



EXECUTIVE SUMMARY

Toward a Vision for Salmon **Habitat** in the Lower Fraser River

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Toward a Vision for Salmon Habitat in the Lower Fraser River
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Raincoast is a team of scientists and
conservationists dedicated to safeguarding the land,
waters, and wildlife of coastal British Columbia.





Executive summary

This is a crucial time for wild salmon that depend on the Fraser River. Following years of decline in the number of Chinook and sockeye salmon returning to the Fraser, the last two years have seen the lowest on record, with significant fisheries closures. Low abundance of coho and chum also constrain recreational and commercial fisheries. Even First Nation fisheries for food, social, and ceremonial purposes have been greatly reduced.

Yet, the Fraser watershed still hosts a remarkable diversity of populations within these species. Many Fraser salmon populations rely on habitat in the lower river to spawn and rear. All populations rely on the lower Fraser to migrate. Despite the Lower Fraser watershed representing less than 5% of the Fraser basin’s size, the lower river supports more than half of the Fraser River’s Chinook and chum, 65% of its coho, 80% of its pink, and significant stocks of sockeye salmon.

Since European colonization, salmon habitats in the lower Fraser have undergone a vast transformation, drastically reducing the quantity and quality of these habitats. Ongoing industrialization, urbanization, and agriculture, combined with the cumulative effects of human impacts and a changing climate, threaten to push salmon populations past a tipping point. Many of these populations, and those in the surrounding

Salish Sea watersheds, are at a crossroads - if we hope to sustain them, the time is now.



This report outlines the history of the Lower Fraser River, the state of salmon and their habitat, current and emerging threats to this habitat, the value of salmon, and the shifting political landscape in which these habitats must be protected and restored. We report on a community-based exercise to imagine a ‘vision’ for salmon habitat in the Lower Fraser. From community input and our findings, we recommend the following actions it to move toward a shared vision for salmon habitat in the Lower Fraser River:

1. Collaborative efforts on habitat conservation and restoration
2. Implementation of fish-first policies
3. A legislated Fraser watershed plan
4. Sustainable funding
5. Rebuilding of monitoring and research capacity
6. Investment in wild salmon education and youth engagement



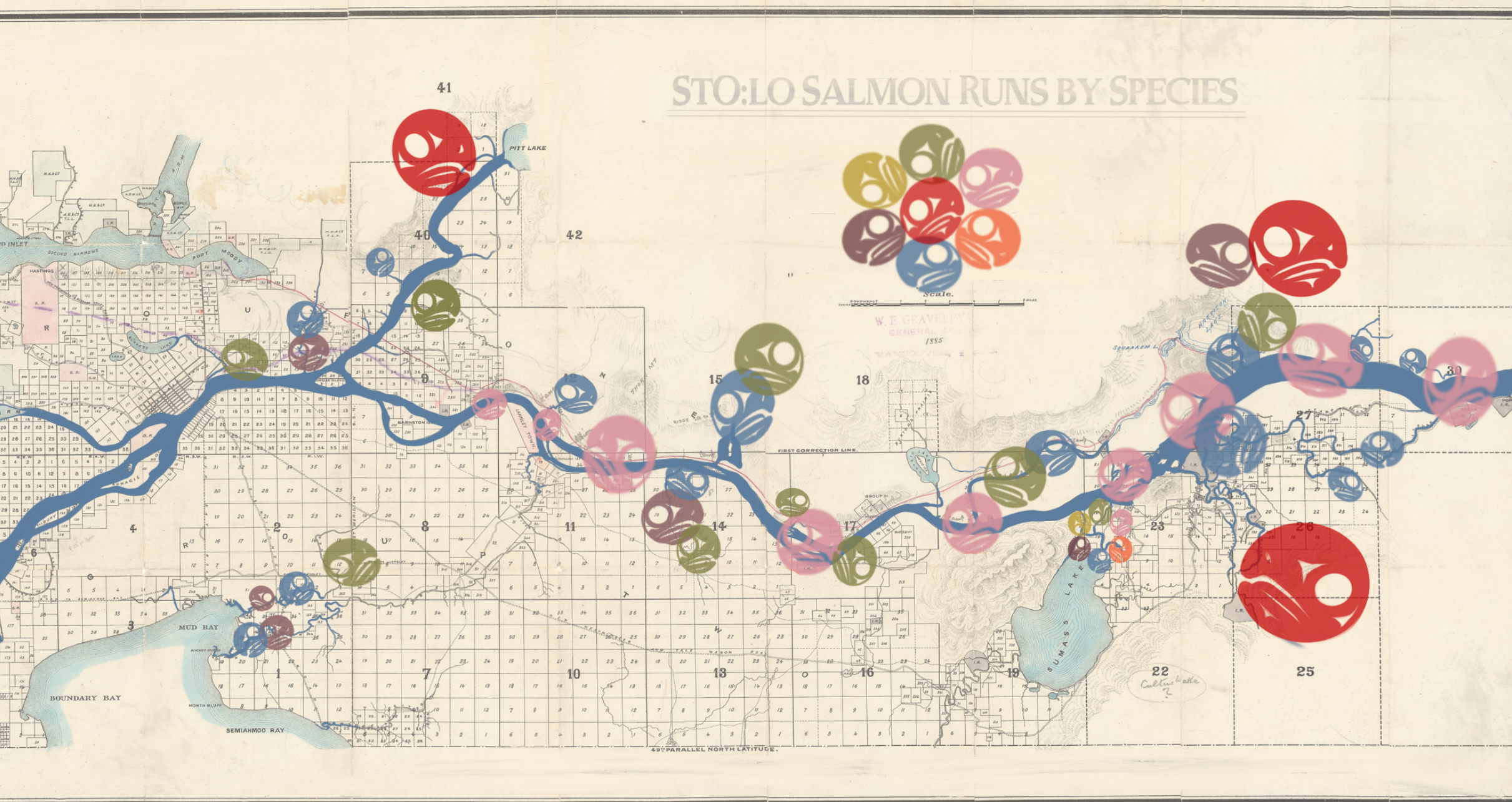
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Historical context

Stó:lō, Dakelh, Lhtakoh, ?Elhdaqox. A river of such length has an equally long history. Long before the river's current namesake explorer, Simon Fraser, ever arrived, Indigenous communities shaped and were shaped by the river, and its salmon.

The Fraser River is the largest on Canada's west coast with a watershed that drains more than one quarter of B.C. Historically, it's considered the greatest salmon producing river in the world. The mouth of the river -the Fraser estuary- is equally significant, linking fish, birds and mammals across thousands of kilometres of the north Pacific Ocean. At 21,000 hectares, the Fraser estuary is the largest on the west coast of North America. All of the salmon that spawn in the Fraser watershed use the Lower Fraser and estuary as a migration corridor, with many also relying on this area for spawning and rearing.

The story of the Fraser remains one of salmon and people. First Nations communities that lived with the cycles of salmon, harvested and traded them since time immemorial, and relied on their yearly returns to provide food for the winter and beyond. With the arrival of Europeans, commercial trade in salmon rapidly expanded, and by 1901 there were 49 different canneries located on the Lower Fraser. Declining abundance and changing fisheries caused the canneries to come and go within a century.



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The state of Lower Fraser salmon and their habitat

European colonization dramatically transformed the Lower Fraser and delta from forests and wetlands to a major metropolis.



In the pursuit of farmland and development, much of the estuary was drained and diked, leaving only a fraction of the salmon habitat that once existed. This transformation of the land base reduced the productive ability of the land to support salmon, and contributed to declines in abundance over the same period.

By the mid-20th century, dikes had disconnected the river from 70% of the floodplain. By the start of the 21st century the original forests and wetlands had been reduced to approximately one-tenth of the land-base. Since the early 1830s, roughly 71,000 hectares of wetlands and almost 150,000 hectares of forests have been lost in the Lower Mainland. Many tidal streams have long been paved and now flow only as storm drains. As of 1997, 20% of lower Fraser streams were completely lost, with most remaining streams threatened (13%) or endangered (63%).

Today, the Lower Mainland is the major hub of British Columbia's population and economic activity with much of this growth at the expense of salmon habitat.

Status of Lower Fraser salmon populations

With salmon returns greatly reduced, First Nations Food, Social and Ceremonial (FSC) fisheries, along with commercial and recreational fisheries in the Lower Fraser, are increasingly restricted. The Fraser River has 54 unique populations (Conservation Units) of federally managed salmon. Sixteen of these spawn directly in, and all must migrate through, the Lower Fraser River and estuary. While eight of these populations are considered healthy, more than half (33) are depressed relative to their former abundance. The Fraser also hosts provincially managed trout.

Of the 46 populations of salmon (44) and steelhead (2) evaluated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 17 (36%) were classed as endangered, 7 (15%) threatened, and 6 (13%) identified as special concern.

Table 2.2. Status of 46 salmon Conservation Units (and populations) in the Fraser River watershed as evaluated by the Committee on the Status of Endangered Wildlife in Canada.

Species	Lower Fraser CUs					Other Fraser CUs (and populations)				
Status	Not at risk	Threatened	Endangered	Special concern	Not assessed	Not at risk	Threatened	Endangered	Special concern	Not assessed
Chinook	0	1	1	1	3	1	3	6	0	3
Coho (Interior)							1			
Sockeye (lake-type)	2	0	1	2	0	5	1	7	3	1
Sockeye (river-type)	1	1	0	0	0					
Steelhead (Interior)								2		
Total	3	2	2	3	3	6	5	15	3	4



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Current and future threats to salmon habitat

Intense development of the Lower Fraser watershed has been associated with a variety of negative effects on salmon habitats. Flood control structures alter hydrological cycles, water quality, and fish passage. In many tributary streams there has been significant loss of forested riparian zones. These treed shorelines would have regulated water flows, cooled summer temperatures, and provided food. Logging and paving of the watershed aggravates flooding and droughts, and degrades water quality. Gravel extraction and water pollution threaten the mainstem, and invasive species compete with native species for space and resources. Along with these pressures in freshwater, Fraser salmon also face stressors from disease and pathogens, interactions with hatchery fish, overfishing, mixed-stock fisheries, and a changing climate.

Climate change and associated sea level rise will require further expansion and upgrades to flood protection structures at an estimated \$8.8 billion along the tidal portion of the Lower Fraser. Climate and other oceanographic changes are altering processes that affect the timing, quality, and magnitude of food availability, compounding our effects on their habitats. While these stressors arise from a variety of sources, they are all felt cumulatively by Fraser salmon; current development proposals that will directly destroy or degrade salmon habitat should be considered through this lens.

Reducing the impacts of human activity in the Lower Fraser and estuary, can help ensure that salmon return in the millions, supplying wildlife such as endangered Southern Resident killer whales and bears, with the food energy they need to survive.



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Salmon and ecosystem services in the Lower Fraser

Ecosystem services are the benefits humans derive from the workings of the natural world. We take almost all of them for granted, but they are crucial to our survival, and to the social and economic well-being of societies.

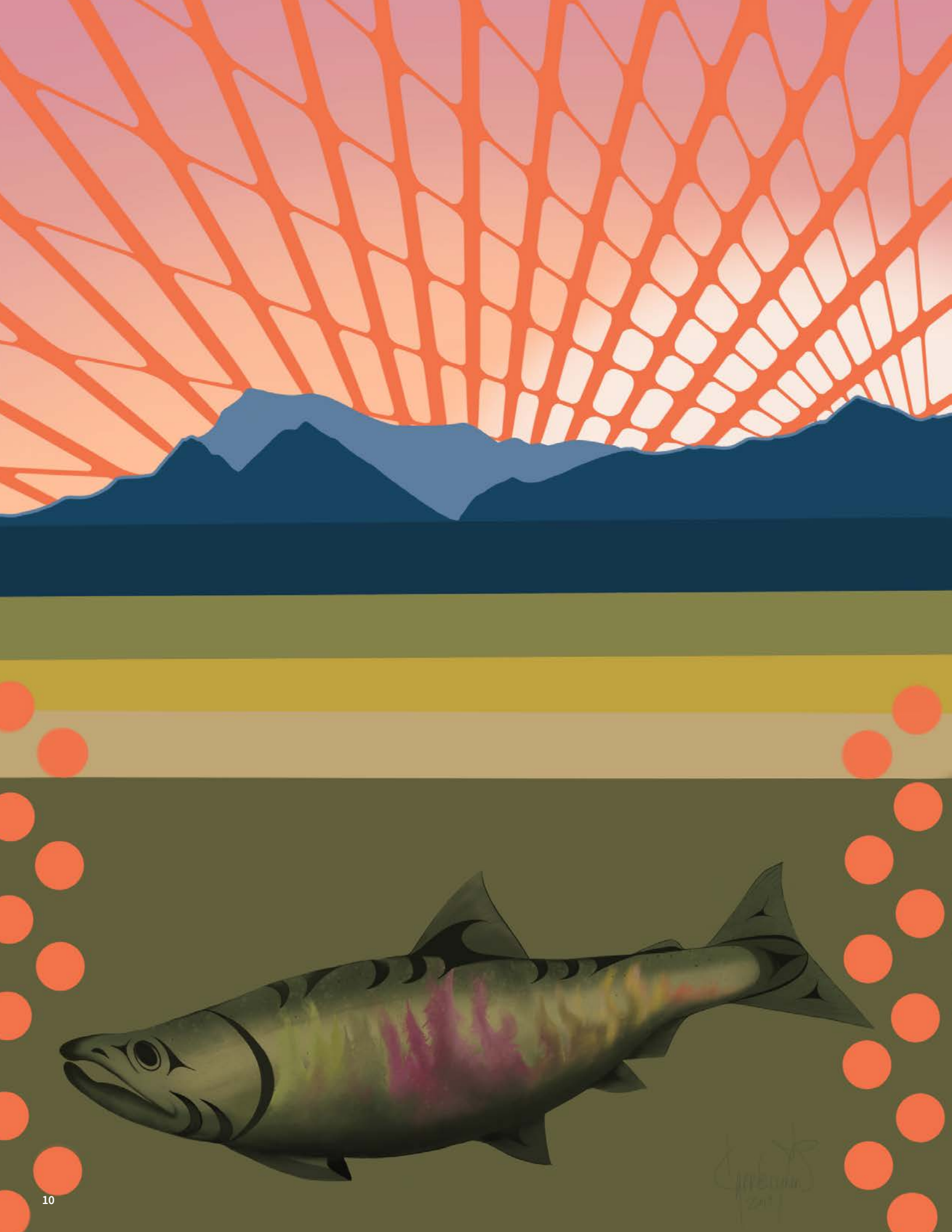
The ecosystem services approach is an attempt to convey the value of natural systems in economic terms. This is not our primary lens as we believe our connection with the natural world is not a monetary one. Given the prominence of economic considerations in decision-making, the ecosystem services approach can place a dollar value on the earth's natural features, like salmon habitats, which are continually undervalued.

If the commercial value of harvested salmon were applied to First Nations and recreational catch, salmon harvested in the Lower Fraser and approach area are worth over \$12 million Canadian each year. Including salmon of Fraser origin caught elsewhere in BC increases this value significantly. Recreational fishing also makes an important economic contribution through expenditures on equipment, guides, and accommodations. The value of sport fishing in BC is estimated at nearly \$957 million, with 20% of that activity occurring in the Lower Mainland.

Fraser salmon have an incredible cultural value to First Nations and local communities that cannot be captured in economic terms. Salmon that escape the fishery also provide critical ecological services, such as nutrients for freshwater ecosystems and food for more than 130 species of wildlife.

Salmon habitats in the Lower Fraser also provide an incredible array of other services including: improving water quality, preventing soil erosion, buffering flood waters, and providing habitat for other commercial and recreational fish species. Ecosystem services provided by nearshore habitats in BC's lower mainland, such as flood protection and fish and wildlife habitats, are estimated to provide between \$30 and \$60 billion in benefits each year. Land-based services such as climate regulation, water filtration, flood protection, clean air, waste treatment, and water supply are estimated to provide \$5.4 billion in benefits each year.

Despite the value of these ecosystem services, it will take creative approaches, such as paying landowners to preserve and restore habitats. We will also need a shift in decision making if salmon habitats are to be restored and protected.



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A shifting political landscape

Political and societal shifts set a broader context for our efforts to identify a vision for salmon habitat in the Lower Fraser. The United Nations Declaration on Indigenous Rights (UNDRIP) has been adopted by Canada and the province of British Columbia. It sets the stage for a new paradigm in conservation.

The Water Sustainability Act introduces the potential for decision-making that could support local watershed plans, including specific objectives for water quality and quantity. With new investments from the federal and provincial governments in salmon habitat restoration, an approach is needed that addresses the systemic issues and failures of the past decision making, as this has created what many recognize as a crisis for Fraser River salmon.

We can learn from the past. From 1985 until 2012, the Fraser River Estuary Management Plan (FREMP) functioned as a partnership between Fisheries and Oceans Canada, various provincial and local governments, and other agencies to conduct research and evaluate development proposals in the Lower Fraser and estuary. Importantly, the plan included clear goals to conserve and enhance the environmental quality of the estuary and ergo, sustain healthy fish, wildlife, plants, and people. The loss of FREMP left a gap in environmental oversight that is apparent throughout the entire Lower Fraser. Restoring governance can increase our chances of ensuring the resilience of many species, including salmon, while also reducing the cost.



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Toward a vision for the future

In an effort to develop a collaborative plan to guide habitat restoration and ensure remaining habitat is protected, Raincoast began a series of workshops following extensive one-on-one meetings with groups that share common interests. Since 2016, we have engaged with more than 100 organizations or individuals that are making important contributions to salmon habitat conservation in the Lower Fraser. All have expressed interest and enthusiasm in developing a vision and have shared their views on what it should include. All participants and feedback is provided in the full report.

Throughout these workshops five key themes emerged: (1) Fish friendly policy solutions, (2) Habitat protection and restoration, (3) Co-governance and regional watershed planning, (4) Rebuilding of monitoring and research capacity, (5) Education for all ages. Meaningful involvement of First Nations was a recurring and common theme in all workshops. In this context, Indigenous guardianship programs to lead

habitat monitoring, restoration, and enforcement were repeatedly highlighted.

Collectively, workshop participants articulated a vision for salmon habitat in the Lower Fraser with ambitious restoration goals for ecological processes and habitats, guided by long term baselines, science, and traditional knowledge. In this vision, the public is educated about the importance of our salmon habitats and informed decisions enable the resilience of wild salmon. First Nations work together and govern with federal, provincial, and municipal governments to ensure that protections exist that enable the long term sustainability of freshwater environments. There is sufficient capacity for local monitoring and enforcement, which is led by First Nations. The health of fish and their habitats are consistently evaluated. Such a vision will lead to a future where habitats are once again productive and salmon are restored to their historical locations for the long term.

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Conclusions and recommendations

Salmon habitats in the Lower Fraser are highly degraded and contribute to the decline in salmon health. Raincoast's recommendations take into account the initiatives of many others, our community workshops and meetings, and the findings of this report. Our intention is that these recommendations, and our next steps, can put salmon and their habitat on a trajectory that enables their ecological resilience.

These recommendations are intended for everyone who participated in the process, for regional First Nations, for federal, provincial, and municipal governments that make land use decisions, and for all who care about wild salmon in the Lower Fraser River.

To move toward a shared vision for salmon habitat in the Lower Fraser River we make the following six recommendations.



1. Collaborative efforts on habitat conservation and restoration

The need for strategic coordination and collaboration that reverses the trajectory of salmon and their habitat has never been more acute. Since 2017, Raincoast has been working with the Lower Fraser Fisheries Alliance (LFFA), West Coast Environmental Law (WCEL), and the University of British Columbia (UBC) to explore pathways to ecosystem-based management that ensures the resilience of species and people reliant on the Lower Fraser River. This dialogue has been guided by the LFFA Strategic Plan and a 'Blueprint for Ecological Resilience'. The latter identifies five key principles (shown right).

We see an opportunity for those with an interest in salmon and ecological resilience to support First Nations, and call on federal, provincial, and municipal governments for conservation and restoration decision making in the Lower Fraser.

Recommendation

We recommend that the Blueprint principles guide prioritization of conservation, restoration, and watershed planning efforts, including a First Nations and LFFA-led Lower Fraser Fish Habitat Strategy.

Our next steps

To support the development and successful implementation of a Lower Fraser Fish Habitat Strategy, led by Lower Fraser First Nations, LFFA, and their respective governments.



Five key principles of a Blueprint for Ecological Resilience

- 01.** A commitment to sustainability that spans seven generations.
- 02.** Governance that honours Aboriginal rights and title and the principles of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).
- 03.** Clear regulatory and enforcement mechanisms to ensure ecological resilience.
- 04.** Sustainable funding for governance and ecosystem-based management.
- 05.** Respect for the opinion, voices, experiences, and culture of others.



2. Implement fish first policy

First Nations, federal, provincial, and municipal governments play a key role in land use planning and local decision making that influences freshwater habitats and processes vital to wild salmon. There is a need to prioritize restoration, reconnection, and protection of salmon habitat in land use planning and processes like the Lower Mainland Flood Management Strategy.

Recommendation

We recommend that those determining land use and water policies should prioritize the broader benefits and ecosystem services supported by fish first policies. Fish first policies would prioritize the interests of wild salmon and their habitat above other economic pursuits in decision-making processes. These policies are our best chance to ensure that wild salmon persist over their historic range at spawner abundance levels suitable to meet the needs of wildlife, ecosystems, and people.

Our next steps

In 2020, we will continue to engage local governments in the Lower Fraser to advance the adoption of a fish first policy in key areas including land use planning and climate adaptation, including components like flood infrastructure and stormwater management.



3. A legislated Fraser watershed plan

The United Nations Declaration on the Rights of Indigenous People (UNDRIP) affirms the right of Indigenous people to self-determination. In 2016, the Canadian government officially adopted UNDRIP and in 2019 the province of British Columbia initiated a process to enact UNDRIP within provincial law. The federal government holds responsibility for salmon management, species at risk, and biodiversity. The province holds responsibilities for freshwater, land use, and wildlife management. The province can delegate powers under the Water Sustainability Act for watershed planning and creation of watershed plans. Local governments manage the development of growth, urban infrastructure and development, stormwater treatment, and flood infrastructure at local and regional scales.

Recommendation

We recommend that all levels of government cooperate across jurisdictions to develop a watershed plan for the entire Fraser River. Such a plan could deliver aspirations identified in this report and address issues relating to water quality, water quantity, and ecosystem health, which are all critical to wild salmon.

Our next steps

Building support for Indigenous-led planning and decision-making processes across the entire Fraser watershed.



4. Sustainable funding

Tackling the crisis faced by wild salmon in the Lower Fraser requires significantly increased and long-term financial resources. We encourage funding sources, including all levels of government, industry, and the philanthropic sector, to consider the key themes identified in the visioning process. Working with the LFFA, WCEL, and UBC, Raincoast has begun to assess a range of funding and finance mechanisms that could support long-term conservation and restoration priorities identified in a First Nations and LFFA led Lower Fraser Fish Habitat Strategy.

Recommendation

We recommend that funding agencies support the implementation of the Lower Fraser Fish Habitat Strategy.

Our next steps

In 2020, we will publish a report outlining options that could support long-term funding and finance for a Lower Fraser Fish Habitat Strategy and watershed scale planning.



5. Rebuilding monitoring and research capacity

Given the resurgence of Indigenous guardianship, and recognized gaps in the monitoring of salmon populations and their habitats, we recommend that increased resources for environmental monitoring capacity be made available to First Nations to conduct this work in their territories. This effort should determine changes from historic baselines to inform effective management decisions. This approach should be informed and guided by the best available science and indigenous knowledge.

Recommendation

We recommend that research and scientific organizations collaborate further to ensure research in the Lower Fraser River is available to, and informed by, the interests and priorities of local Nations.

Our next steps

In 2020, we will support efforts to convene scientists, Indigenous knowledge holders, streamkeepers, and Indigenous guardians to discuss best practices and further develop links between scientists and Indigenous guardians active in the Lower Fraser River.



6. Invest in wild salmon education and youth engagement

Numerous projects and programs have successfully delivered educational outreach that provides children and youth with knowledge of salmon and exposure to their habitats. However, the public remains largely unaware of the magnitude of the threats facing wild salmon and their habitats in the Lower Fraser, and the actions they can take to address these issues.

Recommendation

We recommend that funding agencies and educators expand support for learning that focuses on wild salmon and their ecological roles. Such programs should incorporate Indigenous knowledge and expertise, as well as the latest thinking around experiential, nature-based and place-based learning.

Our next steps

In 2020, we will convene educators, funders, Indigenous knowledge holders, and others to discuss experiential and nature-based programs in support of youth education around wild salmon.

Our thanks

We offer our thanks to the previous generations who have worked to protect and restore Stó:lō, the Fraser River. We thank everyone who has contributed to the efforts reflected in this document and the larger body of knowledge that this report reflects.

We also thank our funders, the Vancouver Foundation, Bullitt Foundation, Real Estate Foundation, Sitka Foundation, Patagonia, and numerous private donors who have made this work possible.



Investigate. Inform. Inspire.

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