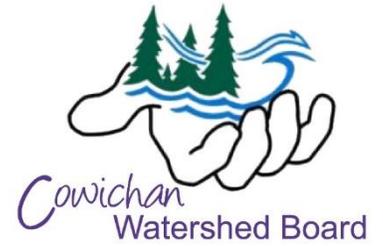


On Target



A guide to the Cowichan Watershed Board's aspirational targets for watershed health



A new relationship between people and water needs to be established to ensure that there will be water supplies for human use, thriving ecosystems and a healthy economy.... both now and in the future.”

Cowichan Basin Water Management Plan, 2007

Origins

Just as capillaries are part of a larger circulatory system in a human body, the smallest seasonal creeks are critical to the health of the watershed in the Cowichan Valley. Caring for the whole organism – the Cowichan watershed – is the local challenge.

A designated Canadian Heritage River, the Cowichan River has sustained the Cowichan Tribes for thousands of years, part of a lake and river system with a catchment area draining nearly one-third of the region. This water resource seems abundant, but residents know they must carefully manage the resource to ensure there is enough for all.

After a drought in 2003, local water use planning was increasingly like crisis management: reactive and not holistic. The drought conditions had people fearing a shutdown of the pulp mill (a major employer in the area), a loss of the native food fishery, inadequate dilution of effluent and restrictions on water use.

Mukw' stem 'o' shilhukw'tul

Hul'q'umín'um' saying that means “Everything is interconnected”

As a result, Cowichan Valley community groups and agencies pushed for proactive policies. In response, the Cowichan Basin Water

Management Forum was created by funding partners Cowichan Valley Regional District, BC Ministry of Environment, Fisheries and Oceans Canada, Catalyst Paper, Cowichan Tribes and the Pacific Salmon Commission. This 28-month planning process (2004-2007) was intended to find a balance between water supply and demand.

After consultation was completed, the Cowichan Basin Water Management Plan (CBWMP) was published in 2007. One of the recommendations was the creation of an advisory council, a local entity to oversee the health of the watershed. The result was the Cowichan Watershed Board (CWB), established in 2010.

Development

The Cowichan Watershed Board (CWB) was developed to address the complex decision-making that is needed in all BC watersheds. Not only does the Cowichan River traverse diverse ecosystems, it cuts through many jurisdictions, including unceded First Nations territories, the Cowichan Valley Regional District (CVRD) and three municipal entities: the City of Duncan, the Town of Lake Cowichan, and the Municipality of North Cowichan. Although it was not given regulatory authority, the CWB was created to provide leadership through partnership, bringing key leaders and representatives together in a collaborative framework.

The membership of the Board was designed to reflect that. Cowichan Tribes and the CVRD co-chair the CWB and each appoint three elected members. Other members are appointed to represent the provincial and federal governments, and areas of watershed expertise for a total of up to 14 board members.

A Technical Advisory Committee (TAC) was then struck to provide the CWB's grounding in scientific expertise and local knowledge. Most major water stewardship groups and scientific agencies became participants in the TAC (or later, in the Technical Working Groups). The committee's mandate is to provide independent, objective advice using its collective expertise to identify watershed issues and to develop workable solutions. The committee recommends only those actions that can be undertaken within the bounds of the CWB's mandate.

Working together in this partnership model, the CWB promotes wise water management practices through monitoring and advocating for watershed health, guiding implementation of the CBWMP, and advising all levels of government. It also engages local people in water management decisions and develops outreach and educational tools to increase public understanding of water stewardship and management. The board has an annual operating budget of \$70,000 that is co-funded by Cowichan Tribes and the CVRD and supplemented by project grants and sponsorships.

Whole-of-watershed Approach

The very foundation for CWB's vision is the notion of whole-of-watershed thinking. This concept aligns with the First Nations saying: Mukw' stem 'o' slhilhukw'tul. Although difficult to translate, this phrase refers to the understanding that "Everything is inter-connected." This philosophy counteracts the modern tendency to fragment environmental decision-making into tiny jurisdictional pieces without recognizing the total impact. By considering the whole watershed in planning and in the development of its targets, the CWB is including freshwater and coastal areas, surface and ground water, and the upstream and downstream activities.

Reconciliation and Co-Governance

Another factor that sets the CWB apart among organizations is the strong co-governance bond created between the CVRD and Cowichan Tribes that has contributed significantly to progress towards reconciliation in the region. The CWB is co-chaired by the Chief of Cowichan Tribes and the Chair of the CVRD and has equal representation in its appointed elected representatives. Co-governance gives the partners equal weight in consensus-driven decision making; considers traditional knowledge as well as new data; and recognizes that both regional and First Nations governments address many of the same issues (e.g. quality of life, water and sewer management, land planning and conservation, environmental monitoring, etc.).

Visions

"We were trying to make the plan come to life," said the CWB's founding coordinator, Rodger Hunter, who co-chaired the technical advisory committee with biologist Cheri Ayers. "If you want people to change, the why is really important. Sterile objectives don't mean a thing."

Creating the CWB was "a leap of faith and it has paid off with a huge benefit to the Cowichan Valley," recalls former CVRD chair, Gerry Giles. "Nothing in our community is more important than protecting our water supply. Signing the agreement (with Cowichan Tribes) was very simple because our goals are the same."

"Water is a shared resource; it is the life blood of our communities," said former Cowichan Tribes Chief Lydia Hwitsum in 2010.

The Targets

The CBWMP included an ambitious and daunting to-do list comprising a vision, six goals, 23 objectives, and 89 actions. However, when local people sat down together with the plan as the newly formed CWB, they decided that a more motivating and inclusive vision was needed to guide implementation. The list had to be refined to form a set of more manageable targets that the community, including Cowichan Tribes, could support. The board examined the PhD

The CWB's best qualities are energy, innovation, respect, collaboration, cooperation and knowledge. Together these support the whole-of-watershed thinking that helps the organization succeed.

*Rodger Hunter
Founding CWB coordinator*

research of Barbara Veale, who explored experiences of several organizations working to implement complex watershed plans. "Rather than focusing strictly on a sequence of steps and a prescribed process, the consideration of a series of context specific questions is advocated to help scope and streamline processes to match stakeholder capacity, address issues of greatest concern, and sustain interest and enthusiasm."¹

The CWB empowered the TAC to explore a targets-based approach. Draft targets were considered for months by the TAC, carefully running each through a set of criteria to arrive at the set that is still guiding CWB today. The targets were intended as aspirational initiatives, distilled into powerful statements that became rallying cries. Efforts were made to make each target tangible, measurable and achievable, either directly or by adding measurable progress indicators.

The original seven targets addressed: protecting and preserving fish populations; adequate summer flows; protecting and preserving riparian habitat; clean water; estuarine health; water conservation; and watershed IQ. These targets reflect all aspects of the watershed's health. Rather than short-term objectives, targets can be viewed as stretch goals. The targets were intended to evolve over time as milestones are reached, and as more knowledge is developed, guided by the TAC. Full profiles on each target are available on the CWB website at www.cowichanwatershedboard.ca.

Target Working Groups

Once the targets were set, the CWB sought out knowledgeable representatives from local stewardship groups, government agencies, industry and the Cowichan Tribes First Nation to guide and implement the targets. Working groups coalesced around each target. These committees represent most of the major partners working in this area, including a mix of staff and volunteer members. They share the whole-of-watershed thinking, crossing jurisdictional lines to support the good of the watershed and community. Initially, there was a working group for each target. However, for added efficiency, some working groups merged to cover two to three interrelated targets.

The working groups stay connected and support each other through the TAC, CWB meetings, and CWB's executive director, who sits on each working group. The current working groups are:

- **Water Quality, Estuarine and Public Health**
- **Fish and Flows**
- **Water Conservation**
- **Outreach and Education**
- **Riparian Health**

¹ Barbara Veale (2010). *Assessing the Influence and Effectiveness of Watershed Report Cards on Watershed Management: A Study of Watershed Organizations in Canada*.

Target: We want to ensure that Cowichan River summer flows are at levels that support the needs of people and fish.

Indicator:

Water reserves in Cowichan Lake are managed such that the rate of flow in the Cowichan River never falls below 7 cubic metres per second (cms).

Rationale

Adequate spring, summer and fall flows in the Cowichan River are essential to ensure a healthy ecosystem and healthy communities in the Cowichan Valley. However, natural water flows, once balanced by our climate, forests, and wetlands, have changed dramatically in 100 years. A reduced snowpack and less rainfall during the summer in recent years means that a new water strategy is required through increased lake water storage. According to recent climate studies by University of Victoria, average summer inflows at Cowichan Lake have declined by 35 per cent between 1955 and 2008 – and this trend is continuing and accelerating.



Healthy flows benefit human communities providing jobs, through industries such as the Crofton mill; locally-grown food; an efficient way to dilute sewage effluent; and recreation and tourism activities, including swimming, kayaking and tubing. In addition, the river must maintain certain minimal levels of flow at various times of year for salmon and the aquatic ecosystem they depend on to thrive. A complex schedule of flows is needed by various fish species throughout the life cycle from egg to returning spawner.

Progress

To revisit earlier findings, in 2016 the Fish and Flows Working Group convened an expert panel to consider optimal flow rates for fish health. This panel included representatives from Cowichan Tribes, federal and provincial governments, the BC Conservation Foundation and recreational fisheries. The year-long process, coordinated by biologist Cheri Ayers, set

Just how much water do salmon need at various life stages in the Cowichan River?

up a target flow model for the Cowichan River, referring to ideal conditions for salmon at all life stages, as well as indicating minimum flows, below which salmon health can be harmed. This foundational work supported the next step - a multi-stakeholder water use planning process for the Cowichan River, directed at developing a strategy to ensure sustainable spring and summer flows for future generations. This process was led by a steering committee with representation from CVRD, Catalyst, Cowichan Tribes and the CWB, and completed in the spring of 2018 with a consensus recommendation of increasing storage in Cowichan

up a target flow model for the Cowichan River, referring to ideal conditions for salmon at all life stages, as well as indicating minimum flows, below which salmon health can be harmed. This foundational work supported the next step - a multi-stakeholder water use planning process for



RIVER FLOWS

Lake by 70 centimeters in a two phased approach in order to address the concerns of all stakeholders. The CWB is now working with partners towards implementation of the recommendations of the Cowichan Water Use Plan

In the Koksilah watershed, which joins the Cowichan watershed at the estuary, the CWB has also successfully engaged the province in monitoring extreme low summer flows to protect critical environmental flows. The CWB is facilitating efforts to support Koksilah watershed water users, particularly large farms, to continue to be profitable with more scarce water resources, including looking for incentives for investing in more efficient watering systems and/or increased water storage.

Monitoring

River flows and lake levels in the Cowichan are closely monitored by a variety of partners. Catalyst Paper, who holds the water storage license associated with the weir, monitors lake levels, with the Water Survey of Canada operating two gauging stations on the river. There are also similar gauging stations on two of the major Cowichan Lake tributaries, Cottonwood creek and Shaw creek. During the spring, summer and fall months the information from these monitoring stations is presented and discussed weekly on a conference call hosted by Catalyst and attended by representatives from all levels of government, Cowichan Tribes, the CWB and stewardship organizations. Recommendations for flow adjustments generated from these conversations are forwarded to the water comptroller. In recent years however, there have been no “good solutions” to summer and fall flow concerns as there is simply not enough water.

Increased monitoring efforts in the Koksilah River are also providing data to inform the tough water management decisions required to balance environmental needs with those of water users.

Next Steps

- Facilitate process to identify conservation water license holder and support the application process
- Help secure funding for weir replacement feasibility and design studies
- Funding and construction of new Cowichan Lake weir as per Water Use Plan recommendations
- Resolution of outstanding stakeholder concerns to allow for utilization of full storage capacity
- Continue partnering with FLNRO on a flow monitoring regime and response for Koksilah River

Target: We want healthy fish populations in the watershed.

Indicator:

Salmon and steelhead pre-smolt abundance in the Cowichan watershed meets or exceeds target population densities set by DFO (Fisheries and Oceans Canada) and FLNRORD (provincial Ministry of Forests, Lands, Natural Resource Operations and Rural Development).

Rationale

Like many coastal BC watersheds, the Cowichan watershed is considered a salmon-driven ecosystem. The massive nutrient load that salmon bring back into the river and shorelines every year when they return from the ocean is akin to adding fertilizer to the garden. Many species feast on the nitrogen-rich fish, eggs, and carcasses, and then cycle those nutrients far upslope. So, protect the fish, and feed the forest.

The fish themselves are also an irreplaceable food and cultural resource for First Nations, an important driver for the recreation and tourism industry locally, and a big part of why the Cowichan is internationally renowned and recognized as a Canadian Heritage River.

A juvenile salmonid indicator was chosen as a measure of watershed health acknowledging that watershed factors only dictate the success of the freshwater component of the salmon life history - we can't control what happens at sea before the adult salmon return! If water quality, water quantity and riparian habitats are healthy enough to protect fish in their juvenile life stages in the watershed, and if there are enough eggs to hatch from returning salmon, then the species should be sustainable. Steelhead¹ were selected for the first target as they spend more time in the river than other types of salmon (up to three years instead of a few days or months for other species), so they are more influenced by watershed factors. Also, unlike chinook and other salmon, they are not targeted by fisheries in the marine environment so the number of adults returning more accurately reflects the health of the watershed.

The working group plans to set targets for species other than steelhead, beginning with chinook, which are of vital importance to Cowichan Tribes and a key indicator of watershed health. Indeed, the health of a whole community was once supported by this iconic species.



¹ Steelhead were considered an anadromous trout until about 10 years ago when they were re-classified as a pacific salmon.

Progress

Progress on this target is closely linked to achievements in the related Flows target due to the interconnectivity between these values (see Flows target profile for more information). Managing river flows is key to meeting this target to ensure adequate conditions for adult migration and spawning, to prevent eggs or alevins (larval salmon still in the gravel) from drying up and to provide enough water for juvenile rearing and downstream migration. These conditions are all supported by the work associated with the Flows target.

Coordinated habitat restoration work in the watershed from the lake tributaries to the estuary has contributed significantly to ensuring sustainable salmonid populations in the river. This whole-of-watershed approach to restoring habitat has recently been bolstered through a \$2.7-million partnership between Cowichan Tribes and Fisheries and Oceans Canada. This work will include extensive riparian restoration in both the Cowichan and Koksilah watersheds,

Governance is the process by which we become the architects of our own future.

*Oliver Brandes
Co-director, POLIS Project on Ecological
Governance, University of Victoria*

major restorative works in the Cowichan Estuary, and the development of a new approach to managing the Stoltz bluffs – a major source of sediment input to the Cowichan River that has been the focus of considerable community effort for over a decade.

As well, a Cowichan chinook rebuilding framework has been developed through extensive engagement of local experts, traditional knowledge and agency professionals. Finally, a coordinated, well-

documented, targeted fry salvage program is implemented annually depending on need and opportunity to effectively re-distribute juveniles to suitable under-utilized habitats.

Monitoring

Steelhead juvenile densities are monitored annually by field crews resourced through a partnership between FLNRORD and the British Columbia Conservation Foundation, with the results being compared to guidelines developed by Provincial staff. As well, chinook salmon are closely monitored on the Cowichan through a partnership between DFO and Cowichan Tribes using a variety of tools including a counting fence, DIDSON sonar monitors, coded transponder tagging (called PIT tags), downstream trapping and a dead-pitch program. In fact, more effort goes into monitoring Cowichan chinook than any other salmon stock on Vancouver Island!

Next Steps

- Complete Cowichan River Water Use Plan (spring 2018)
- Identify a conservation water license holder for the weir at Cowichan Lake
- Secure funding to design and build a higher weir
- Create chinook salmon fisheries target
- Continue partnering with FLNRO on a flow monitoring regime and response for Koksilah River
- Continue to assess and improve salmon and steelhead monitoring programs on Cowichan and Koksilah Rivers
- Continue to implement and assess salmonid habitat restoration works in the Cowichan watershed

Target: We want clean water in our watershed.

Indicators:

- E. coli levels are within acceptable provincial and health authority guidelines for swimming and recreation.
- TSS (total suspended solids, or turbidity) levels in the Cowichan watershed consistently meet accepted provincial water quality objectives.

Rationale

The BC Ministry of Environment (BCMOE) had set water quality objectives for the Cowichan-Koksilah watersheds. Water sampling in repeated years showed failures to meet some of those objectives in some areas, pointing to areas of concern.^{1 2} In addition, there were concerns about swimming closures, and contaminated wells in the lower Cowichan River area.

Progress

Progress on this target is closely linked to achievements in the related targets for estuary health and public health due to the interconnectivity between these values (see related target profiles for more information).

Water quality testing: An early focus for the CWB and its partners was to follow up on BCMOE's observations of pollution levels exceeding the objectives set for the Cowichan-Koksilah rivers³. In 2012 Cowichan Valley Regional District (CVRD) and Cowichan Tribes partnered on a \$200,000 Cowichan Watershed Partnership Project to assess water quality priorities. In 2013 CWB undertook a further round of attainment sampling which has since been repeated a third time, from the headwaters to tidal waters, in 2017 and 2018. Although results have generally been good, samples taken from the lower Koksilah, Cowichan Bay tributaries and Cowichan Bay itself have revealed high levels of phosphorus, turbidity and coliform bacteria. DNA tracking turned up two prominent sources of the coliforms: human and bovine.



¹ McKean, C.J.P. 1989. Cowichan-Koksilah Rivers Water Quality Assessment and Objectives Technical Appendix. Water Management Branch, Ministry of Environment. Victoria, British Columbia.

² CVRD 2010 State of the Environment Report.

³ McKean, C.J.P. 1989. Cowichan-Koksilah Rivers Water Quality Assessment and Objectives Technical Appendix. Water Management Branch, Ministry of Environment. Victoria, British Columbia.

Environmental Farm Plan: After water quality testing revealed issues arising from farm runoff, CWB members visited with local dairy farmers to share large aerial photos pinpointing the extent of coliform contamination. They invited them to a workshop on the issue, held June 19, 2013 and hosted by the BC Ministry of Agriculture (MOA) and the CWB. Entitled "Keeping Your Farm's Runoff Clean," the workshop included information on the autumn 2012 water sampling results; regulations on manure management; tips on maintaining clean runoff; and Washington State's environmental farm plans. This led to a successful Group-based Environmental Farm Plan (GEFP) for dairy producers in the area to identify best management practices and provide funding support to improve nutrient management. A second round of outreach meetings in the Koksilah watershed was carried out in 2018, with participation from the agricultural community, MOA and Fisheries, Lands, Natural Resource Operations and Rural Development (FLNRORD). Water quality monitoring, coupled with support for agricultural education and nutrient management upgrades, is continuing.

Municipal Sewage: The Joint Utility Board (JUB) plans to move the sewage effluent outfall pipe from the Cowichan River to an ocean outfall location. The JUB is a secondary sewage treatment partnership between the Municipality of North Cowichan, the City of Duncan, Cowichan Tribes, and the CVRD. Recent low water levels in the river have challenged the JUB to meet dilution requirements for the treated effluent. Federal funding for the project was announced in 2016. Work is ongoing to resolve this issue.

Monitoring

Regularly testing the water quality throughout the watershed is important to gauge changes over time. In 2017, the CWB conducted a major water quality attainment sampling initiative with local partners to follow up on earlier sampling, and funding is in place to continue sampling into 2018-19. In 2017 this "citizen science" initiative engaged students and volunteers with several stewardship groups to take over 1000 water samples from close to 40 sites in local rivers (Cowichan, Somenos, Quamichan and Koksilah), as well as the south Cowichan area, and over 20 sites in and around Cowichan Bay. The data will supplement the previous attainment sampling, as well as other studies (2010-2012) that assessed water quality after the Cowichan River's Stoltz Bluff was rebuilt in 2006 to keep sediment from destroying spawning beds.

Next Steps

- Ongoing attainment sampling programming delivered in partnership with MOE, local government and ENGOS
- Partner with MOE to create water objectives for Cowichan Bay tributaries and marine environment
- Complete Cowichan water quality attainment reports
- Outreach to Koksilah agricultural community on irrigation and nutrient management
- Report out to greater community on water quality group findings

Target: We want to be able to eat shellfish from Cowichan Bay.

Indicator: Shellfish from designated areas of Cowichan Bay are harvested for human consumption by 2020.

Rationale

Cleaning up the Cowichan estuary so that bivalve shellfish (clams, mussels, oysters, etc.) can be harvested again is a critical target, especially for Cowichan Tribes. Shellfish have been a main food source of the Cowichan people, but there has been a government-imposed harvest closure since 1973 due to pollution concerns. This target was informed by estuary workshops convened by Cowichan Tribes in 2010 and 2011 and promotes a whole-of-watershed approach, looking not only at direct estuary pollutants but also at upstream issues that flow from the Cowichan and Koksilah Rivers as well as feeder streams. “Those clams are the canary in the coal mine,” said Chief Harvey Alphonse.¹



Progress

Progress on this target is closely linked to achievements in related targets for clean water and public health due to the interconnectivity between these values (see those target profiles for more information).

Water quality testing: An early focus for the CWB and its partners was following up on the BC Ministry of Environment’s observations of pollution levels exceeding the objectives set for the Cowichan and Koksilah rivers.^{2 3} In 2012, Cowichan Valley Regional District (CVRD) and Cowichan Tribes partnered on a \$200,000 Cowichan Watershed Partnership Project to assess water quality priorities. In 2013, CWB undertook further water sampling to assess the impact of farming on water quality which revealed extremely high levels of phosphorus, turbidity and coliform bacteria. DNA tracking turned up two prominent sources of the coliforms: human and bovine.

Environmental Farm Plan: After water quality testing revealed issues arising from farm run-off, CWB members visited with local farmers and invited them to a workshop on the issue after sharing large aerial photos pinpointing the extent of coliform contamination. On June 19, 2013, the BC Ministry of Agriculture (MOA) and the CWB hosted a workshop for dairy farmers entitled "Keeping Your Farm’s Run-off Clean." Presentations included: the fall 2012 water sampling results; regulations on manure management; how to keep runoff “clean”; and Washington State Environmental Farm plans. This led to a successful Group-based Environmental Farm Plan (GEFP) for dairy producers in the area to identify best management practices and provide funding support to improve nutrient management. Extensive water quality

¹ Victoria Times Colonist, August 18 2012 “Cowichan Bay Cleanup Begins”
² McKean, C.J.P. 1989. Cowichan-Koksilah Rivers Water Quality Assessment and Objectives Technical Appendix. Water Management Branch, Ministry of Environment. Victoria, British Columbia.
³ CVRD 2010 State of the Environment Report.

monitoring was repeated in 2017-18 and is continuing in the estuarine and lower river areas, coupled with support for agricultural outreach and education.

Better boating: Curbing the impact of human activity in marinas and mooring areas in Cowichan Bay has been an ongoing effort. The CWB's role has largely been to document the problem and encourage action through the Water Quality working group and its partners. To address high coliform levels in the area around the docks, the CVRD brought in regulations on sewer hook-ups for float homes, restricting the amount of untreated sewage entering the bay. In addition, CVRD, along with Cowichan Tribes, DFO and other federal departments, sought to address boat mooring and derelict boats, which were also adding contaminants to the bay. By 2017-18 most derelict vessels had been removed.

Municipal Sewage: The Joint Utility Board (JUB) is a secondary sewage treatment partnership between the Municipality of North Cowichan, the City of Duncan, Cowichan Tribes, and the CVRD. Recent low water levels have challenged the JUB to meet dilution requirements for the treated effluent which flows through an outfall pipe into the Cowichan River. The JUB plans to move the sewage effluent to an ocean location. Federal funding for the project was announced in 2016.

Estuary Education: The Cowichan Estuary Nature Centre, built by the Cowichan Land Trust, is educating residents, visitors and school children about estuary ecology and providing a base for much of the restoration. The CWB contributed funds and support for a three-dimensional watershed display table and wall panels.

Eelgrass Habitats: Nearshore estuary habitats are also important to the overall health of estuary ecosystems, particularly the benthic zone. Through the Cowichan Land Trust, SeaChange, and the Cowichan Estuary Nature Centre, several formerly productive eelgrass beds have been replanted. However, boat propellers and anchor chains were chewing up the new plantings. In 2010 after a citizens group raised concerns, local partners created legally protected zones, using the Vessel Operation Restriction Regulation (VORR) of the Canada Shipping Act. The CWB's Estuary and Water Quality working group helped coordinate this plan and has provided funding for the marker buoys and information brochures.

Clam Garden: In 2018, CWB hired a Cowichan Tribes member to start laying the groundwork for a clam garden pilot project to potentially grow clams in the First Nations tradition.

Monitoring

Regularly testing the water quality throughout the watershed is important to gauge changes over time. In 2017, CWB conducted a major water quality attainment sampling initiative with local partners to follow up on earlier sampling and funding is in place to continue sampling into 2018-19. This "citizen science" initiative engaged students and volunteers with several stewardship groups to take over 1000 water samples from close to 40 sites in local rivers (Cowichan, Somenos, Quamichan and Koksilah), the south Cowichan area, and over 20 sites in Cowichan Bay. The data will supplement previous attainment sampling and other studies (2010-2012) that assessed water quality after Stoltz Bluff on the Cowichan River was rebuilt in 2006 to keep sediment from destroying spawning beds.

Next Steps

- Partner with MOE to create water objectives for Cowichan Bay tributaries and marine environment
- Complete Cowichan water quality attainment report
- Outreach to Koksilah agricultural community on irrigation and nutrient management
- Report out to greater community on water quality findings
- Continued installation of buoys to demarcate eelgrass protection areas
- Brochure to assist partners (RCMP, DFO, Cowichan Guardians) to enforce compliance to protect eelgrass
- Partner with Cowichan Tribes to undertake a clam garden pilot program
- Restoration of tidal channels and restoration of connectivity in estuary

Target: We want to protect and enjoy the benefits of healthy stream, lakefront, and estuary habitats.

Indicators:

- 50% of “intact” riparian habitats protected by 2021
- 10% of impacted riparian habitats restored by 2021

Rationale

Food, shelter and water are considered the basic needs of life; and for everything that lives in the river, those first two needs point to healthy riparian habitats. Instream and shoreline plants and structures (such as logs) provide essential food, cover from predators, shade, and protection from strong currents. These habitats are also like a highway from source to sea, permitting safe travel up and down the river corridor. Riparian habitats can be like the gas stations on a long highway, each one an essential landing pad on the journey.



Barry Hetschko photo

Progress

The riparian working group aims to restore private and park land wherever possible. Eradicating invasive plants and educating homeowners on responsible landscaping are also key factors to success. Plants such as knotweed pose a threat to the ecosystem, so replacing the invaders with native vegetation is vital.

The Cowichan Lake and River Stewardship Society (CLRSS) is an inspiring leader in this work. Through a multi-year shoreline project, the group has made exceptional progress re-establishing natural riparian conditions through planting potted native shrubs and “live stakes” (pieces of re-sprouting native shrubs such as red osier dogwood and willow), restoring over 3,000 square meters of riparian habitat along the lakeshore since 2014. The group is also very involved in education and awareness around the importance of natural shoreline habitats, carrying out an extensive door knocking campaign every summer. Another awareness-raising tool they are using is the Shoreline Steward driveway sign indicating participation in the program. A visible indicator of success is that these signs are popping up throughout the Cowichan Lake area. The group also produced a riparian care and maintenance manual, which is an effective reference for identification and a gardening guide on riparian plants.

Other active partners include Cowichan Tribes and the British Columbia Conservation Foundation (BCCF), which are leading a riparian restoration initiative funded federally through the Coastal Restoration Fund. Almost \$1 million will be dedicated to this work in the Cowichan and Koksilah watersheds from 2017 to 2021. In the summer of 2017, the partners led a project that restored over 2,000 sq. metres of riparian habitat along the Cowichan and Koksilah Rivers.

The riparian working group has a second priority: to develop a generic monitoring system that all Cowichan Valley practitioners could adopt to track riparian restoration data. Again, CRLSS and BCCF are playing a leadership role in this important work. In addition, funding has been received for two Cowichan Valley residents to become certified Green Shores auditors, who can help to assess riparian restoration work in terms of internationally recognized Green Shores standards.

These targets and priorities are ambitious, pushing the CWB riparian group and its partners to take positive steps towards lasting solutions. Its work also includes increasing understanding and engagement through hosting events such as a recent forestry tour and forest hydrology workshop.

Monitoring

Thanks to funding from a variety of sources, Cowichan partners including Cowichan Tribes, Cowichan Lake and River Stewardship Society and the British Columbia Conservation Foundation continue to be actively engaged in riparian restoration on a watershed scale. In order to monitor and maintain these works, extensive inventories of restored sites – and sites that still require restoration – are being created. All areas that have been restored are assessed annually and recently restored sites are irrigated using fire pumps during the dry summer months to ensure the young plants survive their critical first summer.

Next Steps

- Continued riparian inventory, restoration and monitoring in the Cowichan and Koksilah watersheds including common riparian monitoring protocols and data base
- Invasive exotic riparian management workshop
- Funding campaign for riparian habitat purchase including critical Shaw creek area

Along the shores of local waterways lurks a plant that is on BC's top-10 worst invasive list: Japanese knotweed. Setting a strategy to manage this plant invader is one of the goals of the Cowichan Watershed Board's riparian working group.

Said one riverfront property owner, "There was one stalk of Japanese knotweed sticking out of the ground. I pulled it out and thought, there, it is done." Then she saw another shoot coming up about three metres away. That's when she recognized she was waging a battle with an underground enemy – the plant's extensive root system.

Not only does knotweed grow taller than many native plants, it also gets a head start in the spring, shading and stunting the others such as willow and young cottonwood that offer salmon a cool habitat when the water level rises in the fall. Then the knotweed dies back, exposing previously shaded areas just as salmon swim upriver to spawn. Salmon are seriously affected but so are species such as the screech owl that nests in cottonwood trees.

Target: We want Cowichan watershed residents to increasingly know and value their watershed. We can't fully value what we don't understand.

Indicators

- All Grade 4/5 students are provided with a hands-on watershed experience.
- Cowichan residents increasingly know and value their watershed.

Rationale

The Cowichan Watershed Board (CWB) is seeking a sustainable future for the people and ecosystems of the Cowichan watershed. Supporting that vision over the long term requires a deeper understanding of the interconnectivity between our quality of life and the health of the watershed that supports us. It also requires public confidence and support in the CWB leadership, management plan, and activities. As such, the CWB and its many partners are working to build “watershed intelligence” (or IQ) through classroom programs, guest lectures, watershed tours, citizen science, public meetings, and more. Engaging children is about building early connections to nature through watershed experiences. To attempt to reach every child, the partners in the Watershed IQ working group decided to focus on one grade level, choosing Grade 4/5 based on the public school curriculum.



Progress

Watershed Tours: Based on the idea that “seeing is believing,” CWB has hosted dozens of full-day guided bus tours, starting with the weir and shorelines of Cowichan Lake to the estuary at Cowichan Bay. Tour guests learn about the ecology, challenges, successes and politics of keeping the Cowichan watershed healthy.

Public lectures: Since 2014, through a partnership with Vancouver Island University’s Cowichan campus, CWB has co-hosted a monthly speakers series, providing free public lectures by experts on relevant watershed issues. The Cowichan Valley Naturalists and Cowichan Stewardship Roundtable similarly host monthly lectures, and the Cowichan Estuary Nature Centre offers films and other educational events.

Classroom Coordination: The CWB's watershed IQ group seeks to identify gaps and opportunities for collaboration between the many environmental education programs offered by groups such as the Cowichan Lake and River Stewardship Society (CLRSS), Cowichan Land Trust, DFO, the Cowichan Lake Salmonid Enhancement Society, Cowichan Valley Docents, and the Cowichan Green Community. The group works with classroom teachers to get all children out for a watershed experience at least once during elementary school. Work is ongoing to streamline this effort so that all children connect with their watershed during these formative years.

Shoreline Education: The Cowichan Shoreline Stewardship Project was initiated in 2014 to engage and educate residents about riparian areas. Volunteers from the CLRSS visit shoreline owners to explain the benefits of natural vegetation. A survey measured owners' knowledge of riparian protection bylaws and attitudes about balancing their recreational needs with the ecological value of retaining natural shoreline vegetation. Restored sites were used as demonstration areas for riparian tours to engage a wider audience including media, politicians and other property owners. As a result, now property owners are approaching CLRSS to have their properties restored, instead of volunteers having to reach out to the property owners.

River Clean-up: For 10 years, annual river clean-ups encourage citizens to get their hands wet at one of two coordinated full-day events. The CLRSS organizes a Cowichan Lake clean-up, and the CWB and Cowichan Tribes co-host the lower river clean-up. About 200 volunteers turn out annually to help remove litter and debris from the river and shorelines.

Next Steps

- Continue to develop tools and protocols to improve lines of communication/working relationships between aquatic environmental educators in Cowichan Valley
- Write grant proposal for funding to allow for full school district participation in salmon education watershed field trips

Fisheries technician Bob Crandall receives heartfelt letters scribbled by students after his presentations at the educational salmon hatchery at Lake Cowichan. Crandall is one of many independent educators teaching hands-on stewardship.

Every autumn, they meet science teachers in the Cowichan Valley at a mini-conference, reminding them of the potential resources to add to their lesson plans. These resources include DFO's Stream to Sea programs such as storm drain marking and the Salmon in the Classroom modules. The goal is to encourage stream stewardship, classroom salmon incubation and public participation.



WISE WATER USE

Target: We want Cowichan watershed residents to use water wisely.

Indicator:

- Annual residential water consumption is reduced by 20%, or less than 263 litres per person per day by 2018.

Rationale

The changing climate in the Cowichan region was the driving force behind a call to use water more wisely. Water shortages during summer and fall threaten salmon survival, local food growing, water quality, river-based recreation, local businesses, and in some cases, even residential water supply.

Although residential water use is a small percentage of local water consumption compared to industrial and agricultural uses, the CWB chose a residential target based on the “trickle up” theory: if we teach residents to notice and correct small leaks at home, they will bring that culture of conservation to the region’s workplaces.

Studies show that Canadians use far more water than residents in most other countries with similar living standards, proving we could live well on less water. Also, much of the water “use” in Canada is water waste from leaky pipes and taps, and that the amount of water waste can be correlated to water pricing. When prices go up, waste goes down!

Wasted water has many costs, from higher infrastructure and energy costs for water providers (and ratepayers), to dry wells and critically low river flows in some areas. With the increasing trend towards summer drought, coupled with an ever-growing population, it’s time for a culture of conservation.

This target was inspired by success in the Town of Ladysmith, where residents reduced their total water use by about 25% between 2002-2013, while the population grew by 20%. Ladysmith’s average residential water use at that time was 263 litres/person/day, so the challenge was to “meet or beat” Ladysmith!

Progress

In July 2014, the CWB launched the Cowichan Water Conservation Challenge with superhero Water Woman bursting onstage with regional leaders in downtown Duncan during the community’s annual summer festival. The Challenge is a five-year initiative to track and reduce residential water use.

CWB member David Slade, a local well-driller and groundwater expert, made presentations to all local governments and major water suppliers that spring, asking them to join the challenge. The seven largest water providers all signed on to



the challenge and have been meeting annually, collaborating on water conservation bylaws during drought, and reporting their progress. The partners are Municipality of North Cowichan, City of Duncan, Cowichan Valley Regional District, Town of Lake Cowichan, Town of Ladysmith, Cowichan Bay Water District and Mill Bay Water District. Each partner has been working to reduce water consumption through actions like education, tiered water rates, monitoring for leaks, and improvements in outdoor watering bylaws. The CVRD ran a major public awareness campaign making the link between water use and the new normal in climatic conditions.

In addition, the CWB's superhero program has been sending a variety of masked comic-book-style crusaders such as Water Woman, Flo, Raindrop and Leaky Hoser to public events, children camps, and participating storefronts since 2014. Rallying cries like "it's hip to fix a drip" focus on valuing every drop, and the superhero approach framed the effort as an urgent but feel-good way for people to act in a

seemingly daunting situation. In 2017, comedic spokespeople, the Cowichan Hosers, appeared in lumberjack shirts, Cowichan knit toques to encourage people to fix leaky garden hoses.

Calculations show that for every 100 leaky hoses

fixed, approximately 1 million litres of water will be saved seasonally. By fixing a dripping hose once, residents will likely notice and fix drips in the future, so the benefits will "trickle up."

We are not happy with the status quo, so as people who live here, we have a responsibility to change that.

Tom Rutherford

In 2017, the group added a "Capture the Rain" campaign, bringing the macro-story home through classroom presentations and workshops to Slow your Flow (drip irrigation) and Grow your Flow (rainwater harvesting). While the Fish and Flows working group focused on watershed-scale rain storage through raising the height of the weir at Cowichan Lake, the Water Conservation group urged residents to do the same thing at home. Media articles and editorials profiled local people who are taking the lead, demonstrating a wide variety of ways that people are capturing spring rain to mitigate increasingly dry summer conditions. **More info: www.cowichanwaterchallenge.ca**

Monitoring

Annual residential water use statistics are collected from the seven participating Cowichan Water Challenge water purveyors every spring. Highlights of the 2017 consumption results (compared to 2013 values):

- Municipality of North Cowichan – down by 4%
- Mill Bay Waterworks – down by 4%
- Cowichan Bay Waterworks – down by 27%
- Town of Ladysmith – down by 18%

(2017 statistics were not available from Cowichan Valley Regional District, City of Duncan or Town of Lake Cowichan)

Next Steps

- Assess success and lessons from Cowichan Water Conservation Challenge, ending in 2019
- Continue public outreach and education initiatives targeting water conservation practices and strategies
- Work with public utilities, government and business partners to implement larger scale and systemic improvements, such as building code allowances for greywater, development permitting that requires rainwater capture, and financing for water conserving technologies