

2018-2019 ANNUAL REPORT



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INTRODUCTION

Living Lakes Canada works to enhance the protection, the restoration, the rehabilitation, and the health of watersheds in B.C. and across Canada.

We build capacity through community-based water monitoring to help address climate impacts. We promote and facilitate cross-sector collaboration and research to increase water literacy, and support progessive decision-making for improved water stewardship. Our successful leadership and stewardship templates have supported the creation of many other grassroots water stewardship groups.

Living Lakes Canada has received multiple water stewardship awards, and has been recognized by the federal government as a "best practices" example in community-based ecological monitoring in Canada.

Living Lakes Canada is the recipient of two 2017 Water's Next Awards (Water Steward of the Year and Non-Government Organization Winner), and was featured in the March/April 2019 issue of *Water Canada* magazine for work as one of Canada's top water stewards.

Living Lakes Canada is a registered charity and affiliated with Germanbased Global Nature Fund's Living Lakes International, a global network of organizations that share the same mission: to enhance, protect, restore and rehabilitate freshwater areas around the globe.

This annual report covers Living Lakes Canada activity in our 2018-2019 fiscal year, from October 1, 2018 through to September 30, 2019.

Collaborating to protect water in a changing climate.





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MESSAGE FROM THE EXECUTIVE DIRECTOR

Climate-challenged times are affecting the quality and quantity of water in British Columbia, Canada and around the world. The cumulative impacts from human land use, climate-exasperated forest fires, drought and floods on our lakes, rivers, wetlands and aquifers is alarming.

At times, working to protect life-supporting freshwater ecosystems and build climate resiliency into our communities can feel overwhelming. For the most part, though, we regard this work as a paradigm-shifting opportunity for collective problem solving.

Living Lakes Canada is fortunate to have an energetic, passionate team of dedicated individuals who understand the limitations of current constructs and who strive to make the changes needed on whatever scale that can make a difference. For us, this scale is mainly in the grassroots work of engaging and training Indigenous and non-Indigenous community groups to monitor and collect water data from streams, lakes, wetlands and groundwater wells. Water stewardship empowers communities to engage and take an active role in the health of their watersheds, which impacts their own well-being.

Our work to normalize water stewardship in B.C. and across Canada allows us to partner with and be supported by amazing people. With deep gratitude to our team, our board, our advisors, our funders, our partners and our collaborators — thank you!

"Courage has nothing to do with our determination to be great. It has to do with what we decide in that moment when we are called upon to be more."

~Rita Dove

Jel Haly

Kat Hartwig Living Lakes Canada Executive Director



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2018-2019 HIGHLIGHTS



COLUMBIA BASIN WATER MONITORING COLLABORATIVE

The Columbia Basin Water Monitoring Collaborative (Monitoring Collaborative) is the applied iteration of the Columbia Basin Water Monitoring Framework and Data Hub Initiative that got underway in November 2017 when Living Lakes Canada co-hosted the "Cracking the Code in 3D: Water Data Hub and Monitoring Framework" conference in Invermere, BC to envision a water monitoring framework for the Columbia Basin.

The conference was a follow up to the 2017 Columbia Basin Trust report *Water Monitoring* and *Climate in the Upper Columbia Basin: Summary of Current Status and Opportunities* in order to set the stage for coordinated water data collection and applied decision making for the Canadian Columbia Basin.

The first in-person Monitoring Collaborative Steering Committee meeting was hosted

by Living Lakes Canada on November 20, 2018 in Cranbrook, BC. The 50-member cross-sector communities, all levels of government, academia and industry — shared its expertise to shape the first draft of the Monitoring Collaborative Guidance Document.

In 2019, research was conducted on database models used by industry, governments, Indigenous and non-Indigenous communities, and non-profit organizations to assess what would best meet the Monitoring Collaborative's open source database needs.



A Columbia Basin Water Monitoring Collaborative's Steering Committee meeting in Nelson, BC. LLC Photo

It is expected the Monitoring

Collaborative's database will be operational for all users by early Spring 2020.

The monitoring scope of the Monitoring Collaborative has been directed by the Scientific Sub-Committee to best address the water knowledge gaps identified in the Columbia Basin Trust report *Water Monitoring and Climate Change in the Upper Columbia Basin: Guidance Information for Planning Monitoring Programs.*

It was decided that conducting a water balance study would be the most beneficial to support future water budgeting and allocation decisions, with monitoring implementation to begin in Spring 2020

STREAM EDNA DATA SEQUENCING

The STREAM (Sequencing the Rivers for Environmental Assessment and Monitoring) project is a national community-based water monitoring initiative that involves the collection of benthic macroinvertebrates from rivers across Canada. STREAM is a collaboration between Living Lakes Canada, World Wildlife Fund-Canada (WWF-Canada), Environment and Climate Change Canada (ECCC) and the University of Guelph. The project works with interested partners — including Indigenous and non-Indigenous communities, water stewardship groups, academia, all levels of government and industry — to collect data for stream health assessments.

This project uses a modified version of the Canadian Aquatic Biomonitoring Network (CABIN) protocol developed by ECCC for biomonitoring using benthic invertebrates — the small animals on the bottom of streams and rivers. Benthic invertebrates are strong indicators of water quality since the small organisms included in this group are highly sensitive to pollutants and other changes that impact aquatic ecosystem health. Benthic samples are analyzed using the new technology of DNA metabarcoding developed by the University of Guelph.





The logos for STREAM (top) and CABIN (bottom, in English and French)

In 2019, University of Guelph received a grant from Genome Canada to support free DNA metabarcoding sample analysis for

Canadian watersheds for three years, with the goal of collecting 1,500 samples from 15 nationally distributed watersheds (5 watersheds per year) using community-based water monitoring (CBWM). Participants in the project learn stream health assessments and open sourced data inputs and access, while using new, more cost-effective technology.

In partnership with WWF-Canada, ECCC and University of Guelph, Living Lakes Canada delivered Year 1 of the STREAM project, which focused on 5 priority watersheds in 2019: the Columbia Basin, the Skeena, and the Peace-Athabasca in British Columbia, the Bow Valley in Alberta, and Lake Huron and Sudbury in Ontario.

Overall, the Year 1 results are:

- Completion of 5 successful CABIN & DNA Metabarcoding trainings:
 - 1. Columbia Basin Nelson, BC: 18 participants
 - 2. Skeena Basin Smithers, BC: 8 participants
 - 3. Bow Valley Basin Canmore, AB: 18 participants at 3 sample sites: Bow River channel, Spray Lakes Road, Waiporous
 - Peace-Athabasca Basin with Blueberry River First Nation Fort St. John, BC: 12 participants at 4 sample sites: Upset Creek, Blueberry River, Fox Creek
 - 5. Great Lakes Basin Sudbury, ON: 15 participants
- Outreach to over 78 different community-based monitoring groups in Western Canada promoting the STREAM project.
- Sample collection by 17 groups at roughly 81 different sites.

The free data analysis has given some groups the means to start a new monitoring program while simply strengthening others. The Living Lakes Canada STREAM team offered various levels of assistance with study design, shipping logistics, equipment allocation, and CABIN-certified sampling.



There is increased demand for the 2020 Year 2 field

season. Groups that expressed interest in Year 1 but could not commit have requested trainings for Year 2.

For more information on the STREAM partnership:

 https://livinglakescanada.ca/new-multimillion-dollar-partnership-to-revolutionizefreshwatermonitoring/

For more information on the ECCC-CABIN protocol and biomonitoring, visit:

 https://www.canada.ca/en/environment-climatechange/services/canadian-aquaticbiomonitoringnetwork.html

For the STREAM project website, visit:

https://stream-dna.com/



Top: Living Lakes Canada STREAM Coordinator Raegan Mallinson demontrates benthic collection at the Sudbury, ON CABIN-STREAM training in September 2019. LLC Photo

Middle: Lake Windermere Ambassadors Program Coordinator Shannon McGinty incorporates a kicknet procedure into her water monitoring protocol as part of the STREAM project. LLC Photo

Bottom: Participants sampling one of 4 sites in the Canmore, AB CABIN-STREAM training in July 2019. Ghost Watershed Alliance Society Photo



CABIN & INDIGENOUS KNOWLEDGE

Living Lakes Canada is one of the only Canadian NGOs trained by Environment and Climate Change Canada to train Indigenous and non-Indigenous community groups, professionals and industry in the CABIN (Canadian Aquatic Biomonitoring Network) methodology, the most widely used national water monitoring protocol to assess stream health.

Thanks to experience in the field with First Nation communities and mentoring from Canada's top water scientists, we have learned to develop and deliver successful citizen science community-based water monitoring initiatives. We partner with First Nation communities in B.C. to simultaneously interweave traditional Western science (using the standardized CABIN protocol) with Indigenous Knowledge, such as recording culturally significant historical sites and observation of species of concern with local nations as the first stages of a cultural preservation project.

The 2019 CABIN-STREAM field season included workshops with:

- Blueberry River First Nations in the Peace-Athabasca watershed and;
- the member nations of the Environmental Stewardship Initiative in the Skeena Basin including Lake Babine Nation, the Wet'suwet'en Nation, Gitanyow Fisheries Authority and Gitxsan Environmental Services.

A pilot training and monitoring project for STREAM took place in the Liard Basin in October 2018 with the Dena Kayeh Institute and the Dane Nan Yế Dāh Kaska Land Guardian program, and was featured in Canadian Geographic in 2019:

 https://www.canadiangeographic.ca/article/its-very-core-everything-significance-canadaswild-rivers

Living Lakes Canada will continue to link Indigenous Knowledge and Western science for informed decision-making on joint watershed health evaluation and stewardship, effectively working toward on-the-ground examples of applied reconciliation.



The Dane Nan Yế Dāh Land Guardian program celebrate graduating the 2-day CABIN field practicum in the Liard River Watershed hosted by Living Lakes Canada in partnership with WWF-Canada for the Dena Kayeh Institute. LLC Photo

CBWM NATIONAL ROUNDTABLE

Living Lakes Canada — in partnership with The Gordon Foundation, the World Wildlife Fund-Canada, Environment and Climate Change Canada and Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) — convened a National Roundtable gathering in Ottawa, ON on November 27 - 29, 2018.

The goal of the Roundtable was to bring together Indigenous and non-Indigenous community water stewardship groups, academia, all levels of government and industry (either involved or interested in) community-based water monitoring (CBWM). CBWM is building momentum across Canada. A national scan conducted by Living Lakes Canada, Simon Fraser University and University of Acadia revealed that CBWM had grown three-fold within 10 years (visit https://livinglakescanada.ca/wp-content/uploads/2018/12/CBWM-Survey-Highlights-Feb-2018.pdf).

Across all sectors, Canadians are collaborating to build local water monitoring programs

to better understand the state of local watershed health and build climate resiliency into their communities and ecosystems. The growth of CBWM programs across Canada presents an opportunity for the Government of Canada to simultaneously advance a number of its core priorities.

There are already significant investments across Canada, including programming led by Environment and Climate Change Canada, Department of Fisheries and Oceans and Crown-Indigenous Relations and Northern Affairs Canada. To make the most of these investments, efforts are needed to ensure programming across federal departments is well-coordinated.

The key objective of the Roundtable was to identify actionable steps the federal government can take to show leadership and support in advancing CBWM of freshwater ecosystems in Canada. Context documents and case studies of successful CBWM from across Canada and elsewhere around the world were presented and peer-reviewed to create final recommendations for the Government of Canada.

The Roundtable discussion paper can be found here:

 https://livinglakescanada.ca/wp-content/ uploads/2019/04/CBWM-Discussion-Paper.pdf

For the Final Recommendations, visit:

 https://livinglakescanada.ca/wp-content/uploads/2019/04/CBWM-Roundtable-Recommendations-Final-Single-Page.pdf

For the featured CBWM case studies, visit:

https://livinglakescanada.ca/wp-content/uploads/2019/04/Case-Studies-Final-Spreads.pdf



Living Lakes Canada Executive Director Kat Hartwig speaks at the National Roundtable gathering in Ottawa in November 2018 that was co-hosted by Living Lakes Canada, The Gordon Foundation and WWF-Canada. LLC Photo

COLUMBIA BASIN GROUNDWATER MONITORING PROGRAM

The Columbia Basin Groundwater Monitoring Program is increasing our knowledge about groundwater in the Upper Columbia Basin by partnering with well owners to monitor groundwater levels. The program provides training, field support, data management and

analyses, and helps secure, manage and maintain equipment for well owners and communities to monitor groundwater levels. The data show how groundwater levels change seasonally and from year to year. This can help communities be better prepared for seasonal variations and the effects of climate change. The data are shared publicly so they can be used by researchers, water managers, water licensing officers, policy makers and citizens to protect and manage our groundwater resources.

In the Canadian Columbia Basin, we know that groundwater is important for maintaining water levels and water quality in wetlands, streams, rivers and lakes, which are vital for human use and healthy ecosystems. Groundwater is also used for domestic, industrial and agricultural purposes, and demand is increasing. Careful management and allocation of groundwater is becoming increasingly important as populations continue to grow and pressures such as climate change intensify. The details about how and to what extent climate change, groundwater withdrawals and land use are affecting groundwater resources in the Basin remains unclear due to a lack of mapping, monitoring and analyses.

Our Groundwater Monitoring Program collects groundwater level data, engages partners and citizens in the collection of data to increase knowledge and awareness about groundwater, and shares the data publicly so that it can be used to inform groundwater protection and management.



Well owners volunteer their wells to be part of the Columbia Basin Groundwater Monitoring Program. LLC Photo



Key accomplishments of the program to date include:

- Collection of groundwater level data from 13 wells in the Upper Columbia Basin;
- Development of data management tools to analyze and present groundwater level and temperature data and compare to other hydrological parameters such as precipitation;
- 5 data sets are shared publicly on the Provincial Government's BC Real Time Data Website
- (https://www2.gov.bc.ca/gov/content/environment/airland-water/water/water-science-data/water-data-tools/ real-time-water-data-reporting); and
- Transitioning to BlueTooth data loggers, which allow for more efficient data collection and for well owners to access data via a smartphone or tablet.

Groundwater Monitoring Program Manager Carol Luttmer gathers results from a test well with Summer Intern Ashley Dubois. LLC Photo

FORESHORE INVENTORY MAPPING & KOOTENAY LAKE PARTNERSHIP

Foreshore Inventory Mapping (FIM) is a methodology developed in partnership with Fisheries and Ocean Canada in 2004 (FIM was formerly known as Sensitive Habitat Inventory Mapping — SHIM). It provides decision makers, planners, developers, landowners and government agencies with the tools required to make sustainable foreshore development and land-use decisions that take into account cumulative impacts on fish and wildlife habitats. The resulting Shoreline Management Guidelines help direct shoreline development such as docks, retaining walls and marinas in a manner that will protect the areas of highest ecological value.

The Kootenay Lake Partnership (KLP) is a government-to-government, multi-agency initiative chaired by Living Lakes Canada that aims to develop integrated and collaborative

approaches to lake management. Members of KLP include the following agencies: Fisheries and Oceans Canada, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Ministry of Transportation and Infrastructure, Okanagan Nation Alliance, Ktunaxa Nation Council, Yaqan Nukiy Band, City of Nelson, Village of Kaslo, Interior Health Authority, and the Regional District of Central Kootenay. Additional partners include the Friends of Kootenay Lake, Slocan Lake Stewardship Society, Underwater Archaeology Society of BC, and Kootenay Lake Waterfront Property Owners Society.

KLP completed a Sensitive Habitat Inventory Mapping project for the entire lake, and the resulting Shoreline Guidance Document now contributes to a better understanding of the ecological values of the shoreline and directs shoreline development in a manner that will protect those values. Similar projects have been completed for 12 other lakes in the Columbia Basin:

- Lake Windermere
- Columbia Lake
- Wasa Lake
- Moyie Lake
- Monroe Lake
- Jimsmith Lake



Living Lake Canada chairs the Kootenay Lake Partnership, which has a precedent-setting Shoreline Guidance Document incorporating Indigenous cultural values as well as ecological values. LLC Photo

- St. Mary's Lake
- Tie Lake
- Rosen Lake
- Lake Koocanusa (transboundary reservoir)
- Slocan Lake
- Brilliant Headpond

Notably, Kootenay Lake is the first project that has incorporated archaeological and Ktunaxa Nation cultural values within its Shoreline Guidance Document, setting a precedent to meaningfully recognize and protect Indigenous values in the area.

Living Lakes Canada has also expanded FIM work beyond British Columbia, leading FIM projects for Lac la Biche in Alberta and the South Basin of Lake Winnipeg.

Efforts are underway to review and revise the methodology, and re-FIM previously completed lakes to assess the rate of change of the shoreline.

Visit www.kootenaylakepartnership.com.

LAKE & WETLANDS CONSERVATION AND MANAGEMENT

In 2018, the BC Ministry of Environment & Climate Change Strategy contracted the BC Lake Stewardship Society (BCLSS) to develop an integrated framework that incorporated the BC Lake Stewardship and Monitoring Program (the existing BCLSS volunteer monitoring framework) with the BC Lake Monitoring Network. Existing lake monitoring programs in B.C. were reviewed to ascertain whether they could contribute to an integrated monitoring framework. A joint proposal was developed by the BCLSS and Living Lakes Canada.

To access *An Integrated Lake Monitoring Framework for British Columbia Summary* prepared by BCLSS and Living Lakes Canada, visit the link below:

https://livinglakescanada.ca/wp-content/uploads/2018/12/Summary-Report-Final.pdf

The Columbia Wetlands System, which stretches 180 kilometres along the Rocky Mountain Trench from Canal Flats in the south to the head of the Mica Reservoir just north of Donald, is one of the largest wetland complexes in North America and provides important ecological services to the Columbia Valley and beyond. The land tenure is a complex mix of public and private lands. Due to the ecological importance of the Columbia Wetlands and the variety of land tenures, management of these wetlands is multifaceted involving many different jurisdictions.

Living Lakes Canada is an active member of the Columbia Wetlands Stewardship Partners (CWSP), which has compiled a database of reports related to the Columbia Wetlands. A review of this database prepared by Living Lakes Canada identified almost 100 management plans related to the Columbia Wetlands.

To access the *Synthesis of Local and Regional Conservation & Management Goals & Objectives for the Columbia Wetlands* report prepared by Living Lakes Canada for CWSP, visit the link below:

 https://livinglakescanada.ca/wp-content/uploads/2019/04/Synthesis-of-Local-and-Regional-Management-Plans_Feb-24-2018-1.pdf



The Columbia Wetlands with the BC Rockies in the background. Pat Morrow Photo

LIVING LAKES INTERNATIONAL WORLD WETLANDS CONFERENCE

On May 7 - 9, 2019 in Valencia, Spain, the global Living Lakes Network marked its 20th anniversary with the 15th International Living Lakes Conference. The conference, titled the "World Congress for Wetland and Lake Restoration", was based on the theme of Living Lakes – Business and NGO Partnerships for Climate Change Mitigation and Adaptation.

Five Living Lakes Canada team members attended the conference. Highlights included visiting local wetland restoration sites and connecting with Living Lakes International partners to share best community-based water stewardship practices.

The Living Lakes International Network was created by the Global Nature Fund in 1998 and is steadily growing. Currently 111 members from almost 50 countries belong to the network. The network members are highly diverse, from small grassroot NGOs to large organizations, corporations, and governments.

Visit the following link to read an account of the conference by one of the participating Living Lakes Canada team members:

https://livinglakescanada.ca/journey-to-spain-perspectives-passion-and-paella/





Top: Over 200 international delegates from 41 countries attended the Living Lakes International Conference on lakes and wetlands in Valencia, Spain.

Left: Living Lakes Canada team members presenting at the 15th International Conference on Lakes & Wetlands in Spain. Starting second from the left: Avery Deboer-Smith, Claire Pollock-Hall, and Raegan Mallinson.

LLC Photos

BUDGET PROFILE



This chart covers Living Lakes Canada's fiscal year from October 1, 2018 to September 30, 2019. Find our full audited financials at: www.livinglakescanada.ca

COMMUNICATIONS PROFILE



ACKNOWLEDGEMENTS

We would like to acknowledge our Collaborators, Partners and Mentors:

- Adventure Scientists
- Advisian
- Alberta Lake Management Society (ALMS)
- Alberta WPACS
- Arrow Lakes Environmental Stewardship Society
- Astra Earth
- Atlantic DataStream
- BC Lake Stewardship Society
- Bighill Creek Preservation Society
- Blueberry River First Nations
- Canadian Conservation Corps
- Canadian Freshwater Alliance
- Carl Data Solutions
- Chesapeake Monitoring Collaborative
- Columbia Basin Watershed Network
- Columbia Wetlands Stewardship Partners
- Creston Valley Wildlife Management Area
- Crown-Indigenous Relations and Northern Affairs
 Canada
- Environment and Climate Change Canada
- Environmental Stewardship Initiative
 - Ts'il Kaz Koh First Nation (Burns Lake Indian Band)
 - Lake Babine Nation
 - Gitxsan Nation
 - Gitxsan Environmental Services
 - Gitanyow Fisheries Authority
 - Office of the Wet'suwet'en
- First Nations Fisheries Council
- Fisheries and Oceans Canada
- Flathead Lake Biological Station University of Montana
- FlowWorks
- Friends of Kootenay Lake
- Friends of the Lardeau River
- Genome Canada
- Ghost Watershed Alliance Society
- Global Nature Fund Living Lakes International
- Global Water Futures
- Government of Northwest Territories
- GW Solutions
- I4C
- Integrated Ecological Research
- Junction Creek Stewardship Committee

- Kootenay Conservation Program
- Kootenay Lake Partnership
- Ktunaxa Nation ?aq'am Community, Akisqnuk First Nation
- Lake Windermere Ambassadors
- Lake Winnipeg Foundation
- Mackenzie DataStream
- Microsoft
- Miistakis Institute
- Ministry of Environment and Climate Change Strategy
- Ministry of Forests, Lands, Natural Resource Operations and Rural Development
- Nature Conservancy of Canada
- North Amercian Lake Management Society
- Okanagan Nation Alliance
- Our Living Waters
- Parks Canada
- POLIS Project on Ecological Governance
- Regional District of Central Kootenay
- Regional District of East Kootenay
- Regional District of Nanaimo
- Salmo Watershed Streamkeepers Society
- Selkirk College
- Shuswap Indian Band
- Simon Fraser University ACT (Adaptation to Climate Change Team)
- Skeena Knowledge Trust
- Slocan Lake Stewardship Society
- Slocan River Streamkeepers
- Taku River Tlingit First Nation
- Teck
- The Gordon Foundation
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- University of Victoria
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- World Wildlife Fund-Canada

