



**Interior Fraser Steelhead
2019-2021 BC Action Plan and Activities Report
August 2021**

CITATION:

Rhodes, T.R. and E. Jenkins. 2021. Interior Fraser Steelhead 2019-2021 BC Action Plan and Activities Report, August 2021. Fish and Aquatic Habitat Branch, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, British Columbia, Canada. 38pp.

ACKNOWLEDGEMENTS:

The authors would like to thank the many contributors to this report and individuals who provided reviews and advice. A huge debt of gratitude to Jennifer Davis for her leadership and Jennifer Smith who collated huge amounts of data and activities that formed the foundation for this report. Appreciation is extended to Rob Bison and Greg Andrusak for their technical expertise, experience, and multiple reviews as well as all the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) Regional biological staff. Thanks to staff of Ministry of Environment and Climate Change and Ministry of Agriculture, Food and Fisheries, the First Nations Fisheries Council (FNFC), and members of the Provincial Angling Advisory Team (PAAT) who provided information and reviewed drafts.

TABLE OF CONTENTS

Executive Summary.....	4
Purpose Of This Document	5
Background and Status	6
2019 - 2021 Action Plan and Activities Report Summary Table	9
Activities Discussion.....	18
1. Planning and Policy	18
1.1 Goal: Clear objectives and actions for short and long-term IFS population management	18
1.2 Goal: Sufficient funding available to enable IFS recovery.....	19
2. Government Coordination and Collaboration	19
2.1 Goal: Collaboration between governments (BC, Canada, and First Nations) for aligned and effective management of IFS	19
2.2 Goal: Effective relationships with stakeholders for improved management of IFS	19
3. Knowledge, Innovation, and Research	20
3.1 Goal: Science-based planning and decision making informed by the best available information	20
4. Fisheries Management.....	20
4.1 Goal: Maximize the number of IFS to reach the spawning grounds each year	20
4.2 Goal: Management decisions informed by timely and accurate scientific data.....	20
4.3 Goal: Support Indigenous Nations' internal enhanced protection measures	21
5. Compliance and Enforcement.....	21
5.1 Goal: IFS-related regulations are implemented and complied with so that management goals can be met	21
5.2 Goal: Support First Nation's Compliance and Enforcement activities	22
6. Habitat Protection and Remediation	22
6.1 Goal: IFS habitat of suitable quality and quantity to support IFS populations at optimum productivity and individuals at optimum fitness to maximize survival in freshwater and marine life stages. 22	
7. Fish Culture and Other Interventions	22
7.1 Goal: Assess the risks and benefits of hatcheries, fish-culture, and other interventions as tools to conserve and rebuild IFS populations.....	22
7.2 Goal: Evaluate options to increase survival of steelhead at all life stages	23
8. Communication and Transparency	23
8.1 Goal: Transparent decision-making and access to relevant information for partners, stakeholders, and the public.....	23
Priority Focus Areas for 2021-2022 action plan.....	24
Works Cited.....	24
Appendix 1 – IFS BC/Canada Action Plan.....	25
Appendix 2 – Interior Fraser Steelhead 2020 Project Investments	29
Appendix 3a – Project Examples – Selective Fishing	33
Appendix 3b – Project Examples – Fish Passage and Monitoring.....	34
Appendix 4a – Fast Facts: Population Trends and Risk.....	35
Appendix 4b – Fast Facts: Recovery Potential	36
Appendix 4c – Fast Facts: Threats.....	37

EXECUTIVE SUMMARY

Fraser River late-run summer steelhead, known as Interior Fraser Steelhead (IFS), is a group of ten spatially discrete spawning Steelhead trout populations distributed in the Fraser watershed upstream of Hell's Gate. The aggregate spawning migration of IFS in the Fraser River occurs annually over an approximately 12-week period and normally peaks in Johnstone Strait and in Juan de Fuca Strait in late September. In the lower Fraser River near Fort Langley, BC, the run normally begins in late August and continues into the latter half of November, peaking around October 10.

This document summarizes the 2019-2021 Provincial Action Plan (which also encompasses the 2019 BC-DFO Action Plan) to manage IFS and provides a report of the activities undertaken in 2019 through early 2021. IFS are of "extreme conservation concern" according to the province's abundance-based management framework (FLNRORD 2016) and are classified as 'Endangered' by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The Ministry of Forests, Lands, Natural Resource Operations & Rural development (FLNRORD) has implemented numerous regulatory actions to minimize mortality of IFS and has continued to prioritize habitat protection and restoration. Despite these measures, populations are still at risk due to other factors; primary threats to IFS are bycatch in fisheries, low marine survival because of ocean conditions, and pinniped predation. The province's immediate goal for IFS is to reverse the decline and increase year-over-year spawning returns to ensure the persistence of wild IFS populations. The longer-term objective is to rebuild IFS populations to achieve healthy population status characterized as 'Routine Management' by the *Provincial Framework for Steelhead Management in British Columbia* (2016).

The activities undertaken by the province to reverse the decline of IFS fall into eight categories: (1) Planning and Policy, (2) Government Communication and Collaboration, (3) Knowledge, Innovation, and Research, (4) Fisheries Management, (5) Compliance and Enforcement, (6) Habitat Protection and Remediation, (7) Fish Culture and Interventions, and (8) Communication and Transparency. The province has completed numerous activities under each of these categories to date, including the following:

- Identified population targets and estimated returns
- Identified primary threats to IFS
- Created 'Team BC' to work collaboratively across ministries including the Ministry of Agriculture, Food and Fisheries (AFF), the Ministry of Environment and Climate Change Strategy (ENV), and the Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (FLNRORD)
- Collaborated with Fisheries and Oceans Canada (DFO) through the IFS Recovery Potential Assessment (RPA), the BC/Canada Action plan, and increased communication and executive level collaboration
- Building enhanced relationships with First Nations (individual Nations as well as organizations) to work collaboratively on solutions for IFS
- Identified and prioritized IFS related projects for funding through the Provincial-Federal BC Salmon Restoration and Innovation Fund (BCSRIF), the Habitat Conservation Trust Foundation (HCTF), and the Land Based Investment Strategy (LBIS)

- Advocated for an expanded IFS protection window to be implemented by DFO for fisheries it manages to reduce IFS caught as bycatch in non-selective salmon fisheries
- Advocated for the replacement of existing mixed-stock fisheries with fisheries using selective methods
- Closed all IFS directed recreational fisheries, as well as provincially managed trout fisheries where IFS could be caught as bycatch and requested mirror orders by DFO for recreational salmon fisheries
- Increased enforcement of fishing regulations affecting IFS to increase compliance and protect IFS
- Reviewed regulatory frameworks for habitat protection and completed protocols for habitat monitoring tools
- Completed a draft of Tier 1 (GIS evaluation) of the Watershed Evaluation Protocol (WSEP) for IFS watersheds
- Established three Fisheries Sensitive Watersheds in IFS watersheds
- Remediated blockages and helped to recover fish passage, including at the Big Bar slide
- Assessing options such as hatcheries and other interventions to determine feasibility
- Completed parallel stock assessments on other Fraser River steelhead populations to track relative performance and isolate bycatch influences from common marine mortality
- Increased IFS related information available on Provincial website and enhanced communications with First nations, stakeholders, and the public.

The approach for 2021-22 is to continue working with partners and using science-based decision making to best manage IFS. Priorities include updating provincial strategic plans and policies for Steelhead, continuing to monitor IFS spawning returns, continuing to support the transformation of non-selective fisheries to selective fisheries, assessing management interventions including fish culture, and improving transparency, communications, and information available regarding IFS.

PURPOSE OF THIS DOCUMENT

This document provides a summary of the 2019 - 2021 Provincial Action Plan to manage IFS that aligns with the *Strategic Framework for the Management of Steelhead in BC* (2016; 2021 in preparation) and also provides a report of the activities achieved since 2019 through to early 2021. Based on the status of actions and knowledge, priority focus areas are recommended for the 2021/2022 Annual Action Plan (page 24).

The 2019 - 2021 Action Plan and Activities Report Summary Table (pages 9 - 17) outlines the management goals and objectives, and key actions required to achieve those objectives and reach those goals, as well as timeframes and performance metrics and/or deliverables. The Summary Table also provides the status of actions as well as a dashboard of progress. This builds upon the 2019 IFS BC/Canada Action Plan (Appendix 1); it identifies provincial activities both included in, and beyond, those identified in the 2019 joint plan.

This document is not an exhaustive summary of science and current knowledge. Instead, it outlines some key points as context for explaining the current and upcoming priority activities.

Given that IFS is considered by BC to be of Extreme Conservation Concern (ECC) based on its decline and current low abundance, an annual Action Plan and year-end Activities Report are recommended moving forward.

BACKGROUND AND STATUS

The Province of British Columbia has been given the delegated authority to manage freshwater fish stocks in BC by Canada and is the lead jurisdiction responsible to ensure wild steelhead (also known as 'steelhead trout') and their habitat are managed in a manner that results in self-sustaining wild populations for current and future generations. The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) recognizes that steelhead are an iconic fish species of significant cultural, economic, social, and ecological importance and thus is of high priority to the Province of British Columbia.

Interior Fraser Steelhead (IFS) are Fraser River late-run summer steelhead and are comprised of a group of ten spatially discrete spawning populations distributed in the Fraser watershed upstream of Hell's Gate. The aggregate commonly referred to as "Thompson and Chilcotin Steelhead" comprises six out of these ten spawning populations. The aggregate run of Thompson, Chilcotin, and other Fraser River, late-run, summer steelhead stocks occurs over about a 12-week period and normally peaks in Johnstone Strait and in Juan de Fuca Strait in late September. Steelhead have several advantages over other salmonids. Like all salmon, steelhead are a very fecund species meaning each female carries a large number of eggs, but where sockeye, coho, chinook, pink, and chum salmon die after spawning, steelhead can potentially spawn multiple times; these spawned "kelts" return to the ocean and may spawn two to three times. Steelhead also have more survival options than salmon as they can adjust the amount of time they spend in freshwater habitat. Furthermore, resident rainbow trout occasionally develop anadromy and become steelhead, which can provide an additional source of resiliency and help to maintain the steelhead population.

In the past, IFS supported a world-renowned recreational fishery which contributed significantly to local and regional economies. IFS are also an important species with cultural significance for BC First Nations. In recent years, IFS populations have declined and have now reached historic lows (Figures 1 and 2). Based on the province's abundance-based framework (FLNRORD 2016), IFS status is of "extreme conservation concern (ECC)". IFS were classified as 'Endangered' by COSEWIC in 2019 (emergency assessment), and again in 2021 (regular assessment).

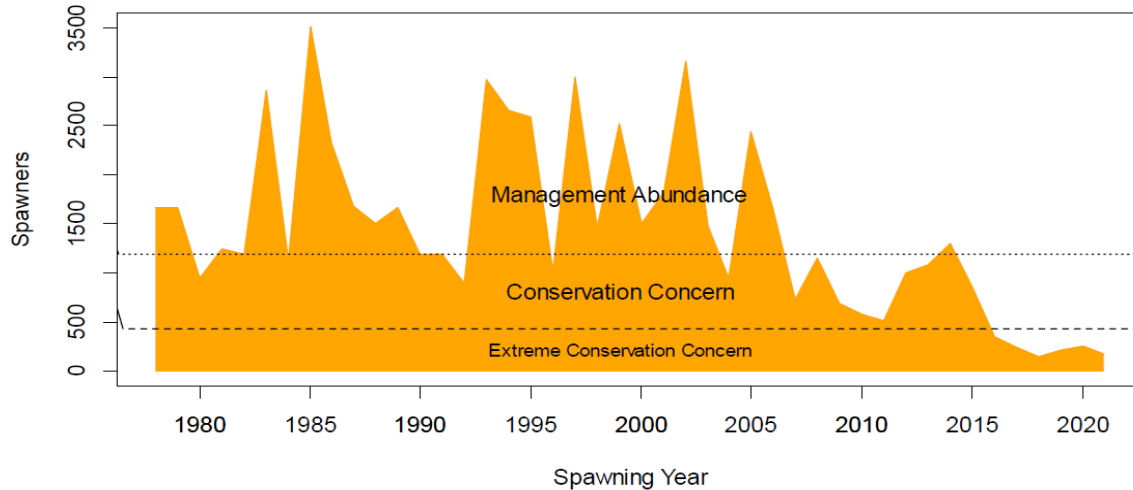


Figure 1. The estimated spawning abundances of Thompson River steelhead in relation to conservation reference points. The last data point illustrates the expected spawner abundance for this season's return which will spawn in the spring of 2021.

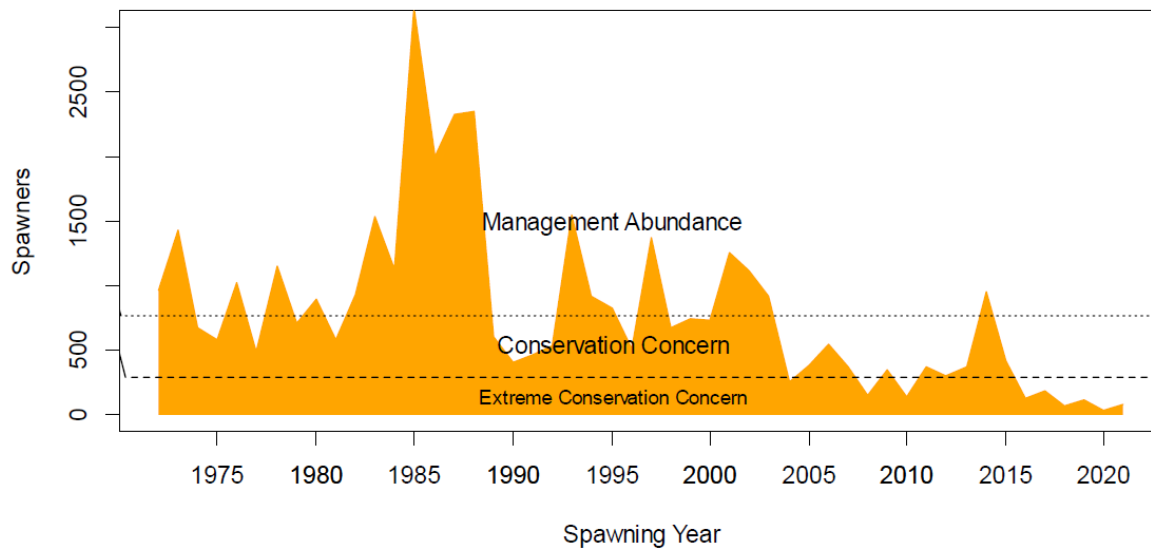


Figure 2. The estimated spawning abundances of Chilcotin River steelhead in relation to conservation reference points. The last data point illustrates the expected spawner abundance for this season's return which will spawn in the spring of 2021.

In 2019, 240 steelhead returned to the Thompson, and 120 steelhead returned to the Chilcotin. In 2020, 257 steelhead returned to the Thompson and 38 returned to the Chilcotin. The 2021 spawning population forecast from fall test fishing is 180 steelhead for the Thompson watershed and 81 steelhead for the Chilcotin watershed. The forecast for the Thompson represents the second lowest observed spawning return over a 44-year monitoring time frame. The forecast for the Chilcotin represents the third lowest spawning return over a 50-year monitoring time frame. In the past, spawning returns for Thompson were as high as 3,500 spawners with a median spawning return of 1,700 steelhead from 1978 to 2007. Spawning returns to the Chilcotin were as high as 3,100 steelhead with a median of 900

steelhead spawners returning from 1972 to 2003 (it should be noted that these are spawning returns only, pre-fishery abundances or “reconstructed runs”, would include catches and would be higher).

It is recognized that effective management and the ultimate recovery of IFS requires the collaboration of all Governments (Canada, Indigenous Nations and BC) as well as partners, stakeholders, and the public. Continued immediate action is critical if declining trends in steelhead abundance are to be reversed in these populations.

Over the past decade, this ministry has implemented numerous regulatory actions (e.g., Fraser and Thompson River closure to recreational angling) to minimize the mortality of steelhead in BC. The province also conducted directed studies of steelhead bycatch in marine areas over five decades. The province has continued to prioritize habitat protection and restoration. Despite these measures, stocks are still at risk due to other factors; primary threats to IFS are bycatch in fisheries, low marine survival because of ocean conditions, and pinniped predation. DFO is responsible for pinniped management as well as the management of salmon fisheries in marine and freshwater environments and the province is working to collaborate across the governments (Federal, Provincial, and First Nations) to address threats to IFS. The province supports and actively advocates for the transformation from non-selective methods (e.g., gillnet) to more selective fisheries for salmon in the Fraser River that would ultimately reduce (and ideally eliminate) bycatch of IFS. The province and First Nations are building collaborative partnerships to identify shared priorities for sustainable management and enable both jurisdictions to take management actions consistent with these priorities.

The province’s immediate intention is to reverse the decline of IFS and modestly increase year-over-year spawning return estimates to ensure the persistence of wild IFS populations. A provincial focus on persistence (as opposed to ‘rebuilding’) recognizes that the current key threats to IFS (ocean conditions, mixed-stock fisheries, and pinniped predation - see appendix 3c) are beyond the direct jurisdiction of the province. Persistence, however, which may be achieved through provincial management actions as well as effective collaboration with other jurisdictions (e.g., DFO, First Nations), would ensure enough steelhead and resident rainbow trout are present and sustained to allow for rebuilding of IFS populations when the combination of environmental conditions improve, and survival threats can be mitigated or changed. Freshwater habitat issues have not been identified as a major contributor to IFS declines, but to ensure persistence of IFS, freshwater survival must be maintained or improved. This document describes the many actions taken by BC to address threats to IFS and to finalize an IFS management strategy.

2019 - 2021 ACTION PLAN AND ACTIVITIES REPORT SUMMARY TABLE

Category	Goal	Objective	Action	Time-frame	Performance Metric / Deliverable	Status	Related Item on BC/Canada Action Plan
1. Planning and Policy							
1.1. Clear objectives and actions for short and long-term IFS stock management							
	1.1a. Create an attainable, measurable plan for IFS stock management	Create an IFS one-year action plan	2019	BC/DFO action plan	Completed in collaboration with DFO	Improving Management & Governance (page 1): DFO-BC executive level	
		Assess and define immediate, short, medium, and long-term IFS population targets	2020 -2021	Final IFS population targets for immediate, short, medium, and long term	Complete (but subject to revision, feedback required) Persistence (short-term): stop decline, 431 Thompson, 296 Chilcotin Rebuilding (long-term): 1187 Thompson, 763 Chilcotin Healthy populations: 1900 Thompson, 1100 Chilcotin	Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)	
		Identify primary threats and priority actions and make steelhead management a top priority	2020	Recovery Potential Assessment identifying threats. Inclusion of threats in Management Framework	Complete - 3 primary threats identified: Marine survival, natural predation, bycatch mortality. Salmonid management has been established as a top priority of the elected Government.	Improve Production (Habitat): Data Knowledge and Management (Page 3) Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)	
		Track all activities related to IFS recovery	Continuous	Activities tracker spreadsheet	Complete - now transitioning to new format (this report), original spreadsheet will continue to be updated until information is transitioned into an updated project management framework		
		Initiate update of Strategic Framework for Management of Steelhead in BC	2020	Draft of abundance-based framework summary table	Original management framework reviewed, and draft of decision-making framework has been completed		
1.2. Sufficient funding available to enable IFS recovery							
	1.2a. Communicate that IFS is a priority to funding agencies	Work with BCSRIF to ensure IFS are a priority for funding	2020	IFS related projects funded by BCSRIF	Complete for 2020, staff participated in BCSRIF project selection process and identified IFS related projects as high priority		
		Work with HCTF to identify IFS projects as high priority for funding	Yearly	Funding delivered to IFS projects through HCTF	Complete (example: see appendices 2 and 3)		
		Work with LBIS to identify IFS as high priority for funding	Yearly	Funding delivered to IFS projects through LBIS	Complete (example: see appendices 2 and 3)		

Status Dashboard
Substantially Incomplete or not initiated
Partial or Ongoing
Completed

<u>Category</u>	<u>Goal</u>	<u>Objective</u>	<u>Action</u>	<u>Timeframe</u>	<u>Performance Metric / Deliverable</u>	<u>Status</u>	<u>Related Item on BC/Canada Action Plan</u>
2. Government Coordination and Collaboration							
2.1. Collaboration between governments (BC, Canada, and First Nations) for aligned and effective management of IFS							
	2.1a. Build relationships with key IFS partner governments	Improve the ongoing BC-DFO collaborations on areas of overlapping responsibility with IFS		2019, 2020, & Continuous	Completed joint DFO-BC projects related to IFS	Complete for 2019 and 2020. Successful DFO-BC work on updates to the Federal Fisheries Act. Regularly scheduled meetings at executive, DRM, and regional levels. Joint BCSRIF funding and administration, DFO invited to participate in FNFC initiative.	Improving Management & Governance (page 1): DFO-BC executive level
		Build / formalize relationship with First Nations Fisheries Council (FNFC) by establishing an MOU and launch a partnership project		2019, 2020 & Continuous	Signed MOU and joint projects established	Established MOU. Collaboration and relationship building is ongoing. IFS Planning Committee established. Knowledge sharing and leveling workshop held in fall 2020. Working with FNFC on a survey to gather information on First Nations' lead salmon habitat recovery projects	Improving Management & Governance (page 1): DFO-BC executive level
		Build / formalize relationship with Lower Fraser Fisheries Alliance (LFFA)		2020, Continuous	Participate in meetings and provide support as needed. Work together on management projects.	Ongoing - discussions ongoing on partnership and management opportunities.	Improving Management & Governance (page 1): DFO-BC executive level
		Build / formalize relationship with Thompson Shuswap Salmon Collaborative (TSSC) and work collaboratively to develop priorities for management of salmonid natal grounds		2020, Continuous	Participate in meetings and provide support as needed. Finalized TOR and shared management plan	Identified 2 FAHB and 2 Region participants at the Planning committee and technical table. Participated in initial drafting of a TOR and hiring a contractor to finalize the TOR.	Improving Management & Governance (page 1): Indigenous collaborations
	2.1b. Build a comprehensive management plan across agencies and governments	Coordinate among BC Ministries and Regions to align the internal-to-BC activities, establish a leadership team (AFF, MOE, FLNR Regions, FLNR Branch), incorporate IFS priorities into the collective business planning.		2020, Continuous	Team established and business planning documents finalized.	Team has been established. IFS Activities Report for 2019-2020 is complete (this document), IFS Action plan for 2021-2022 in preparation. Steelhead Strategic Framework for Management draft complete.	
		Work with First Nations to build collaboration on bi-lateral areas.		2020, Continuous	Agreement on bi-lateral management items.	Ongoing discussions to identify opportunities.	Improving Management & Governance (page 1): Indigenous collaborations
		Create a tri-partite agreement (BC-FN-DFO) to achieve a fully comprehensive strategy with multi-government agreement on actions		2021	A finalized management plan document agreed to by BC, FN, and DFO, posted publicly	Not complete, currently working with FNFC on a Tripartite Planning Committee Collaborative Initiative	Improving Management & Governance (page 1): DFO-BC executive level, Indigenous collaborations
	2.1c. Ensure decisions by all levels of government are made using common scientific understanding	Work with DFO and Team BC to support COSEWIC and on IFS Recovery Potential Assessment		2020	RPA document, agreed to by both governments and posted publicly	Provided support to COSEWIC during IFS listing process. Completed work in 2019 on RPA after IFS designated 'Endangered' in emergency assessment. Status confirmed in November 2020.	Improve Production (Habitat) Data Knowledge and Management (Page 3)

Category	Goal	Objective	Action	Timeframe	Performance Metric / Deliverable	Status	Related Item on BC/Canada Action Plan
2. Government Coordination and Collaboration							
2.2. Effective relationships with stakeholders for improved management of IFS							
	2.2a. Build relationships with key IFS stakeholders	Meet with stakeholders (such as PAAT) to describe plans and receive feedback		2 - 3 times per year	Conduct meetings providing presentations with updates on IFS actions and receive feedback	IFS focused meeting with PAAT held in March 2021	Improve Production (Habitat): Data Knowledge and Management (Page 3) Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)
		Collaborate with the HCTF to ensure their investments benefit IFS		2020, yearly	IFS related projects funded by HCTF	Complete for 2020	
		Collaborate with PSF on Pacific salmon explorer and possible inclusion of steelhead		2021	Final version of Pacific Salmon Explorer including steelhead	Participated in discussion with PSF regarding plans / feasibility of including steelhead in PSE. Supported BCSRIF funding for this project.	Improve Production (Habitat): Data Knowledge and Management (Page 3) Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)
3. Knowledge, Innovation, and Research							
3.1. Science-based planning and decision making informed by the best available information							
	3.1a. Compile best available data and science	Compile run size data for all years that data is available		2020	Finalized summary document	Yearly run sizes are posted on website as part of the IFS 'Fast Facts'. Could be posted as a downloadable spreadsheet to improve accessibility.	Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)
		Finalize target run sizes for both persistence and recovery of IFS populations		2020	Finalized document including targets and how they were established	Targets established, included in several documents, further documentation in 2021.	Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)
		Finalize and describe best estimate for IFS run timing window		2021	Finalized document detailing BC's methodology	In progress. There is internal information, and BC leans on the COSWIC documents, transforming previous work done G2G into a BC paper remains outstanding	Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)
		BC summary of IFS status and threats.		2020	Finalized document	Complete - included in a Fast Facts document. Next year should be included in larger management strategy document.	Improve Production (Habitat): Data Knowledge and Management (Page 3) Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)
		Learn more about marine survival of salmonids.		2020	Attend information meetings, complete literature review	Participated in a two-day workshop hosted by NPAFC regarding offshore survey initiatives and high seas salmon monitoring.	Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)
		Improve the seasonal flow forecasting model capabilities.		2020	Improved forecasting methods used successfully during migration salmon and steelhead migration windows or for other planning purposes.	Complete - The River forecast Center completed modelling improvements which were invaluable in the fish-management response for Big Bar and for 2020 freshet.	Improve Production (Habitat): Data Knowledge and Management (Page 3) Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)

<u>Category</u>	<u>Goal</u>	<u>Objective</u>	<u>Action</u>	<u>Timeframe</u>	<u>Performance Metric / Deliverable</u>	<u>Status</u>	<u>Related Item on BC/Canada Action Plan</u>
3. Knowledge, Innovation, and Research							
3.1. Science-based planning and decision making informed by the best available information							
	3.1b. Identify key knowledge gaps	Identify knowledge gaps and explore ways to include traditional/cultural knowledge as well as the cutting-edge science many Nations are leading		Ongoing	Work with Indigenous Nations to co-design a workplan that potentially includes a literature review, knowledge sharing and engagement.	Initial discussions with First Nations and learning about current projects such as a knowledge assessment and compilation process (led by the Secwépemc Fisheries Commission and invited partnerships with BC and DFO)	Improve Production (Habitat): Data Knowledge and Management (Page 3) Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)
		Explore opportunities to use tagging of steelhead caught in selective fisheries to increase understanding of steelhead migration		2020, 2021	If feasible, conduct a tagging program	Initial discussions suggest that the risks to survival and logistical challenges of a tagging program would be high, and the knowledge gained would not fill any current major knowledge gaps	
	3.1c. Conduct research to fill knowledge gaps	Gain understanding regarding smolt-to-adult survival		Yearly / Ongoing	Reports from Keogh River Research facility	Ongoing - The Keogh River Research Facility studies smolt-to-adult survival, population, and recruitment dynamics of steelhead in BC	Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)
4. Fisheries Management							
4.1. Maximize the number of IFS to reach the spawning grounds each year							
	4.1a. Eliminate all intentional harvest of IFS	Create regulations banning recreational catch of IFS		2019, 2020, Yearly	Regulations approved and in place in time for fishing season.	Complete - Fishing regulations do not allow IFS retention or catch and release (Wild steelhead are not recreationally harvested, though catch and release is permitted for other populations with greater numbers).	Reduce Mortality / Increase Survival: Recreational IFS Fishery (Page 3)
	4.1b. Reduce IFS bycatch mortality as much as possible	Enact regulations increasing IFS protection from sport fisheries for rainbow trout in areas that could result in bycatch of IFS		2020, Yearly as needed	Increased protection for IFS of all sport fisheries under provincial regulation that could intercept IFS	Complete - Increased protections are in place to protect IFS rearing and spawning areas. In 2019 BC added an additional increased protection to the primary migration pathway along the center channel of the Fraser River mainstem.	Reduce Mortality / Increase Survival: Recreational Fishery Bycatch (Page 3)
		Request mirror order from DFO increase protection for IFS in all recreational fisheries that could result in bycatch of IFS		2019, 2020, Yearly	Approved orders from DFO for increased IFS protection from fisheries targeting salmon species in locations and at times when IFS bycatch is a risk.	Complete	Reduce Mortality / Increase Survival: Recreational IFS Fishery (Page 3)
		Using IFMP process and discussions at Executive level, request DFO enact a rolling window of increased IFS protection from all fisheries where IFS may be caught as bycatch		2020, 2021, Yearly as needed	Full window of increased protection for IFS from all fisheries which could intercept IFS	DFO put a rolling window of increased protection in place in 2019, 2020, and likely 2021. The window is smaller than the province's request. The letter to IFMP in 2021 requests a longer window of increased protection.	Reduce Mortality / Increase Survival: Recreational Fishery Bycatch - IFS Migration Route (Page 3)
		Using IFMP process and executive discussion, advocate for DFO to enact selective harvest and terminal fisheries to avoid IFS bycatch		2020, 2021, Yearly as needed	Switch to terminal harvest and / or selective gear throughout the IFS migration route during migration window	Completed letter to IFMP for 2021 requesting changes	Reduce Mortality / Increase Survival: Selective Fisheries (Page 4)

Category	Goal	Objective	Action	Timeframe	Performance Metric / Deliverable	Status	Related Item on BC/Canada Action Plan
4. Fisheries Management							
4.1. Maximize the number of IFS to reach the spawning grounds each year							
	4.1b. Reduce IFS bycatch mortality as much as possible	Using IFMP process and executive discussion, advocate for DFO to enact selective harvest and terminal fisheries to avoid IFS bycatch	2020, 2021, Yearly as needed	Switch to terminal harvest and / or selective gear throughout the IFS migration route during migration window	Completed letter to IFMP for 2021 requesting changes	Reduce Mortality / Increase Survival: Selective Fisheries (Page 4)	
		Advocate for and support First Nations groups to move toward terminal fisheries and selective harvest	Continuous	Switch to terminal harvest and / or selective gear throughout the IFS migration route during migration window	Ongoing - Building relationships with LFFA and FNFC to better understand barriers to terminal fisheries and selective gear. Supported LFFA-led ghost net program and Semá:th selective fishing trials, HCTF funded Matsqui-Yale selective fishing initiative.	Reduce Mortality / Increase Survival: Selective Fisheries (Page 4)	
		Direct investments into selective fishing as a priority area for BCSRIF funding	2020, 2021	Successful project proposals accepted by BCSRIF focusing on selective harvest	Complete - Approved four selective harvest BCSRIF project proposals.	Reduce Mortality / Increase Survival: Selective Fisheries (Page 4)	
4.2. Management decisions informed by timely and accurate scientific data							
	4.2a. Provide yearly IFS run size estimates	Forecast spawning run size based on test fishing catches in lower Fraser river	Yearly: late Nov. / early Dec.	Include forecast estimate in status update document	Complete for 2021 return (these fish migrate in the lower river in fall 2020)	Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)	
		Estimate spawning return run sizes based on spawning ground surveys.	Yearly: late spring / early summer	Results produced for Chilcotin as well as Thompson	Complete for 2019, and 2020. 2021 estimate will be complete in late spring/early fall 2021	Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)	
		Seek opportunities to improve run size estimates	Continuous	Partnerships established to provide additional resources for spawning ground estimates	Partnerships under development with Tsilhqot'in for Chilcotin as well as The Interior Fraser Wild Steelhead Conservation Project	Reduce Mortality / Increase Survival: Stock Data / Information (Page 4)	
4.3. Support Indigenous Nations' internal enhanced protection measures							
	4.3a. Communicate / collaborate with First Nations groups to learn of and support laws and policies related to protecting IFS	Participate in the Tsilhqot'in-BC-DFO Partnership in which the Tsilhqot'in have established closures for their members on steelhead sustenance fishing	Yearly	Regular communication with Tsilhqot'in and DFO to understand latest developments	Ongoing - Tsilhqot'in have worked collaboratively to include federal and provincial enforcement agencies into their indigenous-led approach.		
		Support Skeetchestn FN in implementing a bylaw protecting IFS	2020, yearly	Regular communication with Skeetchestn to understand latest developments and provide support, a successfully implemented bylaw	Complete for 2020		

<u>Category</u>	<u>Goal</u>	<u>Objective</u>	<u>Action</u>	<u>Timeframe</u>	<u>Performance Metric / Deliverable</u>	<u>Status</u>	<u>Related Item on BC/Canada Action Plan</u>
<i>5. Compliance and Enforcement</i>							
5.1. IFS-related regulations are implemented and complied with so that management goals can be met							
		5.1a. Ensure IFS protection rules are in place and clearly communicated	Ensure regulations are set and communicated to participants in fisheries	Yearly	Strong compliance with IFS closures and protective measures	Regulations in place for 2019, 2020, 2021	Reduce Mortality / Increase Survival: Monitoring and Enforcement (Page 4)
			Build alignment between BC C&E and First Nations groups	Continuous	Regular communication between BC C&E and FN groups regarding protection	Ongoing	Reduce Mortality / Increase Survival: Monitoring and Enforcement (Page 4)
		5.1b. Ensure IFS protection rules are enforced	Provide enhanced C&E activities for IFS	Yearly during IFS returns	Strong compliance with IFS closures and protective measures	BC increased presence of the Conservation Officers during the IFS run	Reduce Mortality / Increase Survival: Monitoring and Enforcement (Page 4)
5.2. Support First Nation's Compliance and Enforcement activities							
		5.2a. Communicate / collaborate with First Nations groups to learn of and support efforts compliance and enforcement efforts related to IFS	Participate with the Tsawwassen Nation and DFO in piloting a Fisheries Guardian program	Ongoing	Regular communication with Tsawwassen and DFO and successful implementation of the program	Ongoing	Reduce Mortality / Increase Survival: Monitoring and Enforcement (Page 4)

Category	Goal	Objective	Action	Timeframe	Performance Metric / Deliverable	Status	Related Item on BC/Canada Action Plan
6. Habitat Protection and Remediation							
6.1. IFS habitat of suitable quality and quantity to support IFS populations at optimum productivity							
	6.1a. Provide habitat protection through regulations to avoid barriers to migration and threats to IFS at all life stages	Ensure regulatory framework provides adequate protection for IFS habitat	Yearly, as needed	Comprehensive regulations approved and in place and tools that are well-utilized by regions to ensure habitat protection	Worked with federal government on the re-inclusion of HADD provisions in the Fisheries Act. Updated RAPR came into force in 2019. Completed initial investigations into use of Fisheries sensitive watersheds designations in IFS watersheds.	Improve Production (Habitat): Habitat Protection - Regulatory (Page 2)	
		Ensure regulatory framework provides adequate protection for IFS water quality and quantity	Yearly, as needed	Comprehensive regulations approved and in place and tools that are well-utilized by regions to ensure habitat protection	The Water Allocation Regulatory framework was reviewed, Section 15 of Water Sustainability Act requires consideration of Environmental Flow Needs in new decisions.	Improve Production (Habitat): Habitat Protection - Regulatory (Page 2)	
	6.1b. Ensure IFS habitat is well-monitored to identify any threats or barriers to IFS	Complete protocols for Provincial monitoring tools (Cumulative Effects Framework - CEF, Watershed Status Evaluation Protocol - WSEP)	2020	Completed documents describing CEF and WSEP processes.	Completed CEF and WSEP protocols	Improve Production (Habitat): Watershed Management (Page 1)	
		WSEP Tier 1 (GIS evaluation) for Thompson & Chilcotin watersheds completed April 2020	2020	Completed report describing results of evaluation	Draft evaluation was completed in April 2020	Improve Production (Habitat): Watershed Management (Page 1)	
		Complete Forest and Range Evaluation Program (FREP) Assessment protocol for wetlands, riparian, and water-based habitats.	2020	Completed monitoring protocol document	Completed monitoring protocol April 2020, document available online	Improve Production (Habitat): Habitat Protection - Regulatory (Page 2)	
	6.1c. Undertake habitat remediation or restoration where threats or barriers are identified	Prioritize IFS habitat areas for remediation	2020, ongoing	IFS set as a clear priority for executive, provincial, regional staff, as well as funding agencies	Worked with Federal government to create \$142M BCSRIF with a focus on habitat remediation and inclusion of IFS as a priority fish.	Improve Production (Habitat): Habitat Recovery (Page 1,2)	
		Assess passage and remediate blockages affecting IFS	2020, ongoing	Increasing number of completed passage assessments and remediation projects	Conducted passage assessments, site plans, structure purchases, and road crossing remediations. Assessed blockages related to Elephant Hill Fire, completed Bonaparte River Trap and Truck, also fishway stabilization and repairs.	Improve Production (Habitat): Habitat Recovery - Fish Passage (Page 1)	
		Support BCSRIF projects addressing IFS habitat remediation	2020	IFS habitat-related projects approved for funding from BCSRIF	Approval of additional fish passage remediation work funded through BCSRIF (via the Canadian Wildlife Federation - \$4m over 2 years). Also, the Baker Creek Enhancement Society and Nazko First Nation to undertake restoration of critical habitat affected by the Plateau Fire, also funded by BCSRIF.	Improve Production (Habitat): Habitat Recovery (Page 1,2)	
		Recover fish passage through the area impacted by the Big Bar landslide	2019, 2020, 2021	Restore fish passage at Big Bar at equivalent or higher water levels as existed before the slide	Ongoing - the emergency response phase has ended, but construction of a permanent fishway was underway (paused as of July 2021)	Improve Production (Habitat): Habitat Recovery - Fish Passage (Page 1)	

<u>Category</u>	<u>Goal</u>	<u>Objective</u>	<u>Action</u>	<u>Timeframe</u>	<u>Performance Metric / Deliverable</u>	<u>Status</u>	<u>Related Item on BC/Canada Action Plan</u>
7. Fish Culture and Interventions							
7.1. Assess the risks and benefits of hatcheries, fish-culture, and other interventions as tools to conserve and rebuild IFS populations							
		7.1a. Identify benefits and risks of fish culture using relevant science	Conduct thorough literature review regarding fish culture benefits and risks, including summary of past and present provincial stocking programs	2020, 2021	Finalized, public report regarding risks and benefits of various interventions measures such as fish culture actions and conservation aquaculture.	Ongoing - highlighted as a priority for 2021-22	
		7.1b. Review and, if needed, update existing policies regarding how and when to safely use fish stocking and intervention techniques	Review existing operational policy for steelhead stocking and application for IFS.	2020, 2021	Summary report of current policy and identification of potential changes if required. Updated policy if needed	Initial review of 'Steelhead Stream Classification Policy' (2005) completed. Presentation developed identifying the challenges with impacts of hatcheries on Steelhead. Summary report still pending.	
7.2. Evaluate options to increase survival of steelhead at all life stages							
		7.2a. Find ecologically responsible solutions to issues of increased predation or increased impacts of predation.	Participate in discussions with DFO and First Nations to learn more about predation issues and possible solutions	2020	Attend workshops	BC participated in two DFO-convened expert workshops to summarize what is known about pinniped predation on salmon.	Reduce Mortality / Increase Survival: Predators (Page 4)
			Support First Nations in exploring opportunities to use their FSC to achieve increased steelhead protection	2020, 2021	Pilot project for First Nations to use FSC catch to target likely steelhead predators	Complete - This was planning work only and BC will provide support as/when appropriate to advance this pilot in 2021.	Reduce Mortality / Increase Survival: Predators (Page 4)
		7.2b. Explore options to decrease steelhead mortality during in-river migration period	Assess possibility of transporting steelhead caught in selective fisheries upriver to increase survival	2020, 2021	Document describing feasibility of transporting steelhead	Initial discussions and explorations suggest this option is not viable, it would be logistically very challenging with little benefit, or possibly a negative impact on survival of IFS	
		7.2c. Explore interventions such as kelt reconditioning to increase spawning potential of steelhead	Conduct experiment regarding feasibility of kelt reconditioning	2019, 2020	Document describing feasibility of kelt reconditioning	Initial research suggests kelt reconditioning would not be feasible due to the difficulty in catching IFS kelts for reconditioning and the potential increased risk of mortality of IFS	

<u>Category</u>	<u>Goal</u>	<u>Objective</u>	<u>Action</u>	<u>Timeframe</u>	<u>Performance Metric / Deliverable</u>	<u>Status</u>	<u>Related Item on BC/Canada Action Plan</u>
<i>8. Communication and Transparency</i>							
8.1. Transparent decision-making and access to relevant information for partners, stakeholders, and the public							
		8.1a. Ensure user-appropriate, up-to-date information regarding IFS is easy to find and navigate for provincial employees, partners, stakeholders, and the general public	Post data online including run-size by year, test-fishing catches, and estimated bycatch.	Yearly	Data posted on website in an easy to access format.	Ongoing - run sizes are available as part of 'fast facts' online.	
			Post all relevant documents online, such as the Action Plans and Activities Reports, Management Plan, Status updates, past planning process documents, etc.	2020, 2021	Links on website to relevant documents.	Ongoing - the website includes a number of relevant links, still some missing, some reorganizations required to improve navigation, some documents need to be updated.	
			Update IFS webpage to include links to relevant regulations.	2020	Webpage including links to relevant acts, laws, regulations, and policies (Federal and provincial).	Ongoing - the information is available internally, but not yet posted online in an easy to navigate format	

ACTIVITIES DISCUSSION

1. PLANNING AND POLICY

1.1 Goal: Clear objectives and actions for short and long-term IFS population management

Objectives and Actions: Protection and rebuilding of IFS requires a clear plan and resources, cooperation, collaboration, and joint efforts of several governments (Provincial, Federal, and First Nations) to implement actions and achieve the required outcomes. Clear, specific, measurable, and time specific objectives are required to focus and define actions that will, when achieved, rebuild IFS populations. Spawning abundance estimates and rebuilding targets are required to track progress and adapt management strategies. Primary threats must be identified through concurrent steelhead monitoring on other Fraser River populations that appear to be healthier, and a cooperative management strategy must be developed.

Results and Discussion: BC has established an abundance-based *Strategic Framework for the Management of Steelhead in BC* (2016). An update to the framework is in preparation which requires further collaborative input from First Nations and DFO partners. Based on this draft framework, a three-phased strategic management framework with specific goals, associated objectives, and spawning return targets was identified for IFS. Note: these goals and targets are subject to changes pending collaborative input from First Nations, DFO, and other partners:

- **Phase 1. Persistence (short-term):** The goal of the persistence phase is to ensure that populations are maintained to avoid further declines from current abundances, are resilient to future threats and changes, and can recover when ocean conditions and marine survival improve. The immediate objective is to reverse the current trend of declining spawning returns by achieving year-over-year increases in the number of returning spawning adults. The short-term target is to move from ‘Extreme Conservation Concern’ (ECC) to ‘Conservation Concern’ (CC, as defined by the province’s abundance-based framework, FLNRORD 2016). This would require a spawning return greater than 430 for Thompson, and greater than 300 for Chilcotin (estimates based on recommendations by Johnston, 2013).
- **Phase 2. Rebuilding (long-term):** Achieve minimum targets for a healthy self-sustaining population. The long-term target is to move from ‘Conservation Concern’ (CC) to Management Abundance (as defined by the province’s Framework for Steelhead Management, FLNRORD 2016). This would require a spawning return greater than 1,200 for Thompson, and greater than 760 for Chilcotin (estimates based on recommendations by Johnston, 2013). These numbers are slightly higher than those recommended through the Recovery Potential Assessment (RPA) process undertaken jointly between the province and DFO. The recommendation from the RPA process in 2018 was to achieve, within five to eight years, a minimum of 938 Thompson spawners and 562-744 Chilcotin spawners for each year of one full generation (five to eight years).
- **Phase 3. Healthy Populations (perpetuity):** The ultimate goal is to continue to build IFS populations beyond the conservation concern threshold to a level that is considered healthy, stable, and resilient and can support sustainable fishery opportunities such as limited Food, Social, Ceremonial (FSC) harvest and catch and release recreational fisheries. Average spawner returns in years before the major declines started in the early 2000’s were approximately 1,100 Chilcotin steelhead (average spawners in years 1972 – 2003) and 1,900 Thompson steelhead (average spawners in years 1978 – 2006). These averages serve as an initial goal for phase 3, though would likely be reviewed and updated based on potential harvest and fishing impacts once the phase 2 rebuilding targets were attained.

1.2 Goal: Sufficient funding available to enable IFS recovery

Objectives and Actions: While there are several funding sources that assist in efforts to sustain and recover IFS, it is important that priorities for IFS protection and management are communicated to these funding sources to maximize the resources available to protect and recover IFS.

Results and Discussion: In 2019 and 2020 the province focused on improving alignment and prioritization across six funding sources: Base resources within the ministries, license-fee generated funds administered through the Freshwater Fisheries Society of BC (FFSBC) and the Habitat Conservation Trust Foundation (HCTF), internal annual-priority funding including the Indigenous Funding Envelope (IFE) and the Land Based Investment strategy (LBIS), and the new funds provided through the Provincial-Federal BC Salmon Restoration and Innovation Fund (BCSRIF). See appendix 2 for example actions.

2. GOVERNMENT COORDINATION AND COLLABORATION

2.1 Goal: Collaboration between governments (BC, Canada, and First Nations) for aligned and effective management of IFS

Objectives and Actions: BC is working to build connections within the provincial government across ministries, with the federal government, and with First Nations governments. The objective is to move from siloed approaches to collaborative planning and delivery of priorities. BC has an overall role and responsibility for the sustainable stewardship and management of IFS. It is recognized, however, that First Nations and DFO hold authorities which play a role in IFS management and they are critical partners to design and deliver solutions.

Results and Discussion: The cross-ministry and cross-regional management activities are now compiled and coordinated, with the intention of regular (e.g., annual) action plan updates to ensure adaptive management actions based on current science and population information. BC-DFO activities are being incorporated into regular senior management discussions and priority setting. (Note: The following reflects the provincial leadership perspective and is not intended to speak on behalf of First Nations or DFO.) BC-FN partnerships for priority setting and management for the sustainable stewardship of IFS are growing. While this is a positive start, increased integration and collaboration are needed to achieve a fully comprehensive and effective strategy with multi-government agreement on actions. The province proposes to continue to identify opportunities to collaborate, invest and work together with individual First Nations, First Nation organizations, and tripartite and bipartite planning initiatives.

2.2 Goal: Effective relationships with stakeholders for improved management of IFS

Objectives and Actions: Utilize the expertise, passion, and investment of stakeholders and the public. Significant knowledge and experience are held by stakeholders, educational institutions, and the public. Tap into these groups to identify strategies and receive feedback to protect and recover IFS. Collaborate with non-profits, user-groups, universities, and others to obtain feedback, funding, and support for education and awareness to facilitate stewardship, and leverage citizen science to protect and recover IFS.

Results and Discussion: Some improvements in communication with specific stakeholder organizations have been made, but overall stakeholder engagement dropped in 2020 as staff focused on rebuilding government with government relationships with DFO and First Nations. Moving into 2021, there is a need to re-engage stakeholders, the public and interested parties such as universities and conservation groups. This document will address one key element by providing a publicly accessible and transparent update on the provincial management focus, priorities, status, and upcoming activities.

3. KNOWLEDGE, INNOVATION, AND RESEARCH

3.1 Goal: Science-based planning and decision making informed by the best available information

Objectives and Actions: Science-based decisions require complete and accurate data. Existing data was compiled and made available, knowledge gaps were identified, and efforts are being made to fill those gaps.

Results and Discussion: While some actions have been taken to provide easier public access to existing information (such as adding data and reports to the website), two priority items were not completed.

- BC's summary of IFS status and threats including run timing window: BC fisheries scientists participated in a peer reviewed report associated with the COSEWIC emergency listing recommendation. BC plans to summarize the provincial science and make it available.
- BC's analysis of various fish-culture activities as conservation and management tools: the potential role of hatcheries (and other possible fish culture interventions) is currently being addressed, in part, through an updated *Strategic Framework for the Management of Steelhead in BC* (2021, in preparation) and a planned technical workshop.

4. FISHERIES MANAGEMENT

4.1 Goal: Maximize the number of IFS to reach the spawning grounds each year

Objectives and Actions: The immediate objective is to reverse the current trend of declining spawning returns by achieving year-over-year increases in the number of returning spawning adults.

Results and Discussion: To achieve an increase in the number of returning spawners, BC implemented and maintained fishing regulations that do not allow IFS retention, along with trout fishing closures to protect rearing and spawning steelhead. In 2019, BC added an additional trout fishing closure to the primary migration pathway along the center channel of the Fraser River mainstem. Maintaining and improving ongoing protection through provincially regulated fishing closures remains a BC priority. Bycatch mortality from recreational freshwater fisheries is not considered a primary contributor to recent or continuing population declines because of the protection offered by provincially managed recreational fishery closures on the Fraser River. While the small amount of recreational trout fishing in the Fraser mainstem posed limited risk to IFS, the population is of 'extreme conservation concern'. At this time every IFS is important, and even relatively low risks need to be addressed. With high fecundity, increasing the numbers of fish returning to the spawning grounds by even a small number can play an important role in IFS persistence. Trout closures, in isolation, will not rebuild IFS but it may enable a few more IFS to reach their spawning grounds. Rebuilding this population requires actions on the suite of threats, with targeted action on the highest risk factors.

BC has also requested that DFO implement mirror orders to eliminate or reduce IFS bycatch and used the IFMP process to request that DFO increase protections for IFS during their marine and lower Fraser River migration phases. In 2021, DFO maintained the same closure windows as were implemented in 2020. The Government of Canada also introduced a number of potential fisheries closures under the Pacific Salmon Strategy Initiative (PSSI), some of which may benefit IFS if they are implemented in 2021. BC is advocating for a transition of the remaining fisheries from non-selective fishing methods to selective methods (gear, timing, location).

4.2 Goal: Management decisions informed by timely and accurate scientific data

Objectives and Actions: Ensure a robust monitoring program provides up-to-date and timely migration abundance estimates each year when IFS migrate into the Fraser River, and that thorough spawning ground estimates are conducted when IFS reach their spawning grounds.

Results and Discussion: The monitoring program includes migration abundance estimates in the fall of each year based on test-fishing catches of IFS. Spawning ground estimates are produced in the spring and early summer with the funding support of the HCTF. Spawning populations have been monitored and estimated since the 1970's. Maintaining these monitoring operations and the infrastructure to conduct them is critical. This also involves adapting operations and methods to new challenges as they arise, environmental or otherwise. Improving estimates when and where possible will be advantageous, however, consistent trend data is the priority. The repair of the Bonaparte fishway and the redesign of electronic counter technology used inside the fishway to estimate the spawning population of steelhead and other salmon species are recent improvements for 2020 and 2021. Improvements in counting operations and data analysis is ongoing at both the Bonaparte and Deadman monitoring sites. In 2020, a partnership with T̓silhqot̓'in was initiated to conduct additional flights for estimation of the Chilcotin steelhead population. Given the low populations numbers, reviewing and acting upon additional ways to increase statistical or predictive certainty is important.

4.3 Goal: Support Indigenous Nations' internal enhanced protection measures

Objectives and Actions: BC supports Indigenous Nations which implement internal voluntary management actions such as harvest moratoriums. BC will explore collaborative ways to support compliance and enforcement efforts and to build increasing alignment on compliance and enforcement efforts between BC and First Nations.

Results and Discussion: Several First Nations have imposed voluntary harvest moratoriums for IFS. For example, the T̓silhqot̓'in have established closures for their members on steelhead sustenance fishing and have worked collaboratively to include Federal and Provincial enforcement agencies into their indigenous-led approach. Skeetchestn First Nation has also implemented a bylaw protecting IFS. These are examples of the increasing number of stewardship actions First Nations are taking as part of their interest in having IFS available for cultural use and for generations to come.

5. COMPLIANCE AND ENFORCEMENT

5.1 Goal: IFS-related regulations are implemented and complied with so that management goals can be met

Objectives and Actions: Invest in enhanced compliance and enforcement activities targeting IFS protection.

Results and Discussion: Management decisions, such as recreational fishery closures or limits on gear types, must be communicated with the public and enforced. The BC Conservation Officer Service (COS) holds responsibilities for enforcing angling regulations to protect all fish species in BC's lakes and rivers, as well as for inland waters. Due to the continued immediate threat of extirpation of IFS, compliance with steelhead closures is of the utmost importance, and the COS has put priority attention on IFS.

BC invested an additional \$100,000 in 2019 to support enhanced compliance and enforcement (C&E) activities for IFS. IFS migrate hundreds of kilometers up the Fraser River to reach their spawning grounds, and with so few steelhead in the river, people that will not follow Provincial, Federal or First Nation laws can cause significant harm to IFS. In addition to increasing resourcing to C&E activities, education remains important and should continue to be delivered by all three Governments to improve compliance. The COS has further increased the priority of IFS (and steelhead in general) for 2021 in their annual work planning.

5.2 Goal: Support First Nation's Compliance and Enforcement activities

Objectives and Actions: Build awareness of, and alliance between, BC and First Nations' C&E efforts. Improve how the three Governments partner with each other to work towards the shared goal of protection and compliance with laws (non-indigenous and indigenous).

Results and Discussion: As mentioned in section 4.3, several First Nations have clarified and asserted Indigenous Laws/Policy for the protection of IFS. Further, the Federal *Fisheries Act* was updated to include a formal designation of a Fisheries Guardian, which holds similar authorities to a Peace Officer or Fisheries Officer / Conservation Officer. The Tsawwassen Nation, Federal and Provincial governments are piloting the implementation of a formal Fisheries Guardian program, as per the *Fisheries Act*, and several other First Nations have internal river guardian programs. A priority for 2021-22 is to identify further joint actions and implement them to support more IFS successfully reaching the spawning grounds by influencing behavior through education, enhanced compliance, and monitoring.

6. HABITAT PROTECTION AND REMEDIATION

6.1 Goal: IFS habitat of suitable quality and quantity to support IFS populations at optimum productivity and individuals at optimum fitness to maximize survival in freshwater and marine life stages.

Objectives and Actions: Maintain and restore historic habitat. Habitat quality is connected to genetic resiliency (especially in the face of climate change) and the fitness of kelts leading to potential increases in marine survival. Habitat protection is provided through policy, permitting, regulation, monitoring, and habitat remediation/restoration where threats are identified.

Results and Discussion: Significant investment and actions have been taken toward habitat remediation including areas that BC and First Nations have identified as critical habitat (e.g., spawning areas, rearing areas). Several regulatory tools have been developed and are being implemented to ensure protection for IFS habitat, for example three Fisheries Sensitive Watersheds (FSW) are now in place in IFS watersheds (Deadman Basin, Coldwater Sub-basin, and Spius Sub-basin); FSWs help to conserve important watershed level attributes important for protecting fisheries values. Another important action is the protection of critical environmental flows on the Coldwater River through a Drought Action Plan (WSA). Funding has been identified and directed to high priority habitat projects. The efforts will continue and intensify in the coming years, especially with the development of collaborative relationships with First Nations groups active in those locations who may have ongoing habitat remediation projects identified as well as with recently announced increases in funding of the BCSRIF.

7. FISH CULTURE AND OTHER INTERVENTIONS

7.1 Goal: Assess the risks and benefits of hatcheries, fish-culture, and other interventions as tools to conserve and rebuild IFS populations

Objectives and Actions: Review the available literature and BC experience regarding the risks and benefits of various interventions measures such as fish culture actions and conservation aquaculture to rebuild steelhead populations. Review, clarify, and update BC operational policies on fish culture actions and conservation aquaculture for steelhead.

Considerable research has been focussed on the use of hatcheries to rebuild endangered steelhead and other salmonid populations. BC has reviewed this research as well as BC's experience and results from past and current steelhead culture programs. BC has policies in place regarding the culture of steelhead (Steelhead

Stream Classification Policy, 2005), and these policies were reviewed and clarified in consideration of the current state of IFS.

Results and Discussion: Significant evidence from other jurisdictions as well as BC's experience using hatcheries confirm that attempting to rebuild wild IFS using a hatchery program will likely be unsuccessful at this time and put the wild IFS population at higher risk for extirpation. Scientific staff have advised that resident rainbow trout act as a genetic reserve for IFS and are an important potential source to rebuild the IFS population. As noted elsewhere, a more involved review of fish-culture is required, with clear descriptions of risks and benefits, to help inform future management decisions.

Other interventions such as kelt or smolt conditioning and opportunistic transportation of IFS past identified threats are also being evaluated. The logistics involved and extreme difficulty in capturing IFS, as well as the risks of harm to the fish, make these options challenging, and a thorough review will be conducted before these possibilities are considered operationally.

7.2 Goal: Evaluate options to increase survival of steelhead at all life stages

Objectives and Actions: Assess solutions and interventions that might help increase IFS survival in both freshwater and marine life stages and increase their abundance.

Results and Discussion: Increased predation by pinnipeds has been identified as a threat to IFS, and BC is exploring options to address this issue. BC attended workshops hosted by DFO to learn more about this threat. BC is in discussions with DFO and First Nations regarding the impact of pinniped predation. One BC First Nation is considering a pilot program to use their FSC allocation to hunt known problematic pinnipeds and test whether this would benefit the local steelhead population (not an IFS population).

There is a need for a clear, science-based document that outlines risk factors for BC steelhead at each life stage as well as currently known mortality rates, to help refine targeted management actions. Plans are under discussion to produce a document in 2021 detailing risks, survival rates, and possible interventions to increase survival of steelhead at all life stages.

8. COMMUNICATION AND TRANSPARENCY

8.1 Goal: Transparent decision-making and access to relevant information for partners, stakeholders, and the public

Objectives and Actions: Ensure that the decision-making process is transparent, and that the best information is available to all interested parties. Update the provincial webpage for IFS and add more information and relevant data.

Results and Discussion: The provincial webpage for IFS can be accessed here: <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/fish/aquatic-species/interior-fraser-steelhead>.

Status reports, Fast Facts, the *Provincial Framework for Steelhead Management*, the COSEWIC report, and more are all currently available on the webpage. Many of these documents will be updated to reflect recent developments, and the webpage will be expanded to include more information and educational material, as well as accessible data as appropriate. Links to relevant regulations and policies will be included as well as educational materials to provide information about IFS and how the province is working to protect them.

PRIORITY FOCUS AREAS FOR 2021-2022 ACTION PLAN

- Update the provincial strategic planning and management structure for steelhead.
 - Finalize the updated *Strategic Framework for the Management of Steelhead in BC* (2021 in preparation) in collaboration with First Nations, FLNRORD Regional Staff and stakeholders as appropriate.
 - Create the 2021-2022 Annual Action Plan for IFS and complete a fiscal year-end Activities Report. Align the BC and the DFO actions. Integrate First Nations – Provincial collaborative management agreements and priorities.
 - Update provincial policies regarding steelhead management based on updated management plans and in line with the *Declaration on the Rights of Indigenous Peoples Act*.
- Continue to support and advocate for increased protection of IFS during migration and the transformation of non-selective fisheries to selective fisheries (location, timing, gear).
 - Given spawner estimates for the past two years, collaborate with DFO through the IFMP process and meetings to explore increased protection for migrating IFS, e.g., decrease in mixed stock fisheries in which IFS are potential bycatch; increased protection windows (i.e., closed fisheries), and selective methods.
 - Continue to collaborate with First Nations to reduce bycatch and mortality of IFS and identify habitat remediation or enhancement projects to ensure resiliency of IFS.
 - Support funding toward improvements in selective fisheries which could reduce IFS bycatch.
- Continue to enhance compliance and enforcement and collaborative BC-First Nations enforcement and education initiatives.
- Identify highest priority habitat protection or remediation locations (e.g., fish passage crossings) or issues (e.g., off-road vehicles on gravel bars) to ensure 2021 and subsequent funding is targeted to the highest value actions.
- Assess fish culture and other interventions including holding a technical workshop of IFS managers and experts
- Improve transparency, communications, and public access to information.

WORKS CITED

FLNR. 2016. *Provincial Steelhead Management Framework*. Ministry of Forests, Lands, and Natural Resource Operations, Fish and Wildlife Branch, Victoria, BC. Available: <https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/fishery-resources/provincial-framework-for-steelhead-management-in-bc-april-2016.pdf>

Johnston, N.T. 2013. *Management reference points for the Thompson and Chilcotin late summer-run steelhead (Onchorhynchus mykiss) stock aggregates*. BC Fish and Wildlife Branch, Fisheries Project Report RD139, Victoria, BC. Available: https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/fishery-resources/interior-fraser-steelhead/johnston_2013.pdf

Steelhead Stream Classification Policy. 2005. Fish and Wildlife Branch, Victoria, BC. Available: https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/fishery-resources/steelhead_stream_classification_policy.pdf

APPENDIX 1 – IFS BC/CANADA ACTION PLAN



Fisheries and Oceans
Canada

Pêches et Océans
Canada



Interior Fraser Steelhead BC/Canada Action Plan

The following tables of actions were developed in collaboration between the Province of BC and the Federal Department of Fisheries and Oceans.

Improving Management & Governance.

Year 1 (2019/20)	Lead
Establish DFO-BC Executive Level Dispute Resolution Process. <ul style="list-style-type: none"> Minister. Further develop collaborative management approaches through regular Minister-level meetings as agreed upon February 2019 and an updated MOU. Executive. Schedule regular meetings for the Director/ADM committee to develop options/solutions and improved relationships. 	<ul style="list-style-type: none"> DFO/BC
Indigenous Collaborations on the Management of Interior Fraser Steelhead (IFS) <ul style="list-style-type: none"> Establish an effective partnership between the Province and Indigenous partners along the full watercourse in order to determine “system scale” solutions. 	<ul style="list-style-type: none"> BC
Public & Stakeholder Engagement Process. <ul style="list-style-type: none"> Undertake a public engagement process using Engage BC as well as discussion forums to collect the range of ideas and opinions. 	<ul style="list-style-type: none"> BC

Improve Production (Habitat)

Year 1 (2019/20)	Lead
Watershed Management <ul style="list-style-type: none"> New watershed fish-habitat assessment tool completed 2018. Apply to the Thompson and Chilcotin watersheds to identify priority issues, areas and multi-year actions. Ensure the results of the watershed monitoring are incorporated into resource management decisions, guidance and operational policy. For restoration issues, complete a watershed restoration plan with clear projects priorities and a multi-year implementation plan. Significant investments in the Habitat Program to better support habitat protection, including more staff to evaluate project and development proposals and to support a more integrated management approach. 	<ul style="list-style-type: none"> BC BC/DFO BC DFO
Habitat Recovery – Fish Passage (old road crossings). <ul style="list-style-type: none"> Fish Passage Detailed Assessment. Complete a detailed assessment and inventory of passage problems across the IFS staging and spawning areas. Direct new-funding to these priorities. At least 2 remediation projects completed (approx. \$300,000 each). 	<ul style="list-style-type: none"> BC BC
Habitat Recovery - Bonaparte River <ul style="list-style-type: none"> Fishway stabilization and repairs. Elephant Hill Fire Recovery – Complete a Fish Passage Plan and Restoration Plan for sediment blockages and other on-the-ground Actions by Dec 2019. 	<ul style="list-style-type: none"> DFO BC



Year 1 (2019/20)	Lead
<ul style="list-style-type: none"> Bonaparte River 2019 fish-passage to spawning grounds. DFO has hired a senior biologist for Kamloops as part of the DFO Resource Restoration Unit. 	<ul style="list-style-type: none"> BC - Trap and truck completed DFO
Habitat Recovery – Channelized/Lost streams <ul style="list-style-type: none"> Inventory and riparian assessment of developed streams in drought-prone areas of IFS holding and spawning habitat in order to identify remediation opportunities and prioritize work (including third party). Pilot 1-2 riparian remediation projects (municipal or agricultural). 	<ul style="list-style-type: none"> BC BC
Habitat Protection - Regulatory <ul style="list-style-type: none"> Riparian Areas Regulation (RAR) updates completion (2019) – increased accountability. RAR Effectiveness Review – Review implementation, requirements and guidance; identify options to strengthen RAR for streams with species of concern. Forest and Range Practices Act – improvements to fish and water guidance for legislative process in 2020. Identification and implementation of management actions for agricultural areas. Fisheries Act – completion of the Act updates in 2019 which strengthen the protective measures for habitat. Water Sustainability Act - Sensitive Streams. Complete the assessments and implement decisions on designations (target 2019) on all holding and spawning areas with a first priority on tributaries to the Thompson system. The Province will monitor conditions and be prepared to declare significant water shortages as required and regulate to protect critical environmental flow needs. 	<ul style="list-style-type: none"> BC BC BC BC DFO BC
Habitat Management/Protection – Drought and Water Flow Management <ul style="list-style-type: none"> Water allocation review – update the policy and procedures to ensure water flow and condition needs for IFS are met as a priority. Develop a water flow/temperature mitigation strategy. Identify drought prone areas and areas that may incur water shortages and develop a mitigation plan to address current and future climate change impacts. Assessment of potential alternative Irrigation opportunities/practices in the Thompson (AGRI, FLNRORD). Earlier activation of the BC Drought Response Plan. A Provincial Technical Drought Working Group, with representation from the Province, Environment Canada and Department of Fisheries and Oceans Canada, was initiated early (May 25-28) and the Drought Information Portal was activated. Consideration of the water needs in IFS holding and spawning areas is a priority. To support implementation, each region establishes a stream-watch list early in the year for streams that are fish-bearing and have a history of mortality-generating low flows. Under the current low flow conditions, staff have initiated additional streamflow and temperature monitoring on these streams, including IFS streams. 	<ul style="list-style-type: none"> BC BC BC BC/DFO BC



Year 1 (2019/20)	Lead
<ul style="list-style-type: none"> New regulatory tools. Immediate voluntary water conservation is being encouraged while the Province develops regulations for water usage to give priority of water rights to critical environmental flow thresholds. 	
Habitat Management / Protection – Wildfire <ul style="list-style-type: none"> New 2017 Chief Forester and ADM Stewardship guidance for wildfire salvage, ensuring critical habitat needs were equitable priority with economic interests. Review implementation and results, identify and implement improvements. Use the Watershed assessment to drive the identification and prioritization of habitat recovery/management projects. I.e. ensure hydrological stability before investing in in-stream remediation. 	<ul style="list-style-type: none"> BC BC
Data and Knowledge Management <ul style="list-style-type: none"> Partner with Pacific Salmon Foundation to put Steelhead on the Salmon Explorer. Review Chum hatchery production considering implications for Interior Fraser Steelhead recovery Review advancements in aquaculture/hatchery techniques and update the provincial policy. Develop an enhanced IFS Monitoring Strategy for implementation late 2019. Continue to refine the scientific understanding of IFS through BC-Federal science collaborations as well as incorporation of Traditional Knowledge. 	<ul style="list-style-type: none"> PSF/BC DFO BC BC BC / DFO

Reduce Mortality / Increase Survival

Year 1 (2019/20)	Lead
Recreational IFS Fishery <ul style="list-style-type: none"> Provincial Regulations in place for no IFS fishery. Update penalties including increasing fines to make them a deterrent. 	<ul style="list-style-type: none"> BC - Closure In place BC
Recreational Fishery Bycatch: Holding and Spawning Areas <ul style="list-style-type: none"> Recreational fishing closures for all fishing across holding and spawning areas. 	<ul style="list-style-type: none"> Closures In place
Recreational Fishery Bycatch: IFS Migration Route (Fraser Mainstem) <ul style="list-style-type: none"> Illegal to retain IFS in Fraser Mainstem. Recreational Fishery for other species – <ul style="list-style-type: none"> Fraser River – BC. While regulatory limits are in place, additional regulatory closures are being considered for 2019 to further reduce accidental capture. These may be additional timing restrictions or species restrictions. Fraser River – DFO. Consideration of recreational salmon fishing closures in times and areas where IFS may be intercepted (Fraser River Mainstem, Thompson and Chilcotin Rivers). The SARA reviewed sturgeon Catch and Release fishery does not materially overlap with IFS. BC is seeking additional regulatory tools and consistency in management between the tidal and non-tidal portions of the sturgeon range. 	<ul style="list-style-type: none"> BC - In place BC DFO BC / DFO
Non-Selective Fisheries – Bycatch. <ul style="list-style-type: none"> Due to the extremely low numbers of fish remaining, and to retain a population that is still viable to recover, BC would like to see more than 95% of the run 	<ul style="list-style-type: none"> BC Recommendation



Year 1 (2019/20)	Lead
protected from potential by-catch mortality. BC would also like to see a multi-year commitment in order to support development of multi-year recovery actions.	
Selective Fisheries <ul style="list-style-type: none"> • Invest in partnerships with First Nations in traditional selective methods. • Work with industry to further advance selective fishing methods 	<ul style="list-style-type: none"> • BC & DFO • DFO & BC
Monitoring and Enforcement <ul style="list-style-type: none"> • Increased enforcement. • Guardians and Monitors – In collaboration with the First Nations Fisheries Council, improve coordination and effectiveness between provincial, federal and indigenous guardians/monitors in BC waters. 	<ul style="list-style-type: none"> • BC / DFO • BC
Predators <ul style="list-style-type: none"> • Technical conferences and engagement hosted by DFO on the science and impacts of pinniped predation on all salmonids. This will inform future management discussions. 	<ul style="list-style-type: none"> • DFO • DFO
Stock Data/Information <ul style="list-style-type: none"> • Develop a proposal for integrating data systems between BC and DFO to enable collective access to the best decision-support information. 	<ul style="list-style-type: none"> • DFO/BC

APPENDIX 2 – INTERIOR FRASER STEELHEAD 2020 PROJECT INVESTMENTS

HCTF Projects (2019/20 & 2020/21)			
Project #	Project Name	Project Description	Board Approved
Vancouver Island			
1-319	Keogh River Steelhead Population Dynamics	The Keogh River Research Facility has been in operation since 1976 to annually enumerate salmonid smolt output and winter run steelhead adult returns. This project will obtain precise and accurate counts of returning adults via a fence trap, mark-recapture, and a resistivity counter. This provides a unique opportunity to obtain precise and accurate smolt-to-adult survival used to understand population and recruitment dynamics of steelhead populations in BC. However, it is known the implied marine survival rate does not apply universally to all steelhead populations with evidence many populations are healthier than those from the Keogh River.	<u>20/21</u> \$141,855 <u>19/20</u> \$120,000
Lower Mainland			
2-666	LGL-Matsqui-Yale Selective Fishing Initiative	This project will work with the Matsqui First Nation and Yale First Nation to demonstrate the capabilities of fishwheels to selectively harvest some salmon species and release non-target species (e.g., Coho, steelhead and sturgeon) during the September and October periods when non-selective gear (e.g., gill nets) are not permitted due to bycatch concerns for interior Fraser Coho and steelhead.	<u>20/21</u> \$84,900 <u>19/20</u> \$150,000
Thompson-Nicola			
3-154	O&M – (FSH) – Bonaparte	Operation and maintenance of the Bonaparte Fishway and the Bonaparte Lake Dam.	<u>20/21</u> \$27,500
3-251	Interior Fraser Wild Steelhead Conservation	This project will continue monitoring the abundance, productivity, and conservation status for wild Interior Fraser steelhead. The project will provide scientific knowledge to inform Provincial, federal, and First Nation fisheries management planning, processes and decisions for conservation and responsible use.	<u>20/21</u> Pending <u>19/20</u> \$79,000
3-273	Quality Waters Strategy - Thompson River	River guardians will patrol and survey during times of fishery closure and will patrol and survey the steelhead sport fishery in the event of an opening to assist with fishery management and compliance.	<u>19/20</u> \$24,860
Cariboo			
5-239	Quality Waters Strategy – Cariboo Region	As part of a larger project which also includes work on the Dean River (not related to IFS), river guardians on the Chilcotin River will monitor the steelhead fisheries closure. The Dean River steelhead population is another example of a population that is healthy compared with either Keogh or IFS.	<u>20/21</u> \$146,401 <u>19/20</u> \$164,401

2019 BCSRIF Projects			
Project #	Project Name	Project Description	Allocation
BCSRIF 2019 137	BC Fish Passage Joint Venture	The Canadian Wildlife Federation will bring together partners, including federal and Provincial governments, non-governmental organization, First Nations, and communities to prioritize fish passage remediation efforts across B.C. to maximize the benefits for steelhead trout and Pacific salmon.	\$3,999,721 (2019 – 2021)
BCSRIF 2019 181	Promotion of Habitat Restoration and Stewardship on Agricultural Lands in BC	The British Columbia Cattlemen’s Association will deliver the Farmland riparian interface stewardship program, promoting habitat restoration and stewardship on agricultural lands in BC. The program will encourage environmental farm planning within the agricultural sector for more “fish friendly” land management practices around riparian corridors, as well as promoting water conservation for BC Interior salmon streams experiencing frequent critical low flows.	\$550,000 (2019 – 2024)
BCSRIF 2019 014	Innovative Habitat Restoration Demonstration	Led by the British Columbia Conservation Foundation, the ‘Innovative Habitat Restoration Demonstration’ is a multi-year, watershed-scale demonstration project to showcase innovative habitat restoration methods that accommodate the effects of recent ecosystem shifts with benefits to Chinook, coho, sockeye and steelhead. The project will promote restoration, protection and maintenance of healthy and diverse salmon populations and their habitats.	\$4,980,780 (2019 – 2024)
BCSRIF 2019 018	Rehabilitation of Critical Infrastructure to Improve Survival of Thompson Steelhead & Chinook	The Scw'exmx Tribal Association and partners will assess and rehabilitate degraded habitats in the Coldwater River and Guichon Creek watersheds to improve survival of Thompson steelhead and Chinook salmon.	\$1,314,027 (2019 – 2024)
BCSRIF 2019 067	Elephant Hill Fire Riparian Restoration Project	The Secwepemcul'ecw Restoration and Stewardship Society, in partnership with Secwepemc communities and the 100 Mile Natural Resource District will undertake restoration of critical habitat affected by the 2017 Elephant Hill Wildfire in the Traditional territories of the 8 Secwepemcul'ecw Nations.	2,629,833 (2019 – 2024)
BCSRIF 2019 071	Plateau Fire Recovery – Riparian Plant Collection and Planting	The Baker Creek Enhancement Society will collaborate with the Nazko First Nation to undertake restoration of critical habitat affected by the Plateau Fire. This work will also prevent further habitat degradation from normal precipitation and predictable storm events.	\$750,000 (2019 – 2024)
BCSRIF 2019 040	Determination of bottlenecks limiting wild and enhanced juvenile salmon and steelhead production in BC	Together with partners, the Pacific Salmon Foundation will develop the monitoring and evaluation framework to determine survival bottlenecks in freshwater and marine environments for hatchery and wild Chinook, Coho and Steelhead using PIT tags and spatially comprehensive arrays. Research, monitoring, and evaluation activities will seek to maximize the performance of hatchery and wild stocks; and the installation of new infrastructure will support adaptive management of hatchery programs to meet harvest, conservation, and sustainability objectives.	\$4,619,877 (2019 – 2024)

2020-2021 Land Base Investment Strategy			
Funding Category	Project Name/ Location	Project Description	Allocation
Fish Passage, Habitat Confirmation	Thompson River Watershed	9 habitat confirmations were undertaken across the Thompson River watershed.	\$25,000
Fish Passage, Remediation	Gollen River (Thompson River tributary)	Replacement of a perched culvert that was a barrier to fish passage with a free span bridge. The project was undertaken across 3 years and resulted in restored access to 3000 m of habitat for a diversity of salmon and trout species.	\$311,000
Fish Passage, Remediation	Maka Murray (Nicola River tributary)	Replacement of a perched bridge that is a barrier to fish passage with a free span bridge. In Year One of a two-year project a site plan was completed, and the bridge is being fabricated. The bridge will be installed in fiscal year 2021/22, restoring approximately 430 m of Coho, Chinook, Steelhead, Rainbow and Bull trout habitat.	\$100,000 (Yr 2 estimate \$250,000)
Water Quality	IFS Fisheries Sensitive Watersheds Support and Designations	Project will result in the evaluation of several watersheds within the Thompson and Chilcotin River areas to determine if they meet the criteria established for Fisheries Sensitive Watershed designation. Designation as a Fisheries Sensitive Watershed requires licence holders to meet objectives regarding factors such as: natural stream bed dynamics; stream channel integrity; quality, quantity and timing of water flow; and natural, watershed level, hydrological conditions and integrity.	\$50,000
Water Quality	Bonaparte Fishway counter tubes	The project will achieve the redesign of the Bonaparte Fishway counter tubes to resolve blockage issues related with Elephant Hill Fire sediment and debris flows	\$19,200
Fish Inventory	IFS Management Strategy update	Update of IFS management strategy to reflect changes to federal and Provincial management strategies, responses to interception and fishing pressures, and climate change.	\$10,000
Fish Inventory	Watershed Condition Analysis to Support South Coast Fisheries Management	Ecosystem-based approach to fisheries management in a region with very high population pressure. The objective is to maintain, protect and restore the productive capacity of the freshwater environment in this area.	\$49,000

2019/2020 Indigenous Funding Envelope			
Project #	Project Name/ Location	Project Description	Allocation
IFE (FY 19/20)	Collaborative Management Foundation - IFS Recovery and Priority Action (FNFC)	Engagement with First Nations facilitated by the FNFC will provide an opportunity for collective First Nations along Interior Fraser Steelhead (IFS) migratory route to discuss, identify, and prioritize solutions and strategies to support the rebuilding of IFS populations.	\$60,000
IFE (FY 19/20)	Identification of Habitat Restoration Priorities for Lower Fraser Salmon, Sturgeon and Steelhead (FNFC)	The purpose of the project is to support internal First Nations capacity to participate in discussions coordinated by the Lower Fraser Fisheries Alliance respecting the identification of priority salmon, sturgeon and freshwater fish habitat within the lower reaches of the Fraser River	\$60,000

2020/2021 Indigenous Funding Envelope			
2021/22 Theme Area	Summary Information	2020/21 Projects	20/21 Funding
Salmon & Steelhead Operational- focus Projects	Phase 2 work to identify Indigenous priorities for future salmon/steelhead habitat management and remediation projects was slower than anticipated due to Indigenous Interest in engaging in a more comprehensive and organized manner.	T̓ilhqot'in: \$25k – T̓ilhqot'in 2020 spring instream IFS monitoring Malahat: \$15k - Malahat Nation - Koksilah River WUP FNFC: \$60k – Scoping of Joint BC-First Nations Riparian Approach to Habitat Conservation and Improvements; \$100k – Provincial Scope - Building Collaboration Process and Joint Priorities for Management	\$200k
Steelhead – Interior Fraser (Salmonid) Management Collaborations	Goal: to have a Provincial Management strategy that First Nations co-sign, and stakeholders' support. Enable collaborative management, which includes FN acting under their own authorities to achieve them.	First Nations Fisheries Council: \$10k to FNFC for wrap-up items resulting from previous investment Secwépemc Fisheries Commission. \$40k to Secwepemc Fisheries Council for Indigenous led "RAM" process for 5 salmonids	\$50k
Salmonid – Bio-cultural indicators	Goal: Indigenous-led traditional knowledge focus to enable inclusion into decision making,	First Nations Fisheries Council: \$30k - Development of Salmon Habitat and Water Quality Bio-Cultural Indicators (note: \$30k from selective fishing redirected here, for a total project of \$60k)	\$60k
Prey Dynamics – Salmonids recovery	Goal: A river-wide management plan developed with First Nations. First Focus on an Indigenous led Ghost Net reduction, education and removal program.	Lower Fraser Fishing Alliance: \$50k - LFFA for Eulachon "prey dynamics" study to evaluate impact of food sources on salmon fishery. Predator prey dynamics is key missing information for the mixed stock management for IFS	\$50k
Selective Fishing – Pilots	Goal: to reduce existing challenges with inadvertent interception of non targeted species and stocks in the course of First Nations FSC and Commercial fisheries while yielding a higher value product unmarred by net fishing.	Lower Fraser Fishing Alliance: \$100K – LFFA – for ghost net and derelict fishing gear removal Upper Fraser Fishing and Conservation Alliance: \$50k - Pinniped Predation Pilot on Vancouver Island; cross Nation scoping of interest in collaborative mgt conversations. \$50k	\$200k
Fish Guardians / Environmental Protection	Goal: Program design for monitoring (fishing and stewardship) to Guardians (legal term under federal fisheries act) that can guide development of any new fish related teams and help optimize currently funded programs.	First Nations Fisheries Council: \$25k BC First Nations Environmental Monitoring-to-Guardian Program Design Options Paper. Includes engagement with COS	\$25k

APPENDIX 3A – PROJECT EXAMPLES – SELECTIVE FISHING

Matsqui-Yale Selective Fishing Initiative

The Province of British Columbia is providing support for initiatives that minimize bycatch mortality to provincially significant species (e.g., Interior Fraser Steelhead (IFS) and White sturgeon) in federally managed salmon fisheries. This support is provided by BC through the Ministry of Forests, Lands, Natural Resource Operations and Rural Development's Land Based Investment Strategy (LBIS) as well as through collaboration with the Habitat Trust Conservation Foundation (HCTF). Fish wheels, weirs, and pound nets (traps) have been historically utilized as selective methods to capture salmon in BC. Implementation of more selective fishing methods helps to ensure the sustainability of future fisheries and fish populations while still meeting cultural, social, and economic objectives. Collaboration with the federal government, First Nations, and stakeholders will ensure that the transition to more selective fishing methods is implemented and effective in minimizing bycatch mortality.

Project Costs

HCTF 2019/20	\$150,000
HCTF 2020/21	\$99,000
Total	\$249,000



Matsqui Fishwheels (photo: LGL, 2021).



Yale Fishwheel (photo: MFLNRORD).

Project Objectives

The project objectives were to:

1. Deploy and operate three fishwheels in the lower Fraser River
2. Biological sampling of fishwheel catch to provide data to DFO and BC
3. Potential marking of salmon, Steelhead and/or White Sturgeon
4. Reporting and communications

Project Results

The 2020/2021 season fishing results for Matsqui and Yale fishwheels combined:

1. Salmon catch: 1,051 adult sockeye, 1,140 adult Chinook, 1,757 Coho
2. 46 Steelhead, mainly IFS caught and released
3. 22 White sturgeon caught and released

The project objectives were achieved with coordinated and collaborative efforts between the Province of BC, DFO, Matsqui and Yale First Nations

Project Delivery & Funding Support

Thanks to
Karl English, LGL
and

Habitat Conservation Trust Foundation

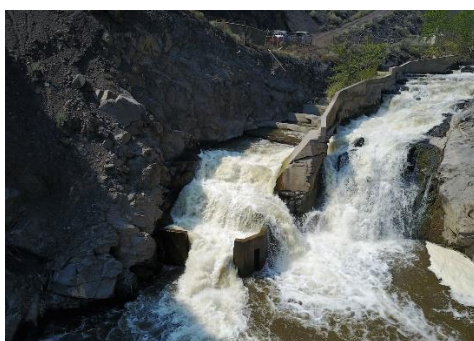
APPENDIX 3B – PROJECT EXAMPLES – FISH PASSAGE AND MONITORING

Bonaparte Fishway and Fish Passage

The Province of British Columbia is providing support for monitoring and facilitated fish passage for Interior Fraser Steelhead (IFS), including in the Bonaparte, Deadman, Nicola, and Chilko rivers. This support is funded by the Habitat Trust Conservation Foundation (HTCF) as well as investments through the Ministry of Forests, Lands, Natural Resource Operations & Rural Development's Land Based Investment Strategy (LBIS). As part of a larger program for rebuilding IFS stocks, improved fish passage at the Bonaparte Fishway is vital for providing access to upstream spawning habitat. The fishway and enumeration monitoring provide important information on spawner abundance which is used to assess IFS conservation status. The project objectives were achieved with coordinated and collaborative efforts between the Province of BC, DFO, and First Nations.

Project Costs

HCTF 2004/15	\$836,000
HCTF 2016/21	\$456,000
Total	\$1,292,000



Damaged fishway (photo: MFNRORD).



Repaired fishway (photo: MFLNRORD).

Project Objectives

The project objectives were to:

1. Continue spawner abundance, productivity, and status monitoring of steelhead in the Bonaparte, Deadman, Nicola and Chilko rivers
2. Monitoring, repair, and maintenance of fish fishway at Bonaparte River
3. Monitoring and maintenance of electronic resistivity counters at Bonaparte and Deadman rivers
4. Reporting and communications

Project Delivery & Funding Support

Thanks to
Rob Bison, MFLNRORD
and

Habitat Conservation Trust Foundation

Project Results

Interior Fraser Steelhead monitoring results:

1. Provided annual IFS conservation status updates and abundance information
2. Conducted assessment of stock productivity
3. Improved and facilitated fish passage at Bonaparte River to allow migrants to access spawning habitat

The project objectives were achieved with coordinated and collaborative efforts between the Province of BC, DFO, and First Nations.

APPENDIX 4A – FAST FACTS: POPULATION TRENDS AND RISK



Population abundance estimates are foundational for determining the required management actions for Interior Fraser Steelhead (IFS). The Province's long-term data set is a critical source of information. Unlike other salmonids, IFS can vary the amount of time they spend in freshwater and marine habitats.

Spawning ground surveys are used to estimate the number of spring spawners. The 2020 final spring spawner abundance estimates were updated on July 24, 2020 (see table). IFS spawner returns for the following spring are predicted in the fall based on catch per effort in the Albion Test Fishery in the lower Fraser River (see 2021 estimates in table in red).

IFS spawner abundances have been declining for many years and their status is deemed "Extreme Conservation Concern" (Figures 1 and 2).

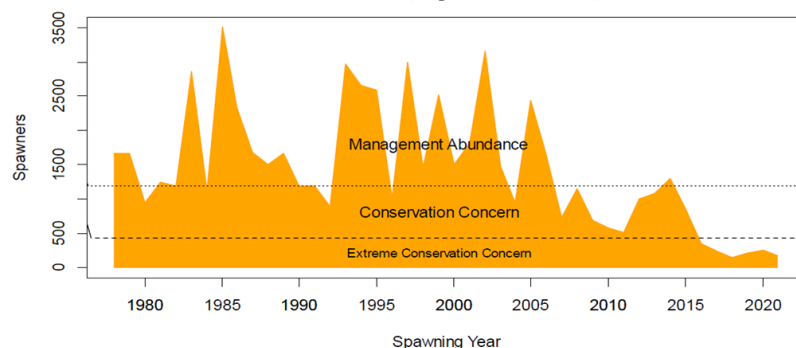


Figure 1. The estimated spawning abundances of Thompson River steelhead in relation to conservation reference points. The last data point illustrates the expected spawner abundance for this season's return which will spawn in the spring of 2021.

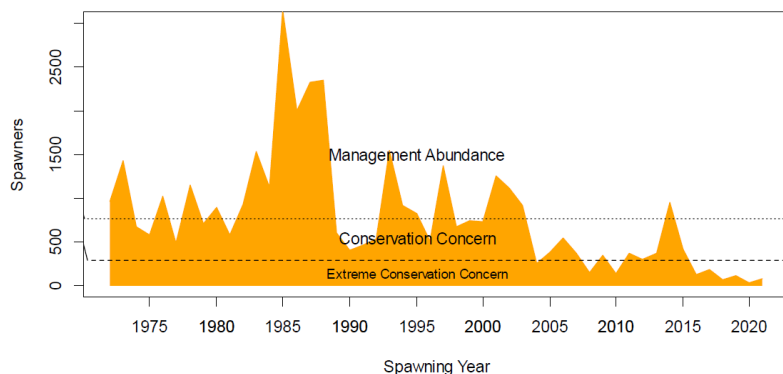


Figure 2. The estimated spawning abundances of Chilcotin River steelhead in relation to conservation reference points. The last data point illustrates the expected spawner abundance for this season's return which will spawn in the spring of 2021.

Spawning Population by Year

Brood	Chilcotin	Thompson
1981	586	1247
1982	936	1190
1983	1531	2857
1984	1133	1120
1985	3149	3510
1986	1992	2330
1987	2328	1680
1988	2342	1500
1989	610	1670
1990	403	1200
1991	466	1200
1992	542	900
1993	1546	2960
1994	917	2660
1995	830	2590
1996	518	1020
1997	1373	3000
1998	672	1470
1999	744	2520
2000	739	1500
2001	1258	1810
2002	1114	3160
2003	917	1480
2004	254	950
2005	384	2440
2006	552	1660
2007	374	740
2008	158	1160
2009	350	690
2010	144	590
2011	374	520
2012	307	1000
2013	374	1090
2014	955	1300
2015	418	850
2016	134	360
2017	187	240
2018	77	150
2019	120	240
2020	38	257
2021*	81	180

*2021 estimates are preliminary, based on Albion fall test fishery

APPENDIX 4B – FAST FACTS: RECOVERY POTENTIAL



Interior Fraser Steelhead

Fast Facts: Recovery Potential



Interior Fraser Steelhead (IFS) have persistence advantages over other salmonids, but with so few fish, the concern is high.

While most salmon die after spawning, some IFS can spawn multiple times and return to the ocean 2-3 times. Steelhead also have more survival options than salmon, as they can adjust the amount of time they spend in freshwater habitat. A small number of adults can, in the right conditions, produce enough offspring to quickly expand and occupy the freshwater habitat.

Historically, Thompson Steelhead were larger, and females were highly fecund with small eggs. Steelhead Specialists have determined that, historically, Thompson Steelhead were 15% more fecund than Chilcotin Steelhead and 40% more fecund than coastal winter run Steelhead in southern BC. However, data show that between 1979 and 1994 there was a large decline in maximum size and fecundities, and a second decline occurred between 2004 and 2009.

Spawner abundance targets for Thompson and Chilcotin are based on the peer reviewed science completed in 2013 by Provincial experts. The persistence target is 430 Thompson spawners and 300 Chilcotin spawners. Reaching these targets would result in moving from a status of 'Extreme Conservation Concern' (ECC) to 'Conservation Concern' (CC) The longer-term objective would be to achieve stable numbers for long term genetic integrity of the stock and move from CC to 'Routine Management'.

- **Phase 1. Persistence (short-term):** A spawning return greater than 430 for Thompson, and greater than 300 for Chilcotin (estimates based on recommendations by Johnston, 2013).
- **Phase 2. Rebuilding (long-term):** A spawning return greater than 1,200 for Thompson, and greater than 760 for Chilcotin (estimates based on recommendations by Johnston, 2013).
- **Phase 3. Healthy Populations (perpetuity):** A spawning return greater than 1,900 for Thompson, and greater than 1,100 for Chilcotin (estimates based on recommendations by Johnston, 2013 and average spawner abundances in years before major declines occurred).

APPENDIX 4C – FAST FACTS: THREATS



Interior Fraser Steelhead

Fast Facts: Threats



Determining the key threats to Chilcotin and Thompson Steelhead is informed by past assessments, modelling of exploitation rates, studies on genetic interactions between resident and anadromous forms, and peer-reviewed work done in the fall 2018 by Provincial Specialists.

Evidence suggests that the three primary causes of population declines include:

1. Predation
2. Low marine survival due to ocean conditions
3. Mortality due to bycatch in other fisheries

All are wholly or partially human induced. Of these, bycatch is the most immediately available management response. The Province's short-term strategy is to immediately reduce IFS bycatch mortality in order to maintain a viable population until other contributing factors such as offshore marine conditions improve and pinniped predation decreases, while also acting on other longer-term activities related to threats to IFS in both the marine and freshwater environments.

IFS spend time in a variety of habitats from the freshwater spawning areas to the offshore marine area. The types of threats to IFS survival can depend on the location. These threats include (organized by habitat):

1. Thompson River System

- Physical habitat degradation (bank erosion, siltation, loss of riparian structure and function).
- Risk of life history shift from anadromous to non-anadromous forms.
- Outbreeding depression of Steelhead caused by increased levels of interbreeding with resident Rainbow Trout owing to lower spawning populations of Steelhead.
- Freshwater range contraction resulting from reduced spawning populations.
- Failure to effectively implement fishing closures when the population is in the Extreme Conservation Concern state.

2. Chilcotin River system

- Outbreeding depression of Steelhead caused by increased levels of interbreeding with resident Rainbow Trout owing to reduced Steelhead spawning populations.

- Freshwater range contraction resulting from reduced Steelhead spawning populations.
- Failure to effectively implement fishing closures when the population is in the Extreme Conservation Concern state.

3. Fraser River

- Fishing mortality from the collective non-selective salmon fisheries (bycatch from commercial fishing, test fisheries, FSC fisheries, etc.).
- Fishing mortality from non-retention sport fishing targeting salmon and trout (due to handling stress).

4. Inshore Ocean Areas

- Fishing mortality in salmon fisheries (bycatch from commercial fishing).
- Ocean conditions.
- Predation.
- Hatchery-produced fish sustaining higher numbers of predators and increasing competition for prey.
- Hatchery enhancement of early-timed Chum Salmon which increases run timing overlaps with IFS.

5. Offshore

- Ocean conditions, such as reduced prey quality and availability, due to climate change and as evidenced by total salmon biomass and body size trends (Ruggerone and Irvine 2018).
- Fishing mortality.