Elk Lake Oxygenation System Update

Regional Parks Committee
June 25, 2025

Presentation Content

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5. Lessons Learned
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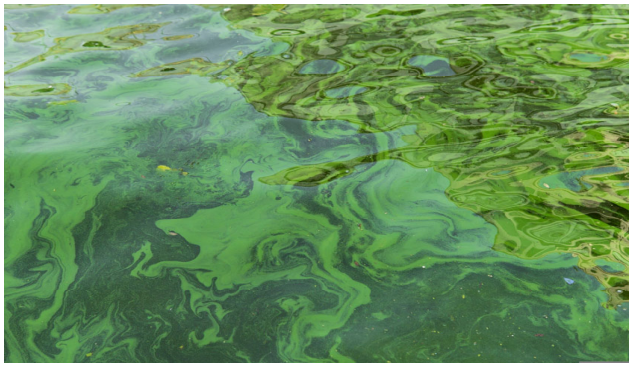
Context

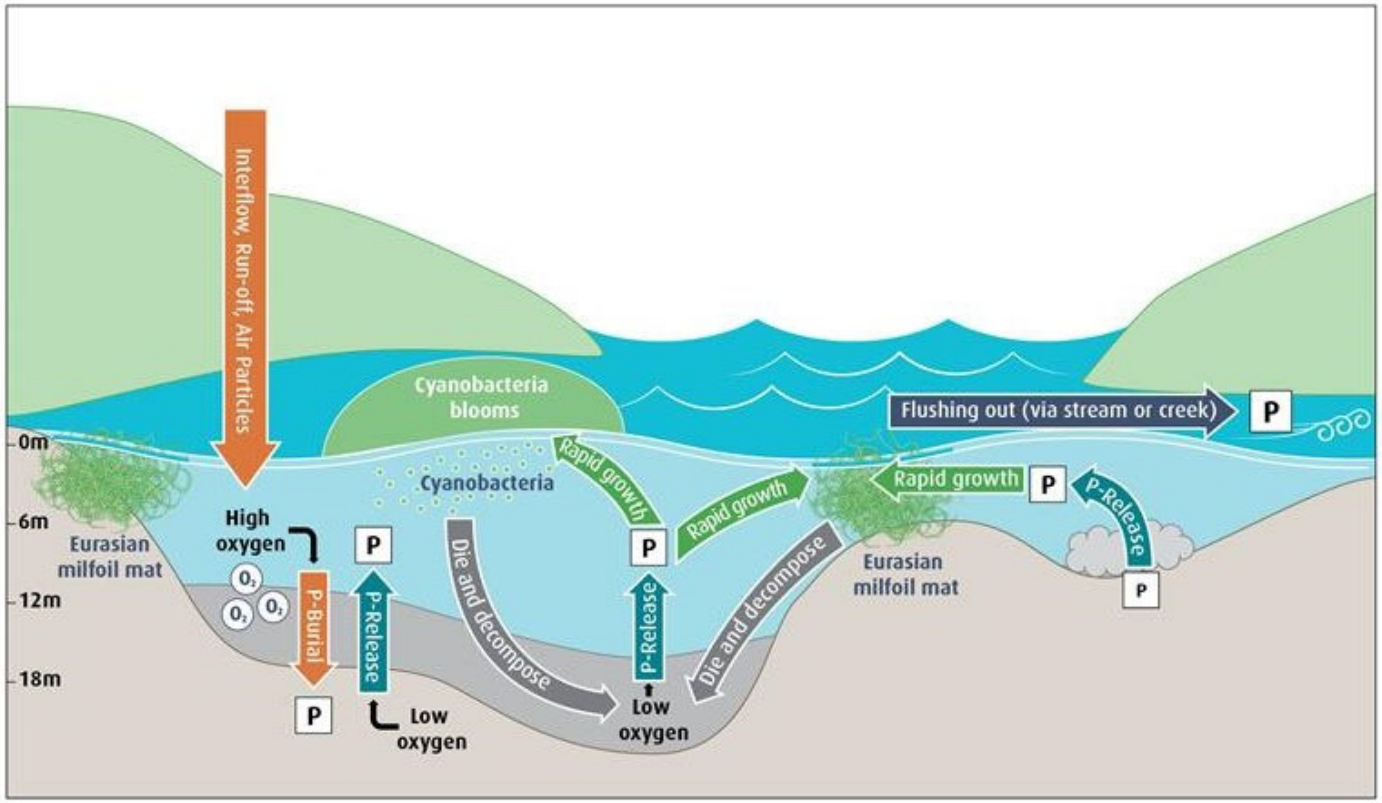


The Elk/Beaver Lake Initiative was established in 2016 to address water quality concerns:

- Blue-green algae
- Eurasian water milfoil
- Poor fish habitat

These issues are largely due to high phosphorus levels in the lake.

Context

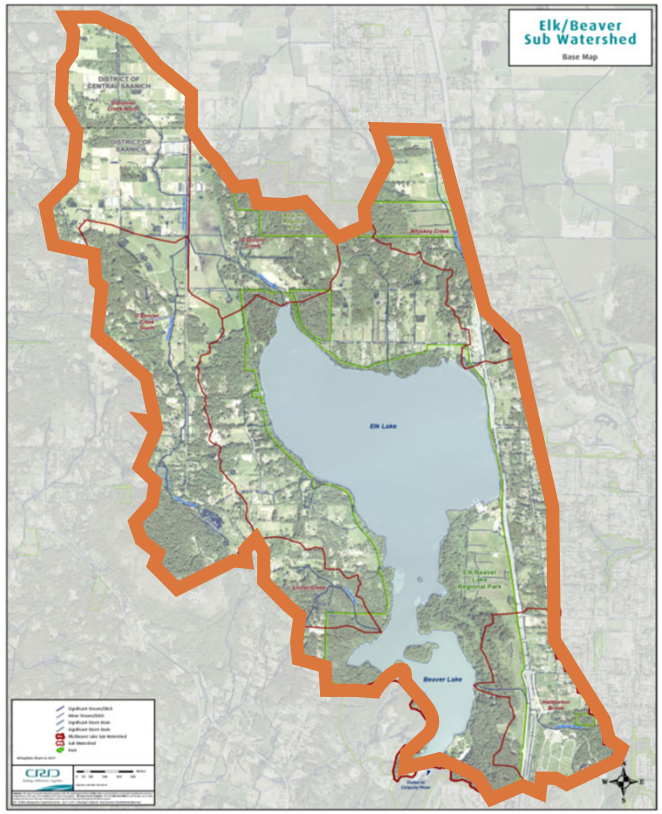


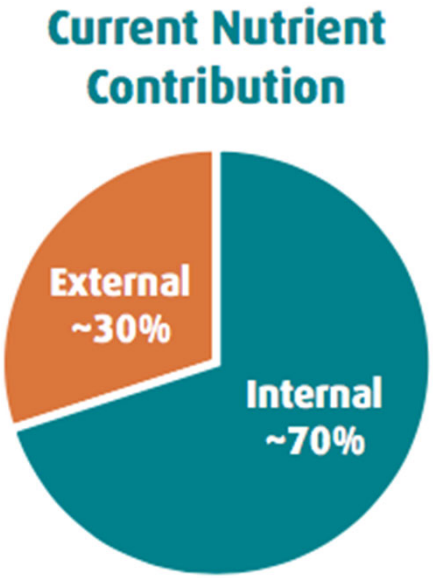
Understanding Phosphorus and Oxygen Levels

P – Phosphorus

0 - Oxygen

Context





Elk/Beaver Lake Watershed Management Plan

- Reduces external nutrient loading

In-Lake Remediation Plan

- Reduces internal nutrient loading

Objectives of the Oxygenation System

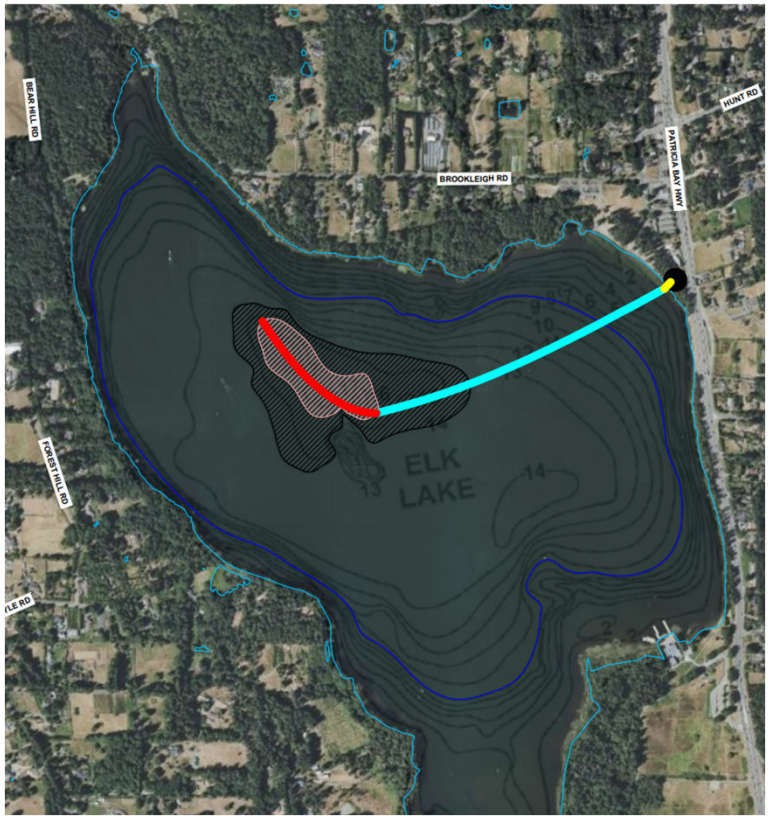
1. Eliminate deep-water oxygen depletion (anoxia)
   - Deep water dissolved oxygen should be more than 2mg/L (ideally more than 5mg/L)

2. Decrease internal phosphorus loading
   - Deep water total phosphorus should not exceed 50ug/L

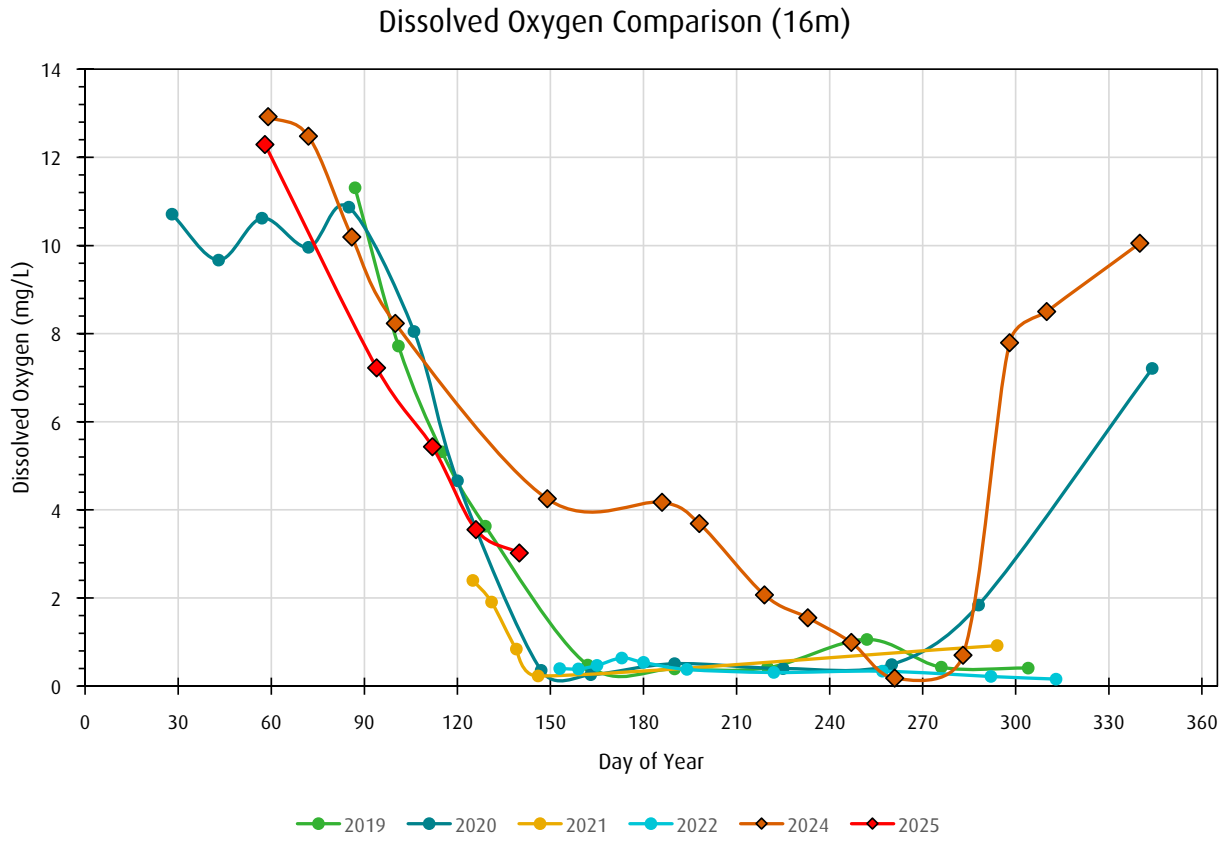
3. Maintain suitable cold-water native fish habitat
   - Deep water temperature should not exceed 15°C

4. Reduce frequency and duration of blue-green algae blooms
   - Reduced park advisories for blooms

How does it work?



Has it been successful?



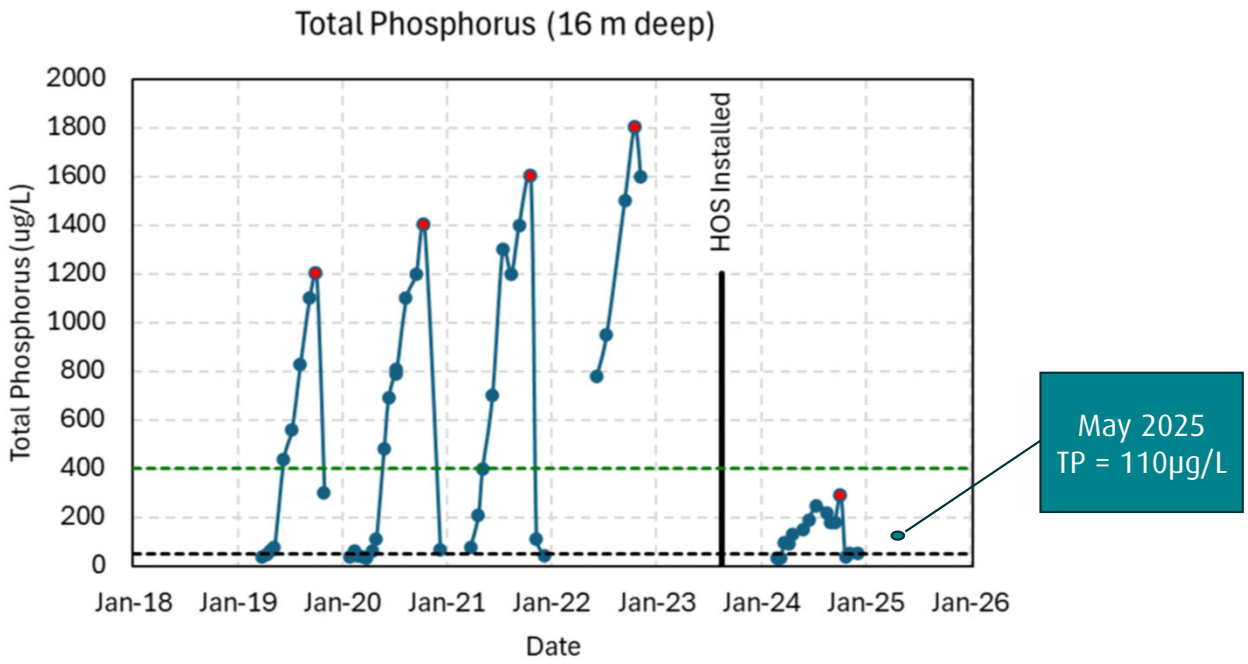
Objective 1

Eliminate deep-water oxygen depletion (anoxia)

Status: ON TRACK

Deep water dissolved oxygen of greater than 5mg/L has not yet been achieved but is expected to be over time.

Has it been successful?



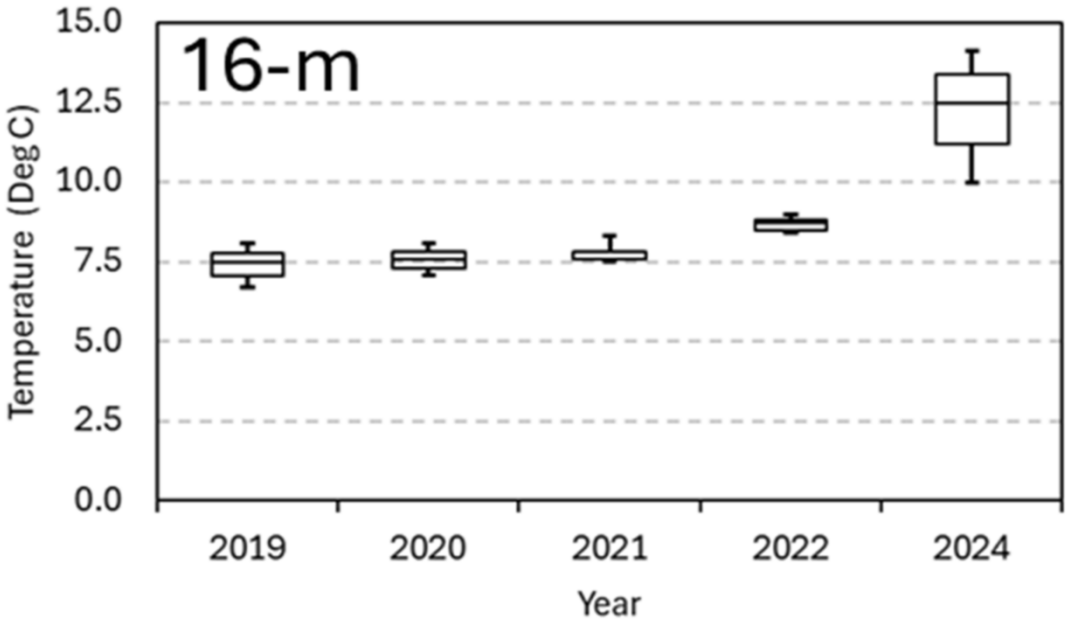
Objective 2

Decrease internal phosphorus loading

Status: ACHIEVED

80% reduction in deep water phosphorus levels.

Has it been successful?



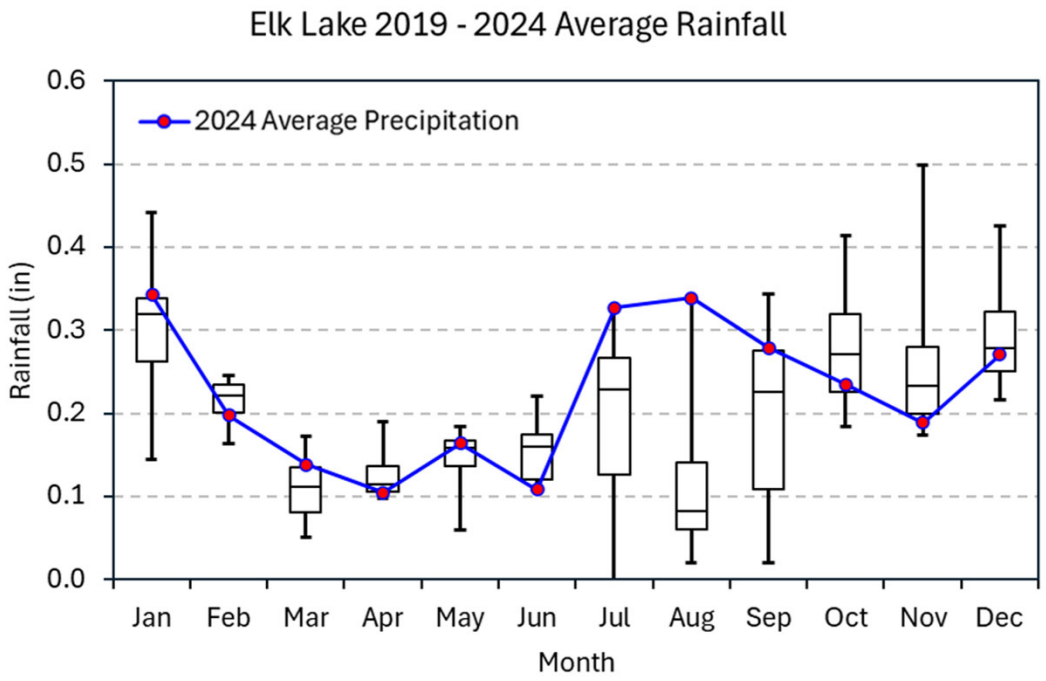
Objective 3

Maintain suitable cold-water native fish habitat

Status: ACHIEVED

Average temperature through summer 2024 was 12.5°C.

Has it been successful?



Objective 4

Reduce frequency and duration of blue-green algae blooms

Status: ON TRACK

Blue-green algae blooms continue to occur and were longer lasting than previous years

2025 Interim Update

- As of early June 2025:
  - Deep-water DO concentrations above 2mg/L
  - Deep-water phosphorus levels near 100µg/L
  - Deep-water temperatures are below 8°C

- Spring bloom that caused the cancellation of the Ironman 70.3 swim appears to be receding

Lessons Learned

Operational Considerations

- Reduced air compressor capacity.
- Reduced flow rate.
- Positioning error of equipment.

Next Steps

Overall, 2024 was a success. In 2025, we can expect:

- Planned system upgrades.
- Continued improvements in water quality.
- Continued water quality monitoring (including Beaver Lake).
- Annual report on system performance and water quality progress.
- Collaboration with Districts of Saanich, Central Saanich and stewardship groups on the actions identified in the Elk Lake Watershed Management Plan.

Thank you!
Questions?

Capital Regional District

CRDVictoria

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