



TRACKING

RAINCOAST INTO 2020

Investigate. Inform. Inspire.

Raincoast is a team of scientists and conservationists dedicated to safeguarding the land, waters, and wildlife of coastal British Columbia.

Raincoast staff and team members

Chris Genovali
Executive Director

Paul Paquet, PhD
Senior Scientist
Senior Associate-Raincoast Lab,
Adjunct Professor,
University of Victoria

Raincoast Applied Conservation Science Lab

Chris Darimont, PhD
Science Director, Chair-Raincoast Lab
Associate Professor, University of
Victoria

Lauren Eckert
Raincoast Fellow and PhD Student

Kate Field
Raincoast Fellow and PhD Student

Hannah Hall
Lab Manager and Research Associate

Lauren Henson
Raincoast Fellow and PhD Student

Tyler Jessen
Raincoast Fellow and PhD Student

Ilona Mihalik
Raincoast Fellow and MSc Student

Marine Operations

Brian Falconer
Guide Outfitter Coordinator

Rob Nelson
Achiever Skipper

Research Consultants

Bryant DeRoy
Research Scientist

Research Associates

Megan Adams, PhD
Postdoctoral Fellow, University
of British Columbia

Kyle Artelle, PhD
Adjunct Professor, University
of Victoria

Andrew Bateman, PhD
Research Scientist, Pacific
Salmon Foundation

Heather Bryan, PhD
Assistant Professor, University
of Northern British Columbia

Faisal Moola, PhD
Associate Professor, University
of Guelph

Christina Service, PhD
Research Coordinator, Kitasoo/
Xai'xais Stewardship Authority

Communications and Development

Ross Dixon
Communications and
Development Director

Sherwin Arnott
Communications Associate

Nathaniel Glickman
Education and Outreach
Associate

Alex Harris
Communications Associate

**Adrienne Jarvela
Rosenberger**
Donor Stewardship Coordinator

Maureen Vo
Education and Development
Coordinator

Finance and Administration

Robyn Byrne
Bookkeeper

Fred Gregory
Special Project Coordinator

Maggy Mittler
Raincoast U.S. Administrator

Wild Salmon Program

Misty MacDuffee
Biologist and Director,
Wild Salmon Program

Riley Finn
Biologist, Research Associate
MSc student, University of
British Columbia

Dave Scott
Biologist, Fraser Estuary
Research and Restoration
Coordinator and PhD student,
University of British Columbia

Kristen Walters
Biologist, Lower Fraser
Conservation Program
Coordinator

Gulf Islands Forest Project

Shauna Doll
Research Analyst

Vision and mandate

Our vision for coastal British Columbia is to protect the habitats and resources of umbrella species. We believe this approach will help safeguard all species, including people, and ecological processes that exist at different scales. Central to our efforts are long-term partnerships with Indigenous governments.

We investigate to understand coastal species and processes.

We inform by bringing science to decision makers and communities.

We inspire action to protect wildlife and wildlife habitat.

Cover: Raincoast biologist Misty MacDuffee holds up juvenile salmon caught (and released) as we monitor, and demonstrate, the effectiveness of our habitat restoration efforts in the Fraser River estuary.

Tracking Raincoast into 2020 artists and photographers

April Bencze

page 5 (Chinook), page 16 (Nicholas Sinclair), back cover (Chinook)

Grant Callegari via Hakai Magazine

page 13 (Megan Adams & Patrick Johnson)

K Cullen Photos

page 2, 4 (Southern Resident killer whales)

Alex Harris

Cover (estuary research), page 8 (Misty MacDuffee, Noah Kussin-Bordo, David Scott, Peter Kidd), page 9 (Fraser Estuary Connectivity Project - crane, clamshell, David Scott & Gary Bouwman, Misty MacDuffee, Noah Kussin-Bordo, David Scott), page 14 (black bear), page 15 (Maple Leaf in the Kitlope), page 20 (Misty MacDuffee in the Fraser estuary)

Brandon Harvey / Maple Leaf Adventures
page 19 (Coastal Douglas-fir ecosystem)

Riley Finn / Martin Lab University of British Columbia
page 6 (map)

Tim Irvin
page iv (wolf)

Sherry Kirkvold
page 14 (Cecil Paul and Brian Falconer)

Sarah Macdonald
page ii (grizzly bear)

Mike Morash / One Island Media
page 1 (Chris Darimont), page 16, 22 (Salish Sea Emerging Stewards)

Katrina Pyne via Hakai Institute
page 16, 17 (Hakai Oceans to Icefields Research Project on *Achiever*)

Eric Sambol
page 25 (grizzly bear)

Jeff Reynolds
page 12 (Spirit bear)

Carrie Lynn Victor
page 10 (Lower Fraser salmon illustration)



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When evidence informs advocacy

WHEN EVIDENCE INFORMS ADVOCACY, a potent approach to conservation becomes available. This philosophy underpins everything we do at Raincoast. One of the primary vehicles to support our unique delivery of what we call *informed advocacy* is the Raincoast *Applied Conservation Science* Lab at the University of Victoria. Partnered with a science-based non-profit and dedicated to applied research, it is the first university lab of its kind.

Operating in a university environment provides extraordinary value and influence, and allows us to harness tremendous intellectual and infrastructure resources. We also provide outstanding educational opportunities to the undergraduate, graduate, and postdoctoral trainees who are passionate to partake in work that will make a difference in the real world. Finally, the scholarly environment demands that we submit our research to peer-review; an important process to maintain the rigour of our work and the resulting authority it is granted.

Although the benefits of the university model are legion, we enthusiastically endeavor to escape from the ivory tower. Whereas we *investigate* problems and opportunities with research, we also strive to *inform* and *inspire*. Raincoast provides opportunities for our team to interact directly with policy processes. Doing so helps us not only design applied work, but also inform policy makers in a timely fashion with new knowledge we pro-

vide. Knowing that policy makers often need a nudge from the public, outreach and communication about our research inspires the public to ask governments to respond with the intensity and urgency often required.

How we do our research matters to us. We are guided by a set of core values, among them social and ecological justice, Indigenous rights, and animal welfare. Guided by these values, we work respectfully with diverse partners and knowledge systems, especially via collaboration with Indigenous Nations.

Each year the scope and urgency of our efforts increases and, as our team grows, so does our need for support. Monthly donors provide a more stable funding environment. This type of investment also bolsters the independent scientific research Raincoast conducts, as well as education for the next generation of applied conservationists and wildlife advocates.



Chris Darimont
Science Director
Raincoast Conservation Foundation



Killer whales and court rooms

WE HAVE TO GO BACK to the last century (1999) to begin our story of killer whales and court rooms. It was then that both Northern and Southern Resident killer whales were recommended for listing, respectively as threatened and endangered. Their listing under Canada's Species at Risk Act came in 2003.

All killer whale photographs taken from land.

In September 2008, without consulting the Recovery Team, Fisheries and Oceans Canada issued a Protection Statement purporting that Resident killer whale critical habitat was protected by existing laws and policies. Raincoast and other NGOs disagreed. In the fall of 2008, our first lawsuit for the Southern Residents was filed, argued and later won, with Ecojustice. It was largely based on the Protection Statement's failure to protect all aspects of critical habitat - biological (food), chemical (water and food quality), and acoustic qualities. Following challenges by the federal government, the appeal court upheld the lower court decision in 2012, again ruling in favour of the whales.

The Species at Risk Act has a clear purpose - to prevent Canadian wildlife species from going extinct and to recover those that are extirpated, endangered, or threatened. It's still this tool we are using today in the context of the threats posed by the Trans Mountain expansion's tanker traffic. These threats are due largely from more vessel traffic noise that interferes with the feeding of hungry killer whales.

While the government says increased tanker traffic is a small percent of total vessel traffic, an extra tanker per day will mean the whales will spend more time in the presence of ships and less time successfully feeding. This makes their recovery all but impossible.

After the Trans Mountain project was first approved by the federal cabinet in 2016, we filed a lawsuit to prevent the seven-fold increase in oil tanker traffic through critical habitat. The case was heard before the Federal Court of Appeal in October 2017 and in a landmark decision for the Southern Residents, we won this lawsuit in 2018. However, the project was again approved by the federal cabinet in June 2019 after "reconsideration." We appealed this decision and in October, the Federal Court of Appeal declined to hear our case. This brings us to our current appeal to the Supreme Court of Canada that we filed in November 2019.

The legal dispute is not over as to whether the project will negatively affect the Southern Residents. The National Energy Board was clear in its reconsideration decision that more oil tankers would accelerate their decline. Our case argues that cabinet can't just ignore the federal laws designed to prevent extinction and accept the loss of these killer whales as a trade-off for economic pursuits. The Act is in place to protect endangered wildlife from going extinct.



Southern Residents and recovery

IN 2019, WE SAW the most significant threat reduction measures the Canadian government has taken to date to support recovery of Southern Resident killer whales. Through coordinated legal, scientific, and public outreach strategies, and government negotiations, Raincoast and our partners compelled the federal government to implement more ambitious measures for endangered whales. These included Chinook (and other salmon) fishing closures, three interim whale sanctuaries, an increased whale watching/vessel approach distance of 400 m, slow downs of commercial freighters and tankers through Haro Strait, and a move to end commercial whale watching on Southern Residents in their critical habitat.

Our engagement with federal departments helped establish five cross-sectoral Technical Working Groups that focus on specific areas for killer whale recovery. We also started Chinook salmon (primary prey) habitat res-

toration in the Fraser estuary, and completed two successful rounds of filming for our upcoming killer whale documentary, with a final round of filming scheduled for 2020. In addition, we continued to garner extensive coverage in regional, national, and international media outlets such as the CBC, Globe and Mail, Seattle Times, the BBC, and Helsinki Times.

Although we have made progress, there is much more to achieve. We are still working to halt major shipping and industrial projects, including the Terminal 2 expansion on Roberts Bank in the Fraser estuary, which would further industrialize critical habitat in the Salish Sea. We also need to change the unsustainable management of Chinook salmon, the primary prey for these whales.

Wild salmon - strength and resilience

EVERY YEAR THE SITUATION for British Columbia's wild salmon worsens. And every year the same actions are repeated by governments and society. We clearcut and pave their watersheds, dam and extract water from their rivers, pour toxins on the lands that drain to their rearing grounds, mar their migration routes with open-net fish farms, dump millions of hatchery fish into the ocean, and harvest in mixed stock fisheries that catch unsustainable numbers of at-risk, immature, and mature salmon.

Each year, Raincoast commits significant staff time and energy working to change salmon management. It requires meetings and calls, participating in technical and stakeholder forums, producing analyses and submissions, and engaging with government. While small steps are made, change is not happening fast enough. Increasingly, we are having to call for fisheries closures as a last resort solution to protect threatened and endangered salmon from entrenched and flawed management decisions.

Chinook salmon are a case in point. Chinook are the oldest and largest of the Pacific salmon, and were once present almost year round. This is partially why Resident killer whales evolved to depend on them. Yet many of the attributes that make these salmon magnificent are now compromised by fisheries that catch them before they are mature, overharvest the biggest and oldest fish, and reduce their size and diversity. Hatcheries have, for the most part, only made these problems worse.

Changing how and where we fish, along with making land use decisions that use salmon as an overarching indicator of sustainability, would make a big difference for all species (humans and non-human) that depend on these fish. In 2020, we will be working on big picture solutions to the systemic problems of salmon and fisheries management.

Searching for the Lower Fraser's lost streams

IN SUPPORT OF OUR EFFORTS to conserve and restore wild salmon habitat, we've worked with Dr. Tara Martin's Conservation Decisions Lab at the University of British Columbia to quantify the lost streams of the Lower Fraser River. This research has been motivated by a desire to understand what fraction of the area's historical salmon habitat remains accessible today.

What the maps don't show

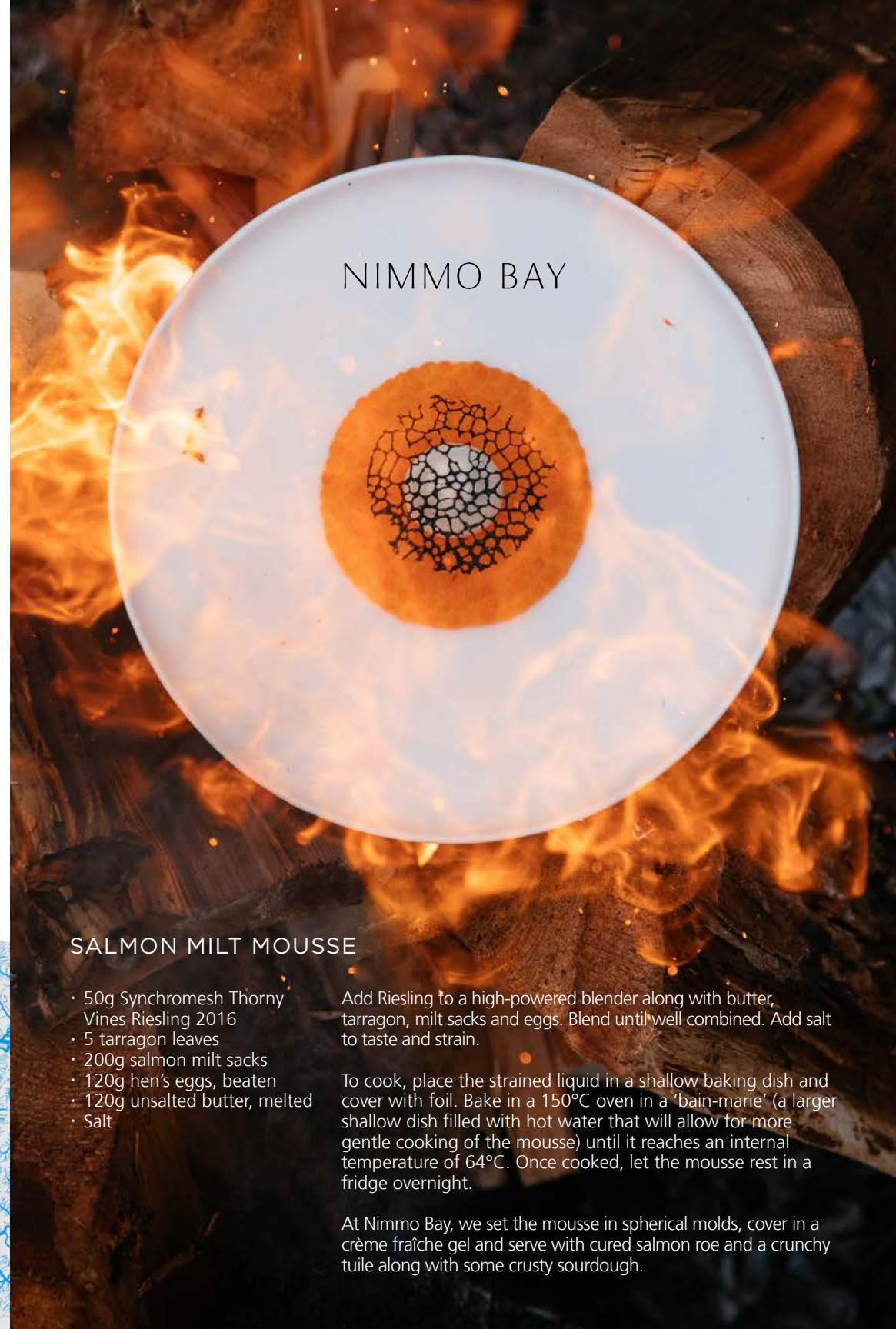
The initial attempt to map lost streams followed Fisheries and Oceans Canada's approach of digitizing historical maps. However, historical mapping focused primarily on locating valuable timber or farmlands, not mapping streams. While some larger rivers exist on these maps, smaller streams that may have been important for salmon were largely overlooked. In order to sharpen the historical picture, it needed to be viewed in a different way.

Digital elevation models can be used to infer where you might expect streams given the topography of the landscape. In BC, the

Freshwater Atlas has systematic mapping of existing streams at a 1:20,000 scale. By comparing a stream network created from a digital elevation model with those in the Freshwater Atlas, streams that may have existed historically (but have since been replaced with pipes, drainage ditches or canals) can be identified.

Restoration targets

By combining the extent of lost streams with information on barriers to fish passage (like dams, culverts, flood gates), the amount of historical salmon habitat that remains accessible to salmon today can be determined. The inclusion of lost streams is important to inform our understanding of remaining habitat, as it guards against shifting baselines and can inform restoration goals. By considering the costs and benefits of restoring access for salmon beyond existing human barriers, these historically productive ecosystems could be restored in a way that is economically efficient and ecologically valuable.



SALMON MILT MOUSSE

- 50g Synchronesh Thorny Vines Riesling 2016
- 5 tarragon leaves
- 200g salmon milt sacks
- 120g hen's eggs, beaten
- 120g unsalted butter, melted
- Salt

Add Riesling to a high-powered blender along with butter, tarragon, milt sacks and eggs. Blend until well combined. Add salt to taste and strain.

To cook, place the strained liquid in a shallow baking dish and cover with foil. Bake in a 150°C oven in a 'bain-marie' (a larger shallow dish filled with hot water that will allow for more gentle cooking of the mousse) until it reaches an internal temperature of 64°C. Once cooked, let the mousse rest in a fridge overnight.

At Nimmo Bay, we set the mousse in spherical molds, cover in a crème fraîche gel and serve with cured salmon roe and a crunchy tuile along with some crusty sourdough.

Reconnecting Fraser estuary salmon habitat

IN MARCH 2019, WE BROKE new ground in the Fraser estuary, literally. After three years researching how juvenile salmon use the Fraser estuary, we began physical habitat restoration to improve their access into habitats that support them. The Fraser estuary has been highly modified by dikes, causeways, and other structures. This includes the Steveston Jetty, an eight km long wall that separates the main arm of the Fraser River from adjacent marsh habitats. Phase one of our restoration efforts is addressing this barrier by creating 50 m breaches in the first three kms of this jetty.

100 years of obstruction

The Steveston Jetty is only one of the many structures dividing the Fraser estuary, altering the movement of salmon, freshwater, and fine sediments to Sturgeon and Roberts Banks. Starting in the 1880s, these walls were built to control the main channel and aid navigation. They restrict the natural processes necessary for a healthy estuary, and interrupt the migratory pathways of

juvenile Chinook and other salmon species into nearshore habitats. They likely force juvenile salmon into the deeper waters of Georgia Strait before they are ready.

In 2017, with support from Fisheries and Oceans Canada, we began hydraulic modelling to investigate a range of project ideas, and acquire baseline data on the abundance of juvenile salmon, marsh growth, and water quality from potential restoration sites. Based on our modelling and surveys, we identified the Steveston Jetty as the first project, anticipating benefits to juvenile salmon and the estuary without negatively affecting navigation.

When we created the breaches in the Steveston Jetty, our strategy was to remove sections of the wall and then let the flow of the river create natural channels onto Sturgeon Bank over time. To sample salmon in these breaches, we work with specially designed nets that funnel fish through an opening where they are then caught, identified, measured, and released.



Habitat restoration succeeds

In just 45 minutes on our first day of sampling at the east breach, March 26th 2019, we caught dozens of juvenile Chinook and chum salmon moving through the breach and into the safety of the marsh. It worked! We continued our sampling of the breaches through the spring and summer, and captured 454 juvenile salmon on 13 sampling days.

From our previous research, we know that May is the peak of the outmigration for juvenile chum in the Lower Fraser and the

peak for juvenile Chinook from the Harrison River. These tiny salmon are barely four to five cms long. These juvenile salmon likely need to spend at least a few tidal cycles in the marsh before they are ready for saltier waters. As such, these breaches should play a critical role in supporting their growth and transition.

In November 2019, we began phase two at each of our jetty breach locations to further reduce their elevation and ensure the breaches allow salmon movement and flow on all but the lowest low tides. We will continue monitoring salmon passage and marsh recovery, so stay tuned for further updates.



Toward a vision for wild salmon in the Lower Fraser

IN PARALLEL TO our research and habitat restoration efforts, we have been working with our project partners to articulate a vision for wild salmon in the Lower Fraser River. Our new report identifies the ongoing erosion of salmon habitat caused by a governance system that prioritizes the conversion of salmon habitat into goods and services at a cost to an irreplaceable cultural, economic, and ecological asset - wild salmon. The report identifies the failure of siloed governance bodies with incompatible land use objectives as a systemic cause of the salmon crisis.

Following visioning workshops and meetings with close to 100 individuals, including members of the Kwantlen, Kwikwetlem, Shxwhá:y Village, Stó:lō, Sts'ailes, Tsawwassen, Tsleil-Waututh, Tzeachten, Kwakwa'apilt, and Yale Nations, the report reflects how a range of organizations and individuals envision a future for the Lower Fraser River that can put salmon, and their habitat, on a trajectory that enables their resilience.

Collectively, these groups identified bold aspirations focused around a number of key themes including education, fish friendly policy, rebuilding of research and monitoring capacity, and education. An overarching theme was the need for engagement of Indigenous Nations and people. Our recommendations to all levels of government, funding

agencies, and all those with an interest in wild salmon, are as follows:

1. Ecological governance and regional planning that honours Aboriginal rights and title and the principles of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP),
2. Collaborative habitat conservation and restoration,
3. Formation of a watershed plan for the entire Fraser River,
4. Sustainable funding mechanisms,
5. Rebuilding monitoring and research capacity,
6. Implementation of fish first policy,
7. Investment in wild salmon education.

Throughout 2020, we will be working to support the uptake of these recommendations with our broad range of partners. A key component will be our support for the development and successful implementation of a Lower Fraser Fisheries Alliance led fish habitat strategy.



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Raincoast Applied Conservation Science Lab

The importance of salmon diversity

ONE OF THE MOST important characteristics of science is its ability to improve understanding about the natural world. Often that means questioning 'established' knowledge.

For years, we have advocated for increased allocation of salmon for wildlife. We typically thought of allocation simply as the total biomass available to bears and other ecosystem recipients. Our recent work, however, has shown how that focus

was too narrow. Although allowing enough salmon biomass to escape the nets of fishers is clearly important, so too is the diversity of salmon species available to wildlife. A recent paper, led by Dr. Christina Service, showed how salmon consumption by black bears increases not with extra salmon biomass, but instead with the availability of more salmon species. Having different areas and times of spawning, multiple salmon species offer black bears more access to salmon across watersheds and the spawning period. This new knowledge helps inform local management decisions relating to



safeguarding (or restoring) smaller, less commercially valuable salmon runs.

Beyond Bears

Although the Raincoast lab is known for its work on grizzly, black, and Spirit bears, we also conduct applied research on other organisms. Our general rule of thumb is to work on plants, animals, or relationships in the natural world that are important to people and places. Lab members are now working on projects related to mountain goats, sea otters, culturally-modified trees, and environmental assessment processes.

The next generation of conservation scientists

One way that our work is magnified is by helping create the next generation of applied conservation scientists. In 2019, several of our long-term students graduated and are now applying their abundant skills and passion. Newly minted MSc Bryant DeRoy is now working in collaboration with the Kitsoo/

Xai'xais Stewardship Authority on developing new biocultural spatial models to support environmental decision making in the Territory. Similarly, the aforementioned Dr. Service serves as Research Coordinator with the Kitsoo/Xai'xais Nation; in part to apply the results of her PhD research. Dr. Megan Adams is continuing applied research on relationships among wildlife, salmon, and people of coastal BC as a Postdoctoral Fellow with the Conservation Decisions Lab at the University of British Columbia. To these and other recent graduates, we pass on our best wishes!

Royal Society of Canada honours Chris Darimont

In 2019, Raincoast Chair Dr. Chris Darimont was elected to the Royal Society of Canada. This 137-year old council of distinguished scholars and leaders is recognized as Canada's foremost academic honour. This is well-deserved recognition of Darimont's rigorous scholarship, passion for applied research, deep curiosity about the natural world, community impact, and inspirational leadership.

Safeguarding coastal carnivores in the Kitlope

ONE OF OUR GREATEST achievements at Raincoast has been our role in ending the trophy hunting of grizzly bears throughout British Columbia.

Acquiring the remaining commercial hunting tenures in the Great Bear Rainforest extends similar protection to all coastal carnivores in this vast region. Having successfully raised funds for the Nadeea tenure at the end of 2018, this past year we have made significant progress on our next goal, the Kitlope hunting tenure.

The Kitlope represents the world's largest intact coastal temperate rainforest watershed, with trees more than 1,000 years old. It is home to a stunning variety and abundance of wildlife, ranging from mountain goats, to

grizzly bear, black bear, wolf, and wolverine. At the head of Gardiner Canal, one of the longest fjords in the world, is one of the largest and most productive river estuaries on the BC coast, home to more than a hundred species of birds, from waterfowl to raptors.

Raincoast's Brian Falconer first visited the Kitlope in 1990 aboard the Maple Leaf at the invitation of the Haisla and Xenaksiala people, who were fighting to save their homeland from clearcut logging. His relationship to this place was forged in large part in with Cecil Paul, a hereditary chief of the Xenaksiala. Cecil

was instrumental in winning protection for this stunning place back in August of 1994, when the Province of British Columbia and the Haisla Nation announced that the Kitlope would be fully protected from industrial activity and jointly managed.

As Brian Falconer's long time friend, Cecil has shared three things he hoped he would see in his lifetime. The first was an end to logging in the Kitlope, which happened in 1994. The second was a return of the Gps'golox pole from a museum in Sweden,

which happened in the early 2000s. The last hope was seeing an end to commercial trophy hunting in the Kitlope. Raincoast shares that hope and we are currently raising funds to purchase commercial hunting rights in the Kitlope tenure.

In July 2019, we secured the \$100,000 deposit for the Kitlope tenure acquisition. We now have until December 2020 to raise the remaining purchase price and take a step closer to safeguarding all coastal carnivores and realizing Cecil's dream.



HAIDA GWAI

KITLOPE
COMMERCIAL TROPHY
HUNTING TENURE

0 50 100 200 km

Guide Outfitter Commercial Hunting Territories

Guide Outfitter owned

Raincoast / Coastal First Nations owned



VANCOUVER ISLAND

Marine operations

THE PAST YEAR SAW *Achiever* and crew as busy as ever with research projects, monitoring visits to our hunting tenures in the Great Bear Rainforest, and playing a central role in our expanding program of youth education in the Salish Sea and beyond. *Achiever* was also on hand to provide extra accommodations for Heiltsuk Nation guests as they opened their stunning new Gvukva'áus Haíłzaqv (house of the Haíłzaqv) with a five day potlatch celebration.

The new year will see a new skipper for *Achiever* as we say a very fond farewell to Nicholas Sinclair. Over seven years, Nick has guided many of our supporters through the estuaries of the Great Bear Rainforest and along BC's coast. His skills as a mariner have kept research crews on track and safe, and he has shared his infectious passion for sailing with youth from BC and around the world. We will miss you Nick and wish you well in your new job.

With changes in mind, 2020 will see the establishment of a new *Achiever Fund* to provide stable support for our marine operations program. With *Achiever* as our core platform for coastal research, wildlife monitoring, and education, we are looking for donors to support our our new marine operations funding model. *Achiever* helps us implement our mandate to safeguard the lands, waters, and wildlife of coastal British Columbia. As a floating classroom for experiential education, it also inspires future generations of stewards.



Research underway with the Hakai Institute.



Achiever





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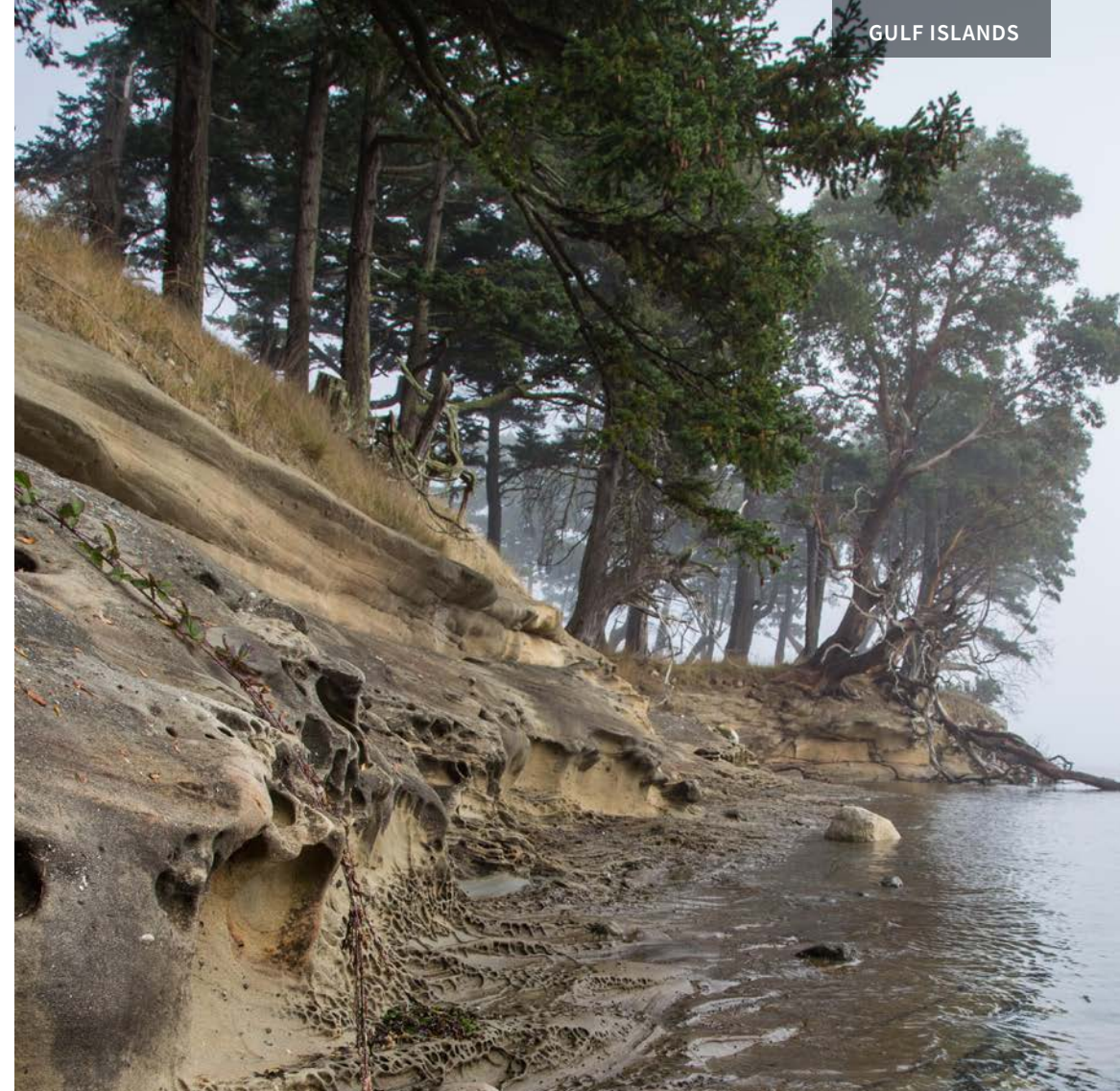
Bluewater Adventures is a proud supporter of Raincoast's efforts in protecting and preserving coastal British Columbia's wilderness and spectacular wildlife.

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Gulf Islands forest project

BRITISH COLUMBIA'S Coastal Douglas-fir (CDF) zone is a rare forest type that lines the southeastern coast of Vancouver Island, crosses through the Gulf Islands, and reaches the Sunshine Coast. Heavily impacted by historic and ongoing logging and development, the CDF is the least protected zone in the province with the highest number of species at risk. It is also showing signs of climate stress. In response

to this, Raincoast has initiated a project to characterize forest health throughout the Gulf Islands, identify measures to protect forest habitat, and promote ecosystem resilience at a time of rapid climate change. Preliminary observations indicate that climate change and land use decisions are stressing these forests and biodiversity is being lost.

Recent peer-reviewed journal articles

- **Royal Society Open Science: Trophy hunters pay more to target larger-bodied carnivores**

PLoS Biology: Publication reform to safeguard wildlife from researcher harm

- **Marine Ecology Progress Series: Habitat use by juvenile salmon, other migratory fish, and resident fish species underscores the importance of estuarine habitat mosaics**

Ecology and Evolution: Functional response of wolves to human development across boreal North America

- **Conservation Biology: Differentiating between regulation and hunting as conservation interventions**

Journal of Animal Ecology: Salmonid species diversity predicts salmon consumption by terrestrial wildlife

- **PLOS One: Raising the bar: Recovery ambition for species at risk in Canada and the US**

Biological Conservation: Supporting resurgent Indigenous-led governance: A nascent mechanism for just and effective conservation

Trophy hunters pay more money to kill larger-bodied carnivores. 'Costly signalling theory' might explain why humans engage in trophy hunting and why large carnivores are exploited at such high rates.

Mihalik I, AW Bateman & CT Darimont. 2019. Trophy hunters pay more to target larger-bodied carnivores. 6. *R. Soc. Open Sci.* <https://doi.org/10.1098/rsos.191231>

This study describes an ethical blindspot in wildlife research, and identifies the important role journals must play in safeguarding ethical research on wildlife.

Field KA, PC Paquet, K Artelle, G Proulx, RK Brook & CT Darimont. 2019. Publication reform to safeguard wildlife from researcher harm. *PLoS Biol* 17(4): e3000193. <https://doi.org/10.1371/journal.pbio.3000193>

Habitat connectivity, the ability to abut one habitat area with another, plays a critical role in the health of the Fraser River estuary and the fish, including salmon, that rely on it.

Chalifour L, DC Scott, M MacDuffee, JC Iacarella, TG Martin & JK Baum. 2019. Habitat use by juvenile salmon, other migratory fish, and resident fish species underscores the importance of estuarine habitat mosaics. *Mar. Ecol. Prog. Ser.* 625:145-162. <https://doi.org/10.3354/meps13064>

This study provides one of the most extensive assessments of how wolves select habitat in response to various degrees of the human footprint in more than a million square kilometers of Canada's boreal ecosystems.

Muhly TB, CA Johnson, M Hebblewhite, EW Neilson, D Fortin, JM Fryxell, ADM Latham, MC Latham, PD McLoughlin, E Merrill, PC Paquet, BR Patterson, F Schmiegelow, F Scurrah & M Musiani. 2019. Functional response of wolves to human development across boreal North America. *Ecol. Evol.* 9, 10 801-10 815. (doi:10.1002/ece3.5600)

Hunting regulations in the past century helped to arrest widespread animal declines caused by unregulated killing. In recent years however, the scientific and western management literature have mistakenly attributed hunting itself as a conservation tool.

Treves A, KA Artelle & PC Paquet. 2019. Differentiating between regulation and hunting as conservation interventions. *Cons. Bio.* doi:10.1111/cobi.13211

The number of salmon species returning to a river is more important for bears than the total number of salmon. Increasing salmon diversity increases the amount bears eat.

Service CN, AW Bateman, MS Adams, KA Artelle, TE Reimchen, PC Paquet & CT Darimont. 2018. Salmonid species diversity predicts salmon consumption by terrestrial wildlife. *J. Animal Ecol.* 00:1-14. <https://doi.org/10.1111/1365-2656.12932>

Goals to recover endangered species are stronger in the United States than Canada, but recovery goals under both countries need improvement.

Pawluk KA, CH Fox, CN Service, EH Stredulinsky & HM Bryan. 2019. Raising the bar: Recovery ambition for species at risk in Canada and the US. *PLoS ONE* 14(11): e0224021. <https://doi.org/10.1371/journal.pone.0224021>

Conservation efforts to safeguard biodiversity and mitigate ecological destruction could be advanced through partnerships with resurgent Indigenous governance.

Artelle K, M Zurba, J Bhattacharyya, DE Chan, K Brown, J Housty & F Moola. Supporting resurgent Indigenous-led governance: A nascent mechanism for just and effective conservation. *Biolog. Cons.* 240: 108284. <https://doi.org/10.1016/j.biocon.2019.108284>

Empowering youth leadership

THE SALISH SEA EMERGING STEWARDS program is based on the idea of consilience - the convergence of principles from different disciplines to form a comprehensive theory. In this case we seek to weave academic, scientific, and Indigenous perspectives on stewardship of the Salish Sea.

Now in its fourth season, we have continued to successfully engage a broad network of community partners to provide students with experiential nature-based learning that is hands-on and immersive.

Partners now include Ocean Networks Canada, Parks Canada, Peninsula Streams, SeaChange, archaeologists, ethnobotanists, Coast Salish knowledge holders, our own educators (Maureen Vo and Nathaniel Glickman), and our team at the Raincoast Applied Conservation Science Lab. We work with those serving Indigenous and underserved youth, the Cowichan school district, and the Red Fox Healthy Living Society. Collaboratively, we have engaged individuals from the Tsleil-Waututh, WSÁNEĆ, Squamish, Blackfoot, Métis, Chalkultan, Heiltsuk (Haíłzaqv), and Cowichan Nations.

Experiential and immersive learning

With the support of this network, students scoured intertidal zones, trekked through temperate rainforests, built model clam gardens, and journeyed in traditional style

canoes to understand the world through the lens of academic scientific and Indigenous knowledge.

Each year, Raincoast's 66-foot research vessel, *Achiever*, serves as our floating classroom as students learn while sailing throughout the Salish Sea. Highlights have included contributing to "citizen-science" water quality testing with Ocean Networks Canada, breaching humpback whales, killer whale encounters, and bow-riding Dall's porpoises. These types of experiences engage all the senses and provide lasting memories, as well as a deeper personal connection to, and understanding of, the Salish Sea.

Supporting emergent leaders

The program now provides a platform for these emerging Stewards at our annual celebration event. Here, students discuss their learning and perspectives, and showcase creative pieces including photography and art inspired by nature. 2019 also included our hire of three new Junior Leader staff, who join Raincoast crew in inspiring the next cohort of students.



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sustainable tourism
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TRAVELERS'
CHOICE
2019

Photo: Shea Wyatt

Knight Inlet Lodge believes in environmentally responsible, sustainable tourism and is proud to have supported Raincoast in their efforts to bring an end to the trophy hunting of grizzly bears in British Columbia. It is through the efforts of dedicated organizations such as Raincoast that we can now celebrate an end to this barbaric activity.

As the original grizzly bear viewing lodge in British Columbia, 2020 will mark our 24th season, Knight Inlet Lodge has been in the forefront of this still growing tourism sector. We look forward to a future where grizzly bears are safe from hunting.



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Profiles of individuals and businesses who deserve special recognition for their dedication and generosity in helping protect the lands, waters, and wildlife of coastal British Columbia



Friend of Raincoast, Eric Sambol

RAINCOAST IS FORTUNATE to work with several amazing photographers. This year we wanted to pay special tribute to Eric Sambol. Eric's images have been key in a number of our initiatives. They have secured us cover shots in scientific journals for our research, they grace our website, and Tracking Raincoast.

ours. To the extent that I can use my camera to make this point, for others to see and feel, is my measure of success."

Your photographs are a huge success Eric. Raincoast is immensely grateful for these images and your financial support.

See more: www.eric sambol.com

His generously donated image of a grizzly bear in Khutze Inlet was a key feature in our *One Shot for Coastal Carnivores* exhibit. Photographed while visiting the area with Raincoast and our guide outfitter coordinator, Brian Falconer, the image shows a grizzly bear, in full profile, and with a visible scar. Taken from below the river bank, the image is imposing. Yet the image expresses the bear's tolerance, which many of us recognize when sharing space with these incredible animals.

Eric spent 34 years working in the family construction business before a trip to the continent of Africa changed everything. "For me, meeting these animals in the world we all share, showing how their world is our world, is essential for their survival, and



While Raincoast studies and protects wildlife and ecosystems in the Great Bear and Salish Sea, as businesses, our unique contribution can be to replace destructive industries with skilled, conservation-based ones.

It's this vision and creativity that drives us and our colleagues who offer boutique expeditions here.

Thank you for supporting Raincoast and thus helping us all change the world.



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