

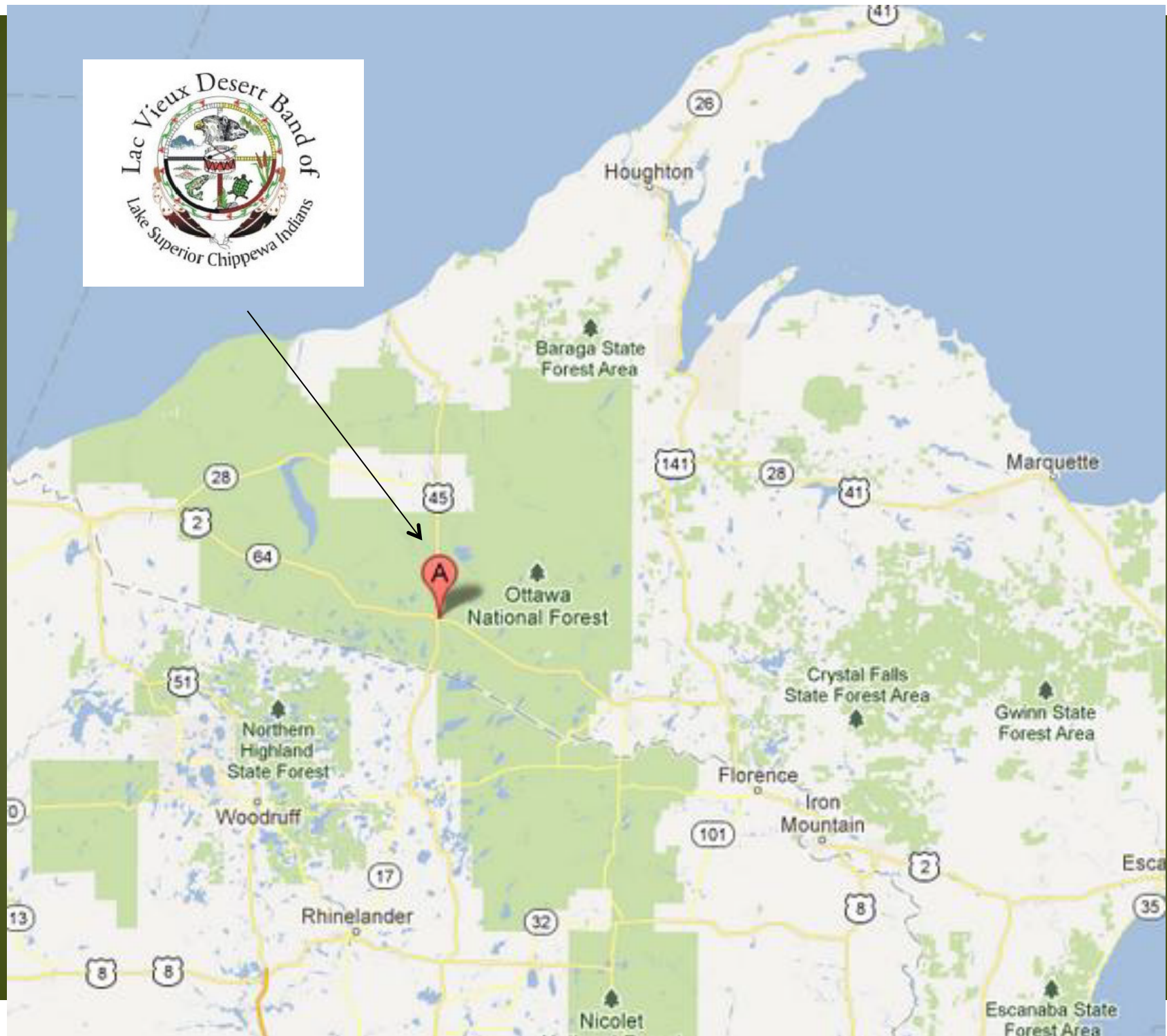
Adapting to the Effects of Climate Change on Wild Rice



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Focus Area

- Relationship between wild ricing, ecology, climate change and cultural knowledge
- Reviewed literature
- Met with Tribal Elders – Traditional Knowledge
- Developed adaptation strategy



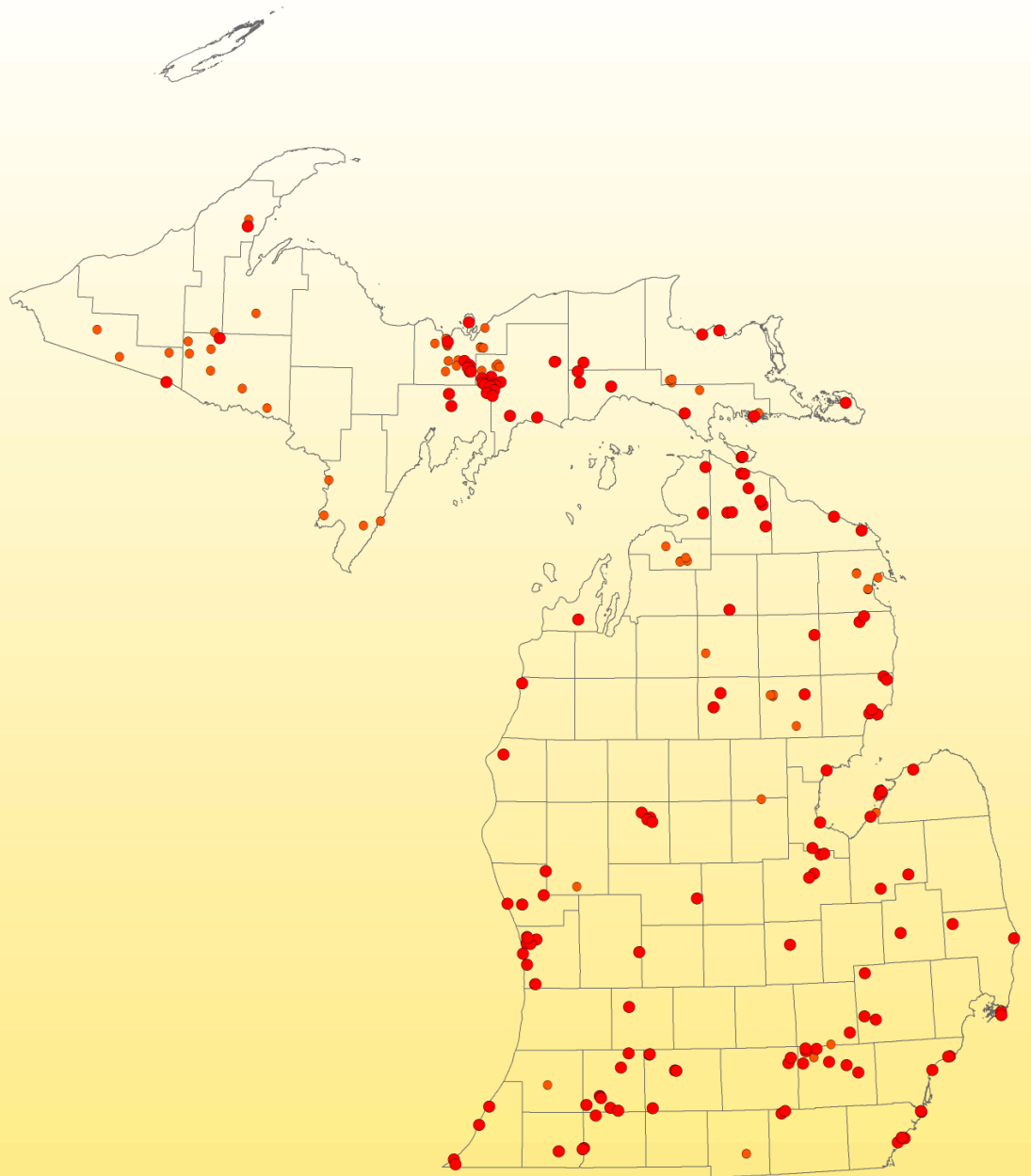
Climate Change Predictions

The potential impacts on Manoomin



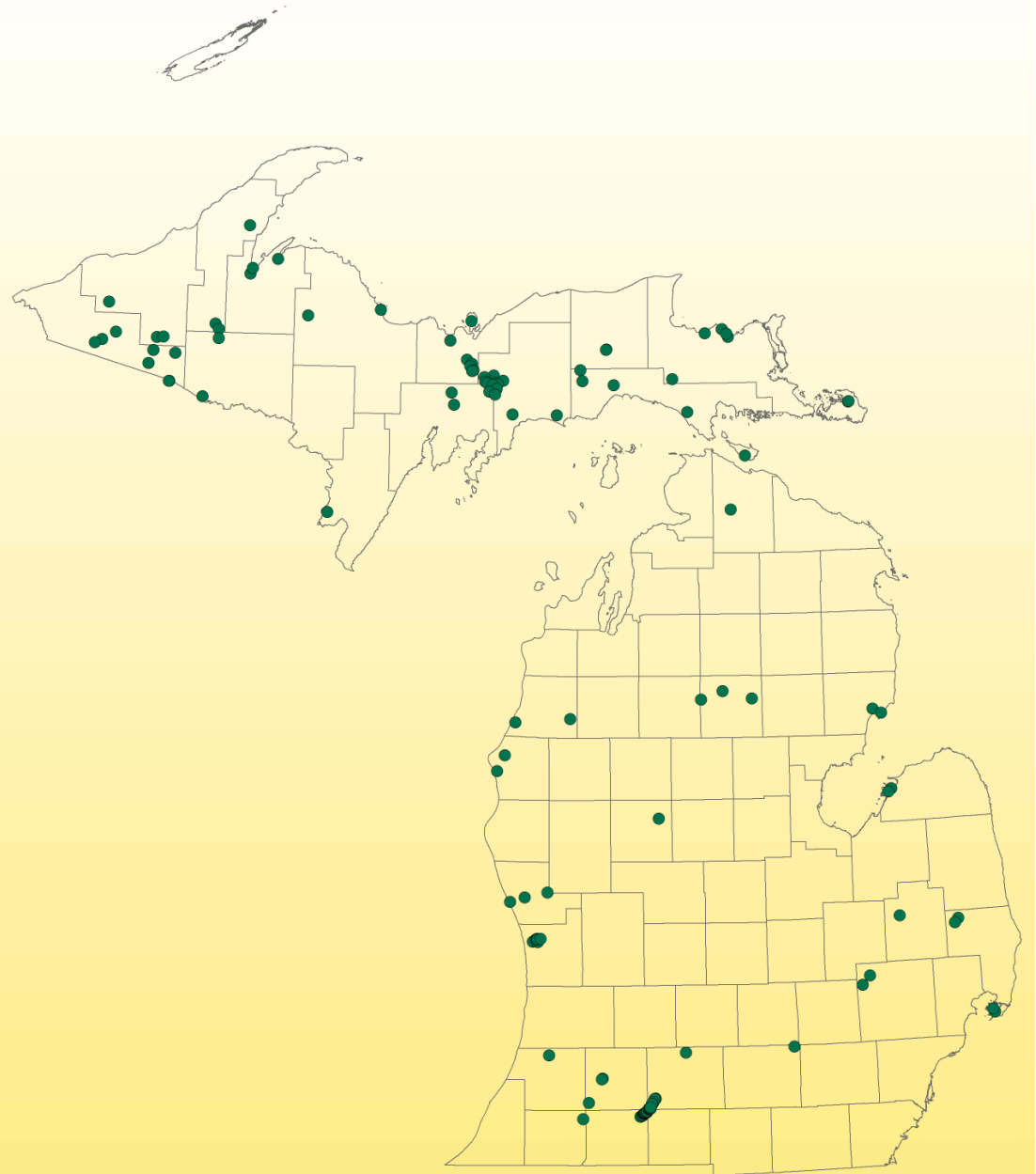
Historic Distribution

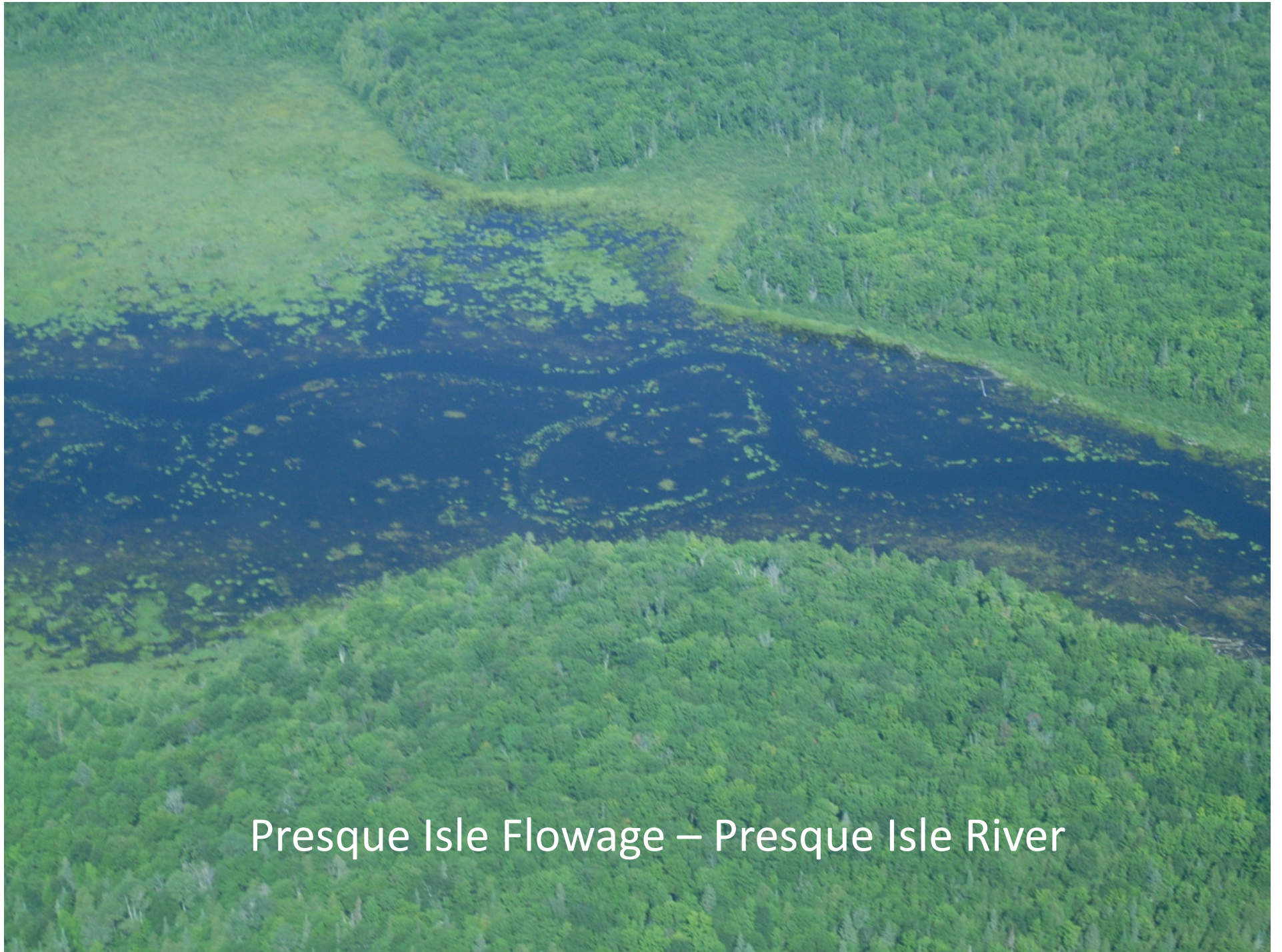
- 245 Sites



Extant Sites

- 154 locations





Presque Isle Flowage – Presque Isle River



Rice Bay, Lac Vieux Desert

Winter

Seeds prefer temps below 35° for 3-4 months to germinate

Temps ↑ 8°

- *Impacts germination*

Loss of Ice Cover

- *Loss of protection from winter storm events*

Precipitation ↑20%

- *Increased flood events in spring*



Spring

Temps ↑ 6.5°

Precipitation

- ↑ *Storm events*
- *Heavy rain events*
25% increase in frequency
- *Flash floods -*
increase in runoff/
snow melt



Summer

Temps ↑ 6.5°

- *Growing season increases 8 - 10 weeks*
- *Drought conditions*
- *Decrease/increase wetland habitat*
- *Pollination affected, reduced seed production*



Summer

Temps ↑ in Lakes

- *Lower O^2 levels*
- *↑ invasives – carp, hydrilla, water hyacinth*
- *Other invasives expand northward*
- *Decomposition ↑, releasing nutrients, contaminants, including phosphorous*



Summer

Dewpoint Trending ↑

- *Warm, humid conditions support growth of brown spot fungus (Bipolaris oryzae, B. sokiniiane)*



Peter David - GLIFWC

Fall

Temps \uparrow 6.5°

- *Low water levels*
- *Advance of Phragmites*
- *Biodiversity \downarrow if rice production declines - bird species moving northward*



Conversations with Tribal Elders



Intergenerational Knowledge

- Elders - cultural knowledge
- Younger members - scientific understanding of climate change
- Elders – historical perspective, ricing heritage, past climatic events



Common Themes - Elders

- Recognition of history and legacy of wild rice
- Sovereignty and rights (legal) of LVD to pursue ricing
- Protection of rice habitats (lakes, wild rice beds)
- Education of younger community members about climate change and wild ricing.

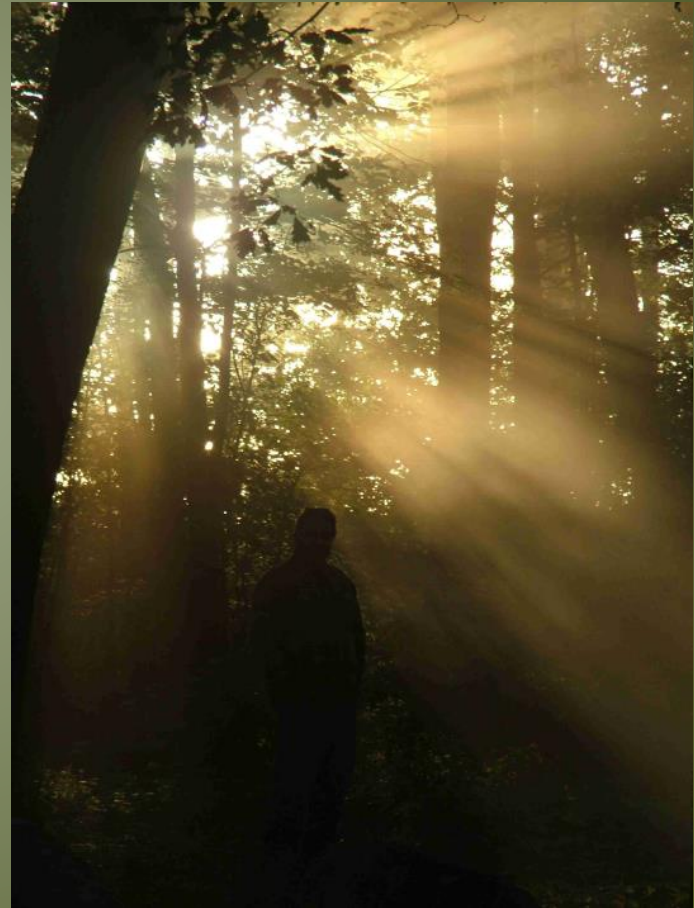
Other Important Points



- Ricing - community identity and connection to the past
- Community members riced in the past, often away from Tribal areas

Threats to Ricing

- Revitalization efforts just beginning
- Outside political and economic factors
- LVD does not have control or influence over traditional harvesting activities
- Lack of younger practitioners and experts that will carry traditions of their ancestors



Adaptive Strategies



- Knowledge building
- Ecological - monitoring
- Regulatory protection
- Education and outreach
- Coalition building and collaborations

Knowledge Building



- Traditional knowledge + western science
- Research on climate change, plant and habitat ecology
- Monitoring conditions/Manoomin beds

Regulatory Protection

- Tied to Tribal sovereignty and treaty rights
- Tribes must preserve and protect wild rice habitats, their right to harvest, and food sovereignty
- Learn from MN and WI Regulatory process



Education and Outreach

- Climate change, Tribal perspective on wild ricing and adaptation
- Ecological, economic and cultural information, ways to develop a climate resilient community



Coalition Building and Collaborators

- GLIFWC (Great Lakes Indian Fish and Wildlife Commission)
- USFWS
- USFS
- US EPA
- MI DNR, DEQ
- Native Wild Rice Coalition
- USDA – NRCS
- Stewardship Network



Summary

- Manoomin affected by climate change
- Adaptation strategies needed
- Merging of TEK and Western Science
- Regulatory protection
- Education and outreach
- Coalition building and collaborations

Miigwetch



Freshwaterfuture.org

Questions?



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