



KAWARTHA CONSERVATION

Discover • Protect • Restore



Lake Dalrymple Working Group Meeting #5

September 8, 2022



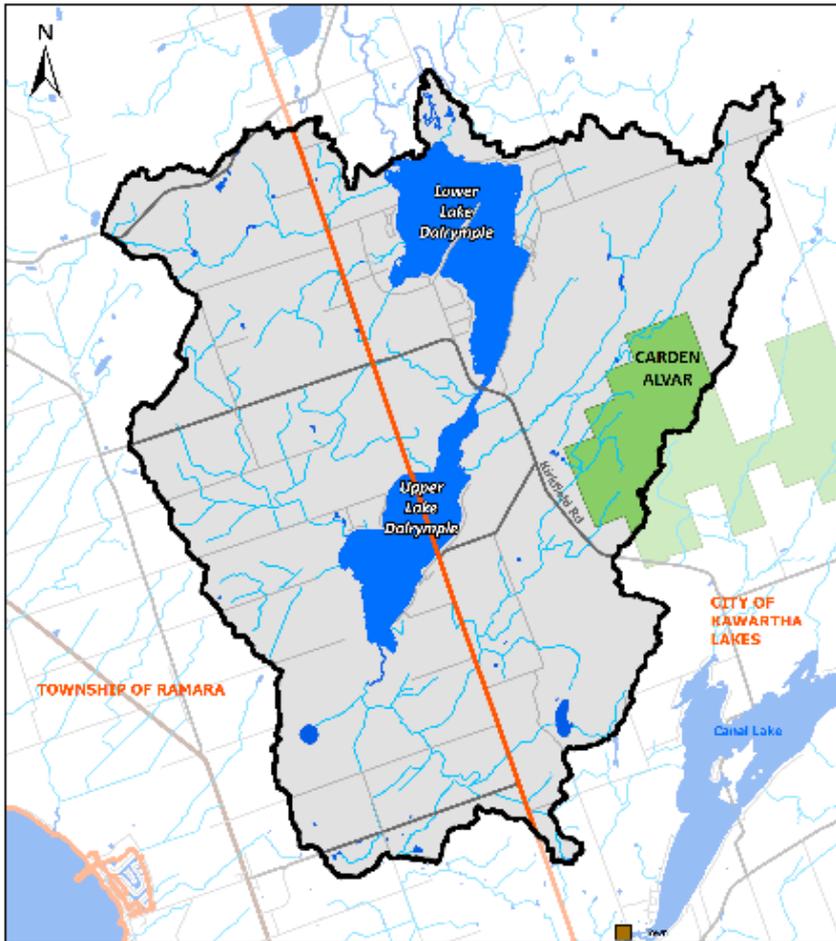
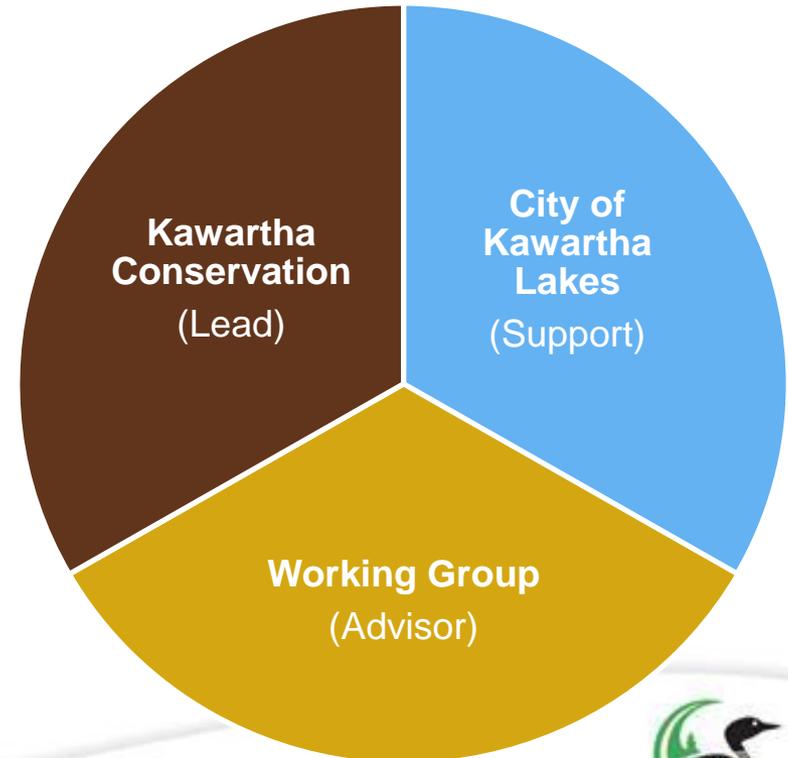
AGENDA

1. Welcome
2. Roundtable Introductions
3. Project timeline
4. 2022 monitoring activities and results:
 - a. Water quality
 - b. Water quantity
 - c. Aquatic Resources
5. Community Engagement Results
6. Roundtable questions/discussions
7. Other business?
8. Closing – next meeting

Project Overview

Lake Dalrymple Management Plan

4 year project
(2021-2024)

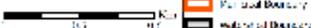


Lake Dalrymple Overview Map



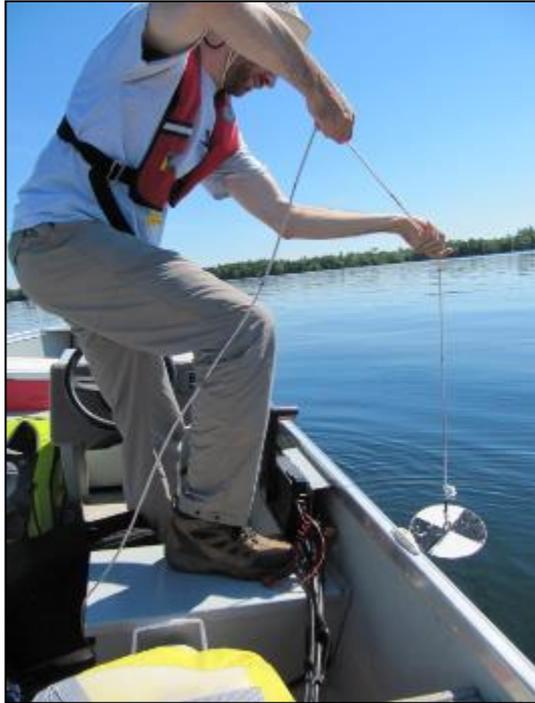
PRODUCED BY Kawartha Conservation with data supplied under license by (c) Queen's Printer for Ontario, 2021.

Scale: 1:95,000



- Town
- Highway
- Lake Shore
- Minor Road
- Watercourse
- Lake Dalrymple
- Lake Simcoe
- Lake Couchiching
- Provincial Boundary
- Municipal Boundary

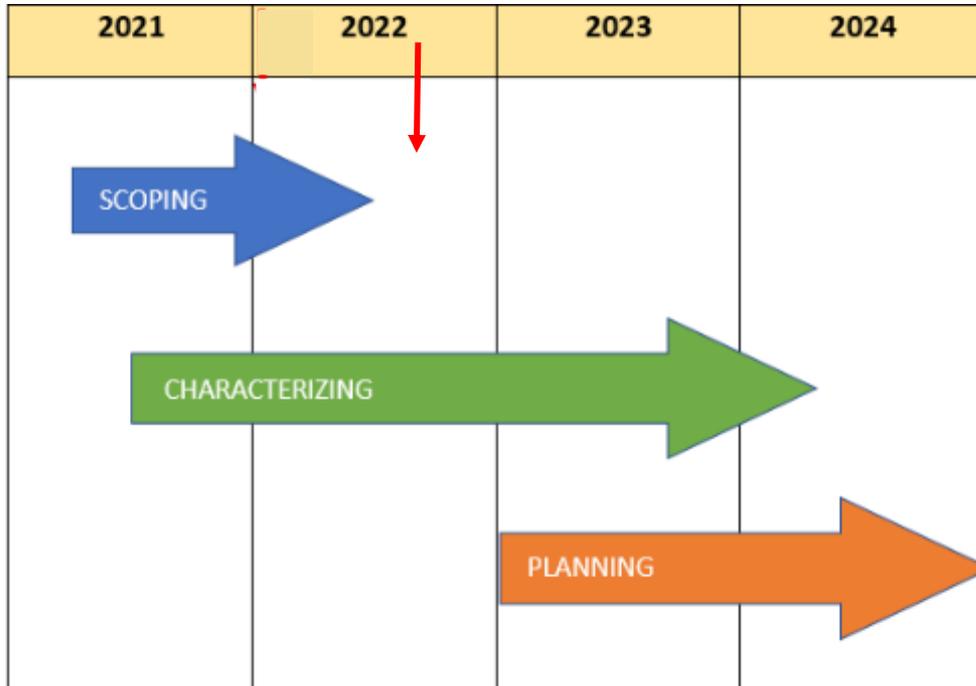
Project Overview - requirements



Science + Community Input = Lake Plan



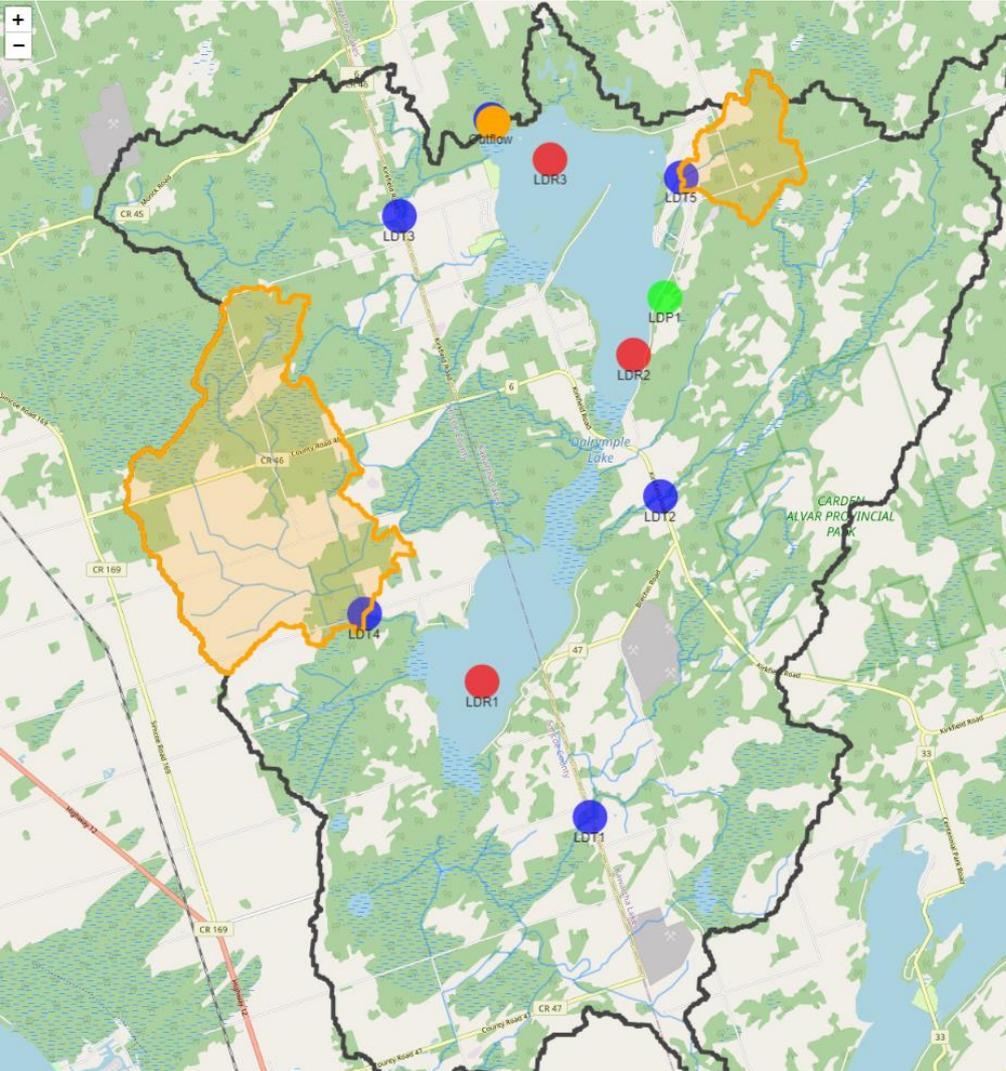
Workplan Update



KEY PLANNING COMPONENTS	
<-- Staff / Stakeholder / Working Group input -->	Scoping a. Who are the key stakeholders? b. What are stakeholder's key values/issues/goals? c. What information is available?
	Characterizing a. What are the key lake resources? b. What are the functions (benefits/values) and linkages? c. What are the key management issues? d. What are the information gaps?
	Planning a. What are the outcomes, goals, objectives? b. What are draft management targets? c. What are the proposed management strategies/actions? d. Evaluate alternatives against response/feasibility criteria? e. What are the preferred management actions? f. How will success, change, efforts be tracked?

WATER QUALITY UPDATES

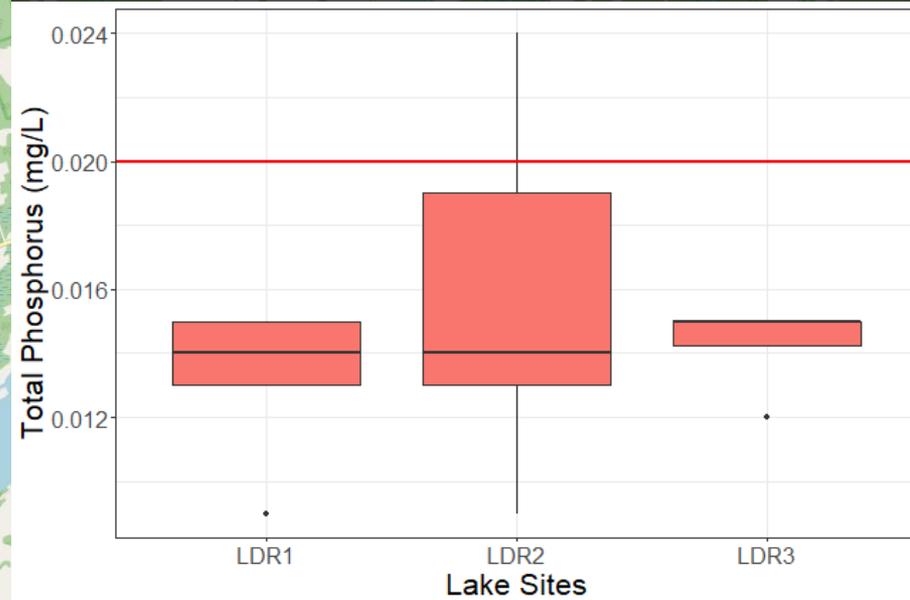


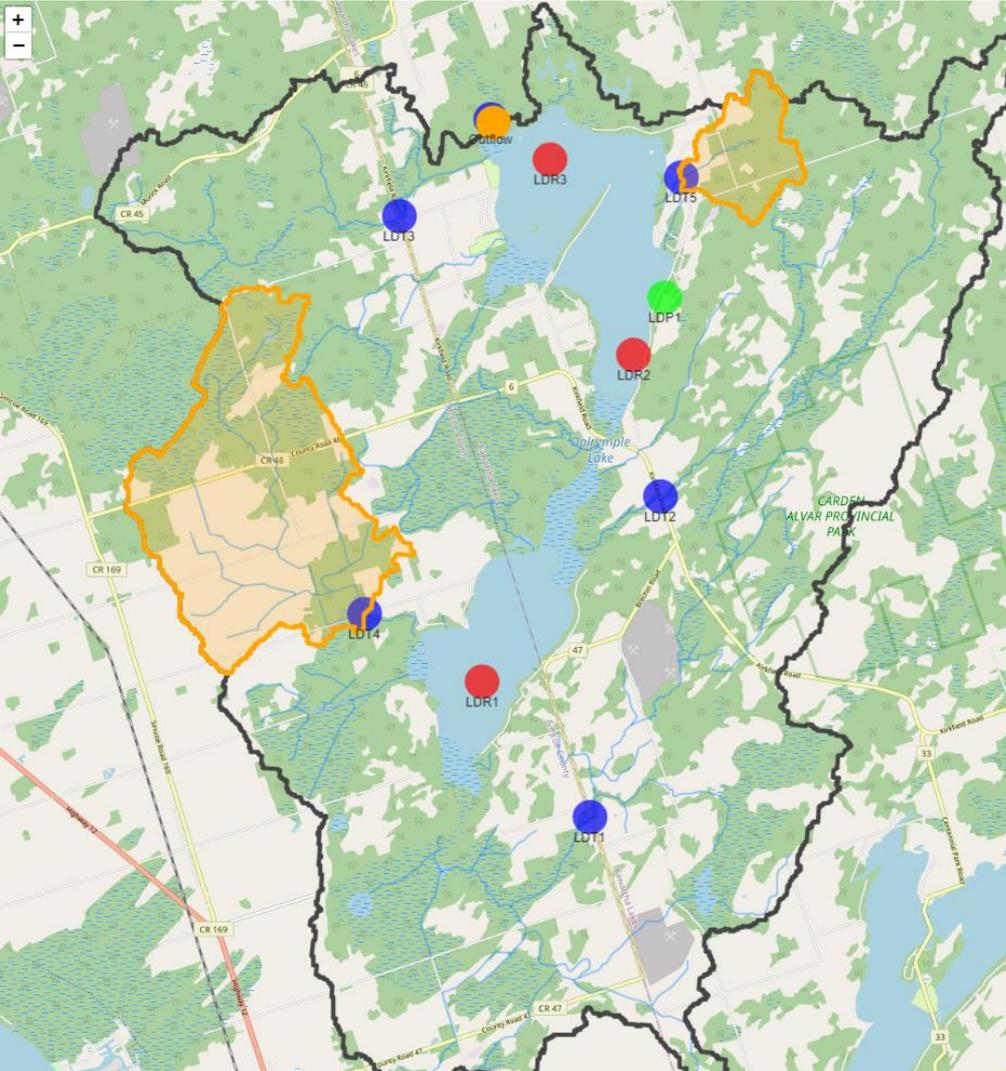


Total Phosphorus - Lake

For 2022, Lake Dalrymple continues to present excellent water quality for total Phosphorus. No difference were found between years.

Of the 14 samples collected, only one (1) exceeded the PWQO.



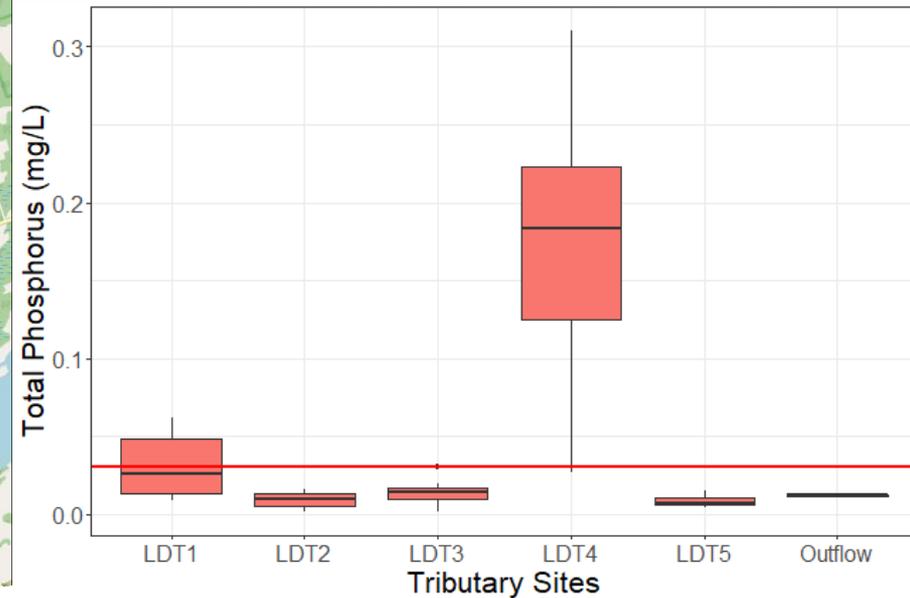


Total Phosphorus

For 2022, Lake Dalrymple tributary continues to present excellent water quality of total Phosphorus at some sites. No significant difference were found between years.

Site LDT1 continues to show fair water quality, where 50% of samples exceed the PWQO.

Site LDT4 (new) continues to exceed PWQO.

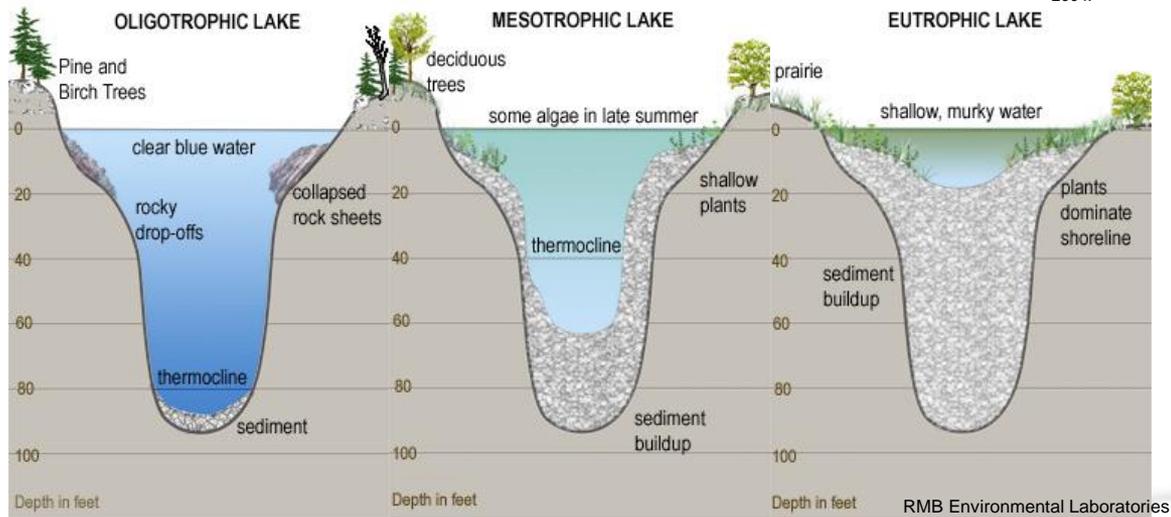


Trophic Status

Region	Upper	Lower	Lake	Tributaries	
Total Phosphorus	0.016	0.017	0.017	0.034	mg/L
	16.2	16.9	16.5	34.3	µg/L
Status	Mesotrophic		Meso-eutrophic		

Trophic Status	Canadian Trigger Ranges Total phosphorus ($\mu\text{g}\cdot\text{L}^{-1}$)
Ultra-oligotrophic	< 4
Oligotrophic	4-10
Mesotrophic	10-20
Meso-eutrophic	20-35
Eutrophic	35-100
Hyper-eutrophic	> 100

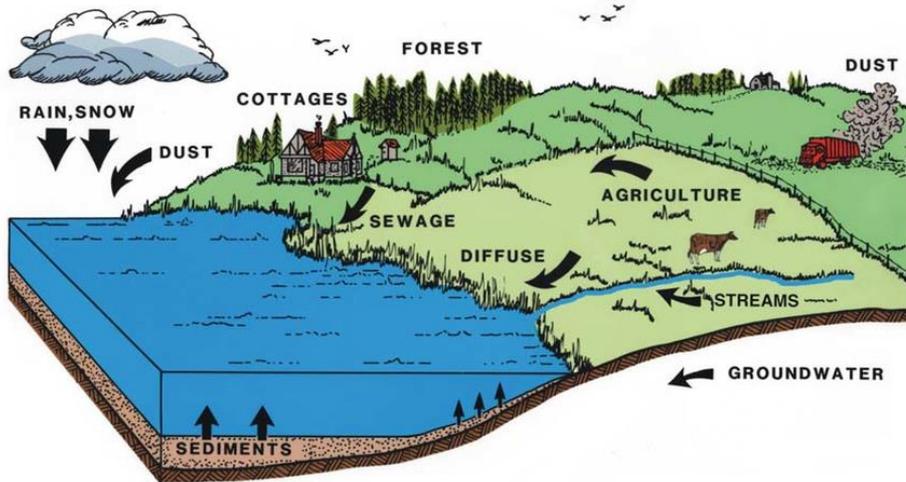
Canadian Council of Ministers of the Environment.
2004.



Nutrient Limitations

Waterbody Type	mg/L TN	mg/L TP	$\mu\text{mol/L}$ TN:TP*	Limited*
Lake	0.74	0.02	28.8	Either N or P
Tributary	0.83	0.03	24.6	Either N or P

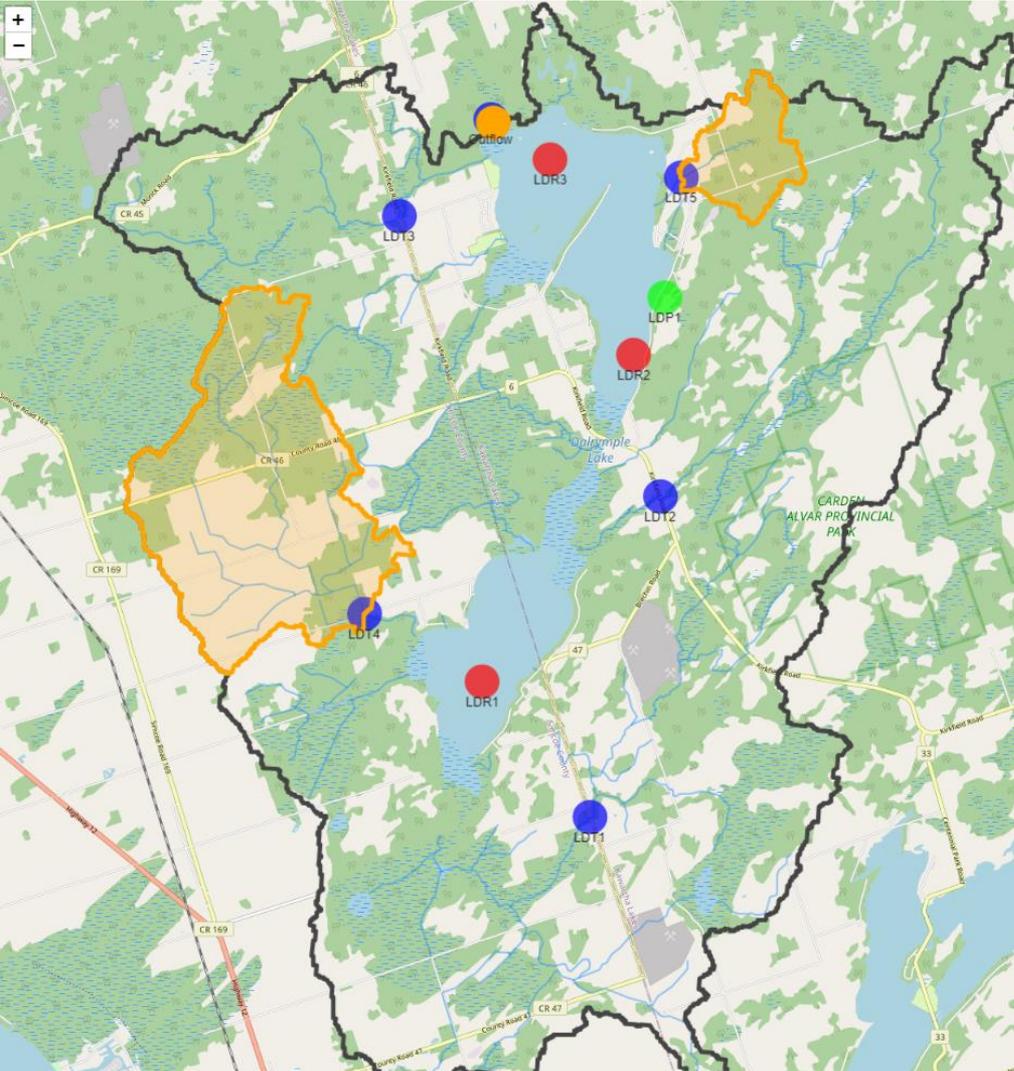
Note: Other factors can also be limiting to aquatic systems, i.e., light, clarity, silicon, carbon, etc.



(Zurawell, 2006)



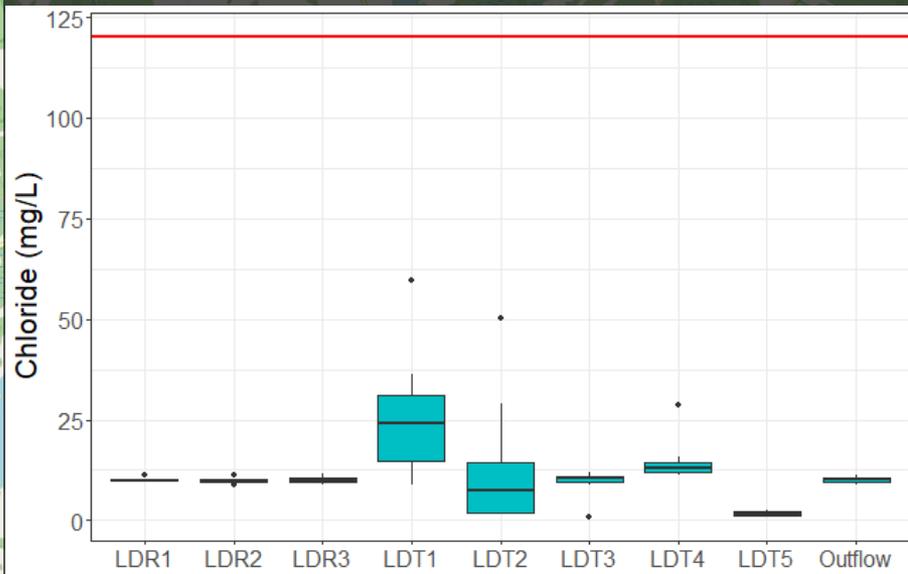
*Guildford, S.J. and Hecky, R.E., 2000. Total nitrogen, total phosphorus, and nutrient limitation in lakes and oceans: Is there a common relationship?. *Limnology and oceanography*, 45(6), pp.1213-1223.



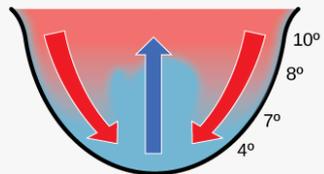
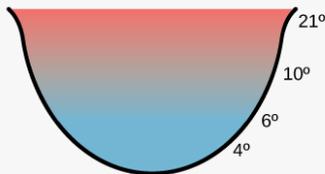
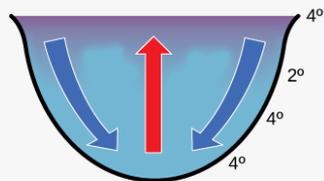
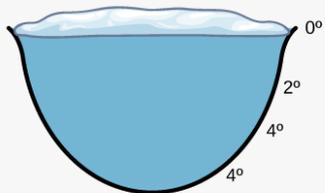
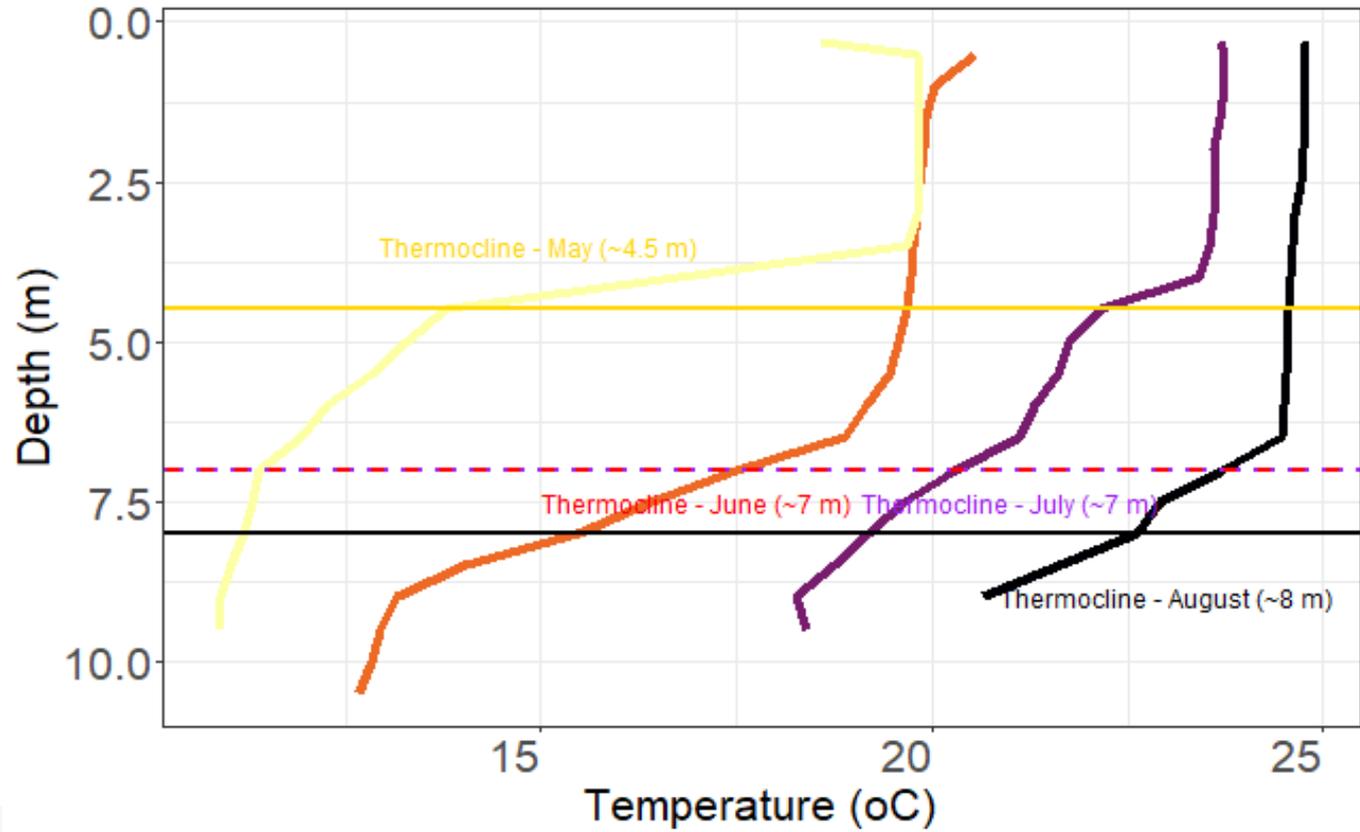
Chloride

For 2022, Lake Dalrymple tributary continues to present excellent water quality of chloride at all sites. No significant difference were found between years.

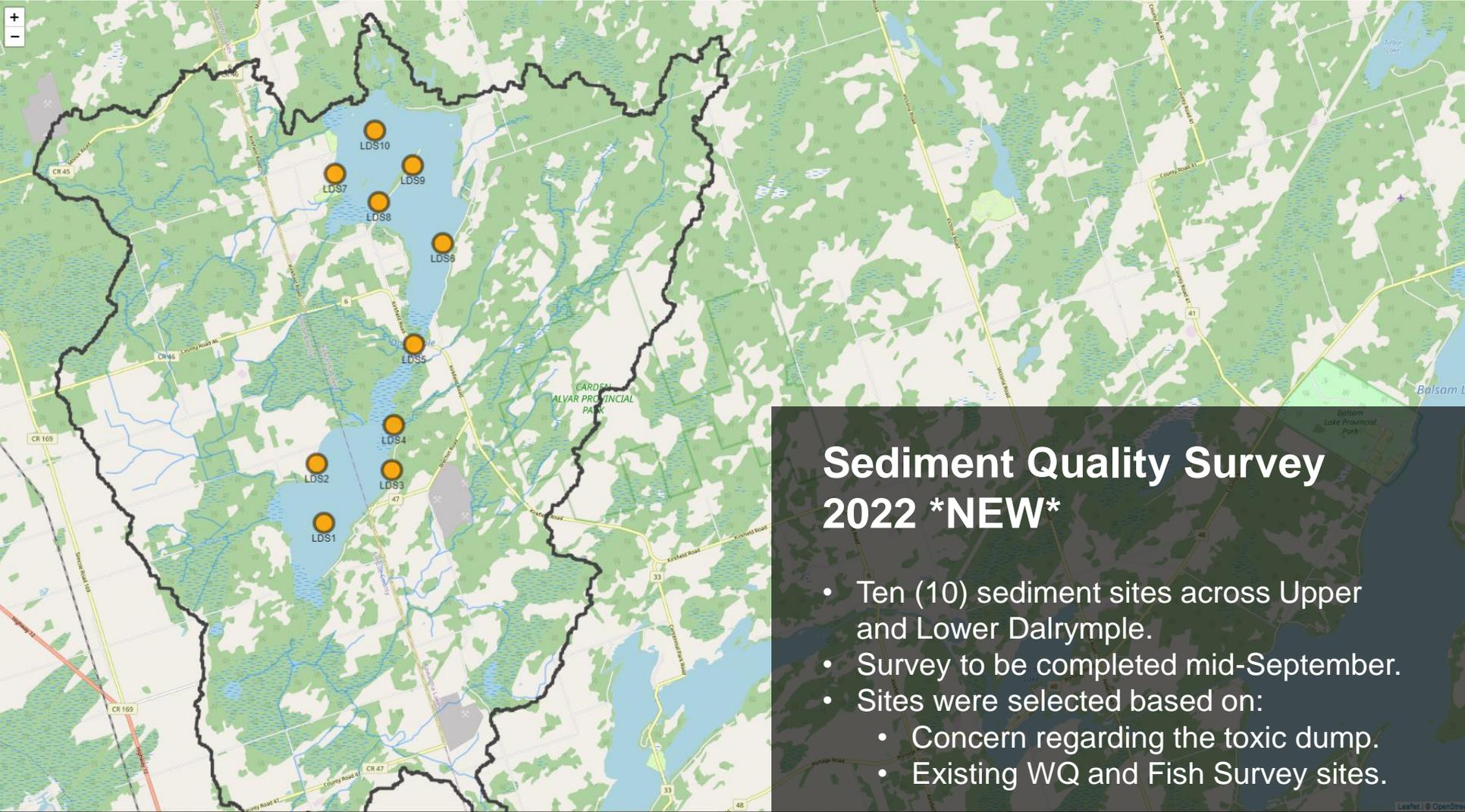
All observations at both lake and tributary sites are well below the guideline for the protection of aquatic life (120 mg/L).



Deepest Point of Lake Dalrymple



(Douglas et al, 2018)



Sediment Quality Survey 2022 *NEW*

- Ten (10) sediment sites across Upper and Lower Dalrymple.
- Survey to be completed mid-September.
- Sites were selected based on:
 - Concern regarding the toxic dump.
 - Existing WQ and Fish Survey sites.



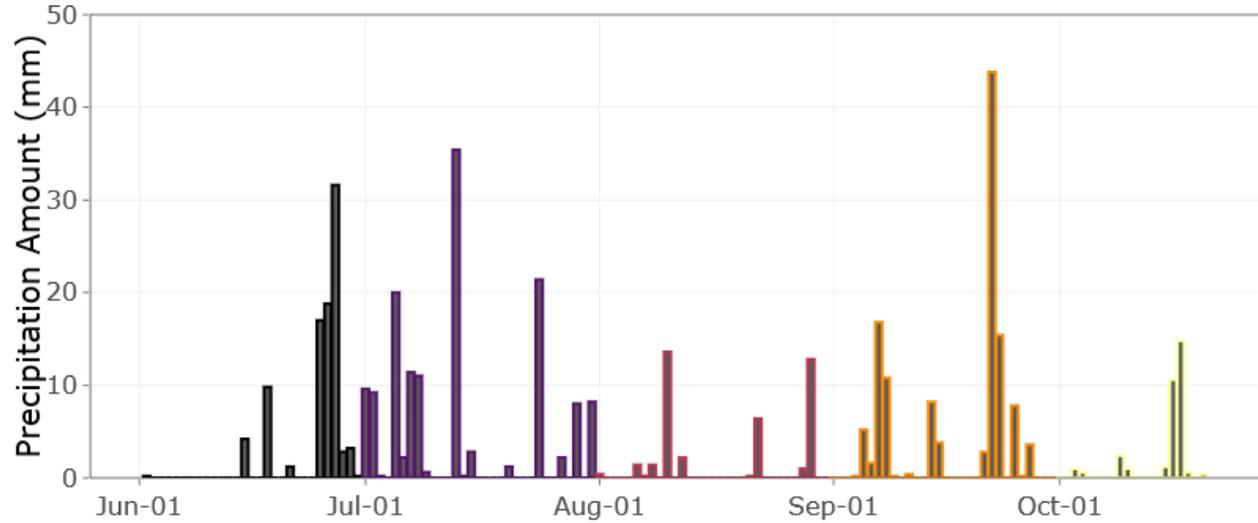
Water Quantity - precipitation

Precipitation results for 2021

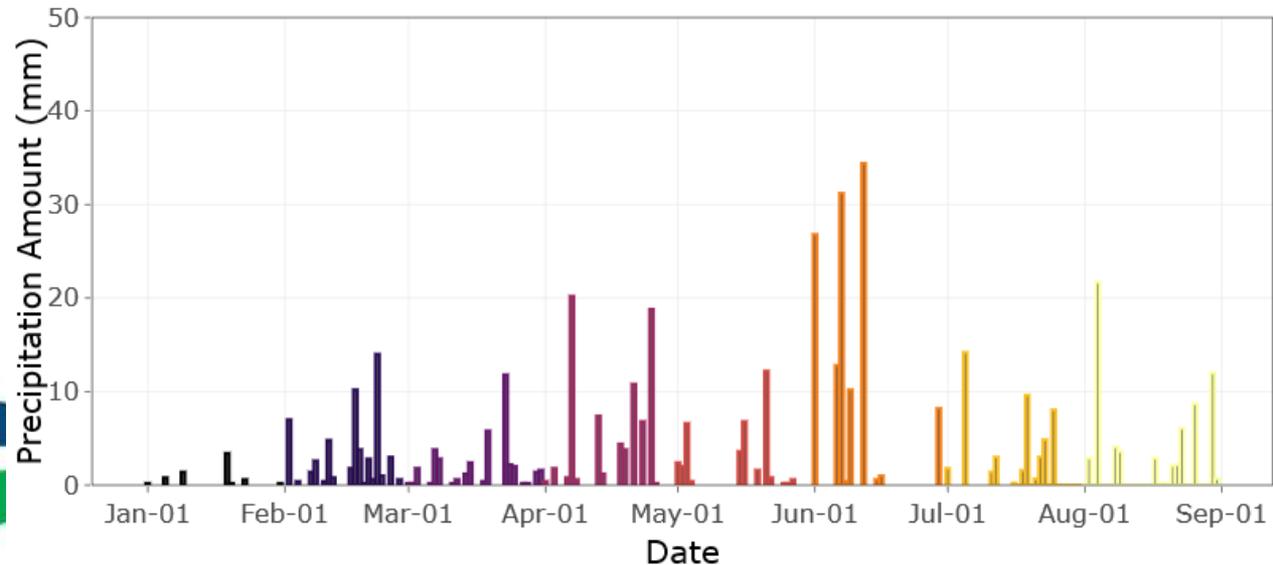
Precipitation Amount



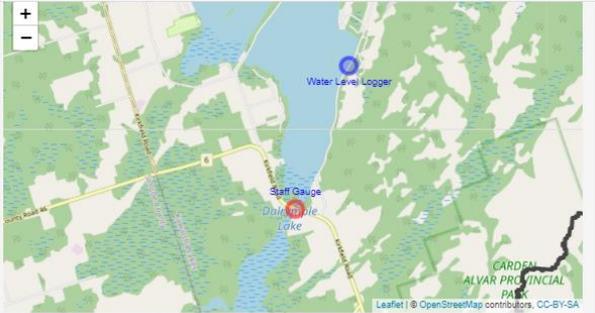
We monitoring all types of precipitation (rain, snow, and mixed snow-rain) at the Carden Recreation Centre. The precipitation logger is set to record daily.



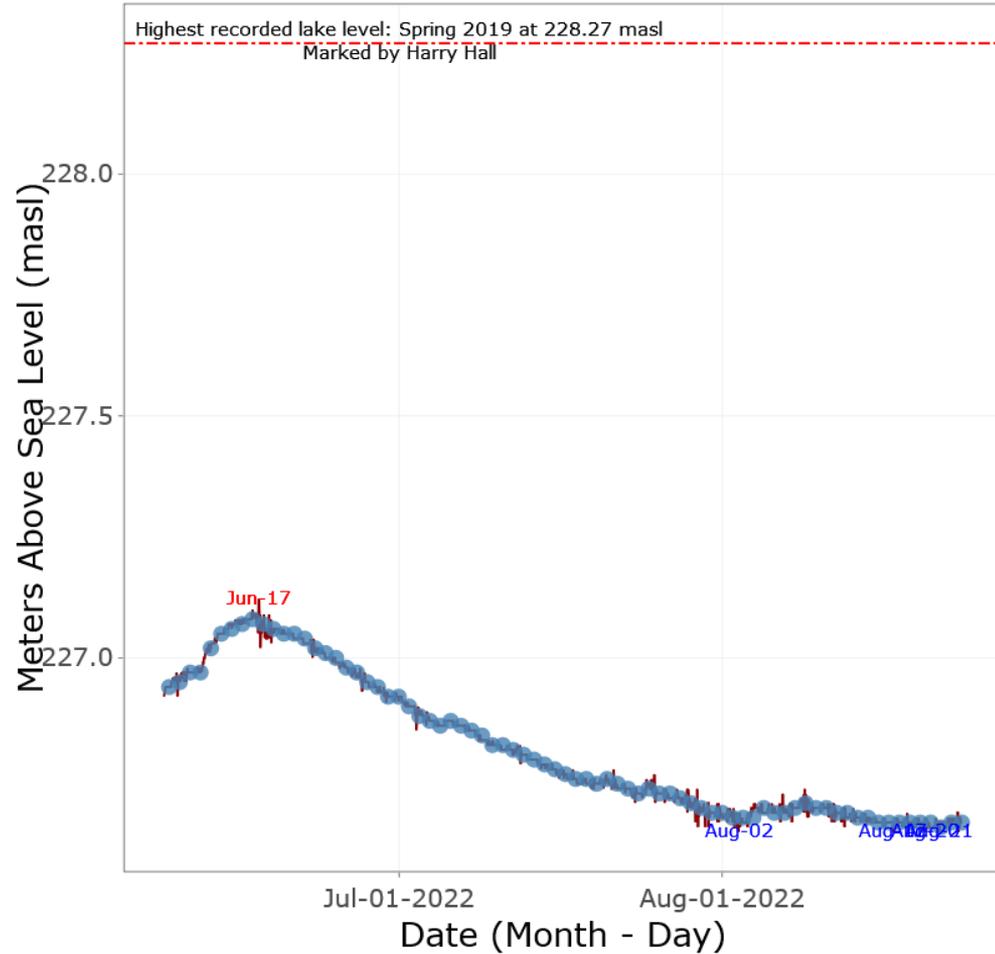
Precipitation results for 2022



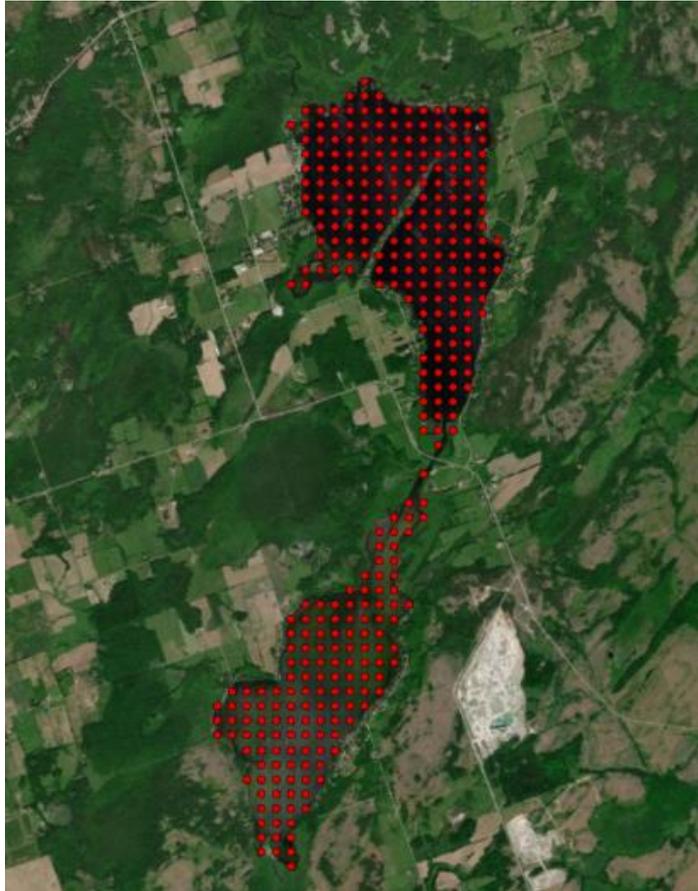
Water Quantity – Lake Levels



Site location of the staff gauge (red circle; image below) and the water level logger (blue circle) in Lake Dalrymple.



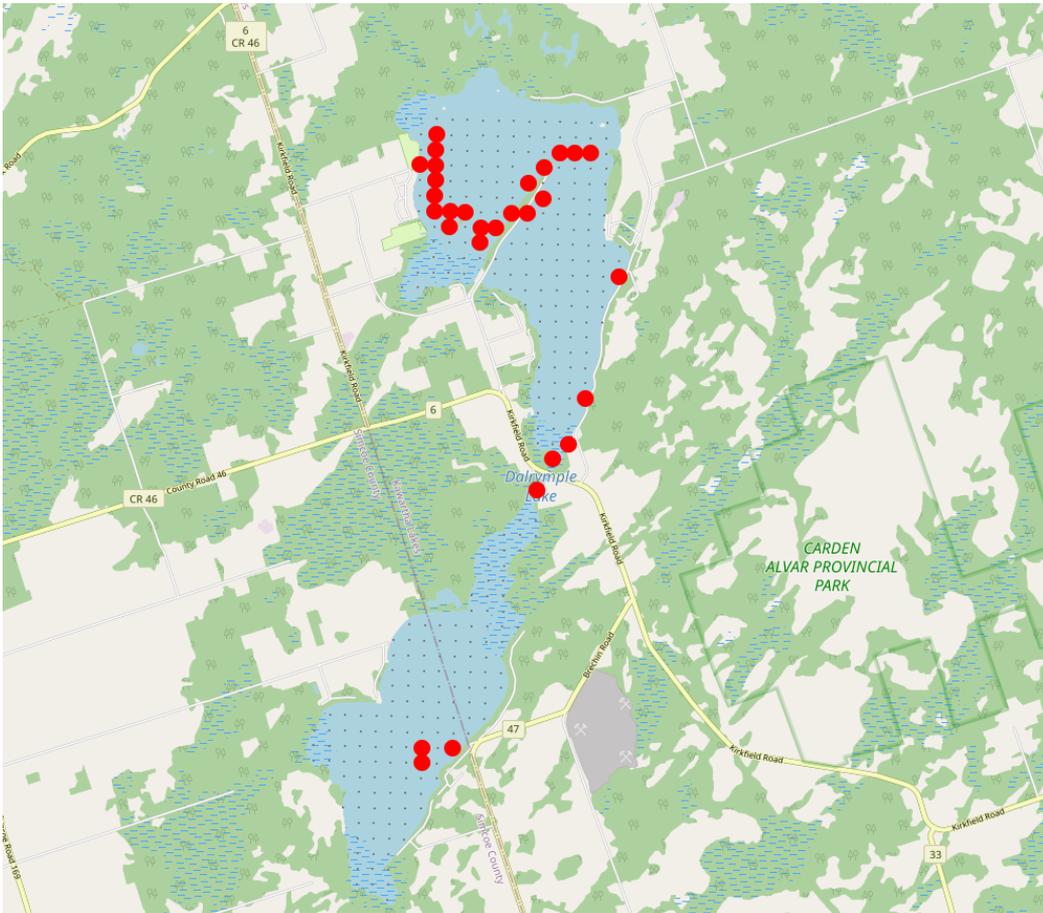
Aquatic Plants



350 sites
200m x 200m grid
Rake Toss
Dense, Moderate, Sparse, None



Invasive Species

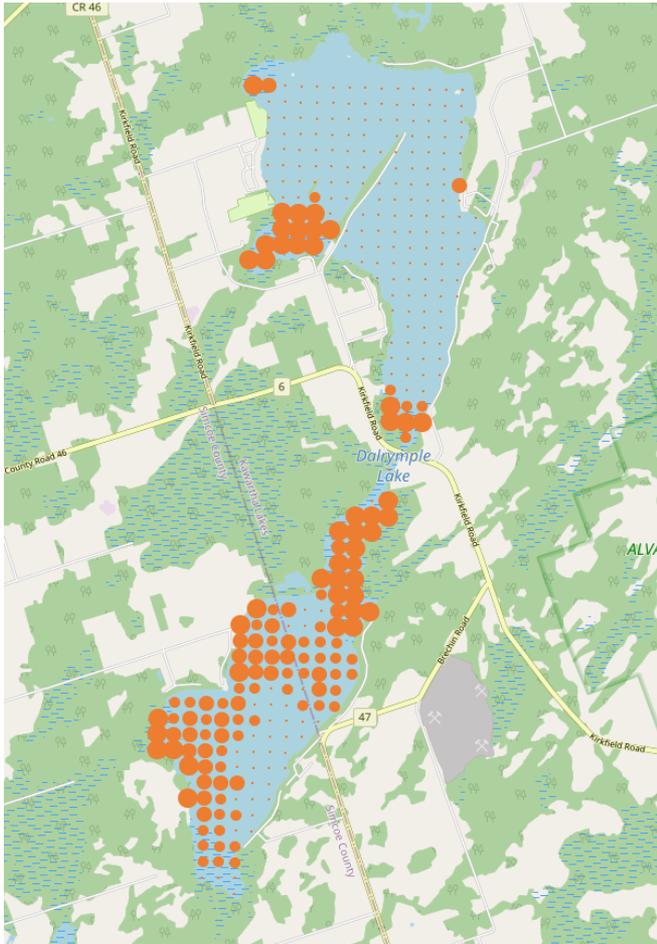


Eurasian Watermilfoil



Starry Stonewort

Emergents



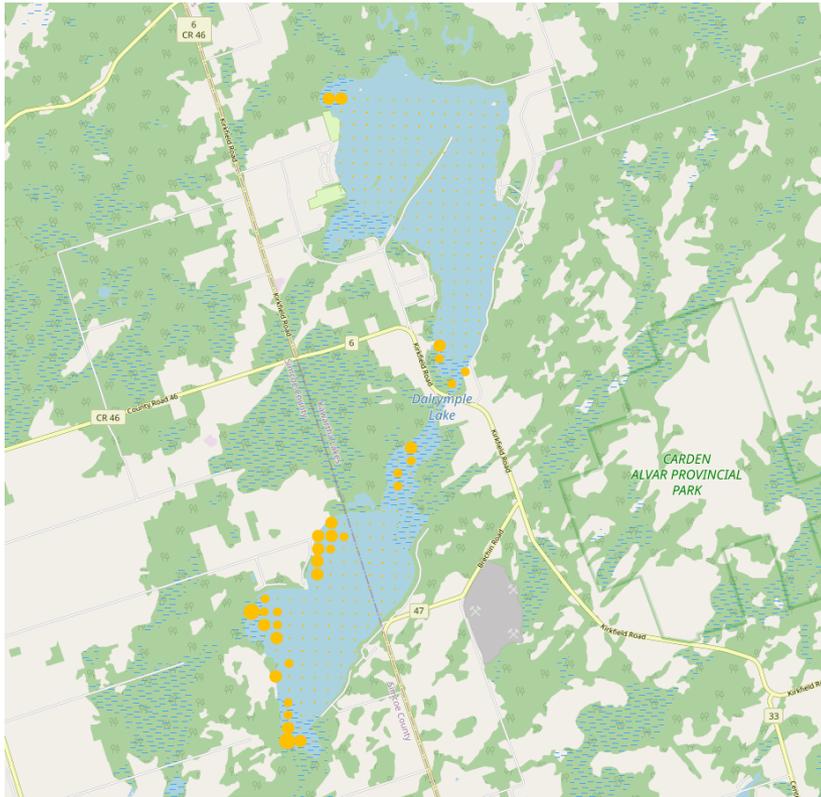
Wild Rice, Pickerelweed



Bullrush



Floating-Leaved



Water lily



Watershield



Submergents

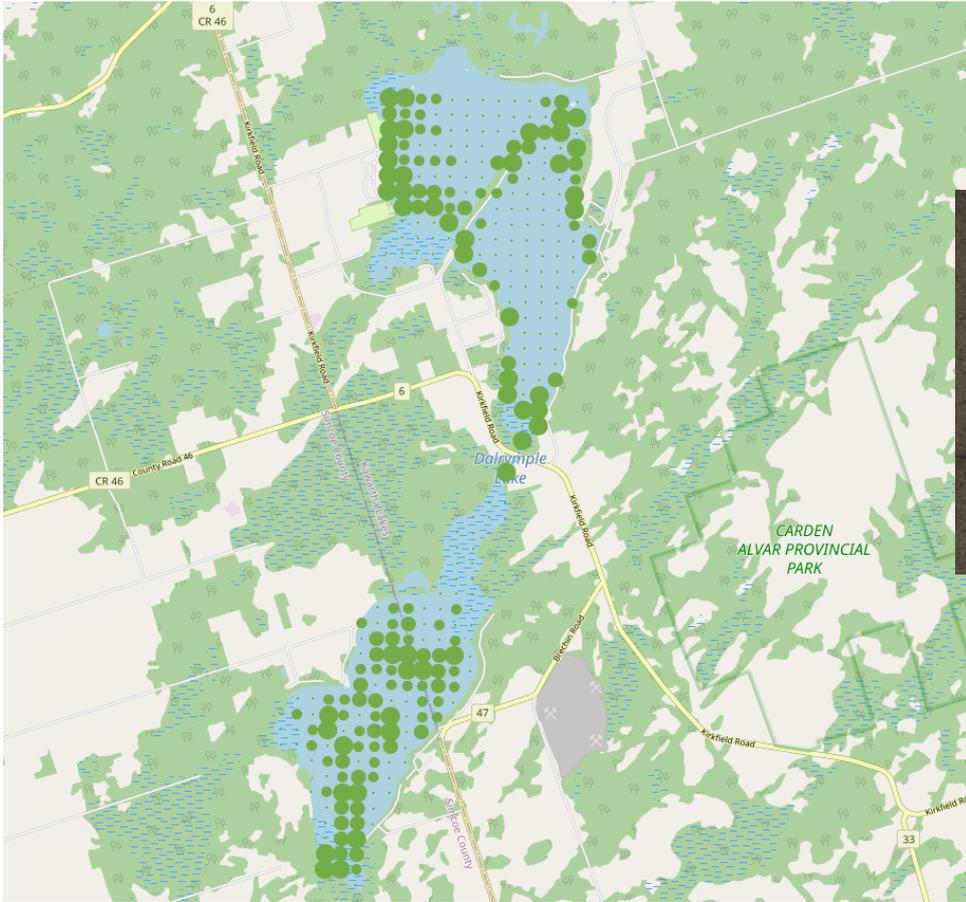
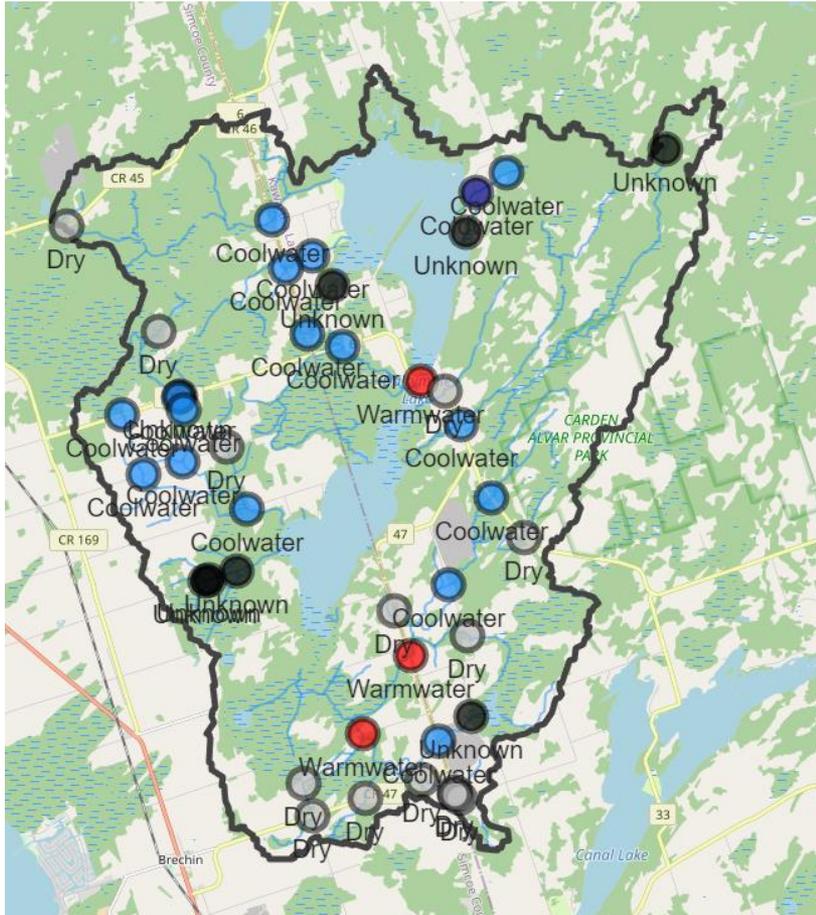


Table: Frequency (% present out of 333 samples) of aquatic plants in Lake Dalrymple, August 2022, * indicates invasive species. Bold indicates top 3 plants.

Aquatic Plants (common name)	Aquatic Plants (scientific name)	Type	Lake Dalrymple	Upper Dalrymple	Lower Dalrymple
Wild Rice sp.	<i>Zizania sp.</i>	Emergent	37	78	11
<u>Tapegrass</u>	<i>Vallisneria americana</i>	Submerged	28	14	36
Pondweed sp.	<i>Potamogeton sp.</i>	Submerged	21	28	17
Naiad sp.	<i>Najas sp.</i>	Submerged	16	39	2
Coontail	<i>Ceratophyllum sp.</i>	Submerged	15	2	22
Bladderwort sp.	<i>Utricularia sp.</i>	Submerged	10	3	14
Canadian Waterweed	<i>Elodea sp.</i>	Submerged	9	4	12
*Eurasian Watermilfoil	<i>*Myriophyllum Spicatum</i>	Submerged	8	2	11
White <u>Water-lily</u>	<i>Nymphaea odorata</i>	Floating	8	18	2
<u>Muskgrass/Stonewort</u>	<i>Chara/Nitella</i>	Submerged	7	3	9
Watermilfoil sp.	<i>Myriophyllum sp.</i>	Submerged	4	4	3
Bulrush sp.	<i>Scirpus sp.</i>	Emergent	3	6	1
Pickerelweed	<i>Pontederia cordata</i>	Emergent	3	7	0
Water Marigold	<i>Bidens beckii</i>	Submerged	2	0	2
Yellow Pond-lily	<i>Nuphar lutea</i>	Floating	2	4	1
*Starry Stonewort	<i>*Nitella Obtusa</i>	Submerged	1	1	1
Cattail sp.	<i>Typha sp.</i>	Emergent	<1	1	0
<u>Watershield</u>	<i>Brasenia schreberi</i>	Floating	<1	2	0
Duckweed sp.	<i>Lemna sp.</i>	Floating	<1	2	0
TOTAL: Aquatic Vegetation			64	86	51
TOTAL: Emergent			38	81	12
TOTAL: Floating			10	20	3
TOTAL: Submerged			44	60	34
TOTAL: Unassessed			5	11	1

Thermal Regime

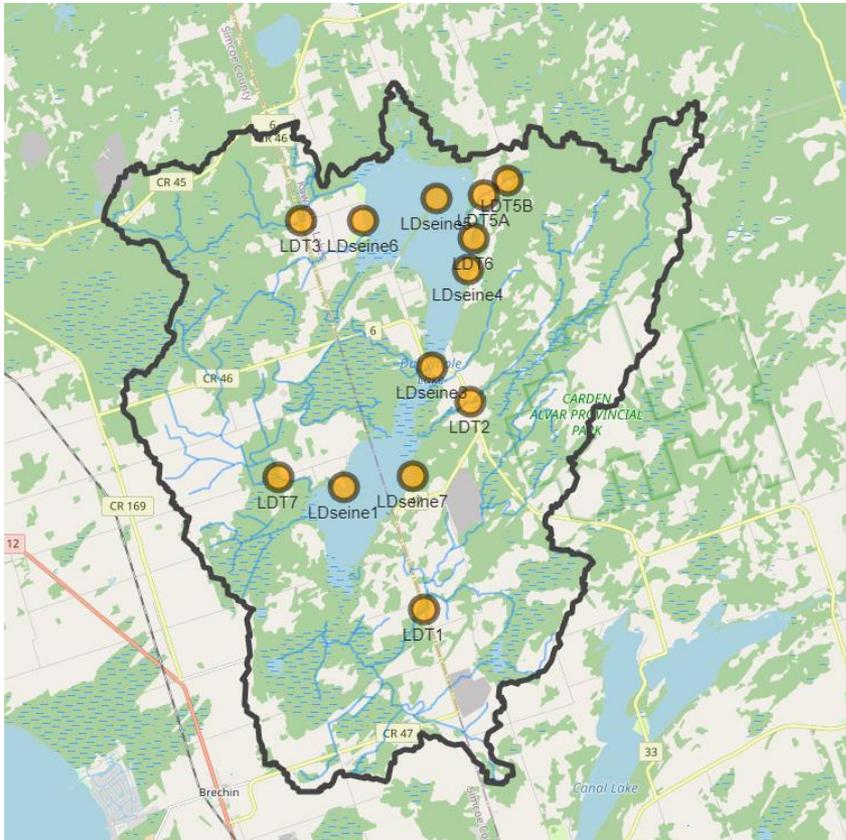


42 road-stream crossings

Sampled during:
heatwave, no rain, late afternoon

Coldwater (1)
Coolwater (14)
Warmwater (5)
Dry (14)
Unknown (8)

Fish Sampling



Nearshore (6 – sites)
Tributaries (7 – sites)

20 fish species captured

No species at risk
No coldwater species

First record for Banded Killifish
First record for Quagga Mussel

SEE PHOTOS



Agenda

1. Welcome
2. Roundtable Introductions
3. Project timeline
4. 2022 monitoring activities and results:
 - a. Water quality
 - b. Water quantity
 - c. Aquatic Resources
- 5. Community Engagement Results**
6. Roundtable questions/discussions
7. Other business?
8. Closing – next meeting

Engagement Survey

- Survey available in person at both Lake Dalrymple Open Houses at the Carden Recreation Centre on May 26 and May 28, 2022, as well as online for a period of May 16 to June 30, 2022.
 - **The survey saw 48 respondents, 83% of which were lakeshore residents (40 people), and 17% off the shore (8 people).**
 - 28 of the responses were completed online, while the remaining 20 were completed in person at the Lake Dalrymple Open Houses.
1. Are you providing comments on behalf of a specific lake association, agency, or business?
 2. Is your cottage/house/business located on the shoreline of Lake Dalrymple?
 3. What major changes have you noticed over the years on the lake its watershed?
 4. What issues about the lake are you most concerned about?
 5. What do you value most about Lake Dalrymple?

Values

Concerns

Changes



Values

Table 1.3: What do you value most about Lake Dalrymple?

Values	Responses
Ambience and Character (23)	<ul style="list-style-type: none"> • Community feel, family friendly (5) • Natural beauty of the area (5) • Peaceful, quiet, and safe (13)
Family Legacy & History (5)	<ul style="list-style-type: none"> • Family history and memories on lake (3) • Protection of the lake for future generations (2)
Fishing & Ice fishing (11)	<ul style="list-style-type: none"> • Being able to continue fishing and ice fishing (11)
Nature & Habitat (40)	<ul style="list-style-type: none"> • Geography, habitat, and nature (12) • Wildlife, plants, and biodiversity (28)
Recreational Activities (18)	<ul style="list-style-type: none"> • Boating, kayaking and water sports (9) • Swimming and other recreational lake activities (9)
Water Quality & Quantity (25)	<ul style="list-style-type: none"> • Clean water (16) • Comfortable water temperature (2) • Water quality, clarity, level, and health (7)

Concerns

Table 1.2: What issues about the lake are you most concerned about?



Concerns	Responses
Algae & Eutrophication (4)	<ul style="list-style-type: none"> Increased algae and eutrophication (4)
Bylaw, Ministry & Agency Action (6)	<ul style="list-style-type: none"> Little or no action from bylaw or ministry on pollution, fishing regulations, etc. (4) Need more balanced recreational conservation and interest from outside agencies (2)
Dumping & Pollution (8)	<ul style="list-style-type: none"> Pollution, leakage, runoff, and contamination in and around lake (4) Residents dumping fill and making property alterations (4)
Erosion, Development & Shoreline Protection (12)	<ul style="list-style-type: none"> Increased development near shorelines and waterfront properties (10) Need more prevention of shoreline erosion (2)
Fishing (30)	<ul style="list-style-type: none"> Change in fish population (13) Need to protect fish health (3) Overfishing and ice fishing business putting pressure on lake resources (14)
Lake Population (6)	<ul style="list-style-type: none"> Increased population, boaters, and noise (6)
Septic Systems (4)	<ul style="list-style-type: none"> Inspections are needed for poorly installed, illegal, and old septic systems on the lake (4)
Water Quality & Quantity (30)	<ul style="list-style-type: none"> Use of water for drinking and swimming (6) Maintaining healthy lake and good water quality for years to come (11) Water level fluctuation (13)
Wildlife, Habitat, & Invasive Species (26)	<ul style="list-style-type: none"> Increase of invasive species and weeds (11) Protecting wildlife, habitat, and natural areas (15)

Changes

Table 1.1: What major changes have you noticed over the years on the lake and its watershed?

Changes	Responses
Algae & Eutrophication (10)	<ul style="list-style-type: none"> Algae appearing sooner each year (1) Increased algae and eutrophication in the lake (9)
Erosion, Development, & Shoreline Protection (13)	<ul style="list-style-type: none"> Beavers impacting water flow (1) Increase in shoreline development, erosion, and loss of natural shoreline (12)
Fishing & Hunting (35)	<ul style="list-style-type: none"> Changes in fish population (20) Fishing, hunting, and boating rules not effectively enforced, increased fishing year-round (7) Overfishing causing pressure on fish (8)
Lake Population (11)	<ul style="list-style-type: none"> Community feel resonates (1) Changes in boat traffic and population (10)
Invasive Species & Weeds (17)	<ul style="list-style-type: none"> Increase in invasive species and weeds (10) Changes in zebra mussels population (7)
Nature & Wildlife (5)	<ul style="list-style-type: none"> Changes in wildlife and plant populations (3) Healthy and plentiful bird population (2)
No Changes Noticed (6)	<ul style="list-style-type: none"> New to the area (3) No major changes (3)
Water Quality & Quantity (17)	<ul style="list-style-type: none"> Changes in water level (15) Water clarity decreasing (2)



Agenda

1. Welcome
2. Roundtable Introductions
3. Project timeline
4. 2022 monitoring activities and results:
 - a. Water quality
 - b. Water quantity
 - c. Aquatic Resources
5. Community Engagement Results
- 6. Roundtable questions/discussions**
7. Other business?
8. Closing – next meeting

Closing

Thank you!

Lake Dalrymple Management Plan Webpage

<https://www.kawarthaconservation.com/en/environmental-sciences/lake-dalrymple-management-plan.aspx>

Examples of Lake Management Plans

<https://www.kawarthaconservation.com/en/environmental-sciences/lake-and-environmental-management-plans.aspx>

Contact Us!

Brett Tregunno, Aquatic Biologist, Kawartha Conservation

btregunno@kawarthaconservation.com

705.328.2271 ext. 222

