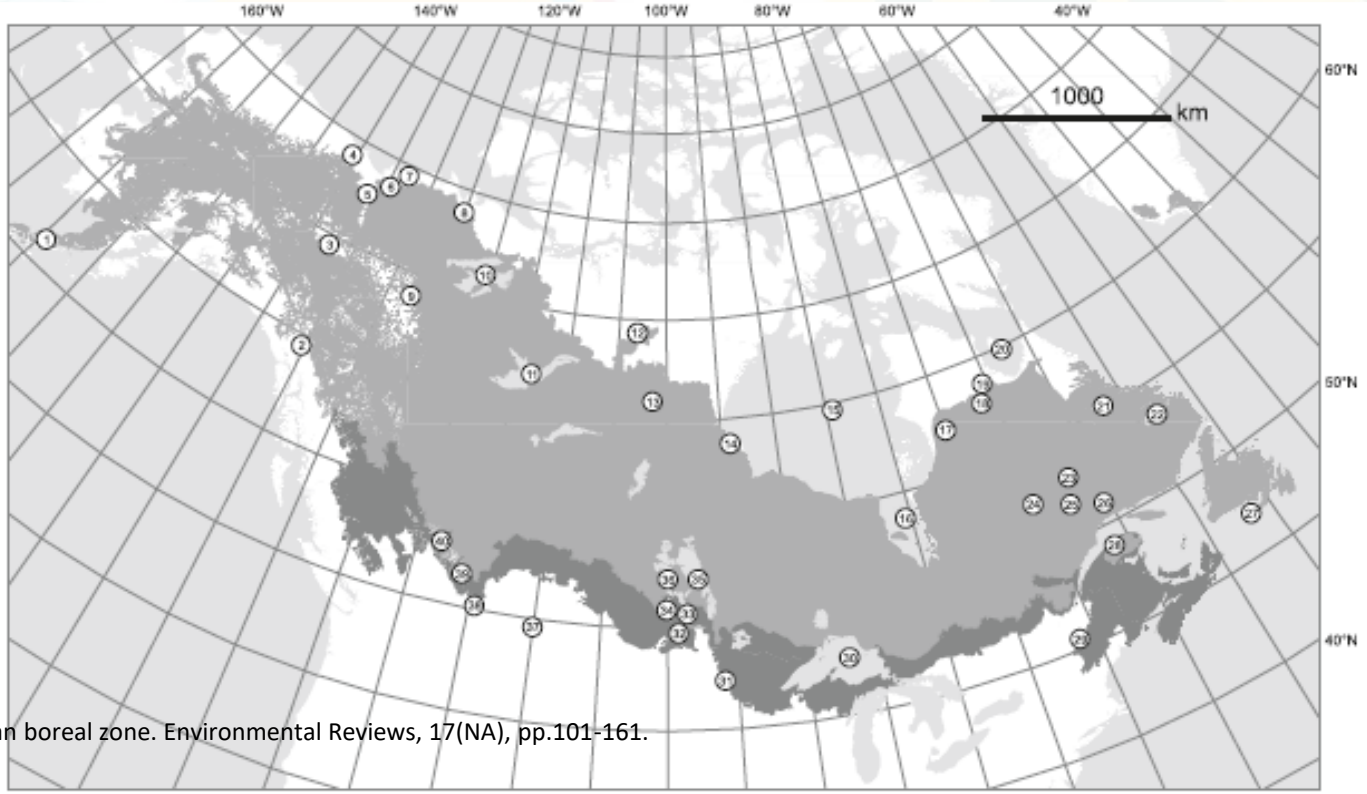
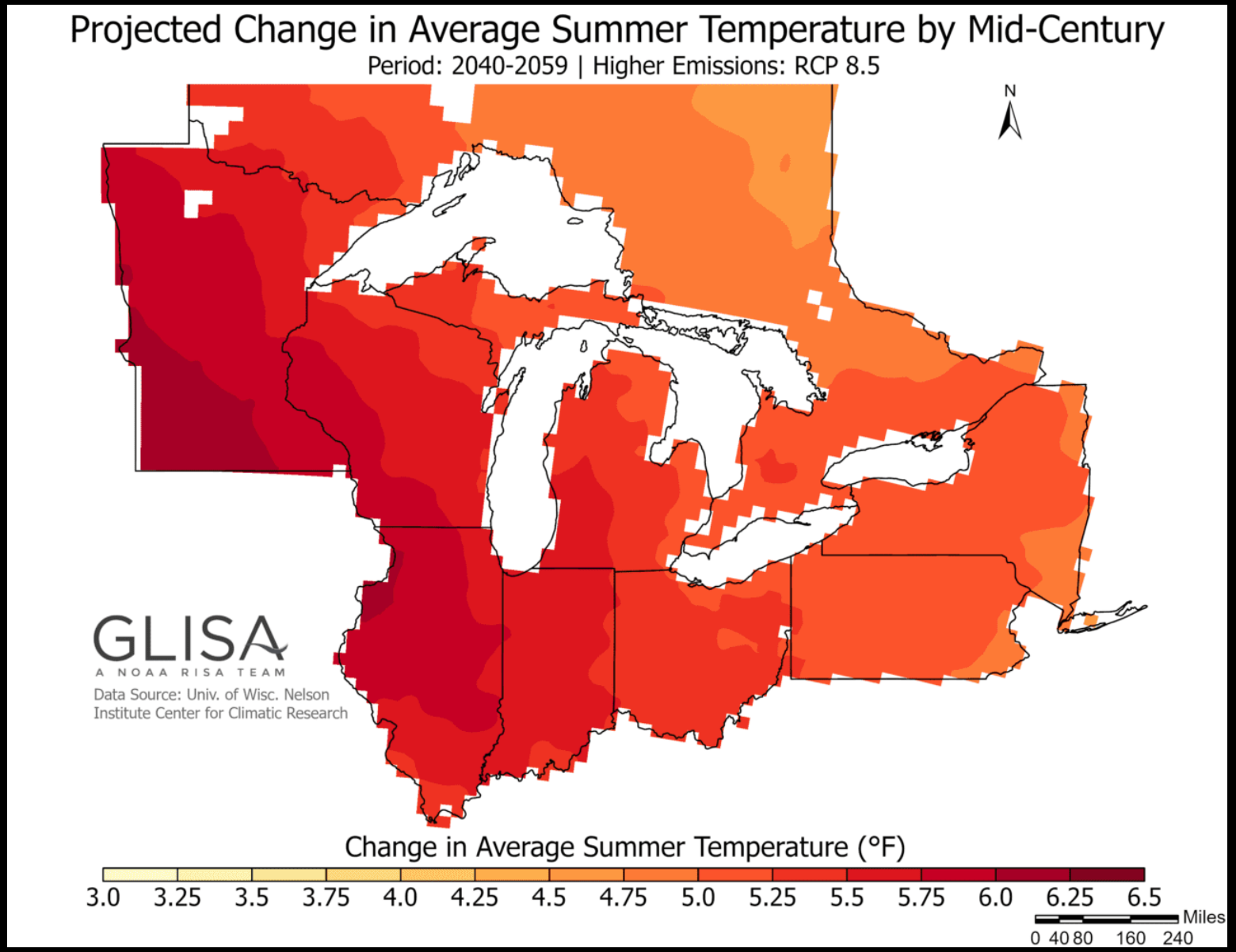
The Ishkode Project
Managing Sharp-tailed Grouse on the Hiawatha NF

Why Remnant Boreal Forest Ecosystems?

- Conifer-dominated ecosystems that make up the discontinuous trailing edge of the hemiboreal region.
- Anishinaabe Culture is inextricably linked to the boreal-temperate ecotone and its flora and fauna.



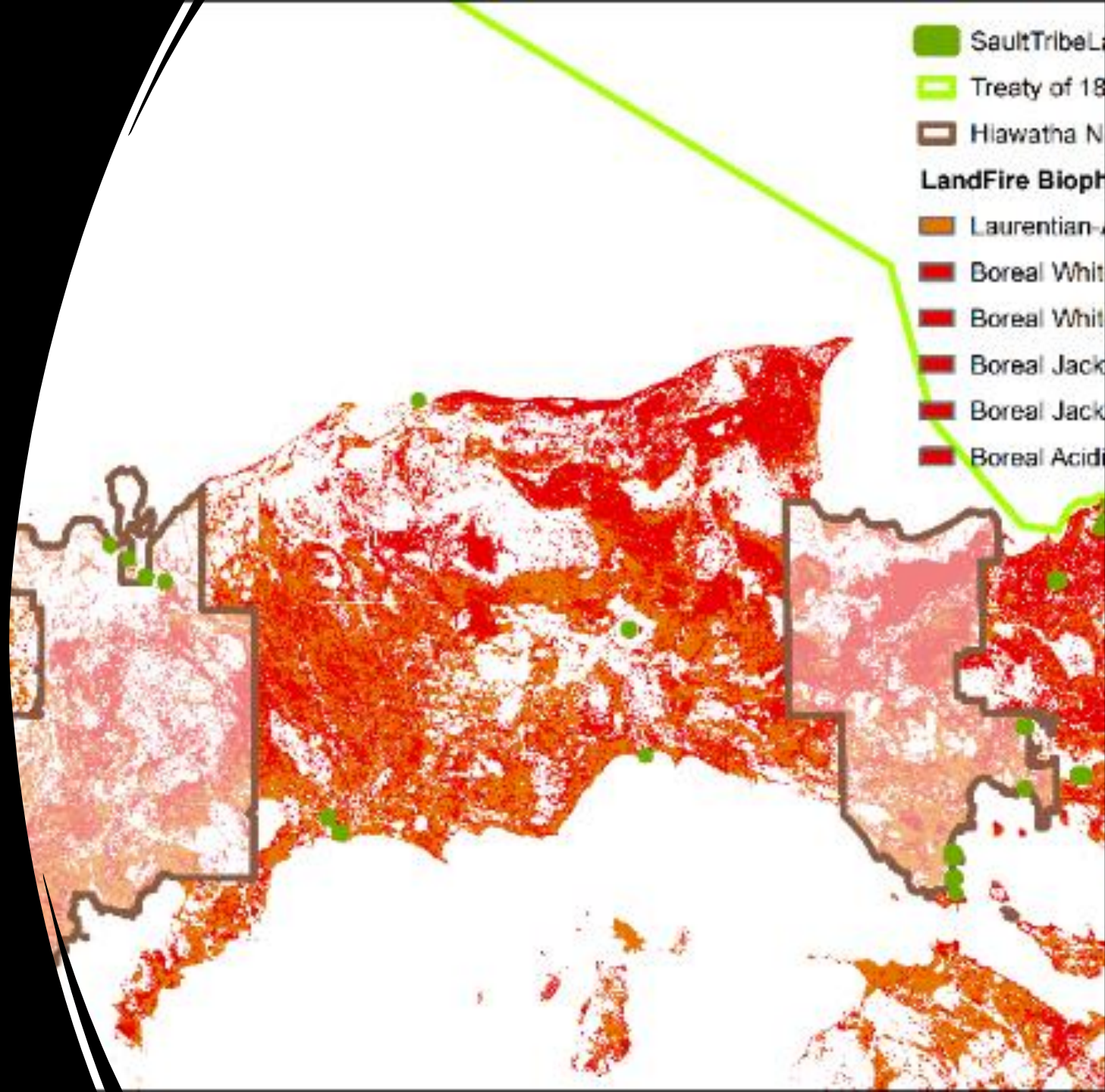
Brandt, J.P., 2009. The extent of the North American boreal zone. Environmental Reviews, 17(NA), pp.101-161.


Projected Change in Average Summer Temperature by Mid-Century
Period: 2040-2059 | Higher Emissions: RCP 8.5
N
GLISA
A NOAA RISA TEAM
Data Source: Univ. of Wisc. Nelson Institute Center for Climatic Research
Change in Average Summer Temperature (°F)
3.0 3.25 3.5 3.75 4.0 4.25 4.5 4.75 5.0 5.25 5.5 5.75 6.0 6.25 6.5
Miles
0 40 80 160 240

Ishkode (fire) as a stewardship tool

Ishkode, ignited by both lightning strikes and by Anishinaabek was the predominant post-glacial disturbance.

Ishkode has been an important part of Anishinaabe forest stewardship for hunting and gathering opportunities for millennia.



Location – The Ishkode Project

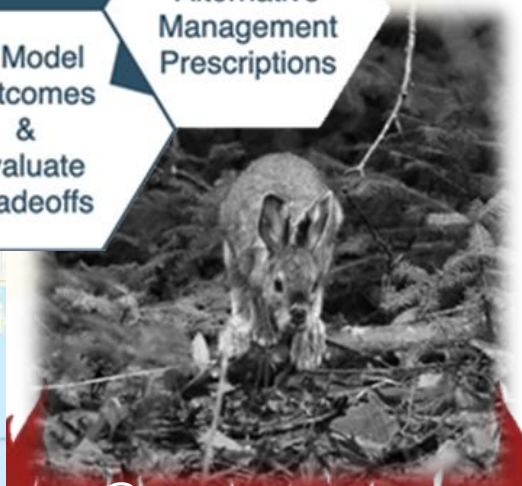
- Raco Plains and Betchlers Marsh
- Fire is a dominant force
- Well known historic location for Ojibway fire, hunting and gathering activities
- Aligns with other studies for both USFS and Sault Tribe

Co-stewardship Approach

- Utilize Anishinaabe and Western Science to understand the impact of current fire management
- Evaluate new prescriptions with different science and cultural perspectives
- Adaptive Management Approach
- Create a plan to enhance:
  - Fire safety
  - Ecosystem resilience
  - Enhance biotic diversity
  - Revitalize and protect ancestral forest relations

Why Adaptive Management as a Focus?

- Dynamic natural resource systems that are subject to only partially predictable environmental variation, along with other sources of uncertainty that limit effective management.
- Structure Decision Making requires inclusiveness.
- Helpful can use both Anishinaabe Community Knowledge and western sciences
- Provides a useful framework for co-stewardship of federal lands.



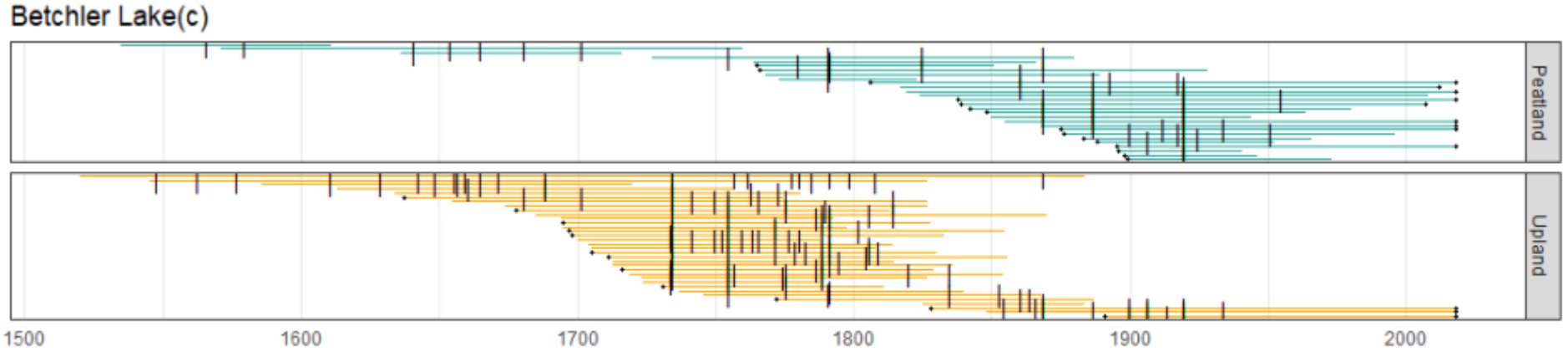
Ecological Data Collection

- How did ishkode shape and maintain local boreal forest ecosystems?
- Cutting Edge Approaches to understanding fire history across the landscape
  - Dendrochronology[1]
  - Peat core Fourier-transform infrared (FTIR) and Nuclear Magnetic Resonance (NMR) spectroscopy[1]
  - Anishinaabe oral traditions

1- Sutheimer, C.M., Meunier, J., Hotchkiss, S.C., Rebitzke, E. and Radeloff, V.C., 2021. Historical fire regimes of North American hemiboreal peatlands. Forest Ecology and Management, 498, p.119561.

Fire scars and tree-rings

- Identify individual fire events including year and season
- Capture widespread low- and moderate-severity fire
- Record 100s to 1000s years of fire history



Widespread fire years: 1718, 1733, 1737, 1751, 1754, 1774, 1847, 1891, and 1920

Forest Ecology and Management 498 (2021) 119561

Contents lists available at ScienceDirect

Forest Ecology and Management

journal homepage: www.elsevier.com/locate/foreco

Historical fire regimes of North American hemiboreal peatlands

Colleen M. Sutheimer [a,*], Jed Meunier [b], Sara C. Hotchkiss [c], Eric Rebitzke [d], Volker C. Radeloff [a]

[a] SILVIS Lab, Department of Forest and Wildlife Ecology, University of Wisconsin, 1630 Linden Drive, Madison, WI 53706, USA
[b] Wisconsin Department of Natural Resources, Division of Forestry, 2801 Progress Road, Madison, WI 53716, USA
[c] Botany Department, University of Wisconsin, 430 Lincoln Drive, Madison, WI 53706, USA
[d] USDA Forest Service, Hiawatha and Ottawa National Forests, 820 Rains Drive, Gladstone, MI 49837, USA

Our methods reconstructed fire regimes at finer spatial and temporal scales and we detected frequent low-severity fire events, which have been largely overlooked in North American peatland fire ecology.

- Low-severity fires were historically frequent (7–31 years) in hemiboreal peatlands.
- Fires were common and widespread within and surrounding hemiboreal peatlands.
- **Fires in hemiboreal peatlands did not occur during severe regional drought.**

Ecological Data Collection

- Focus on community knowledge and relationships
  - Understand fire/ecological relationships and history, focus on species of interest
    - Visiting with elders, knowledge-holders
    - Semi Structured Interviews
  - Engage aadizookanan and revitalize knoweldges
    - Biboon Gatherings
  - Field assessments with knowledge holders
    - Traditional medicine, elders, harvesters

Community knowledge key points

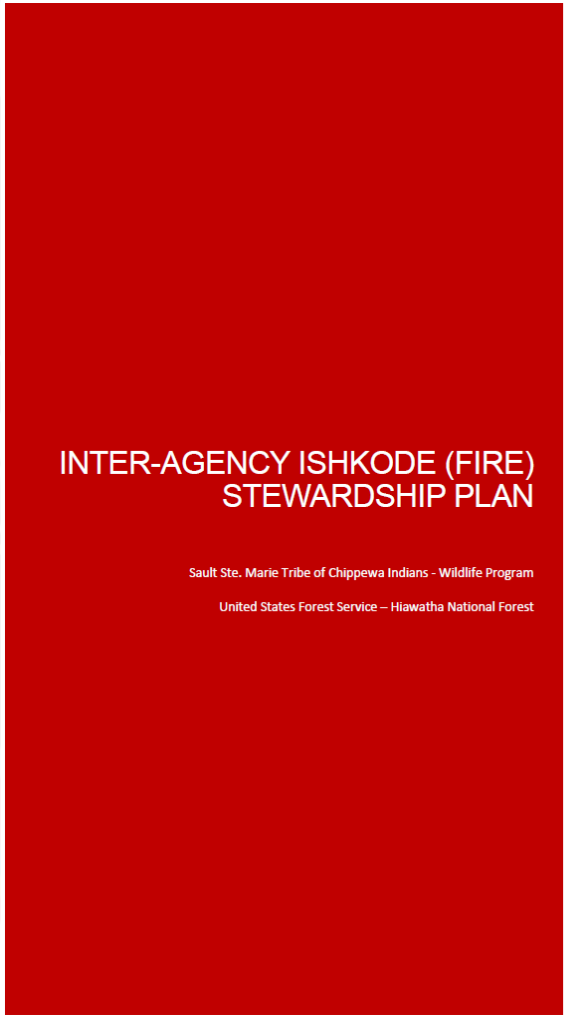
"You know, the other thing about fire is its' a direct connection to Creator…"

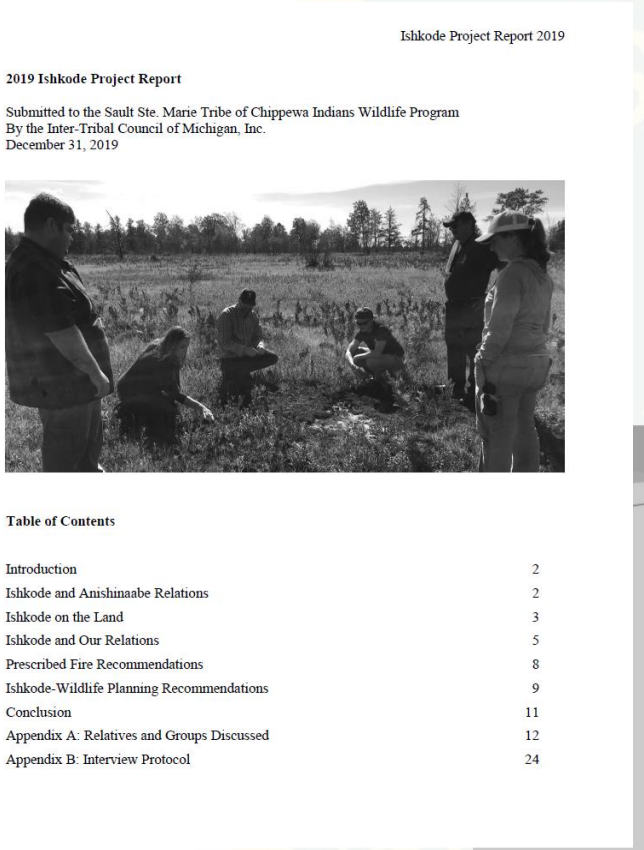
- Focus on respecting fire as a powerful, elder being
- Identified 62 individual wildlife and plant species that benefit from fire
- Identified 10 locations that could benefit from restoration of fire
- Discussed seasonality, intensity, and frequency of prescribed fire

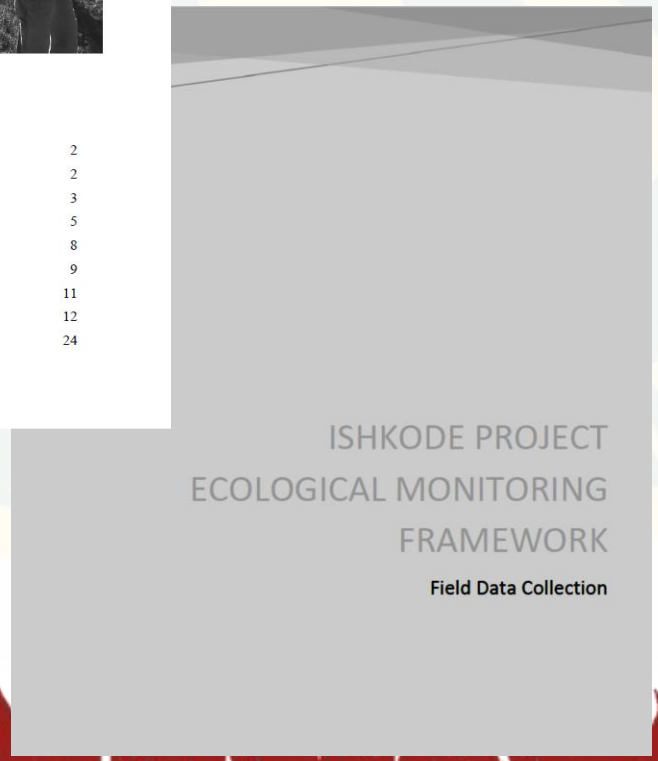
Ecological Data Collection

- Focus on understanding the effects of fire on species of interest
  - Leveraging our existing work in this landscape and collecting new field data
    - Snowshoe hare habitat use
    - Sharptail, Spruce, and Ruffed grouse habitat use
    - Small mammal diversity/distribution
    - American marten habitat use
    - Camera trap studies to evaluate multispecies occupancy
    - Wolf Assessment
    - High resolution landcover mapping
  - Evaluating recent prescribed fire treatments in the Raco area
  - Developing pre-treatment baseline dataset for future fire prescriptions

Inter-Agency Ishkode Stewardship Plan







Landscape typical of Raco North LTA

Ishkode Project Phenological Fire Management Objectives

ELT:	Species:	Desired Fire Effects:	Fire Weather Indices:	Seasonality:	Fire Return Interval:
10/20	Warm Season Grasses	Regeneration. Moderate intensity, contiguous burn	FFMC >20 FWI <7	Late Spring, Avoid Summer Burning	<3yrs
10/20	Jack Pine *Pinus banksiana*	Regeneration. Conditions to form a column must be present.	DMC >40 FWI >20	Spring-Summer	15yrs
10/20 **30**	Blueberry *Vaccinium angustifolium*	Regeneration. Moderate intensity, patch mosaic burning.	DMC 15-55 FFMC >88 FWI >10	Spring	2-5yrs
10/20 **30**	Sweet Fern *Comptonia peregrina*	Regeneration. Moderate-High Intensity Fire	FWI >20	Spring-Summer	15yrs
10/20 **30**	Red Pine *Pinus resinosa*	Maintenance. Low intensity under burn. Reduction of insect and disease	DMC <40	Spring or Fall	Conditional
		Regeneration. Moderate-High Intensity Fire	DMC >40 FWI >20	Spring-Summer	10-80yrs

Review Ishkode Plan Objectives for Grouse

Aagask - Sharp-tailed Grouse

a) Desired Outcomes: Increase quality and quantity of sharp-tailed grouse habitat.

b) Strategies: Engage fire to create and maintain large openings, savanna complexes, and early successional jack pine.

c) Monitoring: Monitor sharp-tailed grouse occupancy, abundance, and distribution.

Mashkodese - Spruce Grouse

a) Desired Outcomes: Increase quality and quantity of spruce grouse habitat.

b) Strategies: Create and maintain mid-successional jack pine forests using fire of varying intensity and severity.

c) Monitoring: Monitor spruce grouse occupancy, abundance, and distribution.

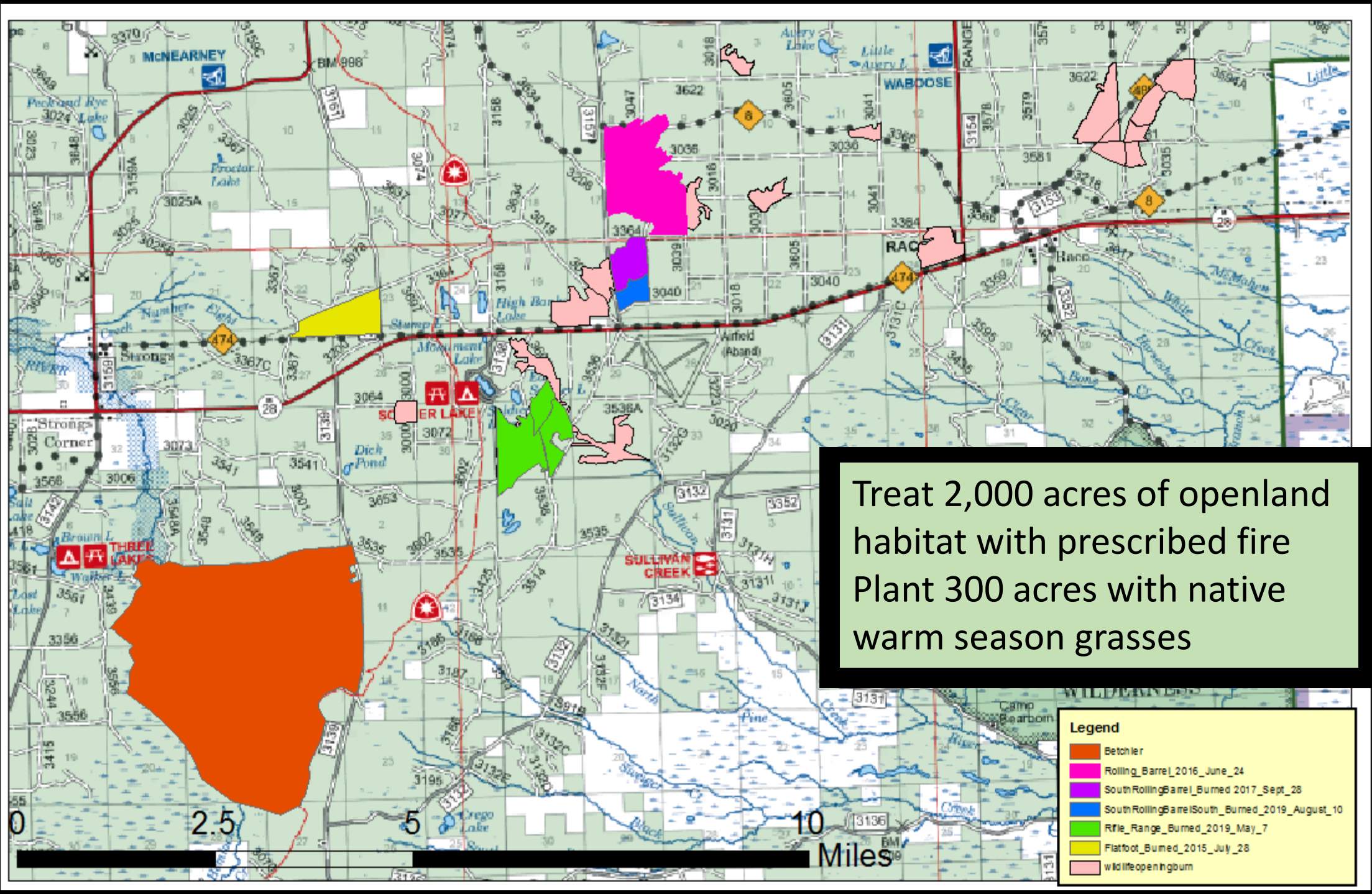
Bine - Ruffed Grouse

a) Desired Outcomes: Increase quality and quantity of winter and breeding season habitat.

b) Strategies: Maintain and/or increase structural and species diversity of vegetation for horizontal cover. Maintain and/or increase diversity of food sources using fires of varying intensities and severities.

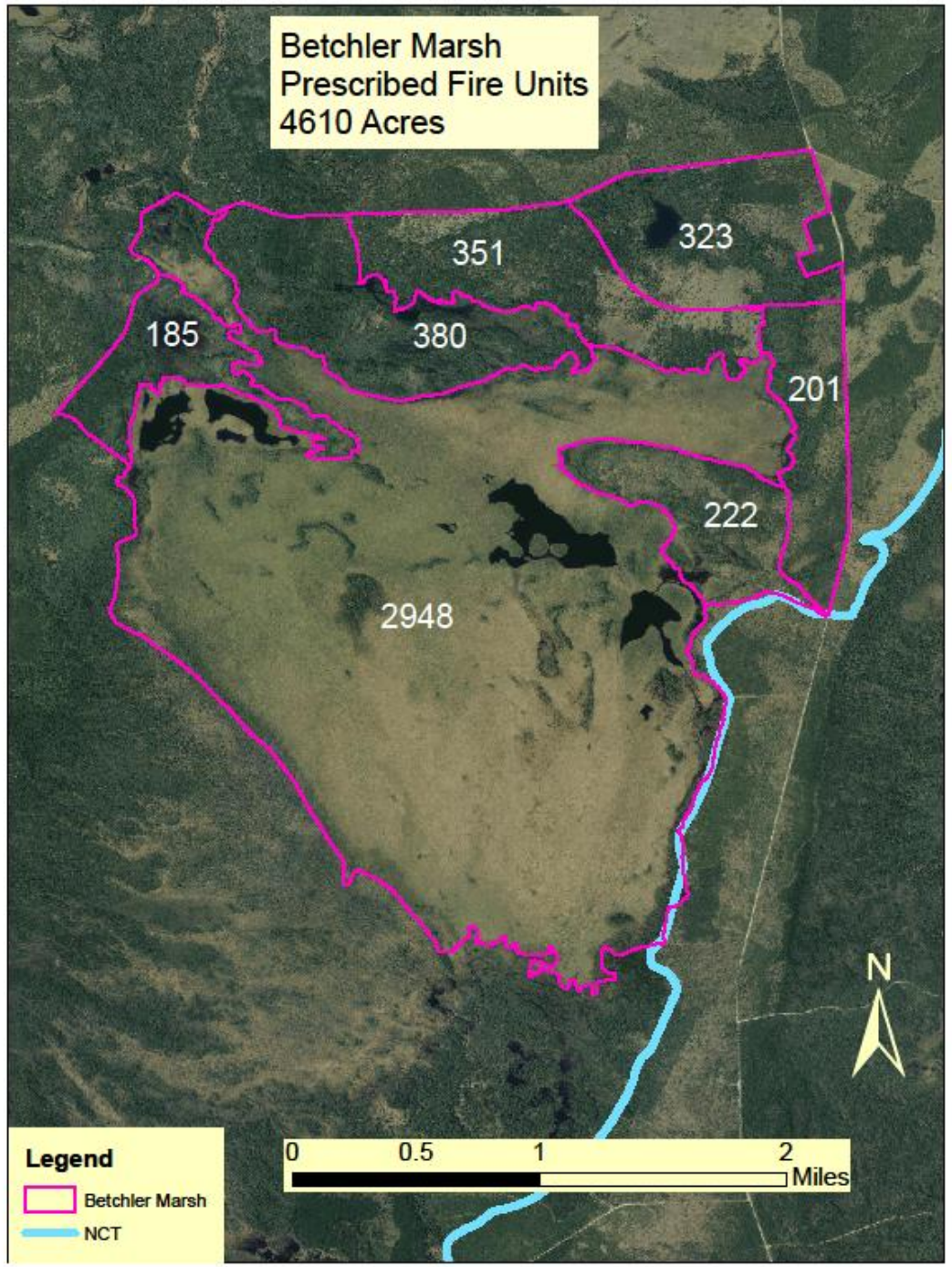
c) Monitoring: Monitor occupancy, abundance, and distribution of ruffed grouse.

- Received $50,000 from GLRI
- Sault Tribe collecting field data
- Collaborating with Michigan Sharp-tailed Grouse Association and UP Resource & Development Council
- Building connective corridors through large opening creation and temporary openings by conducting KW mgmt. around existing openings
- Enhancing habitat through strategic planting of warm season grasses



Treat 2,000 acres of openland habitat with prescribed fire

Plant 300 acres with native warm season grasses



Review the Ishkode Plan Objectives for Betchler's Marsh

- Re-establish ishkode (fire) in Betchler's Marsh.
- **Maintain peatlands** and open wetland character.
- Reduce woody encroachment.
- Reduce black spruce woody encroachment.
- Create opportunities for cedar and hemlock regeneration and recruitment.
- Identify opportunities to protect and promote late seral forests at fine scales.
- Increase biological and structural diversity specifically in red pine plantations.
- Maintain high canopy closure and large wood debris recruitment in cold water streams.
- Engage Sault Tribe members in assessing plant response, habitat change, and other monitoring activities through site visits and harvest reports

List of Partners

- Sault Ste Marie Tribe of Chippewa Indians
- USFS Hiawatha National Forest
- Michigan Sharp-tailed Grouse Association
- Upper Peninsula Resource and Development Council
- Michigan State University
- University of Michigan
- Michigan Department of Natural Resources
- Ruffed Grouse Society
- USFS Northern Research Station

We would like to Acknowledge the many community members who have and continue to share their time and knowledge

Paul Thompson- paul.d.thompson@usda.gov
Eric Clark – eclark@saulttribe.net
Eric Rebitzke – eric.rebitzke@usda.gov
Brenda Dale – brenda.dale@usda.gov
Marty Sarrault- marty0127@peoplepc.com

This project has been supported by the USFS, Sault Ste. Marie Tribe and Bureau of Indian Affairs through Tribal Resilience Program, Michigan Sharptailed Grouse Association, Upper Peninsula Resource Conservation and Development Council and the Great Lakes Restoration Initiative.