Biodiversity and People in a Changing Climate:

Adaptation Imperatives for Enhancing Resilience

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Ontario's Biodiversity Strategy
Protecting what sustains us

Poster Sessions re: Biodiversity and Climate Change

- **P-ADA3** *Mobilizing decision-relevant adaptation knowledge through the varied roles of Professional Biologists in western Canada;* **Pierre Iachetti , College of Applied Biology**
- **P-BIOD1** *State of Ontario's Biodiversity 2015: Climate Change Indicators;* **Amelia Argue, Ontario Ministry of Natural Resources and Forestry;**
- **P-BIOD2** *Climate adaptation of biodiversity conservation strategies for Manitoba's tall-grass prairie;* **Cary Hamel, Nature Conservancy of Canada; and**
- **P-OTHER2** *Ecosystem Services; by* **Michelle Garneau**
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Our Next 5 Years 2016-2020 | Biodiversity & Climate Change

The diversity of life is our best defence in a changing world

Enhance Resilience

Invest. Protect. Restore...**THRIVE**

Engage People

Politicize. Prioritize. Mainstream...**KNOW**

Report on the State of Biodiversity

Monitor. Update. Share...**LEARN**

ACTIONS

- Build awareness and understanding about biodiversity
- Strengthen the Ontario Biodiversity Council
- Mini-summits for active change makers
- Keep the state of biodiversity report current
- Support and advise on our partners' initiatives

Ontario Biodiversity Council

Ontario's **Biodiversity** Strategy
Protecting what sustains **us**

What is Biodiversity ?

- **“Biodiversity is life”**
  - The variety of life through genes, species, and ecosystems that is shaped by ecological and evolutionary processes





- **“Biodiversity is <u>our</u> life”**
  - The variety of life on Earth is essential to sustaining the living systems we depend on for health, wealth, food, and other vital goods and services

Regulatory Services – Climate Change and Biodiversity

- “Too easily forgotten is Gaia’s need: we have to leave enough natural ecosystems on land and in the ocean for planetary self-regulation”.

- "The natural world outside of our farms and cities is not there as a decoration but serves to regulate the chemistry and climate of the Earth, and the ecosystems are the organs of Gaia that enable her to maintain our habitable planet.”

  – From: James Lovelock (2009) The Vanishing Face of Gaia

The Diversity of Life is our Best Defence in a World of Climate Change

- The protection and large-scale restoration of biodiversity enhances:
  - Carbon sequestration and storage
  - Water regulation (water storage and flood prevention)
  - Resilience to extreme weather events
  - Adaptive capacity of our ecosystems to cope with climate change.

- Strategic investing in biodiversity can be a huge win for people and our economy, for climate and for biodiversity.

- Biodiversity loss and climate change are intimately intertwined in both causes and solutions.

Climate Change Threats to Biodiversity

- **Changing Climate Envelopes -** rapidly shifting beyond the spatial envelopes of existing regional ecosystems and beyond the tolerance limits of individual species and entire biotic communities.
  - **Ecoregion 6E (2071-2100)**

  - From: McKenney et al. 2010. CCRR-16. MNR.

Climate Change Threats to Biodiversity

- **Changes in vegetative phenology and insect emergence** with cascading effects on food webs.

- **Changes in the extent and duration of sea ice and freshwater ice cover** again with cascading effects on food webs.

Climate Change Threats to Biodiversity

- **Altered Disturbance Regimes** (insect, disease, drought, fire, extreme storm events and floods) - amplifying in frequency, intensity, scale and geographic scope.

- **Range expansion of Exotic Invasive Species and Eruptive Native Species** – rapid northward expansions with the removal of “thermal barriers” causing significant ecological and economic impacts.

How will Biodiversity and Society Cope?

- What are the relative ***vulnerabilities*** of our ecosystems and species, including people, to changing climatic regimes?
- What are the risks to key ***ecosystem services***, such as flood attenuation?
- How vulnerable are our Cities to major storm events and flooding risks?
- What role do wetlands and other “natural green infrastructure” play in attenuating flood damage?
- Where should we be focusing protection and restoration efforts?

Climate Change and Biodiversity

Our collective challenge:

- To identify some priority “no regrets actions” to enhance resilience for biodiversity, people and our economy.