Building Resiliency in the Face of Climate Change:

Exploring ways land trusts can overcome barriers and act

2022 Canadian Land Trust Summit
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Climate Change and Land Trusts

Protected areas

- High biodiversity
- High threats of habitat degradation, fragmentation and habitat loss
- Mitigate impacts
- Increase community resilience

Research on Ontario land trusts

- **Obstacles**: limited capacity, resources, and knowledge
- **Desired support**: stewardship training and guidance, sharing knowledge and experience, communications

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Climate Action Working Group

Members:

- OLTA staff
- Member land trusts
- Research associates

Goals:

- Provide research, guidance and support
- Develop a platform for information sharing
- Increase public awareness of climate change

Funding & Partners:

Ontario Trillium Foundation / Fondation Trillium de l'Ontario

An agency of the Government of Ontario
Un organisme du gouvernement de l'Ontario

Social Sciences and Humanities Research Council of Canada
Conseil de recherches en sciences humaines du Canada

Canada

Haliburton Highlands Land Trust

Thames Talbot Land Trust

rare Charitable Research Reserve

University of Waterloo

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Climate Action Program Activities

2019-2020

- Communicating climate change
- Climate Vulnerability Assessment Tool development

2020-2022

- Climate change adaptation series
- Analysis and recommendations
- Sharing knowledge


Credit: B. Kennedy

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Communicating Climate Change

Developed climate change communications package to provide land trusts with effective consistent messaging, including:

- Long video with complimentary short videos
- Slide-deck for presentations
- Shareable infographics


Credit: M. Roblin

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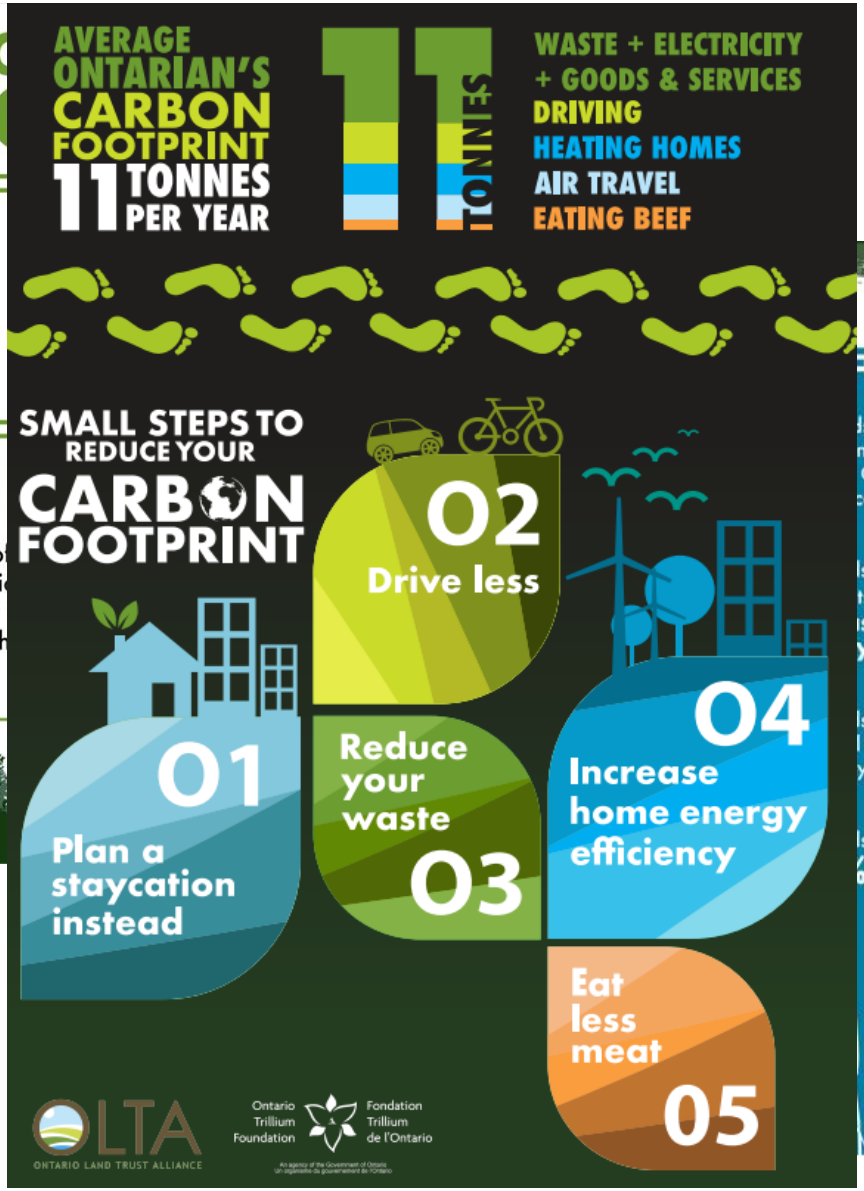

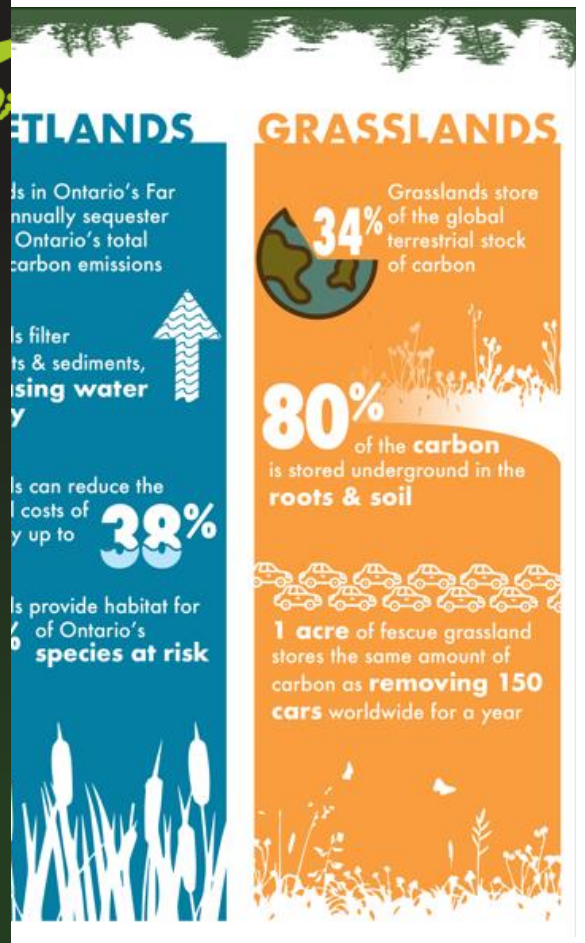

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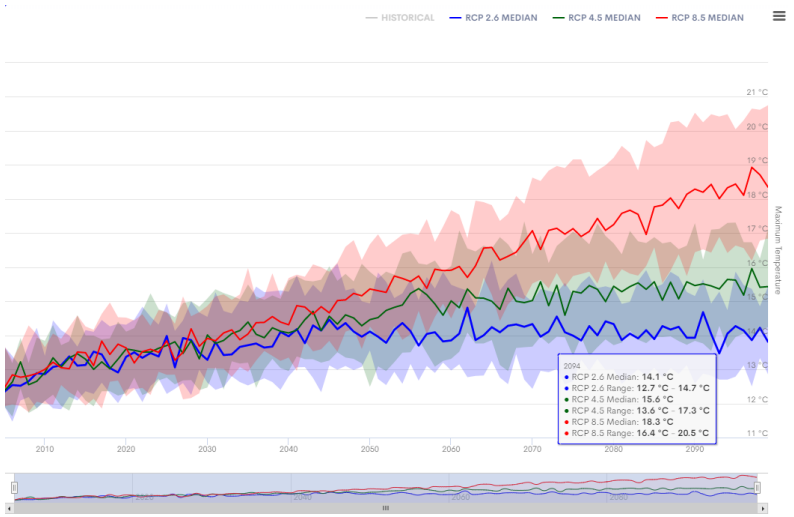
Climate Vulnerability Assessment

Goals

- How do we assess vulnerability and increase resilience of conservation lands?
- How do we translate climate trends into action?



Methods

- 11 climate variables included
- 3 emission scenarios and 3 time periods
- Process based on multiple existing tools and resources

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Climate Vulnerability Assessment

Outcomes

- Choosing adaptation strategies using results of the assessment

Strategy 5: Climate smart restoration

Description

A "fix it forward" approach to restoring functionality and adaptability to future climatic conditions. Focus on processes rather than composition and to the future not to a past that is gone (e.g., Hagerman and Chan, 2009; Lawler, 2009; Mawdsley et al., 2009; West et al., 2009).

Example Adaptation Option

Favour the natural regeneration of species that can adapt to a changing climate and are better suited to projected future conditions (Beavers et al., 2016; Mawdsley et al., 2009; Stein et al., 2014).

Remove barriers to diurnal flooding and freshwater stream flow to support appropriate inundation regimes (Stein et al., 2014; Stevens and Cadrin, 2016; US EPA, 2009).

Restore riparian vegetation along coastal foreshores to increase bank stability and reduce erosion (Haeussler and E.H., 2012; Stevens and Cadrin, 2016; van Proosdij et al., 2016).

Parker et al. 2018. Climate Change Adaptation Options for Biodiversity: Part 1. Context and Guidance Report.

Case Study: ***rare*** Charitable Research Reserve

Prioritizing Conservation Targets: How the Climate Vulnerability Assessment can help

	Conservation Target
	Example: *Cold-water tributaries*
1	Cold-water tributary (Bauman)
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2	Forested Feature (Hogsback)
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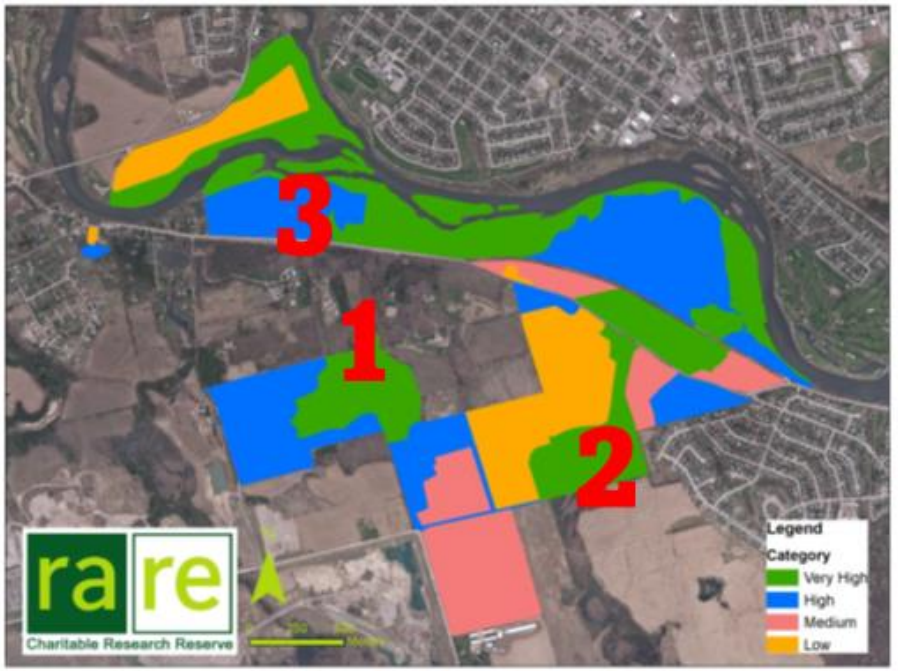
2	Forested Feature (Hogsback)
3	Tallgrass Prairie (Blair Flats)
3	Tallgrass Prairie (Blair Flats)
3	



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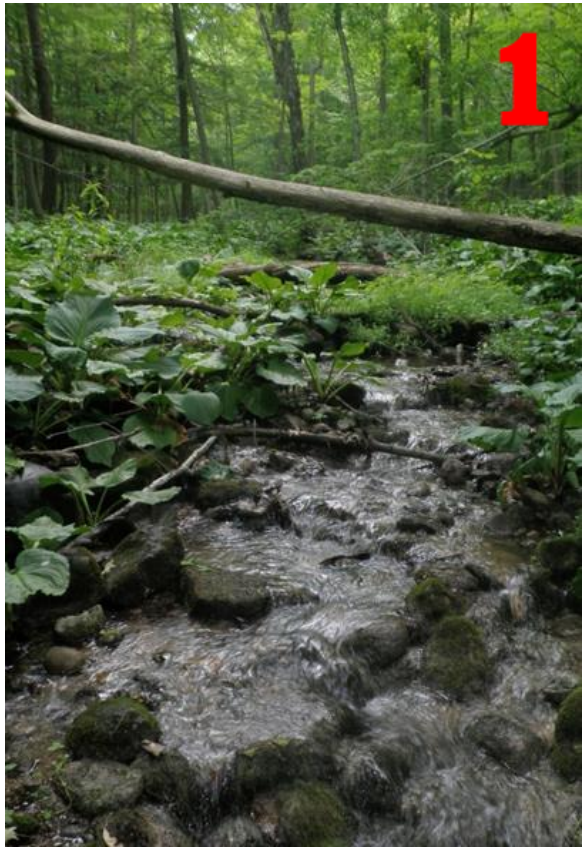
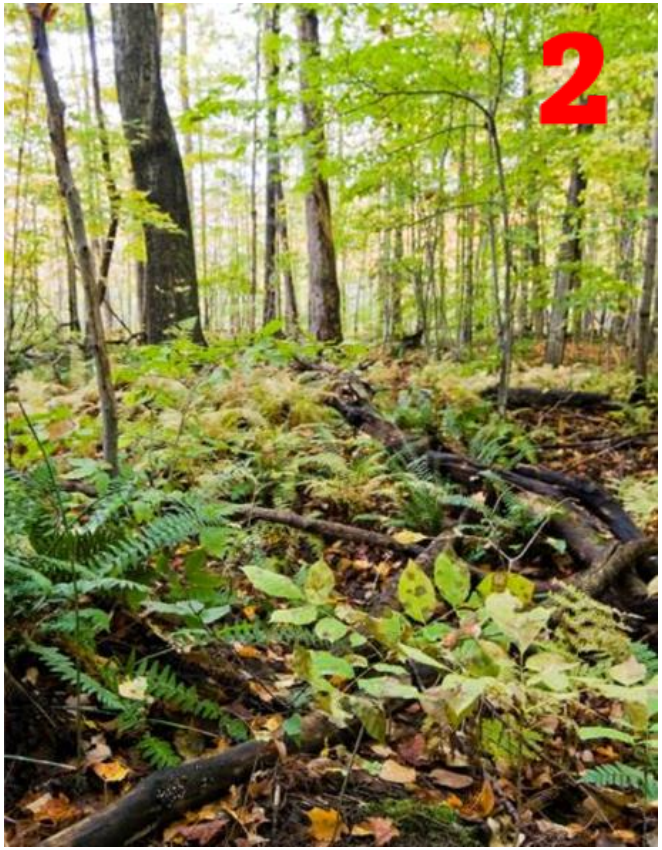
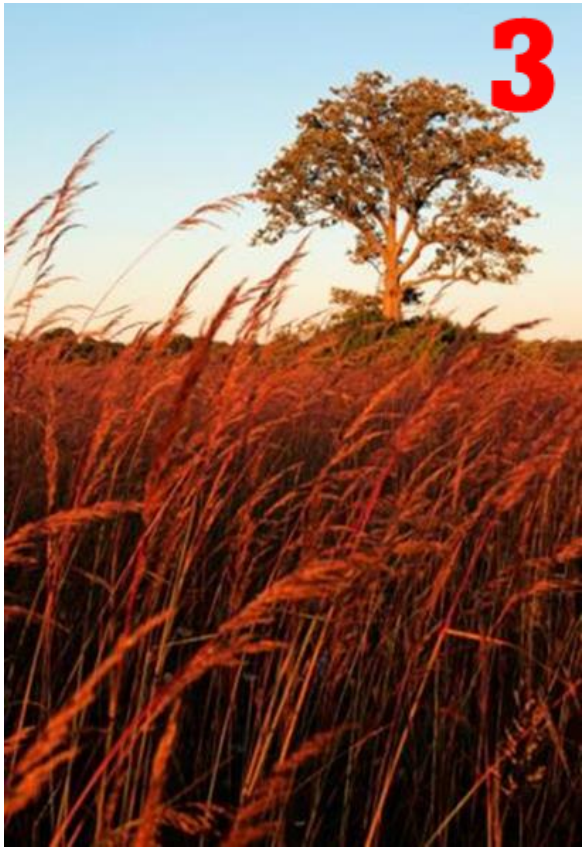
Case Study: ***rare*** Charitable Research Reserve







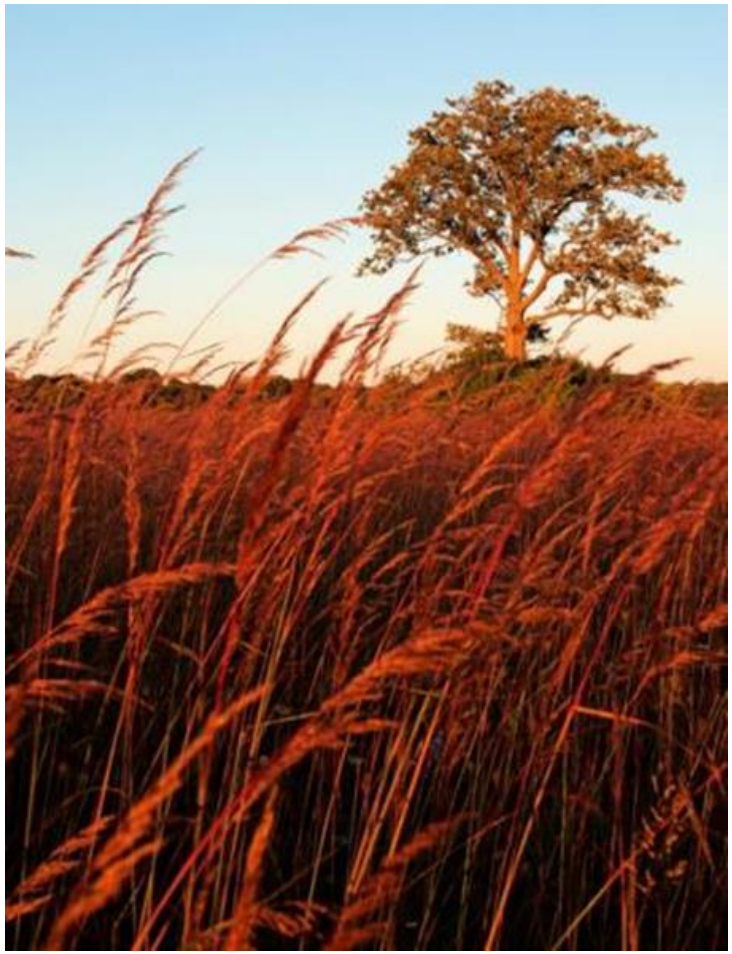
Case Study: ***rare*** Charitable Research Reserve

	Conservation Target	Key Attribute	Indicator	Indicator Rating
	Example: Cold-water tributaries	*Indicator Species*	*Cold-water fish diversity and abundance*	*Very Good*
1	Cold-water tributary (Bauman)	Water Quality	Dissolved oxygen	Good
1	Cold-water tributary (Bauman)	Assemblage	Hilsenhoff Biotic Index	Poor
1	Cold-water tributary (Bauman)	Presence of Brook Trout	Population self-sustainability	Good
2	Forested Feature (Hogsback)	Forest Size	Forest Interior Area (ha)	Fair
2	Forested Feature (Hogsback)	Habitat Matrix & Connectivity	Minimum Corridor Width (m)	Fair
2	Forested Feature (Hogsback)	Invasive Plant Species Dominance	species in ELC communities	Good
3	Tallgrass Prairie (Blair Flats)	Size	Open space area (ha)	Very Good
3	Tallgrass Prairie (Blair Flats)	Invasive Plant Species Dominance	species in ELC communities	Poor
3				

To determine vulnerability of target, consider:

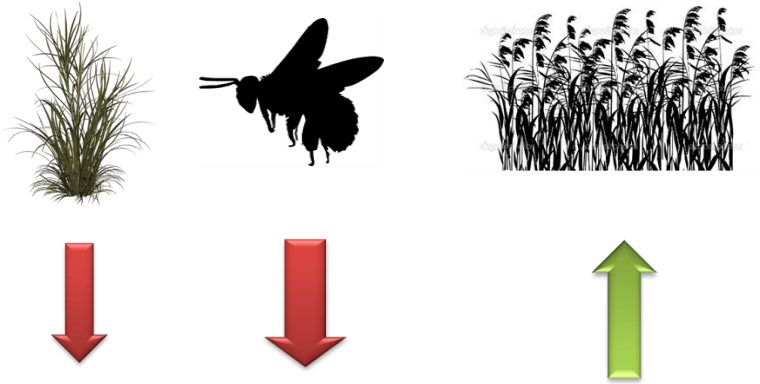
- Interaction of climate & non-climate threats
- Likelihood, size of impact, and risk of those threats
- Adaptive capacity of target

Case Study: ***rare*** Charitable Research Reserve



Existing threats: roadway, invasive species, housing, flooding

Climate threats: increased flooding and drought risk (extreme weather), invasive species



Case Study: ***rare*** Charitable Research Reserve

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Case Study: Thames Talbot Land Trust

Bebensee Tract

- Looking at restoration of 2 acres
- One target for the area is Prairies & Savannahs
  - Current rating of "Poor"
  - Several non-climate change threats
  - Climate threats include changes in fire regime, changes in soil moisture, increased pests & diseases

Case Study: Thames Talbot Land Trust

- Climate threats will have mixed effects on this habitat type
- Climate threats may exacerbate other threats

Prairies & Savannahs	Effects on Habitat	Likelihood	Impact	Risk	Adaptive Capacity	Vulnerability
Change in fire regime	Low intensity spring fires would benefit prairies and savannah in reducing competition from other species and maintaining open canopy. But high intensity summer fires would destroy plants and prevent reproduction. Latter scenario more likely.	Likely	Major	High	Low	High
Reduced soil moisture in summer and fall	Prairie and savannah species are better adapted to drought conditions and may expand their range as moisture loving species decline.	Almost certain	Minor	Moderate	Low	Moderate
Increased pests and disease	Oak wilt and other diseases may spread into the region and kill off key species in savannah and oak woodland habitats.	Almost certain	Major	Extreme	Low	High

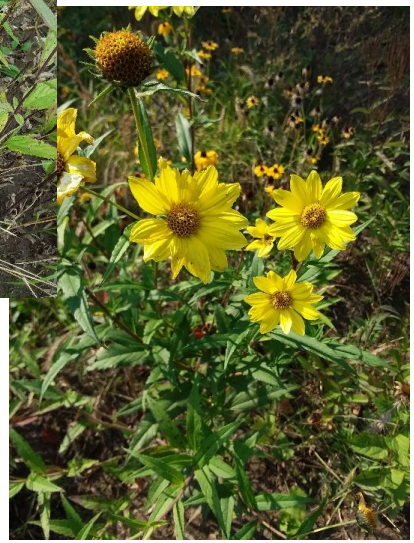
Case Study: Thames Talbot Land Trust

- Planted native seed mix for prairie/savannah
- Sourced seeds from local and more southern populations (Pennsylvania & Kentucky)

Adaptation Strategy	Adaptation Option	Benefits
Increase evolutionary potential	Expand seed collection zone for reforestation and restoration from the local gene pool to include genes from other zones. Additionally, collect seeds produced during "bad" years as well as "good" years since seed produced during "bad" years, such as drought, may have important genetic variation that could help the species adapt to climate change.	More diverse seedling populations increase the potential for populations to adapt to climate change

Case Study: Thames Talbot Land Trust

July 2021 - less than 2 years after planting



Credits: C. Johnson & D. Koscinski

Break Out Activity
(15 minutes)

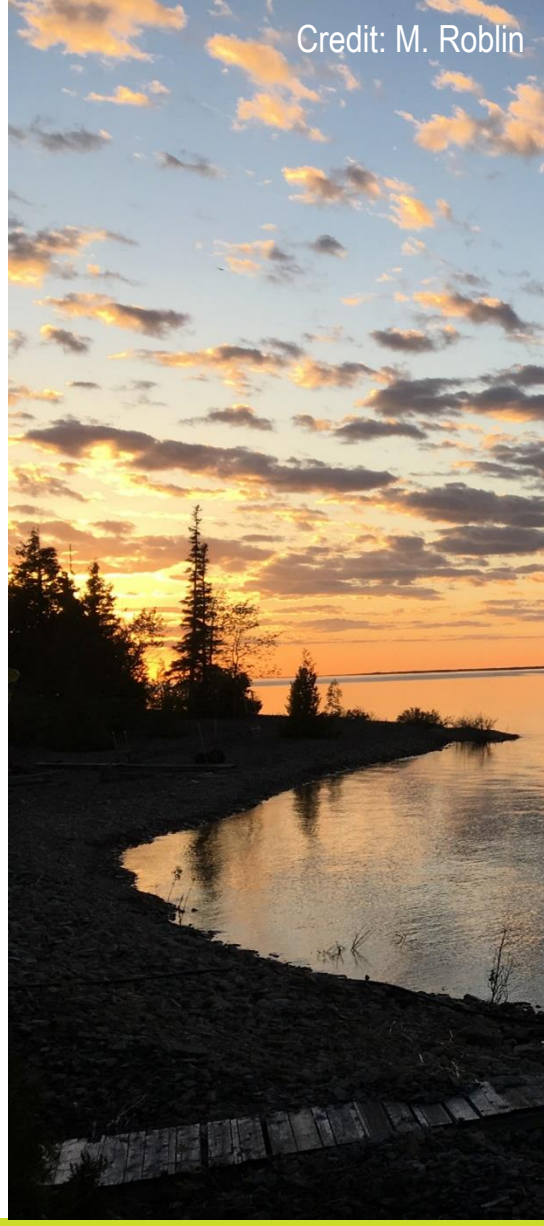
-Select a conservation target
-List existing threats
-Consider how climate change will impact those threats or introduce new threats
-Discuss appropriate climate actions

Climate Adaptation Webinar Series

- Three-part webinar series featuring international, national, and local experts
- Four-part workshop to provide hands on experience using the assessment tool
- Analyzed sessions to identify challenges and opportunities to make recommendations

Results

- 65 individuals attended the 3 webinars
- 17 organizations participated in workshops
- 24 surveys completed by 18 organizations


Credit: M. Roblin

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What We Learned

Challenges/Barriers

- Capacity:
  - Funding constraints
  - Lack of and overworked staff/volunteers
  - Skills and technical knowledge base
  - Lack of property and ecological knowledge
  - Climate change low priority due to competing demands
- Perceptions/philosophy about climate change
- Geographic and demographic factors

What We Learned

Facilitators

- Willingness to act on climate change risks
- Positioning climate change as opportunity to discuss value of land conservation
- Making use of standard frameworks (e.g. CCVAT)
    - Express varied experiences in the same terms to reduce variability/confounding factors
    - Decision making based on clear and explicit assumptions and relationships
- Sharing resources
    - Increasing communication between Land Trusts
    - Access to literature/background studies

Recommendations

1: Shared resources and collaboration

- Take advantage of resources and collaborations that already exist so you don't have to do everything yourself
- Sharing of resources and coordination through larger organizations can support land trusts with fewer resources
- A community of practice can lead to stronger communication and greater collaboration among land trusts


Credit: T. Thorne

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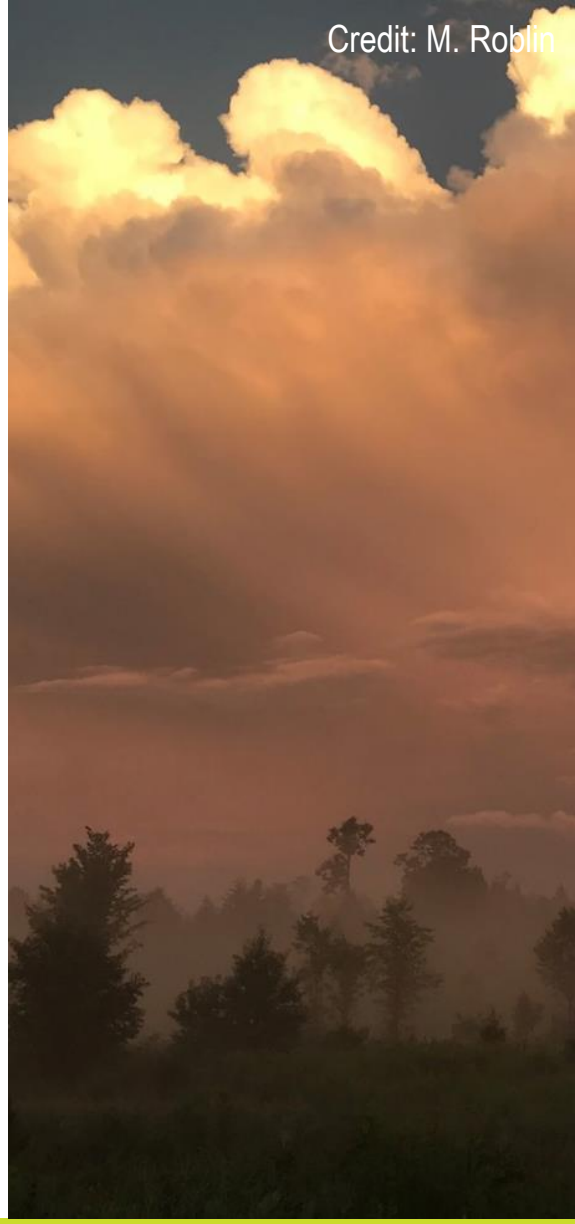
Recommendations

2: Small tweaks

- Reframe work already being done
- Emphasize how Land Trusts are part of climate change mitigation and adaptation solutions
- Focus on resilience of ecosystems

3: Shifting management styles

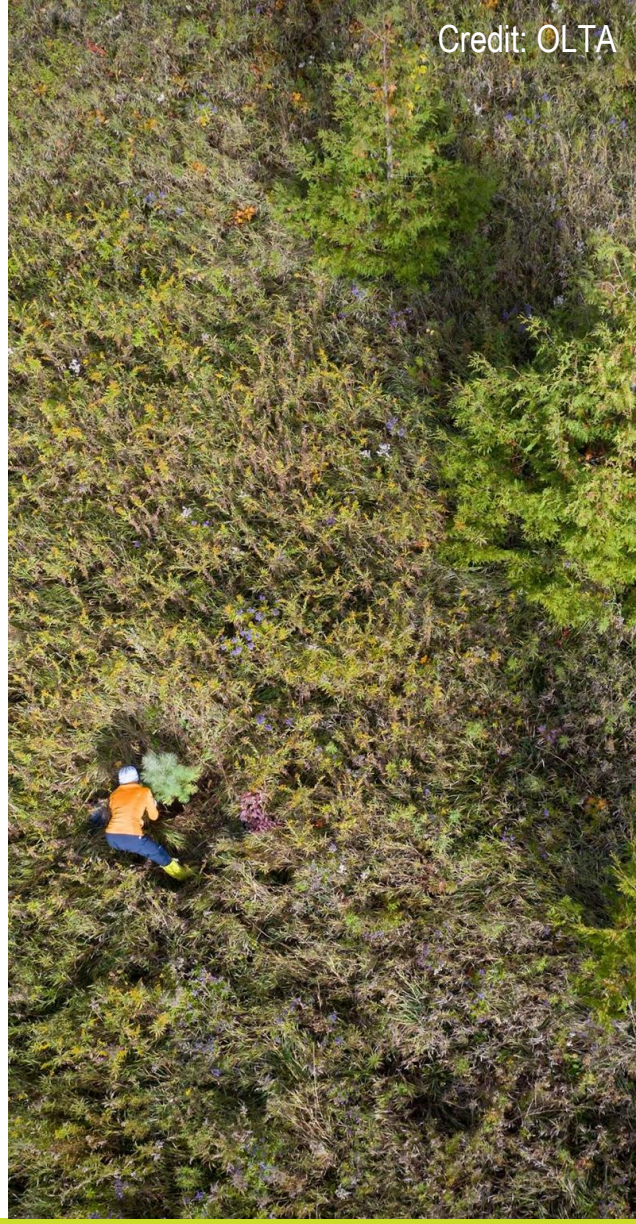
- Shifting to more active management style to be prepared for climate change effects
- Focus on processes rather than species or habitats
- Policy framework to support decisions around climate change actions


Credit: M. Roblin

What's Next?

Big things are coming!

- Opportunity to highlight the contributions of land trusts in meeting climate change targets
- Manuscript on this project is in development
- Community of Practice - in the works!
- Join us!


Credit: OLTA

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