

Volunteers in Parks



Elk Lake Oxygenation Progress

by Jill Robinson

In 2023, in order to address water quality issues and blue-green algae blooms, a deep-water direct oxygenation injection system was installed at Elk Lake and was operational by March 2024. The oxygenation system is located at Elk Lake in the northeast corner adjacent to Hamsterly Beach.

A small onshore building houses air compressors and oxygen generators, which deliver highly oxygenated air (96–99%) through a pipeline into the lake. The system includes a 1.4 km submerged line positioned near the lake bottom, with approximately 400 m of perforated pipe that releases fine bubbles. These bubbles dissolve into the deep water, increasing oxygen levels without disrupting the lake's natural stratification or causing mixing.

What Causes Blue-Green Algae Growth at Elk/Beaver Lake?

Excess phosphorus is the primary driver of blue-green algae growth in the lakes. About 30% of the phosphorus originates from external sources in the surrounding watershed, while roughly 70% is released under low-oxygen conditions from bottom sediments of the lake.

...continued on page 2

Contents:

Volunteer Spotlight:
Christine Parker

Species Spotlight:
A Fall Focus on Ferns!

Staff Profile:
Rachel Palmer

Park Updates

Upcoming Events

The oxygenation system targets this internal source of phosphorus by adding oxygen to deep waters, helping keep phosphorus bound in the sediments and less available to fuel algae growth. Improved deep-water oxygen levels are also expected to improve deep-water fish habitat.

The system does not address phosphorus from shallow bays or external watershed sources. As such, the oxygenation system alone will not resolve all water quality issues in the lake. Lasting improvements require both continued operation of the oxygenation system and implementation of other actions identified in the [2020 Elk/Beaver Lake Watershed Management Plan](#).

Objectives of Oxygenation System

The objectives of the oxygenation system are to:

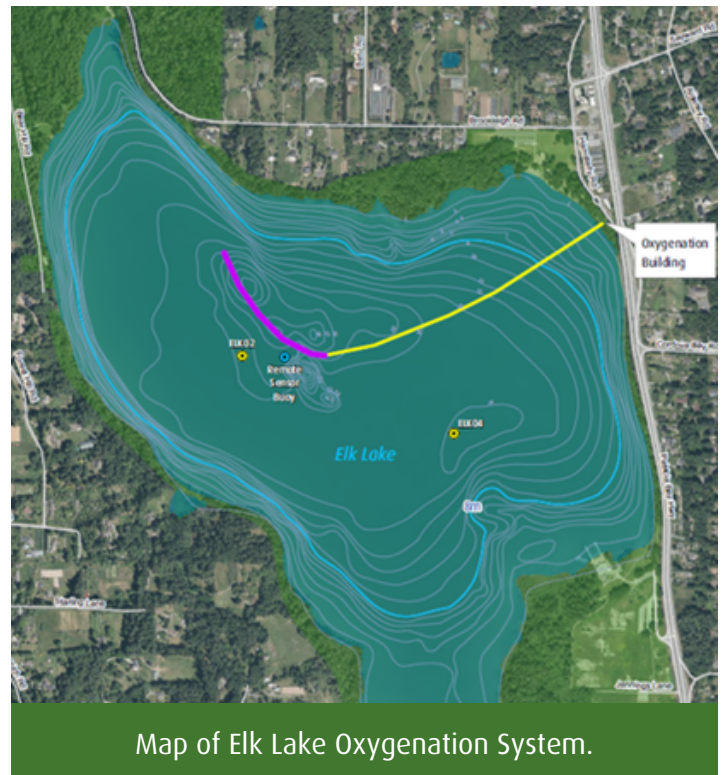
- 1) Eliminate deep-water oxygen depletion (anoxia). Deep water dissolved oxygen should be more than 2mg/L (ideally more than 5mg/L).
- 2) Decrease internal phosphorus loading. Deep water total phosphorus should not exceed 50ug/L.
- 3) Maintain suitable cold-water native fish habitat. Deep water temperature should not exceed 15°C.
- 4) Reduce the frequency and duration of blue-green algae blooms and reduce park advisories for blooms.

Progress on Oxygenation System

Objective 1: Eliminate deep-water oxygen depletion (anoxia)

Status: ON TRACK

Deep water dissolved oxygen of greater than 5mg/L was not achieved in 2025, but as of May 28, 2026, has consistently been above 8mg/L.



Objective 2: Decrease internal phosphorus loading

Status: ACHIEVED

Data indicates a major reduction in phosphorus in deep waters. The total phosphorus in deep water was reduced by 80% in 2024 and 2025, compared to pre-oxygenation conditions. So far in 2026, total phosphorus levels have not exceeded 110ug/L. This significantly reduces the amount of phosphorus available to support blue-green algae growth.

Objective 3: Maintain suitable cold-water native fish habitat

Status: ACHIEVED

Average temperature through summer 2025 was 12.5°C. Average deep-water temperatures in the lake did increase in 2024 and 2025 compared to pre-oxygenation conditions; however, it did not exceed 15°Celsius. Efforts in 2025 to manage spring flow rates more carefully to reduce

...continued on page 3



Oxygenation tubing entering Elk Lake.

potential lake mixing, showed reduced average deep water temperatures compared to 2024 data. As of early July 2026, deep-water temperatures have remained below 8°C.

Objective 4: Reduce frequency and duration of blue-green algae blooms

Status: ON TRACK

There were less frequent blooms in 2025, however the spring bloom that occurred was significant and long-lasting, resulting in the cancellation of the swim portion of the May 25, 2025 IRONMAN triathlon. This bloom was likely driven by heavy rainfall in March and warm, calm weather in April. Outside of this significant bloom, summer conditions supported normal recreational use, with positive feedback from user groups such as the Elk Lake Rowing Club.

Preliminary results from 2026 indicate that improvements observed in prior years are continuing. As of late May, deep-water oxygen levels remain stable and total phosphorus

concentrations are well below historical averages. There was a spring bloom, however the scale and duration of the bloom was significantly reduced and allowed for the IRONMAN 70.3 event to go ahead as planned.

2026 Interim (Summer) Update

- Deep-water dissolved oxygen concentrations above 8mg/L.
- Deep-water phosphorus levels below 50µg/L.
- Deep-water temperatures are below 11°C.

2026 Next Steps

- Planned system upgrades
- Continued water quality monitoring
- The CRD is partnering with the University of Victoria to improve lake-wide bloom detection and tracking.
- An annual report will be prepared on system performance and water quality progress.
- Ongoing implementation of actions identified in the Elk/Beaver Lake Watershed Management Plan, with an update to be provided annually.

Conclusion

The Elk Lake oxygenation system demonstrates measurable improvements in key water quality indicators, particularly deep-water oxygen levels and phosphorus reduction. While algal blooms continue to occur due to external nutrient inputs and environmental conditions, their overall duration and frequency show early signs of improvement. Continued operation of the system, alongside implementation of the Elk/Beaver Lake Watershed Management Plan, will be essential to achieving long-term water quality objectives and sustaining ecological and recreational values in the park.

Volunteer Spotlight: Christine Parker



Removing the broom "forest" at Aylard Farm in East Sooke Regional Park.

Photo: T. Drury

Tell us a bit about yourself.

I retired to Vancouver Island in September 2022. I love spending time with family, friends and our dog Gem and her buddy Dex. This includes exploring the breathtaking sites all over Vancouver Island, going to live theatre, camping, hiking, or paddling on the water. I also enjoy listening to or reading a variety of books, I have read/listened to 62 books so far this year, many while volunteering and hiking.

What do you enjoy most about volunteering with Regional Parks?

I love working outdoors in the beautiful parks in the region. The people (staff and volunteers) are wonderful to work with and get to know. I enjoy learning from the knowledgeable staff about the native species of the particular area and what we can do to control or eliminate invasive species that limit or inhibit the success of the native plants.

What is your favourite volunteer experience or memory?

I really enjoy working on Scotch Broom. I am very proud of the work many of us did this summer at Aylard Farm removing a very large broom forest with trees that were 12 to 15 feet high. This required many volunteers and CRD staff over a two month period to cut bundle and remove all the biomass (3 or more small dump truck loads plus a full bin). We still have a bit to go but we hope to have that area completed by Spring of 2027.

Species Spotlight: A Fall Focus on Ferns!

by Emily Ryan



Spiny Wood fern

A Fall Focus on ... Forest Floor Ferns!

As we move into the fall months, restoration efforts shift from meadow and dune ecosystems to our cooler forest sites, where invasive species like English ivy, holly and daphne are targeted. Removing invasives makes room for our incredible forest floor species, like native species like salal, trailing blackberry, and Oregon grape. Ferns, such as the well-known sword and bracken species, blanket our forests as well.

However, there are many more, perhaps lesser-known, ferns found in British Columbia to keep one's eye out for as we move into cooler temperatures and work to restore our forests!

Spiny Wood Ferns (*Dryopteris expansa*)

Spiny or "spreading" wood ferns are deciduous and can be found in shaded, moist, low to subalpine sites and can easily be mistaken for several other local ferns due to their pale, feathery, and lacy fronds. The fronds are triangular in shape and can measure more than 25cm across, while growing upwards of three to four feet high.

Spiny wood ferns can be found from Alaska all the way down the coast into Northern California. Across Canada, they have also been found in the Rocky Mountains and Great Lakes regions as well as in Europe and Asia.



Maidenhair fern

Indigenous People traditionally harvested the the rhizomes for food, using it as a starchy vegetable or grinding it into flour. The fronds were used to wrap fish, and the pinnae (the small individual leaflets) was sometimes used to stuff pillows.

Western Maidenhair Ferns (*Adiantum pedatum*)

Fans of waterfalls will delight at the sight of these ferns blanketing the wet cliff edges, enjoying a spray from the cascade. Indeed, one may be more familiar with seeing these ferns growing from cliff faces in our forests, but the Western maidenhair fern is also found on the forest floor in large clusters in British Columbia. These ferns prefer humus-rich soil in shaded and moist woodland forest ecosystems.

Western maidenhair ferns are more delicate-looking and grow in shallow soil compared to other hardier local ferns. They've even been referred to as "dainty" by some. Their fronds cascade with small dark-green leaflets, punctuated by dark black stems running the length of each frond, which in some forests, reach lengths of 60cm. Traditionally, these stems are used in basket- and jewellery-making.

...continued on page 6

Western maidenhair ferns range from the Aleutian Islands in Alaska down the Pacific Coast but have been found as far south as parts of Mexico!

Local nurseries sell the perennial and deciduous Western maidenhair fern. They require ample moisture and partial to full shade, but prove deer-resistant, making them lovely additions to cooler gardens.

Deer Ferns (*Struthiopteris spicant*)

Often mistaken for the widespread Western sword fern found in so many of our forests, deer ferns are another star of the BC fern world. Deer ferns are dimorphic, meaning they have two types of fronds – sterile and fertile. Both can reach the same lengths (up to 60cm), but the former grow at an angle to the ground or even horizontally, while the latter shoot upright from the centre of the bunch. Fronds are thinner than those of the sword fern and have nearly symmetrical pinnae (leaflets) which lack the characteristic “flap” at the base of sword fern pinnule.

Deer ferns are named after the deer that were hunted while feeding in and amongst the swaths of these ferns. Fronds are often collected and used to line the inside of pots for steaming tubers, such as camas bulbs. The leaves are traditionally chewed to ward off stomach ailments and the treatment of skin issues.

Deer ferns are found in moist forests, often closer to riparian ecosystems, or western coastlines. They are found throughout the Greater Victoria region and up and down the Pacific Northwest coasts. A walk on the Pike Road Trail in East Sooke Regional Park allows for ample viewing opportunities of massive deer fern dells.

For more fun with ferns, [this glossary of fern terms](#) is highly recommended!



Maidenhair fern



Deer fern

Staff Profile: Rachel Palmer, Stewardship Technician

Tell us a bit about yourself!

I'm Rachel, one of the Restoration Assistants at CRD Regional Parks. I have a BSc in Ecological Restoration from BC Institute of Technology.

After years working in salmonid stock assessment and a broken ankle, I'm thrilled to be refocused on restoring local ecology. I'm also working on my MSc in Environment and Management at Royal Roads University where my focus is shoreline and intertidal food system restoration.

When I'm not working or studying, you can find me cooking for friends, spoiling my cats, or reading non-fiction in my garden in Sidney.

What do you enjoy most about working at Regional Parks?

This job has introduced me to so many amazing parts of the region I hadn't previously known. The diversity of ecosystems in regional parks, from Garry oak to coastal sand dune, keeps the work I do exciting.

I love getting to know our volunteers and seeing the positive change we make on the landscape together.



Rachel searching for an elusive Blue-grey Taildropper.
Photo: R. Palmer



Rachel conducting crab surveys in the Salish Sea.
Photo: R. Palmer

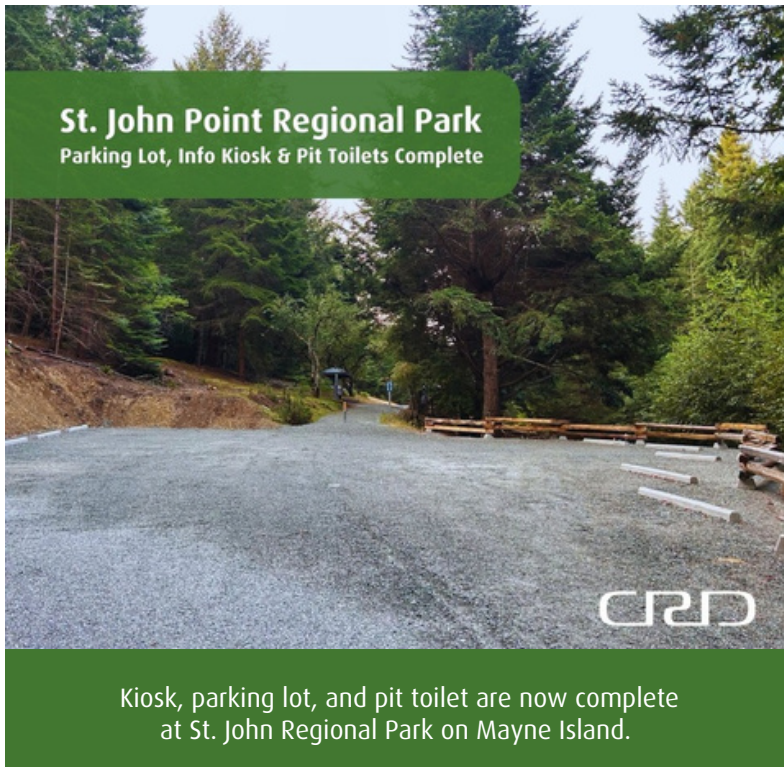
Park Updates



The new accessible paddlecraft launch at Brookleigh Boat Launch.

- A new accessible paddlecraft launch was installed at the Brookleigh Boat Launch in Elk/Beaver Lake Regional Park this summer. The custom built float expands access to paddling through a wheelchair-accessible ramp, step-free dock, and custom launch system. CRD staff worked alongside local contractor Jenkins Marine LTD and Recreation Adapted Society (RAD) Society to design, build and test the custom launch system. The project builds on the Regional Parks Division's broader accessibility initiatives and supports a wide range of users, enabling more people to experience the benefits of paddling.
- The fall nature program brochure is now available online at crd.ca/parks-events, or keep an eye out for printed copies at rec centres and community centres across the region.
- The Province of British Columbia recently denied three related Crown land applications submitted by One with Nature Corp. to establish a commercial outdoor education and wilderness training operation on land within East Sooke Regional Park. View the Reason for Decision document [here](#).
- Repairs on the Teaching Shelter at Witty's Lagoon Regional Park are now complete after the shelter was struck by a falling tree earlier this year.

Park Updates



- Earlier this summer a project to create new visitor amenities at St. John Point Regional Park on Mayne Island was completed by CRD staff, thanks to collaboration with and support from Mayne Island Conservancy, Islands Trust, Environment and Climate Change Canada, the Agricultural Land Commission, Mayne Island Parks and Recreation Commission, involved First Nations, and local residents. The project includes a new 12-stall parking lot, information kiosk and pump-out pit toilet. Future restoration work is currently proposed for the areas associated with the construction, including planting and seeding with native species.



- Restoration work has started on the log sign at Thetis Lake Regional Park after public feedback on plans to eventually remove and replace it put work on hold in 2023. Earlier in August, scaffolding and work fencing was erected and restoration work started. Staff and contractors will remove all existing rot, filler and paint, replace the upper sign, sandblast the log, inject around 60 borate rods into the log to slow its deterioration, and finally, will repaint the entire log in its existing colour scheme. The original carver's family has been notified and they are excited as we are to see this local landmark get a facelift! Work is expected to wrap up sometime in the fall and visitor impacts are expected to remain minimal.

Upcoming Events

STÁUTW (Tsawout) Truth & Reconciliation Restoration Event

Tuesday, September 29 | 9:30am-12:30pm

Honour Truth and Reconciliation Day by joining us on a coastal sand ecosystem restoration in partnership with STÁUTW (Tsawout) First Nation to remove invasive species! Over the past year we have removed over 5,000 pounds of Scotch broom from the site, allowing for the return of many native species. Come be a part of the effort!

**Sign up in the volunteer software or
email Nadine: ncollison@crd.bc.ca**



Fall Volunteer Hike

Saturday, October 24

9-11am

Matheson Lake Regional Park

Join us for a gorgeous fall hike around Matheson Lake to enjoy the autumn crispness! This is a moderate hike, so wear sturdy shoes and bring hiking poles if you need them. We'll meet at the main parking lot. This is a great opportunity to get to know your fellow volunteers!

**Sign up in the volunteer software or
email Nadine: ncollison@crd.bc.ca**



Upcoming Events

Wild Neighbours: Why Parks Matter for Black Bears

Saturday, November 7

10-11:30am

CRD Regional Parks HQ

Join us for a peek into the world of Vancouver Island's black bears! Biologist Helen Davis is pulling back the curtain on our furry local neighbors. We will learn about what they eat, where and when they den, and why parks are vital safe zones. Space is limited, registration required.

Sign up in the volunteer software or email Nadine: ncollison@crd.bc.ca



Winter Volunteer Hike

Friday, December 18 | 2-3:30pm | Francis/King Regional Park

Join us for our annual winter hike at Francis/King Regional Park followed by treats and warm drinks in the Nature House as we celebrate another year of hard work.

For more info, email Nadine: ncollison@crd.bc.ca

