



ECS Lunch and Learn

Supporting internal knowledge transfer within TRCA

December 15, 2021

Biodiversity Offsetting 101

Lunch and Learn

Presented by: Noah Gaetz, Senior Manager
Ecosystem and Climate Science

Dec 15th, 2021

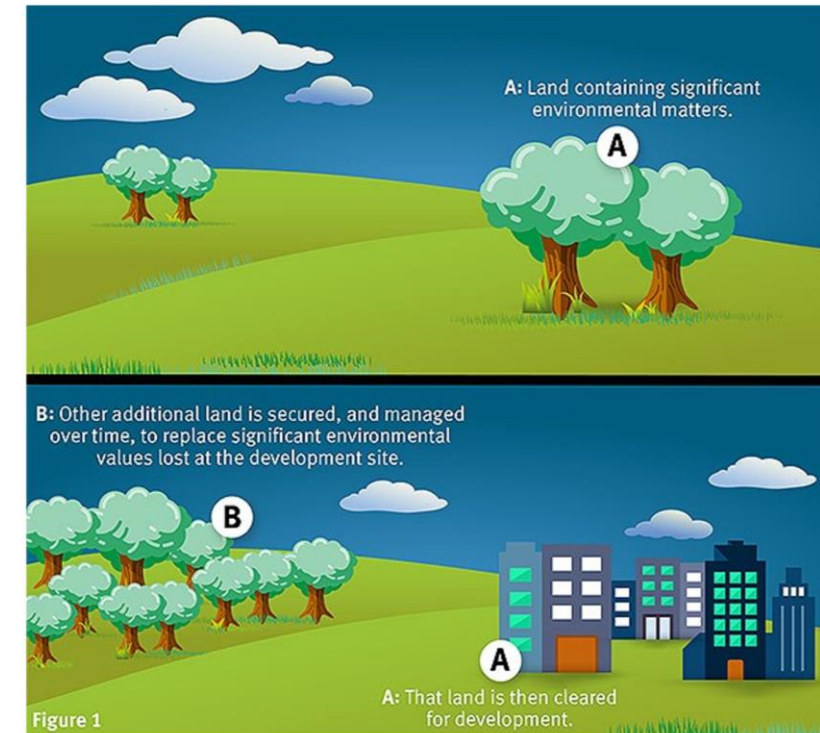
Discussion Outline

1. Defining Biodiversity Offsetting
2. The need for Biodiversity Offsetting
3. Challenges of Biodiversity Offsetting
4. Principles of Biodiversity Offsetting
5. Elements of Biodiversity Offsetting

Defining Biodiversity Offsetting

Several definitions – all basically say the same thing....

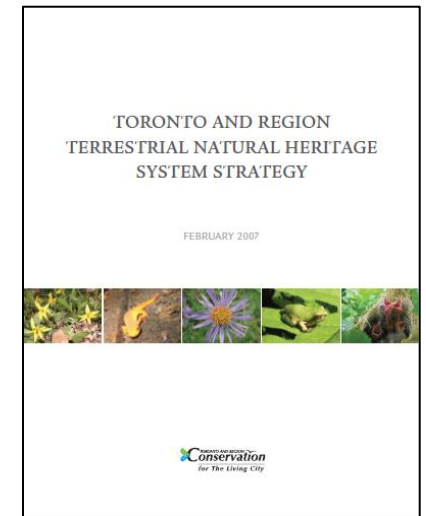
- Biodiversity offsetting entails a **trade-off**: accepting harm on the condition that it is counterbalanced by beneficial actions so that in the end nature is no worse off – or ideally even better off - *Ontario Nature*
- Biodiversity offsets are measurable conservation outcomes designed to compensate for **adverse and unavoidable impacts** of projects, in addition to prevention and mitigation measures already implemented - *International Union for the Conservation of Nature*
- Ecosystem offsetting is an approach **to offset the adverse impacts** of land use change on the natural heritage system through **the creation or restoration of natural features** – *Credit Valley Conservation*



Photo/image credit: Queensland Government

The need for Biodiversity Offsetting

- Much of Southern Ontario has limited natural cover – less than what is required for healthy and sustainable natural heritage systems.
 - TRCA Natural Cover: 24% (including cultural meadows)
- Several Municipalities and Conservation Authorities are working to increase natural cover to improve biodiversity and ecological function.
- Stress is placed on natural heritage systems as landscapes are developed.
- Despite strong protective policy, ecological impacts are unavoidable.



The need for Biodiversity Offsetting

- Continuously working to eliminate these losses
 - Strengthening protective policy
 - Advocating for improved community design
 - Communicating the importance of natural systems
- In addition, biodiversity offsetting has been used to help replace lost ecosystem functions and services.

Challenges of Biodiversity Offsetting

- Ecosystems are very complex and difficult to replicate
- Many ecosystems require a long time to mature and reestablish
- Newly restored ecosystems can be more susceptible to stresses such as invasive species and climate change
- Limited space to accommodate required restoration in proximity to where the impact occurred
- Lack of clear policy and direction
- Working within the linear land use planning process makes it difficult to address unexpected outcomes

Principles of Biodiversity Offsetting

Establishing a set of principles helps to ensure biodiversity offsetting is as effective as possible.

The following principles are adapted from several biodiversity offsetting guidance documents:

- *Biodiversity Offsetting Issues Brief, 2016 International Union for the Conservation of Nature*
- *Biodiversity Offsetting in Ontario: Issues, accomplishments and future directions, 2016, Ontario Nature*
- *The BBOP Principles on Biodiversity Offsetting, Business and Biodiversity Offsetting Programme*
- *Biodiversity Offsets: A User Guide, 2016, World Bank Group*
- *Ecosystem Offsetting Guidelines, 2016, Credit Valley Conservation*
- *Ecological Offsetting Policy. Lake Simcoe Conservation Authority*
- *Guideline for Determining Ecosystem Compensation, 2018, Toronto and Region Conservation Authority*

Principles of Biodiversity Offsetting

Principle 1: Strong and clear legislation, policy, and direction must be in place to guide offsetting decisions and actions

This should include:

- Setting limits to offsetting, establishing which ecosystems should not be impacted
- Outlining the process for how to determine offset requirements, the importance of engaging communities in decision making, the need for monitoring and adaptive measures

Principle 2: Science and traditional knowledge should be used to guide decisions, design, and implementation of biodiversity offsets

Principles of Biodiversity Offsetting

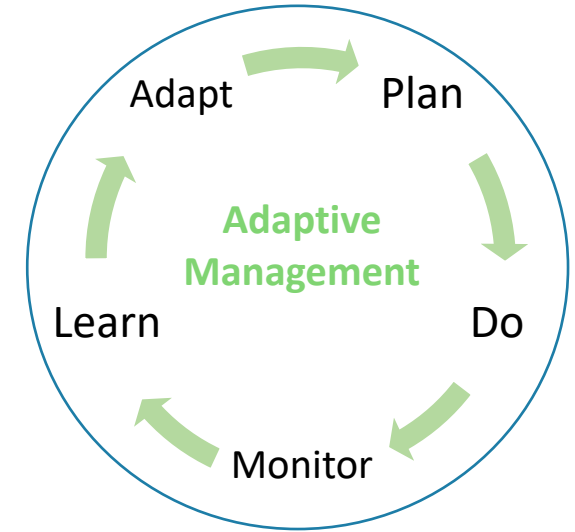
Principle 3: The biodiversity offsetting process should be equitable and inclusive, ensuring all affected parties have an opportunity to participate

Principle 4: The offsetting process should be transparent with information and decisions being openly communicated.

Principles of Biodiversity Offsetting

Principle 5: An adaptive management approach should be used including monitoring, tracking, and evaluation to help ensure offsetting is achieving its goals and to help address uncertainty in outcomes.

This can be challenging in a linear planning process

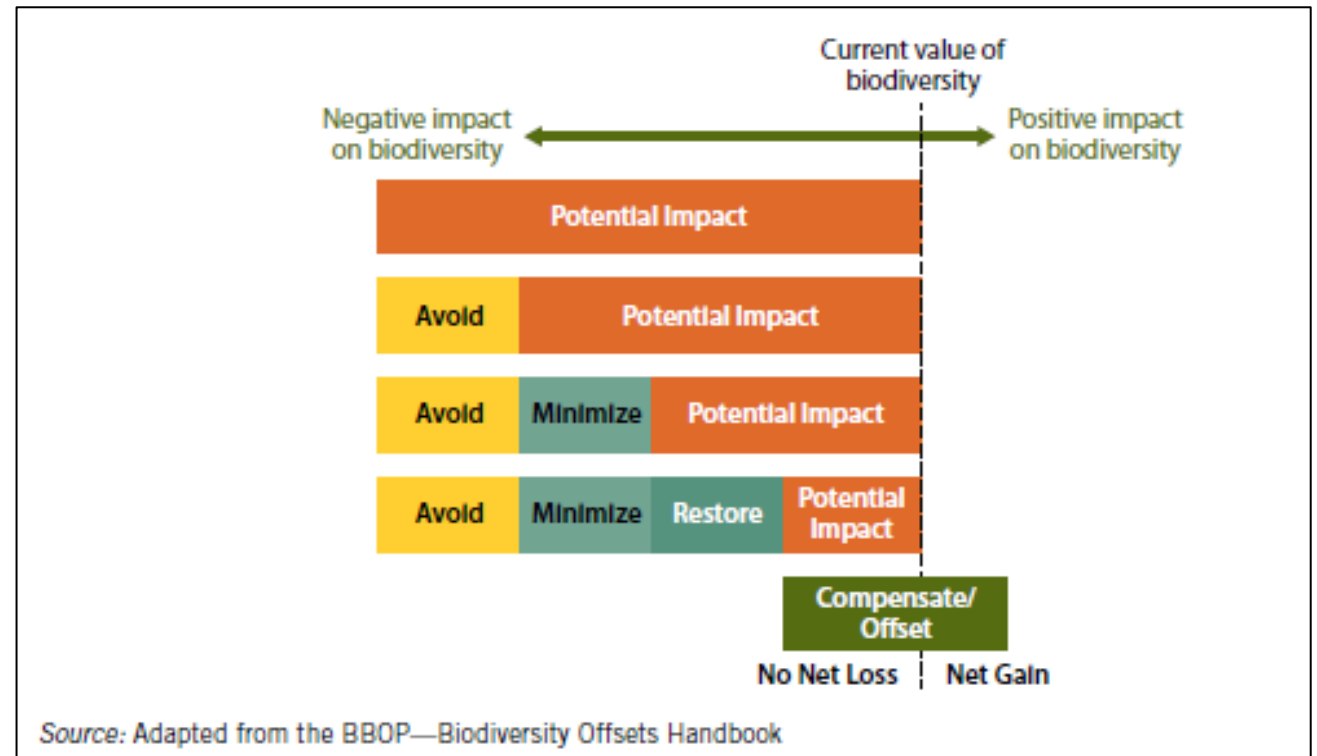


Principles of Biodiversity Offsetting

Principle 6: The Mitigation Hierarchy should be followed to minimize adverse impacts and offsetting should only be considered when all other opportunities to eliminate or minimize impacts have been exhausted.

Mitigation Hierarchy:

A decision-making framework involving a sequence of steps starting with the avoidance of impacts, followed by the minimization of inevitable impacts, on-site restoration and finally, where feasible and necessary, biodiversity offsets. - IUCN



Principles of Biodiversity Offsetting

Principle 7: Offsetting activities should ideally achieve a net gain or at least no net loss

Net gain or no net loss of what?

- Ecosystem function?
- Ecosystem size?
- Over what time frame?

Ensuring additionality is critical

“For any offset to be real, it must be additional. In other words, biodiversity offsets must deliver conservation gains beyond those that would be achieved by ongoing or planned activities that are not part of the offset.”

Source: Biodiversity Offsets: A User Guide, World Bank Group, 2016

Principles of Biodiversity Offsetting

Principle 8: In most instances offsetting actions should strive to reestablish the same biodiversity values as were lost (Like for Like)

Consider the size, structure, and location of the ecosystem, the function of the ecosystem, cultural values, and other ecosystem services important to the communities

Watershed planning and other strategic plans can help to guide offsetting actions when different ecosystem restoration is being contemplated – remove a forest, restore a wetland

Principles of Biodiversity Offsetting

Principle 9: Offsetting actions should be directed to restoring and securing ecosystems in proximity to where the impact occurred

Principle 10: Offsetting actions must be completed promptly (ideally before the impact) and last as long as the impact (typically in perpetuity)

TRCA's Guideline:

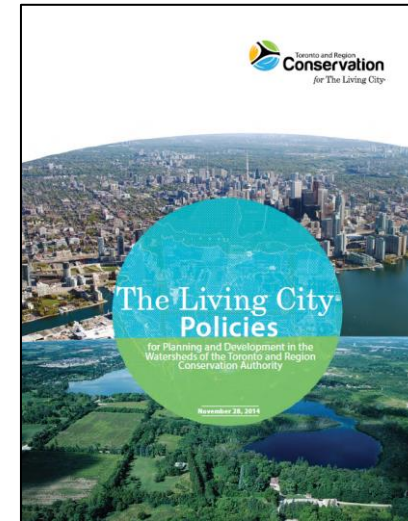
TRCA Guideline for Determining Ecosystem Compensation

Elements of Biodiversity Offsetting

1. Determining **when** offsetting is appropriate

- Guided by municipal, provincial, federal policy
- Situated within the established land use and infrastructure planning processes
- Has been a gap in Ontario for several years but is starting to be addressed

Guided by TRCA Living City Policies



Elements of Biodiversity Offsetting

2. Determining offsetting requirements

Two components addressed when establishing new ecosystem to offset impacts

The structure of the ecosystem

- Type of structure (forest, wetland)
- Quality of the ecosystem impacted
- Time to reestablish lost functions (lag time)
- Replacement Ratios or credits

The land base required to support the ecosystem

- Located in proximity to the impact
- Can be very challenging in an urban landscape



**Guided by TRCA
Guideline for
Determining
Ecosystem
Compensation**

Elements of Biodiversity Offsetting

3. Implementing offsetting actions

There are several different ways to execute offsets:

- On site versus Off site
- Proponent-led implementation versus Agency-led implementation
- Cash-in-lieu
 - Funds provided to an agency to undertake offsetting actions
- Habitat banks
 - Establishes protected ecosystems for the purpose of selling approved credits to proponents requiring offsetting

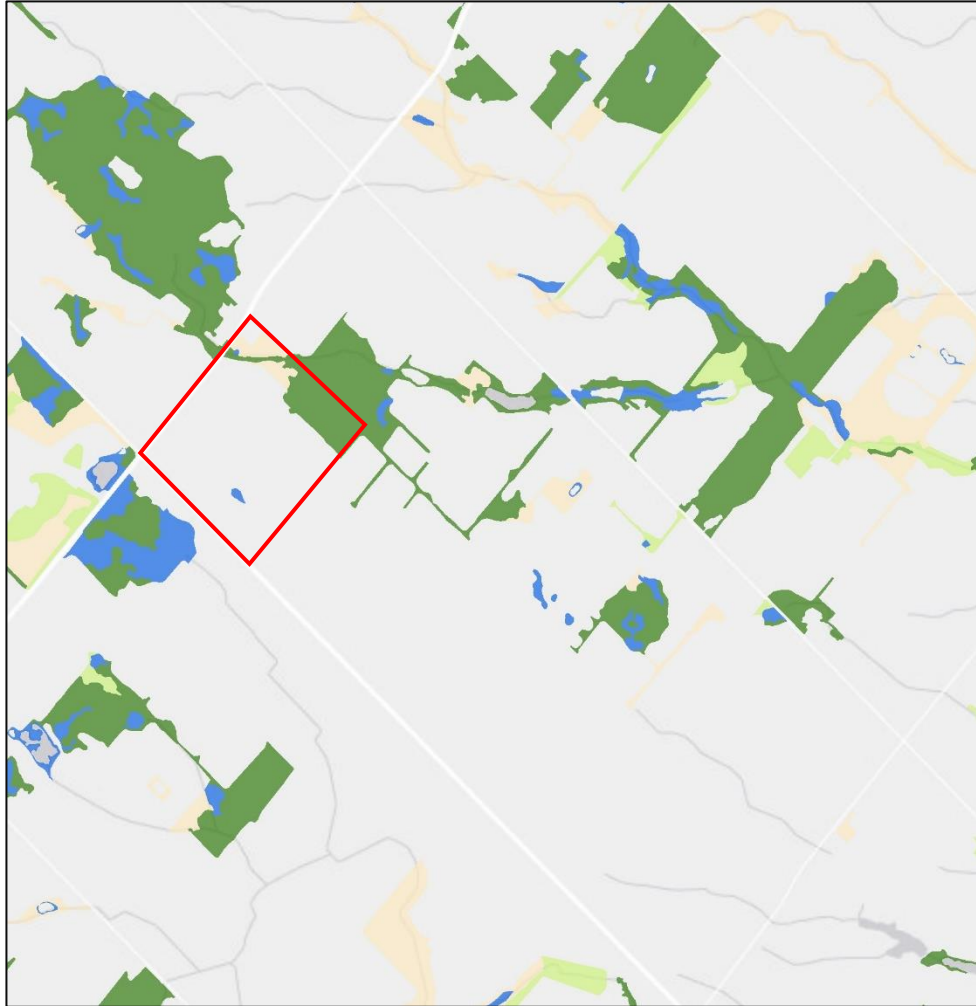
**Guided by TRCA
Ecosystem
Compensation
Management
Framework**

4. Monitoring, Tracking, and Reporting

- Critical to understanding the success of offsetting and improving future practice

Illustrative Examples

Residential development



1

Determining when removals with compensation is appropriate

2

Determining how much compensation is required

3

Applying compensation

4

Tracking and reporting compensation outcomes

Municipal road widening



Illustrative Examples

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Illustrative Examples

Residential development



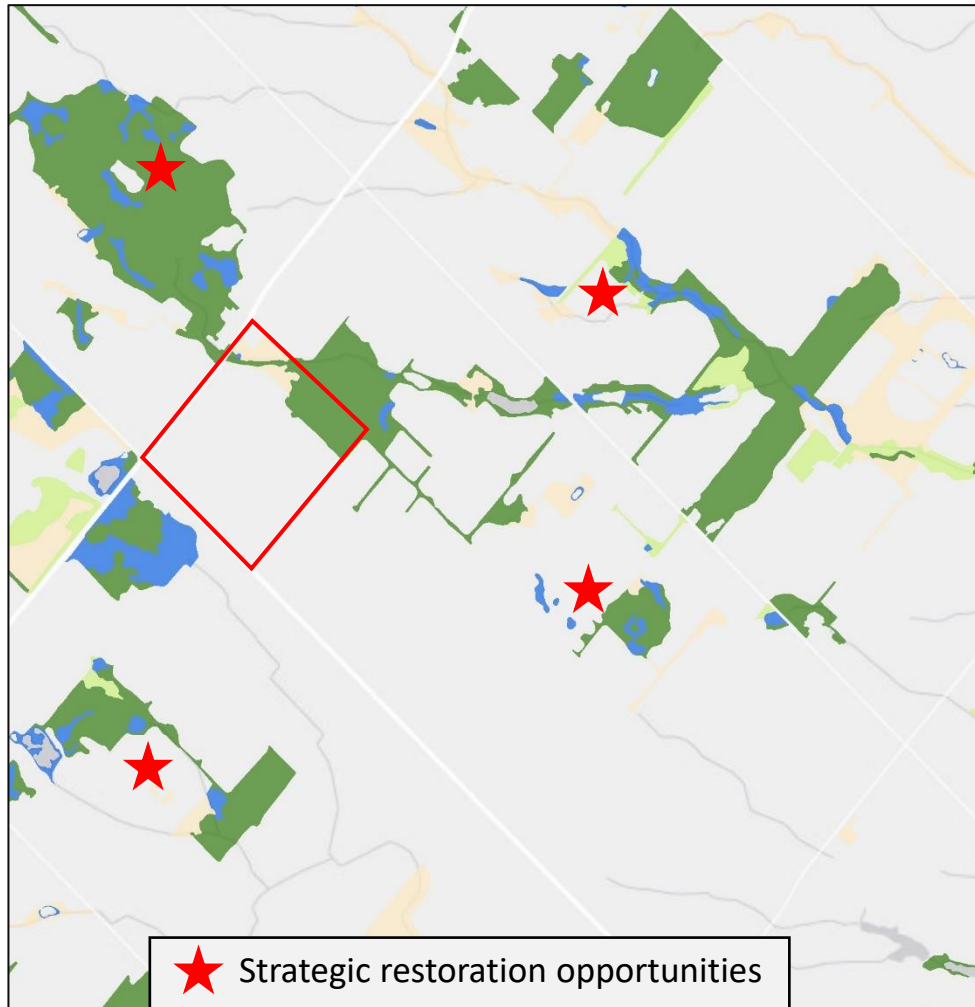
- 1 Determining when removals with compensation is appropriate
- 2 Determining how much compensation is required
- 3 Applying compensation
- 4 Tracking and reporting compensation outcomes

Municipal road widening



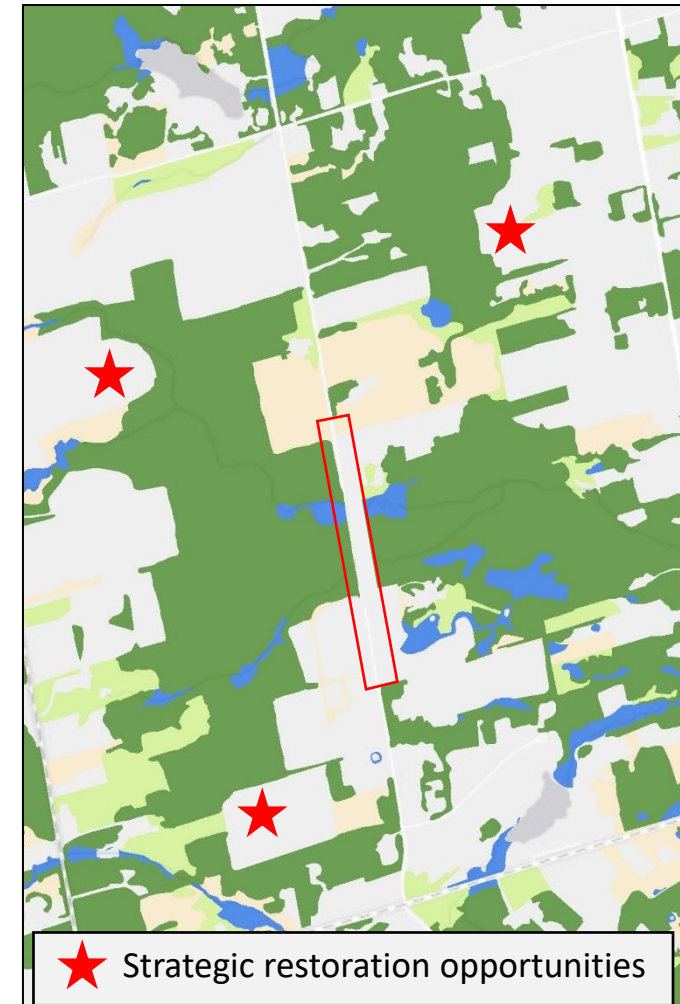
Illustrative Examples

Residential development



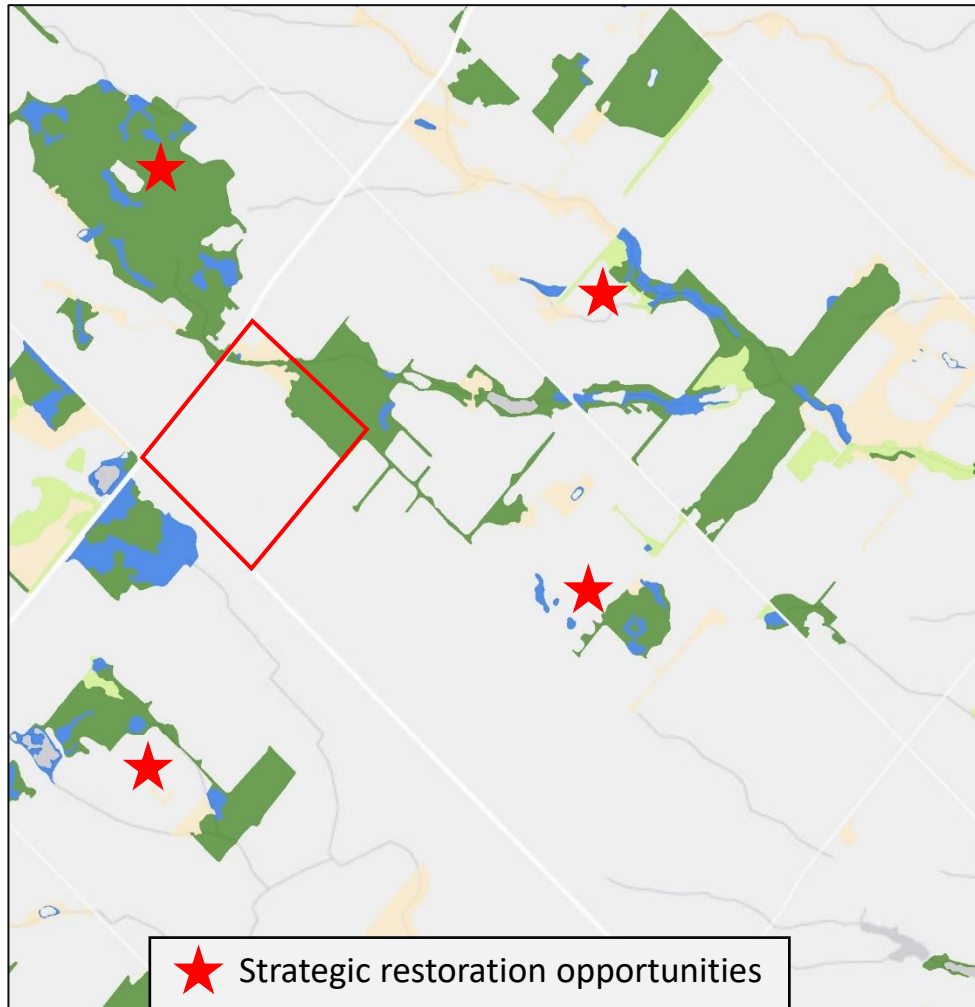
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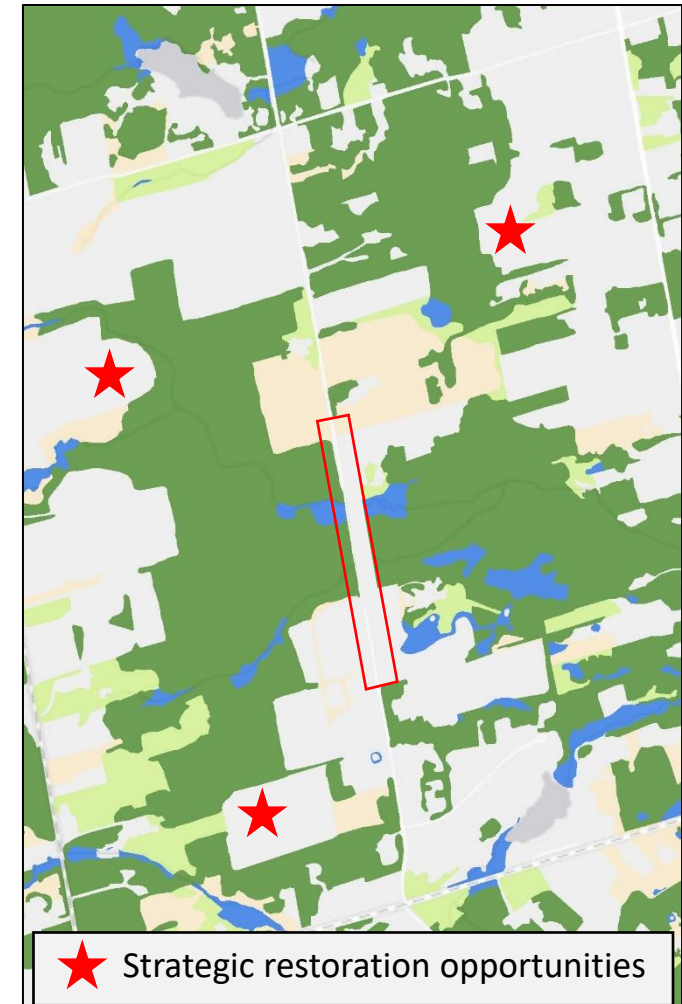
Illustrative Examples

Residential development



- 1 Determining when removals with compensation is appropriate
- 2 Determining how much compensation is required
- 3 Applying compensation
- 4 Tracking and reporting compensation outcomes

Municipal road widening



TRCA Ecosystem Compensation Program

Lunch and Learn

Presented by:

Kelly Jamieson

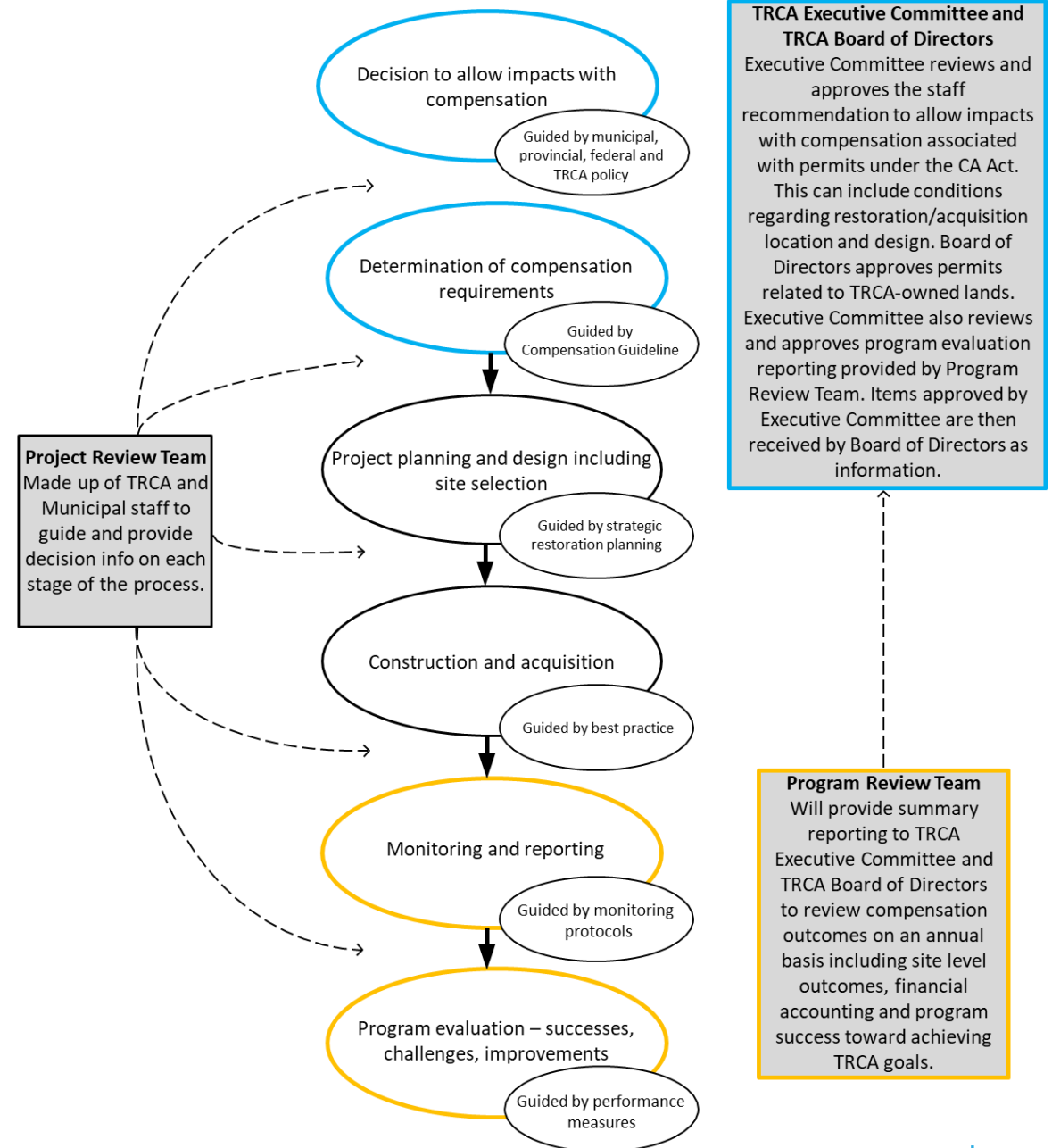
Senior Project Manager, Restoration and Resource Management

Dec 15, 2021

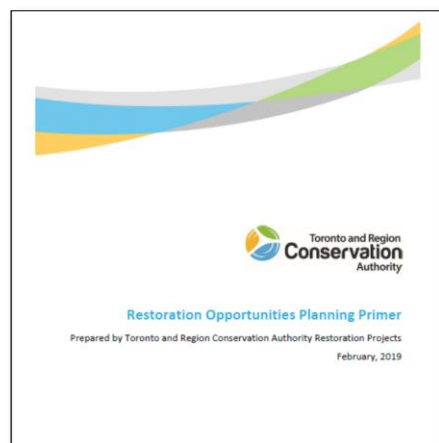
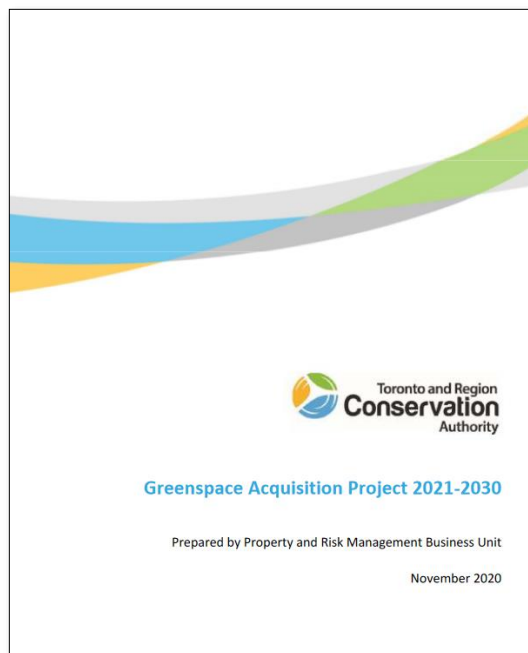
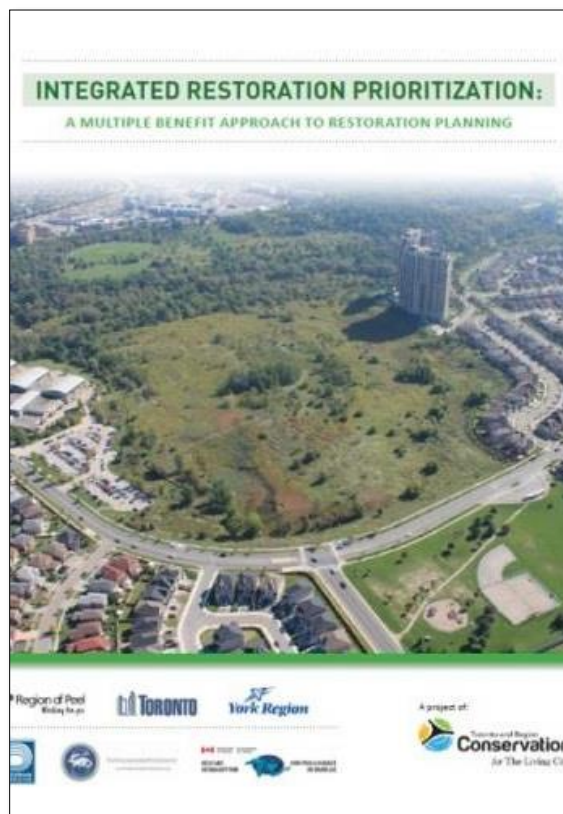


Managing Ecosystem Compensation

Compensation Management Framework



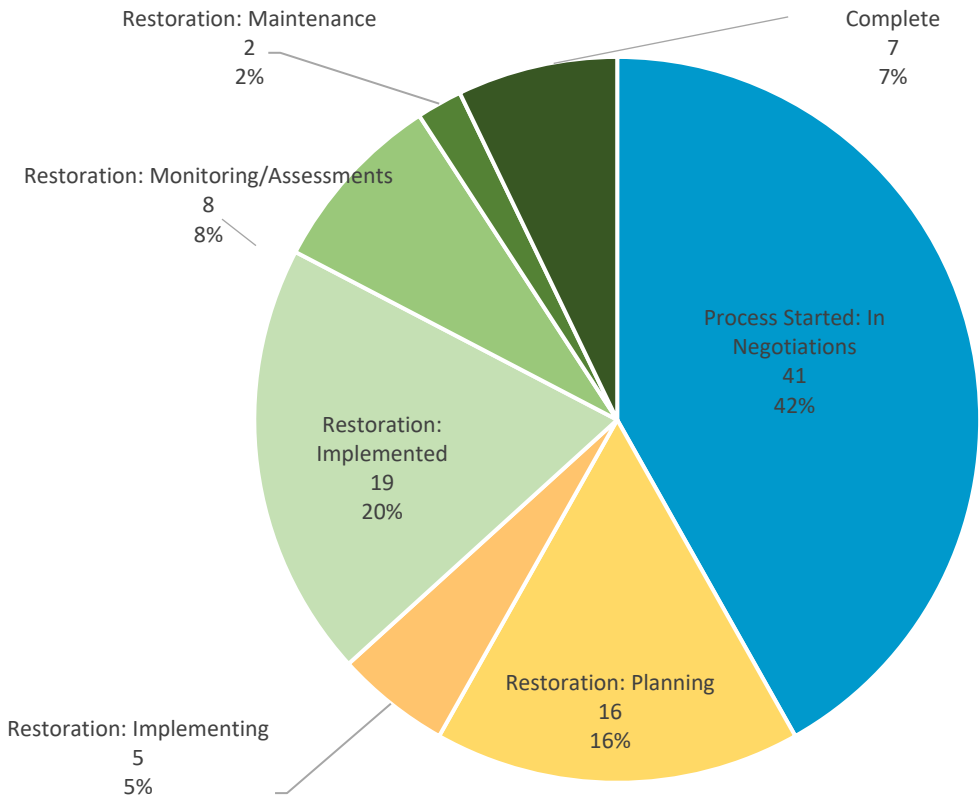
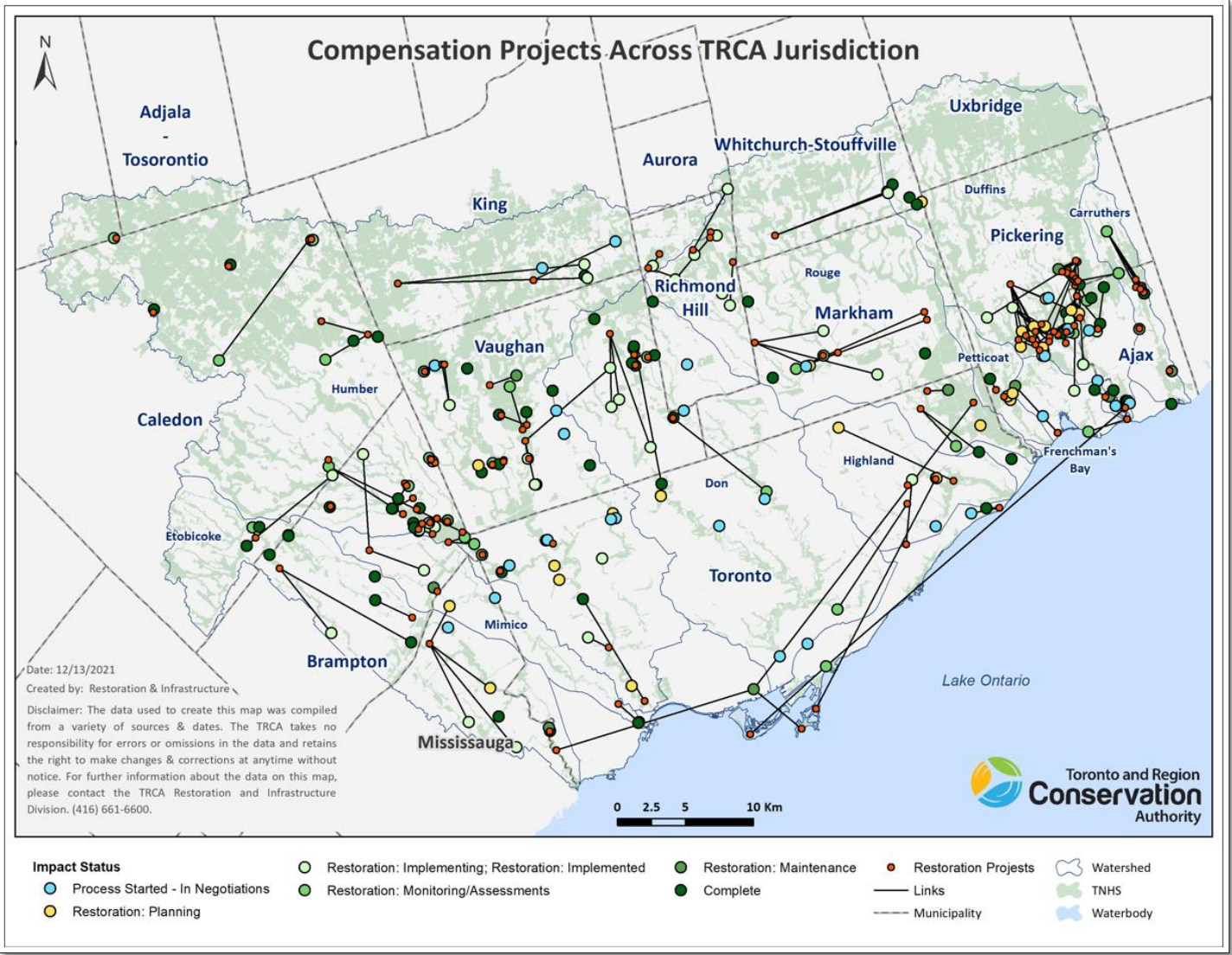
How Strategic Compensation is Implemented



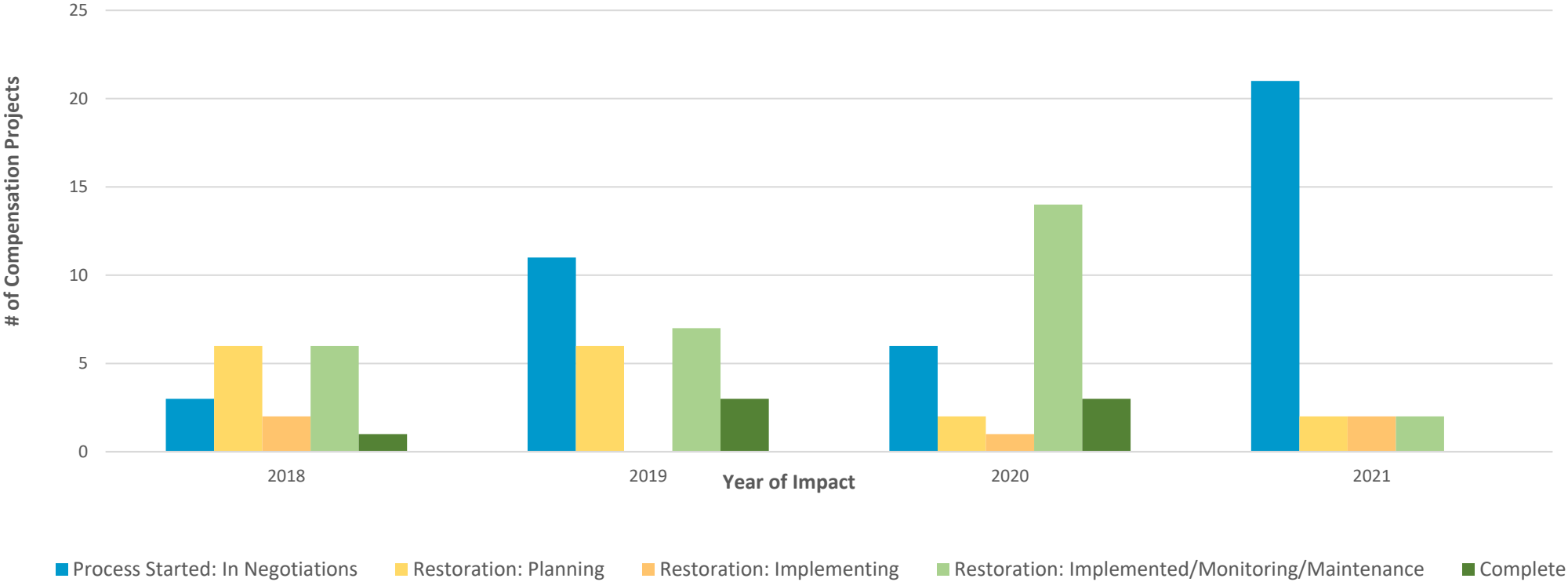
Strategic Restoration Site Selection Tools

- Local Plans / Watershed Plans
- Land Acquisition Priorities
- Restoration Opportunities Planning (ROP)
- Integrated Restoration Prioritization (IRP)
- Restoration Databases (Projects, ROP, Comp)
- Compensation Site Selection Brief
- Compensation Project Completion report
- Annual Reports to TRCA Board

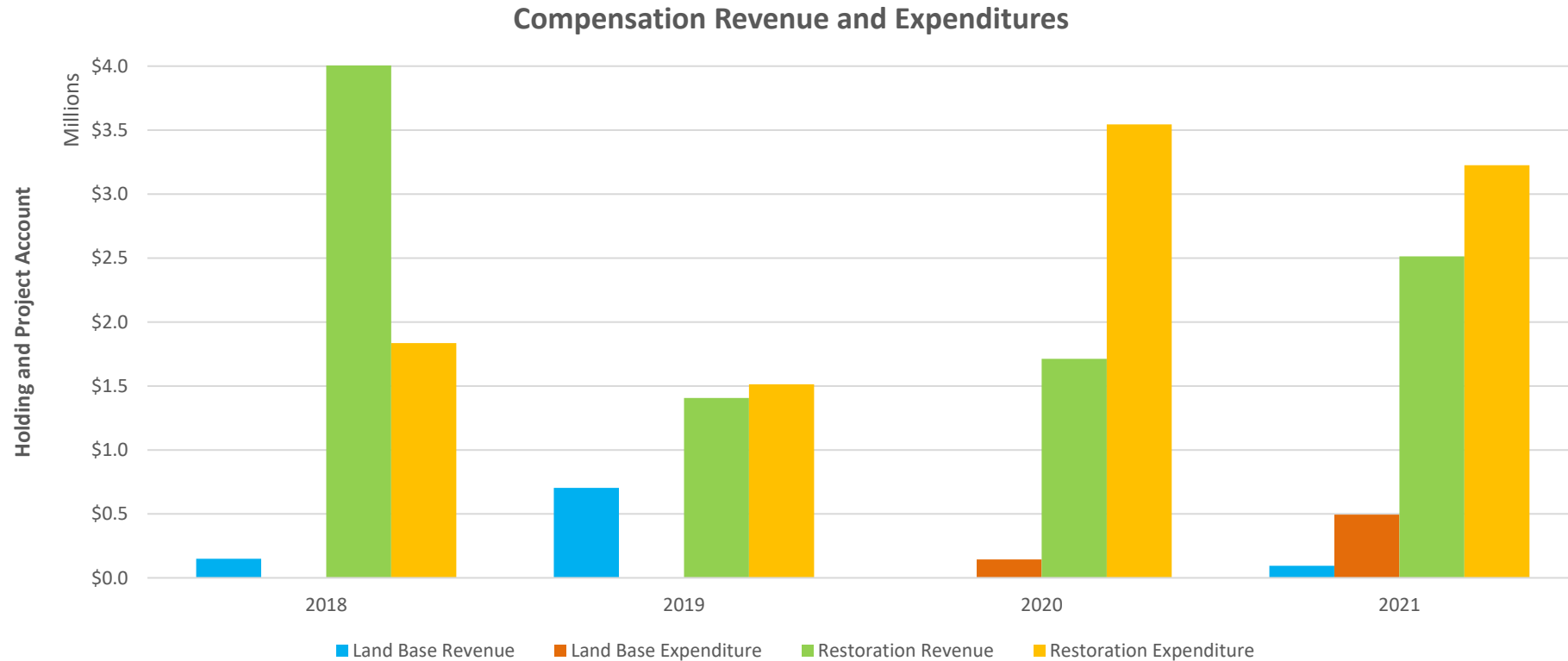
Summary: Compensation Projects by Current Status 2018-2021



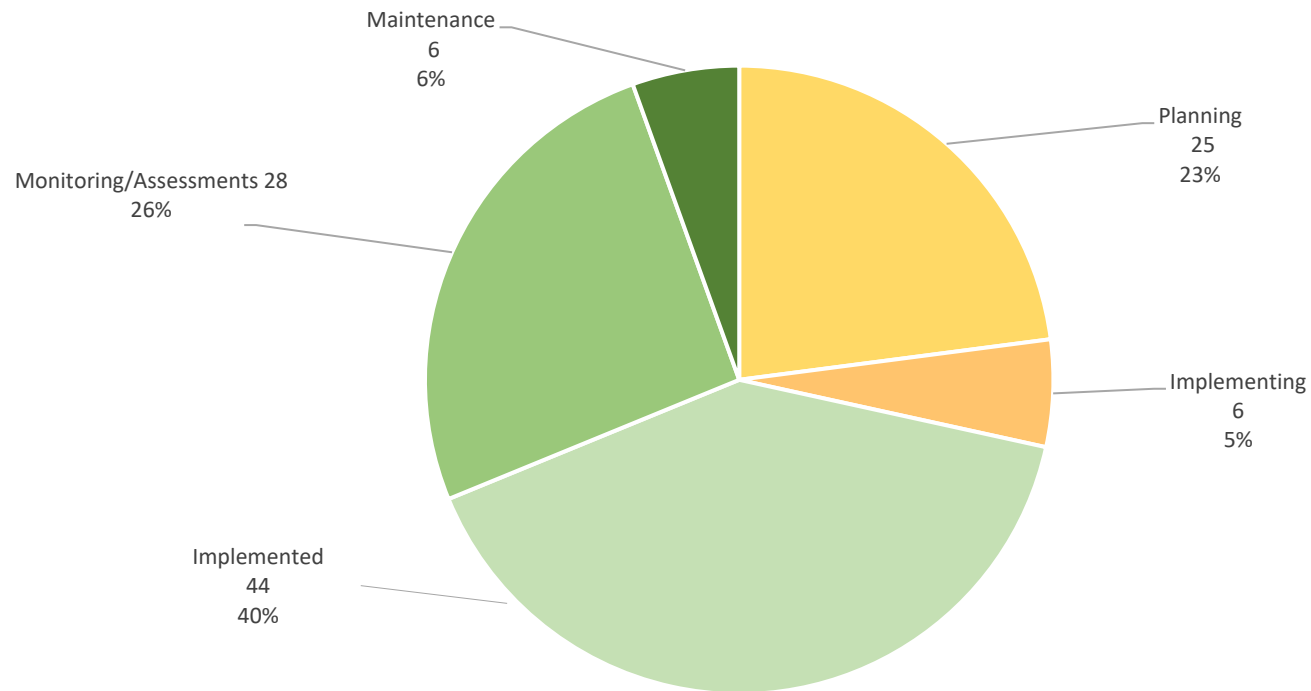
Status of Compensation Projects by Year of Impact from 2018 to 2021



Financial Update



Status of Restoration Projects Using Compensation Funds in 2021



Compensation Net Balances

Terrestrial Natural Features (ha)	Forest	Wetland	Meadow	Total
Restoration Required	13.8	20.0	12.6	46.4
Restoration Completed	21.1	17.4	5.4	43.9
Future Restoration to be Completed (Based on funds in Account)	4.3	14.1	0.1	18.5
Total Restoration Secured Completed + Future	25.5	31.5	5.5	62.5
Restoration Balance Total Restoration – Required	11.7	11.4	-7.1	16.0

Land base Compensation (ha)	Total
Land base Required	0.7
Land base Acquired	62.6
Future Lands to be Acquired (Based on funds in Account)	\$ 551,000.00
Total Lands Secured Completed + Future	62.6+
Lands Balance Total Restoration – Required	61.9+

Aquatic Natural Features (m)	Total
Restoration Required	14.7
Restoration Completed	160.0
Future Restoration to be Completed (Based on funds in Account)	0.0
Total Restoration Secured Completed + Future	160.0
Restoration Balance Total Restoration – Required	145.3

2021 Achievements



Review of the **Guideline** began and will be completed in 2022



Internal and External review of the **Basal Area** concept provided additional support



Update of TRCA Restoration Cost Typical from 2017 to **2021 rates**



Update of the **Framework** - housekeeping and financial processes



Update to the Restoration Project **Completion report**



Review of **TRCA led projects** and how they intersect with compensation



Updating the RRM Restoration Project **Database**

2022

Next Steps

- Minimum cost per hectare
- Data tracking and reporting related to land base compensation (PARES)
- Coordination with Planning Ecology on Guideline to direct staff on how to track compensation triggered by TRCA led projects



Thank You

Questions?

www.trca.ca



Upcoming ECS Lunch and Learns!

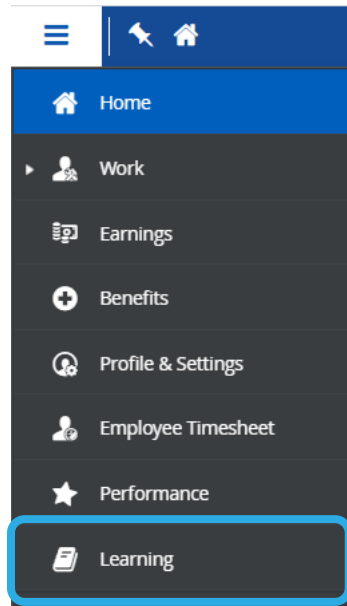
Wednesday, January 26


11:00am-12:00pm

**Ontario's New Excess Soil
Regulations**

By Don Ford

Learning Management System



 Course Catalog

CATEGORIES


FILTERS

Lunch and Learn

X

Q

4 items




New

Lunch and Learn: Teams, OneDrive and SharePoint

EN

Webinar




New

Lunch and Learn: Hobbies for Mental and Physical Health (Please read...

EN

ILT (Instructor-Led Training)




New

Lunch and Learn: Thermal Imaging for Restoration and Conservation

ENROLLED

EN

Webinar



New

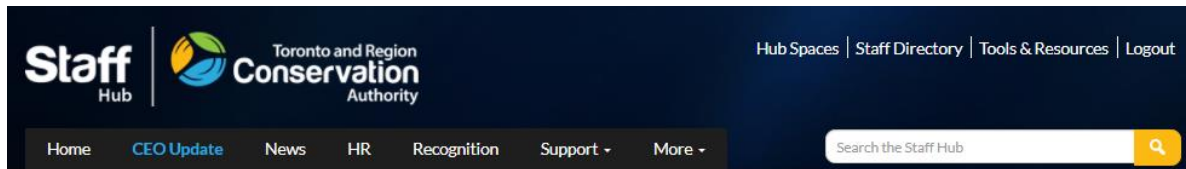
Lunch and Learn: Natural Heritage System Update

ENROLLED

EN

Webinar

Scientific Knowledge Sharing Hub



[Home](#) > [Scientific Knowledge Sharing](#)

Scientific Knowledge Sharing

Evidence-based decision making is at the core of what TRCA does. Several of our Business Units engage in generating new scientific knowledge to support watershed management actions and decisions.

It is critical that the knowledge generated is effectively shared.

The Scientific Knowledge Sharing platform is dedicated to sharing the latest scientific knowledge generated by TRCA and our partners. It is a place where staff can learn about and engage in the scientific work TRCA is undertaking.

PLEASE NOTE: There are several TRCA teams engaged in generating new scientific knowledge. Currently the content on the platform is specific to the Watershed Planning and Ecosystem Science business unit. Additional content from other TRCA teams will be added as the platform develops.



Knowledge Sharing: Learn More

- [Watershed and Ecosystems Reporting Hub](#)
- [Environmental Monitoring](#)
- [Research and Science Working Group](#)
- [TRCA Research Agenda](#)
- [Development and Engineering Services Hub Space](#)

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Knowledge Sharing: Latest Updates

[Knowledge Sharing - Climate Change Analysis at the Local Scale](#)

April 19, 2021 by Hub Admin [Featured](#)

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Past Recordings

The collage consists of 20 individual presentation slides, each with a unique design and content. The slides are arranged in a grid-like fashion, overlapping slightly. The topics covered include:

- Watersheds and Ecosystems Reporting:** Draft Web Application, Introduction to the LID Treatment Train Tool, Watershed and Ecosystems Reporting Hub.
- Biodiversity:** Explore TRCA's Biodiversity, TRCA's Natural Heritage System Update.
- Fish Habitat:** Evaluating the effectiveness of fish habitat restoration across the Toronto waterfront.
- Erosion Risk:** Erosion Risk Management Program.
- Wetland Restoration:** Lake Ontario Fish and Aquatic Ecosystem Health, Lake Ontario Restoration Initiatives.
- Wetlands:** Wetlands, Warehouses or Both? – The Story of Project Lonestar and the Lower Duffins Wetland Complex.
- Flood Protection:** TRCA's Recent Floodplain Mapping Updates, Broadview and Eastern Flood Protection.
- Other Topics:** Thermal imaging for ecosystem conservation and restoration, Precision Biomonitoring Webinar Series, Carruthers Creek Watershed Plan, Making the Connection, Wildlife-vehicle collisions and hot spot identification for roads in Peel and York Regions, Urban Landscapes, Biodiversity, and Habitat Connectivity.

Each slide typically includes a title, a brief description of the content, the presenter's name and affiliation, and the date of the presentation. The TRCA logo is prominently displayed on many of the slides.



Thank you

For questions about the ECS Lunch and Learn Series, please contact:

Sharon Lam
sharon.lam@trca.ca