

Natural Channel Design for an Aquatic Species at Risk vs. Nature's Engineer: Case Study of Mount Pleasant, Brampton

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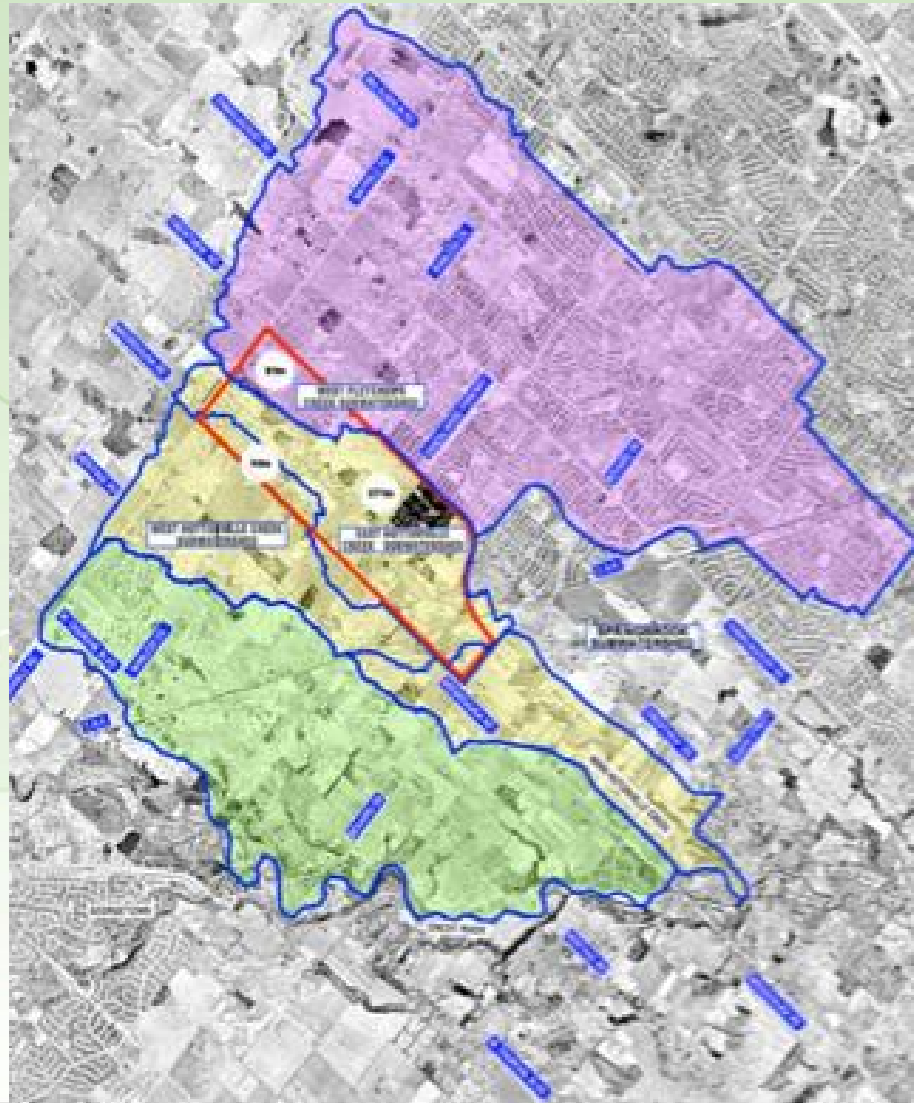
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Presentation Outline

1. Introduction
 - Build out statistics
 - Supporting planning studies
2. Redside Dace and Huttonville Creek
 - Status
 - Habitat Protection and Restoration
3. Block 51-1 Monitoring
 - Observations
 - Issues
4. Future Research
 - Population Assessment
 - Repatriation
5. Conclusion

Mount Pleasant Sub-Area 51-1 Brampton, Ontario



Build Out Statistics

- Initial planning began in 2005 with expansion of settlement boundary
- 2600 homes, 16,000 people
- Build out began in 2010
- 4.5 km channel relocation of East Huttonville Creek built through 3 stages and completed in 2014
- \$30 million for design, valley grading, channel construction, wetlands restoration, culverts and pedestrian trail and bridges, landscape plan



Supporting Planning Studies

- A series of environmental technical studies were completed and integrated with land use planning
 - Northwest Brampton Landscape Scale Analysis
 - Huttonville/Fletchers Creeks Subwatershed Study
 - Block Plan Environmental Implementation Report
 - Comprehensive Fish Compensation Plan

**Redside Dace habitat interests were
incorporated into each study**



Landscape Scale Analysis



City of Brampton

North West Brampton Landscape Scale Analysis

In Support of the Mount Pleasant Secondary Plan
Subwatershed Study

(Draft)

In Collaboration With
Philips Engineering Limited
C. Portt and Associates
Blackport & Associates
Parish Geomorphic

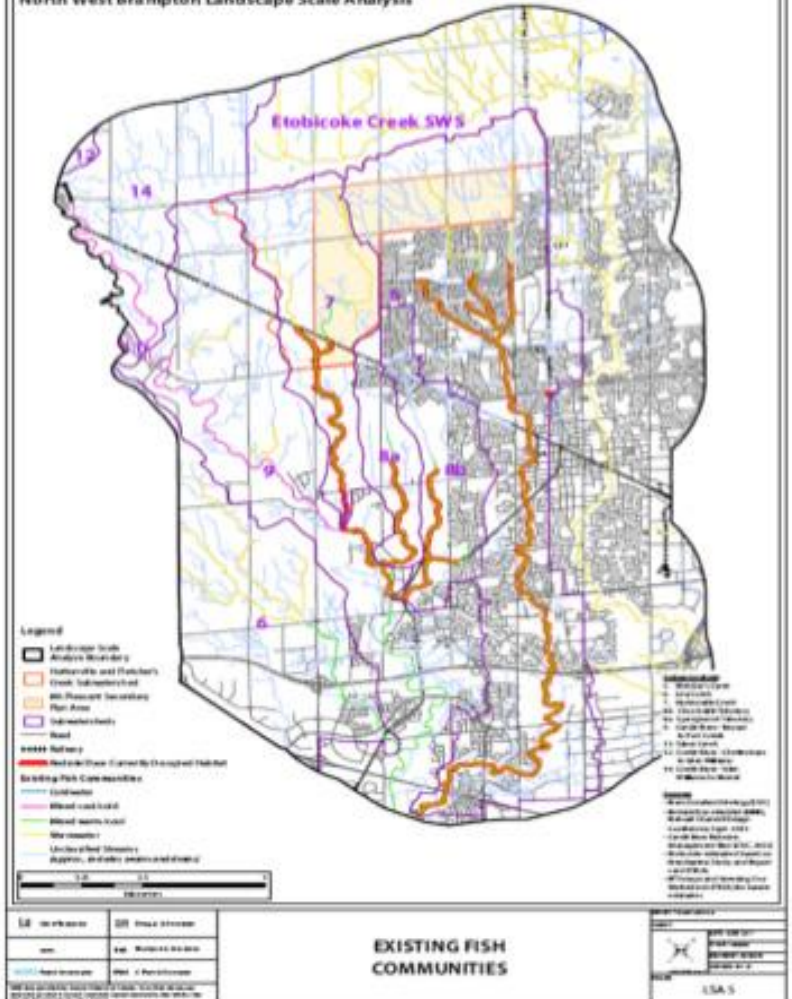
Technical Committee & Data Support
Credit Valley Conservation
Region of Peel
Ministry of Natural Resources
NW Brampton Landowners Group
Toronto Region Conservation Authority

August 2007

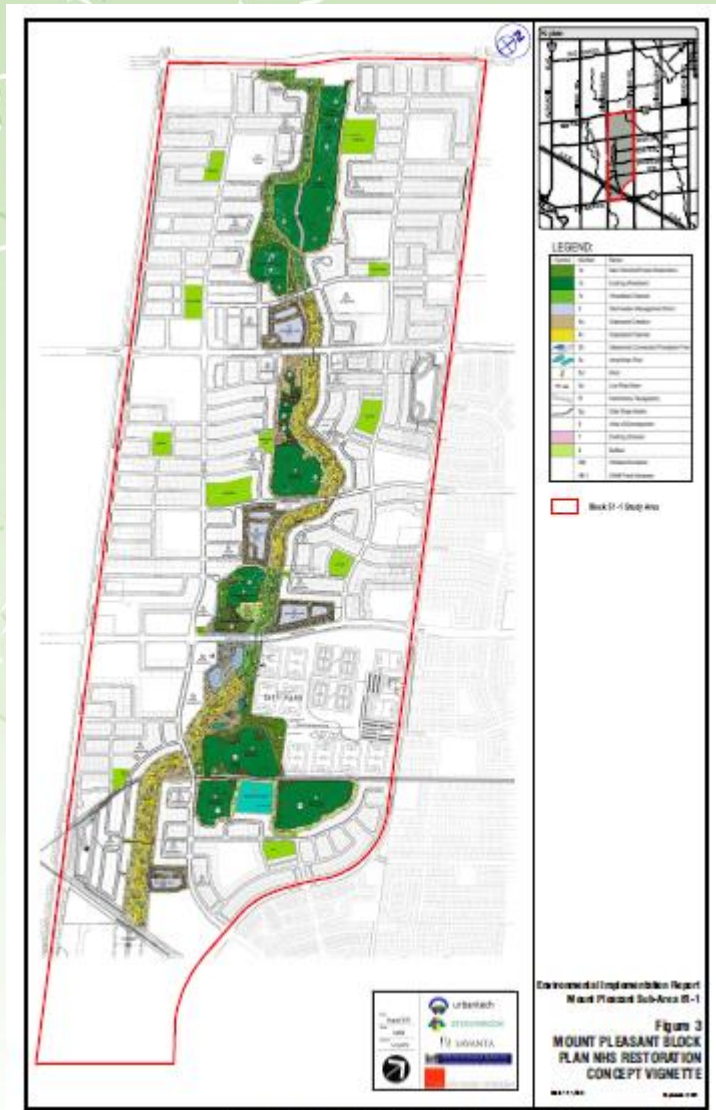


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North West Brampton Landscape Scale Analysis



Environmental Implementation Report



- Implements recommendations of Subwatershed Study
- Identifies key natural heritage features to protect
- Recommends location and dimensions of new stream corridor for East Huttonville Creek
- Recommends locations of stream crossings and storm water management facilities

Supporting Planning Studies

COMPREHENSIVE FISHERIES COMPENSATION PLAN (CFCP)

SUB-AREAS 51-1 & 51-2
WEST FLETCHER'S CREEK & EAST HUTTONVILLE CREEK
MOUNT PLEASANT, NORTH WEST BRAMPTON



Prepared by

MOUNT PLEASANT CONSULTING TEAM

Savanta Inc., Stonybrook Consulting, R. J. Burnside & Associates,
Urbantech Consulting, Cam Portt and Associates, J.T.B. Environmental Systems

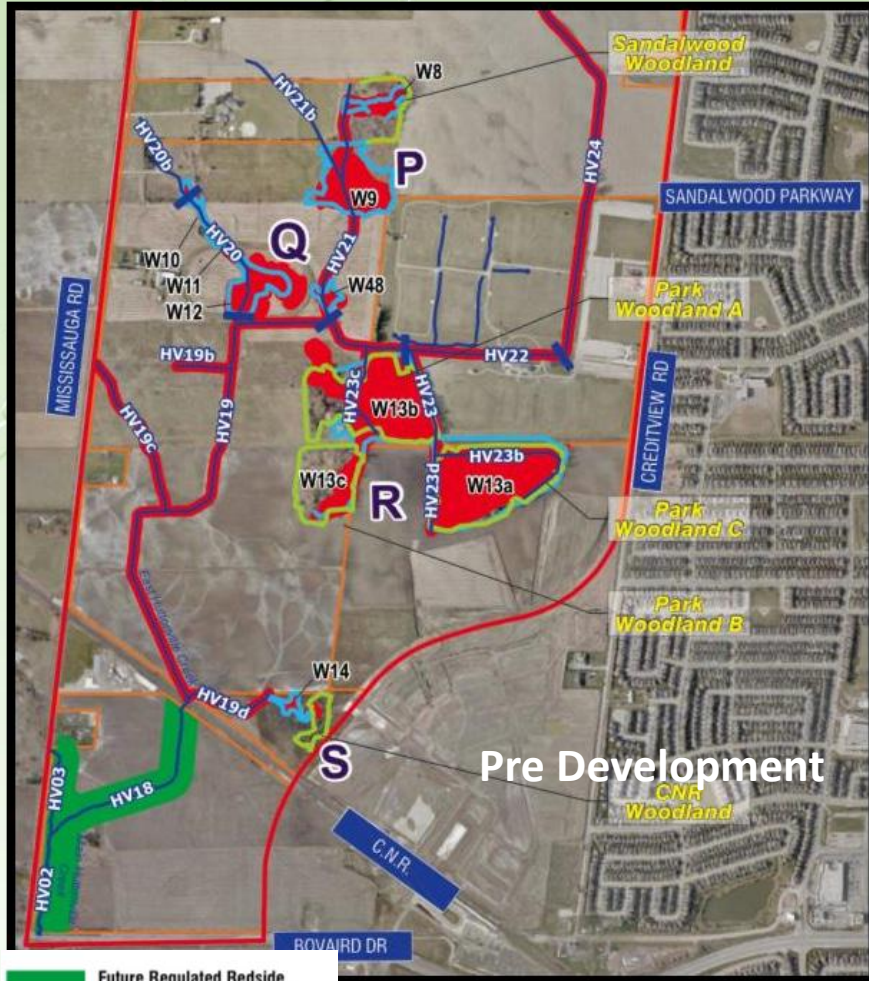
**NOVEMBER 2011
(REVISED MARCH 2012)**

VERSION 1

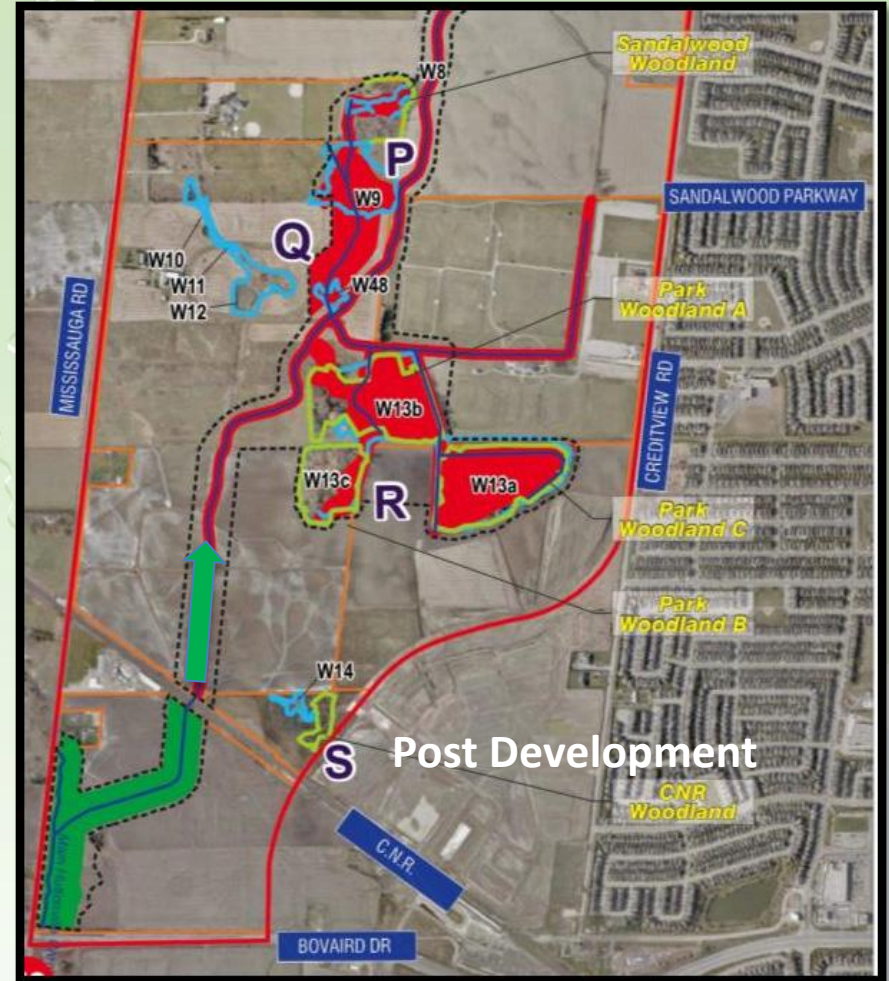


LATORNELL
CONSERVATION SYMPOSIUM

Comprehensive Fish Compensation Plan



Pre Development

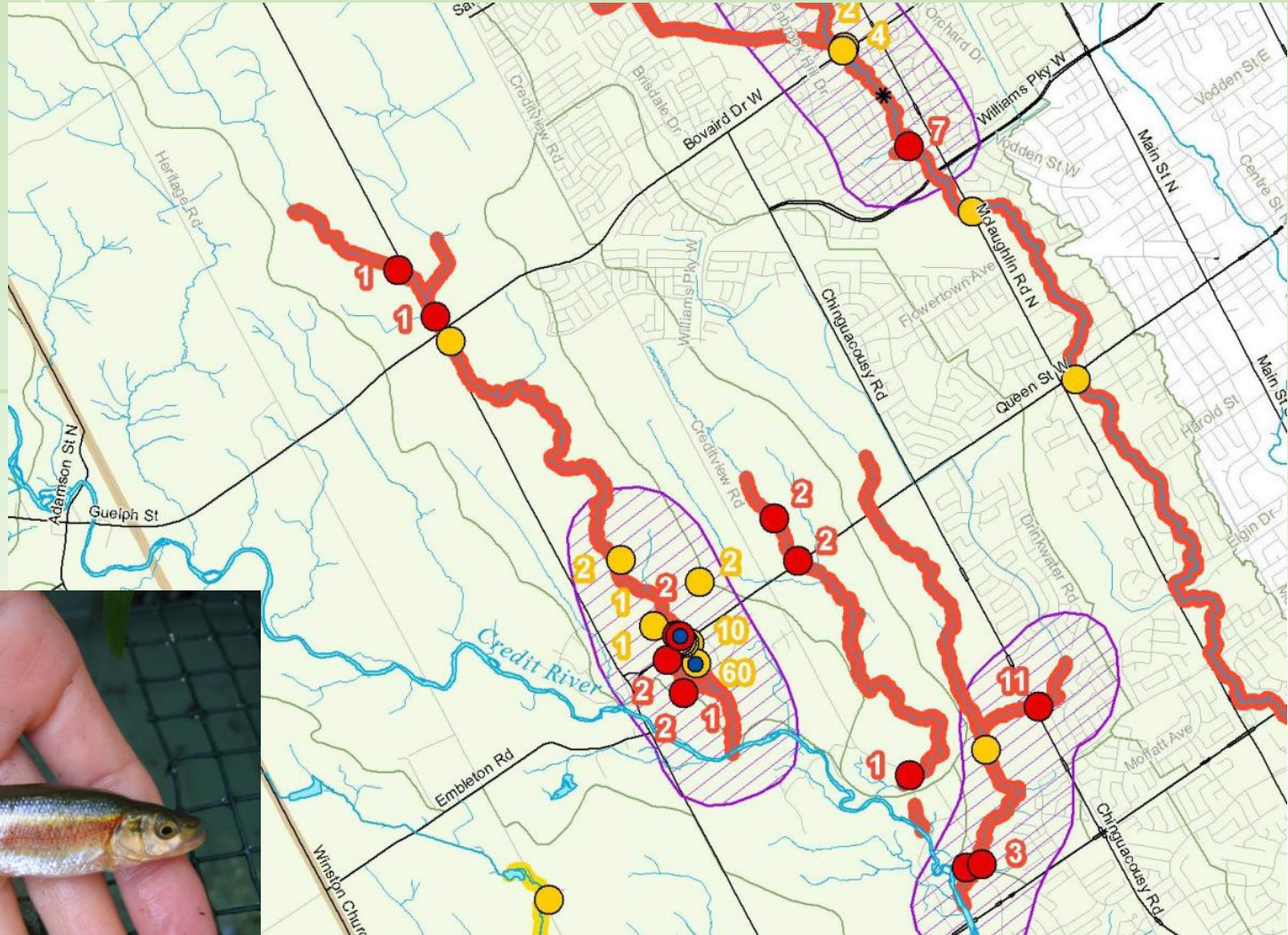


Post Development

- █ Future Regulated Redside Dace Habitat as interpreted from Ont REG 293/11, 29.1(1)i-iv (Formerly "Occupied" Habitat)
- █ Future Regulated Redside Dace Habitat as interpreted from Ont REG 293/11, 29.1(1)v (Formerly "Contributing" Habitat)

Redside Dace Habitat Restoration

Redside Dace and Huttonville Creek



Redside Dace and Huttonville Creek



Redside Dace and Huttonville Creek

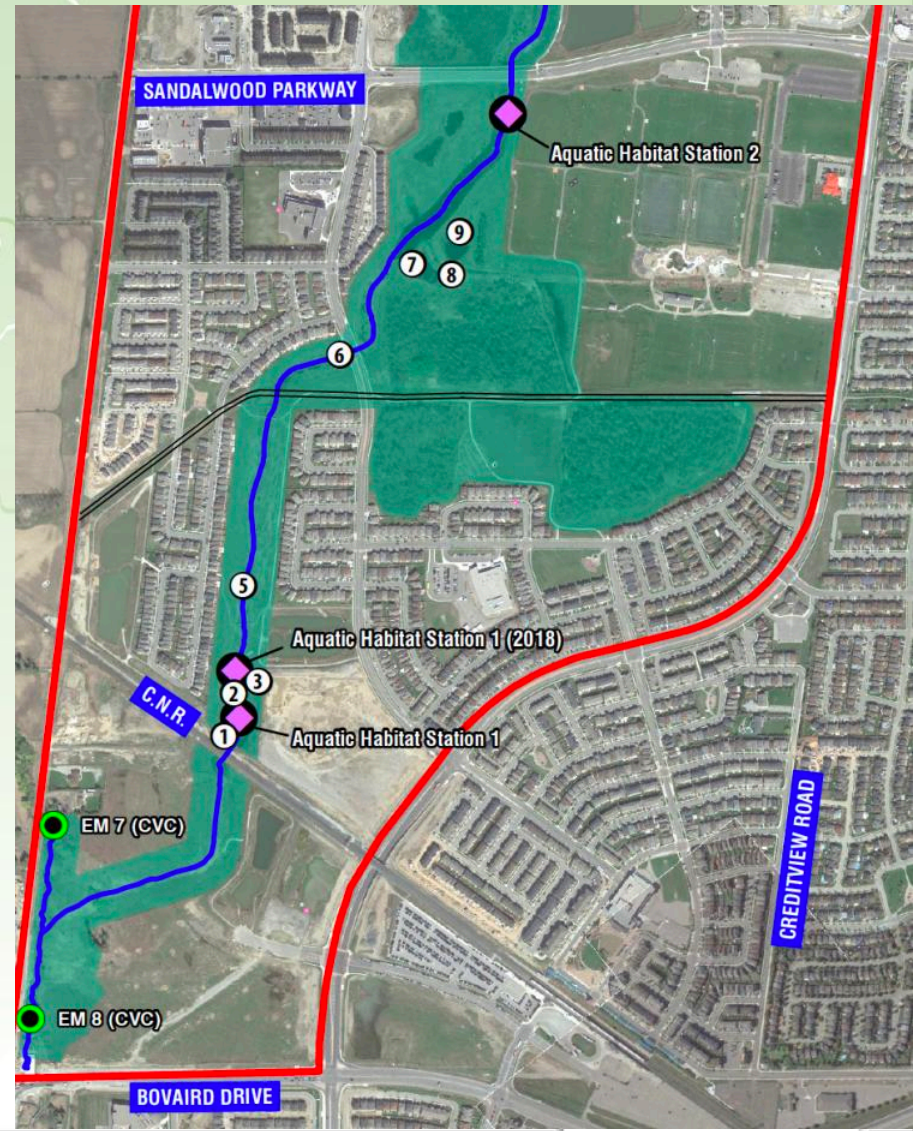
Habitat Protection and Restoration

- ESA habitat protection started in 2008 with species habitat regulation in 2011
- Road widenings, subdivisions, creek relocations in subwatershed are subject to ESA approvals
- Habitat restored through natural channel design, instream barrier removal and wetland restoration
- Development mitigation through application of SiltSmart, 3m deep bottom draw SWM ponds, open bottom culverts and construction inspections
- Comprehensive monitoring tied to ESA approvals



Post-Development Aquatics Monitoring

- 5-year monitoring program (2015 – 2019)
 - Fish community and fish habitat
 - Benthic Invertebrates
 - Water quality (including temperature)
 - Fluvial geomorphology
- Landowners Group
 - Two fixed stations (AHS1/AHS2) in realigned channel
- Credit Valley Conservation
 - Two long-term fixed stations (EM7/EM8) downstream from Block 51-1



Monitoring Results – 2015/2016

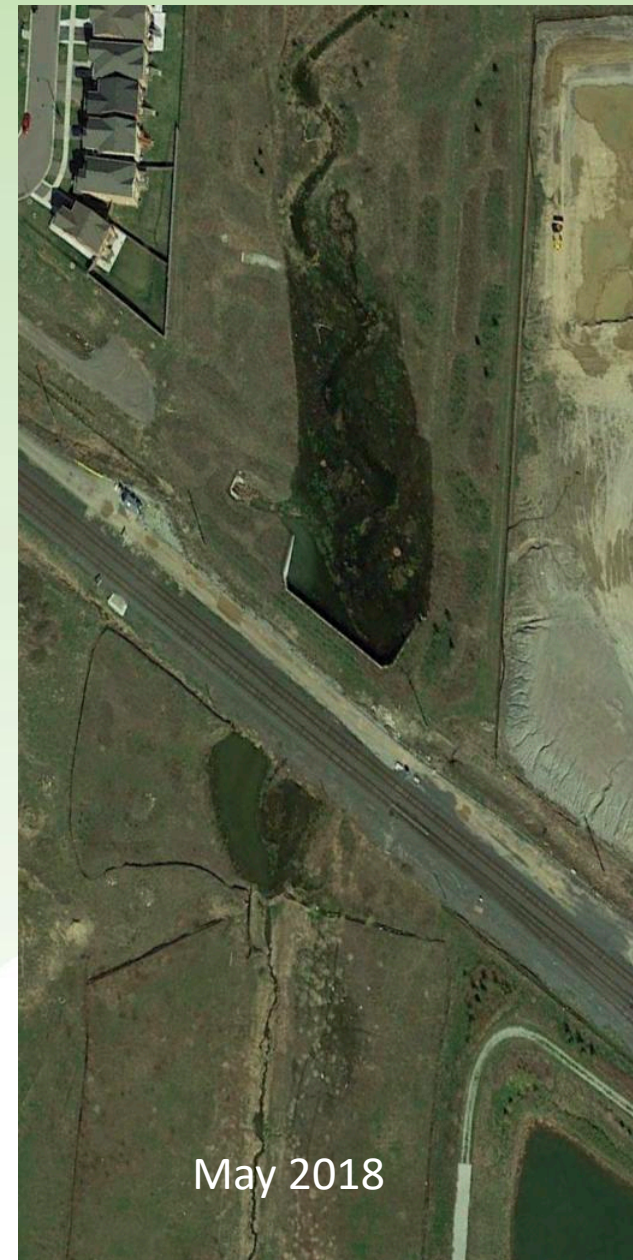
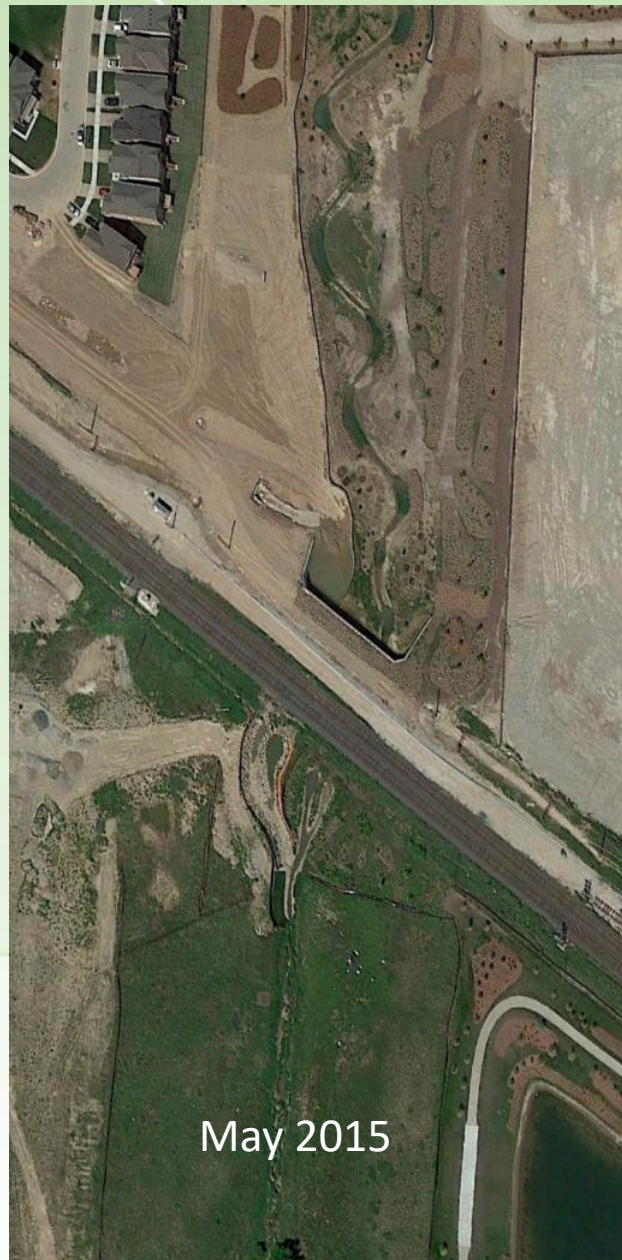
- Observations during first 2 years of monitoring (2015/2016)
 - Watercourse permanently flowing
 - Fish passage past upgraded culvert confirmed (Blacknose Dace and Creek Chub)
 - Rainbow Trout spawning (multiple redds)
 - Diverse in-stream morphology and habitat
 - Developing riparian vegetation
- Spring 2017 – reach upgraded to Occupied Habitat for Redside Dace
 - No fish surveys in 2017/2018



2017 – A New Resident Emerges



AHS 1 – Pre and Post Beaver



AHS 1 – Pre and Post Beaver



AHS 2 – Pre and Post Beaver



AHS 2 – Beaver Dam and Pond



Implications of the Beaver

- Developers concerned about planted stock, flooding, stability
- AHS1 monitoring location no longer representative
- Ecological changes
 - Sediment transport
 - Fish passage
 - Channel function
 - Increased overwintering habitat
- Original determination (fall 2017) was to let nature take its course
- However, City has now trapped Beaver in upper pond and partially removed dam – further reductions planned



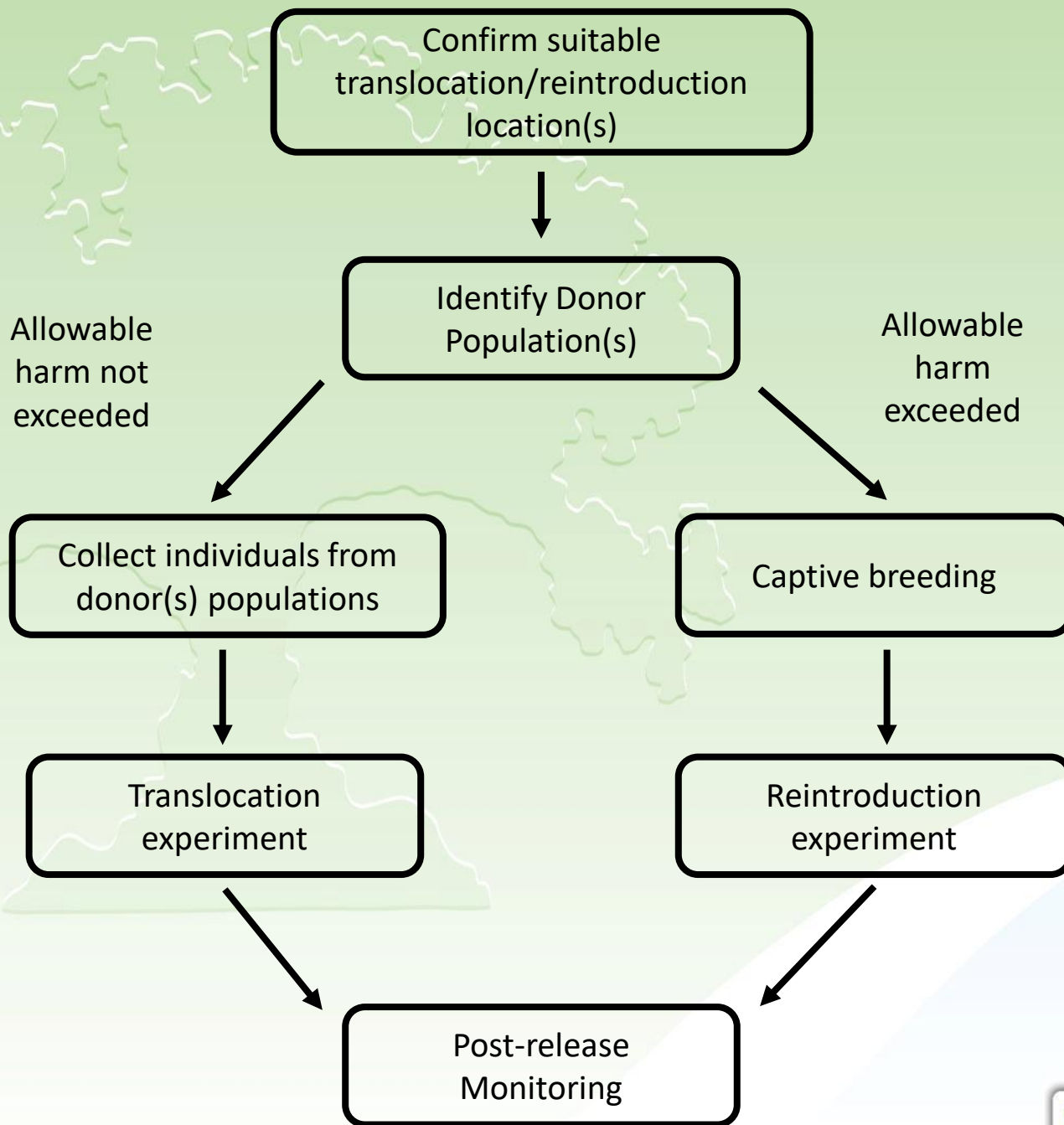
Lessons Learned

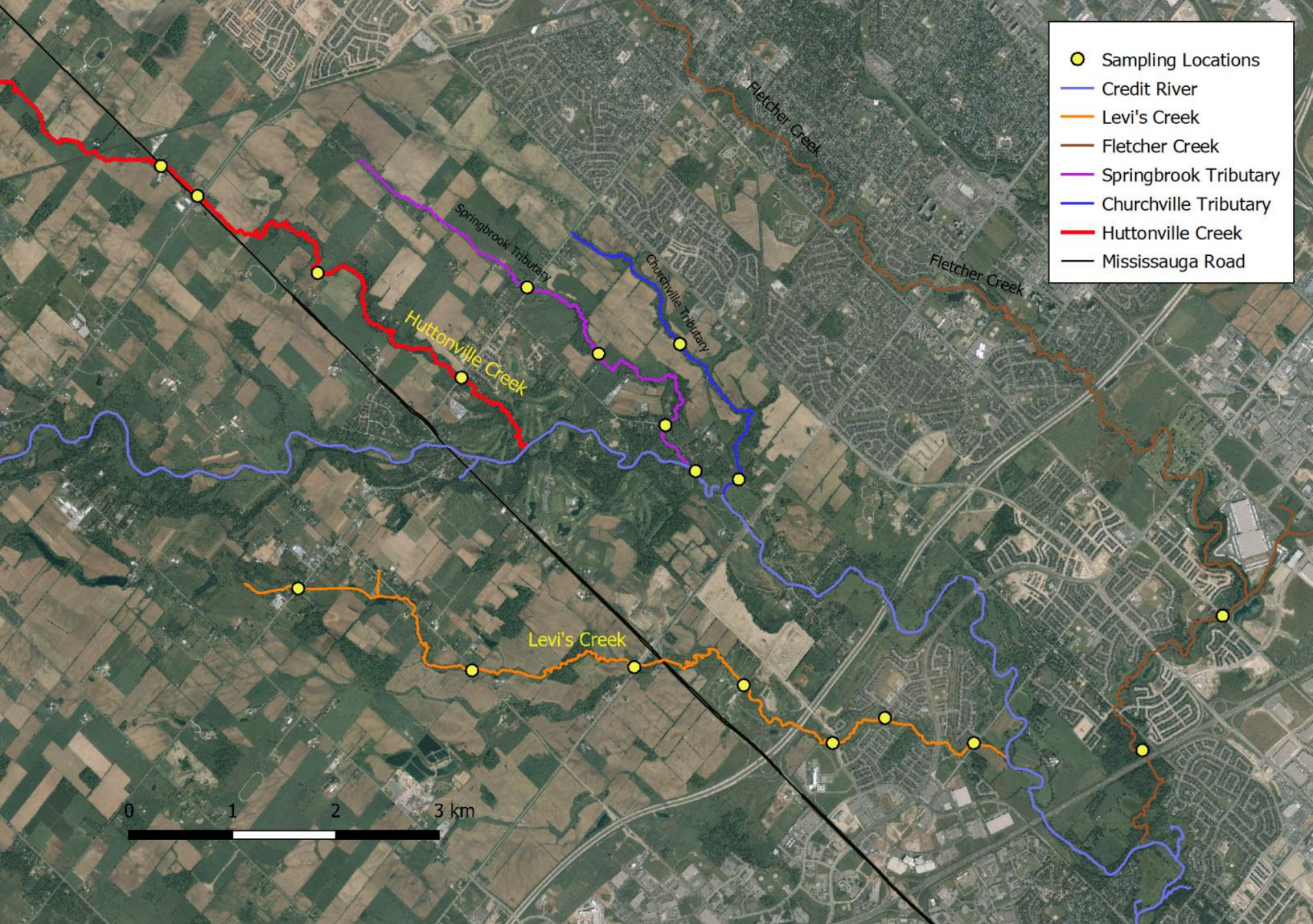
- Experience at restoration sites has shown that Beaver commonly take up residence in newly realigned channels around year 3
- Avoid planting preferred forage species (e.g., poplar, aspen)
- Beaver take advantage of reverse grade floodplain and pinch point in valley form

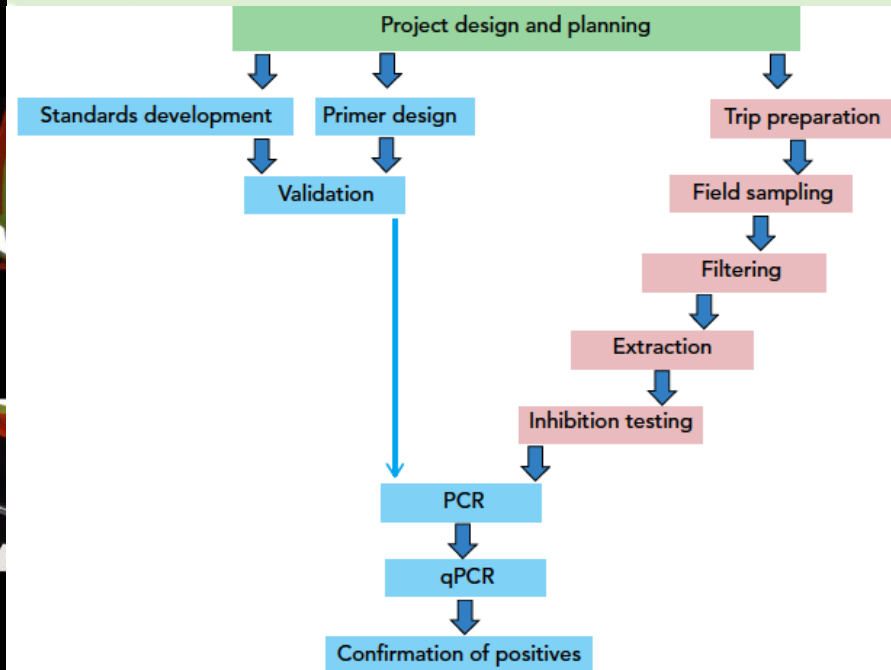
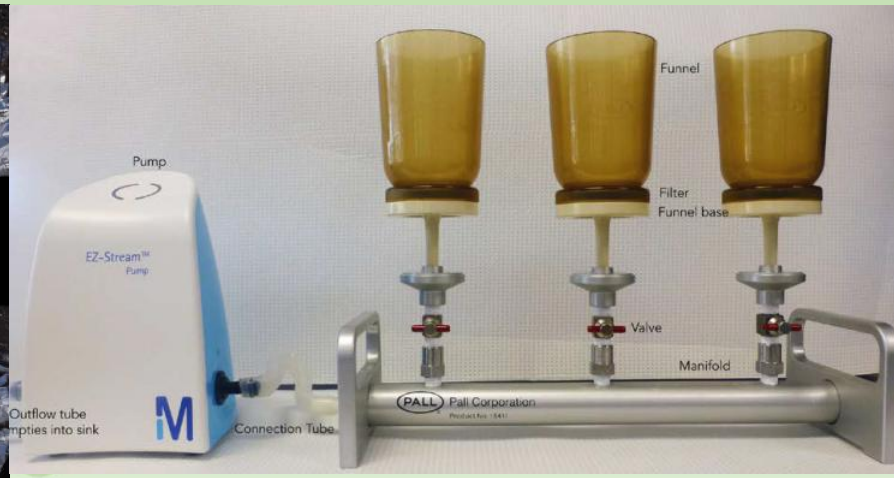
Peel Region Reintroduction Project

- Municipality of Peel
- Road widening project
- Habitat impacted
- Overall Benefits project
- Huttonville Creek









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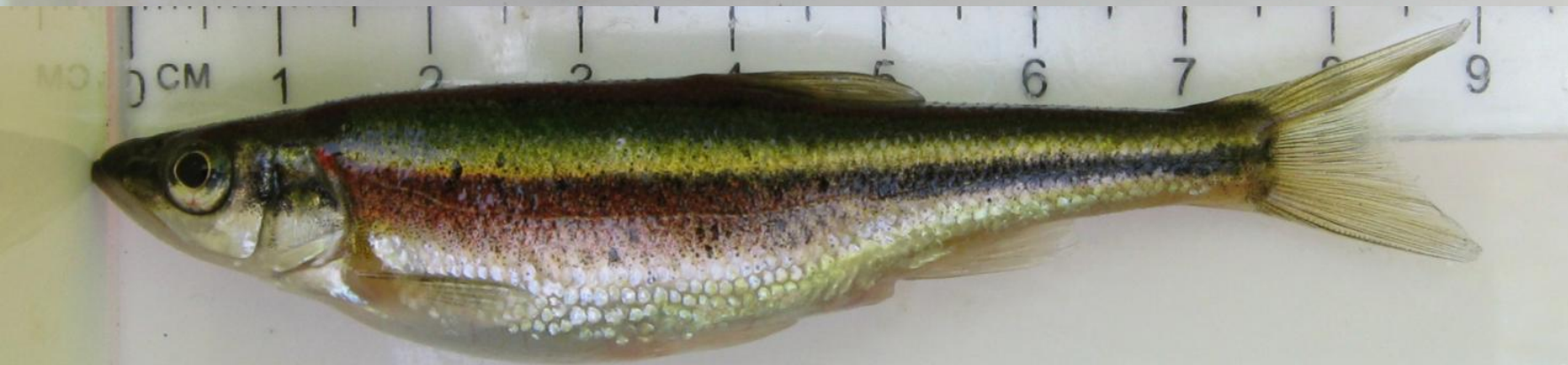


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Conclusions

- Collaboration amongst all parties allowed for much improved outcomes
- The Block 51-1 NHS work and other development mitigation resulted in positive benefits:
 - Productive fish and benthic invertebrate habitat
 - Improved riparian zone form and function
 - Enhanced fish passage
 - Water temperatures improved over conventional urban SWM systems
- Beavers are a natural occurrence and may take up residence in newly created channels
 - Design mitigation may limit the desirability of the area for the species
 - Alterations due to dams may change habitat conditions, but may also provide types of habitat not present in the system (e.g., overwintering habitat)
- eDNA is a viable tool to assess the population status and distribution of Redside Dace and should be used as a component of an overall monitoring strategy
- Repatriation of Redside Dace in the Peel Region is being considered to benefit the species on a subwatershed scale - Block 51-1 NHS work has created conditions that should benefit repatriation efforts

Acknowledgements

Key Stakeholders



Credit Valley
Conservation



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DEVELOPMENTS®



Canada 



Acknowledgements

Consultants and Contractors

