CLIMATE CHANGE ADAPTATION IN THE 1854 CEDED TERRITORY

RISING VOICES 6
4/11/18
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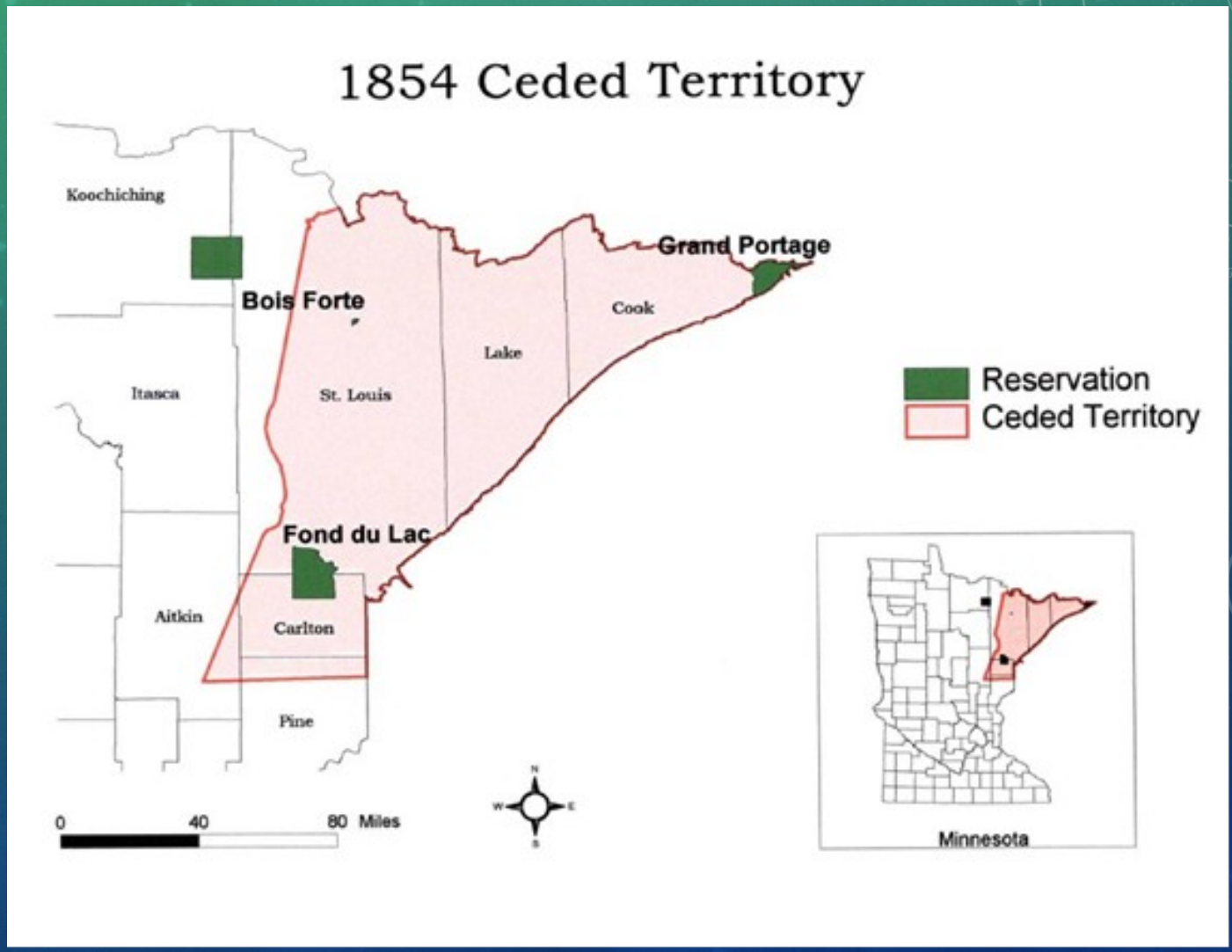
PROJECT AREA



APPROACH

Project Goal

Collaboration

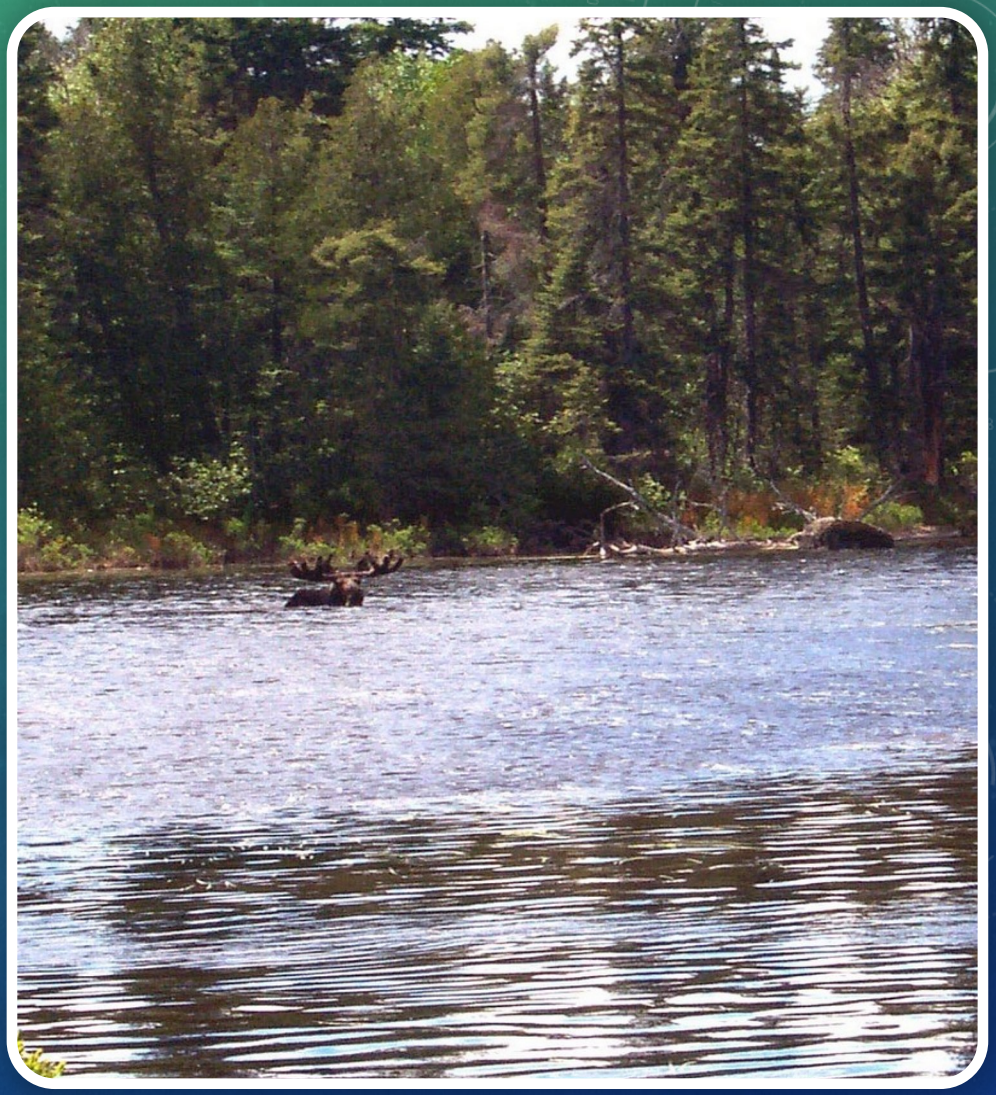
Hired contractor assistance

Identified project team (meetings, calls)

Shared tribally collected data/information, collected outside information to fill gaps

PROCESS

- Rapid Climate Assessment
- Vulnerability Assessment
- Adaptation Strategies

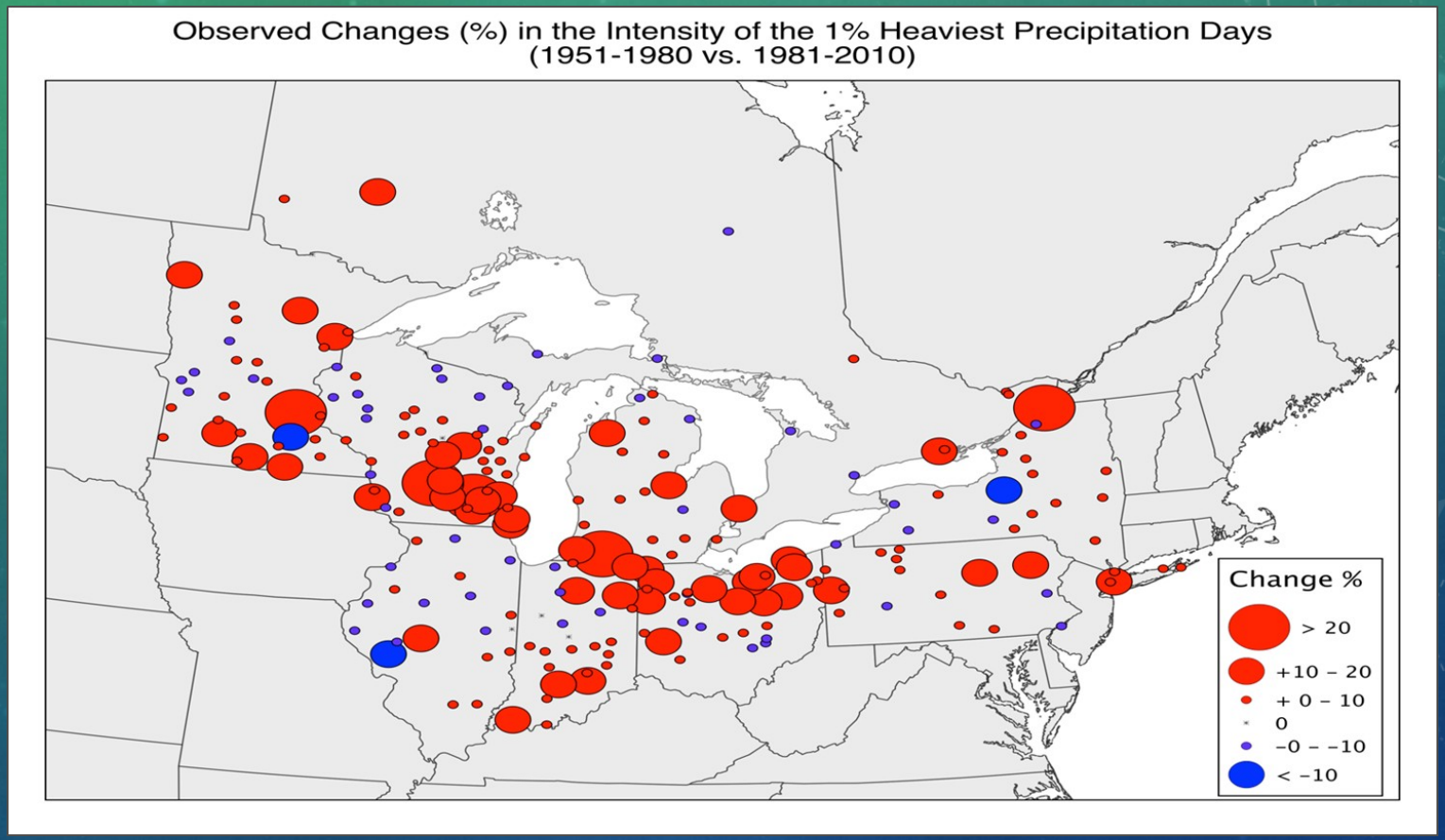


RAPID CLIMATE ASSESSMENT

TEMPERATURE CHANGES

	Annual	Winter	Spring	Summer	Fall
Northeast Minnesota					
Max. Temp.	3.5°F	4.8°F	4.6°F	1.9°F	2.4°F
Min. Temp.	4.0°F	6.8°F	4.4°F	2.4°F	2.3°F
East Central Minnesota					
Max. Temp.	3.2°F	5.0°F	4.4°F	1.1°F	2.1°F
Min. Temp.	3.8°F	6.7°F	4.2°F	1.9°F	2.2°F

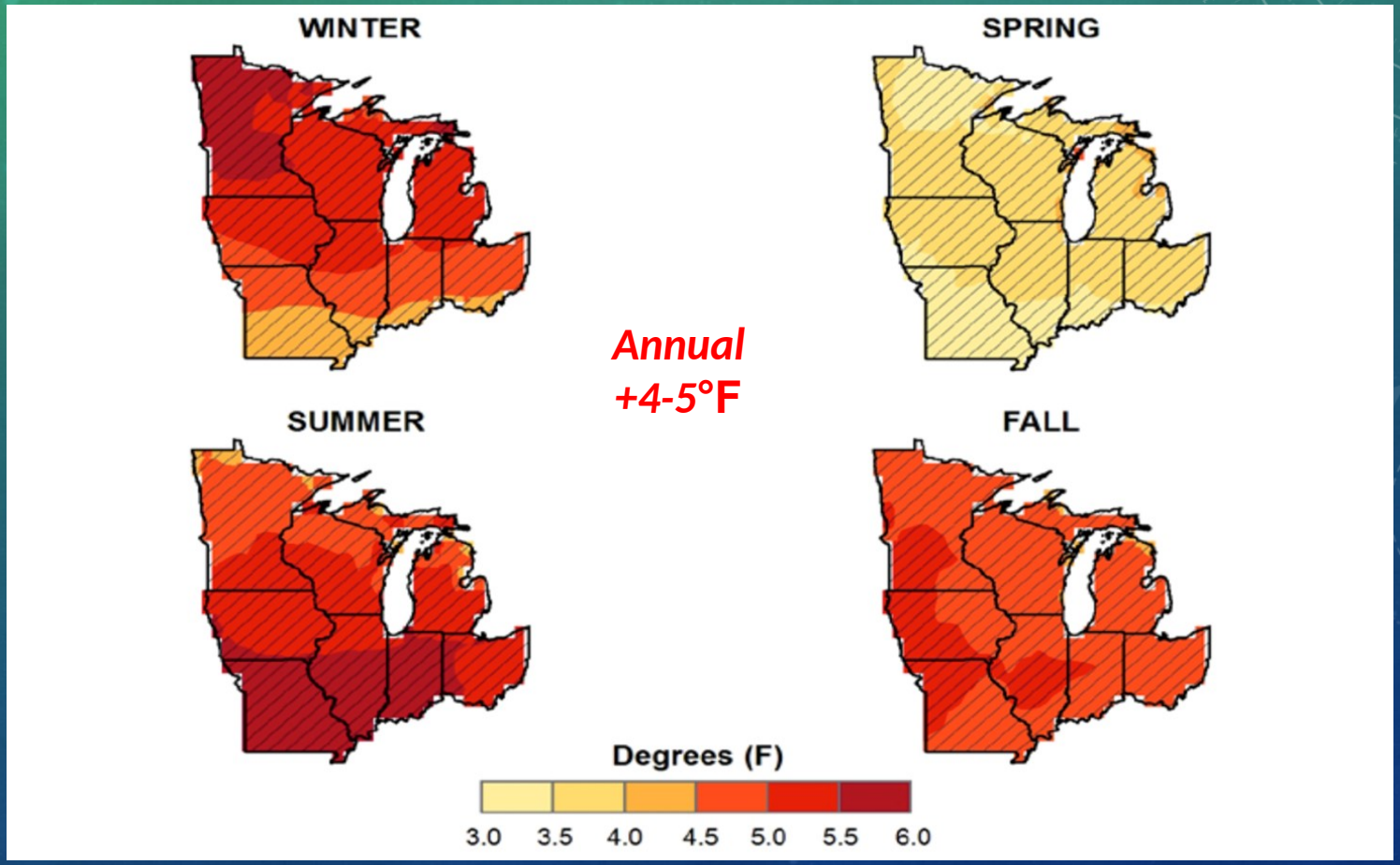
OBSERVED CHANGES



PROJECTED CHANGES: TEMPERATURE

Winter
+5-6°F

Spring
+3-4.5°F

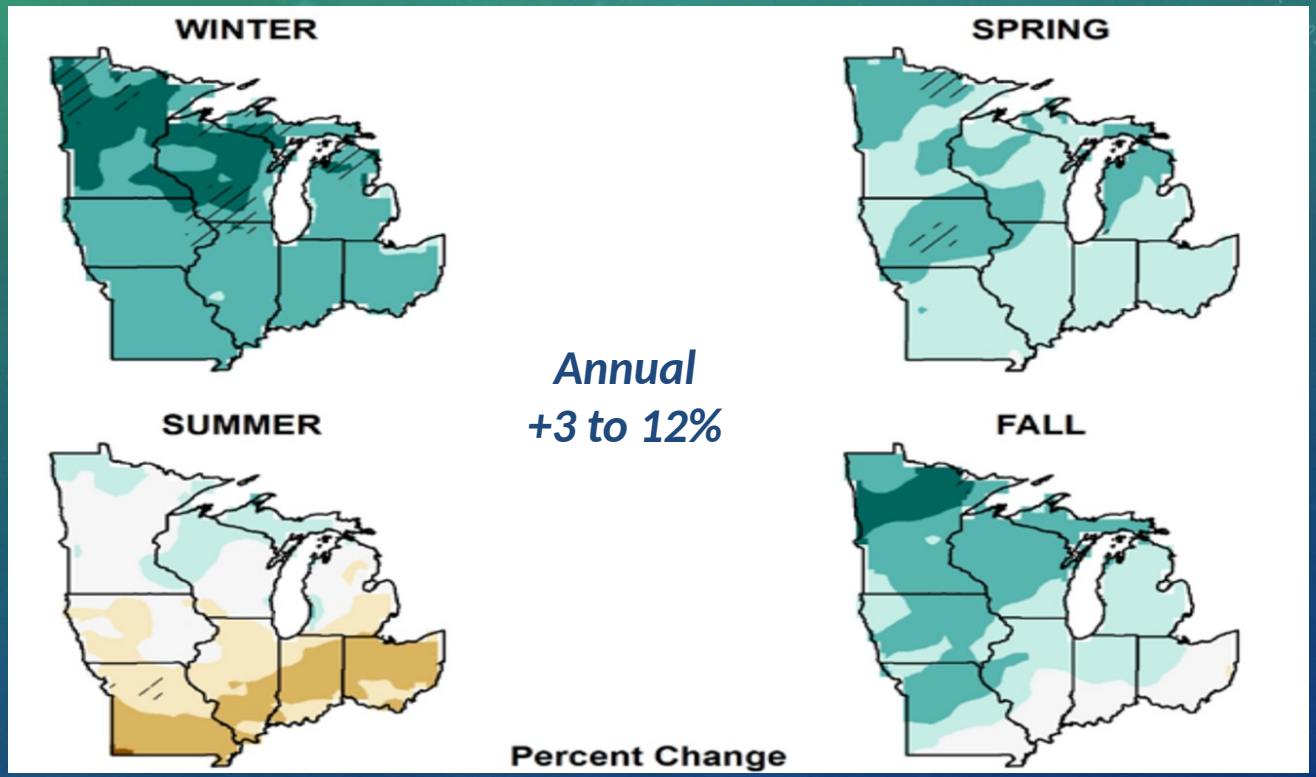


Summer
+4-5°F

Fall
+4-5°F

PROJECTED CHANGES: PRECIPITATION

Winter
+10 to 20%



Spring
+5 to +15%

Summer
0 to 5%

Fall
+10 to +20%

VULNERABILITY ASSESSMENT PROCESS

- Purpose: ID key resources and their vulnerability to climate change
- Resource categories
- Identify experts
- Workshop: 10/20/2015
- Follow-up calls

VULNERABILITY ASSESSMENT

		Sensitivity: Low → High				
		S0	**S1**	**S2**	**S3**	**S4**
Adaptive Capacity: High ↓ Low	**AC4**	• Black Crappie	• Berries (w/o Bog Species) • White-Tailed Deer			
	AC3		• Bald Eagles • Wolves • Birds and Waterfowl (turkey, duck, pheasants, geese)	• **Air Quality** • **Walleye** • Northern Pike	• **Sturgeon** • Eastern White Pine • Furbearers (beaver, black bear, bobcat, coyote, fisher, fox, mink, muskrat, river otter,) • Northern Red Oak, Bass Wood, and Chokecherry	
	AC2			• **Culturally Significant Plants** • **Sugar Maple** • Black Ash • Resource Access • Shrub Wetlands	• **Wild Rice** • **Labrador Tea** • Berries (bog species)	• Quaking Aspen
	AC1			• Culturally Significant Places	• **Water Quality and Quantity** • Birds and Waterfowl (ruffed grouse, spruce grouse, loons, swans) • Cisco • Furbearers (lynx, American marten, snowshoe hare) • Lake Trout • Whitefish	• **Moose** • Brook Trout • Vernal Pools
	AC0					• **Paper Birch** • **Boreal Wetlands** • Northern White Cedar

DEVELOPING ADAPTATION STRATEGIES

- Goal: develop strategies for all resources, detailed strategies for a subset (11)
- Workshop: May 10, 2016
- Reviewed strategies
- Five categories

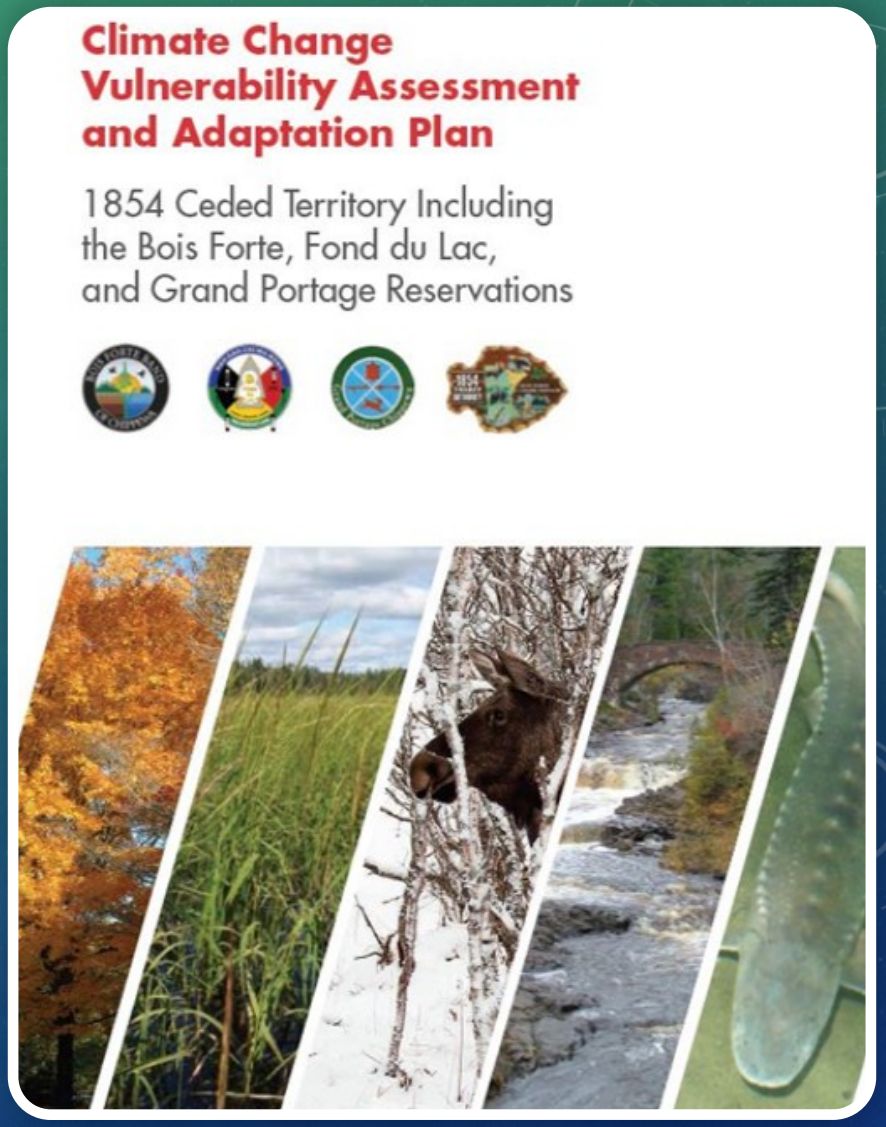
STRATEGY CATEGORIES

Category	Number of Strategies for Focus Species	Example Strategies
Collaboration	45	▪ Enhance collaboration with local, county, state, and federal wetland management organizations to identify, monitor, and track wetlands throughout the region. *(Culturally Significant Plants)* ▪ Strengthen partnerships with the MNDNR and universities to continue to evaluate and monitor climate change impacts on walleye. *(Walleye)*
Conservation Preservation Maintenance	98	▪ Assure future availability of wetlands and other habitats where moose are most secure from heat stress by undertaking wetland conservation initiatives such as conservation easements, mitigation banking, and others deemed viable. (*Moose)* ▪ Promote landscape water retention to protect against soil drying and overall drought stress. (*Paper Birch)* ▪ Protect remaining populations of wild rice, regardless of density. *(Wild Rice)*
Education	31	▪ Work with news media sources to inform and educate the public about moose and moose management programs in northeastern Minnesota. *(Moose)* ▪ Make sure that heat alerts are very clearly advertised to the public through venues such as websites, social media, and potentially an air quality flag system (e.g., EPA has a program). *(Air Quality*)
Monitoring Assessment	69	▪ Develop and maintain water quality database for reservation waters and for waters within 1854 Ceded Territory. *(Water Quality)* ▪ Inventory important sugar maple stands for climate protective site characteristics (e.g. north facing, deep, fertile soils, low drought stress) and work with partners to enhance and protect these areas. *(Sugar Maple)*
Restoration	26	▪ Resize new and existing culverts (e.g., retrofits) to ensure they can handle projected changes in precipitation. *(Boreal Wetlands)* ▪ Reduce non-climate stressors like pollution: expand the restoration or enhancement of riparian buffer zones around key lakes and streams to limit agricultural run-off or other non-point source pollution that would degrade water quality, ensure water quality standards are met and enforced. *(Sturgeon)*

CURRENT STATUS: IMPLEMENTATION

- Plan finalized in August, 2016
- More information: http://www.1854treatyauthority.org/environment/climate-change.html

- Hired Tansey Smith, Climate Change Specialist, to develop program and implement plan



CLIMATE CHANGE PROGRAM

	Conduct: Conduct outreach and education in relation to climate change impacts to natural resources
	Develop and implement: Develop and Implement a monitoring plan to assess impacts of climate change on natural resources
	Engage: Engage by expansion of partnership effort with other management entities
	Implement and update: Implement and update Climate Change Vulnerability Assessment and Adaptation Plan

IMPLEMENTATION: REVIEW, RANKING, PRIORITIZATION

WILD RICE

Adaptation Action-Collaboration	Goal Addressed	Key Staff	Next Steps	Timing of Action	Cost	Ease of Implementation	Partnerships Required	Status
Review and comment on MDNR aquatic plant permits	regulation	Darren	enhance communication to get in more of the information loop	Immediate	Low	Easy	yes, DNR	on-going
Review and comment on MDNR lake management plans	management	Darren	enhance communication and information	Immediate	Low	Easy	yes, DNR	on-going
Continue to advocate or work with EPA to promulgate regional water quality standards to protect wild rice (as opposed to focus only on state standards)	protection	Darren/Tyler	push more formally with EPA	Medium-term	Low	Moderate	yes, Bands	on-going
Consult with federal and state agencies on the development and enforcement of water quality standards	enforcement	Darren/Tyler	continue to be involved in meetings/conversations	Immediate	Low	Easy	yes, MPCA & EPA	on-going
Coordinate management and restoration efforts among tribal, federal, state, county and non-governmental entities	management	Darren	identify opportunities for restoration efforts	Immediate	Low	Easy	yes, Tribes, Fed, State, County, NGOs	on-going

CURRENT IMPLEMENTATION PROJECTS

- Wild Rice (Manoomin) Phenology
- Sugar Maple Phenology
- Moose Breeding Activity
  - Frog/Toad Calling
- Temp Loggers
- Rain Barrels
- Ice Thickness
- Climate Summary

MIIGWECH!! (THANK YOU)

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