

Peace River Angling and Recreational-Use Creel Survey 2008

Interim Year 1 Report



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EXECUTIVE SUMMARY

Sport fishing and river-based recreation are important activities to the communities and economy of the Peace Region and BC Hydro is interested in determining how the potential construction and operation of the Site C dam would change the pattern of river-use. With the aim of establishing a baseline for future assessment, a creel survey was initiated to monitor recreational use (particularly fishing activities) on the Peace and Pine rivers and to interview recreational users in order to quantify the timing, duration, type and location of their recreational activities.

This two-year study focuses on the Peace River from Peace Canyon Dam to the Alberta Border (including the lower reaches of tributaries that would be affected by inundation) and parts of the Pine River. In order to survey a random selection of river users, interviews were conducted at randomly-selected access sites using a randomized work schedule. Over-flights were also conducted on random dates. Flight and interviewing effort were evenly distributed between weekends and weekdays (i.e., 'day-types'), and among four geographic river-strata. From mid-May until the end of December 2008, 29 over-flights were conducted, and 2,809 recreational users were interviewed, including 651 respondents who said that they were angling.

An additional aspect of the study was to identify and describe all recreational use sites located within the Peace River mainstem and any potentially inundated tributaries. In total 34 sites were identified, 32 of which were found throughout the mainstem Peace River and 2 on the Halfway River. The majority of these were either some form of campsite, shoreline access or boat launch and the most common types of activities occurring at these sites were camping, fishing and boating. Discussions with local residents and recreational groups were crucial in determining not only the sites but also where and when various activities occur. Additional Pine River recreational use sites will be identified and described in 2009 (2 sites are included in this report).

Survey results indicated that camping was the most common activity in May and June, whereas jet-boating was the most popular for the rest of the year. Fishing was a popular activity until October; and hunting was popular in the fall. In the summer months, swimming, camping, picnicking and shoreline leisure were popular activities. Fishing was the predominant activity upstream of the potential Site C location, whereas jet-boating was most popular downstream of Site C and in the Pine River. In terms of river access, Peace Island Park was used more than any other site, regardless of month or day-type.

Angler activity patterns differed by day-type. Angler activity was distinctly bimodal on weekdays, and was unimodal on weekends. Angling effort differed significantly among months, among river strata, and between day-types, but did not differ significantly between boat and shore anglers. Total angling effort for the study period was estimated to be 24,625 angler-hours, of which 9,024 were in the Pine watershed.

Creel analysis showed that Arctic grayling and mountain whitefish were the species that were caught in greatest numbers, the majority of which were caught in the Pine River. The total number of Arctic grayling and mountain whitefish reported during interviews was 44 and 52, respectively, which led to an estimated total catch of 3303 Arctic grayling (SE = 2441) and 3121 mountain whitefish (SE = 2856). The catch of rainbow trout reported during interviews totaled 217, which led to an estimated catch of 2,604 fish (SE = 2066). The catch of bull trout reported

during interviews totaled 47, which led to an estimated catch of 1,841 fish (SE = 1465), the majority of which were caught in the Pine River.

For certain species (e.g., rainbow trout), the distribution of catch across river-strata was strongly skewed with larger numbers of fish caught in the areas upstream of Site C. The results of the recreational and angling surveys outlined in this report should help inform decisions regarding the potential impacts of the construction and operation of a hydro dam at Site C.

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INTRODUCTION

BC Hydro is considering the Peace River Site C hydroelectric project (Site C) in northeastern British Columbia as an option to help meet BC's future electricity needs. No decision has been made to build Site C (BC Hydro, 2008) and BC Hydro is taking a stage-by-stage approach to the evaluation of Site C. At the end of each stage, BC Hydro will make a recommendation to the provincial government about whether to proceed to the next stage of project planning and development. The Peace River Site C Hydro Project is currently in Stage 2: "Project Definition and Consultation." As part of Stage 2, studies are being conducted to develop an understanding of current Peace River recreational activity patterns. This baseline information will be used to assess the possible future impacts on recreation activities in the Peace River region, should the Site C project proceed. Moreover, knowledge of potential effects on recreation and of potentially new recreational opportunities is important for effective water management planning.

The current study, part of Stage 2 investigations, includes a survey of anglers and recreation users in the region, as well as the identification and mapping of recreational sites and facilities in the region (e.g., formal and informal access areas, day use areas, hiking trails, camping spots, and fishing or hunting areas). A more fulsome socio-economic study will be conducted as part of Stage 2 investigations.

Sport fishing and river-based recreation are important activities to the communities and economy of the Peace Region. A roving creel census was used in 1985 to estimate that 8,600 anglers fished the Peace River between Peace Canyon Dam and Hudson's Hope between June and October, for a total of 16,890 angler-hours (Hammond 1986). A subsequent exit creel survey (May to October, 1989; and April to June 1990), monitoring a larger geographic area, estimated a total angling effort of 18,500 angler-hours between Peace Canyon Dam and Taylor (including the lower reaches of the Pine, Halfway, and Moberly rivers; DPA 1991). Both creel surveys showed similar patterns of river-use: the majority of fishing effort takes place nearest Peace Canyon Dam, with only a small percentage (6%) occurring downstream of the potential Site C location (DPA 1991). However, the construction and operation of the Site C dam would likely change the pattern of river-use (e.g., a shift from river-based to reservoir-based activities; BC Hydro, 2008), affect angling opportunities (e.g., by changing river and reservoir access); and, therefore modify pressure on sport-fish species.

Previous studies have identified recreational use sites in the Peace River valley (Edwin Reid & Associates Ltd. 1979, DPA 1981a and MacLaren Plansearch Corp. 1991) with regards to potential affects from Site C. A recreation impact assessment was completed in 1979 and identified 13 sites of shoreline features relevant for recreation in addition to 27 shoreline locations with evidence of some type of continuous use (camping or picnicking) (Edwin Reid & Associates Ltd. 1979). DPA Consulting Limited (1981a) conducted an inventory of recreational sites in the Peace River valley from Hudson's Hope to Taylor during a recreation survey in 1981, identifying only six significant recreational access sites. In 1990, MacLaren Plansearch Corp (1991) studied the recreation and tourism resources of the area affected by Site C, identifying 24 sites.

This year-end report summarizes the research activities that were conducted in 2008 (May to December). From the recreational use perspective, this report includes a description of Peace River recreational facilities, and a summary of 2008 recreational use patterns. For fishing use, the creel data have been analyzed to produce fishing effort and catch estimates for 2008.

SCOPE

The geographic scope of the study is the Peace River, extending from the Peace Canyon Dam to the BC/Alberta border, a distance of 150 km (Figure 1). In addition, the study area includes the Pine River (up to Tumbler Ridge) and two of its tributaries (e.g., lower Murray and lower Sukunka rivers). For the purposes of data collection and analysis, the study area was divided into four geographic strata (called “river strata”) and strata were selected to align with previous surveys. These strata are:

- 1) Peace Canyon Dam to Hudson’s Hope;
- 2) Hudson’s Hope to Site C location. This stratum also includes the lower reaches of the Halfway and Moberly rivers, as well as several smaller tributaries;
- 3) Site C location to the Alberta Border. This stratum also includes the lower reaches of the Pine and Beatton rivers; and
- 4) Pine River system (to Tumbler Ridge), including the lower Murray and lower Sukunka rivers.

The Pine River was included in this study because of the hypothesis that bull trout inhabiting the Pine might be migratory into the Peace River and perhaps upstream of Site C. This hypothesis is being tested through an extensive radio telemetry study being conducted jointly by LGL Limited and AMEC for BC Hydro. Interim results of the telemetry study suggest that Pine River bull trout, as well as rainbow and grayling are not highly migratory (Gordon Glova, LGL Limited, pers. comm.).

The temporal scope of the full study is 18 months, from May 2008 to October 2009. Catch, effort, and recreational use surveys are being conducted year-round, with elevated sampling effort during the summer months. This report includes data up to and including December 2008.

OBJECTIVES

There are four primary objectives of this study:

- 1) Review historical use by summarizing previous studies and document current use patterns by conducting a detailed survey of anglers and recreational users within the study area, including mapping of access points and site amenities;
- 2) Obtain statistically valid, stratified estimates of total angler effort and catch each year;
- 3) Assemble and present additional baseline information related to assessing the potential effects of Site C on recreational use and angler use; and

- 4) Collect baseline data to develop empirical relationships linking physical impacts from Site C to factors such as fishing effort, fishing success rate, geographic distribution, species harvested, and catch value.

These objectives are being met under a study plan that includes literature reviews, field surveys of angler and recreational use, fixed-wing surveys to estimate angler effort, and shore-based angler interviews to estimate catch per effort. The methodology used during this study is outlined, by objective, in the following sections. This 2008 year-end report focuses on Objectives 1 and 2.

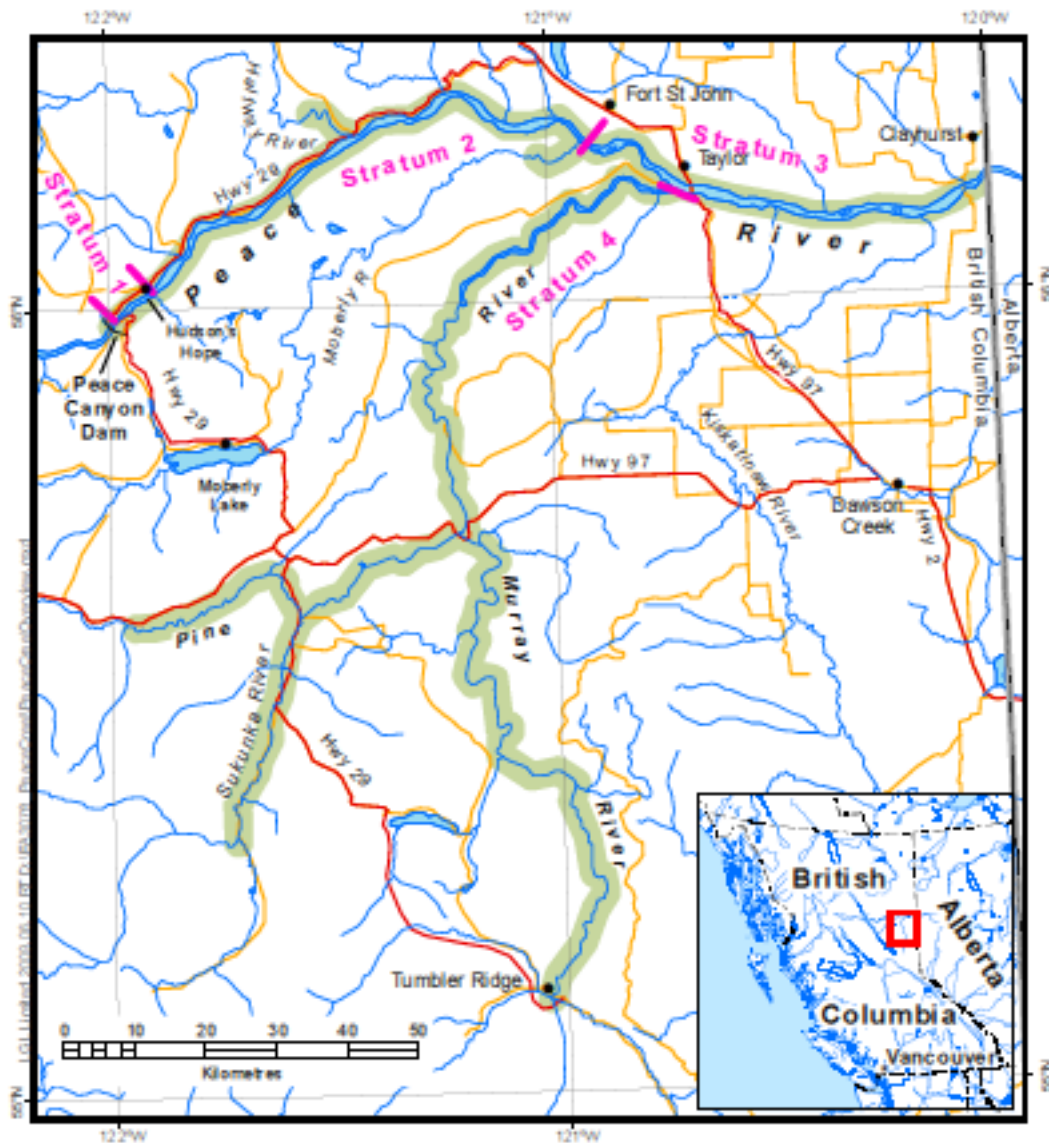


Figure 1. Peace River and its tributaries in northeast British Columbia and northwest Alberta showing study area in green shading and strata.

METHODS

Objective 1: Recreational/Angler Use

Recreational Site Inventory

To assess current recreational use on the Peace River, field assessments were conducted of existing facilities throughout the Peace mainstem from the Peace Canyon Dam to the Alberta border and in the lower sections of potentially inundated tributaries. These field studies, conducted throughout August and September, 2008, were aimed at identifying current recreation sites, in particular, the current status of angler access (including locations and conditions) and the current status of amenities for recreational users (including availability and access). Recreational use sites were identified through discussions with local residents, recreational organizations and municipal staff¹.

All recreational sites were visited during August and September, 2008. Data forms were used to record all relevant information pertaining to type of recreational area, confirmed and potential uses, constraints on recreational use, location and status of access and trails and specifics regarding boat launches, types of angling and campsites (Appendix 1) All locations of important site features were recorded on a hand-held GPS unit and photographs were taken of all sites, including any notable features. Specifically, information collected included:

- 1) Location of the site;
- 2) Type of recreational area (boat access, shore access, campsite, picnic area, trail, cabin);
- 3) Confirmed and potential recreational area uses in both summer and winter (fishing, hunting, birding, wildlife viewing, jet boating, other boating, canoeing, kayaking, swimming, plant gathering, rock / fossil hunting, picnicking, camping, hiking, shoreline leisure, ATV driving, snowmobiling, snowshoeing, cross country skiing, dog sledding);
- 4) Constraints on recreational use (reasons for difficulties accessing property, seasonal constraints);
- 5) Access to the site and shoreline (bank trail, boat ramp, bushwhacking);
- 6) Type of boat ramp (paved, dirt, informal) and size of boat which can be launched;
- 7) Type of angling (shoreline or boat angling);
- 8) Potential hazards to users;

¹ Local residents, recreational organizations and municipality personnel included: Rick Hopkins of Custom River Adventures, Christine Harwood of Lynx Creek RV Park, Eliza Stanford of the Whiskey Jack Nordic Ski Club, Gloria Baker and Troy Gould of the District of Taylor, Terry Turvey of the District of Hudson's Hope; Scott Ebert provided the map of the River Rats camp sites.

- 9) Type of campground (public, primitive maintained, un-maintained), access, size and facilities available (RV service, washroom, tent pad, fire pit, picnic table, refuse collection, etc);
- 10) Shoreline type (rocky, sandy beach, etc.); and
- 11) Bank direction of river access.

Each recreational site was classified according to its primary purpose, such as: boat launch, shore access, public campground, primitive maintained campsite, un-maintained campsite, or scenic location. A description of type of site classification is as follows:

- 1) Boat launch: access to the shoreline which allows the user to launch a boat;
- 2) Shore access: access to the shoreline which allows the user to participate in activities (i.e., fishing, canoeing, kayaking, swimming, picnicking);
- 3) Public campground: well maintained campground with regular upkeep that offers facilities such as RV service, washrooms or pit toilets, tent pads, fire pits, picnic tables and refuse collection. Users generally pay during prime months of operation and may reserve sites;
- 4) Primitive maintained campsite: moderately maintained campsite by the local boaters of the Peace River system which generally has facilities such as an outhouse, fire pit, and picnic table, used on a first come-first serve basis;
- 5) Un-maintained campsite: un-maintained area which often only consists of an obvious clearing in the riparian zone for tents and homemade fire pits. These sites often show evidence of use over years such as obvious bank trails to indicate their location and are used on a first come-first serve basis; and
- 6) Scenic location: natural, scenic locations that recreational users would stop to observe, such as a waterfall.

Both during and subsequent to the field assessments, discussions were conducted with local users and operators of the recreational sites to further determine the extent and types of recreational use as well as additional constraints on use. Discussions were also had with local recreational groups (both winter and summer activities) to determine where and how often some of these activities occur.

Supporting Businesses

In the autumn of 2008, businesses which support recreational use in the project area were identified from the City of Fort St. John business listings, the Fort St. John 2008 Visitor Guide and the business directories on the District of Hudson's Hope and District of Taylor websites. Supporting businesses were then categorized as accommodation, service or transportation and totaled for each municipality.

Recreational Use Surveys

For each river stratum during each month, recreational use patterns were documented by counting recreational users from aircraft and by interviewing users at known access points, in conjunction with angler surveys. At these locations, users were interviewed about the nature of their activities, and their location. They were also asked about their hourly activity patterns both on the current and previous days. Users were also asked whether or not they were finished their recreational activity for the day (Appendix 2).

Data collected during interviews included:

- 1) Number of users and the total hours spent on both shore-and boat-based recreational activities;
- 2) The location of the recreational activity, and the access location (river stratum and location);
- 3) Recreational activity pattern – the hours during which the user participated in the recreational activity, both on the day of the interview and on the previous day, and whether or not the trip was ‘complete’;
- 4) The type of activity (fishing, hunting, birding, wildlife viewing, jet boating, other boating, canoeing, kayaking, swimming, plant gathering, rock/fossil hunting, picnicking, camping, hiking, shoreline leisure, other), and whether or not the activity was guided;
- 5) Whether or not the trip was guided by a professional;
- 6) User demographics – age and community of origin; and
- 7) Timestamp, including date, month, ‘day-type’ (i.e., weekday vs. weekend/holiday) and time of day.

To minimize bias, the interview schedule was designed to capture data from representative recreational users in each river stratum, on both day-types, and over all time periods of the day. Interviewing locations were based initially on the access locations identified in DPA (1991), but were later refined to include the twelve locations shown in Table 1. The access points surveyed were selected from all available access points, based on their geographical distribution and the amount of activity that was assumed to be conducted from that site. Within each geographic region, the busiest (i.e., most accessible) access points were given greater emphasis in order to obtain the maximum number of interviews.

Sampling intensity levels (Table 2) were selected to ensure adequate coverage in all four river strata, on both day-types, and to ensure elevated interviewing effort during the summer months, when anglers and other recreational users are more active. Within each river stratum and day-type, the sampling dates were selected randomly. Once a date was selected, a site within that stratum was randomly selected, where the probability of selection was based on (approximate) expected frequencies of use by anglers and recreational users (Table 1). Interview sampling

sessions were 10 hours long (9 AM to 1 PM, and 3 PM to 9 PM from May to September; and 9 AM to 7 PM from October to December). In total, 186 shifts were scheduled per year (Table 2), summing to 1,752 hours of interview effort per year, and with the majority of the interviewing effort focused on the summer months. Because of the project start date was mid-month (15 May 2008), only 11 shifts were scheduled for May 2008; and a total of 126 shifts were scheduled from May through December, 2008 (the span covered by this report).

For this report, the total number of interview respondents was tallied by month. Also, the percentage of people interviewed who said they were participating in each activity was calculated.

Objective 2: Statistically Valid Estimates of Angler Effort and Catch

The study area spans a very large geographic area, making it unreasonable to obtain a complete and direct (interview-based) census of the entire catch. Therefore, our approach relied on statistical methods to estimate catch by the multiplication of vectors of effort data by vectors of catch per effort data, for each river stratum, month, day-type (weekday vs. weekend), access method (shore vs. boat), and species. This approach is superior to catch reporting calendars in four ways:

- 1) It is based on first-hand interviews conducted by trained interviewers rather than on the fisherman's memory or diligence in accurately filling out the form;
- 2) It enables interviewers to interact directly with the fisherman and validate the catch;
- 3) It provides timely estimates of catch and effort and allows for adaptive control of the sampling procedure; and
- 4) It allows for computation of statistical confidence in the estimates.

For each river stratum during each month, fishing effort was estimated by counting anglers (both on shore and in boats) from aircraft (Appendix 3) ; and catch per unit effort was estimated from shore-based interviews (Appendix 4). Interviews were conducted at known access points. At these locations, anglers were interviewed about their catch, effort, and fishing locations. They were also asked about their hourly fishing activity patterns both on the current and previous days. Anglers were also asked whether or not they were finished their fishing activity for the day.

Data collected during interviews included:

- 1) Angler effort – number of anglers, total fishing effort (in angler-hours), fishing location, access location, target species, and bait used;
- 2) Angler activity – the hours during which angling activity was conducted, both on the day of the interview and on the previous day, and whether or not the trip was 'complete';
- 3) Fish kept – number of fish caught and kept, by species and by river stratum;

- 4) Fish released – number of fish caught and intentionally released, by species and by river stratum;
- 5) Whether or not the catch was verified and counted;
- 6) Whether or not the trip was guided by a professional;
- 7) Angler demographics – age and community of origin;
- 8) Angler access methods (shore vs. boat); and
- 9) Timestamp, including date, month, ‘day-type’ (i.e., weekday vs. weekend/holiday) and time of day.

The analytical methods used were adapted from those developed and documented for the Georgia Strait Creel Survey (English et al. 2002). The methods used to estimate the statistical precision associated with creel survey catch and effort estimates are documented in English et al. (2002) and Blakley et al. (2003).

This procedure provides a statistically unbiased estimate of catch per effort, provided the anglers interviewed are representative of the entire fishery. To ensure this, the interview schedule was designed to capture data from representative fishermen in each river stratum, on both day-types, and over all time periods of the day.

Interviewing locations were based initially on the access locations identified in DPA (1991), but were later refined to include the twelve locations shown in Table 1. The access points surveyed were selected from all available access points, based on their geographical distribution and the amount of fishing activity that was assumed to be conducted from that site. Within each geographic region, the busiest (i.e., most accessible) access points were selected preferentially in order to obtain the maximum number of interviews. This approach was based on two important observations: 1) CPE (catch-per-effort) tends to be more variable among fishing parties landing at a single access point than among different access points within a geographic area; and 2) CPE and effort can vary substantially both within and between days at a single site (English et al. 2002). Under these conditions it better to obtain a large number of interviews covering all temporal strata for a small number of sites than to sample a larger number of sites and obtain fewer interviews and less complete temporal coverage for any specific site.

Sampling intensity levels (Table 2) were selected to ensure adequate coverage in all four river strata, on both day-types, and to ensure elevated interviewing effort during the summer months, when anglers are more active. Within each river stratum and day-type, the sampling dates were selected randomly. Once a date was selected, a site within that stratum was randomly selected, where the probability of selection was based on (approximate) *a priori* expected frequencies of use by anglers and recreational users (Table 1). Interview sampling sessions were 10 hours long (9 AM to 1 PM and 3 PM to 9 PM from May to September; 9 AM to 7 PM from October to December). In total, 186 shifts were scheduled per year (Table 2), summing to 1,752 hours of effort per year, and with the majority of the interviewing effort focused on the summer months. Because of the project start date was mid-month (15 May 2008), only 11 shifts were scheduled for May 2008; and a total of 126 shifts were scheduled from May to December, 2008.

Table 1. Twelve shore-based access sites at which angler and recreational-user interviews were conducted. Two to four sites were located in each of the four study strata. For each interviewing session, the location was randomly selected by randomly selecting a stratum. Within a stratum, a site was randomly selected, where the probability of selection was based on (approximate) expected frequencies of use by anglers and recreational users.

Stratum	Site #	Site Name	Prob of selection
1. Peace Canyon Dam to Hudson's Hope	1	Highway 29 Bridge	0.2
	2	Alwin Holland Park	0.5
	3	Hudson's Hope Launch	0.3
2. Hudson's Hope to Site C	4	Lynx Creek Launch	0.3
	5	Lynx Creek RV Park	0.3
	6	Farrell Creek Mouth	0.1
	7	Halfway River Bridge	0.3
3. Site C to Alberta border	8	Peace Island	0.7
	9	Clayhurst	0.3
4. Pine watershed	10	East Pine	0.4
	11	Twidwell Bend	0.3
	12	Sukunka FS Road	0.3

Table 2. Annual sampling effort (number of interviewer shifts, and interviewer hours), by month and river stratum. Shifts were split evenly between weekday and weekend/holidays.

Month	Shifts per Stratum				Total Shifts	Hours per Shift	Total Hours
	Stratum 1	Stratum 2	Stratum 3	Stratum 4			
April	6	6	6	4	22	10	220
May	6	6	6	4	22	10	220
June	6	6	6	4	22	10	220
July	6	6	6	4	22	10	220
August	6	6	6	4	22	10	220
September	6	6	6	4	22	10	220
October	3	3	3	0	9	8	72
November	3	3	3	0	9	8	72
December	3	3	3	0	9	8	72
January	3	3	3	0	9	8	72
February	3	3	3	0	9	8	72
March	3	3	3	0	9	8	72
Total per Year					186		1752

Angler Activity Patterns

Two weighting factors were used together with the interview-derived angling activity data to estimate the daily fishing activity pattern (DPA 1981b).

The first weighting factor, $W1$, expanded the numbers of days spent interviewing at each site, to account for the total number of days available for sampling. That is, it was assumed that the daily activity pattern recorded during the interview shifts at site i , were consistent for site i , even during the days when no interviews occurred. A specific $W1$ was calculated for each site during each month and day-type as:

$$W1_{msi} = \frac{N_{md}}{K_{msi}} \quad (\text{Eqn. 1})$$

where N_{md} was the total number of type d days in month m ; and K_{msi} was the number of interview shifts that occurred at site i , in river stratum s , on type d days during month m .

The second weighting factor, $W2$, expanded the numbers of interviews conducted, to account for the anglers that were *not* interviewed. That is, it was assumed that the activity pattern recorded during the interview shifts also held for those anglers that were not interviewed. A specific $W2$ was calculated for each shift (k) at each site during each month and day-type as:

$$W2_{msik} = \frac{L_{msik}}{A_{msik}} \quad (\text{Eqn. 2})$$

where L_{msik} was the number of anglers observed and A_{msik} was the number of anglers interviewed during shift k , at interview location i , in river stratum s , during day-type d , and month m .

The proportion of average daily angling effort (P_{msft}) that occurred in each of 16 hourly time-blocks (t) was calculated for each month, day-type, river-stratum, and access method as:

$$P_{msft} = \frac{\sum_i \left(W1_{msi} \cdot \sum_k \sum_q (W2_{msik} \cdot A_{msikqt}) \right)}{\sum_t \sum_i \left(W1_{msi} \cdot \sum_k \sum_q (W2_{msik} \cdot A_{msikqt}) \right)} \quad (\text{Eqn. 3})$$

where A_{msikqt} was the number of anglers reporting activity during time-block t , that were part of the fishing party (q) that was interviewed during shift k , at site i , in river-stratum s , during month m , and on day-type d . For this calculation, ‘current day’ activity was included only if the anglers said their trip was finished for the day. Regardless, ‘prior day’ activity was included in the analyses, being careful to assign the data to the correct temporal categories. For example, if an interview was conducted on a Monday, the ‘prior day’ activity data would be counted under day-type = ‘weekend/holiday’. It should be noted that the ratio of interviewed-to-not-interviewed

anglers was not known for the day prior to the interview, thus $W2$ weights were assigned a value of 1 when processing ‘prior day’ activity data.

Using this method, 144 unique angler activity patterns were to be estimated (i.e., 9 months² × 2 day-types × 4 river strata × 2 access methods). To reliably describe angler activity, a relatively large number of anglers (~ 60) needed to be interviewed in each of the 144 blocks. After eight months of study (May to December, 2008), it became apparent that too few interviews were being obtained (Table 3), thus several levels of detail needed to be removed from the analysis of angler activity pattern. To help decide which data to pool, angler activity was plotted by month (Figure 2), by river stratum (Figure 2), by day-type (Figure 3), and by access method (Figure 3). A strong difference in activity pattern was observed between weekday and weekend/holiday anglers. Since angler activity was relatively consistent among months, river strata, and access methods, it was decided to pool activity data over these factors:

$$P_{dt} = \frac{\sum_m \sum_s \sum_f \sum_i \left(W1_{msfi} \cdot \sum_k \sum_q (W2_{msfik} \cdot A_{msfikqt}) \right)}{\sum_m \sum_s \sum_f \sum_i \sum_t \left(W1_{msfi} \cdot \sum_k \sum_q (W2_{msfik} \cdot A_{msfikqt}) \right)} \quad (\text{Eqn. 4})$$

Catch Per Effort Estimation

Catch per effort (and, similarly, harvest per effort) was estimated for each species of fish from interviews of anglers returning with their catch, conducted at the shore-based access sites. For each interview (i), the month (m), day-type (d), and access method (f) was recorded, along with the catch (C) of each species (r), the number of anglers (A), and the number of hours spent fishing (H) in each river stratum (s). Using these data, catch per effort was calculated as:

$$CPE_{msfri} = \frac{C_{msfri}}{(A_{msfi} \cdot H_{msfi})} \quad (\text{Eqn. 5})$$

Ideally, mean CPE would have been calculated for each month, river stratum, day-type, access method and species. After eight months of study (May to December, 2008), it became apparent that too few interviews were being obtained to provide adequate sample size ($n \sim 3$) to reliably estimate CPE and its variance for each of the 144 blocks (Table 4). As CPE was *expected* to change with month, river stratum and access method, it was decided to pool interview data by day-type.

² Although sampling occurred throughout 12 months, we knew *a priori* that few interviews would be obtained in the winter months, and planned to pool October data with November data, and similarly December with January, and February with March. Thus, it was planned to pool the six winter months into 3 ‘estimation periods’.

In most cases, mean *CPE* was calculated by summing the catch for all n_{msdf} interviews, pooling over day-type, and dividing by the total number of angler-hours of fishing effort recorded for these interviews:

$$\hat{CPE}_{msfr} = \frac{\sum_d \sum_{i=1}^{n_{msdf}} C_{msdfri}}{\sum_d \sum_{i=1}^{n_{msdf}} (A_{msdfi} \cdot H_{msdfi})} \quad (\text{Eqn. 6})$$

The variance for the estimate of mean catch per unit effort was calculated as:

$$S^2_{\hat{CPE}_{msfr}} = \frac{\sum_{i=1}^{n_{msdf}} (\hat{CPE}_{msfri}^2) - \frac{\sum_{i=1}^{n_{msdf}} (\hat{CPE}_{msfri})^2}{n_{msf}}}{(n_{msf} - 1)} \quad (\text{Eqn. 7})$$

In several instances, the month/access method/river stratum-specific sample size was too low, even after the data were pooled over day-type. Since limited sampling occurred in May (as a result of the mid-month start project start date), all data from May and June were combined. Due to low interview counts obtained during the winter, data from October through December have also been pooled into one temporal period. Also, all data from the Pine, regardless of month, day-type and access method, were pooled into a single *CPE* estimate for that river stratum.

Table 3. The amount of data (number of anglers) available to estimate angler activity patterns, for all levels of each factor (data from May to December 2008). No category had adequate sample size to reliably estimate activity, thus data pooling was required.

Month	Day Type	Access Method	River Stratum			
			PCD-HH	HH-C	C-AB	Pine
May	Weekday	Boat	11	5	0	0
		Shore	9	10	1	0
	Weekend	Boat	0	5	0	0
		Shore	39	6	5	0
June	Weekday	Boat	1	5	0	0
		Shore	52	21	2	0
	Weekend	Boat	1	14	5	0
		Shore	34	15	34	4
July	Weekday	Boat	0	8	19	0
		Shore	0	7	4	0
	Weekend	Boat	0	16	19	4
		Shore	38	35	0	0
August	Weekday	Boat	0	0	30	0
		Shore	17	25	4	5
	Weekend	Boat	0	17	48	0
		Shore	18	11	2	3
September	Weekday	Boat	0	0	1	0
		Shore	18	14	5	4
	Weekend	Boat	0	0	17	0
		Shore	6	7	5	1
October	Weekday	Boat	0	0	0	0
		Shore	6	4	0	0
	Weekend	Boat	0	0	0	0
		Shore	9	6	0	0
November	Weekday	Boat	0	0	0	0
		Shore	0	0	0	0
	Weekend	Boat	0	0	0	0
		Shore	0	0	0	0
December	Weekday	Boat	0	0	0	0
		Shore	0	0	0	0
	Weekend	Boat	0	0	0	0
		Shore	0	0	0	0

PCD = Peace Canyon Dam; HH = Hudson Hope; C = Site C; AB = Alberta Border

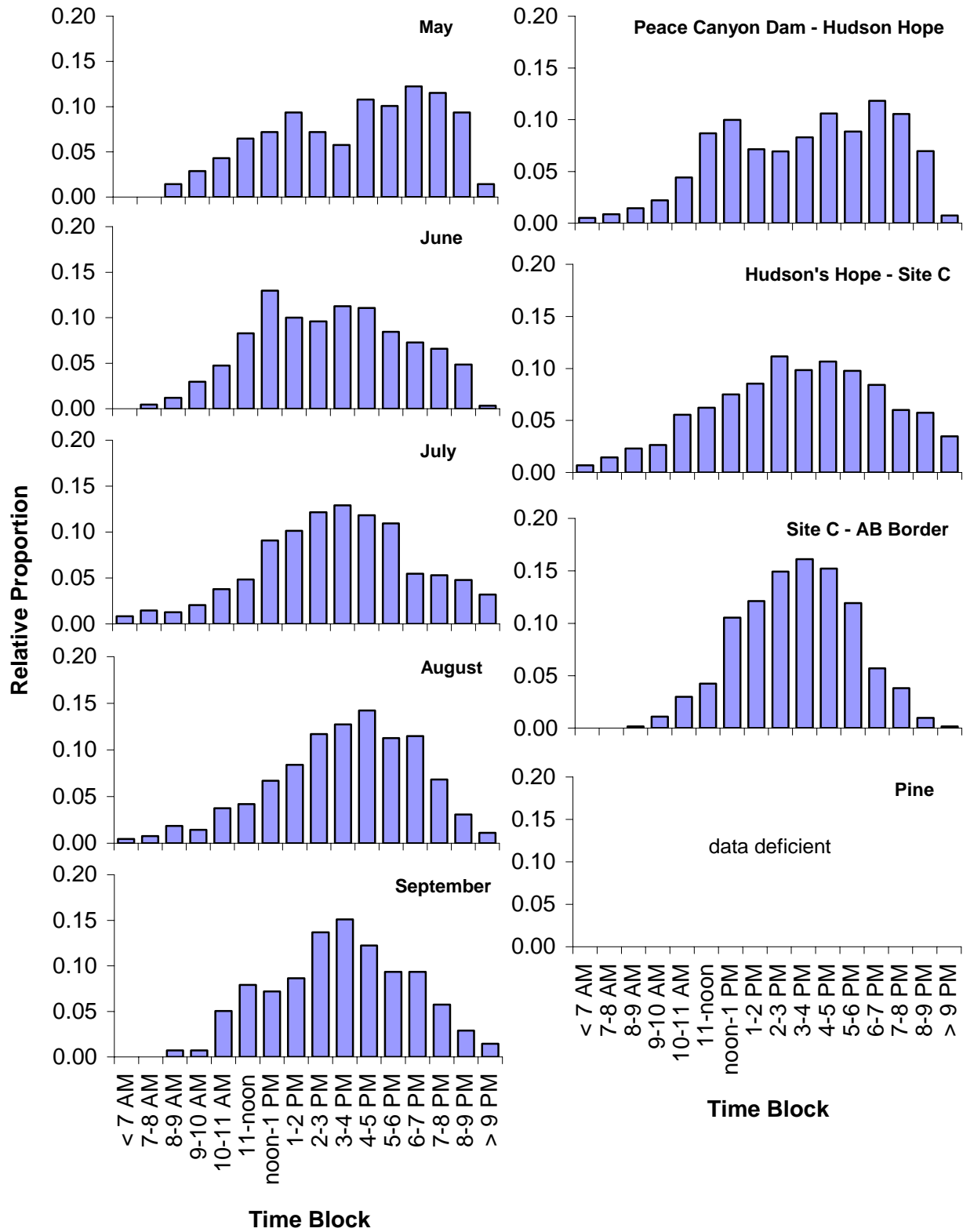


Figure 2. Angler activity patterns, by month (left column; Oct-Dec were data deficient) and by river stratum (right column; Pine River Stratum was data deficient), from interview data collected from May through December 2008.

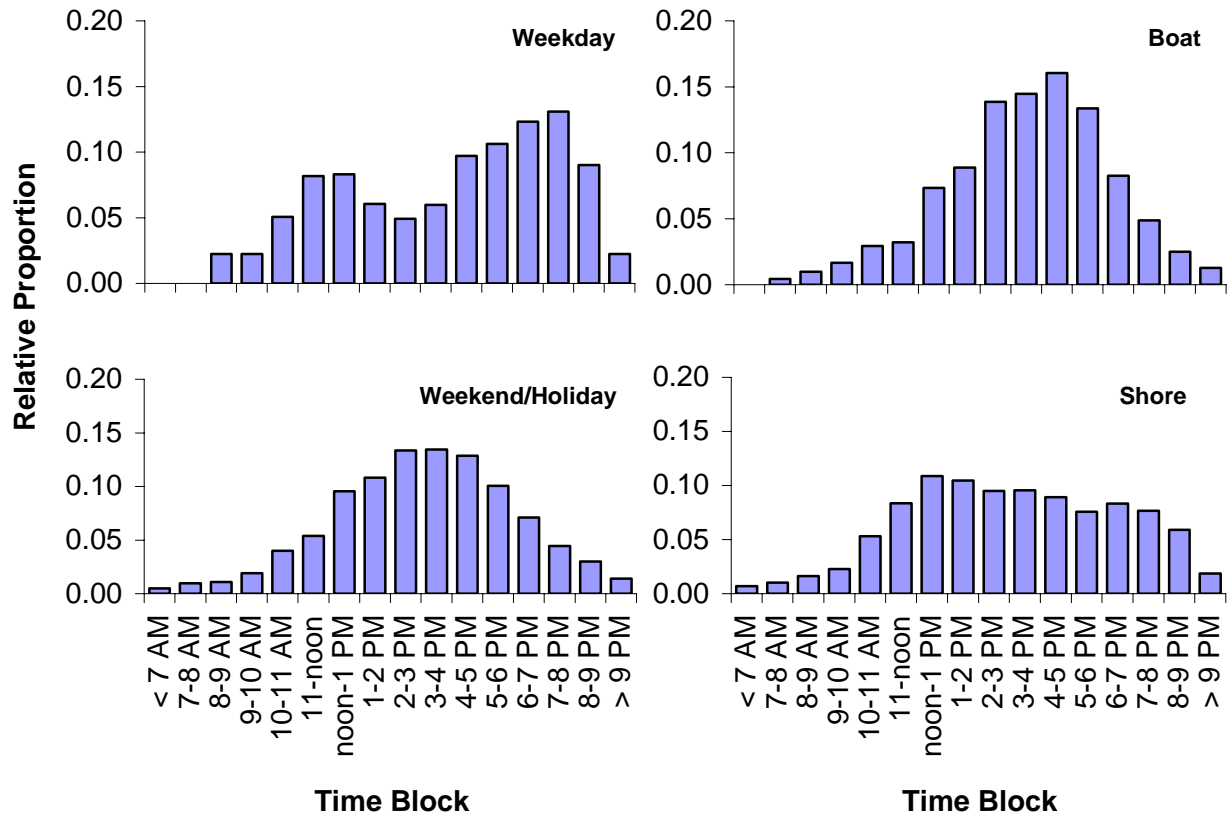


Figure 3. Angler activity patterns, by day-type (left column) and by access method (right column), from interview data collected from May through December, 2008.

Table 4. The sample size of angler CPE data (i.e., the number of interviewed parties reporting catch and effort) for each river stratum, and for each month, day-type and access method (data from May to December 2008).

Month	Day Type	Access Method	River Stratum			
			PCD-HH	HH-C	C-AB	Pine
May	Weekday	Boat	2	0	0	0
		Shore	6	2	0	0
	Weekend	Boat	2	5	0	0
		Shore	10	3	1	0
June	Weekday	Boat	0	0	0	0
		Shore	13	2	1	0
	Weekend	Boat	1	7	2	0
		Shore	17	6	3	2
July	Weekday	Boat	0	1	0	0
		Shore	0	3	3	0
	Weekend	Boat	3	7	6	8
		Shore	5	17	0	0
August	Weekday	Boat	0	1	1	0
		Shore	3	2	2	2
	Weekend	Boat	0	8	9	0
		Shore	5	8	1	0
September	Weekday	Boat	0	0	1	0
		Shore	6	2	1	0
	Weekend	Boat	0	0	3	0
		Shore	5	9	2	4
Oct-Dec	Weekday	Boat	0	0	0	n/a
		Shore	0	1	0	n/a
	Weekend	Boat	0	0	0	n/a
		Shore	6	2	0	n/a

PCD = Peace Canyon Dam; HH = Hudson's Hope; C = Site C; AB = Alberta Border

Angler Effort Estimation

To obtain statistically valid estimates of angler effort, anglers were counted from a fixed-wing aircraft (chartered through Trek Aerial Surveys, Fort St. John) flying over the study area. It took 3 hours to survey the Peace mainstem from Peace Canyon Dam to the Alberta Border (150 km), and an additional hour (from May through September) to survey the Pine River system. Table 5 shows the number and frequency of over-flights scheduled, by month. The dates of the over-flights were selected randomly within each month, and were equally divided between weekday and weekend/holiday day-types. A greater number of over-flights were scheduled during the peak months of June, July and August, and fewer over-flights were scheduled during the winter months.

To maximize statistical precision, timing of angler effort surveys should, to the greatest extent possible, correspond to peak hourly angling effort. Initially, the timing of flights (i.e., late afternoon) was based on data from previous summertime creel surveys (e.g., DPA 1991), however, adjustments were required to account for fluctuating daylight hours. Note that monthly over-flights were chartered before collecting the corresponding hourly angling effort data (from interviews), thus flight timing did not always exactly match that of peak angling effort.

During over-flight o (conducted during month m and on day-type d), observers tallied the total number of anglers (boating and shore-based counted separately, f) that were actively fishing at time t in sub-stratum u (within river stratum s), $A_{mdosuft}$. These tallies were pooled by substratum. Since angling occurs over the course of the entire day, the number of anglers that were observed at the moment of the over-flight was divided by the proportion of average daily angling effort (P_{dt}) that occurred during the time block when the observations were recorded. These adjusted tallies were summed over the duration of the over-flight, to calculate the total number of anglers fishing on the day of the over-flight, by river stratum and access method, B_{mdsfo} :

$$B_{mdsfo} = \sum_t \frac{\sum_u A_{mdosuft}}{P_{dt}} \quad (\text{Eqn. 8})$$

These estimates were then averaged over the number of over-flights conducted, n_{mds} , as:

$$\hat{B}_{mdsf} = \frac{\sum_{o=1}^{n_{mds}} B_{mdsfo}}{n_{mds}} \quad (\text{Eqn. 9})$$

Total monthly fishing effort, was calculated for each day-type, river-stratum, and access method by multiplying the average daily effort by the number days of day-type d in that survey month:

$$E_{mdsf} = \hat{B}_{mdsf} \cdot N_{md} \quad (\text{Eqn. 10})$$

Table 5. Number and duration of scheduled aerial surveys, by month. Flights were scheduled to be 4 hours in duration when the Pine system was surveyed, and 3 hours when flights were restricted to the Peace mainstem.

Month	Total Flights	Hours per Flight	Total Hours
April	4	3	12
May	4	4	16
June	6	4	24
July	6	4	24
August	6	4	24
September	4	4	16
October	2	3	6
November	2	3	6
December	2	3	6
January	2	3	6
February	2	3	6
March	2	3	6
Total per Year	42		152

Variance of the mean daily angler counts was:

$$S_{\hat{B}_{mdsf}}^2 = \frac{\sum_{o=1}^{n_{mds}} B_{mdsfo}^2 - \frac{\left(\sum_{o=1}^{n_{mds}} (B_{mdsfo}) \right)^2}{n_{mds}}}{n_{mds} - 1} \cdot \left[\frac{N_{md} - n_{mds}}{N_{md} - 1} \right] \tag{Eqn. 11}$$

The variance of the estimate of the total monthly fishing effort was:

$$S_{E_{mdsf}}^2 = S_{\hat{B}_{mdsf}}^2 \cdot N_{md}^2 \tag{Eqn. 12}$$

The standard error of the estimate of the total monthly fishing effort, after pooling over day-types, was:

$$S_{E_{msf}} = \sqrt{\sum_d \frac{S_{E_{mdsf}}^2}{n_{mds}}} \tag{Eqn. 13}$$

Catch Estimation

Total catch was calculated for each month, river stratum, access method and species by multiplying total angling effort by catch per effort:

$$C_{msfr} = \sum_d (E_{mdsf} \cdot C\hat{P}E_{msfr}) \quad (\text{Eqn. 14})$$

The standard errors for these catch estimates were derived using the following equation:

$$S_{C_{msfr}} = \sqrt{\sum_d \left(E_{mdsf}^2 \frac{S_{CPE_{msfr}}^2}{n_{msf}} + CPE_{msfr}^2 \frac{S_{E_{mdsf}}^2}{n_{mds}} + \frac{S_{CPE_{msfr}}^2}{n_{msf}} \frac{S_{E_{mdsf}}^2}{n_{mds}} \right)} \quad (\text{Eqn. 15})$$

which is based on the standard formula for combining the variance of the product of two independent random variables (Goodman 1960).

Biosampling

After interviewers collected angler activity and catch per effort data, and when the angler was amenable, catch was inspected. In a subset of cases, interviewers measured fork length, weighed, and took scales from the fish. From 27 August onwards, fish were also scanned for the presence of a PIT tag.

Future Data Analysis

At the end of Year 2, multi-year data will be analyzed to determine trends in total catch, catch rate, and effort over time. Multi-year analysis will also include testing for correlations between catch and effort data and assessing for significant differences among fishing seasons.

RESULTS

Objective 1: Recreational/Angler Use

Recreational Site Inventory

A total of 34 recreational use sites were identified on the mainstem of the Peace River or potentially inundated tributaries. Of these sites, 32 occurred on the mainstem Peace River from the Peace Canyon Dam to the Alberta border and 2 occurred within the inundation zone of the Halfway River. No sites were identified within the inundation zones of any other potentially affected tributaries. Extensive descriptions of each individual site are provided in Appendix 5.

For these 34 sites, the totals of all types of recreational sites in each stratum are documented in Table 6. The stratum from Hudson's Hope to Site C (inundation zone) contained the majority of recreational use sites (24 of the 34 sites identified). The most abundant types of recreational use sites were "un-maintained campsite" and "primitive maintained campsite"; a total of nine of each were located in the study area. "Shore access" was one of the next most common types of recreational use site (seven located). Also, seven "boat launches" were documented, three of

which were part of a “public campground.” An additional “public campground” (without a boat launch) was also identified. A single “scenic location,” consisting of a small waterfall, was also documented. All site locations have been mapped indicating the type of recreational use site (Figure 4).

Table 6. Total number of recreational-use sites on the mainstem of the Peace River or potentially inundated tributaries, by site type and river stratum.

Type of Recreational Use Site	River Stratum			Total
	PCD - HH	HH - C	C - AB	
Public Campground & Boat Launch		1	2	3
Boat Launch (only)	1	3		4
Public Campground (only)	1			1
Primitive Maintained Campsite		8	1	9
Unmaintained Campsite	1	7	1	9
Shore Access	2	4	1	7
Scenic Location		1		1
Total	5	24	5	34

PCD = Peace Canyon Dam; HH = Hudson's Hope; C = Site C; AB = Alberta Border

Included in the 34 sites is one primitive maintained campsite that was observed by a local resident in the fall of 2008, subsequent to the field assessments. This site (located on an island in the mainstem Peace River within the Hudson's Hope to Site C Stratum) has new-looking amenities (picnic table, outhouse and fire pit), but must have previously been an un-maintained campsite as old fire pits are present. This site has not yet been surveyed, photographed or the coordinates documented (and is not included in Appendix 5) but will be assessed in the summer of 2009.

All 33 recreational sites described in detail are accessible to the public. Although many are accessible by both boat and road most were accessed by boat during the current surveys and are therefore all accessible to the public by boat. At this time we have not determined if road access to some sites requires crossing private land. Of those recreational sites which are maintained, public campgrounds and some boat launches are either maintained by the municipalities or private owners while the primitive maintained campsites are maintained by local users such as the River Rats boating club. The unmaintained campsites, shore access sites, scenic location and some boat launches are not actively maintained (other than occasionally by local users) Details regarding access and maintenance can be found in the individual site descriptions (Appendix 5).

Many types of recreational activities have been confirmed at the identified sites. Camping and fishing were the most popular types of activities as they have been found to occur at 23 and 11 of the 33 recreation sites assessed, respectively (Table 7). Boating occurred at six of the sites while shoreline leisure, canoeing and hunting occurred at four, three and three of the sites, respectively. Picnicking, hiking and snowshoeing have each occurred at two of the sites while birding, cross-country skiing and dog sledding were all known to occur at one of the recreational-use sites.

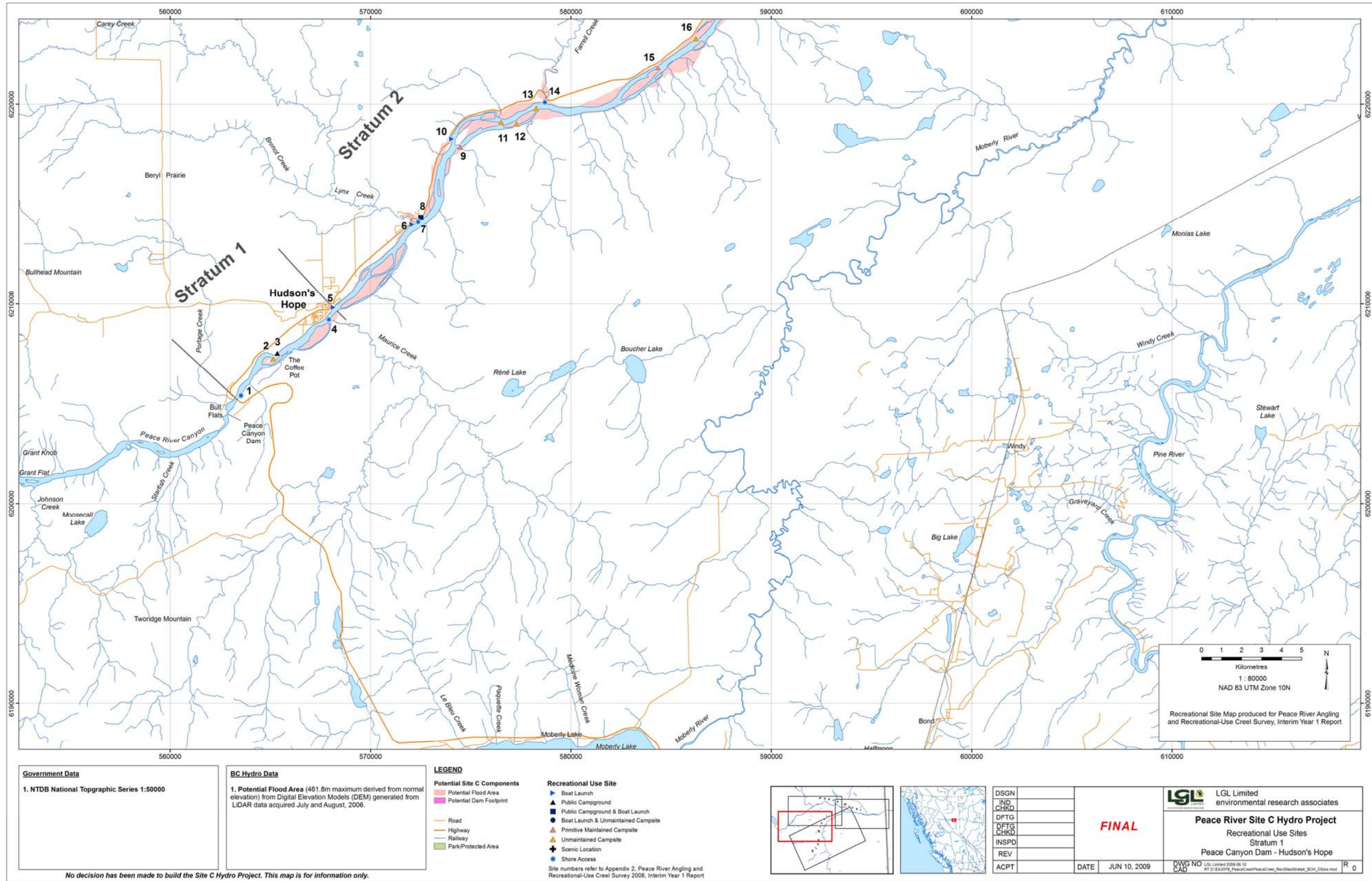


Figure 4. Recreational use sites, classified by type, identified throughout the study area.

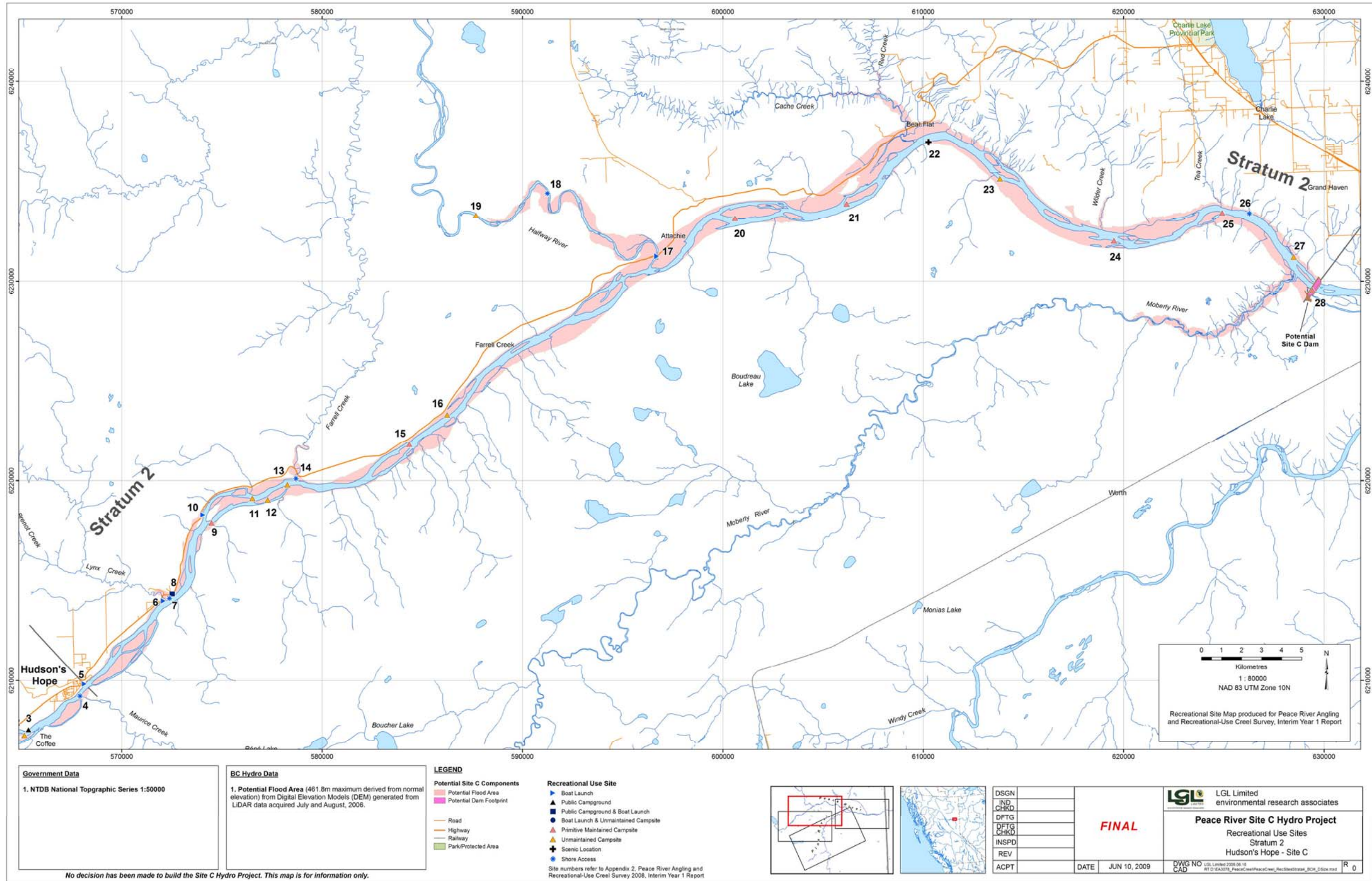


Figure 4 (continued).

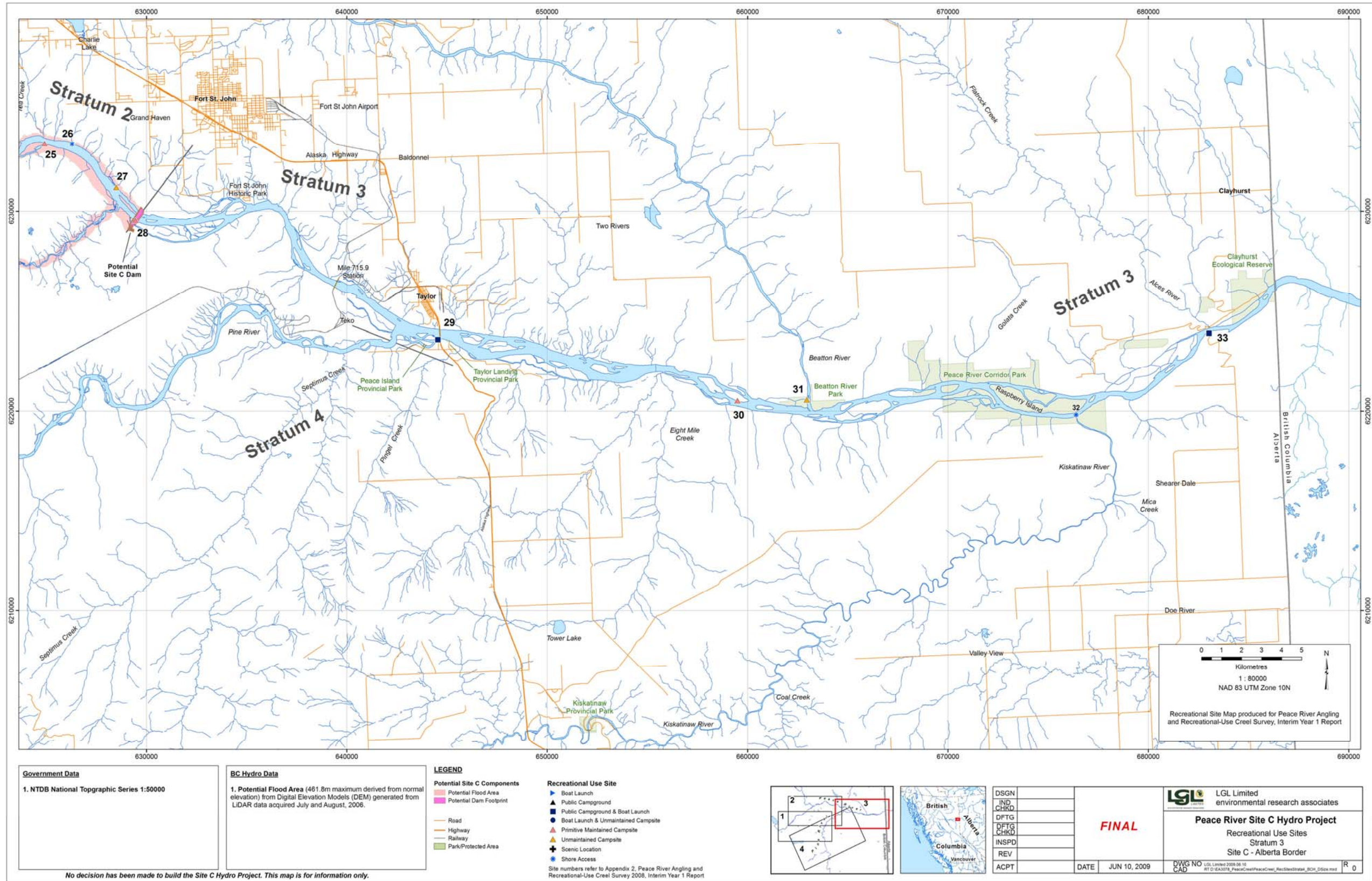


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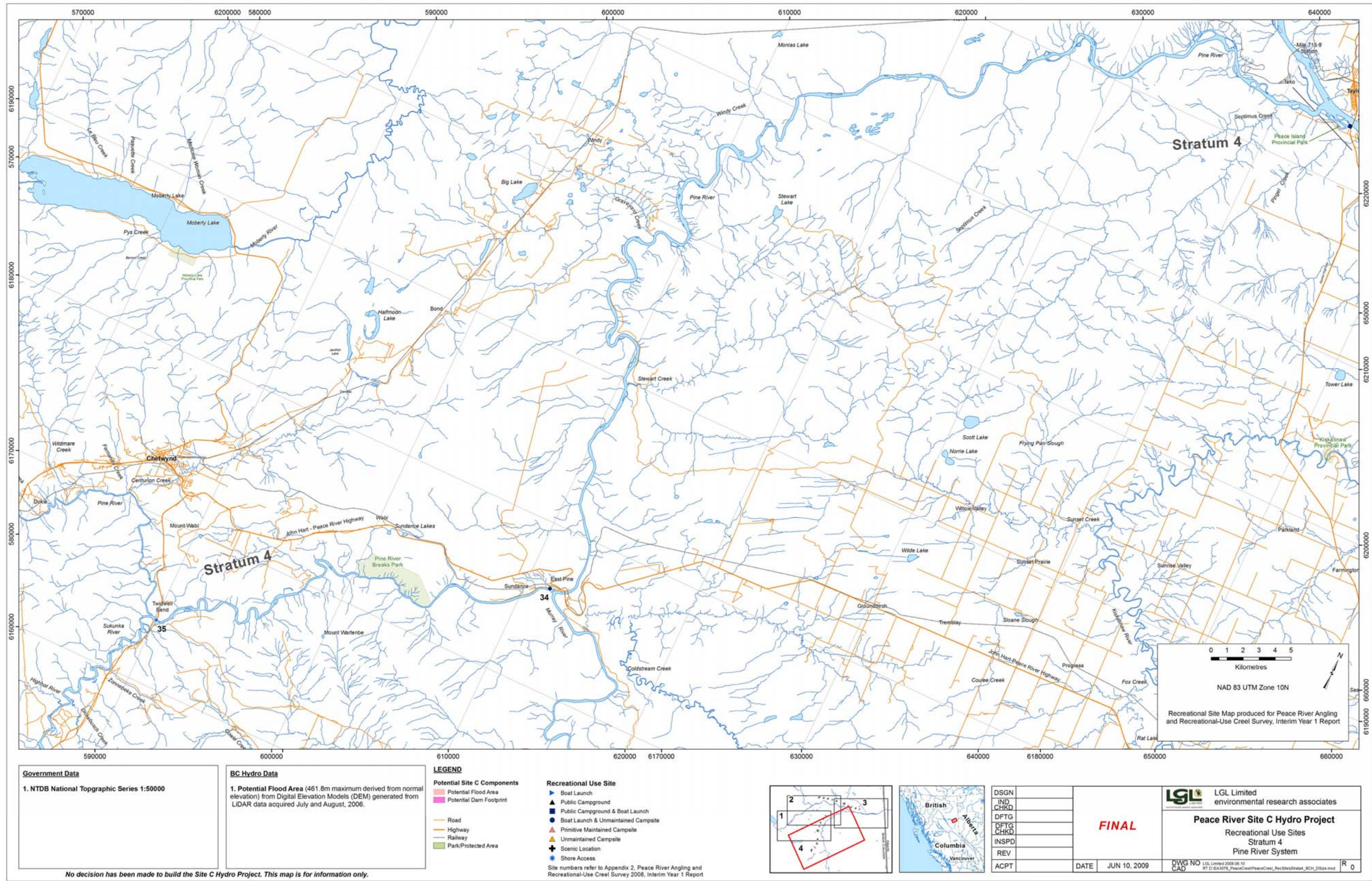


Figure 4 (continued).

Table 7. The total number of sites (33 recreation sites assessed) where each particular activity occurs.

<u>Recreational Activity</u>	<u>No. Rec Sites Where Activity is Confirmed</u>
Fishing	11
Hunting	3
Birding	1
Wildlife Viewing	0
Boating (Jet and Other)	6
Canoeing	3
Kayaking	0
Swimming	0
Plant Gathering	0
Rock / Fossil Hunting	0
Picnicking	2
Camping	23
Hiking	2
Shoreline Leisure	4
ATV Driving	0
Snowmobiling	0
Snowshoeing	2
Cross Country Skiing	1
Dog Sledding	1

Discussions with local recreational groups suggested that activities are occurring in many areas along both the Peace mainstem and the Halfway River, not necessarily at specific sites. The Whiskey Jack Nordic Ski Club, which has 85 members, indicated the Peace Island Park cross country trails are posted for their members. This club estimates there are approximately 300 cross country skiers active in the Peace Valley, and many informal outings occur on un-groomed trails. The club reports that some members do ski along the Peace River, however this often proves difficult as skiers must cross private land. The Northland Trailblazers Snowmobile Club has a membership of 50 people, 20 of which are active members. Snowmobiling does occur along the Peace mainstem in various areas, but trails are sometimes blocked by landowners, and the terrain along the banks is sometimes difficult. The M.O.O.S.E. ATV Club, which has a membership of greater than 100 (current in 2007), has one trail which follows the Peace mainstem just east of Peace Island Park to the confluence of the Beatton River, and another which follows the Halfway River.

In addition to the 34 sites described above, two sites on the Pine River were also identified and assessed (Figure 4; Appendix 5). Within the Pine Stratum, the East Pine and Twidwell Bend sites were assessed as a boat launch & unmaintained campsite and shoreline access site, respectively. Additional Pine River sites will be assessed in 2009.

Guided Services

Of the 2809 anglers and other recreational users that were interviewed, 50 (2%) said they were making use of a guide as part of their activities. The 50 users were in two parties of 25 people each, and were enumerated in two interviews in the summer of 2008 (22 June and 1 July). Both groups were made up of documentary filmmakers, thus were arguably not 'recreational' users, *per se*. No interviewed anglers said that they were making use of guiding services.

Supporting Businesses

As of the end of December, 2008, a total of 143 businesses which may support recreational use in the Peace River area were identified, of which 114 were located in Fort St. John, seven in the District of Taylor and 22 in the District of Hudson's Hope (Table 8). The majority (81) of these were categorized as "Service" and included such business types as food stores, restaurants, sporting goods stores and outfitting / adventure companies. In addition to "Service", businesses classified as "Accommodation" (40) included hotels, motels, bed & breakfasts and campgrounds while those considered "Transportation" (22) included gas stations, RV, all terrain vehicles and snowmobile rental facilities.

Table 8. Total number of businesses that support recreational use along the Peace River, by business type.

Business categories supporting rec use	Municipality			Total
	City of Fort St. John	District of Taylor	District of Hudson's Hope	
Accommodation ¹	26	3	11	40
Service ²	69	3	9	81
Transportation ³	19	1	2	22
Total	114	7	22	143

¹ Accommodation includes hotels, motels, bed & breakfasts, campgrounds, etc.

² Service includes food stores, restaurants, sporting goods stores and outfitting / adventure companies.

³ Transportation includes gas stations, RV, all terrain vehicle and snowmobile rentals.

Recreational Use Surveys

In the eight months of study that are included in this report, 2,809 recreational users were interviewed (Table 9). Based on the percentage of people interviewed who said they were participating in each activity, camping was the most common activity in May (33% of respondents) and June (41%), and jet-boating was the most popular for the rest of the year (36 to 100%). In December, the single person interviewed said he was sightseeing. Fishing was a popular activity until October; and hunting was popular in the fall. In the summer months, swimming, camping, picnicking and shoreline leisure were popular activities.

Fishing was the predominant activity in Stratum one and two; whereas jet-boating was most popular in Stratum three and four (Table 10). In Stratum one, shoreline leisure (19% of respondents) and camping (16%) followed distantly after fishing (52%) in terms of popularity. In Stratum two, camping (34%) and jet-boating (27%) followed fishing (42%). In Stratum three, jet-boating (55%), camping (43%) and shoreline leisure (21%) were the most popular recreational activities. In Stratum four, jet-boating was the main use (87%).

Table 9. The percentage of people interviewed who said they were participating in each activity, by month. The largest values for each month are shown in bold font.

Activity	Month							
	5	6	7	8	9	10	11	12
Fishing	28%	23%	20%	23%	33%	21%		
Hunting	0%				16%	47%		
Birding	5%	0%						
Wildlife Viewing	9%	0%	0%		2%			
Jet boating	26%	19%	57%	47%	36%	71%	100%	
Boating	1%	6%	3%	2%		3%		
Canoeing	1%	4%		1%	2%			
Kayaking	1%	0%	0%	1%	2%			
Swimming		1%	3%	14%	15%			
Plant Gathering		0%						
Rock/Fossil Hunting	3%	0%						
Picnicking	21%	12%	1%	8%	12%	23%		
Camping	33%	41%	47%	32%	35%	3%		
Hiking	2%			2%	4%			
Shoreline Leisure	13%	15%	32%	15%	2%			
Other	8%	13%	4%	2%	8%			100%
People Interviewed	306	691	847	671	214	66	13	1

Table 10. The percentage of people interviewed who said they were participating in each activity, by river-stratum. The largest values for each river stratum are shown in bold font. Abbreviations as in previous tables.

Activity	River-Stratum			
	PCD-HH	HH-C	C-AB	Pine
Fishing	52%	42%	9%	6%
Hunting		3%	2%	1%
Birding	3%	2%	0%	
Wildlife Viewing	3%	3%	1%	0%
Jet boating	8%	27%	55%	87%
Boating	2%	3%	3%	1%
Canoeing		1%	2%	1%
Kayaking	2%	1%	0%	0%
Swimming	1%	2%	6%	5%
Plant Gathering			0%	
Rock/Fossil Hunting	2%	1%		
Picnicking	4%	6%	10%	4%
Camping	16%	34%	43%	8%
Hiking	3%	1%	1%	
Shoreline Leisure	19%	9%	21%	5%
Other	2%	5%	6%	6%
People Interviewed	380	724	1716	614

Recreational use of the Peace River area varied depending on day-type (Table 11). Regardless of day-type, camping and jet-boating were the two most common activities. However, camping was relatively more popular on weekdays; whereas on weekends and holidays, jet-boating was the more popular of the two uses. Fishing and shoreline leisure were relatively insensitive to day-type.

In terms of river access, participants said they used Peace Island Park more than any other site, regardless of month (Table 12) or day-type (Table 13). Of the participants who accessed the river from Peace Island Park, 8% passed the potential Site C location by moving into Stratum 1 or 2; and 35% traveled into the Pine River.

Interviewees were also asked where else they have previously or plan to fish or recreate. The top 6 responses (accounting for around 60% of the choices) were all within the Peace region and included: the Peace River, Pine River, Williston Lake area, Dinosaur Lake, Charlie Lake, and Halfway River (Table 14).

Table 11. The percentage of people interviewed who said they were participating in each activity, by day-type. The largest values for each day type are shown in bold font.

Activity	Day-Type	
	WD	WE
Fishing	20%	24%
Hunting	3%	2%
Birding		1%
Wildlife Viewing	1%	2%
Jet boating	27%	45%
Boating	1%	3%
Canoeing	1%	2%
Kayaking		1%
Swimming	9%	5%
Plant Gathering		0%
Rock/Fossil Hunting	0%	0%
Picnicking	5%	10%
Camping	41%	37%
Hiking	2%	1%
Shoreline Leisure	19%	19%
Other	3%	7%
People Interviewed	706	2103

Table 12. The percentage of people interviewed who said they used each access site, by month. The largest values for each month are shown in bold font.

Access Site	Month							
	5	6	7	8	9	10	11	12
Highway 29 Bridge	8%	4%			1%	5%		
Alwin Holland Park	8%	8%	5%	8%	7%	9%		
Hudson's Hope Launch	13%	1%	5%	1%	1%			
Lynx Creek Launch	10%	12%	11%	4%	8%	3%		
Lynx Creek RV Park	17%	10%	12%	5%	1%			
Farrell Creek Mouth	1%	0%						
Halfway River Bridge	5%	1%	1%	7%		24%		
Peace Island	36%	36%	57%	65%	59%	44%	100%	100%
Clayhurst	8%	11%	6%	4%	1%	15%		
East Pine	1%	1%	3%	1%	6%			
Twidwell Bend	1%			2%	10%			
Sukunka FS Road	1%	16%			3%			
People Interviewed	306	691	847	671	214	66	13	1

Table 13. The percentage of people interviewed who said they used each access site, by day-type. The largest values for each day type are shown in bold font.

Access Site	Day-Type	
	WD	WE
Highway 29 Bridge	3%	2%
Alwin Holland Park	12%	5%
Hudson's Hope Launch	5%	3%
Lynx Creek Launch	7%	10%
Lynx Creek RV Park	8%	9%
Farrell Creek Mouth	1%	
Halfway River Bridge	5%	3%
Peace Island	41%	55%
Clayhurst	12%	5%
East Pine	6%	1%
Twidwell Bend	0%	2%
Sukunka FS Road		6%
People Interviewed	706	2103

Table 14. The number and percent of times other fishing and recreating areas were indicated by respondents as places where they fished/recreated or planned to fish/recreate.

	Fishing		Recreating	
	Count	Percent	Count	Percent
Aberta	3	1.2%	29	4.3%
Alaska	0	0.0%	3	0.4%
Yukon	1	0.4%	4	0.6%
United States	0	0.0%	4	0.6%
Ontario	0	0.0%	1	0.1%
Manitoba	0	0.0%	2	0.3%
Saskatchewan	0	0.0%	3	0.4%
Northern BC	12	4.7%	32	4.8%
Southern BC	1	0.4%	31	4.6%
Peace Region	7	2.7%	32	4.8%
Peace River	61	23.9%	167	24.9%
Beatton River	4	1.6%	5	0.7%
Blackfoot Park	0	0.0%	6	0.9%
Burnt River	2	0.8%	2	0.3%
Cameron Lake	1	0.4%	1	0.1%
Carbon Creek	1	0.4%	1	0.1%
Carp Lake	2	0.8%	1	0.1%
Charlie Lake	18	7.1%	40	6.0%
Chinnamon Lake	2	0.8%	0	0.0%
Chowade River	2	0.8%	0	0.0%
Dinosaur Lake	24	9.4%	40	6.0%
Halfway River	15	5.9%	43	6.4%
Graham River	2	0.8%	2	0.3%
Inga Lake	6	2.4%	6	0.9%
Jones Lake	1	0.4%	0	0.0%
Kchiecwa River	1	0.4%	1	0.1%
Kiskatinaw River	1	0.4%	8	1.2%
Kunuses Falls	1	0.4%	1	0.1%
Lynx Creek	1	0.4%	0	0.0%
Moberly Lake/River	6	2.4%	27	4.0%
Murray River	6	2.4%	15	2.2%
Misichinka	1	0.4%	0	0.0%
One Island Lake	3	1.2%	8	1.2%
Pine River	30	11.8%	64	9.5%
Pine Lake	1	0.4%	0	0.0%
Sukunka River	9	3.5%	9	1.3%
Sundance Lake	1	0.4%	1	0.1%
Swan Lake	1	0.4%	3	0.4%
Williston Lake	15	5.9%	36	5.4%
Wolverine	1	0.4%	0	0.0%
Other Miscellaneous Areas	12	4.7%	43	6.4%
Total	255	100%	671	100%
Top 6 (>5%)	163	63.9%	390	58.1%

Objective 2: Estimates of Angler Effort and Catch

Angler Activity Patterns

Interview data were pooled across months, river strata and fishing access method, resulting in sample sizes of 288 and 424 anglers for weekday and weekend/holiday activity estimates, respectively. The angler activity patterns differed by day-type (Figure 5): On weekdays, angler activity was distinctly bimodal, with activity peaks occurring between noon and 1 PM, and again between 5 and 6 PM. In contrast, angler activity on weekends and holidays was unimodal, with the largest proportions of fishing occurring between 2 and 5 PM.

Catch Per Effort Estimates

In order to obtain adequate sample sizes for CPE estimation, interview data were pooled over day-type, the May data were pooled with June, the October to December data were pooled, and all Pine River data were pooled together. In most cases, the pooled number of interviews was ≥ 3 (Table 4). The exceptions were: the May/June boat anglers in River Stratum 3 ($n=2$); the August boat anglers in River Stratum 1 ($n=0$; CPE for Stratum 2 was assumed); the September boat anglers in River Strata 1 and 2 ($n=0$; CPE for Stratum 3 was assumed); shore anglers in Sept-Dec in River Stratum 3 ($n=0$; CPE for Stratum 2 was assumed); and boat anglers in Sept-Dec ($n=0$; CPE for September was assumed).

After pooling (as described above), CPE estimates were calculated for each species by month, river stratum and access method (Table 15). Examination of the CPE estimates for rainbow trout (the most commonly targeted species) showed a statistically significant effect of river stratum (Figure 6; $\chi^2_3 = 20.2$, $P = 0.0002$). Relatively large differences in the median of the rainbow trout CPE estimates were also observed between shore-based and boat-based anglers, but differences were not statistically significant (access method: $\chi^2_1 = 2.5$, $P = 0.11$). There was no statistically significant effect of month ($\chi^2_4 = 1.0$, $P = 0.92$).

Effort Estimates

From the over-flight data, total angling effort was estimated for each month, day-type, river stratum, and access method (Table 16). The median of the effort estimates differed significantly among months ($\chi^2_4 = 12.3$, $P = 0.02$), among river strata ($\chi^2_3 = 16.2$, $P = 0.001$) and between day-types ($\chi^2_1 = 9.5$, $P = 0.002$; Figure 7). Differences in medians of the angler effort estimates between access methods were not statistically significant ($\chi^2_1 = 0.7$, $P = 0.40$).

Total effort summed across all strata was 24,625 angler-hours, including 6,573 angler-hours from 15 May to 30 June; 4,349 angler-hours in July; 5,485 angler-hours in August, 7,287 angler-hours in September, and 931 angler-hours from 1 October to 31 December (Table 16). Of the estimated 24,625 angler-hours, 9,024 were in the Pine watershed.

Angling effort was mostly shore-based in Stratum 1 (79%) and 4 (63%). In Stratum 2 and 3, effort was more evenly distributed between shore and boats (55% and 50% shore-based, respectively).

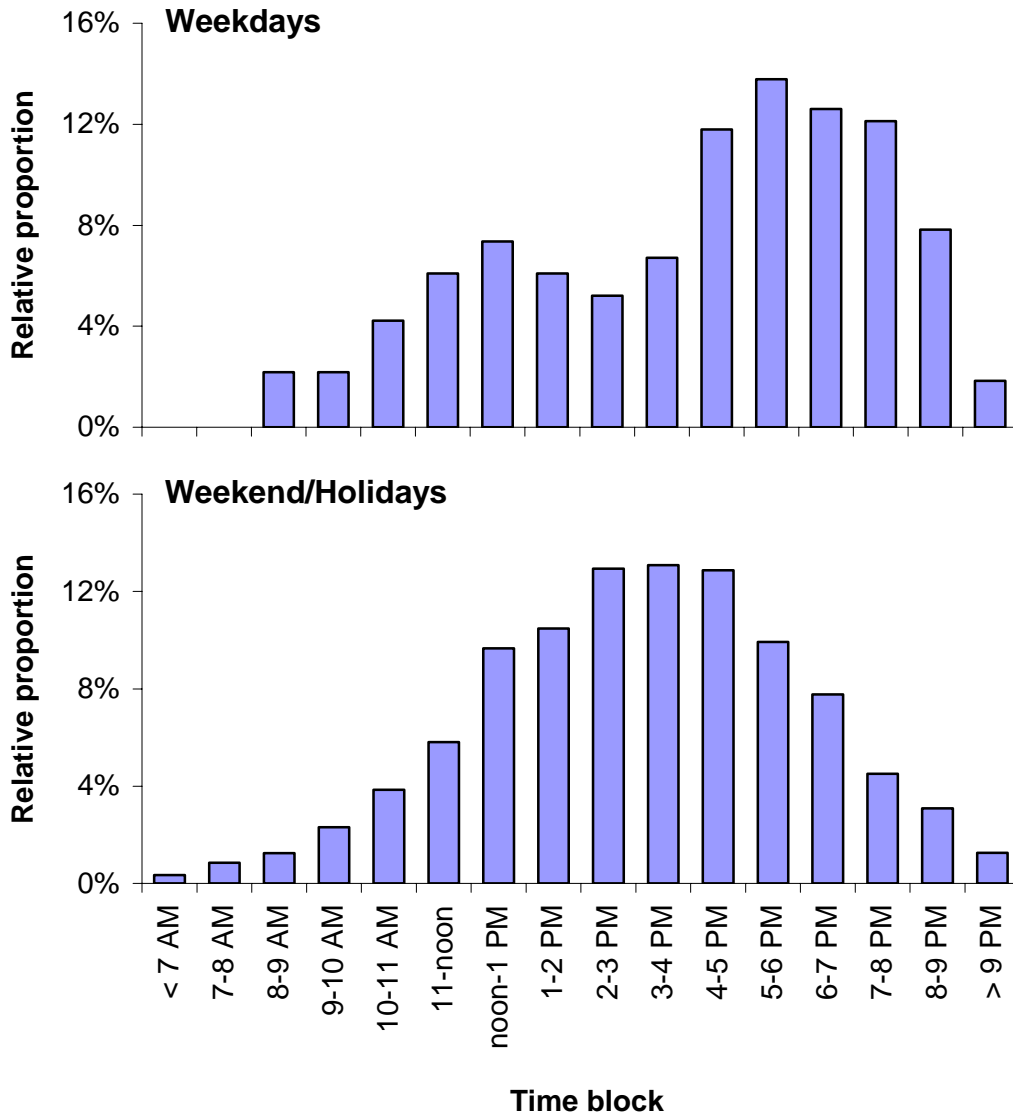


Figure 5. Activity patterns of Peace River anglers on weekdays and weekends/holidays from May to December, 2008. Sample sizes for weekday and weekend/holiday activity estimates were 288 and 424 anglers, respectively. Bars show the relative proportion of the anglers fishing during any one time block.

Table 15. Catch per unit effort (CPE) estimates (fish per angler-hour) for the six most commonly caught sportfish, by month, access method and river stratum. Variance in parentheses.

River	Stratum	Access Method	Species					
			Bull Trout	Arctic Grayling	Mountain Whitefish	Northern Pike	Rainbow Trout	Walleye
PCD-HH	May/June	Boat	0.08 (0.003)	0	0.04 (0.001)	0	0.50 (0.226)	0
	July	Boat	0.10 (0.021)	0	0.05 (0.006)	0	0.15 (0.068)	0
	August	Boat	0.02 (0.001)	0.05 (0.007)	0.01 (0.003)	0.02 (0.003)	0.19 (0.067)	0
	September	Boat	0	0	0.07 (0.184)	0	0.05 (0.002)	0
	Oct-Dec	Boat	0	0	0.07 (0.184)	0	0.05 (0.002)	0
	May/June	Shore	0.02 (0.004)	0	0.04 (0.018)	0.00 (0.001)	0.44 (0.643)	0
	July	Shore	0.02 (0.004)	0	0	0	0.07 (0.004)	0
	August	Shore	0	0	0	0	0.02 (0.000)	0
	September	Shore	0.05 (0.040)	0	0.05 (0.016)	0	0.42 (0.654)	0
	Oct-Dec	Shore	0.11 (0.027)	0	0.15 (0.210)	0.04 (0.167)	0.22 (0.610)	0
HH-C	May/June	Boat	0.06 (0.017)	0.09 (0.038)	0.02 (0.002)	0	0.32 (0.193)	0
	July	Boat	0.08 (0.057)	0.20 (0.239)	0.14 (0.213)	0	0.14 (0.052)	0
	August	Boat	0.02 (0.001)	0.05 (0.007)	0.01 (0.003)	0.02 (0.003)	0.19 (0.067)	0
	September	Boat	0	0	0.07 (0.184)	0	0.05 (0.002)	0
	Oct-Dec	Boat	0	0	0.07 (0.184)	0	0.05 (0.002)	0
	May/June	Shore	0	0	0.01 (0.009)	0.05 (0.004)	0.02 (0.020)	0
	July	Shore	0.04 (0.004)	0.03 (0.001)	0.01 (0.013)	0	0.13 (0.134)	0
	August	Shore	0.09 (0.023)	0	0	0	0.03 (0.011)	0
	September	Shore	0.07 (0.178)	0	0.07 (0.062)	0	0.33 (2.810)	0
	Oct-Dec	Shore	0	0	0.25 (0.066)	0	0	0
C-AB	May/June	Boat	0	0	0	0	0	0
	July	Boat	0	0	0	0.17 (0.454)	0	0.14 (0.289)
	August	Boat	0.02 (0.007)	0.02 (0.006)	0.01 (0.006)	0.07 (0.016)	0.04 (0.032)	0.01 (0.001)
	September	Boat	0	0	0.07 (0.184)	0	0.05 (0.002)	0
	Oct-Dec	Boat	0	0	0.07 (0.184)	0	0.05 (0.002)	0
	May/June	Shore	0	0	0	0.02 (0.800)	0	0
	July	Shore	0	0	0	0	0	0.20 (0.333)
	August	Shore	0	0	0	0.13 (0.037)	0	0
	September	Shore	0.60 (0.480)	0.20 (0.053)	0	0.20 (0.053)	0	1.20 (1.920)
	Oct-Dec	Shore	0	0	0.25 (0.066)	0	0	0
Pine	pooled	pooled	0.12 (0.085)	0.33 (0.750)	0.29 (0.477)	0	0.02 (0.000)	0.02 (0.004)

PCD = Peace Canyon Dam; HH = Hudson's Hope; C = Site C; AB = Alberta Border

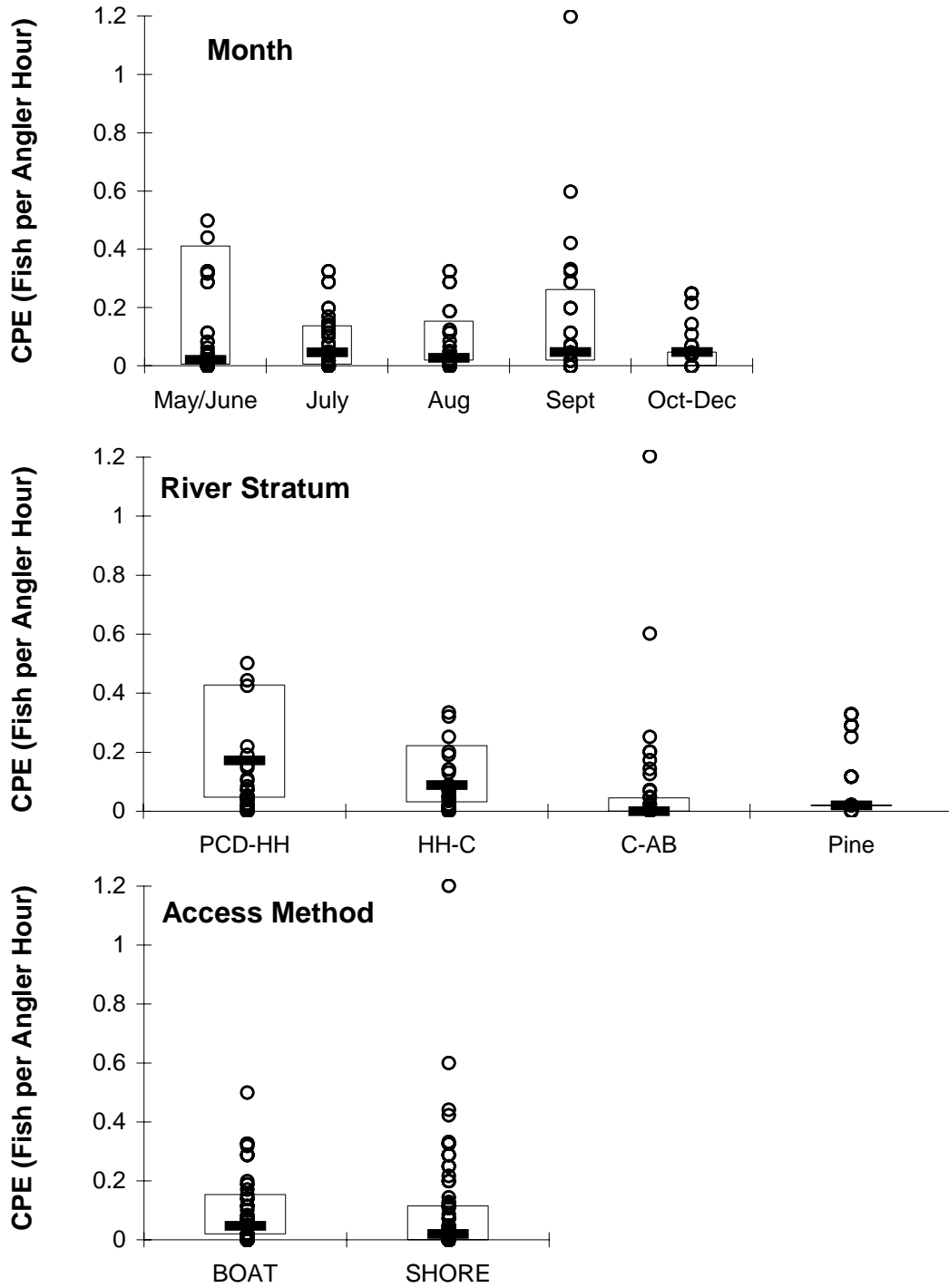


Figure 6. Rainbow trout CPE estimates (fish per angler-hour) by month (upper panel), river stratum (middle panel), and access method (lower panel). Boxes bound the 25th to 75th percentile values; and bold horizontal lines show median values. PCD = Peace Canyon Dam; HH = Hudson's Hope; C = Site C; AB = Alberta Border.

Table 16. Effort estimates (angler-hours), by month, day-type, access method and river stratum. Standard errors in parentheses. Abbreviations as shown in previous tables.

Month	Day Type	Access Method	River Stratum			
			PCD-HH	HH-C	C-AB	Pine
May/June	Weekday	Boat	89 (186)	268 (557)	0	0
		Shore	624 (695)	805 (1259)	0	0
July	Weekend	Boat	249 (315)	906 (674)	205 (367)	61 (109)
		Shore	832 (693)	889 (896)	843 (931)	802 (834)
	Weekday	Boat	0	435 (717)	249 (410)	0
		Shore	62 (102)	275 (312)	0	765 (649)
August	Weekend	Boat	0	242 (363)	60 (91)	0
		Shore	0	880 (637)	23 (35)	1358 (407)
	Weekday	Boat	0	283 (463)	0	128 (210)
		Shore	0	210 (344)	0	298 (488)
September	Weekend	Boat	0	1071 (843)	253 (201)	394 (485)
		Shore	0	833 (762)	356 (276)	1659 (724)
	Weekday	Boat	0	381 (525)	76 (105)	2038 (1946)
		Shore	0	305 (420)	0	0
Oct-Dec	Weekend	Boat	100 (132)	400 (529)	964 (1035)	738 (521)
		Shore	0	1271 (962)	581 (289)	435 (302)
	Weekday	Boat	0	0	0	0
		Shore	0	0	0	0
Weekend	Boat	0	466 (648)	0	0	
	Shore	117 (162)	0	0	348 (483)	

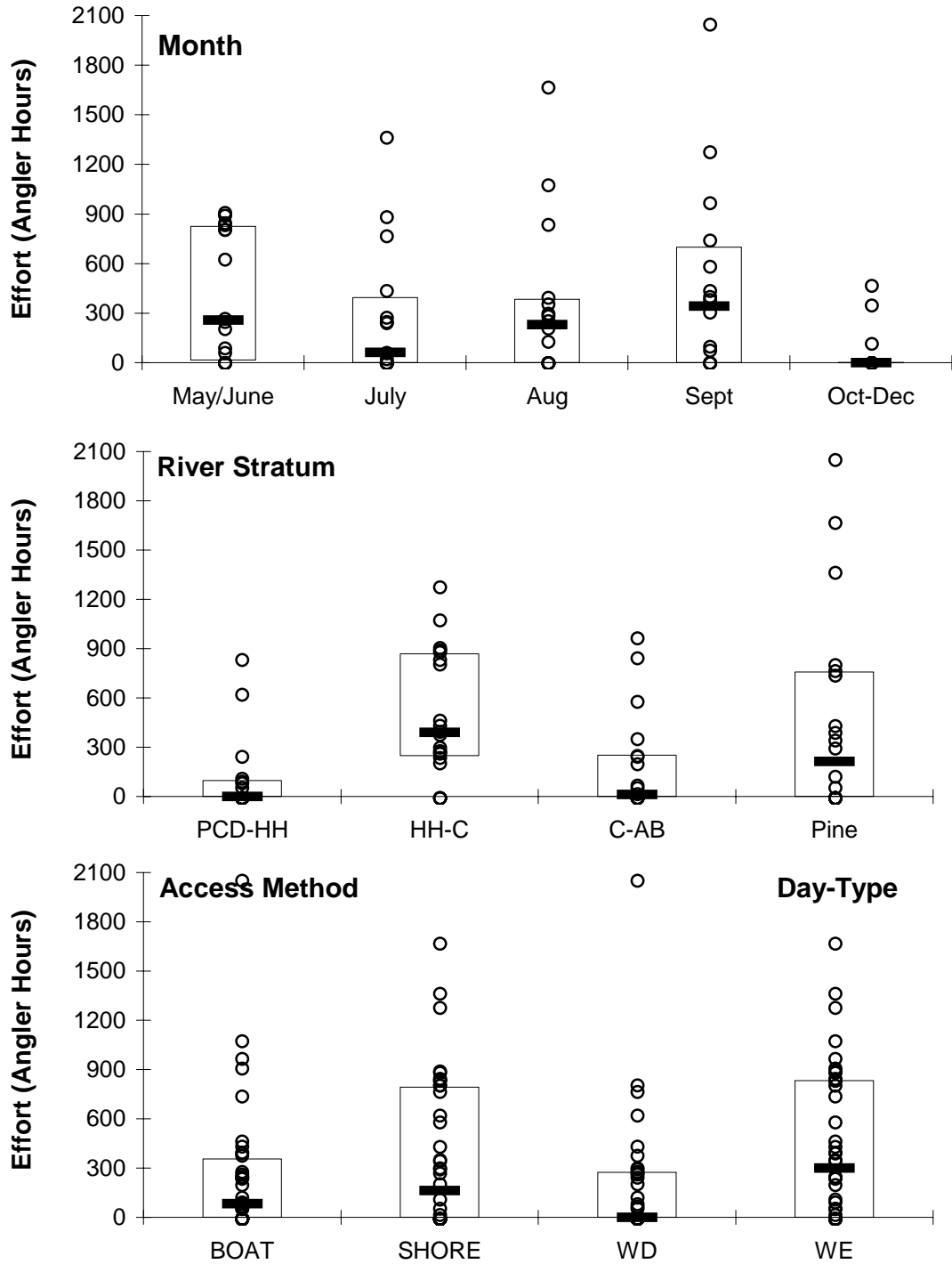


Figure 7. Effort estimates (angler-hours) by month (upper panel), river stratum (middle panel), access method (lower panel), and day-type (lower panel). Boxes bound the 25th to 75th percentile values; and bold horizontal lines show median values. Abbreviations as shown in previous figures.

Catch Estimates

Estimates of total monthly catch were generated by calculating $E \times CPE$, and then summing over day-types (Table 17). Estimation procedures showed that Arctic grayling was the species that was caught in greatest numbers (3,303 fish). The majority (86%) of these fish were caught in the Pine River. Catches increased over the summer, with 12% of the grayling caught in May-June, 26% in July, 27% in August, and 35% in September. No grayling were caught from October to December period, likely because the Pine River was not surveyed during that period. Mountain whitefish was estimated to be the second most frequently caught species (3,121 fish). The geographic and temporal distribution of mountain whitefish catches was similar to that of Arctic grayling (Table 17).

The total catch of rainbow trout, summed across all strata was estimated at 2,604 (Table 17). The distribution of catch estimates across river-strata was strongly skewed to the areas upstream of Site C (33% in Stratum 1; 59% in Stratum 2; 2% in Stratum 3; 6% in Stratum 4). The median of the catch estimates in River Stratum 2 (Hudson's Hope to Site C) was significantly greater than in the other river strata (Figure 8; $\chi^2_3 = 12.4$, $P = 0.006$). Catches of rainbow trout were highest in the May-June period (48%); and 11% of the rainbow trout were caught in July, 14% in August, 26% in September, and 2% from October to December. There were no statistically significant difference in the medians of the rainbow trout catch estimates among months ($\chi^2_4 = 5.7$, $P = 0.23$) or between shore and boat-based anglers ($\chi^2_1 = 0.06$, $P = 0.80$).

The total catch of bull trout was estimated to be 1,841 fish, of which 13% was caught in May-June, 19% in July, 22% in August, 45% in September, and 1% from October to December (Table 17). The majority (54%) of the bull trout were caught in the Pine River, though no differences were statistically significant (month: $\chi^2_4 = 5.5$, $P = 0.24$; stratum: $\chi^2_3 = 7.7$, $P = 0.052$; access method: $\chi^2_1 = 1.58$, $P = 0.21$).

Biosampling

In 2008, interviewers were permitted by anglers to biosample a total of 30 fish of seven species (Table 18). Rainbow trout was the most commonly biosampled fish (n=16), followed by mountain whitefish (n=8). PIT tags were not detected in any of the scanned fish.

After the summer of 2009, a greater number of fish will have been biosampled, permitting more detailed analysis.

Table 17. Estimated catch of the six most common sportfish in four geographic strata in the Peace River watershed, by month (May to December, 2008). Catches are rounded to the closest whole number. Standard errors in parentheses. Abbreviations as shown in previous tables.

River Stratum	Month	Fish Species					
		Bull Trout	Arctic Grayling	Mountain Whitefish	Northern Pike	Rainbow Trout	Walleye
PCD-HH	May/June	62 (32)	0	68 (37)	7 (5)	812 (358)	0
HH-C	May/June	75 (47)	100 (68)	42 (52)	85 (44)	409 (244)	0
C-AB	May/June	0	0	0	17 (385)	0	0
Pine	May/June	100 (90)	282 (264)	249 (218)	0	17 (10)	17 (18)
PCD-HH	July	2 (3)	0	0	0	5 (5)	0
HH-C	July	104 (91)	175 (166)	105 (154)	0	244 (183)	0
C-AB	July	0	0	0	53 (105)	0	49 (96)
Pine	July	245 (129)	694 (379)	612 (307)	0	41 (12)	41 (27)
PCD-HH	August	0	0	0	0	0	0
HH-C	August	114 (79)	70 (44)	12 (23)	23 (25)	293 (187)	0
C-AB	August	6 (8)	6 (7)	3 (7)	62 (61)	11 (17)	3 (3)
Pine	August	286 (192)	811 (565)	715 (462)	0	48 (20)	48 (39)
PCD-HH	September	0	0	7 (30)	0	5 (5)	0
HH-C	September	117 (208)	0	172 (298)	0	562 (864)	0
C-AB	September	349 (275)	116 (92)	73 (265)	116 (92)	49 (43)	697 (550)
Pine	September	370 (294)	1050 (855)	926 (711)	0	62 (35)	62 (58)
PCD-HH	Oct-Dec	13 (17)	0	17 (35)	4 (28)	25 (58)	0
HH-C	Oct-Dec	0	0	33 (144)	0	22 (26)	0
C-AB	Oct-Dec	0	0	0	0	0	0
Pine	Oct-Dec	n/a	n/a	n/a	n/a	n/a	n/a

Table 18. Summary of average weights and lengths of fish that were caught by anglers and biosampled from May to December 2008, by species.

Species	Sample Size	Average Fork Length (cm)	Average Weight (g)
Rainbow Trout	16	36.5	447.8
Mtn. Whitefish	8	34.7	348.8
Bull Trout	2	45.5	840.0
Grayling	1	32.0	368.6
Lake Trout	1	46.0	780.0
Northern Pike	1	67.0	2060.0
Walleye	1	39.0	530.0

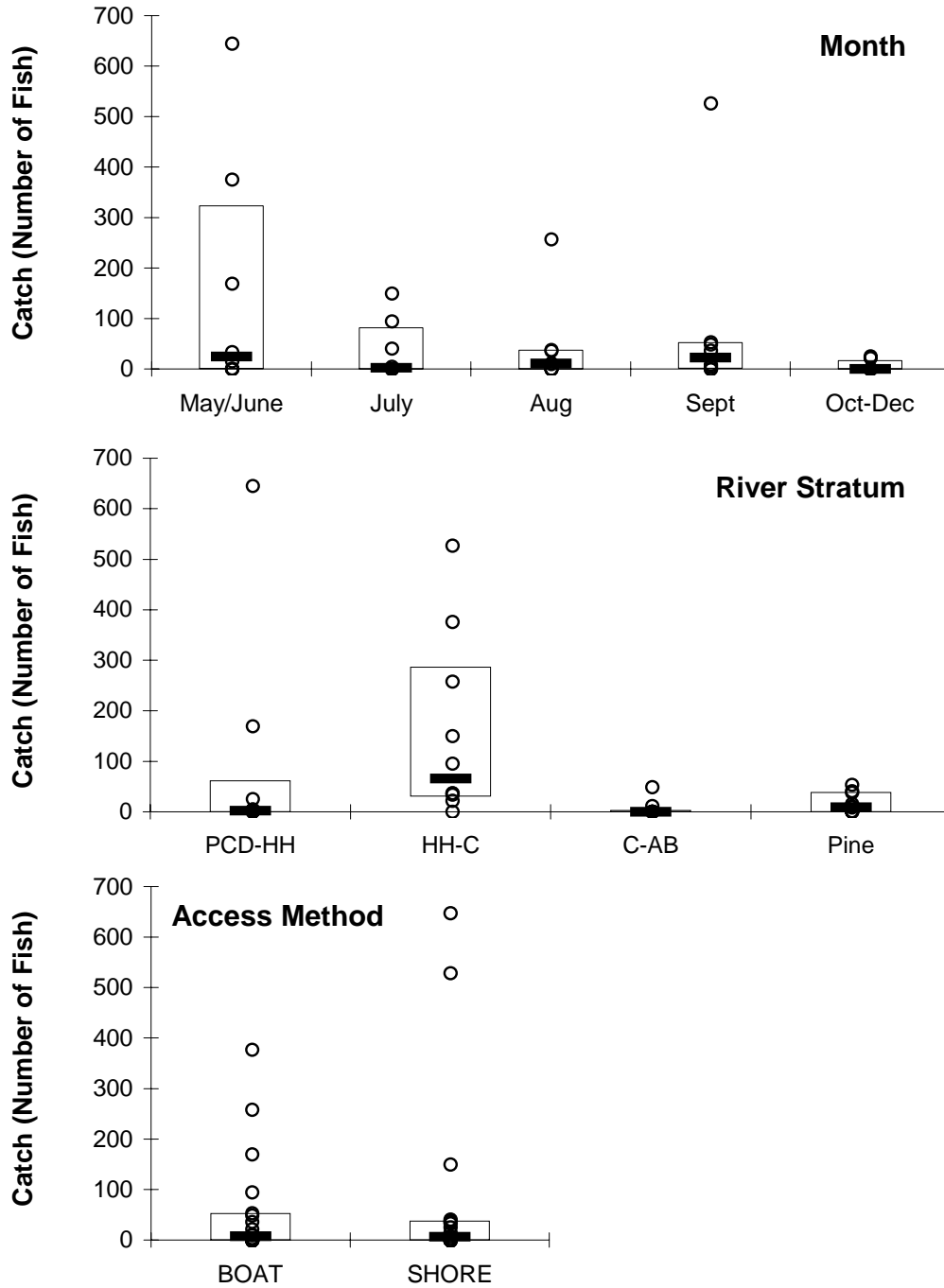


Figure 8. Rainbow trout catch estimates (number of fish per month) by month (upper panel), river stratum (middle panel), and access method (lower panel). Boxes bound the 25th to 75th percentile values; and bold horizontal lines show median values. Abbreviations as shown in previous figures.

DISCUSSION

Objective 1: Recreational/Angler Use

Recreational Site Assessments

The majority (24) of recreational use sites have been documented within the potential inundation zone of Site C. Within this stratum, all types of sites were present with the exception of public campgrounds, and all types of activities that were documented throughout the entire study area occur, with the exception of dog sledding (cross country skiing most likely occurs). This current assessment of 24 sites is comparable with past studies which have identified 40 (includes known sites and additional locations with evidence of some type of continuous use), six and 24 sites (Edwin Reid & Associates Ltd. 1979, DPA 1981a and MacLaren Plansearch Corp. 1991, respectively) with regard to potential affects from Site C. Some of the current sites assessed were also identified in these past studies, such as the Halfway River Bridge Boat Launch, which was identified in all three studies, while others were only noted in some, such as Farrell Creek (DPA 1981a, MacLaren Plansearch Corp. 1991). A portion of the current sites, in particular primitive campsites, unmaintained campsites and shore access sites, were not previously described. It is possible some of the current sites were described in these past studies however as detailed mapping and location descriptions were often lacking it is difficult to confirm this. Similar to our results, these previous reports also identified campsites as the most common type of site occurring; others included boat launches, view points, picnic areas and springs. Unlike the current study, site descriptions in previous studies rarely mentioned fishing as an activity.

Determining the types of activities that occur at the identified recreational use sites was difficult as users may not have been visiting the site or partaking in the particular activity on the day of the field assessments. This proved to be most difficult for winter activities, as field assessments were not done during this season and many sites experience less use during the winter, hence discussions with local residents were less likely to reveal these uses. Recreational use during the winter season is inherently more difficult. Access is often an impeding factor as snow levels are a constraint at many sites. Also, sites which are only used during winter may not have been identified, since fewer local residents are aware of them. Due to these factors, it was particularly important to hold discussions with local recreational groups and residents to determine where and how often the activities occurred throughout the study area. These discussions suggested that recreational activities occur in many areas along both the Peace mainstem and the Halfway River, in particular for the winter-based activities which may span more than designated sites.

While the recreational use site assessments indicate the majority of sites occur within the inundation zone (Hudson's Hope to Site C Stratum), the recreational surveys remind us that various recreational activities occur throughout all strata.

Recreational Use Surveys

The results of the recreational use surveys indicated that camping and jet-boating were the most popular summer-time recreational activities in the Peace River area. Camping appeared to be more popular in the spring/early summer and on weekdays; whereas Jet-boating was more popular in the late summer/fall, on weekends, and was especially popular in River Stratum 3 (the Peace River downstream of Site C) and 4 (Pine River).

Fishing, as a recreational activity, appeared to be of relatively constant popularity (20 to 33% of respondents) from May until October (regardless of day-type). As observed previously (DPA 1991), fishing activities occur mainly in the areas upstream of Site C. Angling activities in Stratum 2 (the Site C inundation zone) were divided fairly evenly between shore-based and boat-based effort.

The Peace River, Pine River, Williston Lake area, Dinosaur Lake, Charlie Lake, and Halfway River were the most frequently (~ 60%) mentioned locations where people encountered in the study area stated they have preliminary or planned to fish or recreate (Table 14).

Objective 2: Estimates of Angler Effort and Catch

Confidence Limits

The creel analysis has produced estimates with a relatively low level of precision. In many cases, the standard errors of estimates are as large as the estimates themselves (Table 17). To understand why, it is important to understand that the variance in the catch estimates result from two factors: 1) the natural variability within the population; and 2) the sampling error. In the present study, both factors played important roles in generating variability in the estimates.

The natural variability in catch rates is such that they tend to follow a negative binomial distribution: most catches are of zero fish; and the larger the catch the rarer the event. For example, the rainbow trout CPE for the Peace River study area was 0 fish per angler-hour for 137 of the 189 angler parties interviewed, <1 fish per angler-hour for 42 other parties, was >1 for only seven parties, and a single group had catch rates over five fish per rod-hour. If catches always tended to be the same, then there would be considerably less variability in the CPE estimates. However, given the wide range of possible outcomes for a fishing event, it is difficult to predict with confidence how many fish an angler is going to catch. This difficulty translates into wide confidence limits around the any estimate of total catch.

Sampling error is the other main source of estimation error. As with any sampling program, the confidence you have in your final estimate is greater when a larger proportion of population has been sampled. In this study, the number of interviews was <64 (i.e., four interviews for each of the 16 “day-type × access-method × river-stratum” categories) for all survey months (Table 4). With catches expected to be widely variable, it follows that estimates drawn from a sample of $n \leq 4$ would be low. One solution is to

pool data among categories, but this is not ideal since we know a priori that catch rates differ among months, among river-strata, and between boat and shore-based anglers. The other solution is to increase interviewing and over-flight effort. To simulate a doubling of survey effort, all interview and over-flight data was copied twice into the model platform, which resulted in a reduction of total catch standard error from 85% down to 51%. Thus, standard errors will still be relatively large, even if sampling effort is doubled (note also that this exercise underestimates confidence limits because natural variability has been artificially 'reduced' by using the same data twice).

Creel Results

Total angling effort was estimated for the eight month period from May to December, 2008 to be 24,625 angler-hours (SE = 24,093). This estimate included 15,601 angler-hours in the Peace mainstem (SE = 16,935), and 9,024 in the Pine watershed (SE = 7159). In 1989-1990, DPA (1991) conducted a creel survey of the Peace mainstem, and found similar results: a total of 18,510 angler-hours between Peace Canyon Dam and Taylor. On the other hand, our and DPA's results contrast strongly with those of Hammond (1986). Hammond (1986) estimated total angling effort for a limited part of our study area (from the Peace Canyon Dam to Farrell Creek) over a five month period (June to October, 1985) to be 16,898 angler-hours: a value greater than what we found for the entire Peace River. It is important to note that our confidence limits are large (the standard error is greater than the estimate), and Hammond's calculation methods are not described, thus the reasons for the differences between reports cannot be determined.

Total catch was estimated to be 12,212 fish, including 5,451 in the Peace mainstem (Table 17). Mainstem catches were dominated by rainbow trout (2,437 fish), bull trout (840 fish) and walleye (749 fish; Table 17). Mainstem catches of mountain whitefish and Arctic grayling were estimated to be 532 and 467, respectively. Hammond (1986) reported a similar dominance by rainbow trout, but found whitefish to be the species caught next most frequently. Hammond (1986) does not mention walleye, and reported bull trout and Arctic grayling catches to be very minor, likely due to the location of his study area in the upstream sections of our area. DPA (1991) reported mountain whitefish to be the species most commonly caught, followed by rainbow trout and Arctic grayling. Interestingly, DPA (1991) reported that kokanee was caught more often than walleye. In our study, no kokanee catch has been recorded.

The creel analysis produced several surprising results, which are discussed below. In particular, we discuss the catch estimates of zero fish for River Stratum 1 in August; the lack of interviews with shore-based anglers on July weekend days in River Stratum 3; and the catches that were estimated in the Pine in August, which are based on very limited angler interview data.

A catch of zero fish was estimated for River Stratum 1 in August (Table 17). In this case, no anglers (boat or shore-based) were observed on either day-type during over-flights (Table 16). However, effort has clearly been underestimated since seven interviews were obtained in River Stratum 1 in August. Nevertheless, in all eight of these interviews, catch was reported as zero, thus the total catch estimate is likely correct, despite the

underestimated effort. According to our interviewer staff, discharge from the Peace Canyon dam in August made angling difficult, as “the Fingers were not showing” (Merv Vaadeland, JWA, pers. comm.).

One unexpected result was the lack of interviews with shore-based anglers on July weekend days in River Stratum 3. As usual for July, three interview shifts were scheduled for each day-type in each of the three mainstem river strata (Table 2). For weekend days in River Stratum 3, two shifts were scheduled for the Peace Island boat launch (5 and 26 July), and one was scheduled for Clayhurst (27 July). Although the Clayhurst interview shift did not occur (due to a change in interviewer staff), both Peace Island shifts were performed. However, one of these shifts (5 July) was during the “River Rats” jet-boating event: a total of 362 recreational users were interviewed, but the number of anglers (either interviewed or not) was zero for the day. During the second Peace Island shift (26 July), 19 anglers were interviewed, all of which were boat-based, and 14 anglers were not interviewed. The majority of these latter anglers would have been shore-based, observed fishing on the opposite bank of the river, thus not accessible for interview. Additional effort will be required in 2009 to ensure that an adequate number of shore-based anglers get interviewed in River Stratum 3 during weekend days in July.

Catch estimates for the Pine River stratum were derived by pooling all the CPE values for that area because of the limited number of angler interviews (Table 17). The relatively large catch estimates for August reflect the high effort estimates for that month. Boat-based effort in August in the Pine (522 angler-hours; Table 16) was elevated relative to that during the previous months (0 in July, 61 in May/June). Shore-based angling effort in August (1,957 angler-hours) was similar to that in July (2,123 angler-hours), but much greater than in May/June (802 angler-hours). Lower effort in the Pine in the earlier months was in part a result of extreme high water and turbid conditions that made fishing very difficult. There were also catch restrictions on bull trout that may have influenced fishing. Also, the poor quality of fishing below Peace Canyon Dam in August may have resulted in anglers shifting to the Pine. However, since the CPE estimate was likely unreliable for each month, the resulting catch estimates are equally unreliable. Angler interview effort along the Pine River would have to be substantially increased if reliable catch estimates are desired for this area.

Biosampling

In 2008, too few fish of each species were biosampled for strong conclusions to be drawn. Ideally, many more fish will be biosampled in 2009.

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Appendix 1. Example of a Recreational Amenity Survey.

Page 1

Peace River Recreational Area Survey

Form #: 4

Surveyor: MM & LS

YEAR 2008

Location of Survey: Lynx Creek RV Park (Site #5)

Date: 22-Aug

Stratum of Survey: Hudson Hope - Site C (Stratum 2)

Time: 14:03 - 14:34

GPS Coordinates: 5a - access from Highway 29

5b - boat landing

Photo #s: 103 - 104, 108, 109: boat launch; 105 - 107: shoreline

110 - 118: campground

Type of Recreational Area¹: boat access, shoreline access, campsite, picnic area

Confirmed Rec area uses (summer and winter²): fishing, camping, hiking, picnicking, shoreline leisure, birding, snow shoeing

Constraints on rec use³: boat launch / shore access is not plowed in the winter therefore access to the shore would be difficult in deep snow

Access to site: dirt road from Highway 29

Condition of site: well maintained campground, boat launch in decent shape although not a paved launch

Access to water⁴: boat launch

If boat ramp access, type of ramp⁵: grassy slope with embedded rock on a moderate incline

Size/type of boat which can be launched: no obvious restriction, potentially size, width of launch at shoreline is 6m

Peace River Recreational Area Survey

If angling area, type of angling⁶: shoreline or boat angling

Potential hazards to users: N/A

If campground, type of campground⁷: public campground

If campground, type of access: road access from Highway 29

If campground, # of camping sites: 24 sites plus field for tents

If campground, approximate area: ~150m x 500m

Facilities available:

RV service (Y/N): Y (22 sites)

washroom / pit toilet (Y/N): Y (fully functional washroom with showers)

tent pad (Y/N): N

fire pit (Y/N): Y

picnic tables (Y/N): Y

refuse collection (Y/N): Y

Other (please describe): other features present such as playground, horseshoe pits, volleyball net

Shoreline type⁸: grassy shore (some cobble)

Bank direction of river access⁹: North bank of Peace River

Other Comments:

Boat launch may get muddy and rutted if used when wet.

Discussions with campground owner indicated snowshoeing occurs in the winter and cross country skiing is possible but has not been observed.

¹ Type of rec areas: boat access, shoreline access, campsite, picnic area, trail, cabin

² Potential rec area uses: fishing, hunting, birding, wildlife viewing, jet boating, other boating, canoeing, kayaking, swimming, plant gathering, rock / fossil hunting, picnicking, camping, hiking, shoreline lesiure, quad driving, snowmobiling, snowshoeing, cross country skiing, dog sledding and other (please describe)

³ Constraints on rec use: reasons for difficulties accessing property, seasonal constraints, other (please describe)

⁴ Access to water: trail down bank, boat ramp, no trail / bushwhacking down bank, other (please describe)

⁵ Type of ramp: paved, dirt, informal, other (please describe)

⁶ Type of angling: shoreline or boat

⁷ Type of campground: public, primitive maintained, unmaintained / non descript

⁸ Shoreline type: rocky, sandy beach, other (please describe)

⁹ Bank direction: i.e. south bank of Peace River

Appendix 2. Recreational Use Survey Form.

Peace River Recreational Use Survey						Form #:
Surveyor:			YEAR			2008
Location of Int:		#:	Date:			
Stratum of Int:			Time:			
# of Recreational Use Participants in Party:						
Type of Activity:	Water	Y	Land	Y	Guided: Y / N	
Residence:	Peace	B.C.	Rest of Canada	U.S.	Other	
Age:						
Time of Activity **TODAY						
	Before 7		10 - 10:59		2 - 2:59	6 - 6:59
	7 - 7:59		11 - 11:59		3 - 3:59	7 - 7:59
	8 - 8:59		12 - 12:59		4 - 4:59	8 - 8:59
	9 - 9:59		1 - 1:59		5 - 5:59	After 9
Access Site Used:	1	2	3	4	5	6
	7	8	9	10	11	12
Stratums Used:						
River Locations:						
Today's Activity:						
Fishing						
Hunting						
Birding						
Wildlife Viewing						
Jet Boating						
Other Boating						
Canoeing						
Kayaking						
Swimming						
Plant Gathering						
Rock/Fossil Hunting						
Picnicking						
Camping						
Hiking						
Shoreline Leisure						
Other						
Completed Trip?: Y or N						
Time of Activity ** YESTERDAY						
	Before 7		10 - 10:59		2 - 2:59	6 - 6:59
	7 - 7:59		11 - 11:59		3 - 3:59	7 - 7:59
	8 - 8:59		12 - 12:59		4 - 4:59	8 - 8:59
	9 - 9:59		1 - 1:59		5 - 5:59	After 9
Where else have you recreated or plan to recreate this year?						

Comments:						

Community From:						

Appendix 3. Angling Effort Data Form.

Peace River Angling Effort Data - 2008

Surveyor (s):	<hr/>	Form #:	<hr/>				
Weather	<hr/>						
Date:	<hr/>	* Be sure to record the number of anglers separately:					
Stratum 1: PCD - HH							
Sub Stratum	1	2	3	4	5	6	7
Start Time							
End Time							
# Shore Anglers							
# Boat anglers							
# Rec Users							
Stratum 2: HH - Site C							
Sub Stratum	1	2	3	4	5	6	7
Start Time							
End Time							
# Shore Anglers							
# Boat anglers							
# Rec Users							
Stratum 3: Site C - AB							
Sub Stratum	1	2	3	4	5	6	7
Start Time							
End Time							
# Shore Anglers							
# Boat anglers							
# Rec Users							
Stratum 4: Pine							
Sub Stratum	1	2	3	4	5	6	7
Start Time							
End Time							
# Shore Anglers							
# Boat anglers							
# Rec Users							
Comments:	<hr/>						
	<hr/>						
	<hr/>						
	<hr/>						
	<hr/>						

Appendix 4. Creel Survey Form.

Peace River Creel Project						Form:			
Surveyor:						Year 2008			
Location of Int: _____ #: _____				Date: _____					
Day Type: _____				Time: _____					
# Anglers (Lines) in Today's Party:									
Type of Fishing:	Boat	Y	Shore	Y	Guided: Y / N				
Residence:	Peace	B.C.	Rest of Canada	U.S.	Other				
Age:	A:	B:	C:	D:	E:	F:	G:		
Times lines were in the water ** TODAY									
	Before 7		10 - 10:59		2 - 2:59		6 - 6:59		
	7 - 7:59		11 - 11:59		3 - 3:59		7 - 7:59		
	8 - 8:59		12 - 12:59		4 - 4:59		8 - 8:59		
	9 - 9:59		1 - 1:59		5 - 5:59		After 9		
	Site 1		Site 2		Site 3				
Stratum Fished:	#	#	#	#	#	#	#		
River Location Fished:	#	#	#	#	#	#	#		
Hours Fished:									
Today's Catch:	Kept	Rel.	Kept	Rel.	Kept	Rel.			
Rainbow									
Bulltrout									
Walleye									
Grayling									
Mtn Whitefish									
Lke Whitefish									
Kokanee									
Lake Trout									
Goldeye									
Northern Pike									
Target Species:	RB	BT	WA	GR	WF	KO	LT	GE	NP
Completed Trip? :	Y	or	N	Catch seen? :	Y	or	N	or	N/A
Times lines were in the water ** YESTERDAY									
	Before 7		10 - 10:59		2 - 2:59		6 - 6:59		
	7 - 7:59		11 - 11:59		3 - 3:59		7 - 7:59		
	8 - 8:59		12 - 12:59		4 - 4:59		8 - 8:59		
	9 - 9:59		1 - 1:59		5 - 5:59		After 9		
Where else have you fished or plan to fish this year?									

Comments:									

Bait used: _____ Community From: _____									

Appendix 5. Summaries of Recreational Use Sites.

1. Highway 29 Bridge

Date surveyed: August 23, 2008

Photo numbers: Photos 1 – 4

GPS coordinates: N55 59.379 W121 58.893

Stratum: 1

Location: Off of Highway 29 Bridge, southwest of Hudson's Hope.

Type / Description: Shoreline access.

Access: Parking at the southwest end of the Highway 29 Bridge, trail to river.

Confirmed recreational use: Fishing.

Possible constraints on rec use: High water levels can impede shoreline access (both use of the river trail and shoreline). Deep snow can cause the site to be inaccessible.

Type of boat launch: N/A

Possible angling types: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Rocky / shale shoreline.

Bank direction of river access: South bank of Peace River.

Potential hazards to users: Water levels can fluctuate quickly due to the close proximity of the Peace Canyon Dam, swift water currents present, bank trail is treacherous footing.

Photo 1. Shoreline access at Highway 29 Bridge site.



Photo 2. Access trail from parking area at Highway 29 Bridge to shoreline access.



Photo 3. Highway 29 Bridge site potential hazard: warning sign indicating dam upstream, river can rise quickly.



Photo 4. Highway 29 Bridge site potential hazard: treacherous footing on bank trail.



2. *Unmaintained Campsite A*

Date surveyed: September 12, 2008

Photo numbers: Photos 5 – 6

GPS coordinates: N56 00.362 W121 57.313

Stratum: 1

Location: Site is located on an island in the Peace River, just upstream of Alwin Holland Memorial Park.

Type / Description: Unmaintained campsite, also shoreline access and picnic area.

Access: Boat access only.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter, swift currents and rapids nearby could impede non motorized boating.

Type of boat launch: N/A

Possible angling types: Shoreline and boat angling.

Campground details: No maintained campsites, beach area to set tents approximately 18x77m, could also set up tents in surrounding forest. Homemade fire pits, homemade tables and old style outhouse area present.

Shoreline type: Rocky shoreline.

Bank direction of river access: East bank of an island in the Peace River.

Potential hazards to users: Water levels can fluctuate quickly due to the close proximity of the Peace Canyon Dam, swift currents and rapids.

Photo 5. Unmaintained Campsite A.



Photo 6. Old style outhouse area at Unmaintained Campsite A.



3. *Alwin Holland Memorial Park*

Date surveyed: August 23, 2008

Photo numbers: Photos 7 – 11

GPS coordinates: N56 00.516 W121 57.110

Stratum: 1

Location: Bodeker Street, off of Highway 29, Hudson's Hope BC.

Type / Description: Public campground, site is also used for shoreline access, picnic area and trails.

Access: Park is drive-in access from Highway 29, water access occurs from several small bush / bank trails.

Confirmed recreational uses: Camping, fishing, and picnicking.

Possible constraints on rec use: Not plowed during winter so difficult access, swift currents and rapids nearby could impede non motorized boating.

Type of boat launch: N/A

Possible angling types: Shoreline and boat angling.

Campground details: The campground is operated and maintained by the District of Hudson's Hope. A total of 12 campsites are present, some have fire pits and picnic tables. Pit toilets and refuse collection available and BBQ pits available for campers or day users of the park.

Shoreline type: Rocky / bedrock shoreline.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: Water levels can fluctuate quickly due to the close proximity of the Peace Canyon Dam, swift water currents present, steep drop offs along river banks.

Comments: A total of 154 camping units were purchased in 2008.

Photo 7. Shoreline access at Alwin Holland Memorial Park.



Photo 8. Typical bush / bank trail to access the Peace River at Alwin Holland Memorial Park.



Photo 9. Alwin Holland Memorial Park campsite.



Photo 10. Alwin Holland Memorial Park picnic area.



Photo 11. Alwin Holland Memorial Park potential hazard: steep drop offs.



4. *Confluence of Maurice Creek*

Date surveyed: September 12, 2008

Photo numbers: Photo 12

GPS coordinates: N56 01.396 W121 54.618

Stratum: 1

Location: Confluence of Maurice Creek.

Type / Description: Shoreline access.

Access: Drive in access from the second access road on the North side of Highway 29 after crossing the Highway 29 Bridge (South bank of the Peace River).

Confirmed recreational use: Camping.

Possible constraints on rec use: Not plowed during winter so difficult access.

Type of boat launch: N/A

Possible angling types: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Rocky shoreline.

Bank direction of river access: South bank of the Peace River.

Potential hazards to users: Access road often in poor condition.

Photo 12. Maurice Creek confluence shoreline access.



5. *Hudson's Hope Boat Launch*

Date surveyed: August 23, 2008

Photo numbers: Photo 13

GPS coordinates: N56 01.726 W121 54.397

Stratum: 1

Location: D.A. Thomas Road, Hudson's Hope, BC.

Type / Description: Boat launch, also shoreline access.

Access: Launch is accessible via D.A. Thomas Road, water access occurs via the boat

launch.

Confirmed recreational uses: Fishing, camping and boating.

Possible constraints on rec use: Boat launch is not plowed during the winter and may require 4 wheel drive vehicle when road is wet.

Type of boat launch: Gravel ramp, width of 13m, no restriction on size or type of boat to launch.

Possible angling types: Shoreline angling (boat angling difficult if other boats launching).

Campground details: N/A

Shoreline type: Rocky shoreline.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: N/A

Comments: Homemade fire pits present.

Photo 13. Hudson's Hope boat launch.



6. *Lynx Creek Boat Launch*

Date surveyed: August 22, 2008

Photo numbers: Photo 14

GPS coordinates: N56 03.923 W121 50.537

Stratum: 2

Location: Off of Highway 29, northeast of Hudson's Hope.

Type / Description: Boat launch, also shoreline access. Boat launch is maintained by the District of Hudson's Hope.

Access: Launch is accessible off of Highway 29. Water access occurs via the boat launch, rock wall kicker adjacent to boat launch used for fishing.

Confirmed recreational uses: Fishing and boating.

Possible constraints on rec use: May be difficult to access due to snow levels.

Type of boat launch: Concrete ramp, width of 9m, no restriction on size or type of boat to launch.

Possible angling types: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Rocky shoreline.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: Swift water currents.

Photo 14. Lynx Creek Boat Launch.



7. *Shoreline Access A*

Date surveyed: September 12, 2008

Photo numbers: Photo 15

GPS coordinates: N56 03.993 W121 50.245

Stratum: 2

Location: Off of Highway 29, between Lynx Creek Boat Launch and Lynx Creek RV Park.

Type / Description: Shoreline access.

Access: Shoreline is drive in access from Highway 29.

Confirmed recreational use: Shoreline leisure.

Possible constraints on rec use: Unlikely this gets plowed unless being used for water trucks. Dirt road extends to shoreline but is very wet and muddy therefore unlikely this is used as a launch.

Type of boat launch: Not a true launch.

Angling: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Muddy shoreline, rocky downstream.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: If used as a boat launch would most likely get stuck in the mud.

Comments: Homemade fire pits and bench on site.

Photo 15. Shoreline Access A.



8. *Lynx Creek RV Park*

Date surveyed: August 22, 2008

Photo numbers: Photos 16 -17

GPS coordinates: N56 04.117 W121 50.109

Stratum: 2

Location: Off of Highway 29, northeast of Hudson's Hope.

Type / Description: Public campground and boat launch. Site is also used for shoreline access and picnic area.

Access: RV Park is drive in access from Highway 29 and water access occurs via the boat launch.

Confirmed recreational uses: Camping, fishing, boating, hiking, picnicking, shoreline leisure and both birding and snowshoeing in the winter.

Possible constraints on rec use: Campsites are closed in the winter season (mid October – mid April). Boat launch is not plowed during the winter and therefore inaccessible to launch from (dependent on snow levels).

Type of boat launch: Grassy slope with embedded rock, width of 6m, no restriction on size or type of boat to launch.

Angling: Shoreline and boat angling.

Campground details: This is a private, maintained campground with a total of 24 campsites and a large field for additional tents. Of the 24 campsites, 22 sites have power hook-ups for RV service; also present at the campground is a sanitation dump. All sites have fire pits and picnic tables while washrooms with showers, refuse collection and playground facilities are also present.

Shoreline type: Grassy shoreline with some rock.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: N/A

Comments: In 2007, a total of 1,875 campsite rentals occurred from April 22 to October 7. In addition, approximately 100 visitors used the boat launch, 20 visitors came to walk dogs or hike, 40 visitors came to picnic, 40 visitors came to photograph the river, 50 visitors came to fish and 50 visitors came for BC Rivers Day.

Photo 16. Lynx Creek RV Park boat launch.



Photo 17. Lynx Creek RV Park campsites.



9. *The Gates*

Date surveyed: September 12, 2008

Photo numbers: Photos 18 – 21

GPS coordinates: N56 05.998 W121 48.154

Stratum: 2

Location: Site is located on an island in the Peace River, just upstream of “The Gates Boat Launch”.

Type / Description: Primitive, maintained campsite, also shoreline access and picnic area.

Access: Boat access only, bank trail from campsite to shoreline.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Main campsite area is approximately 13x22m, also approximately 8x25m and 8x8m cleared spaces for tents in surrounding woods. An outhouse, fire pits (with grill), picnic tables, some covered with a tarp for shelter, firewood and miscellaneous tools such as an axe, rake and shovel, are also on site. Campsite is maintained by local boaters such as the River Rats Club.

Shoreline type: Sandy shoreline.

Bank direction of river access: North bank of an island in the Peace River.

Potential hazards to users: N/A

Comments: Posted with signage indicating name of the site.

Photo 18. The Gates bank trail from the shoreline to campsite.



Photo 19. The Gates campsite area.



Photo 20. The Gates campsite area and amenities.



Photo 21. The Gates campsite amenities.



10. *The Gates Boat Launch*

Date surveyed: September 12, 2008

Photo numbers: Photos 22 – 23

GPS coordinates: N56 06.233 W121 48.558

Stratum: 2

Location: Off of Highway 29, east of Hudson's Hope.

Type / Description: Boat launch, also shoreline access.

Access: Launch is drive-in access from Highway 29, water access occurs via the boat launch.

Confirmed recreational uses: Fishing and boating.

Possible constraints on rec use: Not plowed during the winter, users fish here until too much snow to access.

Type of boat launch: Dirt road extends to shoreline, no actual ramp, width of 9.5m, no restriction on size or type of boat to launch.

Angling: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Fine sediment shoreline.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: Access occurs on a dangerously sharp highway turn.

Photo 22. The Gates boat launch (access road view).



Photo 23. The Gates boat launch (shoreline view).



11. Unmaintained Campsite B

Date surveyed: September 12, 2008

Photo numbers: Photos 24 - 26

GPS coordinates: N56 06.655 W121 46.166

Stratum: 2

Location: Site is located on an island in the Peace River, between Lynx and Farrell Creeks.

Type / Description: Unmaintained campsite, also shoreline access and picnic area.

Access: Boat access only, bank trail from campsite to shoreline.

Confirmed recreational use: Fishing.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: No maintained campsites, cleared area of approximately 8x11m where tents could be set and additional small areas in surrounding woods. Homemade fire pits (some with grills) and firewood also present.

Shoreline type: Rocky shoreline on the south side of the island tip, fine sediment / grassy shoreline on the north side of the island tip.

Bank direction of river access: Site is located on the tip of an island (both north and south banks of the river).

Potential hazards to users: Bank trail is treacherous footing.

Photo 24. Bank trail at Unmaintained Campsite B.



Photo 25. Unmaintained Campsite B.



Photo 26. Example of a small area in surrounding woods of Unmaintained Campsite B where additional tents could be set.



12. Unmaintained Campsite C

Date surveyed: September 12, 2008

Photo numbers: Photos 27 - 28

GPS coordinates: N56 06.605 W121 45.425

Stratum: 2

Location: Site is located on an island in the Peace River, downstream of Unmaintained Campsite B (between Lynx and Farrell Creeks).

Type / Description: Unmaintained campsite, also shoreline access and picnic area.

Access: Boat access only, bank trail from campsite to shoreline.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: No maintained campsites, cleared area of approximately 8x14m where tents could be set and additional small areas in surrounding woods. Amenities present on site include a homemade fire pit with grill, firewood and homemade table.

Shoreline type: Fine sediment / grassy shoreline with some cobble.

Bank direction of river access: South bank of an island in the Peace River.

Potential hazards to users: Potential windfall trees.

Photo 27. Potential area for setting up tents at Unmaintained Campsite C.



Photo 28. Amenities present at Unmaintained Campsite C.



13. Unmaintained Campsite D

Date surveyed: September 12, 2008

Photo numbers: Photos 29 - 30

GPS coordinates: N56 07.006 W121 44.466

Stratum: 2

Location: Site is located on an island in the Peace River, downstream of Unmaintained Campsite C (between Lynx and Farrell Creeks).

Type / Description: Unmaintained campsite, also shoreline access and picnic area.

Access: Boat access only, bank trail from campsite to shoreline.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: No maintained campsites, two cleared areas of approximately 6x6m and 6x15m where tents could be set, homemade fire pits also on site.

Shoreline type: Fine sediment / grassy shoreline.

Bank direction of river access: North bank of an island in the Peace River.

Potential hazards to users: Bank trail is treacherous footing.

Photo 29. Unmaintained Campsite D.



Photo 30. Bank trail at Unmaintained Campsite D.



14. Farrell Creek

Date surveyed: August 22 and September 12, 2008.

Photo numbers: Photos 31 – 32

GPS coordinates: N56 07.166 W121 44.051

Stratum: 2

Location: Confluence of Farrell Creek.

Type / Description: Shoreline access.

Access: Users park at Farrell Creek bridge crossing on Highway 29 and walk down the creek to the confluence with the Peace River.

Confirmed recreational use: Fishing.

Possible constraints on rec use: Difficult to access during winter (dependent on snow levels).

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Rocky shoreline.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: If entering Farrell Creek at the bridge (to walk to confluence) rip rapped bank poses dangerous footing.

Photo 31. Farrell Creek confluence shoreline access.



Photo 32. Rip rap bank of Farrell Creek at Highway 29 Bridge.



15. Hawk Island

Date surveyed: September 12, 2008

Photo numbers: Photos 33 – 34

GPS coordinates: N56 08.034 W121 38.563

Stratum: 2

Location: Site is located on an island in the Peace River, downstream of Farrell Creek.

Type / Description: Primitive maintained campsite, also shoreline access and picnic area.

Access: Boat access only, bank trail from campsite to shoreline.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Campsite consists of the main area with amenities and room for tents, approximately 11x25m, a clearing on the point of the island approximately 6x6m where tents may be set and additional spaces for tents in the surrounding woods. An outhouse, fire pit (with grill), picnic table, homemade tables and old style outhouse area are present on site. Campsite is maintained by local boaters such as the River Rats Club.

Shoreline type: Grassy shoreline, some cobble.

Bank direction of river access: North bank of an island in the Peace River.

Potential hazards to users: N/A

Photo 33. Hawk Island campsite with amenities.



Photo 34. Clearing for tents at the Hawk Island campsite.



16. Unmaintained Campsite E

Date surveyed: August 24 & September 12, 2008

Photo numbers: Photos 35 – 36

GPS coordinates: Campsite: N56 08.807 W121 36.707
Main shoreline access: N56 08.771 W121 36.843

Stratum: 2

Location: Off of Highway 29, between Farrell Creek and the Halfway River.

Type / Description: Unmaintained campsite, shoreline access, picnic area.

Access: Access road off of Highway 29; can drive to campsite and shoreline access (access road splits to both locations a few hundred meters from the river).

Confirmed recreational use: Camping and canoeing.

Possible constraints on rec use: Unlikely access road is plowed in winter so recreational use would be impeded. Unpaved access road requires four wheel drive vehicle, may be too wet at times for any vehicle.

Type of boat launch: Not a true launch.

Angling: Shoreline and boat angling.

Campground details: Campsite consists of the main area with fire pits, firewood and a cleared area for tents, approximately 4x20m, an adjacent small clearing for tents, approximately 4x5m and an additional open area at the end of the access road, approximately 15x20m. Also a large, open space at the shoreline where camping could occur.

Shoreline type: Fine sediment / grassy / cobble shoreline.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: Access road often in poor condition.

Comments: The shoreline access at this site may be used as a boat launch but very unlikely given the rough condition of the access road (potential for boats and trailers to suffer damage).

Photo 35. Drive-in shoreline access at Unmaintained Campsite E.



Photo 36. Main camping area at Unmaintained Campsite E.



17. Halfway River Bridge Boat Launch

Date surveyed: August 22 & September 11 - 12, 2008

Photo numbers: Photos 37 – 40

GPS coordinates: Main boat launch: N56 12.970 W121 26.437
Secondary boat launch: N56 12.735 W121 25.834
Shoreline access of Peace River: N56 12.467 W121 28.132

Stratum: 2

Location: Off of Highway 29, east of Hudson’s Hope.

Type / Description: Boat launch, also shoreline access.

Access: Boat launch is off of Highway 29, east side of bridge. The road then extends few hundred meters to a backchannel and then to the Peace River, this area occasionally used as a boat launch when the main launch is in poor condition. Also another access road to the shoreline on the west side of the bridge (shoreline of both the Halfway River and Peace River). Several bank trails along west side access road.

Confirmed recreational use: Camping and boating.

Possible constraints on rec use: Launch area is not plowed in winter so accessing shoreline can be difficult dependent on snow levels. 4-wheel drive vehicle may be required for access road on the east side of the bridge to the backchannel and secondary launch and access road on the west side of the bridge to the shoreline.

Type of boat launch: Main launch: dirt road extends to shoreline of the Halfway River, no actual ramp, width of 37m, no restriction on size or type of boat to launch. Secondary launch: access road extends to shoreline of the Peace River, width of approximately 30m, no restriction on size or type of boat to launch.

Angling: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Fine sediment / some rock.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: Could potentially get stuck on access roads on east and west sides of bridge (roads may be too wet).

Comments: Several homemade fire pits and large cleared areas for camping present on both sides of the bridge.

Photo 37. Halfway River Bridge boat launch.



Photo 38. Shoreline access (of the Peace River), east side of the Halfway River Bridge, occasionally used as boat launch.



Photo 39. Shoreline access (of the Halfway River) from west side of the Halfway River Bridge looking east.



Photo 40. Shoreline access (of the Peace River), west side of the Halfway River Bridge.



18. Shoreline Access B

Date surveyed: September 11, 2008

Photo numbers: Photo 41

GPS coordinates: N56 14.736 W121 31.647

Stratum: 2

Location: Halfway River, upstream of Highway 29 Bridge crossing.

Type / Description: Shoreline access.

Access: Access only by boat, all terrain vehicle or snowmobile.

Confirmed recreational use: Hunting.

Possible constraints on rec use: Only accessible by boat, all terrain vehicle or snowmobile.

Type of boat launch: N/A

Angling: Shore angling and boat angling.

Campground details: N/A

Shoreline type: Rocky shoreline.

Bank direction of river access: Southwest bank of the Halfway River.

Potential hazards to users: Boating is difficult in summer low water levels.

Photo 41. Shoreline Access B on the Halfway River.



19. Unmaintained Campsite F

Date surveyed: September 11, 2008

Photo numbers: Photo 42

GPS coordinates: N56 14.172 W121 35.123

Stratum: 2

Location: Halfway River, upstream of Shoreline Access B.

Type / Description: Unmaintained campsite, also shoreline access.

Access: Boat access only, no obvious bank trails.

Confirmed recreational use: Camping and hunting.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: No maintained sites, hunters are known to camp in this area, remnants of old fire pits have been observed.

Shoreline type: Rocky shoreline.

Bank direction of river access: Southwest bank of the Halfway River.

Potential hazards to users: Boating is difficult in summer low water levels.

Photo 42. Unmaintained Campsite F.



20. *Rotary*

Date surveyed: September 11, 2008

Photo numbers: Photos 43 – 44

GPS coordinates: N56 13.943 W121 22.619

Stratum: 2

Location: Site is located on an island in the Peace River.

Type / Description: Primitive maintained campsite, also shoreline access and picnic area.

Access: Boat access only.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Campsite consists of a cleared area where tents may be set, approximately 11x42m, an outhouse, homemade fire pits, picnic tables and a shelter area with a picnic table, bench and shelf. Campsite is maintained by local boaters such as the River Rats Club.

Shoreline type: Rocky shoreline.

Bank direction of river access: South bank of an island in the Peace River.

Potential hazards to users: N/A

Photo 43. Rotary campsite.



Photo 44. Rotary campsite shelter area.



21. *Beaver House*

Date surveyed: September 11, 2008

Photo numbers: Photos 45 – 46

GPS coordinates: N56 14.259 W121 17.201

Stratum: 2

Location: Site is located on an island in the Peace River, downstream of the “Rotary” campsite.

Type / Description: Primitive maintained campsite, also shoreline access and picnic area.

Access: Boat access only.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Main campsite area consists of open areas approximately 4x10m and 14x18m where tents could be set, an outhouse, picnic table, fire pit with a grill and firewood. Campsite is maintained by local boaters such as the River Rats Club.

Shoreline type: Fine sediment / grassy shoreline.

Bank direction of river access: South bank of an island in the Peace River.

Potential hazards to users: N/A

Photo 45. Beaver House campsite with fire pit.



Photo 46. Beaver House campsite with picnic table.



22. *Waterfalls*

Date surveyed: September 13, 2008

Photo numbers: Photos 47 – 48

GPS coordinates: N56 15.884 W121 13.174

Stratum: 2

Location: Located on the south bank of the Peace River, just downstream of Cache Creek.

Type / Description: Scenic location, also shoreline access.

Access: Boat access only.

Confirmed recreational use: Shoreline leisure.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Fine sediment.

Bank direction of river access: South bank of the Peace River.

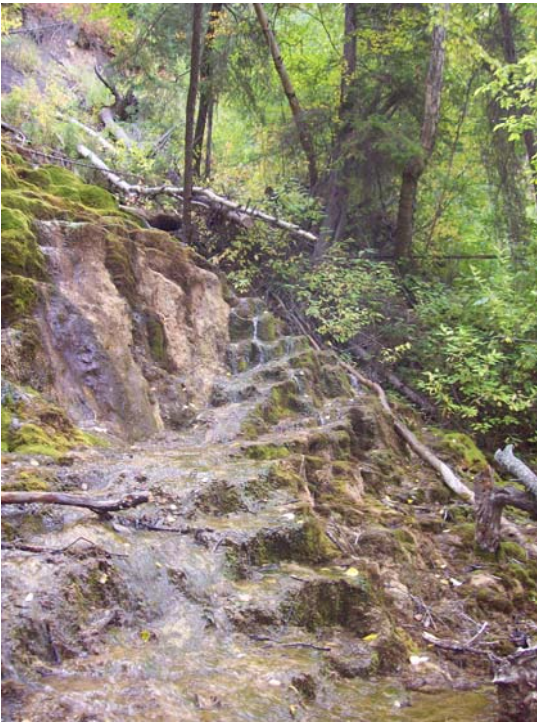
Potential hazards to users: Trail up the falls has slippery footing.

Comments: There is a hiking trail that leads off from the top of the Waterfalls.

Photo 47. The Waterfalls on the south bank of the Peace River (downstream of Cache Creek).



Photo 48. Natural trail meandering up the Waterfalls.



23. *Unmaintained Campsite G*

Date surveyed: September 13, 2008

Photo numbers: Photos 49 – 52

GPS coordinates: N56 14.830 W121 09.773

Stratum: 2

Location: Site is located between Cache and Wilder Creeks.

Type / Description: Unmaintained campsite, also shoreline access and picnic area.

Access: Boat access only, bank trail from the campsite to a side channel of the Peace River (campsite is approximately 50m upstream within the side channel from the river).

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Main campsite area is approximately 6x7m, also numerous small clearings surrounding the main site where tents could be set. Homemade fire pits, firewood, axes, benches and also chairs, tables and footrests carved from logs are present on site.

Shoreline type: Rocky shoreline, some areas fine sediment also.

Bank direction of river access: South bank of the Peace River.

Potential hazards to users: Potential windfall trees.

Photo 49. Unmaintained Campsite G.



Photo 50. Homemade log chair at Unmaintained Campsite G.



Photo 51. Homemade log table at Unmaintained Campsite G.



Photo 52. View of the Peace River from Unmaintained Campsite G.



24. *Limestone*

Date surveyed: September 13, 2008

Photo numbers: Photos 53 – 55

GPS coordinates: N56 13.071 W121 04.351

Stratum: 2

Location: Downstream of Wilder Creek.

Type / Description: Primitive maintained campsite, also shoreline access and picnic area.

Access: Access to site either by boat, all terrain vehicle or snowmobile; bank trail from campsite to shoreline.

Confirmed recreational use: Camping and hunting.

Possible constraints on rec use: Limited access, in particular only access in winter is via snowmobile.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Main campsite area consists of many small areas where tents can be set (3x12m, 10x10m and 7x10m), an outhouse, fire pit with grill, picnic table, firewood and homemade bench. Campsite is maintained by local boaters such as the River Rats Club.

Shoreline type: Fine sediment / cobble shoreline.

Bank direction of river access: South bank of the Peace River.

Potential hazards to users:

Comments: Posted with signage indicating name of the site and GPS coordinates. River banks surrounding the campsite are damaged from all terrain vehicles.

Photo 53. Limestone campsite (with view of the Peace River).



Photo 54. Limestone campsite with amenities.



Photo 55. Small clearing for tent at Limestone campsite.



25. *Eagle Nest*

Date surveyed: September 13, 2008

Photo numbers: Photos 56 – 57

GPS coordinates: N56 13.741 W120 59.094

Stratum: 2

Location: Downstream of Limestone campsite.

Type / Description: Primitive maintained campsite, also shoreline access and picnic area.

Access: Boat access only, bank trail from campsite to Peace River.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Campsite has an outhouse, fire pit with grill, picnic table and small clearings where tents may be set (approximately 4x7m and 5x5m). Campsite is maintained by local boaters such as the River Rats Club.

Shoreline type: Fine sediment / grassy shoreline.

Bank direction of river access: Tip of an island in the Peace River.

Potential hazards to users: N/A

Comments: Posted with signage indicating name of the site and GPS coordinates.

Photo 56. Eagle Nest campsite.



Photo 57. Juvenile Bald Eagle present at Eagle Nest campsite.



26. *Shoreline Access C*

Date surveyed: September 13, 2008

Photo numbers: Photo 58

GPS coordinates: N56 13.708 W120 57.775

Stratum: 2

Location: Downstream of Eagle Nest campsite.

Type / Description: Shoreline access.

Access: Dirt road access from Road 273 to shoreline (requires 4-wheel drive vehicle).

Confirmed recreational use: Canoeing and hiking.

Possible constraints on rec use: Access road may be too wet at times to be passable, unlikely this is plowed in the winter therefore access would be restricted.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Rocky shoreline upstream, fine sediment downstream.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: N/A

Comments: Homemade fire pits present.

Photo 58. Shoreline Access C.



27. *Unmaintained Campsite H*

Date surveyed: September 13, 2008

Photo numbers: Photos 59 – 60

GPS coordinates: N56 12.499 W120 55.701

Stratum: 2

Location: Upstream of the Moberly River confluence.

Type / Description: Unmaintained campsite, also shoreline access and picnic area.

Access: Boat, all terrain vehicle or snowmobile access only; bank trail access to shoreline.

Confirmed recreational use: Camping.

Possible constraints on rec use: Limited access, in particular only access in winter is via snowmobile.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Main camping area is approximately 13x13 paces with an outhouse, homemade fire pit with grill, firewood, bench and table. There is also an adjacent field on the shoreline, approximately 25x35m where tents may be set up.

Shoreline type: Fine sediment / grassy shoreline.

Bank direction of river access: North bank of the Peace River.

Potential hazards to users: N/A

Comments: Cows grazing throughout site.

Photo 59. Unmaintained Campsite H.



Photo 60. Adjacent field on the shoreline where tents could be set at Unmaintained Campsite H (bank trail to main campsite visible).



28. *Birch Camp*

Date surveyed: September 13, 2008

Photo numbers: Photo 61

GPS coordinates: N56 11.583 W120 54.833

Stratum: 2

Location: Downstream of the Moberly River.

Type / Description: Primitive maintained campsite, also shoreline access and picnic area.

Access: Boat access only, bank trail from campsite to shoreline.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Main campsite area is approximately 8x11m; tents can also be set in small clearings in surrounding woods. Amenities present are an outhouse, fire pit with grill, picnic table, hanging pole for hunting and a teepee with a fir bow floor. Campsite is maintained by local boaters such as the River Rats Club.

Shoreline type: Rocky shoreline.

Bank direction of river access: South bank of the Peace River.

Potential hazards to users: Potential windfall trees; bank trail is treacherous footing.

Comments: Posted with signage indicating name of the site and GPS coordinates.

Photo 61. Birch Camp campsite.



29. *Peace Island Park*

Date surveyed: August 22, 2008

Photo numbers: Photos 62 - 66

GPS coordinates: Boat Launch section: N56 08.118 W120 40.439
Island section: N56 08.016 W120 41.093

Stratum: 3

Location: 5894 / 5958 Big Bam Road, off of Alaska Highway, Taylor BC.

Type / Description: Public campground and boat launch. Site is also used for shoreline access, picnic area and trail. Park occurs in two main locations, first area consists of boat launch and 60 camp sites while Island location consists of an additional 39 campsites.

Access: Park is drive-in access from the Big Bam Road off of the Alaska Highway. Water access occurs via the boat launch and several small bush / bank trails.

Confirmed recreational use: Fishing, camping, boating, picnicking, cross country skiing, snowshoeing and dog sledding.

Possible constraints on rec use: Campsites are closed in the winter season (mid November – early April). The main road to the boat launch is plowed inconsistently so use of the launch is dependent on current conditions.

Type of boat launch: Concrete ramp, width of 17m, no restriction on size or type of boat to launch.

Angling: Shoreline angling, generally too much boat traffic for boat angling.

Campground details: The campground is operated and maintained by the District of Taylor. Campsites occur within the two main areas of the park; 60 sites with power hook-ups for RV service are present in the first section of park containing the boat launch and 39 tent sites are present in the Island section of the park (all drive-in sites). All camping areas have pit toilets, playgrounds and refuse collection while all individual sites have fire pits and picnic tables.

A total of 5 group campsites are also available upon request but are not advertised. These sites are located approximately 1.5 km further down the Big Bam Road (from the Island sites) and consist of an open area with only fire pits and picnic tables (Troy Gould, District of Taylor, pers. comm.).

Shoreline type: Rocky shoreline surrounding the boat launch and fine sediment / grassy shoreline downstream of the boat launch and throughout the Island section of the park.

Bank direction of river access: South bank of the Peace River.

Potential hazards to users: Heavy boat traffic and swift water currents.

Comments: A total of 5,468 camping units were purchased in 2007, the majority of which occurred from June to August (one camping unit is equivalent to one night of camping per site, regardless of number of campers per site) (Appendix 6).

Photo 62. Peace Island Park boat launch.



Photo 63. Typical bush / bank trail to access Peace River at Peace Island Park.



Photo 64. Campsite with RV service in the boat launch section of Peace Island Park.



Photo 65. Campsite with no RV service in the Island section of Peace Island Park.



Photo 66. Day-use picnic facilities available within Peace Island Park.



30. Curl Camp

Date surveyed: September 13, 2008

Photo numbers: Photos 67 – 69

GPS coordinates: N56 06.173 W120 26.125

Stratum: 3

Location: Between Eight Mile Creek and the Beatton River.

Type / Description: Primitive maintained campsite.

Access: Boat access only, partial bank trail from campsite to shoreline.

Confirmed recreational use: Camping.

Possible constraints on rec use: Boat access only so not accessed in winter.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Main campsite area is approximately 8x16m, also an adjacent grassy area approximately 7x40m and several small clearings in the surrounding woods

where tents could be set. Campsite amenities include an outhouse, fire pit with a grill, firewood, picnic table and teepee made of sticks. Campsite is maintained by local boaters such as the River Rats Club.

Shoreline type: Rocky shoreline.

Bank direction of river access: South bank of an island in the Peace River.

Potential hazards to users: Potential windfall trees; bank trail is treacherous footing.

Comments: Posted with signage indicating name of the site and GPS coordinates.

Photo 67. Curl Camp campsite.



Photo 68. Small clearing for tent at Curl Camp.



Photo 69. Teepee at Curl Camp campsite.



31. *Confluence of Beatton River*

Date surveyed: September 13, 2008

Photo numbers: Photos 70 – 72

GPS coordinates: Unmaintained campsite: N56 06.122 W120 22.787
Shoreline access: N56 05.986 W120 23.429

Stratum: 3

Location: Confluence of the Beatton River.

Type / Description: Unmaintained campsite, also shoreline access and picnic area.

Access: Dirt access road from the east end of Baldonnel Road; access road splits close to the shoreline, road extends to shoreline access or campsite.

Confirmed recreational use: Fishing, camping and canoeing.

Possible constraints on rec use: May only be passable with 4-wheel drive vehicle during wet conditions; not plowed in the winter hence snowmobile access only.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: Main campsite area is approximately 9x19m and an additional small area of approximately 4x6m where tents may be set up. Also a homemade fire pit and BBQ present on site.

Shoreline type: Fine sediment shoreline at campsite, rocky shoreline at shoreline access.

Bank direction of river access: North bank of the Peace River (shoreline access) and the west bank of the Beatton River (campsite).

Potential hazards to users: Slippery footing along shoreline at campsite.

Photo 70. Shoreline access at Beatton River.



Photo 71. Unmaintained campsite at Beatton River.



Photo 72. Unmaintained campsite amenities at Beatton River.



32. *Confluence of Kiskatinaw River*

Date surveyed: September 13, 2008

Photo numbers: Photos 73 – 74

GPS coordinates: N56 05.446 W120 09.873

Stratum: 3

Location: Confluence of the Kiskatinaw River.

Type / Description: Shoreline access.

Access: Dirt access road from the west end of Road 230; access road extends to shoreline.

Confirmed recreational use: Shoreline leisure.

Possible constraints on rec use: Need 4-wheel drive vehicle for access road; not plowed in the winter hence snowmobile access only.

Type of boat launch: N/A

Angling: Shoreline and boat angling.

Campground details: N/A

Shoreline type: Rocky shoreline, fine sediment some areas.

Bank direction of river access: South bank of the Peace River.

Potential hazards to users: Getting stuck on access road.

Comments: Homemade fire pits and all terrain vehicle tracks present.

Photo 73. Kiskatinaw River shoreline (confluence of Kiskatinaw River view).



Photo 74. Kiskatinaw River shoreline (Peace River view).



33. *Blackfoot Park / “Clayhurst”*

Date surveyed: August 23, 2008

Photo numbers: Photos 75 - 79

GPS coordinates: N56 07.495 W120 03.315

Stratum: 3

Location: Located next to the Clayhurst Bridge crossing of the Peace River off of Rolla Road #3.

Type / Description: Public campground and boat launch - boat launch is posted as closed. Site is also used for shoreline access and picnic area.

Access: Park is drive-in access from Rolla Road #3. Water access occurs via the boat launch and surrounding shoreline (can drive to the shoreline) and few small bush / bank trails.

Confirmed recreational use: Fishing and camping.

Possible constraints on rec use: Boat launch is currently closed and the park is not plowed

so winter access is difficult dependent on snow levels.

Type of boat launch: Concrete ramp, width of 7m, and adjacent gravel area of 14m width which can be used, no restriction on size or type of boat to launch. However boat launch is currently posted as closed and the Peace River Regional District website recommends not to use the launch.

Angling: Shoreline and boat angling.

Campground details: The campground is operated and maintained by the Peace River Regional District from mid May to mid September (weekly maintenance) and there is no fee for the user. There are a total of 15 campsites with fire pits and picnic tables; pit toilets, refuse collection and playground facilities are also present.

Shoreline type: Rocky / sandy shoreline.

Bank direction of river access: South bank of the Peace River.

Potential hazards to users: There is a drop off and large piece of concrete protruding from the water at the end of the boat launch; swift water currents underneath Clayhurst Bridge.

Comments: Annual usage is not recorded at Blackfoot Park.

Photo 75. Blackfoot Park boat launch.



Photo 76. Sign indicating Blackfoot Park boat launch is closed.



Photo 77. Typical bush / bank trail to access Peace River at Blackfoot Park.



Photo 78. Blackfoot Park campsite.



Photo 79. Blackfoot park potential hazard: large piece of concrete at end of boat launch.



34. *Pine River: East Pine*

Date surveyed: August 24, 2008

Photo numbers: Photos 80 – 81

GPS coordinates: N55 43.108 W121 13.499

Stratum: 4

Location: Pine River, just upstream of the confluence with the Murray River.

Type / Description: Boat launch and unmaintained campsite, also shoreline access.

Access: Launch is accessible via Rimsmith Road, just northwest of the Highway 97 Bridge; water access occurs via the boat launch.

Confirmed recreational use: Fishing, boating and camping.

Possible constraints on rec use: Pine River frozen in the winter; Rimsmith Road is not plowed consistently throughout the winter.

Type of boat launch: Concrete ramp, width of 4.2m, may restrict size of boat that can be used.

Angling: Shoreline and boat angling.

Campground details: No maintained campsites, cleared area of approximately 30x200m area where tents and RVs can set up. Homemade fire pits and firewood present; also cleared parking area approximately 18x35m.

Shoreline type: Rocky shoreline.

Bank direction of river access: North bank of the Pine River.

Potential hazards to users: N/A.

Comments: A bed and breakfast, Polly Ranch B & B, is located a few kilometers upriver from the site on the Rimsmith Road, a total of 30 visits occurred at this B&B in 2008 (1 visit = 1 nights stay).

Photo 80. Boat launch at East Pine (Pine River).



Photo 81. Unmaintained campsite at East Pine (Pine River).



35. *Pine River: Twidwell Bend*

Date surveyed: August 24, 2008

Photo numbers: Photos 82 - 84

GPS coordinates: North bank shoreline: N55 36.812 W121 34.223
South bank main access to shoreline: N55 36.801 W121 34.398
South bank secondary access to shoreline: N55 36.726 W121 34.085

Stratum: 4

Location: Pine River, just downstream of the confluence with the Sukunka River.

Type / Description: Shoreline access.

Access: Three main access points: shoreline is drive in access from Highway 29 to the North bank and main access on the South bank, secondary access on the South bank is from Lone Prairie Road.

Confirmed recreational use: Fishing, swimming and camping.

Possible constraints on rec use: Pine River frozen in the winter, also unlikely the site is plowed. Access road to the secondary site on the South bank is very wet and may require 4-wheel drive vehicle to access.

Type of boat launch: Not a true launch.

Angling: Shoreline angling.

Campground details: N/A

Shoreline type: Rocky shoreline.

Bank direction of river access: North and South banks of the Pine River.

Potential hazards to users: N/A.

Comments: Site occurs on both banks of the Pine River, vehicles may park on exposed gravel bars on both sides. Swimming is known to occur regularly at the third access point (South bank secondary access). Homemade fire pits and ATV tracks present on site.

Photo 82. Twidwell Bend North bank shoreline access.



Photo 83. Twidwell Bend South bank shoreline (main access).



Photo 84. Twidwell Bend South bank shoreline (secondary access).



Appendix 6. Total number of camping units purchased in Peace Island Park in 2007.

<u>Dates</u>	<u>No.of Camping Units</u>
April 6 - 13	0
April 14 - 22	0
April 23 - 30	29
May 1 - 7	32
May 8 - 13	128
May 14 - 22	360
May 23 - 28	305
May 29 - June 4	291
June 5 - 11	175
June 12 - 18	314
June 19 - 24	217
June 25 - July 2	430
July 3 - 9	331
July 10 - 19	303
July 20 - 24	232
July 25 - 29	316
July 30 - August 5	469
August 6 - 13	266
August 14 - 17	223
August 18 - 24	141
August 25 - September 4	504
September 5 - 11	127
September 12 - 18	157
September 19 - 25	42
September 26 - October 3	37
October 4 - 9	22
October 10 - 16	3
October 17 - 31	9
November 1 - 6	5
Total	5468