First Nations Restoration Priorities in the Campbell River & Salmon River Watersheds

Project Number: COA-F17-F-1193

Prepared for:
Fish and Wildlife Compensation Program on behalf of its program partners BC Hydro, the Province of BC, Fisheries and Oceans Canada, First Nations and public stakeholders.

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Executive Summary

This project is the result of collaboration between A-Tlegay Fisheries Society (A-Tlegay) and Ecofish Research Ltd (Ecofish). The project team received FWCP funding to collate existing and completed habitat restoration projects within the Campbell River system to use as a basis in the preparation of a comprehensive restoration plan. This report summarizes the results of that FWCP project (COA-F17-F-1193). Through community consultation this report examines habitat restoration priorities of the A-Tlegay member nations with respect to proposed projects within the Campbell system and provides a means to align future projects to these priorities. First Nations habitat restoration priorities were examined based on habitat type, target species, and location. Priorities were measured using an online survey as well as in-person interviews. A total of 62 respondents completed the survey. Priority ratings were developed for the proposed projects based on the survey results. Proposed projects were then prioritized based on survey results, technical feasibility, cost, and other project components. A matrix was created to summarize and rank each of the proposed restoration options. The matrix can be used to evaluate future proposals for their alignment to First Nations interests. Our project found that most of the high-ranking projects had already been completed leaving a gap in feasible future projects. This gap led us to propose projects of our own and analyze them using the matrix. Using the matrix, a proposal to identify specific restoration projects in the Quinsam River was selected.

We identified a project that ranks high in terms of First Nations priorities and is identified as a "priority 1 action" in the FWCP actions table. Therefore, in 2017 we will propose to develop a restoration plan for the Quinsam River identifying specific restoration options focusing on anadromous species. This meets the Action Item identified in the Campbell River Salmonid Action Plan which was to "Assess restoration opportunities in the Quinsam watershed for Coho and Chinook. Actions would likely also benefit pink salmon and other species."

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1. INTRODUCTION

The Campbell River system includes the Campbell River, Quinsam River and Salmon River (due to the Salmon River diversion). All watersheds are located within the traditional territories of four of the five member nations of the A-Tlegay Fisheries Society (A-Tlegay). A-Tlegay member nations include: We Wai Kai (Cape Mudge) First Nation, Wei Wai Kum (Campbell River) First Nation, K'omoks First Nation, Tlowitsis and the Kwiakah First Nation. First Nations have long utilized the resources of the Campbell River watershed as evidenced by the existence of substantial village sites; *Xwasam* located at the mouth of the Salmon River and *Tlamatook* at the mouth of the Campbell River. We felt it important to identify and prioritize First Nations interests with respect to habitat restoration in the Campbell River watershed. Fish habitat restoration is a priority action identified for the members of A-Tlegay. Since the early 1980's, extensive fish habitat restoration projects have been undertaken within the watershed, spearheaded by government agencies (Fisheries and Oceans Canada) and local NGO's supported by funding agencies such as Fish and Wildlife Compensation Program (FWCP) and the Habitat Conservation Trust Fund. Given these extensive works over 25 years, A-Tlegay, in partnership with Ecofish Research, received FWCP funding to collate existing and completed habitat restoration projects within the Campbell River system to use as a basis in the preparation of a comprehensive restoration plan. This report summarizes the results of that FWCP project (COA-F17-F-1193).

The project was broken into three components: background literature review with summary of completed projects; community feedback and development of prioritized restoration options for the watershed.

2. GOALS AND OBJECTIVES

Our project sought to meet 3 objectives. Our first objective was to collate existing proposals and completed works to give us a foundation on which to prepare a restoration plan (given the extensive works proposed and completed within the Campbell River system). Our second objective was to prepare a matrix which enabled us to visualize the types of projects proposed and completed. The matrix was broken into seven project parameters: location, species, likely conservation benefit, FN priority habitat, cost, technical feasibility and potential social or regulatory barriers. Once the information was collated, we created a scoring system for the outstanding projects for the system. The third and final objective was to use the matrix to target a proposed project to enhance or improve conditions in the Campbell River System.

3. STUDY AREA

The study area includes all works both proposed and completed, on the Salmon, Quinsam and Lower Campbell River (Figure 1).

4. METHODS

4.1 Background Literature Review

In order to identify previous works and proposed projects we reviewed background documents, including FWCP reports, fish and fish habitat assessments, the Campbell River Water Use Plan, and other publications.

4.2 Community Consultation

After reviewing and compiling this information we sought to determine the priorities of First Nations with respect to the watershed location, species, and habitat type. In addition to First Nations interests, we included other parameters such as likely conservation benefit, cost, technical feasibility as well as potential social or regulatory barriers. First Nations priorities were evaluated using an online survey with ten questions that examined respondent priorities in terms of location within the Campbell River system, salmon and trout species and habitat types.

4.3 Restoration Matrix

The results of the background literature review and the survey were used to develop a matrix to score projects based on set criteria including project location, target species, conservation benefit, First Nations priority, estimated cost, feasibility and potential barriers. The matrix provides a prioritized list of projects to be undertaken in the Campbell River watershed.

Weighting of the seven matrix parameters was determined based on the strength of the survey results and/or other factors affecting project success. Weighting ranged between (1) and (7) with (1) indicating the lowest and (7) indicating the highest weight. Location was given a relatively low weight of (2) as the majority indicated that all watercourses were equal in importance (with a small preference for the lower Salmon and Campbell as opposed to the upper portions of the watershed(s). Species was given the highest weight (7), as the survey indicated a definitive ranking of species in terms of preference. The “likely conservation benefit” was given a moderate weight of (5) but this was based on a comparative evaluation of similar projects, as opposed to survey results. Habitat type was ranked according to First Nations priorities and was given a relatively low weight (2) since the survey indicated habitat preferences however respondents were not given a great deal of background information on habitat type and associated benefits. Project cost was weighted as (4) based on the importance of this parameter and the feasibility of funds acquisition. Technical feasibility was weighted as (5) to reflect its

importance as a consideration in project feasibility. For similar reasons, "potential social or regulatory barriers" was weighted (5). Weighting and weighting rationale are also presented in table format (Appendix D, Table 9). Note that the weighting table is directly linked to the scoring table, any change in weighting will likely result in a change to the ranking of projects.

The definitions table (Appendix D, Table 10) is incorporated into the scoring by providing a rank to each of the 7 project parameters (this is again based on survey results and analysis of other factors). Note that this table is not directly linked to the scoring table, instead the user is required to use this as a guide for scoring each parameter. For instance, a project with Coho as the target species would receive a score of (7) in the scoring table because Coho ranked as (7), alternatively if the target species was Cutthroat trout the score would be (3) for species in the scoring table.

The scoring table is the product of applying weights and scores to the project parameters resulting in a project ranking (Table 1).

5. PROJECT OUTCOMES

5.1 Background Literature Review

The following tables identify projects that were completed in the Campbell River watershed based on the background literature review. Projects were summarized from Campbell River Estuary (Table 2), Lower Campbell River (Table 3), Upper Campbell River (Table 4), Quinsam River (Table 5), Salmon River restoration (Table 6) and Salmon River Nutrient Enrichment (Table 7).

We catalogued restoration work in the Campbell as far back as 1981, with bank stabilization and soil remediation to clean up an oil spill from the 1940's. Other projects in the Campbell estuary included compensation habitat development in the Nunns Creek estuary (1997). Later, in 2002 the NCC channel was constructed to connect Raven channel to the Baikie Slough. Land purchases have occurred around the estuary with the NCC site Baikie Island in 2000 as well as Ocean Blue in 2007. Upstream of the Campbell estuary, gravel placements have taken place regularly since 1997 with various methods from ranging from helicopters, heavy machinery to wheelbarrow methods. Recently, in 2015 a bulk loading strategy for the Elk Falls canyon was developed, which included infrastructure to allow cost effective gravel delivery into this otherwise inaccessible site. Elk Falls canyon is the uppermost limit of anadromous salmonids. Some sites such as Site 7 downstream of the John Hart Generating station, between the right bank and downstream end of First Island have been subject to multiple gravel placement projects directed at replacing this significant Chinook spawning platform.

More recently, assessments have been initiated to begin improving fish access to the upper portion of the Quinsam watershed with projects undertaken in 2010 and 2015.

The Salmon River is currently connected to the Campbell System by diversion flows created by the Salmon River diversion dam and has also been home to multiple projects. The lower portion of this 80-km long watershed has been a difficult target for restoration projects due to its large size and the dynamic shifting nature of the downstream reach. The main-stem underwent some blasting operations to improve passage back in the 1970's resulting in fish reaching the site of the diversion dam. In the 1980's a fish screen was installed inside the diversion canal to keep Salmon River fish from being diverted into the Campbell system. Then in the early 1990's DFO installed a fish ladder to help fish upstream past the diversion dam. Other projects in the Salmon River include side-channel developments in Big Tree Creek (2008) and the Grilse Creek side-channel (2000). It is likely the Salmon River diversion dam will be removed in the future, which will improve access to Coho and Chinook to the upper portion of the Salmon River and remove the issues associated with fish being diverted into the Campbell River watershed.

5.2 Community Consultation

First Nations priorities were identified using an online survey. The survey targeted individuals from A-Tlegay member nations with interest in fish and fish habitat. Questions were posed to examine priority species, habitat types and areas within the watershed. A total of ten questions were posed to each survey subject. The survey questions and results are in Appendix A and Appendix B.

There were 61 respondents to the survey representing all the A-Tlegay member first nations. The number of respondents was somewhat representative of the member nation populations with a greater number of respondents from the two larger nations (see Appendix C).

Respondents were asked how fish and fish habitat were important to them. Cultural importance of fish as well as its importance as a food source were the two primary reasons of importance. A preference for salt water salmon species was identified. In terms of species interest, Sockeye were the most popular, followed closely by Coho, Chinook, Chum, Pink, Steelhead with a lower interest in the non-anadromous species listed.

Respondents were asked to prioritize watersheds between the Campbell and the Salmon River although many respondents suggested that all watersheds were equally important there were some preferences including the Campbell River main stem, estuary, and the Quinsam (within the Campbell system) and the lower main stem and estuary (within the Salmon River system).

A preference for habitat type was examined by asking respondents to prioritize between adult spawning habitat, adult fish migration/access to spawning, adult holding habitat and juvenile

rearing habitat. A preference for adult spawning habitat was identified. The survey results were used to inform the creation of the restoration matrix presented in Table 1.

5.3 Discussion

The results of the survey were used to inform the rating for proposed (or past) projects based on seven project parameters: location, species, likely conservation benefit, FN priority habitat, cost, technical feasibility and potential social or regulatory barriers. Ratings were assigned using a simple scoring system based on the survey answers (where applicable) and our own opinions (where applicable). The matrix was designed to identify projects that had not yet been completed and that aligned well with First Nations priorities. The prioritized project matrix is outlined in Table 1. We also examined 4 projects that had already been completed and found that they ranked high according to First Nations Priorities, these are identified in green in the Matric (Table 1).

This list will form the basis of project priorities; however, additional opportunities can be included as they are identified. The matrix and its scoring system are available to be shared with FWCP and the public to examine future projects. New projects can be scored easily using the excel file associated with this document, the process requires identifying the location, target species, conservation benefit, habitat type, cost, technical feasibility, potential social or regulatory barriers.

5.4 Recommendations

Using the matrix, we determined that many of the high-ranking projects had already been completed, but we also noted that ongoing and past projects such as gravel placements in the lower Campbell River and nutrient enrichment in the upper Salmon River were rated high per our matrix. Nevertheless, the gap in feasible projects led us to propose projects of our own and analyze them using the matrix. We identified a project that ranks high in terms of First Nations priorities and is identified as a "priority 1 action" in the FWCP actions table. Therefore, in 2017 we will propose to develop a restoration plan for the Quinsam River identifying specific restoration options focusing on anadromous species. This meets the Action Item identified in the Campbell River Salmonid Action Plan, which was to "Assess restoration opportunities in the Quinsam watershed for Coho and Chinook. Actions would likely also benefit pink salmon and other species."

Figure 1. Campbell River Watershed Map.

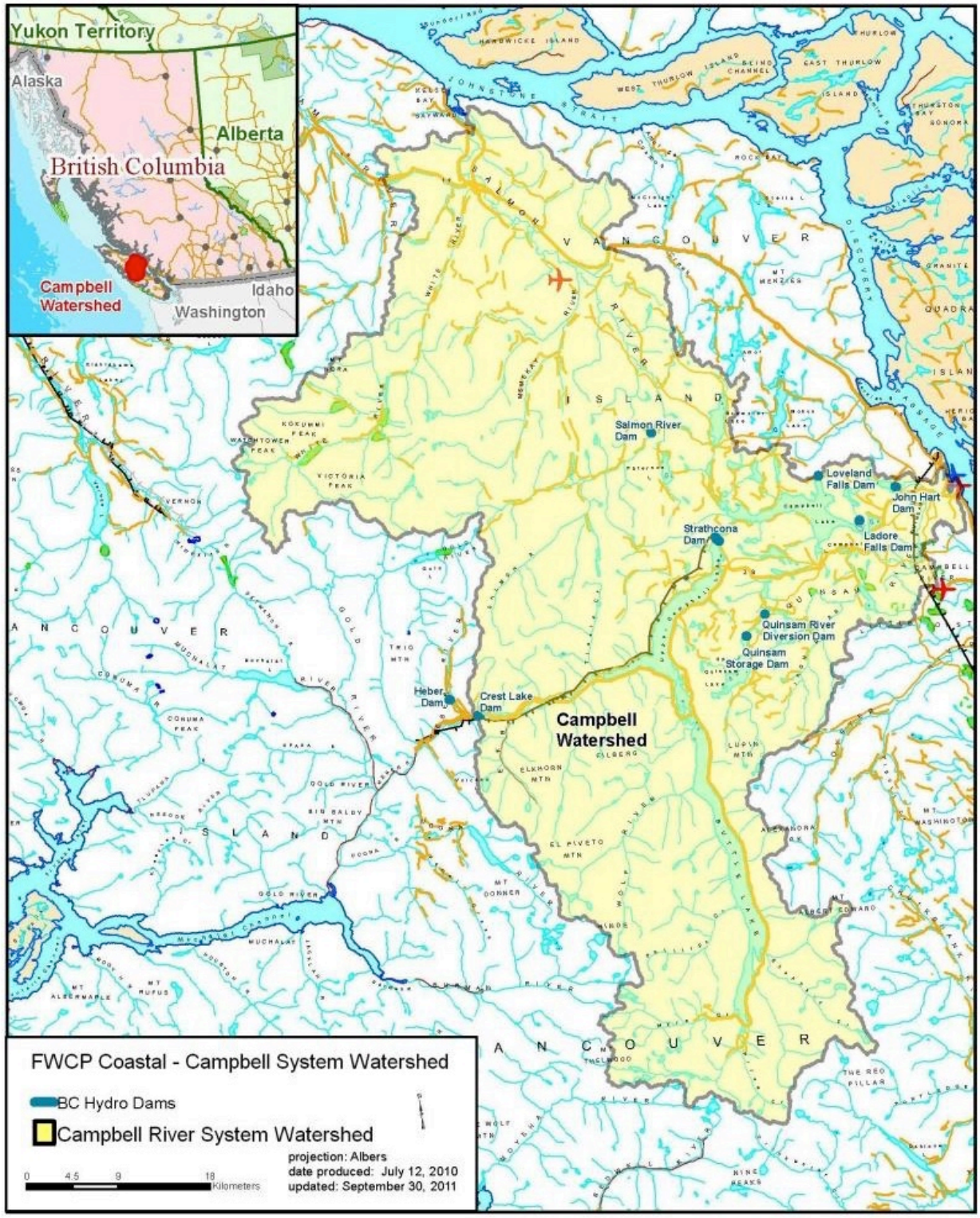

Table 1. Options Matrix for the Campbell River System.

ID	Target Species	Category	Location	Project Type	Location	Species	Likely Conservation Benefit	FN Priority Habitat	Cost	Technical Feasibility	Potential Social or Regulatory Barriers	Priority Rating	rank
CR7	CH Other: ST, CO, CM	Conservation	Campbell River, Site 7 Right side of 1st Island at 3165 m	Place gravel along lower 1/3 of 1st Island in historic CH spawning area. Completed in 2007, 2013, & 2016.	2	6	5	4	5	5	5	149	1
Q2	All anadromous	Conservation	Quinsam River, upstream of hatchery and downstream of Quinsam lake.	Develop a restoration plan for the Quinsam River identifying specific restoration options focusing on anadromous species.	2	6	5	3	5	5	5	147	2
SAL 1	ST, CO	Conservation	Salmon River (Upper)	Nutrient enrichment has been ongoing since 1992. This is conducted in the upper mainstem, Memekay, Grilse and White River.	2	7	5	3	3	5	5	146	3
CR9	CH Other: ST , CO, CM (low velocity portions)	Conservation	Campbell River, Site 9 Right side of channel between 1st and 2nd Islands (3465 m)	Place gravel along RR on major chinook spawning grounds, Access and construction must minimise impact to park trails and all affected areas restored to their natural state. If a helicopter is used, trails on the flight path will have to be temporarily closed. Completed 2011.	2	6	5	4	3	5	5	141	4
CR1	CH, ST, CO Other: SK, RB	Conservation	Campbell River, Site 1 Canyon at Elk Falls Pool Tailout (1210m)	Place gravel at Elk Falls Tailout pool on RL. Utilizes gravel delivery system implemented in 2015.	2	6	3	4	5	5	5	139	5
CR8	CH Other: ST, possibly CO and CM	Conservation	Campbell River, Site 8 RL at 3390 m	Place gravel along RL adjacent to margin, Access and construction must minimise impact to park trails and all affected areas restored to their natural state. Site is relatively far from gravel staging area at Elk Falls Mill pumphouse for wheelbarrows.	2	6	1	4	3	5	3	111	6
CR6	CH	Conservation	Campbell River, Site 6 RR adjacent to JHT parking lot: 6a–3117 m 6b-3125 m 6c–3133 m 6d–3152 m	Place gravel in small pads (~ 30 m2) along RR adjacent to start of trail at parking lot. Place to take advantage of natural shelves with existing boulders on downstream end.	2	6	1	4	3	5	1	101	7
CR10	CH Other: possibly CM	Conservation	Campbell River, Site 10 Sandy Pool tailout at 5165 m	Placement of gravel in Sandy Pool tailout, Project needs assessment by engineer and hydrologist. Issues relate to use of WSC cables for this purpose; if gravel remains at drop area it may affect WSC flow calibration	2	6	1	4	3	5	1	101	7
CR4	CH, ST, CO Other: CM, SK, RB, ACT	Conservation	Campbell River, Site 4 Canyon at 2575m	Place gravel in run. Existing boulders at tailout will help to retain gravel. Likely requires helicopter.	2	6	1	4	1	1	5	93	9
FC	CT, RB, DV	Conservation	Unnamed / Fry Creek (Reach 1,4,7) (carries water from Brewster Lake to Upper Campbell Lake)	NHC 2002 identified3 restoration projects in Fry Creek which included: Plan, profile and cross section surveys to place spawning gravels and add LWD to existing pools to create cover and enhance scour. The reach 7 project was completed in 2015. Projects were proposed based on flows prior to the proposed (2017) decommissioning of the Salmon Diversion.	2	0	5	3	3	4	5	92	10
CR5	CH Other: ST,CO, CM	Conservation	Campbell River, Site 5 JHT tailrace, 2960m	Place gravel in tailout of the tailrace pool. BC Hydro has concerns about potential effects on turbine discharge and risk of dewatering in even of turbine outage.	2	6	3	4	3	1	1	91	11
DC	CT, RB, DV	Conservation	Drum Creek (Reach 1 & 5) (Tributary to the Elk River which feeds Upper Campbell Lake)	NHC 2002 identified 2 restoration projects that could be undertaken in Drum Creek which included plan and cross section surveys to add large woody debris structures to existing pools to create cover and enhance scour. Proposed based on now decommissioned Heber diversion flows. Needs re-assessment.	1	0	3	3	5	1	5	73	12
MC2	CT, RB, DV	Conservation	Miller Creek (Reach 2, 4, 7) (carries water diverted from the Quinsam River to Upper Campbell Lake)	NHC 2002 identified 3 restoration projects that could be undertaken in Miller Creek which included plan and cross section surveys to add large woody debris structures to existing pools to create cover and enhance scour. High costs due to helicopter requirements..	1	0	3	3	5	1	5	73	12
Q1	All	Conservation	Quinsam River, below hatchery, 42 sites.	Install LWD complexing and/or side channels in areas with suitable gradients for juvenile steelhead. (Gaboury 2002 recommends 42 LWD sites on the Quinsam). DFO believes LWD is already ample, High angler use.	2	6	1	3	1	1	1	71	14
CC1	All	Conservation	Cold Creek, 15 Sites.	Install LWD complexing and/or side channels in areas with suitable gradients for juvenile steelhead. (Gaboury 2002 recommends 15 LWD sites on Coldwater Creek). DFO believes LWD is not an issue in this system.	1	6	1	3	1	1	1	69	15

Table 2. Restoration projects in the Campbell River estuary based on Burt (2004), Greenways (2005), Archibald (2011), FWCP (2016) and NCC (2016).

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
1981	Campbell River Estuary, Bank Stabilization	Soil Remediation	N/A	$600,000	TimberWest, DFO.	Clean up soil remediation of TimberWest Private Lands- oil spill crica 1945 excavated.
1981	Campbell River Estuary, Intertidal Islands Estuary	Intertidal Marsh	32,200	N/A	DFO, BCFP	DFO Compensation for Log Sort Dredgeing by BCFP
1996	Campbell River Estuary, River Breach	Marsh Bench	600	incl. below	Habitat Conservation Fund, DFO, BC Hydro	River breach and sedge bench construction and planting.
1997	Campbell River Estuary, Marine Link Bench	Intertidal	1,000	$15,000	Habitat Compensation DFO	River breach and sedge bench construction and planting.
1997	Campbell River Estuary, Benching	Marsh Bench Intertidal	1,000 4,300	$55,000	Habitat Conservation Fund, DFO, HRSEP, BC Hydro	River breach and sedge bench construction and planting.
1997	Campbell River Estuary, Nunns Creek	Low Marsh	9,000	$60,000	Discovery Harbour Development (Compensation)	
1998	Campbell River Estuary, Benching, bank stabilization	Marsh Bench Intertidal	3,400 3,500	$53,000	HCF, TimberWest, DFO, BC Hydro	
1999	Campbell River Estuary, Nunns Creek	Low Marsh	9,000	$100,000	FiRBC, DFO	
1999	Campbell River Estuary, Nunns Creek	Spit Road removal / marsh	8,000	$50,000	Compensation Discovery Harbour Mall	
1999	Campbell River Estuary, Planting of Benches (constructed 97/98)	Marsh & Riparian		$30,000	DFO, NIFI, Fisheries Renewal	
1999	Campbell River Estuary, Trails and Signage	Public Access and Education	1300 (linear)	$28,000	Rotary Club, DFO, NIFI, Fish & Wildlife Club	
1999	Campbell River Estuary, Tyee Spit Bulkhead Replacement Cox Logging / Tyee Trailer Park	Intertidal Marsh Bench and Riparian	500	$28,000	District of CR, DFO, Fisheries Renewal, NIFI	

Table 2. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2000	Campbell River Estuary, NCC Purchase (Baikie Island)	Estuary - riparian, intertidal marsh	180,100	$1,800,000	DFO (HRSEP), BC Hydro, District of CR Community Groups	In 1999, the Nature Conservancy of Canada (NCC), the City of Campbell River and the Tula Foundation joined forces to purchase a small island in the centre of the estuary, known as Baikie Island, and a portion of the adjacent foreshore. After extensive surveying and planning, restoration crews set to work ripping up concrete, excavating more than 38,000 cubic metres of fill and regrading the shoreline to its natural contours, digging two new backchannels, and replanting native vegetation in marsh and riparian areas.
2000	Campbell River Estuary, Tyee Spit Bulkhead Replacement - Tyee Club Silver King	Intertidal Marsh Bench and Riparian	500		District of CR	
2002	Campbell River Estuary, Baikie Island bench/planting	Intertidal Bench, rearing, transition	900	$7,500	Rotary Club CR - compensation Willow Cr boat ramp	
2002	Campbell River Estuary, NCC Channel	Spawning and Rearing	2,100	$150,000	BC Hydro, DFO, HCTF, Dist of CR, Alpine Backhoe Merril & Ring, (compensation)	NCC channel is 420m long, 3-5m wide providing tidal freshwater off channel rearing, spawning habitat, refuge from high mainstem flows and alternate access to the rehabilitated slough area of the Campbell River estuary. In conjunction with the channel construction creation and planting of marsh benches was accomplished, restoring an area heavily impacted by industrial activity. This slough area offers brackish water habitat, providing important transition for juvenile salmonids at outmigration.
2002	Campbell River Estuary, NCC Marsh/Riparian Bench Planting (Marsh constructed with spoil from NCC Channel)	Rearing, transition	7,475	$50,000	Merril & Ring, (compensation), District of CR, NCC, DFO	

Table 2. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2004	Baikie Island back channels Phase 1 - Planning	Planning		$15,250	Greenways Land Trust, BC Hydro (BCRP), PSF, NCC, City of CR	The Campbell River estuary is a vital rearing area for salmonids, with backchannel and marsh habitat both identified as being limiting factors to salmonid production. This planning study reviewed the feasibility of backchannel creation on the Baikie Island Reserve. Detailed construction drawings are presented for the creation of a backchannel area and a marsh bench area, with the marsh bench replacing the original proposal of an eelgrass embayment.
2005	Baikie Island back channels Phase 2 - Implementation	Marsh	7,200	$327,108	Greenways Land Trust, BC Hydro (BCRP), PSF, NCC, City of CR	Both the backchannel construction and the creation of a marsh bench are complete. The total project cost for creating the marsh and backchannel is $327,108.04. The excavation contract was granted to Wacor Holdings Ltd. and excavation began in July 2005. Excavation was complete on August 30, 2005 not including removal of the plug in January to open the backchannel to the estuary. The habitats created by this project cover an area of 17,807 m2, including 7,200 m2 of marsh, 1,817 m2 of riparian, and 1,480 m2 of sub-tidal habitat. In addition, 6,300 m2 will be planted with trees and other upland species. The volume of removed material is 50,000 m3 by excavation. Planting was begun in October 2005 and will continue in 2006.
		Riparian	1,817			
		Sub-tidal	1,480			

Table 2. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2007	Campbell River Estuary, Land Purchase (0.8 hectare) (Ocean Blue Site)	Land Purchase	8,500		Nature Conservancy of Canada	At the time of purchase, this two-acre (0.8-hectare) waterfront property that had been the site of a cedar shake mill bore little resemblance to the rest of the estuary that has been nurtured back to health. Still, the land was ecologically important due to its proximity to Baikie Island and its influence on the intertidal area at the head of the estuary. Working with the local community and engaged supporters, NCC restored the original marsh shoreline, including "daylighting" (uncovering) a fish-bearing stream that lay buried under the rubble of industry.
2011	Campbell River Estuary, Planting at Ocean Blue Site (Estuary) and Daylighting of Woodburn Creek	new marsh	5,292	$232,374	Nature Conservancy of Canada, VanTine and Associates	NCC was successful in completing the proposed work and through cost savings on excavation, was able to over-deliver by completing additional riparian planting work. A grand total to 5,140 shrubs and trees were planted on the Ocean Blue site. Woodburn Creek was successfully removed from the culvert below the surface of the property, and 143 m of creek was created. Woodburn Creek now runs through a re-created stream channel. This stream channel has a gravel substrate, composed of two sizes of gravel: 1.0 – 3.0 cm, and 3.0 – 8.0 cm. The stream habitat consists of complexes of large wood and rock.
		new riparian	4,121			
		new mud & gravel flats	3,972			
		new creek bed	143 (linear)			
Total			**295,957**	**$3,601,232**		

Table 3. Restoration projects in the lower mainstem of the Campbell River based on Burt (2004), Anderson (2004), Guimond (2005), VanTine (2006) and FWCP (2016).

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
1985	Campbell River, 2nd Island	Spawning and Rearing	6,000	$90,000	DFO	
1992	Campbell River, Elk Falls Side Channel	Rearing Spawning	2,000 1,200	$150,000	DFO, HCF, BCHydro	
1995	Campbell River, 2nd Island	Spawning and Rearing	8,000	$210,000	Tyee club, DFO, Community Groups	
1996	Campbell River, 2nd Island Reconstruction	Spawning and Rearing	8,000	$230,000	BC Hydro, DFO	
1997	Campbell River, Gravel Placement (helicopter and highway bridge sites)	Spawning	2,000	$154,000	Tyee Club, HCF, Tide Guide Assoc, Steelhead Society, DFO, BC Hydro	
1998	Campbell River, Raven Channel	Rearing Spawning	1,600 1,400	$235,000	Tyee Club, HCF, Tide Guide Assoc, Steelhead Society, DFO, BC Hydro,	
1998	Campbell River, Elk Falls Side Channel 2	Rearing Spawning	1,400 1,200	$175,000	Tyee Club, DFO, BC Hydro	
1998	Campbell River, Gravel Placement Bobcats	Spawning	2,000	$42,500	BC Hydro, Tyee Club, DFO, Tide Guide Assoc, HCF	
1999	Campbell River, Gravel Placement (Elk Falls Canyon)	Spawning	200	$40,000	MELP (HCF), BC Hydro	
1999	Campbell River, Elk Falls Side Channel 2	Additional Complexing		$30,000	MELP (HCF), BC Hydro	
1999	Campbell River, Elk Falls Side Channel 3	Rearing Channel and Wetland	17,000	$200,000	Interfor (FRBC), DFO, FiRBC, MacMillan Bloedel, CR Fish & Wildlife	
1999	Campbell River, Raven Channel	Additional Complexing		$5,000	Steelhead Society Habitat Restoration Corp (FiRBC)	

Table 3. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2001	Campbell River, Gravel Placement Haig-Brown (d/s of Quinsam right bank)	Spawning	2,085	$102,000	BC Hydro (BCRP), DFO	In 2001 with funding from BCHydro's Bridge Coastal Restoration Program a total of 2165 m2 of mainstem chinook spawning habitat was created using three different and effective methods. This has increased the chinook spawning capacity of the Campbell River.
2002	Campbell River, Gravel Placement (Elk Falls Canyon)	Spawning	313	$35,200	BC Hydro (BCRP), MWLAP (HCTF)	A total of 94 m3 of spawning substrate was placed at two locations in late July, 2002. Increasing egg to fry survival for the remnant population of summer and winter steelhead is an important step in the future recovery of these stocks in the Campbell River watershed.
2002	Campbell River, Gravel Placement 2001	Spawning	2,165	$56,242	BC Hydro (BCRP), DFO, HaigBrown, BC Parks, WLAP Elk Falls Park, MOT, Norske, Uplands	In 2001 with funding from BCHydro's Bridge Coastal Restoration Program a total of 2165 m2 of mainstem chinook spawning habitat was created using three different and effective methods. This has increased the chinook spawning capacity of the Campbell River.
2002	Campbell River, Raven Channel	Complexing	N/A	$11,800	Steelhead Society Habitat Restoration Corp, Alpine Backhoe, DFO	
2003	Campbell River, Elk Falls Side Channel 3	Instream Habitat	1,600	$8,975	CRGC, BC Hydro (BCRP), DFO, BC Parks, Norske Canada	CRGC was able to improve the flows through Elk Falls 3, a constructed side channel, providing valuable coho rearing habitat year round. Two different structures were used to bypass the two beaver dams within the channel. On BC Parks land at the upper section of the channel about 50m of 25cm pipe with a 2.5m screened section on the upstream end was installed through the beaver dam with sections of pipe both well up and downstream of the dam. At the outlet of the swamp to the channel an intake box was constructed and installed with 20cm pipe leading through the dam.
		Wetland	15,000			

Table 3. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2004	Campbell River, Gravel Placement (Mainstem)	Spawning	160	$66,895	Tyee Club, BC Hydro (BCFP), DFO	A total of 160 m2 of mainstem chinook spawning habitat was created restored using bobcats feeding gravel into a 60 cm diameter high density plastic pipe placed to deliver gravel to the river bed. Hand labour then spread the gravel to the area. This has increased the chinook spawning capacity of the Campbell River by 16 pairs.
2005	Campbell River, Gravel Placement (Ebert Rd.)	Spawning	5,292	$125,885	CRGC, BC Hydro (BCRP)	Gravel was delivered to site via a constructed rock and gravel ramp access road built off the end of Ebert Road. Screened and washed gravel was used to build a series of perimeter and cross roads in the river that encompassed the proposed footprint of the spawning platform. Once in place, excavators spread the gravel from these roads to create the spawning platform. The gravel elevation was graded to a depth of 15 centimeters below the river water level when the river discharge was at 34.3 cms during the time of construction. This provided a minimum water depth of 0.6 meters for spawners during the normal operating discharge of 122 cms. Rock clusters were also placed over the entire platform to provide cover for adults and increase hydraulic roughness, which increased gravel stability.
2005	Campbell River, Gravel Placement (Elk Falls Canyon) Spawning Gravel Rehabilitation	Spawning	233	$37,675	Greater Georgia Basin Steelhead Recovery Plan, BH Hydro (BCRP), Habitat Conservation Trust Fund	This project addressed a limiting factor for fish production in the Campbell River (Elk Falls) Canyon by placing high quality spawning gravel in key locations with a heavy lift helicopter Targeting Steelhead Coho and Chinook.
2005	Quinsam River, Fish Passage Improvement	Passage		$86,000	BC Hydro (BCRP), DFO, VanTine, Haig-Brown Instiute, PSF	Excavation of a bypass channel at the lower cascades (10.1km) and contouring the bedrock at cascades 3 and 4 (14km) to provide depth and velocities during late summer low flow periods that Pink salmon could negotiate. Opened up 14km of habitat.
2006	Campbell River, Gravel Placement (Elk Falls Canyon) Bulk Gravel Placement Feasibility	Spawning	N/A	$11,700	Greater Georgia Basin Steelhead Recovery Plan, BH Hydro (BCRP),	The overall goal of the feasibility study was to devise and assess more cost-effective strategies to helicopter placements of spawning gravel in the Elk Falls Canyon.

Table 3. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2007	Campbell River, 1st Island Side Channels	Planning	N/A		NHC, Komori Wong, CRSF, BC Hydro (BCRP)	This report presents the results of the options analysis process, as well as provides detailed information on the preferred First Island Side Channel option. The proposed side channel option involves construction of a new intake and a 400 m long feeder channel. This report also includes the results of the BC Parks Level 2 Impact Assessment completed for the proposed side channel project.
2007	Campbell River, Gravel Placement Site 7, 2006	Spawning	1,600	$118,584	Tyee Club, BC Hydro (BCFP), DFO	In 2006 the Campbell River Gravel Committee undertook a large gravel placement project in a mainstem site. Introduction of screened, washed gravel sized to be both relatively stable at expected flows, and functional for chinook spawning.
2007	Campbell River Chinook Spawning Gravel Platform Design	Design	N/A	Unk	NHC, CRSF, BC Hydro (BCRP), DFO	This report summarizes the hydraulic design component of this project. nhc conducted several field visits, and selected three gravel placement sites in coordination with DFO, MOE, and the CRSF. Conditions in the project reach, including design conditions, were numerically modeled using the River 2D computer program.
2008	Campbell River - (Elk Falls Canyon) Spawning Gravel Placements	Spawning	405	$62,104	BC Hydro (BCRP), DFO, Living Rivers, BCCF, MOE, A-Tlegay	This project addressed a continuing limiting factor for fish production in the Campbell River (Elk Falls) Canyon by placing high quality spawning gravel in key locations with a heavy lift helicopter to ultimately increase the freshwater productivity of the systems remnant populations of summer and winter steelhead stocks as well as coho, chinook and chum salmon.
2008	Campbell River, Elk Falls Side Channel 3 Intake Repair and Channel Upgrade	Rearing Channel and Wetland	2,700	$314,598	NHC, Komori Wong, CRSF, BC Hydro (BCRP), DFO, BC Parks	The project saw the construction of a new 650 mm diameter by 30 m long pipeline installed between the river and a new side channel starting on the left bank near the downstream end of First Island.
2009	Campbell River, Gravel Placement Site 7-II, Construction 2009	Spawning	2,000	$119,325	BC Hydro (BCRP), CRSF, BC Parks, NHC, Gord Lawrence, Mainstream Biological, A. Wood Bulldoaing, DFO, A-Tlegay	In August 2009, 4,200 metric tonnes (t) of graded and washed Chinook spawning gravel placed in the river for a new spawning area of approximately 2,000 m2. Based on biostandards of one spawning pair of Chinook salmon per 10 m2 of gravel platform (Burt,2004), it can be expected that up to 200 pairs will utilize the site.

Table 3. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2011	Campbell River, Gravel Placement Site 9 , Construction 2011	Spawning	1,825	$142,878	NHC, CRSF, BC Hydro (FWCP), DFO, BC Parks, Catalyst Paper, TimberWest, Mainstream, A-Tlegay	1,825 m2 Chinook spawning gravel platform, complete with habitat complexity boulders, was constructed in the Campbell River at Site 9.These projects are implemented to increase spawning habitat for Chinook salmon, and other anadromous and riverine species. The 2012 constructed pad provides spawning area for approximately 180 pairs of Chinook.
2012	Campbell River, Gravel Placement (Elk Falls Canyon)	Spawning	400	$60,200	BCCF, Living Rivers, BC Hydro (FWCP), CRSF, Helifor, BC Parks, MFLNRO, A-Tlegay	This project addressed a continuing limiting factor for fish production in the Campbell River (Elk Falls) Canyon by placing high quality spawning gravel in key locations with a heavy lift helicopter. A total of 98.9 m3 of spawning gravel were placed in the Elk Falls Pool on July14, 2011. The addition of this spawning gravel compliments the existing 491 m3 of gravel placed in the canyon reach since 1999.
2013	Campbell River, Gravel Placement Development of a Bulk Gravel Loading Strategy for Elk Falls Canyon	Spawning	N/A	$7,305	BCCF, BC Hydro (FWCP), CR Rotary Club, McElhanney Enginneering, BC Parks,	Spawning gravel has been periodically added to the Elk Falls Canyon reach of the Campbell River since 1999 with a heavy lift helicopter. The proposed construction of a pedestrian suspension bridge across the Campbell River as viewing platform for Elk Falls has diminished the potential to continue gravel placements with a helicopter. BCCF was approached by the Campbell River Rotary Club (proponent of suspension bridge) to discuss alternative methods to accommodate fish habitat restoration activities in conjunction with bridge construction. Financial support from FWCP was requested to work with professionals involved in the bridge project to develop an alternative gravel delivery system.

Table 3. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2013	Campbell River, Gravel Placement Site 7-III Construction Final Report	Spawning	2,100	$173,316	NHC, CRSF, BC Hydro (FWCP), DFO, RFCPP, BC Parks, A-Tlegay, Upland Excavating	The purpose of the project was to increase the available spawning habitat for Chinook salmon and other riverine species. The constructed spawning platform has an undulated surface, with large boulders placed at grade to provide hydraulic cover for spawning salmon. The constructed platform is approximately 120 meters long, and ranges from 25 meters wide at the upstream end to 13 meters at the downstream boundary, with a surveyed area of approximately 2,100 m2. Based on the assumption of one spawning pair of Chinook salmon per 10 m2 of gravel platform (Burt, 2004), this project supplies spawning habitat for 210 pairs of Chinook.
2016	Elk Falls Canyon Spawning Gravel Delivery System	Delivery System	N/A	$160,000	RFCCP, BC Hydro (FWCP), DFO, CRSF, Living Rivers	The infrastructure, as built, will allow for approximately 0.5 m3 of spawning gravel to be dumped at a time using an overhead skyline spanning the canyon. A gravel staging area has been selected, located adjacent to the existing footbridge that crosses the wood stave penstocks on BC Hydro property, and accessible using tandem axle gravel trucks. Tracked skidsteers (aka Bobcats) will transport the gravel from the staging area through the park, using both existing pedestrian and new trails, to the skyline and bucket. The skyline bucket will be loaded directly by the skidsteer and then lowered out over the canyon. Spawning gravel will be released remotely along the skyline as determined by a spotter from the suspension bridge.
2016	Campbell River, Gravel Placement Site 7	Spawning				
Total			**89,878**	**$3,262,182**		

Table 4. Restoration projects in the lower main stem of the Campbell River based on Burt (2004), Anderson (2004), Guimond (2005), VanTine (2006) and FWCP (2016).

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2000	Campbell River, Interpretive Signage/ trails	Captive Breeding	N/A	$75,516	DFO, CR Fish & Wildlife Club, NIFI, Rotary Club	The objective of the LGB is to help rebuild 3 wild steelhead populations (Little Qualicum River, Quinsam River and Keogh River) to self-sustainable levels while maintaining the genetic diversity found within these stocks. A similar captive breeding program is also in place for both Puntledge River summer-run and winter-run stee1head stocks. The primary purpose of this Puntledge River program is to re-establish a recreational steelhead fishery in this river. $75,515.65 from 1999-2001.
2001	Chinook Captive Brood Program	Captive Breeding	N/A			
2001	Campbell River, Gravel Placement Performance Monitoring of	Monitoring	N/A	$6,052	BC Hydro (BCFW), MWLAP, DFO	Gravel was placed in the Campbell River during 1997 and 1998 to restore spawning habitat that was lost as a result of BC Hydro's operational footprint of the John Hart Dam and Generating Station over the past 50 years. A summer student was hired in the summer of 2000 to assess the stability of gravel placed in the mainstem of the Campbell River during 1997 and 1998.
2002	Campbell River, Nutrient Monitoring	Monitoring	N/A	?	BC Hydro (BCFW), MWLAP, DFO	During the fall of 2002, adult salmon carcasses collected from brood stock sorting and spawning at Quinsam Hatchery were distributed to the upper Campbell River. Numbers of fish and approximate biomass of carcasses was noted. Four water-sampling sites were selected, one above the carcass distribution site and three below. Monthly samples were collected and analyzed for nutrient levels beginning in August 2002 (pre-carcass distribution), and ending the following February 2003 after carcasses had been introduced. The resulting data can be used to assess the affects and trends to these levels over time, and determine the benefits of distributing salmon carcasses into the upper river area that is inaccessible to returning adult salmon.

Table 4. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2002	Upper Campbell River - BC Hydro Diversion Streams Level II Prescription Report	Prescription	N/A	$63,217	NHC, BC Hydro (BCFW), MWLAP, DFO	Three small streams that have been used to convey the diverted flows are: Unnamed and Fry Creeks that carry water diverted from Salmon River, Drum Creek that passes water diverted from Heber River into Elk River, and Miller Creek that receives water diverted from Quinsam River. Increased flow due to diversions into watersheds is recognized to have both short-term and long-term impacts on channel morphology and fisheries habitat. For this project, nhc has adopted the fish habitat assessment and reaches defined by Aquatic Resources Ltd. (Aquatic, 2001) and set priorities for restoration.
2004	Elk River Stabilization Project 2004	Live Staking	N/A	$88,160	BC Hydro (BCFW), MWLAP, DFO,The Nootka Forest Products crews of the Mowachaht/Muchalaht First Nation	The main goal of the project is to speed the natural recovery of the Elk River using live gravel bar staking. This will promote the establishment of riparian vegetation and further accumulation of flood borne materials in treated areas, elevating and stabilizing the gravel bars and forcing the river to scour a narrower and deeper mainstem channel
2004	Elk River Stabilization Project 2004	Assessment	N/A	$6,200	BC Hydro (BCFW), MWLAP, DFO,The Nootka Forest Products crews of the Mowachaht/Muchalaht First Nation	This data report summarizes the information collected during a two day habitat reconnaissance of the lower 8.3 km of the Elk River in September, 2004.
2004	Report: Backchannel Creation on Baikie Island Phase 1 (Planning) BCRP Project	Planning	N/A	-	BC Hydro (BCFW), Greenways Land Trust, VanTine and Associates	This planning study investigates the issues surrounding the construction of two backchannels including: site conditions, design, water and soil management, habitat gains, costs, potential funding sources, and public and agency consultation. Detailed construction designs are presented, along with budget estimates.

Table 4. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2004	Elk River, 2005 Channel Stabilization Project and Year 2 Monitoring Report	N/A	N/A	$45,150	Streamline Environmental, BC Hydro (BCFWRP)	In total 1.41 ha was planted with live stakes at an average density of 8600 stems ha-1. Post-treatment surveys benchmarked the planted area and channel form. Permanent research plots were established and baseline data collected on the number of stakes planted, stake species, natural vegetation and substrate composition. Future monitoring of these performance indicators will allow for the determination of the success of the live staking in achieving the project goals. This information can then be used to help direct future restoration activities.
2005	Drum Creek Fish Habitat Restoration	Assessment	N/A	$40,779	MJ Lough, BC Hydro (BCFWRP)	The project proposed to install the series of LWD structures that NHC recommended in the 2 reaches of Drum Creek between Mud Lake and the confluence with the Elk River. The proposed multi-year project was scheduled over the 4 years between 2005 and 2008. The first year was a pre-treatment year to assess the project feasibility and gather baseline fish data. If feasible, the instream restoration work would take place during 2006 and 2007. The fourth and last year was scheduled for post-construction evaluations.
2007	Elk River Channel Stabilization Monitoring Project	Monitoring	N/A	$11,064	Streamline Environmental, BC Hydro (BCFWRP), Mowachaht-Muchalaht First Nation, Nuu-Chah-Nulth Tribal Council	The objective of the 2006 monitoring was to determine the survival, health and growth of all live stakes and assess whether measurable physical changes of the gravel bars had occurred. In short, the goal of the 2006 monitoring was to determine the overall shortterm success of the live staking that was conducted in 2004 and 2005.
2008	Strobe Lights as a Fish Deterrent	Assessment	N/A	$223,978	BC Hydro (BCFW).	This thesis documents a research project designed to determine if strobe lights are an effective deterrent to the presence of cutthroat trout (Oncorhynchus clarki clarki), rainbow trout (Oncorhynchus mykiss) and Dolly Varden (Salvelinus malma), near the intakes of a hydroelectric dam, the John Hart Dam, Vancouver Island, British Columbia

Table 4. Continued.

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2009	Campbell River, Elk Falls Side Channel 3 Monitoring	Monitoring	N/A	$18,845	NHC, BC Hydro (BCRP), CRSF, DFO, Current Environmental, A-Tlegay, Catalyst Pulp, BC Parks.	The 2009/10 EF3 monitoring focussed on physical and biological metrics. Biological monitoring covered salmonids and ecosystems. Physical monitoring included a review of the constructed works and function. The purpose of the monitoring is to measure the performance and success of the project, and to identify any additional work requirements.
2012	Campbell River, Mainstem Chinook Enhancement - Brood 2012	Instream Chinook Incubation Boxes	N/A	$9,964	CRSF, DFO.	Note, 2012 represented the 8th year of Mainstem Chinook Enhancement. The combination of hatchery technology with low tech instream incubation boxes placed in the Campbell River upstream of the Quinsam River has resulted in nearly 900,000 additional fry released. This could potentially contribute up to 1,000 adults, (composed mainly of 4-5 year olds), to spawn in the upper river re-establishing this historically important run. The eggs for this project were all otolith marked with a distinct banding pattern during incubation at Quinsam Hatchery allowing for assessment of returning adults.
Totals			**0**	**$588,925**		

Table 5. Restoration projects in the Quinsam River based on NHC (2015) and FWCP (2016).

Date	Project	Habitat / Project Type	Habitat Created (m2)	Cost	Partners	Description
2005	Quinsam River Cascades Fish Passage Construction	Fish Passage	N/A	$90,067	VanTine & Associates, BC Hydro (BCFWRP). PSF, Haig Brown Institue, DFO	The goals and objectives of this study were to construct a series of four fishways following the designs established during the feasibility studies. On July 20, 2005 a DFO Resource Restoration team began construction of access roads to the cascade sites and by August 12 all fishway construction works were completed. Follow up assessment confirmed the uninterrupted upstream passage of pink salmon through the new fishways and past the first four cascades.
2009	Quinsam River Cascades Fish Passage - Downstream Assessment	Assessment	N/A	$80,804	JA Taylor, BC Hydro (BCRP), DFO, A-Tlegay	The 2009 outmigration of pink salmon fry from the Quinsam River was assessed through a mark-recapture program conducted between April 21 and June 6. Marked fry were released from above two capture points in the lower river; the first was the Quinsam Hatchery fence site and the second was located above the lower fishway site.
2015	Quinsam River, Fish Passage Improvement	Passage	80,804	$160,000	CRSF, NHC, Pacificus Biological	Fish passage improvements were recently completed at two bedrock cascades on the Quinsam River for the Campbell River Salmon Foundation. The cascades formed a partial barrier for adult Steelhead trout and Coho salmon migration to their upstream spawning sites. Northwest Hydraulic Consultants (NHC) designed the passage improvements, which were constructed during summer 2015. The improvements allow upstream migrating adult Steelhead trout and Coho salmon to navigate the falls under a variety of natural flow conditions.
Totals			**80,804**	**$330,871**		

Table 6. Restoration projects completed in the Salmon River based on Brown (2000), Chapman, 2001, Lill (2002), Burt (2004), Sylvestri (2008), Lyderson (2010), and FWCP (2016).

Date	Project / Report	Habitat Type	Habitat Created (m2)	Cost	Partners	Description
1958	Salmon River Diversion Canal Built	None	-	N/A	BC Hydro	In 1958, the Salmon River BC Hydro diversion canal was built approximately 58 km from the river mouth. The aim was to divert water away from the Salmon River in order to increase water flow available to the BC Hydro power stations located below Elk Falls in the Campbell River system (Ladore and John Hart Generating Stations). At the time of construction, no requirement for fish passage was identified, as the main river below the dam was naturally obstructed by several large boulders which, in combination with bedrock load and debris, formed an effective barrier for migrating salmon.
1976	Salmon River, boulder obstruction removal from mainstem canyon and large increase in accessible length;	Passage	N/A	N/A	BC Fish and Wildlife Branch (MOE)	Prior to 1976, fish passage to the upper watershed was blocked by a 5 m high boulder obstruction in the canyon section approximately 12 km downstream of the diversion dam. In 1975 and 1976, the BC Fish and Wildlife Branch removed the boulder obstruction allowing anadromous fish access upstream.
1986	Diversion Canal Smolt Screen	Passage	N/A	N/A	MOE	In 1986, a smolt screen was installed in the diversion canal 500 m below the canal intake, to re-direct salmon and steelhead smolts that had entered the diversion canal, back to the Salmon River. Currently, the smolt screen is in operation from April 1 – June 30 and is generally operated post July 1 when water temperatures are greater than 5.5oC. When the screen is in operation, maximum discharge through the canal is kept below 15 m3/s to prevent lifting of the smolt screen and passage of juveniles down the canal.
1992	Fishway at Diversion Dam	Passage	N/A	N/A	DFO	A fish-way was constructed at the diversion dam to allow upstream access to migrating salmon and steelhead. Following construction, the number of wild steelhead migrating to the upper watershed increased.

Table 6. Continued.

Date	Project / Report	Habitat Type	Habitat Created (m2)	Cost	Partners	Description
1999	Big Tree Groundwater Channel	Rearing (Off-channel)	800	$68,061	Steelhead Society Restoration Corporation, MacMillan Bloedel, FRBC	A groundwater channel was excavated 610 m west of the confluence with the Salmon River on the mainstem of Big Tree Creek, September 2 to 9, 1999. The channel is 2 to 5 m wide and extends for 400 m for a total habitat area of 800 m2.
1999	Big Tree and Spirit Creeks Riparian Restoration	LWD Habitat	N/A	$108,478	Steelhead Society Habitat Restoration Corporation, Weyerhaeuser Corporation,MELP, FRBC	The silvicultural treatment involved creating circular plots of between 18–20 m in diameter (254–314 m2) by removing 18–21 red alder trees per plot. A 5–m buffer of streamside trees was retained to maintain bank stability and provide inputs of nutrients and LWD into Spirit and Big Tree Creeks.
2001	Salmon River, Paterson Creek culvert removals (2001).	Passage	20,000	$300,000	DFO, RIC, Weyerhauser, Mainstream, BCCF	The culvert crossing of Patterson Creek (S2) at the Menzies Mainline blocked anadromous fish access well before 1960. A 30m bridge enabled access providing access to 1,900 m of S2 channel for coho and steelhead spawning and rearing (up to a chute that was considered a possible anadromous barrier), and an adjacent large wetland complex for rearing.
2001	Watershed Restoration Program Stream Rehabilitation 2001 As-Built Report for Grilse Creek	Rearing (Off-channel) LWD Habitat	1,200 3,840	$73,550	REI, Mainstream, C&B Silviculture, Alpine Excavating, Wakiwa Construction	The restoration objectives for the instream rehabilitation work in Grilse Creek mainstem, Tributaries G02 and G03, and an off-channel alcove were to increase the amount of preferred juvenile summer rearing and wintering refuge for coho and trout by creating a 1200 m2 off-channel alcove; and improve the quality and quantity of holding and rearing habitat for coho and trout by increasing pool frequency and the amount of functional LWD cover in pools along 495 m of stream channel, affecting approximately 3840 m2 of habitat.
2001	Grilse Creek, Excavation of a rearing pond/alcove	LWD Habitat	710	$17,500	DFO, RIC, Weyerhauser, Mainstream, BCCF	An old borrow pit adjacent to the bank of Grilse Creek was prescribed for conversion to a rearing pond for coho and steelhead. Works prescribed included excavation, complexing with LWD, and connection to the Grilse mainstem.

Table 6. Continued.

Date	Project / Report	Habitat Type	Habitat Created (m2)	Cost	Partners	Description
2001	Grilse Creek, Complexing of two S3 tributaries of the lower Grilse Creek.	LWD and Rock	3,450	$43,000	DFO, RIC, Weyerhauser, Mainstream, BCCF	Two small S3 tributaries of the lower Grilse Creek were prescribed for the construction of large woody debris (LWD) and rock structures. The work focused on providing and/or improving approximately 3,540 m2 of coho and steelhead winter rearing habitat.
2001	Grilse Creek, Mainstem LWD Structures	LWD and Rock	300	$9,500	DFO, RIC, Weyerhauser, Mainstream, BCCF	Two sites along the mainstem of Grilse Creek (S1) were prescribed for the construction of LWD and rock structures. The work focused on providing coho and steelhead adult holding habitat and winter rearing habitat, and also provided for bank stabilization and the maintenance of a riparian elk meadow.
2007	Upper Salmon River - Identification of Fish Habitat Restoration Opportunities	Assessment	N/A	$87,165	BC Hydro (BCRP)	In the summer of 2006 and 2007, level 1 and 2 fish habitat assessments were completed in the Salmon River watershed. The objectives of this project were to collect the appropriate fish habitat data to determine current factors limiting fish production and to identify and develop high priority and cost-effective restoration options to mitigate the limiting factors, while also trying to address any impacts as a result of BC Hydro diversion dam operations.
2007	Salmon River Big Tree Main Side Channel Planning and Design	Planning	N/A		Sayward Fish and Game Association, NHC, BC Hydro (BCRP)	the planning, engineering, and permitting work in preparation for channel construction during the summer of 2008. This report presents the topographical surveys, test well data, cultural resources investigations, side channel designs, permitting, cost estimates, and construction planning.
2007	Salmon River Adult Fish Passage Assessment Study	Planning	N/A	$106,457	BC Hydro (BCRP), Mainstream Biological, Kintama Research Corp, Instream Fisheries Research, DFO	This pilot study was initiated to determine if the returning Coho adults found the Fishway structure, if they successfully transited the diversion facility, under what flow conditions, and if possible understand the period of delay for upstream migrants. The results from the resistivity counter and the acoustic tagging program do provide some insight into the relationship of the migrating Coho to the changes in the Salmon River discharge.

Table 6. Continued.

Date	Project / Report	Habitat Type	Habitat Created (m2)	Cost	Partners	Description
2008	Salmon River/Big Tree Main Side Channel	Spawning, Rearing Overwintering	1325m (linear)	$358,365	BC Hydro, (BCRP), GBLR, WFP (FIA), HCTF, MoTH, DFO, MOE, Sayward Fish and Game Club	The primary objective of this project was to install a permanent intake structure (DFO wing style type) and construct a 1,325 km side channel to provide stable rearing, spawning and overwintering habitat in Reach 3.
2009	Salmon River Bigtree Side Channel Performance Monitoring	Monitoring	N/A	$31,022	BCCF, BC Hydro (BCRP), Living Rivers, DFO, MOE, Sayward Fish & Game Association, A-Tlegay	This 2009 study provides a snapshot of the channel's productivity after only one year since construction. From measured results, it appears the channel will support a healthy population of coho for years to come. With the number of adults returning, the future should see even higher fry densities than documented in 2009. As the channel re naturalizes with riparian re growth it will also provide better quality habitat for flora and fauna, and will become more aesthetically pleasing as well.
2011	A Review of Twenty Years of Nutrient Enrichment in the Salmon River Watershed, Vancouver Island (1989-2010)	Review	N/A	$11,405	BCCF, BC Hydro (FWCP)	An investigation of the bio-physical response to varying nutrient treatments was conducted including the effect of nutrient quantity, application timing and stream flow. Biological response was characterized by increased periphyton accrual, accelerated juvenile steelhead growth, and changes in adult steelhead abundance/ distribution.
2012	Salmon River Diversion Steelhead and Coho Passage Evaluation (2011/12)	Study	N/A	$83,200	BCCF, BC Hydro (FWCP), Living Rivers, DFO, MFLNRO, Salmon River Fish Passage Framework Committee	Results support earlier speculation that the difference in head between cells in the fishway is too large to effectively pass adult salmonids when the diversion canal is full. Other factors such as excessive attraction flow may also limit fishway performance. It is recommended that adult passage issues at the site be addressed through the modification of the existing fishway and/or construction of a new fishway.

Table 6. Continued.

Date	Project / Report	Habitat Type	Habitat Created (m2)	Cost	Partners	Description
2013	Salmon River / Big Tree Side Channel Performance Monitoring 2013	Monitoring	N/A	$25,587	BCCF, BC Hydro (FWCP), Living Rivers, DFO, Sayward Fish and Game Club, A-Tlegay	Evaluate side-channel performance and to re-calibrate the rule curves for continued flow adjustments. In August 2013, a five day mark recapture study was completed at four sites within the new channel andone site in the natural channel downstream. The total number of Coho in the channel was estimated at over 9,000. Other species present were Rainbow, and Cutthroat Trout. Adult spawner use was also monitored throughout the fall and numerous channel flow measurements were completed to calibrate staff gauge levels to in channel flows.
2013	Assessment of the Distribution of 2013 Brood Coho Adult Migration Below and Above the Salmon River Diversion Dam	Assessment	N/A	$33,972	DFO, BC Hydro (FWCP), CRSF,	The goal of this study is to monitor coho salmon abundance and distribution in the Salmon River for two years prior to the planned fishway upgrade/replacement project to provide pre-construction baseline data for comparison to post construction assessments on habitat utilization and fish passage above the diversion dam.
2014	Grilse Creek Large Woody Debris Rehabilitation 2014	LWD Habitat	2,700	N/A	BCCF, BC Hydro (FWCP), WFP, BCTS, MOF, RFCCP, CRSF, Living Rivers	During the summer of 2014 BCCF, completed the Grilse Creek LWD rehabilitation Project. As a result 18 LWD structures were built along with two riffle enhancements using large boulders. Work was completed using excavators working instream during low flow conditions to place logs and ballast rock, a three man crew followed and cabled structures to secure them in place. Expected lifespan of the structures is 15 to 20 years.
		Boulder Riffle Habitat	350			

Table 6. Continued.

Date	Project / Report	Habitat Type	Habitat Created (m2)	Cost	Partners	Description
2014	Assessment of the distribution of 2014 brood coho adult migration below and above the Salmon River diversion dam	Assessment	N/A	N/A	DFO, BC Hydro (FWCP), CRSF,	Monitoring coho distribution and escapement prior to fishway construction will be a key element in the performance evaluation of the overall project, which requires a more accurate assessment of the distribution and number of coho salmon that are above and below the diversion dam.
2014	Salmon River Estuary Acquisition Final Report	Land Acquisition	(78ha) 193 acres	N/A	Habitat Conservation Trust Foundation, BC Hydro (FWCP), CRSF, Barnet Rifle Club, Ducks Unlimited Canada, Steelhead Society of BC, Kingfishers Rod & Gun Club, Totem Fly Fishers, Parksville Fish & Game Association, BC Federation of Fly Fishers, and Victoria Fish	The Salmon River Estuary acquisition abuts and complements the adjacent 117 hectares (289 acres) already secured by The Nature Trust of BC and its partners since 1978 resulting in combined area of conservation land of 195 ha (482 acres).
Total			**33,350**	**$1,357,261**		

Table 7. Summary of nutrient enrichment completed in the Salmon River based on Lill (2002), and FWCP (2016).

Date	Project / Report	Habitat Type	Habitat Created (m2)	Cost	Partners	Reference	Description
1990-present	Salmon River, long-term enrichment project since 1990;	Enrichment				Lill, 2002	
2004	Salmon River Nutrient Enrichment for Fish Habitat Restoration	Enrichment	N/A	$23,100	BC Hydro (BCRP), MWLAP, BCCF, FIA	FWCP Reports	This stream enrichment project is designed to enhance the growth and survival of juvenile steelhead (Oncorhynchus mykiss) and coho (O. kisutch) through increased periphyton accrual and subsequent increases in the invertebrate food supply. Stream flow, water chemistry, periphyton accrual, and fish growth monitoring is intended to ensure fertilizer loading rates are not excessive and assess the effectiveness of fertilizer additions.
2005	Salmon River Nutrient Enrichment for Fish Habitat Restoration	Enrichment	N/A	$22,293	BC Hydro (BCRP), MWLAP, BCCF, FIA	FWCP Reports	This stream enrichment project was designed to improve the growth and survival of juvenile salmonids through the addition of liquid fertilizer and pollock bone meal.
2007	Salmon River Nutrient Enrichment for Fish Habitat Restoration	Enrichment	N/A	$27,374	BC Hydro (BCRP), MWLAP, BCCF, FIA	FWCP Reports	This stream enrichment project was designed to enhance the growth and survival of juvenile steelhead (Oncorhynchus mykiss) and coho salmon(O. kisutch) through increased periphyton accrual and subsequent increases in the invertebrate food supply. Stream flow, water chemistry, periphyton accrual, and fish growth monitoring was intended to ensure fertilizer loading rates were not excessive and/or to assess the effectiveness of fertilizer additions.

Table 7. Continued.

Date	Project / Report	Habitat Type	Habitat Created (m2)	Cost	Partners	Reference	Description
2007	Salmon River Nutrient Enrichment for Fish Habitat Restoration	Enrichment	N/A	$23,673	MOE, BC Hydro (BCRP), Living Rivers, WFP, BCCF, BCCC, A-Tlegay	FWCP Reports	This habitat restoration project was designed to improve the growth and survival of juvenile salmonids through the addition of slow release fertilizer.Winter-run steelhead trout (Oncorhynchus mykiss) and coho salmon (O. kisutch) are the primary target for enrichment activities on the Salmon although benefits are shared by many species, both aquatic and terrestrial.
2008	Salmon River Nutrient Enrichment for Fish Habitat Restoration	Enrichment	N/A	$32,100	BC Hydro (BCRP), Living Rivers, BCCF	FWCP Reports	This habitat restoration project was designed to improve the growth and survival of juvenile salmonids through the addition of slow release fertilizer.This stream enrichment project was designed to enhance the growth and survival of juvenile steelhead and coho salmon through increased periphyton accrual and subsequent increases in the aquatic invertebrate food supply.
2009	Salmon River Nutrient Enrichment for Fish Habitat Restoration 2009	Enrichment	N/A	$35,575	BCCF, BC Hydro (BCRP),CRSF, Living Rivers, Habitat Conservation Trust Foundation	FWCP Reports	The spring and summer of 2009 was the twenty first year of inorganic nutrient addition to the Salmon River watershed on Vancouver Island. This habitat restoration project was designed to improve the growth and survival of juvenile steelhead and coho salmon through the addition of slow release fertilizer.

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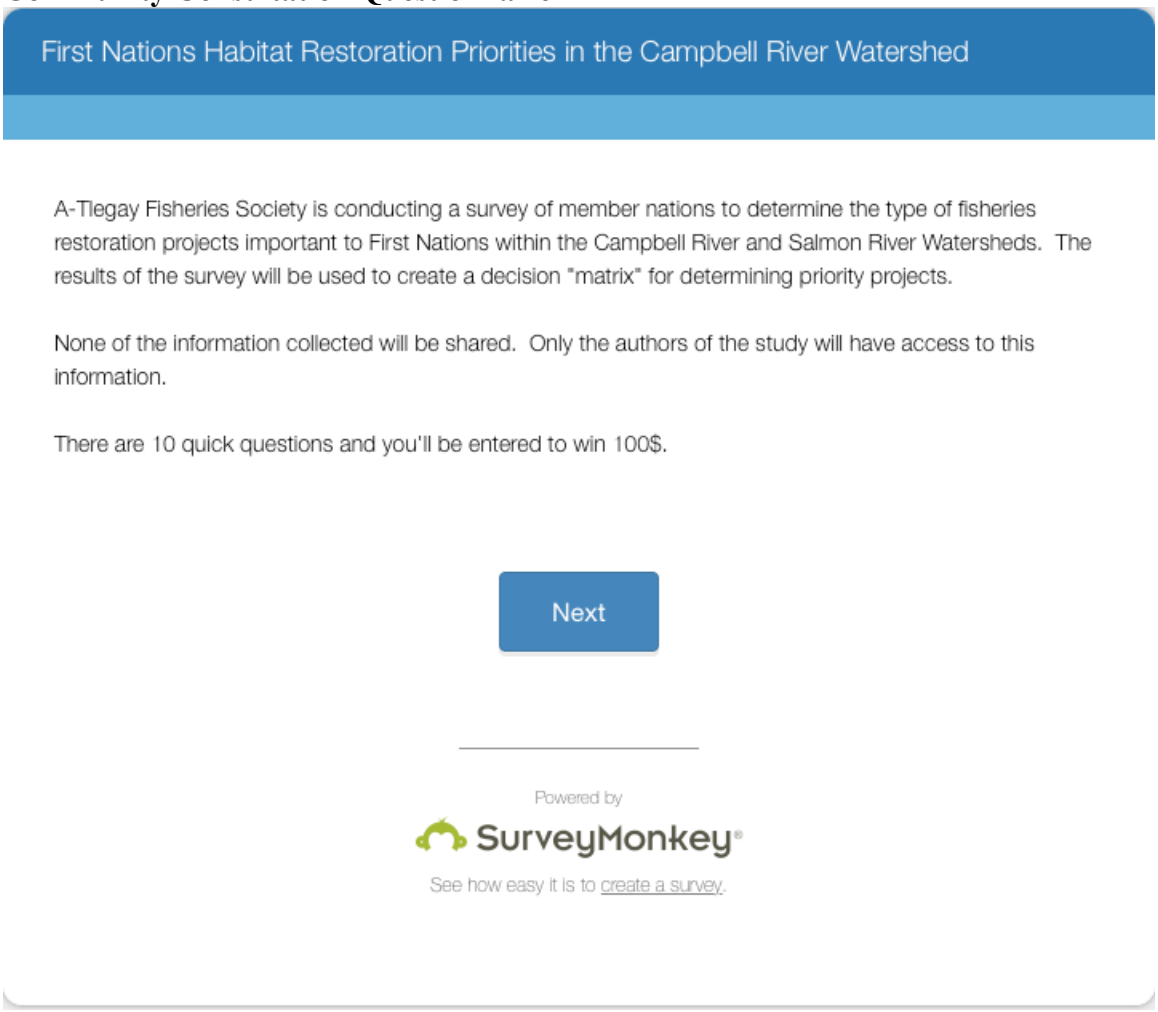
In addition to support from FWCP we'd also like to thank Shannon Anderson (Department of Fisheries and Oceans Canada) as well as Dave Ewart for sharing their knowledge of the Campbell River watershed with us.

APPENDIX A

Community Consultation Questionnaire



First Nations Habitat Restoration Priorities in the Campbell River Watershed

1. What is your first and last name?

2. Which First Nation are you a member of?

- ◯ Wei Wai Kum First Nation (Campbell River)
- ◯ We Wai Kai Nation (Cape Mudge)
- ◯ K'ómoks First Nation (Comox)
- ◯ T'lowistsis First Nation (Turnour Island)
- ◯ Kwiakah First Nation (Phillips Arm)
- ◯ I'm not First Nations

Other First Nation (please specify)

3. How are fish and fish habitat important to you (you can choose more than one answer).

- ☐ Fish is important to me culturally
- ☐ I enjoy eating fish
- ☐ I want to know the current status of fish within the watershed(s)
- ☐ I'm a Commercial fisher
- ☐ I'm a Food fisher (w/ Commercial Gear)
- ☐ I'm a Food fisher (w/ Sport Gear)

- [ ] I'm a Recreational marine fisher
- [ ] I'm a Recreational freshwater fisher
- [ ] I'm interested in fish and fish habitat restoration
- [ ] I'm not interested in fish or fish habitat

4. Which is more important to you?

- ◯ Fresh water species (trout, crayfish)
- ◯ Salt water species
- ◯ Both are equally important

5. Organize the following species in order of importance to you (1 being most important, 9 being least important).

- [ ] Rainbow Trout
- [ ] Coho
- [ ] Pink
- [ ] Chinook
- [ ] Chum
- [ ] Steelhead
- [ ] Sockeye
- [ ] Cutthroat Trout
- [ ] Dolly Varden

6. Between the Campbell River and Salmon River Watersheds, which is a bigger priority for habitat restoration?

- ◯ Salmon River
- ◯ Campbell River
- ◯ Both are equally important
- ◯ Neither are important

7. From a cultural perspective, as it relates to the harvest and use of fish, within the Campbell River watershed which lake, river or creek would be best to focus restoration on? (You can choose more than one option).

- ☐ Campbell River (above estuary)
- ☐ Campbell River Estuary
- ☐ Quinsam River (CR Trib)
- ☐ Coldwater Creek (Quinsam Trib)
- ☐ John Hart Lake (Our drinking water source)
- ☐ Buttle and Upper Campbell Lakes
- ☐ Lower Campbell and McIvor Lakes
- ☐ Sayward Forest Lakes (Amor, Brewster, Gray, Fry, Gosling, Mohun and Goose Lakes)
- ☐ All are equally important

Other (please specify)

8. From a cultural perspective, as it relates to the harvest and use of fish, within the Salmon River watershed which lake,

river or creek would be best to focus restoration on? (You can choose more than one option).

- [ ] Salmon River (Downstream of Island Highway)
- [ ] Salmon River (Upstream of Island Highway)
- [ ] Salmon River Estuary
- [ ] White River
- [ ] Grilse Creek
- [ ] Memekay Creek
- [ ] Kay Creek
- [ ] Big Tree Creek
- [ ] All are equally important

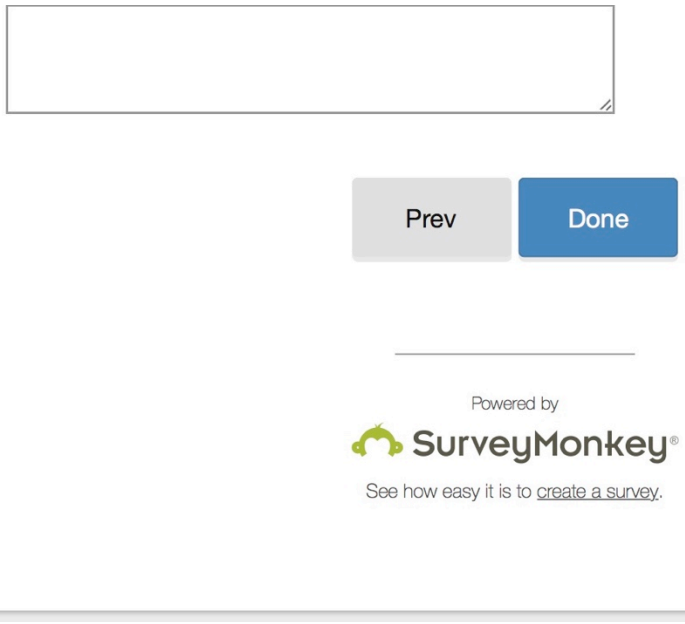
Other (please specify)

9. What types of habitat restoration are most important to you? (you can choose more than one option)

- [ ] adult spawning habitat
- [ ] adult holding habitat (pools)
- [ ] adult fish migration/access to spawning sites
- [ ] juvenile fish rearing habitat

Other (please specify)

10. Do you have any comments you'd like to add about fish habitat restoration?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APPENDIX B

Community Consultation Survey Results

Question 1. What is your first and last name?

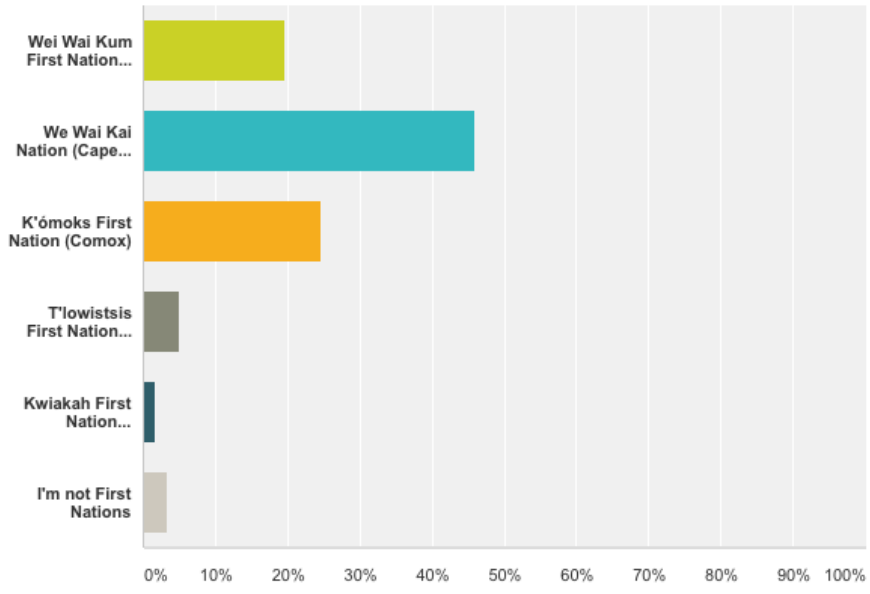
Respondent names, names are not included in the report as they were collected with the acknowledgment that personal information would not be shared. All respondents included provided their name and First Nation.

Question 2. First Nation affiliation

Q2 Customize Export

WhichFirst Nation are you a member of?

Answered: 61 Skipped: 1



Answer Choices	Responses	
Wei Wai Kum First Nation (Campbell River)	19.67%	12
We Wai Kai Nation (Cape Mudge)	45.90%	28
K'ómoks First Nation (Comox)	24.59%	15
T'lowistsis First Nation (Turnour Island)	4.92%	3
Kwiakah First Nation (Phillips Arm)	1.64%	1
I'm not First Nations	3.28%	2
Total		61

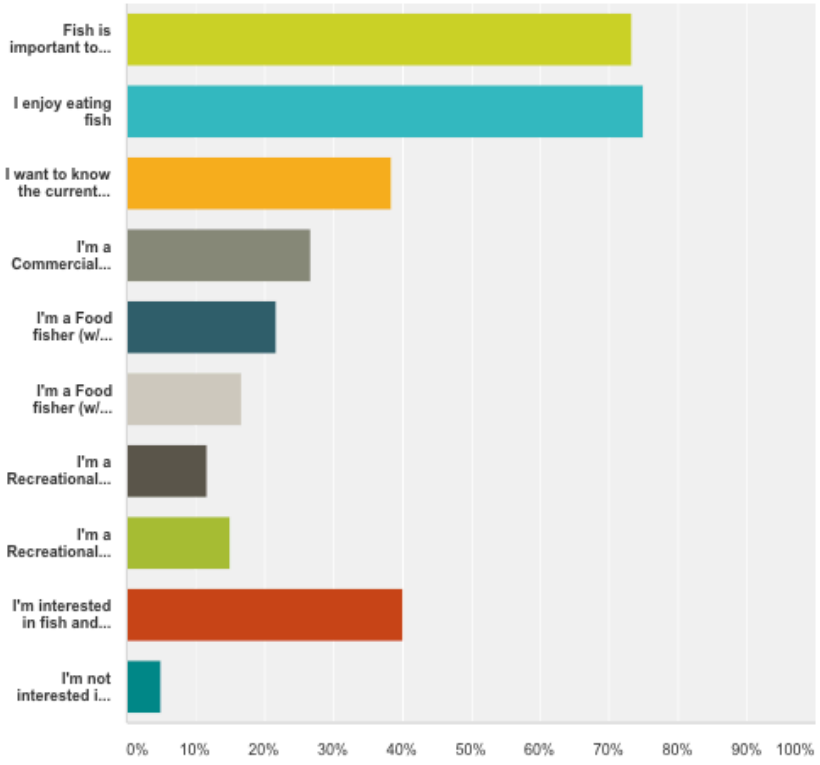
Comments (1)

Question 3. Fish and fish habitat interests

Q3 Customize Export

How are fish and fish habitat important to you (you can choose more than one answer).

Answered: 60 Skipped: 2



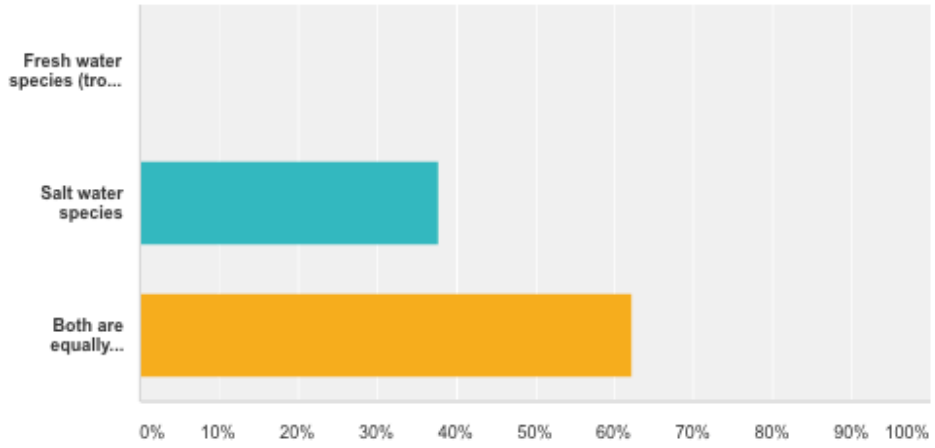
Answer Choices	Responses	
Fish is important to me culturally	73.33%	44
I enjoy eating fish	75.00%	45
I want to know the current status of fish within the watershed(s)	38.33%	23
I'm a Commercial fisher	26.67%	16
I'm a Food fisher (w/ Commercial Gear)	21.67%	13
I'm a Food fisher (w/ Sport Gear)	16.67%	10
I'm a Recreational marine fisher	11.67%	7
I'm a Recreational freshwater fisher	15.00%	9
I'm interested in fish and fish habitat restoration	40.00%	24
I'm not interested in fish or fish habitat	5.00%	3
Total Respondents: 60		

Question 4. Fresh water species vs. salt water species

Q4 Customize Export

Which is more important to you?

Answered: 61 Skipped: 1



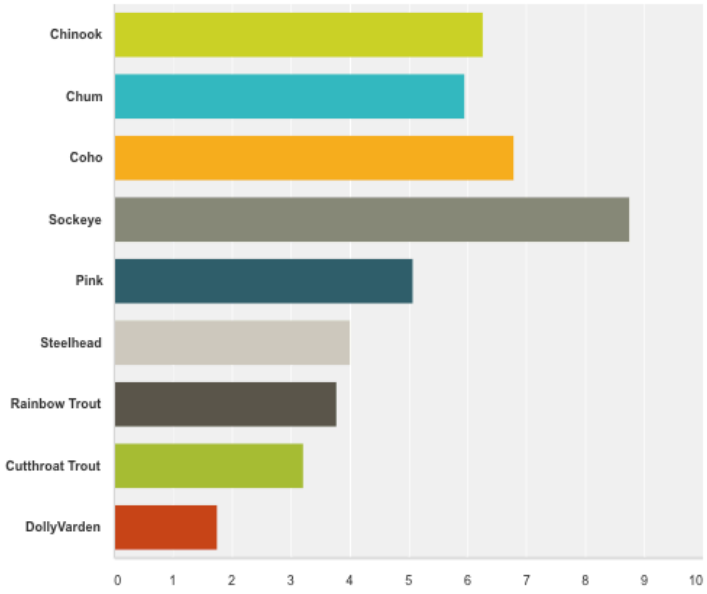
Answer Choices	Responses	
Fresh water species (trout, crayfish)	0.00%	0
Salt water species	37.70%	23
Both are equally important	62.30%	38
Total		61

Question 5. Species Preference

Q5 Customize Export

Organize the followingspecies in order of importance to you(1 beingmost important, 9being least important).

Answered: 61 Skipped: 1



	1	2	3	4	5	6	7	8	9	Total	Score
Chinook	3.51% 2	24.56% 14	28.07% 16	15.79% 9	12.28% 7	3.51% 2	8.77% 5	1.75% 1	1.75% 1	57	6.26
Chum	5.26% 3	29.82% 17	14.04% 8	17.54% 10	10.53% 6	5.26% 3	7.02% 4	1.75% 1	8.77% 5	57	5.96
Coho	3.64% 2	29.09% 16	30.91% 17	20.00% 11	12.73% 7	1.82% 1	1.82% 1	0.00% 0	0.00% 0	55	6.78
Sockeye	91.07% 51	3.57% 2	0.00% 0	1.79% 1	1.79% 1	1.79% 1	0.00% 0	0.00% 0	0.00% 0	56	8.75
Pink	3.57% 2	5.36% 3	14.29% 8	21.43% 12	25.00% 14	10.71% 6	1.79% 1	12.50% 7	5.36% 3	56	5.07
Steelhead	0.00% 0	3.45% 2	3.45% 2	13.79% 8	15.52% 9	29.31% 17	12.07% 7	12.07% 7	10.34% 6	58	4.00
Rainbow Trout	1.82% 1	5.45% 3	1.82% 1	3.64% 2	12.73% 7	21.82% 12	32.73% 18	14.55% 8	5.45% 3	55	3.78
Cutthroat Trout	0.00% 0	1.75% 1	7.02% 4	3.51% 2	7.02% 4	15.79% 9	21.05% 12	31.58% 18	12.28% 7	57	3.21
DollyVarden	0.00% 0	0.00% 0	0.00% 0	1.92% 1	0.00% 0	3.85% 2	15.38% 8	23.08% 12	55.77% 29	52	1.75

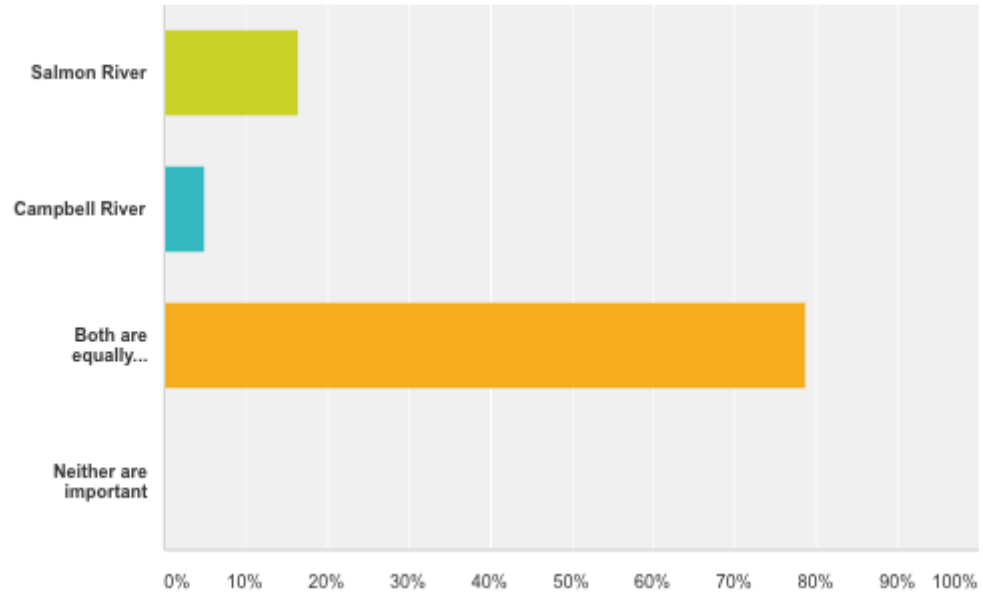
Question 6. Watershed Priority

Q6

Customize Export

Between the Campbell River and Salmon River Watersheds, which is a bigger priority for habitat restoration?

Answered: 61 Skipped: 1



Answer Choices	Responses	
Salmon River	16.39%	10
Campbell River	4.92%	3
Both are equally important	78.69%	48
Neither are important	0.00%	0
Total		61

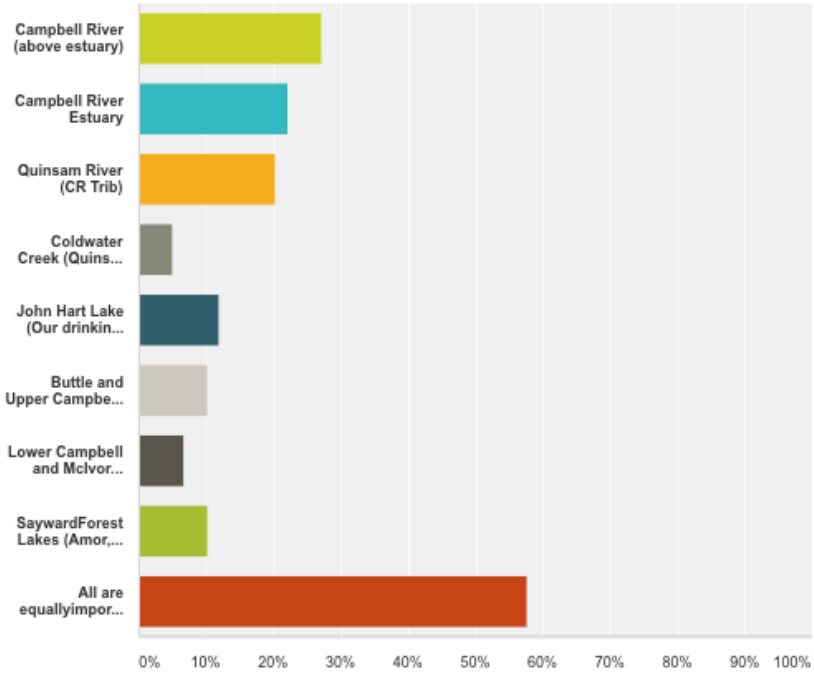
Question 7. Campbell River and tributaries, priorities

Q7

Customize | Export

From a cultural perspective, as it relates to the harvest and use of fish, within the Campbell River watershed which lake, river or creek would be best to focus restoration on? (You can choose more than one option).

Answered: 59 Skipped: 3



Answer Choices	Responses	
Campbell River (above estuary)	27.12%	16
Campbell River Estuary	22.03%	13
Quinsam River (CR Trib)	20.34%	12
Coldwater Creek (Quinsam Trib)	5.08%	3
John Hart Lake (Our drinking water source)	11.86%	7
Buttle and Upper Campbell Lakes	10.17%	6
Lower Campbell and McIvor Lakes	6.78%	4
SaywardForest Lakes (Amor, Brewster, Gray, Fry, Gosling, Mohun and Goose Lakes)	10.17%	6
All are equallyimportant	57.63%	34
Total Respondents: 59		

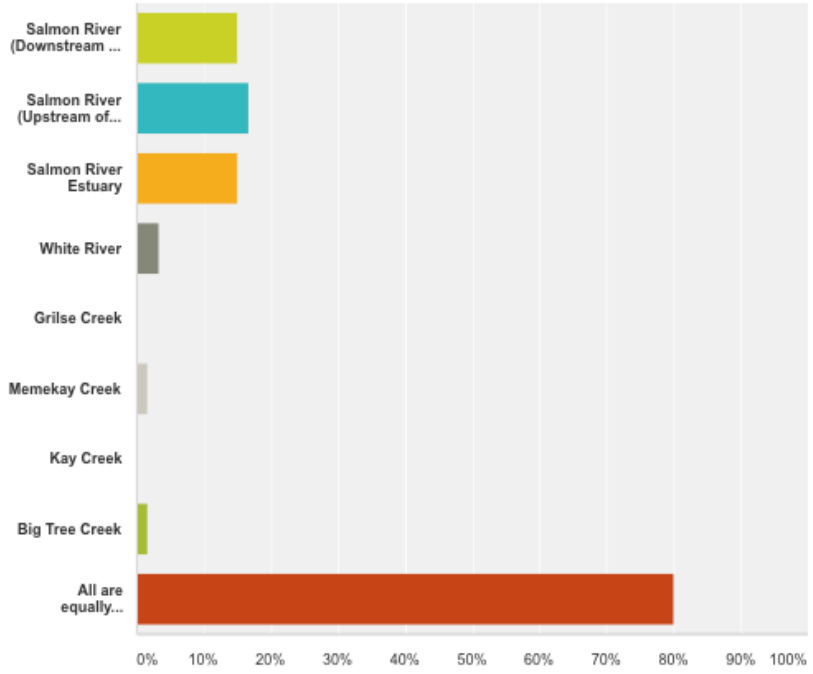
Comments (5)

Question 8. Salmon River and tributaries, priorities

Q8 Customize Export

From a cultural perspective, as it relates to the harvest and use of fish, within the SalmonRiver watershed which lake, river or creek would be best to focus restoration on? (You can choose more than one option).

Answered: 60 Skipped: 2



Answer Choices	Responses	
Salmon River (Downstream of Island Highway)	15.00%	9
Salmon River (Upstream of Island Highway)	16.67%	10
Salmon River Estuary	15.00%	9
White River	3.33%	2
Grilse Creek	0.00%	0
Memekay Creek	1.67%	1
Kay Creek	0.00%	0
Big Tree Creek	1.67%	1
All are equally important	80.00%	48
Total Respondents: 60		

Comments (1)

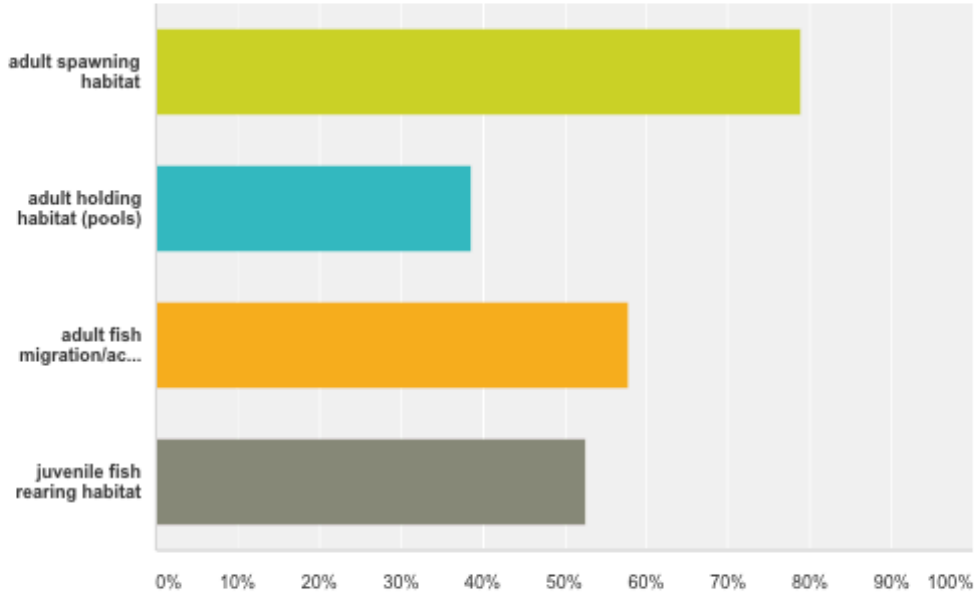
Question 9. Species Preference

Q9

Customize Export

What types of habitat restoration are most important to you? (you can choose more than one option)

Answered: 57 Skipped: 5



Answer Choices	Responses	
adult spawning habitat	78.95%	45
adult holding habitat (pools)	38.60%	22
adult fish migration/access to spawning sites	57.89%	33
juvenile fish rearing habitat	52.63%	30
Total Respondents: 57		

Comments (3)

APPENDIX C

Table 8. Member Nation populations and the number of survey respondents.

Nation	Population	Number of Respondents
We Wai Kai First Nation	1130	28
Wei Wai Kum First Nation	819	12
Tlowitsis First Nation	415	3
K'omoks First Nation	334	15
Kwiakah First Nation	22	1

APPENDIX D

Campbell River Restoration Matrix Weighting and Definitions Tables

Table 9. Reference table for Restoration Matrix (Weighting).

	Location	Species	Likely Conservation Benefit	FN Priority Habitat	Cost	Technical Feasibility	Potential Social or Regulatory Barriers
Weight	**2**	**7**	**5**	**2**	**4**	**5**	**5**
Comments / Rationale	Location is somewhat important to FN respondents with a many identifying priorities however the majority indicated that watercourses were equally important.	Species are ranked definitively by FN and are therefore weighted higher than other considerations.	Not weighted according to FN priorities, instead included and weighted to reflect this important consideration.	Although a FN priority habitat was identified in the questionnaire (adult spawning habitat), this is not given great weight as the available background information to the respondents was insufficient.	Not weighted according to FN priorities, instead weighted to reflect feasibility of successful funds acquisition.	Not weighted according to FN priorities, instead included and weighted to reflect this important consideration.	Not weighted according to FN priorities, instead included and weighted to reflect this important consideration.

Table 10. Reference table for Restoration Matrix (Definitions Table).

Category	Score	Definition
Location	Salmon River and Tributaries	
	1	Grilse Creek
	1	Kay Creek
	1	Memekay Creek
	1	Big Tree Creek
	1	White River
	2	Salmon River (Downstream of Island Highway)
	2	Salmon River Estuary
	2	Salmon River (Upstream of Island Highway)
	Campbell River and Tributaries	
	1	Coldwater Creek (Quinsam Trib)
	1	Lower Campbell and McIvor Lakes
	2	Buttle and Upper Campbell Lakes
	2	SaywardForest Lakes (Amor, Brewster, Gray, Fry, Gosling, Mohun and Goose Lakes)
	2	John Hart Lake (Our drinking water source)
	2	Quinsam River (CR Trib)
	2	Campbell River Estuary
	2	Campbell River (above estuary)
	Note: the scoring scale for "Location" is based directly on the FN survey responses, however a large proportion of respondents selected "All are equally important".	
Species	9	Sockeye
	7	Coho
	6	Chinook
	6	Chum
	5	Pink
	4	Steelhead
	0	Rainbow
	3	Cutthroat
	0	Dolly Varden
	0	the proposed compensation is targeted to benefit Rainbow Trout or Dolly Varden char within John Hart Reservoir or tributaries.
	6	No target species identified (anadromous)
	1	No target species identified (non-anadromous)
	Note: the Species scoring is based on the priorities identified by the FN survey responses, with the addition of the "strong logic to avoid projects that benefit DV and RB in the John Hart Reservoir	
Likely Conservation Benefit	1	there is likely to be only minimal biological response to this action, for species of conservation concern
	3	there is likely to be a moderate biological response to this action, for species of conservation concern
	5	there is likely to be a strong biological response to this action, for species of conservation concern
FN Priority Habitat Type	2	adult holding habitat (pools)
	3	juvenile rearing habitat
	3	adult fish migration / access to spawning sites
	4	adult spawning habitat
	Note: the scoring is based on the priorities identified by the FN survey responses.	
Cost-effectiveness	1	there is likely to be only minimal biological response to this action, per $1000 spent
	3	there is likely to be a moderate biological response to this action, per $1000 spent
	5	there is likely to be a substantial biological response to this action, per $1000 spent
	Note: For cost-effectiveness it may be important to acknowledge that some options cannot be scaled (e.g., entrainment mitigation), but it is still appropriate to consider the return per unit cost to ensure that cost can be compared across options	
Technical Feasibility	1	there would be substantial technical challenges to implement this option
	3	there may be some technical difficulties to implement this option
	5	there are no technical barriers to implement this option
	Note: Technical barriers include certainty in outcomes, so an action with a highly uncertain outcome should be deemed to have low feasibility.	
Potential Social or Regulatory Barriers	1	the action is not within scope or there is a direct conflict with management policies, other initiatives or landowner concerns
	3	the option is within scope, but there may be potential conflicts with management policies, other initiatives or landowner concerns
	5	the option is clearly within and there are no potential conflicts with management policies, other initiatives or landowner concerns
	Note: This is probably best viewed as a screen for whether an option is within scope or should be dismissed for social or regulatory issues.	
N.B. all scoring above indicates greater benefit with higher score		