6A: Tools for Climate Change Planning



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OLTA Annual Gathering
October 8, 2019.

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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

- Survey developed by Dr. Drescher
- Understand land trusts, perceptions, knowledge, barriers
- Range of responses from the land trust community

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Climate Change and Land Trusts

Obstacles

- Capacity/resources
- Knowledge/expertise

Desired Support

- Conferences and forums to share climate trends
- Technical training and guidance for land stewardship
- Training related to communications

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Climate Action Working Group

Members:

- OLTA staff
- Member land trusts
- OLTA partners
- Research associates

Goals:

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

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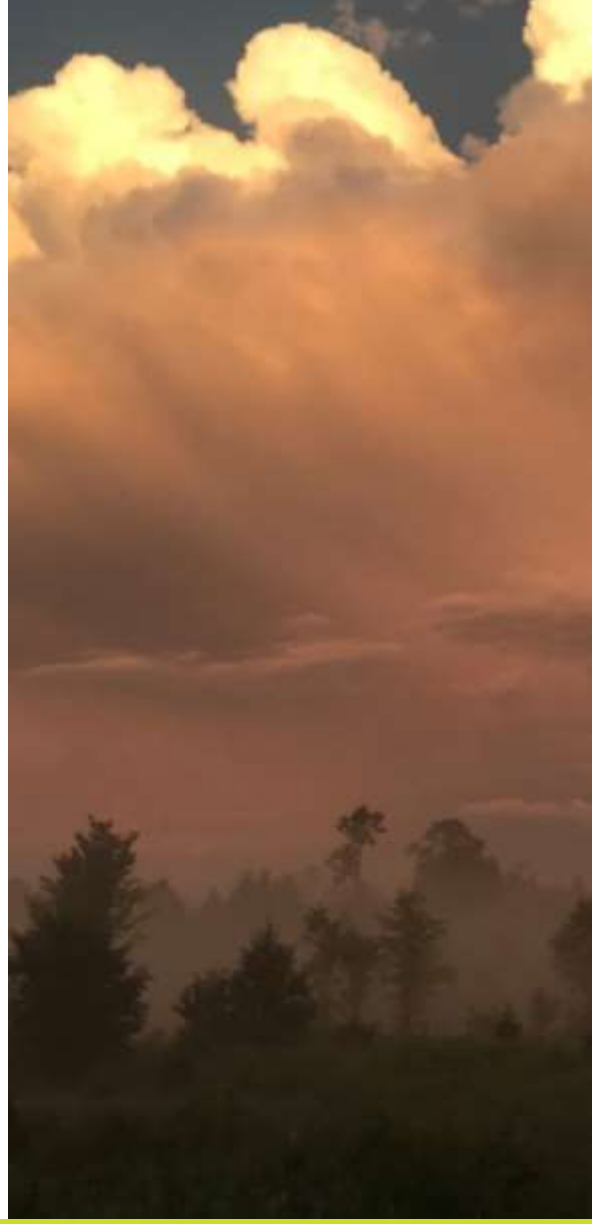
Climate Action Working Group

Projects in progress:

1. Stewardship Forum
2. Communicating climate change
3. Climate Vulnerability Assessment



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1. Stewardship Forum

Goal

- Help land trusts increase resilience to climate change

Objectives

1. Raise awareness of climate change among the land trust community
2. Equip land trusts with climate change adaptation approaches, tools, and strategies
3. Create a community of practice by connecting land trusts, climate experts, and academics

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2. Communicating Climate Change

Problem:

- Climate change is a large-scale, long-term issue

Solution:

- Connecting people to nature can help overcome feelings of hopelessness
- Land trust community connections
- Building climate-resilient communities – land stewardship, conservation
- Providing tangible actions

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Putting FORESTS to work

FORESTS ARE THE LARGEST TERRESTRIAL CARBON SINK BY FAR

In fact, forests absorb nearly 90% more carbon than the next largest source.

Currently, there are

751 MILLION ACRES

OF FORESTLAND IN THE U.S.

THAT'S EQUAL TO ALL OF THESE STATES

A CARBON SINK IS *anything* THAT ABSORBS MORE CARBON THAN IT RELEASES

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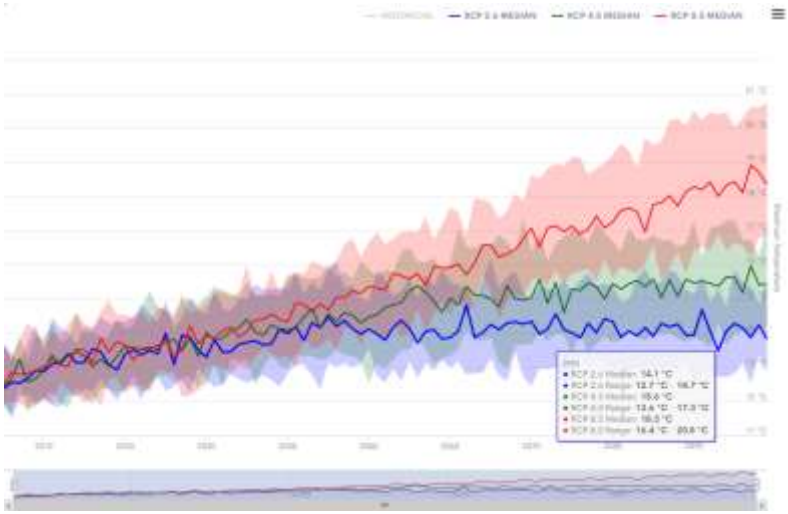
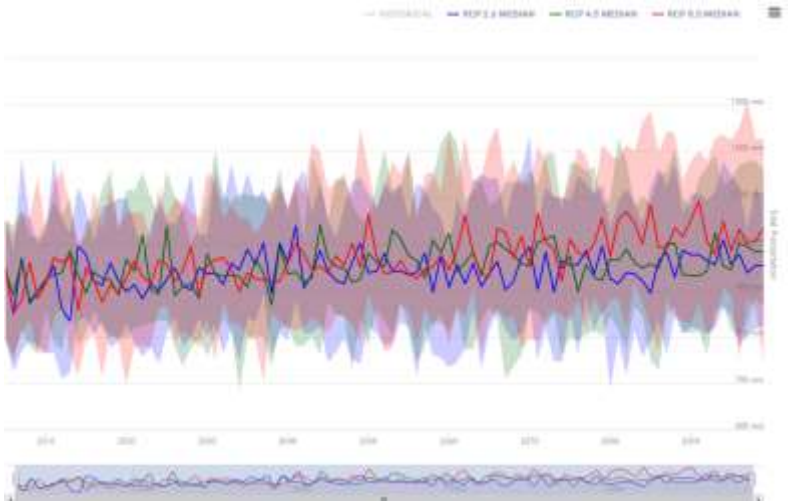
3. Climate Vulnerability Assessment

Overcoming barriers to climate action

- How do we assess vulnerability and increase resilience of conservation lands?
- How do we translate climate trends into action?
- How do we apply large-scale climate projections to a specific ecosystem, species or area?





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3. Climate Vulnerability Assessment

Methodology

- Alex Marino (University of Waterloo Master's in Climate Change) worked on this project
- Conduct systematic literature review and data collection
- Collate climate data – projections, stressors, impacts
- Develop a system for vulnerability assessment

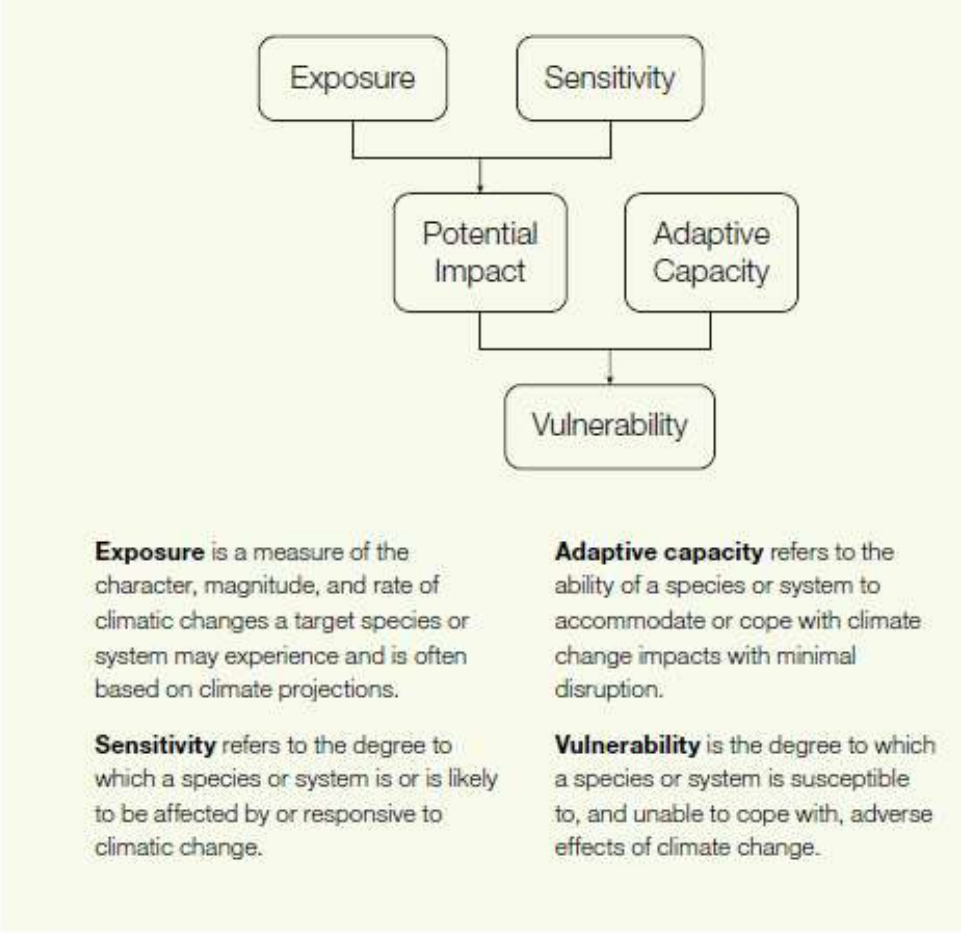

Figure 3
Components of climate change vulnerability (Gross et al., 2016).

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3. Climate Vulnerability Assessment

Methodology

- Stephanie Barr, PhD candidate at University of Waterloo
- Project with Parks Canada
- *Climate Change Adaptation Options Database*
- Link Database to the vulnerability assessment

Table 1 *(continued)*

Impacts	Site Examples
Change in growing season and phenology	· Growing season increase by ~10 days since 1950 at Gros Morne NP (McKenney et al., 2013). · Earlier flowering and seed dispersal times in Quttinirpaaq NP (Panchen and Gorelick, 2017). · 85% increase in plant biomass between 1990 and 2010 in a sedge wetland in Sirmilik NP (Gauthier et al., 2011).
Change in hydrological regimes	· Decline in peak flows in the Bow River in Banff NP (Rood et al., 2016). · Change in hydrology and ecology in the Peace-Athabasca Delta, Wood Buffalo NP (Beltaos, 2018; UNESCO, 2017).
Species loss or shifts in distribution	· 2.2 m/yr upslope migration of the alpine treeline in Kootenay NP (Roush, 2004). · Increased shrub and herbaceous cover at Tuktut Nogait NP (Zorn et al., 2017b), Torngat Mountains NP, Wapusk NP, Sirmilik NP and Ivvavik NP (Fraser et al., 2011). · With decreasing summer sea ice, polar bears spend more time on land and body condition declines at Wapusk NP (Laforge et al., 2017; Stirling and Derocher, 2012). · "Shrubification" facilitated colonization of beaver into Ivvavik NP (Jung et al., 2016). · Climate (e.g., snow depth, icing) as one of the variables in caribou decline in Jasper NP (Bradley and Neufeld, 2012) and Qausuittuq NP (Miller and Gunn, 2003). · Potential emerging parasitic infections in muskox near Aulavik NP (Kutz et al., 2015; Kutz et al., 2004). · Expanded range of boreal birds in Torngat Mountains NP (Whitaker, 2017). · Warmer waters within Lake Superior NMCA (+0.5 °C/decade) affects composition of phytoplankton community (Bramburger et al., 2017; Larouche and Galbraith, 2016).
Increased forest pests	· Favourable climatic conditions for blister rust and bark beetle infestation in Waterton Lakes NP (Wong and Daniels, 2017).
Spread of vector-borne disease	· Expansion of Lyme disease into eastern Ontario, including St. Lawrence Island NP (Cheng et al., 2017; Clow et al., 2017).
Change in wildfire regimes	· In general, wildfire regimes are changing including an increase in area burned and severity in Canada's forests (Coops et al., 2018; Kirchmeier-Young et al., 2017; Wang et al., 2015).

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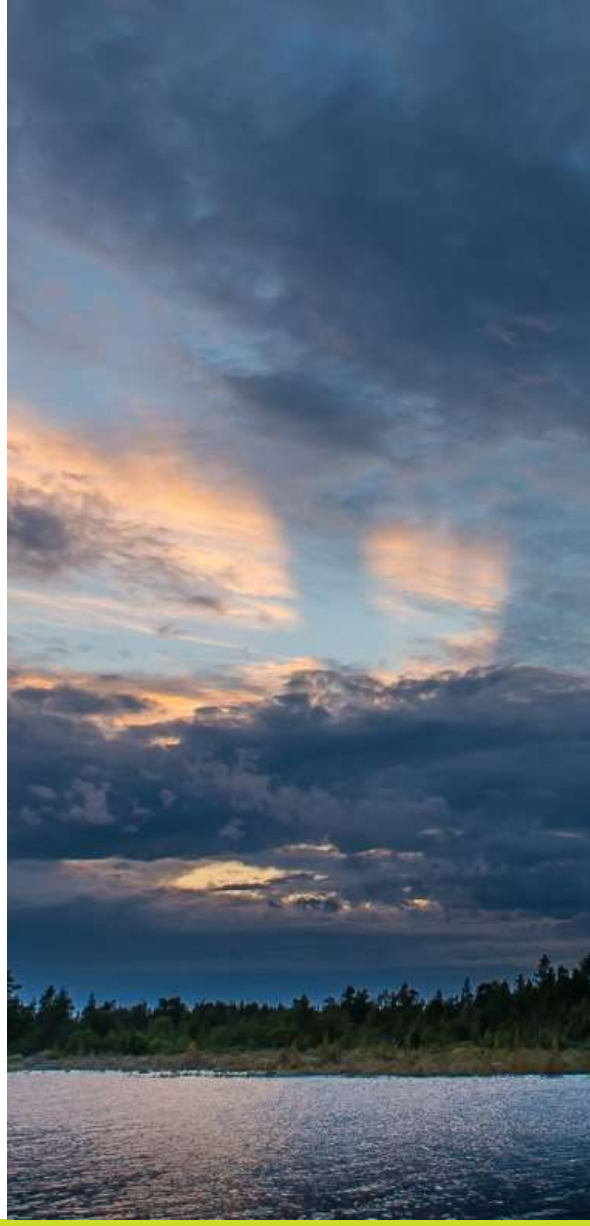
3. Climate Vulnerability Assessment

Next Steps

- Complete the assessment tool
- Pilot the tool on land trust properties
- Refine the tool
- Develop action plans
- Implement adaptation actions to increase resilience



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Actions on the Ground

What can land trusts do?

- There are many strategies that can be taken to adapt to the effects of climate change
- You may already be doing them but not call them “climate change strategies”

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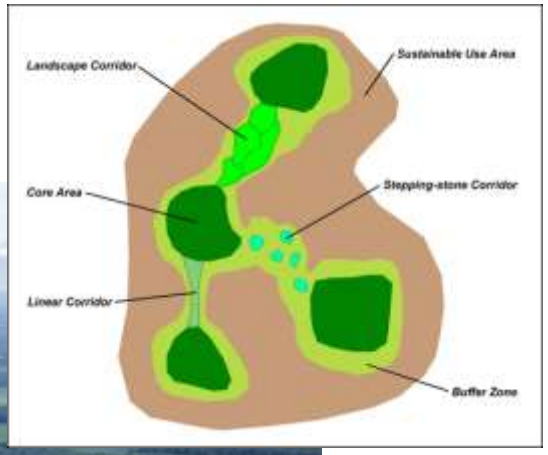
Actions on the Ground

Strategies

- Increase connectivity



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Actions on the Ground

Strategies

- Increase redundancy – multiple examples of each habitat type

Photography by Cathy Quinlan

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Actions on the Ground

Strategies

- Conserve representativity – have a bit of everything





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Actions on the Ground

Strategies

- Reduce non-climatic stressors

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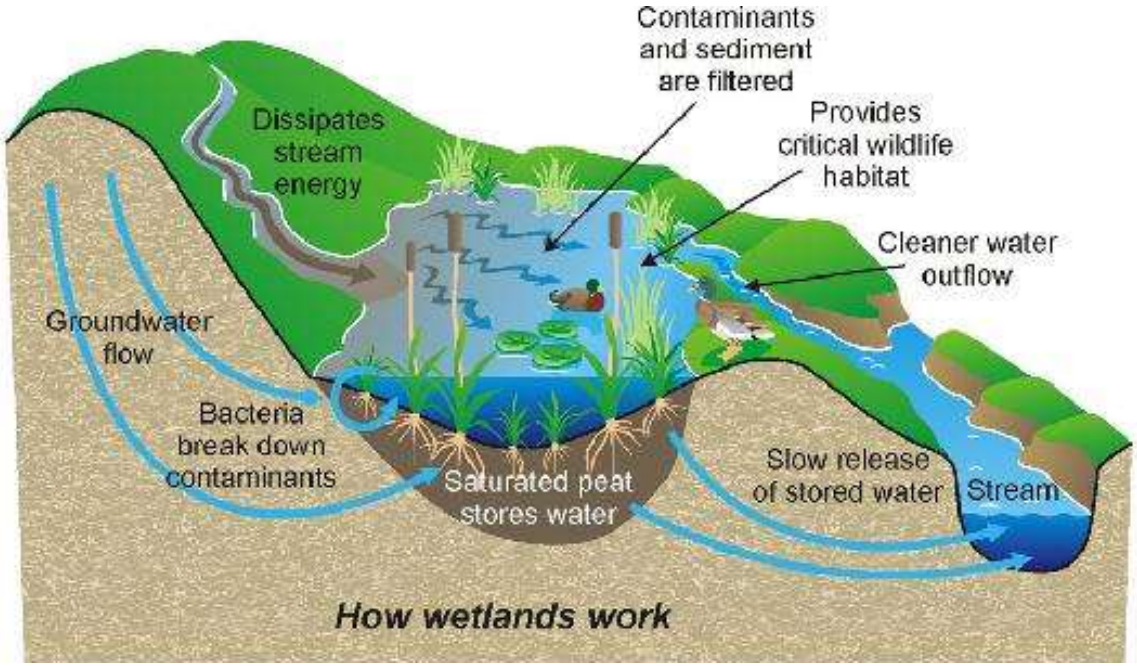
Actions on the Ground

Strategies

- Focus on ecosystem processes rather than specific species assemblages



Actions on the Ground

Strategies

- Climate smart restoration – create for the future, not the past

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Actions on the Ground

Activity

- Brain storm “climate” actions that you’re already doing or could do (even if you’re missing the knowledge right now)
- Identify how it fits with land trust work (e.g. land securement strategy, land management, restoration, communication with public)

Actions on the Ground

Thames Talbot Land Trust

- Focal area in Carolinian Zone
  - –Northern extent of many "southern" species
  - –High biodiversity
  - –High species at risk
- Manage 1733 ac of land, at least 30 species at risk

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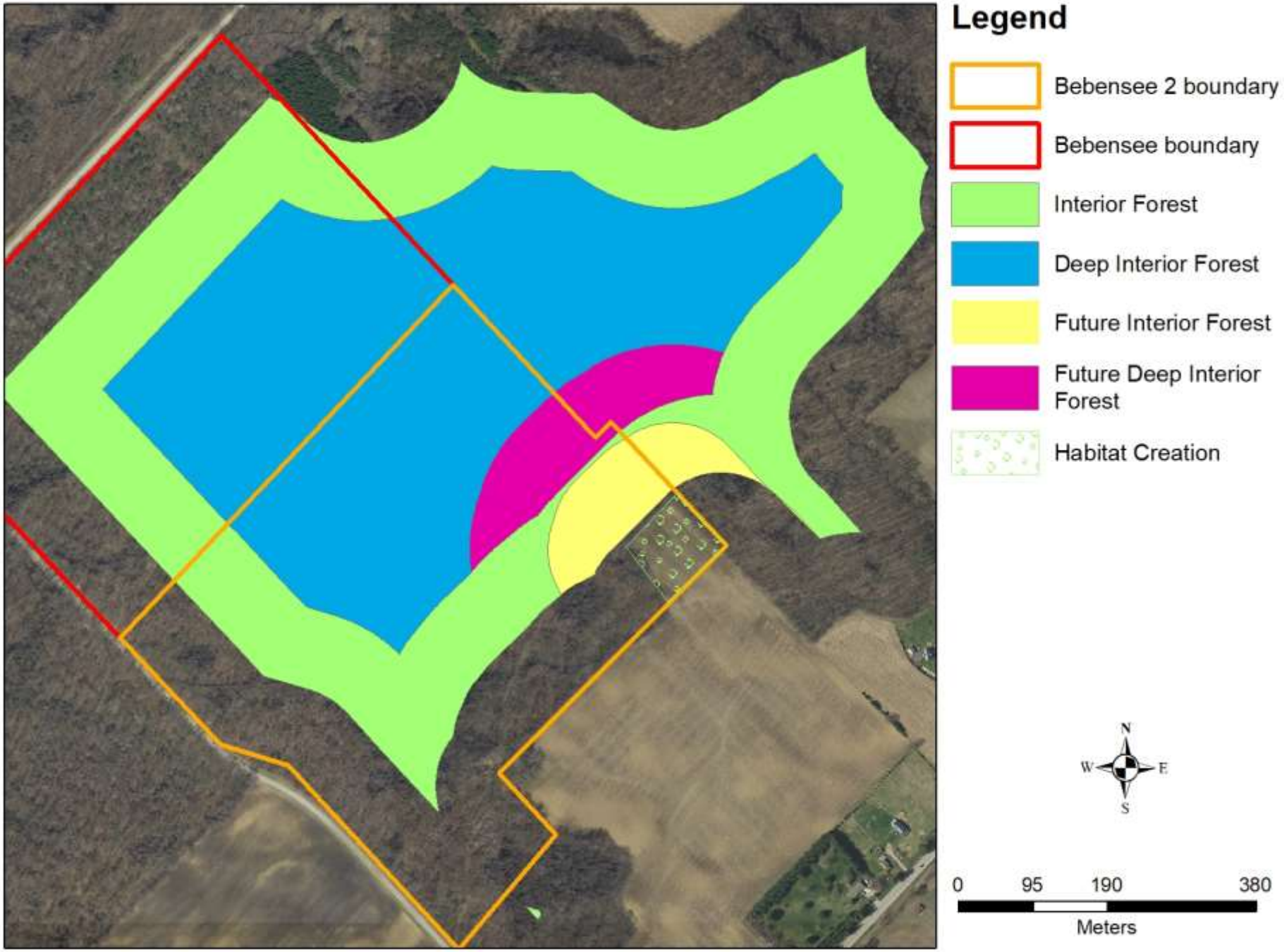
Actions on the Ground

Restoration at Bebensee Tract

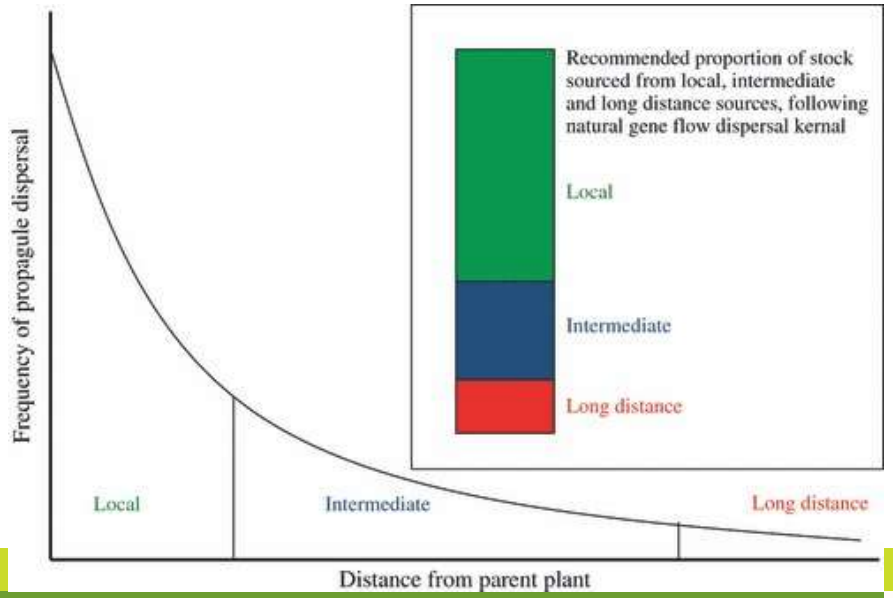
- Priority parcel due to large forest tract and Species at Risk
- Decisions at acquisition:
  - Severance to include small part of farm field for restoration (to increase interior forest)


Legend
Bebensee 2 boundary
Bebensee boundary
Interior Forest
Deep Interior Forest
Future Interior Forest
Future Deep Interior Forest
Habitat Creation
N
W
E
S
0
95
190
380
Meters

Actions on the Ground

Restoration at Bebensee Tract

- Decisions at restoration:
  - –Create meadow and allow natural succession to forest
  - –Source seeds from local and more southern populations



Sgro et al. 2011. Building evolutionary resilience for conserving biodiversity under climate change. Evolutionary Applications: 4: 326-337.

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Actions on the Ground

Activity

- Time: 15 minutes to brainstorm, 4 minutes to present ideas
- Groups:
  1. Species at Risk
  2. Forests
  3. Grasslands
  4. Wetlands and Freshwater systems
  5. Ecosystem services and processes

Questions?

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