

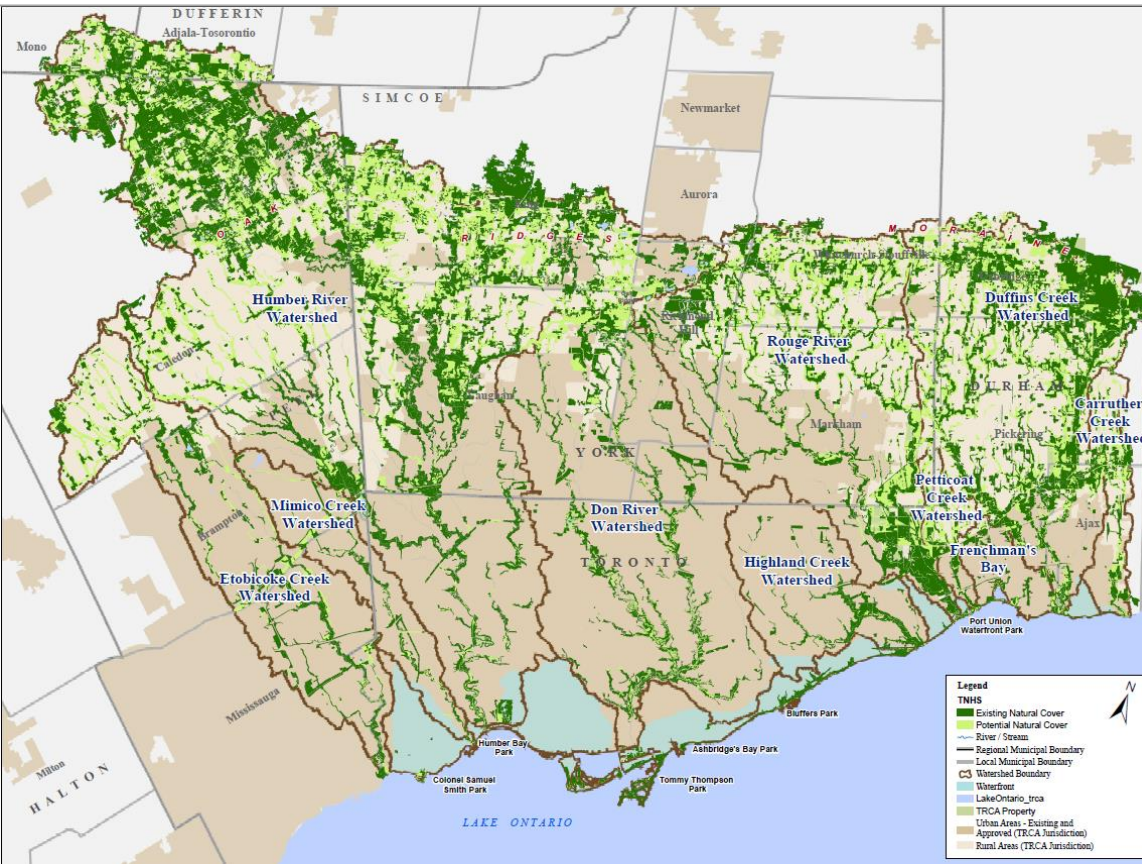
An Update to the Terrestrial Natural Heritage System

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Terrestrial Natural Heritage System (2007)



- Aimed to increase terrestrial biodiversity (habitat and species)
- Focused on protecting existing and restoring potential natural cover
- Included various ecological and policy related criteria
- Acknowledges co-benefits & ecosystem services
- Provided guidance to TRCA staff and partner municipalities

What have been achieved with TNHS?

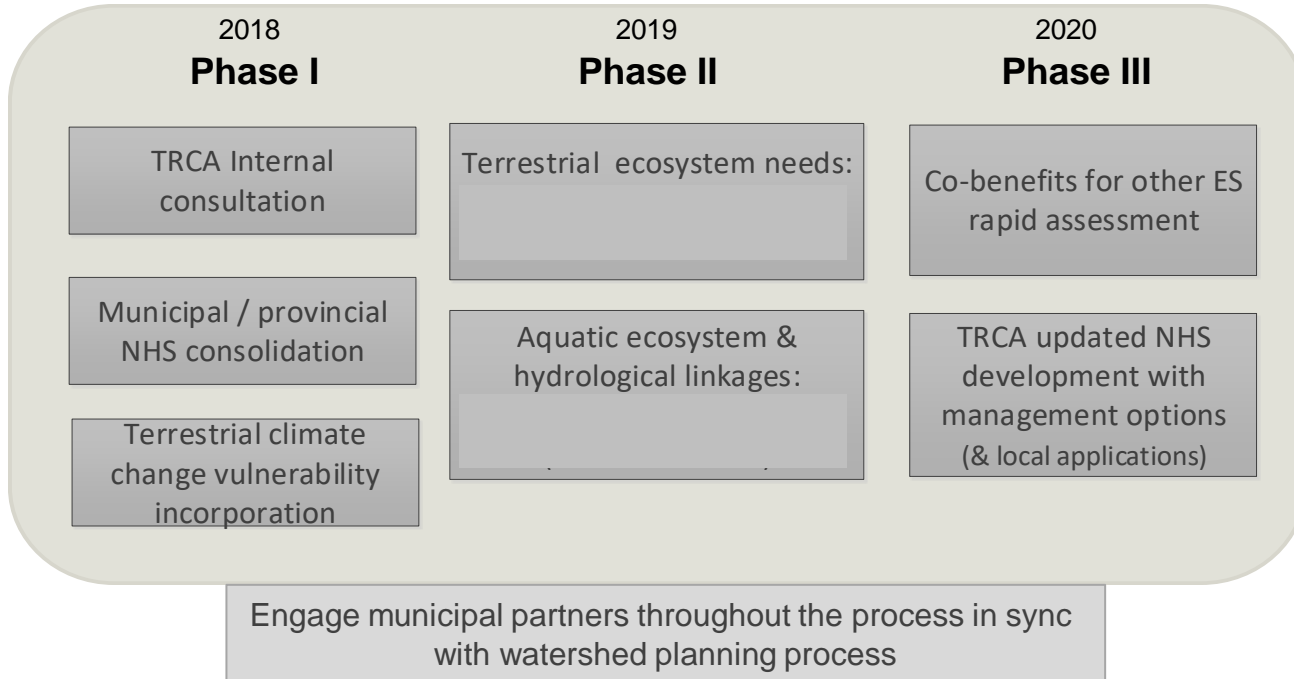
- Assisted municipal partners in development of NHS in their OPs
- Informed provincial and other CA initiatives related to NHS
- Over 1300 ha of land acquired by TRCA within TNHS since 2007
- Over 450 restoration projects completed within TNHS since 2012
- Informed various TRCA and partner municipalities initiatives

(Watershed planning, Restoration planning, Land management, Land acquisition, Development and EA planning, MCR)

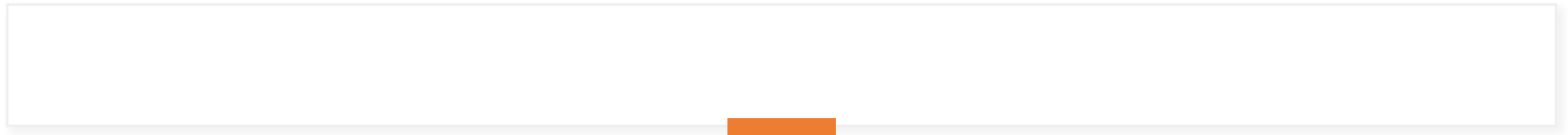
Why an update to the TNHS?

- To consolidate the municipal natural heritage systems
- To account for climate change vulnerabilities of natural systems
- To utilise updated science and practice of natural systems planning (urban)
- To utilise the expanded field data and analytical capacity of TRCA
- To assist TRCA and municipal partners in various strategies and initiatives
(watershed planning, land use planning, restoration planning, climate adaptation, GI implementation, road ecology & habitat connectivity etc.)

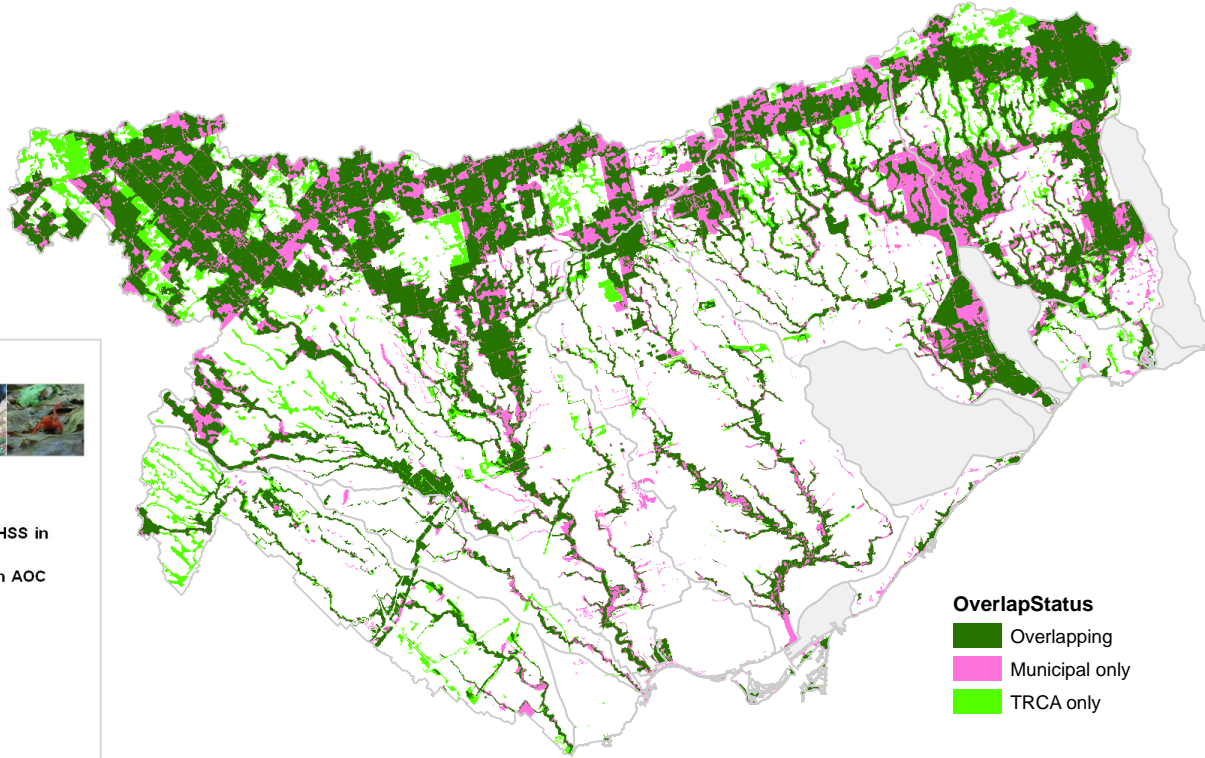
Project Scope



Phase I & II Snapshots



1. Municipal NHS Consolidation



OverlapStatus

- Overlapping
- Municipal only
- TRCA only

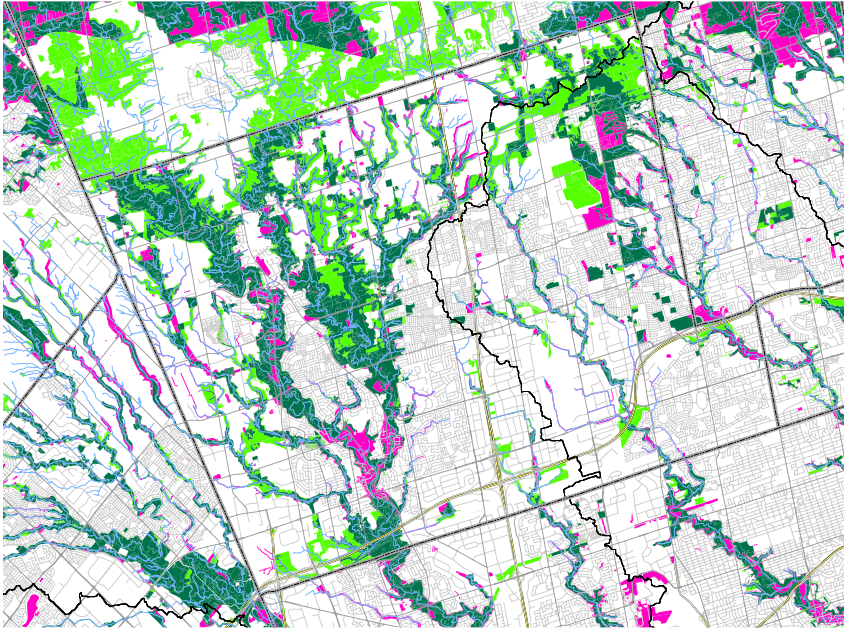


Evaluating the Implementation of the TNHSS in
TRCA Watersheds:
Toward Delisting the Toronto and Region AOC

DRAFT

2018

TRCA TNHS and municipal NHS overlap



TRCA TNHS = 29% of Vaughan

Municipal NHS = 26% of Vaughan

Overlap = 20% of Vaughan

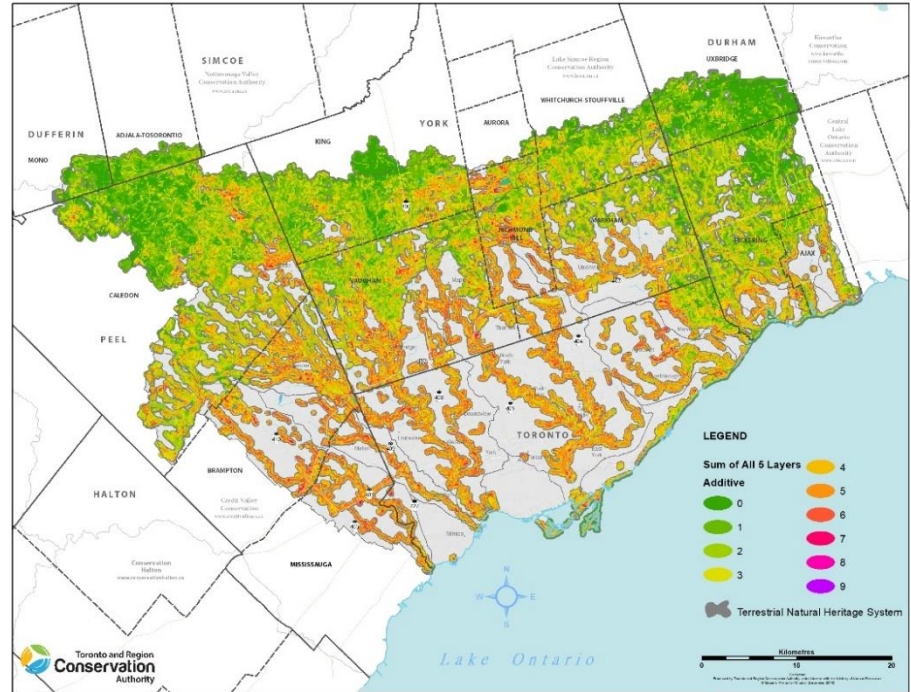
TRCA only = 9% of Vaughan

Municipal only = 5% of Vaughan

2. Climate Change Vulnerability Assessment

Terrestrial Systems VA:

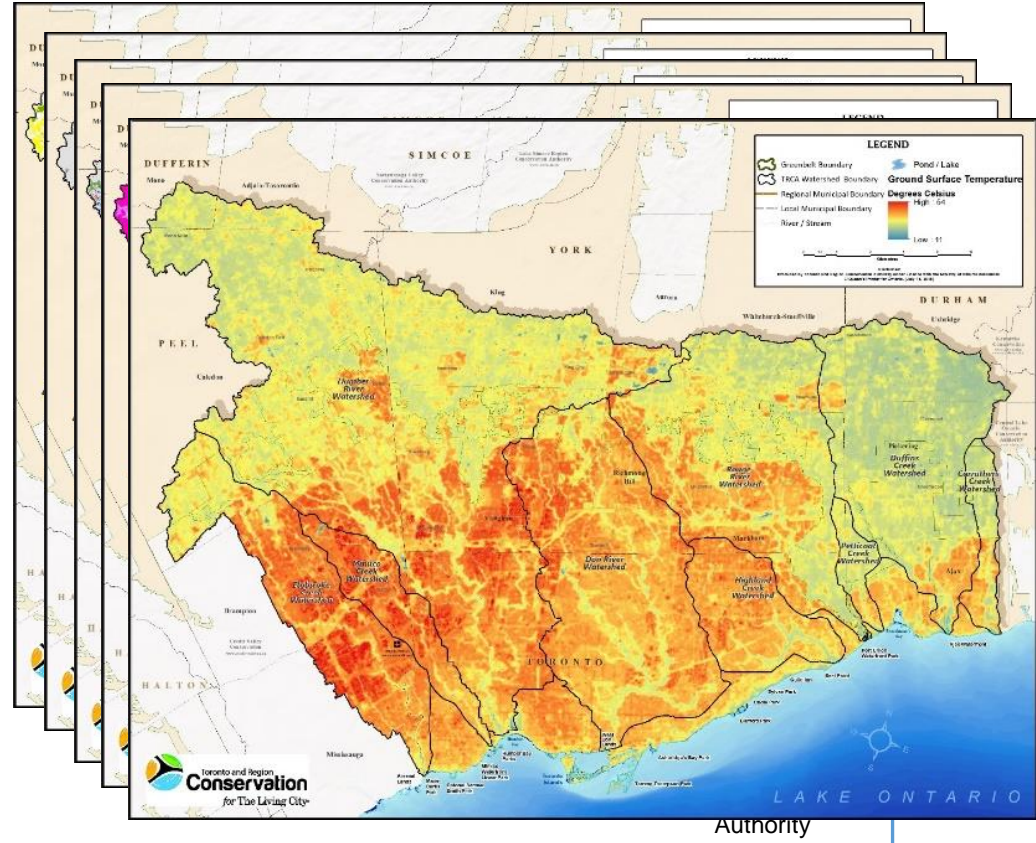
- Habitat patch quality
- Climate sensitive vegetation
- Wetland vulnerability
- Soil drainage
- Ground surface temperature



2. Climate Change Vulnerability Assessment

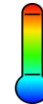
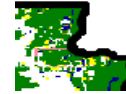
Terrestrial Systems VA:

- Habitat patch quality
- Climate sensitive vegetation
- Wetland vulnerability
- Soil drainage
- Ground surface temperature



2. Climate Change Vulnerability Assessment

- **Habitat patch score:** Existing habitat shape, edge-to-area ratio, and connectivity evaluated using TRCA Landscape Analysis Model
- **Vegetation sensitivity:** Based on vegetation community (ELC) rankings by TRCA ecologists considering vulnerability of hydrology and fertility, and factor interaction
- **Wetland vulnerability:** Vulnerability ↓ as number of water sources ↑ (precipitation, surface water and groundwater)
- **Soil drainage:** Soil drainage class based on textural characterization and topography, also considering impervious areas
- **Temperature:** Divided into 3 equal abundance percentile classes within natural system



- 0 = low vulnerability
- 1 = med vulnerability
- 2 = high vulnerability

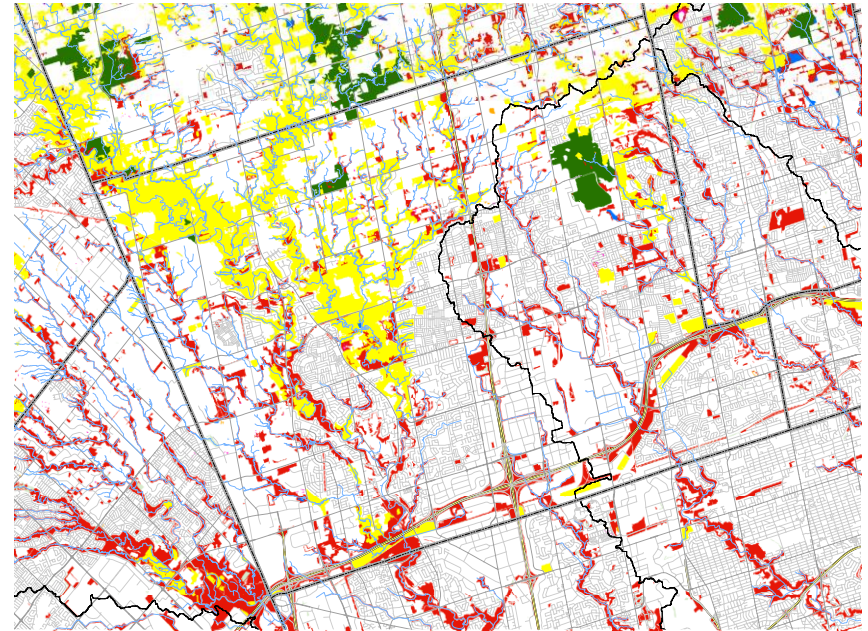
Additive score = sum of equally weighted individual vulnerability scores

Climate Change Vulnerabilities

Terrestrial Systems VA:

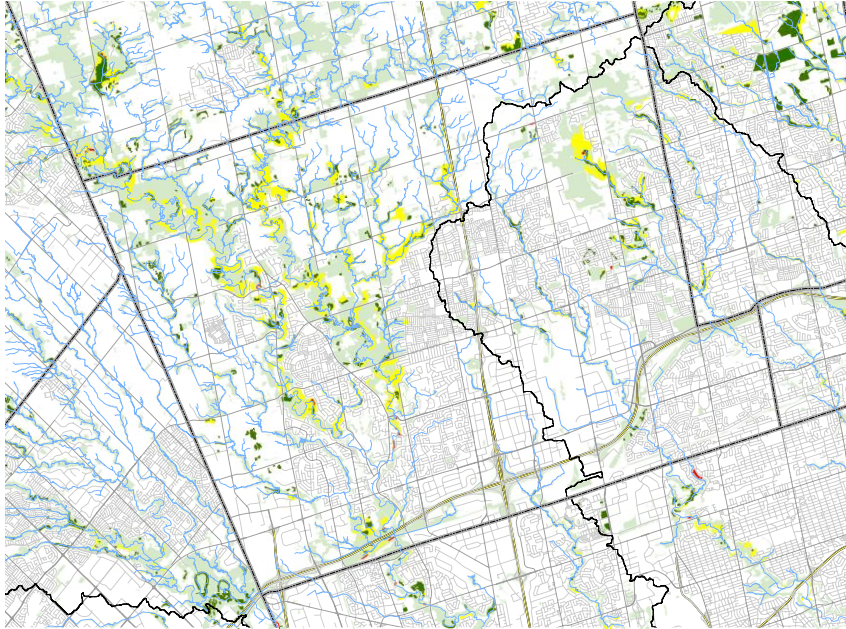
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Habitat Patch Quality

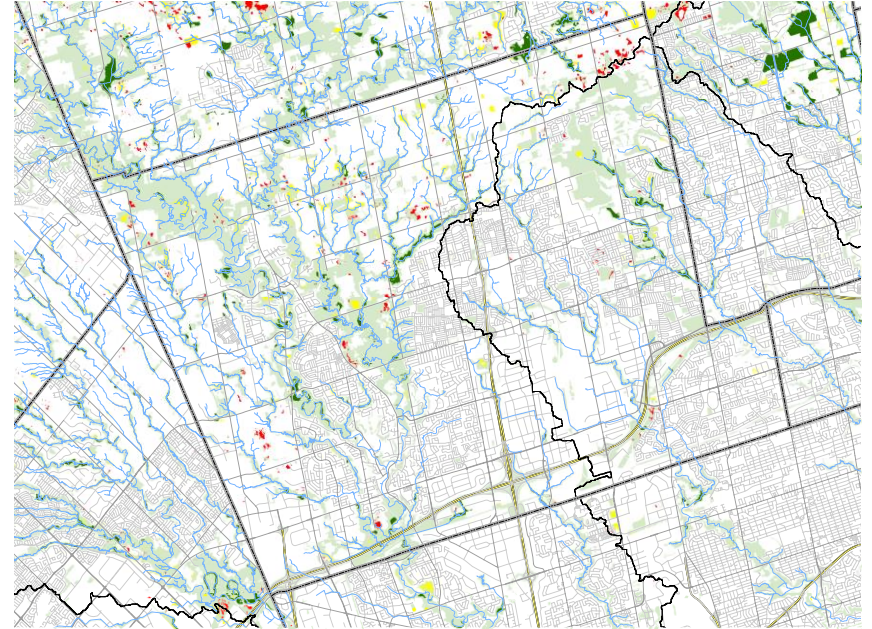


Low Medium High

Climate Sensitive Veg. Comm.



Wetlands Vulnerability



Low

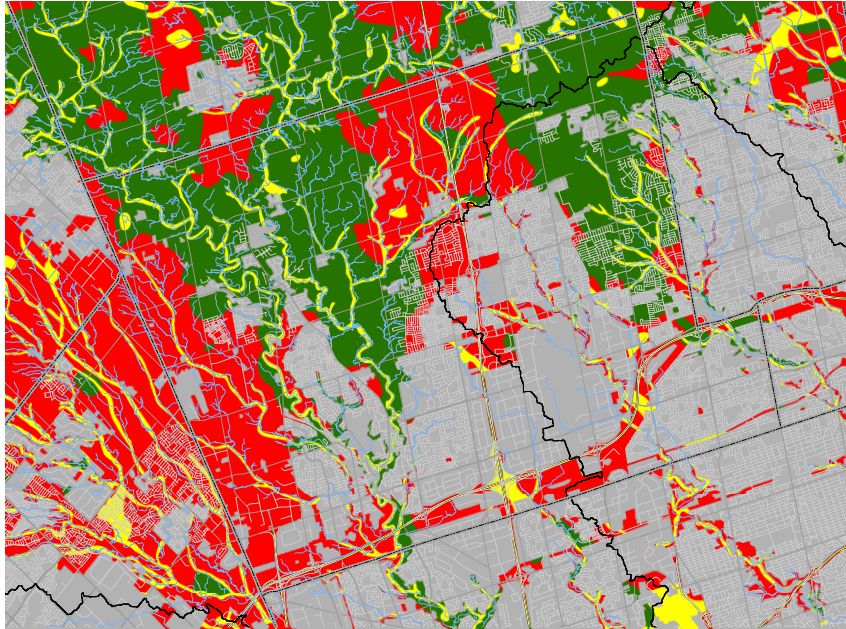


Medium

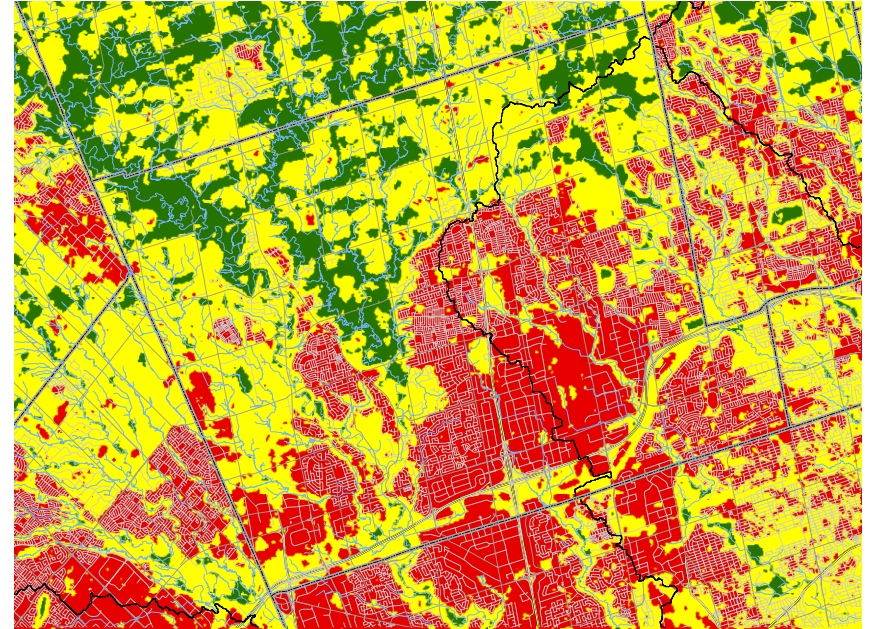


High

Soil Drainage



Ground Surface Temperature



Low



Medium

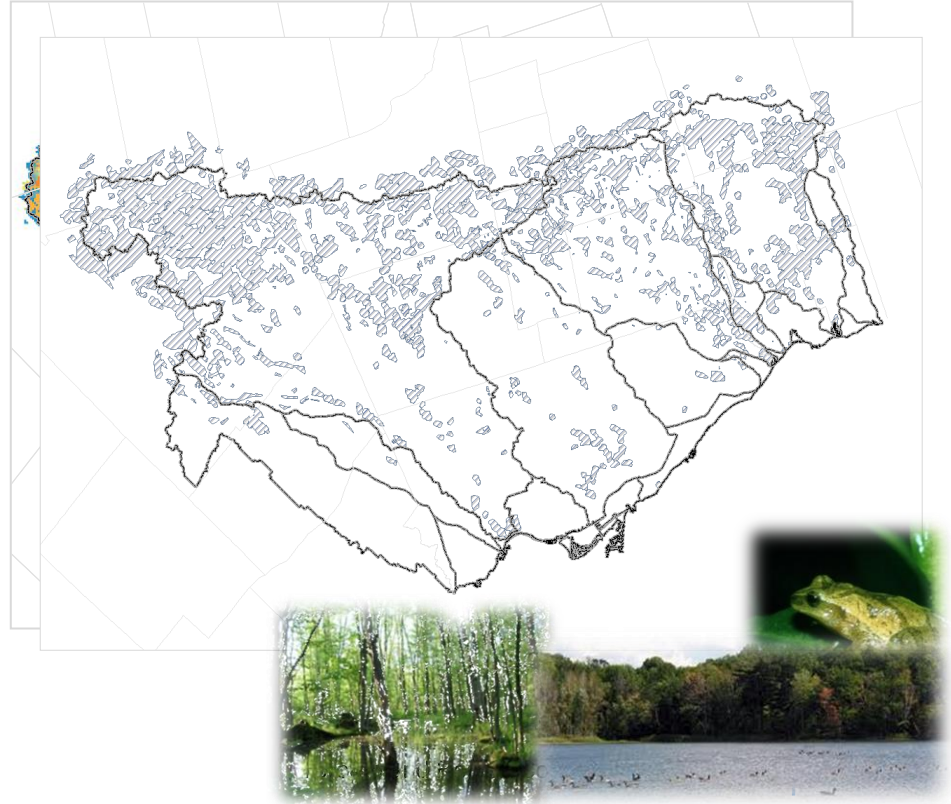


High

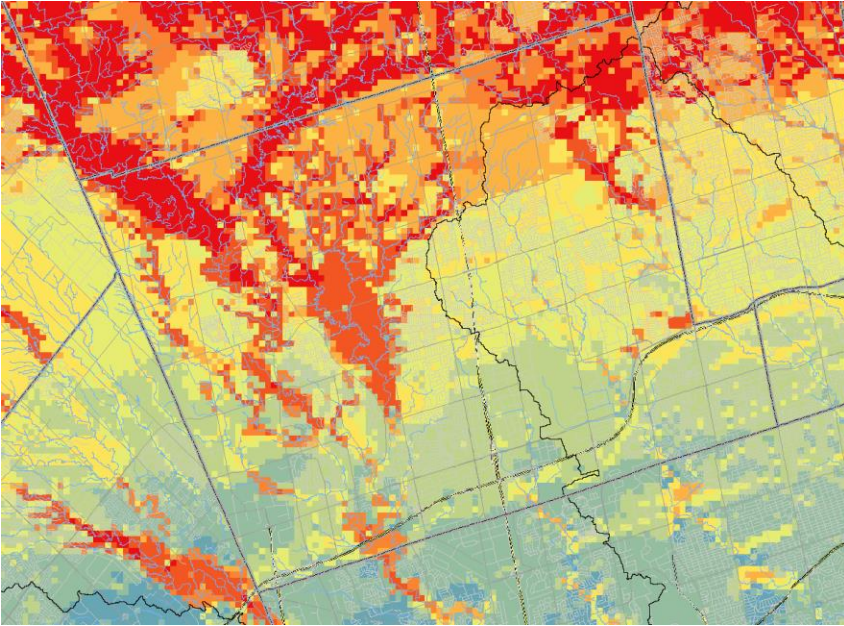
3. Updated Science and Practice

Habitat Connectivity

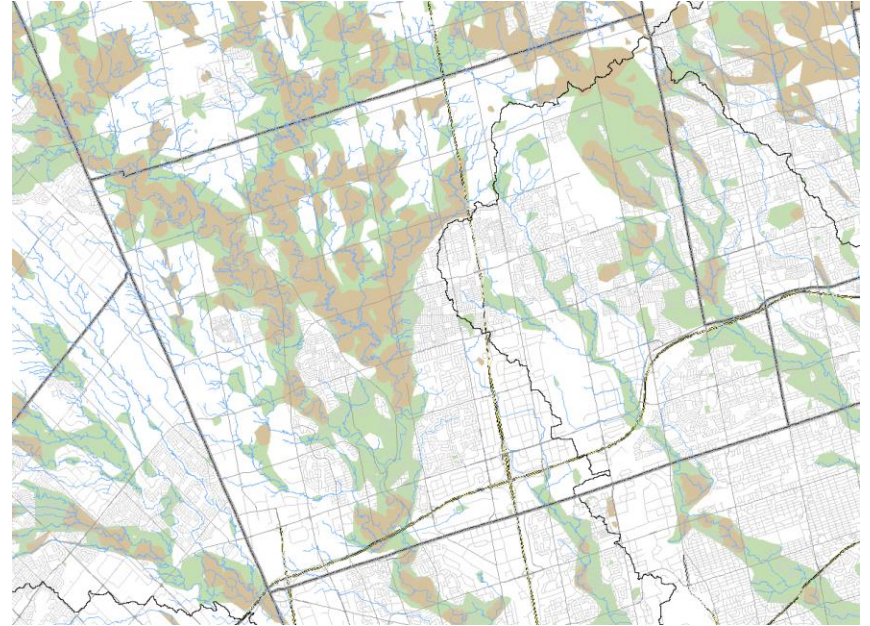
- Regional connectivity priorities for climate adaptation and gene flow for biodiversity
- Local connectivity priorities for avoiding road kills and supporting local populations of biodiversity



Regional Connectivity



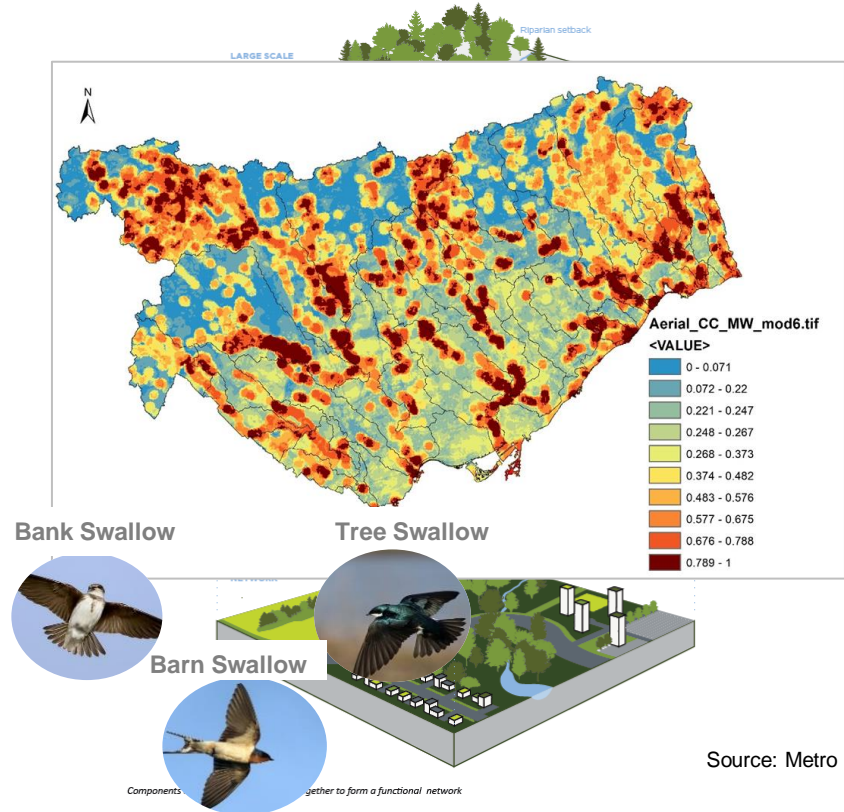
Local Connectivity (W-F & F-F)



3. Updated Science and Practice

Urban Ecology Framework

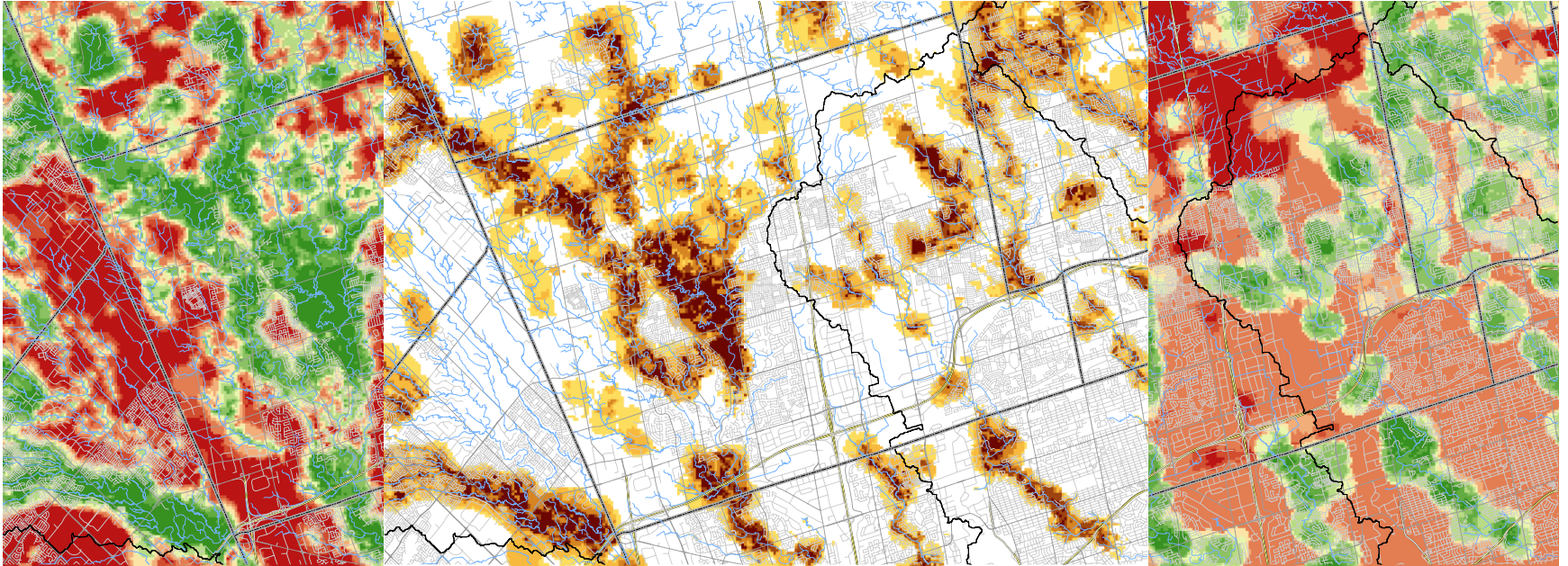
- Map out contribution of entire landscape to biodiversity
- Utilize data on urban forest and other GIs
- Identifies “complementary areas” to natural cover that benefit biodiversity explicitly



Source: Metro Vancouver, 2016

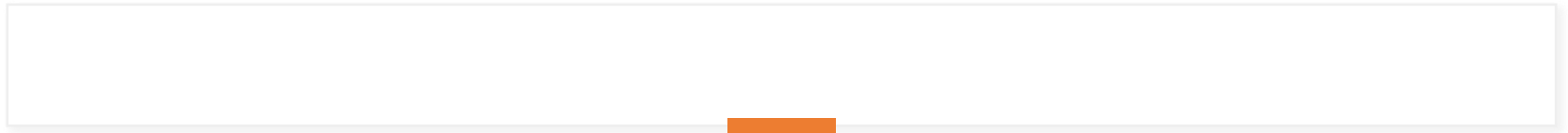
Habitat suitability – Forest Canopy

Habitat suitability – Aerial Insectivores



High Habitat suitability for
5 Species Functional Groups

Other Criteria

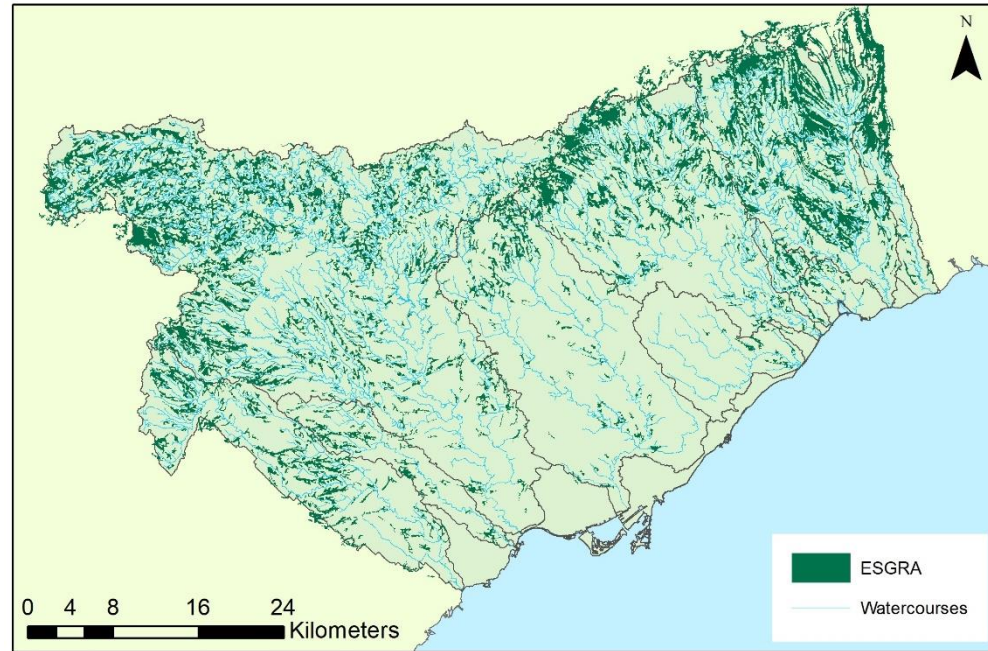


Ecologically Significant Groundwater Recharge Areas

- ESGRA is an area of land that replenishes groundwater systems that directly support sensitive areas like coldwater streams and wetlands (Greenbelt Plan, 2017)
- They are identified using regional-scale modelling to predict where groundwater recharge at a given location will “discharge” within ecologically sensitive areas
- They are an important component of watershed planning and are included in the definitions of significant groundwater recharge areas in the *Growth Plan for the Greater Golden Horseshoe* (Growth Plan) (2019) and *Greenbelt Plan* (2017).
- It is also a part of the criteria for groundwater recharge in TRCA’s *Stormwater Management Criteria* (2012).

ESGRA Mapping for TRCA Jurisdiction

ATTRIBUTE	VALUE
ESGRA total area	34,849 ha
Area as proportion of TRCA jurisdiction	14.0 %
Minimum ESGRA polygon size	5 ha
Proportion of groundwater-dependent ecosystem* recharge areas protected	95.4 %
*as defined in technical memo	
Overlap with Oak Ridges Moraine Conservation Plan area	40.5 %
Overlap with Greenbelt Plan area	62.4 %
Overlap with 2017 natural cover* layer	29.4 %
*all areas of the landscape with natural vegetative cover	
Overlap with TRCA Terrestrial Natural Heritage System	38.7 %
Overlap with other provincial and municipal natural heritage system designations*	46.4 %
*includes Natural Core and Natural Linkage areas of the ORMCP and Greenbelt Plan, as well as Rouge National Urban Park, in addition to other categories of municipal or provincial natural heritage designations	
Overlap with Significant Groundwater Recharge Areas (SGRAs)	56.2



ESGRA - Vaughan

