

Summary of the Quality Waters Strategy Fund Investments for the
Three-Year Period 2021/2022 to 2023/2024

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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 has 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 (FFSBC). 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 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 (deemed Quality Waters Funds) associated with the recreational and commercial use of the freshwater fisheries on classified or quality waters in British Columbia (Anon. 2017). A summary of the Quality Waters Fund expenditures for the three-year period from 2018/2019 to 2020/2021 was previously reported on (see Atagi 2021). This report summarizes the most recent expenditure of the licence surcharge component of the revenue generated from the province's Quality Waters for the three-year period from 2021/2022 to 2023/2024. It documents the financial administration and project investment activities of the Habitat Conservation Trust Foundation.

Project Investments

Project investments were made in four fish and wildlife management regions: Cariboo (Region 5), Kootenay (Region 4), Skeena (Region 6), and West Coast (Region 1). The following table summarizes these investments. More than \$1.21 million was requested and approved by HCTF for Quality Waters Strategy projects. Over \$1.07 million (88.9%) was expended on Quality Waters projects during the reporting period. Two main activities accounted for most of the investments (river guardian and stock assessment projects). Angling management planning activities accounted for the remainder. Cariboo, Kootenay and Skeena regions received and expended 23.3%, 30.5% and 39.6% of the funding respectively. West Coast received fewer funds (6.6%), which correlates with the region having fewer classified waters. Total (actual) expenditure did not exceed the funding requested and approved.

Region	Total (approved)	Angling Management Plans	River Guardian Projects	Stock Assessment Projects	Total (actual)
Cariboo	\$317,603	\$0	\$250,645	\$0	\$250,645 (23.3%)
Kootenay	\$349,702	\$8,798	\$258,229	\$60,199	\$327,226 (30.5%)
Skeena	\$451,000	\$0	\$0	\$425,207	\$425,207 (39.6%)
West Coast	\$95,575	\$0	\$50,601	\$19,848	\$70,449 (6.6%)
Total	\$1,213,880	\$8,798	\$559,476	\$505,254	\$1,073,527

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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 several species of wild and stocked trout, river fisheries for anadromous summer run and winter run Steelhead and various salmon species, and inland trout fisheries for resident Rainbow Trout, Westslope Cutthroat Trout and Bull Trout. BC's vast size and diverse geography means that a number of these river fisheries offer a world class angling opportunity. Since 1990, 50 of these rivers have been managed under special angling regulations that require the purchase of a classified waters licence 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. BC is fortunate that all angling licence fees and surcharges are invested in the fisheries resource. 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 held in the Consolidated Revenue Fund (CRF) and it is transferred to the Freshwater Fisheries Society of BC to fund research, conservation and education programs, improve angler access, and deliver the provincial stocking program (www.gofishbc.com/about-us/who-we-are/). The Habitat Conservation Trust Foundation (HCTF) receives 100% of the surcharge component (Silver 2015). Surcharge revenues derived from the sale of 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. 2023). Four regions (Cariboo, Kootenay, Skeena and West Coast) received QWF funding during the period 2021-2024. Regions delivered projects on a geographically diverse number of waters that supported high quality fisheries for both Steelhead and resident trout (see Figure 1).

The implementation of the QWF was initiated in 2017 and a three-year pilot program was undertaken beginning in fiscal year 2018/2019 and concluding in 2020/2021 and it is reported elsewhere (see Atagi 2021). To receive QWF funding, each Fish and Wildlife region submitted a three-year plan for their proposed activities which was approved by the HCTF. Amendments to these regional investment plans may be approved by HCTF. Each year regional project leaders submit an annual report to the HCTF which summarizes their expenditures, outcomes and project results. This report summarizes these investments and projects completed during the period 2021/2022 to 2023/2024.

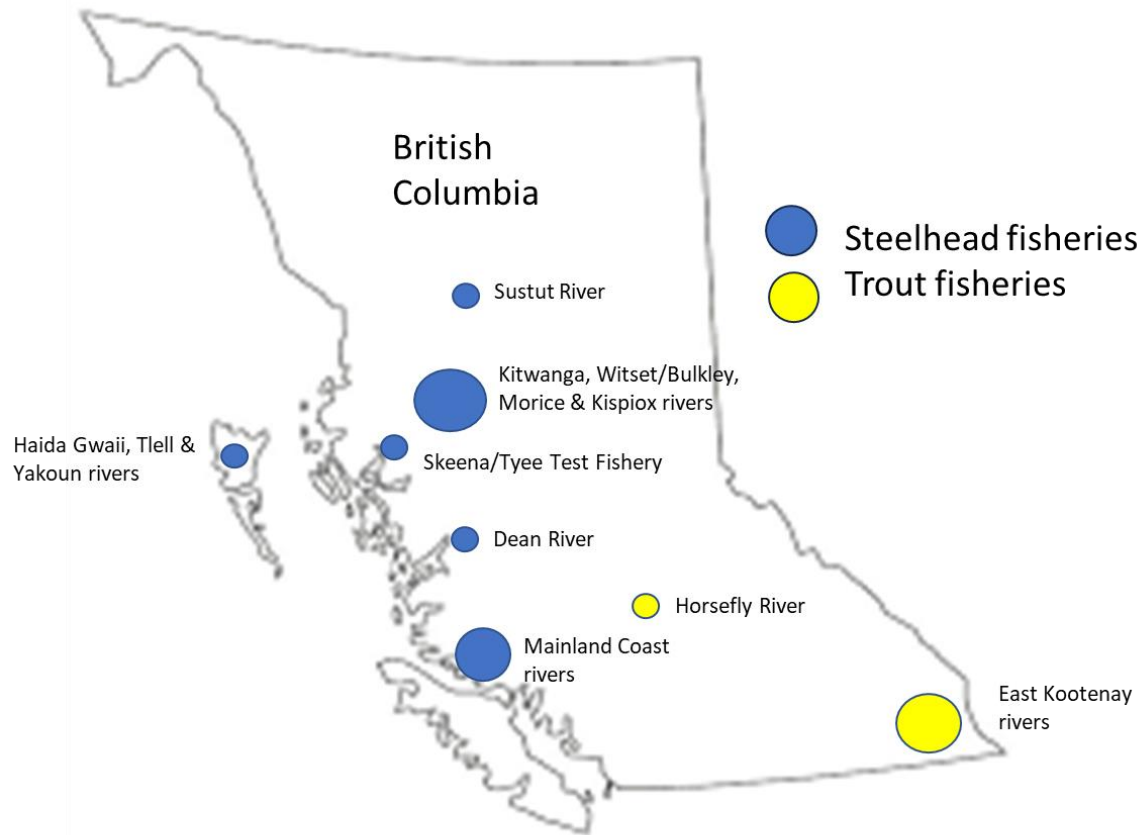


Figure 1. Map of British Columbia showing locations of the projects delivered under the Quality Waters Strategy program for the period 2021/2022 to 2023/2024.

Results and Discussion

Year 1 – Fiscal Year 2021/2022

In 2021/2022, four regions accessed funds from the Quality Waters Fund. The Cariboo (\$83.1k; 21.8%), Skeena (\$146.8k; 38.5%) and Kootenay (\$130.1k; 34.1%) regions expended the greatest amount of funding while the West Coast (Vancouver Island; \$21.4k; 5.6%) expended the least (Figure 2). All regions expended slightly less (actual) than was budgeted (Figure 2).

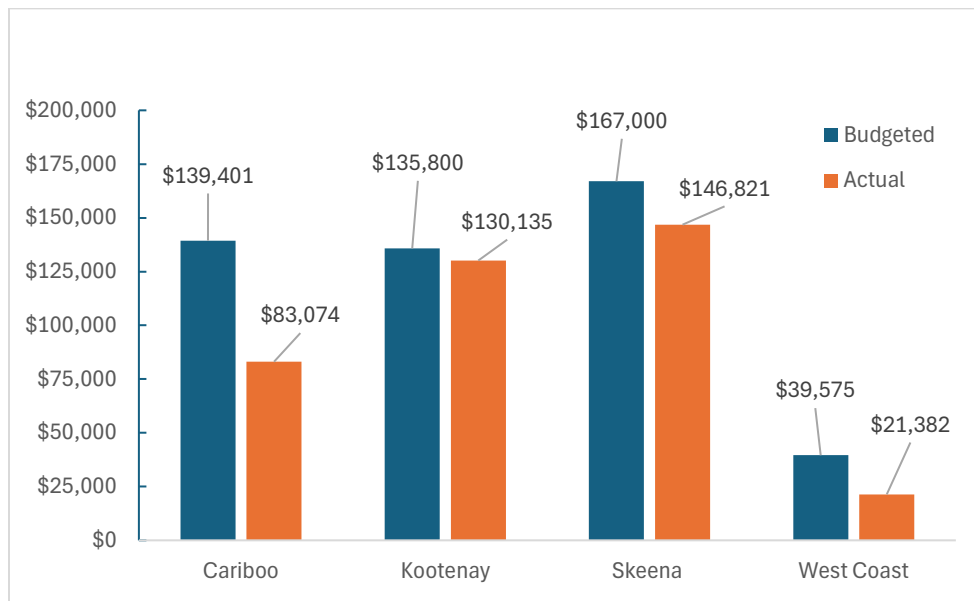


Figure 2. Expenditures (budgeted and actual) by region for fiscal 2021/2022.

Provincially, a total of \$381.4k was expended in 2021/2022 (Table 1). The majority was allocated to River Guardian projects (\$207.7k) followed by stock assessment projects (\$173.0k) and angling management planning projects (\$0.8k; Figure 3).

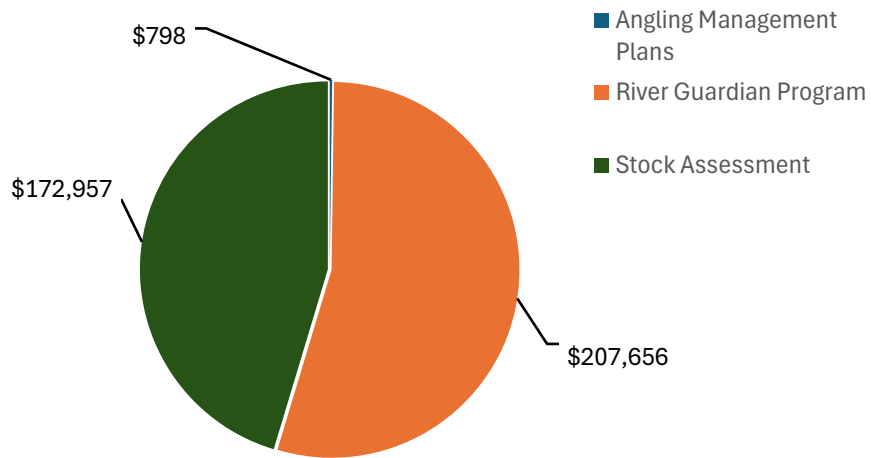


Figure 3. Provincial expenditures by activity in fiscal 2021/2022.

When this was examined by region it was evident that Cariboo, Kootenay, and West Coast regions all conducted significant River Guardian projects in 2021/2022 (Figure 4). Skeena Region prioritized its 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). This expenditure pattern was similar to the previous 2018-2021 period (Atagi 2021).

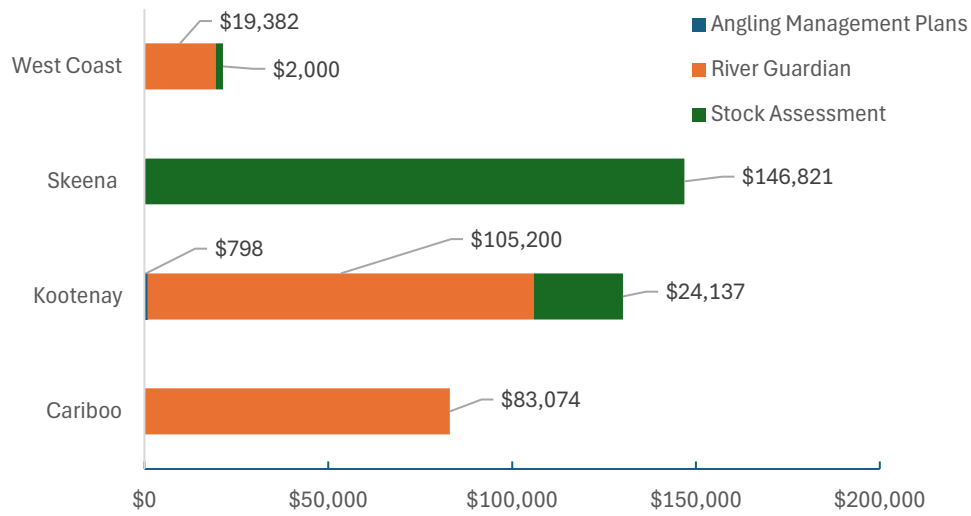


Figure 4. Expenditures by region and activity in fiscal 2021/2022.

In 2021/2022, over three quarters of the funds (76.4%; Table 1) were spent on labour across all the regions. A modest 4.7% was spent on travel and 10.8% and 8.1% was spent on materials and other supplies (Table 1). No monies were spent on capital items (Table 1).

Table 1. Breakdown of regional expenditures by type in fiscal 2021/2022.

Region	Labour	Materials	Travel	Other	Capital	Total
Cariboo	\$49,878 (60.0%)	\$22,724 (27.4%)	\$10,472 (12.6%)	\$0	\$0	\$83,074
Kootenay	\$79,773 (61.3%)	\$13,868 (10.7%)	\$5,504 (4.2%)	\$30,990 (23.8%)	\$0	\$130,135
Skeena	\$140,254 (95.5%)	\$4,567 (3.1%)	\$2,000 (1.4%)	\$0	\$0	\$146,821
West Coast	\$21,382 (100.0%)	\$0	\$0	\$0	\$0	\$21,382
Total	\$291,287 (76.4%)	\$41,159 (10.8%)	\$17,975 (4.7%)	\$30,990 (8.1%)	\$0	\$381,411

Summary of Outcomes and Deliverables for Each Region in 2021/2022

Cariboo Region

In 2021/2022, Cariboo Region completed a River Guardian project on the Dean River (June 1 - September 30, 2021; Figure 1). Angling effort was much reduced due to the COVID-19 restrictions (i.e. border closures for non-residents until mid-August 2021). Angling effort was 60% of “normal” with only 1,440 rod days reported (Hoffos 2022) however this was higher than reported in the 2020 season which was affected by COVID-19 restrictions (Leong 2020). Steelhead fishing was below average, and the escapement was estimated at 717 fish with a catch per unit effort (CPUE) that averaged 0.52 steelhead/rod day. The escapement was underestimated due to low angling effort on the river and should not be interpreted as an accurate reflection of how many fish were in the river (Hoffos 2022).

Kootenay Region

The Kootenay Region River Guardian program was completed on eight East Kootenay classified waters in 2021 (Figure 1). The Kootenay River Guardian Program included angler education, angler compliance checks and angler (creel) surveys on these classified waters. Stream temperature monitoring was conducted during the peak summer heat dome. Two stock assessments were completed in 2021/2022. Westslope Cutthroat Trout inventory (snorkel surveys to estimate density/abundance) was completed on the Upper St. Mary River, White River (Middle Fork), and Wigwam River. Bull Trout inventory (redd counts) was completed on 27 index reaches on seven systems: Blackfoot Creek (3 reaches), White River system (5 reaches), Wigwam River system (9 reaches), and Skookumchuck Creek (1 reach). Habitat evaluations were conducted in both Westslope Cutthroat Trout and Bull Trout systems where inventory projects were completed. See Fernandez and Heidt (2021) for a summary of the river guardian and stock assessment results from previous years.

Angler surveys and compliance checks were completed on these waters with multiple objectives (including creel, effort, CPUE, and compliance and angler education). About 1,000 anglers were checked by River Guardians and a non-compliance rate of 11% was observed. Angling

management plans and classified waters management actions were reviewed with angling guides and stakeholders during two virtual meetings in 2021.

Skeena Region

Skeena Region completed several stock assessment projects related to Skeena summer Steelhead. The Department of Fisheries and Oceans (DFO) operates a gillnet-based test fishery located at Tye on the Lower Skeena River (Figure 1). The operation was extended from August 24 to late September 2021 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. The 2021 return of Skeena steelhead was the lowest in the past 60 years and the recreational fishery was closed in fall and spring of 2021/2022 due to steelhead conservation concerns.

The enumeration weir on the Sustut River was operated for the period August 1, 2021, to September 30, 2021. One hundred and thirty-three (133) Steelhead were counted passing the weir in 2021. This total was 87% below the habitat-based estimates of carrying capacity ($K=1,036$) and 82% below the average annual count for this project ($n=750$). For management purposes, the population status for 2021 was in the Conservation Concern Zone (Maier 2022). Kitwanga River Steelhead were enumerated using a Didson sonar system and is a middle Skeena indicator stock in spring 2021 (representing the 2020 return). The results are still being analyzed and finalized however the results are consistent with other Skeena indices of abundance (K. Miyazaki, pers. comm.). 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 however no results from the program were available for this report (Figure 1). See Saimoto and Saimoto (2021) for a description and earlier results of this project.

Skeena Region did not complete any projects related to fishery development or angling management planning in 2021/2022.

West Coast Region

In 2021/2022, West Coast Region completed a River Guardian program in partnership with the Haida Nation on the Yakoun River (Haida Gwaii) between November 2021 and March 2022 (Figure 1). Angling effort was negatively impacted by the COVID-19 travel restrictions. The total effort was estimated to be 762.7 (SE 211.3) angler days for the season (Fleming 2022). A shift in angler demographics was observed during the pandemic angling seasons in 2020 and 2021 as non-Haida Gwaii BC residents and Haida Gwaii residents (local anglers) were numerically dominant in these years (Fleming 2022). All anglers were compliant with angling licence and regulations during the river guardian program in 2021/2022 (n=61 checks; Fleming 2022).

Due to staffing and time constraints, the proposed stock assessments on the Yakoun River (electrofishing surveys) and the mainland coast Steelhead surveys (snorkel surveys) were not completed in 2021/2022.

Year 2 – Fiscal Year 2022/2023

In 2022/2023, four regions accessed funds from the Quality Waters Fund. The Cariboo (\$67.8k; 25.0%), Skeena (\$112.4k; 41.4%) and Kootenay (\$66.6k; 24.5%) regions expended the greatest amount of funding while the West Coast (\$24.8k; 9.1%) expended the least (Figure 5). All regions expended slightly less (actual) than was budgeted (Figure 5).

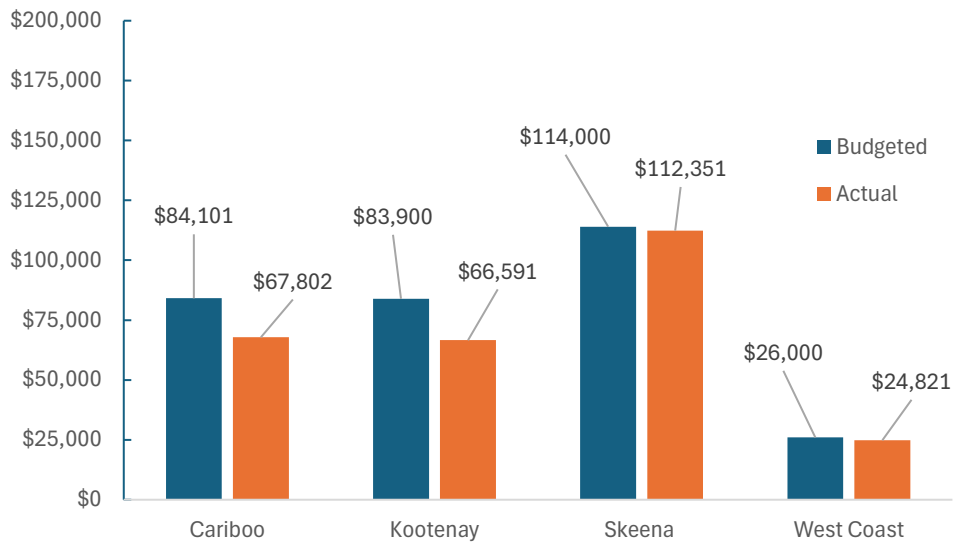


Figure 5. Expenditures (budgeted and actual) by region for fiscal 2022/2023.

Provincially, a total of \$271.6k was expended in 2022/2023 (Table 2) which was a large reduction from the previous year (\$381.4k; Table 1). This was the result of the significant reduction in licence surcharges and angling guide licence and rod day revenue generated in 2021/2022 when the Canadian border was closed to non-resident anglers due to COVID-19 restrictions (B. von Sacken, pers. comm.). The border closures reduced guided and non-guided angler licence revenues. This was a 28.8% reduction from the actual 2021/2022 expenditures (Figure 11). In response to this funding reduction, Regions were requested to prioritize their key activities for the 2022/2023 funding year. Only river guardian and stock assessment projects were conducted this year. No funds were expended on angling management planning. The funding was evenly split between river guardian projects (\$136.5k) and stock assessment projects (\$135.0k; Figure 6).

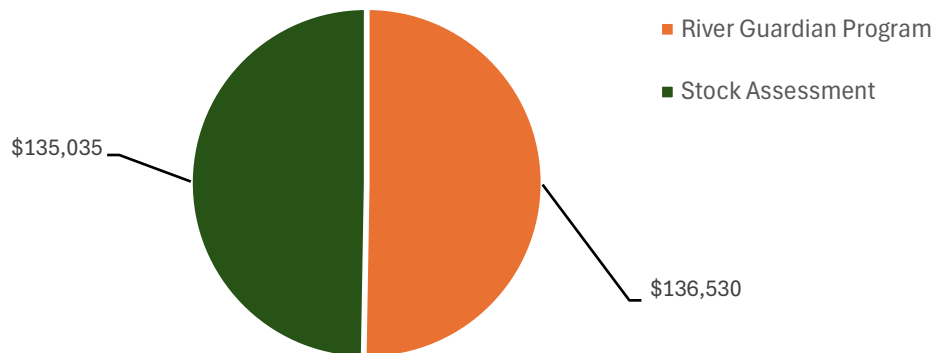


Figure 6. Provincial expenditures by activity in fiscal 2022/2023.

When this was examined by region it was evident that Cariboo, Kootenay and West Coast regions conducted scaled-down River Guardian projects in 2022/2023. Skeena Region allocated 100% of its funding to stock assessment projects while Kootenay and West Coast conducted smaller stock assessment programs (Figure 7).

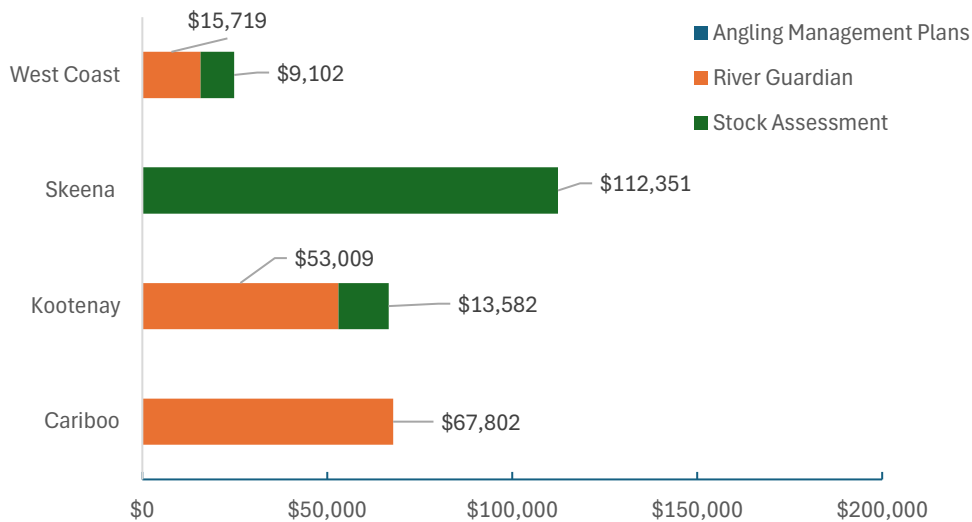


Figure 7. Expenditures by region and activity in fiscal 2022/2023.

In 2022/2023, nearly three quarters (73.3%; Table 2) of the total expenditure was spent on labour across all the regions. Travel accounted for 8.5%, materials for 17.9% and other supplies for 8.5% (Table 2). No capital expenditure was made this year (Table 2).

Table 2. Breakdown of regional expenditures by type in fiscal 2022/2023.

Region	Labour	Materials	Travel	Other	Capital	Total
Cariboo	\$40,926 (60.4%)	\$15,017 (22.1%)	\$11,860 (17.5%)	\$0	\$0	\$67,802
Kootenay	\$34,000 (51.1%)	\$7,991 (12.0%)	\$1,600 (2.4%)	\$23,000 (34.5%)	\$0	\$66,591
Skeena	\$107,351 (95.5%)	\$3,500 (3.1%)	\$1,500 (1.3%)	\$0	\$0	\$112,351
West Coast	\$16,719 (67.4%)	\$0	\$8,102 (32.6%)	\$0	\$0	\$24,821
Total	\$198,996 (73.3%)	\$26,508 (9.8%)	\$23,062 (8.5%)	\$23,000 (8.5%)	\$0	\$271,575

Summary of Outcomes and Deliverables for Each Region in 2022/2023

Cariboo Region

In 2022/2023, Cariboo Region completed a River Guardian project on the Dean River (June 1-September 30, 2022). This was the first year since the onset of the COVID-19 pandemic that the Canadian border was open, and travel restrictions were lifted for the entire angling season. Angling effort was 14% greater than the long-term average in 2022, with a total of 2,795 rod days reported. Steelhead angling success was below average, and the estimated catch per unit effort (CPUE) for steelhead was 0.495 steelhead/rod day. The Dean River Steelhead return was estimated to be 1,556 fish (Durham and Poon 2022).

Kootenay Region

A smaller River Guardian program was completed on eight East Kootenay classified waters in 2022. Angler surveys and compliance checks were completed on these waters with multiple objectives (creel, effort, CPUE, compliance and angler education). Only 500 River Guardian angler checks were conducted (~50% reduction from previous years) and resulted in an angler non-compliance rate of 13%.

Two stock assessments were completed in 2022/2023. Bull Trout redd counts were conducted on 27 index reaches on Blackfoot Creek (3 reaches), White River system (8 reaches), Wigwam River system (9 reaches), and Skookumchuck Creek (2 reaches). Results indicated that Bull Trout populations are currently stable. Westslope Cutthroat Trout (WCT) snorkel surveys were completed on the St. Mary River (lower), White River (North Fork), and Bull River. Results indicate that WCT populations in these systems are currently stable.

No angling management planning activities were proposed or conducted in 2022.

Skeena Region

Skeena Region completed several stock assessment projects related 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 2022 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. The summer Steelhead estimated abundance was well below average, placing the aggregate Skeena interior summer Steelhead population in the Conservation Concern Zone for the fifth time in the past six years. Due to the continued trend of depressed Skeena summer Steelhead abundance, the use of natural bait was restricted in the recreational fishery in 2022. The trend of below average summer Steelhead abundance resulted in monetary savings for the analysis of scale and genetic samples (K. Miyazaki, pers. comm.).

The upper Sustut River fish fence was in operation from August 1 to October 1, 2022. Fence operations were normal, with no instances of flash floods; however, below average flow conditions may have impacted fish migration. Upper Sustut estimate was 181 adult Steelhead which is the fourth lowest return in 20 years of assessment (Miyazaki 2024a). This total was 83% below the estimated carrying capacity (K=1,036) and 76% below the average annual count for this project (n=750). For management purposes, the population status for 2022 was in the Conservation Concern Zone (Miyazaki 2024a). Results from this upper-Skeena index population assessment in 2022 resulted in lower-than-average observations compared to other summer Steelhead assessment projects in the Skeena watershed.

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 raw estimate generated by the Witset Canyon mark-recapture project was consistent with the low abundance observed in the other stock assessment projects.

No angling management planning activities were proposed or conducted in 2022.

West Coast Region

In 2022/2023, West Coast Region completed a River Guardian program in partnership with the Haida Nation on the Yakoun River. The Yakoun River Guardian program operated from November 15, 2022, to February 23, 2023. A total of 15 survey days were completed. River Guardians completed interviews with 10 anglers during the 2022- 2023 season. Total angling effort was estimated as 1,208 (SE 241.3) angler days. The estimated 2022/2023 total effort (1,208 angler days) marked a return to effort levels not seen since 2018/2019 of the program (1,271 angler days; Fleming 2023). This effort level was substantially higher than the estimates for 2021/2022 (762.7 angler days; Fleming 2022). Angler residency was determined for 44 of 60 anglers in the 2022-2023 steelhead season. Of those contacted, 73% were residents of Haida Gwaii, and 27% were residents from elsewhere in BC. Two anglers (3%) observed on the Yakoun steelhead season were in non-compliance as they were angling in closed section of the upper Yakoun River (Fleming 2023).

Winter Steelhead stock assessments (snorkel surveys) were attempted on three mainland coast Steelhead systems (Kakweiken, Ahnuhati, and Glendale rivers) in 2022/2023. These systems had not been surveyed since 2006. Rain and snowmelt conditions in spring 2022 made timing these helicopter-based surveys difficult. Due to the poor water clarity, the observer efficiency during these surveys was poor (M. McCulloch, pers. comm.). Only a single Steelhead was observed (Glendale River) however, this was an underestimate of the true number of fish due to the poor observer conditions. A very recent landslide on the Ahnuhati was observed, photo-documented and communicated out (M. McCulloch, pers. comm.).

Year 3 – Fiscal Year 2023/2024

In 2023/2024, four regions accessed funds from the Quality Waters Fund. The Cariboo (\$99.8k; 23.7%), Kootenay (\$130.5k; 31.0%) and Skeena (\$166.0k; 395%) expended the greatest amount of funding while the West Coast Region (Vancouver Island; \$24.3k; 5.8%) expended the least (Figure 8). Skeena and West Coast regions were underspent (actual versus budgeted) in 2023/2024, and Kootenay Region spent almost exactly their allocated budget (Figure 8). Cariboo Region was slightly overspent which was attributed to the purchase of a capital asset (side by side utility vehicle to support the Dean River Guardian program; Figure 8).



Figure 8. Expenditures (budgeted and actual) by region for fiscal 2023/2024.

Provincially, a total of \$420.6k was expended in 2023/2024 (Table 3). This was \$157.5k (58.0%) more than was expended in the COVID-19 impacted year 2022/2023 (Figure 11). Cariboo Region made the only capital expenditure during the three-year cycle in 2023/2024, and the utility vehicle represented 16.5% of the region’s expenditures (Table 3). As in previous years, most of funds (\$215.3k) were allocated to river guardian projects followed by stock assessment projects (\$197.3k) and angling management planning support projects (\$8.0k; Figure 9).

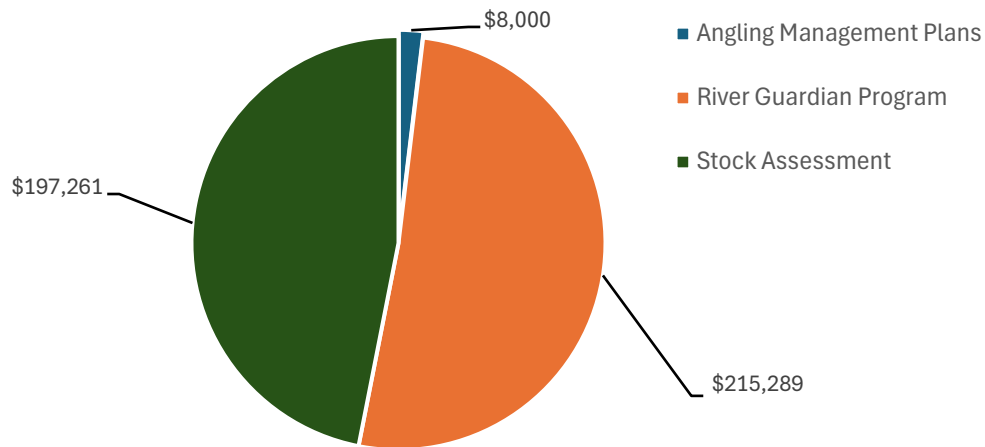


Figure 9. Provincial expenditures by activity in fiscal 2023/2024.

When this was examined by region it was evident that Cariboo, Kootenay and West Coast regions all conducted significant River Guardian projects in 2023/2024 although the West Coast Region River Guardian project was less costly. Skeena Region prioritized stock assessment projects while Kootenay and West Coast conducted smaller stock assessment programs (Figure 10). The Kootenay Region reinstated its angling management planning activities in 2023/2024 (Figure 10).

In 2023/2024, the majority (68.3%) of the total expenditure was spent on labour across all the regions (Table 3). Like the previous year, 9.2% was spent on travel (Table 3) and 10.1% and 8.4% respectively were spent on materials and other supplies (Table 3). As stated previously \$16.4k (3.9%) was spent on capital items in 2023/2024 (Table 3; described above).

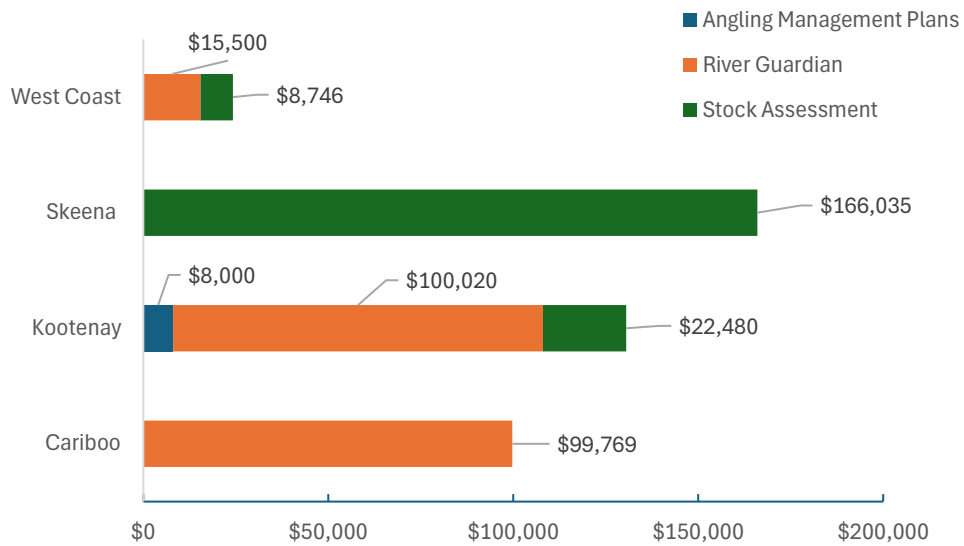


Figure 10. Expenditures by region and activity in fiscal 2023/2024.

Table 3. Breakdown of regional expenditures by type in fiscal 2023/2024.

Region	Labour	Materials	Travel	Other	Capital	Total
Cariboo	\$43,610 (43.7%)	\$22,426 (22.5%)	\$14,294 (14.3%)	\$3,024 (3.0%)	\$16,415 (16.5%)	\$99,769
Kootenay	\$70,278 (53.9%)	\$14,712 (11.3%)	\$13,334 (10.2%)	\$32,176 (24.7%)	\$0	\$130,500
Skeena	\$157,980 (95.1%)	\$5,500 (3.1%)	\$2,500 (1.5%)	\$55 (0%)	\$0	\$166,035
West Coast	\$15,500 (63.9%)	\$0	\$8,746 (36.1%)	\$0	\$0	\$24,246
Total	\$287,368 (68.3%)	\$42,638 (10.1%)	\$38,874 (9.2%)	\$35,255 (8.4%)	\$16,415 (3.9%)	\$420,550

Summary of Outcomes and Deliverables for Each Region in 2023/2024

Cariboo Region

In 2023/2024, two guardians were present on the Dean River throughout the summer months (June 1 to September 30) to collect catch and effort data from Steelhead anglers and conduct licence compliance checks. River patrols were conducted at least 4 times per week during this period. The total angling effort was 2,761 angler days in 2023 which was similar to 2022. This was an increase of 13% compared to the 10-year average (Durham 2023). The Steelhead escapement was estimated to be 2,704 fish with a catch-per-unit-effort (CPUE) of 0.942 steelhead/angler day, a decrease of 9% to the 10-year average. Low and clear water conditions may have contributed to the lower chinook catch rates and higher steelhead catch rates (Durham 2023).

The Dean River is a remote river which requires fly-in or boat-in access and there is limited vehicle access along the river valley. A side-by-side utility vehicle (UTV) is an essential piece of equipment needed to safely deliver the river guardian program. In 2023, Cariboo Region replaced a UTV to support the delivery of the river guardian program. The total cost of the UTV was \$16.4k (Table 3).

Kootenay Region

A river guardian program was completed on eight East Kootenay classified waters in 2023. Angler surveys and compliance checks were completed on these waters with multiple objectives (creel, effort, CPUE, compliance and angler education). 960 angler checks were conducted by River guardians which was nearly double the number of anglers checked in 2022. Angler non-compliance rate was 17% which was up from 2022 (13%).

Two stock assessments were completed in 2023/2024. Bull Trout redd counts were conducted on 27 index reaches on Blackfoot Creek (3 reaches), White River system (8 reaches), Wigwam River system (9 reaches), and Skookumchuck Creek (2 reaches). Results indicated that Bull Trout populations are currently stable. Westslope Cutthroat Trout snorkel surveys were

completed on the Michel Creek, White River (East Fork), and Skookumchuck Creek. Results indicate that Cutthroat Trout populations in these systems are currently stable.

Angling management planning activities on Kootenay classified waters were reinstated in 2023 following the 2022/2023 deferral. Management actions were reviewed with angling guides and stakeholders as directed by the Kootenay Region Angling Management Plan in 2023.

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 2023 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. The 2023 summer Steelhead estimated abundance was below average and placed the aggregate Skeena interior summer Steelhead population in the Conservation Concern Zone for the sixth time in the past seven years.

In 2023, 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. An estimate of the abundance of Bulkley/Morice Interior Summer Steelhead ecotype was not generated in 2023 due to an insufficient number of Steelhead recaptures. The low river flows, changes in river morphology at the tagging site (beach seine), and overall low abundance are impacting the mark-recapture project. These factors are an on-going issue with the Witset Canyon mark-recapture project, especially when the abundance is very low (K. Miyazaki, pers. comm.).

The Kitwanga steelhead enumeration program was reinstated in 2023. Kitwanga River Steelhead were enumerated using a Didson sonar system and is a middle Skeena indicator stock in spring 2023 (representing the 2022 return). The 2023 results are still being analyzed and finalized. However, the preliminary results are consistent with other Skeena indices of abundance (K. Miyazaki, pers. comm.). The upper Sustut River fish fence was operated from August 1 to

October 1, 2023. Fence operations were normal, with no instances of flash floods during the monitoring period. Fish migration was impacted by the 2023 drought as river levels were the lowest observed during the 21 years that the weir operated. The upper Sustut steelhead count was 60 adult Steelhead which was the lowest observed in the 21 years of assessment (Miyazaki 2024b). This total was 94% below the estimated carrying capacity ($K=1,036$) and 92% below the average annual count for this project ($n=692$). For management purposes, the population status for 2023 is in the Extreme Conservation Concern Zone (Miyazaki 2024b). To investigate the low fence count and low water conditions, regional fisheries biologists completed a 1 km snorkel survey immediately downstream of the fence and over 100 adult Steelhead were observed. The observed abnormally poor counts of the fish passing the fence were attributed to a combination of the extremely low stream flows and the overall poor Steelhead return to the Skeena watershed in 2023 (K. Miyazaki, pers. comm.). Even with the addition of 100+ adults, 2023 was a very low count and it was consistent with the other Steelhead abundance indicator projects.

No angling management planning activities were proposed or conducted in 2023.

West Coast Region

In 2023/2024, West Coast Region completed a River Guardian program (sixth year) in partnership with the Haida Nation on the Yakoun River. The Yakoun River Guardian program operated from November 7, 2023, to March 4, 2024. A total of 17 survey days were completed. River guardians contacted 70 anglers during the 2023/2024 season. The creel and angler effort data have been analyzed and the 2023 results are awaiting final reporting (M. McCulloch, pers. comm.).

Winter Steelhead stock assessments (snorkel surveys) were completed on five mainland coast Steelhead systems (Glendale, Ahnuhati, Kakweiken, Atwaykellese, and Wahpeeto rivers) in 2023/2024. Survey conditions (water clarity) were reasonable and resulted in reliable snorkel survey counts. The observed Steelhead abundance was the third lowest on record with a total of 28 steelhead observed in all five rivers combined (McCulloch 2023). The average steelhead density in all streams was 2.8 steelhead/km, well below the long term mean of 10.8

steelhead/km. The recent landslide into the Ahnuhati River (2022) was observed and photo-documented to monitor channel recovery (McCulloch 2023).

Three-year Provincial Roll Up

Provincially, the expenditure varied between years during the three-year period. Actual expenditures were lowest in year two (2022/2023; Figure 11). The restrictions on non-Canadians entry to Canada which were enacted during the COVID-19 outbreak impacted the delivery of the Quality Waters programs. Fewer anglers came to BC, and they purchased fewer licences. This resulted in a significant reduction in QWS funds available in 2022/2023 (Figure 11). The 2022/2023 funding level was the lowest during the past six years of the new QWF program (see Atagi 2021). Regional requests for funding returned to “normal” levels the following year 2023/2024 and resulted in the highest actual expenditures reported in the three-year period (Figure 11 and Table 4).

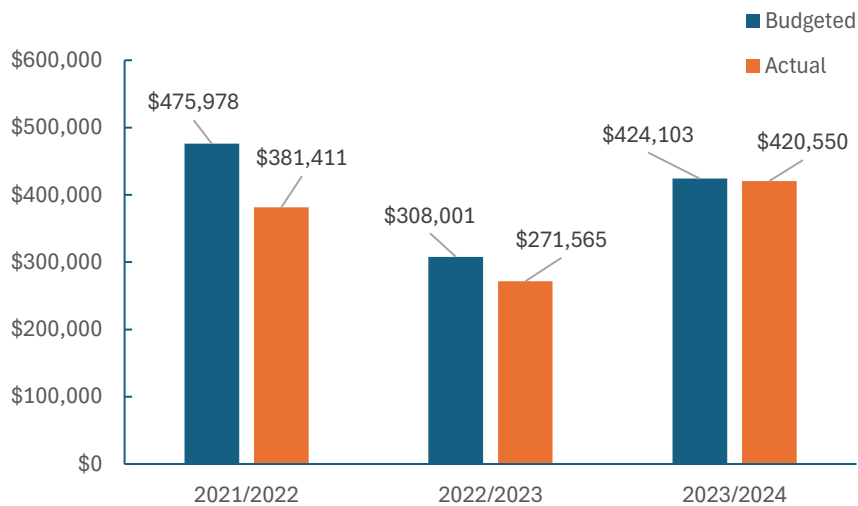


Figure 11. Annual Quality Waters Strategy funds (budgeted and actual) expended for the three-year period 2021/2022 to 2023/2024.

Table 4. Summary of Quality Waters Strategy Fund expenditures by region and by activity type for the three-year period 2021/2022 to 2023/2024.

Region	Fiscal Year	Budgeted	Angling Management Planning	River Guardian	Stock Assessment	Total (Actual)
Cariboo	2021/2022	\$139,401	\$0	\$83,074	\$0	\$83,074
	2022/2023	\$84,101	\$0	\$67,802	\$0	\$67,802
	2023/2024	\$94,101	\$0	\$99,769	\$0	\$99,769
	2021-2024	\$317,603	\$0 (0%)	\$250,645 (100%)	\$0 (0%)	\$250,645 (78.9%)
Kootenay	2021/2022	\$135,800	\$798	\$105,200	\$24,137	\$130,135
	2022/2023	\$83,900	\$0	\$53,009	\$13,582	\$66,591
	2023/2024	\$130,002	\$8,000	\$100,020	\$22,480	\$130,500
	2021-2024	\$349,702	\$8,798 (2.7%)	\$258,229 (78.9%)	\$60,199 (18.4%)	\$327,226 (95.2%)
Skeena	2021/2022	\$167,000	\$0	\$0	\$146,821	\$146,821
	2022/2023	\$114,000	\$0	\$0	\$112,351	\$112,351
	2023/2024	\$170,000	\$0	\$0	\$166,035	\$166,035
	2021-2024	\$451,000	\$0 (0%)	\$0 (0%)	\$425,207 (100%)	\$425,207 (94.3%)
West Coast	2021/2022	\$39,575	\$0	\$19,382	\$2,000	\$21,382
	2022/2023	\$26,000	\$0	\$15,719	\$9,102	\$24,821
	2023/2024	\$30,000	\$0	\$15,500	\$8,746	\$24,246
	2021-2024	\$95,575	\$0 (0%)	\$50,601 (71.8%)	\$19,848 (28.2%)	\$70,449 (73.7%)
All Regions	2021/2022	\$481,776	\$798	\$207,656	\$172,958	\$381,411
	2022/2023	\$308,001	\$0	\$136,530	\$135,035	\$271,565
	2023/2024	\$424,103	\$8,000	\$215,289	\$197,261	\$420,550
	2021-2024	\$1,213,880	\$8,798 (0.8%)	\$559,476 (52.1%)	\$505,254 (47.1%)	\$1,073,527 (88.9%)

For the three-year period, most of the funds were allocated to river guardian projects (\$559.5k; Figure 12) which was less than expended in the 2018-2021 period (\$702.6k; Atagi 2021), followed by stock assessment projects (\$505.2k; Figure 12) which was substantially more than expended in the 2018-2021 period (\$367.1k; Atagi 2021), and angling management planning activities (\$8.8k; Figure 12) which was less than expended in the 2018-2021 period (\$13.8k; Atagi 2021).

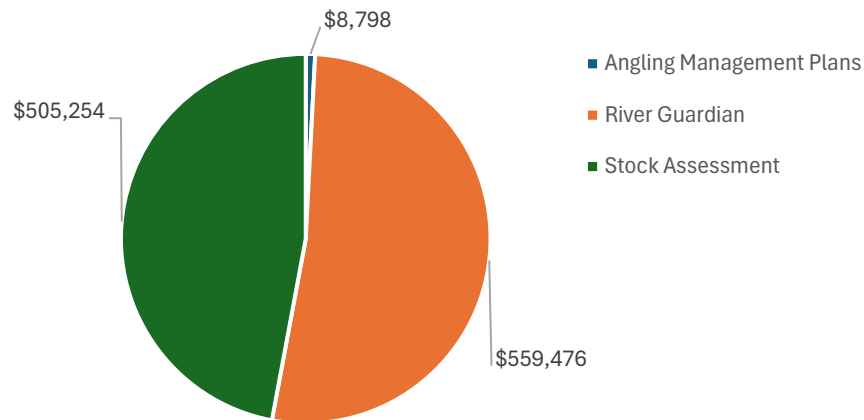


Figure 12. Cumulative Quality Waters Strategy funds expended by activity type for the three-year period 2021/2022 to 2023/2024.

The funding allocation varied between regions as well with Skeena expending the most funds (\$425.2k), followed by the Kootenays (\$327.2k), Cariboo (\$250.6k), and West Coast regions (\$70.5k; Figure 13). These were reductions from the 2018-2021 period for the Cariboo (\$383.5k) and Kootenay (\$379.9k; see Atagi 2021) regions. Compared to the 2018-2021 period, the Skeena (\$272.2k) and West Coast regions (\$60.2k; see Atagi 2021) spent substantially more funds in the most recent period (Figure 13).

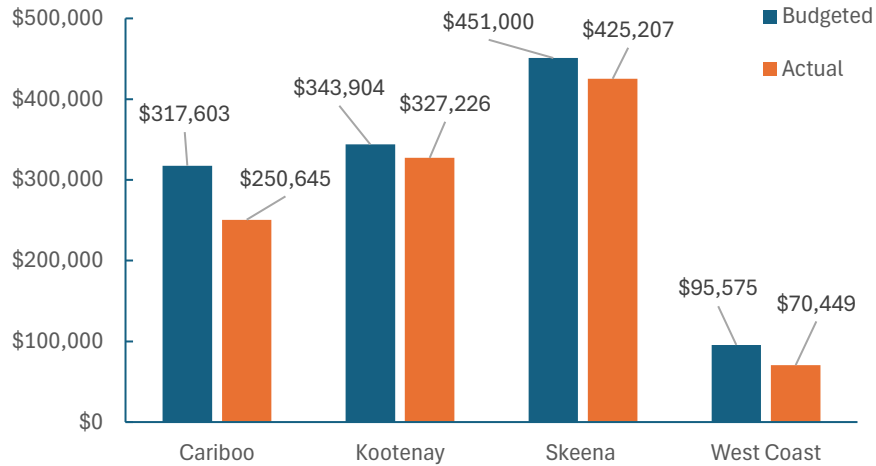


Figure 13. Cumulative Quality Waters Strategy funds (budgeted and actual) expended by the four regions for the three-year period 2021/2022 to 2023/2024.

For the three-year period, Cariboo Region allocated all its Quality Waters Strategy funds to deliver River Guardian programs on the Dean River (Figure 14). Kootenay Region spread its funding over three 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, and angling management planning activities (Figure 14 and Table 4). Skeena Region spent all its funding on high priority Steelhead stock assessment programs on the Skeena, Sustut, Kitwanga and Bulkley/Morice rivers (Figure 14). West Coast Region spent most of its funds on River Guardian programs on the Yakoun River in partnership with the Haida Nation and the remainder was allocated towards priority winter Steelhead stock assessment projects on the mainland coast (Figure 14).

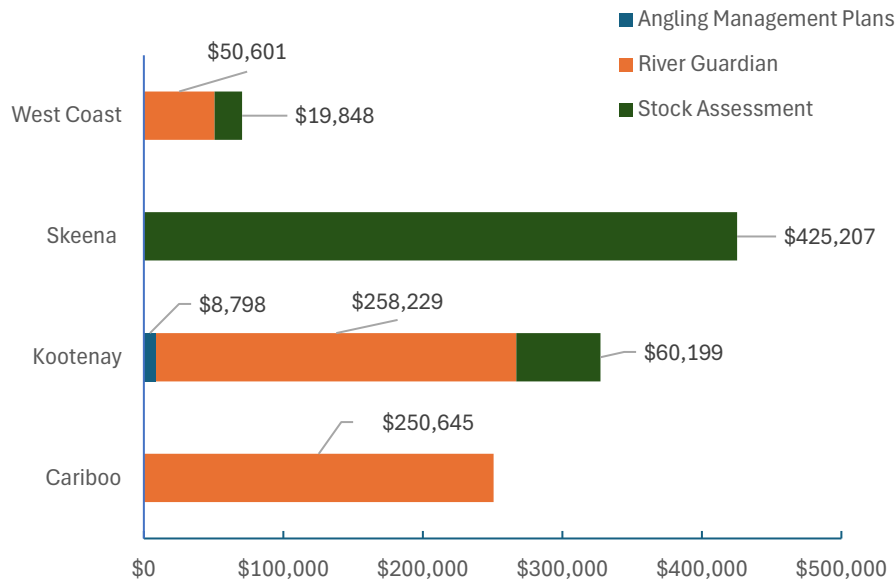


Figure 14. Cumulative Quality Waters Strategy funds expended by the four regions by activity type for the three-year period 2021/2022 to 2023/2024.

Summary of Capital Expenditures

In 2023/2024 (year three), Cariboo Region spent \$16.4k on an approved capital purchase of a side-by-side utility vehicle to support the safe delivery of the Dean River Guardian program (Table 3). This represented 3.9% of the Cariboo Region’s expenditure that year. No other regions requested capital funds during the period 2021 to 2024 (see Tables 1, 2 and 3).

Summary of In-kind Contributions by Water, Land and Resource Stewardship Regions

Each region reported their estimated in-kind contributions that they contributed to the delivery of their respective projects on an annual basis. Over the three-year 2021-2024 period \$453.2k worth of in-kind contributions were reported for the delivery of QWS projects (Table 5) which was down slightly from the 2018-2021 period (\$470.9k; Atagi 2021). 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). West Coast Region made no in-kind contributions during the reporting period.

Cariboo and Skeena regions made in-kind contributions of \$30.0k and \$36.0k respectively (Table 5). 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 WLRS Regions to deliver Quality Waters Strategy projects for the three-year period (2021/2022 to 2023/2024).

Region	In-kind Contributions			
	2021/2022	2022/2023	2023/2024	2021-2024
Cariboo	\$10,000	\$10,000	\$10,000	\$30,000
Kootenay	\$129,600	\$129,600	\$128,000	\$387,200
Skeena	\$15,000	\$10,000	\$11,000	\$36,000
West Coast	\$0	\$0	\$0	\$0
Total	\$154,600	\$149,600	\$149,000	\$453,200

Summary of the Challenges to the QWS Program

The latest three- year funding cycle (2021-2024) was impacted by the COVID-19 pandemic. During this period, the public health restrictions were mostly removed and fishery participation and angling effort returned to near pre-pandemic levels (year 3). However, there were lingering impacts to QWS funding due to the pandemic that resulted in a reduction in classified waters licence surcharge and angling guide licence revenues. The provincial government acknowledged the impact of the pandemic on licensed angling guides by deferring the payment of both angling guide licence fees and rod day fees for the 2020 and 2021 seasons until 2022 (Anon. 2022). In those years, the QWS revenue was \$106k (2020/2021) and \$117k (2021/2022; Anon. 2022). This was a fraction of the pre-COVID QWS revenue of ~\$400k per year. This resulted in a significant reduction in QWS revenues in 2022/2023 (year 2). The QWS funds available to the regional proponents were augmented by HCTF’s unallocated carry-forward QWS funds to ensure that the highest priority activities were conducted during this three-year period (Anon. 2022).

Overall, regional submissions of data were good, however more rigor and direction on how to determine and account for in-kind contributions would be beneficial. The annual short form summary reports should be augmented with the timely submission of project final (annual) reports for all projects that are funded by the Quality Waters Program.

Conclusions

The three-year cycle (2021-2024) of the Quality Waters Strategy program was delivered consistently with the agreement between the Habitat Conservation Trust Foundation and the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (now the Ministry of Water, Land and Resource Stewardship). The Ministry proponents delivered over \$1.07 million worth of projects on some of the provinces' highest value classified waters. Four regions (Cariboo, Kootenay, Skeena and West Coast) accessed this funding. The types of projects funded included: River Guardian/creel survey projects, stock assessment and monitoring projects, and angling management planning activities.

Most of the funds were expended on River Guardian (\$559.5k) and stock assessment projects (\$505.3k), followed by angling management planning activities (\$8.8k), respectively. The Skeena and Kootenay regions received the most funds (\$451.0k and \$349.7k, respectively). Cariboo Region received \$317.6k over the three years. West Coast Region received the fewest funds (\$95.6k). All funded projects were consistent with the memorandum of understanding between HCTF and the Province of BC.

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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).

Classified Water Type	Location by Region	Stream	Premier Fishery
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