



PACIFIC SALMON FOUNDATION



RESILIENT COASTS FOR SALMON

Nature-based solutions for climate change

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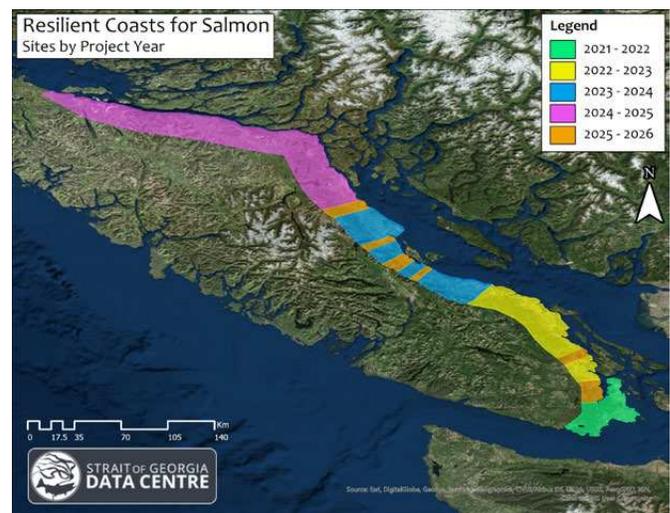
Photo by Mitch Miller

WHAT IS RESILIENT COASTS FOR SALMON?

Resilient Coasts for Salmon is a collaborative initiative and five-year project led by the Pacific Salmon Foundation (PSF) with partners such as the Stewardship Centre for BC (SCBC), World Wildlife Fund – Canada, Peninsula Streams and Shorelines and others. Our aim is to raise public awareness of the impacts of climate change and build capacity to adopt nature-based adaptation approaches within our communities. We want to make our coastlines resilient by protecting coastal infrastructure while preserving and restoring natural shoreline habitat for species like Pacific salmon.



Photo by Maria Catanzaro



To achieve all of this there are four major objectives within the project:

- 1. RAISING AWARENESS** on climate change and how to adapt using nature-based solutions,
- 2. MAPPING** the extent of coastal modification along the east coast of Vancouver Island,
- 3. DEMONSTRATING** nature-based solutions in action with our Green Shores® restoration sites, and
- 4. BUILDING CAPACITY** with Green Shores training.

Figure 1. Each year of the Resilient Coasts for Salmon project, we target different communities on the East Coast of Vancouver Island. In 2021 and 2022 we focused on Southern Vancouver Island from Victoria to Nanaimo (green and yellow areas). Next, we will be bringing our events and training further north from Qualicum Beach to Comox (blue areas), and the years after that we will be working with communities from Campbell River to Port McNeill (pink). The final year of the program we will work with smaller rural areas in between (orange).

Over the course of the program, we are making our way up the East Coast of Vancouver Island with these objectives (Figure 1). In 2023, we will start the third year of the five year program. We will be bringing our events, workshops and training initiatives to communities from Qualicum Beach up to Comox!

YEARS 1-2 OF RESILIENT COASTS FOR SALMON – AT A GLANCE!

With COVID hampering our ability to safely and responsibly participate in and host events, things started out slow in the in-person outreach department in year one. Instead we focused on the development and release of our educational materials. In year two we doubled our outreach efforts and were busy hosting events, training, and workshops from Victoria to Nanaimo.

We had a blast meeting with these communities! We attended events like World Ocean's Day and Nanaimo Hatchery Spawning Days, hosted mapping workshops to collect valuable shoreline data with citizen scientists, delivered presentations to local groups, hosted nine Green Shores Levels 1 and 2 training sessions, and made great progress at our three Green Shores demonstration sites. Restoration is already underway at Songhees Walkway Pocket Beach (right). After the beach was nourished with forage fish friendly gravel in the fall, surf smelt started returning to spawn – hooray!



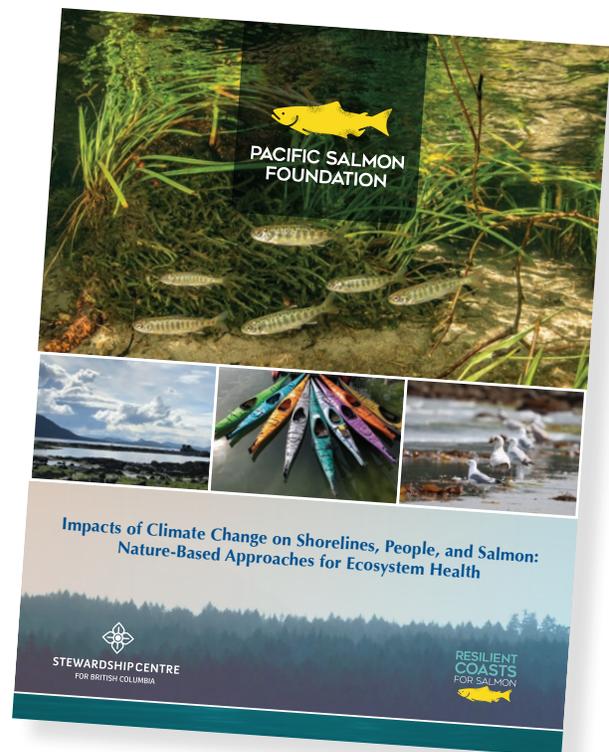
EDUCATIONAL PRIMER RELEASED

In spring of 2022, we launched our educational primer, titled: [*Impacts of Climate Change on Shorelines, People, and Salmon: Nature-Based Approaches for Ecosystem Health*](#). This document provides an overview of climate change impacts on the south and east coast of Vancouver Island, the consequences of hard armouring, the value of preserving natural shorelines, and how to use nature-based solutions as adaptation strategies for sea level rise.

This is a resource for coastal community members, local government staff (planners, engineers), stewards, educators, and anyone interested in our coasts!

We created a long version of the primer that we mailed to First Nations, municipal governments, and stewardship groups along the east coast of Vancouver Island.

We also created a shortened version of the primer as an informative booklet that brings home the key messages of the long document. This booklet is available for free at our outreach events. Both the [full](#) and [short](#) versions are available on our website (resilientcoasts.ca) for you to browse at any time.



If you are interested in receiving a printed and bound copy of the primer, reach out to the Resilient Coasts project manager, Kyla Sheehan at ksheehan@psf.ca

TOOL KIT

We also created a [tool kit](#) that goes hand in hand with the primer. The tool kit is an online library of how-to articles that support citizens making small changes in their homes and habits to reduce their environmental impact. We have articles on topics like reducing microplastic pollution in laundry, how to build a rain garden, and how to choose decode confusing eco-labeling on household cleaning products that claim to be environmentally safe.





Photo by Maria Catanzaro

The Resilient Coasts team at the Nanaimo River Hatchery Spawning Days event.

Outreach & Community Events

The team spent much of 2022 sharing our knowledge and materials at fun events in communities from Victoria to Nanaimo! We have an interactive event booth with games, a kids colouring table, and a large magnetic board to visualize healthy shorelines and how they are impacted when we modify our coastlines. We provide educational opportunities about sea level rise, natural coastal processes, and nature-based solutions. We also have educational content for kids including a Shoreline Treasure Map that has been very popular! Visit resilientcoasts.ca for access to our [colouring and activity sheets](#).



Photo by David James

The RC4S team discussing climate change projections and nature-based adaptation measures with the Qualicum Beach Streamkeepers Association.

Check back at our [events page](#) often, and come visit us when we are visiting your community!



Photos by Amy Sheehan



Our colouring pages and kids activities were a hit at the Alberni Valley Rivers Day event!



SHORELINE MAPPING

The extent of coastal hard armouring (like seawalls) is currently a data gap, but would provide valuable information to prioritize community actions to better adapt to sea level rise. So we embarked on our journey to map the entire east coast of Vancouver Island — some by foot with local citizen scientists and by boat.

Why are we mapping?

There is currently a gap in the knowledge of the extent of hard armouring on our coasts. We are concerned with hard armouring, which is typically put in place to protect communities and infrastructure, because it actually makes the impacts of storm surges and sea level rise worse. Hard armouring such as seawalls, retainment walls, and riprap contribute to coastal squeeze, making our shorelines less resilient and adaptable to change. Healthy intact shorelines, on the other hand, support the marine food web.

Riparian vegetation including shrubs and trees, for example, contribute terrestrial insect prey for salmon and provide shade for spawning forage fish along the high tide line. Marine riparian vegetation also stabilizes the shoreline by holding sediment in place as well as filters out pollutants before they can enter the ocean. Finally, natural shorelines are dynamic and allow for landward migration of critical intertidal habitat. By identifying the extent of shoreline armouring on our coasts, we are building a valuable dataset that can help support informed community planning.

These data can help communities advocate for removal of armouring in sensitive areas, and encourage policy change for shoreline development and protection of critical habitat for the entire marine food web.



Figure 2. Coastal Squeeze occurs where structures like seawalls impede the natural shoreline from adjusting to rising sea levels. The left side of this illustration depicts a seawall in place of habitat which has been lost due to rising sea levels, erosion and scouring. On the right side, a natural shoreline leaves room for vegetation and tidal zones to move landward, preserving important habitats and their function.



Workshops

To collect fine scale data we met with community members for mapping workshops. Together we collected data on shoreline features such as hard armour, erosion, overhanging vegetation, backshore land, and more. These workshops provide valuable opportunities to share our knowledge about healthy intact shorelines, sea level rise, and how coastal modification can cause long-lasting ripple effects along the shoreline — such as coastal squeeze (Figure 2), which affects forage fish and the greater food web. Most importantly, we discussed what we can do about it.

Harmful anthropogenic debris like abandoned vessels, tires, and creosote logs are being collected as data points and shared with Rugged Coast Research Society. Through a partnership with PSF, Rugged Coast has been cataloging hazardous debris around the Strait of Georgia.



In fall 2022, we kicked off by hosting six workshops in these locations:

- Victoria (Oak Bay)
- Nanaimo (Pipers Lagoon)
- Sidney
- Bamberton
- Chemainus
- Ladysmith

Boat-based Monitoring

To be able to capture data for the entire east coast of Vancouver Island, we needed to enlist another team member — Wilbur! Wilbur the boat is outfitted with a 360 degree camera (Figure 3). Secured to a tripod on Wilbur's hardtop, the camera captures continuous video and high-resolution imagery of the shoreline. The footage is captured at high tide, and we need calm weather conditions to make sure the camera is steady. The imagery collected is linked with the boat's GPS and can be mapped. Figure 4 shows track lines of the boat coupled with the location and view of the shoreline. We will use the track lines and high-res photos to mark key features that we see on the shoreline. This will help us determine how much of our shorelines are natural, and how much has been modified with structures such as seawalls. We began collecting our boat-based data this spring and have captured all the way from Pedder Bay to Nanaimo. Now it's time for us to hunker down and digitize these data!

These data will be publicly available in the Strait of Georgia Data Centre's [Marine Reference Guide](#) — where you can visualize the extent of hard armour and other coastal modifications at local scales, and how this intersects with vulnerability to sea level rise, and countless other factors.



Figure 3. Wilbur, our new research vessel, is outfitted with a 360 camera on its hardtop.



Figure 4. Here is an example of some of the track lines of our boat-based mapping.



Community Meetings

We will host follow up [community meetings](#) that are open to anyone interested to discuss our findings on the extent of hard armoring. Along with the results from the workshop, we will share imagery from the boat monitoring, provide an opportunity to discuss hypothetical options for adaptation and restoration, and finish with a live Q&A session.

Be sure to register for the [Resilient Coasts newsletter](#) and keep your eye on your inbox!

Stay tuned for future [mapping workshops](#) that will occur in different communities in the upcoming years:

Summer 2023 > Mid Island communities:
Qualicum, Courtenay, Comox

Summer 2024 > North Island communities:
Campbell River to Port McNeill

Summer 2025 > Smaller or rural Island communities:
Black Creek, Fanny Bay, Bowser,
Royston, Crofton, and the Gulf Islands.

Secure your spot at [resilientcoasts.ca!](https://resilientcoasts.ca)



DEMONSTRATION SITES

Our Resilient Coasts for Salmon project partners at the [Stewardship Centre for BC](#) have been busy with our three Green Shores® for Shoreline Development restoration sites to demonstrate nature-based solutions in action!



Dyke Road Park

Situated in the Comox estuary within the traditional territory of the K'ómoks First Nation, this Comox Valley Regional District park restoration will improve conditions for salmon and other wildlife, and increase resiliency for climate change whilst creating enhanced opportunities for recreational activities such as bird viewing. As part of a multi-partner initiative, construction is scheduled to begin in 2024.



Esquimalt Gorge Park

Located within the Gorge waterway on the traditional territory of the Lekwungen (Lək̓ʷəŋən) People, known today as the Songhees and Esquimalt Nations, the Township of Esquimalt's Gorge Park is a culturally important site, and provides habitat for wildlife as it is part of the Victoria Harbour Migratory Bird Sanctuary. Construction is scheduled for Fall 2023.



Songhees Walkway Pocket Beach

This shoreline restoration project, located on the north shore of Victoria's Middle Harbour, will contribute to local ecological, economic, and cultural values. Shortly after concrete debris and rocks that lined the pocket beach were replaced with sand and gravel, local surf smelt found this restored habitat and started using it to spawn! Find out more about it in this article on [Chek News](#).

Follow along to watch our three Green Shores [demonstration sites](#) come to life at [resilientcoasts.ca!](https://resilientcoasts.ca)



BUILDING PROFESSIONAL CAPACITY AROUND NATURE-BASED SOLUTIONS

The Stewardship Centre for British Columbia's Green Shores program hosted nine training sessions in 2021 and 2022. These include Level 1 and 2 programs.

- **Green Shores Level 1:** This one-day course is for anyone interested in a comprehensive introduction to the Green Shores nature-based solution framework and the four foundational principles that benefit people and the environment. Information about the two Green Shores Credit and Ratings guides (Green Shores for Homes and Green Shores for Shoreline Development) is provided, along with an opportunity to apply learnings on-site at a shoreline field location.
- **Green Shores Level 2:** This two-day course offers opportunities for in-depth application of the two Green Shores Credits and Ratings guides and to practice the design of restoration projects that use the Green Shores principles at multiple shoreline field sites.



Photo by Kelly Loch

By providing training free to local communities and shoreline professionals about the benefits and techniques of nature-based solutions for shorelines, we will create champions for nature-based approaches operating at the community level. Trainees so far include Indigenous government staff, municipal planners, landscape architects, stewardship group members, engineers, biologists, and homeowners.

Check out resilientcoasts.ca for [upcoming training dates](#) in your community.

WANT TO LEARN MORE?

- Check out our educational primer: [Impacts of Climate Change on Shorelines, People, and Salmon: Nature-Based Approaches for Ecosystem Health](#) and our [online Tool Kit](#) to learn more about coastal climate change impacts and how you can use nature-based solutions in your home and daily life to reduce your environmental impact.
- Follow the Resilient Coasts for Salmon project as we develop educational resources, host outreach and training events, and map the shorelines in your community. Go to resilientcoasts.ca, the PSF website psf.ca and [PSF Facebook page](#) and the SCBC website stewardshipcentrebc.ca for more information.
- Spread the Word! Please share this newsletter with your colleagues and friends!
- Have a question? Get in touch with the **Resilient Coasts for Salmon Project Manager, Kyla Sheehan** at ksheehan@psf.ca.



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*Resilient Coasts for Salmon is collaborative initiative led by the Pacific Salmon Foundation with partners such as the Stewardship Centre for BC, World Wildlife Fund – Canada, Peninsula Streams Society and others. Resilient Coasts for Salmon is funded in part by the Government of Canada.