

INTEGRATED RESTORATION PRIORITIZATION: A STRATEGIC TOOL FOR IMPROVING NATURAL SYSTEMS IN THE GREATER TORONTO AREA

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August 28, 2018

Presentation Outline

- Background and Rationale
- Methodology
- Results
- Tools and Utility for Implementation

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Background and Rationale

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Integrated Restoration Prioritization

Challenge:

There are multiple issues, priorities and objectives as it pertains to restoration. Natural heritage monitoring and modelling data informs different land management objectives (terrestrial and aquatic) at different temporal and spatial scales. How can this data be used to prioritize restoration consistently across the Greater Toronto Area in a meaningful way for restoration practitioners?

Opportunity:

Develop a multi-discipline approach to restoration prioritization that compares discrete areas against the need for restoration (level of impairment) and contributions to the natural system if restored. The approach should be consistent, repeatable, adaptable, and defensible.

Definition

Integrated Restoration Prioritization is a process of **combining various strategies**, plans and initiatives for both terrestrial and aquatic systems, upon which a vast assortment of environmental data as well as threats to ecosystem health can be overlaid and compared.



Goals

- Restoration goal is to protect and restore ecosystem function and health to benefit **ecological goods and services**
- Restoration objectives are based on reversing ecological **impairments** and building upon **the existing natural system**
- The **goal of the IRP framework** is to create a consistent and repeatable process to facilitate effective ecological restoration. IRP prioritizes restoration opportunities based on multiple objectives and benefits and help guides restoration planning and resource investment to provide healthier functioning ecosystems throughout the Greater Toronto Area.

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Restoration Objectives

- To restore natural hydrologic processes and associated ecological systems by reversing, repairing or mitigating alterations and impairments
- To restore and/or increase natural cover
- To maximize size, shape and connectivity of natural heritage features
- To enhance landforms and restore soil and soil processes to promote self-sustaining natural communities

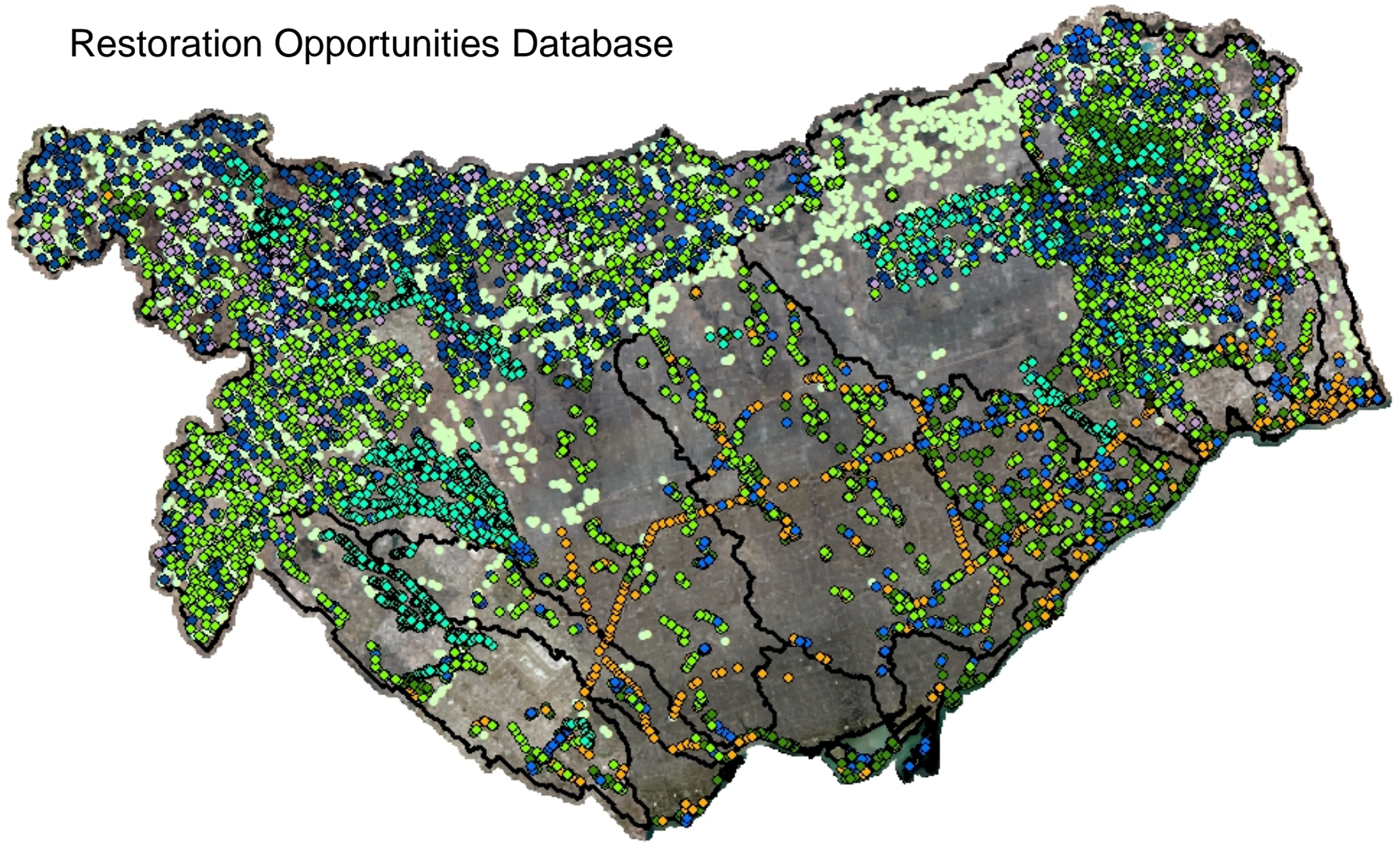


Restoration Opportunities Inventory

- ROP data collected in the field by trained technicians to identify and prioritize individual opportunities
- Utilizes GIS layers, drainage lines, orthophotography for desktop analysis
- To create a database of Restoration Opportunities in the field
- ROP sites are “real” implementable restoration projects



Restoration Opportunities Database



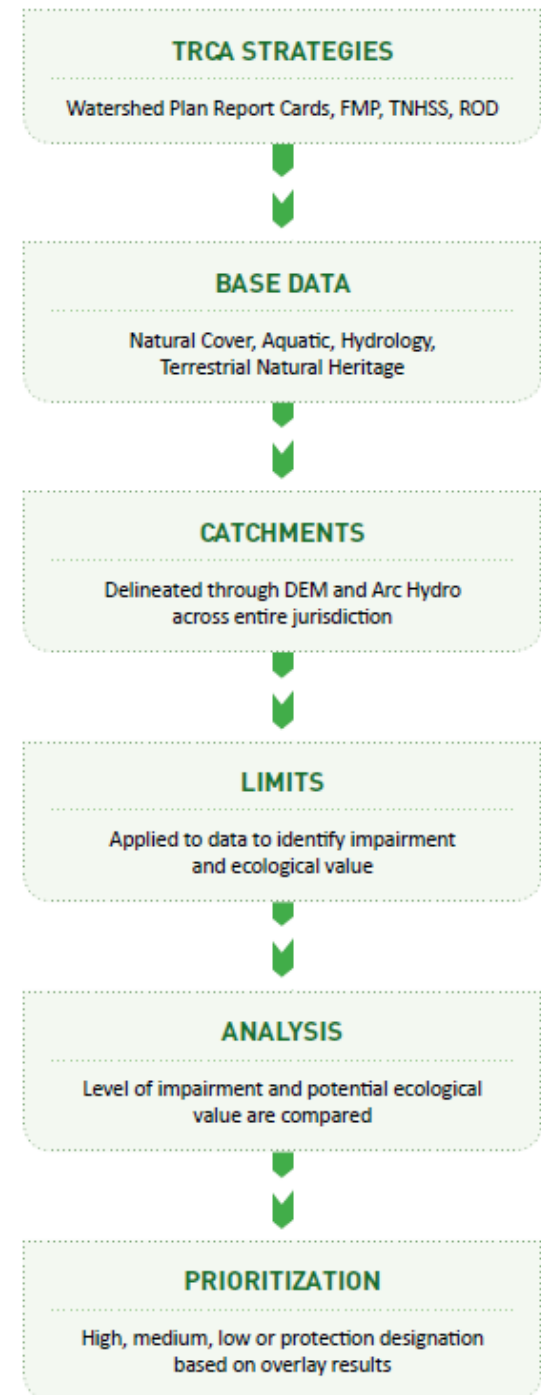
- | | | | | |
|----------------------------|----------|--------------|--------------|-----------------------|
| ◆ Stream opportunities | ◆ Forest | ◆ Riparian | ◆ Wet Meadow | ◆ Wetland Complex |
| ◆ Best Management Practice | ◆ Meadow | ◆ Wet Forest | ◆ Wetland | ◆ Modeled forest dots |

Methodology

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Methods

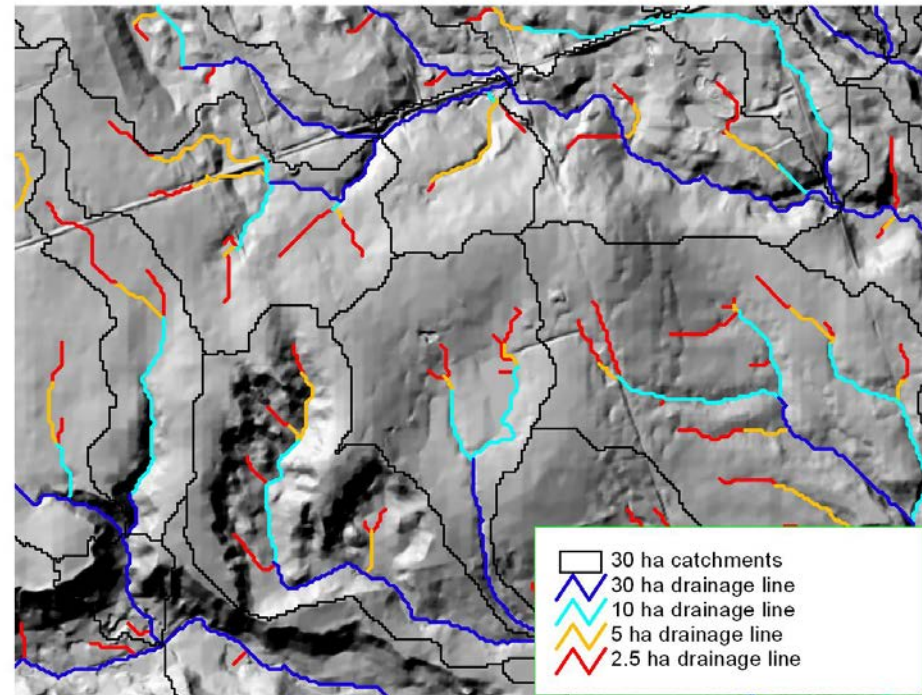
- To utilize the environmental data collected under **Watershed Strategies, Fish Management Plans, Terrestrial Natural Heritage Strategy** that inform Watershed Report Card
- To apply **metrics and thresholds** to this data to identify priority and to measure change
- To develop a standard decision-making tool for **restoration prioritization** that is strategic, defensible and replicable



Base Metrics

Category	Metric	Metric Priority	Rationale
Natural Cover	Riparian	Areas of <u>low riparian</u> cover	Areas in need of more riparian cover
	Wetland	Areas of <u>low wetland</u> cover	Areas in need of more wetland cover
	Forest	Areas of <u>low forest</u> cover	Areas in need of more forest cover
Hydrology	Altered Hydrology	Areas of <u>significantly altered</u> hydrology	Areas where impairments and threats to hydrologic function are likely and are in need of restoration/remediation
Aquatic	Stream temperature	Areas with unstable <u>in-stream temperatures</u>	Upstream areas that are in need of mitigation to reduce in-stream heating (planning, on-line pond removal)
	Barriers	On-line ponds and priority in-stream <u>barriers</u>	Areas where facilitating fish movement is needed
	Water quality	Reaches with “poor” <u>water quality</u> (FBI and IBI)	Upstream areas that are in need of mitigation to improve water quality
Natural Heritage	Ecological value	<u>High value ecological</u> areas with low natural cover	Areas to increase natural cover that are adjacent to areas with significant existing cover
	Potential terrestrial corridor	<u>Corridor connections</u> areas with low natural cover	Areas of low natural cover than can contribute most to connecting areas of high natural cover
	Potential wetland corridor	Areas for <u>wetland corridor</u> connections with low wetland cover	Most suitable areas with low wetland cover to connect to adjacent to high wetland cover

Delineating Catchments



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Catchments

Humber

Rouge

Duffins

Etobicoke

Don

Petticoat

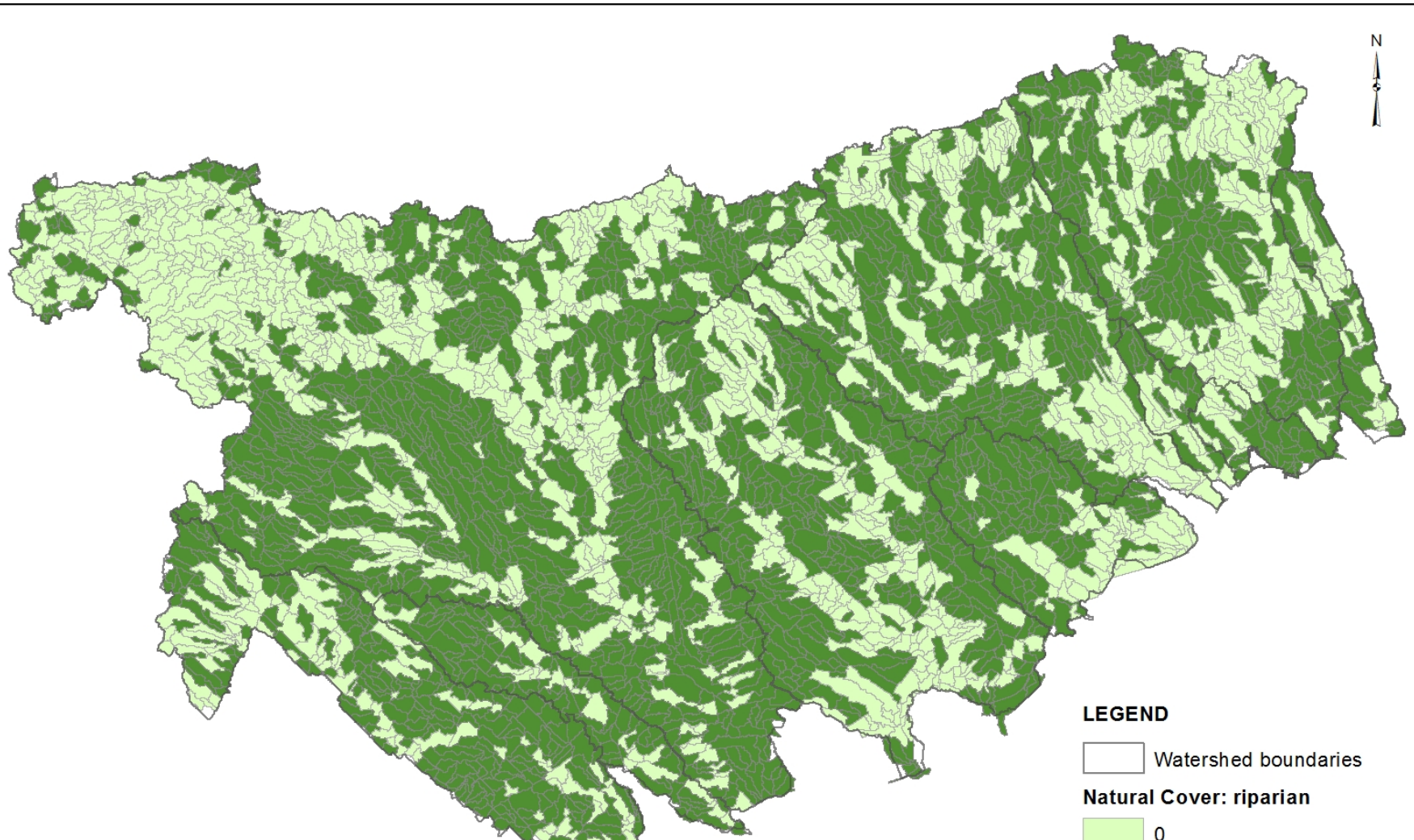
Carruthers

Mimico

Highland


Frenchmans Bay

Waterfront





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LEGEND

 Watershed boundaries

Natural Cover: riparian

 0

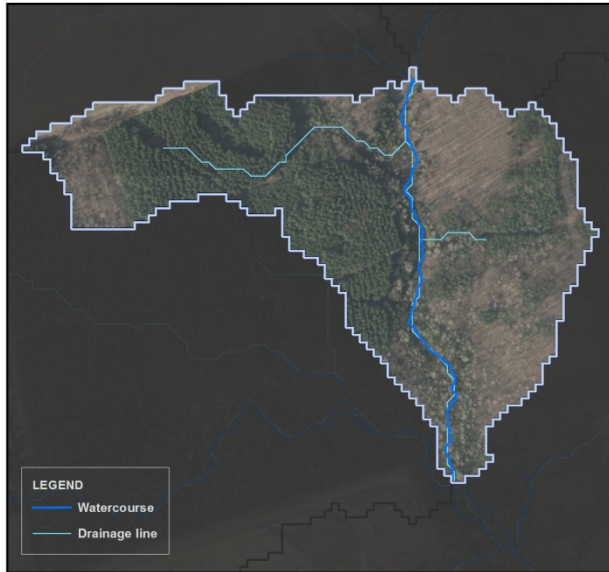
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Date: March 23, 2015



Altered Hydrology



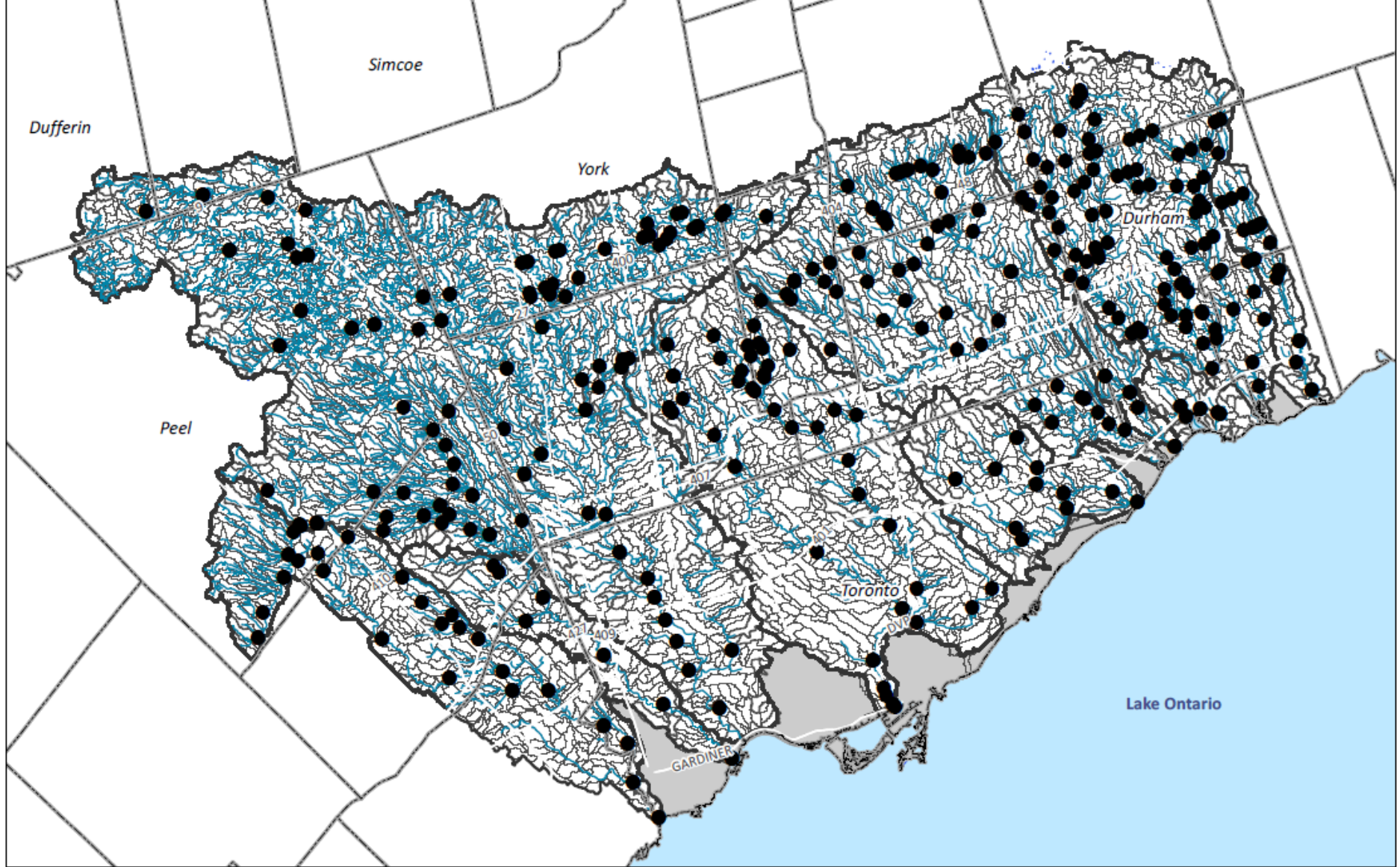
Low = 0



Medium = 1



High = 2

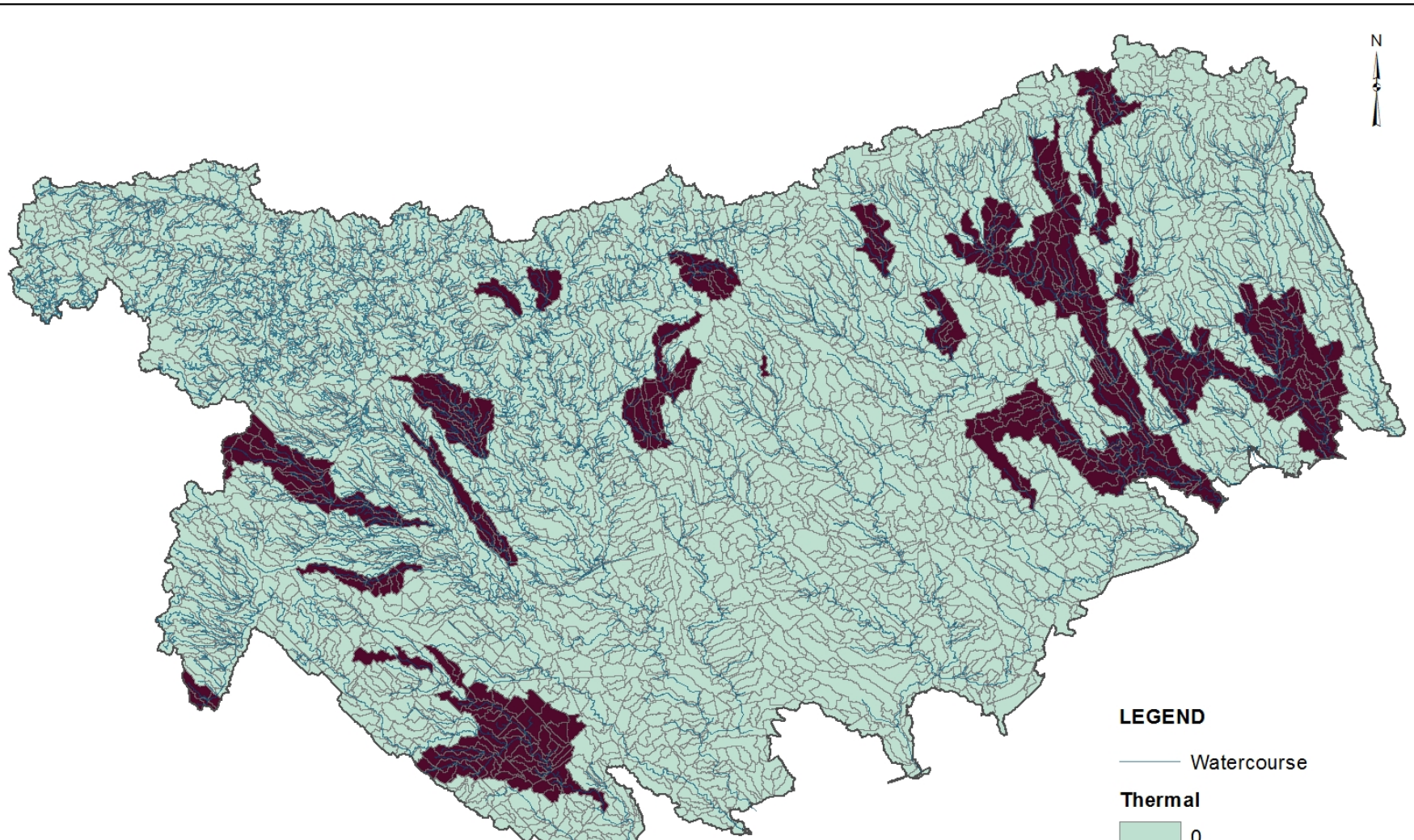


Date: 9/30/2015

Thermal sampling site distribution

- Thermal sites
- Watercourse
- Catchments
- Watersheds

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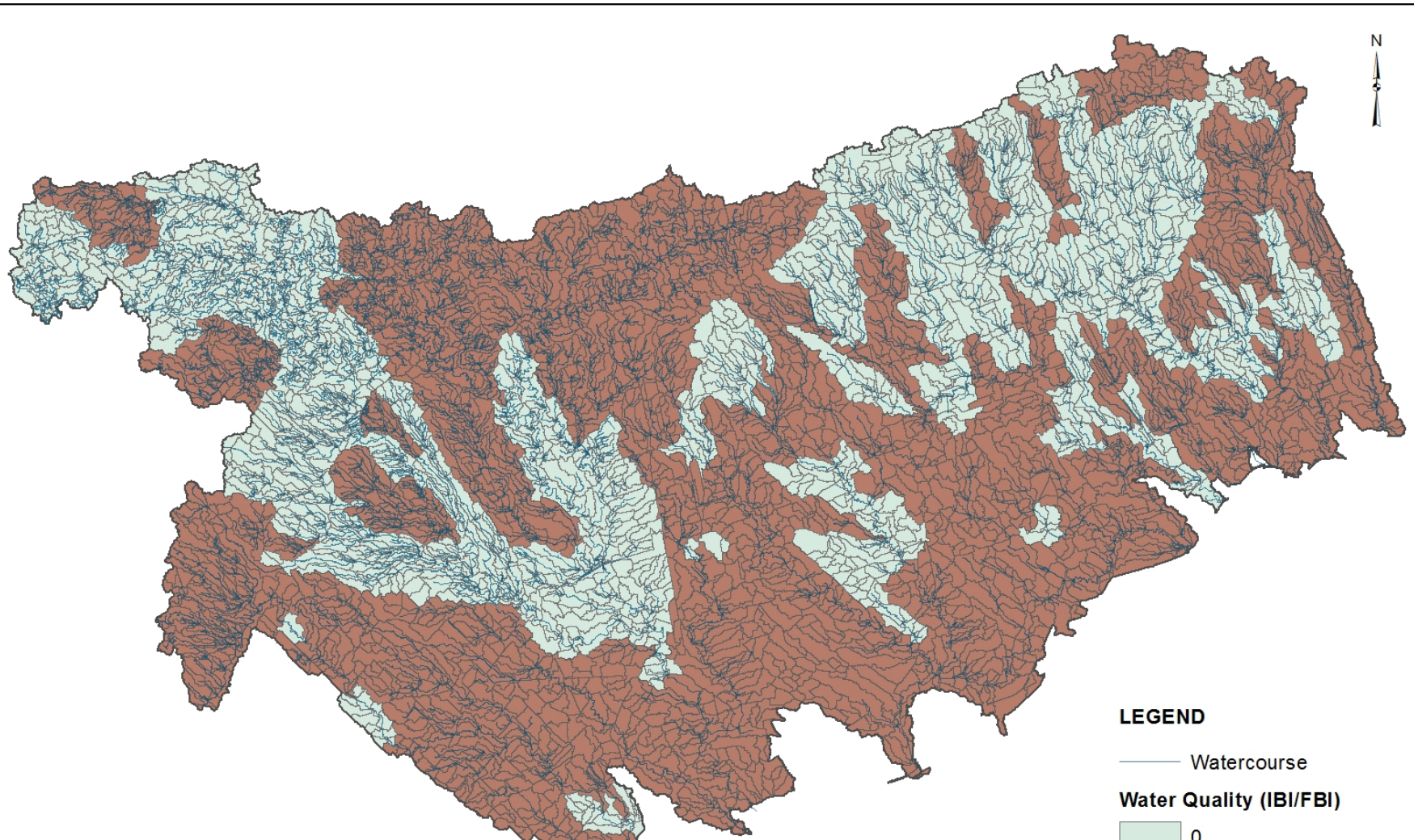
- Watercourse
- Thermal**
- 0
- 1

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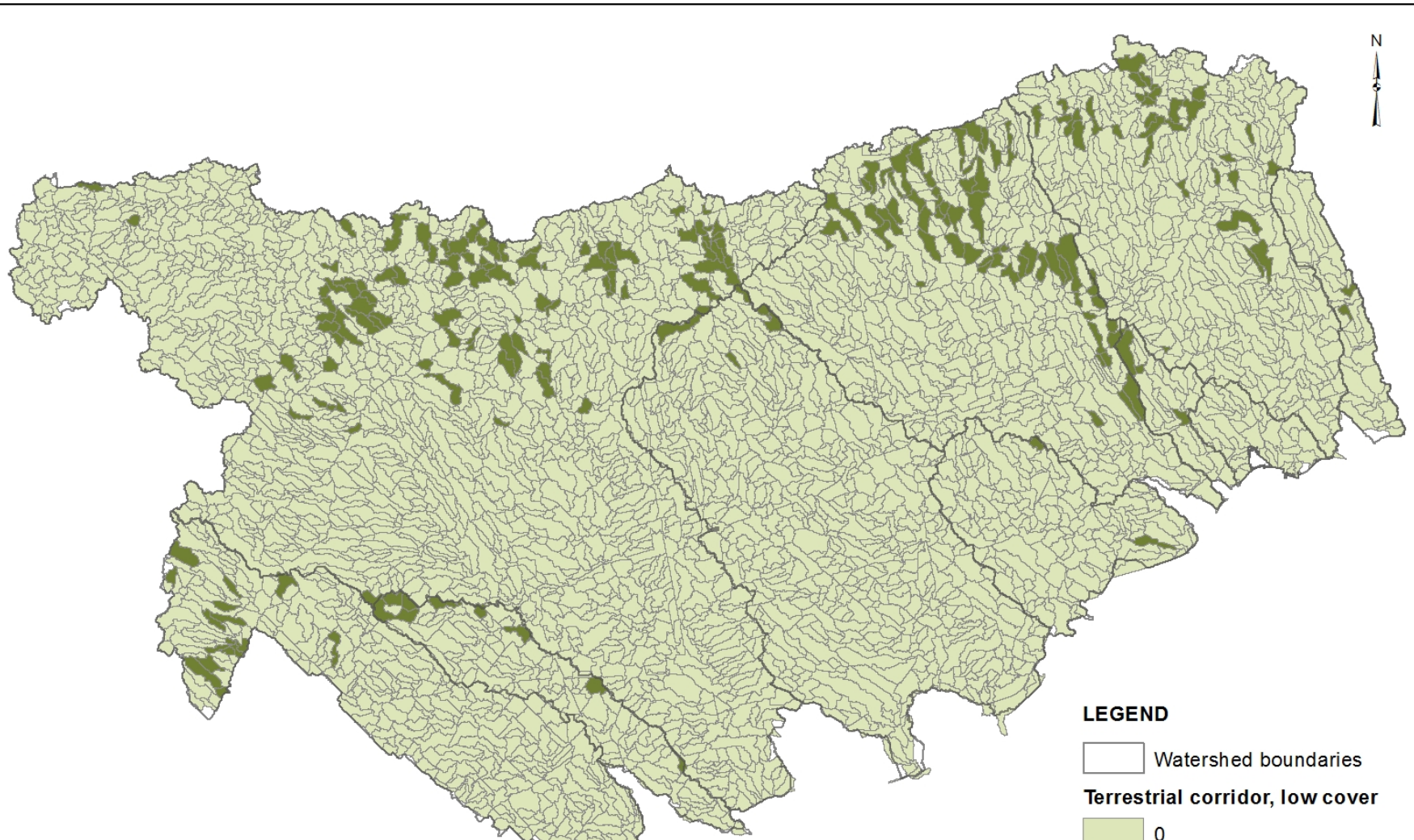
- Watercourse
- Water Quality (IBI/FBI)**
- 0
- 1

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LEGEND

-  Watershed boundaries
- Terrestrial corridor, low cover**
-  0
-  1

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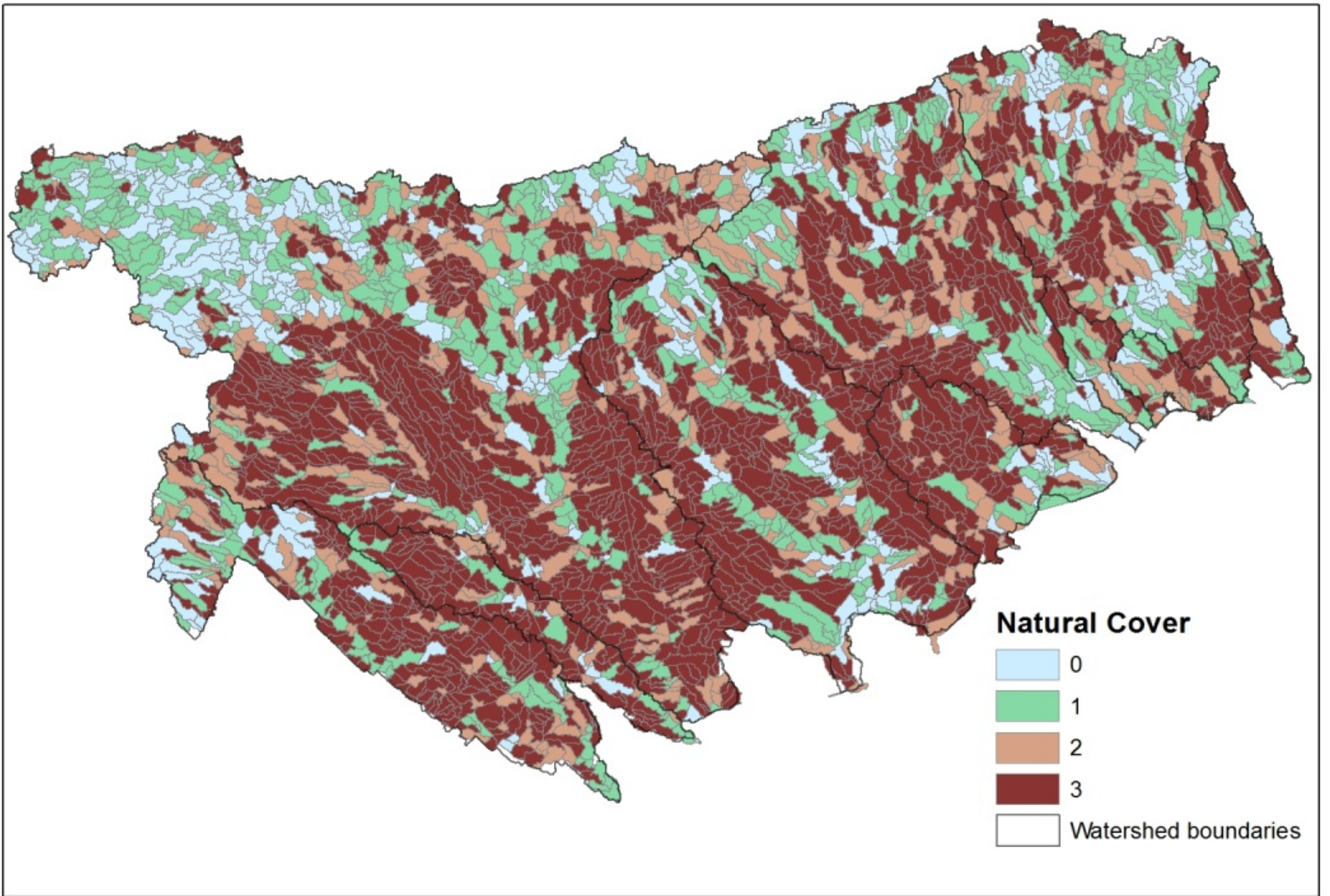
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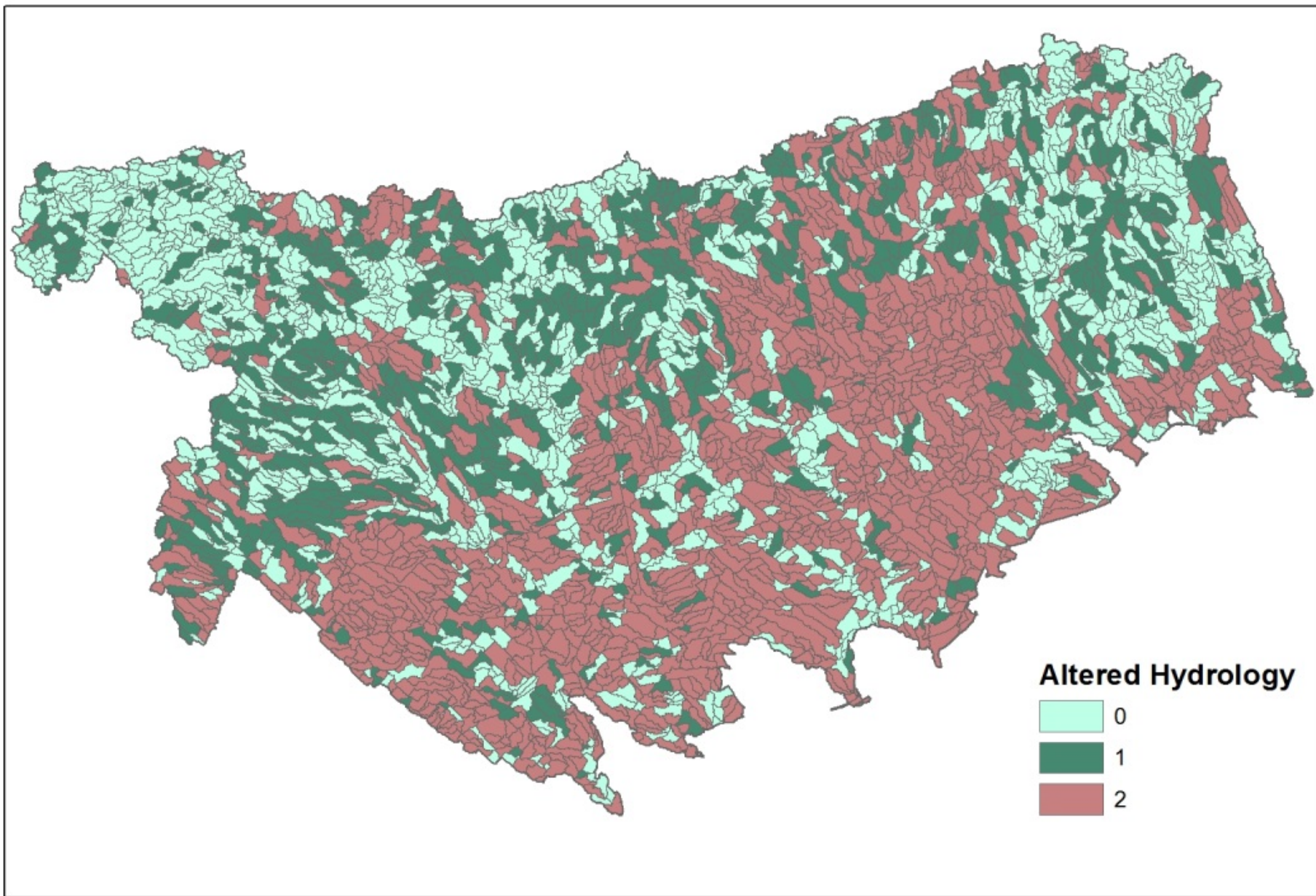
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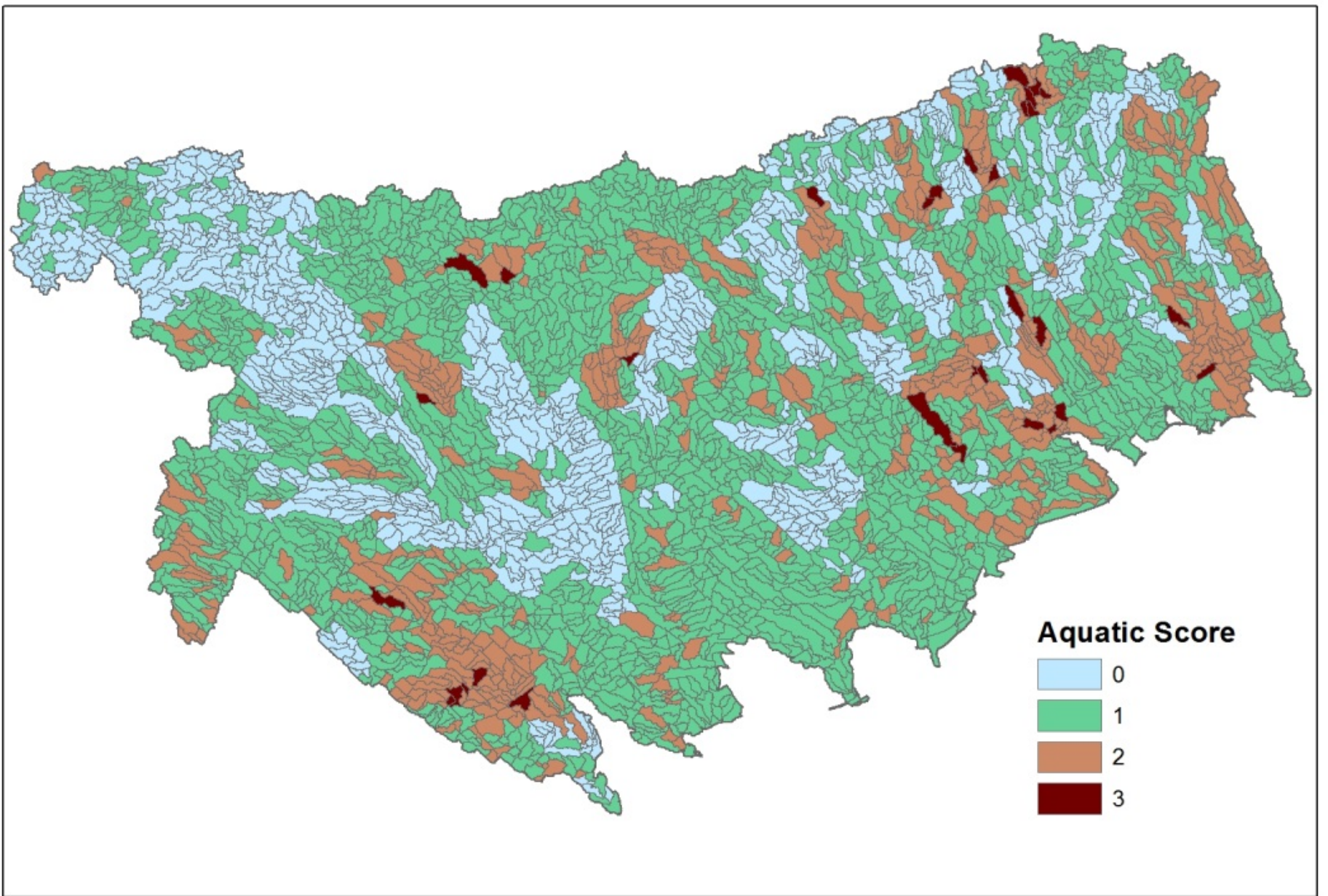


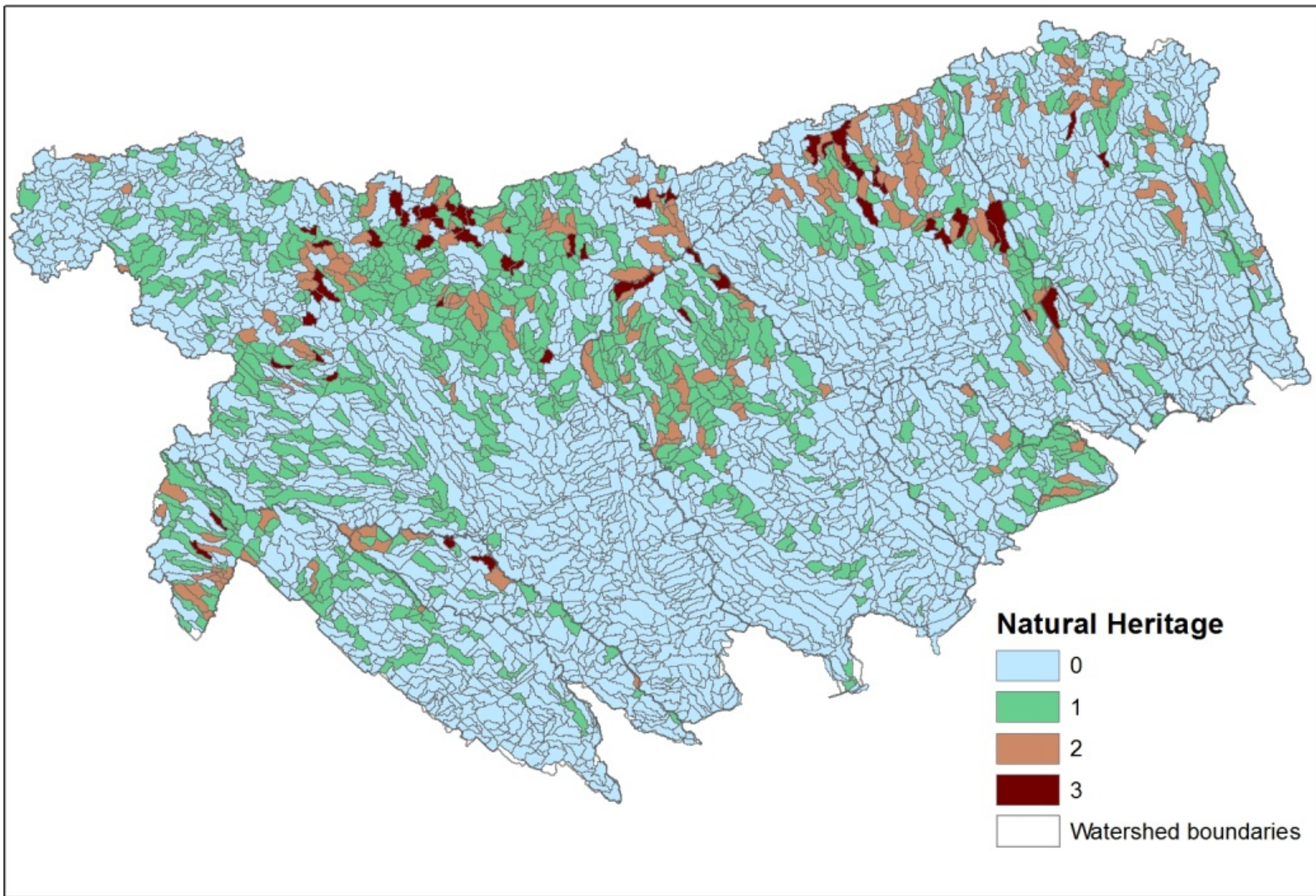
Results

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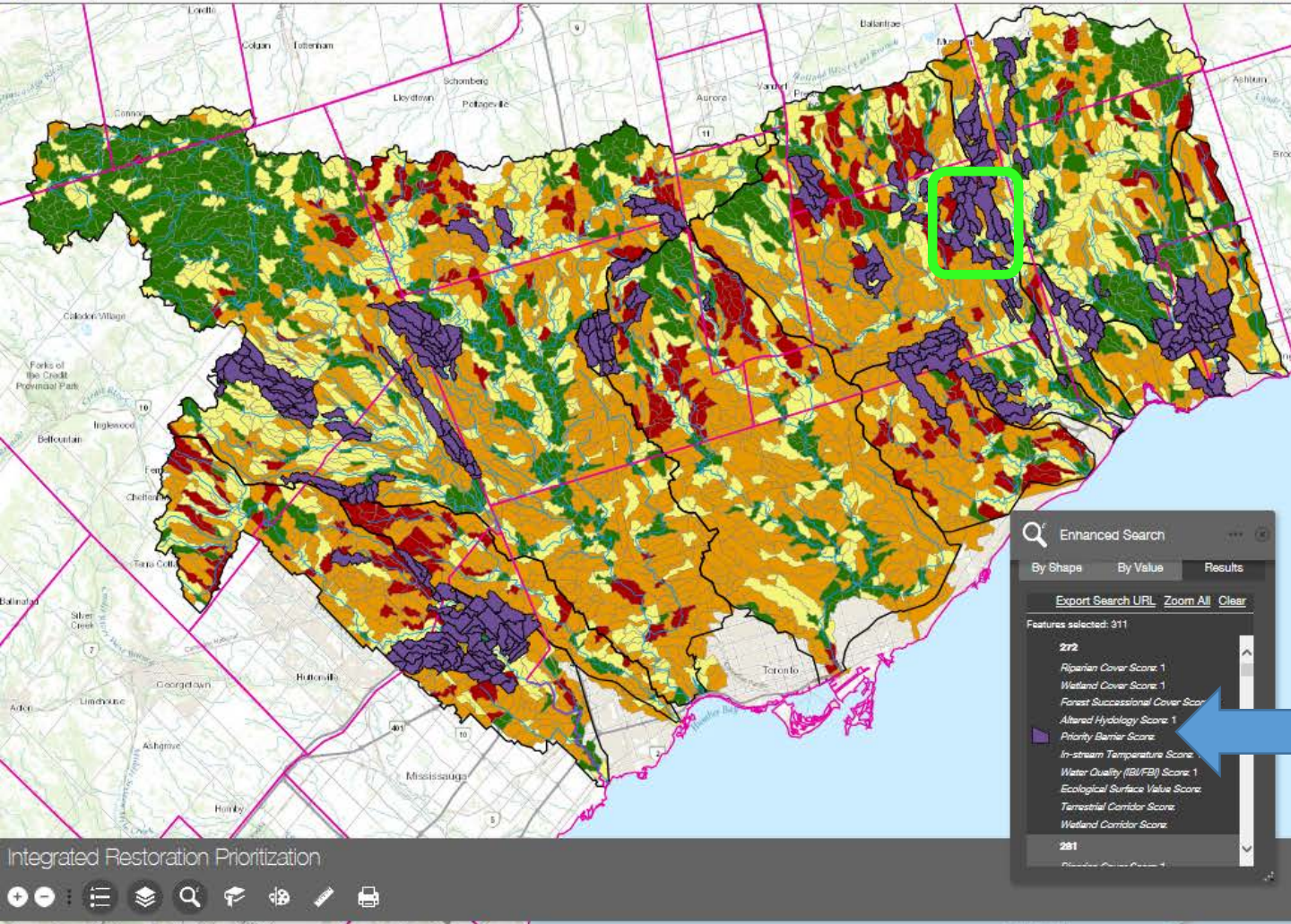






Tools and Utility for Implementation

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Legend

Search Results: IRP Supporting Data

- IRP Supporting Data

IRP Total Score

Final IRP Score

- 7 - 10: High Priority
- 5 - 6: Medium Priority
- 3 - 4: Low Priority
- 0 - 2: Protection

Operational Layers

- Search Results: IRP Supporting Data
- Watercourse
- General Rivers
- Municipalities
- Watershed Boundary
- IRP Total Score
- Total Aquatic Score
- Total Connectivity Score
- Total Wetland Cover Score

Enhanced Search

By Shapes By Value Results

Export Search URL Zoom All Clear

Features selected: 311

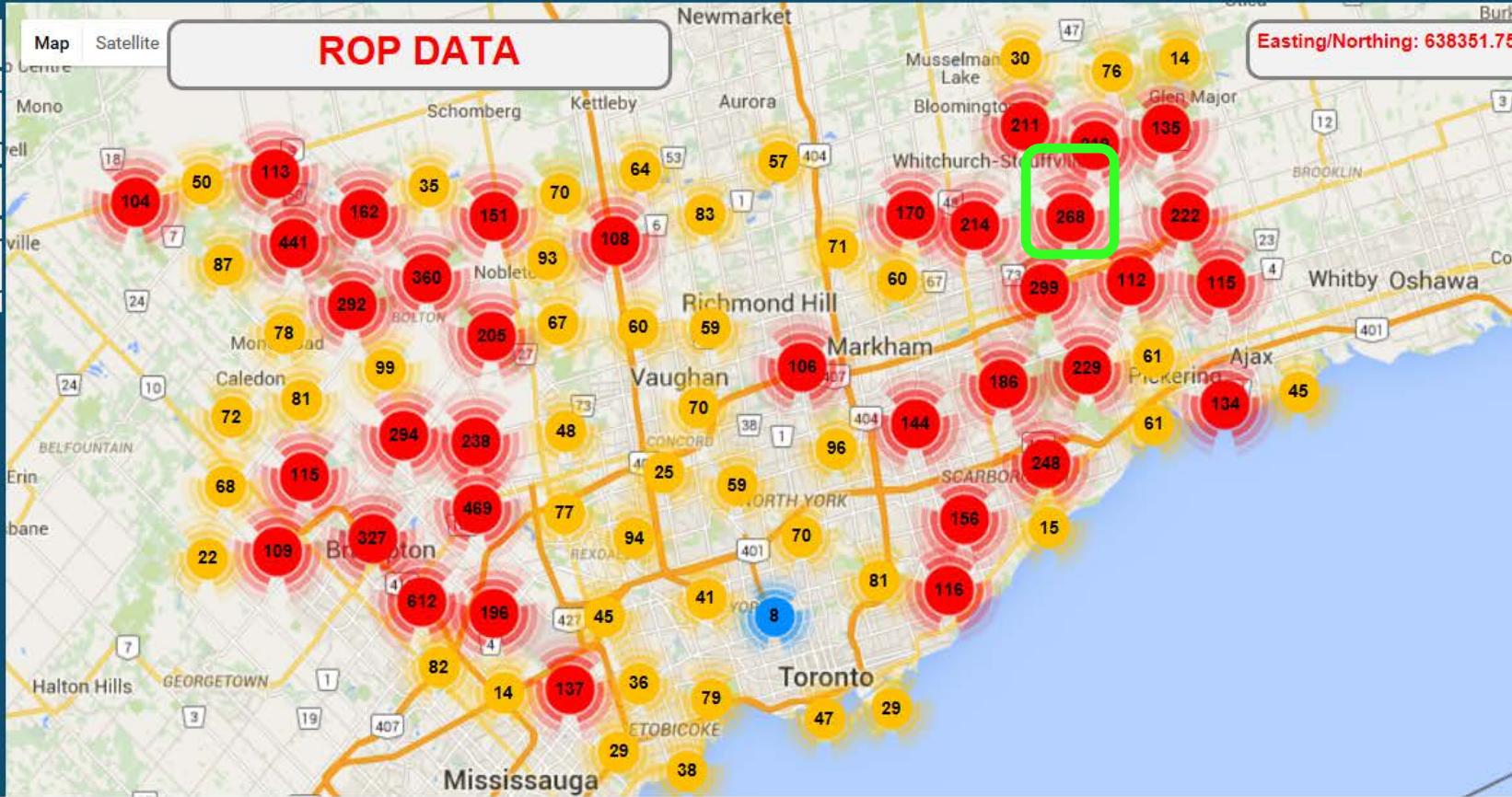
- 222
- Riparian Cover Score: 1
- Wetland Cover Score: 1
- Forest Successional Cover Score
- Altered Hydrology Score: 1
- Priority Barrier Score: 1
- In-stream Temperature Score
- Water Quality (B/FBI) Score: 1
- Ecological Surface Value Score
- Terrestrial Corridor Score
- Wetland Corridor Score
- 281

Query for high temp streams with low riparian cover



TRCA RESTORATION PROJECT DATABASE

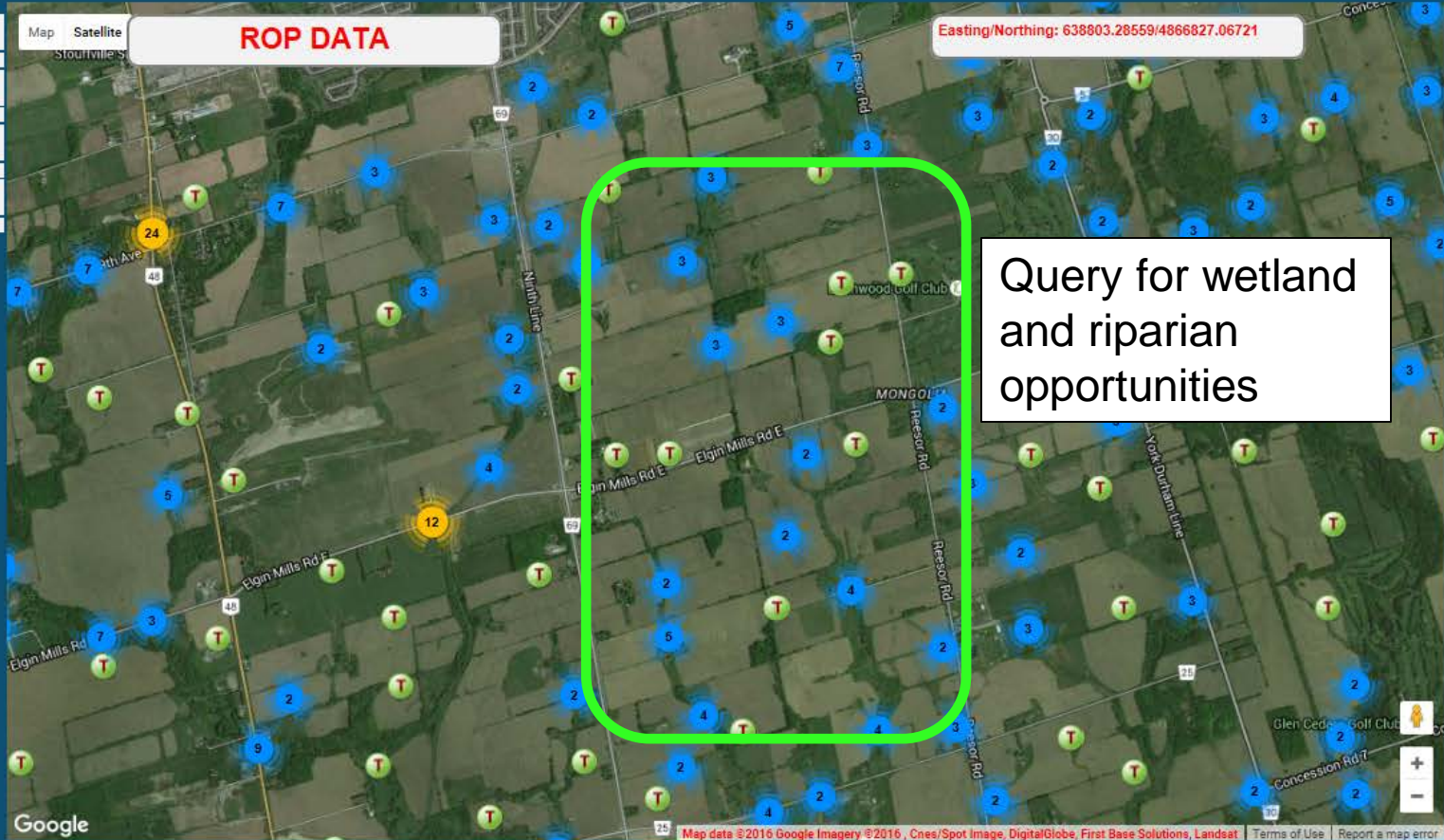
- PROJECTS
- ROP
- REPORTS
- COMPENSATION

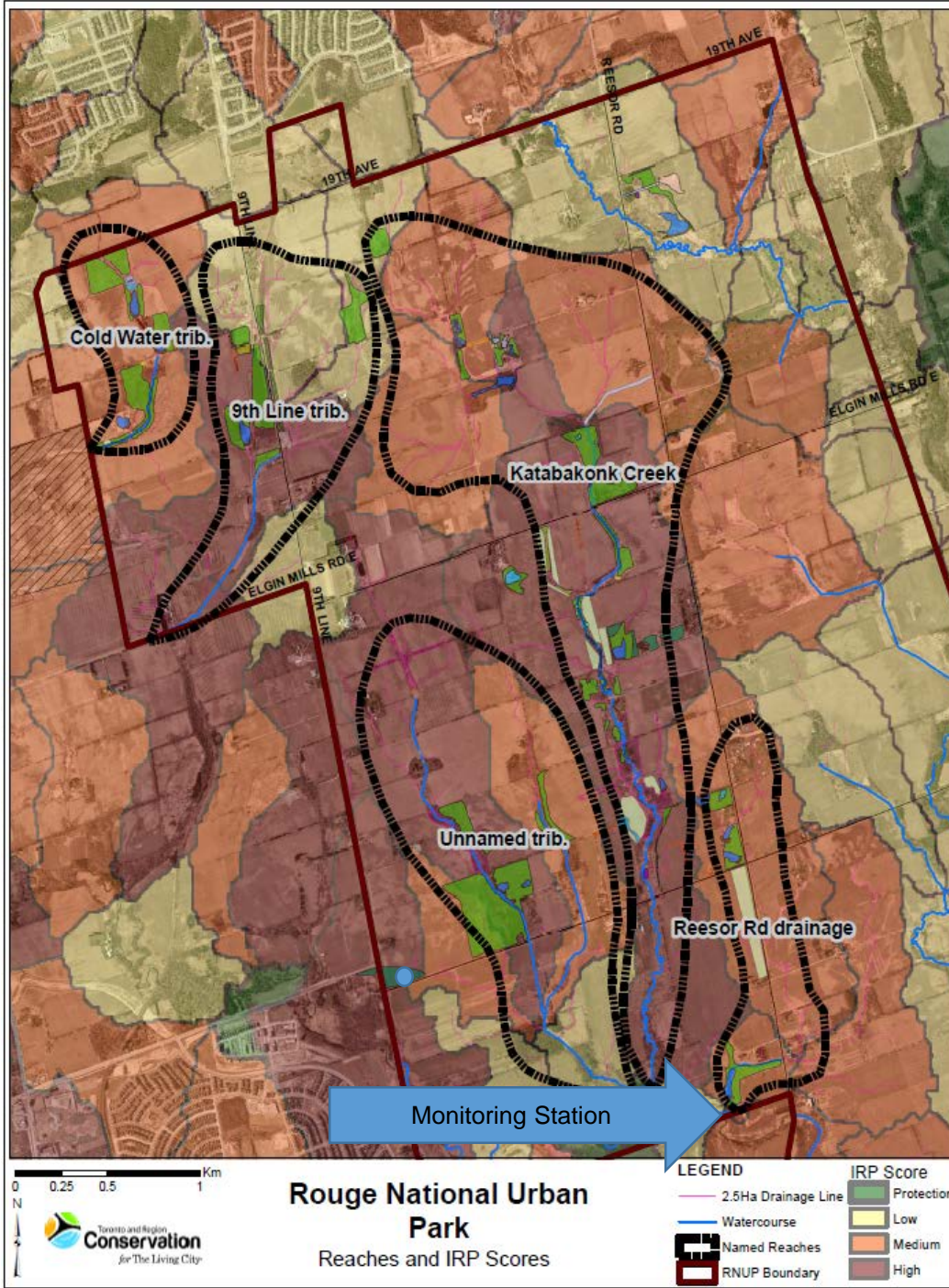




TRCA RESTORATION PROJECT DATABASE

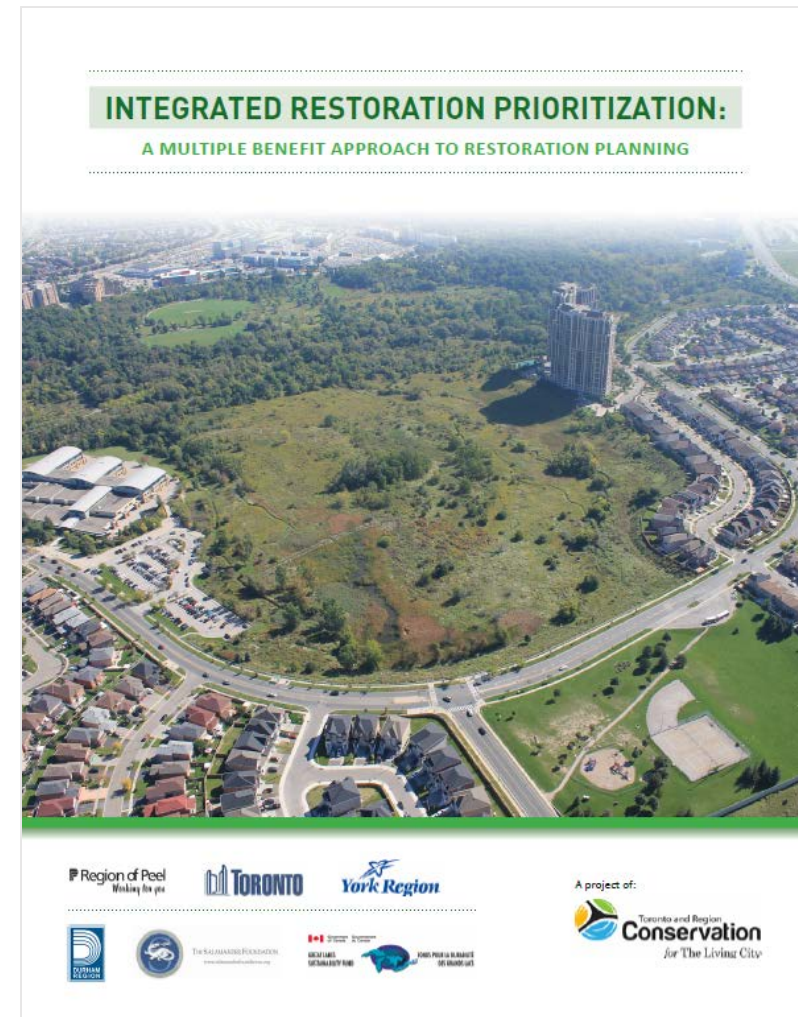
- PROJECTS
- ROP
- REPORTS
- COMPENSATION





Program Utility for Implementation

- Restoration on Public Lands
- Private Land Engagement
- Offsetting/Compensation Planning
- Stewardship and Community Outreach
- Fisheries Management Objectives
- Watershed Plans and Strategies
- Land Acquisition Program
- Climate Change Resiliency
- Partnership Engagement
- Performance Measures



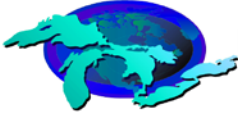
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