Credit Valley Conservation
inspired by nature

Biodiversity Matters in Managing Natural Assets

Working together to protect and manage the species that make up our natural heritage for watershed health and resilience

Laura Timms, CVC

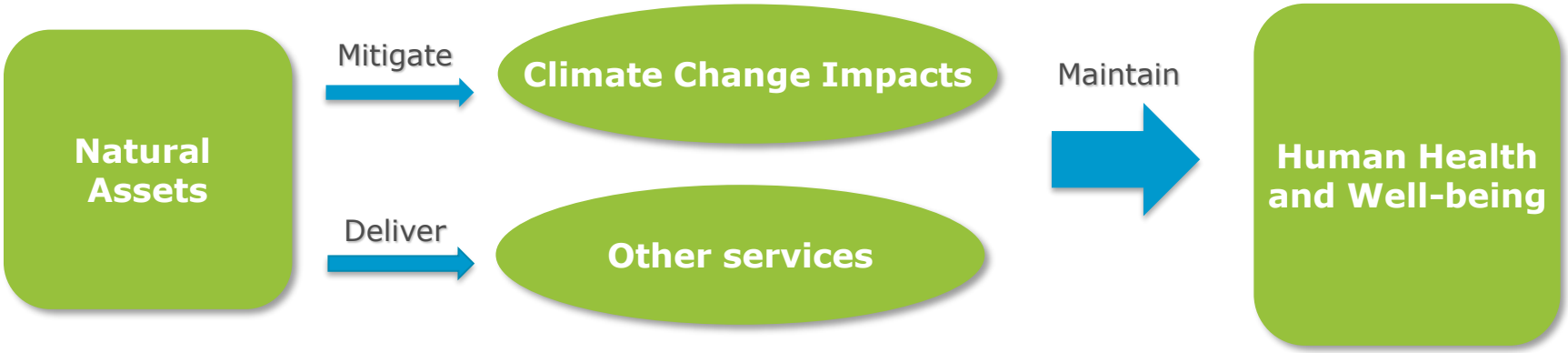
September 29, 2022

Preamble

Climate Change: A Risk Business……

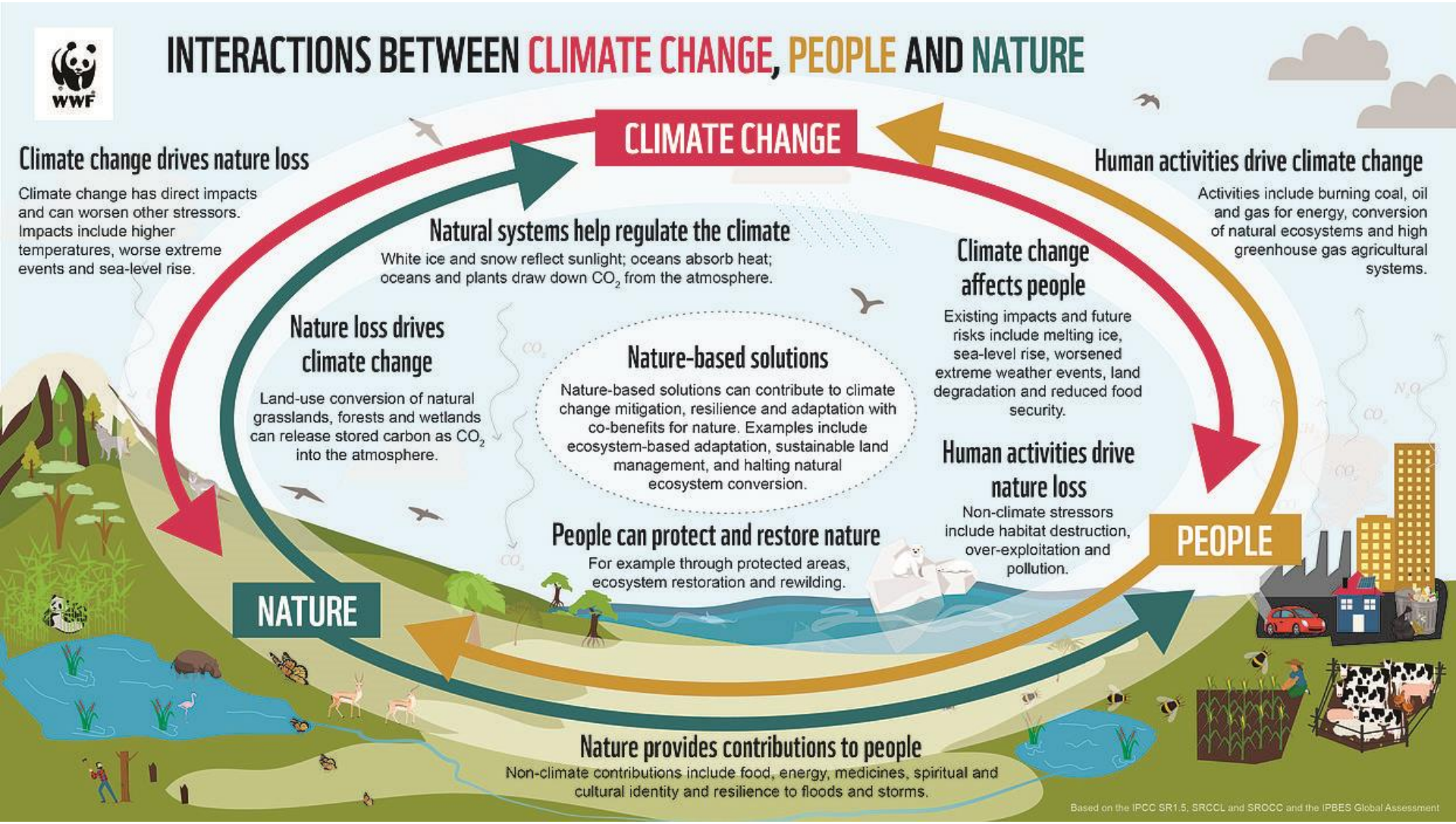
Photo: Rob Bieber

Natural Assets can address climate change



Mitigation of Climate Change Impacts	Delivery of Services
• Carbon sequestration and storage • Stormwater management • Urban heat island reduction	• Recreation and tourism • Waste assimilation • Real estate value appreciation • Drinking water quality enhancement

- **Physical**
- **Mental**
- **Social**
- **Economic**


INTERACTIONS BETWEEN CLIMATE CHANGE, PEOPLE AND NATURE
WWF
CLIMATE CHANGE
Climate change drives nature loss
Climate change has direct impacts and can worsen other stressors. Impacts include higher temperatures, worse extreme events and sea-level rise.
Human activities drive climate change
Activities include burning coal, oil and gas for energy, conversion of natural ecosystems and high greenhouse gas agricultural systems.
Natural systems help regulate the climate
White ice and snow reflect sunlight; oceans absorb heat; oceans and plants draw down CO_2 from the atmosphere.
Climate change affects people
Existing impacts and future risks include melting ice, sea-level rise, worsened extreme weather events, land degradation and reduced food security.
Nature loss drives climate change
Land-use conversion of natural grasslands, forests and wetlands can release stored carbon as CO_2 into the atmosphere.
Nature-based solutions
Nature-based solutions can contribute to climate change mitigation, resilience and adaptation with co-benefits for nature. Examples include ecosystem-based adaptation, sustainable land management, and halting natural ecosystem conversion.
Human activities drive nature loss
Non-climate stressors include habitat destruction, over-exploitation and pollution.
People can protect and restore nature
For example through protected areas, ecosystem restoration and rewilding.
PEOPLE
NATURE
Nature provides contributions to people
Non-climate contributions include food, energy, medicines, spiritual and cultural identity and resilience to floods and storms.
Based on the IPCC SR1.5, SRCCL and SROCC and the IPBES Global Assessment

CVC natural asset management webinar series

- March 31 – Overview of the Ecological Land Classification System
- April 7 – Natural Asset Inventory and Condition Assessment (Part 1)
- April 28 – Fish and Wildlife Passage at Bridges and Culverts
- May 5 – Level of Service, Valuation and Life-Cycle Costing for Natural Assets (Part 2)
- June 2 – Climate Considerations for Management of Natural Features
- June 23 – CVC Ecosystem Offsetting Guidelines
- September 8 – Building Business Case for Natural Assets (Part 3)
- **September 29 – Biodiversity Matters in Managing Natural Assets**

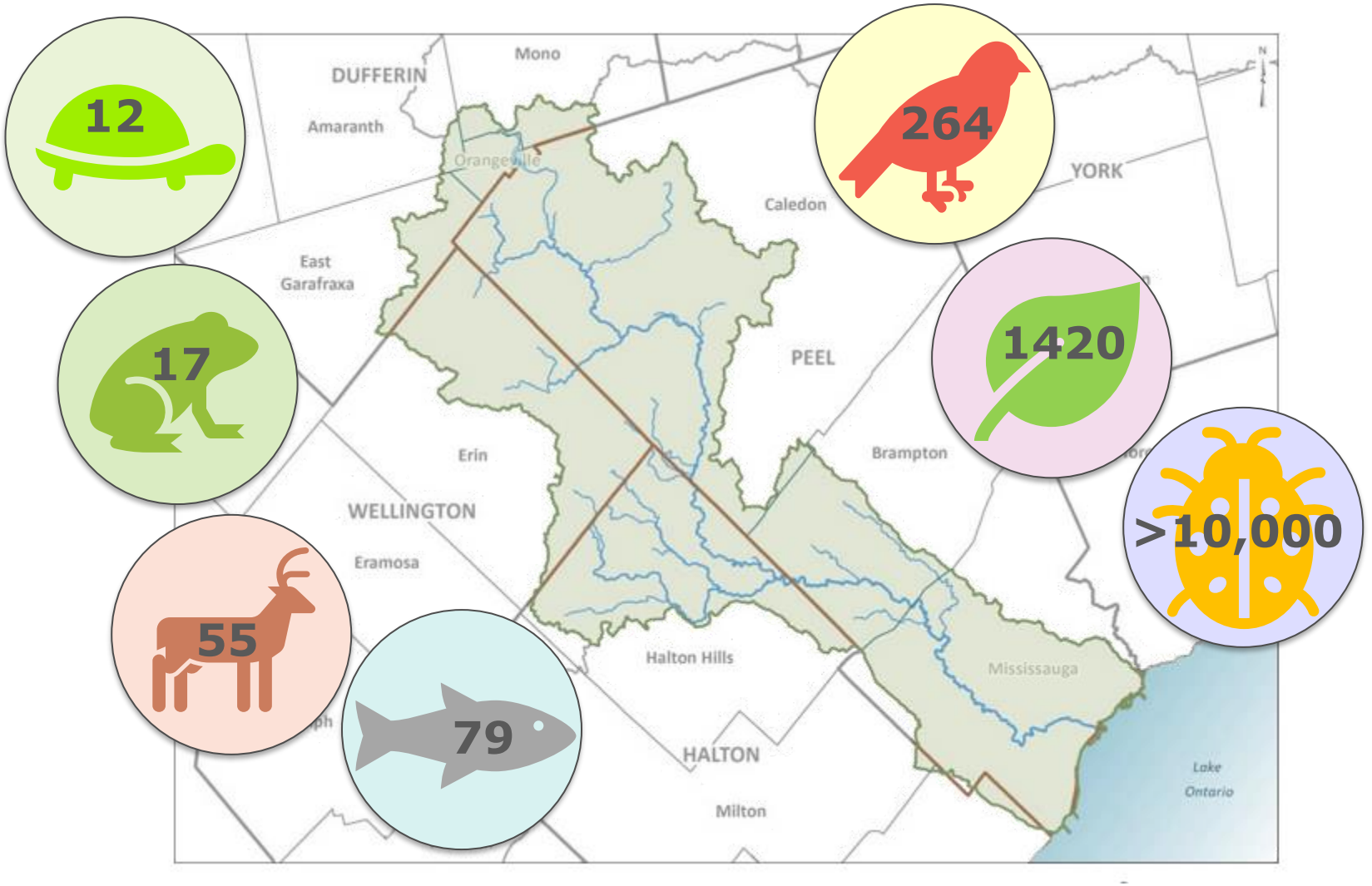
https://sustainabletechnologies.ca/events/2022-webinar-series/

What is biodiversity & why do we care?

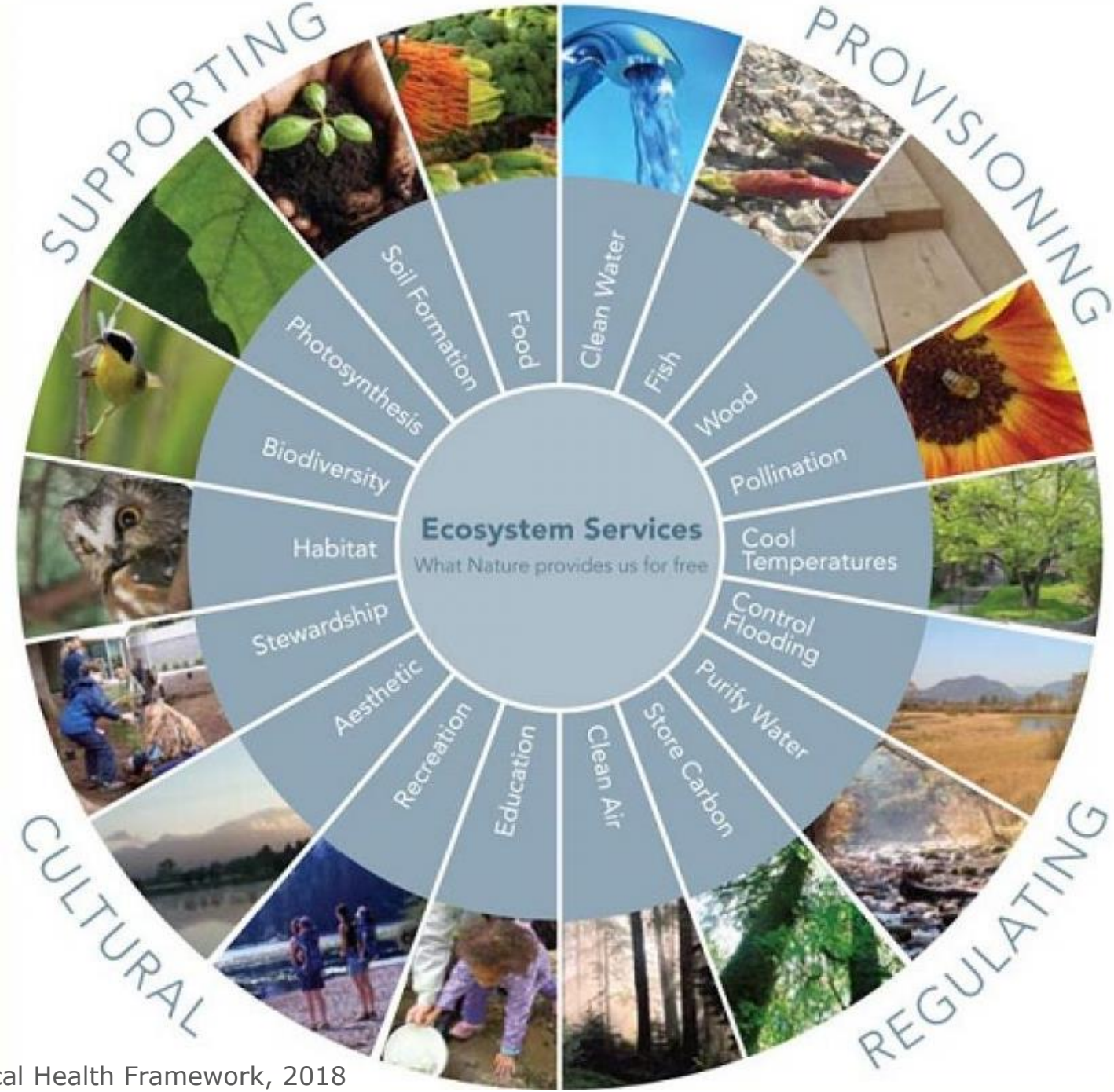
What is biodiversity?

- **Biodiversity:** the variety of life on earth
- All living things and the way they interact with each and the environment
- Genes, species, ecosystems

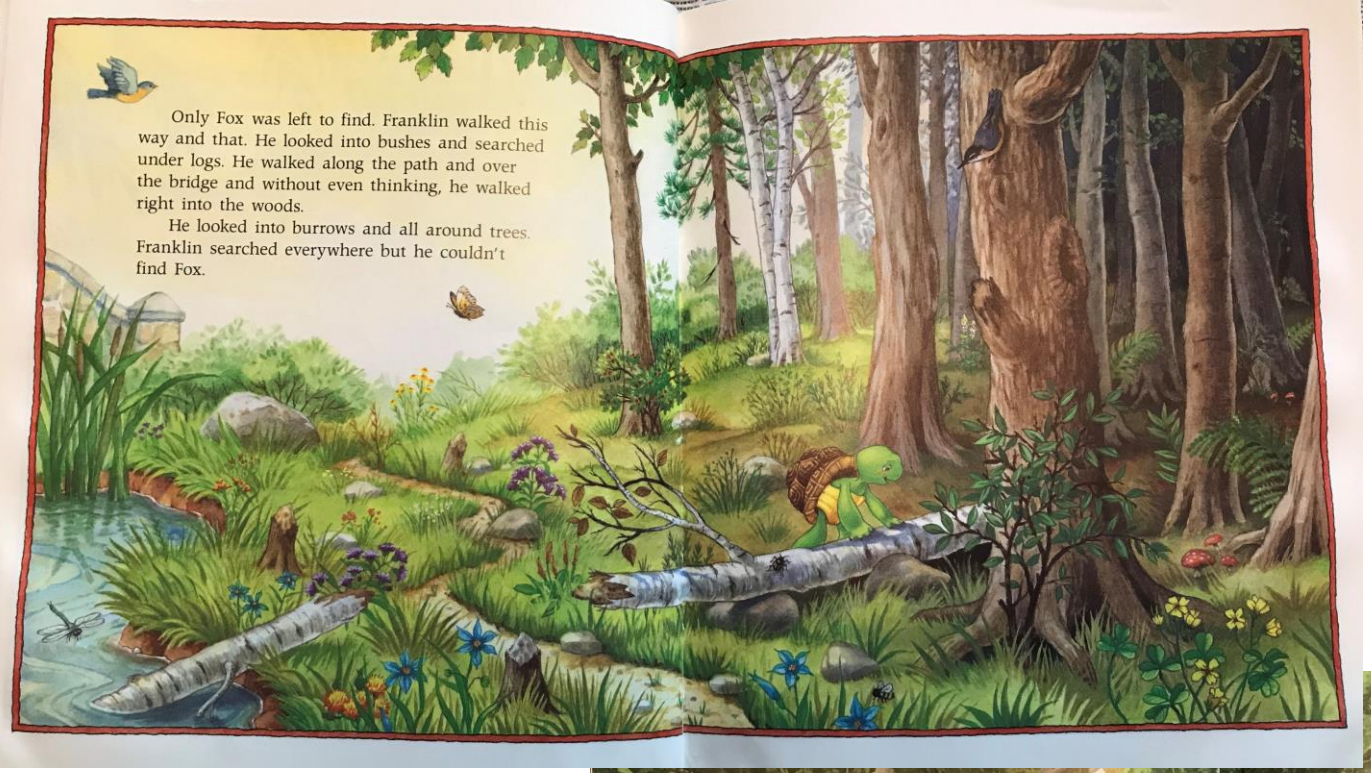
Local biodiversity: What do we have?



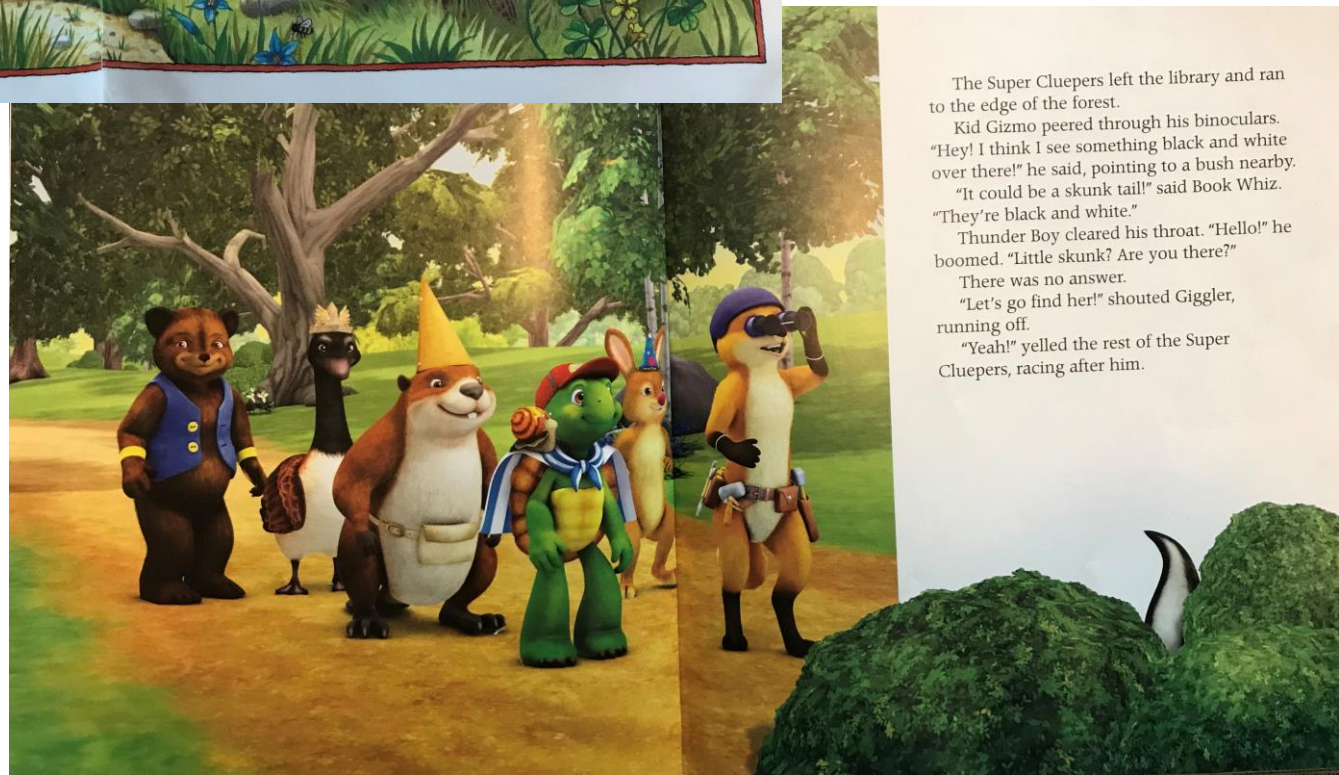
Why do we care?



Metro Vancouver's Ecological Health Framework, 2018


Only Fox was left to find. Franklin walked this way and that. He looked into bushes and searched under logs. He walked along the path and over the bridge and without even thinking, he walked right into the woods.
He looked into burrows and all around trees. Franklin searched everywhere but he couldn't find Fox.

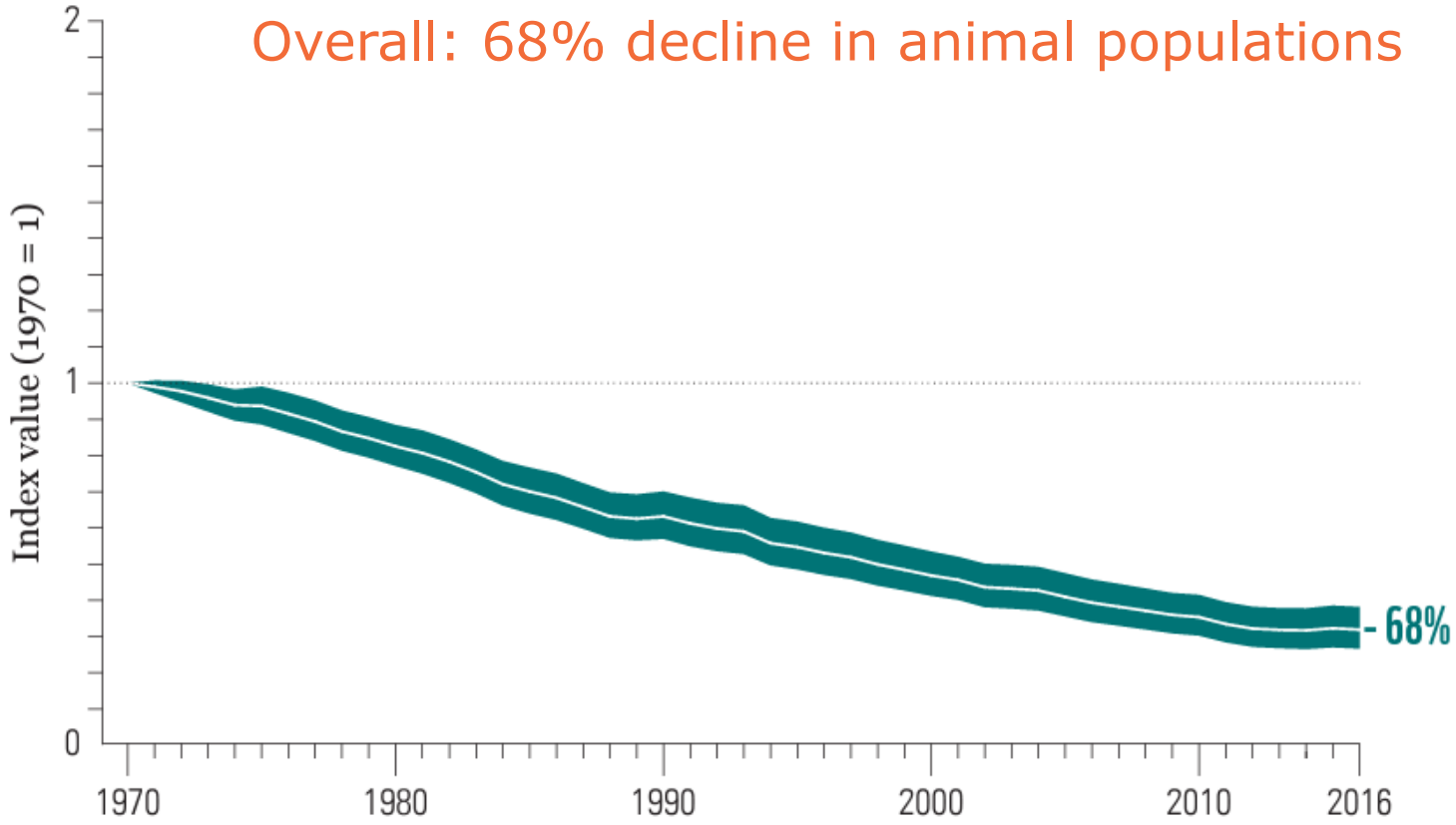
Why do I care?


The Super Cluepers left the library and ran to the edge of the forest.
Kid Gizmo peered through his binoculars. "Hey! I think I see something black and white over there!" he said, pointing to a bush nearby.
"It could be a skunk tail!" said Book Whiz. "They're black and white."
Thunder Boy cleared his throat. "Hello!" he boomed. "Little skunk? Are you there?"
There was no answer.
"Let's go find her!" shouted Giggler, running off.
"Yeah!" yelled the rest of the Super Cluepers, racing after him.

Biodiversity loss

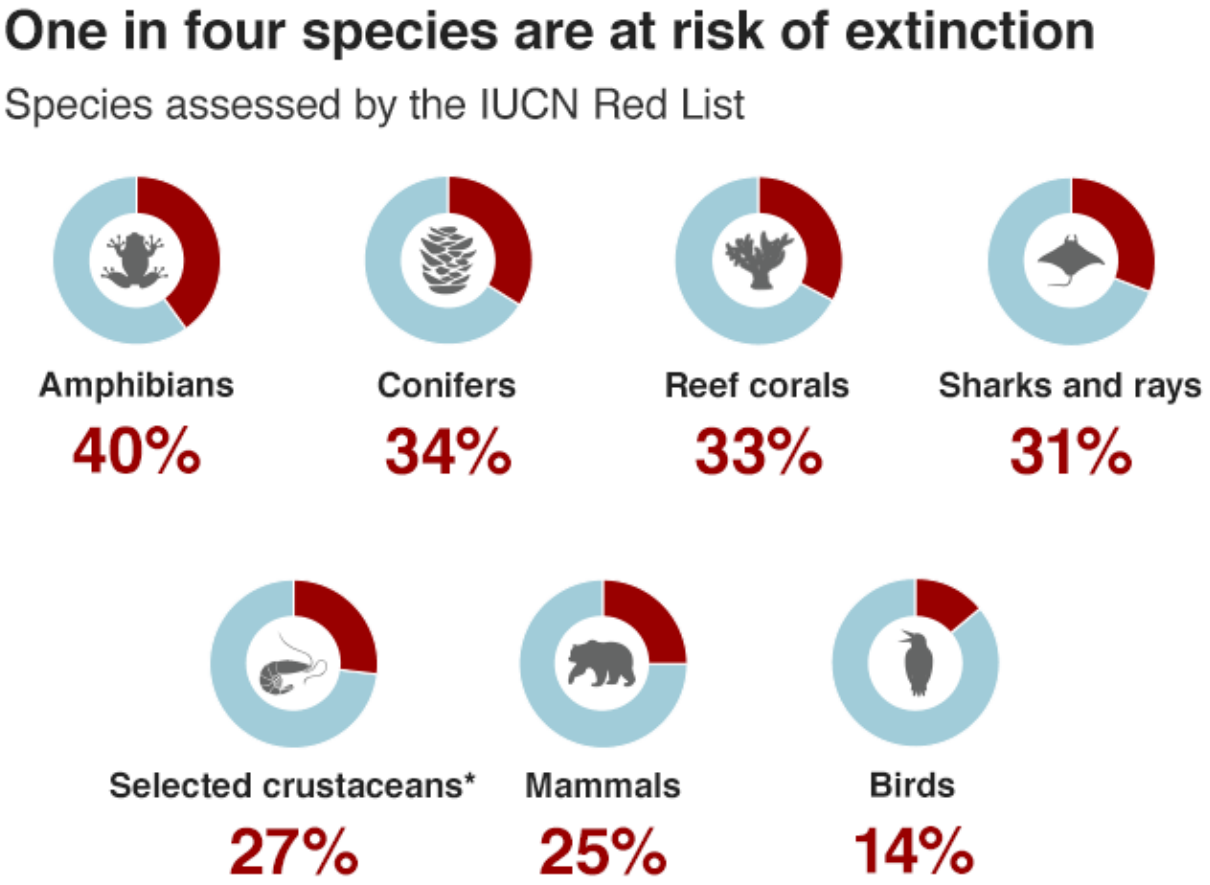
Trends in global biodiversity

Overall: 68% decline in animal populations



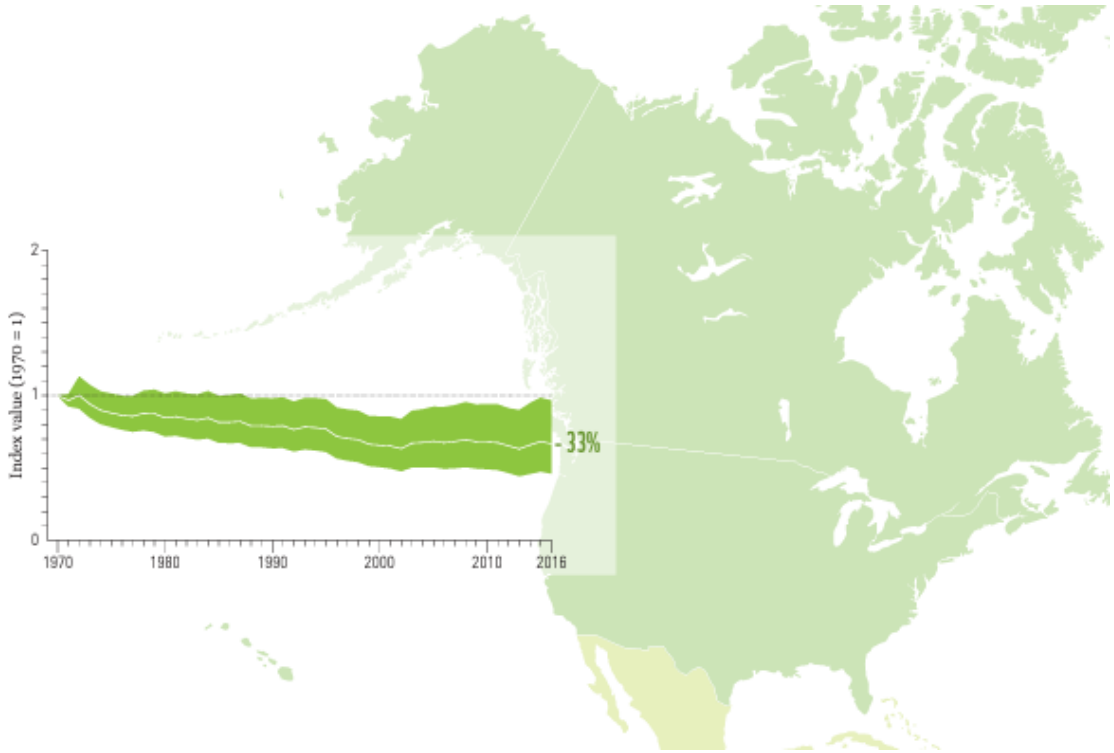
Zoological Society of London and WWF 2020 *The Living Planet Index*

Trends in global biodiversity



Trends in national biodiversity

U.S. & Canada: 33% declines in animal populations



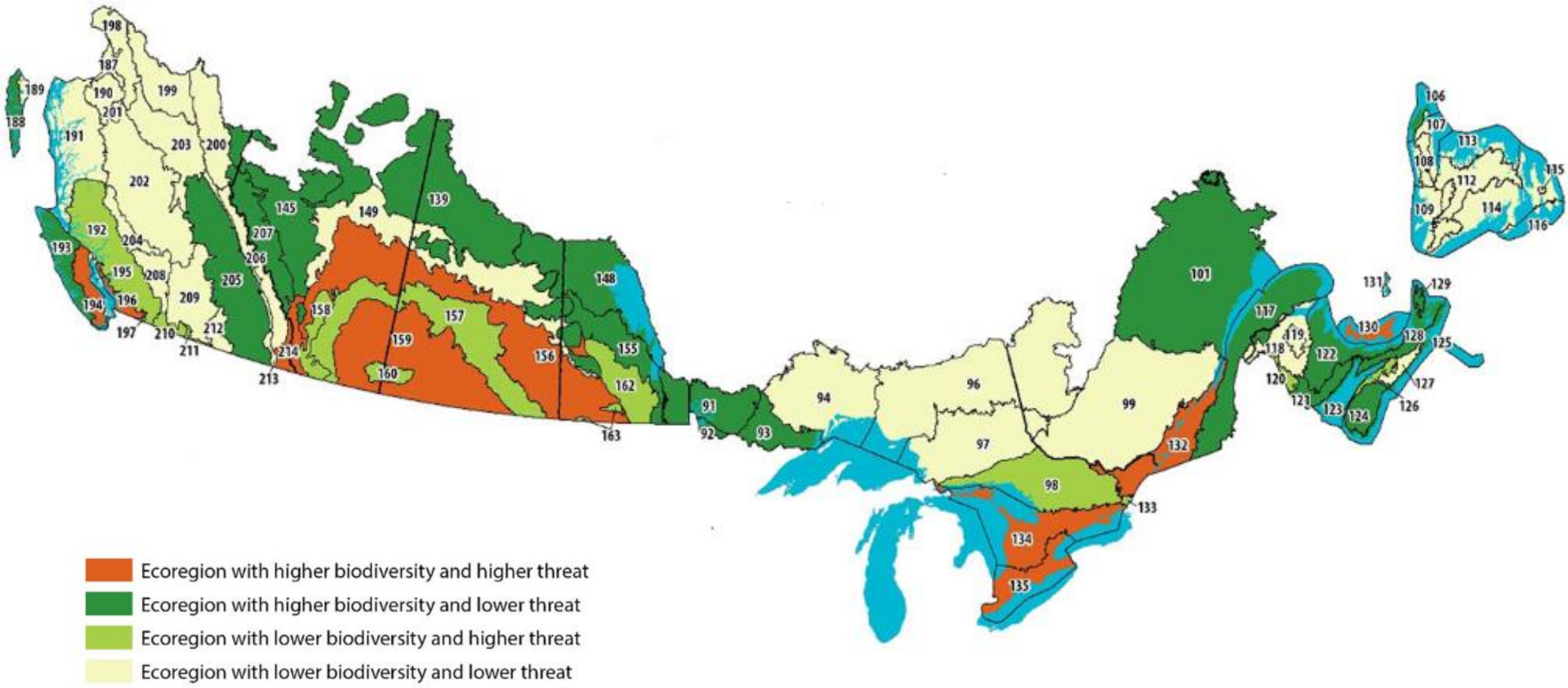
Zoological Society of London and WWF 2020 *The Living Planet Index*

Trends in provincial biodiversity

Indicator	Related target	Status	Trend
Ecosystems – Forest Cover	n/a	66% of Ontario's landbase is forested. Forest cover continues to decline in southern Ontario, in spite of afforestation efforts.	
Ecosystems – Wetland Cover	n/a	0.7% of Southern Ontario's wetlands were lost between 2011-2015, which is an increased rate of loss since 2011.	
Ecosystems – Rare Ecosystems	10	21% of alvars, 62% of prairies and 79% of coastal dune ecosystems are legally protected (up 7%, 1% and 4% respectively since 2015). More than 85% of the area of these rare ecosystems continues to be ranked as good or high quality.	
Ecosystems – State of Great Lakes	n/a	Despite successful restoration efforts and improvement in some areas, the cumulative impacts of many pressures continue to threaten the Great Lakes.	
Species – Species at Risk Status Changes	10	Most Species at Risk that were reassessed by COSSARO showed no change, while 20% moved to a higher risk category and 14% were moved to a lower risk category.	
Species – Species of Conservation Concern	10	Most Species of Conservation Concern showed no change in general status, however more species moved to higher risk categories than lower risk categories.	

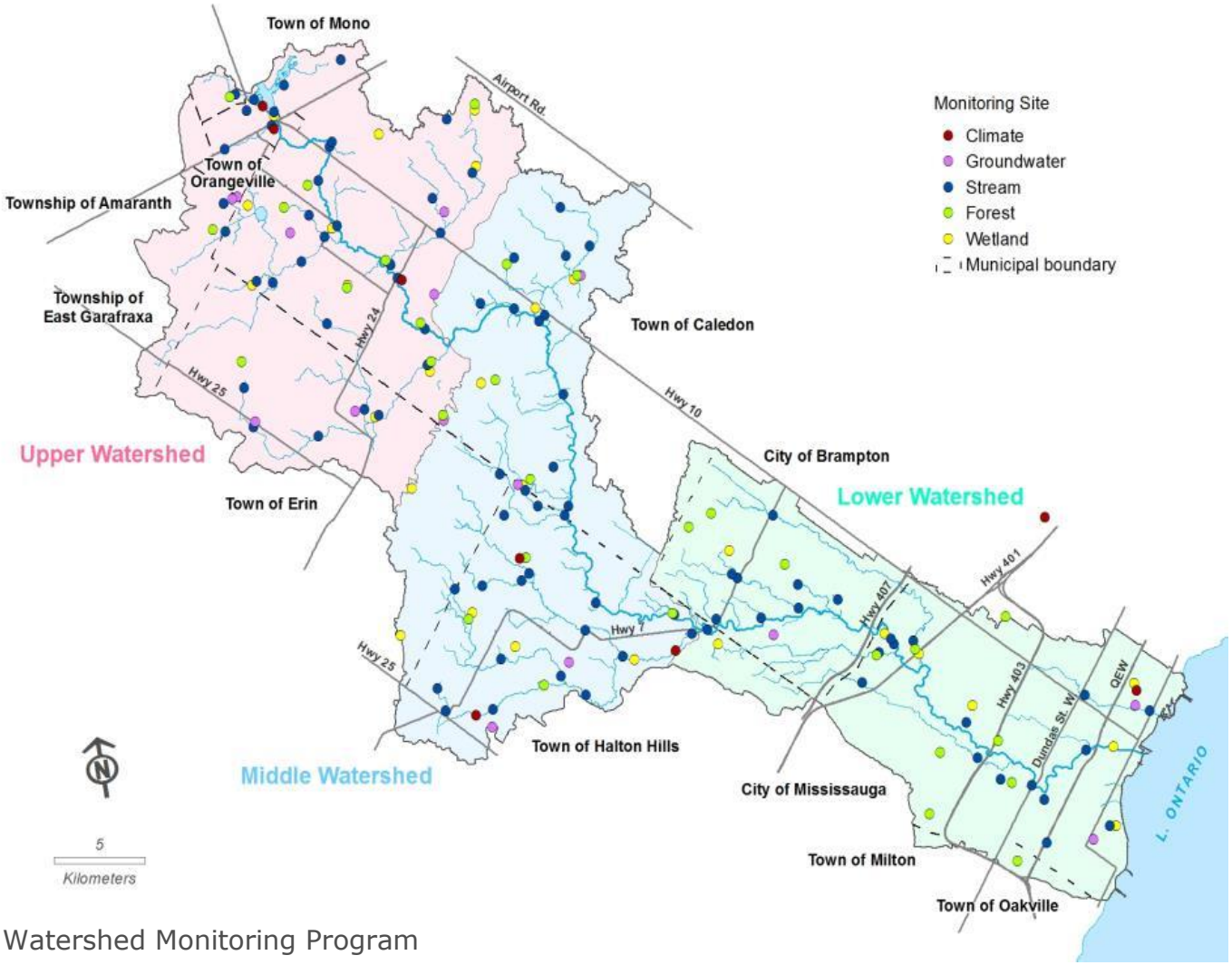
State of Ontario's Biodiversity Report 2020: www.sobr.ca

Southern Ontario is in a biodiversity crisis



Kraus & Hebb 2020: *Southern Canada's crisis ecoregions*

Trends in local biodiversity



Trends in local biodiversity

Drivers of biodiversity loss

Addressing biodiversity loss

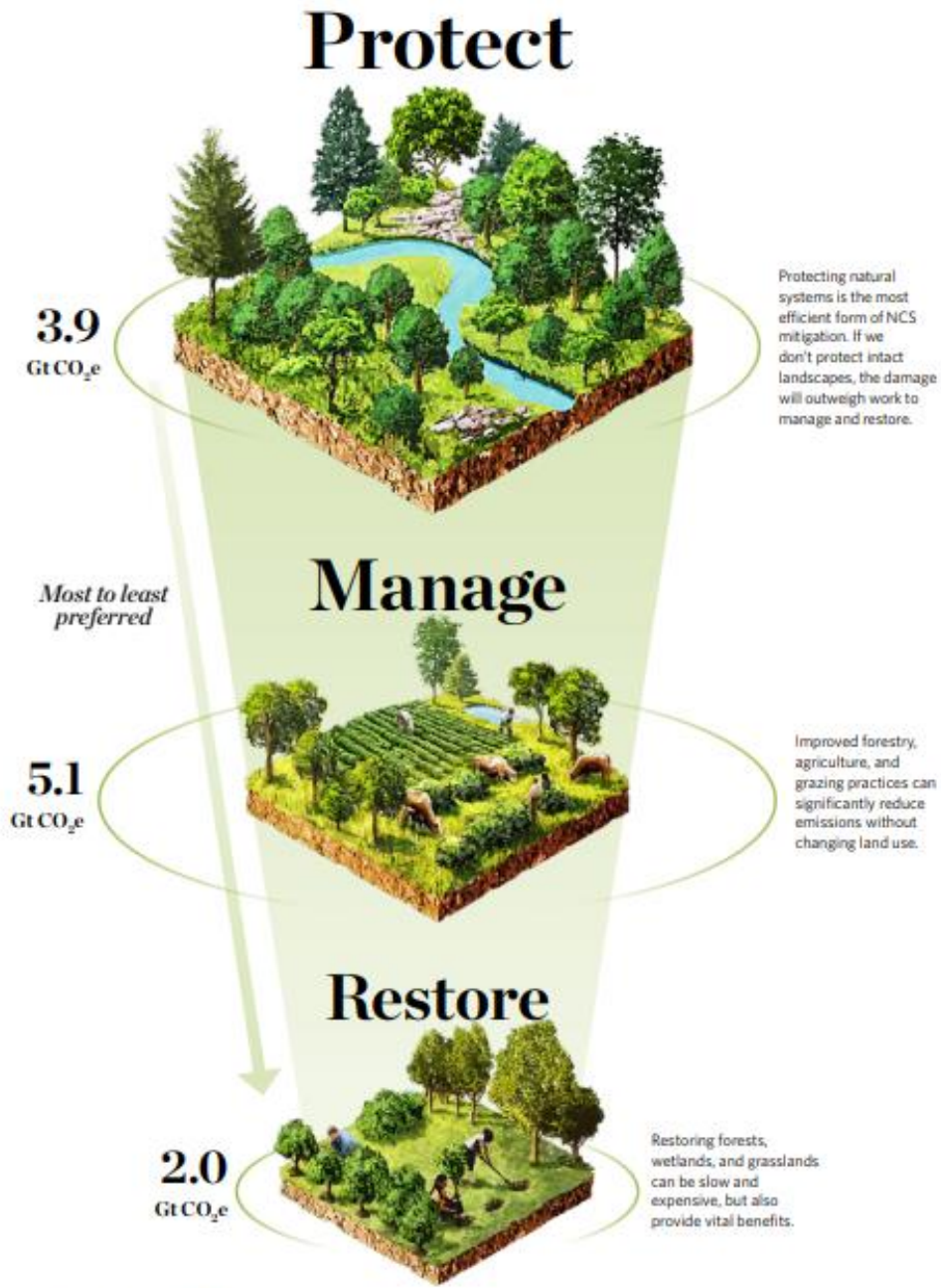
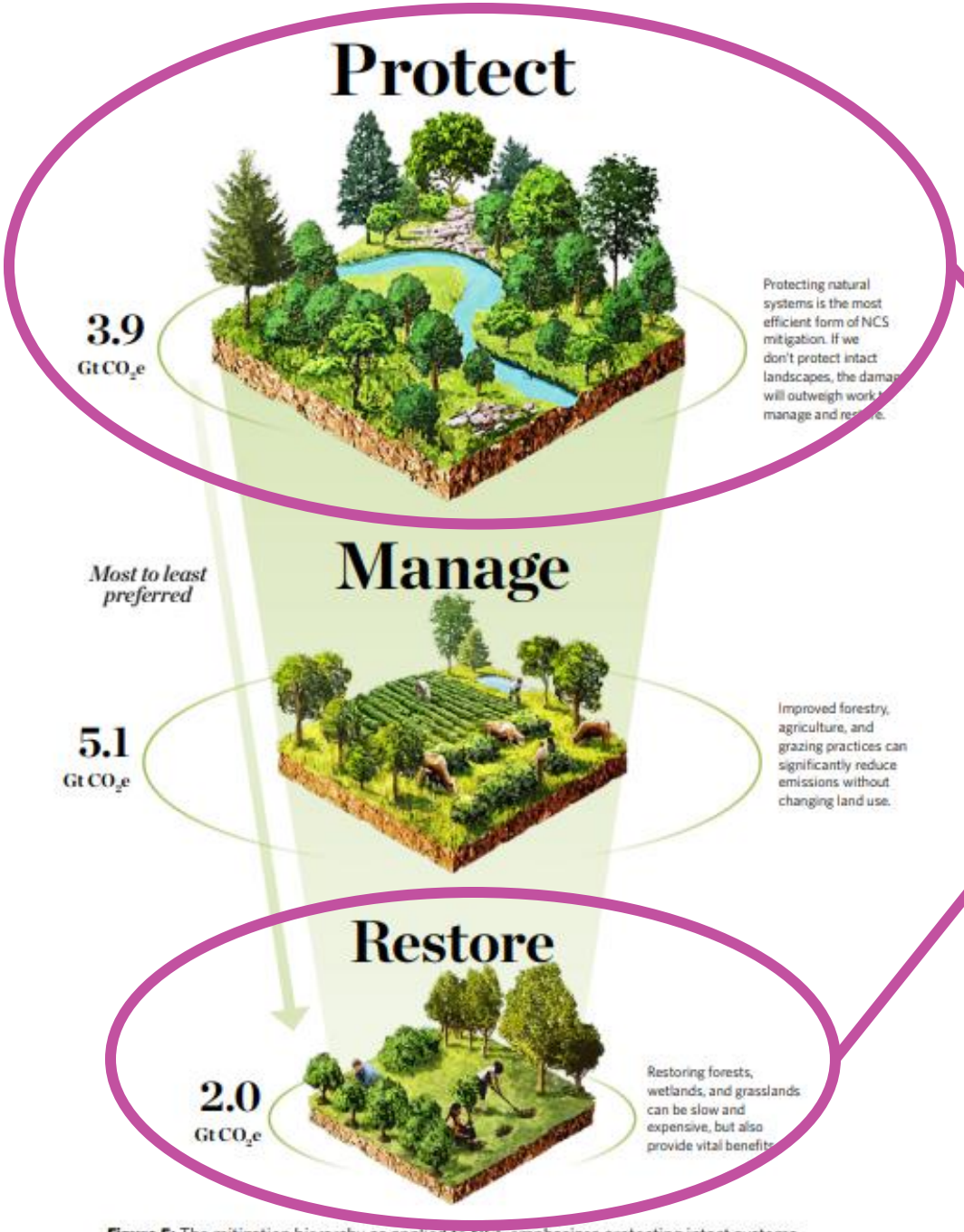


Figure 5: The mitigation hierarchy as applied to NCS emphasizes protecting intact systems

The Nature Conservancy
Natural Climate Solutions Handbook



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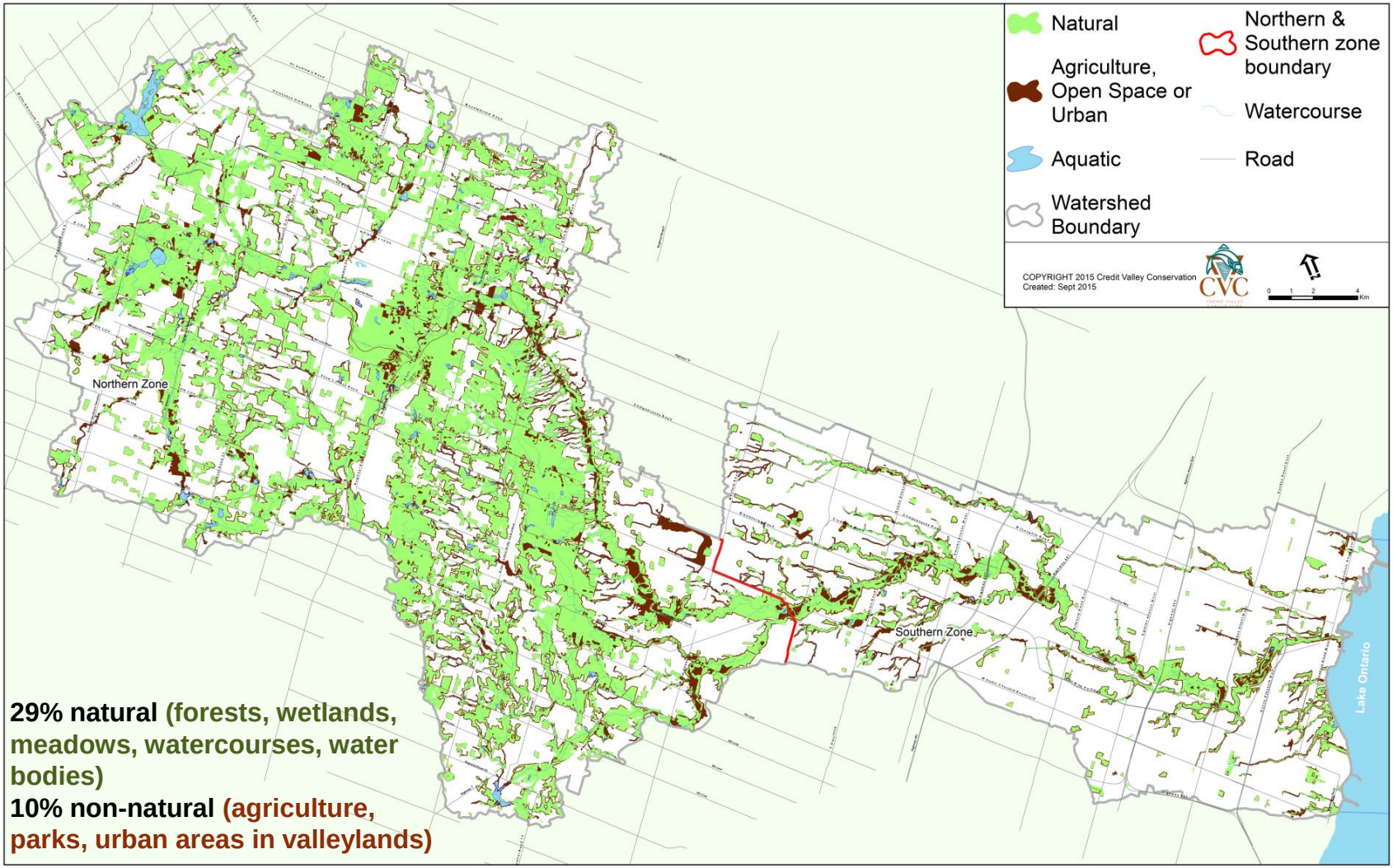
Habitat based approaches

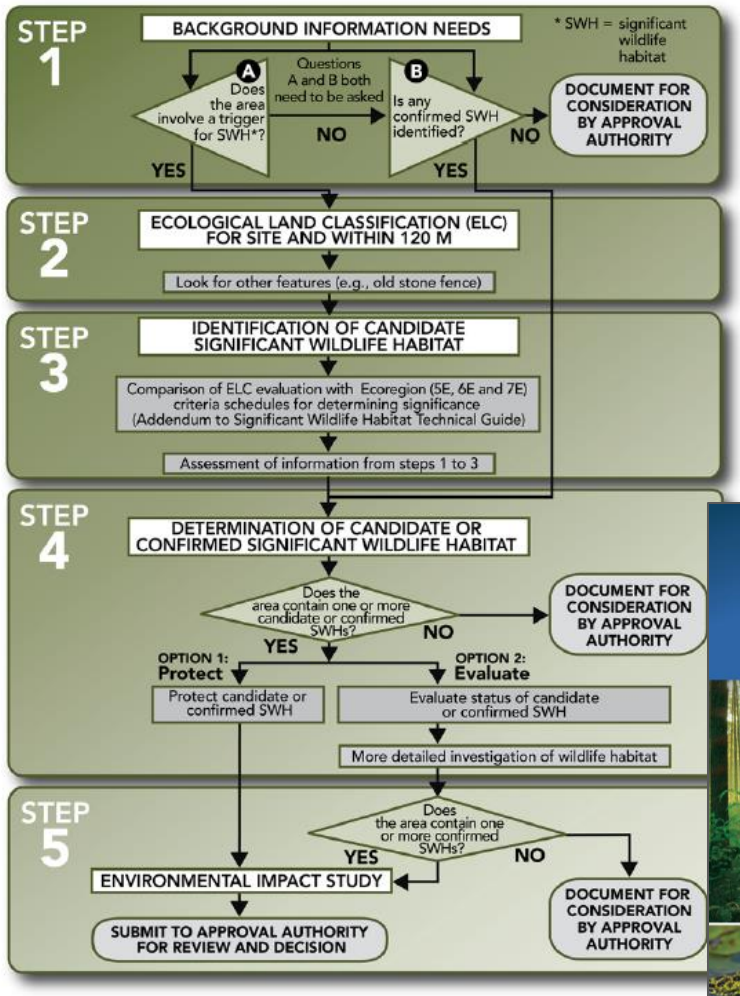
The Nature Conservancy
Natural Climate Solutions Handbook

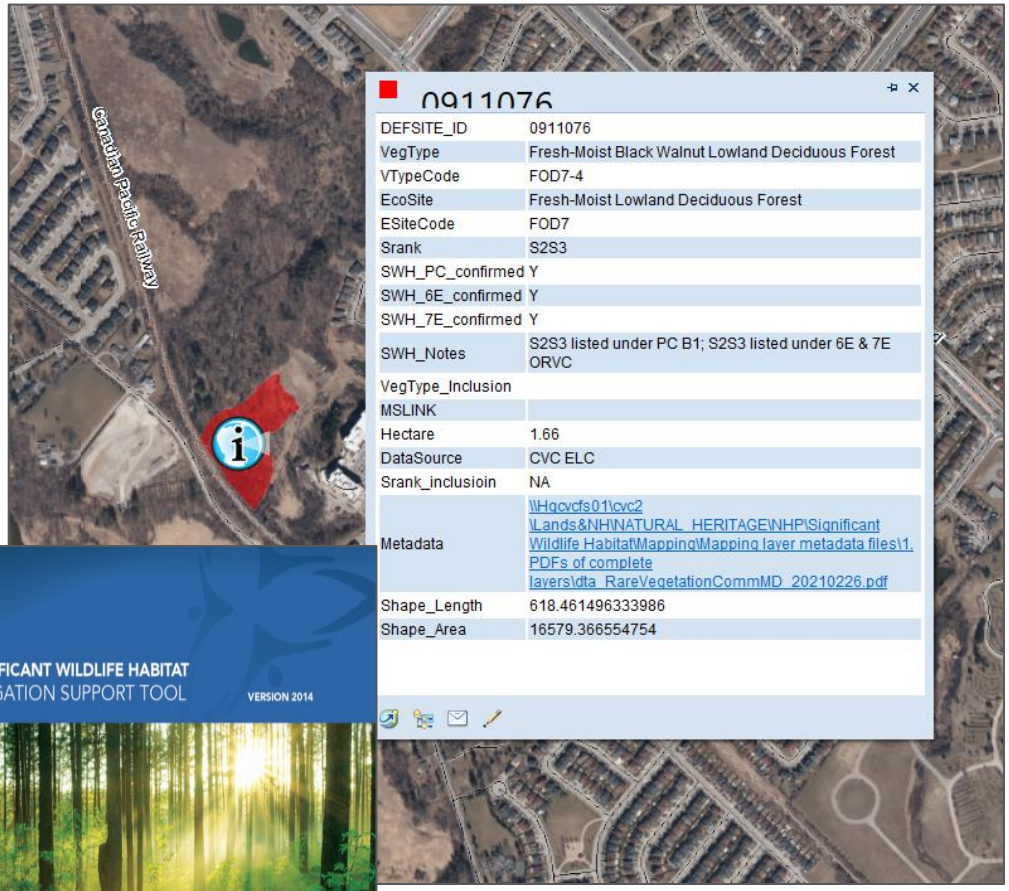
Natural Heritage System Strategy



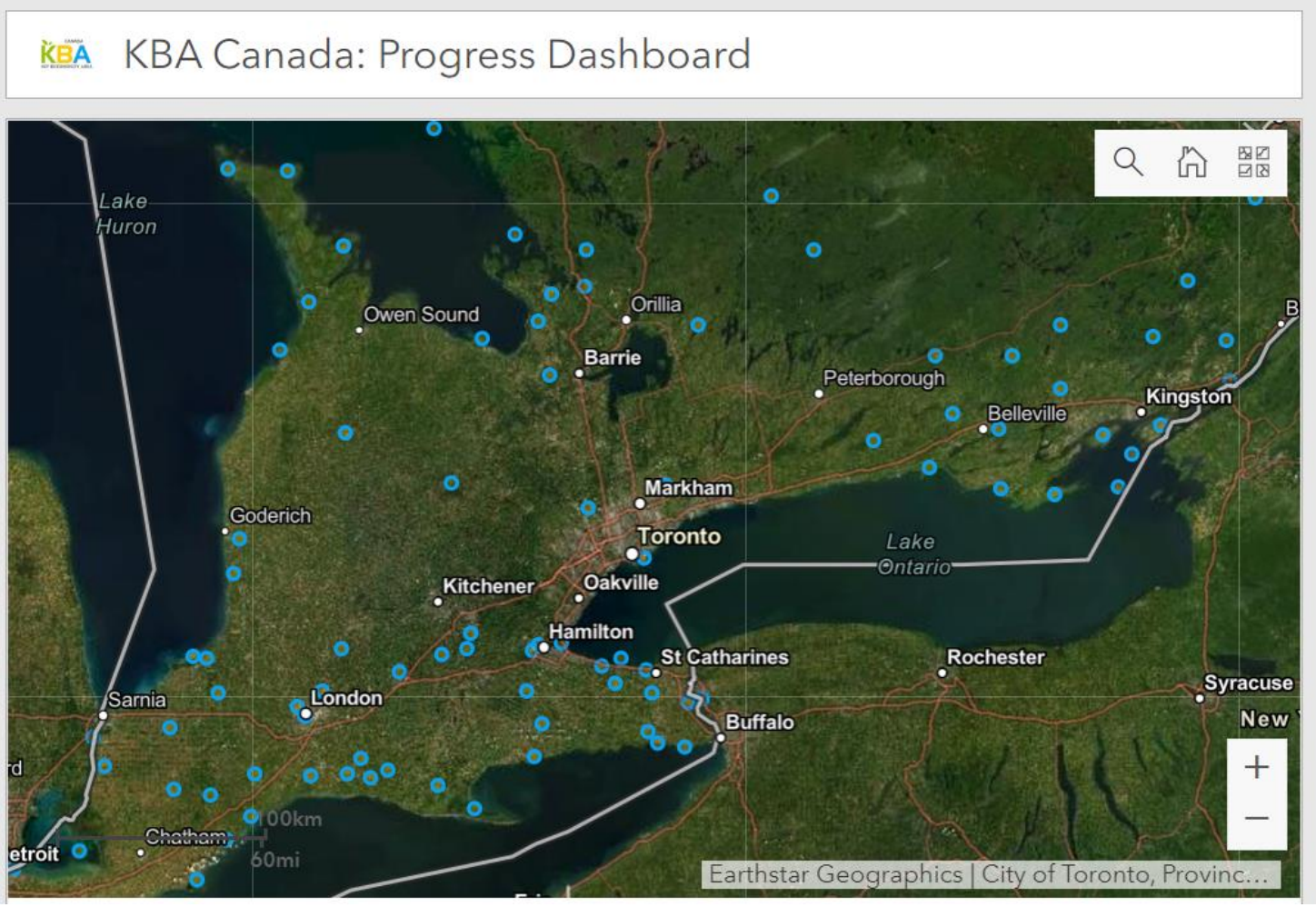
Mapping Significant Wildlife Habitat

Figure 9-1: Process for Identifying and Confirming Significant Wildlife Habitat





Key Biodiversity Areas



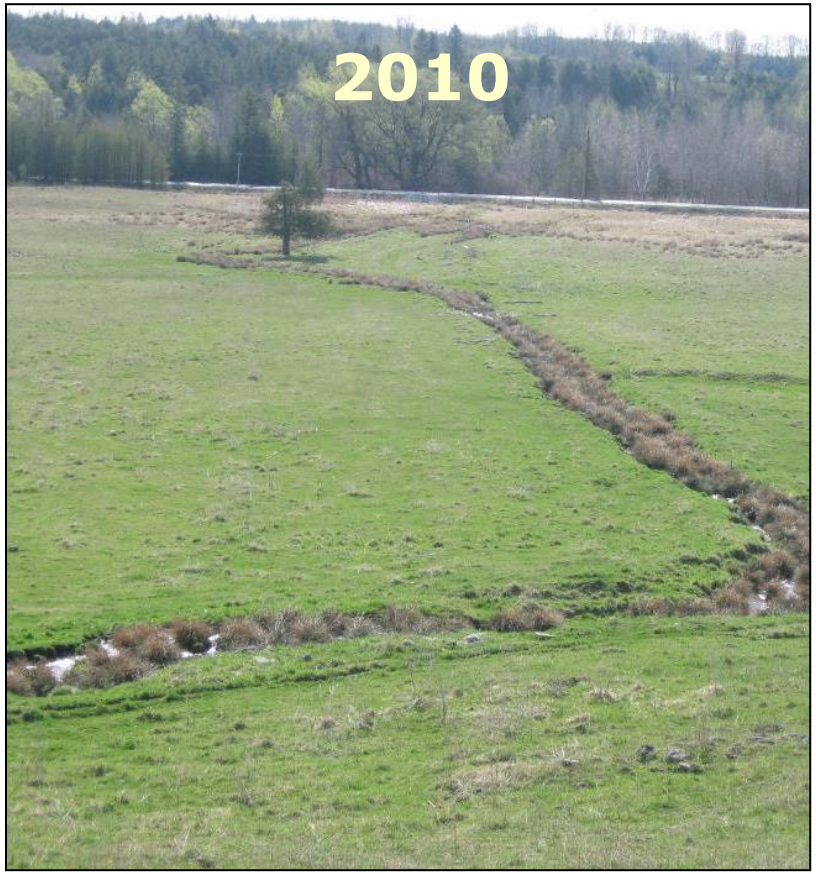
https://www.kbacanada.org/

Restoring habitats

East Credit River, Caledon: Stream daylighting & naturalization

800 m stream restored, 0.3 ha wetland restored, 2 barriers to fish passage removed, 7400 m^3 flood storage created, 1.8 ha riparian grassland created

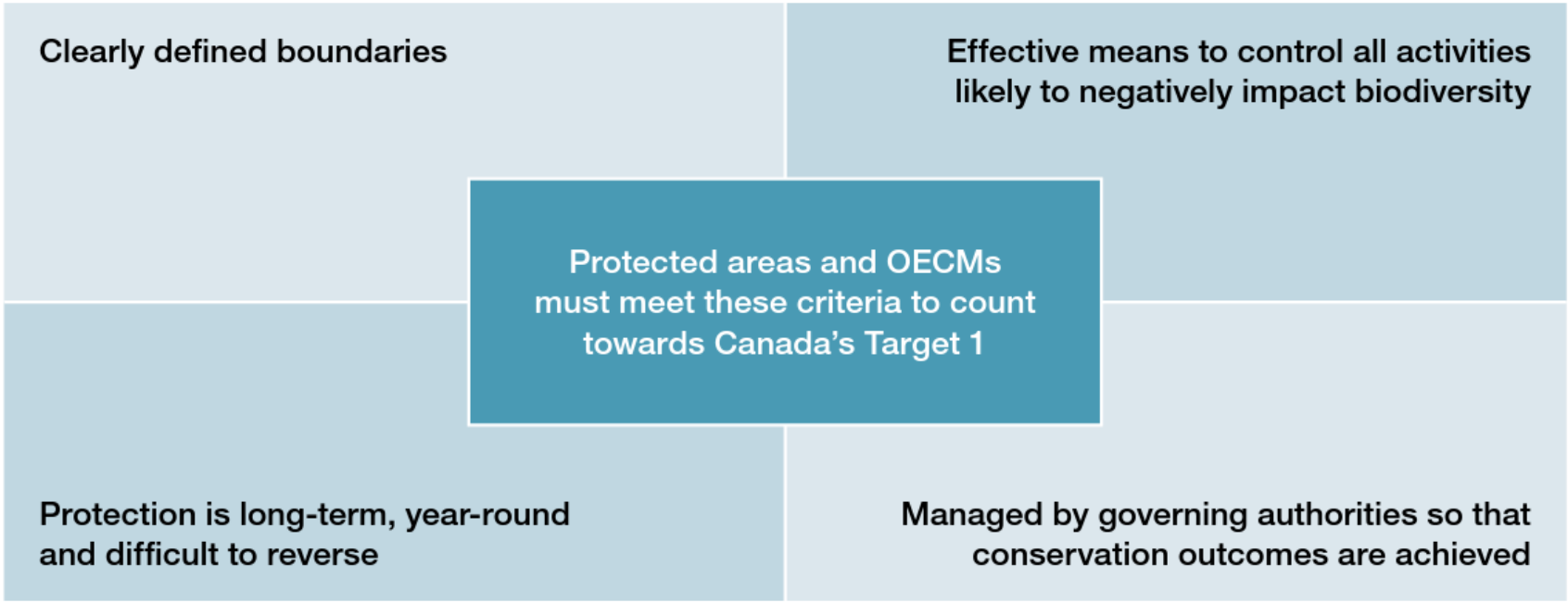
Increasing woodland cover



CVC has planted **1,236,237 trees**
on **717 hectares** since 2002

Protected & restored areas must also be managed for function

Figure 12 *Criteria for establishing Protected Areas and OECMs*



New & increasing pressures threaten function

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Focusing on function for biodiversity conservation

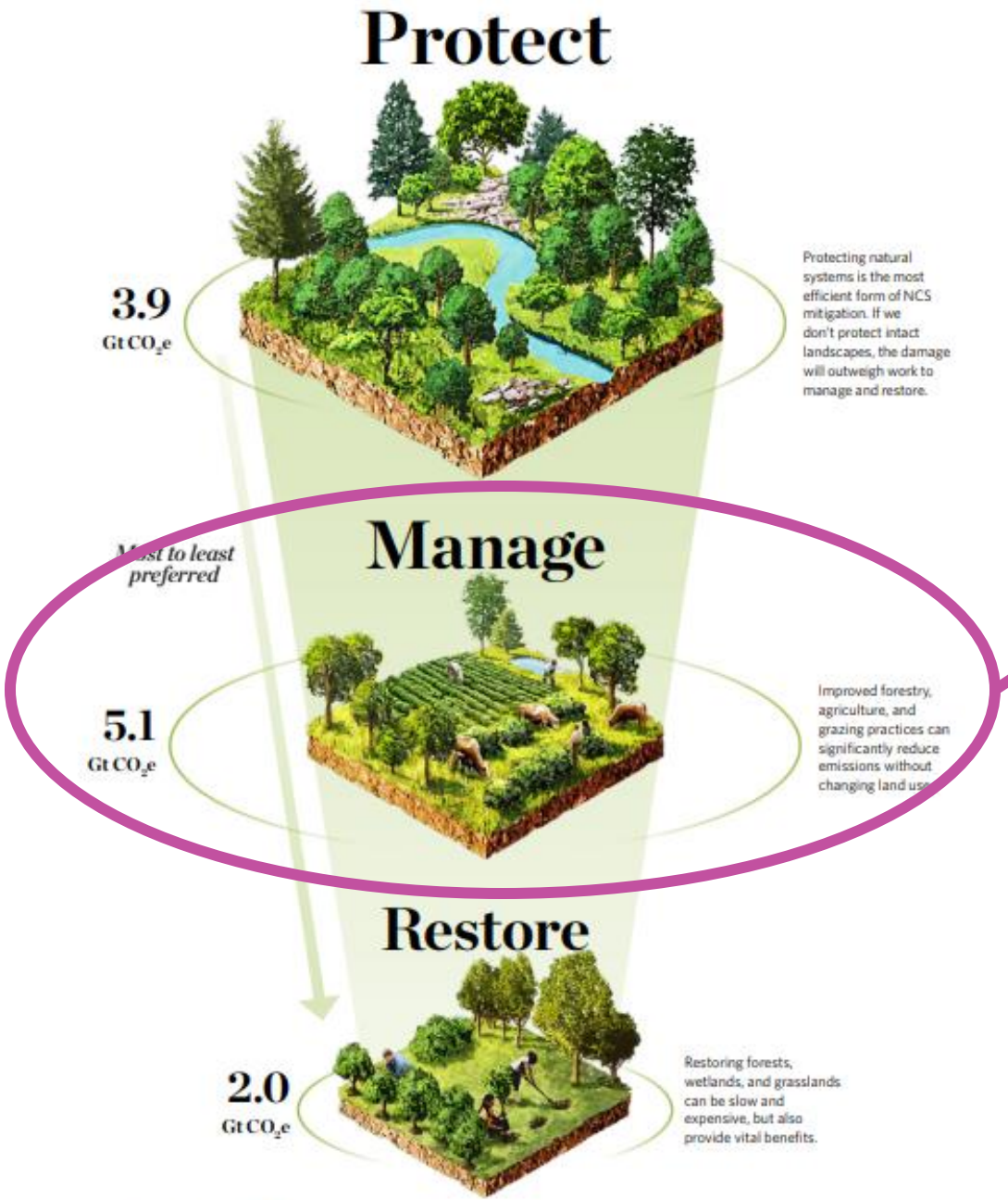
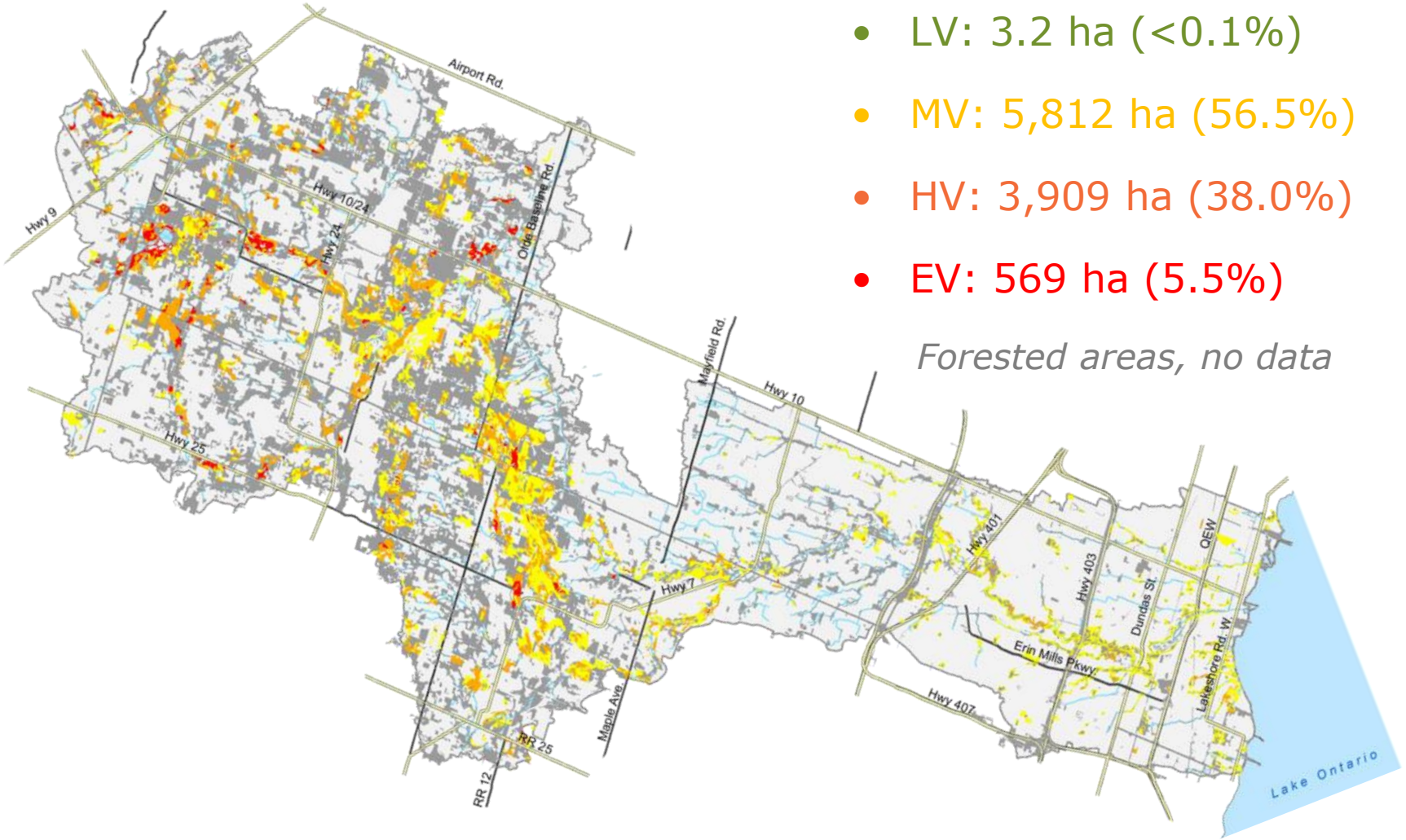


Figure 5: The mitigation hierarchy as applied to NCS emphasizes protecting intact systems

Focus on function

The Nature Conservancy
Natural Climate Solutions Handbook

Mapping climate vulnerable treed habitats



- LV: 3.2 ha (<0.1%)
- MV: 5,812 ha (56.5%)
- HV: 3,909 ha (38.0%)
- EV: 569 ha (5.5%)

Forested areas, no data

Adapting management practices

		HT	THP	DT	LP
Acanthus mollis	NNN	○	●	●	●
Acer negundo	INV	●	●	●	●
Aster lanceolatus	NN	○	●	○	●
Aucuba japonica	NN	●	○	●	●
Avena strigosa	NN	○	○	●	○
Bergenia cordifolia	NN	●	●	●	●
Castanea sativa	NA	●	○	●	●
Cortaderia selloana	INV	○	●	●	○
Dactylis glomerata	NA	●	●	●	●
Foeniculum vulgare	NA	○	●	●	●
Fraxinus angustifolia	NA	●	●	●	●
Galactites tomentosus	NA	○	●	●	○
Hedera helix	NA	●	●	●	●
Jacaranda mimosifolia	NN	○	○	○	●

		HT	THP	DT	LP
Ligustrum lucidum	NN	●	○	●	●
Ligustrum ovalifolium	NN	●	●	●	●
Liriodendron tulipifera	NN	●	●	○	●
Pinus pinaster	NA	○	○	●	○
Pittosporum tobira	NNC	○	○	●	●
Plantago lanceolata	NA	○	●	○	○
Platanus hispanica	NN	●	●	●	●
Populus nigra	NN	○	●	○	●
Pteridium aquilinum	NA	○	○	○	●
Quercus rubra	NN	●	●	●	●
Rubus ulmifolius	NA	○	○	○	●
Veronica arvensis	NA	○	●	○	●
Veronica persica	NN	○	●	○	●
Vinca major	NN	●	●	●	●

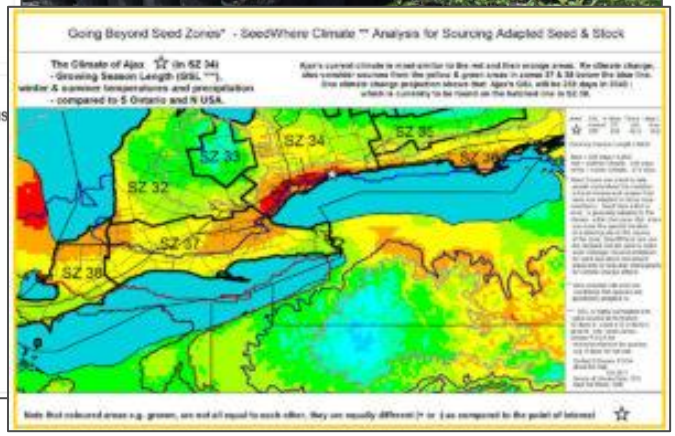
STATUS
NA - Native
NN - Non-native
NNC - Casual
NNN - Naturalized
INV - Invasive

ACTION
Remove
Monitor
Keep
Add

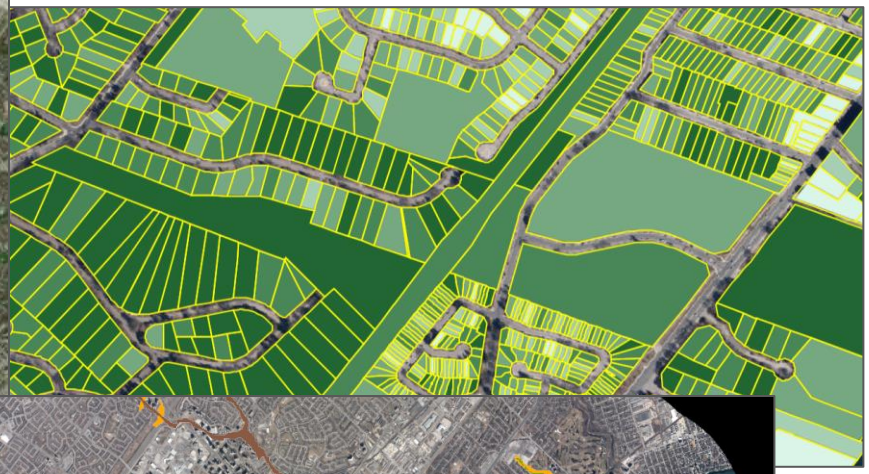
LAYER
Herbaceous
Shrub
Tree

TARGETED ADAPTATION TRAITS
HT - Heat Tolerance
THP - Temperature Hardiness Plasticity*
DT - Drought Tolerance
LP - Light Plasticity**

● Tolerant / High plasticity (≥ 4 zones*, ≥ 2 types**)
○ Not tolerant / Low plasticity / Unknown



Identifying window collision hotspots



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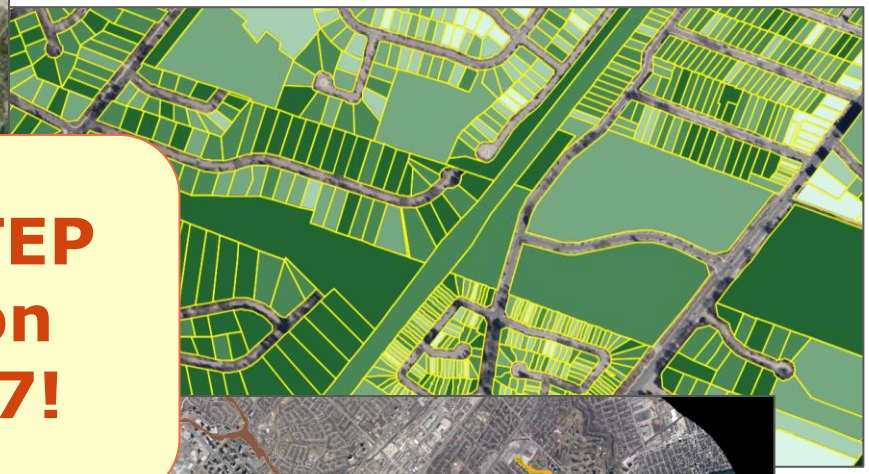
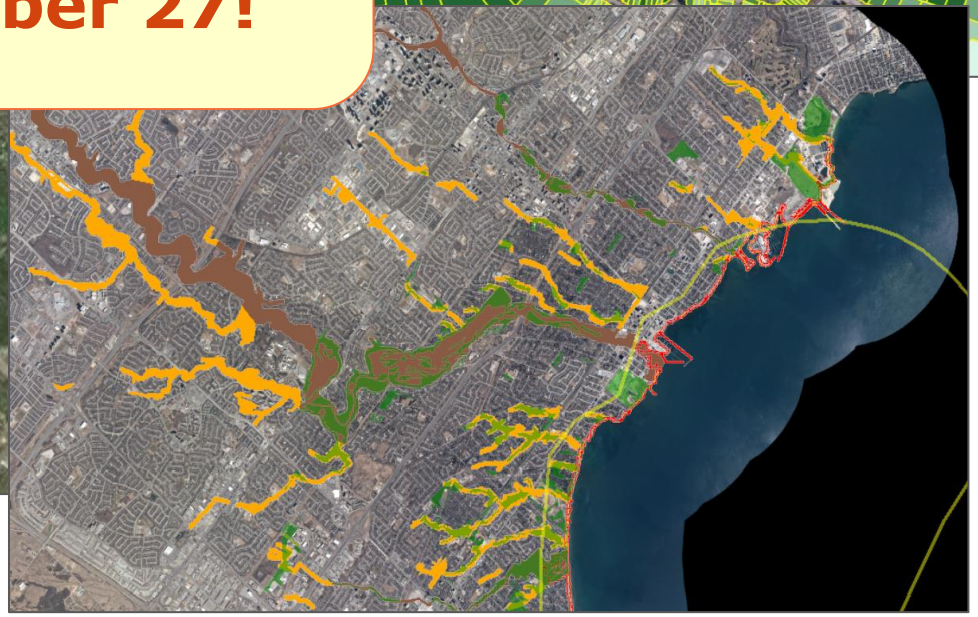
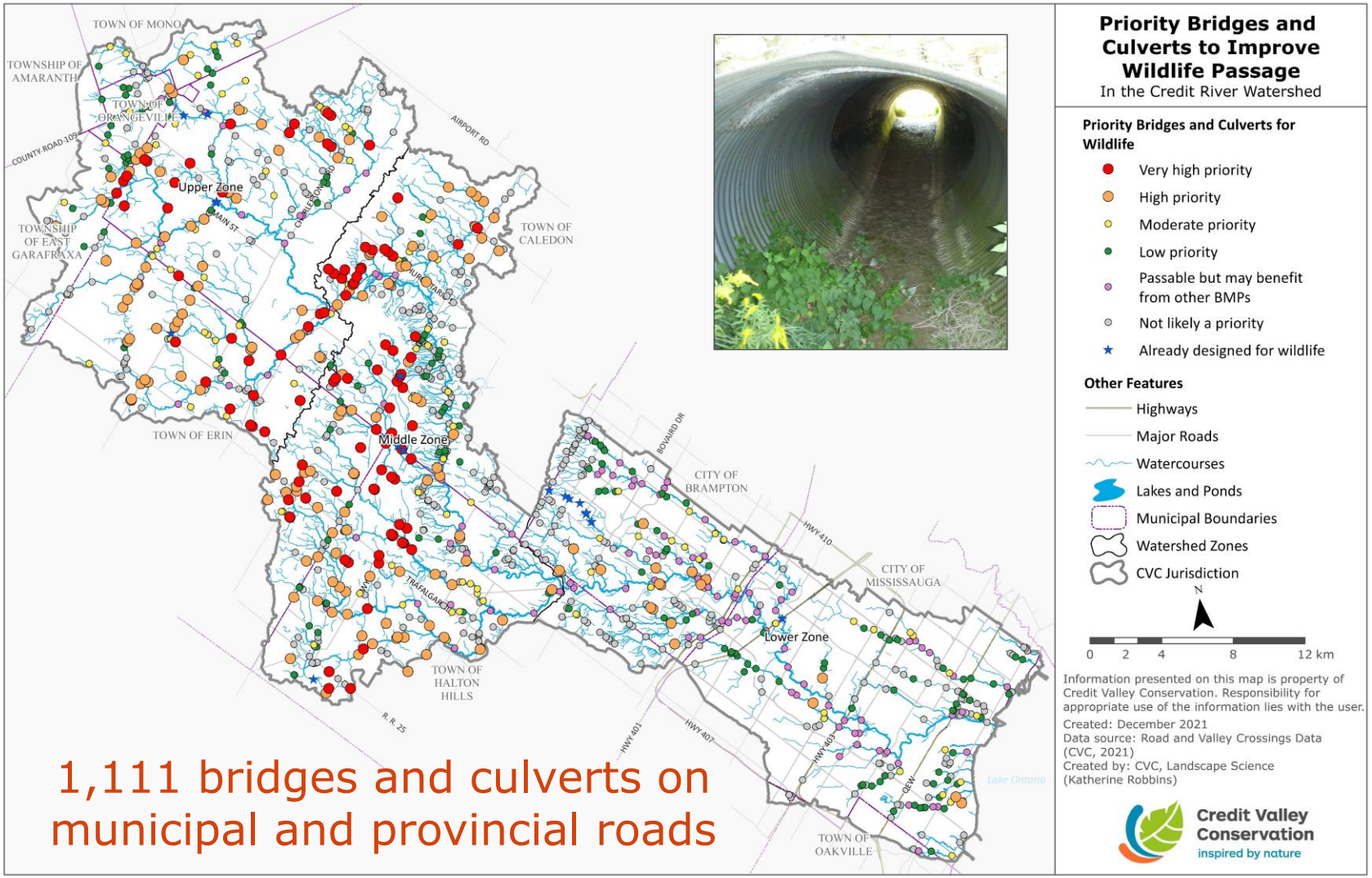


Join the STEP webinar on October 27!

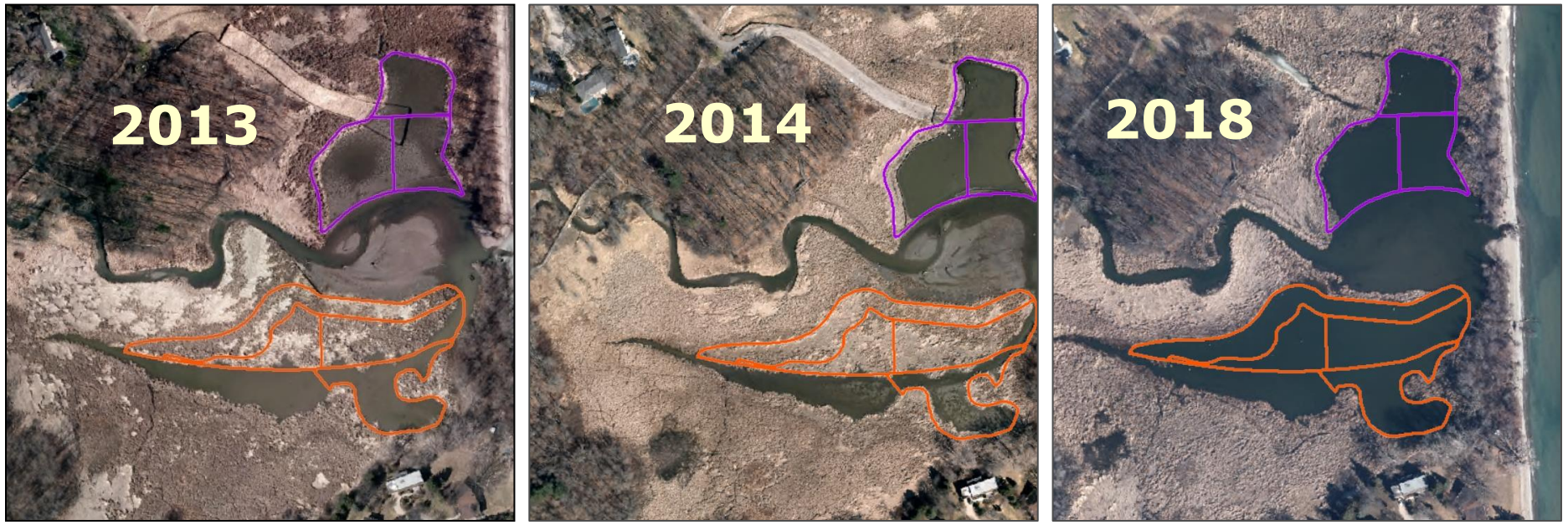


Prioritizing road and valley crossings



1,111 bridges and culverts on municipal and provincial roads

Managing habitats

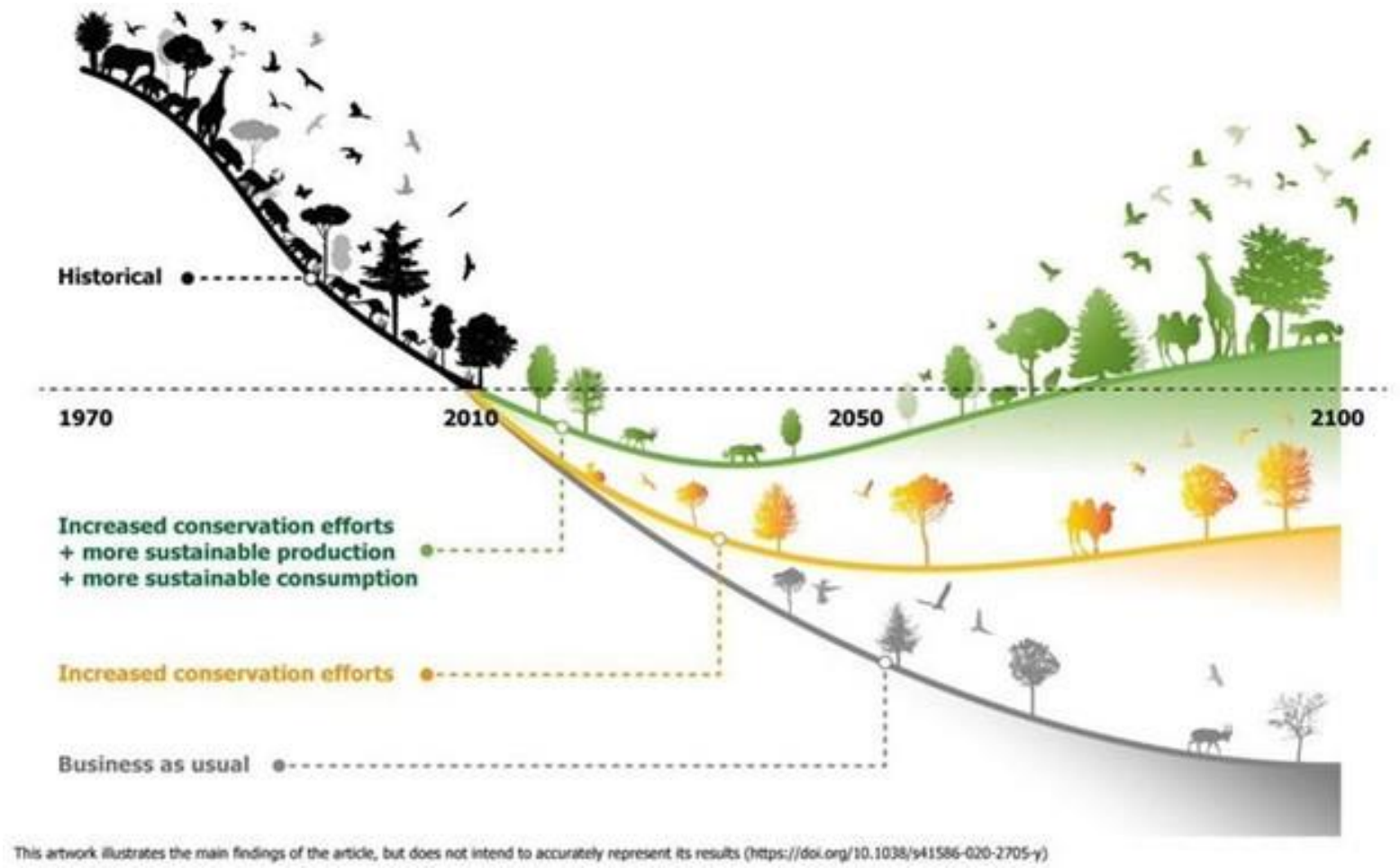


Rattray Marsh, Mississauga: Sediment removal and restoration
3.6 ha of wetland restored, 8300 m^3 flood storage created

Engaging and empowering people

Going further to bend the curve on biodiversity loss

Bending the curve

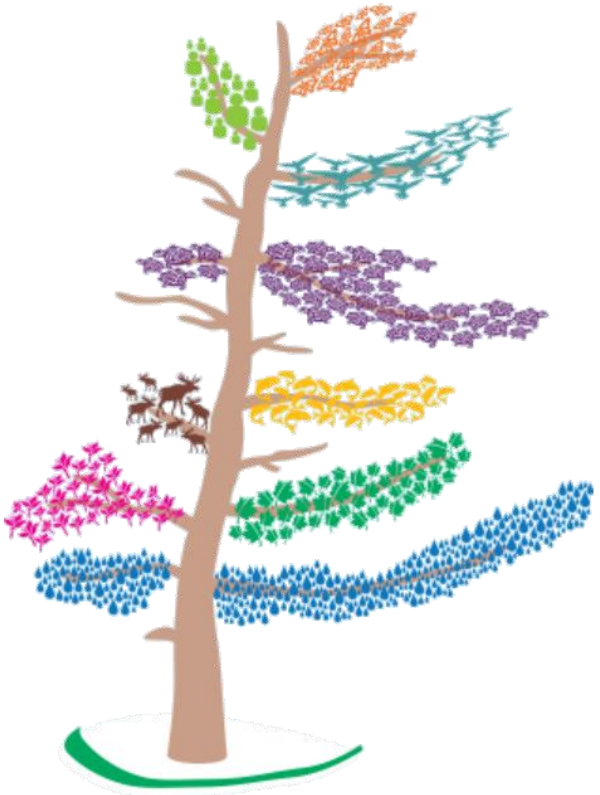


Adam Islaam | International Institute for Applied Systems Analysis (IIASA)

Think strategically

2020 Biodiversity Goals and Targets for Canada (2015)

Ontario Biodiversity Strategy (2011)



Focus locally


Georgian Bay
CITY OF ORILLIA
COUNTY OF SIMCOE
Lake Simcoe
CITY OF KAWARTHA LAKES
COUNTY OF PETERBOROUGH
CITY OF BARRIE
CITY OF PETERBOROUGH
COUNTY OF NORTHUMBERLAND
COUNTY OF DUFFERIN
REGION OF DURHAM
REGION OF YORK
REGION OF PEEL
COUNTY OF WELLINGTON
CITY OF TORONTO
CITY OF GUELPH
REGION OF HALTON
REGION OF WATERLOO
CITY OF HAMILTON
CITY OF BRANTFORD
COUNTY OF BRANT
REGION OF NIAGARA
HALDIMAND COUNTY
Lake Erie
A Place to Grow
Growth Plan for the Greater Golden Horseshoe
Office Consolidation 2020
Ontario.ca/growthplanning
Legend
Boundary of Upper- and Single-Tier Municipalities
Greenbelt Area*
Greater Golden Horseshoe Growth Plan Area**
Sources: Ministry of Infrastructure, Ministry of Natural Resources and Ministry of Municipal Affairs and Housing.
*Ontario Regulation 59/05
**Ontario Regulation 416/05
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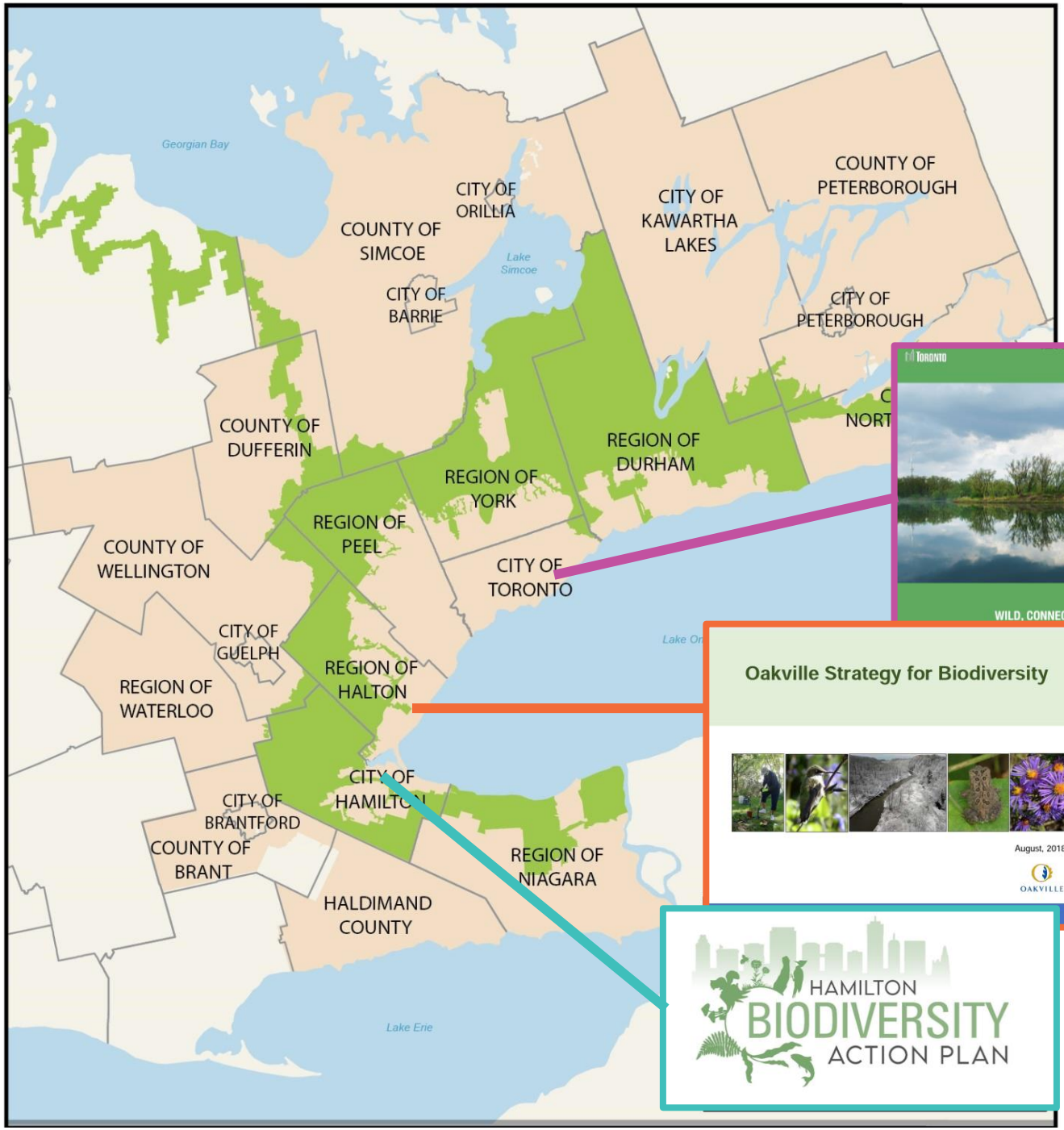
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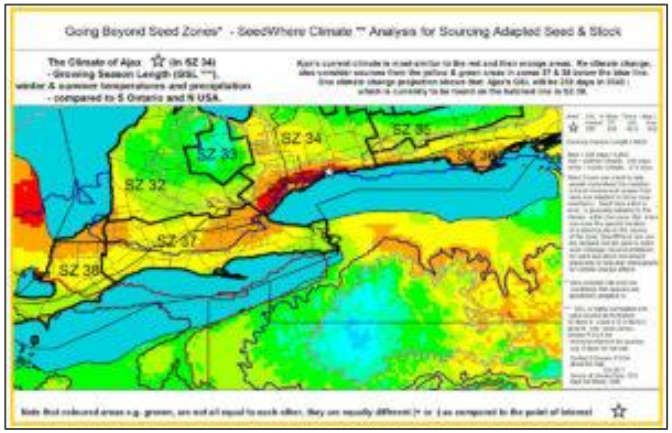
COUNTY OF BRANT
REGION OF NIAGARA
HALDIMAND COUNTY
Lake Erie
2019
WILD, CONNECTED AND DIVERSE:
2018
Oakville Strategy for Biodiversity
August, 2018
OAKVILLE
HAMILTON
BIODIVERSITY
ACTION PLAN
In progress

We need coordinated action from local experts

Collect & share biodiversity data

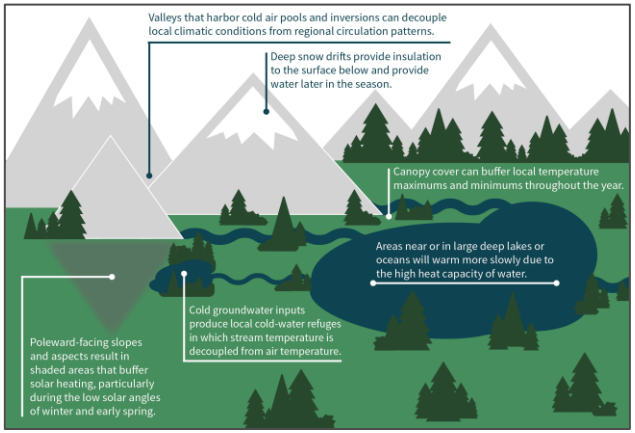
Credit Valley Conservation **Open Data**

Combine demand for southern seed



Forest Gene Conservation Association

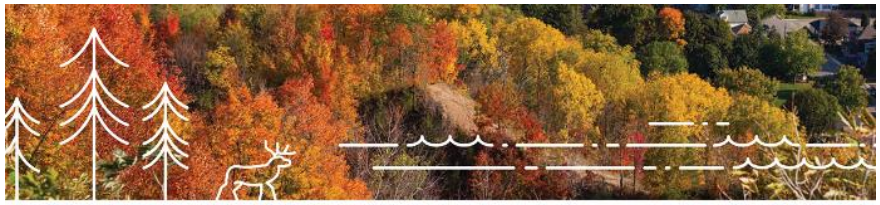
Identify & protect climate refugia



US Forest Service

Innovative solutions & partnerships

CPAWS
CANADIAN PARKS AND WILDERNESS SOCIETY

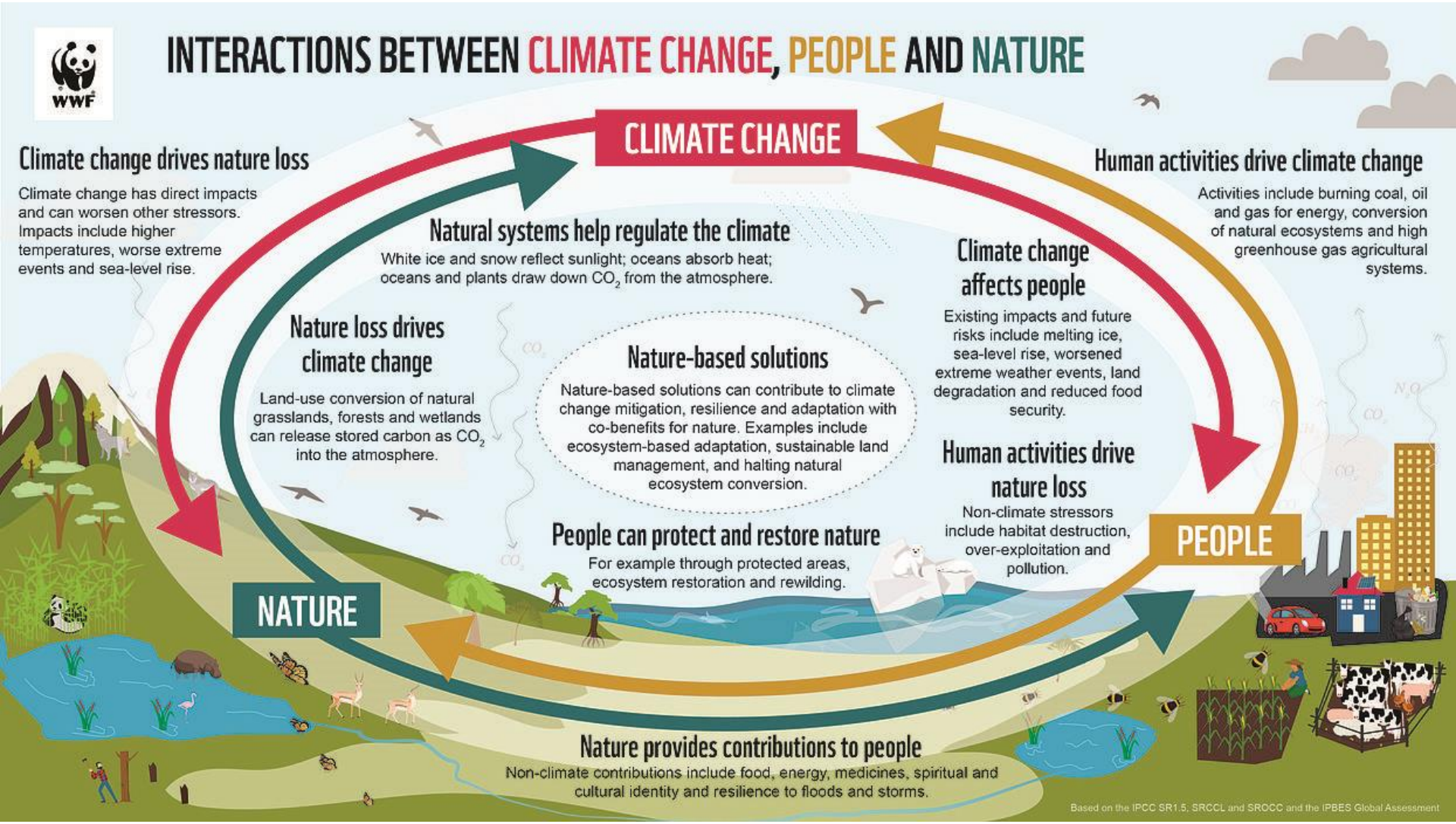


NEAR-URBAN NATURE NETWORK:
A SOLUTION TO CLIMATE CHANGE
AND BIODIVERSITY LOSS

1$ FONDS DES MUNICIPALITÉS POUR LA BIODIVERSITÉ

SHAWANAGA ISLAND
INDIGENOUS PROTECTED & CONSERVED AREA

Summary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For example through protected areas, ecosystem restoration and rewilding.
PEOPLE
NATURE
Nature provides contributions to people
Non-climate contributions include food, energy, medicines, spiritual and cultural identity and resilience to floods and storms.
Based on the IPCC SR1.5, SRCCL and SROCC and the IPBES Global Assessment

Let’s work together to protect & manage our biodiversity and help it thrive for future generations

questions?