

Cultus Lake – A Lake in Transition

The water quality in Cultus Lake is changing. In 2014 scientists confirmed the Fraser Valley lake is in an early phase of cultural eutrophication¹. Left unchecked, in a few years this condition could lead to toxic algae blooms, murky water, a weakened aquatic ecosystem, fish death, and loss of enjoyment of the lake.

A very special place for fish, and for people

Cultus Lake is home to a rich diversity of aquatic and land species that rely on its clear, unpolluted water to survive and thrive. In particular, the lake is a critical habitat to two unique fish species, the:

- Cultus Lake pygmy sculpin: a coast range sculpin subspecies stranded here after the last Ice Age and found only in this lake
- Cultus Lake sockeye salmon: genetically unique from other sockeye, they spend their early years in this lake and come back to Cultus to spawn

However, because their habitat is at risk, these two species are also considered to be threatened or at risk².

Cultus Lake is important for people, too. It is:

- The ancestral home of Soowahlie First Nation and the Ts'elxweyeqw Tribe of the Stó:lō for millennia
- Home to 1,400 full-time residents and dozens of local businesses
- A recreational destination for more than two million people each year who enjoy Cultus Lake Provincial Park, the regional Cultus Lake Park, trails, events, attractions and businesses³, and who inject millions of dollars a year into the local economy
- The site of one the oldest lake research centres in Canada, established in 1920s

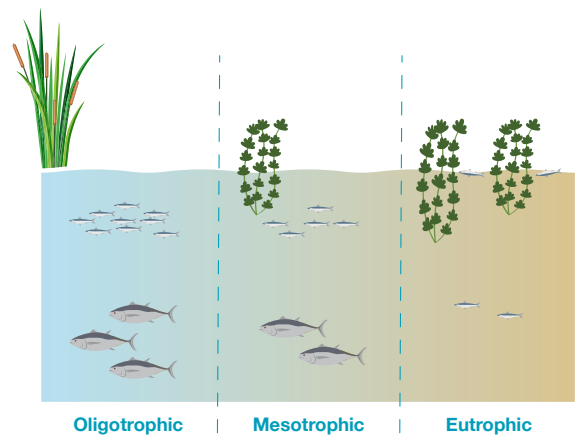


Lake 101 – Trophic stages in a lake

Trophic states refer to the level of nutrients, usually nitrogen and phosphorus, in a water body. When the levels are in balance with the geographic surrounding, nutrients help plants and animals live sustainably in a natural cycle.

- **Oligotrophic (nutrient-poor)** lakes have clear water, ample oxygen, few aquatic plants, and provide a healthy and stable habitat for fish like trout and salmon.
- **Mesotrophic** waters can be clear, but have increased levels of nutrients and aquatic plants.
- **Eutrophic (nutrient-rich)** waters have abundant plants and algae blooms, but are murky and dark. As plants die and decay, the process consumes oxygen, leaving few inhabitable zones for aquatic life. The hypoxia, or low oxygen levels, leads to reduced aquatic biodiversity, fish death and even extinction. Invasive species may outcompete native inhabitants.

Cultural eutrophication occurs when the excess nutrients are derived from human activity. Unused nitrates and phosphates build up in soils, and escape into the air as dust and air pollution. The components are eventually deposited on land and into streams and lakes. In water, these nutrients speed up eutrophication.



¹ A. Putt, et al., 2019, Eutrophication forcings on a peri-urban lake ecosystem - context for integrated watershed to airshed mgmt. www.ncbi.nlm.nih.gov/pubmed/31339893

² Cultus Lake pygmy sculpin (SARA, threatened; COSEWIC, endangered), Cultus Lake sockeye salmon (COSEWIC, threatened)

³ BC Parks 2019 statistics; Cultus Lake Park, 2019

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Sources of excess nutrients in Cultus Lake

The studies indicate that Cultus Lake is in an oligo-mesotrophic state, with moderate levels of nutrients but higher levels than what should naturally occur¹. The main sources of nitrogen and phosphorus entering Cultus Lake are:

- Gull droppings that are rich in phosphorus
- Treated residential septic effluent that has high nutrient levels
- Ground run-off from Columbia Valley farms and the surrounding watershed
- Airborne deposits of gaseous compounds and dust from the Fraser Valley region

In a few decades, excess nutrient will lead to polluted water and significant ecosystem damage, along with far-ranging cultural, social and economic losses for the Cultus Lake community and Fraser Valley region. The added impacts of climate change make the need for action even more urgent.

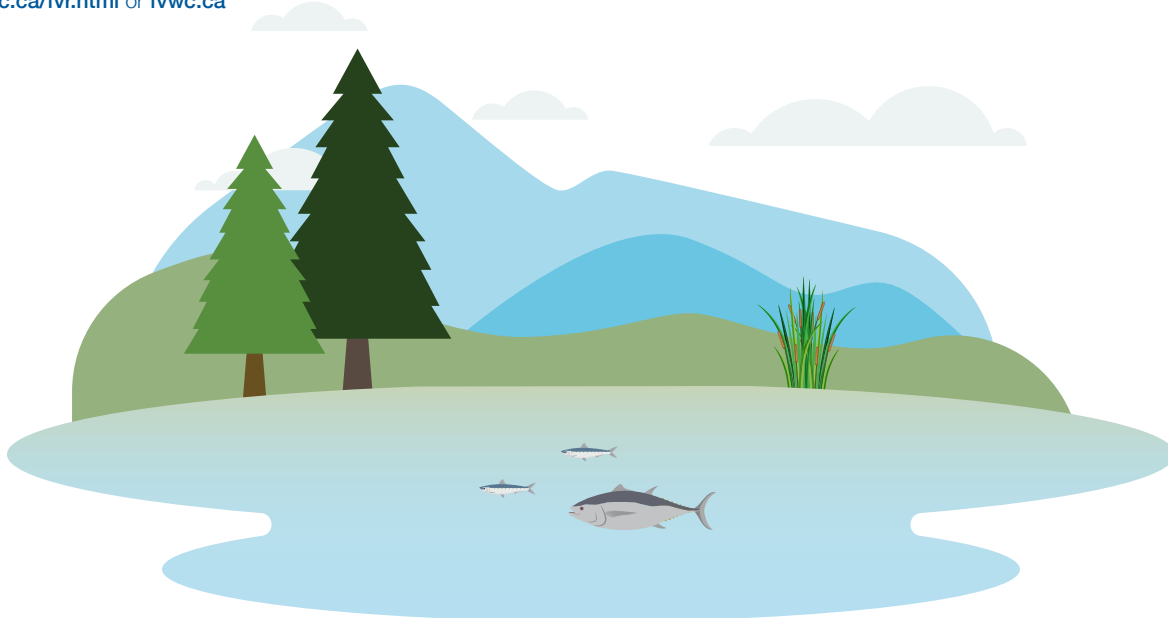


We can protect Cultus Lake for future generations

Good news: We can slow cultural eutrophication in Cultus Lake and keep it healthy for its aquatic inhabitants, and for human enjoyment. We can use nutrients more effectively and reduce their flow into the lake. Some programs are underway or planned to control septic effluent content, invasive fish and plants, and animal feed content. This is an opportunity for scientists, First Nations, governments, agriculture, transportation and others to work together to preserve this unique body of water. Their collective efforts will benefit Cultus Lake and the entire region for generations. Some other steps we can take:

- Discourage gulls from congregating on Cultus Lake
- Modify fuel content, farming and other sector practices to reduce nutrients going into the air
- Reduce nutrient loading from ground run-off

For more on this initiative, please see:
fraserbasin.bc.ca/fvr.html or fvwc.ca



¹ A. Putt, et al., 2019, Eutrophication forcings on a peri-urban lake ecosystem - context for integrated watershed to airshed mgmt. www.ncbi.nlm.nih.gov/pubmed/31339893