

Summary of the Quality Waters Strategy Fund Investments for the  
Three-Year Period 2018/2019 to 2020/2021

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## Executive Summary

Freshwater sport fishing in British Columbia is managed by the provincial government to maintain healthy fish populations and return social and economic benefits to the Province. The province has over 20,000 lakes and more than 750,000 kilometers of streams that support 24 different fish species targeted by anglers. BC is blessed with world class rivers and unique fisheries that occur in wilderness and semi-wilderness areas of unparalleled quality. Licensing of freshwater anglers is the sole responsibility of the Province of British Columbia. Revenue derived from the fee component of non-tidal angling licences is managed under contract to the Freshwater Fisheries Society of BC. The surcharge component of those licences is directed to the Habitat Conservation Trust Foundation (HCTF) by the British Columbia *Wildlife Act*.

Some of the revenue generated from angling licences is a result of steelhead, salmon and trout fisheries based on the province's premier angling streams or Quality Waters. The value of surcharges on these licences has changed since its inception in 1990 whenever licence pricing has changed. Licensed angling guides on Classified Waters pay annual rod day fees in order to operate on these Quality Waters. In 2017 the Province and the HCTF entered into an agreement for the administration and investment of restricted revenues (Quality Waters Funds) associated with the recreational and commercial use of the freshwater fisheries on classified or quality waters in British Columbia (Anon. 2017). This report summarizes the expenditures of the licence surcharge component of the revenue generated from the province's Quality Waters for the three-year pilot project period from 2018/2019 to 2020/2021. It documents the financial administration and project investment activities of the Habitat Conservation Trust Foundation.

### Project Investments

Project investments were made in five different fish and wildlife management regions: Cariboo (Region 5), Kootenay (Region 4), Skeena (Region 6), Thompson (Region 3) and West Coast (Region 1). The following table summarizes these investments. Nearly \$1.30 million was requested and approved by HCTF for Quality Waters Strategy projects. Over \$1.11 million was expended on Quality Waters during the reporting period. Two main activities accounted for

most of the investments (River Guardian and Stock Assessment projects). Angling management planning and information database development activities accounted for the remainder. Cariboo, Kootenay and Skeena regions received 34.4%, 34.1% and 24.4% of the funding respectively. West Coast Region received fewer funds (4.4%) which correlates with the region having fewer classified waters. Thompson Region only received funds for a single year (2018/2019; 1.6%) to support an on-going River Guardian project to monitor compliance with interior Fraser steelhead conservation closures on the Thompson River. To some degree every region's actual expenditures were less than the funding requested and approved.

<b>Region</b>	<b>Total (budgeted)</b>	<b>Angling Management Plans</b>	<b>River Guardian</b>	<b>Stock Assessment</b>	<b>Information -database</b>	<b>Total (actual)</b>
<b>Cariboo</b>	\$420,903	\$0	\$383,508	\$0	\$0	\$383,508 (34.4%)
<b>Kootenay</b>	\$407,500	\$12,670	\$262,352	\$74,839	\$30,000	\$379,861 (34.1%)
<b>Skeena</b>	\$354,000	\$1,146	\$0	\$270,984	\$0	\$272,130 (24.4%)
<b>Thompson</b>	\$24,860	\$0	\$17,823	\$0	\$0	\$17,823 (1.6%)
<b>West Coast</b>	\$89,325	\$0	\$38,899	\$21,285	\$0	\$60,184 (4.4%)
<b>Total</b>	<b>\$1,296,588</b>	<b>\$13,816</b>	<b>\$702,582</b>	<b>\$367,107</b>	<b>\$30,000</b>	<b>\$1,113,506</b>

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## Introduction

Angling in British Columbia is important socially, culturally and economically. It provides an opportunity for residents and out-of-province anglers to engage in the sport of fishing in some of the province's most beautiful places. BC offers a diverse range of angling opportunities ranging from large lake fisheries for Rainbow Trout, Lake Trout and Kokanee, small lake fisheries for both wild and stocked trout, river fisheries for anadromous summer run and winter run Steelhead and various salmon species, and to inland trout fisheries for resident Rainbow Trout, Westslope Cutthroat Trout and Bull Trout. BC's vastness means that a small number of these river fisheries offer a world class fishing opportunity. Since 1990, 50 of these rivers have been managed under special angling regulations that require the purchase of a classified waters licence in order to participate. Commercial angling guides operating on these waters are also required to pay annual rod day fees to guide clients on these waters (Anon. 2017).

Angling licence fee structure is determined by the Province of British Columbia under the *Wildlife Act* and its regulations. When an angler purchases a freshwater or non-tidal angling licence, the licence fee is comprised of two components: a fee component and a surcharge component. When combined they add up to what the angler or angling guide pays for a licence or authorization. The Province receives 100% of the fee component and it is deposited into the Consolidated Revenue Fund (CRF) while the Habitat Conservation Trust Foundation (HCTF) receives 100% of the surcharge component (Silver 2015). Surcharge revenues derived from annual and daily classified waters licences and rod day fees are held in the Quality Waters Fund (QWF) which is a "restricted" fund within the HCTF. It is managed jointly by HCTF and the Province under a Memorandum of Understanding (MOU; Anon. 2017). It is noteworthy that only the licence fee increases implemented after 1997 on classified waters angling licences and rod day fees paid by angling guides are dedicated to the restricted QWF while the remainder is dedicated to HCTF's Main Fund. The Quality Waters Fund was established to fund projects that support the implementation of the Quality Waters Strategy (Anon. 2017). The MOU sets out a process to fund projects, the type of projects that are eligible (see Appendix 1) and the types of projects that are ineligible (see Appendix 2) for funding.

A synopsis of the four categories of the types of projects and activities eligible for funding under the QWF are as follows:

1. Fishery development and planning
  - Angling management planning
2. Fishery implementation
  - River Guardian (creel survey/fishery monitoring) programs
3. Fishery information
  - Analytical tools and support
  - Stock assessment
  - Information (data and database)
4. Administrative coordination

Currently, only government-led projects can access Quality Waters Funds. Project activities must be directed on Classified Waters as designated in the Angling and Scientific Collection Regulation BC Regulation 125/90 (Appendix 3; Anon. 2019).

A three-year pilot program for the implementation of the QWF was initiated in 2017 beginning in fiscal year 2018/2019 and concluding in 2020/2021. Each Fish and Wildlife region submitted a three-year plan for their proposed activities to be funded by the QWF which is approved by the HCTF. Amendments to these regional investment plans are allowed pending the approval by HCTF. Each year regional project leaders submitted an annual report to the HCTF which summarized their expenditures, outcomes and project results. This report summarizes these investments and projects completed during the period 2018/2019 to 2020/2021.





Figure 1. Map of British Columbia showing locations of the projects delivered under the Quality Waters Strategy program for the period 2018/2019 to 2020/2021.

## Results and Discussion

### Year 1 – Fiscal Year 2018/2019

In 2018/2019, five regions accessed funds from the Quality Waters Fund. The Cariboo (\$108.2k; 30.8%), Skeena (\$107.4k; 30.6%) and Kootenay (\$93.2k; 26.5%) regions received the greatest amount of funding while the West Coast (Vancouver Island; \$24.9k; 7.1%) and Thompson (\$17.8k; 5.1%) regions received the least (Figure 2). All regions expended slightly less (actual) than was budgeted (Figure 2).

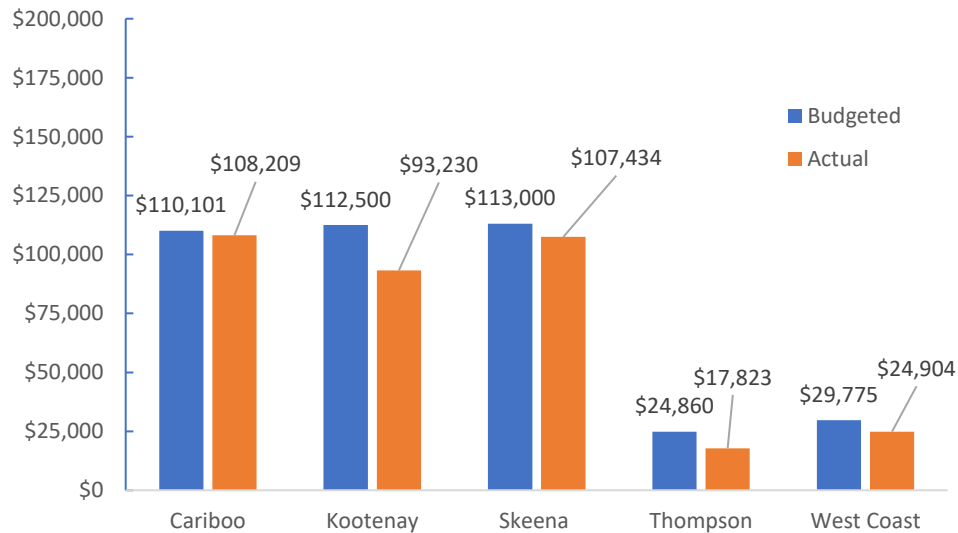


Figure 2. Expenditures (budgeted and actual) by Region for fiscal 2018/2019.

Provincially, a total of \$351.6k was expended in 2018/2019 (Table 1). The majority was allocated to River Guardian projects (\$201.8k) followed by stock assessment projects (\$139.8k) and angling management planning projects (\$9.9k; Figure 3).

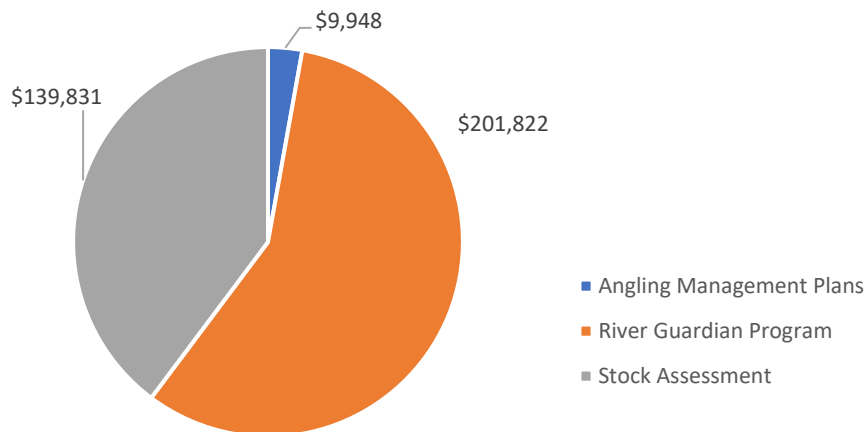


Figure 3. Provincial expenditures by activity in fiscal 2018/2019.

When this was examined by region it was evident that Cariboo, Kootenay, Thompson and West Coast regions all conducted significant River Guardian projects in 2018/2019 (Figure 4). Skeena Region prioritized stock assessment projects above all others while Kootenay and West Coast conducted smaller stock assessment programs. Only Kootenay Region undertook angling management planning activities (Figure 4).

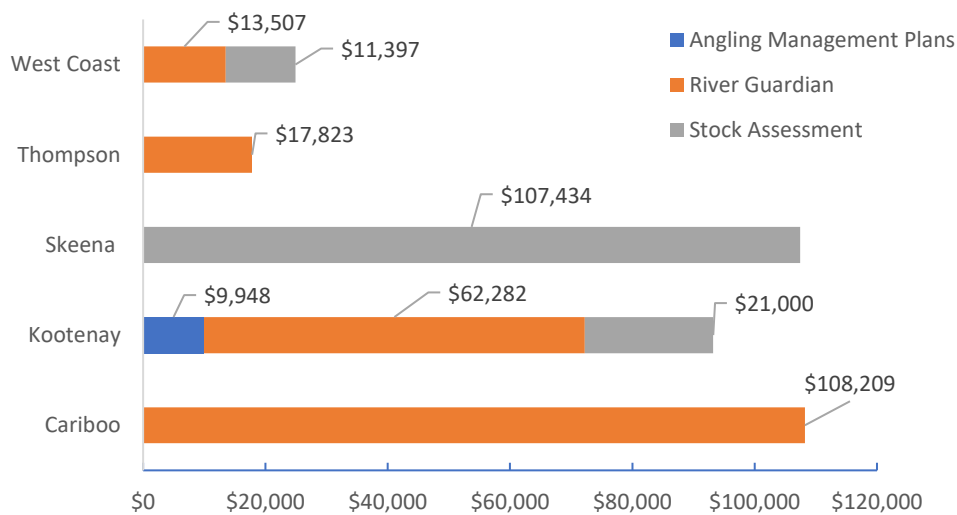


Figure 4. Expenditures by Region and Activity in fiscal 2018/2019.

In 2018/2019, nearly three quarters of the funds (72.8%; Table 1) were spent on labour across all the regions. A modest 4.5% was spent on travel (Table 1) and 8-9% was expended for materials and other supplies (Table 1). 5.4% was spent on capital items by the Cariboo Region to support river guardian programs on the Dean River (Table 1).

Table 1. Breakdown of regional expenditures by type in fiscal 2018/2019.

Region	Labour	Materials	Travel	Other	Capital	Total
<b>Cariboo</b>	\$62,615 (57.9%)	\$18,810 (17.4%)	\$7,655 (7.1%)	\$0 (0%)	\$19,129 (17.7%)	\$108,209
<b>Kootenay</b>	\$55,297 (59.3%)	\$7,839 (8.4%)	\$5,750 (6.2%)	\$24,345 (26.1%)	\$0 (0%)	\$93,230
<b>Skeena</b>	\$104,854 (97.6%)	\$2,580 (2.4%)	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$107,434
<b>Thompson</b>	\$17,598 (98.7%)	\$0 (0%)	\$190 (1.1%)	\$35 (0.2%)	\$0 (0%)	\$17,823
<b>West Coast</b>	\$15,580 (62.6%)	\$2,630 (10.6%)	\$2,401 (9.6%)	\$4,294 (17.2%)	\$0 (0%)	\$24,904
<b>Total</b>	\$255,943 (72.8%)	\$31,859 (9.1%)	\$15,996 (4.5%)	\$28,674 (8.2%)	\$19,129 (5.4%)	\$351,600

## Summary of Outcomes and Deliverables for Each Region in 2018/2019

### Cariboo Region

In 2018/2019, Cariboo Region completed a River Guardian project on the Dean River (June-September 2018; see Figure 1). Compliance with angling regulations and angling effort targets was high. The fishery supported 3,011 angler days. The Dean River return was estimated to be 4,181 Steelhead. The results of this program are summarized in Wieduwilt (2018).

Additionally, a River Guardian program was implemented on the Chilcotin River in partnership with the Tsilhqot'in National Government (Figure 1). Compliance with interior Fraser summer Steelhead fishing closures was high.

## **Kootenay Region**

A River Guardian program was completed on eight East Kootenay classified waters in 2018 (Figure 1). Angler surveys and compliance checks were completed on these waters with multiple objectives (i.e. creel, effort, CPUE, compliance and angler education included). 1,080 anglers were interviewed and a non-compliance rate of 14% was observed. Two stock assessments were completed in 2018/2019. Bull Trout redd counts were conducted on selected river systems in 19 index reaches. Results indicated that Bull Trout populations are currently stable. Westslope Cutthroat Trout inventories were completed on the Upper St. Mary, Middle/North forks of the White and Wigwam rivers. Results indicated that Westslope Cutthroat Trout populations are currently stable. Lastly, the Kootenay Angling Management Plan Review Committee (KAMPRC) met in 2018/2019 to complete the four-year review of all Kootenay classified waters Angling Management Plans (AMPs). This committee included representatives for government (provincial and First Nations), BCWF, resident anglers, tourism, angling guides, etc. The KAMPRC made recommendations for incorporation in future revisions of the current AMPs.

## **Skeena Region**

Skeena Region did not complete any projects related to fishery development or angling management planning in 2018/2019. Skeena Region completed several stock assessment projects relating to Skeena summer Steelhead. The Department of Fisheries and Oceans (DFO) operates a gillnet-based test fishery located at Tyee on the Lower Skeena River (Figure 1). The operation was extended from August 24 to late September 2018 to cover most of the summer Steelhead return. A Skeena Steelhead aggregate population estimate was generated, and genetic and scale samples were collected to provide key stock identification and size at age data. Gitanyow First Nation surveyed its members to generate first estimates of harvest of overwintering summer Steelhead for food, social and ceremonial purposes. Kitwanga River Steelhead were enumerated using a Didson sonar system and is a middle Skeena indicator stock. Finally, Wet'suwet'en Fisheries operated a mark and recapture project at Witset Canyon (formerly Moricetown) to generate an abundance estimate for the Bulkley/Morice Steelhead ecotype (Figure 1).

## **Thompson Region**

The Thompson Region attempted to complete a field-based River Guardian program on the Thompson River in 2018/2019 (Figure 1). The Thompson River steelhead sport fishery was closed in summer 2018 prior to the start of the fishery due to increasing conservation concern and concern with the continuation of bycatch in other fisheries. River Guardian activities were undertaken to assist with the implementation of this closure. Compliance by licensed recreational anglers was found to be very high. Some First Nation angling effort was observed, and some enforcement actions were taken in cases where Steelhead were killed, and guardian survey data were used to estimate the possible range of Steelhead harvest (described in Phelps and Bison 2018). Given the profile of the sport fishery and the well-known conservation status of Thompson River Steelhead, compliance by sport anglers was expected to be high. Continuation of the Thompson River Guardian monitoring program in 2019/2020 and beyond was deemed (by Region) to be no longer applicable as all the remaining angling activity was in the form of some First Nation fishing effort. The implementation and enforcement of the closure continues as a priority activity with the Conservation Officer Service (R. Bison, pers. comm.). However, the program was cancelled due to safety concerns for River Guardians who received threats from the public during 2018. In October 2018 compliance patrols were abandoned due to concerns for staff safety.

## **West Coast Region**

In 2018/2019, West Coast Region completed a River Guardian program in partnership with the Haida Nation on several Haida Gwaii streams between November 2018 and February 2019 (Figure 1). Juvenile Steelhead stock assessments were completed on the Yakoun River. Planning for a stakeholder led (Tlell Watershed Society) project to tag adult Coastal Cutthroat Trout on the Tlell River was initiated.

## Year 2 – Fiscal Year 2019/2020

In 2019/2020, four regions accessed funds from the Quality Waters Fund. The Cariboo (\$164.4k; 39.2%), Kootenay (\$148.5k; 35.4%) and Skeena (\$82.3k; 19.6%) received the greatest amount of funding while the West Coast region (Vancouver Island; \$24.1k; 5.7%) received the least (Figure 5). It is worth noting that the Thompson Region did not request any funds in 2019/2020. Skeena and West Coast regions expended slightly less (actual) than was budgeted, the Cariboo Region spent the budgeted amount and the Kootenay Region slightly exceeded their budgeted amount (Figure 5).

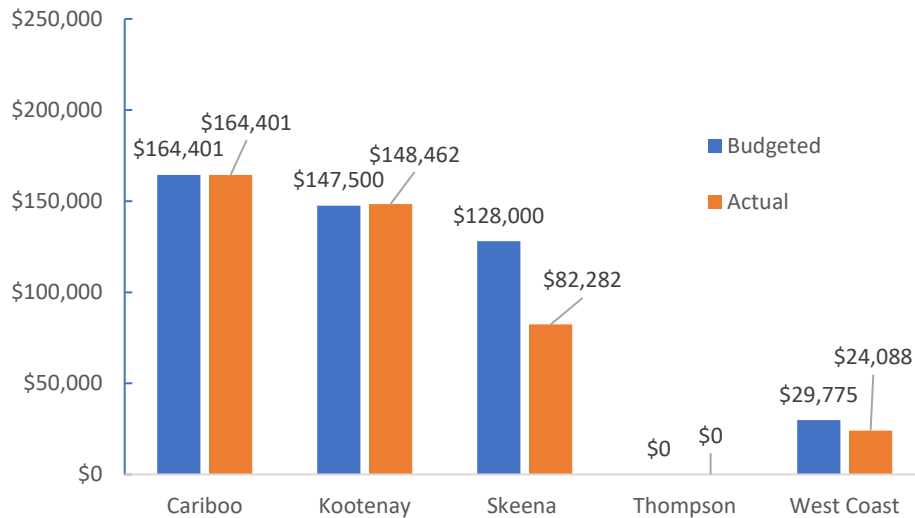


Figure 5. Expenditures (budgeted and actual) by Region for fiscal 2019/2020.

Provincially, a total of \$419.2k was expended in 2019/2020 (Table 2). This was 19.2% higher than 2018/2019 (Figure 11). The majority (\$282.1k; increase from previous year) was allocated to River Guardian projects followed by stock assessment projects (\$119.3k; decrease from previous year) and angling management planning projects (\$2.9k; decrease from previous year; Figure 6). In 2019/2020, an information/database project was also funded (\$15.0k; Figure 6) and delivered by staff in the Kootenay Region.

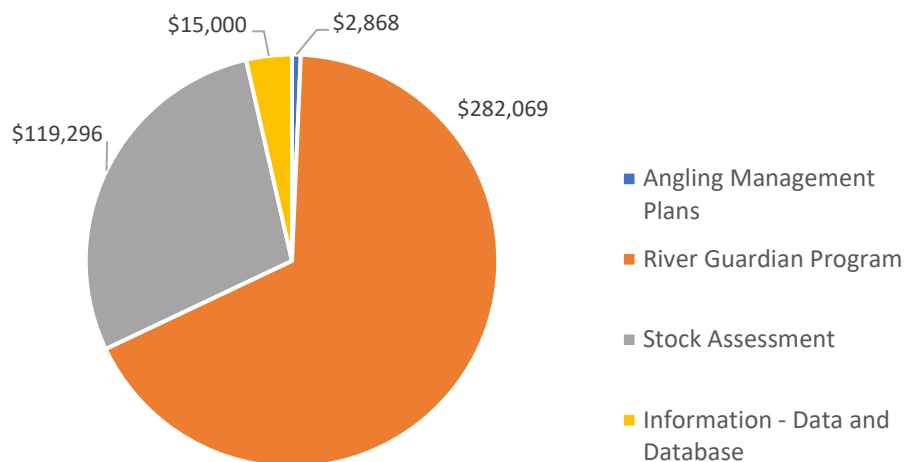


Figure 6. Provincial expenditures by activity in fiscal 2019/2020.

When this was examined by region it was evident that Cariboo, Kootenay and West Coast regions all conducted significant River Guardian projects in 2019/2020 with the Cariboo Region project increasing the most from the previous year. This was a result of the capital purchase of a new jet boat and trailer for the Dean River Guardian program. Skeena Region prioritized stock assessment projects above all others while Kootenay and West Coast conducted smaller stock assessment programs. Both Skeena and Kootenay regions undertook small angling management planning activities (Figure 7).

In 2019/2020, just under two thirds (63.2%; Table 2) of the total expenditures was spent on labour across all the regions. A modest 4.1% was spent on travel (Table 2) and 17.9% and 8.9% respectively were expended for materials and other supplies (Table 2). 5.9% was spent on capital items by the Cariboo Region to support River Guardian programs on the Dean River (Table 2; described above).



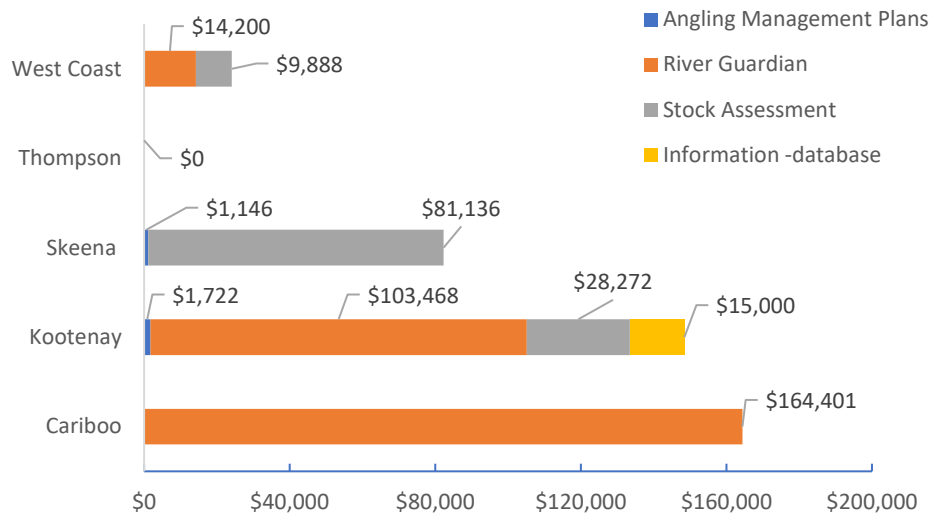


Figure 7. Expenditures by Region and Activity in fiscal 2019/2020.

Table 2. Breakdown of regional expenditures by type in fiscal 2019/2020.

Region	Labour	Materials	Travel	Other	Capital	Total
<b>Cariboo</b>	\$72,495 (44.1%)	\$59,361 (36.1%)	\$7,818 (4.8%)	\$0 (0%)	\$24,727 (15.0%)	\$164,401
<b>Kootenay</b>	\$95,021 (64.0%)	\$12,552 (9.5%)	\$5,571 (3.8%)	\$35,318 (23.8%)	\$0 (0%)	\$148,462
<b>Skeena</b>	\$78,905 (95.9%)	\$3,146 (3.8%)	\$230 (0.3%)	\$0 (0%)	\$0 (0%)	\$82,282
<b>Thompson</b>	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$0
<b>West Coast</b>	\$18,692 (77.6%)	\$0 (0%)	\$3,493 (14.5%)	\$1,903 (17.9%)	\$0 (0%)	\$24,088
<b>Total</b>	\$265,114 (63.2%)	\$75,059 (17.9%)	\$17,112 (4.1%)	\$37,221 (8.9%)	\$24,727 (5.9%)	\$419,233

## **Summary of Outcomes and Deliverables for Each Region in 2019/2020**

### **Cariboo Region**

In 2019/2020, Cariboo Region completed a River Guardian project on the Dean River (June-September 2019). Compliance with angling regulations and angling effort targets was high. The fishery supported 3,281 angler days. The Dean River return was estimated to be 1,994 Steelhead. The results of the program are summarized in Leong (2019). A River Guardian program was implemented on the Chilcotin River in partnership with the Tsilhqot'in National Government to monitor compliance with the spring 2020 fishing closures. Compliance with interior Fraser summer Steelhead fishing closures was high in 2020. Cariboo Region spent \$24.8k on two approved capital items this year (boat and a utility trailer) to support the safe delivery of the Dean River Guardian program.

### **Kootenay Region**

A River Guardian program was completed on eight East Kootenay classified waters in 2019. Angler surveys and compliance checks were completed on these waters with multiple objectives (creel, effort, CPUE, compliance and angler education). 1,071 anglers were interviewed and a non-compliance rate of 11% was observed. Two stock assessments were completed in 2019/2020. Bull Trout redd counts were conducted on selected index reaches on Blackfoot Creek, White River, Wigwam River and Skookumchuck Creek. Results indicated that Bull Trout populations are currently stable. Westslope Cutthroat Trout (WCT) inventories were completed on the Lower St. Mary River, North fork of White River and Bull River in 2019/2020. Results indicate that WCT populations are currently stable. The Kootenay Angling Management Plans are undergoing review and progress was made on these Kootenay classified waters Angling Management Plans (AMPs). In 2019/2020, Kootenay Region undertook an information project to create a MS Access River Guardian database and to load all Kootenay Region and Skeena Region River Guardian program data into a searchable provincial database (A. Chirico, pers. comm.). This would provide access to this information to all regions.

## **Skeena Region**

Skeena Region completed several stock assessment projects related to Skeena summer Steelhead. DFO operates a gillnet-based test fishery located at Tye on the Lower Skeena River. The operation was extended from August 24 to late September 2019 to cover most of the summer Steelhead return. A Skeena Steelhead aggregate population estimate was generated, and genetic and scale samples were collected to provide key stock identification and size at age data. Gitanyow First Nation surveyed its members to generate estimates of harvest of overwintering summer steelhead for food, social and ceremonial purposes. Kitwanga River Steelhead were enumerated using a Didson sonar system and is a middle Skeena indicator stock. Wet'suwet'en Fisheries conducted a mark and recapture project at Witset Canyon (formerly Moricetown) to generate an abundance estimate for the Bulkley/Morice Steelhead ecotype. The results for both 2018 and 2019 are summarized in a regional report (see Saimoto and Saimoto 2021). Skeena Region undertook a small signage project on the Bulkley, Morice, and Kispiox rivers to support fishery development and angling management planning in 2019/2020.

## **Thompson Region**

No activities were planned or undertaken by the Thompson Region in 2019/2020 as Thompson Region did not request funding for the delivery of a River Guardian program on the Thompson River.

## **West Coast Region**

In 2019/2020, West Coast Region completed a River Guardian program in partnership with the Haida Nation on the Yakoun River. River Guardians contacted 45 anglers from 22 fishing parties. The project yielded interesting spatial and temporal insights into Steelhead angling effort. Stock assessment of juvenile Steelhead in the Yakoun River was planned but an unusual September freshet event forced its cancellation. See Sebbald (2020) for a full summary of the Haida Gwaii River Guardian program for 2018/2019 and 2019/2020. For a second year, a partnership with the Tlell Watershed Society (TWS) was pursued to deliver an adult Coastal Cutthroat Trout tagging project on the Tlell River however the TWS was unable to deliver on its tagging commitments. West Coast Region is no longer pursuing this project.

### Year 3 – Fiscal Year 2020/2021

In 2020/2021, four regions accessed funds from the Quality Waters Fund. The Cariboo (\$110.9k; 32.4%), Kootenay (\$138.2k; 40.3%) and Skeena (\$82.4k; 24.1%) received the greatest amount of funding while the West Coast Region (Vancouver Island; \$11.2k; 3.37%) received the least (Figure 8). For the second year in a row, the Thompson Region did not request any funds in 2020/2021. All regions were significantly underspent (actual versus budgeted) in 2020/2021 which was attributed to a variety of impacts of COVID-19 restrictions (Figure 8). This is discussed further in the summary of outcomes and deliverables section below.

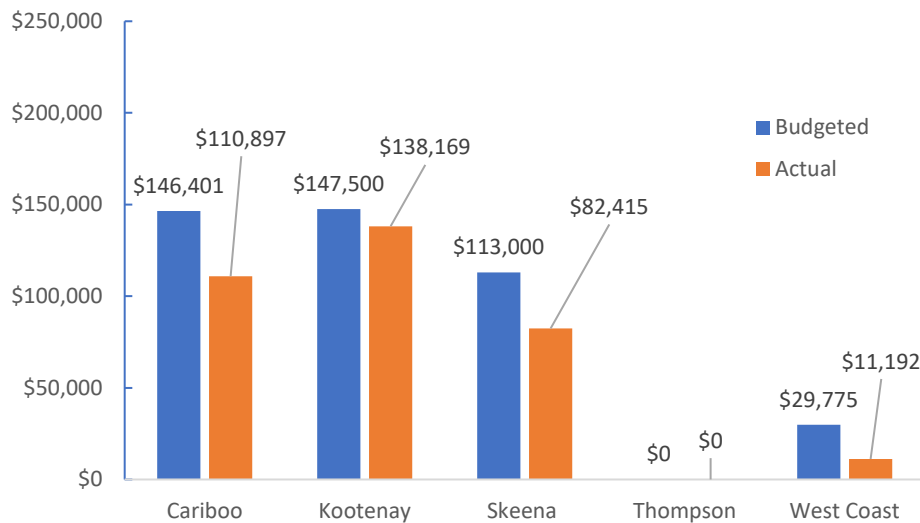


Figure 8. Expenditures (budgeted and actual) by Region for fiscal 2020/2021.

Provincially, a total of \$342.7k was expended in 2020/2021 (Table 3). This was significantly less (18.3%) than was expended in 2019/2020 (Figure 11). All regions reported that COVID-19 restrictions significantly impacted their ability to deliver or cancelled some components of their projects in 2020/2021 which contributed to reduced expenditures. Additionally, there were no capital expenditures in 2020/2021 (Table 3). The majority of funds (\$218.7k, decrease from previous year) were allocated to River Guardian projects followed by stock assessment projects (\$108.0k; decrease from previous year) and angling management planning support projects

(\$1.0k; decrease from previous year; Figure 9). In 2020/2021, the River Guardian information/database project was funded for a second year (\$15.0k; Figure 9).

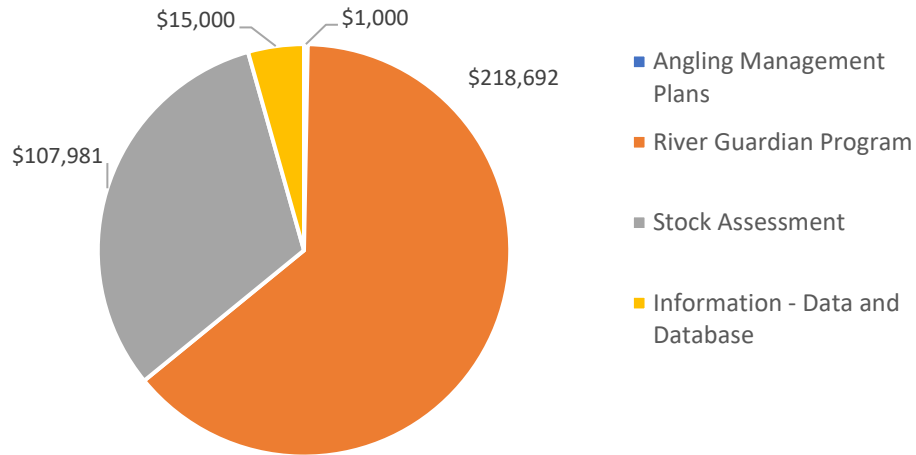


Figure 9. Provincial expenditures by activity in fiscal 2020/2021.

When this was examined by region it was evident that Cariboo, Kootenay and West Coast regions all conducted significant River Guardian projects in 2020/2021 although the West Coast Region River Guardian project was less costly. Skeena Region prioritized stock assessment projects above all others while Kootenay conducted a smaller stock assessment program. West Coast Region’s stock assessment project was cancelled due to COVID-19 impacts. Only the Kootenay Region conducted angling management planning activities (Figure 10). Kootenay Region delivered a second year of development of the provincial River Guardian database (Figure 10).

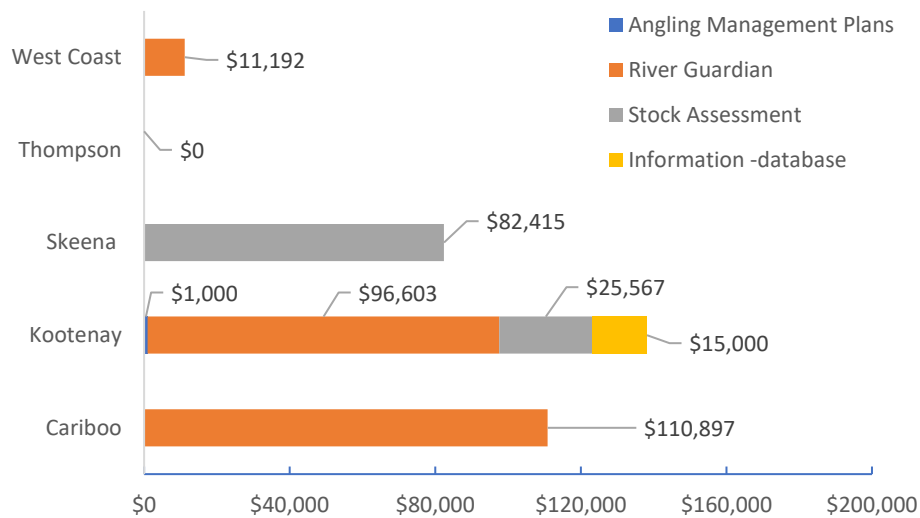


Figure 10. Expenditures by Region and Activity in fiscal 2020/2021.

In 2020/2021, over three quarters (75.5%; Table 3) of the total expenditures was spent on labour across all the regions. A modest 5.4% was spent on travel (Table 3) and 11.9% and 7.2% respectively were expended on materials and other supplies (Table 3). As stated previously no funds were spent on capital items in 2020/2021 (Table 3; described above).

Table 3. Breakdown of regional expenditures by type in fiscal 2020/2021.

Region	Labour	Materials	Travel	Other	Capital	Total
<b>Cariboo</b>	\$64,775 (58.4%)	\$30,021 (27.1%)	\$10,101 (9.1%)	\$6,000 (5.4%)	\$0 (0%)	\$110,897
<b>Kootenay</b>	\$100,480 (72.7%)	\$10,653 (7.7%)	\$8,431 (6.1%)	\$18,606 (13.5%)	\$0 (0%)	\$138,169
<b>Skeena</b>	\$82,287 (99.8%)	\$0 (0%)	\$119 (0.2%)	\$0 (0%)	\$0 (0%)	\$82,415
<b>Thompson</b>	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$0
<b>West Coast</b>	\$11,192 (100%)	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$11,192
<b>Total</b>	\$258,733 (75.5%)	\$40,682 (11.9%)	\$18,651 (5.4%)	\$24,606 (7.2%)	\$0 (0%)	\$342,673

## **Summary of Outcomes and Deliverables for Each Region in 2020/2021**

### **Cariboo Region**

In 2020/2021, the Dean River Guardian program operated between June and September to survey Steelhead anglers. River patrols were conducted at least 4 times per week during this period. No angling infractions were observed by River Guardians on the Dean River in 2020. Compliance with the AMP was high. Due to the abnormally low angler effort resulting from COVID-19 related travel restrictions, Steelhead escapement and angler effort estimates were not generated in 2020/2021. The results of the program are summarized in Leong (2020).

Beginning in 2020/2021, enforcement patrols on the Chilcotin River were conducted by the BC Conservation Officer Service (COS) in partnership with Tsilhqot'in National Government. Fishing effort has been very low and compliance with closures has been high. The 2020/2021 compliance data can be obtained from the COS. Responsibility for the enforcement program on the Chilcotin River has been transferred to the COS and support from HCTF is no longer required. The 2020/2021 Horsefly River creel survey was cancelled due to the impacts of the COVID-19 pandemic. The survey has been deferred to 2021/2022.

The Dean River is a remote river with fly-in or boat-in only access and a cabin is an essential piece of infrastructure needed to deliver the River Guardian program. Cariboo Region applied to replace the River Guardian cabin on the Dean and it was funded over three fiscal years. The project included the deconstruction and removal of the 30+ year old existing cabin (\$10k), the purchase of building materials (\$37k), the transport of materials costs (by barge) and the new cabin construction costs (\$20k). The total cost of the new River Guardian cabin was \$67,000 over the period 2018-2021.

### **Kootenay Region**

A River Guardian program was completed on eight East Kootenay classified waters in 2020. Angler surveys and compliance checks were completed on these waters with multiple objectives (creel, effort, CPUE, compliance and angler education). 800 anglers were interviewed and a non-compliance rate of 13% was observed. Interestingly, overall angling effort was not

significantly reduced by COVID-19 travel restrictions as declines in non-resident alien anglers were compensated by increased BC resident and Canadian angler participation (K. Heidt, pers. comm.). Two stock assessments were completed in 2020/2021. Bull Trout redd counts were conducted on 27 index reaches on several East Kootenay rivers. Results indicated that Bull Trout populations are currently stable. Redd counts suggested that some systems (White River mainstem and lower Bull River), may require changes to regional retention/size regulations but additional surveys are needed to fully evaluate this. Westslope Cutthroat Trout (WCT) inventories were completed on three systems in 2020/2021. Results indicate that WCT populations are currently stable. Kootenay Region has summarized the results of annual BT and WCT monitoring programs and East Kootenay River Guardian programs for the five-year period 2015-2020 (see Heidt 2021). The Kootenay Angling Management Plans have been reviewed and revised Angling Management Plans (AMPs) for East Kootenay classified waters will be developed in 2021. Kootenay Region has completed year two of the information project to load all River Guardian (RG) data into a searchable MS Access database. To date, all Kootenay Region RG data has been entered into the database up to 2020. Skeena Region RG data from the Bulkley, Kispiox, Skeena, and Zymoetz rivers have been entered. Thompson Region RG data from the Clearwater, Fraser, Mahood and Thompson rivers and Kamloops Lake have been entered. West Coast Region RG data from the Dean and Yakoun rivers have been entered. A pilot field data entry application has been developed and is ready for field testing. Some preliminary data queries have also been developed to assist with searching the database (A. Chirico, pers. comm.).

### **Skeena Region**

Skeena Region completed several stock assessment projects relating to Skeena summer Steelhead. DFO operates a gillnet-based test fishery located at Tyee on the Lower Skeena River. The operation was extended from August 24 to late September 24, 2020 to cover most of the summer Steelhead return. A Skeena Steelhead aggregate population estimate was generated, and genetic and scale samples were collected to provide key stock identification and size at age data. Gitanyow First Nation surveyed its members to generate estimates of harvest of overwintering summer Steelhead for food, social and ceremonial purposes in 2020/2021. Due to COVID-19 concerns the Didson sonar Kitwanga Steelhead enumeration project was not conducted in



2020/2021. Wet'suwet'en Fisheries conducted a mark and recapture project at Witset Canyon (formerly Moricetown) to generate an abundance estimate for the Bulkley/Morice Steelhead ecotype. Due to COVID-19 and Skeena Region staff shortages, the angling management planning activities for Bulkley, Morice and Kispiox rivers were not completed in 2020/2021. Skeena Region reported that the past three years have been extremely challenging for fisheries staff as the Skeena fisheries section has been understaffed since 2019. This resulted in the sections inability to complete some of their proposed QWS activities. COVID-19 further exasperated this situation by reducing the staff's ability to participate in and complete annual stock assessment and quality waters projects. (K. Miyazaki, pers. comm.)

### **Thompson Region**

No activities were planned or undertaken by the Thompson Region in 2020/2021.

### **West Coast Region**

In 2020/2021, West Coast Region completed a River Guardian program in partnership with the Haida Nation on the Yakoun River on Haida Gwaii between November 2020 and March 2021. River Guardians contacted 31 anglers from 21 fishing parties on the Yakoun River. Access was restricted due to the impacts of COVID-19 and extreme wind events. The project continued to yield interesting spatial and temporal insights into Steelhead angling effort on the Yakoun River. See Sebbald (2021) for a full summary of the Yakoun River Guardian program on Haida Gwaii. Stock assessment of juvenile Steelhead in the Yakoun River was planned for 2020/2021 but COVID-19 travel restrictions to Haida Gwaii forced its cancellation. No activities were planned or undertaken on the Tlell River or classified waters on the mainland coast in 2020/2021.

## Provincial Roll Up

Provincially, the expenditures varied between years with 2020/2021 seeing a significant drop in expenditures due to the impacts of the restrictions enacted by the Provincial Health Officer to address the COVID-19 virus outbreak in BC (Figure 11). Regions requested the greatest amount of funding in fiscal year 2019/2020 (budgeted) and corresponded to the highest actual expenditures during the three-year period (Figure 11 and Table 4). Actual expenditures were similar in year one (2018/2019) and three (2020/2021) even though substantially more money was allocated in 2020/2021 (Figure 11). This due to the inability to complete project components due to COVID-19 restrictions in 2020.

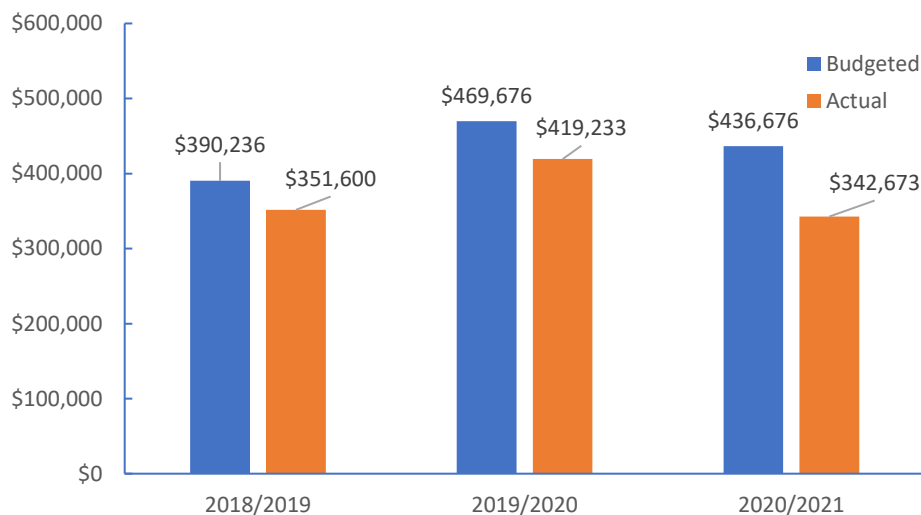


Figure 11. Annual Quality Waters Strategy funds (budgeted and actual) expended for the three-year period 2018/2019 to 2020/2021.

For the three-year period most of the funds were allocated to River Guardian projects (\$702.6k), followed by stock assessment projects (\$367.1k), information database development (\$30.0k) and angling management planning activities (\$13.8k; Figure 12 and Table 4). Funding allocation varied between regions as well with the Cariboo (\$383.5k) and Kootenay (\$379.9k) regions spending the most funds followed by Skeena (\$272.2k), West Coast (\$60.2k) and Thompson regions (\$17.8k; Figure 13).

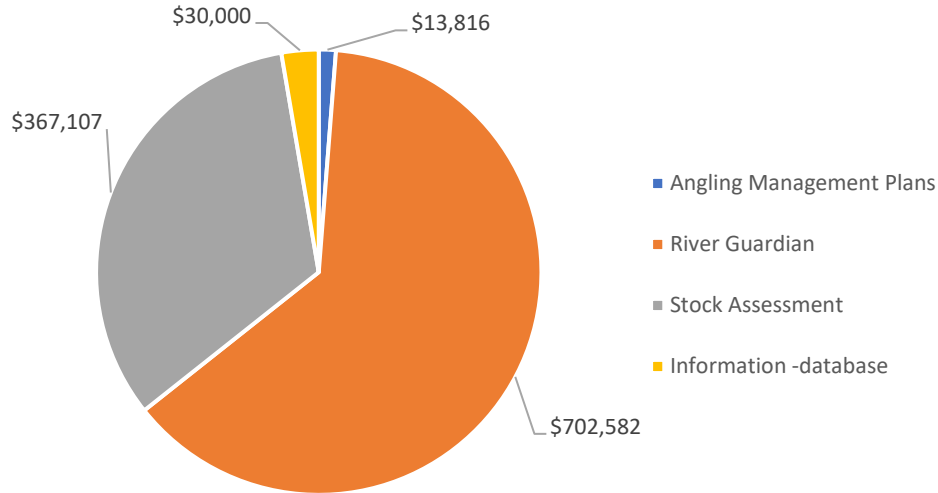


Figure 12. Cumulative Quality Waters Strategy funds expended by activity type for the three-year period 2018/2019 to 2020/2021.

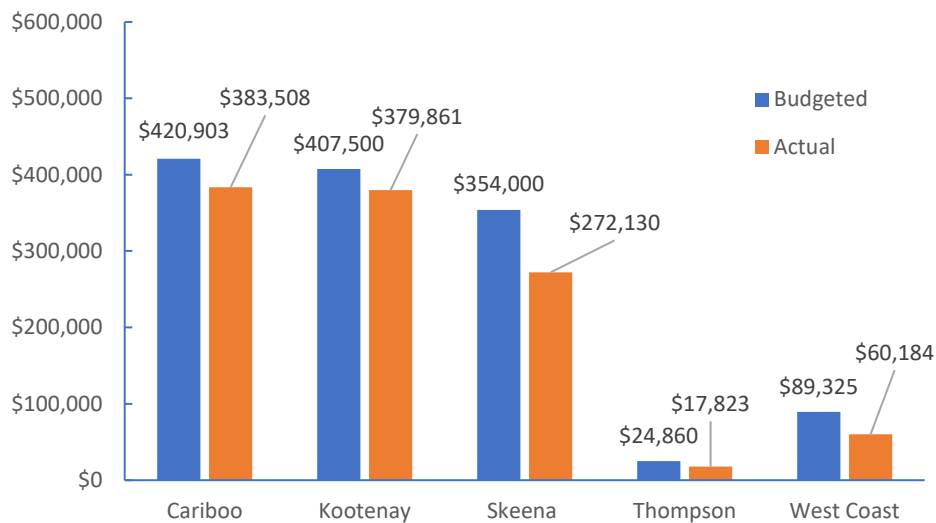


Figure 13. Cumulative Quality Waters Strategy funds (budgeted and actual) expended by the five regions for the three-year period 2018/2019 to 2020/2021.

For the three-year period, Cariboo Region allocated all its Quality Waters Strategy funds to deliver River Guardian programs on the Dean and Chilcotin rivers (Figure 14). Kootenay Region spread its funding over four activity types in descending order: River Guardian programs

on East Kootenay classified waters, annual stock assessments of Bull Trout and Westslope Cutthroat Trout that drive the classified waters fisheries, database development for RG data, and angling management planning activities (Figure 14 and Table 4). Skeena Region focused its funding on high priority Steelhead stock assessment programs on the Skeena, Kitwanga and Bulkley/Morice rivers over the other eligible activities (Figure 14). West Coast Region spent most of its funds on River Guardian programs on the Yakoun River to develop a partnership with the Haida Nation to better understand this Haida Gwaii fishery and the remainder was allocated to winter Steelhead stock assessment projects (Figure 14). The Thompson Region was anomalous as it only requested funding in year 1 (2018/2019) to conduct a River Guardian project on the Thompson River. Thompson Region chose to forgo future requests as licensed angler compliance with the conservation closures was high and any fishing non-compliance was from Indigenous food, social and ceremonial fishers.

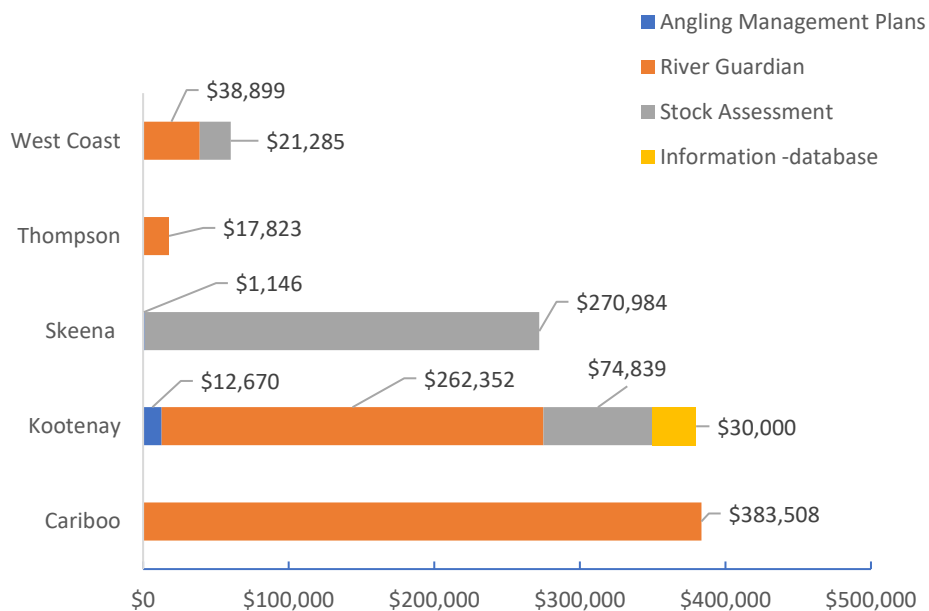


Figure 14. Cumulative Quality Waters Strategy funds expended by the five regions by activity type for the three-year period 2018/2019 to 2020/2021.

Table 4. Summary of Quality Waters Strategy Fund expenditures by Region and by activity type for the three-year period 2018/2019 to 2020/2021.

Region	Fiscal Year	Budgeted	Angling Management Plans	River Guardian	Stock Assessment	Information -database	Total (Actual)
Cariboo	2018/2019	\$110,101	\$0	\$108,209	\$0	\$0	\$108,209
	2019/2020	\$164,401	\$0	\$164,401	\$0	\$0	\$164,401
	2020/2021	\$146,401	\$0	\$110,897	\$0	\$0	\$110,897
<b>Cariboo</b>	<b>2018-2021</b>	<b>\$420,903</b>	<b>\$0</b> <b>(0%)</b>	<b>\$383,508</b> <b>(100%)</b>	<b>\$0</b> <b>(0%)</b>	<b>\$0</b> <b>(0%)</b>	<b>\$383,508</b>
Kootenay	2018/2019	\$112,500	\$9,948	\$62,282	\$21,000	\$0	\$93,230
	2019/2020	\$147,500	\$1,722	\$103,468	\$28,272	\$15,000	\$148,462
	2020/2021	\$147,500	\$1,000	\$96,603	\$25,567	\$15,000	\$138,169
<b>Kootenay</b>	<b>2018-2021</b>	<b>\$407,500</b>	<b>\$12,670</b> <b>(3.3%)</b>	<b>\$262,352</b> <b>(69.1%)</b>	<b>\$74,839</b> <b>(19.7%)</b>	<b>\$30,000</b> <b>(7.9%)</b>	<b>\$379,861</b>
Skeena	2018/2019	\$113,000	\$0	\$0	\$107,434	\$0	\$107,434
	2019/2020	\$128,000	\$1,146	\$0	\$81,136	\$0	\$82,282
	2020/2021	\$113,000	\$0	\$0	\$82,415	\$0	\$82,415
<b>Skeena</b>	<b>2018-2021</b>	<b>\$354,000</b>	<b>\$1,146</b> <b>(0.4%)</b>	<b>\$0</b> <b>(0%)</b>	<b>\$270,984</b> <b>(99.6%)</b>	<b>\$0</b> <b>(0%)</b>	<b>\$272,130</b>
Thompson	2018/2019	\$24,860	\$0	\$17,823	\$0	\$0	\$17,823
	2019/2020	\$0	\$0	\$0	\$0	\$0	\$0
	2020/2021	\$0	\$0	\$0	\$0	\$0	\$0
<b>Thompson</b>	<b>2018-2021</b>	<b>\$24,860</b>	<b>\$0</b> <b>(0%)</b>	<b>\$17,823</b> <b>(100%)</b>	<b>\$0</b> <b>(0%)</b>	<b>\$0</b> <b>(0%)</b>	<b>\$17,823</b>
West Coast	2018/2019	\$29,775	\$0	\$13,507	\$11,397	\$0	\$24,904
	2019/2020	\$29,775	\$0	\$14,200	\$9,888	\$0	\$24,088
	2020/2021	\$29,775	\$0	\$11,192	\$0	\$0	\$11,192
<b>West Coast</b>	<b>2018-2021</b>	<b>\$89,325</b>	<b>\$0</b> <b>(0%)</b>	<b>\$38,899</b> <b>(64.6%)</b>	<b>\$21,285</b> <b>(35.4%)</b>	<b>\$0</b> <b>(0%)</b>	<b>\$60,184</b>
All Regions	2018/2019	\$390,236	\$9,948	\$201,822	\$139,831	\$0	\$351,600
	2019/2020	\$469,676	\$2,868	\$282,069	\$119,296	\$15,000	\$419,233
	2020/2021	\$436,676	\$1,000	\$218,691	\$107,981	\$15,000	\$342,672
<b>All Regions</b>	<b>2018-2021</b>	<b>\$1,296,588</b>	<b>\$13,816</b> <b>(1.2%)</b>	<b>\$702,582</b> <b>(63.1%)</b>	<b>\$367,107</b> <b>(33.0%)</b>	<b>\$30,000</b> <b>(2.7%)</b>	<b>\$1,113,506</b>

## Summary of Capital Expenditures

In 2018/2019, Cariboo Region spent \$19.1k on two approved capital items that year (35 hp outboard jet engine and an inflatable raft) to support the safe delivery of the Dean River Guardian program (Table 1). In 2019/2020, Cariboo Region spent an additional \$24.8k on two approved capital items (boat and utility trailer) to support the delivery of the Dean River Guardian program (Table 2). No other regions requested capital funds during the period 2018 to 2021 (see Tables 1, 2 and 3).

## Summary of In-kind Contributions by FLNRORD Regions

Each region reported the estimated in-kind contributions that they contributed to the delivery of their respective projects on an annual basis. Over the three-year period \$470.9k worth of in-kind contributions were reported for the delivery of QWS projects (Table 5). The Kootenay Region made the largest contributions (by a factor of 10 compared to the other regions) to their projects over all years (Table 5). Both Skeena and Thompson regions made no in-kind contributions in 2018/2019 to deliver their projects which were valued at \$107.4k and \$17.8k respectively (see Table 1). These large variances between regions are likely due to differences in delivery model (i.e. delivery under contract) and a general lack of consistency in accounting and reporting.

Table 5. In-kind contributions reported by FLNRORD Regions to deliver Quality Waters Strategy Projects for the three-year period (2018/2019 to 2020/2021).

Region	In-kind Contributions			
	2018/2019	2019/2020	2020/2021	2018-2021
Cariboo	\$13,500	\$13,500	\$10,000	\$37,000
Kootenay	\$104,500	\$138,700	\$140,700	\$383,900
Skeena	\$0	\$15,000	\$15,000	\$30,000
Thompson	\$0	NA	NA	NA
West Coast	\$8,000	\$9,500	\$2,500	\$20,000
<b>Total</b>	<b>\$126,000</b>	<b>\$176,700</b>	<b>\$168,200</b>	<b>\$470,900</b>

## Summary of the Challenges to the QWS Program

A few challenges were evident from the review of the program delivery following the initial three-year period. Firstly, the impacts of the COVID-19 pandemic cannot be understated. The public health restrictions impacted government staff's ability to travel, conduct field work and to deliver projects. The pandemic also affected fishery participation and angling effort on some river fisheries that traditionally attract non-resident alien (non-Canadian) Steelhead anglers on the Dean and Skeena rivers and its tributaries. This was not observed on East Kootenay rivers where BC resident and Canadian anglers are more prevalent in these fisheries. COVID-19 also affected some key partners ability to deliver projects (i.e. Gitanyow First Nation). As with all field projects, environmental conditions such as un-seasonally high stream flows impacted the delivery of stock assessment projects on the Yakoun River (Haida Gwaii). Concerns for staff safety and the complexities of River Guardians monitoring indigenous fishers were also an unexpected delivery challenge. Staffing levels and capacity to deliver projects by regional staff was also identified as a significant challenge. Overall, regional submissions of data were good however more rigour and direction on how to estimate and account for in-kind contributions would be beneficial. The annual short form summary reports could be augmented if regional technical reports produced with this QWS funding were submitted to HCTF as additional reference material.

## Conclusions

The three-year pilot period pilot program for the new Quality Waters Strategy funding delivery model for the has been completed as per the agreement between the Habitat Conservation Trust Foundation and the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development. The Ministry delivered over \$1.1 million worth of projects on some of the provinces highest valued classified waters. Five different regions accessed these funds. The types of projects funded included: River Guardian/creel survey projects, stock assessment/monitoring projects, angling management planning activities and information/database management projects.

Most of the funds were expended on River Guardian (\$702.6k) and stock assessment projects (\$367.1k), followed by River Guardian information/database projects (\$30.0k) and then angling management planning activities (\$13.8k), respectively. The Cariboo and Kootenay regions received the most funds (\$383.5k and \$379.9k, respectively). Skeena Region received \$272.1k over the three years. West Coast and Thompson regions received the fewest funds (\$49.0k and \$17.8k, respectively). All funded projects were consistent with the memorandum of understanding between HCTF and the Province.



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## Appendices

Appendix 1. List of categories and eligible activities.

### **1. Fishery Development and Planning**

#### **• Angling Management Plans (AMPs)**

- Development and Updating of AMPs
- Includes collecting and analysing data to inform AMPs
- Public consultation relating to AMPs
- Economic impact surveys or analysis relating to AMP development or review

### **2. Fishery Implementation**

#### **• River Guardian Program**

- Administration of lottery draws for anglers
- Provide an ‘on river’ presence and liaise with angling guides and anglers
- Includes addressing issues or conflict that arise on the river
- Collect angler use data (i.e. creel census) to gauge compliance with AMPs, inform AMP updates, estimate total escapement and inform next year’s draw
- Provide compliance presence and liaise with Conservation Officers
- Compliance audits of angling guides
- Provide stewardship information and educational materials to anglers (may include attending club meetings, installing signage)

### **3. Fishery Information**

#### **• Analytical support and tools**

- Support to analyse data collected to support fishery management (e.g., statistical analysis)

#### **• Stock Assessment**

- Example specific activities include redd counts, snorkel surveys, electrofishing, and others
- Note: Proposal should include rationale as to how the stock assessment will help improve fisheries management, and why it is needed over, and above creel survey data collected as part of the River Guardian Program

#### **• Information (data and database)**

- Data entry, analysis and project reporting

### **4. Administrative Coordination in Victoria**

- Assist in provincial coordination, quality control, and reporting
- Completion of Year 3 provincial report on QWF investments

## Appendix 2. List of HCTF corporate ineligible activities.

- Non-applied Research, such as:
  - Research not related to the increased understanding of population
  - baselines and conservation status of species, and/or
  - Research that does not identify key opportunities for restoration, enhancement, maintenance, or acquisition.
- Training costs for project personnel\*
- Law enforcement activities
- Fish rearing, farming, stocking, or hatcheries projects
- Wildlife Rescue Centres
- Captive breeding and rearing with the exception of activities that are a critical step toward population recovery
- Feeding of wildlife species with the exception of activities that are part of population recovery projects
- Control of wildlife species (note that we will consider control of invasive, nonnative wildlife species)
- Salaries for regular government employees
- Salmon-only projects that do not also bring benefit to freshwater and terrestrial species or habitats
- Marine projects outside of intertidal and estuary zones
- Mapping-only projects that are not integral to the development of a larger, eligible HCTF project
- Development or production of fishing and hunting, tour, or curriculum guidebooks or publication materials
- Information projects on regulations\* or stocking
- Conferences
- Production or sponsorship of commercial programs
- Stand-alone interpretative services that are not integral to the development of a larger, eligible HCTF project
- Creation or management of stand-alone electronic databases, websites or file systems

In special circumstances, HCTF will consider funding these activities or types of projects where they are critical to the outcomes and objectives of HCTF.

\* Training costs for project personnel, and information projects on regulations, are both considered eligible activities under the Quality Waters Fund only.

Appendix 3. Eligible waterbodies (Classified Waters) as defined under the Angling and Scientific Collection Regulation (BC Reg. 125/90).

<b>Classified Water Type</b>	<b>Location by Region</b>	<b>Stream</b>	<b>Premier Fishery</b>
Class I – Coastal Waters Anadromous	Cariboo	Dean	Summer ST & CH
	Skeena	Babine	Summer ST
	Skeena	Gitnadoix	Winter ST & salmon
	Skeena	Lakelse	Summer ST
	Skeena	Suskwa	Summer ST
	Skeena	Sustut	Summer ST
	Skeena	Zymoetz	Summer ST
Class II – Coastal Waters Anadromous	West Coast/Vancouver Island	Ahnuhati	Winter ST
	West Coast/Vancouver Island	Kakweiken	Winter ST
	West Coast/Vancouver Island	Kingcome	Winter ST
	West Coast/Vancouver Island	Seymour	Winter ST
	West Coast/Vancouver Island	Wakeman	Winter ST
	Thompson	Thompson	Summer ST
	Cariboo	Atnarko/Bella Coola	Summer & Winter ST
	Cariboo	Chilcotin	Summer ST
	Cariboo	Chuckwalla/Kilbella	Winter ST
	Cariboo	Nekite	Winter ST
	Skeena	Bulkley	Summer ST
	Skeena	Damdochax Cr	Summer ST
	Skeena	Ecstall	Winter ST
	Skeena	Kispiox	Summer ST
	Skeena	Kitseguecla	Summer ST
	Skeena	Kitsumkalum	Summer ST
	Skeena	Kitwanga	Summer ST
	Skeena	Kluatantan	Summer ST
	Skeena	Kwinageese	Summer ST
	Skeena	Ksi X'anmas	Winter ST
	Skeena	Morice	Summer ST
	Skeena	Skeena	Summer & Winter ST
	Skeena	Zymoetz	Summer ST
	West Coast	Yakoun	Winter ST
	West Coast	QCI Other	Winter ST & salmon
Class II Inland Waters Non- Anadromous	Kootenay	Bull	BT & WCT
	Kootenay	Elk	BT & WCT
	Kootenay	Upper Kootenay	BT & WCT
	Kootenay	Michel Cr	BT & WCT
	Kootenay	Skookumchuck Cr	BT & WCT
	Kootenay	St. Mary	BT & WCT
	Kootenay	White	BT & WCT

	Kootenay	Wigwam	BT & WCT
	Cariboo	Chilko	Rbt & BT
	Cariboo	Dean	Rbt & CCT
	Cariboo	Horsefly	Rbt
	Cariboo	West Road (Blackwater)	Rbt & CCT
	Omineca	Stellako	Rbt