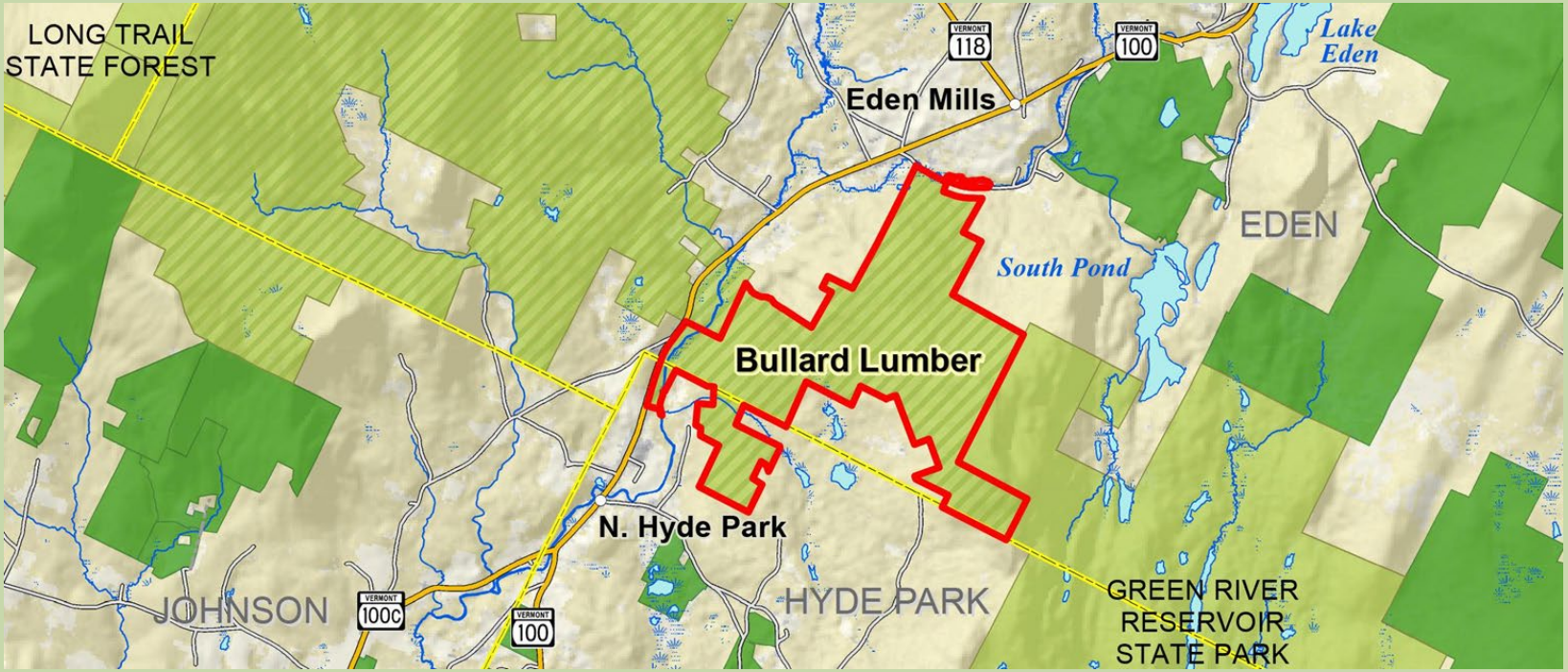


VT Conservation Design

Current priority NAPAW Linkages from Staying Connected Initiative

(https://storymaps.arcgis.com/stories/8905860a33fb4118aba55be06a765c8a)

Protect Large Forest Blocks and Connecting Blocks to Maintain Integrity

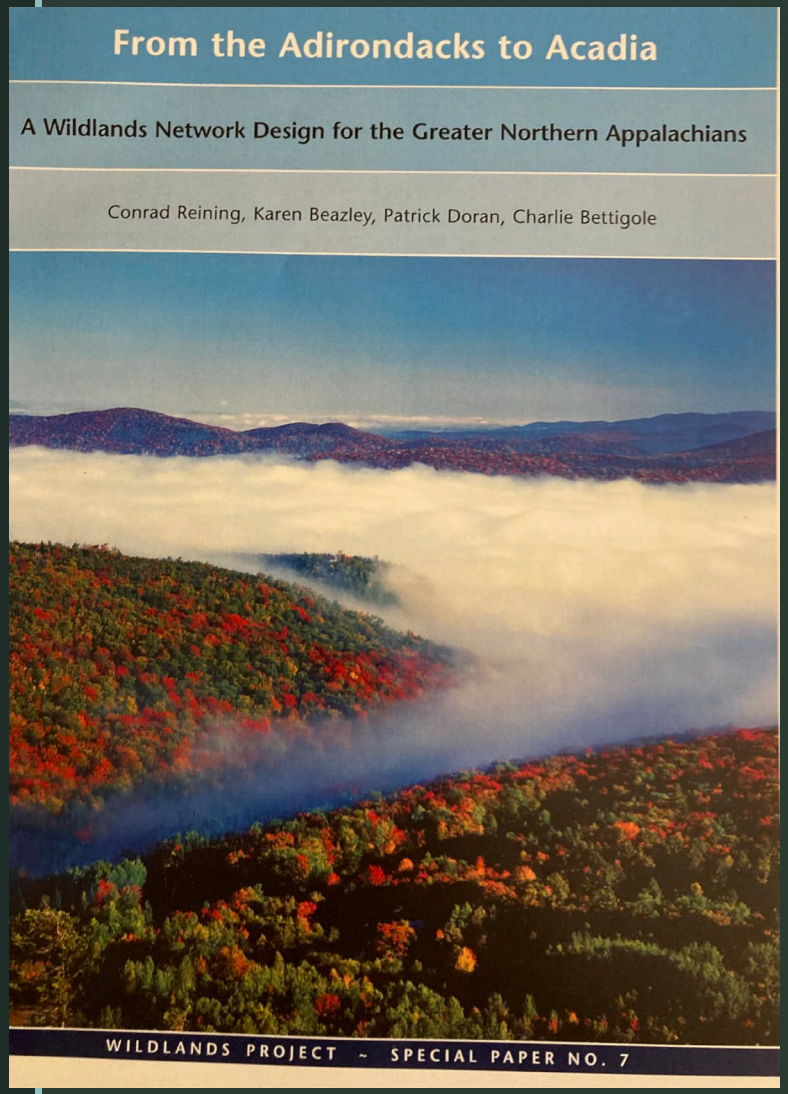


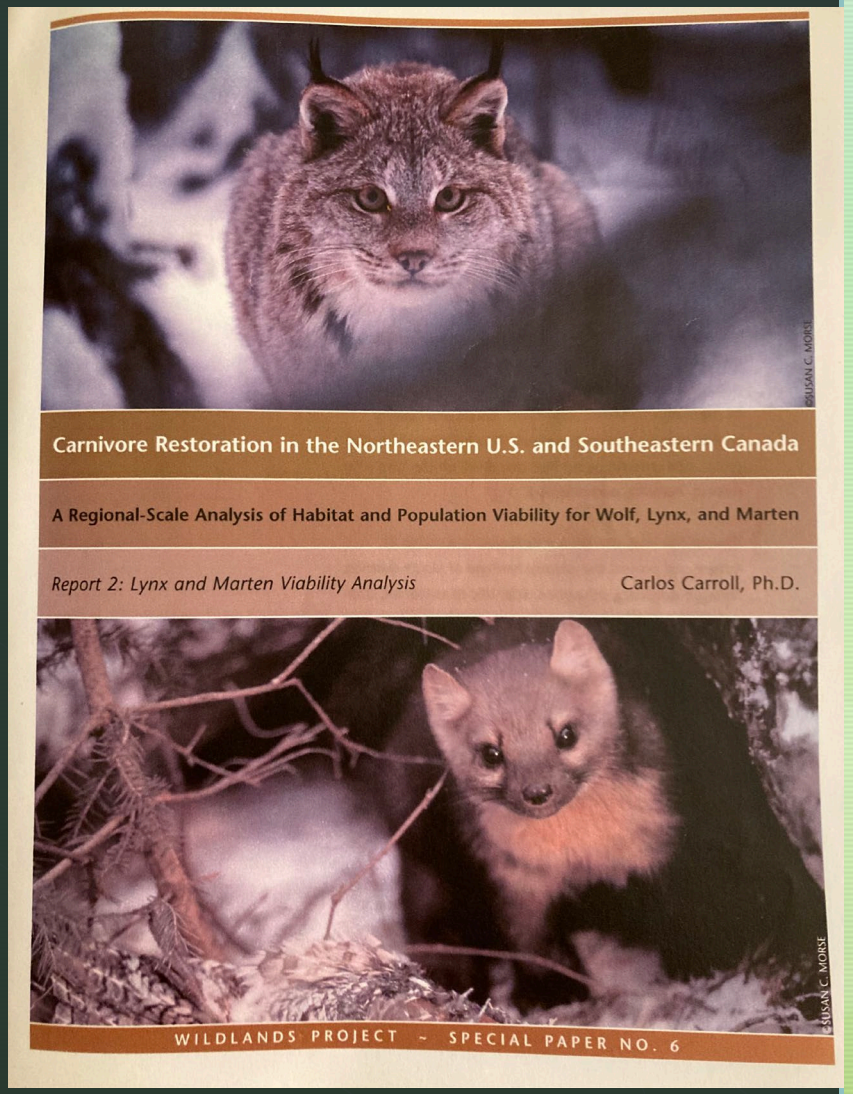
Vermont Conservation Design Core and connectivity forest blocks

Eastern Wildway (EW) Vision map

Cores +
Corridors (linkages, connections)
=Connectivity

Interactive EW GIS





Coexistence

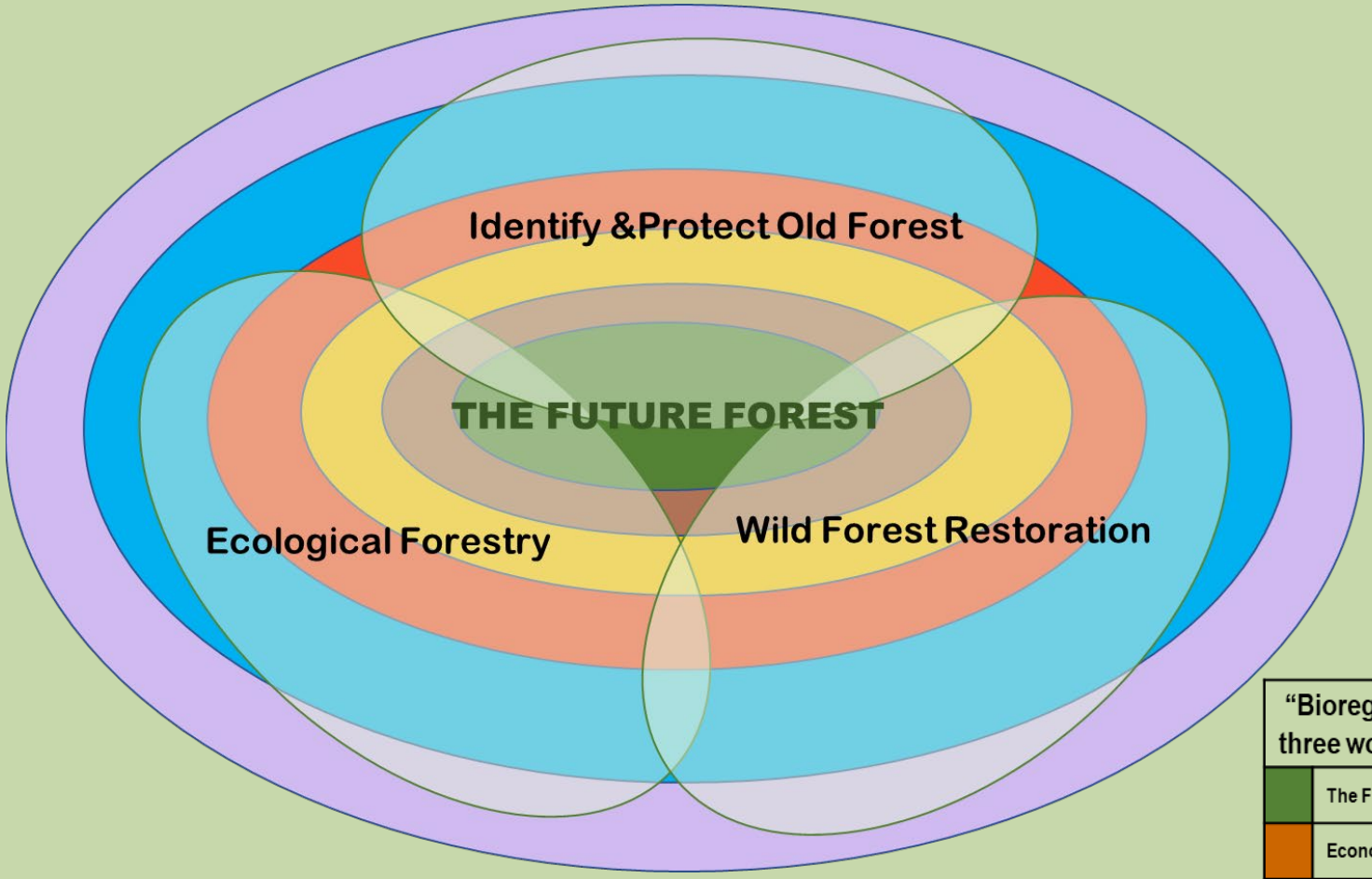
Conclusions

- Insight #1: Elevate First Nations and Tribal rights, histories, understandings and knowledge
- Insight #2: Create a transparent and inclusive leadership structure to move forward collectively with equal power in decision making
- Insight #3: Old Forests must be adequately mapped across jurisdictions and land tenure patterns
- Insight #4: A bioregional identity that includes linking a healthy environment with community well-being must be shaped and communicated so that the story of place is understood and celebrated.

FFR Website https://2c1Forest.org/future-forests-reimagined/

Workshop Summary https://wildlandsnetwork.org/resources/future-forests-reimagined

How We Move Forward

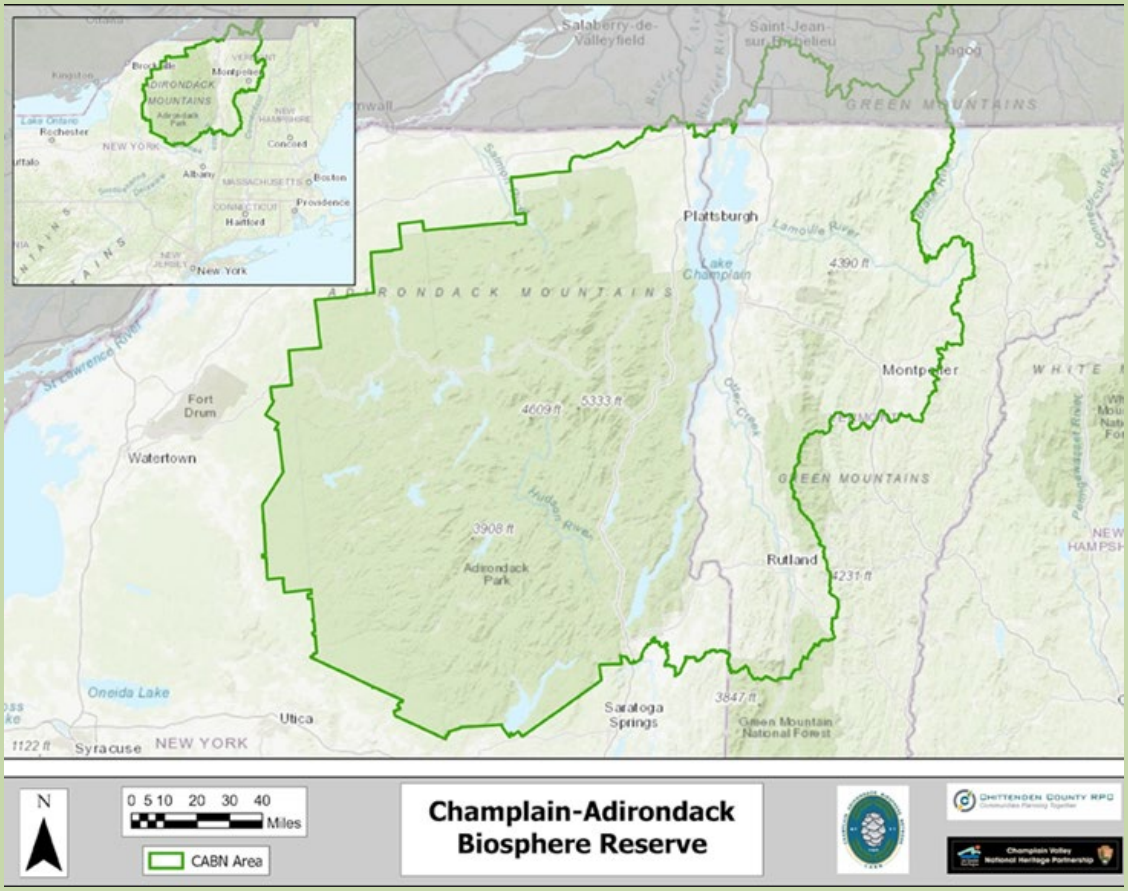


"Bioregional Dimensions" of the three working areas (Interpretative Key)	
	The Future Forest
	Economics
	Policy
	Human Wellbeing
	Knowledge (local, Indigenous and Academic)
	Partnerships

FFR Phase two underway:

- Advisory team reconvening
- Two Countries-One Forest and Wildlands Network
- Lake Champlain Basin Program grant to convene UNESCO Biosphere programs across northeastern U.S and Canada, workshopping FFR goals and opportunities
- Three Borders Linkage partnerships (SW Quebec, NW New Brunswick and Aroostook County, Maine)
- VT Old Forest Model project- nearly complete

United Nations Biosphere Exchange



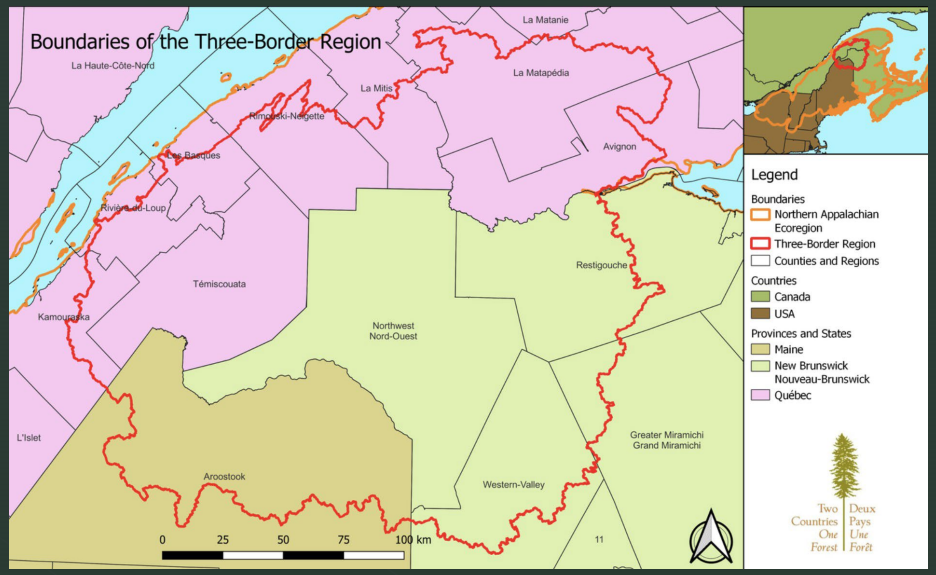
Eastern Canada Biospheres

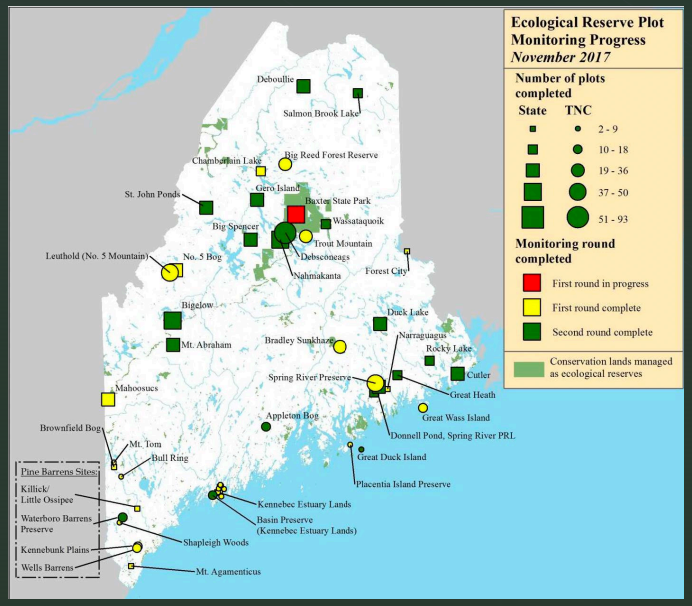
- Frontenac Arch
- Lac St. Pierre
- Mont St. Hilaire
- Charlebois
- Fundy
- Southwest Nova

Funding for this project comes from a 2024 Champlain-Adirondack Biosphere Special Program awarded by the Champlain Valley National Heritage Partnership. This project was funded in whole or in part by the Great Lakes Fishery Commission (GLFC) under an agreement to assist the New England Interstate Water Pollution Control Commission (NEIWPCC) in partnership with the Lake Champlain Basin Program.

Three Borders Project in Aroostook County Maine

Maine

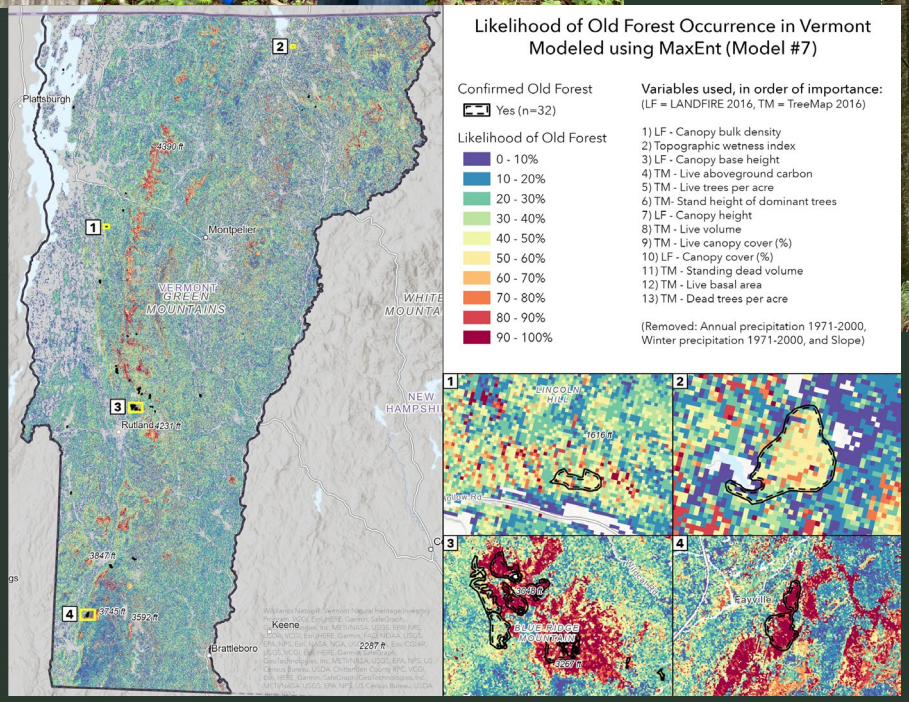




- Indigenous, First Nations and Tribal Relationship Building
- Future Forests Reimagined
  - Marten, Canada lynx (US FWS Threatened)
- Mining
- Salmon
- Beginning with Habitat- municipal powers
- Partner recommendations and Consultant's report

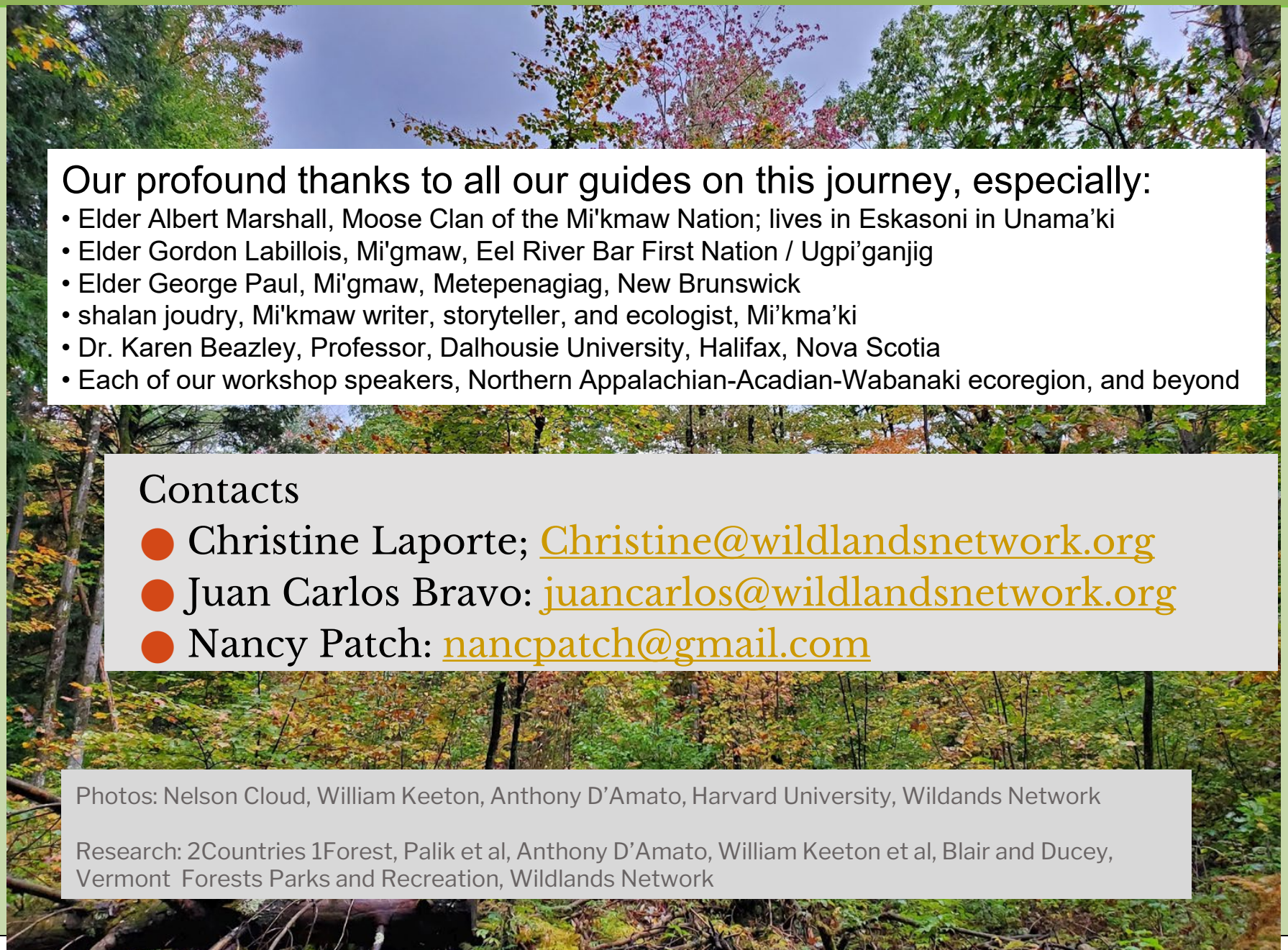
New TWS model (2023) "Classifying, inventorying, mapping mature and old-growth forests in the UnitedStates ", Aplet and Belote

Vermont Old forest Model with VT F&W and Wildlands



Old Forest Probability Model

Acknowledgements & Contacts



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- Elder Albert Marshall, Moose Clan of the Mi'kmaw Nation; lives in Eskasoni in Unama'ki
- Elder Gordon Labillois, Mi'gmaw, Eel River Bar First Nation / Ugpi'ganjig
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- Dr. Karen Beazley, Professor, Dalhousie University, Halifax, Nova Scotia
- Each of our workshop speakers, Northern Appalachian-Acadian-Wabanaki ecoregion, and beyond

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Time for ?

Regional Conservation Partnership NETWORK

2024 RCP NETWORK Gathering

to fill out the

SESSION EVALUATION FORM

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