

A Survey of Steelhead Anglers on the Bulkley, Kispiox, Zymoetz II and Skeena IV Classified Waters in 2013



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Executive Summary

Effort

Angler interviews

- In the fall of 2013, 682 anglers were approached for an interview. 298 interviews were conducted on the Bulkley River, 95 on the Kispiox River, 258 on Zymoetz II, and 31 on Skeena IV. The majority of anglers were interviewed only once (597 anglers, 88%), however some completed an interview multiple times (85 anglers, 12%).
- For the Smithers River Guardians, the highest number of interviews was during the last week of September (54 interviews, 14%) and first week of October (53 interviews, 13%). For the Terrace River Guardians, the highest number of interviews was during the last week of August (47 interviews, 16%) and first week of September (51 interviews, 18%).
- Anglers typically distribute themselves evenly along the river, although the greatest number of interviews on the Kispiox River was between the Rodeo Grounds and Upper Recreation Site (43 interviews, 45% of total interviews conducted on the Kispiox River), and between Telkwa and the Smithers Bridge (61 interviews, 21% of total interviews conducted on the Bulkley River) on the Bulkley River.
- On the Bulkley River, 251 individual anglers were approached for an interview, 217 provided their residency. 155 (71%) were BC residents, 11 (5%) were non-resident Canadians, and 51 (24%) were non-resident aliens.
- On the Kispiox River, 76 individual anglers were approached for an interview, 69 provided their residency. 39 (57%) of those were BC residents, four (6%) were non-resident Canadians, and 26 (37%) were non-resident aliens.
- 27 individual anglers were approached for an interview on Skeena IV, residency was not collected from one angler. Eight (31%) were BC residents, none were non-resident Canadians, and 18 (69%) were non-resident aliens.
- On Zymoetz II, 243 individual anglers were approached for an interview, 227 provided their residency. 100 (44%) of those were BC residents, 38 (17%) were non-resident Canadians, and 89 (39%) were non-resident aliens.

Angler interview resident categories over previous year's studies

- The proportion of BC resident interviews on the Bulkley River has increased since 1997 and 1998 when the last surveys were conducted. Meanwhile, the percentage of non-resident alien interviews has decreased over the same time period.
- The proportion of BC resident interviews on Zymoetz II has continued to decline since the first study was conducted in 1975, while the proportion of non-resident alien interviews has generally increased over time. The current study has the most balanced distribution of angler interviews among residency categories.

- Evidenced from the 1975, 1997, and 2001 data from the Kispiox River angler surveys, the majority of interviews were from non-resident aliens, followed by BC residents. This differs from this study where for the first time observed, the number of BC resident interviews exceeded that of non-resident alien anglers.

BC resident interviews during restricted and unrestricted times

- On the Zymoetz II and Bulkley rivers there was only a slight difference between the average number of BC resident angler interviews during either restricted (2.5 and 7.8, respectively) or unrestricted (2.2 and 7.1, respectively) non-resident aliens times.
- There were not enough BC resident anglers interviewed on the Skeena IV and Kispiox rivers to complete a full analysis.

Guided angler status

- Based on electronic licence sales, guides are most commonly used by non-resident aliens. On the Bulkley and Kispiox rivers, 98% of guided anglers were non-resident aliens and 2% were non-resident Canadians. On the Skeena IV River, 97% of guided anglers were non-resident aliens, and 3% were non-resident Canadians. On the Zymoetz II River, 89% of guided anglers were non-resident aliens and 11% were guided non-resident Canadians.

Trends in use for non-resident Canadians and non-resident aliens

- On the Bulkley River, both non-resident Canadians and non-resident aliens purchased the greatest number of angler days during the first week of October, followed by the last week of September. The Kispiox River had the greatest number of angler days purchased during the first week of October for both non-resident Canadians and non-resident aliens.
- The Skeena IV and Zymoetz II rivers had two peaks of Classified Waters licence purchases, one during the end of August and beginning of September and another at the end of September.
- Based on the number of days purchased, unguided non-resident alien anglers had the highest levels of use on all rivers included in this study. Following the regulation changes in 2012, the number of angler days purchased by these anglers declined from 2011 to 2012 to varying extents on the Bulkley, Kispiox and Zymoetz II rivers and then either stayed flat or increased from 2012 to 2013. The largest decline in angler days from 2011 to 2012 was on the Kispiox River, from 1,736 to 1,075 days.
- The second largest user group (based on angler days purchased) on the rivers included in this study was guided non-resident alien anglers. Except for the Zymoetz II River on Saturdays (in a zone) and on Sundays, however, this class of angler is not restricted by the Canadian resident-only regulation changes. Generally, effort by these anglers from 2009 to 2011 increased, followed by continued increases in 2012 when the regulation changes were implemented.
- Except for the Kispiox River, the number of angler days purchased by unguided non-resident Canadians has increased following the regulation changes in 2012.

Trends in use for non-resident Canadians and aliens during restricted and unrestricted times

- On the Bulkley River during unrestricted times, the number of angler days purchased by unguided non-resident aliens has increased since 2012. Use by this class of angler during restricted times (i.e. weekends) has declined to zero in 2012 and 2013 (except for instances of non-compliance), owing to the Canadian resident-only times and zones. Effort by guided non-resident aliens and unguided non-resident Canadians has increased from 2009 to 2013 during both the unrestricted and restricted times.
- On the Kispiox River in 2012 and 2013, the number of unguided non-resident alien angler days reduced to zero during restricted times (except for instances of non-compliance), and also decreased during unrestricted times with a slight recovery in 2013. During this same period, the number of angler days purchased by guided non-resident aliens and unguided non-resident Canadians has increased during restricted times.
- On the Kispiox River, the number of angler days purchased by guided non-resident aliens has increased during restricted times. Additionally, the number of unguided non-resident Canadians has increased during restricted times. This indicates that both these angler classes are fishing more on the weekends after the regulation changes than before them.
- Trends of use on the Skeena IV do not possess significant shifts in unguided non-resident alien effort during restricted times before and after the regulation changes. This said, effort by this class of angler has increased during unrestricted times (i.e. weekdays). This may be related to crowding concerns from the residents of Cedarvale, however, further monitoring is required to understand how this effort is spatially and/or temporally concentrated on this classified section of the Skeena River.
- Zymoetz II showed a large decline of unguided non-resident aliens during restricted times in 2012 and 2013. Guided non-resident alien angler days purchased during restricted times also declined, whereas during unrestricted times they increased with a slight decline in 2013. The number of angler days purchased by unguided non-resident Canadians has increased during both unrestricted and restricted times.

Angler satisfaction

Factors attributing to a quality angling experience

- Due to a small sample size on the Kispiox and Skeena IV, only the Bulkley and Zymoetz II rivers had enough interview data to make an overall estimation of the factors contributing to a high quality angling experience.
- On the Bulkley River, the majority of BC residents and non-resident Canadians attributed high fish abundance/catching fish (71 responses, 34%), number of anglers/crowding (68 responses, 32%), and beauty/scenery/esthetic attributes (58 responses, 27%) to be the three most commonly acknowledged factors contributing to a high quality angling experience.
- The majority of non-resident aliens attributed beauty/scenery/and esthetic attributes (27 responses, 51%), high fish abundance/catching fish (26 responses, 49%), and quality of fish/wild fish (17 responses, 32%) to be the most important factors contributing to a high quality angling experience.

- BC residents and non-resident Canadian anglers on Zymoetz II appeared to be more sensitive to the number of anglers/crowding (62 responses, 42%) fish abundance/catching fish (56 responses, 38%), and beauty/scenery/esthetic attributes (50 responses, 34%).
- Non-resident aliens on the Zymoetz II attributed beauty/scenery/esthetic attributes (33 responses, 36%) as the most commonly addressed factor to their quality angling experience. Further, high fish abundance/catching fish (28 responses, 30%), and quality of fish/wild fish (24 responses, 26%) were commonly mentioned as factors that contributed to a high quality angling experience

Mean rating of quality angling experience

- The majority of anglers rated their overall angling experience as excellent (36%), good (25%) or fair (25%) and few anglers rated their experience as poor (8%) or very poor (6%) in 2013 on the Bulkley, Kispiox, Skeena IV, and Zymoetz II rivers.
- The average quality angling experience rating from all anglers on all rivers included in this study was 3.8 out of 5. The average quality angling experience rating from all anglers on the Bulkley and Kispiox rivers was 3.8 and 4.0, respectively. The average quality angling experience rating from all anglers on Skeena IV and the Zymoetz II rivers was 3.5 and 3.7 respectively. There was no significant difference between average ratings on a river specific basis, meaning that anglers didn't have a better or worse experience amongst rivers.
- On the Bulkley, Kispiox and Skeena IV rivers, the mean overall angling experience didn't vary among BC residents and non-resident aliens. The number of non-resident Canadian interviews was too low to be used in this analysis. On the Zymoetz II River among BC residents, non-resident Canadians, and non-resident aliens the mean quality angling experience rating showed no statistical difference.

Impact of regulations changes made on April 1, 2012

- Of all the anglers who responded to the question regarding the impacts of regulation changes (522 anglers), 333 (64%) had fished on the Bulkley, Kispiox, Skeena IV, or Zymoetz II rivers prior to regulation changes made on April 1, 2012. 189 (36%) had not fished these waters prior to the regulation changes.
- Only anglers who had fished prior to regulation changes were considered for further responses. 47% of anglers thought the regulation change reduced crowding on the river, 25% of anglers thought that the crowding on the river stayed the same after the regulation change, 18% of anglers didn't know how the regulation change had impacted crowding on the river, and 10% of the anglers thought that this regulation change increased crowding on the rivers.
- Of the 10% of anglers who thought that crowding had increased on the river, 6.5% of those anglers were non-resident aliens. Of the 47% of anglers who thought the regulation change reduced crowding on the river, 35.9% were BC residents.
- 37% percent of anglers who had fished prior to regulation changes thought their quality angling experience had improved since the changes, 25% thought it had reduced, 31% percent thought it had stayed the same, and 12% didn't know.

- Of the majority of anglers (37%) who thought the regulation changes improved their angling experience, 30.9% were BC residents. Of the 20% of anglers who felt their quality angling experience declined since the regulation changes, 17.8% of those were non-resident aliens.

Angler comments

- 384 out of 597 (64%) individual anglers approached for an interview made comments about freshwater fisheries management in the Skeena Region. Generally, of all comments that were made to the River Guardians, anglers most commonly commented on the regulation changes made in 2012.
- 72% of the comments stating a dislike of regulations changes (such as non-resident alien restricted times and zones) were from non-resident aliens and 28% of the comments were from BC residents and non-resident Canadians. 85% of the comments stating support of the regulation changes were from BC residents and non-resident Canadians, and 15% of these comments were from non-resident aliens.

Angler compliance

- 74 out of the 597 (12%) anglers that were interviewed had some type of licence infraction. 23 (3%) of those were BC residents, 8 (1%) were non-resident Canadians, and 9 (1%) of those were non-resident alien. The rest is unknown, as it wasn't possible to assess the resident categories of the failure to produce licence infractions as the River Guardians terminated the interview when anglers were unable to produce a licence.
- Failure to produce a licence was the most frequent infraction and included anglers who refused to show their basic angling licence (34 anglers, 46%). 26 (35%) of the infractions were failure to possess a valid Classified Waters licence and the majority of these violations were committed by BC residents (19%). 14 (19%) of the infractions were from a failure to possess a Steelhead Stamp, and similar to other licence violations, BC residents were the least compliant.

Access methods and catch estimates

- River Guardians conducted angler surveys by foot, which increased the probability of intercepting foot based anglers. As a result, the following data reflects all anglers interviewed, but may not be representative of all Steelhead anglers on the rivers included in this study.
- Of the BC residents, non-resident Canadians, and non-resident aliens that were surveyed, the majority accessed the river by foot (93%, 100%, and 82%, respectively). Non-resident aliens used drift and jet boats the most. The majority of BC residents that were interviewed accessed the river by foot, but a small percentage used drift boats (5.3%), and even fewer use jet boats (1.7%).
- The percentage of fly anglers among BC residents (64%), non-resident Canadians (73%), and non-resident aliens (88%) was higher than gear anglers. Of all resident categories, BC residents had the greatest percentage of gear anglers (36%), with non-resident aliens using gear the least (12%).
- The greatest percentage of anglers who were interviewed on the Zymoetz II (91%), Bulkley (90%), Kispiox (89%), and Skeena IV (87%) rivers accessed fishing locations by foot. Of all rivers, the Kispiox River had the greatest percentage of drift boat users (11%), next to the Zymoetz II River (9%), and the Skeena IV has the greatest percent of jet boat users (13%).

- Of the anglers who landed a fish, the percentage of anglers using fly tackle was greatest for the Zymoetz II River (81%), followed by the Skeena IV (74%). Of all rivers, the Bulkley and Kispiox had the greatest percentage of anglers using gear (38% and 34%, respectively).
- 163 Steelhead were reported landed between August 20 and October 31, 2013 by anglers interviewed for this study. BC residents landed the majority of the Steelhead (59%), next to non-resident aliens (36%), and non-resident Canadians (5%).

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1.0 Introduction

1.1 Goals and objectives

In April 2012, a number of provincially unique angling regulation changes were implemented on twelve Classified Waters in the Skeena Region. These changes were intended to address social issues during the recreational Steelhead fishery such as crowding and conflict amongst anglers. Of all the changes, the most significant was the creation of restrictions for non-resident alien anglers temporally and spatially. This was a controversial regulation change given the dependency of the regional tourism and business sector upon this class of angler.

The overall goal of this study, called the Skeena River Guardian Project, was to monitor how anglers were responding to the Skeena Steelhead regulation changes. In an attempt to address this goal, three general objectives are discussed in this report, including: assessment and trends of angler effort, measurement of angler satisfaction, and evaluation of angler compliance. These objectives were selected as they provide key insight into how anglers perceive the new rules, whether they are complying with them, and how their behaviour has changed as a result.

The Skeena River Guardian Project is a three-year initiative. This report provides data from the first year, 2013. Subsequent studies will continue during the fall months of 2014 and 2015. This timing was selected in an attempt to coincide with peak angler effort during the period when regulation changes were in effect. Given the large number of waters impacted by the new regulation changes (for a complete summary, see Appendix 3.0) four systems, of the most heavily fished, were selected as indicators. They include the Bulkley, Kispiox, Zymoetz II and Skeena IV Classified Waters. The rationale for selecting these rivers is discussed in Section 2.0. The intent of this report is to present activities carried out as part of the Skeena River Guardian Project in 2013, its first year of operation.

1.2 Rationale

Opportunities to engage with anglers on the river are rare. The last series of River Guardian projects in the Skeena Region were implemented a decade ago, between 1997 and 2004 for the Babine, Bulkley, Kispiox, Morice and Zymoetz rivers. This project intends to build on these efforts by gathering information and producing annual monitoring reports to update understanding of angler effort, compliance and satisfaction during the Skeena Steelhead fishery. Species catch information was also collected as part of this project and will be used to inform fisheries managers pertaining to unrelated regulation changes in the Skeena Region.

The project will be successful if the monitoring results it produces allows the public to evaluate how the regulation changes are working and enables the Ministry of Forests, Lands and Natural Resource Operations (MFLRNO) to make informed decisions regarding the future management of this valuable resource.

2.0 Study Site

For this study, the River Guardians conducted angler surveys primarily on the Bulkley, Kispiox, Zymoetz rivers and to a lesser extent on the Skeena River Section IV located in northern British Columbia (BC) (Figure 1). These rivers were selected as indicators because they are geographically situated close to the communities of Smithers, Hazelton and Terrace respectively. Further, they all have non-resident alien restrictions, receive high levels of use, and are known as places where crowding issues have been identified.

The target species for many anglers on these rivers in the fall season are Steelhead and Coho salmon. Resident freshwater species are also sought during this time (albeit at a much lower rate) and include resident Rainbow Trout, Cutthroat Trout, Dolly Varden and Bull Trout.

2.1 Bulkley River

The Bulkley River is a Class II Classified Water from September 1 to October 31. This drainage originates at Morice Lake and flows for 74 km as the Morice River until its confluence with the Little Bulkley River near Houston, BC (Figure 2; Anonymous, 1996). From this point, the Morice River becomes the Bulkley River and flows 142 km until it reaches the Skeena River confluence near Hazelton, BC (Figure 2). This study surveyed anglers on the Bulkley River from its confluence with the Morice River downstream to its confluence with the Skeena River.

Along Highway 16, the communities of Houston, Telkwa, Smithers, Moricetown and Hazelton are adjacent to the Bulkley River leading to high accessibility for foot and boat based anglers. The majority of angling occurs in the most navigable waters in the sections between the Telkwa Bridge and the Smithers Bridge (about 15 km), the Smithers Bridge and Chicken Creek confluence (about 6 km), Kathlyn Creek (Chicken Lake Creek meets Kathlyn Creek and remains Kathlyn Creek) to Trout Creek (about 27 km), and further downstream between Trout Creek and Moricetown (about 9 km) (Morten, 1999).

The Bulkley River typically has good water clarity throughout most of the Steelhead angling season (Anonymous, 1996). The Telkwa River contributes the majority of the turbidity in the Bulkley River during warmer periods or times of high run off. At these times, anglers move upstream of the Bulkley-Telkwa confluence (Morten, 1999).

2.2 Kispiox River

The Kispiox River is a Class II Classified Water from September 1 to October 31. This river flows for approximately 140 km and drains into the Skeena River 10 km northwest of Old Hazelton, 12.5 km northwest of New Hazelton (Figure 3). The Kispiox River drains a total area of 2,086 km² and has a minimal amount of lake influence (Morten and Giroux, 2006). The River Guardians surveyed anglers on the Kispiox River from its confluence with the Sweetin River downstream to the confluence of the Skeena River (approximately 80 km).

The Kispiox River is accessible by road for part of its length. Power boats are prohibited on the river, but drift boats are permitted and are commonly used by anglers (Morten and Giroux, 2006). The majority of anglers utilize this river between the Rodeo Grounds and Upper Kispiox Recreation Site (about 19 km in length).

It is important to note that the River Guardians did not have permission to access land on the lower Kispiox River until September 26, 2013. This prevented angler interviews from being conducted for the first month of surveying in the area extending from the Potato Patch downstream to the confluence with the Skeena River. For this reason, feedback from anglers in this section during the month of September is not included in this report.

2.3 Zymoetz River Class II (Zymoetz II)

The Zymoetz River is 109 km in length, flowing from its headwaters in the McDonnell Lake chain to its confluence with the Skeena River, 8 km north east of Terrace, BC (Figure 4). The watershed drains an area of 3,080 km² with the Clore and Kitnayakwa rivers being the major tributaries (Beere, 1995). This study surveyed anglers on the Zymoetz River from 47 km on the Copper Forest Service Road to its confluence with the Skeena River.

The Zymoetz River has Class I and Class II sections, designated in 1990 when the Ministry of Environment established the current Classified Waters regulations. Only the Class II section was sampled for this study, which extends from Limonite Creek downstream to the Skeena River (Figure 4). The main access to the Class II section of the Zymoetz River is the Copper River Forest Service Road, although anglers also use the Copperville Road to access the north side of the river.

Weather events causing unfavorable fishing conditions are common on the Zymoetz River (Morten, 2000). Large amounts of rainfall and/or fast snowmelt cause high runoff, which significantly reduces water clarity. In turn, this negatively impacts angler success, especially below the Clore River (the major contributor of sediment). In response, anglers typically avoid the lower river, choosing to fish upper sections instead.

2.4 Skeena River Section IV (Skeena IV)

The Skeena River Section IV is a Classified Water from July 1 to December 31 and is one of the largest drainages on the Pacific Coast of North America. Originating in north-western BC, the Skeena River flows approximately 620 km southwest and drains an area of 54,400 km² before reaching the Pacific Ocean near Prince Rupert. Major tributaries include the Babine, Bulkley-Morice, Kispiox and Sustut rivers (Figure 5).

Generally, recreational anglers on the Skeena River Section IV Classified Water are focused on catching Steelhead. To a lesser degree, Chinook, Coho and Sockeye salmon are also targeted (Paish and Associates, 1985). For the purposes of this study, River Guardians opportunistically surveyed the Skeena

River Section IV Classified Water from its lower boundary 1.5 km above the Zymoetz River to the community of Cedarvale.

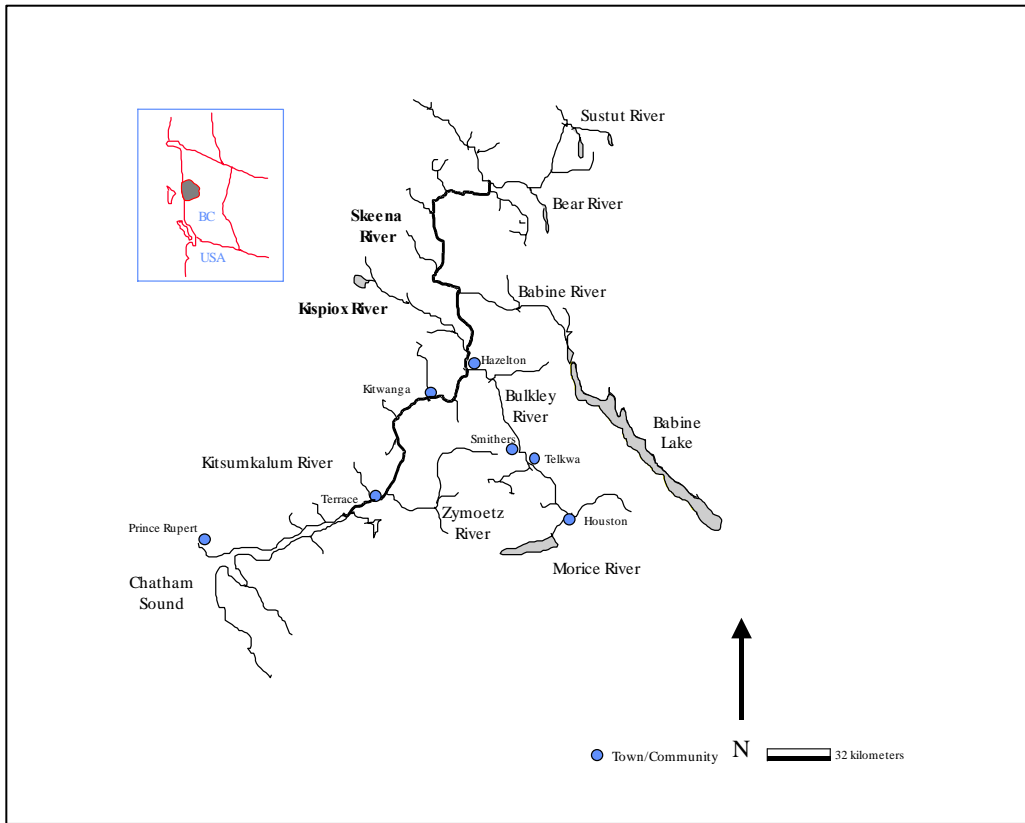


Figure 1: The Skeena Watershed (Morten and Giroux, 2006).

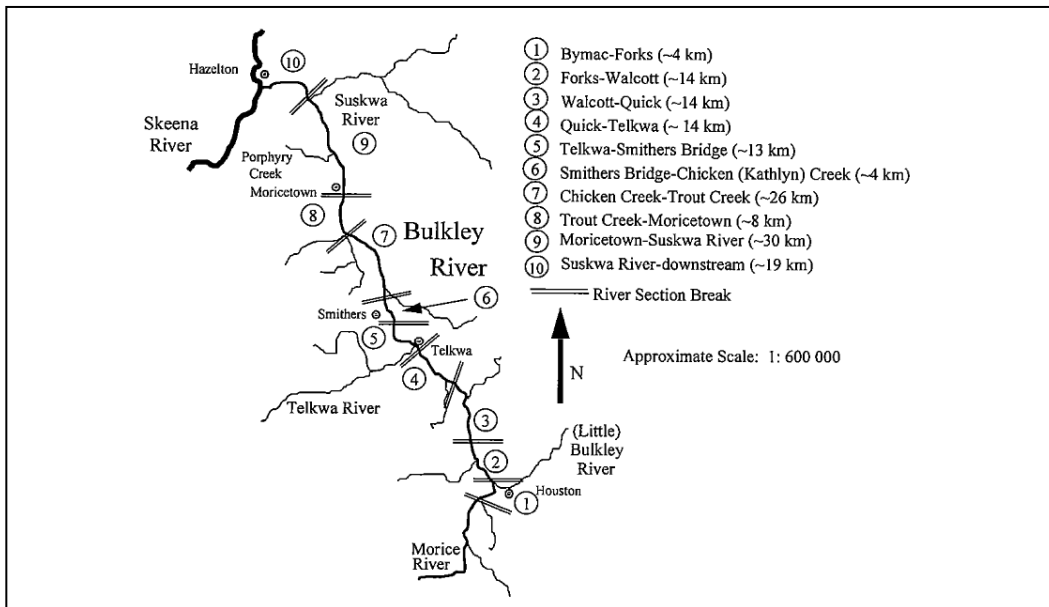


Figure 2: The Bulkley River Classified Water (Morten, 1999).

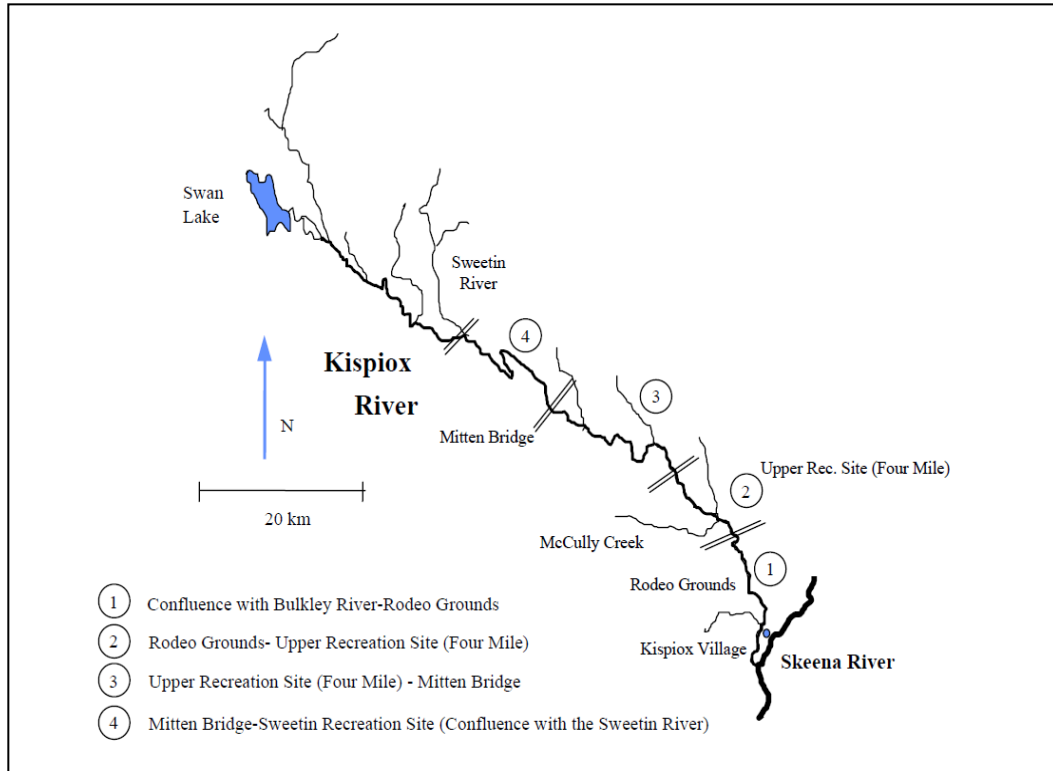


Figure 3: The Kispiox River Classified Water (Morten and Giroux, 2006).

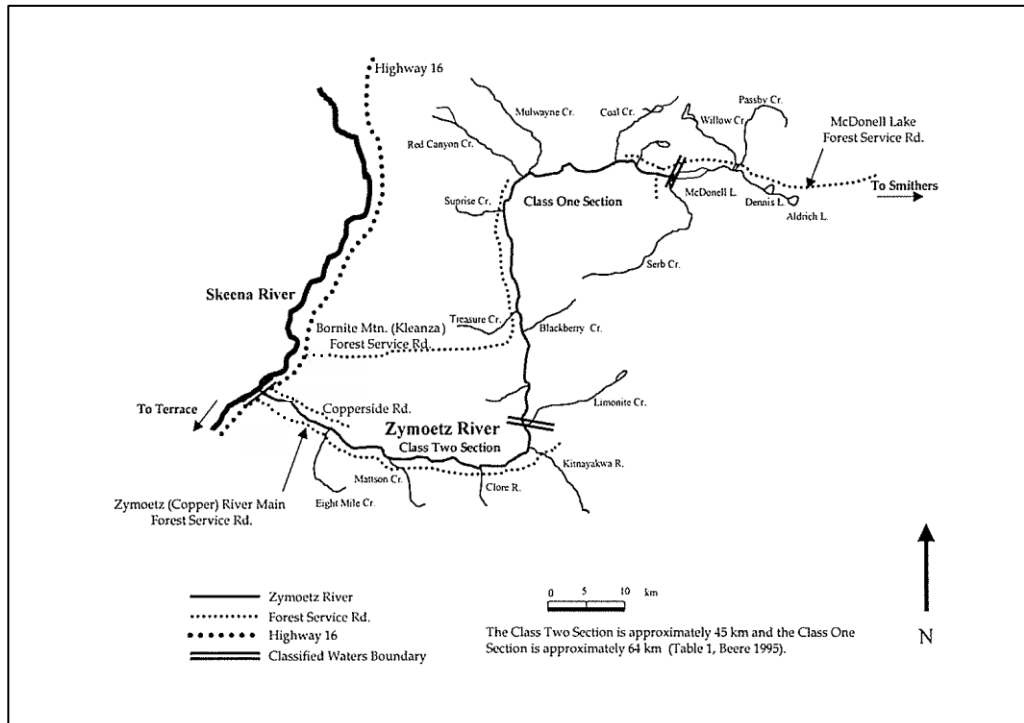


Figure 4: The Zymoetz River showing Class I and Class II sections (adapted from Morten, 2000).

portion of the Classified Waters period. The Classified Water period for all rivers is presented in Appendix 3.0.

For this project there were two crews of two River Guardians roving rivers in their respective regions. The Smithers River Guardians focused on the Bulkley and Kispiox, and the Terrace River Guardians focused on the Zymoetz II and Skeena IV. The River Guardians accessed known angling locations and approached anglers by foot to initiate interviews. Apple iPad® devices were used to collect roving survey and angler interview data.

Days to conduct angler interviews during the study period were chosen using a stratified random sampling design (Zar, 1984, Schafer *et al.*, 1990, Pollock *et al.*, 1994). Sampling effort was stratified by restricted and unrestricted non-resident alien times for each river. The restricted non-resident alien times for the Zymoetz River includes Friday, Saturday, and Sunday. The restricted non-resident alien times for the Bulkley, Kispiox and Skeena IV rivers includes Saturday and Sunday. With the exception of a region on the Skeena IV that is unrestricted to non-resident aliens during Saturday and Sunday. River Guardians surveyed the rivers during seven to eight hour shifts in daylight hours, commonly focusing on the time period between 10 am to 6 pm², although surveys were also conducted as early as 730 am and as late as 800 pm to intercept anglers fishing at different times. Sampling effort was stratified by week starting on a Monday ending on a Sunday as follows:

- On the Bulkley River, two weekday days and one weekend day were sampled each week
- On the Kispiox River, one weekday day and one weekend day were sampled each week.
- On the Zymoetz River, three weekdays and both weekend days were sampled each week
- At times, the Terrace River Guardians conducted interviews on both Zymoetz II and Skeena IV on the same day. Generally, Skeena IV was sampled when the Zymoetz II was blown out.

The Bulkley River was divided into nine sampling sections (Figure 2; Morten 1999), and the Kispiox River was divided into four sampling sections consistent with previous Steelhead angler surveys (Figure 3; Morten and Giroux, 2006). River sections for the Kispiox and Bulkley rivers were designed to collect data from all sections of each river to determine trends and distribution of angler effort. The Smithers River Guardians sampled specific river sections as instructed by the scheduled random sample. To be consistent with historical reports, Zymoetz River and Skeena IV were not divided into river sections. On the Zymoetz River only the Class II section was sampled, and on the Skeena River only Section IV was sampled.

The River Guardians completed two data forms, the Roving Survey and Interview Form (Appendix 1.0 and 2.0). Upon arriving at a river section, the River Guardians would initiate a roving survey that included environmental data and angler counts. All anglers that were accessible to the River Guardians were interviewed using the interview form. When the River Guardians departed a river section they closed the roving form by recording the time. Any anglers that were inaccessible (on the other side of the river or wouldn't come out of the water) were not interviewed. If an angler refused to conduct an interview or

² This time period corresponds to peak angler effort based on historical Steelhead angler surveys in the Skeena Region.

there was a language barrier, the River Guardians recorded as much data as possible. Anglers approached more than once were still interviewed, but were only asked a subset of questions pertaining to that specific day. Anglers violating licence regulations completed the interview if they desired, however the River Guardians didn't place emphasis on ensuring interview completion. River Guardians recorded observed licence infractions and forwarded all licence violations to the Conservation Officer Service. Anglers under the age of 16, or First Nations were also interviewed, even though they were not required to purchase a fishing licence. The River Guardians were not officers under the *Wildlife Act* and therefore did not have enforcement authority; their role was primarily for data collection and to provide information to anglers. Anglers were requested to provide a licence upon request by the River Guardians, but participation was voluntary.

3.1.1 Roving survey

A roving survey was completed each day the River Guardians surveyed a specific river or river section (Appendix 1.0). The River Guardians conducted interviews and roving surveys in tandem. The purpose of the roving survey was to collect observational data of that particular day on a specific river or river section. The roving survey included environmental data on weather, water level, water clarity and general route descriptions. In addition to this, the River Guardians took note of the number of anglers observed.

3.1.2 Interview form

The interview data form was initiated upon approaching an angler (Appendix 2.0). Anglers who possessed all required angling licences and agreed to participate in an interview were asked questions by the River Guardians. Interview questions focused on angler demographics, licence compliance, catch, and information pertaining to the anglers' perception of what constitutes a quality angling experience. The time and location of the interview were recorded to account for spatial and temporal distribution.

If the angler refused an interview or had a language barrier, limited or no data were collected. If the angler didn't have their licence present, this was recorded as a licence infraction and the interview was terminated and only the location was recorded. If the angler possessed some licence requirements (but not all), the interview was still conducted and the licence infraction was noted.

3.1.3 Electronic licence sales database

In addition to collecting interview and roving data by the River Guardians, data were also obtained from the electronic licence sales database, primarily to evaluate angler effort. This database is derived from an Oracle© platform that administers the sale of all angling licence products in the province. The information available within this database is an accurate means of assessing angler effort for non-resident Canadian and non-resident alien anglers, as they are required to purchase a Classified Waters licence on a day and river specific basis and also declare whether they were guided or not. Unfortunately, this same level of detail is not available for BC anglers as they purchase an annual Classified Waters licence.

For the purposes of this report, the best source of data was relied upon for determining angler characteristics (e.g. demography, guided status) and effort. For non-resident Canadian and non-resident alien anglers the electronic licence sales database was used, while for BC resident anglers, data collected by River Guardians was used.

3.2 Relevant definitions

Basic angling licence: Anglers are required to purchase a basic freshwater angling licence before they fish for any species in British Columbia. Various types exist: annual, 1 day, 8 day.

Classified Waters licence: All anglers required to buy a basic angling licence must also purchase a Classified Waters licence before fishing on a stream during the period when it is classified. An annual Classified Waters licence allows BC residents to fish on any Classified Water during the licensing year (April 1st to March 31st). For non-residents, the Classified Waters licence is sold on a per diem basis and is date and water specific. Although anglers may purchase as many Classified Waters licences as they wish, each licence may not exceed 8 consecutive days.

Classified Waters period: The period of time when anglers must purchase a Classified Waters licence on a Classified Water.

Steelhead Stamp: Anglers must purchase a Steelhead Stamp (also known as a Steelhead Conservation Surcharge) if they intend to fish for Steelhead in BC or when Steelhead are present. A Steelhead Stamp may be mandatory when fishing a Classified Waters, even if anglers are targeting species other than Steelhead.

Angler day or Rod day: Represents the effort of one angler fishing for one day.

BC resident: Your primary residence is in BC, and (a) you are a Canadian citizen or landed immigrant, and have been physically present in BC for the greater portion of each of six calendar months out of the immediately preceding 12 calendar months, or (b) you are not a Canadian citizen or landed immigrant, but have been physically present in BC for the greater portion of each of the immediately preceding 12 calendar months.

Non-resident Canadians: You are not a BC resident, but (a) you are a Canadian citizen or landed immigrant, or (b) your primary residence is in Canada, and you have resided in Canada for the immediately preceding 12 months.

Non-resident aliens: You are neither a BC resident nor a non-resident Canadian.

Unrestricted non-resident alien times: A period of time specific to Classified Water where non-resident aliens are permitted to fish.

Restricted non-resident alien times: A period of time specific to Classified Water, or zone on a Classified Water where non-resident aliens are not permitted to fish. In some cases, this restriction can be avoided if a non-resident alien angles with a licenced angling guide.

3.3 Analysis methods

3.3.1 Data analysis and sources of information

The data compilation and analysis for this project was performed in Microsoft Excel and R Studio. For comparison, data were assessed with consideration of previous River Guardian reports in the Skeena Region. Two datasets were used for this report. The data collected by the River Guardians was used to

analyze angler satisfaction, assess angler demographics, determine the amount of catch, understand the angler compliance with new regulations, and record the daily weather and water conditions. The data accessed from the Oracle platform was used to assess angler effort for non-resident Canadian and non-resident alien anglers.

3.3.2 Interviews

Interview and roving data were summarized to efficiently represent trends. To quantify the amount of time the River Guardians spent roving each river, the roving data were organized by unrestricted non-resident alien times or restricted non-resident alien times (Table 1). To highlight angler distribution and concentration during the Classified Waters period, the data was stratified into weekly time periods (Table 2). This method was chosen as opposed to synchronizing with historical documentation of using two-week periods based on previous report recommendations (Morten, 1999, Morten and Giroux, 2006). To compare angling location and effort, the interviews were stratified into river sections (only for the Bulkley and Kispiox rivers) consistent with previous Steelhead angler surveys (Figure 2 and 3; Table 3).

Table 1: Number (%) of days River Guardians spent roving on each river in 2013

	Bulkley¹	Kispiox¹	Zymoetz II^{2,3}	Skeena IV³	All Rivers
Unrestricted non-resident alien times	18 (67)	10 (56)	25 (54)	11 (59)	71 (65)
Restricted non-resident alien times	9 (33)	8 (44)	21 (46)	8 (41)	39 (36)
Total Days	27 (100)	18 (100)	46 (100)	19 (100)	110 (100)

¹ Restricted times on the Bulkley and Kispiox rivers includes Saturday and Sunday.

² Restricted times on the Zymoetz River includes Friday, Saturday and Sunday.

³ The Zymoetz II and Skeena IV were frequently both sampled on the same day.

Table 2: The date ranges for each time period strata used for data analysis (one-week blocks).

Week	Dates
8-3	Aug. 19 – Aug. 25
8-4	Aug. 26 – Sept. 1
9-1	Sept. 2 – Sept. 8
9-2	Sept. 9 – Sept. 15
9-3	Sept. 16 – Sept. 22
9-4	Sept. 23 – Sept. 29
10-1	Sept. 30 – Oct. 6
10-2	Oct. 7 – Oct. 13
10-3	Oct. 14 – Oct. 20
10-4	Oct. 21 – Oct. 27
10-5	Oct. 28 – Oct. 31

Table 3: Rivers and river sections used for analysis

	River Section
Kispiox River	
1	Confluence with Skeena River – Rodeo Grounds
2	Rodeo Grounds – Upper Recreation Site
3	Upper Recreation Site – Mitten Bridge
4	Mitten Bridge – Sweetin Recreation Site
Bulkley River	
1	Bymac – The Forks
2	The Forks – Walcott Bridge
3	Walcott Bridge – Quick Bridge
4	Quick Bridge – Telkwa Bridge
5	Telkwa Bridge – Smithers Bridge
6	Smithers Bridge – Chicken Creek
7	Chicken Creek – Trout Creek
8	Trout Creek – Moricetown
9	Moricetown – Sukswa River

*Zymoetz II and Skeena VI are not spatially delineated into River Sections.

3.3.3 General angler characteristics

Anglers were interviewed once to several times. Non-resident Canadian and non-resident aliens were asked their province or country of origin, respectively. The number and percentage of angler interviews were summarized by residence category. Percentages of interviews conducted by anglers of different residency categories were compared against data from historical River Guardian programs to determine temporal trends.

3.3.4 BC resident interviews

For BC residents, interview data were assessed to determine the concentration and distribution of BC resident anglers during either unrestricted or restricted times on rivers in the Skeena Region. The concentration of BC residents was assessed using the number of interviews conducted on each river or river section. Weekday type was used in order to determine how angler behavior changed during the week in response to the non-resident alien restricted times. In addition, an assessment was made to determine the average number of daily BC resident interviews occurring during either an unrestricted or restricted time. This was done by dividing the total number of interviews by the total number of days spent roving during either an unrestricted or restricted time on each river.

3.3.5 Licence sales during Classified Waters period

Electronic licence sales were summarized by residency category over one-week periods during the Classified Waters period to assess when anglers of different residency categories had a larger presence on each river.

3.3.6 Residence category and guided status

Guided status (guided or unguided) was recorded when anglers were interviewed. The guided angler interview data didn't meet the assumptions for statistical analysis, as the sample size was insufficient. However, the electronic licence sales database contains data on whether the angler was guided or unguided and if they were a non-resident alien or non-resident Canadian. This information was available because all non-BC anglers must purchase their Classified Waters licence per angling day. Guided status was summarized and analyzed by whether the angler was a non-resident alien or non-resident Canadian. A Chi squared test of homogeneity was used to compare the frequency of guided and unguided anglers of each residency category on each river.

3.3.7 Average guided and unguided angler days during restricted and unrestricted times

The electronic licence sales database was assessed to determine the concentration and distribution of guided and unguided non-resident aliens and non-resident Canadians angling during unrestricted and restricted times. To determine how many anglers of each residency category and guided status were on a river per day an average daily number was calculated during restricted and unrestricted times. This was done by summing the total number of angling days purchased for each guided or unguided residency category and dividing this by the number of days during a restricted or unrestricted time over each rivers Classified Waters period.

3.3.8 Trends in angler use

Historical data obtained from electronic licence sales was used to determine the number of anglers and angler days for guided and unguided non-resident aliens and non-resident Canadians. Analysis of this data from 2009 to 2013 was conducted for rivers included in this study. Additionally, an assessment was made to determine how unguided and guided non-resident aliens and non-resident Canadians were distributed during either restricted and unrestricted times since 2009.

3.3.9 Quality angling experience

Anglers were asked, "*Past research has shown that a number of factors contribute to quality angling experiences. In order of importance, what factors contribute to your quality angling experience on this river?*" Three factors were obtained from the anglers, which were recorded and summarized with no emphasis on the order that they were mentioned. Characterizing the data in this form limits the amount of interview bias occurring with this particular question (Zale *et al.*, 2012). The quality angling experience factors were summarized for each river and by residency category. The individual angler was used for the unit of analysis, not the number of angler interviews because repeat interviews didn't include this set of questions.

Anglers were also asked "*How would you rate your quality angling experience today?*" based on a scale from 1 (being very poor), and 5 (being excellent). Mean ratings of the quality angling experience were summarized by each river and residency category. Unlike the aforementioned quality angling experience question, all angler interviews were used for analysis because the angler was asked to rate their experience on each day. ANOVA and student t-tests were conducted to determine if there was a significant difference among means by river and residency category.

3.3.10 Angler crowding and regulations

Anglers were asked, “*How many anglers do you remember seeing today?*” (based on a range of 0-2, 3-5, 6-12, and 12+). The anglers were then asked, “*Thinking about the total number of anglers you encountered today on a scale of 1 to 5, 1 being not crowded at all, and 5 being extremely crowded. How crowded did you feel?*” The responses to these questions were summarized by each river and residency category. All angler interviews were used because the angler was asked how many anglers they remembered seeing each time they were interviewed. How crowded the angler felt was summarized by the individual anglers on each river and by residency category.

Anglers were asked, “*Did you fish this river during the Classified Waters period between 2007 and 2011?*” if the angler answered yes, they were also asked, “*What impact has the regulation change had on crowding on the river? Has the level of crowding been reduced, stayed the same or has it increased?*” and “*Overall, has your quality angling experience improved, stayed the same or declined as a result of this regulation change?*” The angler’s opinion of the regulation changes and whether there has been an improvement or lack thereof was summarized by river and residency category. The five year period of 2007-2011 was selected for the initial question as it represents the period of time immediately preceding the regulation changes and is likely the maximum extent that anglers could be reasonably expected to recall past levels of crowding and quality of experience on the river. Correlation analysis was conducted between the anglers angling experience and how crowded they felt to determine if there was an association between crowding and the anglers overall experience.

3.3.11 Angler comments

Anglers were asked if they had any other comments. The comments were categorized into broad groups of similar themes. These themes were consistent with previous reports. The individual angler was used for analysis not the angler interviews, as only upon the first interview were anglers asked to make a comment.

3.3.12 Angler licences

The River Guardians requested anglers to show their basic angling licence, Classified Waters licence, and Steelhead stamp during the interview. The type of infractions observed by the River Guardians was recorded on the interview form. The frequency of infractions was summarized by residence category and time period to assess how the number of infractions changed over the Classified Waters period.

3.3.13 Catch

The observed catch and angling method were recorded during the interviews. River Guardians asked the anglers, “*What species of fish have you landed today? How many did you catch and release?*” The anglers were asked what section of river the fish was landed in, how they accessed the river, and what gear type was used. On each river, the number of each species kept and released was summarized. The access method, gear type used and residency category were summarized with the total number of fish caught.

4.0 Results and discussion

4.1 Effort

4.1.1 Interviews

From August 19 to October 31, 2013, a total of 682 anglers were approached for an interview. The Smithers River Guardians spent approximately 27 days (76% of their effort) roving the Bulkley River, and 18 days (24% of their effort) roving the Kispiox River. The Terrace River Guardians spent approximately 46 days (89% of their effort) roving the Zymoetz II, and 19 days (11% of their effort) roving Skeena IV. A total of 298 interviews were conducted on the Bulkley River, 95 on the Kispiox River, 258 on Zymoetz II, and 31 on Skeena IV.

Six hundred and eighty two Steelhead anglers were approached for an interview. Forty anglers (6%) refused to complete the interview. Thirty eight anglers (6%) claimed to not speak enough English to complete the interview in its entirety, however, the River Guardians preceded to get as much information as possible. Twenty-six anglers (4%) were First Nations and two anglers were under the required age (<16). While First Nation anglers and those under the age of 16 are not required to hold a recreational angling licence they were still interviewed. The majority of anglers were interviewed only once (88%, 597 anglers), however some completed an interview multiple times (12%, 85 anglers).

River Guardians spent more days roving rivers when non-resident aliens were unrestricted than times when non-resident aliens were restricted from angling (Table 1). This is due to the greater number of unrestricted days on each river, and as a result more interviews were conducted during unrestricted times (Table 4; 5). For example, the Smithers River Guardians collected 243 interviews (63% of their interviewing effort) during unrestricted non-resident alien times and 150 interviews (37% of their interviewing effort) during restricted non-resident alien times (Table 4). Similarly, the Terrace River Guardians collected 185 interviews (64% of their interviewing efforts) during unrestricted non-resident alien times and 104 interviews (36% of their interviewing efforts) during restricted non-resident alien times (Table 5).

For the Smithers River Guardians, the highest number of interviews was during the last week of September (54 interviews, 14%) and first week of October (53 interviews, 13%) (Table 4). Previous studies on the Bulkley (Morten, 1999) indicate the second and fourth week of September were the busiest for angler interviews. For the Terrace River Guardians, the highest number of interviews was during the last week of August (47 interviews, 16%) and first week of September (51 interviews, 18%), in accordance with previous studies on the Zymoetz River (Morten, 2000; Table 5).

Table 4: The total number of angler interviews initiated during unrestricted and restricted non-resident alien times within one week blocks during the Classified Waters period on the Bulkley and Kispiox rivers. This data was compiled from the interview surveys.

Smithers: Total number of angler interviews initiated (%)									
Period¹	Bulkley			Kispiox			Total		Total
	Un	Res	Total	Un	Res	Total	Un	Res	
9-1	16	22	38	0	11	11	16	33	49 (12)
9-2	25	11	36	4	6	10	29	17	46 (12)
9-3	22	14	36	6	4	10	28	18	46 (12)
9-4	32	11	43	4	7	11	36	18	54 (14)
10-1	27	10	37	7	9	16	34	19	53 (13)
10-2	33	7	40	0	8	8	33	15	48 (12)
10-3	25	16	41	2	2	4	27	18	45 (12)
10-4	17	6	23	8	6	14	25	12	37 (9)
10-5	4	0	4	11	0	11	15	0	15 (4)
Total	201 (67)	97 (33)	298 (100)	42 (44)	53 (56)	95 (100)	243 (63)	150 (37)	393 (100)

Un = Unrestricted non-resident alien times, Res = Restricted non-resident alien times

¹Classified Waters period for Bulkley and Kispiox Rivers is Sept 1 to Oct 31.

Table 5: The total number of angler interviews initiated during unrestricted and restricted non-resident alien times within each one week block during the Classified Waters period on the Zymoetz II and Skeena Section IV rivers. This data was compiled from the interview surveys.

Terrace: Total number of angler interviews initiated (%)									
Period	Zymoetz II¹			Skeena IV			Total		Total
	Un	Res	Total	Un	Res	Total	Un	Res	
8-3	6	19	25	0	0	0	6	19	25 (9)
8-4	33	3	36	0	11	11	33	14	47 (16)
9-1	24	23	47	3	1	4	27	24	51 (18)
9-2	31	7	38	0	0	0	31	7	38 (13)
9-3	13	12	25	0	1	1	13	13	26 (9)
9-4	39	6	45	0	0	0	39	6	45 (16)
10-1	15	2	17	2	13	15	17	15	32 (11)
10-2	8	0	8	0	0	0	8	0	8 (3)
10-3	9	6	15	0	0	0	9	6	15 (5)
10-4	2	0	2	0	0	0	2	0	2 (1)
10-5	0	0	0	0	0	0	0	0	0 (0)
Total	180 (70)	78 (30)	258 (100)	5 (16)	26 (84)	31 (100)	185 (64)	104 (36)	289 (100)

Un = Unrestricted non-resident alien times, Res = Restricted non-resident alien times

¹Non-resident alien restricted times includes Friday, Saturday and Sunday on Zymoetz River.

4.1.2 Spatial distribution of angler interviews among rivers

The Bulkley and Kispiox rivers were stratified into river sections to determine where anglers were concentrating their effort (Table 6; Figure 6). Angler residency categories among river sections were also assessed (Figure 6). Anglers typically distribute themselves evenly along the river, although the greatest number of interviews on the Kispiox River was between the Rodeo Grounds and Upper Recreation Site (43 interviews, 45% of total interviews conducted on the Kispiox River). The number of BC resident interviews was higher than non-resident Canadians and non-resident aliens in most cases, besides between the Upper Recreation site and Mitten Bridge location where more non-resident aliens were interviewed. This is consistent with the report by Morten and Giroux (2006) (Figure 6). The majority of BC resident interviews occurred between Rodeo Grounds and Upper Recreation site or between the Confluence with the Skeena River and the Rodeo Grounds.

The number of interviews on the Bulkley River was not evenly distributed throughout the river (Table 6, Figure 6). The number of BC resident interviews was higher than non-resident Canadians and non-resident aliens in all river sections, showing that BC residents are the dominant users of this river. The majority of interviews occurred between the Telkwa Bridge and the Smithers Bridge or between Trout Creek and Moricetown. Similar to Morten and Parken (1998), the majority of angler interviews were between Telkwa and Smithers Bridge (61 interviews, 21% of total interviews conducted on the Bulkley River) with only a few anglers interviewed between Walcott and Quick. The results from the Morten (1999) study showed a higher proportion of interviews being conducted from Chicken Creek and Trout Creek. The similarities to Morten and Parken (1998), but differences to Morten (1999) could be due to the similarities and differences in sample designs.

Table 6: Number (%) of interviews initiated in each section of the Kispiox and Bulkley rivers. This data was compiled from the interview surveys.

River Section	Number (%) of Interviews Initiated¹
<i>Kispiox River</i>	
Confluence with Skeena River – Rodeo Grounds	35 (37)
Rodeo Grounds – Upper Recreation Site	43 (45)
Upper Recreation Site – Mitten Bridge	11 (12)
Mitten Bridge – Sweetin Recreation Site	6 (6)
Total	95 (100)
<i>Bulkley River</i>	
Bymac – The Forks	14 (5)
The Forks – Walcott Bridge	9 (3)
Walcott Bridge – Quick Bridge	6 (2)
Quick Bridge – Telkwa Bridge	31 (10)
Telkwa Bridge – Smithers Bridge	61 (21)
Smithers Bridge – Chicken Creek	52 (18)
Chicken Creek – Trout Creek	29 (10)
Trout Creek – Moricetown	54 (18)
Moricetown – Sukswa River	40 (13)
Total	296 (100)

¹River section data were not gathered from two anglers on the Bulkley River.

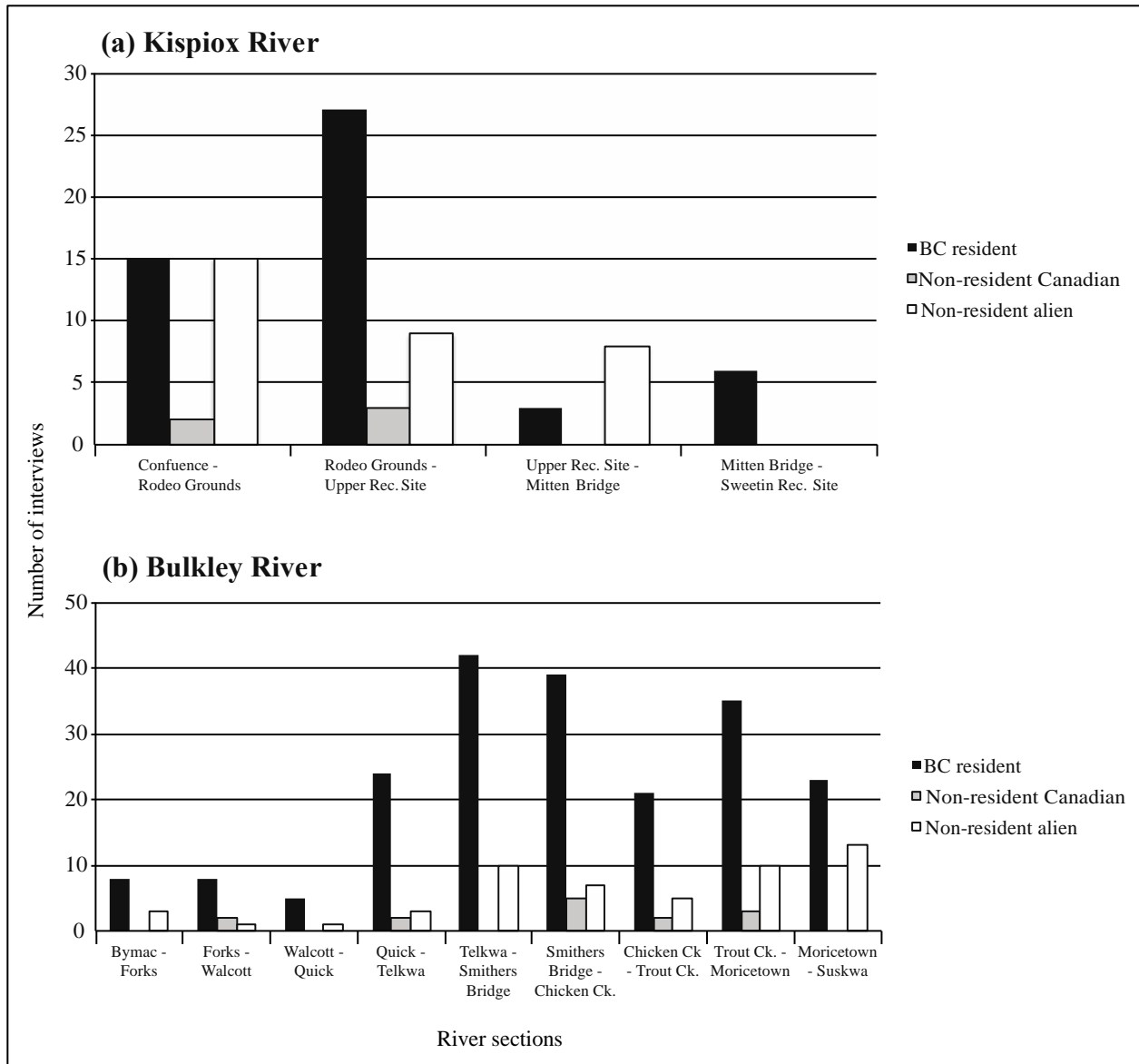


Figure 6: The number of angler interviews of each residence category in each river section, (a) Bulkley River, and (b) Kispiox River. This data was compiled from the interview surveys.

4.1.3 Angler interview residence categories

Angler interviews were organized into residency category by river (Table 7). On the Bulkley River, 251 individual anglers were approached for an interview, 217 provided their residency. One hundred and fifty five (71%) were BC residents, 11 (5%) were non-resident Canadians, and 51 (24%) were non-resident aliens. On the Kispiox River, 76 individual anglers were approached for an interview, 69 provided their residency. Thirty-nine (57%) of those were BC residents, four (6%) were non-resident Canadians, and 26 (37%) were non-resident aliens. Twenty-seven individual anglers were approached for an interview on Skeena IV, residency was not collected from one angler. Eight (31%) were BC residents, none were non-resident Canadians, and 18 (69%) were non-resident aliens. On Zymoetz II, 243 individual anglers were approached for an interview, 227 provided their residency. One hundred (44%) of those were BC residents, 38 (17%) were non-resident Canadians, and 89 (39%) were non-resident aliens.

Table 7: The percentage (n) of individual anglers for each residency category on all rivers surveyed. This data was compiled from the interview surveys.

River	Residency category	Number (%) of individual anglers
Bulkley¹	BC resident	155 (71)
	Non-resident Canadian	11 (5)
	Non-resident aliens	51 (24)
Kispiox²	BC resident	39 (57)
	Non-resident Canadian	4 (6)
	Non-resident aliens	26 (37)
Skeena IV³	BC resident	8 (31)
	Non-resident Canadian	0 (0)
	Non-resident aliens	18 (69)
Zymoetz II⁴	BC resident	100 (44)
	Non-resident Canadian	38 (17)
	Non-resident aliens	89 (39)
All Rivers⁵	BC resident	302 (56)
	Non-resident Canadian	53 (10)
	Non-resident aliens	184 (34)

¹The residence was not collected from 34 individual anglers.

²The residence was not collected from seven individual anglers.

³The residence was not collected from one individual angler.

⁴The residence was not collected from 16 individual anglers.

⁵The residence was not collected from 58 individual anglers. All Rivers includes, the Zymoetz II, Bulkley, Kispiox, and Skeena IV.

4.1.4 Angler interview resident categories over previous year's studies

Previous River Guardian programs were conducted on the Bulkley, Kispiox and Zymoetz rivers from as early as the mid-1970's. An attempt was made to compare the residency category proportions from these studies to this year's program. However, it should be noted that the historical studies had varying sample designs, so the comparisons should be assessed with caution.

The proportion of BC resident interviews on the Bulkley River has increased since 1997 and 1998 when the last surveys were conducted (Table 8). Meanwhile, the percentage of non-resident alien interviews has decreased over the same time period. The Bulkley River has always been more commonly used by BC-residents as the river runs through the communities of Houston, Telkwa, Smithers, Moricetown, and Hazelton providing good accessibility for local anglers.

Table 8: A summary of angler residence from previous angler surveys on the Bulkley River (adapted from Morten, 2000).

	Morten & Parken (1998)	Morten (1999)	Current study (2015)¹
Survey year	1997	1998	2013
Period	Sept. 1 – Oct. 31	Aug. 25 – Nov. 22	Sept.3– Oct. 31
Number of interviews	374	1119	298
Resident categories			
BC resident (%)	50	62	71
Non-resident Canadian (%)	8	5	5
Non-resident alien (%)	42	33	24

¹ Current study focused on Bulkley, Kispiox, Skeena IV and Zymoetz II rivers

The proportion of BC resident interviews on the Zymoetz II has continued to decline since the first study was conducted in 1975, while the proportion of non-resident alien interviews has generally increased over time (Table 9). The current study has the most balanced distribution of angler interviews among residency categories. This could possibly be due to the regulation changes made in 2012, which doesn't allow unguided non-resident aliens to fish on Friday, Saturday or Sunday. Of note is the increase in number of non-resident Canadians interviewed in this current study. Perhaps more non-resident alien anglers Canadians are accessing the rivers as they are unaffected by the regulation changes.

Table 9: A summary of angler residence from previous angler surveys on the Zymoetz River (adapted from Morten, 2000).

	Whately (1975)	Chudyk & Whatley (1980)	Chudyk & Whatley (1980)	Lewynsky & Olmstead (1990)	Morten (2000)	Current study, (2015)¹
Survey year	1974	1978	1979	1989	1999	2013
Period	Sept. 14 – Oct. 7	Sept. 1 – Oct. 29	Aug. 18 – Dec. 13	Aug. 15 – Oct. 15	Aug. 21 – Dec. 5	Aug. 20 – Oct. 31
Number of interviews	51	912 ²	839 ³	239	748	258
Resident categories						
BC resident (%)	79	82	93	63	65	45
Non-resident Canadian (%)	8	8	5	2	4	17
Non-resident alien (%)	13	10	2	35	31	38

¹ Current study focused on Bulkley, Kispiox, Skeena IV and Zymoetz II rivers

² Number of angler trips not individual anglers.

³ Approximate numbers because data were interpreted from a bar graph

Evidenced from the 1975, 1997, and 2001 data from the Kispiox River angler surveys, the majority of interviews were from non-resident aliens, followed by BC residents (Table 10). This differs from 2013 where for the first time observed, the number of BC resident interviews exceeded that of non-resident alien anglers. It should be noted that this could be due to sample design, as the River Guardians only

accessed the river by foot, eliminating many of the non-resident alien anglers who approached the river by raft and drift boat.

Table 10: A summary of angler residence from previous angler surveys on the Kispiox River (adapted from Morten, 2000).

	Whately (1977)	Morten (1998)	Morten & Giroux (2006)	Current study, (2015)¹
Survey year	1975	1997	2001	2013
Period	Autumn ²	Sept .1 – Oct. 31	Aug. 27 – Nov. 18	Sept. 2 – Oct. 31
Number of interviews	-	280	257	95
Resident categories				
BC resident (%)	36	28	30	57
Non-resident Canadian (%)	10	1	2	6
Non-resident alien (%)	54	71	68	37

¹ Current study focuses on Bulkley, Kispiox, Skeena IV and Zymoetz II rivers

² Exact time period not indicated in report

4.1.5 BC resident interviews

To determine if BC resident anglers had a higher presence on the river during the restricted non-resident alien times relative to unrestricted times, the number of BC resident interviews was averaged by the number of days spent roving during restricted or unrestricted times over the study period (Table 11). This analysis indicated that on the Zymoetz II and Bulkley rivers there was only a slight difference between the average number of BC resident angler interviews during either restricted (2.5 and 7.8, respectively) or unrestricted (2.2 and 7.1, respectively) non-resident aliens times (Table 11). There were not enough BC resident anglers interviewed on the Skeena IV and Kispiox rivers to complete a full analysis.

Table 11: Average daily number of BC resident interviews during unrestricted and restricted non-resident alien times. This data was compiled from the angler interview surveys.

	All Rivers¹	Zymoetz II	Bulkley
Unrestricted	2.7	2.2	7.1
Restricted	4.3	2.5	7.8

¹ All Rivers includes, the Zymoetz II, Bulkley, Kispiox, and Skeena IV.

To assess the temporal distribution of BC resident anglers during the 2013 Steelhead fishery, the number of individual interviews was used to determine the percent of BC residents utilizing the river during restricted and unrestricted non-resident alien times (Table 12; Figure 7). When assessed by weekday, BC residents were interviewed comparably during restricted and unrestricted non-resident alien times (Table 12; Figure 7). However, on the Kispiox River BC residents were interviewed more frequency during restricted times, particularly on Sundays.

Table 12: Number (%) of interviews from BC residents by day type on the Zymoetz II, Bulkley and Kispiox rivers. This data was compiled from the angler interview surveys.

	All Rivers ¹	Zymoetz II	Bulkley	Kispiox
Mon	59 (16)	27 (25)	23 (12)	9 (18)
Tues	49 (14)	14 (13)	35 (18)	0 (0)
Wed	44 (12)	13 (12)	31 (16)	0 (0)
Thurs	19 (9)	1 (1)	14 (8)	4 (8)
Fri	37 (10)	13 (12)	23 (12)	1 (2)
Sat	62 (17)	11 (11)	39 (20)	8 (16)
Sun	93 (26)	29 (27)	32 (16)	28 (56)
Total	363 (100)	108 (100)	197 (100)	50 (100)

¹ All Rivers includes, the Zymoetz II, Bulkley, Kispiox, and Skeena IV.

* Grey shaded areas are non-resident alien restricted periods in the Skeena Region.

** Data for Skeena IV was not included as interview numbers were too low

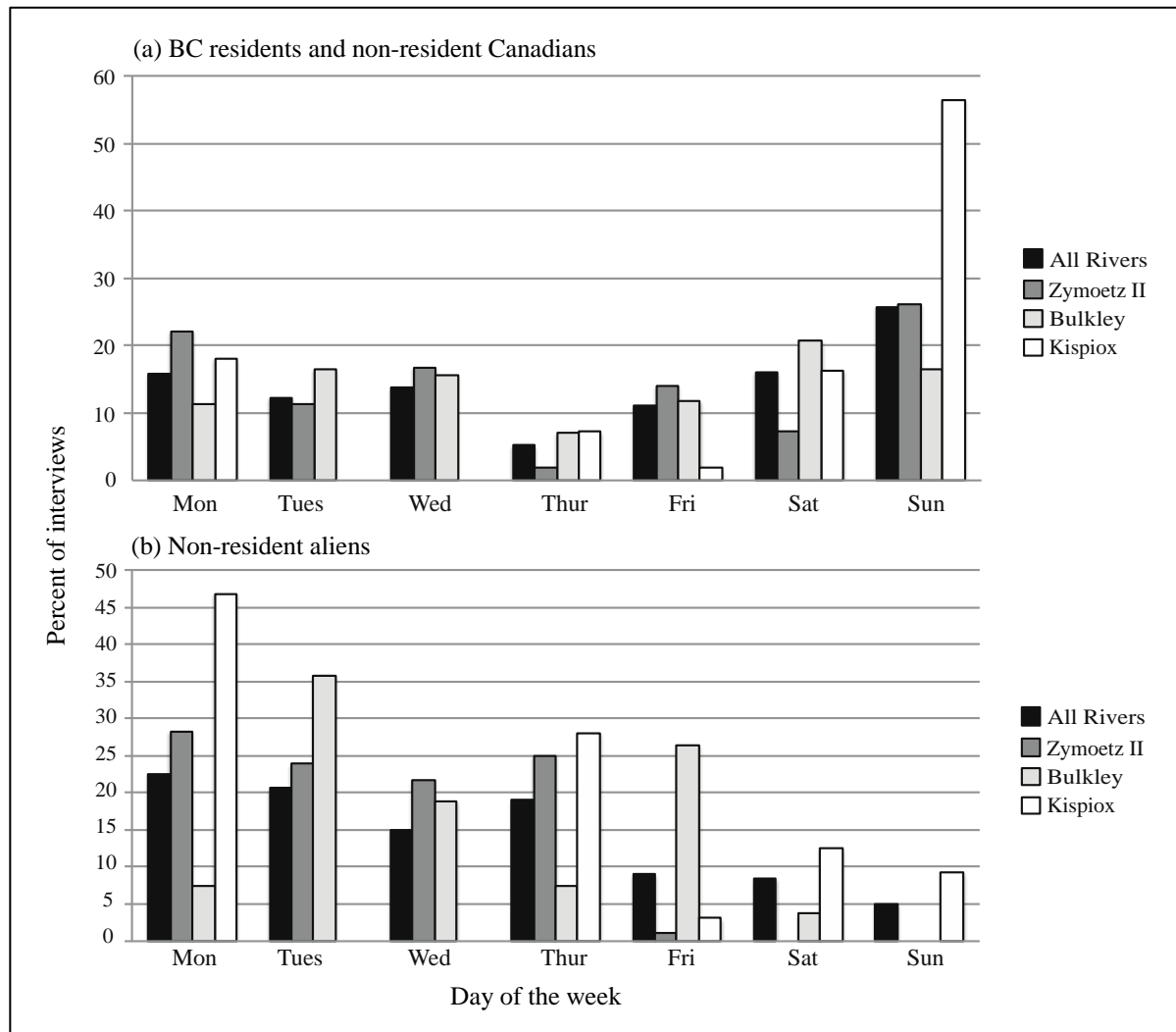


Figure 7: (a) Percentage of interviews on each day for BC residents and non-resident Canadian anglers for select rivers and (b) Percentage of interviews on each day for non-resident aliens on select rivers. This data was compiled from the interview survey. All rivers includes the Zymoetz II, Bulkley, Kispiox and Skeena IV rivers

4.1.6 Non-resident Canadian and alien licence sales over Classified Waters period

The number of non-resident Canadian and non-resident alien Steelhead anglers during the Classified Waters period was assessed to determine trends in angling use. BC resident effort could not be evaluated, as the electronic licence system does not require these anglers to declare the number of days or river they intend to fish. On the Bulkley River, both non-resident Canadians and non-resident aliens bought the greatest number of angler days during the first week of October, followed by the last week of September (Figure 8). The Kispiox River had the greatest number of angler days purchased during the first week of October for both non-resident Canadians and non-resident aliens (Figure 8). The Skeena IV and Zymoetz II rivers have two peaks of angler days purchased. These peaks occurred during the end of August, beginning of September and at the end of September (Figure 8). There is a pattern between fish abundance and the number of angler days purchased, although other environmental factors additionally affect when anglers choose to fish.

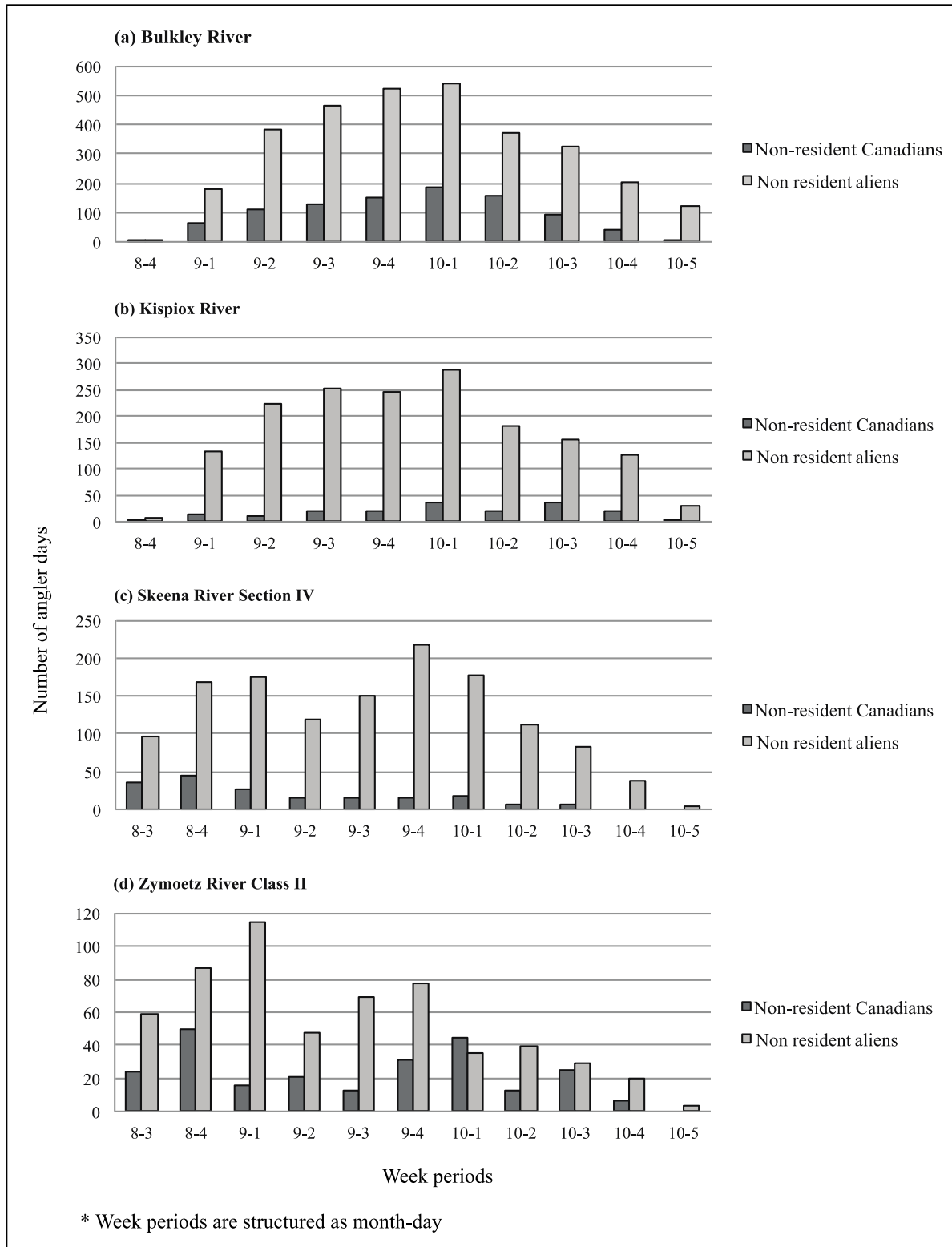


Figure 8: Non-resident Canadians and non-resident aliens Classified Waters angler day purchases during each week of the Classified Waters period in 2013. This data was compiled from the electronic licence database.

4.1.7 Guided angler status

Using electronic licence sales data, assessments were made to determine the percentage of non-resident Canadians and non-resident aliens that use the services of angling guides on the Bulkley, Kispiox, Skeena IV, and Zymoetz II rivers (Table 13). Results indicate that non-resident aliens were more likely to be guided than non-resident Canadians (Table 13). On the Bulkley and Kispiox rivers, 98% of guided anglers were non-resident aliens and 2% were non-resident Canadians. On the Skeena IV and Zymoetz II rivers, 97% and 89% of guided anglers were non-resident aliens respectively, 3% and 11% were guided non-resident Canadians respectively.

Table 13: The number (%) of guided and unguided non-resident Canadian and non-resident alien anglers on the Bulkley, Kispiox, Skeena IV, and Zymoetz II rivers during the River Guardian study period, 2013. This data was compiled from the electronic licence database

River	Residency category	Guided	Unguided	Statistics
Bulkley	Non-resident alien	282 (98)	419 (70)	$\chi^2 = 27.12$, df = 1, p = $1.9e^{-07}$
	Non-resident Canadian	5 (2)	182 (30)	
	Total	287 (100)	601 (100)	
Kispiox	Non-resident alien	100 (98)	271 (82)	$\chi^2 = 12.5$, df = 1, p = 0.000
	Non-resident Canadian	2 (2)	60 (18)	
	Total	102 (100)	331 (100)	
Skeena IV	Non-resident alien	114 (97)	361 (73)	$\chi^2 = 20.75$, df = 1, p = $5.2e^{-06}$
	Non-resident Canadian	4 (3)	131 (27)	
	Total	118 (100)	492 (100)	
Zymoetz II	Non-resident alien	89 (89)	189 (66)	$\chi^2 = 13.88$, df = 1, p = 0.000
	Non-resident Canadian	11 (11)	99 (34)	
	Total	100 (100)	288 (100)	

4.1.8 Average guided and unguided angler days during restricted and unrestricted times

To determine the trends of angler use of different resident categories during restricted non-resident alien times relative to unrestricted times, the number of angler days was averaged during restricted and unrestricted times over the study period (Table 14). This was assessed to better understand how anglers were redistributing given the recent regulation changes. The average number of guided and unguided angler days purchased per day during restricted and unrestricted times was calculated over the Classified Waters period for each river in 2013 (Table 14). The restricted times generally occur on Saturday and Sunday (i.e. weekends) during the Classified Waters period and apply to unguided non-resident alien anglers, however, there are exceptions as described below in Table 14 and in Appendix 5.0. Data for BC resident anglers was not available for this analysis, as angler day information for this residency category is not collected through the electronic licence sales database.

On the Bulkley and Kispiox rivers during unrestricted times (i.e. weekdays) the average number of angler days purchased per day was highest for unguided non-resident aliens (39.0 and 24.8, respectively), whereas during the restricted times guided non-resident aliens had the highest average number of angler days purchased per day (23.5 and 8.9, respectively) (Table 14). This trend is expected given the restrictions, which prevent unguided non-resident aliens from fishing on the weekends without a guide.

On Skeena IV, unguided non-resident aliens purchased the highest average number of angler days per day during the restricted and unrestricted times (8.7 and 9.7, respectively) (Table 14). Unlike the Bulkley and Kispiox rivers, use by this class of angler did not vary substantially from weekday to weekend as sections of Skeena IV remain “open” to unguided non-resident alien anglers on Saturdays and Sundays. For example, the area extending from Chimdemash Creek to Sedan Creek is unrestricted while the adjacent river sections are restricted on weekends during the Classified Waters period. Concerns have been raised by anglers who were interviewed as part of this project that the presence of unrestricted zones adjacent to restricted zones has concentrated anglers within the unrestricted zones on weekends and contributed to increased crowding, particularly in the Cedarvale area. Due to these public concerns, this area will be monitored again in 2014 and 2015 to understand how the regulation changes discussed in this report may have changed angling effort in this area. A summary of River Guardian observations at the Cedarvale bar in 2013 are presented in Appendix 8.0.

The highest average number of angler days purchased per day on Zymoetz II during unrestricted times was by unguided non-resident aliens (6.1) (Table 14). During the restricted times, average use by unguided non-resident Canadians was the highest (2.1), exceeding that of guided non-resident aliens. This is a trend that is the result of unique river-specific angling guide restrictions on Saturdays (in a zone) and Sundays (on the entire river). During these times and in these zones, both guided and unguided non-resident alien anglers are restricted from fishing.

When assessing the data in Table 14, two interesting trends are apparent. Firstly, on the Kispiox and Zymoetz II rivers the average number of angler days per day purchased by unguided non-resident Canadians was slightly, but not considerably higher between unrestricted and restricted times (3.2 and 2.1 respectively). This is somewhat surprising as non-resident Canadians were expected to angle considerably more frequently during restricted times to take advantage of potentially less crowded conditions. Secondly, guided use by non-resident aliens was higher during restricted times than unrestricted times on the Bulkley and Kispiox rivers. This suggests that angling guides are fishing on average a greater number of weekend-days than week-days, perhaps to offer their clients a less crowded fishing experience on these rivers.

From a compliance perspective, it is important to note that unguided non-resident alien anglers purchased angler days on all rivers during the restricted times (i.e. weekends; Table 14). As this data is based on electronic licence sales, it is not possible to determine whether these angler days were mistakenly purchased or were actually used in non-compliance.

Table 14: Average number of guided and unguided non-resident alien and non-resident Canadian angler days during restricted and unrestricted times of the Classified Waters period, 2013. This data was compiled from the electronic licence database.

	Bulkley¹				Kispiox¹			
	Unrestricted times		Restricted times		Unrestricted times		Restricted times	
	Average	Std Dev.	Average	Std Dev.	Average	Std Dev.	Average	Std Dev.
Guided non-resident alien	21.6	5.0	23.5	6.9	7.1	3.9	8.9	4.9
Unguided non-resident alien	39.0	12.8	1.4	1.0	24.8	10.6	0.6	0.9
Guided non-resident Canadian	1.0	1.0	1.0	1.0	0.1	0.4	0	0
Unguided non-resident Canadian	15.4	10.8	13.1	9.1	2.8	2.4	3.2	3.4
	Skeena IV²				Zymoetz II³			
	Unrestricted times		Restricted times		Unrestricted times		Restricted times	
	Average	Std Dev.	Average	Std Dev.	Average	Std Dev.	Average	Std Dev.
Guided non-resident alien	3.5	4.3	3.0	4.3	2.5	2.5	0.6	1.4
Unguided non-resident alien	8.7	8.2	9.7	7.8	6.1	7.8	0.1	0.5
Guided non-resident Canadian	0.1	0.4	0.1	0.4	0.2	0.6	0.1	0.4
Unguided non-resident Canadian	2.5	2.5	2.6	2.3	1.6	1.8	2.1	1.5

¹ Restricted to unguided non-resident alien anglers on Saturday and Sunday from September 1 to October 31. This weekend restriction does not apply to guided non-resident alien anglers.

² Non-resident alien restrictions apply in two zones on Saturday and Sunday from July 1 to December 31, including: 1) the Shegunia River confluence downstream to Sedan Creek confluence and 2) the Chimdemash Creek confluence downstream to 1.5 km upstream from Zymoetz River confluence. These weekend restrictions do not apply to guided non-resident alien anglers in zone 1, however, it they do apply to guided non-resident alien anglers in zone 2.

³ Restricted to non-resident aliens on Friday, Saturday and Sunday. Exceptions include guided non-resident aliens may fish on Friday and Saturday in a zone from Mattson Creek to the confluence with the Skeena River.

4.1.9 Trends in non-resident alien and non-resident Canadian angler use

The electronic licence sales database was queried to evaluate trends in angler use before and after the regulation changes were implemented on April 1, 2012. Data from 2009 to 2013 was available for non-resident Canadian and non-resident alien anglers. Information for BC resident anglers was not available as this class of angler is not required to declare the day or river they fish during the Classified Waters period. It is important to note that while five years of data was available for this assessment (2009 to 2013), only two years of data exists after the regulation changes were implemented (2012 and 2013). This limits trend assessment before and after the regulation changes until additional licence sales data becomes available in future years of this study.

Based on the number of days purchased, discounting BC residents, unguided non-resident alien anglers had the highest levels of use on all rivers (Figure 9). Trends in use for this class of angler varied prior to 2012 on a river specific basis. Following the regulation changes in 2012, the number of angler days purchased by these anglers declined to varying extents on the Bulkley, Kispiox and Zymoetz II rivers and then either stayed flat or increased from 2012 to 2013 on all rivers included in this study (Figure 9). In general, this also occurred for the number of anglers on these systems (Figure 10). The largest decline in angler days from 2011 to 2012 was on the Kispiox River, from 1,736 to 1,075 days respectively.

On the Zymoetz II River, caution is warranted when conducting comparisons in licence sales before and after the regulation changes, as the Classified Waters period for both of these rivers was changed in 2012. This required non-resident Canadian and non-resident alien anglers to purchase a day specific Classified Waters licence at times when they formerly didn't have to (for a summary of the regulation changes, refer to Appendix 3.0). This means that potential declines in angler use due to the Canadian resident-only restrictions may be offset by increases in licence sales due to the Classified Waters period extensions. To address this issue for Zymoetz II, the Number of Angler Days data were used to isolate the Classified Waters purchases from September and October before and after 2012 (Figure 11). This analysis indicates that a decline in angler days purchased by unguided non-resident alien anglers occurred on Zymoetz II (Figure 11). This decline is not shown in Figure 9 as the changes to the Classified Waters period are not taken into consideration. Although the Classified Waters period on the Skeena IV also changed in 2012, very few anglers purchased angler days in 2012 and 2013 beyond the previous Classified Waters period date of Oct 31. A difference in licence sales trends were not observed when taking the change of Classified Waters periods into account for the Skeena IV.

The second largest user group (based on angler days purchased) on the rivers included in this study was guided non-resident alien anglers (Figure 9). Except for the Zymoetz II River on Saturdays (in a zone) and on Sundays, however, this class of angler is not restricted by the Canadian resident-only regulation changes. Generally, effort by these anglers from 2009 to 2011 increased, followed by continued increases in 2012 when the regulation changes were implemented. On all rivers except for the Kispiox, use by these anglers then declined to varying extents from 2012 to 2013 (Figure 9). Except for the Kispiox River, the number of angler days purchased by unguided non-resident Canadians has increased following the regulation changes in 2012.

When assessing licence sales data to estimate trends in angler effort, it is important to note that this information is based on the number of licence days sold. Presumably, few anglers purchase days without using them, however, in some cases this may occur (e.g. when a river unexpectedly blows out due to adverse weather conditions). Such instances create overestimation of effort where the number of angler days purchased exceeds the number of days that were used on the river. Conversely, other factors may underestimate angler effort. For example, in some cases guided anglers do not accurately identify their guided status on their licence. Also, errors have been noted whereby guided anglers do not enter their guide's name on their licence, or the assistant guide is incorrectly identified on the licence as opposed to the rod day holder³. These issues cause the electronic licence sales data to underestimate the actual number of guided days that were used.

For reference, data tables for Figure 9 and 10 are presented in Appendix 4.0 and Appendix 5.0.

³ In most cases where an assistant angling guide was incorrectly identified on an angling licence in the electronic licence sales system, it was possible to assign the angler day to the appropriate rod day holder.

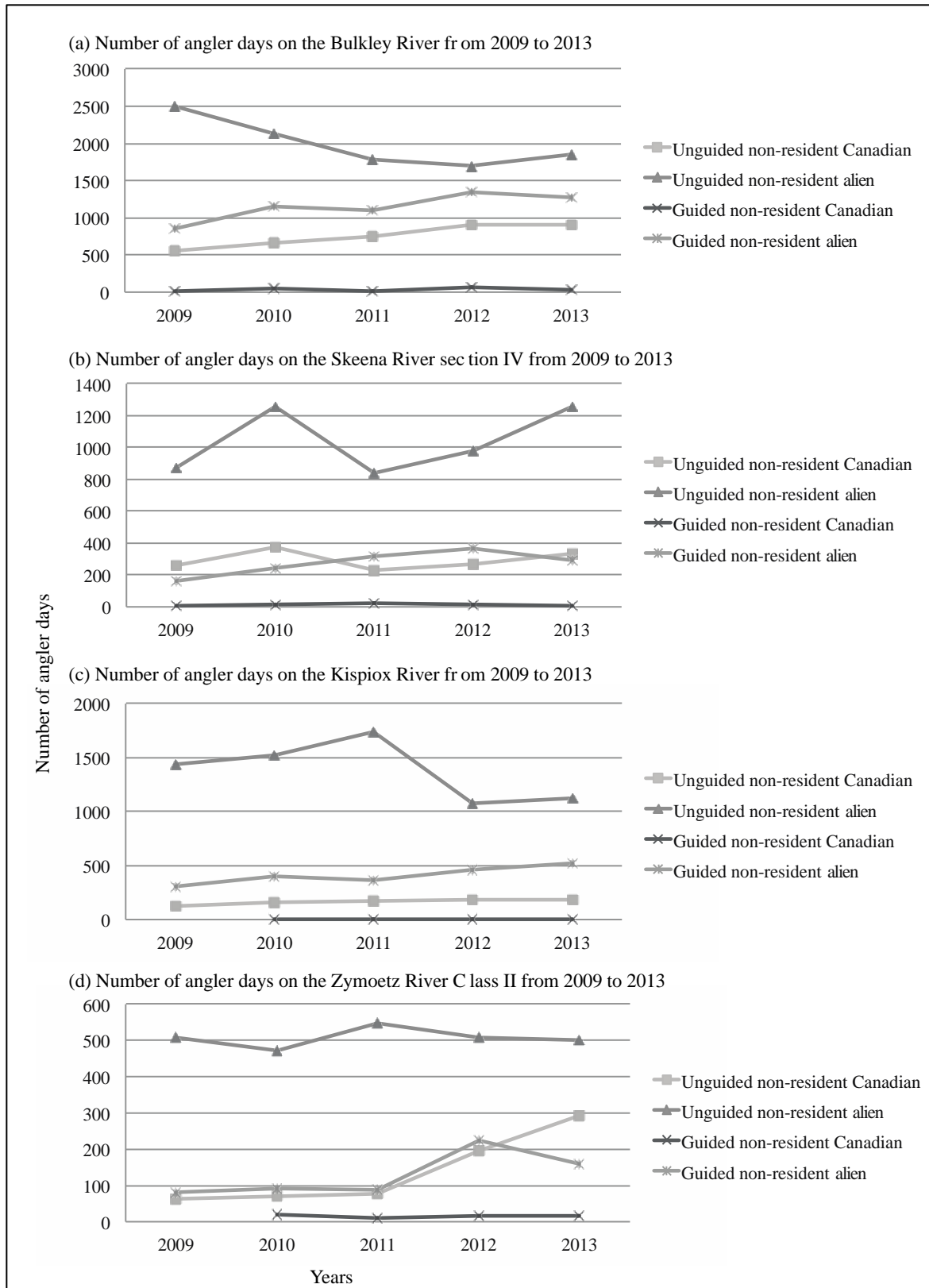


Figure 9: Number of angler days during Classified Waters period on select rivers from 2009 to 2013. This data was compiled from the electronic licence database.

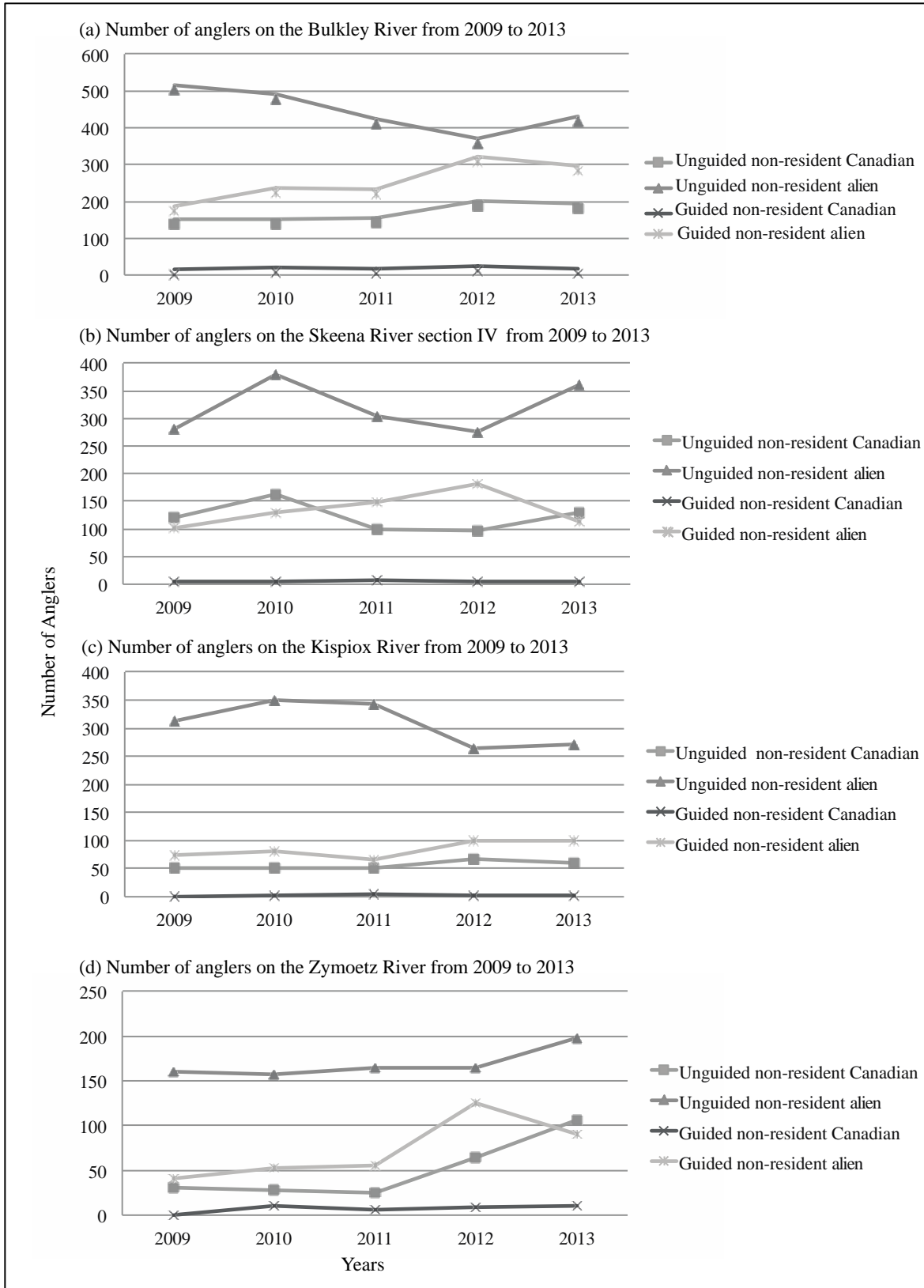


Figure 10: Number of anglers on select rivers during Classified Waters period from 2009 to 2013. This data was compiled from the electronic licence database.

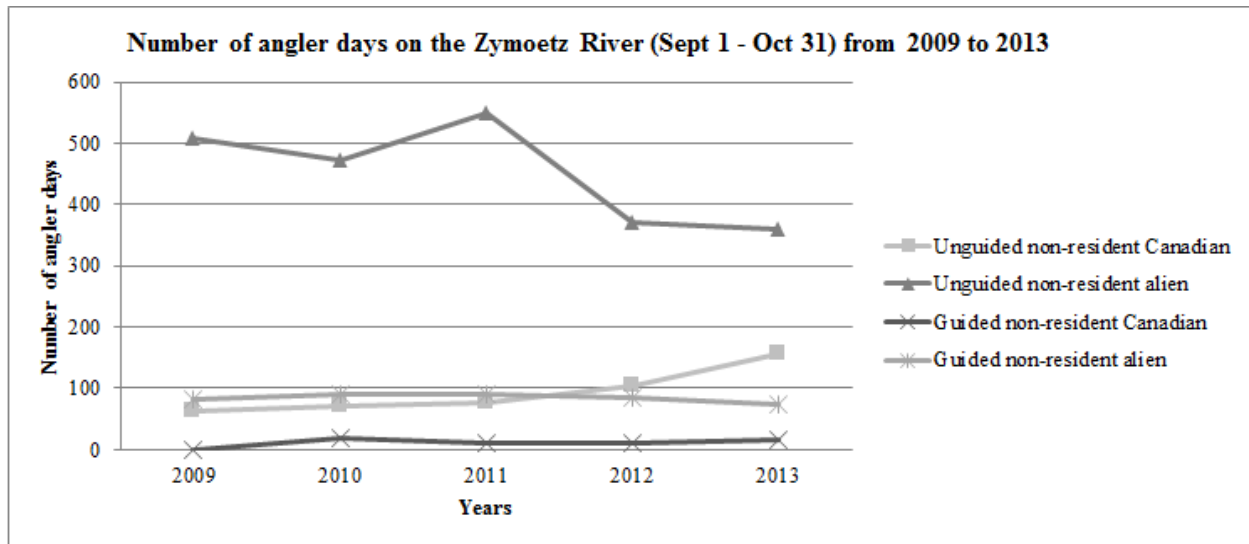


Figure 11: Number of angler days on Zymoetz II from 2009 to 2013 during the months of September and October.

4.1.10 Trends in non-resident alien and non-resident Canadian angler use during restricted and unrestricted times

Analysis before and after the angling regulation changes implemented on April 1, 2012 indicates that changes in angler effort have occurred. As discussed in the previous section of this report, however, it is important to note that the following assessments are based on data extending three years before the regulation changes and two years after them. This lack of data after the regulation changes limits the ability to assess trends in angler use until additional licence sales data becomes available in the future.

During unrestricted times on the Bulkley River, the number of angler days purchased by unguided non-resident aliens has increased since 2012 (Figure 12). Conversely, use by this class of angler during restricted times (i.e. weekends) has declined to zero in 2012 and 2013 (except for instances of non-compliance), owing to the Canadian resident-only times and zones. Effort by guided non-resident aliens and unguided non-resident Canadians has increased from 2009 to 2013 during both the unrestricted and restricted times.

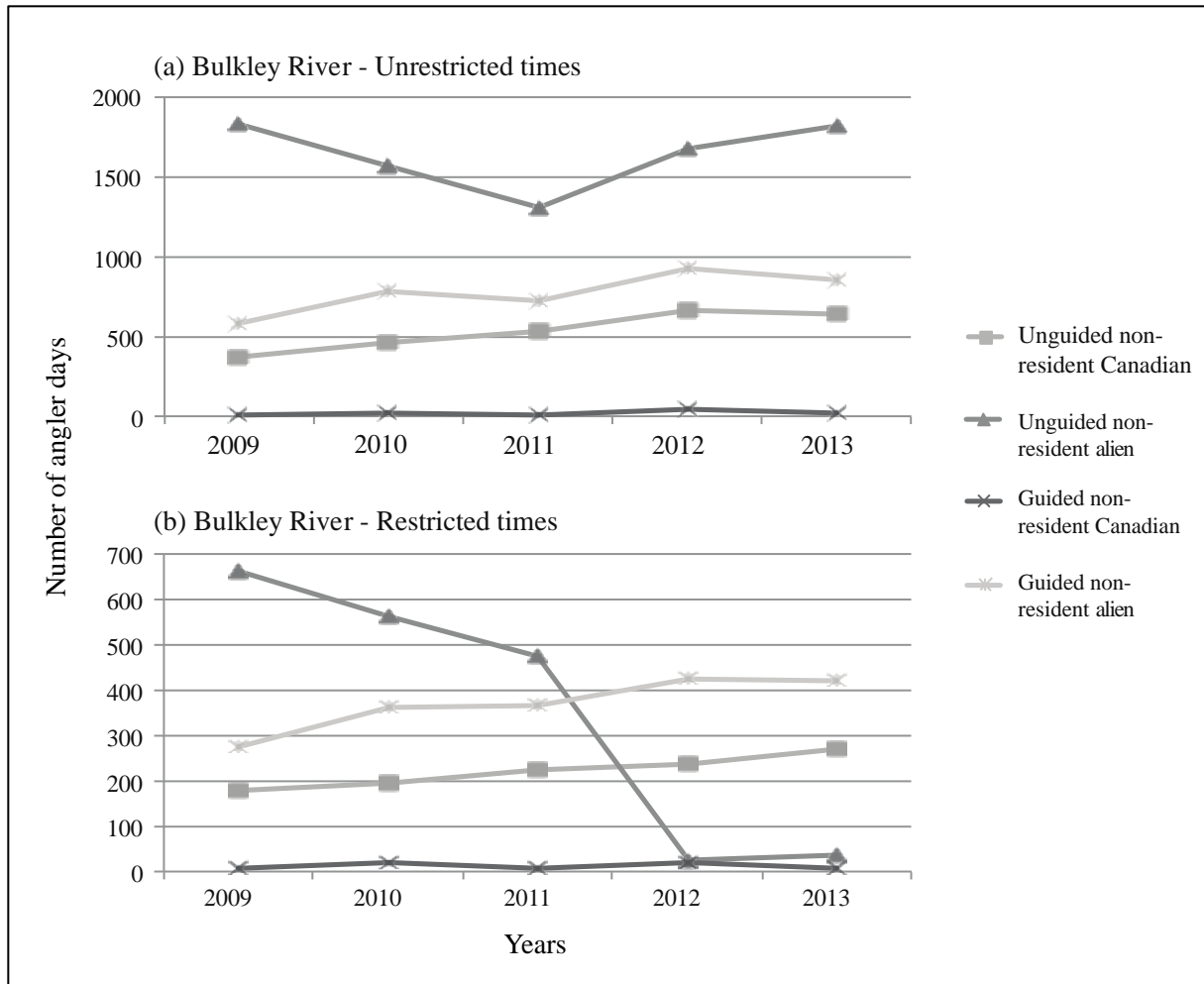


Figure 12: Number of Angler days purchased by each residency category during either unrestricted or restricted times on the Bulkley River. This data was compiled from the electronic licence database.

On the Kispiox River before the regulation changes, the number of unguided non-resident alien angler days purchased were increasing during the unrestricted time and staying constant during the restricted time (Figure 13). In 2012 and 2013, however, the number of unguided non-resident alien angler days has reduced to zero during restricted times (except for instances of non-compliance), and also decreased during unrestricted times with a slight recovery in 2013. The number of angler days purchased by guided non-resident aliens on the Kispiox River has increased during restricted times. Additionally, the number of unguided non-resident Canadians has increased during restricted times. This indicates that both these angler classes are fishing more on the weekends after the regulation changes than before them.

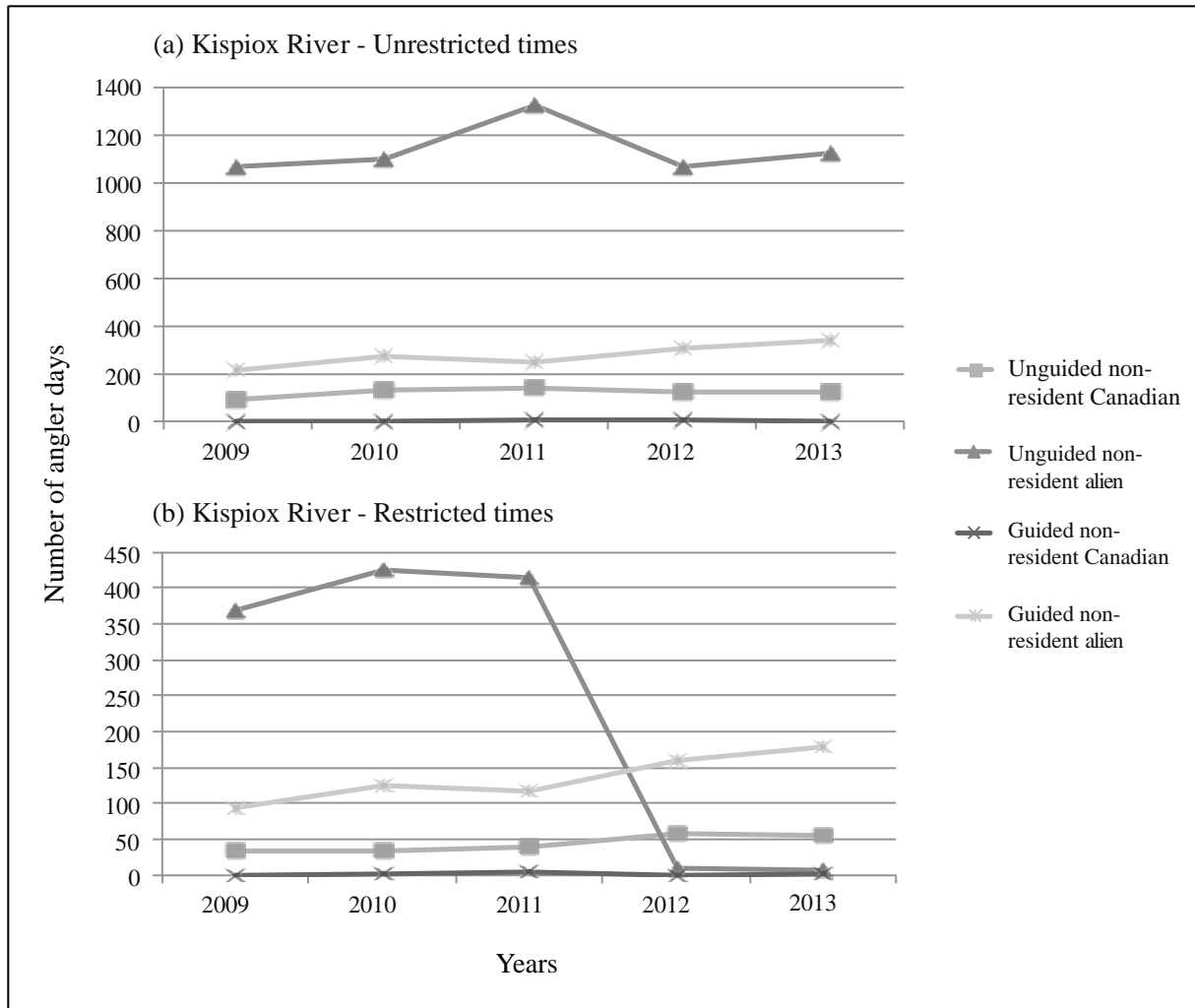


Figure 13: Number of Angler days purchased by each residency category during either unrestricted or restricted times on the Kispiox River. This data was compiled from the electronic licence database.

Unlike the other rivers included in this study, trends of us on the Skeena IV don't possess significant shifts in unguided non-resident alien effort during restricted times before and after the regulation changes (Figure 14). As Skeena IV does not have restrictions that impact the entire river section, this may explain this trend. For example, on weekends from July 1 to December 31 this Classified Water is restricted in two zones, leaving other areas that are open to angling for all classes of anglers. As such, unguided non-resident alien anglers have the option to fish this water seven days a week, unlike other rivers with weekend restrictions that can only be fished five days a week. It is interesting to note that unguided non-resident alien effort has increased during unrestricted times (i.e. weekdays) on Skeena IV. This may be related to crowding concerns from the residents of Cedarvale, however, further monitoring is required to understand how this effort is spatially and/or temporally distributed on this Classified Water.

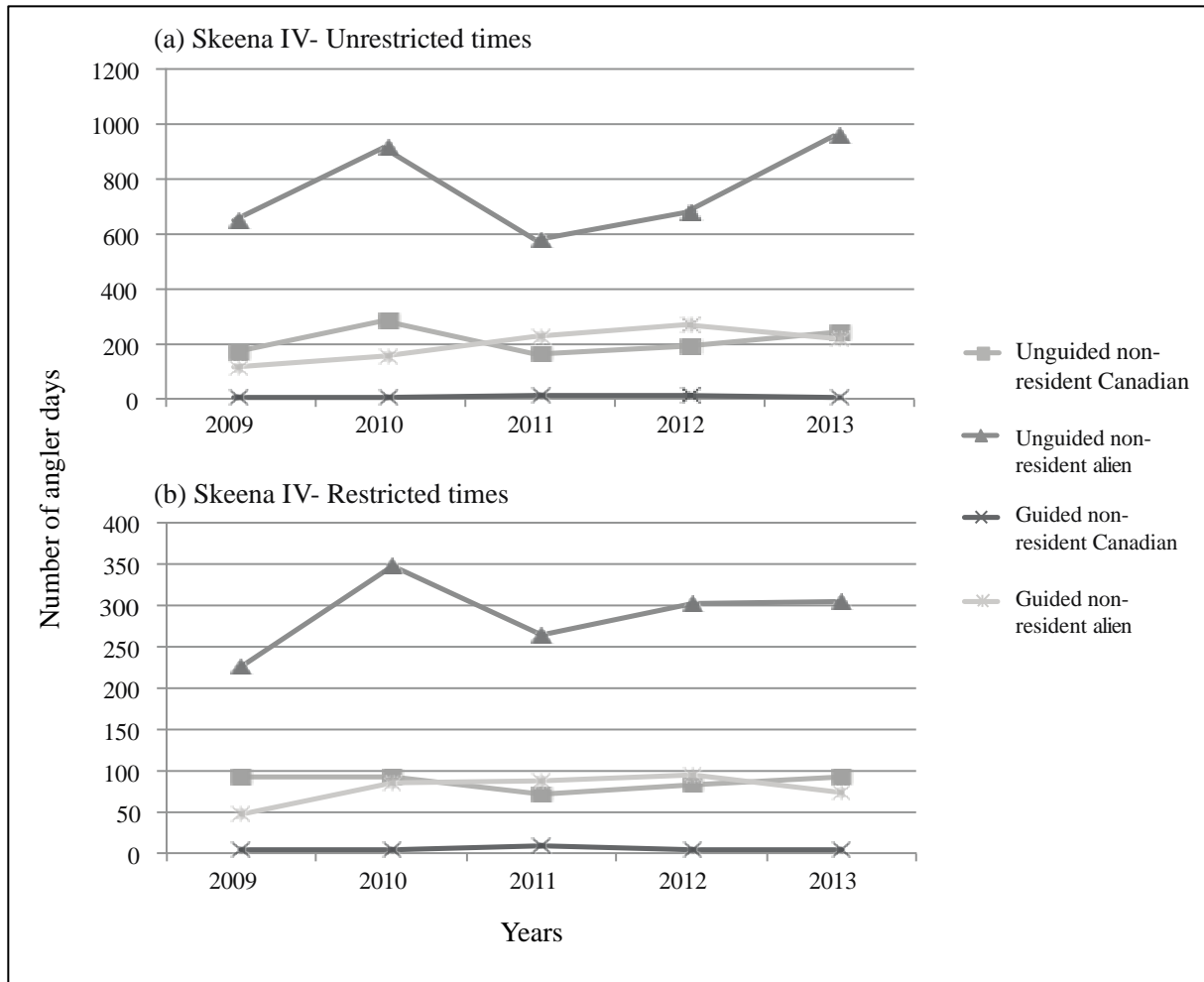


Figure 14: Number of Angler days purchased by each residency category during either unrestricted or restricted times on Skeena IV. This data was compiled from the electronic licence database.

Zymoetz II shows similar trends as the Kispiox and Bulkley rivers of a large decline of unguided non-resident aliens during restricted times in 2012 and 2013 (Figure 15). Guided non-resident alien angler days purchased during restricted times have also declined, whereas during unrestricted times they have increased with a slight decline in 2013. This trend may be attributed to the angling guide restrictions as mentioned in section 4.1.7. The number of angler days purchased by unguided non-resident Canadians has increased during both unrestricted and restricted times. The number of angler days purchased by guided non-resident Canadians on Zymoetz II is low and constant, similar to the other rivers included in this study.

For reference, data tables for Figures 12, 13, 14 and 15 are presented in Appendix 6.0 and Appendix 7.0.

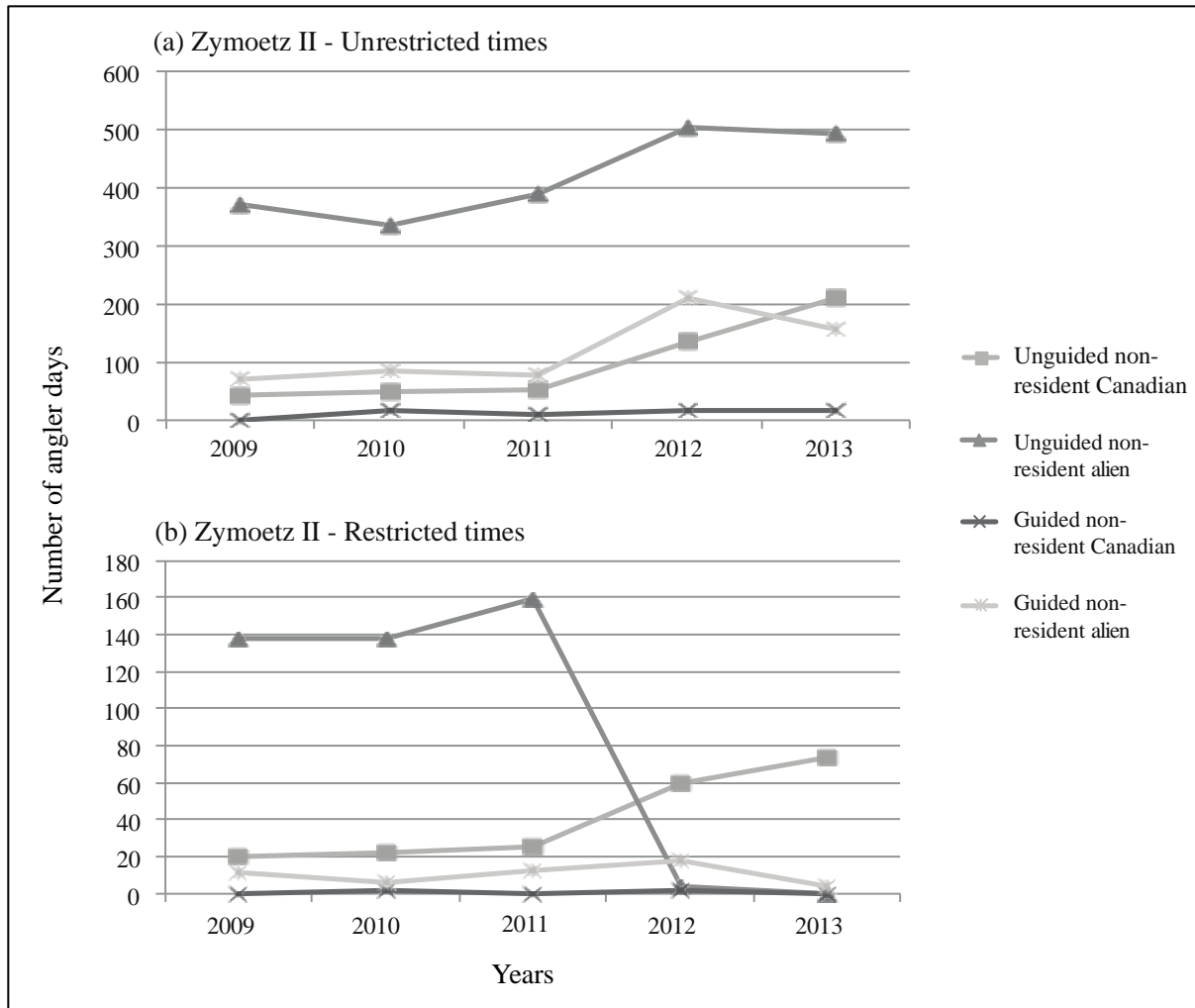


Figure 15: Number of Angler days purchased by each residency category during either unrestricted or restricted times on Zymoetz II. This data was compiled from the electronic licence database.

4.2 Angler satisfaction

4.2.1 Factors contributing to a quality angling experience

Anglers were asked, “Past research has shown that a number of factors contribute to quality angling experiences. In order of importance, what factors contribute to your quality angling experience on this river?” Three hundred and five individual anglers reported factors contributing to a high quality angling experience. These responses were sorted into 15 general categories and specific to each river and resident class (Figure 16 and 17). Due to a small sample size on Kispiox and Skeena IV, only the Bulkley and Zymoetz II rivers had enough interview data to make an overall estimation of the factors contributing to a high quality angling experience.

On the Bulkley River, the majority of BC residents and non-resident Canadians attributed high fish abundance/catching fish (71 responses, 34%), number of anglers/crowding (68 responses, 32%), and beauty/scenery/esthetic attributes (58 responses, 27%) to be the three most commonly acknowledged

factors contributing to a high quality angling experience (Figure 16). BC residents and non-resident Canadians angling on the Bulkley River also mentioned that good accessibility/close to home, quality of fish/wild fish were factors contributing to their high quality angling experience. Meanwhile, the majority of non-resident aliens attributed beauty/scenery/and esthetic attributes (27 responses, 51%), high fish abundance/catching fish (26 responses, 49%), and quality of fish/wild fish (17 responses, 32%) to be the most important factors contributing to a high quality angling experience (Figure 16). After this, non-resident aliens believed that high fish abundance/catching fish and quality of fish/wild fish to be factors that contributed to a high quality angling experience. Non-resident alien anglers didn't rank number of anglers/crowding as high on the list as BC residents and non-resident Canadians, highlighting the preference BC residents and non-resident Canadians have toward un-crowded fishing opportunities. Previous studies on the Bulkley River didn't include this type of question during the interview process.

BC residents and non-resident Canadians anglers on Zymoetz II appeared to be more sensitive to the number of anglers/crowding (62 responses, 42%) than anglers on the Bulkley River as this was ranked the most common factor contributing to a quality angling experience (Figure 17). Following this, fish abundance/catching fish (56 responses, 38%), and beauty/scenery/esthetic attributes (50 responses, 34%) were ranked highly by BC residents and non-resident Canadians on Zymoetz II. Non-resident aliens attributed beauty/scenery/esthetic attributes (33 responses, 36%) as the most commonly addressed factor to their quality angling experience (Figure 17). Further, high fish abundance/catching fish (28 responses, 30%), and quality of fish/wild fish (24 responses, 26%) were commonly mentioned as factors that contributed to a high quality angling experience. Zymoetz II tends to have a higher concentration of anglers than the Bulkley River owing to its popularity and smaller size. Morten (2000) found that most Canadians attributed beauty/scenery/esthetic attributes to be the highest ranked factor contributing to a quality angling experience, with crowding issues being further down on the list of importance.

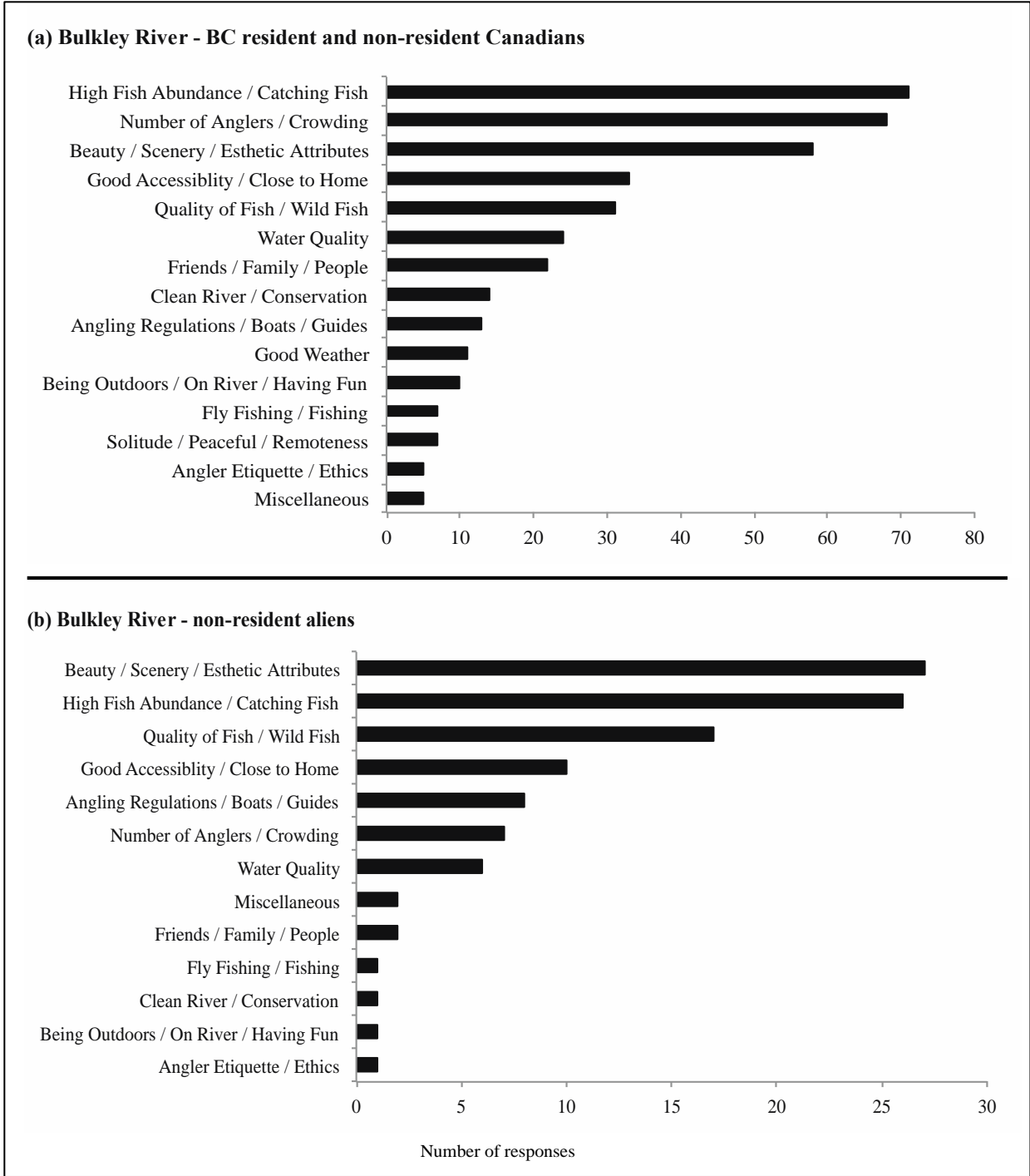


Figure 16: Factors contributing to a quality experience for BC residents, non-resident Canadians and non-resident alien anglers on the Bulkley River in 2013. This data was compiled from angler interviews.

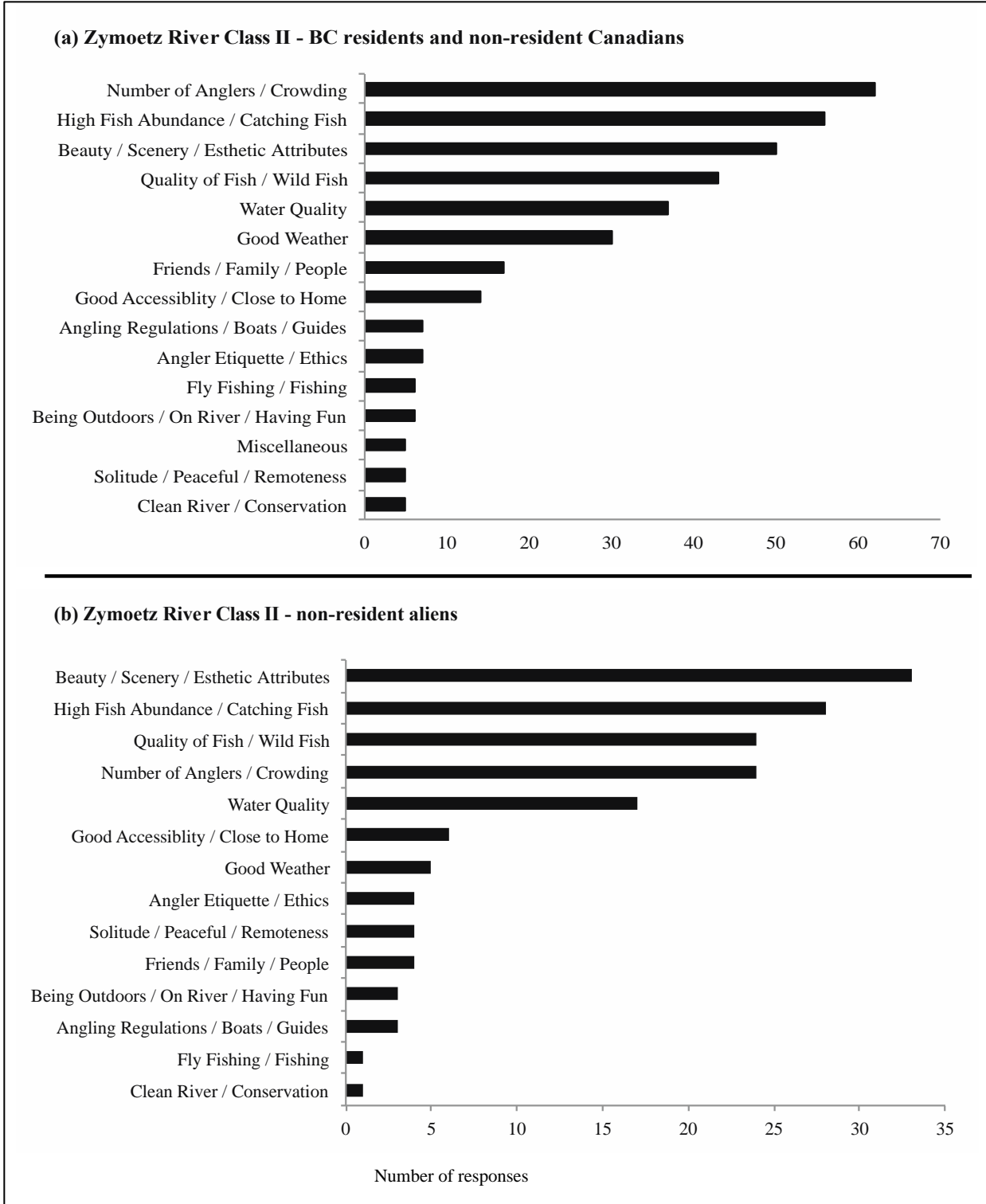


Figure 17: Factors contributing to a quality experience for BC residents, non-resident Canadians and non-resident alien anglers on Zymoetz II. This data was compiled from angler interviews.

4.2.2 Mean ratings of quality angling experience

Anglers were asked “How would you rate your quality angling experience today?” based on a scale from 1 (being very poor), and 5 (being excellent). Five hundred and ninety six anglers responded to this question, and the overall average for all anglers on all rivers (Kispiox, Bulkley, Zymoetz II, and Skeena IV) was 3.8 (between fair and good) (Table 15). This value corresponds to previous reports on the Zymoetz River (Morten, 2000) and the Kispiox River (Morten and Giroux, 2006). The Bulkley River Guardian project in 1998 (Morten, 1999) didn’t include this interview question and there haven’t been any similar projects on the Skeena IV. The majority of anglers rated their experience as excellent (36%), good (25%) or fair (25%) and few anglers rated their experience as poor (8%) or very poor (6%). An ANOVA was used to determine if there was a statistical difference between these ratings. The mean angling experience on a river specific basis showed no significant difference (Table 15), meaning that anglers didn’t have a better or worse experience on any particular river.

Table 15: Mean ratings of anglers’ overall quality experience on each river. This data was compiled from the interview survey.

	Mean (n) Rating	Standard Deviation	Statistical test result
All Anglers on all rivers	3.8 (596)	1.2	N/A
River Specific			
Bulkley	3.8 (262)	1.3	ANOVA F= 1.62, df = 3, $P \leq 0.182$
Kispiox	4.0 (86)	1.2	
Skeena IV	3.5 (31)	1.0	
Zymoetz II	3.7 (215)	1.1	

To determine if anglers of different resident categories had different mean quality angling experiences, ANOVA and t-test statistical analyses were conducted (Table 16). On the Bulkley, Kispiox and Skeena IV rivers, the mean overall angling experience didn’t vary among BC residents and non-resident aliens. Due to small sample size of non-resident Canadians a t-test was used between non-resident aliens and BC residents. The mean quality angling experience among BC residents, non-resident Canadians, and non-resident aliens on Zymoetz II showed no statistical difference. This could be due to the range of factors that contribute to a high quality angling experience (Figure 13). Previous reports found the overall angling experience was higher for non-resident aliens using guide services, and anglers using drift boat to access the river had a higher mean rating in their quality experience (Morten, 2000; Morten and Giroux, 2006). However, this report didn’t capture enough data to employ statistical tests determining variance and difference of mean rating of the anglers quality angling experience.

Table 16: Mean ratings for anglers' quality experiences by residency category. This data was compiled from the interview survey.

	Mean (n) Rating	Standard Deviation	Statistical test result
Bulkley River*			
BC residents	3.9 (194)	1.2	t = 2.1, $P \leq 0.06$
Non-resident Canadians	2.6 (14)	1.2	
Non-resident aliens	3.5 (50)	1.3	
Kispiox River*			
BC residents	4.1 (48)	1.0	t = 1.4, $P \leq 0.16$
Non-resident Canadians	4.8 (5)	0.5	
Non-resident aliens	3.7 (32)	1.4	
Skeena IV*			
BC residents	3.6 (8)	0.7	t = 0.6, $P \leq 0.55$
Non-resident Canadians	0	0	
Non-resident aliens	3.4 (22)	1.1	
Zymoetz II			
BC residents	3.7 (108)	1.0	ANOVA F= 3.0, df = 2, $P \leq 0.059$
Non-resident Canadians	4.0 (39)	1.2	
Non-resident aliens	3.5 (63)	1.2	

* Resident data didn't meet the assumptions of an ANOVA test on the Skeena IV, Kispiox, Bulkley, so a student t-test was used to compare the BC residents against the non-resident aliens

4.2.3 Angler crowding and regulations

Anglers were asked 'Did you fish this river during the Classified Waters period between 2007 and 2011?' (Figure 18). Three hundred and thirty three anglers responded 'yes' to fishing during the Classified Waters period between 2007 and 2011. One hundred and eighty nine responded 'no'. Only anglers who responded 'yes' to having fished prior to regulation changes were considered for further responses. To the question, 'what impact has the regulation change had regarding crowding on the river', 10 percent of anglers thought that the regulation change increased crowding, 47% of anglers thought the regulation changes had reduced crowding on the river. Twenty five percent of anglers thought that the crowding on the river stayed the same after the regulation change and 18% of anglers didn't know how the regulation change had impacted crowding on the river. The response to this question varied considerably depending on the residency category of the angler. For example, the majority of anglers who thought that the regulation changes increased crowding on the river were non-resident aliens (6.5%; Figure 18). BC residents predominantly thought that the regulation change reduced crowding on the river (35.9%).

To the second question anglers were asked 'has your quality angling experience improved as a result of this change', 37% of anglers thought their quality angling experience had improved, 20% thought it had reduced, 31% thought it stayed the same, and 12% didn't know. The majority of anglers (30.9%) who thought that the regulating changes improved their angling experience were BC residents (Figure 18). The greatest percentage of anglers who felt that regulation changes reduced their quality angling experience were non-resident aliens (17.8%).

The angler crowding and regulation data presented in Figure 16 were compiled for all rivers surveyed by the River Guardians, and was not analyzed on a river specific basis. Detailed analysis on a river specific basis was conducted and indicated that opinions of the regulation changes and crowding weren't different among rivers.

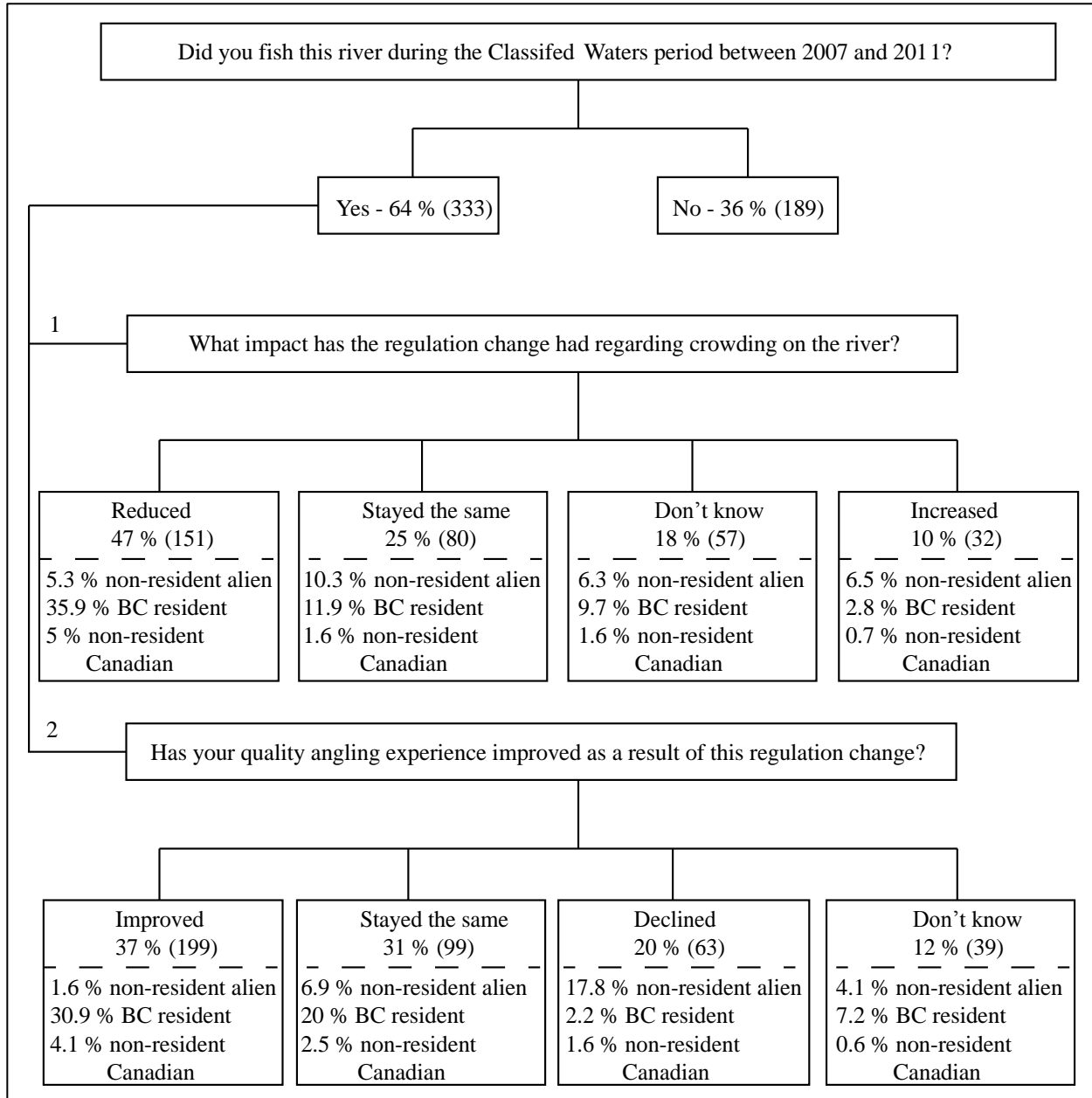


Figure 18: Angler responses to crowding and regulation questions. This data was compiled from the angler interview surveys.

Correlation analysis was conducted between the mean ratings of quality angling experiences and how crowded anglers felt on the interview day. During the interview, anglers were asked their overall rating of their quality angling experience based on a scale between 1 (being very poor), and 5 (being excellent).

They were also asked how crowded they felt on that particular day based on a scale between 1 (not at all crowded), and 5 (extremely crowded). This was done to determine if there was any relationship between the anglers overall experience and crowding on the river. However, there was no statistical relationship between these two variables ($r = 0.03$). Many factors contribute to a quality angling experience, and crowding isn't a significant enough factor to impact the anglers overall experience.

4.2.4 Angler comments

Three hundred and eight four out of 597 individual anglers (64%) approached for an interview made comments about freshwater fisheries management in the Skeena Region to the River Guardians during this project. There appears to be a constant theme to the comments; anglers either dislike the regulations, think that it only benefits the guides, and they target the non-resident aliens or support the regulation changes and recent changes to the resident only times. Other comments were much fewer and pertained to inconveniences around purchasing of Classified Waters licences (i.e. having to print off licence, having to purchase a licence each day on any particular river) and that there is increased pressure during the weekdays when there is no restriction of non-resident aliens. There were also comments in support of the River Guardian program and a desire to have more regulation and enforcement on the rivers.

Seventy-two percent of the comments stating a dislike of regulations changes (such as non-resident alien restricted times and zones) were from non-resident aliens and 28% of the comments were from BC residents and non-resident Canadians (Figure 19). Feedback to the River Guardians indicated the regulation changes benefit the guides only, or individuals expressed concern that they target the non-resident aliens. Eight-five percent of the comments stating support of the regulation changes were from BC residents and non-resident Canadians, and 15% of these comments were from non-resident aliens (Figure 19).

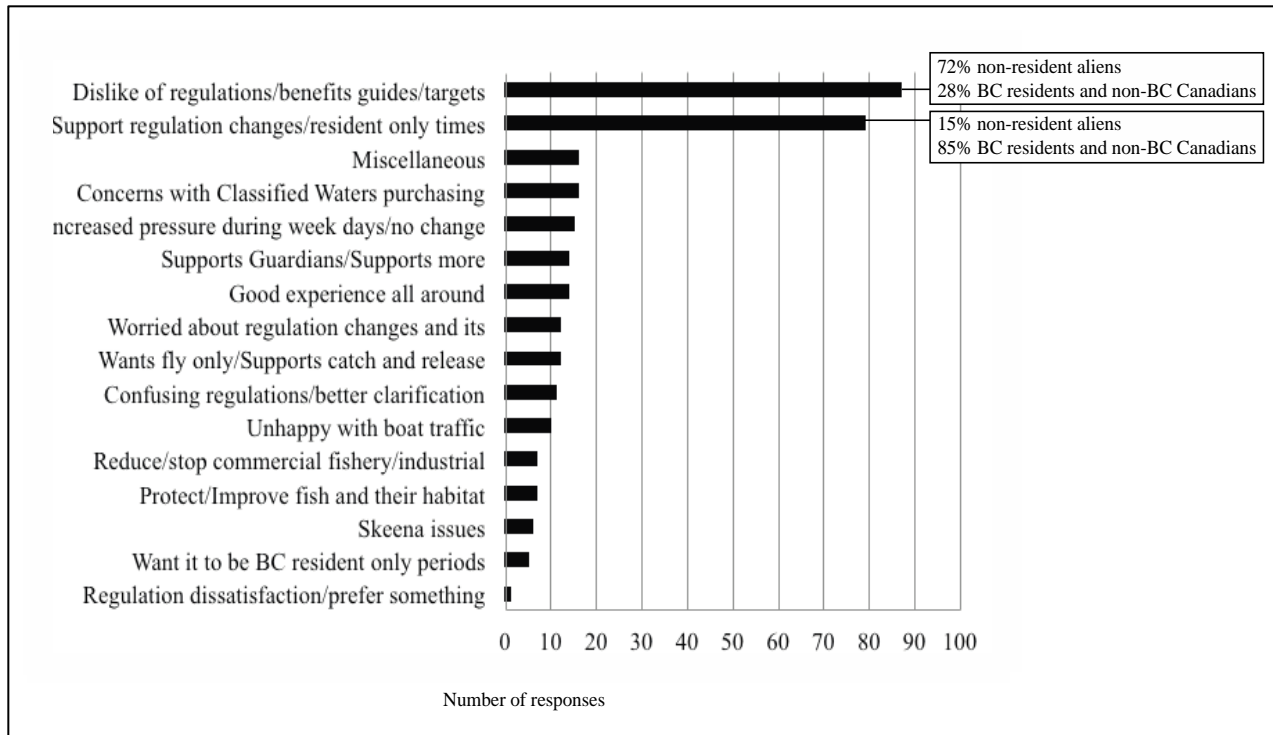


Figure 19: Top 16 groups of comments reported to River Guardians. This data was compiled from the angler interview surveys.

4.3 Angler licence and compliance

4.3.1 Angler licence infractions

The River Guardians inspected licences to assess compliance with the new and existing Steelhead angling regulations. If there was a non-compliance observed, it was recorded on the interview form. The River Guardians did not have the authority to issue tickets for non-compliance, but recorded the licence infraction if one existed. This data was monitored as the project progressed and the Conservation Officer Service was notified if non-compliance was high in a particular river or river section. All failure to carry/produce licence infractions were made when the River Guardians asked to see the license and the angler refused. As the River Guardians don't have any ticket issuing authority, it is possible that the angler held a licence and refused to comply.

Seventy-four out of the 597 (12%) of anglers that were interviewed had some type of licence infraction. Twenty-three (23%) of those were BC residents, eight (1%) were non-resident Canadians, and 9 (1%) of those were non-resident alien. The rest is unknown, as it wasn't possible to assess the resident categories of the failure to produce a licence infraction as the River Guardians terminated the interview when anglers were unable to produce a licence. Only four out of 682 (.6%) unguided non-resident alien anglers were approached by a River Guardian during restricted times.

Failure to produce a licence was the most frequent infraction and included anglers who refused to show their basic angling licence (34 anglers, 46%) (Table 17). Twenty-six (35%) of the infractions were failure

to possess a valid Classified Waters licence and the majority of these violations were made by BC residents (19%, Table 17). Fourteen (19%) of the infractions were from a failure to possess a Steelhead Stamp, and similar to other licence violations, BC residents were the least compliant. It stands out that BC residents are the main attributers to licence violations. This is a trend that has been observed in previous angler surveys on the rivers included in this study (Morten, 1998; Morten, 1999; Morten, 2000; Morten and Giroux, 2006).

Table 17: The number (%) of all anglers noted with each type of infraction and the percentage of infractions within each residency category. This data was compiled from the interview survey.

Type of Infraction	All Infractions	Percentage (n) of Anglers with Infractions		
		BC residents	non-resident Canadians	non-resident aliens
Failure to carry/produce licence	34 (46)	Unknown	Unknown	Unknown ¹
No Classified Waters licence	26 (35)	14 (19)	5 (7)	7 (10)
No Steelhead Stamp	14 (19)	9 (12)	3 (4)	2 (3)
Total	74 (100)	23 (31)	8 (11)	9 (12)

¹Failure to carry/produce resident class was not possible to assess by residency category as there was no licence data to obtain the information from.

River Guardians on Zymoetz II began conducting angler surveys during the third week of August. Of all the rivers monitored for this study, Zymoetz II had a high rate of non-compliance, particularly at the beginning of this project (Figure 20). Non-compliance declined in the first week of September, but increased again in mid to late September (Figure 20).

River Guardians on the Bulkley and Kispiox rivers began surveying anglers in the first week of September. Licence violation on these systems was lower than Zymoetz II. On the Bulkley River there was initially a high non-compliance rate, followed by a decrease in the second week, with an increase again during the month of October. The Kispiox and Skeena Rivers had a low non-compliance rate, but their interview numbers were also lower than the other two rivers. Previous studies on the Bulkley and Kispiox rivers noted that the infractions were equally distributed and no trend was presented throughout the study period (Morten, 1999; Morten, 2000). Previous studies on the Zymoetz River didn't investigate spatial trends along the river.

From a license sales perspective, it is important to note that at times unguided non-resident alien anglers purchased angler days on all rivers during the restricted times (i.e. weekends). It is not possible to determine if these angler days were mistakenly purchased or were actually used in non-compliance. In 2013 on the Bulkley River, 36 out of 733 (5%) angling licences were purchased by non-resident aliens during restricted times. On the Kispiox River, 17 out of 242 (7%) angling licences were purchased by non-resident aliens during restricted times. On Zymoetz II, there were no licence sales made during restricted times by non-resident aliens, however, during the weekend there were 4 out of 77 (5%) licence sales sold by guided non-resident aliens during weekends, which is permitted on the Zymoetz River.

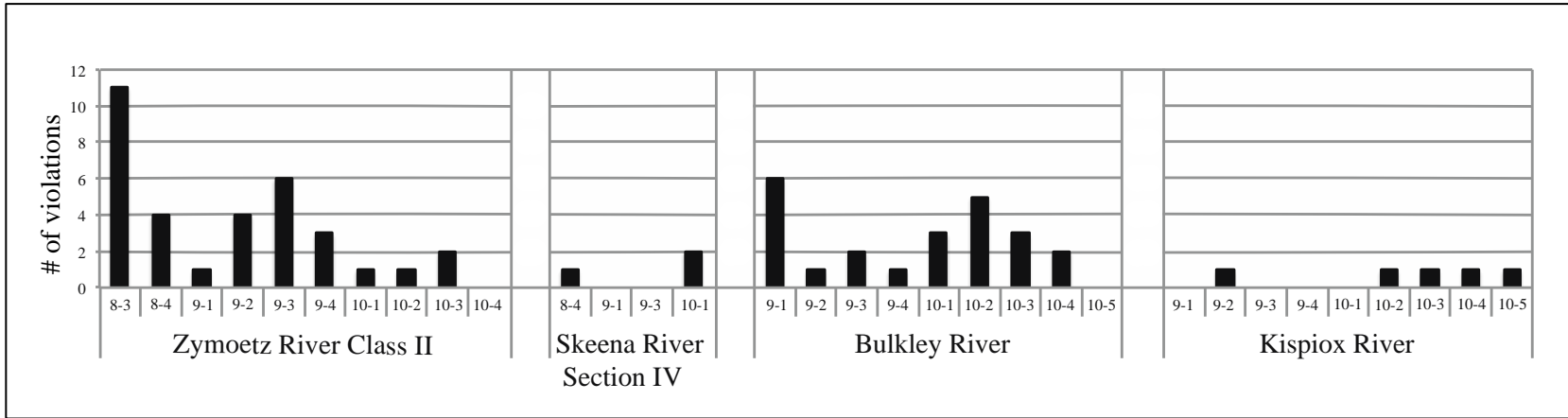


Figure 20: Number of infractions by river. Infractions include: failure to produce angling licence, no Classified Waters licence, or no Steelhead Stamp. This data was compiled from the interview survey

4.4 Catch methods and estimates

The method of river access used by anglers was assessed by resident category for this study (Table 18). When interpreting this information, it is important to note that River Guardians conducted angler surveys by foot, and this significantly increases the probability of intercepting foot based anglers. As a result, the following data reflects all anglers interviewed, but is not considered representative of all Steelhead anglers on the rivers included in this study.

Of the BC residents, non-resident Canadians, and non-resident aliens that were surveyed, the majority accessed the river by foot (93%, 100%, and 82%, respectively) (Table 18). Non-resident aliens used drift and jet boats the most. This is likely attributed to non-resident aliens utilizing guided services, which commonly access the rivers by drift and jet boat. The majority of BC residents that were interviewed accessed the river by foot, but a small percentage used drift boats (5.3%), and even fewer use jet boats (1.7%).

Similar to access method, the gear type (fly or gear) used by interviewed anglers was also assessed (Table 18). This information was only recorded if an angler had landed a fish, which was a shortfall of this study. The percentage of fly anglers among BC residents (64%), non-resident Canadians (73%), and non-resident aliens (88%) was higher than gear anglers. Of all resident categories, BC residents had the greatest percentage of gear anglers (36%), with non-resident aliens using gear the least (12%).

Table 18: The number (%) of fly and gear anglers and drift boat and shore-access anglers in each residence category. This data was compiled from the angler interview surveys.

Residence	Number (%) of anglers			Number (%) of anglers ¹	
	Drift boat	Jet boat	Foot	Fly	Gear
BC resident	19 (5)	6 (2)	334 (93)	96 (64)	55 (36)
Non-resident Canadian	0 (0)	0 (0)	30 (100)	22 (73)	8 (27)
Non-resident alien	22 (12)	12 (6)	156 (82)	87 (88)	12 (12)

¹Gear type was only recorded if angler had landed a fish

An assessment was made on the percentage of anglers accessing each river by drift boat, jet boat, or foot, and whether the anglers were using fly or gear (Table 19). The greatest percentage of anglers who were interviewed on Zymoetz II (91%), Bulkley (90%), Kispiox (89%), and Skeena IV (87%) rivers accessed fishing locations by foot. As previously noted, this data is biased as the River Guardians conducted surveys on foot, which increased their chances of intercepting anglers who also accessed the rivers by foot (and limited their interaction with boat based anglers). Of all rivers, the Kispiox River had the greatest percentage of drift boat users (11%), next to Zymoetz II (9%), and the Skeena IV had the greatest percent of jet boat users (13%). The percentage of anglers using fly tackle was greatest for Zymoetz II (81%), followed by the Skeena IV (74%). Of all rivers, the Bulkley and Kispiox had the greatest percentage of anglers using gear (38% and 34%, respectively) (Table 19).

Table 19: The number (%) of fly and gear anglers and drift boat and shore-access anglers by river. This data was compiled from the interview survey.

	Number (%) of anglers			Number (%) of anglers ¹	
	Drift boat	Jet boat	Foot	Fly	Gear
Zymoetz II	23 (9)	0 (0)	218 (91)	133 (81)	31 (19)
Bulkley River	13 (5)	15 (5)	254 (90)	43 (62)	26 (38)
Kispiox River	10 (11)	0 (0)	81 (89)	23 (66)	12 (34)
Skeena IV	0 (0)	4 (13)	27 (87)	14 (74)	5 (26)

¹Gear type was only recorded if angler had landed a fish

Anglers were asked by the River Guardians how many fish they landed on the day they were interviewed. Of the anglers that reported catching a fish, the majority of anglers indicated they had caught a Steelhead (Table 20). One hundred and sixty-three Steelhead were landed between August 20 and October 31, 2013 on the rivers surveyed in this study (Table 20). This is a low catch rate compared to previous angler surveys on the Kispiox, Bulkley and Zymoetz II (Morten and Giroux, 2006; Morten and Parken, 1998; Morten, 2000) and may be attributed to the following factors. Firstly, water clarity was inconsistent during the 2013 Steelhead angling fishery; the Zymoetz River in particular had many days when the river was blown out, which made for poor fishing. Secondly, anglers who were interviewed weren't always approached at the end of the day, and they could have landed fish after they had been interviewed. Thirdly, Steelhead escapement data in 2013 indicates returns were at or below long-term averages for the Tyee Test fishery and at the Moricetown Canyon project⁴. This may also explain why few Steelhead were caught during this study relative to previous angler surveys.

BC residents landed the majority of the Steelhead, next to non-resident aliens, and non-resident Canadians. Of the 302 BC resident anglers interviewed, 69 landed a steelhead; of the 53 non-resident Canadians interviewed, seven landed a steelhead; and of the 184 non-resident alien anglers, 37 landed a steelhead. Factors such as total extrapolated catch and catch per unit effort (e.g. steelhead per rod day) were not estimated for this study. Given the key objective was to evaluate how anglers were responding to regulation changes implemented on April 1, 2012, such analysis was considered out of scope.

Table 20: Total catch estimates by species and if they were released or kept. This data was compiled from the interview survey. This data was compiled from the interview survey.

River	Steelhead ¹		Coho		Cutthroat trout		Pink		Dolly Varden		Rainbow trout	
	K	R	K	R	K	R	K	R	K	R	K	R
Zymoetz II	1	46	0	8	0	0	1	3	0	10	0	0
Bulkley	1	77	10	3	0	0	0	1	0	3	0	1
Kispiox	7	35	1	19	0	3	0	0	1	0	0	1
Skeena IV	0	5	0	0	0	0	0	3	0	3	0	0
All Rivers	9	163	11	30	0	3	1	7	1	16	0	2

K = kept, R = Released

¹All steelhead that were kept were First Nation anglers.

⁴ The exception to this is the Sustut fence project, which had an above average escapement in 2013

5.0 Limitations of the survey

The main limitations of this study include 1) the use of foot patrols as an access technique to interview anglers and 2) the time period when this study was conducted. For example, anglers accessing the river by foot had a higher probability of being interviewed than anglers using a boat (many of which are guided anglers). Also, this study was conducted during the majority of the Classified Waters period for the Bulkley and Kispiox rivers, however, only a portion of the Classified Waters period was covered for Zymoetz II and Skeena rivers. In both cases, these factors may bias the results of this project and limit its ability to capture a representative sample of all Steelhead anglers on the rivers included in this study. As stated above, this particularly applies boat-based anglers and guided anglers, for which few interviews were collected relative to foot based anglers.

Specific to the Kispiox River, the Guardians were unable to access the lower 8.5 km of this system (from the Potato Patch to the confluence with the Skeena River) for approximately the first month of surveys on this river (September 3-25, 2013). Spatially, this represents approximately 11% of the total survey area and coincides with the Kispiox Band reserve lands that overlap this section of river. The inability to interview anglers on this section of river for half of the study period impacted the Guardians data collection abilities. Adding to this, the Kispiox Band also carried out an access fee initiative on their reserve lands during the 2013 Steelhead fishery, which likely resulted in below average effort on this section of river,

6.0 Recommendations

1. To balance the number of survey days between restricted and unrestricted non-resident alien times, future studies should try to structure a sampling plan that captures an even number of days during both unrestricted and restricted times. A scheduling plan with a 4 day/10 hour workweek could achieve this.
2. Have River Guardians stationed out of Hazelton, BC to survey the Kispiox River. The time spent in 2013 to travel from Smithers to Kispiox was high, and having to split the River Guardian effort onto two river systems was challenging. A suggestion would be to have two River Guardians stationed out of Terrace, two out of Smithers, and two out of Hazelton.
3. The sampling methodology of foot based angler surveys prohibited access to many boat users. This restricted data collection and analysis from boat users, which includes guided anglers (guides commonly use boats). Conducting angler interviews by foot prevents assessments on the number of anglers accessing the river by boat vs. foot, which is a useful piece of information. This study should consider using boats to conduct surveys in future years.
4. Using Apple iPad's for data collection in 2013 was efficient and reliable. It may be worth configuring the iPad's with short message service (SMS) capabilities in future studies to enhance communication between the River Guardian coordinator and River Guardians for more effective study delivery and data management.
5. The interview form should be changed to add the question 'What species of fish are you angling for?' This will assist in determining whether the angler is fishing for Steelhead or another species.

6. The interview form should also have the question added ‘What angling method are you using?’ In 2013, this data was only collected if a fish was landed. It is important to know what type of gear is mainly used on each river system even if no fish are landed.
7. For the question “How many anglers do you remember seeing today?”, the River Guardians recorded responses according to predetermined groupings (e.g. 0-3, 3-5, 5-12, 12+). These groupings should be eliminated. Recording the actual number of anglers observed would allow for correlation analysis, which was not possible in 2013.
8. Infraction data was difficult to measure by residency category in 2013 as the River Guardians terminated the interview if the angler didn’t hold a basic angling licence. In such cases, ‘failure to produce licence’ was recorded and no additional information was collected. Future studies may want to consider continuing the interview, even if a licence cannot be produced, to collect angler residency information.
9. Due to challenges in cross-examination of databases, it wasn’t possible to assess if interviewed anglers were from the Skeena region. It is important to have this data so that managers know what anglers from the region think of regulation changes. Next year if these challenges cannot be overcome, it would be effective to obtain the actual address of the angler when conducting the interview to remove such barriers.
10. Photographs provide useful information once the study period has closed. It is recommended that River Guardians take as many photos of infraction activities, crowding on rivers et cetera in the following years of the project.

7.0 Acknowledgments

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9.0 Appendix

Appendix 1.0 The Roving Survey form

DAILY COMMENTS

Date and time: _____ Interviewer: _____
River: _____ Day type _____
Weather (<i>circle one</i>): SUN PARTIAL CLOUD 100% OVERCAST RAIN SNOW
Start time: _____ End time: _____

ZONE SPECIFIC COMMENTS

1) River section: _____ Water level: FALLING RISING HIGH LOW FLOOD
Water clarity (<i>circle one</i>): POOR (0-10 cm visibility), MURKY (10-25 cm), CLOUDY (25-75 cm), CLEAR (75-100 cm)
Anglers observed: _____ Time entered: _____ Time exited: _____
Route description and general comments: _____ _____ _____
2) River section: _____ Water level: FALLING RISING HIGH LOW FLOOD
Water clarity (<i>circle one</i>): POOR (0-10 cm visibility), MURKY (10-25 cm), CLOUDY (25-75 cm), CLEAR (75-100 cm)
Anglers observed: _____ Time entered: _____ Time exited: _____
Route description and general comments: _____ _____ _____
3) River section: _____ Water level: FALLING RISING HIGH LOW FLOOD
Water clarity (<i>circle one</i>): POOR (0-10 cm visibility), MURKY (10-25 cm), CLOUDY (25-75 cm), CLEAR (75-100 cm)
Anglers observed: _____ Time entered: _____ Time exited: _____
Route description and general comments: _____ _____ _____
4) River section: _____ Water level: FALLING RISING HIGH LOW FLOOD
Water clarity (<i>circle one</i>): POOR (0-10 cm visibility), MURKY (10-25 cm), CLOUDY (25-75 cm), CLEAR (75-100 cm)
Anglers observed: _____ Time entered: _____ Time exited: _____

Route description and general comments:

5) River section: _____ Water level: FALLING RISING HIGH LOW FLOOD
Water clarity (*circle one*): POOR (0-10 cm visibility), MURKY (10-25 cm), CLOUDY (25-75 cm), CLEAR (75-100 cm)
Anglers observed: _____ Time entered: _____ Time exited: _____

Route description and general comments:

6) River section: _____ Water level: FALLING RISING HIGH LOW FLOOD
Water clarity (*circle one*): POOR (0-10 cm visibility), MURKY (10-25 cm), CLOUDY (25-75 cm), CLEAR (75-100 cm)
Anglers observed: _____ Time entered: _____ Time exited: _____

Route description and general comments:

7) River section: _____ Water level: FALLING RISING HIGH LOW FLOOD
Water clarity (*circle one*): POOR (0-10 cm visibility), MURKY (10-25 cm), CLOUDY (25-75 cm), CLEAR (75-100 cm)
Anglers observed: _____ Time entered: _____ Time exited: _____

Route description and general comments:

8) River section: _____ Water level: FALLING RISING HIGH LOW FLOOD
Water clarity (*circle one*): POOR (0-10 cm visibility), MURKY (10-25 cm), CLOUDY (25-75 cm), CLEAR (75-100 cm)
Anglers observed: _____ Time entered: _____ Time exited: _____

Route description and general comments:

Appendix 2.0 The Angler Interview form

Form 1 - Angler Interview

Interview date and time: _____ River: _____ Site Name (if known): _____

Angler Gender MALE FEMALE Location (section #): _____ Interviewer: _____

Hello! My name is _____. I am a River Guardian funded by the Habitat Conservation Trust Foundation. We are collecting information from anglers to monitor recent regulation changes. I have three topics I would like to ask you questions about. These include information about yourself, your catch, and your views regarding the Skeena Steelhead fishery. May I ask you some questions and see your licence? This interview is voluntary and will take approximately 5 min.

YES NOT APPLICABLE (*not angling*) DOES NOT SPEAK ENOUGH ENGLISH REFUSED

Have you been interviewed before? NO YES (*if YES, only completed bolded and * questions below*)

*Angler # _____ *Basic Licence # _____ *Classified Waters Licence # _____ *Steelhead Stamp: YES NO *Angler Name _____

*Year of Birth _____

*Guided YES NO If yes, Licenced Angling Guide Name _____

*Residence B.C. postal code _____, CDN province _____, NON-CDN country and state _____

*Basic Licence Class I DAY 8 DAY ANNUAL *Classified Days Purchased _____

*Observed Licence Violations NONE NO STEELHEAD STAMP NO CLASSIFIED WATERS NO LICENCE FAILURE TO PRODUCE _____ OTHER _____

How did you access the river today? DRIFT BOAT JET BOAT FOOT

*What species of fish have you landed today? How many did you keep or release?

Species	River Section	# Rel./Kept	Fly or Gear	Release condition

*Observed catch violations: _____

How many years have you fished this river? _____

How many days have you already fished for Steelhead on this river this year? _____

How many *more* days do you plan to fish for Steelhead on this river this year?

1. Past research has shown that a number of factors contribute to quality angling experiences. In order of importance, what factors contribute to your quality angling experience on this river?
() QUALITY OF FISH, () QUANTITY OF FISH, () NUMBER OF ANGLERS
() BEAUTY/SCENERY, () WATER QUALITY, () GOOD ACCESS TO THE RIVER
OTHER 1) _____ 2) _____ 3) _____.

Do not read, pre-coded responses, select up to 3 responses in order of priority, list three responses if factors not on list.

2. ***Overall, taking all factors into consideration, on a scale of 1-5, where 1=very poor and 5=excellent, how would you rate your quality angling experience today?** (*don't read responses below*)

1=VERY POOR, 2=POOR, 3=FAIR, 4=GOOD, 5=EXCELLENT, 6= DON'T KNOW

3. ***How many other anglers do you remember seeing today?** 0-2, 3-5, 6-12, 12+, Not sure

4. Thinking about the total number of anglers that you encountered today, on a scale of 1 to 5, where 1=not at all crowded and 5=extremely crowded, how crowded did you feel?

Select one response. 1 2 3 4 5 DON'T KNOW

5. Did you fish this river during the Classified Waters period between 2007 and 2011? Y or N

6. If Y to #4, in an attempt to reduce crowding on the river and improve angling experiences, new Classified Waters angling regulations were implemented in April 2012. One significant regulation change was the implementation of Canadian resident-only times and zones.

- a. **What impact has this regulation change had on crowding on the river? Has the level of crowding been reduced, stayed the same or has it increased?** *Select one response.*

REDUCED, STAYED THE SAME, INCREASED, DON'T KNOW (*don't read*)

- b. ***Overall, has your quality angling experience improved, stayed the same or declined as a result of this regulation change?**

IMPROVED, STAYED THE SAME, DECLINED, DON'T KNOW

7. Do you have any other comments regarding recent regulation changes on this river?

Response: _____

***Interview location** Lat _____

Long _____

Appendix 3.0 Summary of Regulation Changes

Bulkley River

- Canadian resident-only on Saturday and Sunday from September 1 to October 31; guiding not permitted
- Telkwa River Canadian resident-only all week from September 1 to October 31; guiding not permitted
- Regional Manager to resolve 53 Permit Days upstream of CN railway bridge

Morice River

- Canadian resident-only on Saturday and Sunday from September 1 to October 31; guiding permitted

Babine River

- Canadian resident-only Saturday and Sunday from September 1 to October 31 in a zone from the outlet of Nilkitkwa Lake (smolt fence) downstream to the Nilkitkwa River confluence; guiding not permitted
- Reduction of guided angler-day quota (long term)
- Regional Manager to resolve 80 angler-day discrepancy

Kitwanga and Kitsequecla Rivers

- Resident-only on Saturday and Sunday from April 1 to March 31; guiding not permitted

Suskwa River

- Change from Class II to Class I designation from April 1 to March 31
- Canadian resident-only on Saturday and Sunday from April 1 to March 31; guiding not permitted

Kispiox River

- Canadian resident-only Saturday and Sunday from September 1 to October 31; guiding permitted

Lakelse River

- Change from Class II to Class I designation
- Extension of mandatory Steelhead Stamp from September 1 to May 31
- Canadian resident-only zone April 1 to March 31 from outlet of Lakelse Lake downstream to powerline crossing located 3.5 km upstream of the Lakelse River confluence with the Skeena River.

Zymoetz River Class I Section

- Extension of Classified Waters period from July 24 to December 31
- Extension of mandatory Steelhead Stamp from July 24 to December 31
- Guide restrictions: maximum 3 anglers/group and 1 group/guide/day
- Increase allocation of guided angler-days from 58 to 100

- Decrease guided angler-day allocation from 250 to 100 in Schedule A of B.C. Regulation 125/90
- Canadian resident-only on Friday, Saturday and Sunday from July 24 to December 31; guiding permitted

Zymoetz River Class II Section

- Extension of mandatory Steelhead Stamp from July 24 to May 31
- Extension of Classified Waters period from July 24 to May 31
- Canadian Resident-only on Friday, Saturday and Sunday from July 24 to May 31
 - Guiding allowed on Friday and in a zone on Saturday from Mattson Creek confluence downstream to the Skeena River confluence
- Guide restrictions: maximum 3 anglers/group and 1 group/guide/day
- Modify guided angler-day allocation to accommodate Classified Waters period extension
 - Maintain allocation of 117 days from September 1 to October 31
 - Allocate 100 days from July 24 to August 31
 - Allocate 50 days from November 1 to May 31

Kitsumkalum River

- Extension of mandatory Steelhead Stamp from August 7 to May 31
- Guide restrictions: maximum 3 anglers/group; 1 group/guide/day in upper river and 1 group/guide/day in lower river
- Reduce total number of angling guides from 13 to 11
- Ministry decision to alter no guiding period to November 1 to April 1
- Canadian resident-only from April 1 to March 31 on:
 - Saturday in zone from Kitsumkalum Lake outlet downstream to Glacier Creek confluence; guiding not permitted
 - Sunday on the entire river; guiding not permitted

Skeena River Section IV

- Extension of Classified Waters period from July 1 to December 31
- Extension of mandatory Steelhead Stamp from July 1 to December 31
- Increase guided angler-day allocation by 586 days amongst 12 new guide licences in a zone from Flint Creek confluence to the Chindemash Creek confluence
 - Concern was expressed that allocation may be too high. Accordingly, these days will be offered on a limited term opportunity, such as 20 years or less.
- Canadian resident-only on Saturday and Sunday from July 1 to December 31 in the following areas:
 - a) Shegunia River confluence downstream to Sedan Creek confluence; guiding permitted
 - b) Chindemash Creek confluence downstream to 1.5 km upstream from Zymoetz River confluence; guiding not permitted

Appendix 4.0 - Number of Angler Days Purchased from 2009 to 2013 Based on Licence Sales

	Number of Angler days				
	Sum of UC	Sum of UA	Sum of GC	Sum of GA	Total
Bulkley (Sep 1 - Oct 31)					
2009/2010	548	2492	13	854	3907
2010/2011	656	2132	41	1143	3972
2011/2012	754	1781	12	1091	3638
2012/2013	900	1701	60	1352	4013
2013/2014	910	1855	27	1267	4059
Kispiox (Sep 1 - Oct 31)					
2009/2010	125	1435		307	1867
2010/2011	163	1523	2	398	2086
2011/2012	176	1736	8	367	2287
2012/2013	178	1075	4	464	1721
2013/2014	179	1128	2	517	1826
Skeena IV (Jul 1 - Dec 31)					
2009/2010	264	873	6	161	1304
2010/2011	372	1258	11	243	1884
2011/2012	230	839	21	315	1405
2012/2013	272	975	14	366	1627
2013/2014	332	1258	10	296	1896
Zymoetz Class 2 (Jul 24 - May 31)					
2009/2010	63	507		81	651
2010/2011	71	472	18	91	652
2011/2012	76	548	10	89	723
2012/2013	194	507	17	226	944
2013/2014	292	501	16	161	970
UC - non-BC Canadian anglers who angled as unguided on this water					
UA - non-resident alien anglers who angled as unguided on this water					
GC - non-BC Canadian anglers who angled as guided on this water					
GA - non-resident alien anglers who angled as guided on this water					

Note – This table reflects licence sales data to December 31, 2013. It does not include licence sales on the Zymoetz River Class II Section during the Classified Waters period from January 1, 2014 until May 1, 2014.

Appendix 5.0 - Number of Anglers from 2009 to 2013 Based on Licence Sales

	Number of Anglers						Total
	GA	UA	&A	GC	UC	&C	
Bulkley (Sep 1 - Oct 31)							
2009/2010	173	503	13	2	137	3	831
2010/2011	223	477	31	6	137	5	879
2011/2012	219	412	29	4	143	1	808
2012/2013	307	356	30	10	188	5	896
2013/2014	282	419	22	5	182	3	913
Kispiox (Sep 1 - Oct 31)							
2009/2010	75	312	25	0	50	0	462
2010/2011	80	349	32	2	52	0	515
2011/2012	66	344	28	4	51	0	493
2012/2013	99	264	24	2	67	0	456
2013/2014	100	271	29	2	60	0	462
Skeena IV (Jul 1 - Dec 31)							
2009/2010	101	281	3	6	120	0	511
2010/2011	130	379	9	4	163	1	686
2011/2012	149	305	17	7	99	0	577
2012/2013	181	276	26	5	97	3	588
2013/2014	114	361	23	4	131	1	634
Zymoetz Class II (Jul 24 - May 31)							
2009/2010	41	160	5	0	31	0	237
2010/2011	52	157	4	11	28	1	253
2011/2012	56	164	6	6	25	0	257
2012/2013	125	165	2	9	64	3	368
2013/2014	90	198	1	11	106	0	406

GA - non-resident alien anglers who only angled as guided on this water
UA - non-resident alien anglers who only angled as unguided on this water
&A - non-resident alien anglers who angled some days on this water as unguided and some as guided
GC - non-BC Canadian anglers who only angled as guided on this water
UC - non-BC Canadian anglers who only angled as unguided on this water
&C - non-BC Canadian anglers who angled some days on this water as unguided and some as guided

Note – This table reflects licence sales data to December 31, 2013. It does not include licence sales on the Zymoetz River Class II Section during the Classified Waters period from January 1, 2014 until May 1, 2014.

Appendix 6.0 - Summary of License sales between 2009 and 2013 on Weekends and Weekdays

BULKLEY RIVER					
		UC	UA	GC	GA
Weekend	2009	178	661	6	274
Weekend	2010	193	561	18	360
Weekend	2011	223	475	6	366
Weekend	2012	236	25	18	423
Weekend	2013	268	36	9	420
Weekday	2009	370	1831	7	580
Weekday	2010	463	1571	23	783
Weekday	2011	531	1306	6	725
Weekday	2012	664	1676	42	929
Weekday	2013	642	1819	18	847

KISPIOX RIVER					
		UC	UA	GC	GA
Weekday	2009	91	1066	0	213
Weekday	2010	130	1097	0	273
Weekday	2011	136	1322	4	251
Weekday	2012	121	1065	4	304
Weekday	2013	124	1121	0	339
Weekend	2009	34	369	0	94
Weekend	2010	33	426	2	125
Weekend	2011	40	414	4	116
Weekend	2012	57	10	0	160
Weekend	2013	55	7	2	178

UC: Unguided non-resident Canadian

UA: Unguided non-resident alien

GC: Guided non-resident Canadian

GA: Guided non-resident alien

Appendix 7.0 - Summary of License sales between 2009 and 2013 on Weekends and Weekdays on the Skeena IV and Zymoetz II rivers

SKEENA IV RIVER					
		UC	UA	GC	GA
Weekday	2009	172	648	3	115
Weekday	2010	280	911	7	158
Weekday	2011	159	576	13	228
Weekday	2012	190	673	10	272
Weekday	2013	240	955	5	222
Weekend	2009	92	225	3	46
Weekend	2010	92	347	4	85
Weekend	2011	71	263	8	87
Weekend	2012	82	302	4	94
Weekend	2013	92	303	5	74

ZYMOETZ II RIVER					
		UC	UA	GC	GA
Weekday	2009	43	369	0	70
Weekday	2010	49	334	16	85
Weekday	2011	51	389	10	76
Weekday	2012	134	503	15	208
Weekday	2013	210	491	16	156
Weekend	2009	20	138	0	11
Weekend	2010	22	138	2	6
Weekend	2011	25	159	0	13
Weekend	2012	60	4	2	18
Weekend	2013	73	0	0	4

UC: Unguided non-resident Canadian

UA: Unguided non-resident alien

GC: Guided non-resident Canadian

GA: Guided non-resident alien

Appendix 8.0 - Summary of River Guardian Observations at Cedarvale in 2013

Date	Number of Interviews	Residency	Day	Summary	
2013-08-31	0		Saturday		
2013-09-17	0		Tuesday	Number of days surveyed	14
2013-09-20	0		Friday	Number of days anglers observed	3
2013-10-04	1	NRA	Friday	Number of interviews	8
2013-10-04	1	NRA	Friday	Percent interviews on weekdays	50%
2013-10-05	1	NRA	Saturday	Percent interviews on weekend	50%
2013-10-05	1	NRA	Saturday		
2013-10-06	1	NRA	Sunday		
2013-10-06	1	NRA	Sunday		
2013-10-06	1	NRA	Sunday		
2013-10-06	1	NRA	Sunday		
2013-10-07	0		Monday		
2013-10-09	0		Wednesday		
2013-10-10	0		Thursday		
2013-10-11	0		Friday		
2013-10-19	0		Saturday		
2013-10-24	0		Thursday		
2013-10-26	0		Saturday		
2013-10-29	0		Tuesday		
Note - NRA stands for non-resident alien angler (non-Canadian)					