
Saving Salmon

One Meter of Shoreline at a Time

A community-based
approach to shoreline
habitat restoration

Danny Swainson

British Columbia Conservation Foundation (BCCF)

Elodie Roger

Origins Environmental Services



Association of Vancouver
Island and Coastal
Communities

April 1st 2022

Danny Swainson

- Fisheries Biologist with BCCF
- ~10 years of experience with freshwater and marine environments Canada-wide



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Elodie Roger

- Ecosystem Restoration Consultant with Origins Environmental Services
- 10 years of experience in conservation, restoration of terrestrial habitats in BC and overseas



Email: Elodie@originsenvironmental.com

Gratitude

Quw'utsun and Ts'uubaa-asatx Nations

Gerald Thom

Hundreds of volunteers, property managers and landowners

Our summer field crews, students, youth

And the many more who coordinated the project behind the scene

Coastal Restoration Fund (Government of Canada) and private donors; DFO; PSF; HCTF; BCCF (Craig Whiteman, Lisa Limerick, Danny Swainson, Jeramy Damborg, Christine Brophy, Jeff Strohm, Dannielle Owen); Cowichan Lake And River Stewardship Society (Board members); Town of Lake Cowichan; Government partners Peter Woods, Andrew Coster, Luke Clarke, Grant Bracher; Polster Environmental Services Ltd. (Dave Polster, Genevieve Singleton) who contributed their expertise, mentorship and guidance once again; BC Forestry Research Station who provided the project with a plant storage and watering facility; Khowutzun Forest Services (Cedar Elliott, Troy Elliott, Rob Furness and their staff) for fostering our partnership with First Nations., Royal Road University; Local Schools...



Agenda

1. Riparian Areas and their significance for Fish
2. The Story of Cowichan Lake
3. Cowichan Shoreline Stewardship Project
4. Future of grass-root restoration initiatives around Lake Cowichan



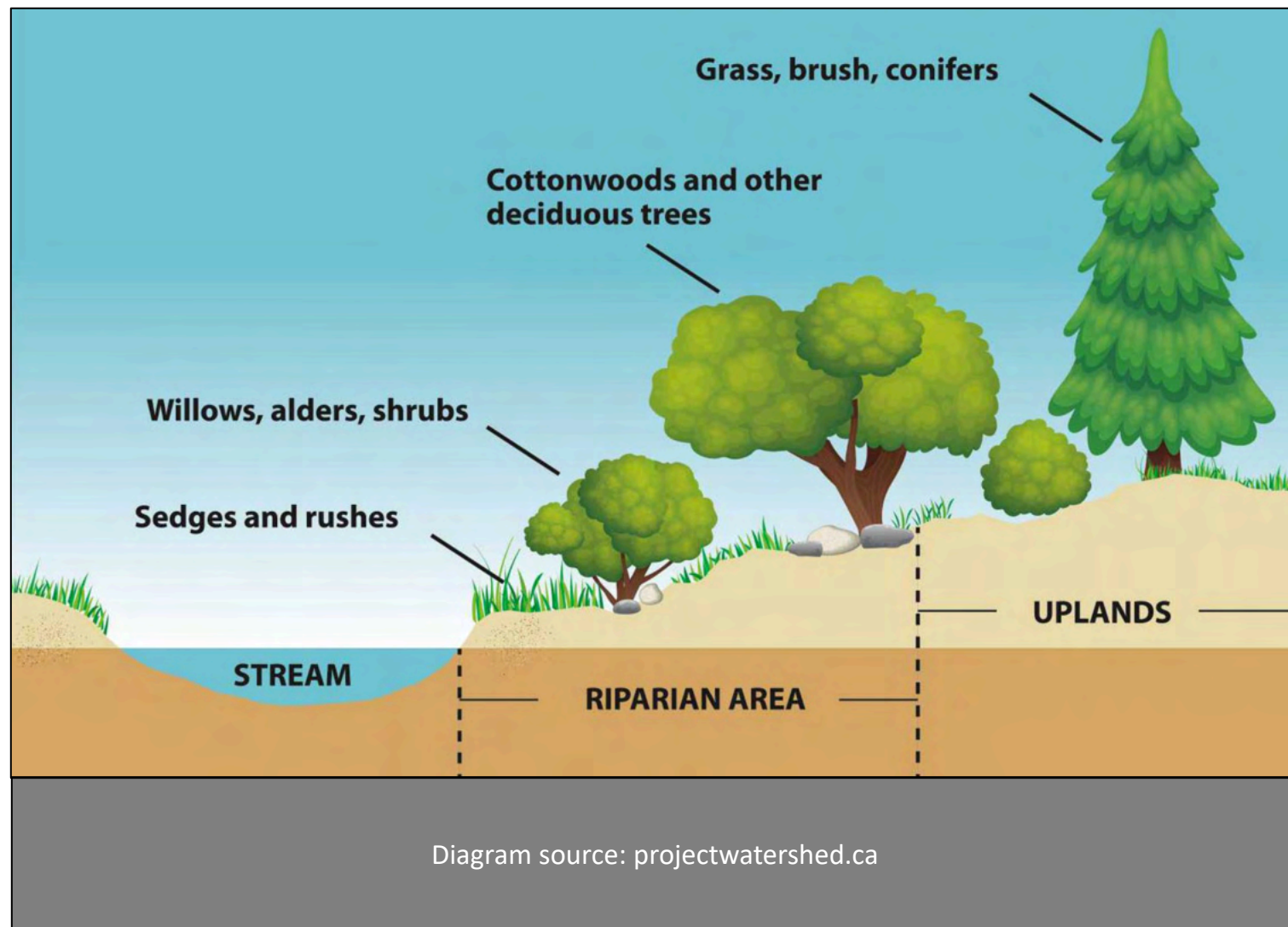
Section 1

Riparian Areas and their significance for Fish

What is a Riparian Area?
and why do we even care?

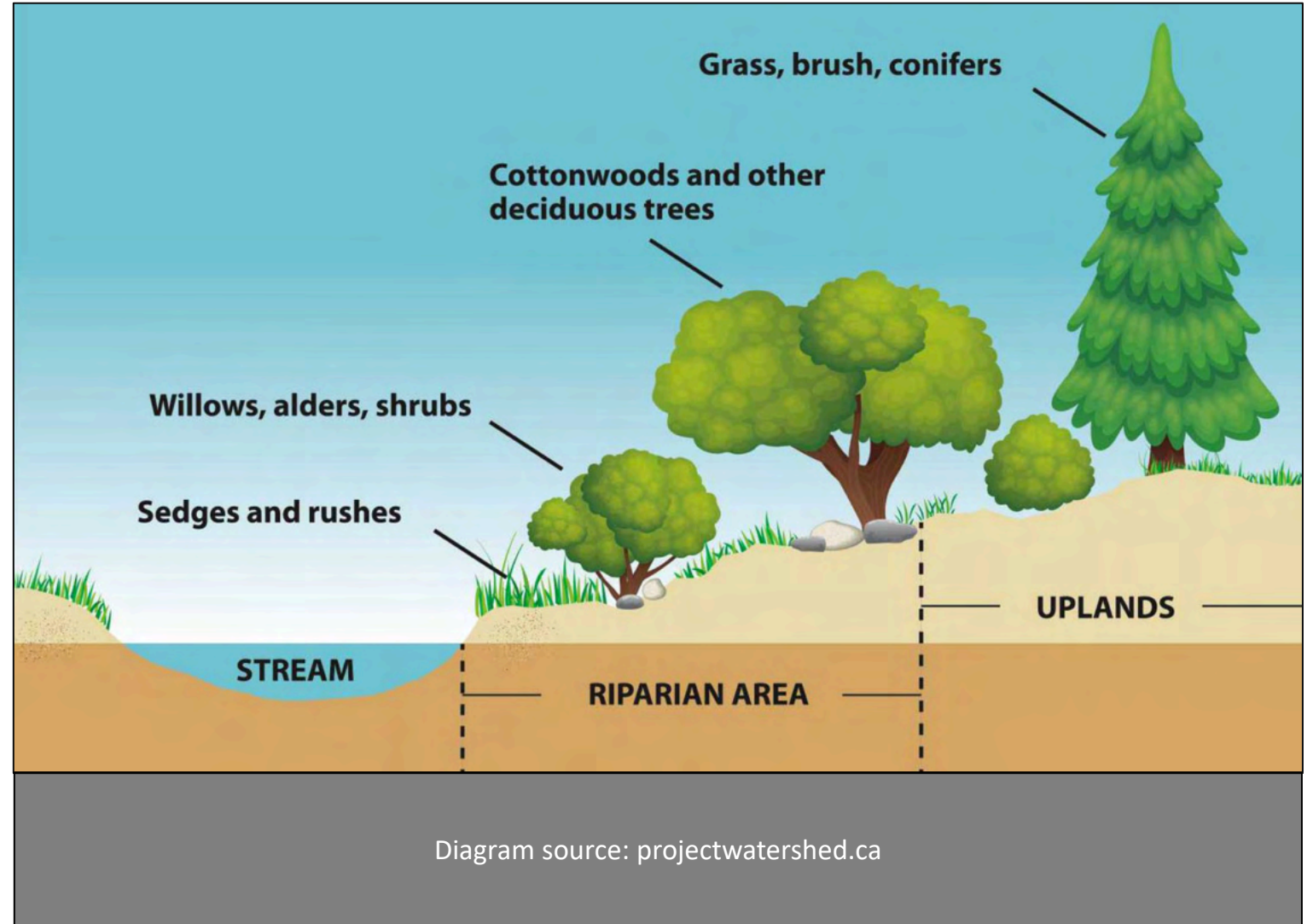


A Riparian area
is the
interface between a
body of water and
the adjacent land.



Healthy riparian areas provide many important ecosystem services !

- Shoreline stability
- Flood control
- Shade
- Habitat for birds, wildlife and insects
- **Fish habitat !**



Planting Trees = Saving Salmon?



Healthy Riparian
Areas
Keep Fish Happy
and Alive !



When it comes
to salmon...

Wood is
Good!



Juvenile Chinook Salmon utilizing riparian vegetation on the
Cowichan River

Photo by: Craig Whiteman

When it comes
to salmon...

Wood is
Good!



Adult Chinook Salmon utilizing riparian vegetation on the
Englishman River

Photo by: Danny Swainson



Over-hanging Myrica gale



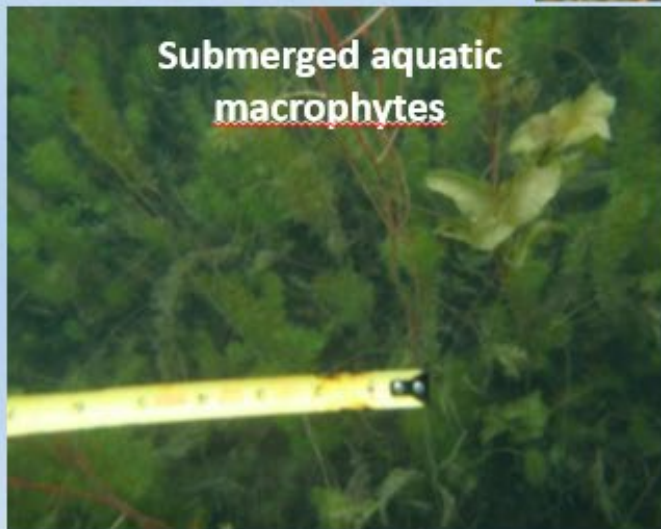
Submerged SWD over coarse gravel



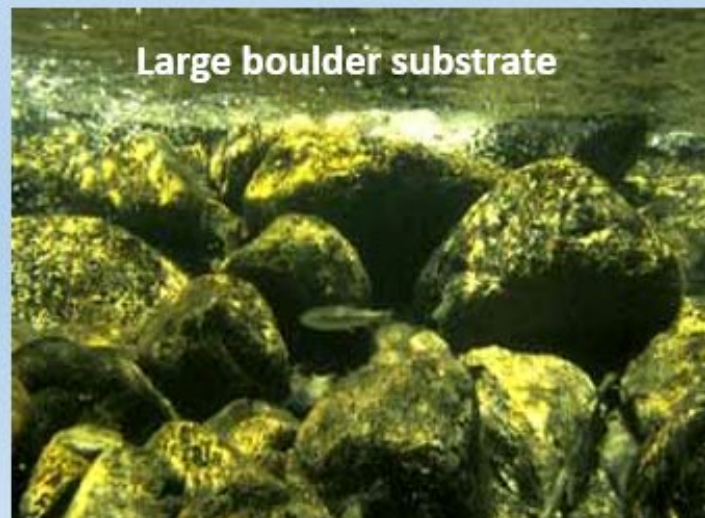
Fully intact riparian zone and emergent macrophytes



Submerged LWD



Submerged aquatic macrophytes



Large boulder substrate



Emergent Potamogeton

- Summer/Fall**
 1st - Stream Mouth
 2nd - Rocky shores
 3rd - Wetlands



Cowichan Lake's
 Healthy
 Productive Fish
 Habitats

Dominant Fish Species of Cowichan Lake Shorelines



Chinook salmon fry



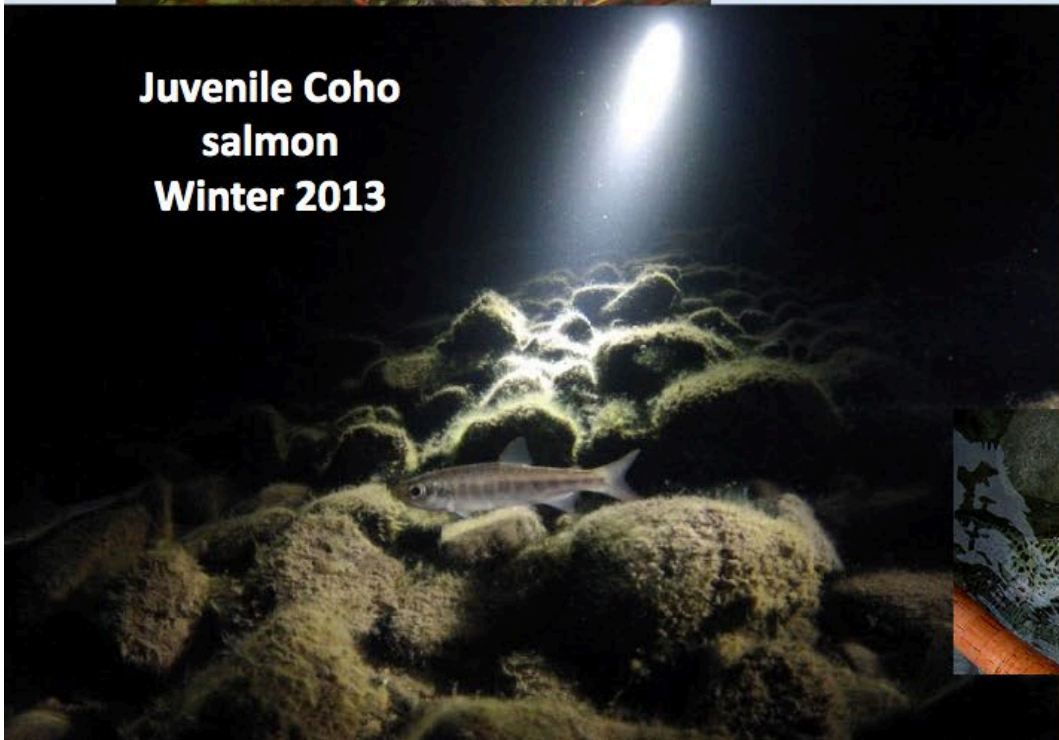
Three-spine Stickleback



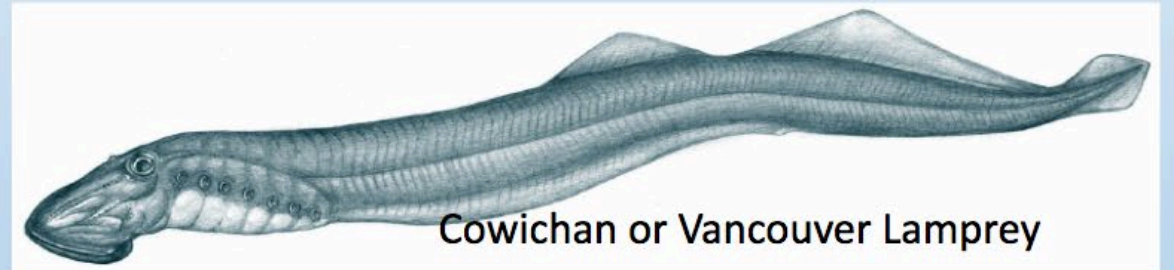
Cowichan Kokanee



Prickly Sculpin



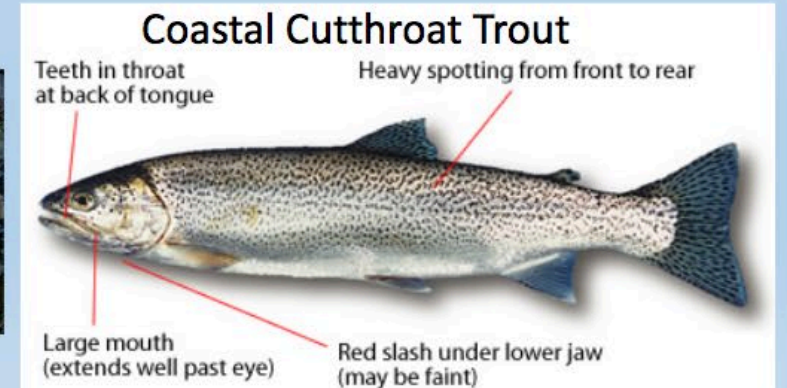
Juvenile Coho salmon
Winter 2013



Cowichan or Vancouver Lamprey



Cowichan Rainbow Trout



Coastal Cutthroat Trout

Teeth in throat
at back of tongue

Heavy spotting from front to rear

Large mouth
(extends well past eye)

Red slash under lower jaw
(may be faint)

Riparian Areas
are...

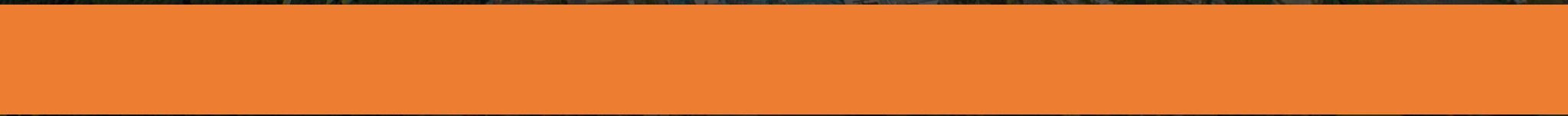
an Ecosystem Worth
Investing In !



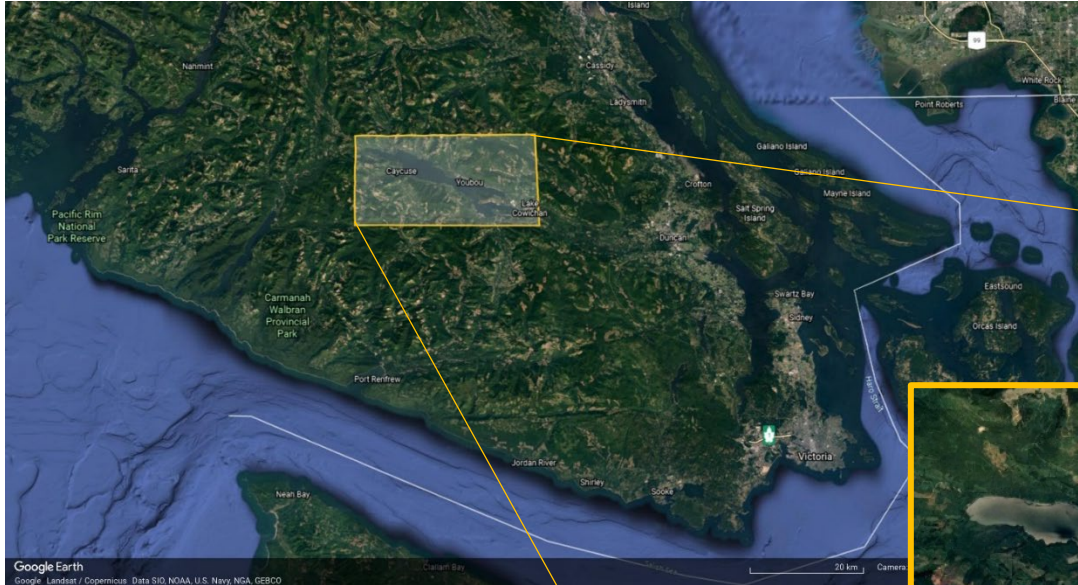


Section 2

The Story of Cowichan Lake



Cowichan Watershed



Source: Roger (2022)



Development Trends in the Lake Cowichan Area

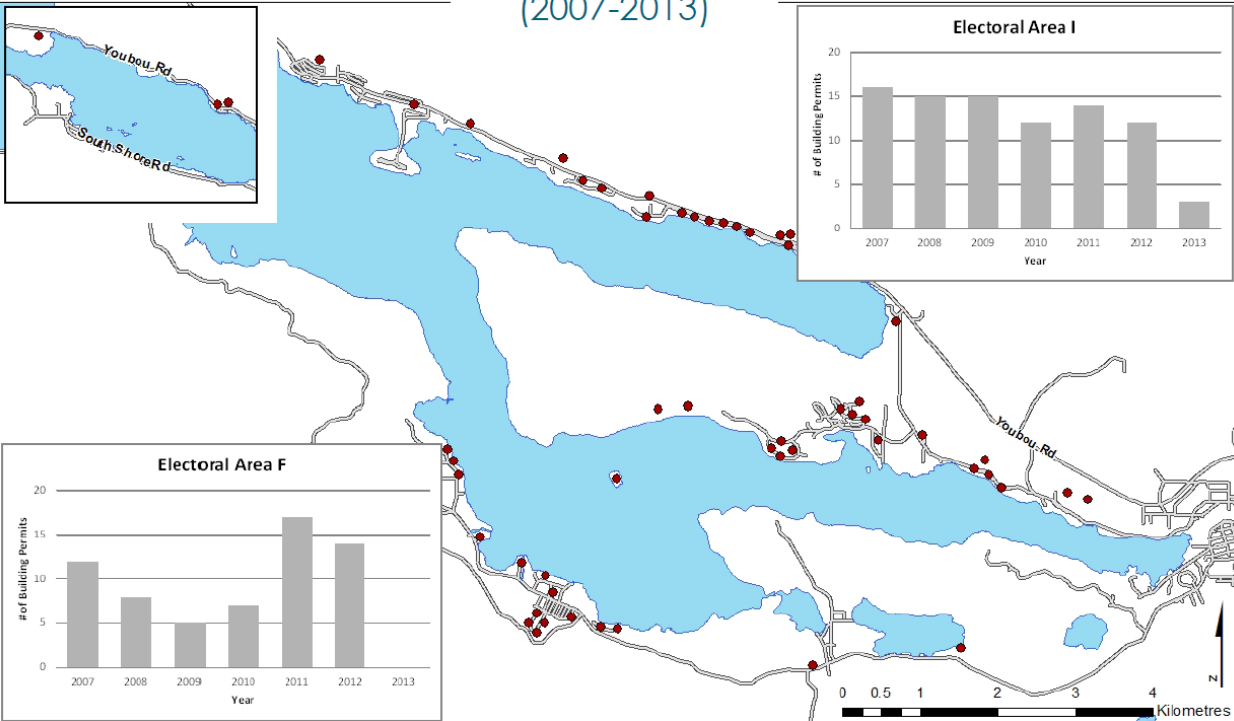


From "Lake Cowichan Shoreline Workshop", Dec. 2015

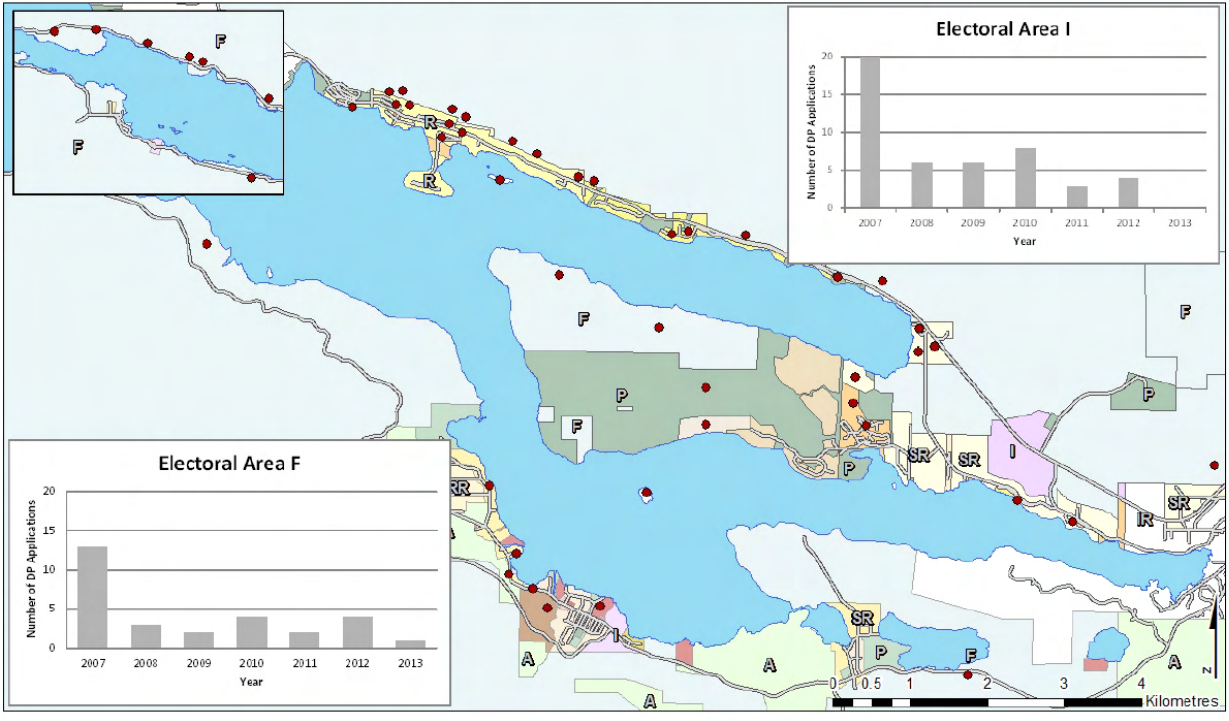
Development around Lake Cowichan

SF Building Permit Applications

(2007-2013)



RAR DP Applications 2007-2013



CVRD Area F and Area I
 Source: "Lake Cowichan Shoreline Workshop", Dec. 2015

British Columbia Conservation Foundation
Cowichan Lake Erosion Assessment



Eric Morris, M.A.Sc., P.Eng.

Erica Ellis, M.Sc., P.Geo.

1

Natural Biophysical Processes that Shape the Shore

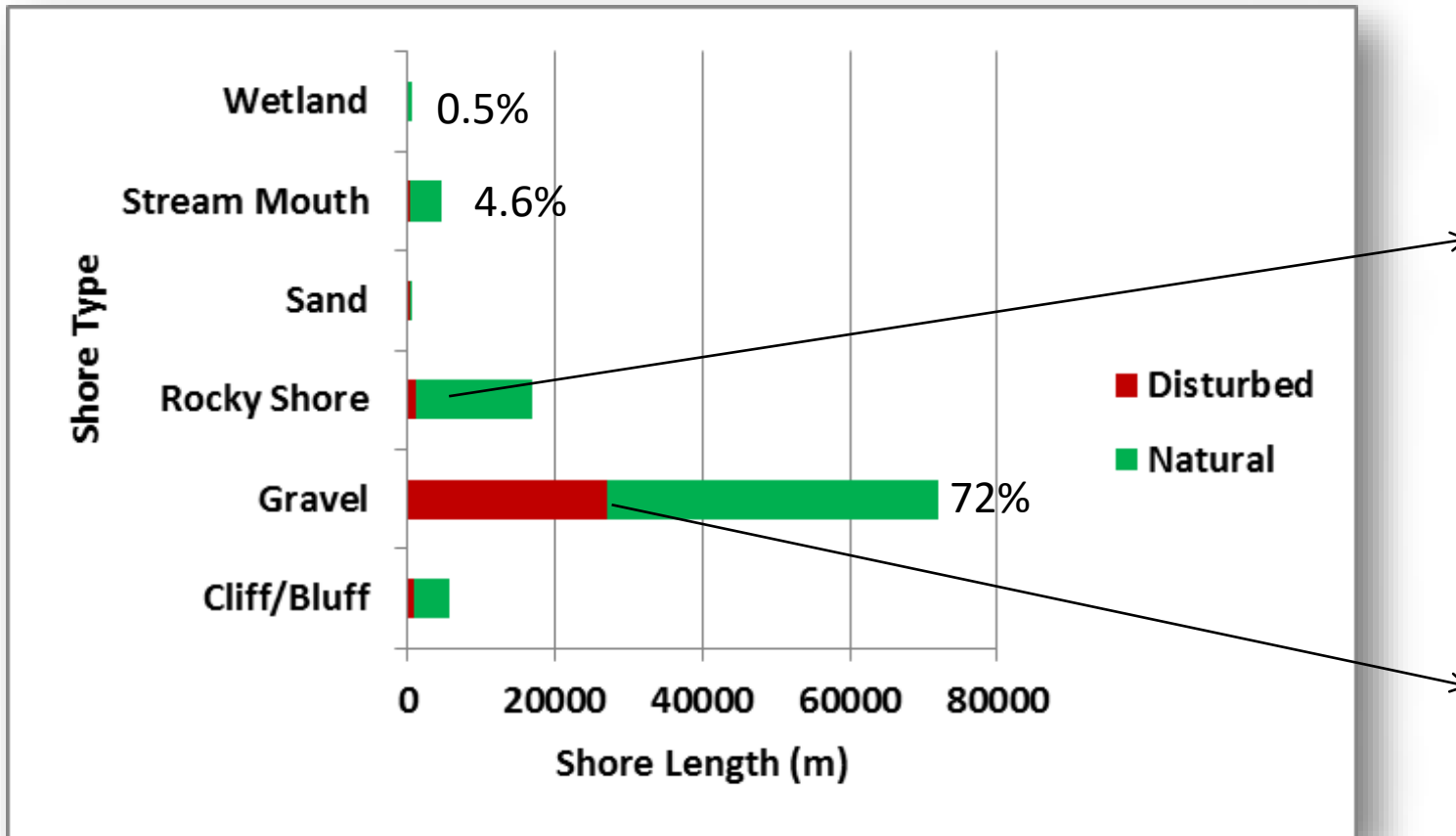
“What are the natural causes of erosion on the lake’s shoreline?”

“What influence seasonal lake levels have on this process?”





Findings: Shoreline Types and Disturbances



Gravel, cobble shorelines and man-made structures are the most vulnerable to site-specific erosion pressures cause by:



Existing Erosion- Potential Causes

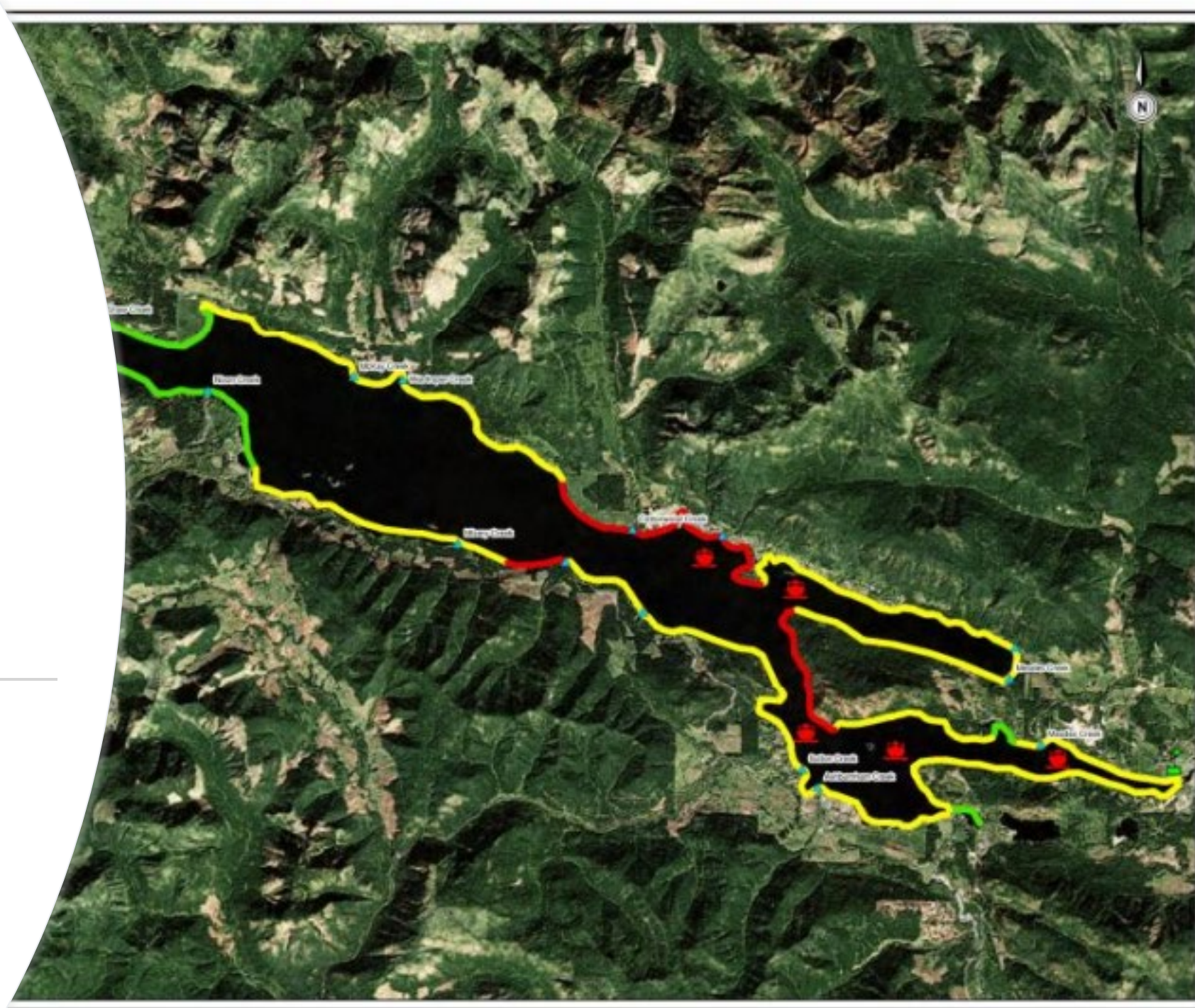
- **Seasonal Beach Profile Changes**
- **Seawall and Groyne Construction**
- **Climate Change (Wind, Waves, Inflows)**
- **Cowichan Lake Weir (1961)**
- **Subsea Landslide at Youbou due to 1946 Earthquake**
- **Shoreline Vegetation Removal**
- **Log Boom Installation and Removal**
- **Vessel Traffic**

23



Gordon Bay

Findings:
Action from
Waves and
Winds tend to
magnify erosion
risks around the
shore



Findings: Riparian disturbances





Findings: Natural vs. Modified shoreline



EVERYTHING IS CONNECTED





Section 3
Cowichan Shoreline
Stewardship Project

2013 - 2022



“The lake can be restored to preserve its conservation values for the benefit of the next generation”

Gerald Thom

A River Run Through Him



The last day of Gerald's life



Cowichan Lake and River Stewardship Society (CLRSS) BCCF, Cowichan Watershed Board, Governances

1 Workshop
And
A 10-Year
Vision

Question

How could our Community assist in
“Maintaining the Lake as a Healthy
Ecosystem”.

Components of the project

- 1.Landowner Education
- 2.Shoreline restoration
- 3.Community Engagement



April 24th -25th 2013 Workshop



CSSP Targets
2014 - 2022



Objective 1:

2 linear kilometers or 18,000 m² of damaged shoreline habitats restored along Cowichan Lake and River



Objective 2:

600 shoreline property visits and 450 owner surveys



Objective 3:

15 km of shoreline and riparian habitats protected on the lake and river through partnership building with local First Nation, governances, landowners and conservation organizations



Objective 4:

Shifting cultures through youth and community engagement to better protect shoreline habitat

CSSP project objectives and performance indicators

(2014 – 2022)

Phase I: 2014-2016

Phase II: 2017-2019

CSSP Targets
2014 - 2022

The infographic features a central blue circle with white dots containing the text 'CSSP Targets 2014 - 2022'. Four blue lines radiate from this circle to four circular images, each representing an objective. Objective 1 shows a rocky shoreline with a blue sky. Objective 2 shows three people in outdoor gear standing on a rocky bank. Objective 3 shows a stylized green and black mask. Objective 4 shows a group of people, including children, engaged in an outdoor activity.

Objective 1:

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Objective 4:

Shifting cultures through youth and community engagement to better protect shoreline habitat

What CSSP Achieved

18,758 square meters (+ 4.22%)
1.8 km of linear shoreline and fish habitat

Hundreds of residents contacted
4 years of resident surveys and property visits

Growing First Nation partnerships and support from local governances.
Increased landowner's concerns and awareness for healthy shoreline habitat
Documented riparian restoration opportunities for on-going restoration

Numerous community events, youth engagement programs and educational opportunities through Universities and Schools



Summary of 7 years of shoreline stewardship

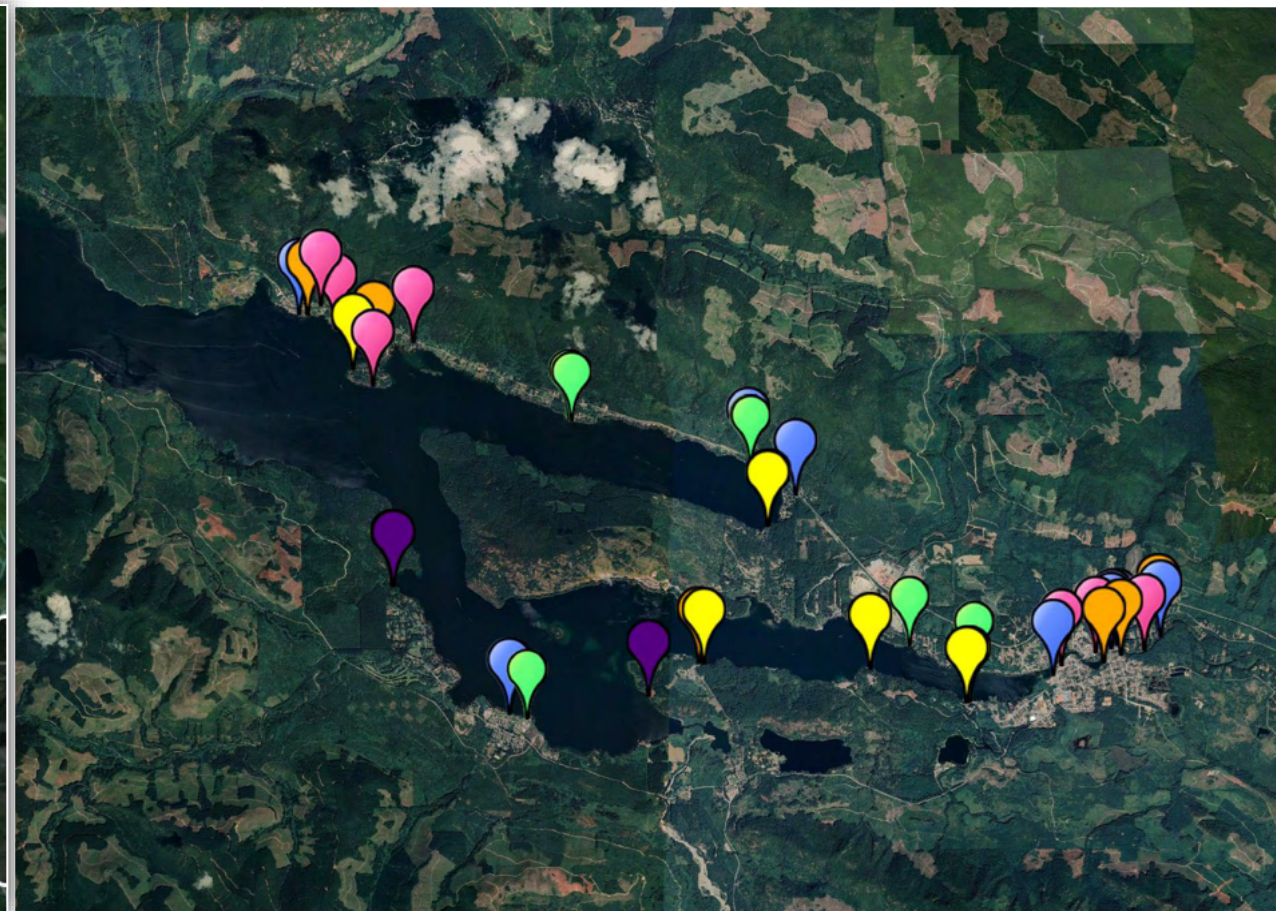
Cowichan Shoreline Stewardship Project	Number of Planting Sites	Planting Area (m2)	Linear Metres	Number of potted plants
CSSP 2014	7	3352.86	311.5	2326
CSSP 2015	9	1898.78	325.9	1083
CSSP 2016	8	2355.1	208.8	689
CSSP 2017	8	3088	264	954
CSSP 2018	8	4326.43	214.6	827
CSSP 2021	6	3737.7	489.5	1980
	Number of Planting Sites	Planting Area (m2)	Linear Metres	# of potted plants
Total CSSP 2014 - 2022	46	18,758.87	1,814.30	7859

Ecological Restoration

Map of highly impacted shoreline (red)

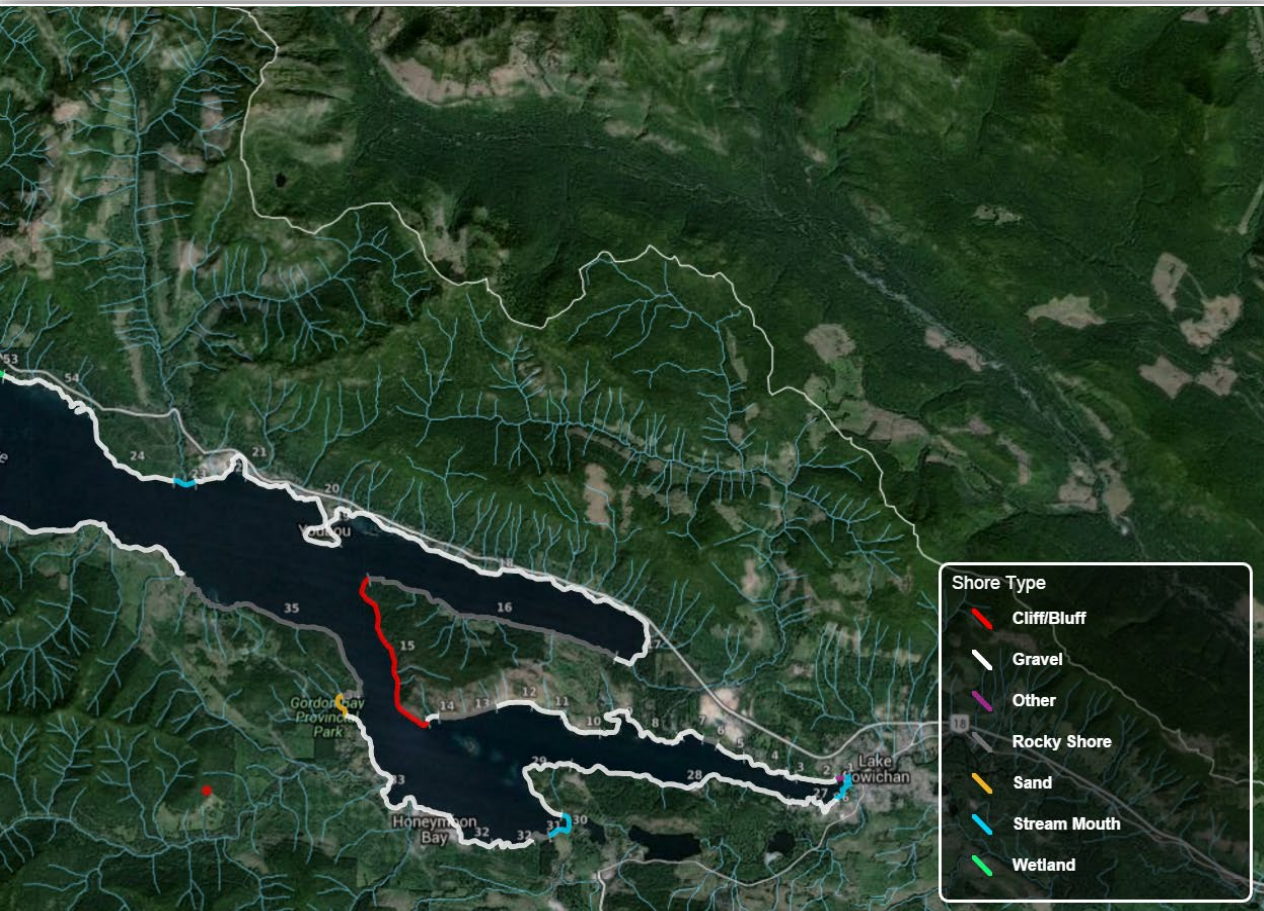


Map of restored sites between 2014 - 2022



Ecological Restoration

Map of shoreline types



Map of restored sites between 2013 - 2022

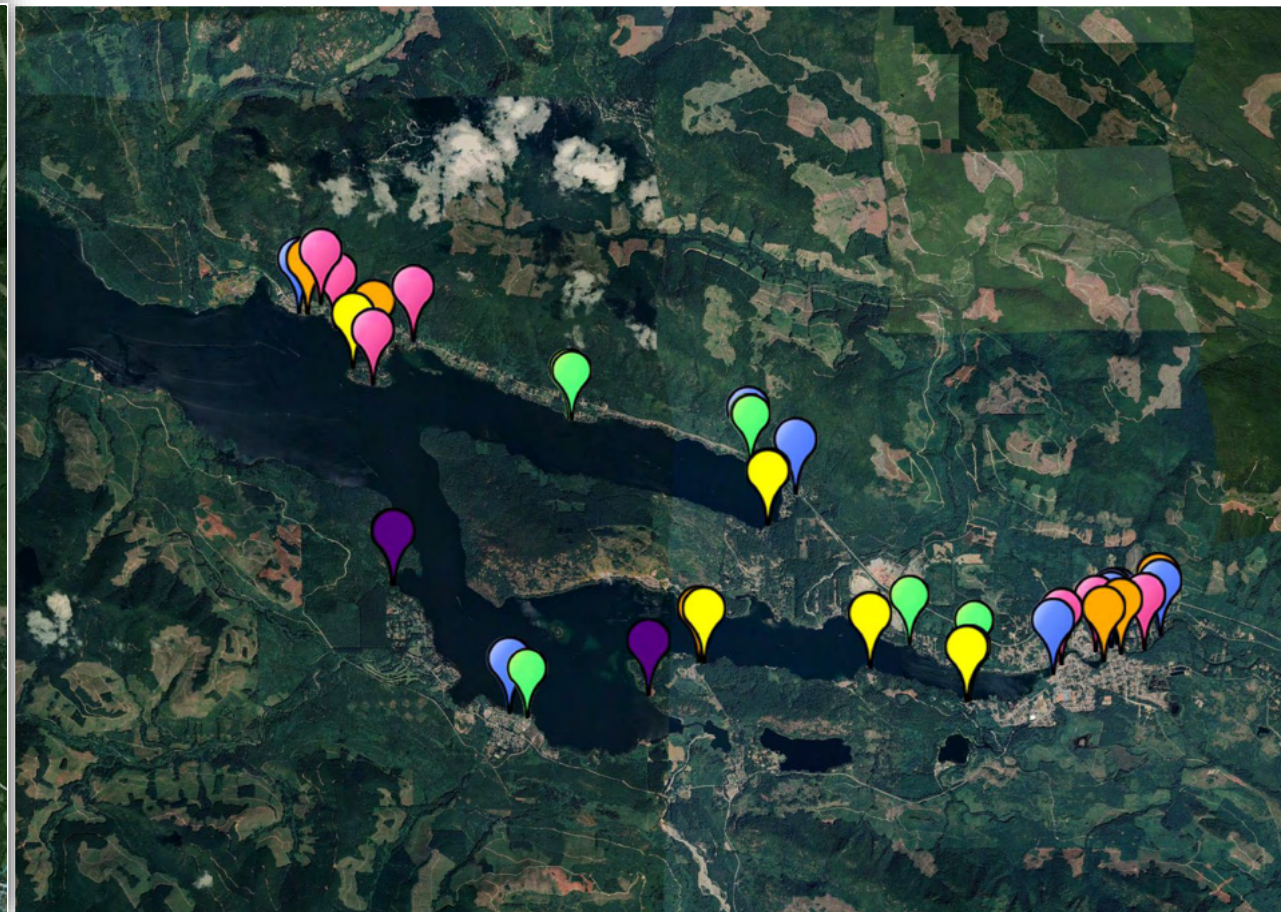




Figure 10. Before (2015) and after (2018) at a private residence, a 2015 Riparian Restoration Site



Figure 11. Before (2015) and after (2018) at a private residence, a 2015 Riparian Restoration Site



Figure 7. Construction of a live-stake wattle fence at two CSSP 2018 sites along Cowichan River



Figure 6. Invasive plant removal at CSSP private residence on Cowichan Lake and Koksilah River











Awareness raising !

You need the fish, the fish needs you

Oh Deer !!

WITHOUT THIS FENCING, THIS AREA WOULD BE A DEER RESTAURANT!

PLANTING OF NATIVE PLANTS HAS BEEN DONE HERE TO INCREASE SHADE FOR BABY FISH NEEDING SAFE PLACES TO REST.



HAVING MORE PLANTS ALONG THE SHORELINE WILL SUPPORT MORE FISH IN THE LAKE.

THANKS FOR YOUR SUPPORT!

COWICHAN SHORELINE STEWARDSHIP PROJECT

A PROJECT SUPPORTED BY:
COASTAL RESTORATION FUND
BRITISH COLUMBIA CONSERVATION FOUNDATION
COWICHAN LAKE AND RIVER STEWARDSHIP SOCIETY



Do you like to go fishing?

WE DO!!

THESE NATIVE PLANTS PROVIDE PLACES FOR INSECTS TO REST THAT THEN FALL INTO THE WATER PROVIDING FISH FOOD.

BABY SALMON ESPECIALLY LIKE TO HIDE ALONG SHORE EDGES UNDER PLANTS. BY PLANTING HERE, WE ARE HELPING THERE BE MORE FISH FOR US ALL TO GO FISHING!



DEER LIKE TO EAT THESE YOUNG PLANTS, WHICH IS WHY WE HAVE THIS TEMPORARY FENCING.

THANKS FOR YOUR SUPPORT!

COWICHAN SHORELINE STEWARDSHIP PROJECT

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Who are we?

The Cowichan Lake & River Stewardship Society (CLRSS) is a volunteer group of caring neighbours dedicated to the protection and enhancement of the Cowichan Lake Watershed. The CLRSS Riparian Education Project promotes a "stewardship first" culture and acts in cooperation with landowners to protect and enhance riparian areas on private land.

Did you Know?

- 92% of the lake shoreline (including forest land) is privately owned. Owners of ecologically important habitat are responsible to preserve publicly owned resources, the fish and the water, now and for future generations.
- 70% of shoreline of Cowichan Lake is still in an undisturbed state and needs protection. This land and vegetation adjacent to watercourses (the riparian zone) is essential for water quality, fish stocks and wildlife, as well as flood and erosion control.
- The shoreline of Cowichan Lake is a nursery for up to 300,000 wild cutthroat salmon annually. It also contains self-sustaining populations of cutthroat, rainbow, dolly varden and kokanee.

How can CLRSS support you?

- Visit our riparian webpage www.cowichan-lake-stewardship.ca to learn more about the importance, protection, enhancement and regulation of riparian areas.
- Request a riparian visit to evaluate your riparian area.
- Visit healthy riparian shorelines that are recreation friendly.
- Become a member! Meetings are held locally in Lake Cowichan. For details call us or visit our website.

President Larry Van Wieman
250-709-7308
www.cowichan-lake-stewardship.ca

Join us as we work together for the healthy future of Cowichan Lake and the Cowichan River.

This brochure has been supported by the Pacific Salmon Foundation

Riparian Insights

Defend the story says: "The healthy future of Cowichan Lake is in our hands!"

www.cowichan-lake-stewardship.ca

What can we do?

- Leave our riparian areas intact.**
Prevention is easier than restoration. Common changes that can damage riparian health include:
 - Clearing vegetation to create beaches, lawns or enhanced views.
 - Adding fill, rock or sand to create beaches and extend property.
 - Building docks and boat launches for recreation.
 - Introducing non-native plants for aesthetics.
 - Removing woody debris and aquatic "weeds" for water sports.
- Minimize impact when accessing the water.**
 - Use only one point of access, build docks, frame views and use gravel pathways.
- Restore damaged riparian areas.**
Let natural re-vegetation take its course or re-establish native plants. A native plant is one that occurs naturally in a particular region, ecosystem or habitat and occurred prior to European contact.

Native Plants:

 - Are beautiful & low maintenance.
 - Provide wildlife with food, shelter and places to reproduce.
 - Help regulate climate, prevent erosion, improve water quality and much more.
- Respect Riparian Area Regulations (RAR) and avoid fines.**
Leave riparian areas intact for erosion control, water quality, habitat protection, coho production and flood prevention. Any disturbance within 30 metres of the high water mark of lakes and streams requires contact with local government.

Riparian Habitat Contacts

CVRD Development Services
250-746-2620

Town of Lake Cowichan 250-749-6881

Provincial Government (Environment)
250-751-3100

Fisheries and Ocean Canada (Habitat Enquiries)
1-866-845-6776

For online contacts or more riparian habitat information, visit our riparian webpage.

Do NOT collect native plants from the wild. Propagated native plants are readily available.

To learn more about native plants and local sources, visit our riparian webpage: www.cowichan-lake-stewardship.ca

Safe Boating Practices

The Cowichan Lake and River Stewardship Society has a mandate to promote respectful and safe boating practices on our lake and river. We have produced a "Welcome Boarder" brochure that is distributed to marinas and to boat rental. A printable version is available at our website www.cowichan-lake-stewardship.ca.

Water Quality Monitoring

Regular monitoring provides baseline data which will be used to detect change over time. The information is shared with the Province and the BC Lake Stewardship Society to compare our lake with others in the province. Of 110 monitored lakes in BC we are currently ranked second for clarity. For more information on BC lakes visit: www.acls.org

Committees

There are several committees in the CLRSS focusing on various aspects of our work. To learn more of voluntary, please see our website www.cowichan-lake-stewardship.ca.

- Water Traffic Committee
- Education Committee
- Monitoring Committee
- Retail Sales Committee
- Annual River Clean-up Committee
- Executive/Finance Committee
- Water Monitoring Committee
- Cowichan Shoreline Stewardship Committee

Cowichan Lake and River Stewardship Society
PO Box #907
Lake Cowichan, BC
V0R 2G0

For current information visit our webpage www.cowichan-lake-stewardship.ca
email enquiries webmaster@cowichan-lake-stewardship.ca
President Larry Van Wieman
Phone 250-709-7308
email lvan@cowichan-lake-stewardship.ca

Cowichan Shoreline Stewardship Project

The Cowichan Lake and River Stewardship Society has set the goal of protecting 25% and restoring 3% of the Cowichan Lake Shoreline by 2020. This process was started in the spring of 2014 when we received funding from several donors and all levels of government to begin the Shoreline Stewardship Project. By September we had completed restoration on seven lakefront properties by removing invasive plants and planting over 2,500 native riparian plants in their place. We held a crew of four secondary school students and a VUB Environmental Studies student to supervise the restoration.

Saywell Park Restoration

In fall 2013 the CLRSS completed the Saywell Park riparian restoration by removing invasive plants and planting over 1,000 native riparian plants in their place. Interpretive signs were installed. This project serves as a demonstration of the value of riparian restoration being done in the Shoreline Stewardship Project.

Fish Habitat Signs

CLRSS volunteers have spent the past few years installing these signs on beaches where they cross streams that are utilized by salmon and trout. These signs help increase community awareness of sensitive habitat and promote the health of our aquatic ecosystem.

Annual River Cleanup

The third weekend in August is reserved for our annual river cleanup. This two-day event sees volunteers working in teams to rid our river of any foreign objects that have accumulated over the year. Saturday is the upper river cleanup activity for the CLRSS and Sunday is the lower river cleanup organized by Cowichan Tribes. Every year we remove tons of garbage and hundreds of dollars in recyclable items from our river. After the work we all enjoy a barbecue and social event where we share stories about our day.

Gerald's Legacy:

Encouraging Environmental Study and Action for Generations to Come

Our Youth is our most important resource. They hold the future of our community in their hands. Gerald Thom always emphasized the importance of engaging our youth in the stewardship of our watershed. The Cowichan Lake and River Stewardship Society is working hard to preserve and protect our watershed. We want to follow Gerald's lead by encouraging our young people to become aware of and directly involved in the protection and preservation of our precious watershed ecosystems. We are pleased to provide some financial assistance to disallow LCS students that want to learn more about environmental protection and preservation.

The Cowichan Lake and River Stewardship Society
PO Box #907
Lake Cowichan, BC
V0R 2G0
President: Larry Van Wieman
250-709-7308
www.cowichan-lake-stewardship.ca

The Gerald Thom Environmental Studies Bursary

Announces

The Gerald Thom Environmental Studies Bursary

Gerald Thom and volunteers completing his last project
July 26, 2014

Gerald spent his last day doing what he loved, working with volunteers to restore Lake Cowichan First Nation land. Previous days had seen removing invasive blackberry and preparing the site. The large group of volunteers that showed up on July 26 completed the project by planting and watering hundreds of native plants on the site. We all enjoyed lunch and used drinks and Water Monitor showed her appreciation.

The Gerald Thom Bursary \$1,000

Conditions

One annual bursary is awarded in the name of Gerald Thom to honour his substantial contributions to ecological restoration, environmental education and advocacy.

Eligibility

Priority will be given to LCS applicants planning to enrol in post secondary environmental studies related courses.

Criteria

Preference for this Bursary will be awarded to a Lake Cowichan School student who:

- Has successfully completed the Lake Studies Program.
- Has demonstrated commitment and service to improving or restoring the local environment. (Actions include effort towards water testing, record keeping, clean-up activity, planting, grant writing and nursery management.)
- Has demonstrated a willingness to educate others regarding environmental stewardship.

Applications

- Application forms are available from the Lake Cowichan School Office.
- Applications will be reviewed and recipients selected by the LCS and CLRSS Education Committee.

Donations

If you would like to donate to the Gerald Thom Environmental Studies Bursary Program please send contributions to:

CLRSS, PO Box 907
Lake Cowichan BC V0R 2G0
or
Lake Cowichan School, 100 South Bluff Rd.
PO Box 40, Lake Cowichan, BC V0R 2G0

Cowichan Lake and River Stewardship Society
www.cowichan-lake-stewardship.ca

Youth And Public Engagement



Working with
First Nations
Through
leadership,
knowledge
sharing and
capacity building



SSP Riparian Restoration Site Tour, September 24th, 2018



Conclusion and Future of CSSP

Recommendations made at the end of the project



COWICHAN SHORELINE
STEWARDSHIP PROJECT
2022 INTERIM REPORT



Interim report prepared by Elodie Roger at Origins Environmental Services

Submitted to the British Columbia Conservation Foundation, Lantzville, BC

BCCF Service Agreement #: 1172038-003

BCCF Project #: 1172038

Duncan, BC
February 2022

Elodie Roger
Origins Environmental Services



There is more to do...

Site Name	Access	Addresses	Geographical Area	CSSP Status	Restoration recommendations	Approx. Restoration Area (meters squared)
	Private	50 Prospect Ave, Lake Cowichan	Cowichan River	Follow-up	Property adjacent to Mrs. Danaher, facing extreme bank collapse. Mrs. Adrams received CSSP restoration efforts in the past. Email communications mention that wattle fences installed in the past had washed away.	TBD
	Private	66 Prospect Ave, Lake Cowichan	Cowichan River	New	Bank collapse by private residence due to winter river flood. Staking possible at bottom of slop below high water mark. Upper slope requires staking with support from QEP. Threats to fish habitat and riparian health include Cowichan River winter flooding. Bank collapse by house footings. Wildlife grazing.	36
	Private	7314 Peri Rd, Honeymoon Bay, BC VOR 1Y0	Cowichan Lake	Follow-up	Restoration follow up and signage after 2018 CSSP Planting. Fencing, educational signs required on the property. Survival rate monitoring.	TBD
	Private	8354 Sa-seen-os Road	Cowichan Lake	Follow-up 2019 CSSP	Plant and signage monitoring.	600
	Private	7314 Peri Road	Cowichan Lake	Follow-up 2019 CSSP	Plant and signage monitoring.	650
	Public	Meades Creek	Cowichan Lake	Follow-up 2019 CSSP	Plant and signage monitoring.	1500
	Public	Honeymoon Bay	Cowichan Lake	Follow-up 2019 CSSP	Plant and signage monitoring.	600
	Private	Honeymoon Bay	Cowichan Lake	Follow-up 2019 CSSP	Plant and signage monitoring.	500
	Private	67 South Shore Road	Cowichan River	Follow-up 2019 CSSP	Plant and signage monitoring.	450
	Private	222 Greendale Road	Cowichan River	Follow-up 2019 CSSP	Plant and signage monitoring.	525
	Public	Gordon Road	Oliver Creek	Follow-up 2019 CSSP	Plant and signage monitoring.	750
	Public	Tresle Bridge	Cowichan River	Follow-up 2019 CSSP	Plant and signage monitoring.	500
	Private	10332 Youbou Road	Utility Creek	Follow-up 2019 CSSP	Plant and signage monitoring.	500
	Private	9262 / 9264 North Shore	Cowichan Lake 2015 A	Follow-up 2019 CSSP	Plant and signage monitoring.	1000

Recommendation Category	Action Item	Rational
Plants	Adding plants to the 33 CSSP sites	Cowichan Lake water level decreases considerably over the summer, turning healthy shoreline and fish habitat into a fragmented landscape. Sites planted between 2014 and 2021 will benefit from regular monitoring and planting to increase habitat connectivity.
Plants	Identify shoreline restoration opportunities for 14 additional sites	14 properties were identified as potential candidates for shoreline restoration or additional planting. Landowner outreach and site visits should be orgnized to research and design site-specific shoreline enhancement or restoration practices with the guidance of a Qualified Environmental Professional.
Plants	Refer to Effectiveness Evaluation Report for future monitoring and restoration work	Morley and Barlow (2019) recommendations should be considered when designing the next phase of CSSP. More frequent Effectiveness Evaluation reports should be planned for to verify the quality of work delivered and consider adaptive restoration practices and project management strategies if needed.
Plants	Monitoring in Spring 2022 and Fall 2022	Vegetation planted in 2021 will need to be monitored with the support of a crew member who was part of the crew in 2021. Monitoring should take place after their first winter once plants start budding, and after their second dry summer in 2022.
Plants	On-going watering	Consistent watering will need to be coordinated for Summer 2022 at the six sites planted in 2021. Property owners and managers must be informed of the site visits.
Plants	Following Section 11 recommendations	Referring to the conditions under which Section 11 was approved in 2021: Ensure native plants receive sufficient water during the first two summers to fully establish.
Signage	Spring Beach signage	Install permanent signage at Spring beach in accordance with DFO guidelines.
Outreach	Following-up with CSSP recipients (2014-2021) and identify action items	Several participants contacted CSSP 2021 crew and raised concerns about shoreline erosion, plant survival, or lack of signage on their properties. These participants should be contacted by phone or email to follow-up and determine restoration or support needs.
Partnership	Site visit with Project Partners	Before the end of this project, a site visit should be organized with each property owner and showcase the restoration work that took place.
Partnership	Presentation to local governances and conservation groups,	Before March 2022, we recommend presenting the results of this project to local partners, local governances, and organizations and community to encourage further riparian and shoreline restoration work within the Valley.
Partnership	Seeking funding opportunities	The project has gained considerable momentum since its start in 2014. A new multi-year funding should be considered to increase shoreline restoration and protection efforts around Cowichan Lake and Upper Cowichan River.

2022 – 2023: CSSP Research and Development

- \$15,000 secured for this fiscal year with the goal to develop a new multi-year, community driven restoration initiative!
- Will include effectiveness monitoring of previous restoration work



Thank You
Huy ch q'u

Questions?

