THE PACIFIC SALMON FOUNDATION MAGAZINE

# SALMON STEWARD

WINTER 2025 | PSF.CA

## WILD SALMON RECOVERY

MONITORING WILD JUVENILE SALMON NEAR CLOSED OPEN-NET PEN SALMON FARM SITES


### HELPING SALMON SPAWN

Improving spawning habitat on Vancouver Island and in the Fraser Valley

### FRONTLINES OF CLIMATE CHANGE

Taking action so salmon stay cool as rivers heat up

# SALMON STEWARD

WINTER 2025

PACIFIC SALMON FOUNDATION


**ABOUT US**

We're salmon first, salmon always. Our vision is healthy, sustainable, and naturally diverse populations of Pacific salmon for the benefit of ecosystems and people for generations to come.


**EDITOR**

Braela Kwan

**CONTRIBUTING WRITERS**

Oscar Beardmore-Gray
Chloë Fraser
Braela Kwan

**DESIGN**

Carmen Bright

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320 – 1385 West 8th Avenue
Vancouver, B.C. Canada V6H 3V9
604.664.7664
salmon@psf.ca | psf.ca

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PSF's Michael Meneer tagging fish with the Bottlenecks to Survival project — a partnership between the Pacific Salmon Foundation and BC Conservation Foundation.

## CEO'S MESSAGE

### Salmon are having a moment in British Columbia.

This year, better-than-expected numbers of sockeye returned to the Skeena and Fraser Rivers. In the summer, a Lower Fraser recreational sockeye fishery opened for the first time in three years.

On the south coast, you couldn't miss the pinks jumping out of the water near the mouth of the Fraser River.

We are uplifted by these encouraging returns and celebrate that salmon are making national headlines.

South of the border, salmon are also seeing success. In September, a Chinook salmon passed through a fish ladder in the upper Klamath River in Oregon — the furthest a returning salmon has been recorded since four lower river dams were removed between 2023 and 2024. This is a major milestone for the watershed and a testament to the resilience of salmon and the power of collective action.

These 'good news' stories motivate us to build on this momentum and remain focused on advancing salmon recovery and resilience now and into the future. More than **two-thirds** of salmon populations in British Columbia and the Yukon are below their long-term averages, as reported in our data-driven State of Salmon overview (*see more on pages six and seven*).

Together, we can put our heads together to help **recover** salmon and their habitats, building on favourable ocean conditions and major restoration efforts underway.

In the Discovery Islands, PSF proudly joins a legacy of monitoring efforts that are seeking to understand if wild salmon are recovering following the removal of open-net pen Atlantic salmon farms from the area (*see more on page five*). This has been decades in the making following years of research, and will help us understand how salmon are responding to the removal of the open-net pens over time.

These kinds of long-term projects remind us that our **collective efforts matter**. Progress is possible through sustained efforts and investments.

For more than 35 years, PSF's focus has been saving and restoring wild Pacific salmon. We thank you for your continued support that allows us to show up for salmon, so they can come back to rivers, streams, and creeks.

Together, we're helping this salmon moment thrive — not just this year, but for generations to come.

Michael Meneer
President & CEO,
Pacific Salmon Foundation

**ON THE COVER:**
Monitoring wild juvenile salmon near closed open-net pen salmon farm sites.

Photo (top): Chelsea Pope

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### SCIENCE IN THE NEWS

A new peer-reviewed study published in the *Canadian Journal of Fisheries and Aquatic Sciences* found the last decade was the worst on record for salmon monitoring in B.C. and the Yukon since broadscale surveys began more than 70 years ago. Coho and chum salmon saw the greatest declines in monitoring. Pink salmon also saw major reductions, especially in northern and central B.C.

In another recent paper published in *FACETS*, Gideon Mordecai from UBC's Institute for Oceans and Fisheries argues that shortcomings in Fisheries and Oceans Canada (DFO)'s assessments of fish-farm-associated pathogens undermine evidence-based regulation.

### GUARDIAN DIVE TRAINING ON CALVERT ISLAND

Eight divers from six coastal B.C. Nations took part in a five-day Indigenous Guardian dive workshop at Calvert Island hosted by the Hakai Institute. Working with expert trainers, participants sharpened their kelp survey and species identification skills to support ecosystem monitoring efforts. PSF was proud to support this training along with the Hakai Institute and WWF-Canada, with thanks to Environment and Climate Change Canada and DFO.


### YUKON SALMON EVENTS

PSF staff joined community dinners hosted by the Yukon Salmon Sub-Committee across the territory in mid-October. Staff shared and discussed early data on the status of local Chinook and chum populations and their habitats, soon to be available in the Pacific Salmon Explorer (salmonexplorer.ca).

Earlier this year, PSF attended the annual salmon gathering co-hosted by the Carcross/Tagish First Nation and Council of Yukon First Nations, which PSF is providing support for in 2025 and 2026.

### SAVE THE DATES!

PSF's South Vancouver Island Gala Dinner & Auction will take place on **Saturday, February 28**, at the Delta Victoria Ocean Pointe Resort.

On **Thursday, April 16**, join us at our Vancouver Gala Dinner & Auction — presented by Wheaton Precious Metals — at the Fairmont Pacific Rim.

# $1.3 MILLION RESTORATION PROJECT TO REVIVE VANCOUVER ISLAND CHINOOK

**A threatened population of Chinook salmon will get a major boost from significant restoration work in the Nootka Sound region of Vancouver Island.**

The new project is improving spawning habitat at the outflow area of Muchalat Lake, a remote area about 90 kilometres west of Campbell River, and is a collaborative effort spearheaded by Nootka Sound Watershed Society, Ecofish Research, a Trinity Consultants Canada team, Mowachaht/Muchalaht First Nation, and the Pacific Salmon Foundation.

Restoration efforts aim to recover the local Chinook population, which was assessed as **threatened** by the Committee on the Status of Endangered Wildlife in Canada in 2020.

This population has suffered from increased flows brought on by heavy logging practices and climate effects that have degraded the Muchalat and Gold River watersheds.

It's anticipated that improved spawning habitat will significantly increase the number of fish annually spawning at the site to about 1,000 to 2,000 adult Chinook salmon.

"If you come here in the fall, you'll see massive amounts of fish coming through here," says Kent O'Neill, President of Nootka Sound Watershed Society. "But spawning isn't as prolific as it should be because the fish don't have enough quality habitat."

To remedy this problem, construction to enhance the critical spawning site in the Muchalat River began in August 2025. The work was completed in early September before returning salmon arrive at the site in October.

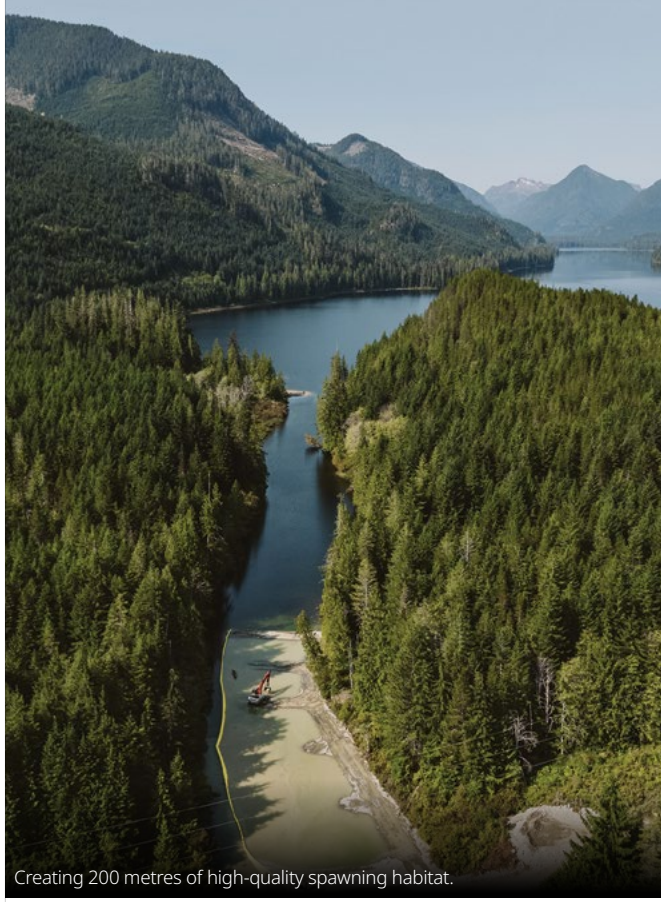
Crews from Ecofish Research spent several weeks engineering high-grade spawning gravel and preparing the site to minimize impact on the ecosystem, before placing the gravel into the river with an excavator. The result: 200 metres of high-quality spawning habitat that will encourage fish to spawn and successfully lay their eggs.

A second stage of the project is slated for 2026 to build an additional feature that will help retain water at the site and protect the new spawning channel from the growing impacts of drought and periods of heavy rainfall.

### BACKING GAME-CHANGER PROJECTS FOR SALMON

The Pacific Salmon Foundation (PSF) provided $560,000 in funding to support this game-changing effort.

"This project is a big deal," says Jason Hwang, Chief Program Officer and Vice President, PSF. "It's a big deal in terms of the money going into it, but it's also going to be a big deal in terms of the benefits to salmon and to this river."



Creating 200 metres of high-quality spawning habitat.

Team members from Nootka Sound Watershed Society, Ecofish Research, Mowachaht/Muchalaht First Nation, and PSF.

Photos: Graham Dorsay

Other partners raised an additional $740,000, underscoring the collaborative nature of the project and the universal backing it's received.

"Everybody thinks this is a great idea," emphasizes O'Neill. "No one has said, this is too risky, or this isn't going to do what you think it's going to do. Everybody has felt that it's going to have a good outcome. So that's a really good feeling."

Like many small communities on B.C.'s coast, Pacific salmon play an integral role in Gold River, a town of 1,300 people nearest to the project site.

"Salmon recovery would be enormous for us because we all depend on salmon," says Chief Jerry Jack, Mowachaht/Muchalaht First Nation. "People from all over the world come here to fish, so restoring salmon habitat and protecting our streams is really good news."

*Special thanks to RBC Foundation, a 2024 grant from Mosaic BigCoast Forest Climate Initiative, and the Pacific Salmon Endowment Fund Society for supporting PSF on this project.*

Left to right: Farlyn Campbell, Kyra Ford (PSF), and Jody Eriksson — vital members of the field crew.

Photo: Chelsea Pope

# AFTER THE FISH FARMS

**The Discovery Islands, an archipelago east of Campbell River, form a key migratory channel for Fraser River salmon.**

Both adult salmon coming back to spawn and young salmon headed out to the open ocean travel through these waters. Local salmon populations also rear, feed, and grow nearby.

Until recently, open-net pen Atlantic salmon farms operated in the area for decades, raising concerns about the potential spread of pathogens from farmed to wild fish.

Following a decision by the federal government **not** to renew Atlantic salmon farm licences in the Discovery Islands, open-net pens were phased out of the area between 2021 and 2022.

Understanding how wild salmon respond to the removal of open-net pens over time requires monitoring while the farms are operating and after they are phased out. The Pacific Salmon Foundation (PSF) has stepped in to help lead these vital data collection efforts from 2025 to 2028, building off a legacy of monitoring established by the Hakai Institute, Dr. Kristi Miller-Saunders from Fisheries and Oceans Canada (DFO), and independent scientist Dr. Alexandra Morton.

During the juvenile salmon outmigration season in spring to early summer, PSF's Salmon Health Program, along with partners from the University of Toronto and the local area, sampled juvenile salmon for pathogens, counted sea lice, and studied other environmental factors as the fish migrated past now-inactive salmon farms.

"This research matters because we're seeing salmon declines across their range. They're facing many stressors, with impacts from Atlantic salmon farms among them. By monitoring wild salmon after the farms are removed, we'll be able to see if salmon are recovering," says Dr. William Bugg, a postdoctoral scientist with PSF.

"Without this fieldwork, we risk losing a critical opportunity to monitor juvenile wild salmon during this key period of change."

### FARMED AND WILD SALMON IN CLOSE QUARTERS

To monitor for pathogens and environmental stressors, PSF's field crew samples juvenile salmon and applies 'Fit Chip' technology — similar to what's used in personalized human medicine — to screen salmon for overall health. The team simultaneously collects environmental DNA from surrounding waters for the presence of pathogens and viruses. Together, these measures will reveal how juvenile salmon are doing now that the farms have been removed.

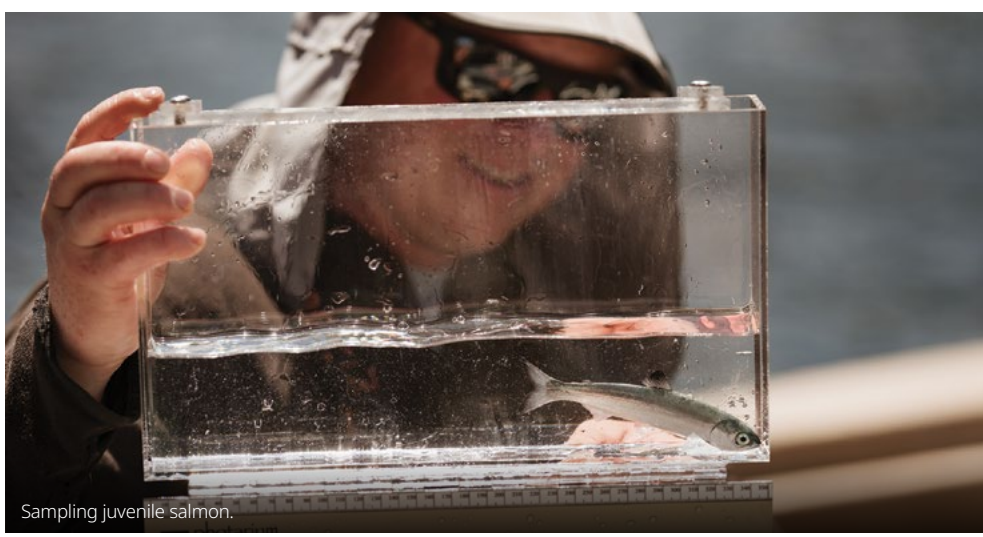
In collaboration with numerous partners, PSF has published a mountain of peer-reviewed, independent research clearly linking open-net pen salmon farms to risk factors for wild Pacific salmon in B.C.

Open-net pen salmon farms, set to be phased out of B.C. entirely by 2029, raise Atlantic salmon in crowded pens in the ocean. Such conditions make farmed fish a breeding ground for pathogens that can spread to wild salmon migrating nearby.

In the Discovery Islands, open-net pens have been absent for several years. The field crew may be starting to see the effects.

"We are seeing huge numbers of healthy-looking local salmon," says Kyra Ford, fisheries health technician with PSF, adding that the fish "have persisted much later into the summer than when the farms were around."

*This work is co-led by the University of Toronto, with critical support from Raincoast Research Society and funding from the Natural Sciences and Engineering Research Council of Canada.*



Sampling juvenile salmon.

Photo: Chelsea Pope

Pink salmon.

Photo: Eiko Jones

# STATE OF SALMON

## NEW REPORT HIGHLIGHTS BOTH CONSERVATION CONCERN AND GLIMMERS OF HOPE.

**The Pacific Salmon Foundation (PSF) has released its latest State of Salmon Report, finding that the majority of salmon populations in B.C. and the Yukon are below average, yet some are showing hopeful signs of recovery.**

Building off the inaugural report from 2024 with updated data, PSF's new State of Salmon report — the only comprehensive summary of its kind — provides a critical overview of all six species of Pacific salmon, including steelhead, across 10 major regions in B.C. and the Yukon.

"The State of Salmon report tells us how salmon are doing today relative to their historical returns, shedding light on which populations need our help and where we need to take action," says Michael Meneer, CEO and President, PSF.

The report found that two-thirds of Pacific salmon are below their long-term averages, reflecting decades of decline and the mounting effects of climate change. Yet it also provides hope by highlighting areas where salmon are increasing in abundance.

For example, pink salmon are showing up in high numbers across many regions in B.C. and the Yukon. The State of Salmon report indicates that pink salmon are thriving in many regions, such as in the Nass, where pink salmon are 564 per cent above their long-term average and had record-high returns in 2024. Pink salmon are also surpassing their long-term average by 110 per cent in the Fraser.

"The data-driven State of Salmon report identifies how and where salmon have changed over time, allowing us to celebrate the recovery wins while staying focused on the long game of restoring salmon for generations to come," says Meneer.

> **"Recent gains for some salmon species show that salmon can rebound when conditions are right."**
>
> — **Katrina Connors**

Chinook salmon.

Photo: Fernando Lessa

## SOUTHERN REGIONS SIGNAL HOPE

**Across the south coast, some sockeye and Chinook populations are showing signs of improvement.**

Chinook salmon are 45 per cent up in the Fraser and 236 per cent up in East Vancouver Island and Mainland Inlets compared to their long-term averages. Although these aggregate results are encouraging, they may not fully represent the status of all Chinook populations across the region.

Many Chinook populations on eastern Vancouver Island are doing well, including in the Cowichan River, where returns have recently rebounded to record highs from a low of just 500 spawners only 15 years ago. Many of these regional Chinook populations are enhanced by hatcheries. This enhancement, combined with strong marine survival in recent years due partly to favourable conditions in the Strait of Georgia, are contributing to recent increases.

Sockeye also exemplify the resilience of salmon in some areas. Columbia sockeye, which faced near extinction less than three decades ago, are 187 per cent above their long-term average, making an astounding comeback. Just last year, more than 150,000 sockeye made it to spawn in the Canadian portion of the Columbia — one of the best years in recent decades.

While these signs of increased abundance are encouraging, the State of Salmon Report makes clear that significant conservation challenges remain ahead.

“Recent gains for some salmon species show that salmon can rebound when conditions are right,” says Katrina Connors, Senior Director with PSF. “But a few good runs in recent years doesn’t outweigh decades of decline and the rising challenges of climate change, habitat loss, and pollution, among others. We can’t afford to lose sight of the urgency to prioritize salmon conservation and recovery.”

Yukon River Chinook.

Photo: Peter Mather

## CAUSE FOR CONCERN IN NORTHERN AND CENTRAL REGIONS

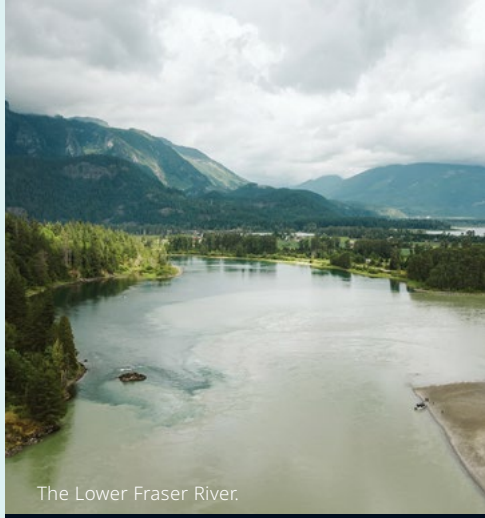
**Salmon declines are especially prominent in central and northern regions.**

In the Yukon, for example, Chinook salmon are down 50 per cent and chum salmon are down 74 per cent compared to their long-term averages. Fishing opportunities for both species have disappeared in recent years.

However, large and growing data gaps make it difficult to determine the severity of declines in regions like the Central Coast, Haida Gwaii, and the Northern Transboundary area.

Monitoring cuts in the Nass and Skeena Rivers made headlines earlier this year, contributing to a decades-long decline in salmon monitoring. Concerns remain about further reductions in the future, and the need to develop a long-term strategy for collecting the data needed to assess the state of salmon and guide recovery efforts.

Despite steep declines and growing data gaps, salmon are still capable of improving. For example, the Nass River region, the third-largest salmon-bearing system in British Columbia, has one of the most positive outlooks for salmon. According to the State of Salmon report, all species except steelhead have increased over the last generation. Nass chum are 118 per cent above their long-term averages, while coho are 74 per cent above.



The Lower Fraser River.

Photo: Brandon Deepwell

## A GOOD YEAR FOR THE FRASER RIVER

Salmon returned to the Fraser River in impressive numbers in 2025.

Fraser sockeye returns were three times higher than predicted, with an estimated 9.2 million fish. This is still below the historical average. Fraser sockeye return in four distinctly-timed groups, the earliest called the ‘Early Stuart’ run. The 2019 Big Bar landslide devastated the Early Stuart run, which has struggled since. But this year’s Early Stuart run was the strongest in nearly two decades, a nod to the resilience of salmon.

Pink salmon also came back in healthy numbers this year, with more than 14.4 million returning.

What’s behind these high numbers? The answer could be out at sea.

“Something good is happening in the Salish Sea. Pinks are good at taking advantage of these ocean conditions and having a flashy, really strong return year,” says Eric Hertz, a PSF analyst.

Still, the 2025 salmon run was marked by climate change. Unseasonably warm and dry conditions persisted into the fall. A widespread lack of rain created migration and spawning challenges for many salmon on eastern Vancouver Island, Fraser Interior, Central Coast, and other areas.

*Thank you to the Sitka Foundation and Province of B.C. for supporting PSF’s State of Salmon report.*

*The State of Salmon report will be updated on an annual basis to reflect the best available data.*

***STATEOFSALMON.CA***

Improving spawning channel habitat.

Photo: Seabird Island Band

# BRINGING CHINOOK BACK TO MARIA SLOUGH

**For years, Tl'élx̱xel (Chinook salmon) harvests proved impossible for the Sq'éwqel (Seabird Island Band) near Agassiz — until 2024. After sustained restoration efforts, Seabird Island members were able to harvest a small number of Chinook to share with the entire community.**

"We had one of the highest Chinook returns in a decade," says Jillian Stewart, a biologist for the Sq'éwqel. "Most came back to spawn in the channel we'd just restored in Sqémelech (Maria Slough). When you give fish the right conditions, they respond."

Elders and knowledge holders like Councillor Rodney Peters recall the slough as a once-vibrant side channel of the Fraser River, which supported abundant Chinook, Sthéqi (sockeye), Kwőx̱weth (coho), Kw'ó:lexw (chum), and Hőliya (pink). Over time, development and climate change have degraded this critical habitat and cut off freshwater flows.

To help rebuild dwindling stocks, the community has created and maintained spawning channels that doubled salmon habitat. But severe drought conditions in recent years — compounded by water management challenges and failing culverts — have restricted Chinook passage and their ability to spawn. The population has since been designated **endangered** by the Committee on the Status of Endangered Wildlife in Canada.

Photo: Chloë Fraser

New habitat features will offer Chinook shade and shelter.

In 2024, Seabird Island collaborated with Fisheries and Oceans Canada (DFO)'s Habitat Restoration Centre of Expertise and other partners to restore these channels and address the dangerously low flows. With support from PSF's Community Salmon Program in 2025, crews redistributed spawning gravel throughout the channel and added boulders and logs to cool the water, boost oxygen, and keep flows moving through summer heat.

"It's a stepping stone toward our hope of reconnecting Maria Slough to more freshwater — so it's not stagnant anymore — and bringing back a lot more salmon," adds Stewart.

To combat invasive canary reed grass, the restoration team cut and cleared it weekly so native dogwood and willow could take root. The goal of the restoration is to give salmon easier access to high-quality habitat where they can find shelter for years to come.

Chinook were traditionally harvested in early spring, providing critical nutrition after long winters. Today, the Sq'éwqel continue to reconnect with salmon and support their recovery through annual reporting sessions, monitoring, planting events, and spring fry releases. These activities create a feedback loop where community members can share their input and see new ideas put into practice — from water quality monitoring to species surveys.

"Our connection to the land, the water, and all living beings is evident in our guiding principles. We have an inherent responsibility to listen to what the salmon are telling us, steward them, and ensure they are there for years to come," says Sally Hope, Councillor of Seabird Island.

"This project will allow a safe place for salmon to spawn — and hopefully, an opportunity for our grandchildren to harvest."

*PSF was proud to support this project with a $112,384 grant. Every year, our Community Salmon Program stewards revenue from the Salmon Conservation Stamp on behalf of DFO. Thanks to generous donor support, we leverage these funds to support more than 150 community-led stewardship projects.*

**DONATE TO SUPPORT**
***PSF.CA/DONATE***

# MAPPING THE IMPACT OF THE COMMUNITY SALMON PROGRAM

**In the 35 years since its inception, the Pacific Salmon Foundation's Community Salmon Program (CSP) has distributed $31 million in grants to more than 3,500 projects across B.C. and the Yukon.**

The funding program provides grants to streamkeepers, First Nations, schools, and conservation organizations by stewarding Salmon Conservation Stamp funds on behalf of Fisheries and Oceans Canada (DFO).

Now, thanks to a new online 'Restoration Atlas', exploring the archive of CSP projects has never been easier.

By providing a collection of previously completed community-led salmon restoration projects, the database will help community groups visualize successful projects and focus their efforts for future applications.

Impactful CSP-funded initiatives over the years have included salmon habitat restoration, monitoring and research, streamkeeper training, and educational programs that raise awareness for salmon.

"The Community Salmon Restoration Atlas has been a long time coming," says Ben Skinner, a GIS Specialist at Pacific Salmon Foundation who was responsible for developing the Atlas. "Creating this resource is a great way of spotlighting the impact that local community groups have had for salmon across B.C over the years."

The Restoration Atlas visually pinpoints projects from across the province, highlighting the breadth and scope of the local action the Pacific Salmon Foundation has supported since 2015.

Restoration efforts at Hiłsyaqλis

Photo: Tom Balfour/Redd Fish Restoration Society

**"From Haida Gwaii to the Interior of B.C., we're lucky to have so many committed people for salmon who get involved in community-led projects."**

— **Ben Skinner**

The records include everything from project objectives, the number of volunteers involved, how many hours a project took to complete, to post-construction photos of the positive impact stamp dollars have had for salmon.

"Building this resource really creates a visual tapestry of salmon restoration," says Skinner. "From Haida Gwaii to the Interior of B.C., we're lucky to have so many committed people for salmon who get involved in community-led projects."

The Restoration Atlas will be housed in PSF's Restoration Hub, a repository of open-access informative resources and decision-support tools to guide and help coordinate adaptive habitat restoration approaches and strategies.

## *PSF.CA/RESTORATION-ATLAS*

*Thanks to DFO's Habitat Restoration Centre of Expertise, West Coast Aquatic, and Redd Fish Restoration Society for their support. Funding for this work was provided by DFO's Aquatic Ecosystem Restoration Fund as part of the PSF-led project called 'Greening the Salish Sea: Decision Support Tools for Successful Pacific Salmon Habitat Recovery.' Additionally, thank you to the many dedicated stewardship groups and First Nations participating in salmon habitat restoration.*

**The Community Salmon Restoration Atlas will feature major fish habitat recovery efforts like at Hiłsyaqλis (Tranquil Creek) near Tofino on Vancouver Island.** The Community Salmon Program has provided **$235,000** in funding over several years, enabling Tla-o-qui-aht First Nation and Redd Fish Restoration Society to implement a holistic and innovative approach that restores river processes and creates habitat for salmon that was damaged by decades of logging. Over eight years, Tla-o-qui-aht and Redd Fish installed 38 engineered log jams and placed more than 800 large trees back into the river, the natural processes vital to salmon production across their life cycle.

Photo: Ross Reid

Snorkelling the Coldwater River to record water temperatures and collect other data.

Photo: Nicole Van Zutphen

# FINDING THE 'COLD' IN THE COLDWATER RIVER

At-risk salmon in the Coldwater River are on the frontlines of climate change. Biologists and local Guardians are giving these fish a fighting chance.

**What connects British Columbia's lush west coast to the arid, dry Nicola Valley in the Southern Interior?**

Look no further than the Pacific salmon migration.

As salmon travel from the coast into the Nicola Valley, home of the Nlaka'pamux and the Syilx Peoples, they bring an important pulse of nutrients inland.

The Coldwater River, the largest tributary of the Nicola River, is critical for both juvenile and adult salmon. Yet, the Committee on the Status of Endangered Wildlife in Canada has designated coho salmon that swim through the river as **threatened**, and Chinook and steelhead as **endangered**.

Locals have been living with the reality of salmon declines for many years.

"For decades, the community hasn't had access to salmon for food," says Nathan Lustig, fisheries biologist with Scw'exmx Tribal Council, which represents the Coldwater, Nooaitch, Shackan, and Upper Nicola bands. "To be able to fish, community members have had to go down to the Thompson or Fraser. But the long-term vision is for members to be able to fish for salmon at home."

## A BUFFER AGAINST CLIMATE CHANGE

In the Coldwater River, salmon are on the frontlines of climate change. The watershed's already warm summers are getting hotter and drier.

Water temperatures as high as 27°C in the Coldwater have been observed recently, well above the tolerable threshold for salmon. This year, adult salmon returning to the Coldwater faced unbearably warm waters and some died before they could spawn.

Fortunately, the river is naturally equipped with 'thermal refuges', or distinct patches cooler than surrounding waters. Thermal refuges often form where cool groundwater flows upward into a river or where a river meets a tributary. Salmon use these cool spots to find relief from thermal stress.

"It's similar to air conditioning. When it's hot out, people move inside to thermoregulate. Salmon do the same thing. They seek out these cool water areas to take a break from the heat," says Auston Chhor, a salmon habitat biologist with Raincoat Conservation Foundation.

With support from the Pacific Salmon Foundation (PSF), the Scw'exmx Tribal Council, Citxw Nlaka'pamux Assembly (CNA),

and Raincoast have embarked on a project to identify and map out thermal refuges in the 94-kilometre-long Coldwater River. Ultimately, they aim to protect and enhance these thermal refuges and help salmon increase their resilience against climate change.

**DRONES AND SNORKELS**

In the summer of 2025, biologists and local Guardians identified and mapped several thermal refuges along the Coldwater River.

This endeavour provided valuable insights into how the river's dynamics have shifted since catastrophic flooding in 2021, which altered its course and displaced thermal refuges, raising ongoing concerns about impacts on fish habitat.

To locate the thermal refuges, they used a drone equipped with a thermal camera to produce a map of the river.

The researchers then conducted snorkel surveys at identified sites. They went underwater to record water temperatures, count fish, identify species, evaluate fish behaviour, and assess habitat features.

Snorkelling also provided the field team with much-needed breaks from the heat. “Swimming was an added bonus this summer,” says Chhor.

The team found that juvenile salmon, and other fish species, were actively using the cool water patches. However, the unexpectedly small size of the sites meant they were less suitable for larger adult salmon returning upstream.

As salmon were coming back in September, the team trialled low-tech methods to improve and expand these thermal refuge sites, such as shading the river to reduce temperatures, or constructing temporary rock weirs to prevent cool pools from mixing with warm waters.

“The salmon that are adapted to this area haven’t been able to keep up with climate change. We have an opportunity to protect thermal refuges and improve habitat to help salmon in the long term,” says Chhor.

**TRAINING THE NEXT GENERATION OF INDIGENOUS GUARDIANS**

In the field, Chhor and Lustig were joined by two Indigenous Guardians from Citxw Nlaka’pamux Assembly.

Using drones to map the Coldwater River.

Photos: Nicole Van Zutphen

> **“The salmon that are adapted to this area haven’t been able to keep up with climate change. We have an opportunity to protect thermal refuges and improve habitat to help salmon in the long term.”**
>
> — Auston Chhor

**CLIMATE EMERGENCY FUNDING**

As of mid-October, PSF approved **$855,180** in funding in 2025 to help salmon in response to extreme drought and other climate emergencies across the province. Local partners leveraged the funding to tag fish to assess salmon passage, improve river flows, and monitor conditions on the ground.

The Guardians gained hands-on experience planning, collecting data, counting fish, and analyzing data.

A major goal of this project is to provide training in scientific protocols for the next generation of Indigenous Guardians, supporting their goal of increased leadership in conservation science.

“We would like to see this project flourish as the data that is being collected will significantly enhance our understanding of the watersheds in the Nicola Valley,” says Ariel Voght, Guardians Manager with CNA.

*The Pacific Salmon Foundation supported this project through the British Columbia Salmon Restoration and Innovation Fund (BCSRIF) — a joint program from the Government of Canada and Province of British Columbia.*

*Through BCSRIF, PSF has collaborated with Dr. Eric Saczuk from BCIT’s Remotely Piloted Aircraft Systems Hub to train 10 Indigenous partners in the use of thermal drones to map and monitor salmon habitats.*


Salmon need us to show up for them today so they can continue coming back into the future.

**DONATE TODAY TO MAKE A DIFFERENCE.**

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