Horsefly River Creel Survey 2004

Cariboo Regional Fisheries Report CA-2004-5

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February 2005
British Columbia Conservation Foundation

Funded by The Habitat Conservation Trust Fund

Abstract

A creel survey was conducted on the Horsefly River under the auspices of the Provincial River Guardian Program. Cariboo Envirotech (Likely BC), was contracted to collect and record angler data over a four month period commencing on July 10,2004 and concluding on October 16, 2004. Cariboo Envirotech randomly selected one weekday and one weekend day to be surveyed per week. Methods used to access anglers on the Horsefly River comprised of driving the classified portion of the river and interviewing all easily accessible anglers. After driving the classified portion of the river, a decision was made as to which section contained the highest density of boat anglers. Then that section was drifted and anglers were interviewed as they were encountered.

The creel survey crew interviewed 110 anglers over the course of the season. The majority (32 % n=36) of anglers interviewed were angling in zone four. Zone four extends upstream of the Woodjam Creek Bridge to the Bosk Bridge, and provides easy access for both shore and boat anglers. Residents of British Columbia represented 81% of the anglers interviewed during the 2004 survey. Non resident aliens represented 19% of the survey, and there were no Canadian residents interviewed in 2004. 15% of anglers interviewed were guided, and 85% were non-guided. All guided anglers surveyed were non-resident alien anglers. Overall angler effort was likely affected by the spot closure below the Woodjam Bridge from July 26 to August 13, 2004. Over the course of the survey, a higher proportion of anglers were interviewed on the weekend in comparison to weekdays. The mean number of anglers interviewed on weekend days was 5.36, and the mean number of anglers interviewed on weekdays was 2.92. Overall angler effort from July to the end of October is estimated to be 647 angler days. Three species of fish were reportedly captured during the 2004 survey. Anglers reported capturing rainbow trout, mountain whitefish and northern pike minnow. The reported hourly catch rate for rainbow trout, mountain whitefish and northern pike minnow was 1.39, 0.16 and 0.0007 respectively. 59% anglers interviewed were shore anglers and 41% accessed the river by boat. Most of the anglers interviewed traditionally make 1-5 trips per year to the Horsefly River, and a few make over 50 trips per year. Angler experience on the Horsefly River ranged from first trip to over 30 years. Interviewed anglers averaged 5.7 years of experience on the Horsefly River. The majority of anglers (38%) felt that angling success had remained the same over the past few years while 28% felt it was worse, 24% felt it was better and 10% were undecided. Anglers were unanimous in their support for the sport fishing closures that have resulted from high water temperatures in 2003 and 2004. Most anglers (77%) were in favour of limiting and distributing non-guided, non resident alien angler use. Water temperatures were recorded manually by the creel survey crew and electronically by Stowaway Tidbit Temperature data loggers. The data loggers were located at the Horsefly River Bridge, Woodjam Creek Bridge and near the confluence of Black Creek and the Horsefly River mainstem. Above average water temperatures were recorded between July 13 and August 22. During this time period the mean water temperature recorded at the Horsefly Bridge was 18.92ºC and the maximum temperature was 24.68ºC. The logger located at Woodjam Bridge during that time period recorded a mean of 18.2ºC and a maximum of 22.19ºC.

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1. Introduction

The headwaters of the Horsefly River are located in the Quesnel Highlands and flows through coniferous forests, several high gradient canyon reaches and low gradient agricultural areas for approximately 98 km before it enters Quesnel Lake. The river provides spawning and rearing habitat for Quesnel Lake rainbow trout as well as sockeye salmon, chinook salmon and coho salmon. Currently, MWLAP estimates that the Horsefly River produces 75% of the Quesnel Lake rainbow trout population (R Dolighan per com 2001). This genetically unique sub-species of late maturing rainbow trout do not spawn until reaching 5 or 6 years of age. They are, therefore, subject to capture by anglers in both the lake and river sports fishery for an extended period of time before reaching maturity.

A continuing study on the Horsefly River rainbow trout population has indicated a decrease in the average size at maturity (R Dolighan per com 2001). The recorded decrease in size has reduced the fecundity of mature females by an estimated 40%, therefore, reducing the number of eggs available to be fertilized during spawning (R Dolighan per com 2001). Currently the fisheries branch estimates the Horsefly River rainbow trout escapement to be approximately 300 spawners (R Dolighan per com 2001). Fisheries managers remain concerned that the number of adult rainbow trout in Quesnel Lake and spawning in the Horsefly River are still depressed due to various factors including angling demands on the lake and river fishery, reduced kokanee populations and mortalities related to exceptionally warm summer water temperatures (R Dolighan per com 2001). The current fisheries management goals for the Horsefly River fishery are to:

- conserve and enhance the wild rainbow trout population upon which the sport fishery depends.
- maintain the quality aspects of the Horsefly River sports fishery.
- provide fair access to angling opportunities on the Horsefly River for all classes of anglers.
- manage angler density over the key angling areas during the angling season.

The Horsefly River is designated as a Class 2 river that is open for catch and release, artificial fly angling from June 1 to October 31. A river guardian program began on the Horsefly River in the 2000 angling season.

- estimate overall angling effort.
- estimate angler effort in specific areas, and establish proportional residency of anglers and record angler catch success.
- monitor angler compliance with existing regulations on the Horsefly River.
- provide anglers with current information about the Horsefly River rainbow trout population and present conservation concerns.

2. Methods

In 2004, data collection was contracted to Cariboo Envirotech Ltd based in Likely, British Columbia. Data collection methodology was based on Horsefly River creel programs that occurred in 2001 and 2002. Typically, the entire length of the classified portion of the river was driven by vehicle and any observed anglers that were easily accessible were interviewed. Tributaries to the Horsefly River such as Mckinley Creek Moffat Creek were not included in the survey. Subsequent to traveling the Black Creek road interviewers determined what section of river had the highest amount of angler effort and utilized a boat to access that section of river. After the river closed for temperature reasons below the Woodjam Creek Bridge on July 26, angling effort was confined to a significantly smaller area and undoubtedly increased the efficiency of the creel crew.

Angler interviews commenced on July 10, 2004 and concluded on October 16, 2004. Creel data was collected bi-weekly and was stratified by one weekend day and one weekday. Once contact was made, anglers were asked a predetermined series of questions (Table 1).

Horsefly Creel Questionnaire, 2004
1) Where is your permanent residence?
2) Are you an unguided or guided client? If guided by whom?
3) How many fish have you landed today? If yes what species?
4) How long have you been fishing?
5) (If in a boat) Where did you put in? Where do you plan to take out?
6) How many trips a year do you take on the Horsefly River?
7) How many years have you been coming?
8) Is the fishing better or worse in the past few years?
9) Due to high temperatures the Horsefly was closed for two weeks in 2003. Do you support these closures for conservation purposes?
10) There has been consideration for classifying the Horsefly River to "limit and distribute non-guided, non-resident alien use". Do you agree with this?
11) Comments:

Table 1. Horsefly River Angler Questionnaire 2004.

Each angler interviewed has his/her responses recorded and organized into a spreadsheet for analysis.

3.Results

3.1 EFFORT BY ZONE

The Horsefly River is separated into five zones to measure angler distribution on the classified portion of the river. In 2004, angler distribution was probably affected by the sport fishing closure resulting from high water temperatures in zone one, two and three. The closure came in affect on July 26, 2004 and continued until August 13, 2004.

Zone one begins at the point at which the Horsefly River enters Quesnel Lake and proceeds upstream to the forestry recreation site at Squaw Flats. This area contains limited access points for both shore and boat anglers and proportionally receives the least amount of angler effort (fig 1). Overall, 4% (n=4) of anglers interviewed in 2004 were angling in zone one. In comparison, 10% (n=10) of anglers interviewed in 2002 were angling in zone one (fig 1).

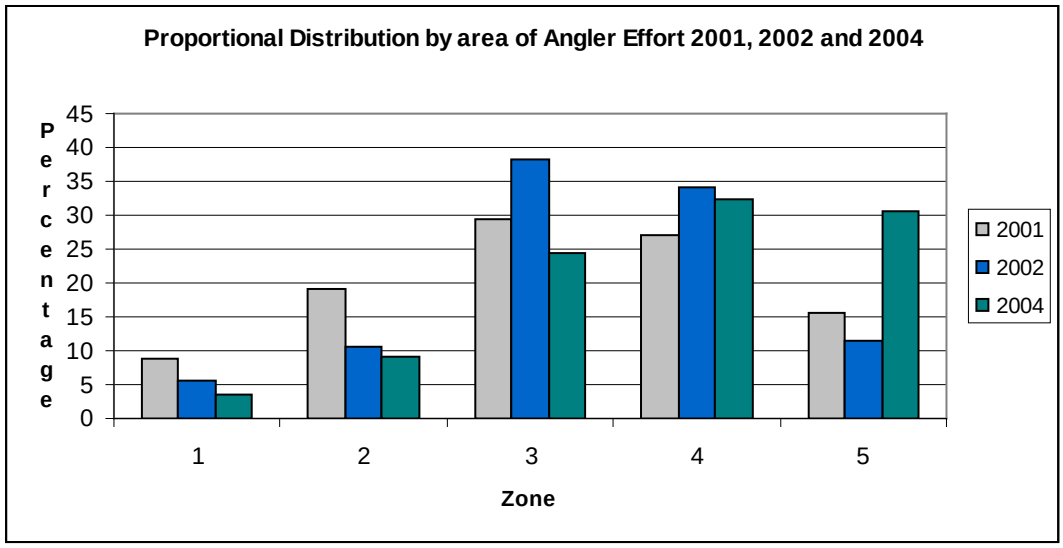

Figure 1. Overall Proportional Distribution of Angler Effort by area 2001, 2002 and 2004.

Zone two begins at Squaw Flats and continues upstream to the townsite bridge in Horsefly. This high gradient section of river area flows through several canyon reaches and is relatively inaccessible to shore anglers. Boat anglers can access this section of river via boat launches at the townsite bridge, Rocky Bar and Squaw Flats. Most boat anglers chose to avoid the falls, known as “the steps”, between the townsite bridge and Rocky Bar. Proportional angler effort in zone two in 2002 and 2004 were similar at 10% (n=19) and 9% (n=10) respectively.

Zone three begins at the townsite bridge and continues upstream to the Woodjam Bridge. This area of the river flows through meandering low gradient agricultural areas, coniferous forests and several canyons. Well established trails below the agricultural land provide decent access for shore anglers. Boat anglers in this area typically utilize the boat launch at "106 km" and float to the Horsefly townsite bridge. In 2004, zone three represented 24% (n=19) of anglers interviewed in comparison to 38% (n=69) in 2002.

Zone four continues upstream of the Woodjam Bridge to the Bosk Bridge located just above the Horsefly River / Mckinley Creek confluence. This section flows through coniferous and deciduous forests and low gradient meandering agricultural land. This section also contains a significant portion of private land which limits access to both shore and boat anglers, however, many boat anglers chose to float this long section between the Bosk Bridge and "118 km." Shore anglers also have good access to the river over Crown Land in the Bosk Bridge area. Data indicates that in a typical year angler effort in zone four is second only to zone three (fig 1). 32% of angler interviewed in 2004 (n= 36) were angling in zone four. This is comparable to proportional effort recorded in zone four in 2002 (34%) (n=62).

Zone five begins upstream of the Bosk Bridge to Horsefly River falls. The falls are an impassable barrier to fish and are also the terminus to the classified portion of the Horsefly River. It is a short section that flows through steep canyons and coniferous and deciduous forests. It has good access for shore anglers in the vicinity of the Bosk Forestry Recreation Site. Anglers can walk upstream of the recreation site a short distance before the canyon precludes any further access. Boat anglers can also access this section via the recreation site, however, any boat access upstream is limited by a series of cascades and no access points above the recreation site. Proportionally, a significant increase in effort was recorded in 2004 (30%) (n=34) in comparison to data collected 2002 (11%) (n=21).

Data recorded in 2001 and 2002 indicated that zone three receives more effort than any other zone (fig 1). Overall, in 2004, the majority of recorded effort occurred in zone four followed by zone five (fig 1). By excluding data collected during the spot closure, the data still indicates a significant increase in angling effort in zone five (fig 2).

Figure 2. Proportional Distribution of Angler Effort by Area, 2001, 2002 and 2004Excluding Data Collected During Spot Closure 2004.

3.2 RESIDENCY

Angler residency was recorded during the survey. The majority of anglers interviewed (61%) (n=68) were residents of the Cariboo. Williams Lake residents accounted for 41% (n=46) of the anglers interviewed (fig 3).

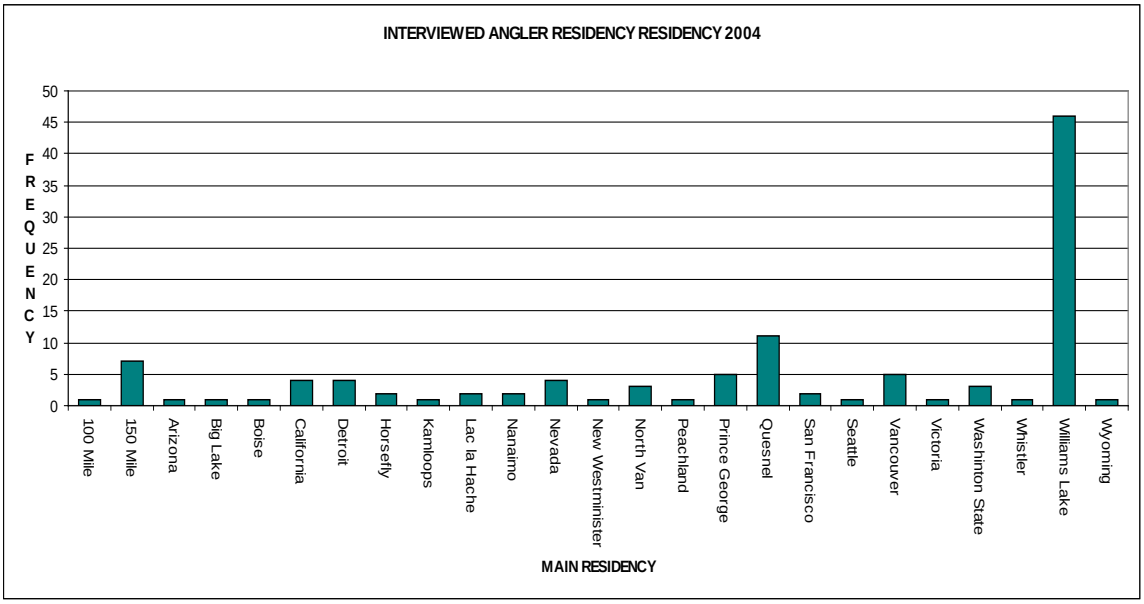

Figure 3. Residency of Anglers Interviewed during the Horsefly River Survey 2004.

Overall, residents of British Columbia accounted for 81% (n=90) of anglers interviewed during the 2004 season. Non–resident alien anglers accounted for 19% (n=21), and there were no Canadian residents interviewed during the survey.

In 2004, residency data indicates a decline in the number of non–resident alien anglers. Surveys in 2001 and 2002 showed that non-resident alien angler effort varied between 38% and 40% of the total recorded effort (Table 2).

	2004	2002	2001
BC Resident	81% n=90	59% n=107	62% n=116
Canadian Resident	0% n=0	0% n=0	0% n=0
Non-Resident Alien	19% n=21	40% n=74	38% n=71

Table 2. **Proportional Effort by Residency 2004, 2002 and 2001.**

3.3 GUIDED/NON GUIDED

Since the Horsefly River is designated as a Class II water, guided angler effort is regulated by the Angling and Scientific Collection Regulation. In regulation, there can be a maximum of five angling guides and 500 guided angler days. The Horsefly River angling management plan distributes the guided effort throughout the length of the classified portion of the river and tributaries.

During the 2004 survey 15% (n=17) of anglers interviewed were guided anglers, and 85% (n=94) were non-guided anglers. The results are similar to ratios recorded in 2001 and 2002 (fig 4). In 2001, 79% (n=148) of interviewed anglers were non-guided and 21% (n=39) were guided. In 2002, 82% (n=149) were non guided and 18% (n=32) were guided. The guided anglers interviewed in 2004 were accompanied by three of the five licensed guides, or their assistant guides, on the river. The number of daily guided anglers per guide and their assistants ranged from three to four. All guided anglers interviewed during the survey were non-resident aliens.

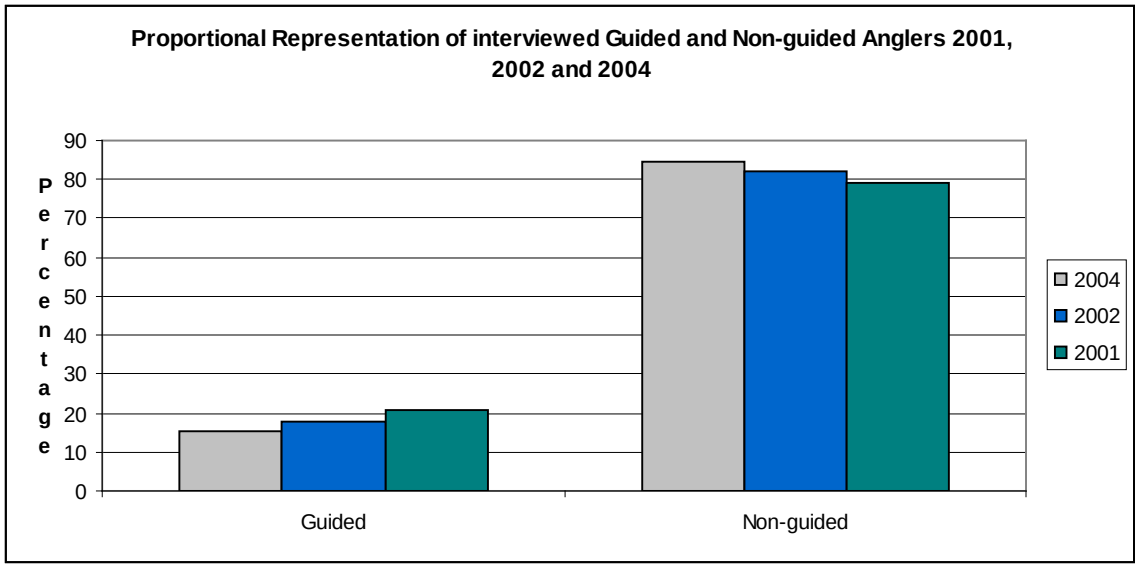

Figure 4. Proportion Representation of Interviewed Guided and Non-guided Anglers 2001, 2002 and 2004.

3.4 ANGLER EFFORT

Angler effort is measured in terms of effort on a daily basis and then extrapolated to estimate effort from July to October. Angling effort is one of the main criteria that fisheries managers measure to determine if the "quality waters" objectives for that system are being achieved. As a Class II water, the Horsefly River Angling Management Plan details MWLAP goals in terms of daily effort and distribution.

Overall, in 2004, angler effort was likely affected by the sport fishing closure below the Woodjam Bridge from July 26 to August 13, 2004. Tables 3, 4 and 5 indicate the difference between the daily frequency of anglers interviewed in 2001, 2002 and 2004.

2004	WEEKEND	WEEKDAYS
MEAN (anglers contacted)	5.6	2.9
RANGE	1-11	1-7
STANDARD DEVIATION	3.05	1.54
VARIANCE	3.01	2.38

Table 3. Summary of Overall Daily Angler Effort on Creel Days Stratified by Weekdays and Weekend Days and Statutory Holidays 2004.

2002	WEEKEND	WEEKDAYS
MEAN (anglers contacted)	9	5.74
RANGE	0-27	0-21
STANDARD DEVIATION	7.89	5.23
VARIANCE	62.25	27.35

Table 4. Summary of Overall Daily Angler Effort on Creel Days Stratified by Weekdays and Weekend Days and Statutory Holidays 2002.

2001	WEEKEND	WEEKDAYS
MEAN (anglers contacted)	5.36	4
RANGE	0-15	0-15
STANDARD DEVIATION	4.4	4.46
VARIANCE	19.37	19.86

Table 5. Summary of Overall Daily Angler Effort on Creel Days Stratified by Weekdays and Weekend Days and Statutory Holidays 2001.

As a result of the spot closure in 2004, angler effort data may not accurately indicate what the effort may have been in a typical year. The frequency of anglers interviewed on a daily basis ranged from one, which was recorded on three separate dates, to a high of 11 on September 4 (fig 5). Proportionally, 34% (n=38) of anglers were surveyed on weekdays, and 66% (n=73) anglers were surveyed on weekends and statutory holidays. The data in figure 5 is stratified by weekend days and statutory holidays (blue bars) and weekdays are indicated by (green bars).

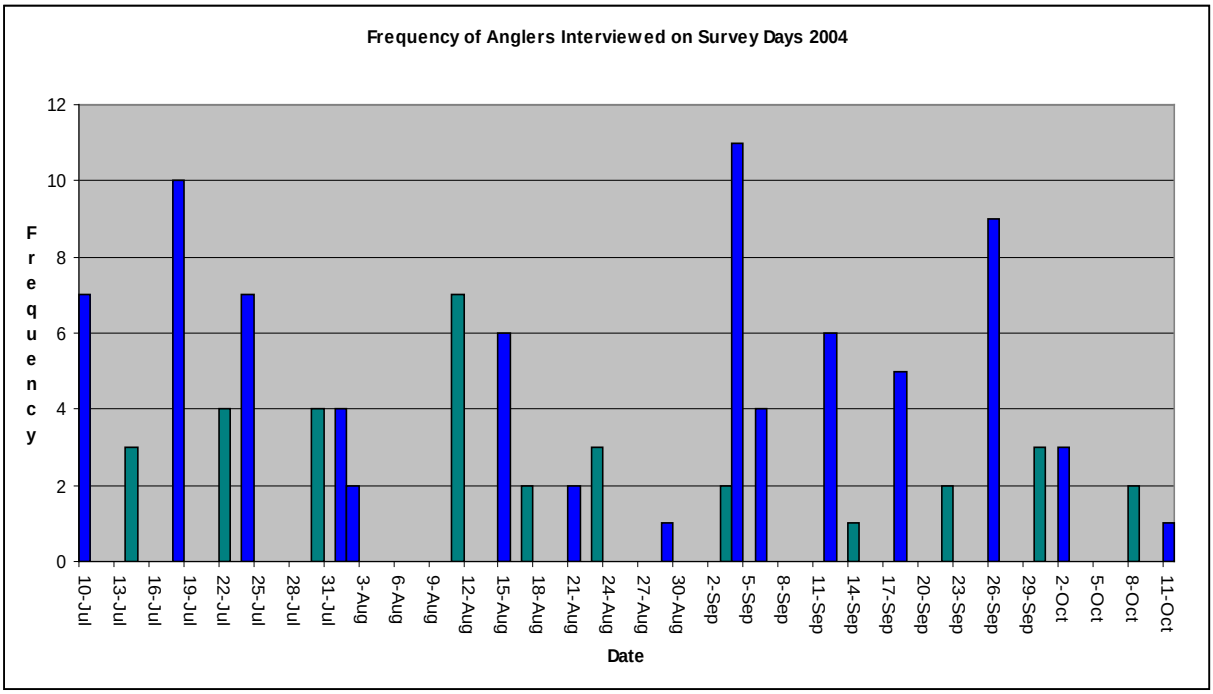

Figure 5. Frequency of Anglers Interviewed on Survey Dates 2004.

Monthly distribution of surveyed effort was highest in September (38.7% n=43) followed by July (31.5% n=35), August (24.3 n=27) and October (5.4% n=6) (fig 6). The low sample size recorded in October could also be a result of the limited number of survey days scheduled for the month. There were only three creel days in October in comparison to July (6), August (8) and September (9) days respectively.

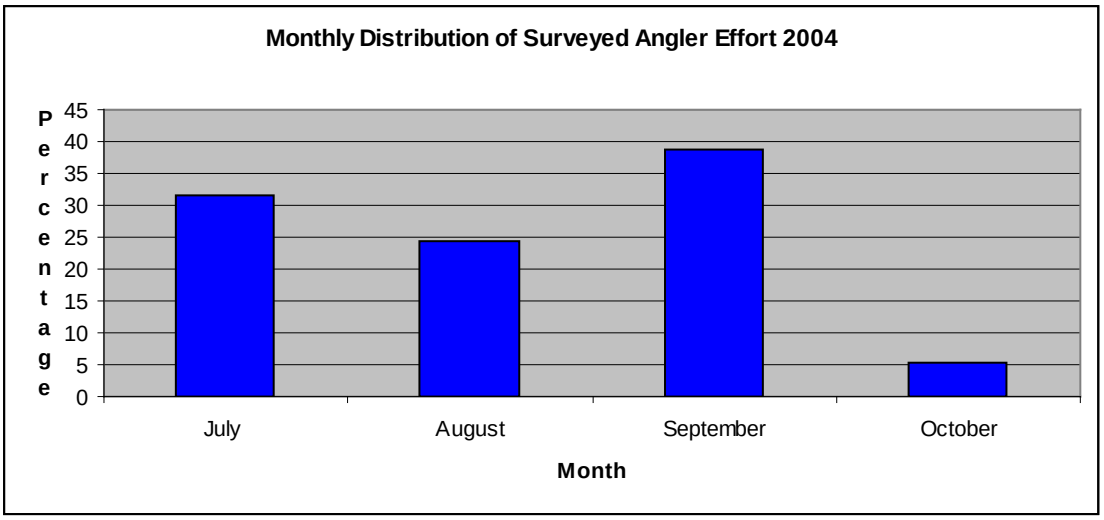

Figure 6. Monthly Distribution of Surveyed Angler Effort 2004.

Overall effort is estimated by expanding recorded monthly effort stratified by weekend and weekdays and applying the results to the entire month. Aerial counts conducted in 2001 in conjunction with ground surveys determined that, on average, 60% of anglers were contacted on creel days.

In July 2004 there were 10 weekend days which included one stat holiday (Canada Day). Correspondingly there are 21 weekdays in July. There were six creel days in July. Three of those days occurred during the week and three during weekend days /statutory holidays. A total of 24 angling days were recorded on the weekdays and 11 angling days were recorded on the weekend.

11/3= 3.7 angling days (mean) 3.7 angling days x weekdays in July (21) = 78
78+40%=117 (mean)
24/3= 3.75 angling days 8 angling days x weekend days in July (10) = 80
80+40%=112

Estimated 112 days on weekends in July
Estimated 117 days on weekdays in July
Estimated Total 229 angler days in July

In August there were 10 weekend days including one stat holiday (Victoria Day), and 21 weekdays. Eight surveys were conducted in August. Three surveys occurred during the week and five surveys on the weekend. 12 angling days were recorded on the weekdays and 15 angling days were recorded on the weekend.

12/3= 4 angling days (mean) 4 angling days x weekdays in August (21) = 84+40%=118

15/5=3 angling days (mean) 3 angling days x weekend days in August (10) =30+40%=42

Estimated 42 days on weekends in August
Estimated 118 days on weekdays in August
Estimated Total 160 angler days in August.

In September there were nine weekend days including one stat holiday (Labour Day), and 21 weekdays. Nine surveys were conducted in September. Four surveys occurred during the week and five surveys/holidays on the weekend. Eight angling days were recorded on the weekdays, and 35 angling days were recorded on the weekend.

8/4= 2 angling days (mean) 2 angling days x weekday days in September (22) =44
44+40%=62

35/5= 7 angling days (mean) 7 angling days x weekend days in September (9) =63
63+40%=88

Estimated 80 days on weekends in September
Estimated 88 days on weekdays in September
Estimated Total 168 angler days in September

In October there were 10 weekend days including one stat holiday (Thanksgiving Day) and 21 weekdays. Three surveys were conducted in October. Two surveys occurred during the week and one on the weekend. A total of six angling days were recorded in October, four on weekends/holidays and two on weekdays.

2/1= 2 angling days (mean) 2 angling days x weekday days in October (21) =44
44+40%=62

4/2= 2 angling days (mean) 2 angling days x weekend days in October (10) =20
20+40%=28

Estimated 28 days on weekends in October
Estimated 62 days on weekdays in October
Estimated Total 90 angler days in October

229+160+168+90= **647** estimated angler days on the Horsefly River in 2004

3.5 ANGLER SUCCESS

Angler success is measured collectively as an angler's success over a period of time (Catch per Unit Effort). Catch rates collected over several years can provide trend information that may be an early indicator of changes in the rainbow trout population. For the purposes of this report, the period of time or unit effort is measured in hours. During angler interviews, anglers were asked how long they had fished (hours) and species captured. Horsefly River rainbow trout anglers will sometimes capture Mountain Whitefish (*Prosopium willliamsoni*) and Northern Pikeminnow (*Ptychocheilus oregonensis*) as a by catch. Collectively anglers reported capturing 166 rainbow trout, 24 mountain whitefish and nine northern pikeminnow.

A simple calculation (catch/ hourly effort) was performed to determine the hourly catch rates by species. Overall, the reported catch per hourly effort was calculated to be rainbow trout (1.39), mountain whitefish (0.16) and northern pikeminnow 0.0007. The maximum number of rainbow trout captured at time of interview was 25 and the minimum was 0. The mean number of rainbow trout captured at time of interview was 1.5.

Rainbow trout catch data collected in 2001 and 2002, resulted in hourly catch rates of 0.46 and 1.12 respectively (fig 7).

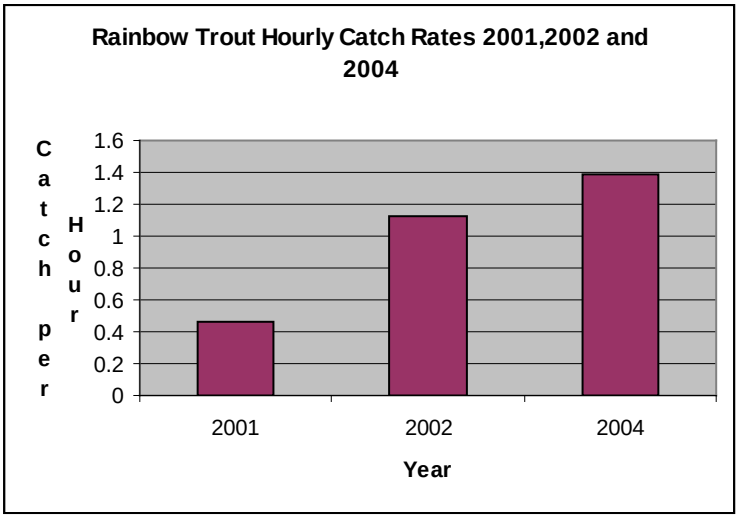

Figure 7. Angler Reported Rainbow Trout Hourly Catch Rates 2002, 2002 and 2004.

3.6 ACCESS BOAT/SHORE

There are several easy access points for both shore and boat anglers along the Horsefly River. In 2004, 59% (n=65) of anglers interviewed accessed the river by shore, and 41% (n=45) accessed the river via boats.

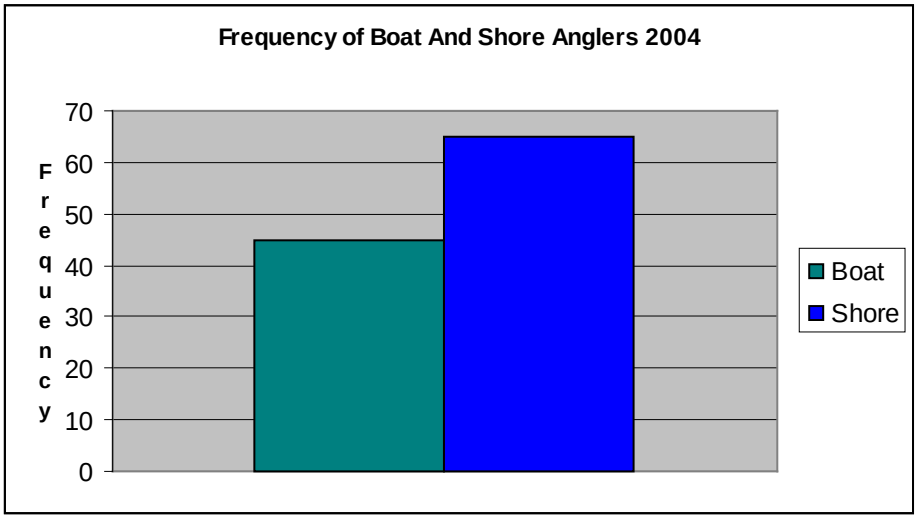

Figure 8. Frequency of Shore and Boat Anglers Interviewed During the 2004 Creel Survey.

3.7 ANGLING TRIPS PER YEAR

Question number 6 on the angler questionnaire asks "how many trips per year do you make to the Horsefly River". The maximum number of trips by any individual was 100 and the minimum was 1. The mean number of trips per year was 4.74, and the standard deviation was 12.47. The histogram in figure 9 indicates the large variance in angler responses to this question.

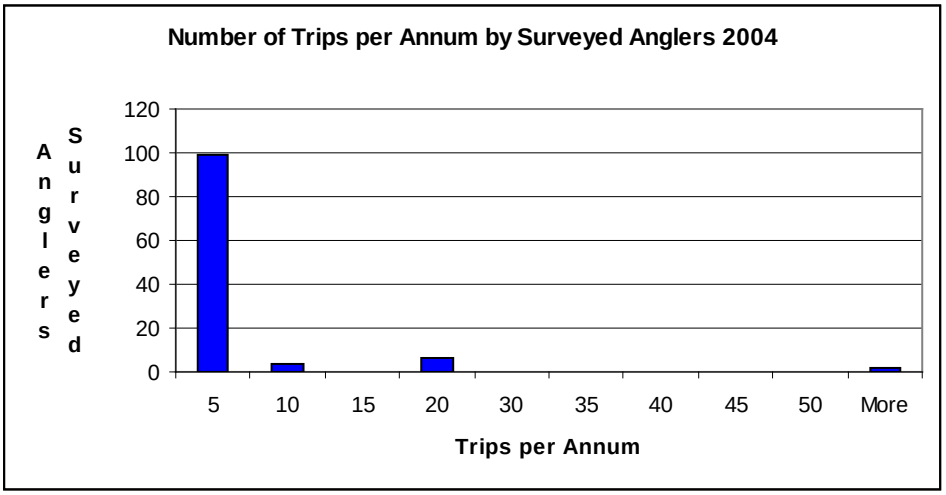

Figure 9. Projected Frequency of Annual Trips by Surveyed Anglers 2004.

3.8 YEARS OF HORSEFLY RIVER ANGLING EXPERIENCE

Question number 7 asks "how many years have you been coming to the Horsefly River". Responses ranged from first time to 30 years. The mean response was 5.7 years and the standard deviation was 6.5. Figure 10 shows the results from question number 7.

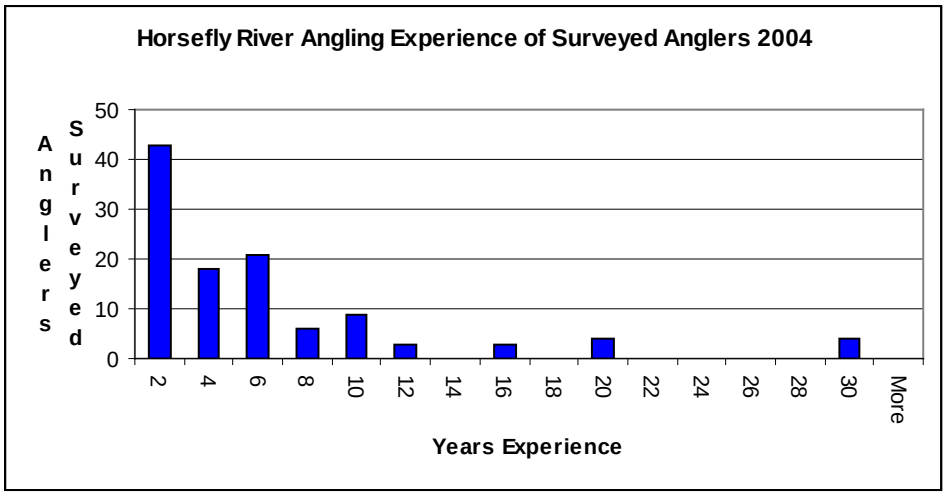

Figure 10. Horsefly River Angling Experience of Surveyed Anglers 2004.

3.9 QUALITY OF SPORTS FISHERY

Question number 8 asked anglers if the angling was "better, worse or the same than in the past few years". 24% (n=16) felt the fishing was better, 38% (n=26) thought angling success was the same, 10% (n=7) were undecided and 27% (n=19) thought the fishing was worse (Table 6).

Response	n	%
Better	16	24
Same	26	38
Undecided	7	10
Worse	19	28
Grand Total	68	100%

Table 6. Surveyed Angler Response to Question #8 2004.

No anglers with more than 11 or more years of Horsefly River angling experience felt that angling has improved, and were split evenly between "worse" (n=7) and "same" (n=7) while one angler was undecided. While anglers with 10 or less years of angling experience were more inclined to feel that angling had improved or remained the same (n=35) 16 anglers felt angling was worse and 6 were undecided.

3.10 SUPPORT FOR WATER TEMPERATURE CLOSURES

All 111 anglers interviewed, during this survey, were unanimous in their support for water temperature related sport fishing closures that occurred, in 2003 and 2004.

3.11 SUPPORT FOR A CLASS 1 DESIGNATION ON THE HORSEFLY RIVER

The final question on the 2004 survey asked, “There has been consideration for classifying the Horsefly River to "limit and distribute non-guided, non-resident alien use". “Do you agree with this?”

Overall response was in favor of managing the Horsefly River as a class 1 system. A total of 111 anglers were surveyed and 77% (n=85) answered yes, 0.9% (n=1) were undecided and 23% (n=25) answered no (Table 7).

	N	%
No	25	23
Undecided	1	0.9
Yes	85	77
Total	111	100

Table 7. Overall Angler Response to “Limiting and Distributing Non-guided. Non resident Alien Use on the Horsefly River.

Response by residency indicated that there was a significant difference of opinion between BC resident anglers and non resident alien anglers. 90 BC resident anglers were surveyed and 82% (n=74) answered yes, 17% (n=15) answered no and 1% (n=1) was undecided. 21 guided and non guided, non resident alien anglers were surveyed and 52% (n=11) answered yes and 48% (n=10) answered no (Table 8).

	BC Residents	%	Non resident aliens	%
Yes	74	82	11	52
No	15	17	10	48
Undecided	1	1	0	0
Total	90	100	21	100

Table 8. Angler Response by Residency to “Limiting and Distributing Non-guided. Non resident Alien Use on the Horsefly River.

4. Horsefly River Temperature

Horsefly River water temperatures, in 2004, were monitored by the creel survey crew and MWLAP. The creel survey crew manually measured water temperatures at Squaw Flats, Horsefly River Bridge and in the vicinity of Bosk Bridge. MWLAP installed three "Stowaway Tidbit Temperature Loggers". The loggers were installed at the Horsefly River Bridge, Woodjam Creek Bridge and in the vicinity of Black Creek. The loggers recorded temperature hourly and were downloaded every three days.

Below average snow levels and lack of precipitation resulted in below average flows and above average temperatures during the Horsefly River sports fishery. By July 6, 2004, the creel crew reported afternoon temperatures of 18º C at Squaw Flats and 17ºC at the Horsefly Bridge.

Stoaway Tidbit Temperature Data Loggers were installed at the Horsefly River Bridge, Woodjam Creek Bridge on July 9, and a third logger was installed near the Horsefly River-Black Creek confluence on August 4. The third logger was installed to measure the affects of the Mckinley Lake temperature control structure on water temperature. Fisheries and Oceans Canada did not operate the siphon in 2004, and data comparing water temperatures, in the Horsefly River mainstem, before and after water release from the structure is not available.

Data collected from the temperature logger at the Horsefly River Bridge indicated that maximum daily water temperatures reached the 18ºC threshold on July 13. The maximum temperature in that 24 hour period was 18.69ºC and the mean was 16.83ºC. Daily maximum and mean temperatures remained above, or near, the threshold until a decrease in temperature was observed for a five day period in early August (fig 11). Water temperatures rose above the threshold again on August 10 and remained that way until August 22. From July 13 to August 22 the mean temperature was 18.92ºC (SD 2.27). The maximum temperature recorded, during that time period, was 24.68ºC on August 14. After August 22, water temperatures fell below the threshold and remained that way for the remainder of the season. Mean temperatures recorded at the Woodjam Creek Bridge during the same time period were comparable to the data collected at the Horsefly River Bridge (Table 9).

	Horsefly River Bridge Mean	Woodjam Creek Mean
Mean	18.92º C	18.20ºC
Median	18.69ºC	18.27ºC
Mode	18.20ºC	19.24ºC
Std Dev	2.27	1.64
Variance	5.15	2.96
Minimum	12.99ºC	13.53ºC
Maximum	24.68ºC	22.19ºC

Table 9. Comparison Between Temperature Data Collected At Horsefly River Bridge and Woodjam Creek Bridge July 13- August 22, 2004.

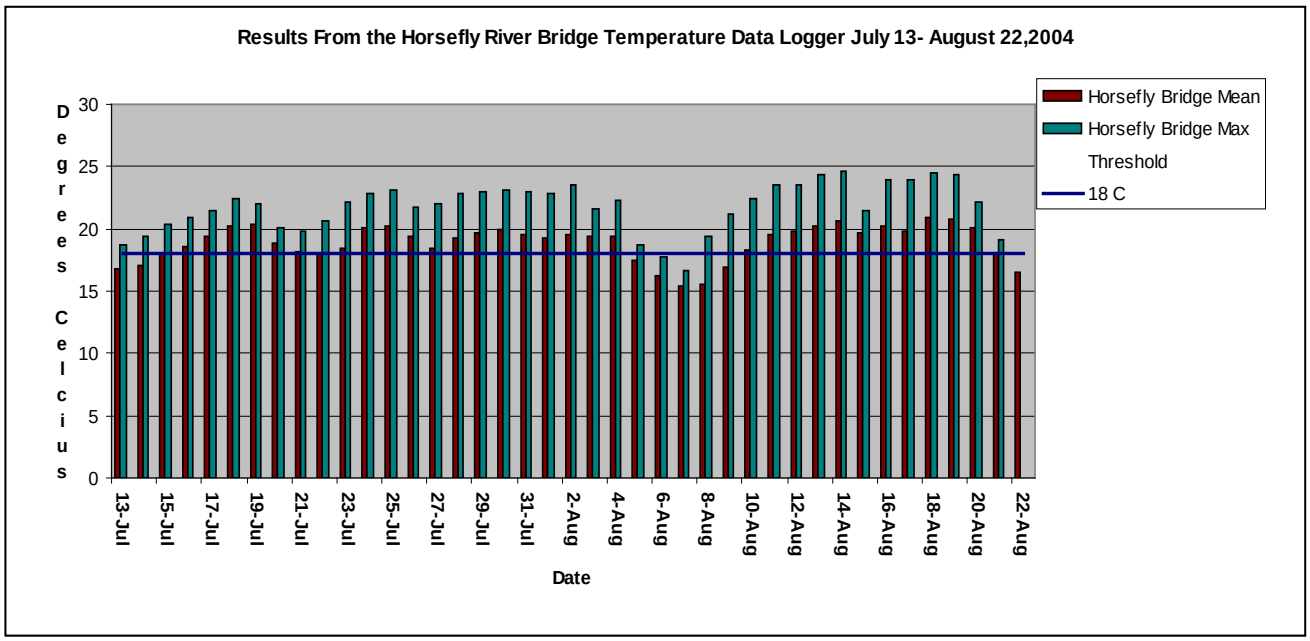

Figure 11. Daily Results from Water Temperature Data Collected at the Horsefly River Bridge July 13-August 22, 2004.

5. Literature Cited

Rob Dolighan Ministry of Water Land and Air Protection.
Personal Communication, May 2001