Friends of Swan Lake Park

Focused on Rehabilitation of Swan Lake and Swan Lake Park

From this

to This

Markham Subcommittee

July 29, 2024

Request That The Committee:

1) Approve staff recommendations for continuing with current plan
2) Approve York U. CIFAL proposal for Citizen Science Lab
3) Follow through on TRCA's shoreline recommendations and community's request for $730,000 over the next 1-3 years for:
   a) Shoreline fencing ($125,000)
   b) Two recreational nodes with benches ($360,000)
   c) A new viewing location overlooking the western shoreline ($225,000)
   d) Six benches along southern and western shoreline ($20,000)
4) Support the community effort to raise $60,000 for research for the 2026 Lake Management Plan review by:
   a) Providing two tribute boards in Swan Lake Park
   b) Committing $15,000 in seed funding for lake management research
   c) Supporting staff and FOSLP pursuit of community, regional, provincial and federal funding

Partnering with the Markham Lions Club

April 2024: Lions and FOSLP Install 9 Birdhouses

May 2024: Mark Cullen donates tomatoes to Lions and FOSLP

Sustaining Biodiversity
First Residents: Tree Swallow

Thank you to Markham's park staff for installing the posts

Ongoing Park Improvements

- Children's Playground Upgraded 2023
- Brush cleared along shoreline (Mar 2024)
- Ongoing path and dock maintenance
- Bridge replacement underway
- Markham Lions Club reports Swan Lake Park to be one of cleanest parks they support

THANK YOU MARKHAM!

Discussion Outline

1) **Shoreline Enhancement**
2) 2024 Research Submissions
3) 2023 Water Quality Report
4) 2026 Swan Lake Plan Review

Primary Objective: Shoreline Enhancement

a) **Request $730,000 for Shoreline Enhancement**

More benches, two new recreational nodes, western viewing node, geese fencing

b) **Update David Plant: email May 7, 2024**

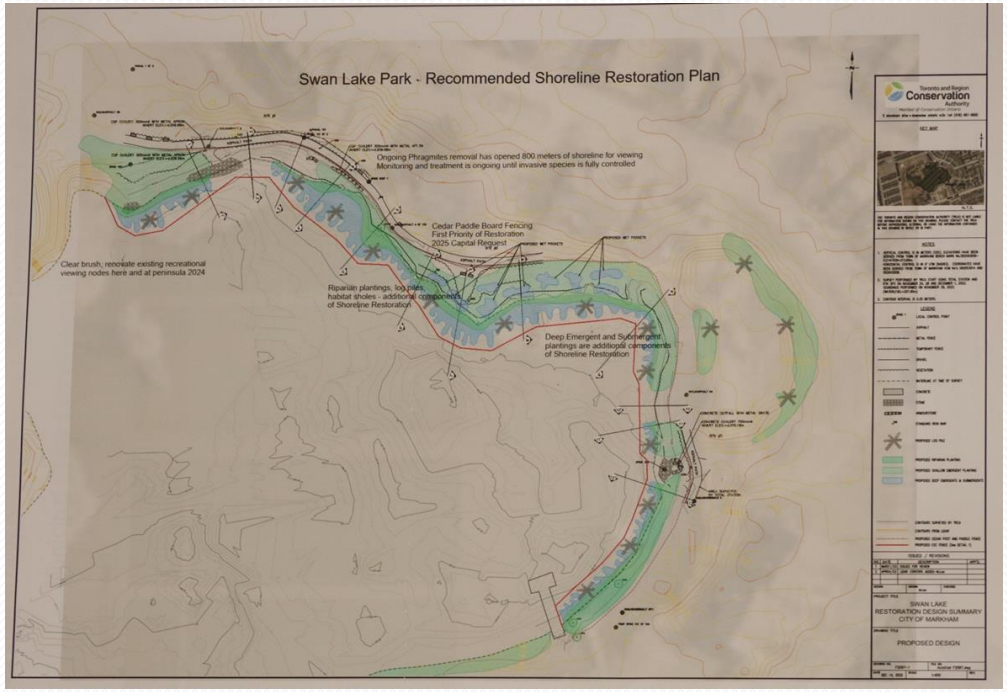
Given the number of areas to view the water compared to Toogood Pond staff do not support additional recreational nodes at Swan Lake.

1) Capital costs for TRCA style viewing nodes is $179,000
2) Will propose $125,000 fencing along eastern shoreline

SWAN LAKE 80% LARGER THAN TOOGOOD POND WITH VERY RESTRICTED VIEWING AREAS

Shoreline Restoration – Fencing ($125,000)

- TRCA had recommended use of stoneware along the eastern shoreline.
- Staff recommend lower cost fencing similar to Toogood Pond



TRCA's Shoreline Restoration Goals (2022)

√ Removal of invasive species (phragmites)
– almost completed

√ Reducing waterfowl access to shoreline
- with fencing similar to Toogood

X Improved shoreline access ("viewing & recreational nodes") **– not needed**

Example of Recreation Node Installation

TRCA Recommendations (April 2022)

Recommended four new recreational nodes with benches for viewing

Two Benefits:

1) Increased water access for residents & fishers
2) Less conflict between fishers and residents on the dock

Markham staff:

Not needed, already have more viewing areas than Toogood Pond but doesn't resolve human conflict.

TRCA Example

Existing Swan Lake Dock A Popular Venue

For Marriage Proposals

And Sunsets

Toogood Pond has 3 comparable lookout features

Existing Viewing Areas: Limited Visibility

E1: Existing Elevated Viewing (to be retrofitted)

- Not accessible, no benches

E2: Existing Elevated Viewing (to be retrofitted)

- Better accessibility

Upgrade Existing Recreational Node N1

- Primary access area
  - for fishing
  - land access point for geese
- Shoreline overgrown, poor viewing from benches on opposite side of path
- Needs TRCA style upgrade to support resident access

Existing Recreational Node N2

- Only Accessible Viewing Area Other Than Dock
- Traditionally overgrown, still needs improved viewing

Eastern Pathway/Bench Viewing Locations

Pathway Near Swan Club

Across from Recreational Node N2

New Features Proposed for Western Shoreline

New Recreational Node (N5) Near Amica & Townhomes

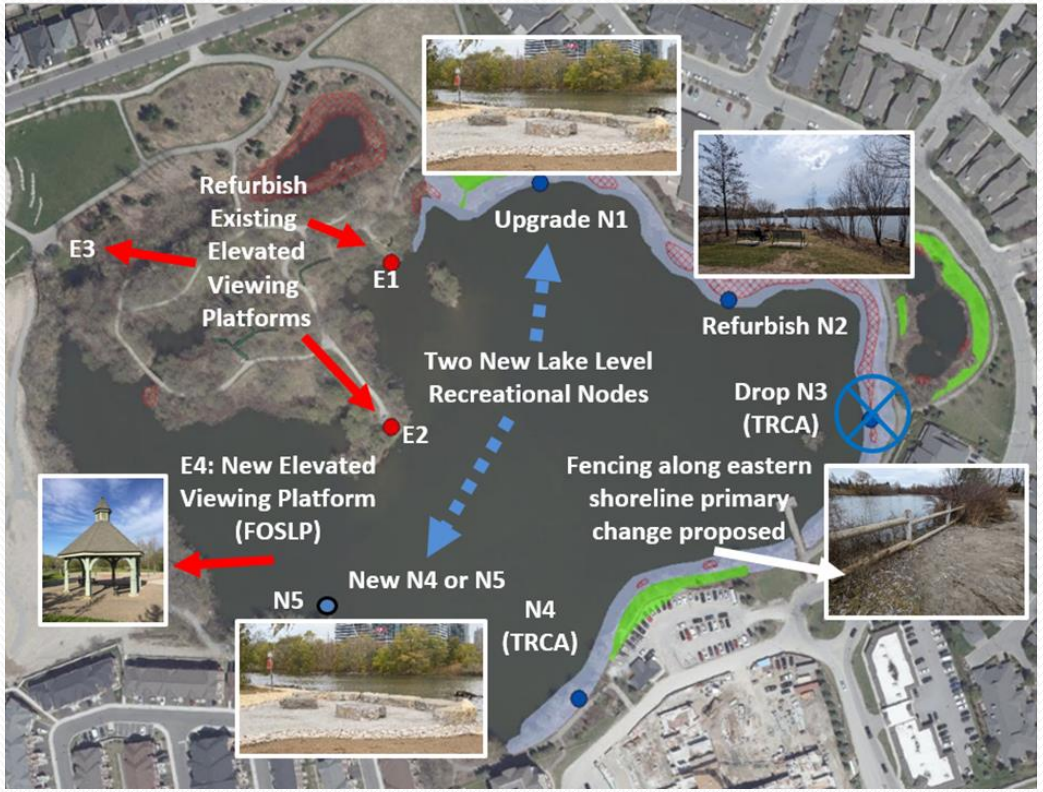
Original park plan recommended multiple points for fishing access along the shoreline

New Viewing Area (E4) Overlooking the Lake

Original park plan included recommendations for a dock along the western shoreline

FOSLP Proposed 2024 Recommendations

- Two new recreational nodes N1 & N5
  - Rather than 5
- Refurbish N2 – provide unrestricted views
- Add Gazebo (E4) as viewing area on western shoreline
- Install low-rise fencing provided it does not obstruct viewing areas



Swan Lake Shoreline Questionnaire

June 2024 124 Respondents

1) The invasive phragmites have been removed. (Choose 1)

96% I believe removing phragmites was an improvement for Swan Lake

4% I believe the phragmites should have been left alone

2) The TRCA recommended the use of stonework along the shoreline to restrain geese access to the shoreline. Markham staff is proposing lower cost fencing for geese restraint.

46% I support the use of stonework to restrain the geese (cost not known)

43% I support the use of lower cost fencing to restrain the geese. (cost estimate $125,000)

11% I believe there should be no effort to restrain the geese

Swan Lake Shoreline Questionnaire

3) In 2022, the TRCA recommended 4 new recreational nodes and FOSLP requested an additional node along the western shoreline. In 2024, FOSLP is recommending two new recreational nodes be added along the shoreline. (Choose 1)

19%	I support the 2022 recommendations for installing 5 recreational nodes (cost estimate $900,000)
65%	I support FOSLP's 2024 recommendations for installing 2 recreational nodes (cost estimate $360,000)
16%	I support Markham staff recommendations that no new nodes be added (cost nil)

4) At present there is no view of the lake from the pathway along the western shoreline which is about 3-5 m above the water level. FOSLP recommends that a new elevated viewing area along the western pathway be added to provide residents on the western side of the park with a view of the lake. (Choose 1)

80%	I support FOSLP's recommendation for a new elevated viewing platform on the western shoreline. (FOSLP cost estimate $225,000)
20%	I do not support the installation of a new viewing platform on the western pathway.

Shoreline Enhancements: Capital Cost Estimates

	Additional Capital Cost Estimates		
	TRCA & FOSLP (April 2022)	**FOSLP** (June 2024)	**Markham Staff** (May 2024)
Shoreline Fencing for Geese	$125,000	$125,000	$125,000
Lakeside Viewing Nodes for the People	$900,000 (5)	$360,000 (2)	nil
Viewing Platform (Western Pathway)	$225,000	$225,000	nil
Six Pathway Benches	$0	$20,000	nil
Estimated Capital Cost *	**$1,250,000**	**$730,000**	**$125,000**

* Markham staff estimates. Excludes costs for improving existing sites

1) **Determine if development funds available**
2) **Please approve $730,000 to support the community's request for new access & viewing locations and more benches!**
   - **84% requested new recreational nodes**
   - **80% requested a western lookout**

Discussion Outline

1) Shoreline Enhancement
2) **2024 Research Submissions**
3) 2023 Water Quality Report
4) 2026 Swan Lake Plan Review

FOSLP Research Contributions

1) York U. research into biochar filtering underway
2) Four research initiatives in 2024
   i. York CIFAL: Swan Lake Citizen Lab
   ii. Benthic Invertebrate Monitoring
   iii. U of Toronto students' assessment of water quality options
   iv. McMaster University – alternative to PAC

CIFAL York Proposal

Swan Lake Citizen Science Lab (Drone Monitoring)

Project Leader: Professor Ali Asgary, Director CIFAL York
CIFAL York based in York Markham campus

York Region Involvement with CIFAL York

CIFAL York one of 31 UN approved training centres

1) Advisory Board Members from York Region
   - Wayne Emmerson, Chairman & CEO, York Region
   - James MacSween, Chief, York Region Police
   - Janel Smith, Program Manager, Community Investments, York Region

1) Several projects within York Region underway

Swan Lake Citizen Science Lab Objectives

1) **Citizen Science and Community Engagement Lab:**

   Empower the local community to participate in environmentally friendly activities and scientific drone-based data collection and AI-Based data analytics through creation of a Citizen Science & Community Engagement Lab Initiatives.

2) **Co-monitoring the Lake:**

   Utilize drone and AI technologies to monitor water levels, ecological changes, and water quality in Swan Lake, providing valuable continuous data to inform conservation efforts.

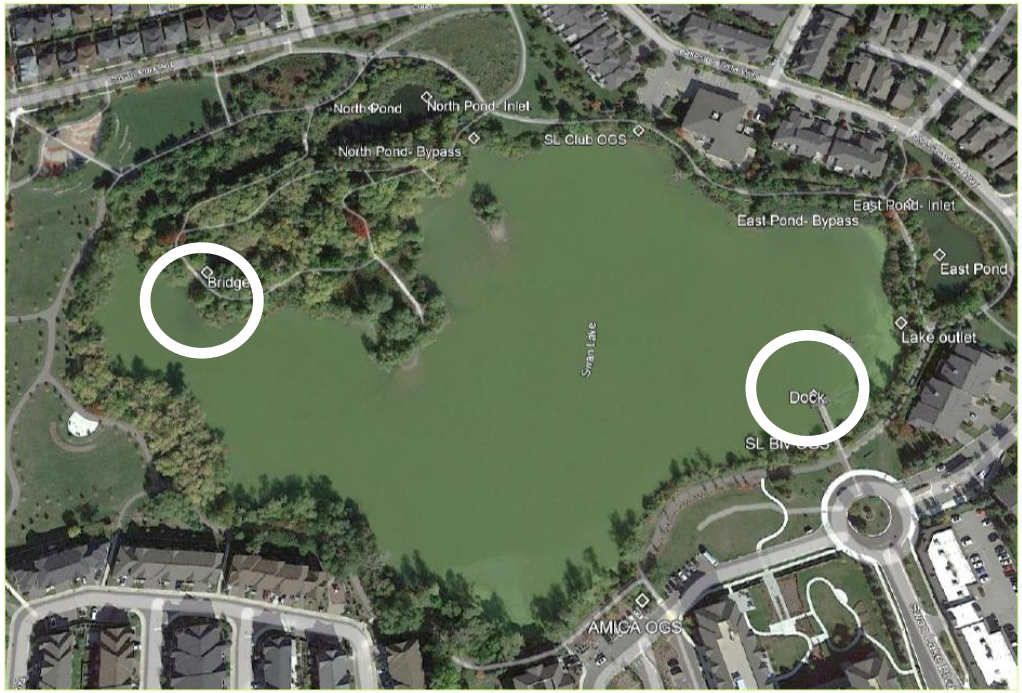
3) **Co-creating Documentary Films:**

   Create documentary films to raise awareness about the ecological importance of Swan Lake Park, the threats it faces, and the efforts to preserve and restore its wetlands.

Drones Will Provide More Extensive Testing

- Current testing for algae only at bridge & dock areas
- Testing for total algae content taken infrequently
- Drones can monitor the entire lake and report on algae levels by area and more frequently

Figure 1: Swan Lake and Runoff Monitoring Stations



Markham's Support for CIFAL Project

- FOSLP will assist with co-ordinating project discussions with Markham staff and CIFAL over the summer
- Markham requested to permit:
  1) Drone mapping by York U researchers
  2) Drone mapping by community volunteers
  3) Collection of water samples
  4) Release of information and images for public education and awareness
- Investigate potential use of information for Swan Lake rehabilitation plans
- No funding required
- Potential to incorporate other environmental elements

Swan Lake Benthic Invertebrate Monitoring

Chris Reeves
January 12, 2024

Commissioned by

Friends of Swan Lake Park

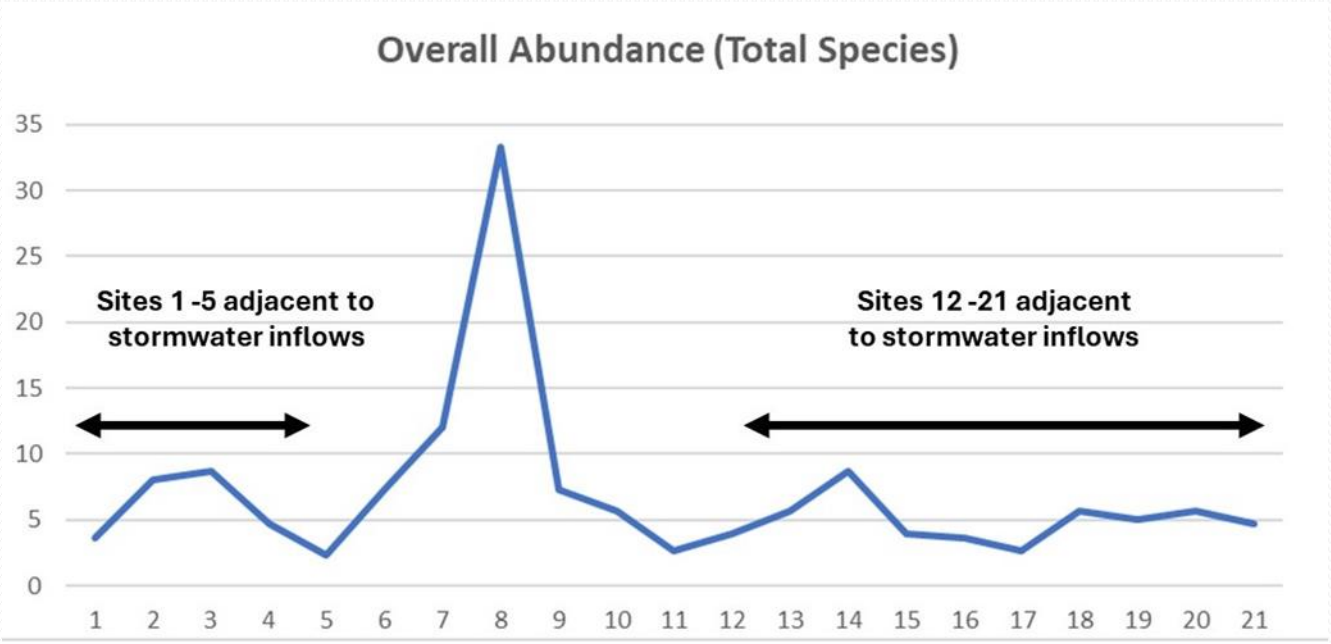
Summer 2023:

Benthic Invertebrate Monitoring: Chris Reeves

- Water quality is reflected in abundance and diversity of certain indicator species of insects.
- Provides an initial benchmark for monitoring improvement in water quality over time
- 16 taxonomic classes identified
  - 3 species indicators of “good” water quality
  - 4 species indicators of “fair” water quality
  - 6 species indicators of “poor or low” water quality
  - 3 other species associated with saline (chloride) rich environments

Chris Reeves' Conclusions:

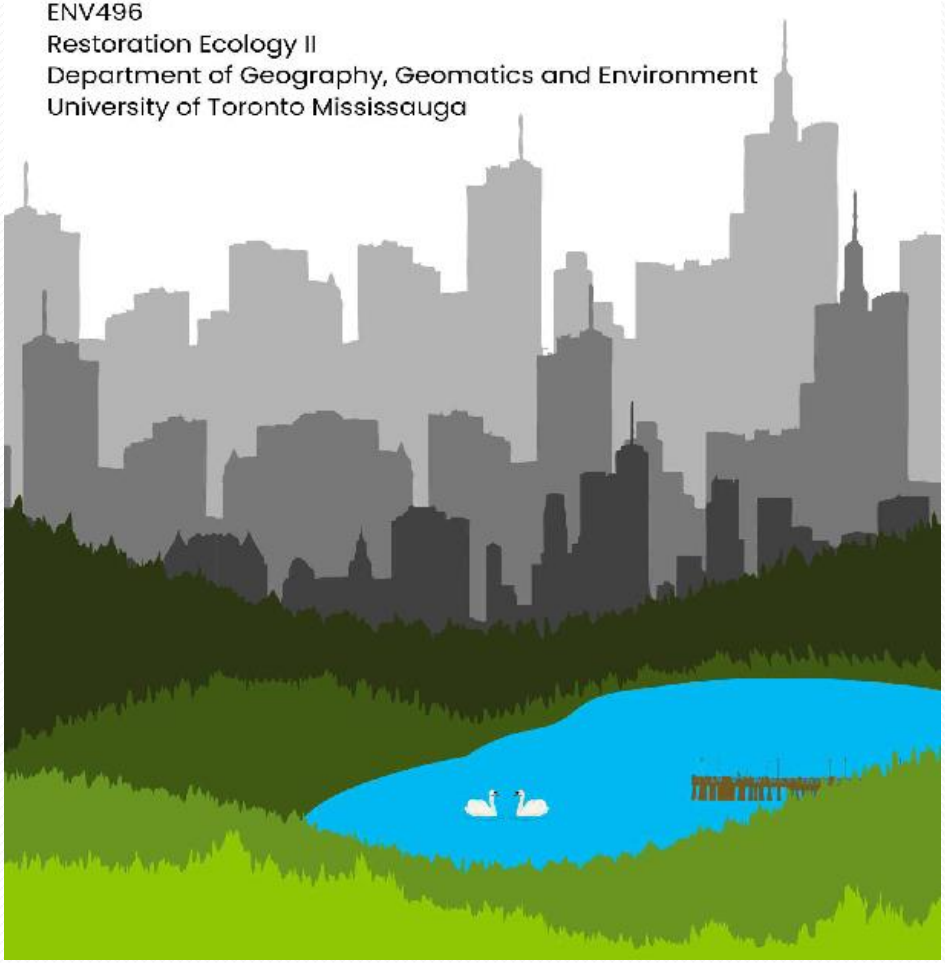
- Overall abundance of species "rather low"
- Many sites had very few individuals, suggesting point sources of pollution
- Conclusion: indications of "intermediate or fair water quality"



Swan Lake Park Restoration Plan

April 2024

ENV496
Restoration Ecology II
Department of Geography, Geomatics and Environment
University of Toronto Mississauga



Winter 2024

University of Toronto – Student Assessment

1) Reviewed Markham's plan and FOSLP's 2023 recommendations in the context of current academic sources
2) Sponsor: Professor Monika Havelka, PhD
   - 4th Year Ecology Restoration Program
   - 36 students, four focused teams: 95-page report
     1) Chemical Treatment Options
     2) Shoreline Restoration
     3) Upland Terrestrial Ecosystem
     4) Community Engagement/ Awareness

U of T Student Assessment: April 2024

1) "**rehabilitation**" better term than "**restoration**" for framing the current and future interventions at Swan Lake Park
2) Current chemical treatments:
   - **Unlikely that this program is sufficient to <u>maintain</u> … interim target**"
3) **Water Quality:** Support FOSLP's call for investigation into additional options such as
   - sediment removal, additional chemical treatments, oxygenation, planting
4) **Community Engagement:** Support recommendations for new viewing platforms along shoreline

Discussion Outline

1) Shoreline Enhancement
2) 2024 Research Submissions
3) **2023 Water Quality Report**
4) 2026 Swan Lake Plan Review

2023 Water Quality Report

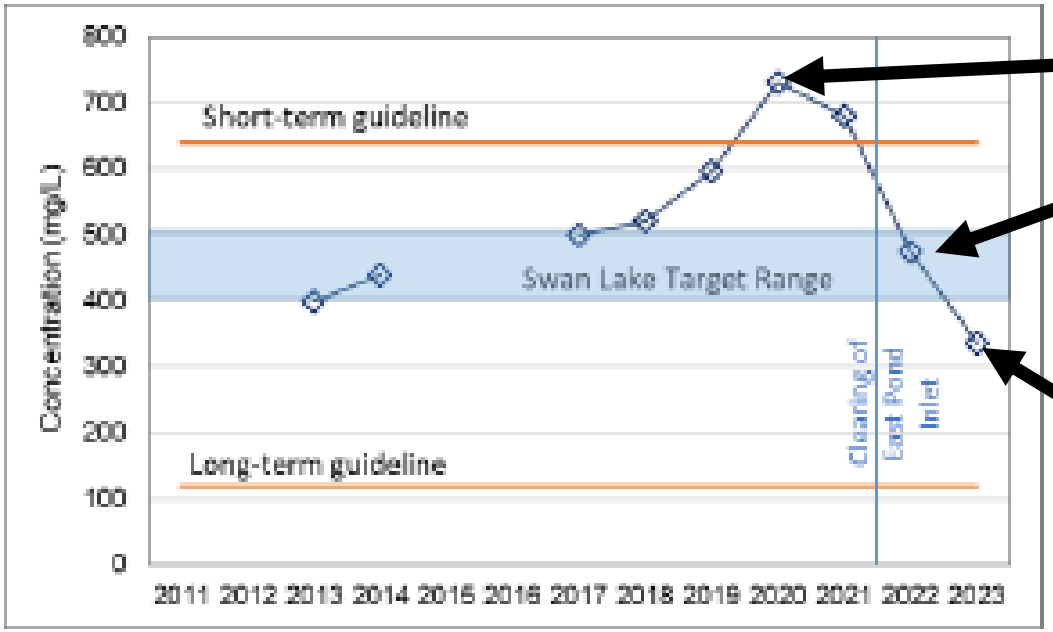
Positive But Unexpected Results

1) Drop in Chloride levels
2) Improvement in oxygen levels
3) Improvement in Phosphorus & Nitrogen
4) Static Aquatic Environment (Algae and Oxygen)

Raises questions about:

1) Impact of the aquifer
2) Impact of removal of phragmites
3) Disconnect between nutrient levels and algae levels

Significant Drop in Chloride Levels (2021-2023)



2020 55 tonnes

2022 39 tonnes
(Reduction 16 tonnes or 29%)

2023 26 tonnes
(Reduction 13 tonnes or 34%)

Where did chloride go? Dilution requires two step process:

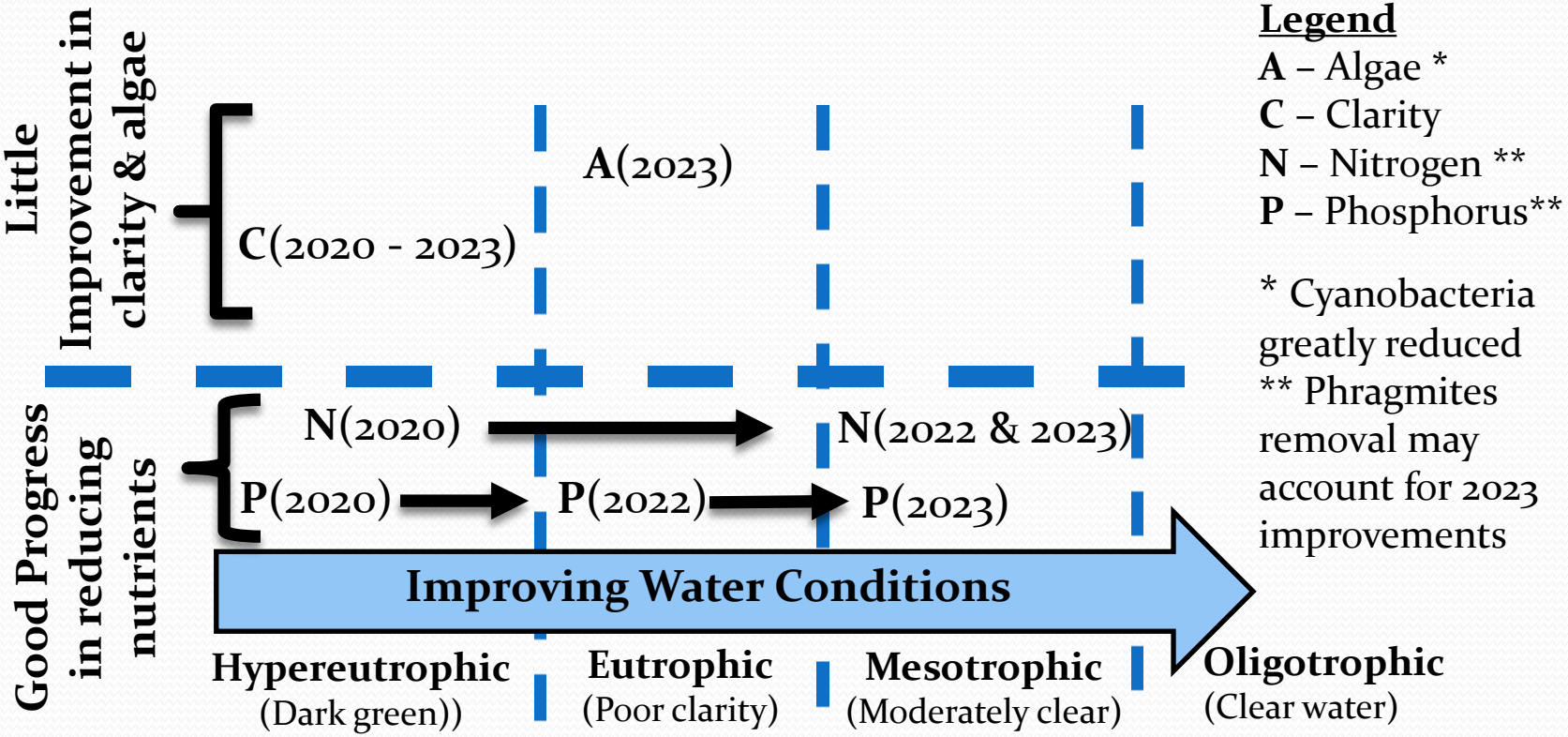
(1) Annual loss of 30%+ of chloride-laden water had to go somewhere - via lake outlet (not likely levels below outlet) or aquifer (most likely)

(2) Outflow replaced by fresh water – likely from aquifer (evaporation exceeds volume of precipitation)

Lower chloride levels may permit acceleration of aquatic planting

A Lag in Water Quality or a Disconnect?

- Goal of phosphorus-focused program is to reduce algae
- Nutrient reduction not leading to improved water quality



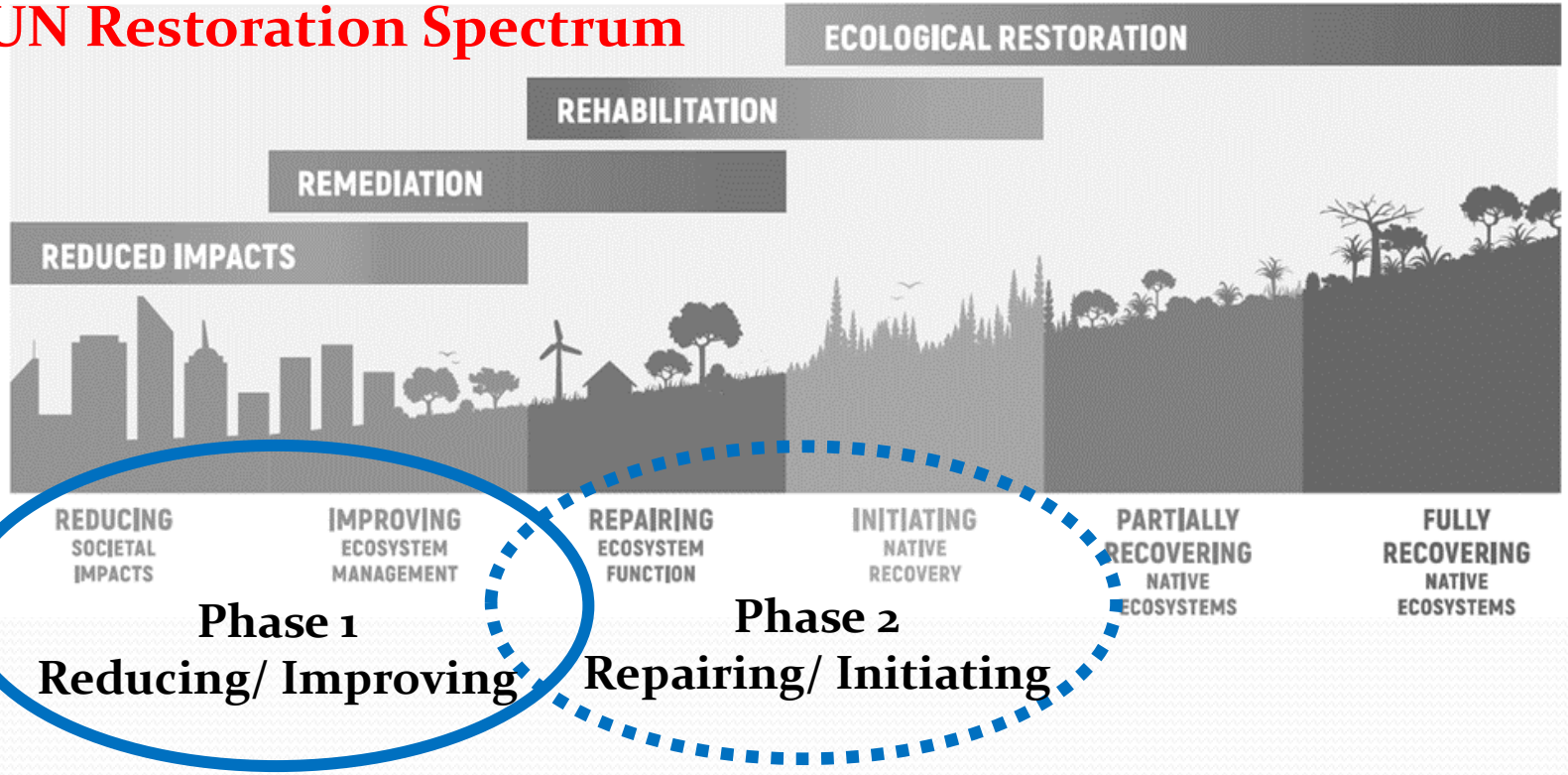
Some academic researchers questioning effectiveness of phosphorus-centric programs

Discussion Outline

1) Shoreline Enhancement
2) 2024 Research Submissions
3) 2023 Water Quality Report
4) **2026 Swan Lake Plan Review**

Two Challenges: (1) Improving (2) Sustaining

UN Restoration Spectrum



2026 Plan Review: Inflection Point

- Transitioning from improving to sustainability
- What's desirable? What's attainable? What's sustainable?

Preparing for Phase 2 Review (2025)

OPTION #1: Independent but Collaboratively

- Markham staff and FOSLP each engage environmental consultants to work collaboratively during 2026 review

OPTION #2: Pooling of Resources

- Hire one environmental consultant reflecting perspectives of both Markham and community stakeholders
- Co-ordination on defining scope of assessment:
  a) Initial review of plan results and potential options
  b) Subsequent assessment(s) on selected topics
- Joint effort to identify funding for environmental consultants

Community Fundraising Goal: $60,000

1) **Community sources $30,000** (Timeline Fall 2024)
   a) **FOSLP**: $15,000 from Businesses, Organizations, Individuals
   b) **Markham's Contribution**
      i. Provide two "Tribute Boards" in Swan Lake Park to recognize community contributors
      ii. $15,000 – inspirational seed financing
2) **Foundations $30,000** (Timeline 2025)
   a) Lions International (active discussion/$30k matching basis)
   b) Federal Nature Smart Climate Solutions Fund (Fall 2024)
   c) Other Environmental Endowment Funds

2025

Ontario Great Lakes Local Action Fund ($1.8 m)

- Targeting “hands-on” Community projects
- Up to $50,000 for most projects

Eligibility:

- Municipalities and research groups that **partner with at least one community-based organization** involved in delivering the project (staff time, funding?)
- Applications by September 26, 2024

Two Swan Lake related examples cited:

1) Planting native species (aquatic plants?)
2) Mitigating the impacts of road salt (York U researchers)

Request That The Committee:

1) Approve staff recommendations for continuing with current plan
2) Approve York U. CIFAL proposal for Citizen Science Lab
3) Follow through on TRCA's shoreline recommendations and community's request for $730,000 over the next 1-3 years for:
   a) Shoreline fencing ($125,000)
   b) Two recreational nodes with benches ($360,000)
   c) A new viewing location overlooking the western shoreline ($225,000)
   d) Six benches along southern and western shoreline ($20,000)
4) Support the community effort to raise $60,000 for research for the 2026 Lake Management Plan review by:
   a) Providing two tribute boards in Swan Lake Park
   b) Committing $15,000 in seed funding for lake management research
   c) Supporting staff and FOSLP pursuit of community, regional, provincial and federal funding

Friends of Swan Lake Park

Focused on Rehabilitation of Swan Lake and Swan Lake Park

Rehabilitation Partner

UA LOCAL 46
SUPERIOR PIPING SKILLS SINCE 1890

Sponsor

WALKER PARKER
REAL ESTATE