WEST COAST REGION

FISHERIES

Yakoun River Guardian Program

Year 4 Summary

(2021 - 2022)

by

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1.0 INTRODUCTION

In 2017, the Haida Fisheries Program and the West Coast Region of the B.C. Ministry of Forests, Lands, Natural Resource Operations & Rural Development (MFLNRORD), with support from the BC Conservation Foundation (BCCF) and funding from the Habitat Conservation Trust Foundation, initiated a River Guardian program on the Yakoun River. The Guardian program aims to assess and enhance regulatory compliance as well as describe the nature of the steelhead fishery on the Yakoun River (e.g. spatial/temporal distribution, access points, angler type, effort, etc.). This information supports an improved understanding of how the fishery is implemented and promotes the direct involvement of Haida Nation in the collection of fisheries information in this classified water. The program also serves to exchange information directly with anglers on current management and conservation issues and to collect feedback.

Provincially, the Yakoun River is designated as a 'Class II - Classified Waters' under the *BC Wildlife Act.* Classified Waters are streams that have highly productive trout populations and provide unique opportunities for anglers. As a Classified Water, the Yakoun River has a limited number of angler-days granted to commercial angling guides (155 angling days) and requires that unguided anglers purchase a special Classified Waters Licence during the period from September 1 to April 30. As well, anglers must purchase a Steelhead Stamp as a conservation surcharge to their license if fishing the Yakoun River from December 1 – April 30, regardless of whether they are fishing for steelhead (*Oncorhynchus mykiss*) or other species.

The fourth year of the Yakoun River Guardian program was completed during the 2021-2022 steelhead angling season (~November – ~March). The first three seasons of the Guardian program were in 2018-2019, 2019-2020, and 2020-2021 and are reported on under separate cover (Sibbald 2020, Sibbald 2021). This report summarizes creel data collected in the project's fourth year and describes fishing effort, including the spatial and temporal distribution of effort, gear use, angler residency, and catch, as well as the relationship between the number of anglers and the number of vehicles observed at access points.

As in Year 3 of the Yakoun River Guardian program, the entire steelhead season in Year 4 occurred within the context of the global COVID-19 pandemic. While Provincial Health Orders were less restrictive during the 2021-2022 steelhead season than the previous year, the cooling effect of the pandemic on travel and recreation is not yet fully understood and should not be understated. The circumstances of the pandemic and its effects on the Yakoun River steelhead fishery are discussed herein.

1.1 Site Description

The Yakoun River, on Graham Island in Haida Gwaii, B.C. flows north for 67 km from its headwaters at Skidegate Plateau (1,088 m elevation) before meeting the ocean at Masset Inlet near Port Clements (Figure 1). The Yakoun River drains a 477 km^2 basin, including Yakoun Lake and 21 first and second order tributaries that vary from low geographic relief, more common in the eastern tributaries, to high geographic relief, characterizing the southern and western tributaries that primarily drain Skidegate Plateau into Yakoun Lake (Hogan and Schwabe 1990; Whelen 2002). The Yakoun drainage basin lies within the Skidegate Plateau physiographic region in the Coastal Western Hemlock Biogeoclimatic Zone.

The Yakoun River mainstem has a relatively low gradient (<2%) and is thus dominated by shallow riffles, long runs, and slow pools (de Leeuw 1987). Reconnaissance surveys of the Yakoun River mainstem identify gravel and cobble as the dominant substrate types and dominant fish cover types as large woody debris (LWD), deep pool, cut bank, and the darker, tannin-coloured water (Whelen 2002).

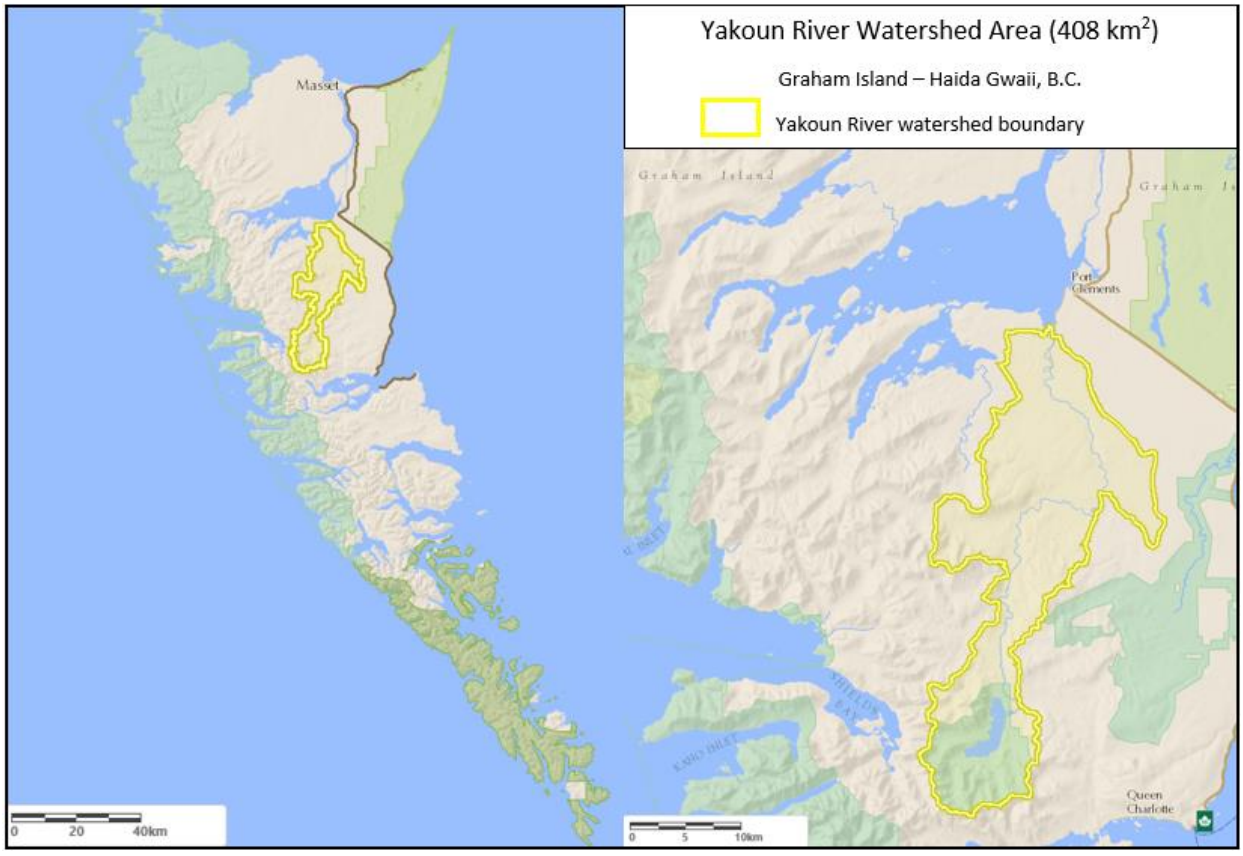

Figure 1. Location of the Yakoun River watershed on Graham Island in Haida Gwaii, British Columbia.

1.2 Fisheries Resource

The Yakoun River watershed supports anadromous populations of steelhead and cutthroat trout, as well as coho, chinook, chum, pink, and sockeye salmon for its entire 67 km from the estuary to Yakoun Lake. Anadromous rock barriers exist in steep tributaries roughly 1 km upstream of Yakoun Lake. Populations of resident rainbow and cutthroat trout, as well as Dolly Varden char, stickleback, cottid, and lamprey species also occur in the watershed. Fish presence in the Yakoun River has been relatively well documented (Brown & Musgrave 1979; de Leew 1986; CHN 1995; Whelen 2002) though specific information about the life histories and populations of steelhead and resident freshwater fish is sparse.

Steelhead have been documented throughout the length of the Yakoun mainstem. Brown & Musgrave (1979) and de Leeuw (1987) reported a stream residency time of a few days to nine months, with adult steelhead entering streams from roughly September to May. In Haida Gwaii in general, peaks in run timing occur in November and December, late February, and March (de Leeuw 1986).

The steelhead fishery on Yakoun River takes place from October to April, with most of the effort occurring between November to January (de Leeuw 1986). Data from the first four years of the Yakoun River Guardian Project corroborate this timing, and show that November and December tend to have highest fishing effort, while later in the season effort might be reduced by poor access and weather conditions (e.g. wind and snow) and high river discharge (Sibbald 2020, Sibbald 2021). Spatially, the Yakoun River Steelhead fishery has occured in the middle reaches, between river kms 20-40 (de Leeuw 1986). The upper 13 km of the Yakoun River are closed to angling from October 1 to April 30 to provide a steelhead sanctuary (MFLNRORD 2021). The lower 16 km of the Yakoun is relatively less accessible to anglers, and thus has lower fishing pressure. Based on the data from the four years of the Guardian program, most of the fishing effort occurs within a 10 km section beginning just downstream of the fishing boundary.

Steelhead effort and catch data have been investigated via the Steelhead Questionnaire (STQ) since 1966-67. The STQ is a Province-wide annual questionnaire mailed to a sample of anglers that purchased a steelhead conservation surcharge stamp in the previous licence year. Data from the STQ is used by fisheries managers to understand the current fishery and identify long-term trends. STQ data for the Yakoun River show an association between effort (days) and catch data. On average, angling effort over the last decade is slightly less than half (44%) of the long-term average (Figure 2). The first two years of River Guardian data corroborate estimates of total effort collected in the STQ reasonably well. In year 1, data from the Guardian program produced an estimate of 1,271 angler days while the STQ reported 873. In year 2 the Guardian program and the STQ reported 795 and 888 angler days, respectively. These estimates can be

considered similar, especially when considering the variability inherent in the STQ (DeGisi 1999). The most recent data from the 2020-2021 STQ diverges considerably from Year 3 River Guardian angling effort estimates however, with the Guardian Program and STQ reporting 705 and 158 angler days respectively. This difference between Guardian Program and STQ effort estimates in Year 3 is notable in that it is greater than can be explained by standard error, or the inherent variability and natural biases in the STQ survey (DeGisi 1999) and suggests a broad disagreement between the two effort estimates. While the reasons behind these differences are unclear, it is possible this is related to the Covid-19 pandemic and changes in angler residency (i.e. local residents underreporting/not purchasing steelhead stamps, or local Haida anglers who are not required to purchase a licence) given the concurrent timing.

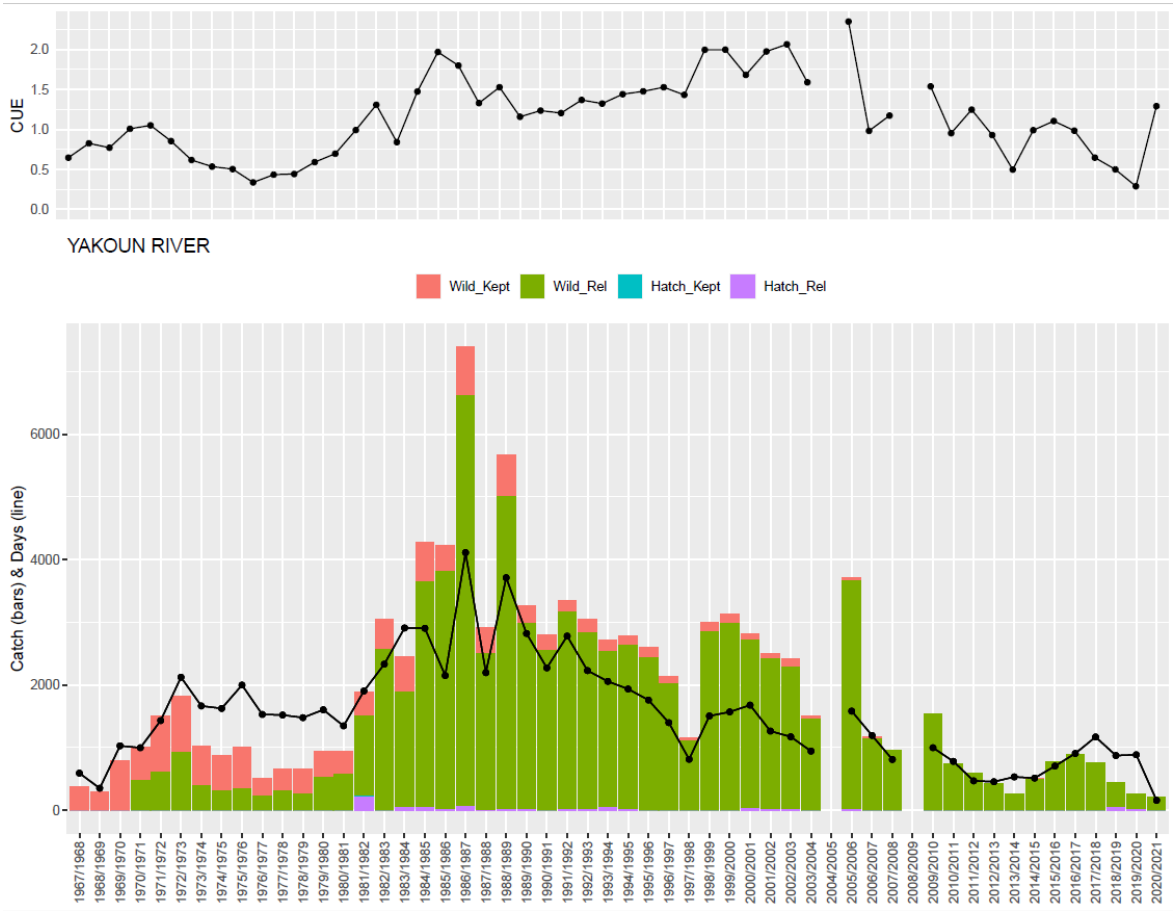

Figure 2. Steelhead Questionnaire (STQ) catch, effort, and catch per unit effort (CUE) data for the Yakoun River for the entire period of record (1967 – 2021). Source: Brendan Anderson - MFLNRORD.

2.0 METHODS

2.1 Sampling Design

The Yakoun River Guardian program was modelled as a **roving creel** survey; an "on-site, intercept design" by which surveyors interview streamside anglers on foot at several access points (Pollock et al. 1994). This survey type is contrasted by an access creel, in which surveyors stay stationary at known, discrete, angler access points (e.g. a boat launch at a lake). Anglers encountered in a roving creel are interviewed at a point during their fishing day (incomplete trip) rather than interviewed at the end of their fishing day (complete trip). Due to the nature of the fishery in the Yakoun River (i.e. numerous access points), a roving creel survey is most appropriate.

A unique characteristic of a roving creel survey, unlike an access survey, is that anglers do not have an equal probability of being surveyed (Pollock et al. 1997). In a roving creel the probability of an angler being encountered is proportional to their total time on the water; anglers that fish longer are more likely to be interviewed in a roving creel survey (Lucas 1963; Malvestuto 1983). This is known as length-of-stay (LOS) bias and is an inherent feature of roving creel surveys (Pollock et al. 1997). Surveys are conducted from upstream to downstream, or vice versa, at random on different survey days. In theory, randomly selecting survey starting locations also allows better coverage at various times of the day.

The survey can also be described as a **progressive** count because interviews are conducted through the duration of a survey day. Angler effort is measured in angler-hours and is "extrapolated to the number of hours in a fishing day" to estimate total effort (Pollock et al. 1994), and then converted to angler-days on the assumption that there are 4 angler-hrs/day. Total catch is not estimated in this program because the two key assumptions for estimating catch in a roving creel have not been adequately met: 1) that catch rate at time of survey remains constant throughout the fishing day, and 2) that catch rate of interviewed anglers is the same for anglers that are not interviewed (Pollock et al. 1994). Nevertheless, catch data was collected in the Yakoun River Guardian program to be used as a qualitative means of understanding the fishery.

Sampling days were distributed randomly across the fishing season but truncated slightly at the end of the season to align with fiscal-year funding availability (November 1 to March 31) and weighted more heavily toward months in the peak period of the fishery (November and December). Sampling days were stratified by day type (i.e. weekday or weekend) and weighted toward weekend days, which were assumed initially to see greater angling pressure although current analysis shows no significant difference between these strata.

2.2 Field Sampling

Surveys were conducted by two Haida Fisheries Program staff who travelled by vehicle along a series of forestry roads that closely parallel most of the length of the Yakoun River (Figure 4). This road corridor provides the majority of access for steelhead anglers, with a discrete number of access points spurring off to the river. At each access point, Guardian staff surveyed the area by foot to identify and speak with anglers. Data collected on each survey day included time, location, number of vehicles, number of anglers, angler demographics, gear type, use of bait, catch, and compliance (Appendix A).

In Year 4, surveys were randomly selected to begin at either the most downstream site and occur in an upstream direction, or vice versa. On each survey day, the entire fishable (i.e. accessible) length of the river was surveyed, whereby guardians drove along an access road and stopped at an access point if a vehicle(s) was/were observed or there were other signs of angler use. Some sites were checked regardless of whether there was a sign of anglers, such as the Yakoun Mainline Bridge (upstream of the fishing boundary) to monitor for infractions, or the Counting Fence, which represents the downstream extent of the fishery. Ultimately, anglers were recorded as being at one of ten locally-named access points (Figure 3).

Figure 3. Location of the ten primary angler access-points surveyed as part of the Yakoun River Guardian program in 2021-2022. Survey locations are shown in relation to total river length and fishing boundary (triangle).

2.3 Data Processing and Analysis

River Guardian data was used to generate estimates of annual angling effort by taking progressive count data (I_i) and extrapolating to the total amount of hours in the fishing day (T), and the fishing season. To do this, the following formulas were used:

To estimate daily effort by stratum:

$$\hat{e}_i = I_i \times T$$

To estimate total effort by stratum, the mean of daily estimates ($\bar{e}_i$) are expanded by the number of days in each strata (N_i) and then the two strata are added together:

$$\text{By stratum} \qquad \hat{E}_i = N_i \bar{e}_i$$

$$\text{together} \qquad \hat{E} = \hat{E}_1 + \hat{E}_2$$

To calculate effort variances and standard errors, by stratum and together:

$$s_1^2 = \frac{1}{n_1 - 1} \sum_{i=1}^{n_1} (e_{i^1} - \bar{e}_1)^2$$

$$\hat{Var}(\bar{e}_1) = \frac{s_1^2}{n_1}$$

$$\hat{Var}(\hat{E}_1) = N_1^2 \hat{Var}(\bar{e}_1)$$

$$\hat{SE}(\hat{E}_1) = \sqrt{\hat{Var}(\hat{E}_1)}$$

$$\hat{Var}(\hat{E}) = \hat{Var}(\hat{E}_1) + \hat{Var}(\hat{E}_2)$$

$$\hat{SE}(\hat{E}) = \sqrt{\hat{Var}(\hat{E})}$$

Extrapolated estimates of angler effort on each survey day were used to summarize temporal distribution of angler effort across the survey period. Spatial analysis of angling effort was completed by estimating percent of the total observed angling effort for each of the five angler access points within the survey area, where the survey area represents most of the area over which the steelhead fishery occurs. To inform whether camera trapping vehicles at access points could allow for accurate extrapolation to angler effort, daily estimates of the number of anglers per vehicle were used to derive an average for all years.

3.0 RESULTS & DISCUSSION

Creel data for Year 4 of the Yakoun River Guardian program was collected from November 8th, 2021 to March 29th, 2022. A total of 20 surveys were scheduled at the beginning of the season, 13 of which were scheduled on weekdays and seven of which were scheduled on weekends. However, similar to previous years, inclement weather and logistical constraints prohibited four scheduled surveys (December 20th, January 04, January 08, January 20). Three of the four surveys were then re-scheduled and conducted in February and the missed dates resulting from poor conditions (3) were assigned a value of zero angler hours (Sibbald 2020). Thus, a total of 22 (n) surveys were completed in Year 4, of which 13 occurred on weekdays and nine occurred on weekends.

3.1 Angler Effort

A total of 25 interviews with 61 anglers were conducted during the 2021- 2022 season. Each count of anglers across a survey day represents a snapshot in time of angling effort. Extrapolated to the total fishable hours in a day (defined as 8 hours for this survey period) and the number of days in the survey window (N=151 days) this produced a total effort estimate of 3, 051 angler hours. Converted to angler days, based on a four-hour day to standardize with the STQ, results in a total effort estimate of 762.7 (SE 211.3) angler days. This total effort estimate is similar to the recent decadal average (666.5, n=10, SE 93.4) and approximately half of the long-term average (1532.5, n=52, SE 116.2). The year 4 total effort estimate will be directly compared to the STQ derived estimate for 2021-2022 once those data are in-hand.

Average daily angler effort was greater on weekends (31.1, n=9, SE 17.0) than on weekdays (16.0, n=13, SE 4.2) though this difference is not statistically significant (p=.41). Similar to Year 3, the variability in the weekend effort estimate was very high in Year 4 and as a result meaningful differences in these strata would be difficult to detect with these sample sizes. Significant differences between weekday and weekend strata were observed in year 2, but not in years 1, 3 or 4. No significant differences were observed when comparing all 4 years weekday and weekend strata combined. The high variability observed in weekend strata in year 4 was not as pronounced as the weekday strata, continuing to indicate that stratification is likely beneficial. However, it remains unclear whether weekday and weekend strata are meaningful in the Yakoun River steelhead fishery.

Total effort and daily effort estimates were derived by using a sample size of 22 survey days, 19 of which were completed survey days and three of which were scheduled but not completed and assigned an effort value of zero. This analysis (i.e. including all scheduled survey days) was also completed in Year's 2 and

3 and was chosen because angler effort was likely zero, or near zero, during the period that surveys were unable to be completed as a result of access limitations. In this fourth year of the program, the number of interviews (25) and number of anglers interviewed (61) was higher than the previous year (21 and 37, respectively) higher than year 2 (23 and 46, respectively) and lower than year 1 (41 and 71, respectively). It is also worth noting that the highest number of surveys occurred in Year 4 (22), compared to Years 1-3 (17, 19 and 16, respectively). This was due in part to a small increase in the program's field budget, carried over from unused funds on another Guardian Program on Haida Gwaii.

Table 1. Mean observed daily angler effort and estimated total angler effort from Year 4 of the Yakoun River Guardian program.

Yakoun River Guardian Program Year 4 Effort Summary	**2021-2022 Year 4**
mean daily angler effort on weekdays (angler hours)	16 (4.2)
mean daily angler effort on weekends (angler hours)	31.1 (17)
mean daily angler effort for all days (angler hours)	22.2 (7.3)
days in survey period (N)	151
days surveyed (n)	22*
estimated weekday angler effort (angler days)	436 (113.1)
estimated weekend angler effort (angler days)	326.7 (178.4)
estimated total angler effort (angler days)	**762.7 (211.3)**

values in brackets are standard errors

* scheduled survey days did not occur because of poor access due to snow and poor road conditions.

The effects of the COVID-19 pandemic, and associated travel restrictions on estimated total angler effort observed on the Yakoun River during Years 4 and 3 (705, SE 227) are not obviously discernible when comparing estimates with the two previous years of the Guardian program (2018-2019 – 1271, SE 240; 2019-2020 – 795, SE 204). However, differences in angler origin as a result of the pandemic are discussed in section 3.4.

3.2 Temporal and Spatial Distribution of Angler Effort

Daily angler effort in Year 4 ranged from 0 to 160 angler hours across the 22 survey days during the survey period from November 1, 2021 to March 31, 2022 (Figure 4). The highest daily effort was observed on the seventh survey day (December 5th), followed by November 28th and November 24th which both recorded daily angler efforts of 40 hours. Observed effort in the 2021-2022 steelhead season appeared bifurcated into a relatively short period of higher effort between November 16th and December 5th, and a slightly longer period of relatively lower daily effort between February 3rd and March 7th. However, several more surveys were conducted in the later period which shows a relatively consistent daily effort between surveys during this time. As in previous years, the lull in observed fishing effort between these two periods is coincident with the most challenging environmental conditions of the winter. As previously noted, the three surveys scheduled in January were not completed due to snow and poor road conditions. These days were assigned an effort value of zero, bringing the total number of survey days in the season with zero fishing effort up to 9. Year 4 of the Yakoun River Guardian program marks the first time in four years that angler effort in the later half of the season was observed so consistently and at relatively similar (albeit lesser) levels than that of the first half of the season. While this is a departure from the trend of previous years, continuing to maintain a survey schedule weighted toward the beginning of the season should still be prioritized.

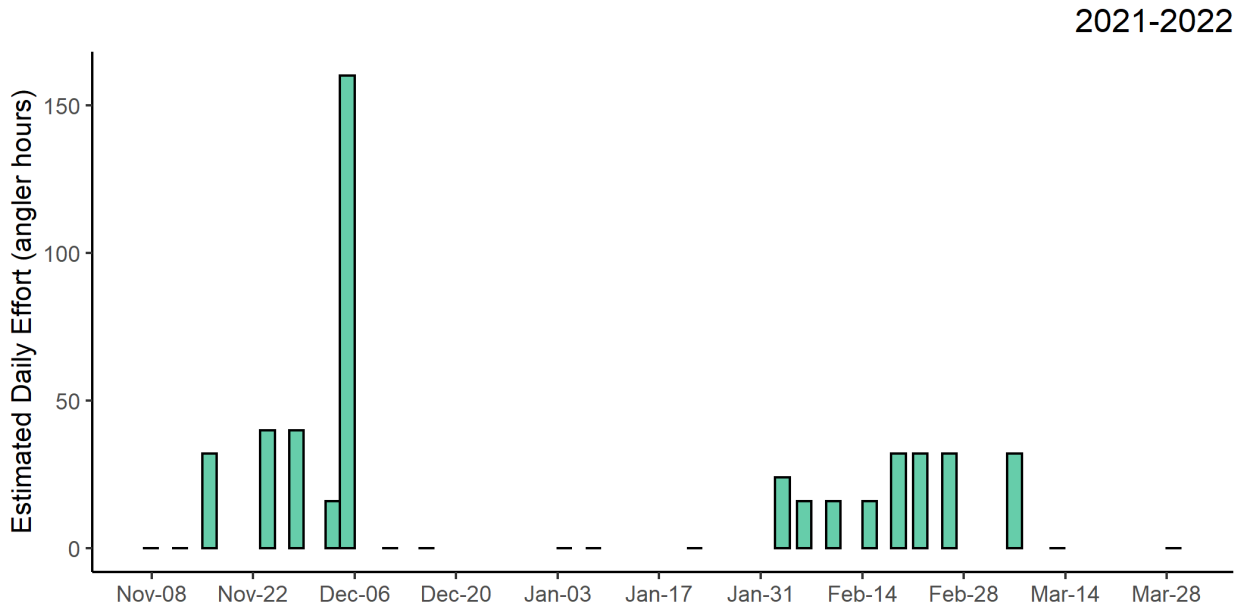

Figure 4. Estimated daily effort (angler hours) from the Yakoun River Guardian program during the 2021-2022 steelhead season. A dash on the x-axis indicates a survey day with a count of zero anglers.

Spatial analysis of the distribution of angler effort was slightly different in Year 4 than Year 3, as it incorporated a tenth access point (Ten Ton Bridge) that was surveyed only once in Year 3 but surveyed

considerably more in Year 4 (n=13) during which time it was the site of angling observation. As reported on under previous cover (Sibbald 2021), clarification in Year 3 around coordinates and access points saw the addition of 4 new access points/sites that had previously been reported under the initial 5 access points in Years 1 and 2. This difference in spatial analysis meant that in Years 1 and 2, effort at Powder Pool appeared higher than all other access points, however this is no longer the case (Figure 5).

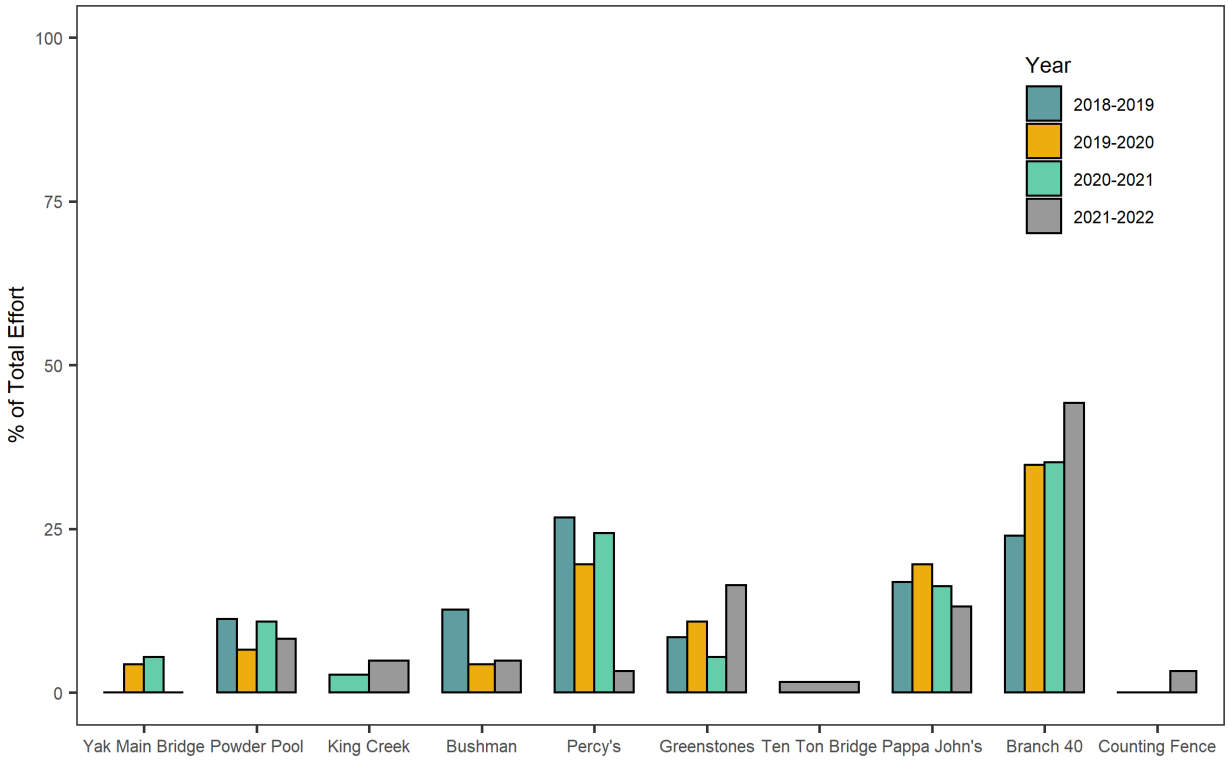

Figure 5. Percent of total angler effort spatially distributed across ten sites surveyed in the 2018-2019, 2019-2020, 2020-2021, and 2021-2022 years of the Yakoun River Guardian program. Sites along x-axis are ordered from upstream to downstream (left to right).

The Yakoun Mainline Bridge access point is the most upstream site and is also upstream of the fishing boundary. Therefore, any angling observed at Yakoun Mainline Bridge during the closure period from October 1 to April 30, is an infraction of the BC Freshwater Fishing Regulations. While Years 2 and 3 saw a small number of anglers in non-compliance (Figure 5), no anglers were observed at the Yakoun Mainline Bridge or upstream of the fishing boundary in 2021-2022.

All of the ten angler access points surveyed in Year 4 are within a 54 km section of the 67 km river (Figure 3). Nearly all angling effort in year four occurred within a ~10 km section of river from Powder Pool to Branch 40. The exception to this was the Counting Fence site, which recorded its first anglers on Feb 26,

2022 since the program began (Figure 5). The approximate coverage at each discrete survey site is about 1.0 km of river.

During Year 4 of the program Guardians observed most of the angling effort at Branch 40 (44%), followed by Greenstones (16%), Pappa John's (13%), and Powder Pool (8%). King Creek and Bushman each saw 5%, while Percy's and Counting Fence each saw 3%- and Ten-Ton Bridge 2%. As mentioned, no angling was observed at the Yakoun Mainline Bridge. While more sites were included in the spatial analysis of angler effort in years 3 and 4, the overall nature of the fishery appears the same as in previous years: the majority of the steelhead fishing effort on the Yakoun River appears to be spatially concentrated in the 10 km section of river that begins just downstream of the fishing boundary. This suggests that the lower reaches of the Yakoun River are not a significant part of the steelhead fishery, at least in part due to limitations in access.

3.3 Vehicles & Angler Effort

As was done in Years 1 through 3 of the program, the number of vehicles parked at the entrance of an access point in Year 4 were recorded on all field days at all sites to evaluate the potential use of 'camera trapping' vehicles as a method to acquire continuous estimates of angling effort. This method would require a precise and accurate expansion factor for the number of anglers per number of vehicles present. In year 4, the daily average of the number of anglers per number of vehicles observed was 2.0 (n=13, SE 0.17). These results were compared to those from Year 1 (1.7, n=14, SE 0.1), Year 2 (2.2, n=11, SE 0.1) and Year 3 (1.4,n=11, SE 0.17) using a one-way ANOVA, which indicated that there was a significant difference in the means between these groups (p=1.69e-4). A post hoc Tukey-Kramer HSD test was completed to test the pairwise comparisons between these means and identify which groups' means were different from one another. Results of this test showed that there was a significant difference in the mean number of anglers per number of vehicles observed when comparing years 2018-2019 to 2019-2020, 2019-2020 to 2020-2021 and 2020-2021 to 2021-2022. No other pairwise comparisons between program years were found to be significant. Linear regression of the daily number of anglers at an access point, as predicted by the daily number of vehicles observed, shows a strong relationship (R^2= 0.90; Figure 6). These data suggest that an expansion factor of ~1.95 anglers per vehicles observed at an access point could be a reasonable value to work with if camera traps are used in the future.

The results of the last four years of data suggest that camera trapping vehicles would be a viable and effective method for estimating angler effort on the Yakoun River in future years. As such, efforts will be

made to initiate a camera trapping component in Year 5 of the Yakoun River Guardian Program. This additional component may provide valuable data and help refine the program and analysis in future years.

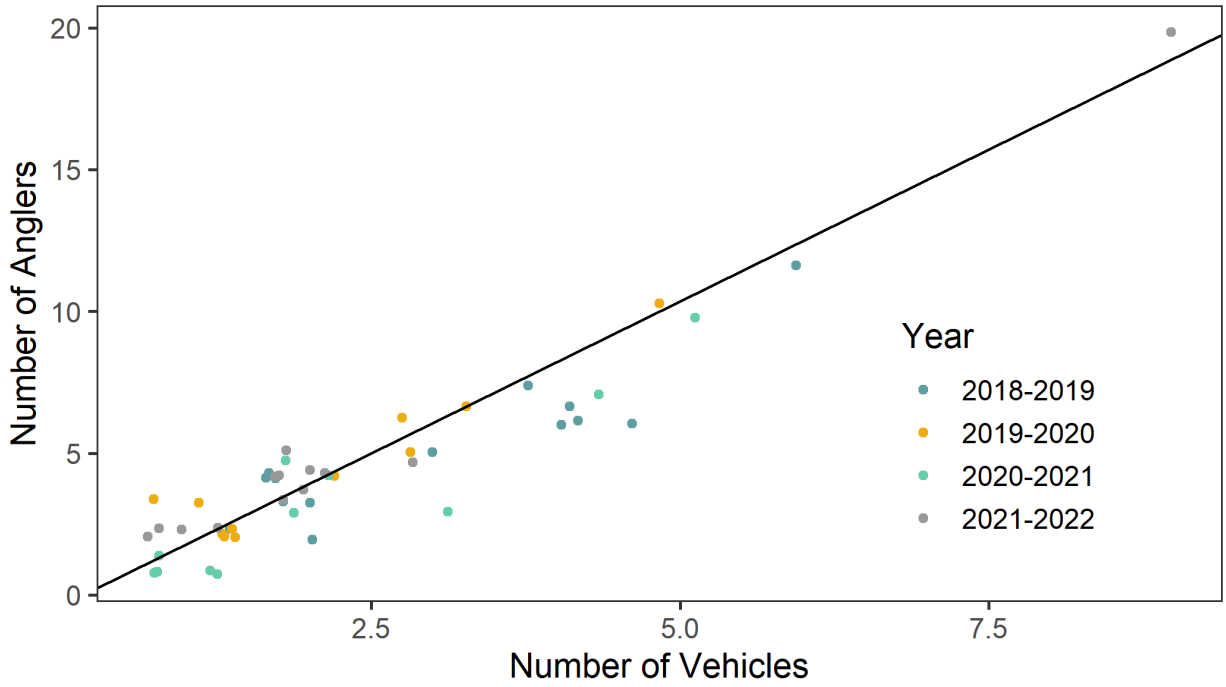

Figure 6. Linear regression of the relationship between the daily total number of vehicles and the daily total number of anglers observed during Yakoun River Guardian program surveys (n=74) over four years (2018 - 2022). The slope of the model is y ~ 1.95x, where y is the number of anglers and x is the number of vehicles. Data points are jittered for visualization purposes.

3.4 Demographics, Gear, Compliance, and Catch

Angler residency was recorded in 22 of the 25 interviews conducted (56 of 61 individual anglers). Of the anglers interviewed in the 2021-2022 steelhead season, 36% were residents of Haida Gwaii, 59% were residents from elsewhere in BC (i.e. BC residents that are not Haida Gwaii residents), and 5% were from outside of BC (Table 2). Comparing angler residency to previous years, of the anglers recorded in 2018-2019, residency was comprised of 10%, 85%, 5%, of Haida Gwaii, BC-other, non-BC residents, respectively (32 anglers not recorded; n=71 anglers). In 2019-2020, Haida Gwaii, BC-other, and non-BC residents made up 11%, 71%, and 17%, of recorded anglers respectively (11 anglers not recorded; n=46 anglers). In 2020-2021 residency was comprised of 65%, 35%, and 0%, Haida Gwaii, BC-other, and non-BC residents respectively (14 anglers not recorded; n=37 anglers). These data show a marked proportional increase in resident Haida Gwaii anglers on the Yakoun River during the 2020-2021 and 2021-2022 steelhead seasons, coincident with the COVID-19 pandemic. While 2020-2021 saw a notable decrease in

BC resident anglers, the 2021-2022 steelhead season saw a return to similar numbers of off-island residents (Figure 7). This initial Year 3 shift in BC resident angler demographics was predictable considering that the 2020-2021 steelhead season occurred during the COVID-19 pandemic when Provincial Health Orders recommended restricting travel beyond one's community. Likewise, the rebound of this demographic in Year 4 to pre-pandemic levels can likely be attributed to the relaxing of Provincial Health Orders limiting travel. Considering that angler effort in years 3 and 4 was relatively similar to the two previous, the data also suggest that Haida Gwaii residents spent more time fishing on the Yakoun River during the pandemic. Broadly, it appears that off-island BC residents are once again angling the Yakoun River at pre-pandemic levels of effort and that local anglers continue to angle more frequently on the Yakoun than before the COVID-19 pandemic.

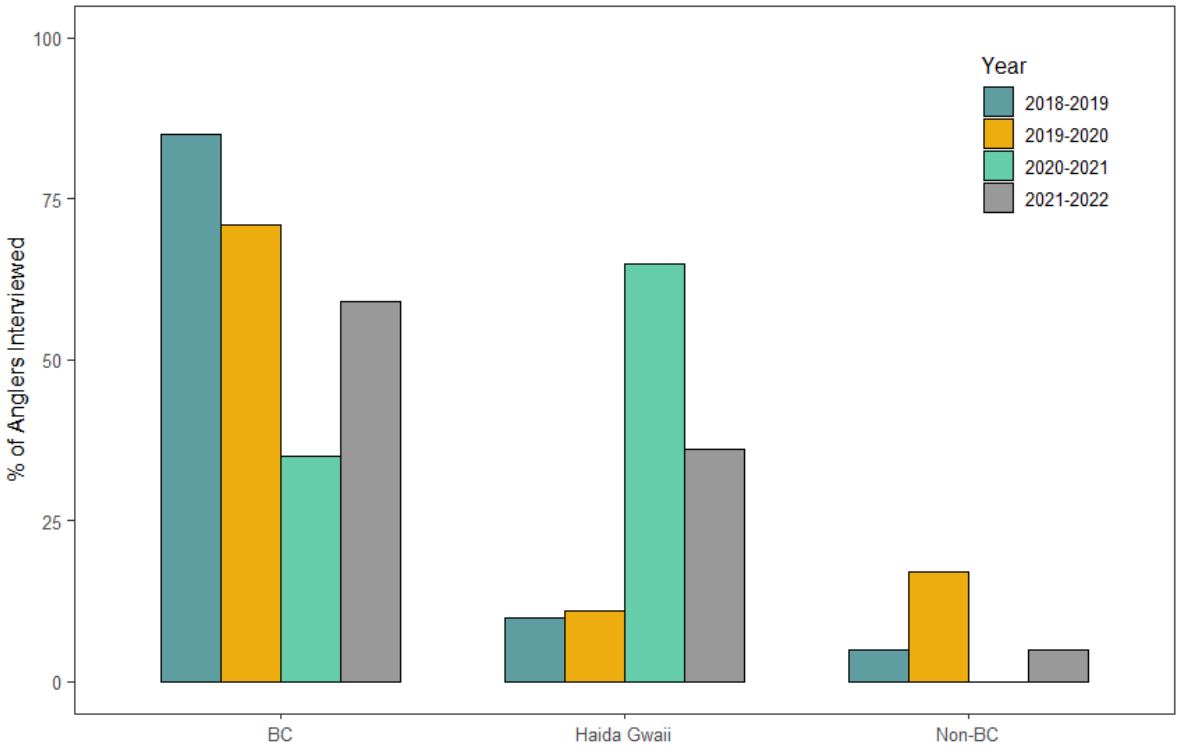

Figure 7. Residency of anglers interviewed in the Yakoun River Guardian program in Year 1 (n= 39), Year 2 (n= 35), Year 3 (n= 23) and Year 4 (n=56) in percent of anglers.

ANGLER RESIDENCY				
	Haida Gwaii	BC residents	Non-BC residents	
% of anglers*	36	59	5	
GEAR TYPE				
	Fly	Float	Spoon	Not recorded
% of anglers*	20	33	5	42
USE OF BAIT				
	Yes	No	Not recorded	
% of anglers*	38	20	42	
COMPLIANCE				
	Yes	No		
% of anglers*	100	0		
*Total number of anglers = 61				

Table 2. Summary of residency, gear selection, and compliance of anglers interviewed during the fourth year of the Yakoun River Guardian program (2021-2022).

The type of fishing gear used in the fourth year of the Guardian program was recorded during 16 of the 25 interviews conducted. Of the 35 anglers interviewed, 20% of anglers used fly fishing gear, 33% of anglers used floats, 5% used spoons, and gear type was not recorded for 42% of anglers. Guardians also recorded whether anglers used bait during 16 of the 25 interviews. Of the 35 anglers interviewed, 38% used bait, 20% were recorded as not using bait, and the use of bait (and gear type) was not recorded for 42% of anglers (Table 2). All anglers recorded using spoon and float gear types in 2021-2022 used bait, and the 20% of anglers not using bait were exclusively those fly fishing. This is a notable difference from Years 1-3 of monitoring, during which time the fishery was predominantly characterized by fly anglers. However, given the relatively large proportion of anglers whose gear/bait was unrecorded in Year 4, it is possible that this is not an accurate representation of angler gear type and bait use in 2021-2022.

All 61 anglers (100%) observed on the Yakoun during the 2021-2022 steelhead season were in compliance with the BC Freshwater Fishing Regulations closure of the upper Yakoun River. This closure extends from Yakoun Lake to the posted fishing boundary approximately 13 river kms downstream (October 1 to April 30).

During the 2021-2022 Yakoun River Guardian program interviews were conducted with 61 anglers who reported catching a total of 2 steelhead, resulting in an overall catch rate of 3%. An additional steelhead was recorded as being caught however it was reported as being a juvenile. The distinction between a juvenile steelhead (parr or smolt) and a resident rainbow for an angler is unclear and no further information was forthcoming. Of the 61 anglers interviewed, 3 cutthroat trout were also reported as being captured.

Given the complications of incomplete trip bias noted earlier, no further analysis of total catch or catch per unit effort was completed.

4.0 SUMMARY & RECOMMENDATIONS

The fourth year of the Yakoun River Guardian program continues to offer unique insights into the river's steelhead fishery, one that once again occurred in the context of a global pandemic. Despite the ongoing Covid-19 challenges, River Guardians were again able to carry out the monitoring program in 2021-2022 much the same as they had done in the first two years of the program. Estimated angler effort was relatively unchanged from Years 2 and 3, despite the observed reductions in off-island travel related to public health mandates and guidelines. The first year of monitoring (2018-2019) still maintains the highest estimated total angler effort (1271 angler days). This may have been a result of better access throughout the season, and or better fishing (Sibbald 2020). Interestingly, with the 2020-2021 STQ data now in hand, Year 3 marked the first year in which estimated total angler effort derived from River Guardian surveys differed substantially from that of the STQ. The reasons for this are unclear, however given its coincident timing with the first year of the pandemic, it seems possible this discrepancy is related to changes in angler residency within the fishery (i.e. local residents underreporting/not purchasing steelhead stamps, or local Haida anglers who are not required to purchase a licence). Differences between STQ derived estimated effort and that of the Guardian Program will be of interest in future years as such differences may help highlight biases and shortcomings within the STQ model and offer insights into potential discrepancies in angling effort in similar watersheds. The predominance of anglers' residency in Haida Gwaii was a clear departure from what had been observed in the first two years of this program and demonstrates that more locals continued to participate in the fishery during the 2021-2022 season. No significant difference was detected in the average daily angler effort between the weekday and weekend strata in Year 4, or in all years combined. It remains unclear if these strata are meaningful, and we would recommend the continuation of such stratification for at least another year, especially given the minimal effort required to maintain consistency with previous years scheduling and analysis. Although a significant portion of anglers interviewed did not have their gear recorded, of those that did, 66% were found to be using gear and bait. While not a complete picture, the available data suggest that gear fishing and bait use eclipsed fly-fishing gear as the primary mode of angling in the 2021-2022 Yakoun River steelhead season. This marks a clear departure from previous survey years and will be a point of interest for future monitoring.

Similar to the first three years of the program, the majority of the temporal distribution of angler effort was concentrated at the beginning of the season. However, Year 4 was the first instance since monitoring began where such a lengthy and consistent display of angler effort was observed in the latter half of the season. This may have to do with favourable weather/environmental conditions during this time. As in Years 2 and 3, poor access and weather conditions affected the River Guardians' ability to conduct surveys during the winter periods (January), and presumably affected angler effort as well. The peak of angler effort was recorded on the seventh survey day on December 5th, 2021. This was also the highest display of angler effort recorded in a single day since monitoring began (160 angler hours as compared to the previous high of 96 angler hours on December 6th 2018). The second highest counts of Year 4 occurred on November 24th and November 28th, 2021. To date, all peak counts of single-day angler effort have occurred in the first half of the steelhead season and no later than January 7th. The previous year's monitoring schedule commenced on November 17th, which was the latest start date since monitoring began. The recorded peak count of anglers on this day in Year 3 raised the question if the historical monitoring schedule might be missing an earlier pulse of angling effort occurring before the beginning of November. The start date in Year 4 of November 8th was similar to historic dates and captured the previously observed gradual increase in angling effort seen in Years 1 and 2. This suggests that an early November start date is likely effective in capturing representative angler effort at the beginning of the season and does not need to be adjusted earlier.

The Year 4 spatial analyses of the distribution of effort was essentially the same as Year 3, with the exception of the Ten-Ton Bridge site, which was included for the first time due to its first observed instance of angler use/effort. This site had been monitored in past years but not included in the analysis given its low (0) angler use. No infractions were observed in Year 4, marking the second time in four years no anglers were observed fishing above the fishing boundary. As in previous years, the majority of angling effort in 2021-2022 was seen at the Branch 40 site, and more broadly, angling effort was observed to be higher in the downstream half of the 10 kilometre survey area. Moving forward, future analysis should continue to include the complete list of ten access points visited by River Guardians.

Another year of data has helped refine an expansion factor for the number of anglers per number of vehicles observed at an access point. With this data now in hand, Year 5 of the Guardian program will be an apt time to initiate the proposed camera trapping component. This expansion factor can be used in conjunction with camera traps at discrete access points, to calculate estimates of angler effort. This method could be an effective option for estimating angler effort not only on the Yakoun River, but on other systems of interest on Haida Gwaii, or elsewhere in BC. As well, the integration of camera traps at strategic sites along the

Yakoun River provides an opportunity to further evaluate patterns in angler use through the season and effective stratification of survey efforts and results.

While these results are interesting, it should be recognized that this program is first and foremost a River Guardian program. In its fourth year, the Guardian program on the Yakoun River continued to provide opportunity for the Haida Fisheries program to engage with steelhead anglers and learn about the nature of the steelhead fishery on the Yakoun River. The creel data collected and described herein comes with known biases and does not wholly meet the requirements of a progressive count creel survey, as detailed extensively under previous copy (Sibbald 2021).

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APPENDIX A

Field data sheets from the Yakoun River Guardian program (2021-2022).

River: YAKOUN RIVER
Observer: KW/BW
Start Time (24hr): 830
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):
Patrol Method: Creel
Date (yyyy/mm/dd): 2021/11/08
Weather: Wx = Wet Snow
Sheet ___ of ___
Comments:

Line	Time/Location: Time	River	Location (Rd/km)	Angler Data: Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	Catch: STH	CT	RB	DV	Comments (Guide Name, Compliance follow up, Boat Use, etc)
1	1050	YAK	21.5K															1133 No Fish
2	1200	YAK	30K															1220 No Fish
3	1223	YAK	32K															1224 No Fish PP
4	1226	YAK	34K															1227 No Fish
5	1229	YAK	34.5K															1230 No Fish
6	1232	YAK	35K															1233 No Fish
7	1234	YAK	30.5K					BC										1242 2 hunters NF
8	1243	YAK	30K					BC										1335 4 hunters = Rupp Johns 1339 NF
9	1340	YAK	29K					BC										1341 = 2 HUNTERS →1432 No Fish
10	1504	YAK	4 Boat															1530 No Fish
11	1241	YAK	35K															
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
32																		
24																		
25																		

Comments:

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
BC= BC Residence
CN= Canadian Res

Haida Gwai Steelhead Survey - Winter 2018-2019

River YAKOUN River

Observer KW, TW

Start Time (24hr) 850 Start Location (Rd/km)

End Time (24hr) End Location (Rd/km)

Patrol Method

Date (yyyy/mm/dd) 2021/11/12

Weather partly Cloudy

Sheet ___ of ___ Comments

Int#	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)
	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	
1	1031	YAK	Port 4 km															River = High & muddy 1100 out
2	1135	YAK	29K															River = High & muddy 1240 out
3	1240	YAK	30K															Pt Hunt = River Hi & Muddy 1335 out
4	1330	YAK	30.5K															Hi & muddy 1340
5	1342	YAK	32K															Hi & Muddy 1343
6	1344	YAK	33K															Hi & Muddy 1345
7	1350	YAK	35.5K															Hi & muddy 1351
8	1352	YAK	32.5S															Hi & muddy 1353
9	1355	YAK	32S															Powder Pool = Hi & Muddy 1410
10	1434	YAK	21.5S															River = High & Tea color 1515
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		

Comments

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
BC= BC Residence
CN= Canadian Res
AL= non Resident Alien

Haida Gwai Steelhead Survey - Winter 2018-2019

River: Yakoun R
Observer: KW / BW
Start Time (24hr): 830
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method:
Date (yyyy/mm/dd): 2021/Nov/16
Weather: Wx Partly Cloudy
Sheet ___ of ___
Comments:

Int#	Time/Location: Time	River	Location (Rd/km)	Angler Data: Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	Catch: STH	CT	RB	DV	Comments (Guide Name, Compliance follow up, Boat Use, etc)
1	1030	Yak	21.5s															No Fishers → 1120
2	1200	YAK	32s															Powder Pool No Fishers → 1215
3	1217	YAK	32.5s															No Fishers → 1230
4	1222	YAK	34s		1	1	50	BC	10	3		Float	Y	0				No Fish = 1 Fisher → 1230
5	1232	YAK	34.5s															No Fishers → 1235
6	1239	YAK	33k															No Fishers → 1240
7	1241	YAK	32k															No Fishes → 1242
8	1245	YAK	30.5k															No Fishers → 1247
9	1248	YAK	30k															No Fishers → 1325
10	1327	YAK	29k	GM	3	1	30-40	HG	1330			Float	Y					3 ~~Fishers~~ → ~~1325~~ 1440
11	1518	YAK	Past 4km															No Fishers → 1532
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
32																		
24																		
25																		

Comments:

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
BC= BC Residence
CN= Canadian Res
AL= non Resident Alien

Haida Gwai Steelhead Survey - Winter 2018-2019

River YAKOUN River

Observer KW/BW

Start Time (24hr) 850 Start Location (Rd/km)

End Time (24hr) End Location (Rd/km)

Patrol Method

Date (yyyy/mm/dd) 2021/11/24

Weather Rainy, Windy 7°C

Sheet ___ of ___ Comments

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)
Int#	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	
1	1015	YAK	Port 4K															High + muddy No Fishers → 1035
2	1110	YAK	29K		2	1			—	—		FL	Y					1212 2 fishers w/ raft (Mass) → 1235
3	1240	YAK	30K		1	1			—	—		FL	Y					1245 1 fisher (RL) → 1333 PJ
4	1337	YAK	30.5K															No Fishing → 1337
5	1340	YAK	32K															No Fishers → 1340
6	1342	YAK	33K															No Fishers → 1342
7	1346	YAK	34S															No Fishers → 1346
8	1349	YAK	32.5S															No Fishers → 1349
9	1350	YAK	32	(2x)2		1						FL	Y					No Fishers, Hi + Muddy → 1400 PP
10	1430	YAK	21.5S															No Fishers → 1515
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		

Comments

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
BC= BC Residence
CN= Canadian Res
AL= non Resident Alien

Haida Gwai Steelhead Survey - Winter 2018-2019

River: Yakoun River
Observer: KW/DW
Start Time (24hr): 830
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method:
Date (yyyy/mm/dd): 2021/11/28
Weather: Cloudy 80%, fairly Sunny
Sheet ___ of ___
Comments:

Int#	Time/Location: Time	River	Location (Rd/km)	Angler Data: Angler Initial	# In Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	Catch: STH	CT	RB	DV	Comments (Guide Name, Compliance follow up, Boat Use, etc)
1	955	YAK	21.5															No Fishers → 1050
2	1125	YAK	32.5		3	1		HG	9	3		Float	Y	1 juv.				Powder Pole = #caught = 1 juvenile 1140
3	1148	YAK	32.5S															No Fishers 1142
4	1145	YAK	33.5K		1	0		BC	11									1 drop off 1146
5	1150	YAK	33K															No Fishers High + Muddy 1152
6	1154	YAK	32K															No Fishers High + Muddy old 1155
7	1159	YAK	30.5K		1	1		CN:	K									1 fisher wanting to fish One Dead Bear 1205
8	1210	YAK	30K															No Fishers High + muddy 1253
9	1245	YAK	29K															No Fishers High + Muddy 1357
10	1442	YAK	Port 4K															2 Hunters, high + muddy, 1505
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		

Comments:

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
BC= BC Residence
CN= Canadian Res
AL= non Resident Allen

Haida Gwal Steelhead Survey - Winter 2018-2019

River Yakoun R

Observer KW / BW

Start Time (24hr) 850 Start Location (Rd/km)

End Time (24hr) End Location (Rd/km)

Patrol Method

Date (yyyy/mm/dd) 2021/12/3

Weather Cloudy 80%, Snowy

Sheet ___ of ___ Comments

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)
Int#	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	
1	1030	YAK	Port 4K															No Fishers, Trees across road, 1040
2	1115	YAK	29K															No Fishers, One Hunter, 1210
3	1212	YAK	30K															No Fishers, P.J. 1250
4	1252	YAK	30.5K															No Fishers x 1253
5	1256	YAK	32K		2	1		ALI										2 Fishers, Rafting x 2 1305
6	1307	YAK	33K															No Fishers 1308
7	1312	YAK	33.5S															No Fish 1313
8	1315	YAK	32.5S															No Fishers 1316
9	1320	YAK	32 SPP															No Fishers 1325
10	1401	YAK	21.5S															No Fishers 1414
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
32																		
24																		
25																		

Comments

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
BC= BC Residence
CN= Canadian Res
AL= non Resident Alien

Haida Gwai Steelhead Survey - Winter 2018-2019

River YAKOUW River

Observer KW/BW

Start Time (24hr) 830 Start Location (Rd/km)

End Time (24hr) End Location (Rd/km)

Patrol Method

Date (yyyy/mm/dd) 2021/12/05

Weather Cloudy 100%

Sheet ___ of ___ Comments

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)
Init	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	
1	1010	YAK	21.5		0	0												No Fishers → 1030
2	1114	YAK	32.5		/	/												No Fishers → 1130
3	1132	YAK	32.55		/	/												No Fishers → 1133
4	1135	YAK	33.5 S		/	/												No Fishers → 1137
5	1144	YAK	33.5 K		3	1		HG	9									3 Fishers for HG → 1150
6	1155	YAK	33.05 K		4	2		HG	11						1			4 x 2 vehicles → 1211
7	1219	YAK	32 K		1	1		HG	10									1 fisher → 1222
8	1227	YAK	30.5 K		/	/		/	/									No Fishers → 1228
9	1229	YAK	30 K		5	2		HG BC	10	3					1			3 from DC, 2 HG → 1320
10	1322	YAK	29 K		7	3			8	30					1			3 for BC again, 2 for Terrace 1410
11	1500	YAK	Port 4		/	/												No Fishers 1511
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
32																		
24																		
25																		

Comments

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
BC= BC Residence
CN= Canadian Res
AL= non Resident Alien

Haida Gwai Steelhead Survey - Winter 2018-2019

River: Yakoun River
Observer: KW/BW
Start Time (24hr): 830
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method:
Date (yyyy/mm/dd): 2021/12/11
Weather: Cloudy, Snowy
Sheet ___ of ___
Comments:

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)	
Int#	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV		
1	1025	Yak	Post 4		/	/												No Fishers	1030
2	1110	Yak	29 k		/	/												No Fishers, total snow (4-6")	1130
3	1134	Yak	30k		/	/												No Fishers, Papa Johns	1145
4	1158	Yak	30.5 k		/	/												No Fishers 6-8" snow	1199
5	1203	Yak	32k		/	/												No Fishers	1204
6	1205	Yak	33K		/	/												No Fishers	1206
7	1207	Yak	33.5 K		/	/												No Fishers	1208
8	1211	Yak	33.5 S		/	/												No Fishers	1212
9	1213	YAK	32.5 S		/	/												No Fishers	1214
10	1215	Yak	32 S		2	1		BC										No Fishers Powder Pool	1230
11	1256	Yak	21.5 S		/	/												No Fishers	1300
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
32																			
24																			
25																			

Comments:

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
BC= BC Residence
CN= Canadian Res
AL= non Resident Alien

Haida Gwai Steelhead Survey - Winter 2018-2019

River: YAKoun River
Observer: KW/BW
Start Time (24hr): 830
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method:
Date (yyyy/mm/dd): 2021/12/16
Weather: Partly cloudy, Haze, 0°C
Sheet ___ of ___
Comments:

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)	
Int#	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV		
1	1031	YAK	21.5 s		/	/												No Fishers	1032
2	1119	YAK	32 s		/	/												No Fishers Powder Pool	1130
3	1133	YAK	32.5 s		/	/												No Fishers	1134
4	1136	YAK	33.5 s		/	/												No Fishers	1137
5	1143	YAK	~~33~~ K 33.5 K		/	/												No Fishers	1144
6	1145	YAK	33 K		/	/												No Fishers	1146
7	1148	YAK	32 K		/	/												No Fishers	1149
8	1153	YAK	30.5 K		/	/												No Fishers	1154
9	1155	YAK	30 K		/	/												No Fishers Papa John's	1230
10	1234	YAK	29 K		/	/												No Fishers Br 40	1259
11	1348	YAK	Post 4 K															No Fishers	~~1348~~ 1359
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
32																			
24																			
25																			

Comments:

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
BC= BC Residence
CN= Canadian Res
AL= non Resident Alien

Haida Gwai Steelhead Survey - Winter 2018-2019

River: YAKoun River
Observer: KW/BW
Start Time (24hr): 850
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method:
Date (yyyy/mm/dd): 2022/2/3
Weather: 100% Cloud
Sheet ___ of ___
Comments:

Ind#	Time/Location: Time	River	Location (Rd/km)	Angler Data: Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bail (Y/N)	Catch: STH	CT	RB	DV	Comments (Guide Name, Compliance follow up, Boat Use, etc)
1	1020	YAK	21.5K	–	–	–	–											11:00, No Fishers
2	1129	YAK	32K	–	–	–	–											11:39 No Fishers
3	1140	YAK	32.5K	–	–	–	–											1142 No Fishers
4	1145	YAK	33.5K	–	–	–	–											1146 No Fishers
5	1150	YAK	33.5K	–	–	–	–											1151 No Fishers
6	1152	YAK	33K	–	2	1	–	BC	10	300		Spoon	YA	0				1202 2 Fishers, 500m downstream
7	1206	YAK	32K	–	–	–	–											1207 No Fishers
8	1209	YAK	30.5K	–	–	–	–											1210 No Fishers
9	1211	YAK	30K	–	–	–	–											1240 No Fishers
10	1244	YAK	29K	–	1	1		BC	11	1		Spoon	Y	0				1354 1 fisher
11	1420	YAK	Port 4	–	–	–	–	–	–									1446 No Fishers
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		

Comments:

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
HG= Haida Gwai Resident
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Haida Gwai Steelhead Survey - Winter 2018-2019

River: YAKoun River
Observer: IS w/ BW
Start Time (24hr): 830
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method: Creek
Date (yyyy/mm/dd): 2022/02/06
Weather: Cloudy 50-60%, clearing @ 12:00
Sheet ___ of ___
Comments:

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)
Int#	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	
1	458	YAK	Port 4km	-	-	-	-	-	-	-	-	-	-	-	-	-	-	River Hi & muddy, No Fishers, 10:27
2	1057	YAK	29K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	River Hi & muddy, No Fishers, 1157
3	1211	YAK	30K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	River Hi & muddy, No Fishers, 1254
4	1256	YAK	30.5K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Fishers, 1257
5	1300	YAK	32K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Fishers, 1301
6	1303	YAK	33K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Fishers, 1304
7	1305	YAK	33.5K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Fishers, 1305
8	1312	YAK	34.8K	-	2	1	25	BC	8	-	-	FL	N	-	-	-	-	2 Fishers, 1313
9	1316	YAK	32.5S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Fishers, 1317 Hi & dark Tea
10	1318	YAK	32S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Fishers, 1325 Hi & dark Tea
11	1350	YAK	21.5S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Fishers, 1450 Hi & dark Tea
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
32																		
24																		
25																		

Comments:

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
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Haida Gwai Steelhead Survey - Winter 2018-2019

River: YAKOUN River
Observer: KW / BW
Start Time (24hr): 850
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method: Creek
Date (yyyy/mm/dd): 2022/02/10
Weather: Cloudy 95%
Sheet ___ of ___
Comments:

	Time/Location			Angler Data										Catch				
Inst	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	Comments (Guide Name, Compliance follow up, Boat Use, etc)
1	1026	YAK	21.5 s	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1121, 2 hunters at (Blk Toyota), Hi & dark tea/mu
2	1150	YAK	32.5 PP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1202, No Fishers, Hi & dark tea/muddy
3	1203	YAK	32.5 s	—	—	—	—	—	—	—	—	—	—					1204, No Fishers
4	1208	YAK	33.5 s	—	—	—	—	—	—									1208, No Fishers
5	1213	YAK	33.5 s	—	—	—	—											1213, No Fishers
6	1214	YAK	33 K	—	—	—	—	—										1215, No Fishers
7	1216	YAK	32 K	—	—	—	—	—										1217, No Fishers
8	1220	YAK	30.5 K	—	—	—	—	—										1221, No Fishers
9	1222	YAK	30 K	—	—	—	—	—										1253, No Fishers, Hi & dark Tea/muddy
10	1255	YAK	29 K	—	2	1	30's	DC				Fly	N					1430 2 Fishers in camper, Hi & dark Tea
11	1510	YAK	Part 4km	—	—	—	—	—										1530, No Fishers, Hi & Muddy
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
32																		
24																		
25																		

Comments:

Gear Type
DF = Drift Gear
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Haida Gwai Steelhead Survey - Winter 2018-2019

River: Yakoun River
Observer: KW/BW
Start Time (24hr): 830
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method: YAK Crew Q
Date (yyyy/mm/dd): 2022/02/15
Weather: Cloudy 100%
Sheet ___ of ___
Comments:

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)
	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	
1	1020	YAK	Port 4 km			X												3 Vehicles
2	1215	YAK	29 K															Environment Canada = 4 people + 2 CHN monitors 1145
3	1337	YAK	30 K															Dark Tea, No Fishers 1335
4	1408	YAK	30.5 K															Dark Tea, No Fishers 1406
5	1411	YAK	32 K		2	1		BC						0				No Fishers 1408
6	1419	YAK	33 K															2 Fishers 1413
7	1420	YAK	33.5 K															No Fishers 1419
8	1425	YAK	34.5 S															No Fishers 1420
9	1427	YAK	32.5 S															No Fishers 1425
10	1429	YAK	32 S															No Fishers 1427
11	1509	YAK	21.5 S															No Fishers 1441
12																		1 hunter, 1 vehicle No Fishers 1544
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		

Comments:

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
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AL= non Resident Alien

Haida Gwai Steelhead Survey - Winter 2018-2019

River: Yakoun River
Observer: KW/BW
Start Time (24hr): 850
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method: Creel
Date (yyyy/mm/dd): 2022/02/19
Weather: Rainy 100% Overcast
Sheet ___ of ___
Comments:

Init	Time/Location: Time	River	Location (Rd/km)	Angler Data: Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	Catch: STH	CT	RB	DV	Comments (Guide Name, Compliance follow up, Boat Use, etc)	
1	1022	YAK	21.5 s															No Fishin, Dark Tea	1110
2	1138	YAK	32 s															No Fishin, Dark Tea, P.Pool	1150
3	1153	YAK	32.5 s															No Fishin	1153
4	1157	YAK	33.5 s															No Fishin	1157
5	1202	YAK	33.25 K															No Fishin	1202
6	1204	YAK	32.75 K															No Fishin	1204
7	1206	YAK	32 K															No Fishin	1207
8	1210	YAK	30.25 K															No Fishin	1210
9	1211	YAK	30 K															No Fishin, Papa John's, Dark Muddy ~~1215~~	1240
10	1247	YAK	29 K		4	2		BC	11	3		F	N					Dark muddy Tea, high water,	1406
11	1509	YAK	Port 4km															Dark Muddy, fairly high water	1537
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
32																			
24																			
25																			

Comments:

Gear Type
DF = Drift Gear
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Haida Gwai Steelhead Survey - Winter 2018-2019

River Yakoun River

Observer KW/BW

Start Time (24hr) 830 Start Location (Rd/km)

End Time (24hr) End Location (Rd/km)

Patrol Method

Date (yyyy/mm/dd) ~~2022/02/22~~ 2022/02/27

Weather Clear cold -1°C

Sheet ___ of ___ Comments

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)
Instr	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	
1	1048	YAK	Port 4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	No Fishers Dark coffee, Normal level 11°C
2	1131	YAK	29K	–	4	2	–	HG	10	–	–	F	N					2 people: BC, Dark Coffee 1304
3	1305	YAK	30K PJ															No Fishers Dark Coffee 1322
4	1323	YAK	~~30.5K~~ 30.25K															No Fishers 1324
5	1327	YAK	32K															No Fishers 1327
6	1329	YAK	32.75K															No Fishers 1328
7	1330	YAK	33.25K	–	2	1												Same (2) previous recorded, 1330
8	1334	YAK	33.5S															No Fishers 1335
9	1338	YAK	32.5S															No Fishers 1338
10	1354	YAK	32S															P.P. Dark coffee, calm, No Fishers 1400
11	1423	YAK	21.5S															No Fishers, Dark Coffee 1502
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
32																		
24																		
25																		

Comments

Gear Type
DF = Drift Gear
FF = Fly Fish
SG = Spin Gear

Origin
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Haida Gwai Steelhead Survey - Winter 2018-2019

River Yakoun River

Observer KW/BW

Start Time (24hr) 830 Start Location (Rd/km)

End Time (24hr) End Location (Rd/km)

Patrol Method Creel

Date (yyyy/mm/dd) 2022/02/26

Weather Cloudy, raining, windy picking up

Sheet ___ of ___ Comments

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)
Inv	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	
1	1035	YAK	21.5 S															No Fishers, Lt Tea color, Normal wtr, 1121
2	1142	YAK	32.5 PP															No Fishers, Lt Tea color, Norm. Water level 1200
3	1202	YAK	32.5 S															No Fishers 1202
4	1205	YAK	33.5 S															No Fishers 1205
5	1210	YAK	33.5 K															No Fishers 1210
6	1211	YAK	32.75 K															No Fishers 1211
7	1213	YAK	32 K															No Fishers 1213
8	1216	YAK	30.25 K															No Fishers 1216
9	1217	YAK	30 K															No Fishers, Dark Tea, Normal Level, 2 hunters, 1248
10	1250	YAK	29 K		2	1		BC	11			Float	Y					Dark Tea, Normal - below normal 1400
11	1447	YAK	Past 4 Km		2	1		BC				Float	Y					Dark Tea, Moderate level 1500
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		

Comments

Gear Type
DF = Drift Gear
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Origin
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Haida Gwai Steelhead Survey - Winter 2018-2019

River: Yakoun River
Observer: KW / BW
Start Time (24hr): 830
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method: Creel
Date (yyyy/mm/dd): 2022/03/07
Weather: Overcast 90's
Sheet ___ of ___
Comments:

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)
Index	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	
1	1003	YAK	Pout 4km															Dark Coffee, low levels No Fishes, 1025
2	1055	YAK	29K		2	1		BC	11	-		float	Y	2				Dark Tea, Low, 1204
3	1207	YAK	30K		2	1		BC	"			float	Y					Dark Tea, Low water "same couple pres recorded 1235
4	1236	YAK	30.25K															1236
5	1240	YAK	32K															1240
6	1243	YAK	32.75K															1243
7	1244	YAK	33.25K															1244
8	1249	YAK	33.5S															1249
9	1252	YAK	32.5S															1252
10	1254	YAK	32S															1315
11	1342	YAK	21.5S															
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		

Comments:

Gear Type
DF = Drift Gear
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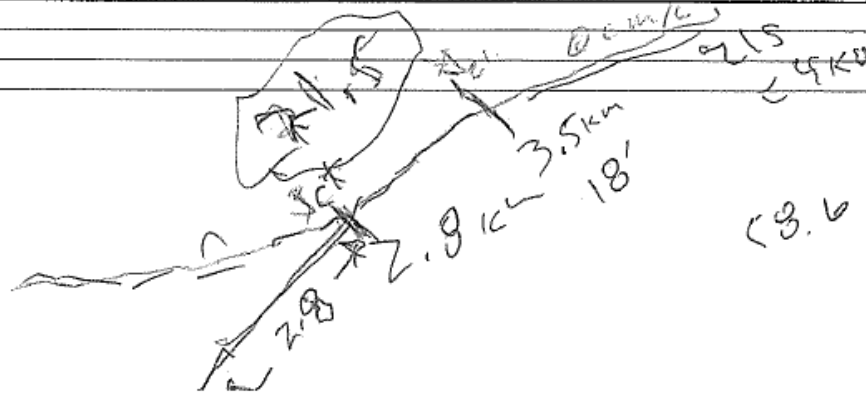

Haida Gwai Steelhead Survey - Winter 2018-2019

River: Yakoun River
Observer: KW/BW
Start Time (24hr): 530
Start Location (Rd/km):
End Time (24hr):
End Location (Rd/km):

Patrol Method: Creel
Date (yyyy/mm/dd): 2022/03/13
Weather: Overcast / Haze
Sheet ___ of ___
Comments:

	Time/Location			Angler Data										Catch				
Int#	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV	Comments (Guide Name, Compliance follow up, Boat Use, etc)
1	1009	YAK	21.5 S															No Fishers, Dark Tea, Normal High 1054
2	1123	YAK	32 S															No Fishers, Dark Tea, Normal 1140 P.P.
3	1141	YAK	30.5 S															No Fishers 1141
4	1144	YAK	33.5 S															No Fishers 1144
5	1150	YAK	33.25K															No Fishers 1150
6	1151	YAK	32.75K															No Fishers 1151
7	1153	YAK	32 K															No Fishers 1153
8	1157	YAK	30.25K															No Fishers 1157
9	1158	YAK	30 K															P.S. No Fishers Dark Tea, Normal 1226
10	1229	YAK	29K															No Fishers Dark Tea, Normal 1400
11	1447	YAK	Port 41km															No Fishers, Dark Tea, Normal 1503
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		

Comments:

Gear Type
DF = Drift Gear
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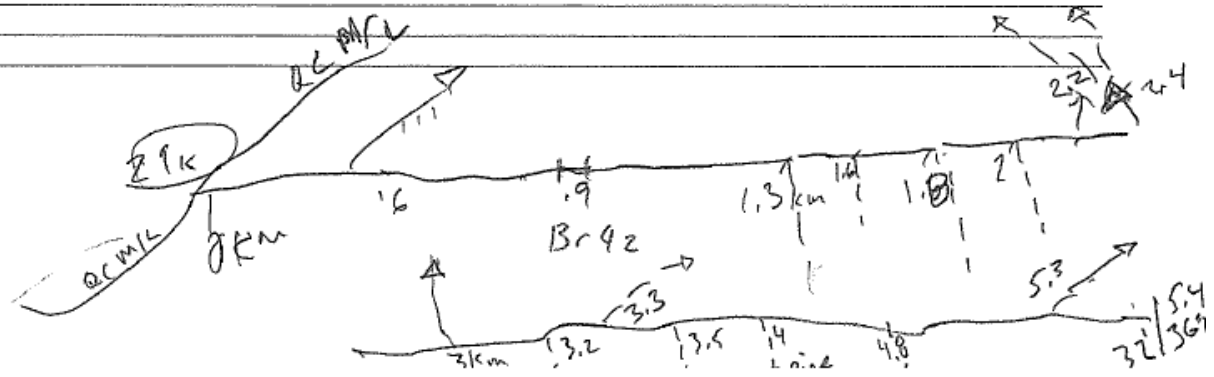

Haida Gwai Steelhead Survey - Winter 2018-2019

River Yakoun River

Observer KU/BW

Start Time (24hr) 830 Start Location (Rd/km)

End Time (24hr) End Location (Rd/km)

Patrol Method Creel

Date (yyyy/mm/dd) 2022/03/29

Weather Overcast 90%

Sheet ___ of ___ Comments River Level = Moderate

	Time/Location			Angler Data										Catch				Comments (Guide Name, Compliance follow up, Boat Use, etc)	
Line#	Time	River	Location (Rd/km)	Angler Initial	# in Group	# Vehicles	Age	Origin	Start Fish	Finish Fish	Actual Hrs	Gear Type (Fly, Spoon, Float)	Bait (Y/N)	STH	CT	RB	DV		
1	1023	YAK	Rest 4 km															No Fishers, Dark Tea,	1045
2	1120	YAK	29 k															No Fishers, Dark Tea, Bear	1233
3	1225	YAK	30 k															No Fishers, Dark Tea FJ	1257
4	1258	YAK	30.5 k															No Fishers	1258
5	1302	YAK	32 k															No Fishers	1302
6	1304	YAK	32.75 k															No Fishers	1304
7	1306	YAK	33.5 k															No Fishers	1306
8	1311	YAK	33.5 S															No Fishers	1311
9	1314	YAK	32.5 S															No Fishers	1314
10	1316	YAK	32 S															No Fishers Dark Tea	1330
11	1356	YAK	21.5 S															No Fishers Dark Tea	1445
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
32																			
24																			
25																			

Comments

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FINI