TRACKING RAINCOAST INTO 2023



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Investigate. Inform. Inspire.

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

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-standing relationships with
Indigenous communities.

Our mandate

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 photo by Lance Barrett-Lennard, Ocean Wise, taken under SARA license MML-18.



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The ocean we share

IS THE FASCINATION that so many of us have for the marine world innate, in our genes somehow? Or is it cultivated, instilled in us by parents, teachers, stories, and media? In our case, neither of us can remember a time when we didn't love being on, in, or beside the ocean. Somehow, partly passion, partly luck, our childhood dreams of the sea led to careers as marine scientists. Collectively, we've now spent over 50 years studying cetaceans (whales, dolphins, and porpoises).

We've studied aspects of whale social behaviour, how they forage, what they eat, how they communicate and maintain contact, how they choose mates to avoid inbreeding, their impact on other species, and how their health closely reflects the abundance of prey in their environments. Throughout this work we've become increasingly concerned about their long-term prospects in the face of climate change, high underwater noise levels from ships and other human sources, chemical pollutants,

and depletion of the fish and other species they depend on for food.

It was our desire to weave together our research on these incredible species with efforts to conserve them that led us to join Raincoast at the end of 2021. Raincoast is remarkably effective at using rigorous peerreviewed science to influence government, industry, and individuals to protect marine wildlife and marine environments — exactly what was needed, in our opinion.

Our new Cetacean Conservation Research Program was launched at the beginning of 2022 and we couldn't be more excited about it. It dovetails with some of Raincoast's other work, notably its Healthy Waters and Wild Salmon programs; it works with First Nations, other governments, universities, and other NGOs to collaboratively measure and mitigate human-caused threats to cetaceans. We have a lot planned for the coming years and look forward to continuing this work.



Whale conservation and recovery

RAINCOAST'S NEW CETACEAN Conservation Research Program is premised on the conviction that solutions to the threats facing at-risk species must be based on solid science. One of the ways that we contribute to this science is by conducting studies that identify cetaceans individually and track their health, association patterns, behaviour, and reproduction over time.

This research helps us better understand their susceptibility to anthropogenic threats and the impact of those threats, and develop practical and effective measures to reduce them.

Conservation through genomics

Raincoast is establishing our own conservation genetics laboratory that will focus on mating systems and inbreeding in at-risk killer whale populations.

Humpback whale acoustic behaviour

Working with the North Coast Cetacean Society, we will study the acoustic behaviour of humpback whales in the marine waters of the Great Bear Rainforest, to inform our understanding of impacts of underwater noise from projected increases in shipping traffic.

NoiseTracker

NoiseTracker combines the efforts of multiple partners in monitoring changes in underwater noise levels along the BC coast, assessing the effectiveness of existing noise reduction efforts and informing the development of new measures.

Aerial photogrammetry

Using low-impact drones, we use aerial photographs to assess the health of threatened and endangered killer whales, and examine their condition in the context of fluctuations in salmon abundance.

Studying beluga communication

Acoustic research that identifies individuals and groups based on their complex communication system helps us monitor at-risk populations and informs our work on other whales.



2022 MARKED THE FOURTH year of collaborative efforts by NGOs, First Nations, stakeholders, and the federal government to implement recovery measures for endangered Southern Resident killer whales. The overarching problem for these whales is they are nutritionally stressed due to both reduced salmon abundance and the underwater vessel noise that interferes with their foraging.

The measures implemented to date have resulted in less whale watching traffic following them, slower ships as they move through their critical habitat, and designated areas with less competition from fishing vessels for Chinook salmon. This has given whales more space to forage with less noise, disturbance, and competition. All good things.

Despite these measures, the population of whales has not improved in the last few years, even with new births. An outstanding issue affecting food supply is the ongoing harvesting of Chinook salmon along their migration routes to the Salish Sea, especially in years when salmon abundance is low.

Raincoast continues to work toward an ocean that provides healthy, abundant salmon and is quiet enough for hunting and feeding.



SV Achiever's busiest year yet

WHEN ACHIEVER WAS purchased by us in 2003, our goal was to undertake several years of cetacean research that could inform the dialogue around oil transport and development on the BC coast. This year, the vessel's busiest to date, Achiever went back to its roots, supporting Raincoast scientists doing in-house marine mammal research, facilitating government scientists surveying marine birds, and hosting youth trips.

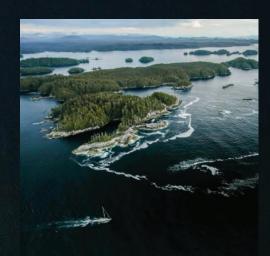
Achiever spent 26 weeks collecting baseline data on local and migratory seabird populations with the Canadian Wildlife Service. We also joined Koeye camp, the Haílzaqv Nation's education and cultural camp, to support their science week programming with activities and learning on marine mammal and bears.

Achiever hosted Raincoast's first Indigenous Women at Sea expedition that saw ten women, including an all-female crew, undertake a five-day excursion in the Salish Sea. Achiever also hosted youth from Tsawassen,

WSÁNEĆ, and Quw'utsun (Cowichan). These trips were great opportunities to foster cultural exchange, gain nautical skills, and make new connections.

Our Marine Operations Program will continue supporting the sea bird and Northern Resident killer whale research projects, as well as expanding our Indigneous youth engagement. We are also envisioning upgrades to *Achiever* so it is better equipped for research, including being quieter underwater in marine habitats.











Protecting threatened forest ecosystems in BC

OUR FOREST CONSERVATION Program, previously called the Gulf Islands Forest Project, was initiated just over three years ago. It has been evolving to identify and implement strategies to safeguard the threatened coastal forests standing sentinel at the edge of the Salish Sea. These strategies have included policy review, education programs, a community big tree initiative, restoration, and land protection.

The Coastal Douglas-fir (CDF) biogeoclimatic zone is among the most threatened ecosystems in BC. Since settler arrival, ecosystems in this region have been converted and fragmented, leaving a patchwork of altered landscapes. Less than 1% of the historic extent of old growth remains and biodiversity has plummeted due to removal of Indigenous stewardship practices, alien species invasions, and disruption of local trophic cascades.

We have spent 2022 working toward the purchase and permanent protection of KELÁ_EKE Kingfisher Forest on S,DÁYES (Pender Island) with our partner, Pender Islands Conservancy. This 45 acre forested property is a meeting place between land and sea, and weaves together a connectivity corridor.

Both KELÁ_EKE Kingfisher Forest, and S,DÁYES Flycatcher Forest (acquired in 2021), are located in W SÁNEĆ territory. These land protection initiatives aim to safeguard forests for future generations, guided by management regimes that support W SÁNEĆ food systems, land healing practices, and education programs. To support our efforts to protect CDF forests, Raincoast joined The Land Trust Alliance of BC in spring of 2022.

We've been collecting expert perspectives for a series called *The Story of the CDF*. Though anthropogenic degradation within the CDF has been profound in the past 150 years, humans have been part of these ecosystems for millenia longer. While human decision-making has been the problem, it can also be the solution. Project TEACH, another initiative facilitated by Raincoast, sought to connect both Indigenous Knowledge and academic science to explore policy solutions in the CDF and neighbouring ecosystems.

Looking to 2023, we will increase our efforts to heal CDF forests through land-based restoration, community engagement, education, and research, all rooted in our commitment to safeguard forests for the future.



Ending commercial trophy hunting in the Southern Great Bear Rainforest tenure

ONE OF OUR LONGEST running projects at Raincoast has been our Safeguarding Coastal Carnivores campaign, which seeks to stop commercial trophy hunting in the Great Bear Rainforest. Since 2005, we have purchased five hunting tenures, extinguishing guided trophy hunting within those regions in perpetuity. This is the best way to ensure that changes in political leadership don't impact coastal wildlife. We currently control the hunting rights in approximately 39,000 km² of the Great Bear Rainforest with our Coastal First Nations partners.

We are raising funds to purchase one of our biggest tenures yet, the 18,239 km² Southern Great Bear Rainforest tenure, and have until December 2023 to raise \$1.92 million.

The Southern tenure is home to significant populations of grizzlies, cougars, black bears, wolves, and Roosevelt elk. It contains six major coastal inlets, over ten major river systems with critical estuaries, and countless smaller named and unnamed watersheds that support healthy ecosystems, from Smith Inlet to Toba Inlet. This purchase would support the new conservation economy, as there are more than 19 ecotourism companies who rely on respectful wildlife viewing.

Although Raincoast is not opposed to hunting for food, we have always considered trophy hunting unjustified and sought to bring an end to it. Acquiring the Southern Great Bear Rainforest tenure will bring us one step closer to our goal of ending all commercial trophy hunting in the Great Bear Rainforest.







The restoration and conservation funding landscape of the

THE FRASER RIVER ESTUARY supports Canada's largest runs of Pacific salmon, along with hundreds of other species, many of which are threatened and endangered. This includes endangered killer whales and many populations of Chinook salmon.

Despite this, the Vancouver Fraser Port Authority is proposing to double the size of its shipping terminal and shipping traffic at Roberts Bank, further degrading this stressed estuary. Raincoast has been working inside

and outside of the federal review process to stop Terminal 2. Through our research, scientific evidence to the review panel, work with partners, and public engagement, Raincoast is bringing the message to decision makers that endangered Chinook and Southern Resident killer whales can not endure further losses of critical habitat.

This fall, we published research that provides a funding landscape, or quantitative baseline, of the scale and scope of resources invested in salmon habitat restoration in the Lower Fraser Building on our relationship with local First Nations partners and the Lower Fraser Fisheries Alliance, we are working towards a multi-year research and monitoring project in a tributary of the Fraser River. This project will gather data on salmon population abundance, spawning habitat quality, and the role predators play in nutrient cycling and carbon sequestration. Our

work will inform ecosystem requirements for a sustainable, terminal salmon fishery that is Indigenous-led and ecosystem-based.

region over the last decade. We did this because we knew that tens of millions of dollars were being invested in salmon habitat in the Lower Fraser, yet there was no resource or database that showed how these resources were being spent. Gaps identified in the report, which include inequitable distribution of resources, lack of coordination, and inaccessible fiscal information, will inform our efforts to advance governance and policy for salmon habitat in the Lower Fraser.

Fraser Estuary restoration

IN 2022, WE CONTINUED the Fraser Estuary Connectivity Project, our restoration initiative that seeks to reconnect habitat in the fragmented Fraser River Estuary. This project saw immediate success after we created three breaches in the Steveston Jetty, giving juvenile salmon access to brackish marsh habitats.

This year, we moved our focus to the North Arm Jetty (a 6 km long barrier) and constructed a 30m breach. This opening reconnected the North Arm of the river to Sturgeon Bank for the first time in over 100 years, allowing the flow of sediment and the movement of juvenile salmon. Before these breaches, young salmon would be forced into the ocean by the jetties, subjecting them to salty water and predators with a low chance for survival. Access to the marsh habitats of

Sturgeon Bank gives them time to feed and grow before making their way to the ocean.

Subsequent monitoring in the spring of 2022 found that the breach in the North Arm Jetty was utilized by four species of juvenile salmon, including Chinook, chum, pink, and sockeye. We found that these were primarily very small salmon in their first year of life that would benefit from remaining in the estuary.

We will be creating a second breach of the North Arm Jetty in early 2023, further restoring pathways for juvenile salmon in an estuary that has been highly modified over the decades. We will be partnering with Ducks Unlimited, the Lower Fraser Fisheries Alliance, and the Tsawwassen First Nation, with support from the BC Salmon Restoration and Innovation Fund.





RAINCOAST'S FISHERIES WORK prioritizes technical engagement on salmon management and its implications for ecosystems, wildlife, and people. We provide scientific leadership and analysis, as well as build public and agency awareness of the need for conservation and recovery of wild salmon across the landscape in BC.

For the most part, salmon harvests in BC still occur much as they did decades ago; many are inherently unsustainable. They catch salmon from multiple populations at once (mixed stock fisheries); catch salmon hundreds, even

thousands, of kilometers from their spawning grounds (interception fisheries), and often overharvest populations that are less productive, in low abundance, threatened or endangered (recruitment overfishing).

Some fisheries are conducted on rearing grounds of young salmon, removing them before they mature (growth overfishing) thus contributing to younger and smaller fish. Our fisheries are still managed using economic models designed to maximize the 'yield' of the resource, not considering wildlife that depend on salmon, or marine

and terrestrial ecosystems that are affected by the overharvest of fish. Lastly, many fisheries rely on hatcheries, as most wild populations in BC are in various states of decline, or extirpation.

Hatcheries are not designed to recover wild salmon. Decades of evidence shows they have not only failed in this regard; they actually contribute to the decline in wild salmon abundance and diversity while robbing watersheds and the BC landscape of the spawning fish that shaped ecosystems, cultures, and our ecological heritage. Decision making that affects salmon, both federally and provincially, is still premised on commodity extraction. It does not serve salmon, wildlife, ecosystems, First Nations, or future generations. It perpetuates the salmon crisis, it doesn't provide solutions to it.

Recovering wild salmon requires a fundamental shift in the way we manage land and salmon. Wild salmon are place-based, unique to the watersheds where they begin life and return to die. Their management must reflect this scale of adaptation, and the sense of place inherent to their presence.

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SPRING 2022 MARKED the start of our pilot year studying wolves on BC's south coast. With the support of the Lower Fraser Fisheries Alliance, we deployed remote cameras and acoustic recorders in a tributary valley of the Lower Fraser River. In this salmon-bearing watershed, we detected multiple species, including wolves, grizzly bears, and cougars, among several other mammals of cultural and ecological value.

Following our wildlife welfare ethic, 2023 will see us continuing our application and advancement of non-invasive approaches for monitoring wolves. As we develop a workflow to identify individuals via their distinct howls and unique pelage colour patterns, our goal is to transition away from conventional approaches to the scientific

study of wolves that can be highly invasive, expensive, and logistically challenging.

We will also employ a variety of measures to understand large carnivore movements and foraging behaviour in relation to prey abundance and ecological processes that support climate change adaptation, such as nutrient transfer and carbon sequestration. Through this research, we hope to shift the provincial management of gray wolves away from a poorly-informed and exploitation-based model, which relies on culls and recreational killing, to one that respects the welfare of wolves and their important role in functioning ecosystems.

In summer 2022, we published an extension of our photography ethics policy, "An ethical

approach to wolf photography," noting the sensitivity of wolves and the importance of putting wildlife, and their environment, first.

To continue our commitment to science, ethics, and public education, 2023 will see us launching our second season of *Wolf School* alongside a new article series called *Wolf Stories*. Through these two projects, we will facilitate conversations with ethicists, scientists, biologists, and Indigenous



Knowledge Holders to improve public understanding of the ethical, philosophical, and social dimensions of predator management. These efforts, paired with our pilot research project, will inform Raincoast's ethical policies and practices, which are inextricably linked to our scientific research and foundational to the advancement of our conservation objectives.



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Ten years of patience yields enduring change

"SCIENCE DEMANDS PATIENCE," wrote Arthur C. Clarke.

With each datum collected, analysis wrestled with, and journal article written, as well as with every application of research implemented, this statement accumulates evidence. Each step, done well, takes longer than ever imagined. But it pays off.

Embracing patience has been our way at the Raincoast Applied Conservation Science Lab at the University of Victoria. As we reflect on our recent ten-year anniversary, we think of the life cycles of research projects. Several years are required not only to produce knowledge, but also to mentor graduate students to become the next generation of applied conservation scientists.

Long after students leave with graduate degrees, their work lives on in its implementation. Typically, this takes the form of Indigenous governments, with which we commonly partner, drawing on the evidence we co-produce to inform and empower their decision-making. Often, one project leads to another, leveraging the relationships and knowledge we build together into another applied domain.

While honouring the patient pace of good science, we also recognize that some of the most urgent conservation problems and opportunities require some hustle. Whereas a solid research process and the relationships on which they are built, have no tolerance for shortcuts, we are able to make haste. Critically, we co-design work to provide policy-ready evidence. And we

strive to work with the determination and efficiency to match the challenge.

Informing hunting policy where the Spirit bear roams

Research that identified Spirit bear 'hotspots' provides a recent example of well-designed research that transformed policy at (relative, for science) warp speed. Upon invitation of the Kitasoo Xai'xais Nation, a PhD project was born in 2012. Our partnership sampled furiously and, after many analyses, revealed the locations of where the genes that code for white fur are found in highest concentrations.

Armed with this information, as well as their own cultural knowledge, the Kitasoo Xai'xais (and neighbouring Gitga'at Nation) successfully negotiated with the province an end to the hunting of black bears. Protecting these black-coated 'silent carriers' of the Spirit bear gene provides additional capacity for the Spirit bear to thrive into the future. In this way, our patient investment in policy-relevant science made an enduring impact. We celebrated the announcement this summer as our lab turned ten.

Looking to the future

The past decade has brought many applied research projects our way. We have done our best to serve decision-makers who will dictate the future for species as varied as salmon, mountain goats, killer whales, and cedar trees, as well as the protection of biodiversity in general. What will the next decade bring?





Ross and Jane Woodland have been stalwart supporters of Raincoast for close to twenty years. They share Raincoast's passion for wildlife and their habitats, as well as our belief in conservation science. Jane is a long-standing Raincoast board member and has generously given her time to help us achieve our goals. Ross, a lawyer and partner at Turnham Woodland in Victoria, has a long history of supporting the work of nonprofits in the region.

Tracking Raincoast artists and photographers

Lance Barrett-Lennard, Ocean Wise

Cover, iv, 2-3, 4 (killer whales, taken under SARA licenses)

Cael Cook

19 (black bear inset)

Chelsea Greer

18, 23 (wolves)

Alex Harris 1 (Valeria Vergara and Lance

Barrett-Lennard), 6 (par-

sampling), 8 (inset), 10-11

ticipants, inset), 8-9 (scientists

(KELÁ EKE Kingfisher Forest),

15 (juvenile salmon), 16-17

(North Arm Jetty), 16 (North

salmon), 23 (Chelsea Greer),

Jane Woodland)

Lee Horbachewski 25 (Spirit bear, inset)

23 (trail camera), 26 (Ross and

Arm Jetty, inset) 18-19 (sockeye

Sarah Jim 14 (art inset)

John Kelsey

ii-iii (*Achiever*), 7 (*Achiever*, inset), 20-21 (*Achiever*), 20 (*Achiever*, inset), 21 (youth, inset) 24-25 (Spirit bear)

John E. Marriott

22 (wolf)

Jeff Reynolds

12-13 (coastal wolf)

National Oceanic and Atmospheric Administration

18 (killer whale, inset, taken under NMFS research permit 19091) Please photocopy or remove and mail.

Oliver Tweedie

11 (Belted Kingfisher, inset), back cover (Belted Kingfisher)

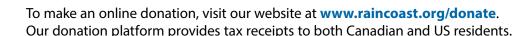
Mark Williams

6-7 (Achiever), 6 (Achiever, inset), 13 (Achiever, inset)

Andy Wright

14 (lower Fraser)

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