



Cowichan Lake & River
Stewardship Society

July/August 2024

CLRSS acknowledges that our virtual newsletter is being shared on the unceded territories of the Quw'utsun, Malahat, Pauquachin, Ts'uubaa-asatx, Halalt, Penelakut, Stz'uminus, Lyackson, Ditidaht & Pacheedaht Peoples who have stewarded this land since time immemorial.

CLRSS will be emailing member newsletters every six weeks. Contributions from members: Judy Brayden (editor), Jean Atkinson, Jim Deck, Dave De Pape, Diana Gunderson, Parker Jefferson, Cam McCauley, Heather Pritchard, Maureen Quested, Joe Saysell Genevieve Singleton, Jacqueline Sherk, Ken Traynor, Leroy Van Wieren, and many others. Any questions, comments or feedback please see [Home | Cowichan Lake & River Stewardship Society British Columbia \(cowichan-lake-stewards.ca\)](http://cowichan-lake-stewards.ca)

**Our next regular Board meeting is Thursday, September 5, 2024
at 6:30 –
in the Country Grocer meeting room. Everyone welcome!**

Our Strategic Planning session is Friday, August 23, 2024, at the home of Cam McCauley in Woodland Shores, Lake Cowichan – 10:00 – 3:00 with 45-minute catered lunch break.

All members welcome! RSVP to mccauleyc62@gmail.com or judybrayden@shaw.ca by August 16th, thanks! Directions and more details will be sent to registrants.

In this Edition:

- **Celebrate with us! Recap of the very successful Celebrating Water Festival – *Weir All Connected***
- **Getting Ready – Plan along with us for the future of the society on August 23rd**
- **The Story of River's Day - Quw'utsun Sta'lo' Skweyul – Sunday September 22, 2024**

- Invasive Species – Quagga Mussel
- The history of the Quw'utsun Basin and looking under the surface at groundwater
- A primer for Weekly Water Quality Updates
- What do you do if you see a dead fish?
- Update on Project 84,000

Become a CLRSS Member
Only \$10.00 = 4 cups of coffee



You can support CLRSS programs by purchasing Thrifty Smile Cards – order Smile Cards in any amount up to \$1000. 6% of the card value is donated to CLRSS.



Also remember code **484** will allow you to donate your bottle and can return money to CLRSS at the Duncan Island Return It. With thanks!

Celebrate with us! Recap of the very successful 2024 Celebrating Water Festival – *Weir All Connected*

With sincere thanks to all who participated as sponsors, volunteers, exhibitors or attendees from Festival Lead, Maureen Quested and her trusty team!



Left to right:

Chair of the CVRD and Mayor of Ladysmith, Aaron Stone, Mayor Rob Douglas of the Municipality of North Cowichan, CLRSS 2024 president, Judy Brayden, Oxford the Otter, Councillor Kristine Sandhu of Lake Cowichan, Mayor of Lake Cowichan, Tim McGonigle, Member of Parliament, Alistair McGregor, CWB Big Dancing Fish, and Larry George, Director Land & Governance for Cowichan Tribes.



Left to right: Lake Cowichan Mayor, Tim McGonigle, Larry George, Director Land & Governance for Cowichan Tribes, CLRSS member, Beverley Nimmo and CLRSS Festival Lead, Maureen Qusted.



Displays and demonstrations, hands- on activities and popular weir tours!





Jenae Weir

1d · 🌐



Today I went down to saywell to check out the weir all connected water festival. It was all about me! Haha just kidding. One of the key points at this festival was the plan to construct a new weir in the town of Lake Cowichan. The weir helps to maintain the water levels in both the Cowichan Lake and River during the hot months of the summer and the wet cool months of the fall and winter which allows for everyone to enjoy the lake and river to their fullest potential at all points of the year. A new weir would allow for the Cowichan Lake area residents and animals to continue enjoying this pristine body of water for generations to come!
[#mascotmugshot](#)



FESTIVAL HIGHLIGHTS	WINNERS
Weir Walk & Talk with the dynamic duo Brian Houle, Environment Manager, Catalyst Crofton - A Paper Excellence Company & Tom Rutherford, CWB	\$25 coupon from Jakes at the Lake & associated businesses & a copy of Witnessing the Water to Vicki Pauze, Layne (Van Wieren), Jennifer Bilsbarrow, Margie Miller
Weir Celebrating Cake – from Island Pastry Haus overlooking the weir	Mascot Mugshot Challenge First Place - Jenae Weir (who joked the day was all about her) won a waterproof speaker Second Place – Megan Bell won Bluetooth earbuds
The Fishy Shuffle by the CWB Dancing Fish	Thanks to MAJOR SPONSORS
Jedson August & his daughter Carleen with their superlight, cedar canoe and Sta'lo stories	Catalyst/Paper Excellence – donated \$2000 & support with equipment
Metal Water Bottles from Mid Island Co-op – With a \$10 donation; fill ups at the CUPE Local 358 water cart (eliminating plastic)	Jakes at the Lake – long time supporter of CLRSS activities donated 4 - \$25 gift certificates valid at all their venues, as well as 20% off coupons for volunteers
Fish Rubbings representing the 84,000 fish that died in the river during the 2023 heat wave	Lake Cowichan Country Grocer – community supporter extraordinaire supplied all the hot dogs, drinks & condiments for the event
Genevieve Singleton's Kids' Crafts	Mid Island Co-op – gifted \$700 for metal water bottles to help eliminate plastic use
DFO's 20' Coho evaded capture again in 2024	Thanks to ADDITIONAL SUPPORTERS
Lulumexun Marine Team S-hwuhwa'us Thi'lut Kw'atl'kwa (Thunderbird Protecting the Ocean)	Town of Lake Cowichan Island Pastry Haus Bakery CUPE local 358 (Water Cart) One Cool Cookie food truck CVRD Sports Event Loan Program Lake Ambassadors
Hot dog & drink by donation (benefitting Bear Aware and CLRSS) courtesy of the ever-supportive Lake Cowichan Country Grocer	

Getting Ready – Plan along with us for the future of the society on August 23rd

This is your opportunity to influence the direction of your society. All members welcome! The more the merrier and your input is crucial to our future success.

RSVP to mccauleyc62@gmail.com or judybrayden@shaw.ca by August 16th, thanks!

Directions and more details will be sent to registrants.

The planning day looks like this:

9:30 Introductions and quick overview of the CLRSS Mission and Vision

10:00 Overview of current programs/priorities - additions or deletions
programs/priorities

10:30 Break into small groups – one for each program/priority – “café style”.
Participants move from table to table, with a Table Lead to record the various thoughts, ideas, etc. - goal to develop one-, three- and five-year plans and deliverables for that program/idea.

11:30 Table Lead reports back to the group with the comments and suggestions made

12:00 Complementary lunch and informal discussion

1:00 Review various suggested outcomes and develop consensus where possible

3:00 Conclusion of day

The Story of River's Day - Quw'utsun Sta'lo' Skweyul – Sunday September 22nd

Millions of people around the world celebrate World River's Day on the last weekend of September. This event was started in 1980 in BC by Mark Angelo, river conservationist, and the BC Outdoor Recreation Council. From there Mark's vision has encircled the globe. In 2017 and 2019 Cowichan Tribes and the Cowichan Stewardship Roundtable co-hosted Quw'utsun River Day. Cowichan Tribes is the largest band in BC and is active on many fronts doing river stewardship.

Cowichan Stewardship Roundtable was founded with Cowichan Tribes and conservation groups 19 years ago. It is a grass roots group promoting collaboration on solving watershed issues. Together they have teamed up to offer a fun day every *two years*.



From Cowichan Valley Voice article of 2021 - Photo from the CRST website

Cowichan Tribes and the Cowichan Stewardship Roundtable are co-hosting:

Quw'utsun Sta'lo' Skweyul Cowichan River Day

Sunday, September 22, 2024 10:00AM to 3:00PM

Gather with us at Black Bridge Beach, on Cowichan Tribes private property. Parking will be available behind Si'em Lelum Gym, 5574 River Road, Duncan. From the parking area, you will take a short walk to the river site.



Free! Everyone welcome! Refreshments!

Please wear an orange shirt!

Performance by the Tzinquaw Dancers, learn Cowichan Teachings, make salmon art, meet birds of prey, and experience so many more opportunities to learn about the watershed!

Bring your own water bottle!

The Quw'utsun River has been the heartbeat of the Cowichan People since time immemorial and is a Provincially and Nationally designated Heritage River. Come learn about and celebrate the river with us!



Please let our volunteers know if you require accessibility support.

For more information, contact: 250-701-1054 or cowichanstewardshiproundtable@gmail.com.

Invasive Species – Quagga Mussel - thanks to the Invasive Species Committee of Dave DePape, Cam McCauley, Jacqueline Sherk and Jay White



**CLEAN
DRAIN
DRY**

Prevent the Spread of Aquatic
Invasive Species

Quagga Mussel (*Dreissena rostriformis bugensis*)

Zebra Mussel (*Dreissena polymorpha*)

ZEBRA AND QUAGGA MUSSELS

These freshwater bivalves are native to the Black Sea region of Eurasia. They were first introduced to the Great Lakes in the late 1980s, by trans-Atlantic ships discharging ballast water that contained adult or larval mussels. They spread widely and as of 2019, can be found in Ontario, Quebec and Manitoba. They are now established in at least 24 American states. Quagga and zebra mussels have not yet been detected in BC, Saskatchewan, Alberta or the north.

IDENTIFICATION

Zebra and quagga mussels—or dreissenid mussels—look very similar, but quagga mussels are slightly larger, rounder, and wider than zebra mussels. Both species range in colour from black, cream, or white with varying amounts of banding. Both mussels also possess byssal threads, strong fibers that allow the mussel to attach itself to hard surfaces—these are lacking in native freshwater mussels.

There are other bivalve species found within BC waters to be distinguished from zebra and quagga mussels (*see table on reverse*).

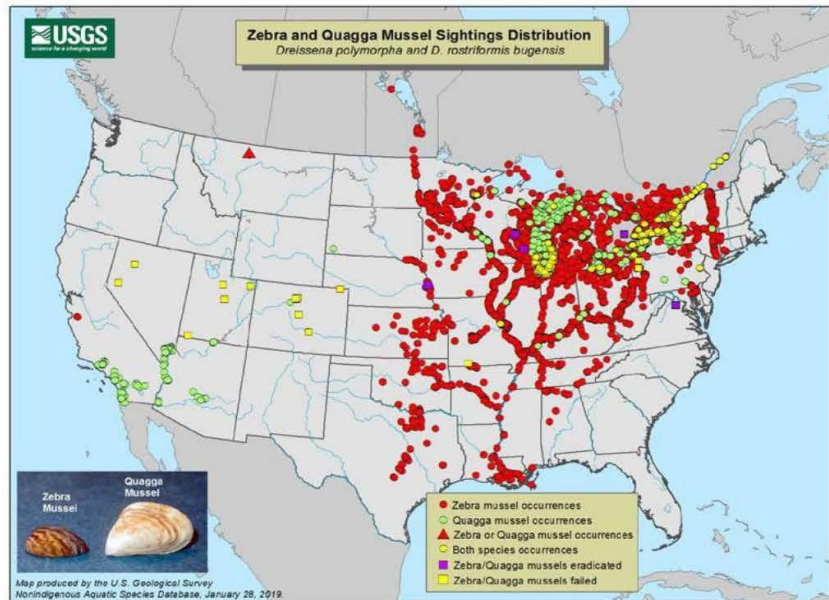
ECOLOGICAL CHARACTERISTICS

Habitat: Zebra mussels can be found in the near shore area out to a depth of 110 metres, while quagga mussels may be as deep as 130 metres. Zebra and quagga mussels prefer depths of 2-12 metres and 10-30 metres respectively, in freshwater lakes, rivers, reservoirs, ponds and quarries, but have been reported in brackish waters as well.

Reproduction: Females can produce up to one million eggs each year. Fertilized eggs hatch into free-floating veligers (larvae) within 2-3 weeks, produce a calcium-based shell and then settle to a hard surface.

Dispersal: Dreissenid mussels may disperse naturally as a free-swimming larvae with water currents or as adults attached to other organisms, aquatic infrastructure or boats.

Human-mediated dispersal includes commercial shipping, recreational boating, water in live wells, bait bucket or bilges and equipment such as work barges and dredges. The primary transport vector within North America is recreational boating. Depending on the temperature and humidity, dreissenids can survive up to **30 days** out of water.



IMPACTS

Ecological: Zebra and quagga mussels pose a serious threat to the biodiversity of aquatic ecosystems, competing for resources with native species like phytoplankton and zooplankton, which form the basis of aquatic food webs.

Removal of large masses of phytoplankton can alter the water clarity, forcing light-sensitive organisms deeper into the water body and also encourages the growth of unwanted aquatic vegetation. Dreissenid mussels selectively avoid toxic algae when feeding, which may facilitate toxic blooms.

Economic: Dreissenid mussels create massive colonies that can block water intakes and interfere with municipal water supplies, agricultural irrigation and power plant operations. This often results in millions of dollars per year being allocated to removal and management. The impact of invasive mussels to BC if introduced is projected to be at least **\$43 million** annually.

Social: Dreissenid mussel colonies can take over beaches, leaving the shoreline covered in razor sharp shells that render it unusable for recreational purposes, and in turn affect property values and tourism. They can also affect boaters as they colonize exposed boat surfaces and often damage boat engines by clogging water intakes.

Once established, invasive dreissenids are nearly impossible to fully eradicate from a water body. Currently, there are very limited tools available to attempt to control or eradicate dreissenid mussels from natural systems without causing harm to other wildlife, including salmonids. Prevention is the most effective solution to protecting waters from invasive mussels.

PREVENTION

CLEAN off all plant parts, animals, and mud from boat and equipment (e.g. boots, waders, fishing gear).













DRAIN onto land all items that can hold water (e.g. buckets, wells, bilge, and ballast). Ensure to always pull all the plugs!

DRY all items completely before launching into another body of water.

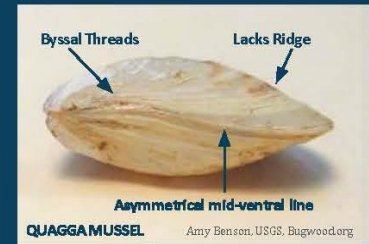
Remember, this goes for all types of watercraft and gear—canoes, kayaks, paddle boards, paddles/oars, life jackets, etc.—not just motorized boats!

Rule of thumb: if it touches water it needs to be cleaned.

Learn more at CleanDrainDry.ca

SPECIES	PHOTO & LENGTH*	SHELL CHARACTERISTICS	DISTINGUISHING FEATURES
Zebra Mussel <i>Dreissena polymorpha</i> NP	 ≤3.5 cm	D-shaped, variable dark and light banding	Bysall threads, straight mid ventral line, bilaterally symmetrical
Quagga Mussel <i>D. rostriformis bugensis</i> NP	 ≤4 cm	D-shaped, may have banding ranging from black, cream to white	Bysall threads, asymmetrical with without a straight mid ventral line
Rocky Mountain Ridged Mussel <i>Gonidea angulata</i> N	 ≤12 cm	Trapezoidal, bluish-green shell with defined growth rings	No bysall threads, only found in the Okanagan Basin
Asian Clam <i>Corbicula fluminea</i> P	 ≤6.5 cm	Ovate, yellow/green to brown shell with concentric rings	No bysall threads, inside of shell is purple
Floater Mussels <i>Anodonta</i> spp. N P	<i>A. kennerlyi</i>  ≤12.5 cm	Elliptical, yellow to brown, smooth & shiny	No bysall threads
	<i>A. oregonensis</i>  ≤12.5 cm	Elliptical, light to dark brown, smooth and shiny	
	<i>A. nuttalliana</i>  ≤18 cm	Ovate, olive, yellow, red-brown or black	
Western Pearlshell <i>Margaritifera falcata</i> N P	 ≤12.5 cm	Elongated, light brown to dark brown or black	Much thicker shell than dreissenid species, no bysall threads, bottom shell edge is concave
Blue Mussels <i>Mytilus</i> spp. P	<i>M. californianus</i> N  ≤25 cm	Wedge-shaped, bluish black to brown, ridged	Bysall threads
	<i>M. trossulus</i> N  ≤10 cm		
	<i>M. edulis</i>  ≤10 cm		
	<i>M. galloprovincialis</i>  ≤10 cm		

*Images shown at ¼ of actual size except *A. nuttalliana* and *M. californianus* which are shown at ½ of actual size.
¹A. Benson, Bugwood.org. ²A. Smith. ³F. Maretzsohn, Bugwood.org. ⁴I. Gardiner. ⁵L. Gelling. ⁶B. Davies. ⁷L. Schroeder



LEGAL STATUS IN BC

Under provincial regulations, zebra and quagga mussels (dead or alive) are **Prohibited Species** and are illegal to possess, breed, transport or release.

REPORTING IN BC

For watercraft that have been operated outside of BC, AB, WA, ID, OR, or WY please contact the BC Conservation Officer Service R.A.P.P. Hotline 1-877-952-7277 prior to entering BC waters. Additionally, all watercraft must stop at open designated watercraft inspection stations in BC. It's the LAW. Sightings of zebra or quagga mussels must be reported to the R.A.P.P. hotline.

For more information on Clean Drain Dry and local partners go to bcinvasives.ca.

REFERENCES/LINKS

Ministry of Environment. Mussel Defense Program. <https://www2.gov.bc.ca/gov/content/invasive-mussels/invasive-mussel-defense-program>. Accessed 2018, August, 28.

Therriault et al. 2012. Risk Assessment for Three Dreissenid Mussels (*Dreissena polymorpha*, *Dreissena rostriformis bugensis*, and *Mytilopsis leucophaea*) in Canadian Freshwater Ecosystems <http://www.dfo-mpo.gc.ca/library/348700.pdf>

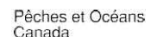
Western, Oregon and Winged Floaters *Anodonta* spp. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/okanagan/anodonta_spp.pdf

Western Pearlshell https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/okanagan/margaritifera_falcata.pdf

Mytilus trossulus E-PAUNA BC. ELECTRONIC ATLAS OF THE WILDLIFE OF BRITISH COLUMBIA <http://lnnet.geog.ubc.ca/efluna/Atlas/Atlas.aspx?scheme=Mytilus%20trossulus>



N Native species I Invasive species
 NP Not present in BC P Present in BC



Invasive mussels, such as zebra mussels, can have significant negative impacts on the environment. Here are some reasons why they are harmful – collated by Jay White from *What are zebra mussels and why should we care about them?* | U.S. Geological Survey ([usgs.gov](https://www.usgs.gov))

Ecosystem Disruption: Zebra mussels filter out algae that native species need for food¹. They can also attach to and incapacitate native mussels¹. This severely alters aquatic ecosystems by consuming algae and plankton².

Rapid Reproduction: Zebra mussels mature in a year and release their larvae into the water to develop³. This rapid reproduction allows them to spread quickly throughout water systems³.

Infrastructure Damage: Zebra mussels rapidly coat water intake pipes, which can cause problems for drinking water treatment plants, power plants, and any other industry that pulls water out of the lakes through a pipe³. Infested water and hydropower infrastructure can fail or choke off water transmissions⁴.

Biodiversity Loss: Freshwater mussels throughout the nation are already struggling, and the situation worsens when zebra mussels take over their food and spawning grounds³. In many areas where the invasive mussels have come in, native mussel species have been wiped out³.

Recreational Impact: Zebra mussels interfere with boating or shipping industry, whether it's fouling up hulls, motors, docks or marinas³. Their shells litter beaches and beachfront property around the Great Lakes, decreasing property values and the amount of beach use in those areas³.

Preventing the spread of invasive mussels is a critical task. Strategies include discouraging the transportation of zebra mussels for use as bait, food, and aquarium pets, and encouraging good boat hygiene¹.”

The history of the Quw'utsun Basin and Water Wells Looking Under the Surface
From October 2005 Cowichan Basin Water Issues report by Westland Resource Group Inc.

Water shaped the Cowichan Basin. The basin we see today is the product of the working of the hydrologic cycle (Figure 1) over thousands of years of geologic and climatic processes, and decades of human activity. About 29,000 years ago, a climatic event known as the Fraser Glaciation began. Most precipitation fell as snow, and glacial ice accumulated in the mountains of Vancouver Island. The ice flowed into valleys, and gouged deep depressions like the one that now holds Cowichan Lake. By 15,000 years ago, the ice was hundreds of metres thick, and so heavy that all of Vancouver Island was depressed by more than 150 metres. The climate then warmed, and by 10,000 years ago, meltwater was carrying glacial debris toward the sea. These gravels, sands, and clays were deposited in the Cowichan estuary, the Somenos and Quamichan sub-basins, around Duncan, and other flatter portions of the Basin. Relieved of the weight of ice, Vancouver Island rebounded to its previous elevations, causing rivers and streams to cut further through the Cowichan Basin's rocks.

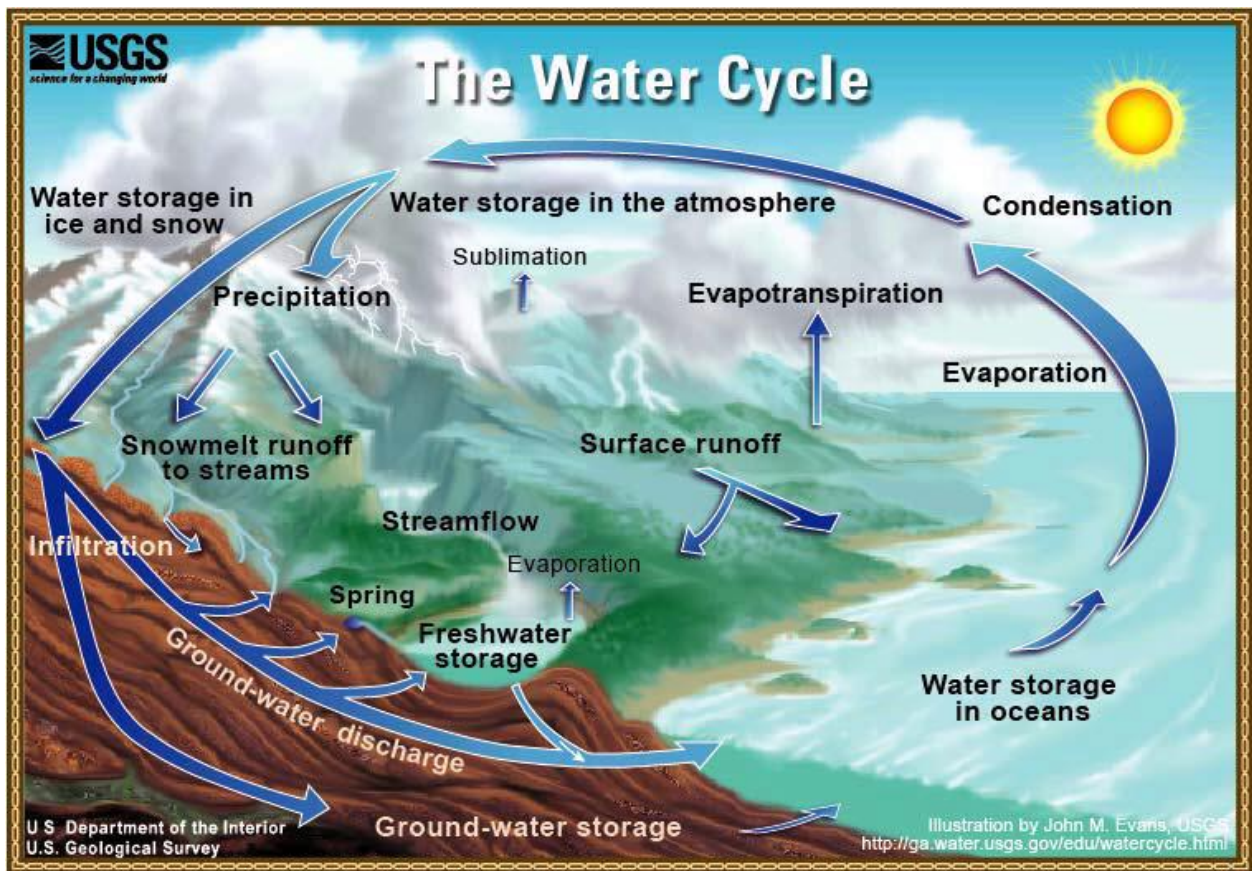


Figure 1. Managing water requires an appreciation of the hydrologic cycle, which explains the timing, amounts, and movement of water in the Cowichan Basin.

Plants recolonized the land, aided by a mild, moist climate. Forests of conifers grew on the young soils of the Cowichan Basin. The forests were watered by winter rains and snow, and withstood summer droughts. As it does today, water evaporated from the Pacific Ocean was carried eastward by prevailing winds. Rising over the peaks of the Vancouver Island Range, the air cooled and moisture condensed, dropping up to 5 m of water yearly on the peaks west of Cowichan Lake. Much of this precipitation would percolate into forest soils, where it would slowly flow toward streams or enter aquifers. Deep snow would accumulate on the peaks, mainly north of Cowichan Lake, slowly melting to provide a flow of water in early summer.

The annual floods of this hydrologic cycle carried soil and gravels into the lower Cowichan Basin. During annual flood events, the waters would spread out in the flatter reaches of the Cowichan River. The soil gradually accumulated in fertile pockets.

Salmon were attracted to the gravels deposited on the bed of the Cowichan River, which were ideal for spawning. Lakes and channels in the river and estuary provided excellent rearing habitat for fish. Gradually, other animals filled the ecological niches of the Cowichan Basin--worms and insects, ducks and eagles, bears and elk. The web of life in the Cowichan Basin became complex and resilient.

Aboriginal people reached the Cowichan Valley not long after the glaciers receded. The people adapted themselves to the seasonal pattern of weather, fish, and plants. A rich culture flourished on the banks of the Cowichan River for centuries. The Cowichan people recognized and appreciated the seasonal patterns in the Basin; winter flood and summer drought; erosion and deposition; spawning and rearing.

Then, in the early 1800s, Euro-Canadian settlers arrived, bringing a different view of the Cowichan Basin. Explorer Robert Brown wrote of Douglas-fir forests as far as the eye could see, constituting "an easy fortune for any man of moderate means" (Drushka 1992).

By the 1860s, logging and land clearing were well underway. The lower part of the Basin was being settled by farmers. By 1884, Cowichan Lake saw its first logging operation, set up by W.A. Robertson, who ran logs down the Cowichan River during the spring freshet (Gaunt 1990). In 1913, Canadian Pacific extended a rail line to Lake Cowichan. By 1920, eighteen logging companies employed 1,200 men in the removal of the Cowichan Basin's ancient forests.

The new residents of the Cowichan Basin made big changes to the hydrologic system, and not only by logging. Winter floods threatened investments in road, railroads, and the growing settlement at Duncan. Dykes were the answer. The dykes greatly narrowed the Cowichan River's flood plain. The demand for water led to the extraction of water from aquifers and from streams. Farmers capitalized on the rich soils that were a gift of water in the Cowichan Basin. They straightened and deepened streams to hasten drainage, drilled wells, and extracted water for irrigation. With settlements came pavement, storm drains, septic fields, and sewage treatment plants, all affecting the Basin's water.

Industry, too, needed water. In the mid-twentieth century, the government agreed that the new pulp mill at Crofton could divert substantial quantities of water from the Cowichan River. A weir was built at the outlet of Cowichan Lake to store water to support the endeavour.

In the past 150 years, the face of the Cowichan Basin has changed more than in the preceding 5,000. The old growth forests are nearly gone, replaced by young trees that are cut when they mature. The river has been channelized. Water has been diverted from streams and pumped from aquifers. The Basin is home to many times the number of people that lived here 100 years ago. Thousands of visitors come to play in the waters of the Cowichan Basin. The rate of change is accelerating.

Residential and commercial development increases the demand for water and changes the hydrology of the Basin through its very presence. Wishing to be near to the water, people build houses on the banks of rivers and lakes, removing riparian vegetation to improve access and views. Hundreds of licences have been issued to divert water from streams and lakes in the Basin, and more than 1,300 wells have been drilled to pump water from the aquifers.

Global factors, both economic and climatic, affect the Cowichan Basin. Little precipitation comes as snow anymore. Instead, it comes as rain, which runs off quickly. Forest soils are thinner, their water holding capacity reduced. Summer dry periods are growing longer, jeopardizing the ecological health of the river and the economic health of those who depend on its water.

Federal, provincial, and local governments have passed laws, set regulations, and adopted plans to stimulate development of the Cowichan Basin. To protect the flow of water and all that it supports, these governments—and the residents of the Basin—may now need to establish a new relationship between people and water. A water management plan can help to define this relationship. Can water be managed better in the next century than in the past one? The answer will be determined by the people of the Cowichan Basin.

Water wells: Looking under the surface

Understanding groundwater

Groundwater in an aquifer can be connected to surface water. This means your well may be pulling water from a nearby river or stream.

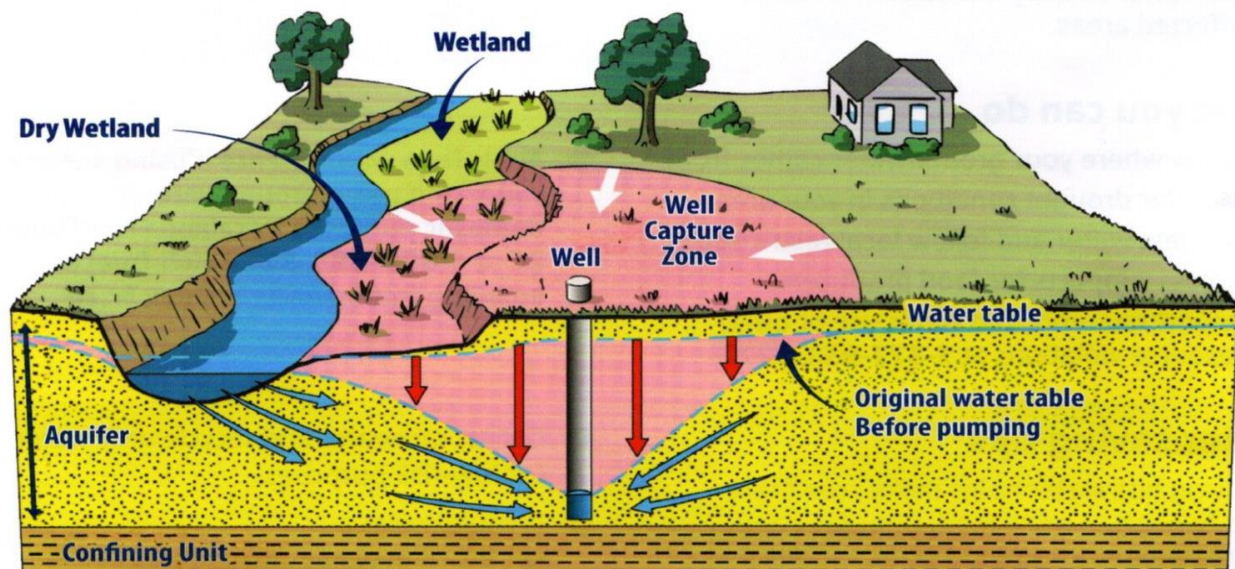
During times of drought, this can worsen the impacts on a stream and cause long-lasting harm to fish, animals and the environment.

Keep this in mind as you plan your water use.

How it's connected

This diagram shows one example of how pumping groundwater from a well can reduce streamflow by:

- Pulling water away from a stream and redirecting it to the pumping well.
- Taking groundwater flow that would have otherwise entered the stream.



Source: Canada's Groundwater Resources, 2014

What you can do: Know where your groundwater comes from

The type and properties of an aquifer can affect how much groundwater is available, how groundwater pumping will impact a stream, and how well we can predict these interactions.

- To learn more about your aquifer, visit gov.bc.ca/Groundwater

A primer for Weekly Water Quality Updates and the latest update

Editor's Note: Weekly water quality reports are being generated by the Cowichan Watershed Board and community partners: Cowichan Tribes, BC Fisheries, DFO, CVRD, Town of Lake Cowichan, Municipality of North Cowichan. Results are used by the partners to make decisions on required responses to protect fish health and their habitat, hopefully avoiding a fish loss like that of July 2023. CLRSS members have prepared this 'primer' for readers of the weekly report. Watch for weekly reports posted on our website [Updates | Cowichan Lake & River Stewardship Society \(cowichan-lake-stewards.ca\)](https://www.cowichan-lake-stewards.ca) or receive via email if requested to judybrayden@shaw.ca

Background & Rationale

- As a result of the tragic fish mortality event in 2023, the CWB, with resources generously provided by the Pacific Salmon Foundation, organized two “subject matter expert workshops” the spring of 2024 to develop a monitoring plan and a response plan in an effort to avoid similar mortality events moving forward.
- The resulting monitoring program, supported by numerous partners (DFO, BC WLRS, BC MOE, Cowichan Tribes, CVRD, CWB, BCCF, CLRSS, Local stewards and ENGO's) includes 20 grab sampling sites and 7 continuous monitoring stations and has been called “the best riverine WQ monitoring program in Canada) by subject matter expert Dr. Ken Ashley.
- It was identified early on that it would be important to share the outputs of this monitoring program regularly with the broader community so that everyone who lived in the watershed, was affected by the fish kill, and was interested in how “our river was doing” this year, could access the information that was being collected.
- Accordingly we have developed a weekly update that is being distributed through a variety of channels including direct email, posting to our website, and social media platforms

Content

- The weekly update includes information from our “continuous monitoring stations”, which are recording temperature, dissolved oxygen and pH 24/7 at 6 locations:
 - Joe Saysell's
 - Lamb's side channel
 - 70.2 mile trestle
 - Horseshoe bend
 - Upstream of JUB outfall
 - Downstream of JUB outfall
- Joe's place is above all wastewater inputs and is regarded as a 'control'. Levels of Dissolved Oxygen (DO) and pH have generally been “good” at Joe's.

- Each update contains graphic representation of temperature, dissolved oxygen, and pH readings from all stations dating back to the beginning of the sampling program to the present, with a brief explanation of what each is and what kind of readings we'd like to see for a healthy river – and when we should be getting concerned.

Brief Interpretation

Temperature:

- Water temperatures above 16 C are stressful to salmon and trout. Temperatures above 20C are extremely stressful and temperatures above 24° C can be lethal.
- Cowichan River temperatures tend to be on the high side as the river is fed by surface water from Cowichan Lake which warms up with warm & sunny weather.
- During high temperature events, fish tend to congregate in extremely high densities in cold ground water fed refugia in the river.
- River temperature is more closely related to ambient air temperature than flow volume.

Dissolved Oxygen:

- Like us- fish need oxygen in the water to survive. The ability of water to hold oxygen is inversely related to temperature: the warmer the water is the less oxygen it can hold.
- Dissolved Oxygen levels between 8 and 14 ppm are generally regarded as healthy for fish.
- Oxygen levels that fluctuate wildly can be problematic. Diurnal (daily) D.O. fluctuations result from algal respiration. Effects of excessive algal growth on diurnal DO fluctuations can be stressful, and in extreme cases, lethal to fish populations.

pH:

- pH is a measure of acidity and alkalinity. Neutral is 7 with lower numbers being more acidic and higher numbers more basic. A range between 7-8 is best for salmonids.
- Diurnal (daily) pH fluctuations result from algal respiration. Wide diurnal fluctuations indicate excessive algal growth which is harmful and can be lethal to fish populations.
- pH readings approaching 9 are cause for concern. High pH conditions facilitate the transformation of ammonium (NH₄) to ammonia (NH₃) – which is toxic to fish.

What do you do if you see a dead fish?

See a Dead Fish? Here's What to Do

Last summer, we lost 84,000 steelhead in the Cowichan River, with an estimated 100,000+ fish perishing in total.

This wasn't the first time our fish have been in crisis. The Cowichan Watershed Board traces its roots to a drought crisis in 2003 when extremely low flows in the river prevented Chinook salmon from migrating upstream, necessitating physical relocation.

In response to last summer's devastating loss of fish life, the CWB leaders called for action and quickly organized all levels of government to develop community-wide solutions. These included:

- A collaborative monitoring plan to identify problems early on.
- A response plan for partners to take action.
- A communication plan to ensure quick and effective crisis response.

So what can you do if you see dead fish?

Let everyone know! Contact both:

- The Federal Government at "Observe Record Report" (ORR): DFO.ORR-ONS.MPO@dfo-mpo.gc.ca / 1-800-465-4336
- The Provincial Government at the RAPP line: 1-877-952-RAPP

Update on Project 84,000

To date: **75,000 fish images created by over 1200 participants!** *From team members Jennifer Shepherd and Judy Brayden:*

Jennifer: It's beautiful to witness children and adults create with curiosity, compassion, and a dash of courage. The simple act of picking up a crayon and rubbing it across the paper gets their energy flowing. The motion sparks emotion and interesting conversations, questions, and reflection. It's a gift to witness one another in these moments. I feel grateful to everyone engaging wholeheartedly in creating this community memorial together.

Judy: Community art projects are always valuable when they require authentic engagement, and individual community folks making marks as part of a larger body of creators. *Project 84,000* has seen young eyes and old tears, transfixed attention and cathartic results! It has been an immense honour to have worked toward this tremendous goal of 84,000 images. Thank you so much, Cowichan.

What's next?

See us at the Duncan Farmers' Market, Aug. 17 and at the **Quw'utsun Sta'lo' Skweyul** – Sunday September 22nd where we will see the unveiling of the 14 – 50' rolls! A week later the images will be part of the Project 84,000 installation and interactive event at the *Cowichan Valley Arts Council Annex Gallery, 2687 James St., Duncan. September 30th – October 19th*
 Gallery hours: M – Fri. 11:00 – 4:00 and Sat. 12:00 – 4:00



**Please call this number
directly when you see**

**Concerned about an
environmental issue?**

REPORT ALL POACHERS & POLLUTERS

Provincial Government RAPP line

1 877 952 RAPP

THIS BEGINS A REVIEW PROCESS.

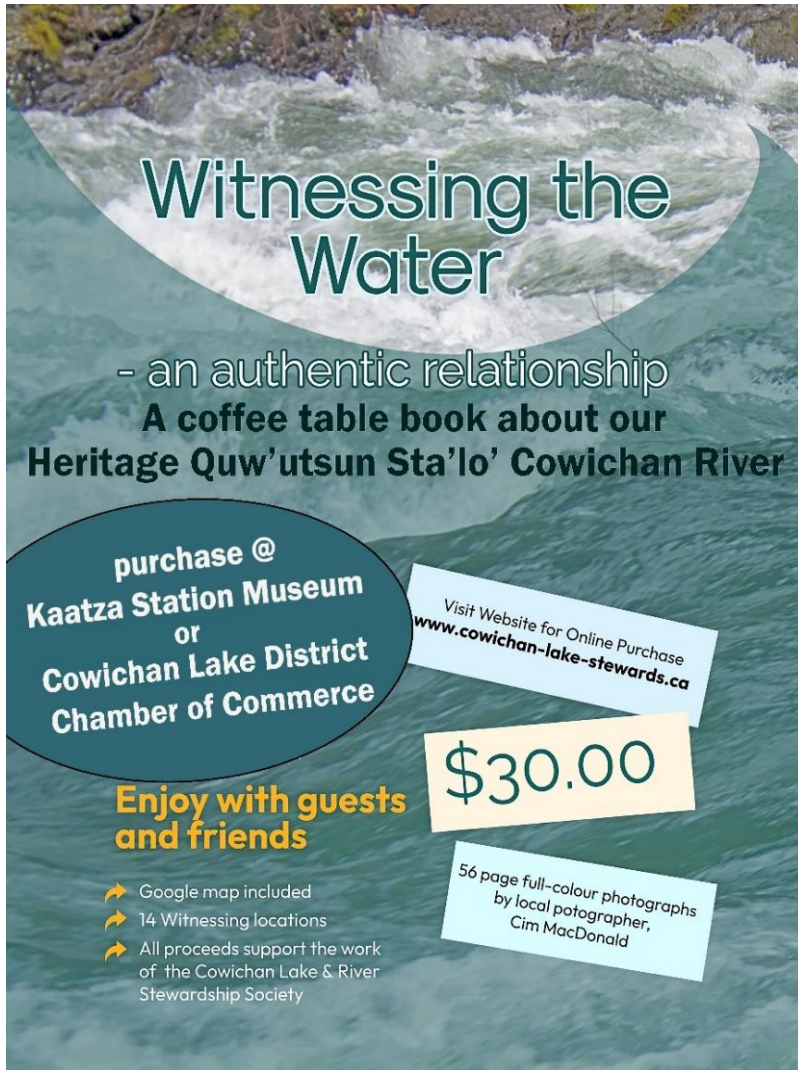
***THE APPROPRIATE
JURISDICTION AND LEVEL OF GOVERNMENT
WILL BE
INFORMED OF THE ISSUE***

**Remember the more people who report an
issue, the greater the response.**

**Ask for a call back to let you know if and
how the issue was
resolved.**



anything that concerns you!



**Witnessing the Water
– an authentic relationship**

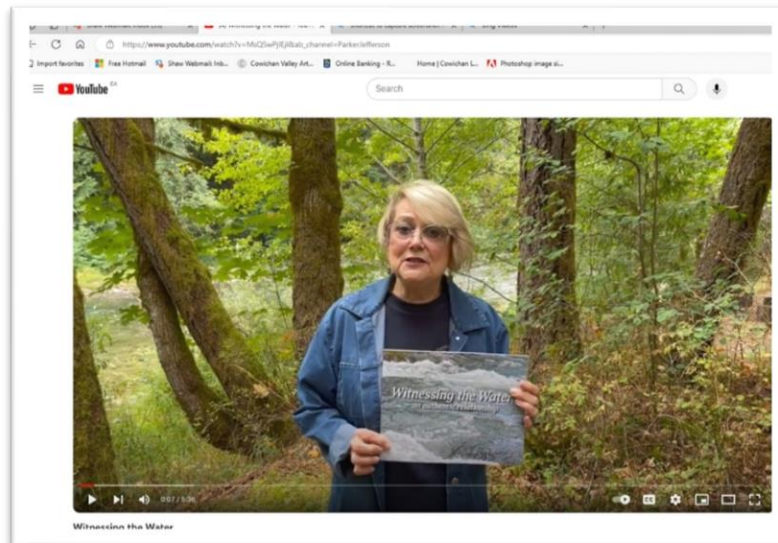
Find your copy at Kaatza Station Museum, Cowichan Lake District Chamber of Commerce, Volume One Books and Ten Old Books in Duncan and online at [W the W | Cowichan Lake & River \(cowichan-lake-stewards.ca\)](http://www.cowichan-lake-stewards.ca)

What readers are saying about the book:

“I just want to tell you this is a magnificent book about our river...it's such a beautiful tribute to this ancient life-giving, sacred water.

Check this out!

**Witnessing the Water
YouTube video thanks to
Parker Jefferson**



https://youtu.be/MsQ5wPjIEjI?si=CyNo_n-17lwpVWuM