

**Columbia River Project Water Use Plan**

**Kinbasket and Arrow Recreation Management Plan**

**Boat Ramp Use Study – Final Report**

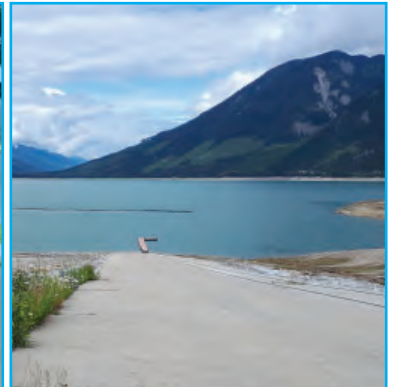
**Implementation Year 10**

**Reference: CLBMON-14**

**Study Period: 2010-2019**

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# CLBMON-14 Boat Ramp Use Study

Final Report (Implementation Year 10)  
Study Period: 2010-2019  
June 2021

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**Table 1.** CLBMON 14 STATUS of OBJECTIVES, MANAGEMENT QUESTIONS and HYPOTHESES after Year 10

Objectives	Management Questions	Management Hypotheses	Year 10 (2019) Status
<p>The objective of this study is to monitor trends in public use of boat ramp facilities where access improvements have been made as part of the Columbia River WUP, and assess the effectiveness of these projects in providing benefits to recreational interests in the area.</p>	<p>1) Does public use of boat ramps increase on Kinbasket and Arrow Lakes reservoirs after installation and upgrading of the WUP boat ramp facilities?</p>	<p>H<sub>1</sub>: The volume of public use of existing boat ramps where improvements have been undertaken increases over time following implementation of the Water Use Plan.</p>	<p>Public use did not increase at most sites. Out of eight sites where improvements were made, one site showed an increase in volume of public use, three sites experienced a decrease in volume of public use, and four sites saw no change in volume.</p> <p>Hence H<sub>1</sub> is rejected.</p>
	<p>2) If there is an increasing use of new or improved facilities, is it due to existing users visiting more often or new users being attracted to the area?</p>	<p>H<sub>2</sub>: The volume of public use of new boat ramps increases with the availability of new access opportunities.</p> <p>H<sub>2A</sub>: The volume of public use of new boat ramps does not reduce the usage of nearby existing boat ramps negatively.</p> <p>H<sub>2B</sub>: The volume of public use increases due to new users being attracted.</p>	<p>The volume of reported use of new or improved facilities did not reduce the usage of nearby existing boat ramps or result in an increase in new users.</p> <p>Hence failed to reject H<sub>2A</sub>.</p> <p>H<sub>2B</sub> could not be tested as we could not differentiate between new users and users who changed their habits.</p>
	<p>3) Does user satisfaction increase with improvements made to the existing boat ramps and construction of the new boat ramps?</p>	<p>H<sub>3</sub>: User satisfaction of the new and upgraded boat ramps is greater than that experienced by users of the older facilities.</p>	<p>User satisfaction increased at all boat ramps. Average visitor satisfaction increased from a scale 2.9 to 4.1 (out of a possible maximum of 5) post-construction. This was a statistically significant increase in user satisfaction following improvements to existing boat ramps and parking lot conditions.</p> <p>Hence failed to reject H<sub>3</sub>.</p>
	<p>4) Is there a need for installation of additional facilities to satisfy the needs of</p>	<p>H<sub>4</sub>: There are no changes in the socio-demographic or trip behavior characteristics of users of</p>	<p>There does not appear to be any needs for additional facilities.</p> <p>There were no changes in the socio-</p>

	boat users on Kinbasket Reservoir and Arrow Lakes Reservoir?	boat ramps on Kinbasket and Arrow Lakes reservoirs.	demographic or trip behaviour characteristics of users of boat ramps on Kinbasket and Arrow Lakes reservoirs. Hence failed to reject H <sub>4</sub> .  Results show that boat ramp improvements have satisfied the majority of boat users' needs.
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## 1. Executive Summary

During the Columbia River Water Use Planning (WUP) process, the Consultative Committee recognized an opportunity to improve access for water-based recreation on the Arrow Lakes and Kinbasket Reservoirs through physical improvements to existing boat ramps and the construction of new ramps (BC Hydro 2007). Since that time, BC Hydro has completed boat ramp facility construction or improvements at ten locations – eight locations on the Arrow Lakes Reservoir and two on Kinbasket Reservoir. The CLBMON 14 Boat Ramp Use Study was ordered by the Comptroller of Water Rights to monitor use levels and user satisfaction at the boat launch improvement sites to inform future operational decisions.

Information gained through this monitoring program will assist future decision making around the effectiveness of the boat launch works and their maintenance, the value of implementing additional physical works to improve access to the reservoirs, and any potential unintended impacts associated with improved boat access.

To address the management questions and supporting hypotheses specific parameters were measured through a combination of monitoring (vehicle count and observational data collection) and interviews (on-site surveys). The study had a 10-year horizon (2010 to 2019), with sampling occurring in Years 1 to 4 inclusive (years 2010 to 2013), and in Years 8 and 10 (years 2017 and 2019). Years 7 and 9 (2016 and 2018) included a full program of vehicle counts, but with no intercept surveys being administered.

Boat ramp improvements did not lead to a large increase in daily visitor volume, new users, or change in the type of user group. Visitor satisfaction was the factor most affected with average satisfaction increasing from 2.9 to 4.1 postconstruction, suggesting these projects have been effective in providing benefits to recreational interests in the area. The percentage of respondents reporting no problems or providing positive comments about the boat ramp facilities increased substantially over the course of the project period (from 17% to 59%) suggesting that launch improvements to date have been successful in addressing boat users' needs.

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The status of CLBMON 14 after Year 10 (2019) with respect to the management questions and management hypotheses is summarized in Table 1.

**Table 1.** CLBMON 14 STATUS of OBJECTIVES, MANAGEMENT QUESTIONS and HYPOTHESES after Year 10

Objectives	Management Questions	Management Hypotheses	Year 10 (2019) Status
The objective of this study is to monitor trends in public use of boat ramp facilities where access improvements have been made as part of the Columbia River WUP, and assess the effectiveness of these projects in providing benefits to recreational interests in the area.	1) Does public use of boat ramps increase on Kinbasket and Arrow Lakes reservoirs after installation and upgrading of the WUP boat ramp facilities?	H <sub>1</sub> : The volume of public use of existing boat ramps where improvements have been undertaken increases over time following implementation of the Water Use Plan.	Public use did not increase at most sites. Out of eight sites where improvements were made, one site showed an increase in volume of public use, three sites experienced a decrease in volume of public use, and four sites saw no change in volume.  Hence H <sub>1</sub> is rejected.
	2) If there is an increasing use of new or improved facilities, is it due to existing users visiting more often or new users being attracted to the area?	H <sub>2</sub> : The volume of public use of new boat ramps increases with the availability of new access opportunities.  H <sub>2A</sub> : The volume of public use of new boat ramps does not reduce the usage of nearby existing boat ramps negatively.  H <sub>2B</sub> : The volume of public use increases due to new users being attracted.	The volume of reported use of new or improved facilities did not reduce the usage of nearby existing boat ramps or result in an increase in new users.  Hence failed to reject H <sub>2A</sub> .  H <sub>2B</sub> could not be tested as we could not differentiate between new users and users who changed their habits.
	3) Does user satisfaction increase with improvements made to the existing boat ramps and construction of the new boat ramps?	H <sub>3</sub> : User satisfaction of the new and upgraded boat ramps is greater than that experienced by users of the older facilities.	User satisfaction increased at all boat ramps. Average visitor satisfaction increased from a scale 2.9 to 4.1 (out of a possible maximum of 5) post-construction. This was a statistically significant increase in user satisfaction

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			<p>following improvements to existing boat ramps and parking lot conditions.</p> <p>Hence failed to reject H<sub>3</sub>.</p>
	<p>4) Is there a need for installation of additional facilities to satisfy the needs of boat users on Kinbasket Reservoir and Arrow Lakes Reservoir?</p>	<p>H<sub>4</sub>: There are no changes in the socio-demographic or trip behavior characteristics of users of boat ramps on Kinbasket and Arrow Lakes reservoirs.</p>	<p>There does not appear to be any needs for additional facilities.</p> <p>There were no changes in the socio-demographic or trip behaviour characteristics of users of boat ramps on Kinbasket and Arrow Lakes reservoirs. Hence failed to reject H<sub>4</sub>.</p> <p>Results show that boat ramp improvements have satisfied the majority of boat users' needs.</p>

## 2. Introduction

### 2.1 Background

During the Columbia River Water Use planning (WUP) process, the Consultative Committee (CC) recognized an opportunity to improve access for water-based recreation on the Arrow Lakes and Kinbasket Reservoirs through physical improvements to existing boat ramps and the construction of new ramps (BC Hydro 2007). Since that time, BC Hydro has completed boat ramp facility improvements<sup>1</sup> at ten locations – eight locations on the Arrow Lakes Reservoir and two locations on Kinbasket Reservoir (see Tables 3, 4).

While the CC recognized the value of these projects, they also highlighted a need for a public use measurement study to monitor use levels and user satisfaction at the boat launch improvement sites to inform future operational decisions. CLBMON 14 Boat Ramp Use Study was ordered by the Comptroller of Water Rights as one of a series of monitoring programs that fulfills BC Hydro's obligations under the Columbia River Water Use Plan<sup>2</sup>.

CLBMON 14 is a 10-year study that assessed the effectiveness of the boat ramp facility improvements that were made as part of the Columbia River WUP, by monitoring the ten sites where access improvements occurred. Sampling was also undertaken at two control sites. Information gained through this monitoring program will assist future decision making around the effectiveness of the boat launch works and their maintenance, the value of implementing additional physical works to improve access to the reservoirs, and any potential unintended impacts associated with improved boat access. This final report summarizes the comprehensive results from Years 1 to 10 (2010 to 2019).

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<sup>1</sup> Recreational boat access improvements may include ramp extensions, breakwaters, debris booms, boarding floats, parking and other site changes.

<sup>2</sup> Concurrent to Years 1-4 of CLBMON 14, BC Hydro conducted the Arrow Lakes Recreational Demand Study (CLBMON 41). Due to significant overlaps, the two studies were combined into one delivery model; however, data collection for CLBMON 41 concluded in 2013.

## 2.2 Management Questions and Objectives

The key management questions addressed by this study are:

- MQ1: Does public use of boat ramps increase on Kinbasket and Arrow Lakes reservoirs after installation and upgrading of the WUP boat ramp facilities?
- MQ2: If there is an increasing use of new or improved facilities, is it due to existing users visiting more often or new users being attracted to the area?
- MQ3: Does user satisfaction increase with improvements made to the existing boat ramps and construction of the new boat ramps?
- MQ4: Is there a need for installation of additional facilities to satisfy the needs of boat users on Kinbasket Reservoir and Arrow Lakes Reservoir?

The main objective of the study is to monitor trends in public use of boat ramp facilities where access improvements have been made as part of the Columbia River WUP, and assess the effectiveness of these projects in providing benefits to recreational interests in the area.

## 2.3 Management Hypotheses

Four primary management hypotheses frame this monitoring program:

“The first hypothesis is associated with evaluating whether increasing the usability of the existing ramps over a wider range of reservoir water elevations results in increased public use relative to pre-WUP conditions, at times when water levels are low. Testing of this hypothesis is informed directly by observed trends in usage obtained through ongoing monitoring of these sites.

H<sub>1</sub>: The volume of public use of existing boat ramps where improvements have been undertaken increases over time following implementation of the Water Use Plan.

The second hypothesis is associated with determining whether construction of new ramp facilities results in increased access to the reservoir, or a shift in use away from existing boat ramps because of accessibility to the area (*i.e.*, proximity to the boat ramp) or safer launch conditions. Testing of this hypothesis is informed both directly

through use data collected during the monitoring, as well as through survey questionnaires related to user characteristics and level of user satisfaction.

H<sub>2</sub>: The volume of public use of new boat ramps increases with the availability of new access opportunities.

H<sub>2A</sub>: The volume of public use of new boat ramps does not reduce the usage of nearby existing boat ramps negatively.

H<sub>2B</sub>: The volume of public use increases due to new users being attracted.

A third hypothesis addresses possible changes to the recreation experience offered to the users of the boat ramps. The simplest indicator of a quality recreation experience is user satisfaction, which is investigated as part of the survey questionnaires. Satisfaction analysis also considers related information that is collected during the monitoring study. Other changes to the users, such as socio-demographic characteristics or reservoir recreation behaviour related variables, are also used as indicators.

H<sub>3</sub>: User satisfaction of the new and upgraded boat ramps is greater than that experienced by users of the older facilities.

Finally, satisfaction alone does not provide any insights about changes to user groups characteristics. Therefore, it is important to monitor if user characteristics change over time.

H<sub>4</sub>: There are no changes in the socio-demographic or trip behavior characteristics of users of boat ramps on Kinbasket and Arrow Lakes reservoirs.”

(Terms of Reference, BC Hydro, 2009 p.6)

One of the key issues with the CLBMON 14 management questions and management hypotheses is the timing of improvements at each of the boat launch ramps. Ramp locations that were improved early in the study period do not have much, if any, pre-improvement data against which the post-improvement data can be compared. Conversely, ramps that are improved later in the study period (after year 4) will not have as much post-improvement data, except that gathered in year 10. This will mean that hypotheses *H<sub>2B</sub>*, *H<sub>3</sub>* and *H<sub>4</sub>* may not be uniformly tested over every boat launch ramp location.

### 3. Methods

To address the management questions and supporting hypotheses, specific parameters were measured through a combination of monitoring (vehicle counters, spots counts and observational data collection) and interviews (on-site intercept and online surveys). This study had a 10-year horizon, with sampling occurring in spring, summer, and fall seasons (Terms of Reference, BC Hydro 2009, p.9). In order to meet scheduling and budget criteria, (gained through integration with CLBMON 41), sampling occurred in Years 1 to 4 inclusive, and Years 7 to 10 (Table 2). Sampling intensity was higher during the summer due to the proportional increase in volume, the diversity of recreational activities during this period, and the longer season (as spring and fall on-water recreation seasons are limited by snow, cold weather and daylight hours). At the end of each sampling year, the data were summarized in report format.

**Table 2.** Activities and reporting by monitoring year.

Year	CLBMON 14	Activities	Annual Report
2010	Year 1	<ul style="list-style-type: none"> <li>• Survey development</li> <li>• First full field season</li> </ul>	Interim Report
2011	Year 2	<ul style="list-style-type: none"> <li>• Second full field season</li> <li>• Two new sites added</li> </ul>	Interim Report
2012	Year 3	<ul style="list-style-type: none"> <li>• Third full field season</li> <li>• All sites sampled</li> </ul>	Interim Report
2013	Year 4	<ul style="list-style-type: none"> <li>• Fourth full field season</li> <li>• All sites sampled</li> </ul>	Mid-Term Analysis Report
2014	Year 5	<ul style="list-style-type: none"> <li>• No sampling</li> </ul>	-
2015	Year 6	<ul style="list-style-type: none"> <li>• No sampling</li> </ul>	-
2016	Year 7	<ul style="list-style-type: none"> <li>• Vehicle counters at all sites</li> <li>• No surveys</li> </ul>	Progress Report
2017	Year 8	<ul style="list-style-type: none"> <li>• Vehicle counters at all sites</li> <li>• Surveys at three sites</li> </ul>	Progress Report
2018	Year 9	<ul style="list-style-type: none"> <li>• Vehicle counters at all sites</li> <li>• No surveys</li> </ul>	Progress Report
2019	Year 10	<ul style="list-style-type: none"> <li>• Full field season</li> <li>• All sites sampled</li> </ul>	Final Comprehensive Report



This final comprehensive report (Year 10, 2019) includes a detailed summary of the findings as they relate to the management questions and hypotheses.

This methods section is presented under the following headings:

- Sampling Sites;
- Vehicle Data Collection;
- Observational Data Collection;
- Sampling Design;
- Survey Delivery;
- Survey Design, and
- Sampling Analyses.

### **3.1 Sampling Sites**

The sampling sites used in this study (see Tables 3, 4 and Figures 1, 2) include the ten sites that were approved by the Comptroller of Water Rights for access improvement work, such as the construction of new boat ramps and improvements to existing ramps, as well as two control sites. Burton Historical Park<sup>3</sup> was used as a control site on the Arrow Lakes Reservoir. Esplanade Bay was used as a control site on the Kinbasket Reservoir in Years 2 to 4; however, Esplanade Bay was found to be a low-use site with limited value as a control site, and measurement of vehicle counts was discontinued at this site after Year 4. Nixon Creek was not included as a sample site as roads were inaccessible during the sampling period. The status of improvements and ramp elevations at sampling sites used in this study is summarized in Tables 3 and 4 (Monitoring Program and Physical Works Annual Report: BC Hydro 2017).

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<sup>3</sup> The town of Burton has two boat launches: Burton Historical Park and Burton South. Burton Historical Park is a Provincial Park and Burton South is the brand-new location where BC Hydro built the WUP boat launch.

**Table 3.** Locations and status of boat ramp improvements on Arrow Lakes Reservoir.

Boat Ramp	Year Completed	Elevation of ramp toe (m)	Lowest water level where ramp is still operational (meters above sea level)	Comments
<b>Arrow Lakes Reservoir</b>				
Nakusp	2016	420.50	421.50	Construction began in 2013, completed February 2016.
McDonald Creek	2015	426.00	427.00	Construction in 2014 and 2015.
Burton Historical Park	Control site	n/a	n/a	n/a
Burton South <sup>†</sup>	2015	425.40	426.40	Construction occurred between 2010 and 2015.
Fauquier	2011	424.66	425.66	Construction in 2010 and 2011. Some adjustments to the breakwater in 2015.
Edgewood	2015	425.76	426.76	Construction occurred between 2013 and 2015.
Anderson Point	2015	425.00	426.00	Construction began in 2013, completed in 2015.
Shelter Bay	2016	422.86	423.86	Construction began in 2015, completed April 2016.
Syringa	2015	421.87	422.87	Construction in 2015.

<sup>†</sup> A vehicle counter was installed at Burton South boat ramp on August 24, 2011 as an additional study site.

**Table 4.** Location and status of boat ramp improvements on Kinbasket Reservoir.

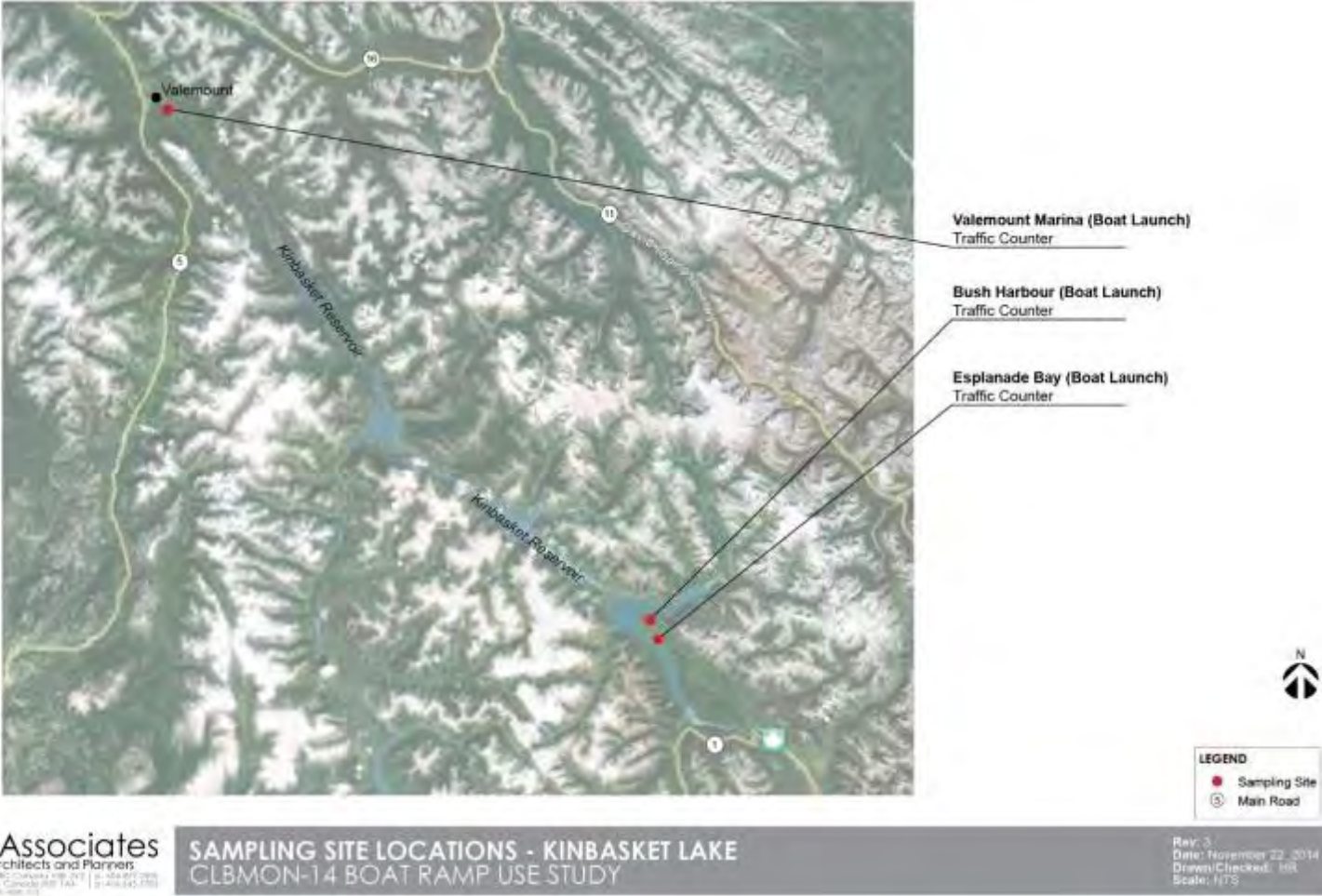
Boat Ramp	Year Completed	Elevation of ramp toe (m)	Lowest operational water level (meters above sea level)	Comments
<b>Kinbasket Reservoir</b>				
Valemount Marina	2013 (Except walkway)	727.59	728.59	Majority of construction completed in 2011. Further ramp extension in 2013. Boarding floats (walkway) replacement completed in 2016.
Bush Harbour	2013	724.60	725.60	Construction occurred between 2011 and May 2013.
Esplanade Bay <sup>†</sup>	Used as a control site in Years 2 to 4	n/a	n/a	n/a
Nixon Creek	n/a	n/a	n/a	Not included in study. NB: While Nixon was identified as a potential ramp for improvement and as a study site in the CLBMON-14 Terms of Reference, it was not possible to guarantee the Forest Service Road would remain open throughout the recreation season. Therefore, this site was eliminated from both study and construction considerations.

<sup>†</sup>A vehicle counter was installed at Esplanade Bay boat ramp for use as a control site in Years 2 to 4 (2011 to 2013).

Figure 1. Sampling locations map – Arrow Lakes Reservoir.



Figure 2. Sampling locations map – Kinbasket Reservoir.



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**SAMPLING SITE LOCATIONS - KINBASKET LAKE**  
CLBMON-14 BOAT RAMP USE STUDY

## 3.2 Vehicle Data Collection

Vehicle counters are a reliable tool for monitoring public recreation use and have been found to be very useful in identifying use trends and patterns to better manage public access (Terms of Reference, BC Hydro 2009, p.8). TRAFx G3 magnetic field-controlled vehicle counters were selected for use in this study, as they are the preferred and recommended vehicle counter of BC Parks, Parks Canada and the US National Parks Service.

Vehicle counters were configured and installed at each sampling location as per the manufacturer's specifications to monitor the number of vehicles using the ramp facilities. Vehicle counters remained in place year-round to collect vehicle counts in Years 1-4, inclusive. Vehicle counters were re-installed in Year 7 of the study, once all planned boat ramp improvements were completed. Counter re-installation took place between May 10 and May 12, 2016, as soon as all boat launches were accessible after winter snow and ice conditions. Once installed, continuous vehicle counts were taken through May 25, 2020.

Annual vehicle counts were collected and automatically compiled by the TRAFx DataNet system for each full calendar year. This was done to standardize the calculation and application of average daily use to missing data. The system then enables the selection of any time period across years for calculating and reporting daily, weekly and monthly counts, averages and comparisons. Further discussion of annual vehicle count calculations can be found in Appendix A. Vehicle counter results are presented in Appendix C.

### 3.2.1 Arrow Lakes Reservoir Vehicle Counters

Vehicle counters were installed at boat access sites at Nakusp, McDonald Creek, Burton Historical Park, Burton South, Fauquier, Syringa, Shelter Bay, Edgewood and Anderson Point.

Where applicable, the vehicle counters remained in place at old boat ramps until the construction of new boat ramp locations was completed.

Counter sensitivity and delay settings were configured to most accurately record vehicle traffic at each site, in order to achieve a level of accuracy that would permit conclusive answers to the management questions. Thresholds were adjusted to the least sensitive setting that would still pick up a vehicle passing through but not smaller or more distant metal objects; there is a 17 second delay between

counts on single lane ramps and 15 second delay on double lane ramps to reduce multiple counts of same vehicle.

Settings were monitored and adjusted during the first year of study (2010) and inspected three times each study year to ensure counters were configured to most accurately record vehicle traffic at each site. In 2013, Nakusp counter settings were adjusted to accommodate placement of the counter in the middle of the new cement ramp. Other than at Nakusp, the counter sensitivity and delay settings remain unchanged since Year 2 (2011). Vehicle counter settings used at Arrow Lakes sites are included in Appendix A.

### *3.2.2 Kinbasket Reservoir Vehicle Counters*

Vehicle counters at the Bush Harbour and Valemount Marina boat ramps were installed at the beginning of the study in April 2010. A vehicle counter was installed at Esplanade Bay, a provincial recreation site, in Years 2 to 4 (2011 to 2013), for use as a control site. Vehicle counter sensitivity and delay settings used at Kinbasket Reservoir sites are included in Appendix A. The counter sensitivity and delay settings at Kinbasket sites have remained unchanged since Year 2 (2011).

## **3.3 Special Operational Conditions**

Counters remained in-situ during construction periods for applicable boat ramps; however, these periods have been excluded from the data (Table 5). Counters were removed during the exceptional high water period experienced in July and August 2012 (Table 5).

**Table 5.** Construction and high water periods (Years 1-10).

<b>Location</b>	<b>Construction Period<sup>†</sup></b>			<b>High Water Period*</b>		
Bush Harbour	2010-04-12	to	2010-08-09	2012-07-21	to	2012-09-10
McDonald Creek	2010-05-16	to	2010-07-01	2012-07-06	to	2012-08-15
Fauquier	2010-05-31	to	2010-09-21	2012-07-06	to	2012-08-15
Valemount	2011-04-01	to	2011-06-27	2012-07-24	to	2012-09-11
Nakusp	2013-02-04	to	2013-05-17	-		-
Edgewood	2013-03-11	to	2013-05-17	2012-07-06	to	2012-08-15
Shelter Bay	2015-01-01	to	2016-04-01			
Syringa	2015-01-01	to	2016-04-01			
Anderson Point	2012-05-14 2012-10-31	to	2012-06-12 2013-04-26	-		-
Burton Historic <sup>¥</sup>	-		-	2012-07-06	to	2012-08-15
Burton South	-		-	2012-07-06	to	2012-08-15
Esplanade Bay	-		-	2012-07-21	to	2012-09-10

<sup>†</sup> Construction period dates are excluded in the data.

\* Counters at these ramps were removed to prevent water damage thus no readings were taken during these periods.

¥ Burton Historical Park was used as a control site on the Arrow Lakes Reservoir.



### 3.4 Observational Data Collection

Field surveyors collected observational data about the visitors that they encountered, photographs of site conditions and natural conditions (Table 6). These observations consider information on visitors including number of people seen, gender and age range, recreational activities, and number and origin of cars in the parking lot. They also consider information on natural conditions that can affect the level and nature of boat ramp usage, such as weather and reservoir conditions (*i.e.*, precipitation, wind, waves, percent cloud cover, and air temperature). Observational data were assessed using standardized forms and definitions developed for this purpose (see Appendix E).

**Table 6.** Observational data collection: variables collected each field day.

Observation	Description
Number of people seen	<ul style="list-style-type: none"> <li>Provides an overall sense of the level of activity that day; recording the number of people approached provides basis for calculating response rate for the on-site survey.</li> <li>Party size was recorded where possible to compare with established BC Parks statistics<sup>†</sup>.</li> </ul>
Gender and age range	<ul style="list-style-type: none"> <li>Total male and female</li> <li>Age range (1-10, 11-15, 16-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71+)</li> </ul>
Activities	<ul style="list-style-type: none"> <li>Type of recreational activity observed</li> </ul>
Number of cars in parking lot (and origin)	<ul style="list-style-type: none"> <li>The number and origin of license plates was recorded through continuous observation to provide information about the number of parties using the facilities, visitors' place of residence and rough travel distance. A systematic tally system was used at the beginning and end of each shift in conjunction with the surveys to minimize double counting.</li> </ul>
Site photography	<ul style="list-style-type: none"> <li>Photographic records of sample sites to capture site conditions.</li> <li>Taken from same vantage point to facilitate comparison between years.</li> </ul>
Weather*	<ul style="list-style-type: none"> <li>General descriptions to supplement individual measurements.</li> </ul>
Presence of waves*	<ul style="list-style-type: none"> <li>Wave height and formation.</li> </ul>
Wind*	<ul style="list-style-type: none"> <li>Wind direction and an estimate of speed (Beaufort Scale).</li> </ul>
Percent cloud cover*	<ul style="list-style-type: none"> <li>An assessment of the amount of sky/sun obscured by clouds.</li> </ul>
Air temperature*	<ul style="list-style-type: none"> <li>Recorded in Celsius.</li> </ul>
Water temperature*	<ul style="list-style-type: none"> <li>Recorded in Celsius.</li> </ul>

<sup>†</sup> BC Parks party size data are determined by number of people in group divided by the number of groups.

\* Observational data collected was each field day at 13h00.

### 3.5 Sampling Design

This section outlines the sampling design including details about the methods of collection for the observational data and on-site survey.

#### 3.5.1 Arrow Lakes Reservoir Sampling Strategy

The sampling periods at CLBMON 14 boat ramp sites on the Arrow Lakes Reservoir were designed to maximize the response to the user survey and to capture a broad selection of outdoor recreation participants. Survey days at sample sites were randomly selected (Gregoire & Buhyoff, 1999). The random sample was stratified by four factors: (1) section of the Arrow Lakes; (2) season (the number of sample days in each season is proportional to the number of days in that season); (3) type of day (*i.e.*, weekends, week days, holidays); and (4) the time of day that sampling occurs (*i.e.*, morning or afternoon). Over the course of the sampling horizon, this approach provided a representative sample of visitors to boat ramp sites on the Arrow Lakes Reservoir.

Data collection for each sampling year typically commenced in April and finished in October (see Appendix F – Sampling Schedules). As a further step to ensure the representation of a wide range of outdoor recreation activities and respondents, surveyors were on-site during randomly selected six-hour periods (8:00 am to 2:00 pm or 1:00pm to 7:00pm in summer; and 8:30 am to 2:30 pm or 10:30 am to 4:30 pm<sup>4</sup> in spring and fall).

#### 3.5.2 Kinbasket Reservoir Sampling Strategy

The sampling strategy adopted for Kinbasket Reservoir provides that survey days at sample sites were randomly selected (Gregoire & Buhyoff, 1999). The random sample was stratified by three factors: (1) season (the number of sample days in each season is proportional to the number of calendar days in that season); (2) type of day (*i.e.*, weekends, week days, holidays), and (3) the time of day that sampling occurs (*i.e.*, morning or afternoon).

During each program year, each sample site on Kinbasket Reservoir was sampled eight times (see Appendix F – Sampling Schedules). As a further step to ensure the representation of a wide range of

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<sup>4</sup> The six hour sampling period is based on successful application in previous recreational studies undertaken by the study team. An overlap of morning and afternoon periods ensures surveyors capture the higher use time over lunch hour. In 2012, summer sampling hours were shifted to capture more 'evening' recreationists.

outdoor recreation activities and respondents, surveyors were on-site during randomly selected six-hour periods (8:00 am to 2:00 pm or 1:00 pm to 7:00 pm in summer; and 8:30 am to 2:30 pm or 10:30 am to 4:30 pm<sup>5</sup> in spring and fall).

### 3.6 Survey Delivery

The visitor survey was designed to be delivered in two formats over the course of the project: (1) an on-site survey, administered to visitors at sample sites; and (2) an online survey, administered to regional residents to capture a broader range of attitudes and opinions about boat ramp use (or non-use) on the Arrow Lakes and Kinbasket Reservoirs. Due to low volume of responses (n = 0 to n = 37 responses per study year), the online survey was taken offline at the end of the fall 2013 sampling period and discontinued.

#### 3.6.1 On-site Survey

Wherever possible, all parties at a sample site were approached for inclusion in this study. People were approached *after* using a boat ramp facility so that their responses would be based on their use of the facilities that day. Except where single-family parties were identified, all party members were asked to participate in the survey; when families were identified, only one representative was asked to participate in the survey; however, if other members of the party wished to participate they were welcomed to do so. The majority of respondents completed the questionnaires on-site. The number of people approached for inclusion in the study was recorded to permit the calculation of response rate. Number of parties and total number of people on site was also recorded. People who refused to participate were thanked for their time and were not engaged further. A standard introduction statement was made to all prospective participants that summarized the cover letter that accompanied the questionnaire. If asked what the surveys would be used for, people were told that the information would be used to inform the development of strategies to guide the management of water flows and recreational access points on the Arrow Lakes and Kinbasket Reservoirs. Contact information for the project team was provided in the event that anyone had questions or concerns about the project.

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<sup>5</sup> The six-hour sampling period is based on successful application in previous recreational studies undertaken by the study team. An overlap of morning and afternoon periods ensures surveyors capture the higher use time over lunch hour. In 2012, summer sampling hours were shifted to capture more 'evening' recreationists.

### 3.6.2 Online Survey

In addition to the on-site survey, information about the use (or non-use) of the Kinbasket and Arrow Lakes Reservoir, and reasons for non-use, was solicited through an online survey. This self-selected sample was invited to participate in the online survey in order to capture a broader range of attitudes and opinions about boat ramp use, or non-use, on the Kinbasket and Arrow Lakes Reservoirs.

The online version of the survey was also available for on-site visitors that preferred to provide their information online. The online survey was identical to the on-site survey and was available at [www.arrow-kinbasket-recreation-survey.ca](http://www.arrow-kinbasket-recreation-survey.ca). Due to low volume of responses (n = 0 to n = 37 responses per study year), the web-based data was collected for informational purposes only and was not used in the analysis. The online survey was taken offline at the end of the fall 2013 sampling period and discontinued.

## 3.7 Survey Design

Questions that specifically address the usage of boat ramp facilities were added to the visitor questionnaire already in use for the Arrow Reservoir Recreational Demand Study (CLBMON 41). By combining questions onto one questionnaire the need for multiple interviews and the potential for survey fatigue were minimized.

The Visitor Survey questionnaire was developed using the principles of the *Tailored Design Method*. This method identifies procedures to maximize survey return rates and minimize survey error (Salant & Dillman, 1994; Dillman, 2000), including questionnaire layout considerations. The questionnaire was designed to ensure a logical flow of the questions, and that the wording of the questions and instructions to the respondents would be clear and as brief as possible. A key requirement of the questionnaire was that it be suitable for repeated delivery at multiple locations in order that a better understanding of recreation and boat ramp use on the Kinbasket and Arrow Lakes Reservoirs be identified.

The first version of the questionnaire already included two questions in Section 5 relating to satisfaction with boat ramp facilities and parking lot conditions at the sites. Prior to the beginning of the Boat Ramp Use Study, drafts of the additional survey questions specific to boat ramp use were circulated in order to promote discussion around question ordering, question wording, answer options, and/or question

instructions. Reviewers included the LEES+Associates team, the BC Hydro team, and members of the *Collaborative for Advanced Landscape Planning* at the *University of British Columbia*. The final version of the questionnaire included four additional questions pertaining specifically to boat ramp usage, in Section 6. The other sections remained the same. The questionnaire retained the same format – a four-page booklet (two 8.5” by 11” sheets printed on both sides, stapled in the top left corner) that comprehensively measures people’s use of, and attitudes about, recreation on the Kinbasket and Arrow Lakes Reservoirs. A distinct version of the questionnaire was used for Kinbasket sampling and Arrow Lakes sampling to avoid confusion about which lake users were being asked about (Appendix D – Visitor Survey).

The survey questions in Sections 5 and 6 permitted the isolation of variables to characterize boat ramp use on the Kinbasket and Arrow Lakes Reservoirs. Recreationists are not a homogeneous group (Bryan, 1977; Manning, 1999; Salz *et al.*, 2001; Rollins & Robinson, 2002), as participants differ in their values, the activities that they pursue, preferred settings, desired experiences, and motivations for participating (Choi *et al.*, 1994). These measurement protocols follow standard practices and are appropriate for a project of this type.

The questionnaire included three sections with questions related to boat ramp usage:

Section 5: Arrow Lakes / Kinbasket Reservoir Outdoor Recreation Management.

Section 6: Arrow Lakes / Kinbasket Reservoir Outdoor Recreation Experiences.

Section 7: Demographics.

A detailed rationale for the data captured by each of these questions follows. Figure illustrations are taken from the Arrow Lakes version of the questionnaire.

### 3.7.1 Section 5: Arrow Lakes Reservoir / Kinbasket Reservoir Outdoor Recreation Management.

This section has two parts. The first part of this section (Figure 3) includes questions that ask how respondents feel about existing boat ramps and parking lot conditions on the Arrow Lakes and Kinbasket Reservoirs (questions 3 and 4). These provide an assessment of visitor satisfaction with these facilities, which is used to test H<sub>3</sub>.

The management of the Arrow Lakes seeks to balance many tasks. Please indicate your satisfaction with management activities.

Never  
Rarely  
Sometimes  
Frequently  
Always

On the whole, are you satisfied with water levels on the Arrow Lakes?

On the whole, do you have satisfying experiences on the water or onshore of the Arrow Lakes?

On the whole, are you satisfied with the conditions of the boat ramps on the Arrow Lakes?

On the whole, are you satisfied with the parking lot conditions when you visit the Arrow Lakes?

On the whole, are you satisfied with the management of the Arrow Lakes?

**Figure 3.** Section 5 questions, part 1.

*3.7.2 Section 6: Arrow Lakes Reservoir / Kinbasket Reservoir Outdoor Recreation Experiences.*

This section has three parts which ask about respondents' recreation experiences on the reservoir. The second part includes 4 questions related to respondents' experience while using boat ramp facilities (Figure 4). The first question addresses H<sub>2</sub> by asking about which boat ramp facilities people usually use on the Arrow Lakes and Kinbasket Reservoirs. The last two questions ask about what visitors liked and disliked about the boat ramp facilities they used on Kinbasket Reservoir and Arrow Lakes Reservoir to address MQ<sub>2</sub>.

Which boat ramp facility do you usually use on the Arrow Lakes?	Why did you come to this boat ramp facility today?
What did you LIKE MOST about the boat ramp facility that you visited today?	What did you LIKE LEAST about the boat ramp facility that you visited today?

**Figure 4.** Section 6, part 2, questions pertaining to boat ramp use.

3.7.3 Section 7: Demographics.

Section 7 (Figure 5) collects basic information about respondents' demographic characteristics. These questions provide information about user group socio-demographic characteristics, which addresses H<sub>4</sub>.

What year were you born in? 19 \_\_\_\_      What community do you live in? \_\_\_\_\_

Gender:  Male     Female      How long have you lived in your community? \_\_\_\_\_ years.

Please list any outdoor recreation clubs or organizations that you belong to.

Do you have any additional comments about recreation on the water or on the shore of the Arrow Lakes?

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**Figure 5.** Section 7 questions.

Data collection took advantage of the different elements of the study (*i.e.*, vehicle counters and questionnaire-elicited data). Table 6 illustrates the links between the management questions and specific data or questionnaire subsection.

**Table 7.** Relationship of Management Questions to Specific Monitoring Parameters

<b>Management Question</b>	<b>Management Hypothesis</b>	<b>Mode of Measurement</b>
1) Does public use of boat ramps increase on Kinbasket and Arrow Lakes reservoirs after installation and upgrading of the WUP boat ramp facilities?	H <sub>1</sub> : The volume of public use of existing boat ramps where improvements have been undertaken increases over time following implementation of the Water Use Plan.	Vehicle Counter Data
2) If there is an increasing use of new or improved facilities, is it due to existing users visiting more often or new users being attracted to the area?	H <sub>2</sub> : The volume of public use of new boat ramps increases with the availability of new access opportunities.  H <sub>2A</sub> : The volume of public use of new boat ramps does not reduce the usage of nearby existing boat ramps negatively.  H <sub>2B</sub> : The volume of public use increases due to new users being attracted.	Vehicle Counter Data  Section 6, question 2 “Which boat ramp facility do you usually use on the Arrow Lakes?”
3) Does user satisfaction increase with improvements made to the existing boat ramps and construction of the new boat ramps?	H <sub>3</sub> : User satisfaction of the new and upgraded boat ramps is greater than that experienced by users of the older facilities.	Section 5, questions 3 and 4 “On the whole, are you satisfied with the condition of the boat ramp facilities at this site?” “On the whole, are you satisfied with the parking lot conditions at this site?”
4) Is there a need for installation of additional facilities to satisfy the needs of boat users on Kinbasket Reservoir and Arrow Lakes Reservoir?	H <sub>4</sub> : There are no changes in the socio-demographic or trip behavior characteristics of users of boat ramps on Kinbasket and Arrow Lakes.	Section 6, question 5 “What did you LIKE MOST/LEAST about the boat ramp facility that you visited today?”  Section 7, questions 1 and 3 “What year were you born in?” “Gender?”



### 3.8 Survey Analyses

The analysis considers the seven improved boat launch locations on the Arrow Lakes Reservoir (Anderson Point, Edgewood Community Park, Fauquier Community Park Boat Launch, McDonald Creek Provincial Park, Nakusp Boat Launch, Shelter Bay and Syringa Creek Park Boat Launch) and two Kinbasket Reservoir locations (Bush Harbour and Valemount Marina), as well as two control sites (Burton Historical Park and Esplanade Bay). Esplanade Bay was used as a control site on the Kinbasket Reservoir in Years 2 to 4; however, it was found to be a low-use site with limited value as a control site, and measurement of vehicle counts was discontinued at this site after Year 4. Due to the timing of the study pre-construction vehicle counter data was not available for Bush Harbour or Burton South. For all statistical tests,  $\alpha = 0.05$  was used to establish statistically significant differences.

Independent sample t-tests were used to examine Management Question 1; boat ramp counter data was compared for average daily visits for the pre-construction phase and the post-construction phase. A comparison of respondents' "usual boat ramp" pre- and post-construction was made to investigate Management Question 2. Independent t-tests were also employed to examine Management Question 3; visitor satisfaction with boat ramp facilities and with parking lot conditions was compared pre- and post-construction. Pearson chi-square tests (or Fisher's exact test for sparse contingency tables in cases with cells with small counts) were used to examine Management Questions 2 and 4; aspects of their experience that visitors disliked about the boat ramp that they visited on the day they completed a questionnaire were compared between pre- and post-construction sample days. Differences in the age of survey respondents surveyed pre- and post-construction were tested using independent t-tests. Differences in the proportion of the gender of survey respondents surveyed pre- and post-construction were tested using chi-square tests (or Fisher's exact test for sparse contingency tables when cell counts were small).

#### 3.8.1 Data Entry QA/QC

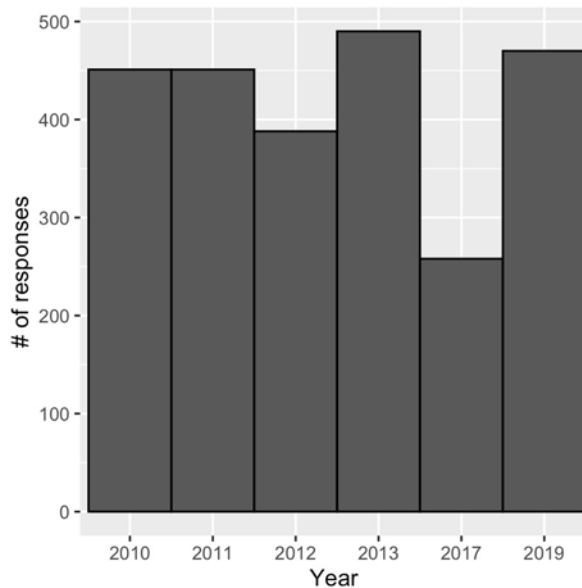
The data from all completed questionnaires were entered (twice) into two SPSS databases to facilitate the verification of data for keying errors, and accuracy and consistency in data coding (Salant & Dillman, 1994). Each completed questionnaire was compared between the two datasets such that each cell (each answer to a question) was verified using the Identify Duplicate Cases function of SPSS (if two cases are identified as being duplicates, then it is assumed that they have been entered correctly). When

discrepancies were identified, the appropriate questionnaire was consulted, and the necessary correction was made. The resultant dataset can be considered to be free of errors from data entry. The data were checked for “protest votes” (*i.e.*, outliers or obvious patterns); when these were identified they were checked against the corresponding questionnaire. No obvious “protest votes” were identified.

## 4. Results

### 4.1.1 Completed Responses at Ramps where Construction Occurred

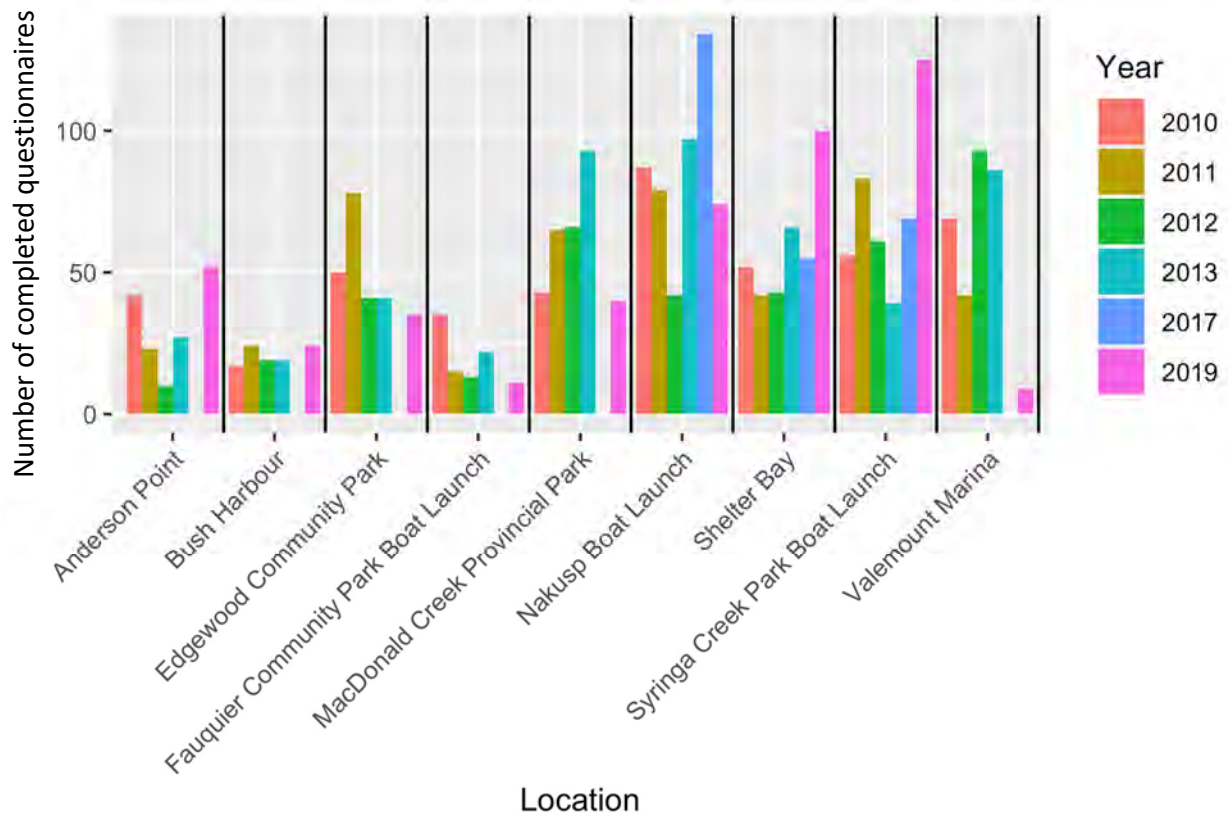
A total of 2,508 completed questionnaires were collected at nine sample locations from 2010 to 2019 (Figure 6). The number of completed questionnaires collected at each location varied by year (Table 8; Figure 7).



**Figure 6.** Questionnaire returns by sample year.

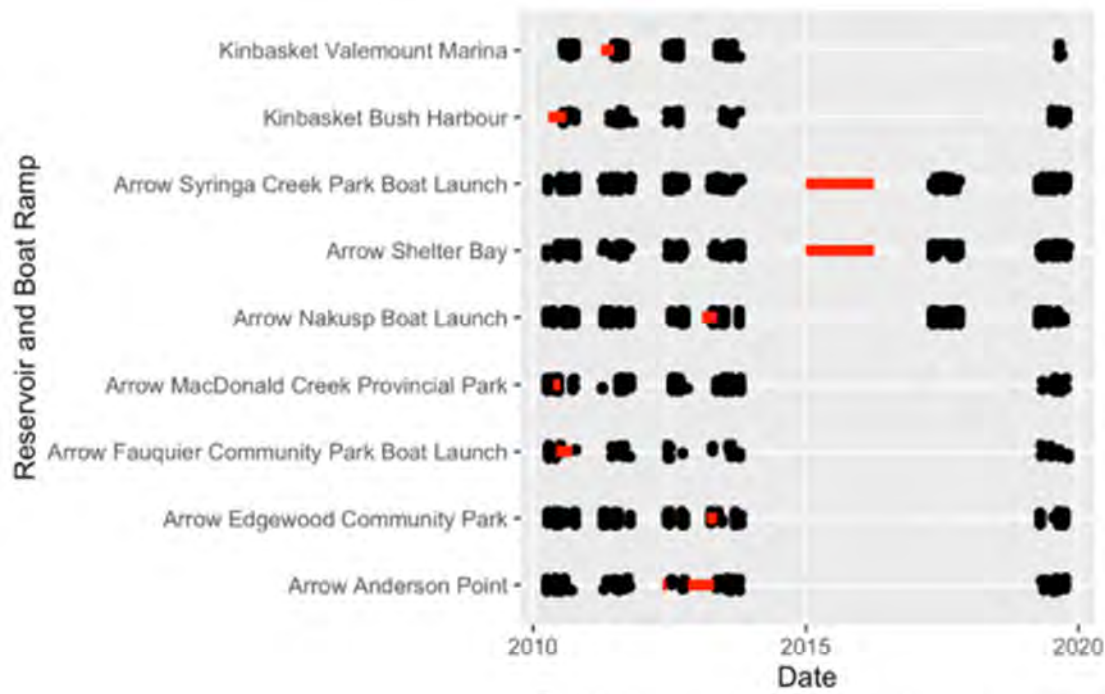
**Table 8.** Completed questionnaires by sample location.

Sample Location	Year						TOTAL
	2010	2011	2012	2013	2017	2019	
Anderson Point	42	23	10	27		52	154
Edgewood Community Park	50	78	41	41		35	245
Fauquier Community Park Boat Launch	35	15	13	22		11	96
McDonald Creek Provincial Park	43	65	66	93		40	307
Nakusp Boat Launch	87	79	42	97	134	74	513
Shelter Bay	52	42	43	66	55	100	358
Syringa Creek	56	83	61	39	69	125	433
Bush Harbour	17	24	19	19		24	103
Valemount Marina	69	42	93	86		9	299
<b>TOTAL</b>	<b>451</b>	<b>451</b>	<b>388</b>	<b>490</b>	<b>258</b>	<b>470</b>	<b>2,508</b>



**Figure 7.** Completed questionnaires by sample location (n = 2,508).

Surveys were collected pre-construction (except for Bush Harbour), during construction (in some cases), and post-construction. The period of construction varied across ramps. A plot of when questionnaires were completed, and the construction periods at each ramp location is shown in Figure 8. For each ramp, a red line is overlaid onto survey collection dates, and indicates when construction at the boat ramps took place. Note that Burton Historical Park was the control site for the Arrow Lakes Reservoir.



**Figure 8.** Completed questionnaires (black dots) and construction periods (red).

#### 4.1.2 Visitor Encounters – Kinbasket Reservoir

Field staff encountered 1,128 visitors at sample sites on the Kinbasket Reservoir between 2010 and 2019 and asked 621 visitors to participate in the survey; 64 of those had previously completed a survey in that sampling year. A total of 402 completed questionnaires were returned which represents an overall response rate of 72% (see Appendix B, Table 19). Note that the differing response rates do not affect the management questions. The Kinbasket Reservoir sites were not surveyed in 2017 and so all entries are 0 for that year.

#### 4.1.3 Visitor Encounters – Arrow Reservoir

Field staff encountered 6,563 visitors at sample sites on the Arrow Lakes Reservoir between 2010 and 2019 and asked 2,312 visitors to participate in the survey; 241 of those had previously completed a survey in that sampling year. A total of 1,688 completed questionnaires were returned which represents an overall response rate of 82% (see Appendix B, Table 20).

## 4.2 Management Question 1:

*MQ1. Does public use of boat ramps increase on Kinbasket and Arrow Lakes reservoirs after installation and upgrading of the WUP boat ramp facilities?*

There is evidence of a change in the mean launches per day for Anderson Point (decline), Fauquier (decline), McDonald Creek (increase), and Nakusp (decline), (Figure 9, Table 9). However, a simple before-after comparison may show an effect that is due to general temporal changes rather than an impact of construction. Consequently, in Appendix G, a more refined analysis compares the changes seen at the boat launches with construction and changes in control boat launches, without construction, to control for general temporal trends.

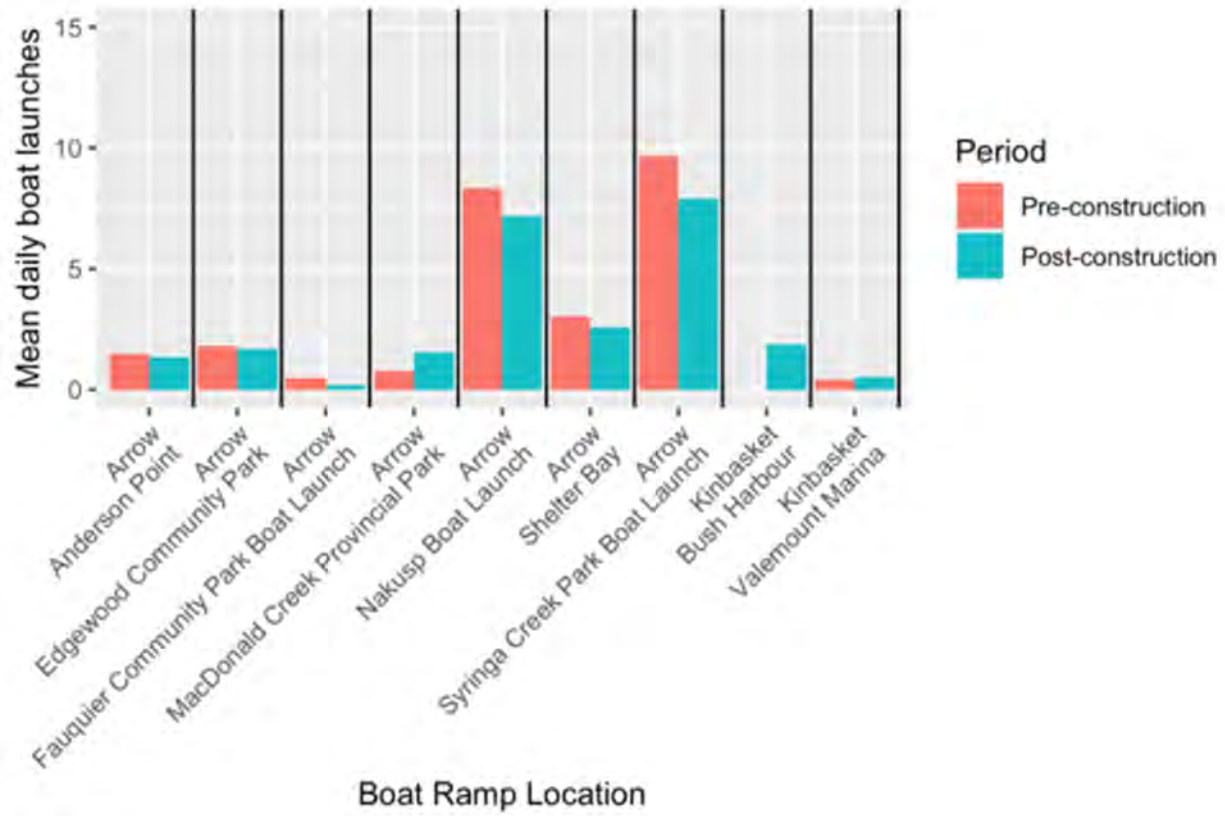


Figure 9. Average Daily Boat Launches at Boat Ramp Locations Pre- and Post-Construction

**Table 9.** Average daily launches at boat ramp locations that have had new ramps constructed.

Boat Ramp	Construction Period	n	Min	Max	Median	Mode	Mean Daily Boat Launches <sup>†</sup>	SD	95% CI	P-value	diff	diff.se
Anderson Point	Pre	767	0	9	1	0	1.47	1.52	0.11	0.027	-0.14	0.06
	Post	1,711	0	8	1	1	1.33	1.28	0.06			
Edgewood Community Park	Pre	1,209	0	15	1	0	1.80	2.09	0.12	0.141	-0.12	0.08
	Post	1,409	0	28	1	0	1.68	2.04	0.11			
Fauquier Park Boat Launch	Pre	257	0	5	0	0	0.47	0.91	0.11	<0.001	-0.28	0.06
	Post	2,350	0	3	0	0	0.19	0.45	0.02			
McDonald Creek Provincial Park	Pre	245	0	6	0	0	0.77	1.18	0.15	<0.001	0.76	0.09
	Post	2,618	0	23	1	0	1.53	2.38	0.09			
Nakusp Boat Launch	Pre	1,234	0	58	6	4	8.32	7.91	0.44	<0.001	-1.13	0.27
	Post	1,636	0	59	5	4	7.18	6.23	0.30			
Shelter Bay	Pre	1,466	0	23	2	0	3.04	3.86	0.20	0.001	-0.46	0.13
	Post	1,386	0	25	2	0	2.59	3.28	0.17			
Syringa Creek Boat Launch	Pre	1,498	0	92	4	2	9.68	13.64	0.69	<0.001	-1.78	0.44
	Post	1,465	0	63	4	1	7.89	10.13	0.52			
Bush Harbour <sup>†</sup>	Pre											
	Post	2,151	0	27	0	0	1.87	3.23	0.14			
Valemount Marina	Pre	348	0	11	0	0	0.42	1.06	0.11	0.190	0.08	0.06
	2,088	2,088	0	18	0	0	0.50	1.17	0.05			

<sup>†</sup> Pre-construction boat launch counter data was not collected for Bush Harbour.



### 4.3 Management Question 2:

*MQ2. If there is an increasing use of new or improved facilities, is it due to existing users visiting more often or new users being attracted to the area?*

This section summarizes results pertaining to MQ2 for all boat launches. For individual results for each boat launch, see Appendix H.

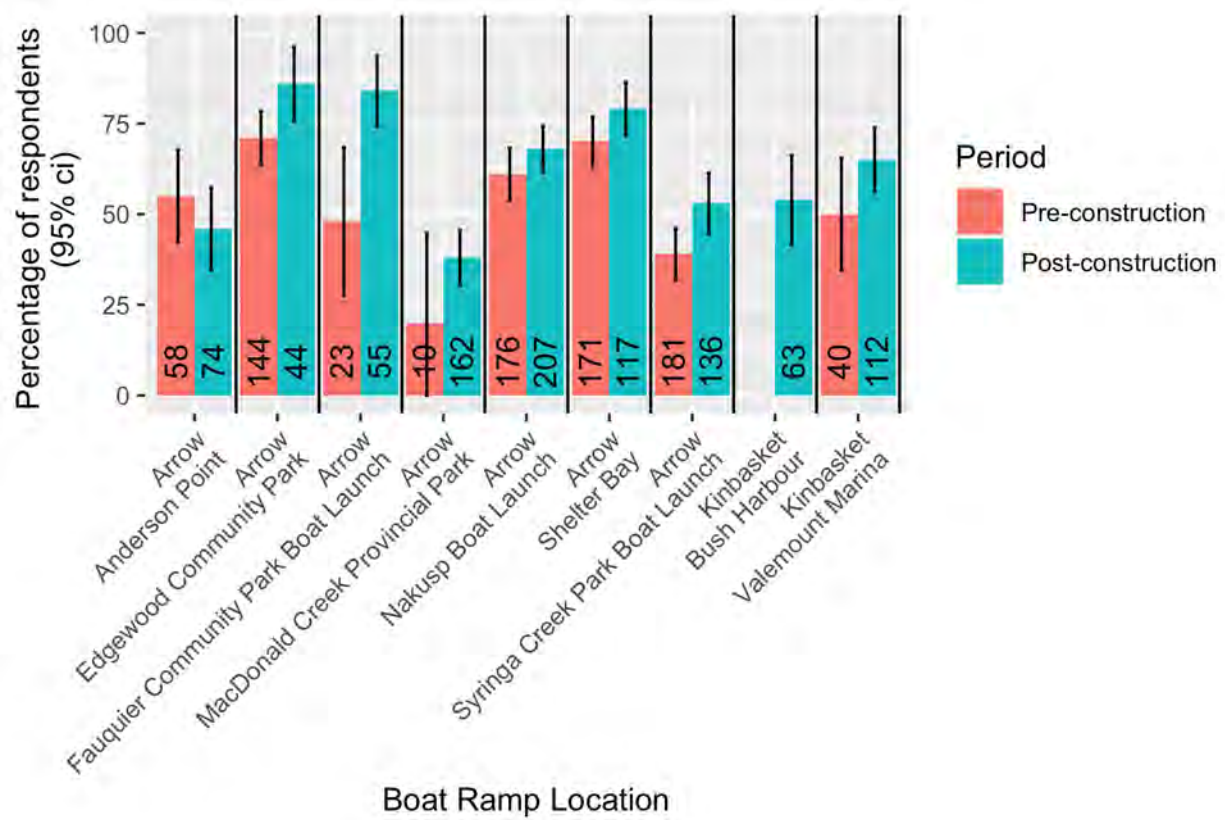
The following table and graph show the fraction of respondents at each boat ramp who declared the boat ramp where they received the questionnaire as their usual boat ramp (Table 10, Figure 10).

The observed change in the proportion of respondents at a boat ramp facility that indicated that this was their usual launch was larger post-construction, but not statistically significant (95% ci's overlapped considerably), except at the Fauquier Boat Launch where the proportion seems to have increased.

**Table 10.** Which boat ramp facility do you usually use on Arrow/Kinbasket Lake?

Boat Launch	Pre-construction	Post-construction
	%	%
Anderson Point	55%	46%
Edgewood Community Park	71%	86%
Fauquier Community Park Boat Launch	48%	84%
McDonald Creek Provincial Park	20%	38%
Nakusp Boat Launch	61%	68%
Shelter Bay	70%	79%
Syringa Creek Park Boat Launch	39%	53%
Bush Harbour <sup>†</sup>		54%
Valemount Marina	50%	65%

<sup>†</sup>Pre-construction boat launch counter data was not collected for Bush Harbour.



† Pre-construction boat launch counter data was not collected for Bush Harbour.

**Figure 10.** Reported use pre- and post-construction at Arrow and Kinbasket Reservoir boat ramps. Error bars are 95% confidence intervals.

#### 4.4 Management Question 3:

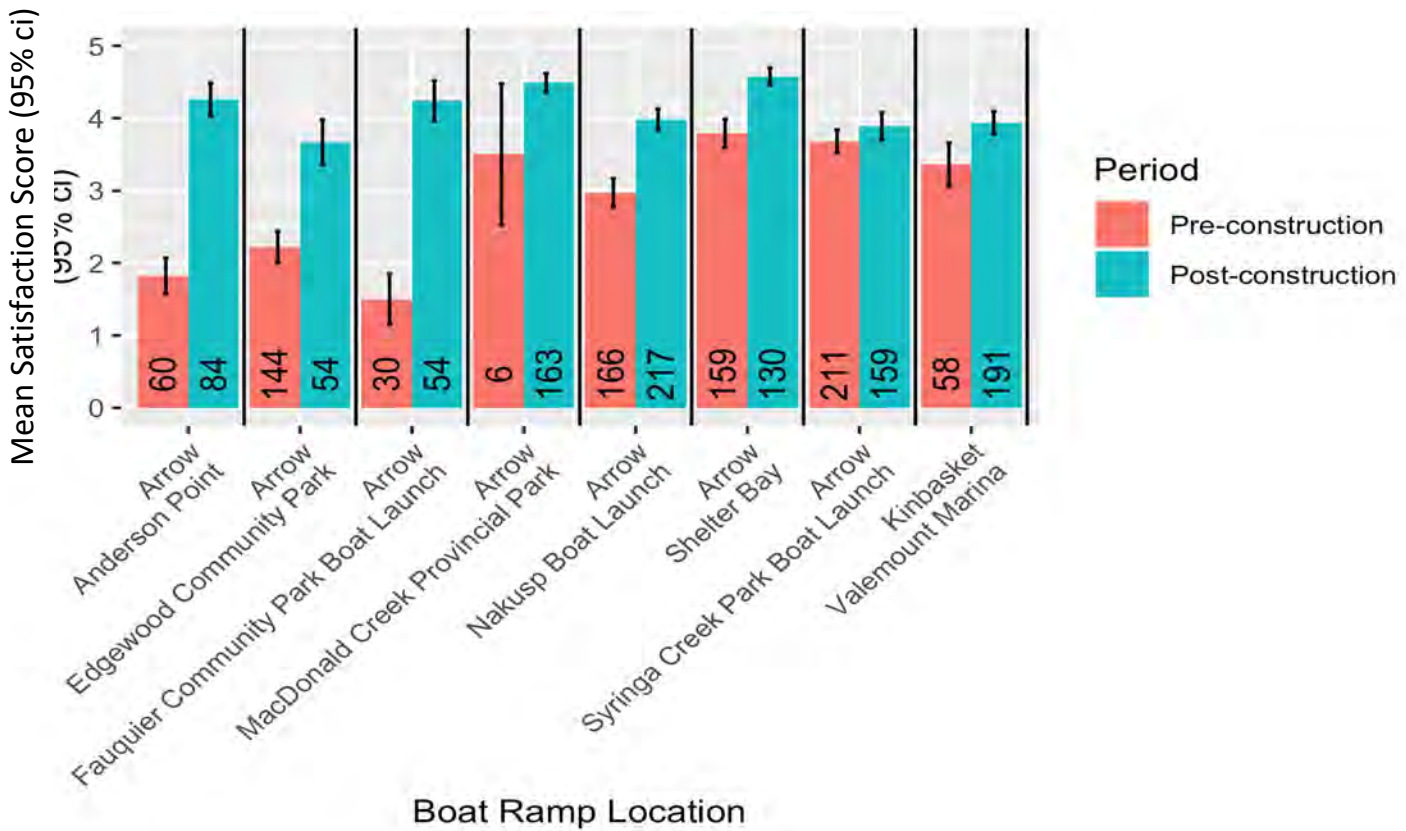
*MQ3. Does user satisfaction increase with improvements made to the existing boat ramps and construction of the new boat ramps?*

There was evidence of a change (increase) in mean satisfaction between the pre- and post-construction periods for all ramps except at McDonald Creek and Syringa (Tables 11, 12 and Figure 11). In the former case, the sample size in the pre-construction period was very small making it difficult to detect changes in the mean satisfaction.

**Table 11.** Satisfaction with boat ramp facilities at boat ramp locations that have had new ramps constructed. “On the whole, are you satisfied with the condition on the boat ramp facilities at this site?”

Location	Construction Period	n	Never	Rarely	Sometimes	Frequently	Always
Anderson Point	Pre	60	45%	38%	10%	3%	3%
	Post	84	6%	1%	10%	27%	56%
Edgewood Community Park	Pre	144	45%	17%	19%	10%	10%
	Post	54	4%	15%	22%	30%	30%
Fauquier Community Park Boat Launch	Pre	30	73%	13%	3%	10%	0%
	Post	54	4%	6%	6%	33%	52%
McDonald Creek Provincial Park	Pre	6	0%	17%	50%	0%	33%
	Post	163	2%	1%	6%	26%	64%
Shelter Bay	Pre	166	17%	23%	23%	19%	17%
	Post	217	5%	4%	21%	29%	41%
Syringa Creek Park Boat Launch	Pre	159	9%	8%	19%	23%	42%
	Post	130	1%	1%	7%	23%	68%
Nakusp Boat Launch	Pre	211	7%	9%	24%	30%	30%
	Post	159	6%	8%	16%	31%	39%
Bush Harbour <sup>†</sup>	Pre						
	Post	78	4%	4%	13%	17%	63%
Valemount Marina	Pre	58	7%	14%	36%	22%	21%
	Post	191	4%	8%	18%	29%	40%

<sup>†</sup> Pre-construction boat launch counter data was not collected for Bush Harbour.



**Figure 11.** Mean satisfaction with boat ramp facilities at boat ramp locations that have had new ramps constructed, where 1 equals ‘never satisfied’ up to 5 = ‘always satisfied’. Error bars are 95% confidence intervals.

**Table 12.** Average satisfaction with boat ramp facilities at boat ramp locations that have had new ramps constructed<sup>†</sup>.

Location	Construction Phase	n	Mean	95% CI	P-value	diff	diff.se
Anderson Point	Pre	60	1.82	± 0.25	< .001	2.45	0.17
	Post	84	4.26	± 0.23			
Edgewood Community Park	Pre	144	2.22	± 0.22	< .001	1.44	0.20
	Post	54	3.67	± 0.31			
Fauquier Community Park Boat Launch	Pre	30	1.50	± 0.35	< .001	2.74	0.23
	Post	54	4.24	± 0.28			
McDonald Creek Provincial Park	Pre	6	3.50	± 0.98	< .050	0.99	0.50
	Post	163	4.49	± 0.13			
Nakusp Boat Launch	Pre	166	2.97	± 0.20	< .001	1.01	0.13
	Post	217	3.98	± 0.15			
Shelter Bay	Pre	159	3.79	± 0.20		0.78	0.12
	Post	130	4.58	± 0.12			
Syringa Creek Boat Launch	Pre	211	3.68	± 0.16		0.21	0.13
	Post	159	3.89	± 0.19			
Valemount Marina	Pre	58	3.36	± 0.30	< .010	0.58	0.17
	Post	191	3.94	± 0.16			

<sup>†</sup> Pre-construction boat launch counter data was not collected for Bush Harbour.

There is evidence of a change in mean satisfaction with parking at Anderson Point (increase), Fauquier (increase), Nakusp (increase), Shelter Bay (increase) and Valemount Marina (increase) (Tables 13 and 14, Figure 12). Again, sample size at McDonald Creek in the pre-construction period was too small to estimate the mean satisfaction with parking prior to construction with any precision. Increase in mean satisfaction at Anderson Point was the largest among the launches considered.

**Table 13.** Satisfaction with parking lot conditions at boat ramp locations that have had new ramps constructed. “On the whole, are you satisfied with the parking lot conditions at this site?”

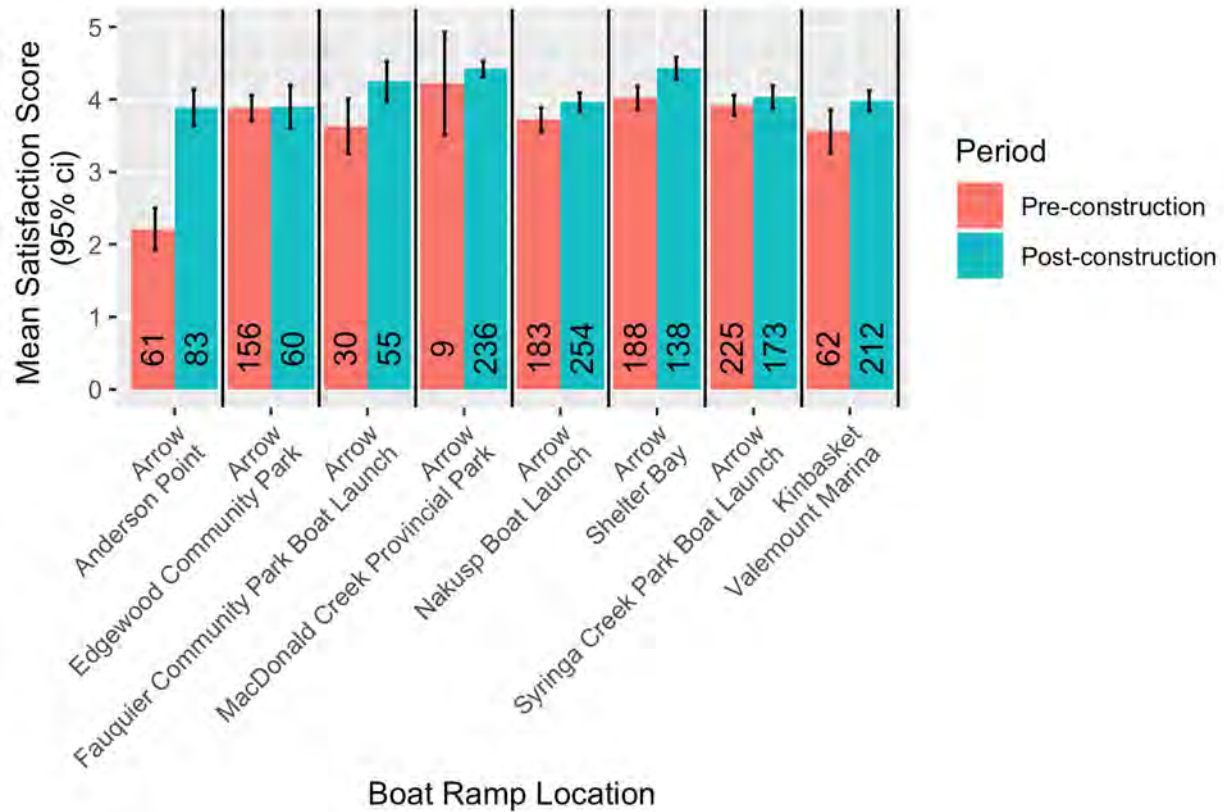
Location	Construction Period	n	Never	Rarely	Sometimes	Frequently	Always
Anderson Point	Pre	61	34%	30%	20%	13%	3%
	Post	83	5%	10%	16%	31%	39%
Edgewood Community Park	Pre	156	4%	10%	18%	29%	38%
	Post	60	7%	5%	18%	32%	38%
Fauquier Community Park Boat Launch	Pre	30	3%	13%	20%	43%	20%
	Post	55	5%	2%	7%	33%	53%
McDonald Creek Provincial Park	Pre	9	0%	11%	11%	22%	56%
	Post	236	1%	2%	8%	31%	58%
Nakusp Boat Launch	Pre	183	5%	11%	21%	29%	33%
	Post	254	3%	6%	20%	34%	37%
Shelter Bay	Pre	188	4%	9%	13%	30%	45%
	Post	138	1%	2%	12%	20%	64%
Syringa Creek Boat Launch	Pre	225	3%	6%	23%	32%	36%
	Post	173	4%	4%	16%	36%	39%
Bush Harbour <sup>†</sup>	Pre						
	Post	81	2%	4%	9%	26%	59%
Valemount Marina	Pre	62	6%	11%	32%	19%	31%
	Post	212	3%	7%	21%	29%	41%

<sup>†</sup> Pre-construction boat launch counter data was not collected for Bush Harbour.

**Table 14.** Average satisfaction with parking lot conditions at boat ramp locations that have had new ramps constructed<sup>†</sup>.

Location	Construction Phase	n	Mean	95% CI	p
Anderson Point	Pre	61	2.21	0.29	<0.001
	Post	83	3.89	0.25	
Edgewood Community Park	Pre	156	3.88	0.18	0.903
	Post	60	3.90	0.30	
Fauquier Community Park Boat Launch	Pre	30	3.63	0.38	0.013
	Post	55	4.25	0.28	
McDonald Creek Provincial Park	Pre	9	4.22	0.71	0.606
	Post	236	4.42	0.11	
Nakusp Boat Launch	Pre	183	3.72	0.17	0.027
	Post	254	3.96	0.13	
Shelter Bay	Pre	188	4.02	0.16	<0.001
	Post	138	4.43	0.15	
Syringa Creek Boat Launch	Pre	225	3.92	0.14	0.284
	Post	173	4.03	0.16	
Valemount Marina	Pre	62	3.56	0.30	0.017
	Post	212	3.98	0.14	

<sup>†</sup> Pre-construction boat launch counter data was not collected for Bush Harbour.



**Figure 12.** Mean satisfaction with parking lots at boat ramp locations that have had new ramps constructed, where 1 equals “never satisfied” up to 5 = “always satisfied.” Error bars are 95% confidence intervals.



## 4.5 Management Question 4:

*MQ4. Is there a need for installation of additional facilities to satisfy the needs of boat users on Kinbasket Reservoir and Arrow Lakes Reservoir?*

This section summarizes results pertaining to MQ4 for all boat launches. For individual results for each boat launch, see Appendix I.

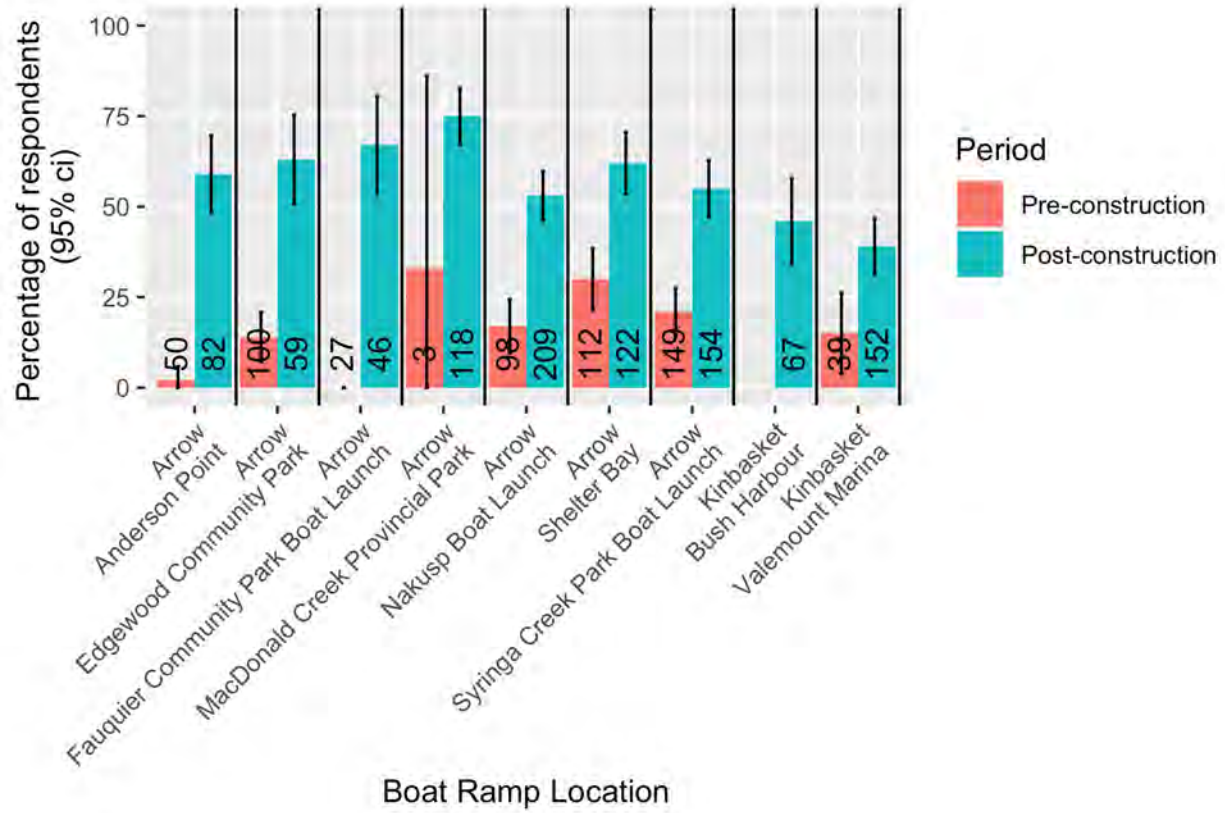
### 4.5.1 Overall Percentage of Boat Users Reporting a Need for Additional Facilities

This following table and figure show the fraction of each respondents at each boat ramp who declared the boat ramp where they received the survey had no problems or reported positive comments (Table 15, Figure 13).

There were dramatic increases in the proportion of respondents who reported no problems or positive comments for all launches where pre- and post-construction data was collected except for McDonald Creek, where the sample size in the pre-construction period was too small.

**Table 15.** Percentage of survey respondents reporting no problems or providing positive comments about the boat ramp facility pre- and post-construction.

Boat Ramp	Pre-construction (n = 578)		Post-construction (n = 1,009)	
	n	%	n	%
Anderson Point	50	2%	82	59%
Edgewood	100	14%	59	63%
Fauquier	27	0%	46	67%
McDonald Creek	3	33%	118	75%
Nakusp	98	17%	209	53%
Shelter Bay	112	30%	122	62%
Syringa Creek Park	149	21%	154	55%
Bush Harbour	0		67	46%
Valemount	39	15%	152	39%
<b>TOTAL</b>	<b>578</b>		<b>1,009</b>	



**Figure 13.** Percentage of survey respondents reporting no problems or providing positive comments about the boat ramp facility pre- and post-construction. Error bars are 95% confidence intervals.

4.5.2 Socio-Demographic Characteristics

There was some evidence of an increase in the mean age of respondents post-construction at the Edgewood Community Park Boat Launch (Table 16). The reasons for this are unknown.

**Table 16.** Pre- and post-construction differences in age among survey respondents.

Boat Ramp	Pre-Construction		Post-Construction		p
	n	Mean Age	n	Mean Age	
Anderson Point	61	52	88	50	0.311
Edgewood	161	53	62	58	0.010
Fauquier	30	51	60	57	0.068
McDonald Creek	12	49	266	51	0.583
Nakusp	199	55	271	56	0.295
Shelter Bay	194	54	145	54	0.943
Syringa Creek	232	50	184	48	0.214
Valemount Marina	63	46	217	46	0.784

There was some evidence of a change in the distribution of self-reported gender of respondents at the Nakusp Boat Launch with a change in the proportion of males from 72% (pre-construction) to 56% (post-construction) (Table 17). The reasons for this are unknown.

**Table 17.** Pre- and post-construction differences in gender among survey respondents.

Boat Ramp	Pre-Construction		Post-Construction		p
	Male n	Female n	Male n	Female n	
Anderson Point	40	23	57	32	1.000
Edgewood	101	56	37	25	0.626
Fauquier	20	10	40	21	1.000
McDonald Creek	6	6	166	101	0.586
Nakusp	143	57	158	125	0.001
Shelter Bay	137	62	98	45	1.000
Syringa Creek Park	178	57	89	94	<0.001
Valemount Marina	38	30	137	80	0.353

## 5. Discussion

### 5.1 Management Question 1

*MQ 1. Does public use of boat ramps increase on Kinbasket and Arrow Lakes reservoirs after installation and upgrading of the WUP boat ramp facilities?*

The impact of boat ramp improvements on volume of public use at sites on Kinbasket Reservoir and Arrow Lakes Reservoir was mixed. Mean post-construction visitation was statistically higher than mean pre-construction visitation at McDonald Creek. Mean post-construction visitation was statistically lower than mean pre-construction visitation at three sites: Anderson Point, Fauquier, and Nakusp. There was no statistical difference between mean pre-construction and mean post-construction visitation at Edgewood, Shelter Bay, Syringa Creek or Valemount Marina. At the site that saw an increase in volume (McDonald Creek) for every pre-construction visit, there was an average of 1.5 post-construction visits. At the site that saw an increase in public use (McDonald Creek), a higher proportion of respondents indicated post-construction that seasonal carrying capacity may be affected (*i.e.*, that more parking is needed). However, the limited number of pre-construction respondents at McDonald Creek makes it difficult to detect changes in the mean satisfaction.

Simple changes over time can be affected by many factors outside of construction improvements. For example, a certain year could have generally poorer weather; or economic factors may affect number of visits. As well, timing of construction was not consistent across boat ramps so comparisons of pre- and post- may not involve the same set of years for all boat ramps.

### 5.2 Management Question 2

*MQ2. If there is an increasing use of new or improved facilities, is it due to existing users visiting more often or new users being attracted to the area?*

Reported usual use of improved boat launches post-construction increased at five sites with no evidence of a change at three sites.

There was no evidence of a change in the distribution of reported usual use of boat launches between pre- and post-construction at Anderson Point, McDonald, or Syringa; there was evidence of an increase at Edgewood (from 71% to 86% with a reduction in users specifying multiple sites), Fauquier (from 48%

to 84% with a reduction in users specifying the Needles and Arrow Park Ferry), Shelter Bay (from 70% to 79% with a reduction in users specifying multiple sites), Nakusp (from 61% to 68% with a reduction in users specifying multiple sites) and Valemount (from 50% to 65% with a reduction in users specifying multiple sites); there were no boat launches where there was evidence of a decrease in the proportion of users at a launch specifying that this was their usual launch.

Users typically use multiple ramps depending on what part of the lake they want to access, water levels, activities etc. Whether a visitor is a “new user” (i.e., new to the Arrow Lakes) or an existing user who has “shifted” usages is confounded by outside factors.

It appears that construction at the ramps has made users “more loyal” to their usual ramp, e.g., although MQ1 shows a decrease in visitor use post-construction, users now tend to be more loyal to a particular boat ramp even if they reduce their total visits.

### **5.3 Temporal changes reflect outside factors, so a reduction in usage may reflect weather, the economy, etc. However, shifts in usage are somewhat independent of total usage, e.g., fewer uses of the ramp, but people now tend to use the same ramp a higher proportion of the time. Management Question 3**

*MQ3. Does user satisfaction increase with improvements made to the existing boat ramps and construction of the new boat ramps?*

Visitor satisfaction with boat ramp facilities and with parking lot conditions increased at all sites following improvements made to the existing facilities. Average mean satisfaction increased from 2.9 to 4.1 out of 5 following WUP improvements. This suggests that the improvements made were effective in addressing visitor expectations.

### **5.4 Management Question 4**

*MQ4. Is there a need for installation of additional facilities to satisfy the needs of boat users on Kinbasket Reservoir and Arrow Lakes Reservoir?*

Overall, the average percentage of respondents reporting no problems or providing positive comments about the boat ramp facilities increased substantially (from 17% to 59%) post-construction at the eight

improved boat launch sites examined, suggesting that boat ramp improvements to date have been successful in addressing boat users' needs and there is no need for additional facilities.

Data from Anderson Point, Edgewood, Fauquier, McDonald Creek, Nakusp, Shelter Bay and Syringa suggest that boat launch improvements at these sites have satisfied the majority of respondents' concerns. While there were some significant dislikes about certain facilities post-construction, the number of people reporting these issues was very low (< 5 per site).

At Valemount the percentage of respondents reporting no problems or providing a positive comment doubled, however more people indicated issues with the dock/dock ramp and debris post-construction.

There were no significant differences between the pre- and post-construction age or gender of survey respondents at the boat ramps examined, apart from an increase post-construction in the mean age of respondents at the Edgewood Community Park Boat Launch, and an increase in the proportion of women post-construction at the Nakusp Boat Launch (Table 17). As there were no other significant differences between the pre- and post-construction age and proportion of men and women at the six other boat ramps that were examined, there is support for Management Hypothesis #4 (there are no changes in the socio-demographic or trip behavior characteristics of users of boat ramps on Kinbasket Reservoir and Arrow Lakes Reservoir). This suggests the improved boat launches are attracting the same demographic of user, rather than a demographic that is more satisfied in general or has different recreation behaviours.

## **6. Limitations and Opportunities for Further Study**

A variety of unexpected situations arose that affected use, particularly with regard to construction periods and high-water curtailment of vehicle counts. Construction exclusion dates (*i.e.*, starts are finishes) represent best estimates based on information provided to the study team by BC Hydro, Columbia Power Corporation and on-site observations by project field staff. There is some uncertainty as to exact dates of construction activity that impacted the use of the boat ramps (either construction vehicle traffic increasing counts or construction activity not allowing public access to ramp). For example, there was likely a fair amount of construction activity on either side of the official McDonald Creek construction period that affected vehicle counts. In some cases, construction took place in the

water (pile driving) and did not impede the use of the ramp but support vehicles would have been counted.

A key limitation of the study was the timing of physical improvements at each of the boat launch ramps. Ramp locations that were improved early in the study period do not have much, if any, pre-improvement data against which the post-improvement data can be compared. This means that hypotheses  $H_{2B}$ ,  $H_3$  and  $H_4$  may not have been uniformly tested over every boat launch ramp location.

## 7. Conclusion

Results suggest that boat ramp improvements did not lead to a large increase in daily visitor volume, an increase in new users, or a change in the type of user group. Visitor satisfaction was the factor most affected post-construction. Average satisfaction increased from 2.9 to 4.1 (out of a possible maximum of 5) after ramp improvements, suggesting these projects have been effective in providing benefits to recreational interests in the area.

The overall percentage of respondents reporting no problems or providing positive comments about the boat ramp facilities increased substantially over the course of the project period (from 17% to 59%) suggesting that boat ramp improvements to date have been successful in addressing boat users' needs. Very few respondents at Anderson Point, Nakusp, Fauquier, McDonald Creek, Shelter Bay, Syringa and Edgewood reported dislikes post-construction suggesting boat launch improvements at these sites have satisfied the majority of respondents' concerns. At Valemount the percentage of respondents reporting no problems or providing a positive comment doubled, however more people indicated issues with the dock/dock ramp and debris.

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## APPENDIX A – TRAFx Vehicle Counters

### Vehicle counter settings

During the study period, vehicle counters were configured and installed at the following monitoring sites. Vehicle counters were configured and installed using the following settings (Table 18):

**Table 18.** Vehicle counter settings.

Location	Mode	Period	Delay	Threshold	Rate
<b>Arrow Lakes Reservoir</b>					
Anderson Point	VEH_2s	000	120	16	S
Edgewood	VEH_2s	000	120	16	S
Fauquier	VEH_2s	000	120	16	S
Burton Historical Park	VEH_2s	000	120	16	S
Burton South	VEH_2s	000	120	16	S
McDonald Creek	VEH_2s	000	120	16	S
Nakusp	VEH_5d	000	96	16	S
Shelter Bay	VEH_2s	000	120	16	S
Syringa Creek	VEH_4d	000	96	16	S
<b>Kinbasket Reservoir</b>					
Bush Harbour	VEH_4d	000	120	16	S
Valemount	VEH_2s	000	120	16	S

Notes:

Mode: VEH\_2s = single lane traffic; VEH\_4d = double lane traffic with counter on side of road;

VEH\_5d=double lane traffic with counter in middle of road

Period: 000 = timestamps

Delay: 8 = 1 sec; 96 = 12 sec; 120 = 15 sec

Threshold: Range is 3-16; 16 is least sensitive

Rate: S = slow (<50 km/h)

### How does the vehicle counter work?

Ferrous metal (*i.e.*, metals with iron content) objects distort the earth's magnetic field as they move through it. Pure aluminum (non-alloy aluminum) will not be detected. Moving the counter (*i.e.*, pointing it in different compass directions, tilting it, jiggling or jolting it) will also cause counts to occur. This is

because the earth's magnetic field has different strengths for different directions and tilts, and the counter senses this.

As vehicles move, they disturb the earth's magnetic field. The TRAFx Vehicle Counter digitizes and analyzes these disturbances using highly sophisticated hardware and software. Thus, as a vehicle passes within the detection zone it changes the earth's magnetic field in that area which triggers a count. Different modes are used to meet the particular needs and traffic pattern of a given site. That is why the modes and sensitivity settings were selected at each site to best reflect the local conditions.

***Can the vehicle counter be buried? Does it perform differently when buried?***

Yes, it can be buried. Because it responds to changes in the earth's magnetic field, the TRAFx Vehicle Counter functions the same whether the counter is buried or installed above ground.

***Will the counter still function if a vehicle parks over or near the counter?***

Yes. Unlike most other types of vehicle counters, the TRAFx Vehicle Counter will automatically adjust to the presence of a vehicle parked over top or nearby and will continue to function properly. Likewise, if the counter is placed near a metal pole (*e.g.*, signpost) or similar static metal object (*e.g.*, guard rail, cattleguard, bridge beam *etc.*) it will automatically adjust to its presence.

***How are annual vehicle counts calculated?***

TRAFx DataNet vehicle count estimates follow the most widely accepted vehicle traffic calculation methods used in North America. This system is used by the US Army Corps of Engineers, US Bureau of Land Management, US Fish and Wildlife, US Forest Service, US National Parks Service, Parks Canada, most Canadian provincial and territorial governments, and numerous countries in Europe and the South Pacific.

For this study, Annual Vehicle Counts are collected and automatically compiled by the TRAFx DataNet system for each full calendar year. This is done to standardize the calculation and application of average daily use to missing data. The system then enables the selection of any time period across years for calculating and reporting daily, weekly and monthly counts, averages and comparisons.

The Annual Vehicle Count Summary shows estimated total yearly counts by recording the total daily counts and calculating the average daily count for that month, then applying that average daily count to

missing data periods (such as partial months due to mid-month start date or interruptions due to data downloads, dead batteries or missing data). Thus, if a given counter has at least one day of counts in a month but is also missing at least one day of counts that month, the TRAFx Datanet will apply the monthly average daily traffic (ADT) count to only those days where data has been interrupted or is missing. If the counter had been operating without interruption during a day or month and there was absolutely no traffic recorded, the TRAFx DataNet calculates a '0' traffic count for that day or month. The sum of recorded and calculated counts generates the total estimate for the year.

***How are boat launch counts calculated?***


To get an accurate count at a boat launch it is necessary to apply additional factors, including:

- Filter – a 12 to 15 second delay is applied (12 seconds on double lane ramps and 15 seconds on single lane ramps) to remove any multiple counts within those intervals to reduce the possibility of multiple counts for a single launch.
- Divide by two – as a vehicle must pass the counter twice to launch a boat (going into the water loaded and coming out empty) the count is divided by two. This may provide a slightly more conservative estimate than reality at Anderson Point but it is applicable for much of the year and maintains a common standard application of the methodology across all sites.
- Adjustment Factor of '0.5' – as a vehicle must make two trips per boating experience (one to launch the boat and another to load the boat) the count is again multiplied by 0.5 (or in other words again divided by two).

The ADT procedure has been applied as described above for minor occurrences of missing data. Operational conditions causing interruptions to continuous data collection, such as construction activity, excessive high water and counter malfunction resulted in some gaps in the data. Data was excluded for periods when a ramp was unavailable for public use due to construction activity.

## APPENDIX B – Visitor Survey

(Arrow Lakes Reservoir Version)



**LEES + Associates**  
RESEARCH & PLANNING

604 899 3806 | www.etas.bc.ca

### Arrow Lakes Recreation Survey

- The purpose of this survey is to obtain information about recreation use of the Arrow Lakes.
- Participation in this study is completely voluntary; you may refuse to participate at any time.
- You may skip any question that you do not feel comfortable answering, although we encourage you to complete all questions if possible.
- The survey will take about 5 to 10 minutes to complete.

All information resulting from this study will be kept strictly confidential. Please do not write your name anywhere on this questionnaire. Individual responses will not be made available to anyone outside of the *Arrow Lakes Recreation Survey Research Team (LEES + Associates)*.

**If you have any questions about this research, or would like further information, please do not hesitate to contact LEES + Associates at (604) 899-3806.**

**Q1** The questions in this section ask about the recreation activities that you do **ON THE WATER** or **ON THE SHORE** of the Arrow Lakes.

Indicate **ALL** of the activities that you do **ON THE WATER** or **ON THE SHORE** of the Arrow Lakes.

<input type="checkbox"/> Fishing	<input type="checkbox"/> Beach activities	<input type="checkbox"/> Hunting	<input type="checkbox"/> Mushroom picking
<input type="checkbox"/> Boating (motor cruising)	<input type="checkbox"/> Nature study	<input type="checkbox"/> Scenic viewing	<input type="checkbox"/> Berry picking
<input type="checkbox"/> Canoeing/kayaking	<input type="checkbox"/> Bird watching	<input type="checkbox"/> Picnicking	<input type="checkbox"/> Drawing/painting/photography
<input type="checkbox"/> Swimming	<input type="checkbox"/> Wildlife viewing	<input type="checkbox"/> Camping	<input type="checkbox"/> Cross-country skiing
<input type="checkbox"/> Waterskiing	<input type="checkbox"/> Horseback riding	<input type="checkbox"/> Walking/hiking	<input type="checkbox"/> Snowmobiling
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> AT V/Trail bike/4 x 4	<input type="checkbox"/> Mountain biking	<input type="checkbox"/> Other: _____

**On average, how many DAYS PER SEASON do you visit the Arrow Lakes?**

Spring _____ days/season	Summer _____ days/season
Fall _____ days/season	Winter _____ days/season

**What recreation activities did you do TODAY on the water or on the shore of the Arrow Lakes?**

**Are you participating in this activity today as a paying customer of a commercial recreation or tourism operator/guide?**

Yes  No **Please elaborate:**

Version: March 29, 2010.

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**Q2** The following questions ask about the *ONE* outdoor recreation activity that is **MOST IMPORTANT** to you. Refer to this activity when answering all of the questions in this section.

Of all of the activities that you do on the water or on the shore of the Arrow Lakes, which one is the **MOST IMPORTANT**? *Identify only one activity.*

My most important recreation activity is \_\_\_\_\_

How many years have you done this activity? \_\_\_\_\_ years.

On a scale of 1 to 5, with 1 being **BEGINNER** and 5 being **EXPERT**, how skilled are you at this activity?

Beginner  1  2  3  4  5 Expert

On a scale of 1 to 5, with 1 being **NOT IMPORTANT AT ALL** and 5 being **VERY IMPORTANT**, how important is this activity to your lifestyle?

Not important at all  1  2  3  4  5 Very important

Who do you usually do this recreation activity with? *Check only one.*

Alone  Family  Friends  Clubs  People from work  Other \_\_\_\_\_

On average, how many **DAYS PER SEASON** do you do this activity?

Spring: \_\_\_\_\_ days/season Summer: \_\_\_\_\_ days/season

Fall: \_\_\_\_\_ days/season Winter: \_\_\_\_\_ days/season

**Q3** The following questions ask about some of the **EXPERIENCES** that you may have had while visiting the Arrow Lakes for recreation activities.

Consider how many people you are comfortable seeing while you are visiting the Arrow Lakes and complete the following statement:

It is OK to have as many as \_\_\_\_\_ encounters per day

**OR**

It doesn't matter to me how many people I see

For each season below, indicate on a scale of 1-9 how crowded you have felt while visiting the Arrow Lakes.

Spring:  1  2  3  4  5  6  7  8  9  
Not at all crowded      Somewhat crowded      Moderately crowded      Extremely crowded

Summer:  1  2  3  4  5  6  7  8  9  
Not at all crowded      Somewhat crowded      Moderately crowded      Extremely crowded

Fall:  1  2  3  4  5  6  7  8  9  
Not at all crowded      Somewhat crowded      Moderately crowded      Extremely crowded

Winter:  1  2  3  4  5  6  7  8  9  
Not at all crowded      Somewhat crowded      Moderately crowded      Extremely crowded

Have you ever experienced any conflicts with other people or recreation activities while you were visiting the Arrow Lakes?

Yes  No Please elaborate:

**Q4** The questions below ask about your USE and FAMILIARITY with the Arrow Lakes.

From the list below, indicate why you come to the Arrow Lakes. Check all that apply.

- To learn about reservoirs
- To discover new things
- To learn more about nature
- To view the scenery
- To be close to nature
- To think about my personal values
- To get exercise
- To give my mind a rest
- To have a change from my daily routine
- To be with friends
- To be with family
- Other \_\_\_\_\_

The Arrow Lakes serves many purposes. In your opinion, what are the 3 most important management goals for the Arrow Lakes? Place a 1, 2, or 3 beside your choices (with 1 being the most important management goal).

**Rank**

- \_\_\_\_\_ Provide local employment
- \_\_\_\_\_ Safety for reservoir users
- \_\_\_\_\_ Provide recreation opportunities
- \_\_\_\_\_ Flood control
- \_\_\_\_\_ Electricity generation
- \_\_\_\_\_ Provide habitat for aquatic species
- \_\_\_\_\_ Other \_\_\_\_\_

**Q5** The questions below ask about HOW YOU FEEL about the management of recreation on the Arrow Lakes.

The management of the Arrow Lakes seeks to balance many tasks. Please indicate your satisfaction with management activities.

Never  
 Rarely  
 Sometimes  
 Frequently  
 Always  
 Don't know

On the whole, are you satisfied with water levels on the Arrow Lakes?  1  2  3  4  5  6

On the whole, do you have satisfying experiences on the water or on the shore of the Arrow Lakes?  1  2  3  4  5  6

On the whole, are you satisfied with the condition of the boat ramp facilities at this site?  1  2  3  4  5  6

On the whole, are you satisfied with the parking lot conditions at this site?  1  2  3  4  5  6

On the whole, are you satisfied with the management of the Arrow Lakes?  1  2  3  4  5  6

Compared to the water levels that you experienced today, how might different water levels affect your use of the Arrow Lakes for recreation activities?

I will come back  
 I will go somewhere else  
 Not sure

If the water level is the **same** as today.

If the water level is **higher** than today.

If the water level is **lower** than today.

**Please elaborate:**







**Q6** The following questions ask about YOUR RECREATION EXPERIENCES on the Arrow Lakes.

How long have you been coming to the Arrow Lakes for recreation activities? \_\_\_\_\_ years.

Based on your experience today, will you come back to the Arrow Lakes for recreation activities?

Yes  No Please elaborate:

Which boat ramp facility do you usually use on the Arrow Lakes?

Why did you come to this boat ramp facility today?

What did you LIKE MOST about the boat ramp facility that you visited today?

What did you LIKE LEAST about the boat ramp facility that you visited today?

How did you first hear about recreation opportunities and activities near and on the Arrow Lakes?  
*Check all that apply.*

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> Tourism information booth     | <input type="checkbox"/> Family            | <input type="checkbox"/> BC Hydro web site                        |
| <input type="checkbox"/> Tourism information brochures | <input type="checkbox"/> Friends           | <input type="checkbox"/> BC Hydro facility (e.g., Revelstoke Dam) |
| <input type="checkbox"/> Tourism operators             | <input type="checkbox"/> BC Parks          | <input type="checkbox"/> BC Hydro Bill                            |
| <input type="checkbox"/> Private marinas               | <input type="checkbox"/> BC Forest Service | <input type="checkbox"/> Other: _____                             |

**Q7** These questions below ask about you. We use this information only to assist us in compiling the survey results.

What year were you born in? 19 \_\_\_\_ What community do you live in? \_\_\_\_\_

Gender:  Male  Female How long have you lived in your community? \_\_\_\_\_ years.

Please list any outdoor recreation clubs or organizations that you belong to.

Do you have any additional comments about recreation on the water or on the shore of the Arrow Lakes?

**Visitor Survey Response Rates**

*Response Rates - Kinbasket Reservoir*

Field staff encountered 1,128 visitors at sample sites on the Kinbasket Reservoir between 2010 and 2019 and asked 621 visitors to participate in the survey; 64 of those had previously completed a survey in that sampling year. A total of 402 completed questionnaires were returned which represents an overall response rate of 72% (Table 19). Note that the differing response rates do not affect the management questions. The Kinbasket Reservoir sites were not surveyed in 2017 and so all entries are 0 for that year.

**Table 19.** Kinbasket Reservoir visitor encounters and survey response rates.

<b>Year</b>	<b># Visitors Encountered</b>	<b># Visitors Asked to Participate</b>	<b># Previously Completed<sup>†</sup></b>	<b># Completed Questionnaires</b>	<b>Response Rate</b>
2010	217	123	0	86	70%
2011	221	112	35	66	86%
2012	241	156	2	112	73%
2013	298	179	21	106	66%
2017	0	0	0	0	n/a
2019	151	51	6	33	73%
<b>TOTAL</b>	<b>1,128</b>	<b>621</b>	<b>64</b>	<b>402</b>	<b>72%</b>

<sup>†</sup> People who have previously completed the survey in this sampling year. These visitors are subtracted from the number of visitors asked to participate, in order to calculate response rate.

*Response Rates - Arrow Reservoir*

Field staff encountered 6,563 visitors at sample sites on the Arrow Lakes Reservoir between 2010 and 2019 and asked 2,312 visitors to participate in the survey; 241 of those had previously completed a survey in that sampling year. A total of 1,688 completed questionnaires were returned which represents an overall response rate of 82% (Table 20).

**Table 20.** Arrow Lakes Reservoir visitor encounters and survey response rates.

<b>Year</b>	<b># Visitors Encountered</b>	<b># Visitors Asked to Participate</b>	<b># Previously Completed<sup>†</sup></b>	<b># Completed Questionnaires</b>	<b>Response Rate</b>
2010	928	322	28	273	93%
2011	1,235	326	35	266	91%
2012	707	227	22	172	84%
2013	815	332	15	282	89%
2017	993	375	30	258	75%
2019	1,885	730	111	437	71%
<b>TOTAL</b>	<b>6,563</b>	<b>2,312</b>	<b>241</b>	<b>1,688</b>	<b>82%</b>

<sup>†</sup> People who have previously completed the survey in this sampling year. These visitors are subtracted from the number of visitors asked to participate, in order to calculate response rate.

## APPENDIX C – Vehicle Counter Results

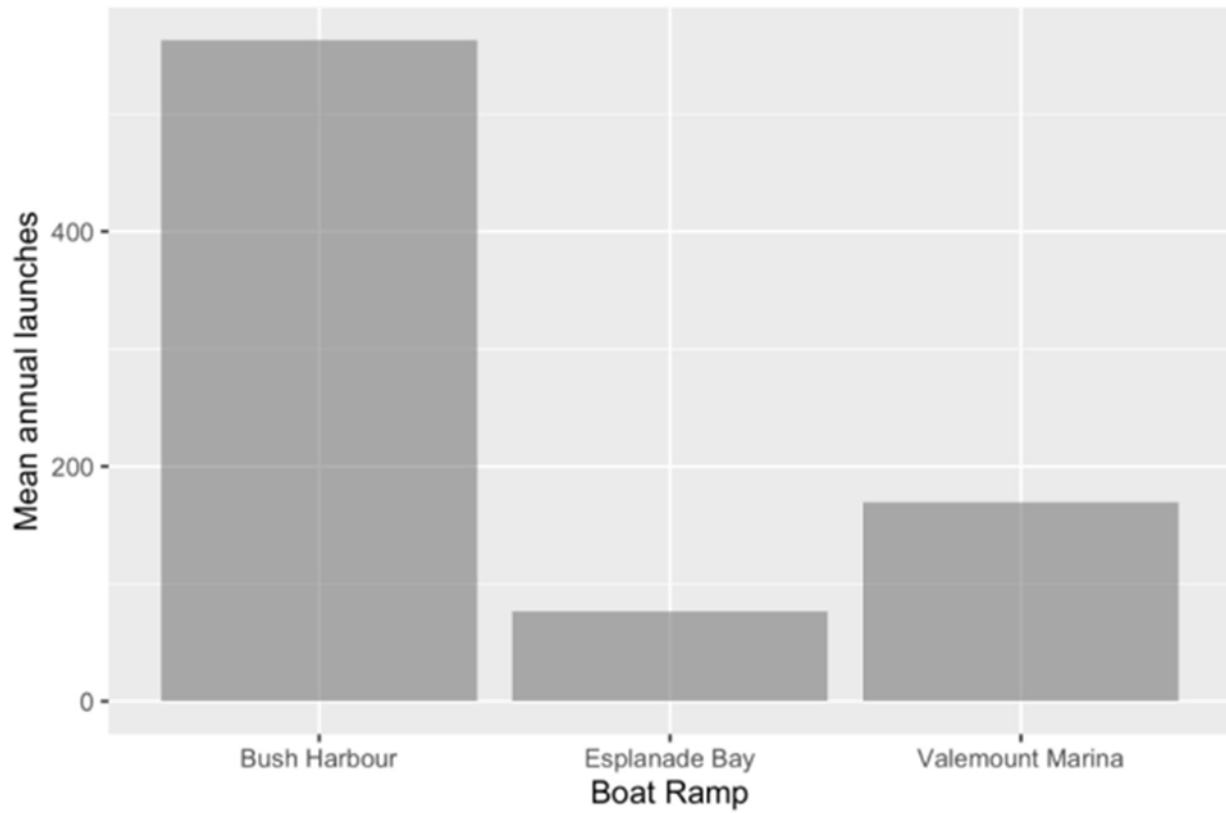
### Kinbasket Reservoir – Vehicle Counter Results

Below is a summary of adjusted vehicle counts for the study period (2010 - 2019), which included vehicle counts in Years 1 to 4 (2010 - 2013) and Years 7 to 10 (2016 - 2019), (Table 21, Figures 14, 15) as collected and automatically compiled by the TRAFx DataNet system.

The table presents traffic counts adjusted to best reflect actual use. This means TRAFx Datanet applies the average daily traffic count to those days where data has been interrupted or is missing. If the counter had been operating without interruption during a day or month and there was absolutely no traffic recorded, the TRAFx DataNet calculates a '0' traffic count for that day or month. The application of average daily traffic counts is described further in Appendix A.

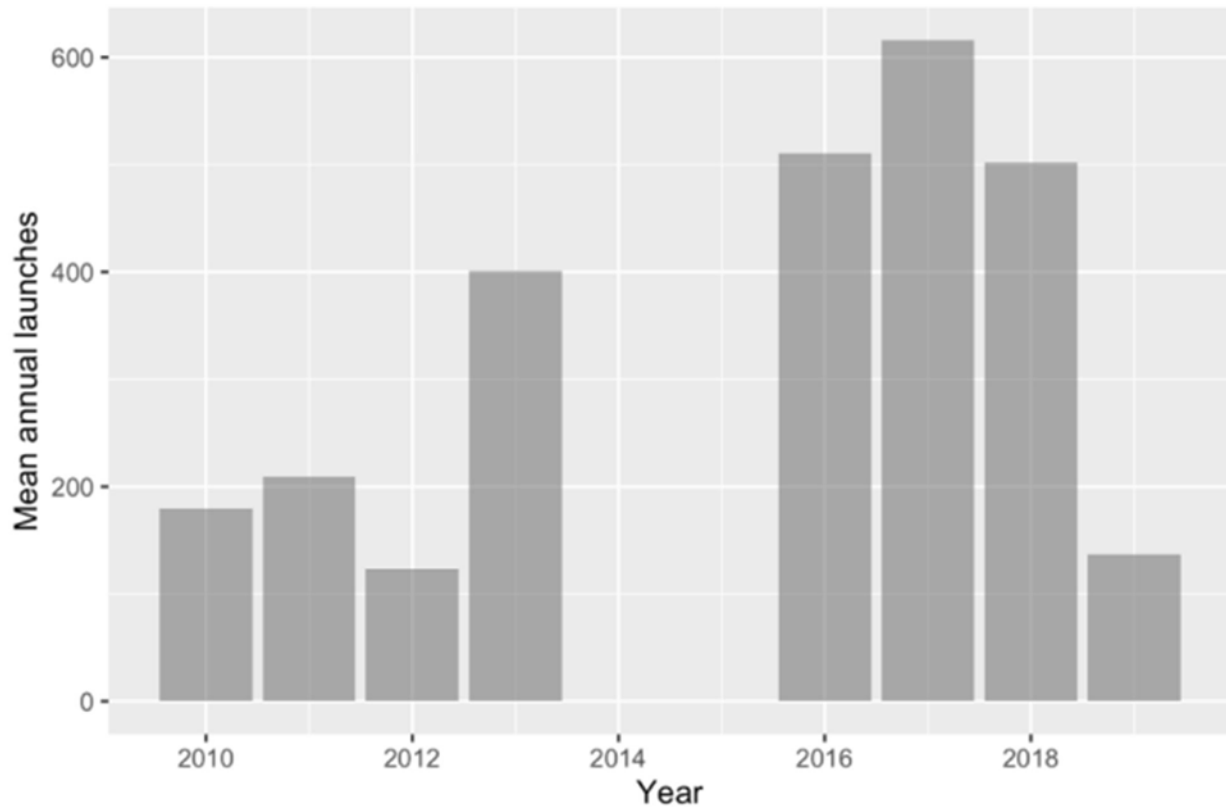
**Table 21.** Kinbasket Reservoir Boat Launches – Annual Vehicle Count Summary, 2010-2019 (Adjusted)

Year	Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Annual Total
2010	Bush Harbour	-	-	-	-	-	-	-	93	44	50	7	0	194	359
	Valemount	-	-	-	14	8	15	65	33	27	3	0	0	165	
2011	Bush Harbour	0	0	-	0	47	52	106	88	66	34	6	0	399	628
	Esplanade Bay	-	-	-	-	-	-	-	67	26	6	0	0	99	
	Valemount	0	0	2	-	-	60	38	16	14	0	-	-	130	
2012	Bush Harbour	0	0	0	2	45	67	105	-	9	3	3	-	234	369
	Esplanade Bay	0	0	0	0	7	7	31	-	9	1	0	-	55	
	Valemount	1	0	0	0	7	31	18	-	18	5	-	0	80	
2013	Bush Harbour	-	-	-	196	242	120	109	107	91	32	60	-	957	1,203
	Esplanade Bay	-	-	-	-	10	9	11	32	8	6	-	-	76	
	Valemount	0	0	0	9	9	75	28	32	16	1	0	-	170	
2016	Bush Harbour	-	-	-	-	117	133	174	197	120	78	45	2	866	1,020
	Valemount	-	-	-	-	20	30	43	38	20	1	2	0	154	
2017	Bush Harbour	0	0	0	9	120	150	251	201	156	95	17	9	1,008	1,231
	Valemount	0	0	1	6	35	25	65	51	35	4	0	1	223	
2018	Bush Harbour	0	0	0	2	65	120	233	188	112	65	-	-	785	1,003
	Valemount	0	0	2	2	14	37	54	66	37	3	2	1	218	
2019	Bush Harbour	-	-	-	-	2	6	11	19	8	10	1	0	57	273
	Valemount	2	0	1	5	4	33	34	81	45	7	2	2	216	



\*Esplanade Bay was used as a control site in Years 2 to 4

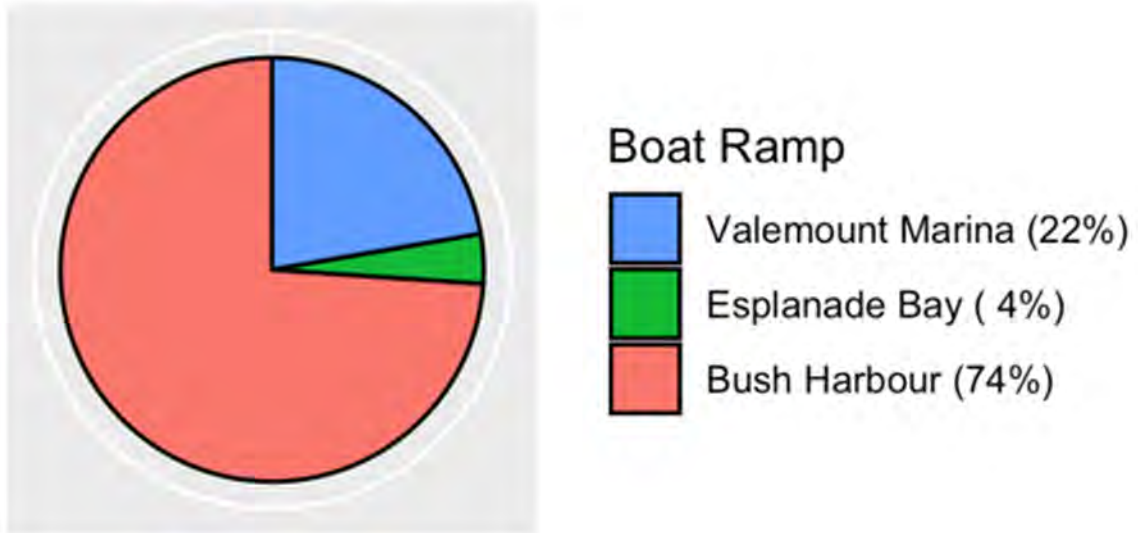
**Figure 14.** Kinbasket Reservoir – Average Annual Total by Site, 2010 - 2019 (Adjusted)



**Figure 15.** Kinbasket Reservoir – Total Number of Boat Launches by Year, 2010 - 2019 (Adjusted)

Over the full study period (2010 - 2019), the average annual boat launch use on Kinbasket Reservoir was 727 launches per year. Year 1 (2010) was a partial year as Bush Harbour was not available to the public until August. There was a marked reduction in boat launch use in 2012 compared with other years. This may have been due to it being an excessively high water year with a resulting increase in floating debris and reduction in accessible beach area. There was also a marked reduction in boat launch use in 2019 compared with the preceding years. This may have been due to a counter malfunction that led to reduced sensitivity of the counter, thus giving lower vehicle counts. Year 8 (2017) saw the highest use during the study period with a total of 1,231 launches.

### Kinbasket Reservoir – Vehicle Counts by Site

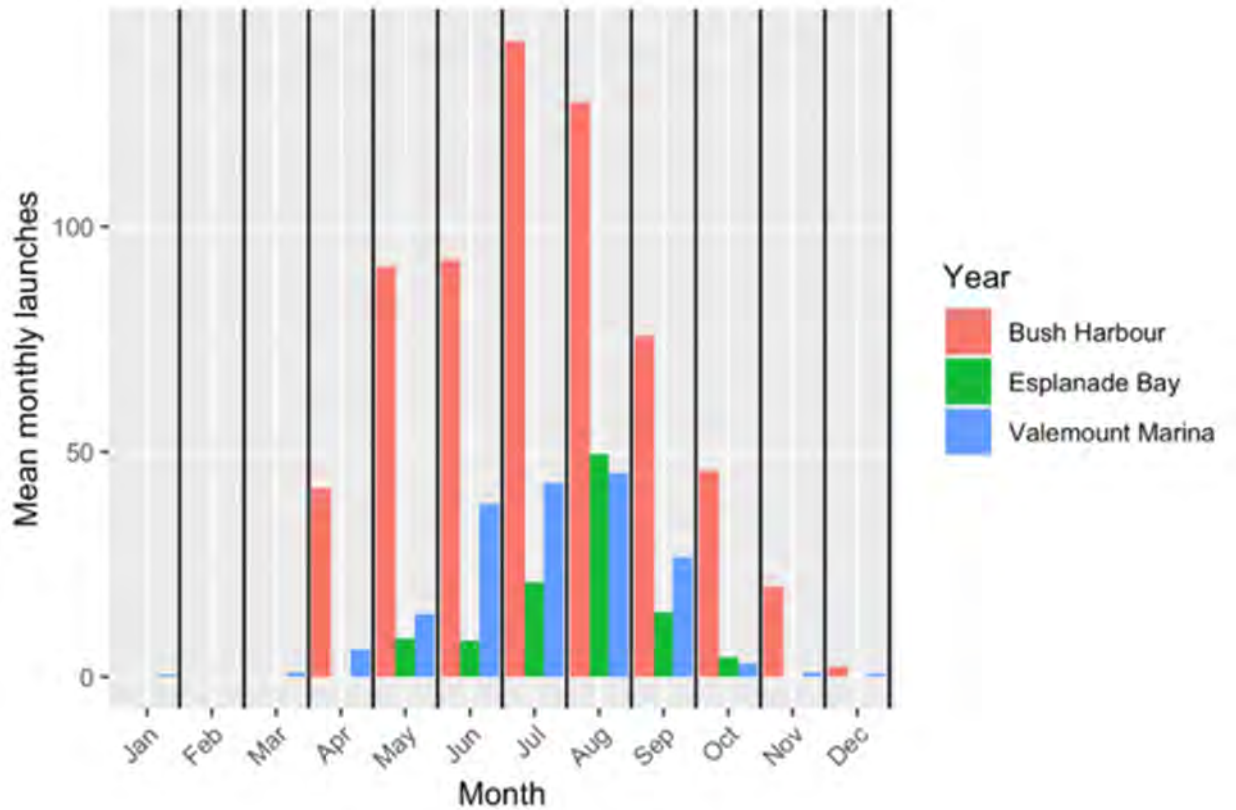


**Figure 16.** Kinbasket Reservoir – Vehicle Counts by Site (2010 - 2019)

The percentage of overall use by site (Figure 16) shows that Bush Harbour generated 74% of the recorded boat launch use on Kinbasket Reservoir study sites, while Valemount produced 22% and Esplanade Bay 4%. However, the actual amount of boating use at Valemount may be higher than shown due to the onsite marina and nearby recreation sites and Trails BC campgrounds where people can moor their boat rather than removing it each time they use it.



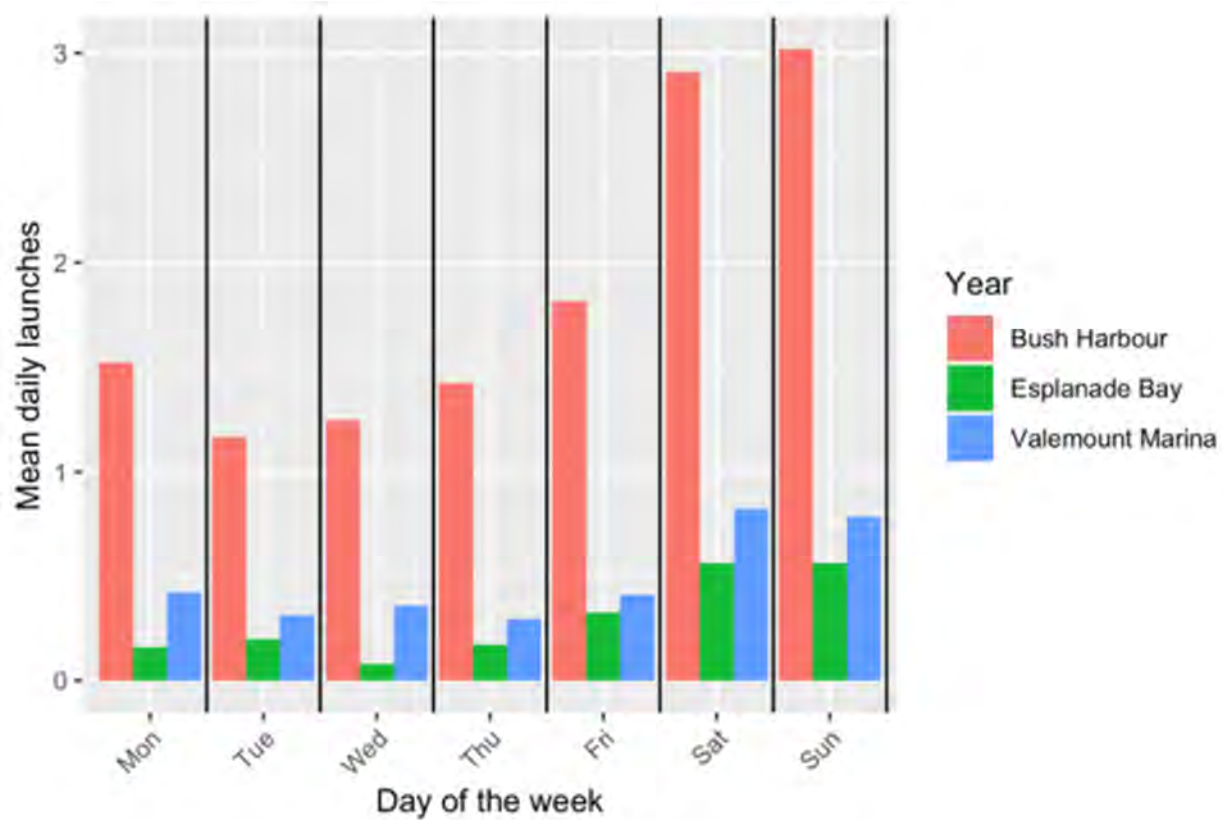
### Kinbasket Reservoir – Vehicle Counts by Months of the Year



**Figure 17.** Kinbasket Reservoir – Vehicle Counts by Months of the Year

According to adjusted figures, the heaviest boat launch use occurred in July in Bush Harbour and in August in Valemount (Figure 17). As each of these sites is snow bound for five or six months, virtually all recorded activity occurs during the late spring, summer and early fall. A few recorded uses in winter were likely an anomaly where a snowmobile may have been recorded using the boat ramp to access the frozen lake.

### Kinbasket Reservoir – Vehicle Counts by Days of the Week



**Figure 18.** Kinbasket Reservoir – Vehicle Counts by Days of the Week

Figure 18 shows daily average launches over the course of the year during the study period (2010 to 2019). As expected, most recorded use occurred on the weekends. At Bush Harbour over 50% of use was attributed to Saturdays and Sundays. Sundays got the heaviest use overall. At both Bush Harbour and Valemount, Fridays and Mondays saw the most week day use. Because boats are kept at the Valemount Marina and there are several Forest Service campgrounds close by there may be more boating activity (*i.e.*, total “boater/days” on the reservoir), than the recorded vehicle counts indicate.

### Kinbasket Reservoir Boat Ramp Construction – Before and After Photos



**Figure 19.** Bush Harbour at low water before



**Figure 20.** Bush Harbour at high water after



**Figure 21.** Valemount before



**Figure 22.** Valemount at low water after



**Figure 23.** Valemount at high water after



**Figure 24.** Valemount at high water with debris, 2012

## Arrow Lakes Reservoir – Vehicle Counter Results

Below is a summary of adjusted vehicle counts for the study period (2010 - 2019), which included vehicle counts in Years 1 to 4 (2010 - 2013) and Years 7 to 10 (2016 - 2019), (Table 22, Figures 25,26) as collected and automatically compiled by the TRAFx DataNet system. The table presents traffic counts adjusted to best reflect actual use as described in Appendix A.

**Table 22.** Arrow Lakes Reservoir – Annual Vehicle Count Summary, 2010 - 2019 (Adjusted)

Year	Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Total
2010	Anderson Pt	-	-	-	39	54	103	102	97	58	44	24	21	542	
	Burton Hist	0	3	2	8	32	83	106	123	15	19	9	2	402	
	Eagle Bay	0	0	1	1	22	2	41	25	17	2	0	0	111	
	Edgewood	96	100	136	64	61	88	174	103	26	34	21	15	918	
	Fauquier	5	23	26	17	40	-	-	-	10	2	1	0	124	
	McDonald	6	27	27	37	133	-	303	221	91	43	16	3	907	
	Nakusp	150	160	165	187	239	321	711	518	161	184	86	146	3,028	
	Revelstoke	2	16	33	24	42	90	159	87	86	68	17	0	624	
	Shelter Bay	0	41	100	89	165	85	142	148	118	179	31	0	1,098	
	Syringa Cr	101	127	175	162	297	545	955	713	170	162	64	32	3,503	<b>11,257</b>
2011	Anderson Pt	18	21	24	31	45	62	106	91	66	63	33	14	574	
	Burton Hist	0	9	2	11	32	72	121	144	56	6	2	2	457	
	Burton So	-	-	-	-	-	-	-	35	22	5	0	1	63	
	Eagle Bay	0	0	0	0	9	3	23	13	11	7	1	0	67	
	Edgewood	12	10	42	51	66	68	140	123	53	29	7	11	612	
	Fauquier	4	0	4	8	8	7	7	5	3	0	0	1	47	
	McDonald	0	0	0	40	41	60	104	150	59	12	3	8	477	
	Nakusp	176	111	116	188	191	311	611	679	258	158	83	152	3,034	
	Revelstoke	0	0	0	25	44	60	119	129	91	51	2	0	521	
	Shelter Bay	0	0	22	102	171	119	116	174	174	129	24	17	1,048	
Syringa Cr	42	76	94	140	233	471	1,011	958	366	109	52	50	3,602	<b>10,502</b>	
2012	Anderson Pt	19	23	38	55	69	68	77	94	90	-	-	-	533	
	Burton Hist	1	0	0	1	13	44	101	128	30	6	2	0	326	
	Burton So	0	0	2	8	4	13	8	37	24	5	0	3	104	
	Eagle Bay	0	0	0	2	16	4	31	2	6	1	0	0	62	
	Edgewood	14	12	33	52	50	52	68	126	76	35	16	4	538	
	Fauquier	0	2	7	5	5	12	0	-	6	-	0	0	37	
	McDonald	6	0	3	19	47	52	74	114	61	19	5	4	404	
	Nakusp	165	106	201	200	221	216	494	662	308	219	128	130	3,050	
	Revelstoke	1	5	4	30	24	64	205	136	79	34	4	0	586	
	Shelter Bay	4	0	7	88	181	70	87	205	223	132	39	8	1,044	
Syringa Cr	47	44	87	139	231	255	832	956	325	144	84	75	3,219	<b>9,903</b>	

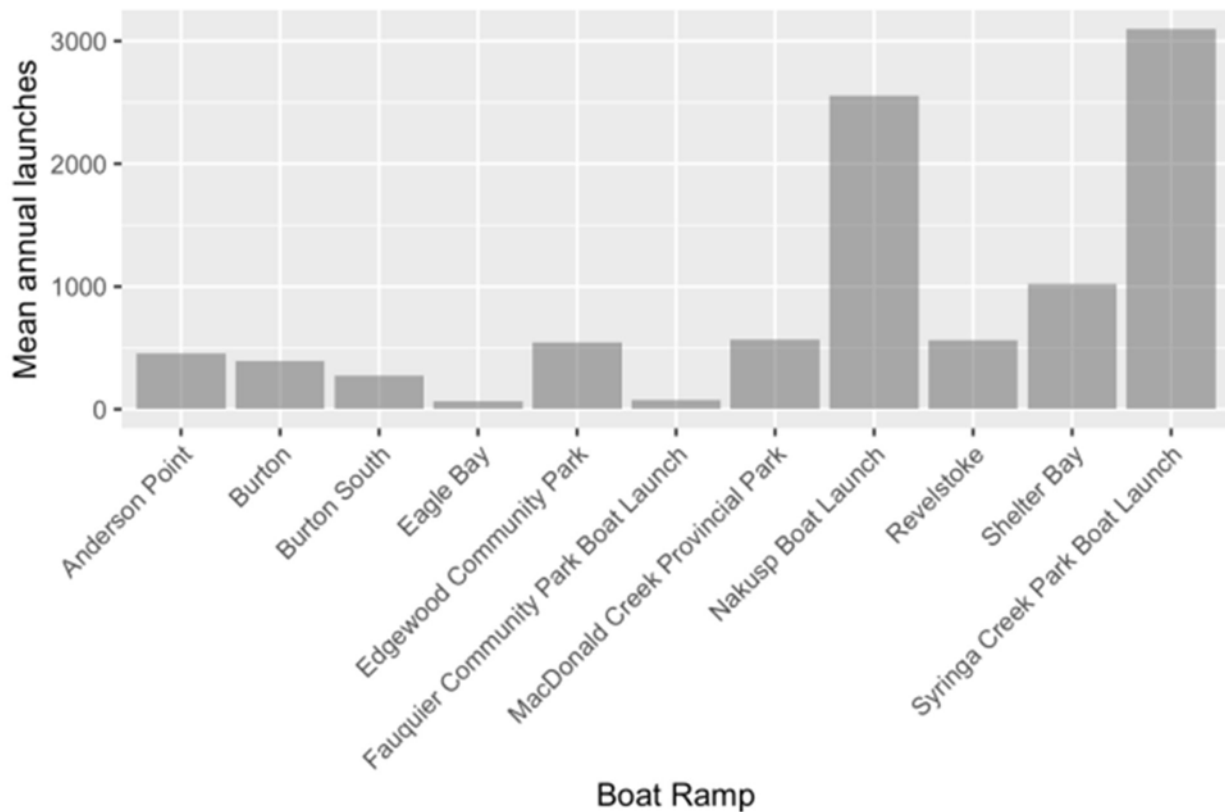
**Table 40 (Cont'd).** Arrow Lakes Reservoir – Annual Vehicle Count Summary, 2010 to 2019 (Adjusted)

CLBMON 14 Boat Ramp Use Study  
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Year	Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Yearly Total
2013	Anderson Pt					40	56	81	75	33	27	18	-	330	
	Burton Hist	0	0	0	5	27	26	106	132	28	5		-	329	
	Burton So	0	79	70	14	23	24	72	54	12	2	15	-	365	
	Eagle Bay	0	0	0	0	4	3	5	10	3	2		-	27	
	Edgewood	10	44			143	32	60	85	31	25	12	-	442	
	Fauquier	0	4	8	7	4	5	10	23	7	5	12	-	85	
	McDonald	6	2	38	35	50	75	149	167	61	20	12	-	615	
	Nakusp	169	140			246	252	517	475	236	190	132	-	2,357	
	Revelstoke	3	13	24	19	43	65	121	77	89	33	23	-	510	
	Shelter Bay	1	8	107	95	202	116	133	168	152	120	45	-	1,147	
Syringa Cr	75	114	142	169	263	443	856	697	219	103	72	-	3,153	<b>9,360</b>	
2016	Anderson Pt	-	-	-	-	47	52	74	66	33	27	17	11	327	
	Burton Hist	-	-	-	-	34	41	160	168	5	0	3	0	411	
	Burton So	-	-	-	-	31	60	80	89	29	14	11	4	318	
	Edgewood	-	-	-	-	47	28	87	100	25	16	19	14	336	
	Fauquier	-	-	-	-	3	8	22	13	4	2	2	2	56	
	McDonald	-	-	-	-	47	65	144	191	51	58	23	4	583	
	Nakusp	-	-	-	-	154	258	396	411	153	129	113	90	1,704	
	Shelter Bay	-	-	-	-	127	62	103	194	129	98	45	12	770	
	Syringa Cr	-	-	-	-	246	351	617	573	147	74	71	38	2,117	<b>6,622</b>
2017	Anderson Pt	5	18	14	23	43	60	75	55	43	34	20	12	402	
	Burton Hist	1	0	1	8	11	47	125	147	60	11	5	1	417	
	Burton So	9	0	9	19	41	31	94	101	50	21	12	5	392	
	Edgewood	43	13	29	67	41	51	80	107	38	24	-	-	493	
	Fauquier	1	0	4	12	14	11	5	9	14	4	0	2	76	
	McDonald	3	1	0	23	47	55	135	135	53	29	12	11	504	
	Nakusp	159	88	112	149	207	278	462	433	198	126	63	70	2,345	
	Shelter Bay	0	6	31	135	143	77	110	171	153	96	51	39	1,012	
	Syringa Cr	31	31	111	155	281	370	889	710	310	136	78	51	3,153	<b>8,794</b>
2018	Anderson Pt	17	17	25	25	52	41	78	66	41	40	34	14	450	
	Burton Hist	1	0	1	8	43	57	94	118	34	26	0	0	382	
	Burton So	0	1	16	24	38	36	99	63	22	23	10	4	336	
	Edgewood	-	-	-	-	31	43	84	110	55	31	23	26	403	
	Fauquier	1	0	2	3	7	11	9	10	15	6	5	4	73	
	McDonald	0	0	0	31	47	57	123	104	61	27	14	7	471	
	Nakusp	186	105	158	141	261	248	462	290	149	135	94	5	2,364	
	Shelter Bay	9	10	44	119	137	97	123	149	168	188	49	30	1,123	
	Syringa Cr	41	67	124	142	310	317	830	572	286	130	77	49	2,945	<b>8,547</b>

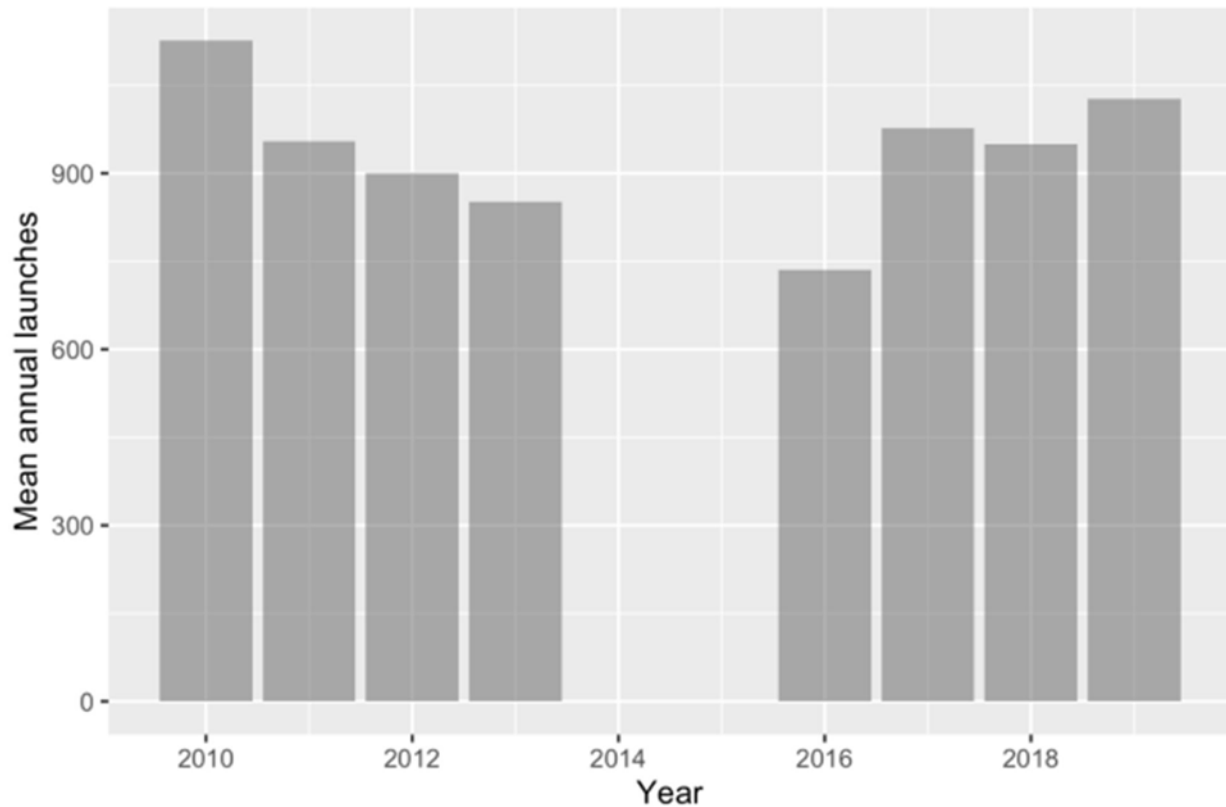
**Table 22 (Cont'd).** Arrow Lakes Reservoir – Annual Vehicle Count Summary, 2010 to 2019 (Adjusted)

Year	Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Yearly Total
2019	Anderson Pt	10	15	28	46	57	75	86	76	37	39	23	8	500	9,239
	Burton Hist	0	0	4	8	45	54	112	128	36	33	5	3	428	
	Burton So	1	0	6	50	59	44	-	103	46	18	12	5	344	
	Edgewood	53	9	46	49	66	84	86	142	43	28	7	21	634	
	Fauquier	6	1	7	13	10	6	13	38	6	7	11	5	123	
	McDonald	26	11	17	48	59	95	116	136	48	24	19	2	601	
	Nakusp	232	120	209	161	238	313	395	419	140	122	82	149	2,580	
	Shelter Bay	0	4	70	122	170	130	108	186	-	93	53	5	941	
	Syringa Cr	66	57	101	155	338	470	693	670	278	105	89	66	3,088	



\* Burton South counts began in 2011

**Figure 25.** Arrow Lakes Boat Launches – Average Annual Total by Site (2010-2019)

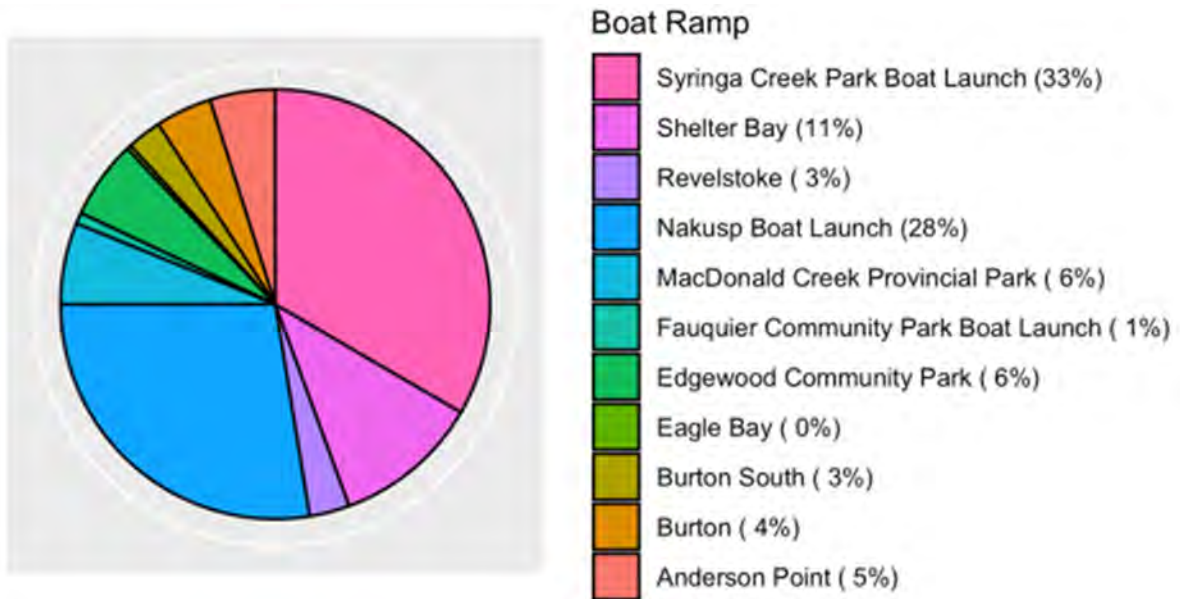


**Figure 26.** Arrow Lakes – Total Number of Boat Launches by Year (2010-2019)

Over the full study period (2010 - 2019), the average annual boat launch use on the Arrow Lakes Reservoir was 9,278 launches per year. Year 1 (2010) saw the highest use during the study period with a total of 11,257 launches.

The annual data shows McDonald Creek boat launch use in 2010 appears to be almost double that of subsequent years. This may be due to increased construction vehicle traffic between May and August which occurred while the ramp was open to the public during some of the construction and for which the construction traffic did not get excluded from the vehicle counts. Between 2013 and 2016, many of the boat launches were unavailable for use for periods of time due to construction, which contributed to lower overall counts during these years.

### Arrow Lakes Reservoir – Vehicle Counts by Site



**Figure 27.** Arrow Lakes Reservoir - Vehicle Counts by Site (2010 – 2019)

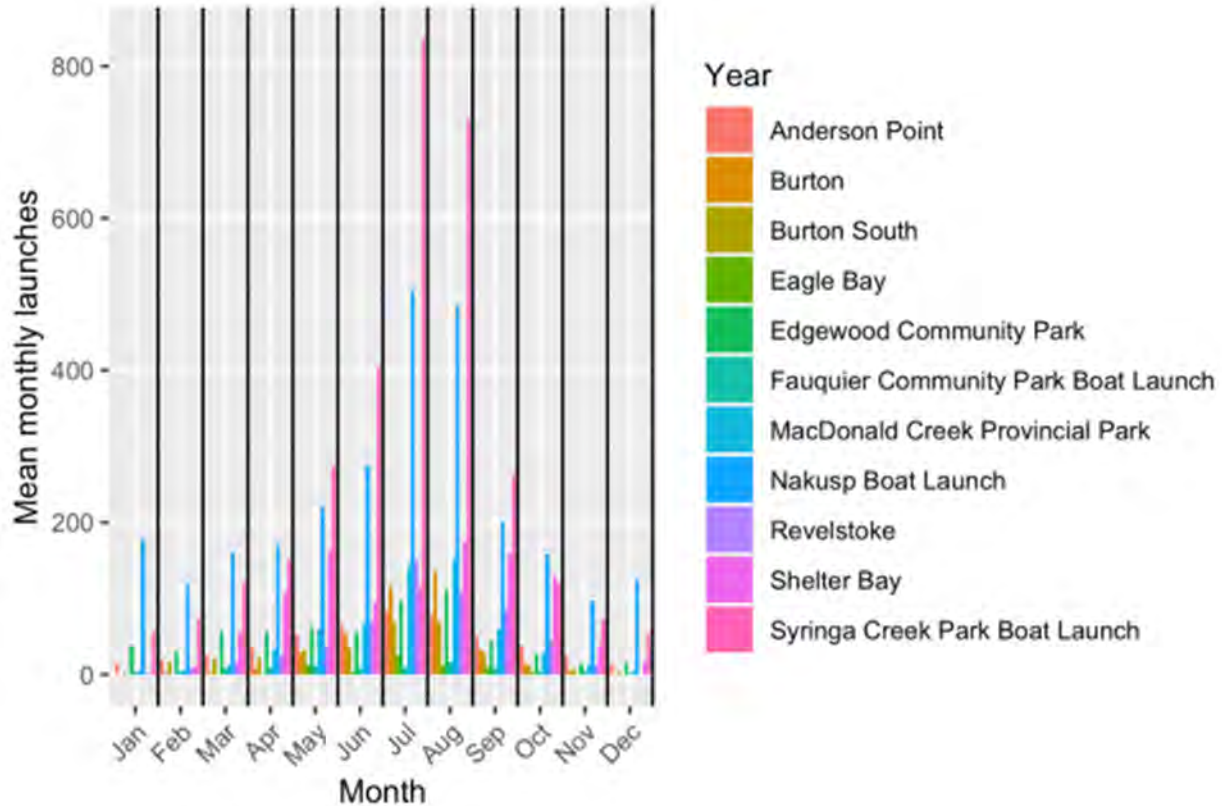
On average, the Syringa Creek Boat Launch and Nakusp were the most active boat launch locations and constituted approximately 61% of the daily recorded traffic at the selected boat launch locations on the Arrow Lakes in this study<sup>6</sup>. Fauquier Boat Launch generated only about 1% of total boat launch traffic. The Fauquier counter was monitored during the study period and was functioning normally.

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<sup>6</sup> This percentage is for the locations used in this study only and does not represent the overall percentage of boat launch use on the Arrow Lakes.



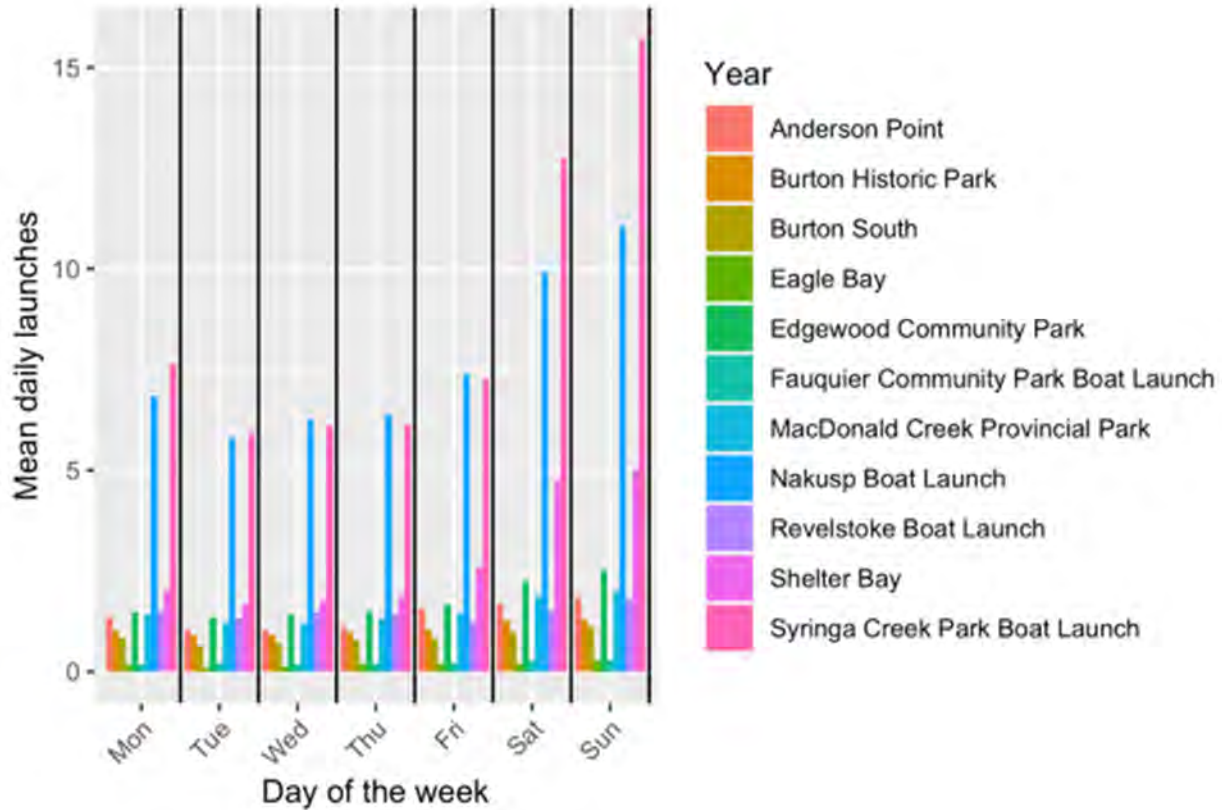
### Arrow Lakes Reservoir – Vehicle Counts by Months of the Year



**Figure 28.** Arrow Lakes Reservoir – Vehicle Counts by Months of the Year (2010 - 2019)

Use patterns were as expected with increasing activity in the summer months with most locations peaking in July or August, then tapering off in the fall. Nakusp generated significant use throughout the winter months and exceeded use at Syringa Creek for seven months of the year. Anderson Point, Edgewood, Nakusp, and Syringa Creek received more relative use over the winter months (November – March) than at other locations. Nakusp showed an increase in December and January over adjacent months but the reason for this is not readily evident from the data. It may be that boats normally kept in the marina are not left there over winter thus need to be launched each time a person wants to use them, or that these are the best months for catching fish in that area of the Arrow Lakes.

### Arrow Lakes Reservoir – Vehicle Counts by Days of the Week



**Figure 29.** Arrow Lakes Reservoir – Vehicle Counts by Days of the Week (2010 -2019)

Figure 29 shows daily average launches over the course of the year during the study period (2010 to 2019). Anderson Point, Burton Historical Park, Burton South, Edgewood, Nakusp, Shelter Bay and Syringa Creek boat launches had an expected relationship of greater weekend than weekday use, *i.e.*, Saturdays and Sundays received about 1.5 – 2.0 times as much traffic as weekdays.

### Arrow Lakes Reservoir Boat Construction – Before and After Photos



**Figure 30.** Anderson Point before



**Figure 31.** Anderson Point after



**Figure 32.** Burton South before



**Figure 33.** Burton South after



**Figure 34.** Edgewood before



**Figure 35.** Edgewood after





**Figure 36.** Fauquier before



**Figure 37.** Fauquier after



**Figure 38.** McDonald Creek before



**Figure 39.** McDonald Creek after



**Figure 40.** Nakusp before



**Figure 41.** Nakusp after



**Figure 42.** Shelter Bay before



**Figure 43.** Shelter Bay after



**Figure 44.** Syringa before



**Figure 45.** Syringa after

## **Special Operational Considerations**

Continuous vehicle counts were not possible at all locations as counters were removed during periods of boat launch upgrades and new construction. These are outlined below.

### *Construction Periods*

Nine of the eleven boat launches studied had major construction work undertaken during the study period making them unavailable for full public use. This resulted in the removal of the respective vehicle counter for a time. Construction exclusion dates are noted in Table 5.

### *High Water Period*

Year 4 (2012) produced an excessively high water year with a sustained water level approximately two feet above normal pond level on both the Arrow Lakes and Kinbasket Reservoirs for much of the summer. This created a number of operational challenges to data collection during the busiest boating periods on the lake. The high water resulted in a much greater than normal amount of driftwood and floating debris on the lake which created a boating safety hazard as well as making access to the water at the boat launches more difficult. This may have further reduced the potential amount of boating use during the high water period. To protect the sensitive electronic vehicle counters from water damage eight of the eleven vehicle counters were removed (see Table 5 for water level exclusion dates).

### *Equipment Issues*

On October 31, 2012 during regular fall traffic counter winterization schedule, the Anderson Point counter was removed due to planned road construction activities in preparation for boat ramp construction during the following winter and spring. Upon removal, this counter was found to have a faulty battery pack case which resulted in the counter not functioning from September 9 to October 31, 2012.

Since 2017, there have been two boat launch sites that had periods where there were gaps in data collection, due to counter malfunction.

The vehicle counter at Edgewood Community Park experienced a counter malfunction from October 23, 2017 to May 30, 2018 resulting in no data for that period.

The Bush Harbour vehicle counter had a counter malfunction from October 29, 2018 to December 31, 2019. This led to reduced sensitivity of the counter, thus giving lower vehicle counts for study year 10.

While the disruption of vehicle counts during these periods posed a few challenges, the numbers derived from the vehicle counter records provide a very reasonable estimate of the average annual boat launch use of the sites studied.

## **APPENDIX D – Univariate (Descriptive) Statistics for all questions asked at CLBMON-14 sites**



**NOTE:** The analyses reported here consider on-site responses from respondents at the following Arrow Lakes Reservoir and Kinbasket Reservoir sample sites:

**Arrow Lakes Reservoir Sites**

- Anderson Point
- Edgewood Community Park
- Fauquier Community Park Boat Launch
- McDonald Creek Provincial Park
- Nakusp Boat Launch
- Shelter Bay Boat Launch
- Syringa Creek Park Boat Launch

**Kinbasket Reservoir Sites**

- Bush Harbour
- Valemount Marina

**Question 1: Recreation Activities Done on the Water or on the Shore of the Arrow Lakes.**

**Table 23.** Indicate all of the activities that you do on the water or onshore of the Arrow Lakes or Kinbasket Lake.

<b>Activity</b>	<b>Pre-Construction (n = 996)</b>	<b>Post-Construction (n = 1,453)</b>
ATV/Trail bike/4 x 4	30%	28%
Beach activities	64%	62%
Berry picking	29%	28%
Bird watching	35%	31%
Boating (motor cruising)	66%	63%
Camping	67%	68%
Canoeing/kayaking	28%	33%
Cross-country skiing	8%	7%
Drawing/painting/photography	17%	17%
Fishing	79%	69%
Horseback riding	4%	2%
Hunting	21%	15%
Mountain biking	16%	15%
Mushroom picking	23%	19%
Nature study	24%	19%
Other	8%	7%
Picnicking	57%	52%
Scenic viewing	59%	62%
Snowmobiling	14%	13%
Swimming	69%	69%
Walking/hiking	61%	64%
Waterskiing	20%	15%
Wildlife viewing	47%	46%
Wind surfing	2%	2%

**Table 24.** On average, how many days per month do you visit the Arrow Lakes or Kinbasket Lake in each season?

Season	Construction Period	n	Mean	SD	95% CI	P-value
Spring	Pre	839	11.8	11.1	0.7	0.639
	Post	1,183	12.1	19.2	1.1	
Summer	Pre	882	17.2	11.1	0.7	0.033
	Post	1,276	18.6	19.1	1.0	
Fall	Pre	844	11.7	11.1	0.7	0.486
	Post	1,161	12.2	18.7	1.1	
Winter	Pre	808	7.7	11.1	0.8	0.030
	Post	1,057	9.2	18.9	1.1	
Annual	Pre	796	147.3	120.2	8.3	<0.001
	Post	1,208	93.6	107.7	6.1	

**Table 25.** What recreation activities did you do today on the water or onshore of the Arrow Lakes<sup>†</sup>?

Activity	Pre (n = 996)		Post (n = 1,453)	
	Freq.	%	Freq.	%
ATV/Trail bike/ 4 x 4	22	2%	34	3%
Beach activities	77	9%	161	13%
Berry picking	3	0%	8	1%
Bird watching	47	5%	48	4%
Boating (motor cruising)	205	23%	325	25%
Camping	123	14%	183	14%
Canoeing/kayaking	39	4%	81	6%
Dog walking	24	3%	32	2%
Drawing/painting/photography	25	3%	52	4%
Fishing	367	41%	419	33%
Horseback riding	2	0%	0	0%
Hunting	5	1%	2	0%
Mountain biking	13	1%	27	2%
Multiple	0	0%	2	0%
Mushroom picking	5	1%	6	0%
Nature study	12	1%	13	1%
Other	62	7%	81	6%
Picnicking	66	7%	110	9%
Scenic viewing	127	14%	162	13%
Swimming	100	11%	204	16%
Walking/hiking	160	18%	289	23%
Waterskiing	10	1%	22	2%
Wildlife watching	20	2%	37	3%
Windsurfing	0	0%	1	0%

<sup>†</sup> Some respondents identified more than one activity.

**Table 26.** Are you participating in this activity today as a paying customer of a commercial recreation or tourism operator/guide?

Response <sup>†</sup>	Pre-Construction (n = 925)		Post-Construction (n = 1,378)		P-Value
	Freq.	%	Freq.	%	
No	811	88%	1,209	88%	1.000
Yes	114	12%	169	12%	

<sup>†</sup> There is no evidence of a change in the proportion of respondents who indicated they were a paying customer (1.000).

**Question 2: The One Recreation Activity that is Most Important to Respondents.**

**Table 27.** Of all of the activities that you do on the water or onshore of the Arrow Lakes, which one is the most important<sup>†</sup>?

Activity	Pre-Construction (n = 996)		Post-Construction (n = 1,453)	
	Freq.	%	Freq.	%
ATV/Trail bike/4 x 4	13	1%	32	2%
Beach activities	31	3%	62	4%
Berry picking	1	0%	0	0%
Bird watching	6	1%	8	1%
Boating (motor cruising)	206	22%	288	21%
Camping	123	13%	200	14%
Canoeing/kayaking	36	4%	73	5%
Cross-country skiing	2	0%	0	0%
Dog walking	5	1%	15	1%
Drawing/painting/photography	6	1%	11	1%
Fishing	411	43%	498	36%
Horseback riding	3	0%	0	0%
Hunting	6	1%	17	1%
Mountain biking	6	1%	7	1%
Multiple	0	0%	2	0%
Mushroom picking	3	0%	5	0%
Nature study	2	0%	8	1%
Other	38	4%	67	5%
Picnicking	6	1%	9	1%
Scenic viewing	27	3%	43	3%
Snowmobiling	2	0%	2	0%
Swimming	67	7%	139	10%
Walking/hiking	51	5%	115	8%
Waterskiing	8	1%	8	1%
Wildlife viewing	7	1%	4	0%
Wind surfing	0	0%	2	0%

<sup>†</sup> Some respondents identified more than one activity.

**Table 28.** How many years have you done this activity?

Construction Period	n	Min	Max	Mean <sup>†</sup>	SD	95% CI	P-value
Pre	943	1	75	23.5	16.3	1.0	0.024
Post	1,342	1	85	21.9	16.9	0.9	

<sup>†</sup> There is NO evidence of a difference in the mean number of years doing their favorite activity (p 0.024).

**Table 29.** On a scale of 1 to 5, with 1 being beginner and 5 being expert, how skilled are you at this activity?

Construction Period	n	Beginner	Somewhat Skilled	Moderately Skilled	Very Skilled	Expert	Mean <sup>†</sup>	SD	95% CI	P-value
Pre	943	1%	5%	25%	38%	30%	3.9	0.9	0.06	0.409
Post	1342	2%	4%	25%	39%	29%	3.9	1.0	0.05	

<sup>†</sup> There is NO evidence of a difference in the mean skill level of the respondents favorite activity (p 0.409).

**Table 30.** On a scale of 1 to 5, with 1 being not important at all and 5 being very important, how important is this activity to your lifestyle?

Construction Period	n	Not Important at All	Somewhat Important	Moderately Important	Mostly Important	Very Important	Mean <sup>†</sup>	SD	95% CI	P-Value
Pre	943	0%	2%	14%	25%	58%	4.4	0.8	0.05	0.335
Post	1,342	1%	3%	14%	27%	56%	4.3	0.9	0.05	

<sup>†</sup> There is evidence of a difference in the mean importance of the respondents favourite activity to their lifestyle (p 0.335).

**Table 31.** Who do you usually do this recreation activity with?<sup>†</sup>

Construction Period	n	Alone	Family	Friends	Clubs	People from work	Other	P-value
Pre	943	6%	44%	24%	0%	0%	25%	0.492
Post	1,342	6%	46%	21%	0%	0%	26%	

<sup>†</sup> There is NO evidence of a difference in the distribution of with whom the respondents did their favourite activity (p 0.492).



**Table 32.** On average, how many days per season do you do this activity?

Season	Construction Period	n	Min	Max	Mean	SD	95% CI	P-value
Spring	Pre	862	0	99	14.7	23.0	1.5	0.094
	Post	1,303	0	94	13.0	23.7	1.3	
Summer	Pre	862	0	99	24.6	26.4	1.8	0.013
	Post	1,303	0	100	21.7	25.5	1.4	
Fall	Pre	862	0	94	14.7	22.7	1.5	0.052
	Post	1,303	0	94	12.7	23.0	1.3	
Winter	Pre	862	0	99	9.6	21.9	1.5	0.400
	Post	1,303	0	94	8.8	21.6	1.2	
Annual	Pre	862	0	378	63.5	87.6	5.8	0.058
	Post	1,303	0	376	56.2	88.4	4.8	

**Question 3: Experiences Had While Visiting the Arrow Lakes for Recreation Activities.**

**Table 33.** Consider how many people you are comfortable seeing while you are visiting the Arrow Lakes/Kinbasket Lake and complete the following statement: “It is OK to have as many as \_\_\_\_\_ encounters per day”.

Construction Period	n	Min	Max	Mean <sup>†</sup>	SD	95% CI	P-value
Pre	946	0	100	4.1	11.3	0.7	0.046
Post	957	0	1000	6.5	34.6	2.2	

<sup>†</sup> There is NO evidence of a difference in the respondents mean number of preferred daily encounters (p 0.046).

**Table 34.** It doesn’t matter to me how many people I see.

Construction Period	n	% <sup>†</sup>	P-value
Pre	952	66%	0.858
Post	1,430	66%	

<sup>†</sup> There is NO evidence of a difference between pre- and post-construction respondents.

**Table 35.** For each season below, indicate on a scale of 1 - 9 how crowded you have felt while visiting the Arrow Lakes/Kinbasket Lake.

Season	Construction Period	n	Min	Max	Mean	SD	95% CI	P-value
Spring	Pre	836	1	9	2.0	1.4	0.09	0.105
	Post	1,144	1	9	1.9	1.3	0.07	
Summer	Pre	893	1	9	3.9	2.3	0.15	0.033
	Post	1,313	1	9	3.6	2.3	0.12	
Fall <sup>†</sup>	Pre	815	1	9	2.2	1.5	0.10	0.580
	Post	1,140	1	9	2.2	1.4	0.08	
Winter	Pre	690	1	9	1.5	1.0	0.07	0.497
	Post	968	0	7	1.4	0.9	0.05	

<sup>†</sup> There is no evidence of a change in crowding threshold in any period.

**Table 36.** Have you ever experienced any conflicts with other people or recreation activities while you were visiting the Arrow Lakes/Kinbasket Lake?<sup>†</sup>

Construction Period	n	Response	Freq.	%	P-value
Pre	950	No	797	84%	0.071
		Yes	153	16%	
Post	1,387	No	1,202	87%	
		Yes	185	13%	

<sup>†</sup> There is NO evidence of a difference in the experience of conflicts (p 0.071).

**Question 4: Use and Familiarity with the Arrow Lakes/Kinbasket Lakes.**

**Table 37.** From the list below, indicate why you come to the Arrow Lakes/Kinbasket Lake.

Motivation	Pre-Construction (n = 996)		Post-Construction (n = 1,453)		P-value
	Freq.	%	Freq.	%	
Other	213	21%	235	16%	0.001
To be close to nature	593	60%	932	64%	0.019
To be with family	651	65%	917	63%	0.282
To be with friends	622	62%	844	58%	0.035
To discover new things	337	34%	476	33%	0.622
To get exercise	457	46%	695	48%	0.346
To give my mind a rest	589	59%	826	57%	0.287
To have a change from my daily routine	524	53%	725	50%	0.207
To learn about reservoirs	48	5%	74	5%	0.828
To learn more about nature <sup>a</sup>	294	30%	362	25%	0.013
To think about my personal values <sup>b</sup>	260	26%	305	21%	0.004
To view the scenery	724	73%	1059	73%	0.914

<sup>a b</sup> There is evidence of a change in the proportion of respondents who wanted to learn about nature (increase) and think about their personal values (decrease).

**Table 38.** The Arrow Lakes/Kinbasket Lake serve many purposes. In your opinion, what are the 3 most important management goals for the Arrow Lakes/Kinbasket Lake?

Management Goals	Construction Period	n	1		2		3	
			Freq.	%	Freq.	%	Freq.	%
Provide local employment	Pre	996	108	11%	64	6%	102	10%
	Post	1,453	170	12%	129	9%	185	13%
Safety for reservoir users	Pre	996	118	12%	96	10%	111	11%
	Post	1,453	202	14%	180	12%	137	9%
Provide recreation opportunities	Pre	996	328	33%	223	22%	163	16%
	Post	1,453	512	35%	291	20%	240	17%
Flood control	Pre	996	115	12%	105	11%	115	12%
	Post	1,453	220	15%	157	11%	179	12%
Electricity generation	Pre	996	104	10%	139	14%	130	13%
	Post	1,453	231	16%	178	12%	188	13%
Provide habitat for aquatic species	Pre	996	246	25%	171	17%	159	16%
	Post	1,453	431	30%	230	16%	192	13%
Other	Pre	996	21	2%	10	1%	12	1%
	Post	1,453	44	3%	7	0%	17	1%

**Question 5: Visitor Satisfaction with Management Activities.**

**Table 39.** The management of the Arrow Lakes/Kinbasket Lake seeks to balance many tasks. Please indicate your satisfaction with management activities.

Management Activities	Construction Period	n	Never	Rarely	Sometimes	Frequently	Always	Mean	SD	95% CI	P-value
On the whole, are you satisfied with water levels on the Arrow Lakes/ Kinbasket Lake? <sup>†</sup>	Pre	859	5%	15%	42%	25%	12%	3.2	1.0	0.07	0.054
	Post	1,204	6%	12%	38%	29%	14%	3.3	1.1	0.06	
On the whole, do you have satisfying experiences on the water or onshore of the Arrow Lakes/Kinbasket Lake?	Pre	938	1%	1%	13%	38%	46%	4.3	0.8	0.05	0.049
	Post	1,321	1%	1%	9%	39%	49%	4.3	0.8	0.04	
On the whole, are you satisfied with the conditions of the boat ramps on the Arrow Lakes/ Kinbasket Lake? <sup>†</sup>	Pre	834	21%	16%	21%	20%	23%	3.1	1.4	0.10	<0.001
	Post	1,130	4%	5%	14%	27%	50%	4.1	1.1	0.06	
On the whole, are you satisfied with the parking lot conditions when you visit the Arrow Lakes/ Kinbasket Lake? <sup>†</sup>	Pre	914	6%	10%	20%	29%	35%	3.7	1.2	0.08	<0.001
	Post	1,293	3%	5%	15%	31%	47%	4.1	1.0	0.05	
On the whole, are you satisfied with the management of the Arrow Lakes/Kinbasket Lake? <sup>†</sup>	Pre	853	6%	11%	36%	28%	21%	3.5	1.1	0.07	<0.001
	Post	1,220	4%	9%	25%	30%	32%	3.8	1.1	0.06	

<sup>†</sup>There is evidence of a change in the mean satisfaction score for the water levels on the Arrow Lakes (increase), condition of boat ramps (increase), parking lot conditions (increase), and management of Arrow Lakes (increase).

**Table 40.** Compared to the water levels that you experienced today, how might different water levels affect your use of the Arrow Lakes/Kinbasket Lake for recreation activities?

Statement	Construction Period	n	I will come back	I will go somewhere else	P-value
If the water level is the same today...	Pre	775	95%	5%	0.397
	Post	1,136	96%	4%	
If the water level is higher than today... <sup>†</sup>	Pre	780	92%	8%	0.125
	Post	1,093	89%	11%	
If the water level is lower than today...	Pre	679	83%	17%	0.533
	Post	1,003	81%	19%	

<sup>†</sup> There is evidence that respondents are less likely to return if the water level is higher than the level at the time of the survey.

#### Question 6: Recreation Experiences on the Arrow Lakes.

**Table 41.** How long have you been coming to the Arrow Lakes/Kinbasket Lake for recreation activities (years)?

Construction Period	n	Min	Max	Mean <sup>†</sup>	SD	95% CI	P-value
Pre	906	1.0	70	20.9	15.1	0.98	0.004
Post	1,287	0.5	88	19.0	15.6	0.85	

<sup>†</sup> There is evidence of a difference in the mean number of years coming to the Arrow Lakes (p 0.004).

**Table 42.** Based on your experience today, will you come back to the Arrow Lakes/Kinbasket Lake for recreation activities?<sup>†</sup>

Construction Period	n	Yes	No	P-value
Pre	947	99%	1%	0.655
Post	1,378	99%	1%	

<sup>†</sup> There is NO evidence of a difference in the proportion of respondents who would return to Arrow Lakes (p 0.655), but this number is already close to 100%.

**Table 43.** What boat ramp facility do you usually use?

Boat Ramp Location	Pre-Construction (n = 833)		Post-Construction (n = 1,089)	
	Freq.	%	Freq.	%
Above Revelstoke Dam	2	0%	0	0%
Anderson Point	32	4%	35	3%
Arrow Park Ferry	12	1%	4	0%
Burton Historic Park	5	1%	9	1%
Bush Harbour	1	0%	34	3%
Deer Park	0	0%	6	1%
Don't use boat ramps	30	4%	119	11%
Eagle Bay	3	0%	1	0%
Edgewood Community Park	106	13%	43	4%
Esplanade Bay	0	0%	8	1%
Fauquier Community Park Boat Launch	15	2%	48	4%
Galena Bay	0	0%	2	0%
Griffin	3	0%	0	0%
MacDonald Creek Provincial Park	6	1%	67	6%
Multiple sites	199	24%	228	21%
Nakusp Boat Launch	109	13%	165	15%
Needles	3	0%	1	0%
Renata	5	1%	3	0%
Revelstoke Boat Launch	2	0%	1	0%
Scotties Marina	11	1%	8	1%
Shelter Bay	189	23%	138	13%
Syringa Creek Park Boat Launch	77	9%	91	8%
Syringa Creek Park Day Use	3	0%	2	0%
Valemount Marina	20	2%	76	7%



**Table 44.** Why did you come to this boat ramp facility today?

Response Categories	Pre-Construction (n = 776)		Post-Construction (n = 1,021)	
	Freq.	%	Freq.	%
Access to Renata	20	3%	12	1%
Best one	10	1%	10	1%
Close to beach	4	1%	7	1%
Close to camping	41	5%	82	8%
Close to home (local)	76	10%	106	10%
Close to swimming	7	1%	21	2%
Closest to other recreation activities	132	17%	64	6%
Closest to where I want to go	8	1%	8	1%
Convenient	59	8%	69	7%
Cost (free)/Public launch	7	1%	9	1%
Didn't use ramp today	3	0%	4	0%
Do not have boat	0	0%	6	1%
Keep boat here	11	1%	18	2%
Multiple	23	3%	47	5%
Not crowded	8	1%	11	1%
Only one	43	6%	22	2%
Only one with appropriate facilities	22	3%	21	2%
Other	92	12%	97	10%
Other ramp(s) closed	0	0%	1	0%
Preferred one	18	2%	8	1%
Previous enjoyable experience	6	1%	8	1%
Scenery	21	3%	36	4%
To complete survey	10	1%	4	0%
To fish	93	12%	109	11%
To launch boat/take boat out of water	55	7%	75	7%
Unclassified	0	0%	153	15%
Water levels	7	1%	13	1%

**Table 45.** What do you like most about the boat ramp facility that you visited today?

Boat Ramp Location	Pre-Construction (n = 682)		Post-Construction (n = 913)	
	Freq.	%	Freq.	%
Access	44	6%	38	4%
Amenities (toilets, garbage containers, etc.)	8	1%	24	3%
Boat tip ups	2	0%	1	0%
Clean/well maintained	48	7%	91	10%
Close to activities	5	1%	3	0%
Close to campsite	5	1%	5	1%
Close to home	14	2%	14	2%
Concrete ramp/dock	52	8%	20	2%
Convenient	18	3%	24	3%
Cose to Renata	2	0%	0	0%
Cost (free)	1	0%	5	1%
Didn't use today	9	1%	12	1%
Do not like/negative comment	81	12%	15	2%
Dock	10	1%	15	2%
Easy to use	26	4%	68	7%
Lots of space	9	1%	8	1%
Multiple	34	5%	56	6%
No problems/General positive comment	49	7%	170	19%
Not crowded	65	10%	62	7%
Only one	1	0%	2	0%
Other	124	18%	117	13%
Paved parking lot	11	2%	15	2%
Upgrade/well constructed	35	5%	113	12%
Water levels	23	3%	10	1%
Wide ramp	6	1%	25	3%

**Table 46.** What do you like least about the boat ramp facility that you visited today?

Boat Ramp Location	Pre-Construction (n = 578)		Post-Construction (n = 1,009)	
	Freq.	%	Freq.	%
Debris	23	4%	52	5%
Did not use today	4	1%	6	1%
Docks too far from shore	6	1%	3	0%
Hard to get to	2	0%	2	0%
Hard to use	2	0%	1	0%
Improvements needed for all components	31	5%	4	0%
More parking needed	17	3%	28	3%
Multiple	29	5%	20	2%
Needs barrier-free access	4	1%	0	0%
Needs picnic area	0	0%	2	0%
No boat launch	8	1%	1	0%
No boat tie-ups	3	1%	5	0%
No problems/positive comment	105	18%	567	56%
No wharf	1	0%	0	0%
Not enough room to turn around/load/unload	9	2%	0	0%
Not safe	5	1%	2	0%
Not well maintained/not clean	34	6%	5	0%
Other	70	12%	99	10%
Problems with breakwater	26	4%	13	1%
Problems with dock/dock ramp	79	14%	66	7%
Problems with parking lot	5	1%	29	3%
Ramp angle too steep	6	1%	11	1%
Ramp not long enough	16	3%	5	0%
Rough launch	3	1%	1	0%
Rough road	2	0%	3	0%
Too crowded	28	5%	30	3%
Too high	1	0%	1	0%
Too narrow/not wide enough	13	2%	6	1%
Too sandy/muddy	2	0%	3	0%
Washrooms needed	6	1%	1	0%
Water levels	38	7%	43	4%

**Table 47.** How did you hear about recreation opportunities and activities near and on the Arrow Lakes/Kinbasket Lake?

Information Source	Pre-Construction (n = 996)		Post-Construction (n = 1,453)	
	Freq.	%	Freq.	%
Tourism information booth	31	3%	57	4%
Family	431	43%	618	43%
BC Hydro web site	7	1%	9	1%
Tourism information brochures	35	4%	69	5%
Friends	536	54%	724	50%
BC Hydro facility ( <i>e.g.</i> , Revelstoke Dam)	6	1%	11	1%
Tourism operators	8	1%	15	1%
BC Parks	89	9%	180	12%
BC Hydro bill	2	0%	2	0%
Private marinas	28	3%	21	1%
BC Forest Service	38	4%	49	3%
Other	255	26%	318	22%

**Question 7: Respondents' Demographic Characteristics.**

**Table 48.** Respondent age.

Construction Period	n	Min	Max	Mean <sup>†</sup>	SD	95% CI	P-value
Pre	960	13	84	52.4	14.1	0.89	0.307
Post	1,390	14	90	51.8	14.5	0.76	

<sup>†</sup> There is NO evidence of a difference in the mean age (p 0.307).

**Table 49.** Respondent's gender<sup>†</sup>.

Pre-construction (n = 964)		Post-construction (n = 1,394)		P- value
Male	Female	Male	Female	
69%	31%	60%	40%	<0.001

<sup>†</sup> There is NO evidence of a difference in sex ratio of respondents coming to the Arrow Lakes (p <0.001).

**Table 50.** How long have you lived in your community?

Construction Period	n	Min	Max	Mean <sup>†</sup>	SD	95% CI	P-value
Pre	950	0	78	26.2	17.7	1.13	0.819
Post	1,364	0	1,954	26.5	55.3	2.94	

<sup>†</sup> There is NO evidence of a difference in the mean length of residence in community (p 0.819).

**Table 51.** Membership in outdoor recreation clubs or organizations<sup>†</sup>.

<b>Construction Period</b>	<b>n</b>	<b>% Yes</b>	<b>% No</b>	<b>P-value</b>
Pre	996	25%	75%	0.359
Post	1,453	23%	77%	

**Table 52.** Respondents' communities of residence.

Distance	Post-construction (n = 3,466)	
	n	%
Canada BC < 80km	2,068	60%
Canada BC > 80km	840	24%
Canada - AB	449	13%
International	44	1%
US	27	1%
Canada - MB	2	0%
Canada - NL	1	0%
Canada - NS	1	0%
Canada - NW	1	0%
Canada - ON	12	0%
Canada - QC	4	0%
Canada - SK	13	0%
Canada - unspecified	2	0%
Canada - YK	2	0%

**Table 53.** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes? – Anderson Point Boat Launch

<b>ANDERSON POINT</b>
<b>Pre-construction (n = 36)</b>
A bridge over Renata creek! would be excellent!
We like the isolation, non-commercial private, off the main grid
Use Anderson Point as access to home for emergency access, for supplies. definitely need a ramp put in, all got promises & promises with no action.
Need docks boat launch water levels need to be more consistent high
Build a boat ramp!
The Kokanee limit should be 15. The locals think they own this area, not very polite
I am annoyed when summer water levels are too low and one has to hike down with all your swimming/kayaking gear every day. Canadians should have a full pond before giving any away to the Americans.
Constant water levels would be preferred. the higher the better
A beautiful area, love it! but, hate inconvenience like no boat space, no parking, water going up & down.
House boats always dump their waste into the lake. we do not like this because some people drink the water.
"Yes" The survey mostly has to do with recreational use but a lot of people including us live across the lake 7/8 months of the year, and some full time. We need this launch so we have access to town for doctors, hospitals, healthcare, to bring in living supplies & in case of emergencies.
Would like to see a higher limit for Kokanee
We need consistent water level especially during peak season. A regulated warf. Decent parking. Signs and policing of over night camping in residents park. no camping. no parking signs
Make water level more consistane
Way of life: fishing, living are primary activities and important to our life styles on the lake. Please keep "high" water about 1m lower, our shoreline erodes at high water and all beaches are lost.
Nice place to live
Obviously - water level consistency during peak months would only be a positive factor for all recreation users
Make water levels more consistant
This is where we live so we need a better boat ramping also there isnt one now. we find it very hard to leave the boat when we have to go to town.
Road to Anderson needs more plowing- boat ramp needs to be built.
To increase the limit on Kokanee from 5 to 15 at least
Recreational activities enhance the area and can provide an economic boom for the area which could promote the area to have a focus of fun and entertainment.
Will I be alive to see a dock and boat ramp at Anderson Point?!?



**Table 53 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>ANDERSON POINT (cont'd)</b>
<b>Pre-construction (n = 36)</b>
More access points to arrow lakes
Residents need proper year round boat launch, but docking and parking at Anderson Point. Also proper camping facility other than Syringa pk.
There should be a designated area for ATVs. this will keep them off the road.
Keep it accessible
There should be a designated area for ATVs. this will keep them off the road.
Needs new road, docks, as stated above
I like that this lake is usually not busy and its warmer than Kootney lake. we enjoy boating activities and this is a great lake for it. more campgrounds please! forestry campsites would be great (with docks for boats)
The water level is too high. no shore and land erosion
To protect what areas are left in the Kootneys, tourism should not be promoted in the Arrow Lakes area. "in wilderness is the preservation of the world"
I hope this lake does not get over developed
Renata is a very safe, clean area- off the main grid- peaceful. I would like to keep it that way
Bigger boat launch and parking lot
The boat launch at Renata needs a lot of help!
<b>Post-construction (n = 44)</b>
Lake level does not matter, fluctuations in the level cause the problems with excessive driftwood, erosion, loss of access, stabilization of level would be a better option
Clean up wood on lake shore
I'd like to see improvements to recreation areas and roadways
We would like to see the boat launch completed at Anderson Point asap, as promised. the questions above are not pertinent because there is no boat ramp/launch where we are (Anderson Pt)
We would like the boat ramp done this year! the Bay of Dog Creek has a lot of driftwood that needs to be cleared up. need more parking places
Syringa needs more floats, larger breakwaters
Stairway at Renata from launch to parking lot
Beautiful
Keep it that way
Good job on the boat launch at Andersons Point, its awesome, keep up the good work
They need to brush cut more spots to get trailers in, more boat and quad access
Need a more usable dock at Renata

**Table 53 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

**ANDERSON POINT (cont'd)**

**Post-construction (n = 44)**

Yes, i did fish here but dont bother anymore. the limit was 25 per day then 18, 15, 10 now 5. i could limit out in 4 hours at 25 and get a few rainbows. now you cant get 5. salmon came up here before dams. now we cant even stock kokanee.
Please put sign up to have people park in lot and leave boat launch clear at anderson point
If deer park doesn't want their proposed launch, renata could sure use it
More boat access rec sites would be nice and mooring bouys in deeper water. not usable at this time
Widen syringa ramp
There could be a fuel station in nakusp, that would help in tourism on the lake and boaters extend their stay on the water. fuel in nakusp is one of the most important things on my list as i travel there via boat frequently
The anderson point boat ramp needs signs in parking lots, plus on ramp for parking. the bottom of the ramp can not be used in low water because it is to steep and big rock, need concrete further into water for winter use
B.c parks have restricted too much of the access to the lake. tulip creek and more. there was a public beach called drift wood bay that was used for a canal to the new powerhouse, but no public area returned
Great ramp
Dangerous single boom log tethered north of gladstone creek and islands north of that should have flags or buoys for people not knowing they exist
Its a beautiful spot/area to come camp, fish and hang with friends and family
We need a dumping station for houseboat use. What are they using?
Please do build a boat launch in deer park. This is a great facility and functions great.
Its a beautiful place
Rec sites are amazing! Its gorgous out here!
Doggy bags and garbage should be made available
Smells like dog poo today
Cant wait to get on the water!
More parking
We would love to see more people respect what this lake has to offer & appreciate the efforts in keeping rec sites clean & maintained
Beautiful!
Maintain a higher level during summer
1st time I come so not sure what to answer here!
All good
Road & provide more free camping

<b>Table 53 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?
<b>ANDERSON POINT (cont'd)</b>
<b>Post-construction (n = 44)</b>
We would like to see the mouth of the dog creek managed, with the low water & sand flooding the mouth opening = salmon cannot get up
The syringa boat launch needs to be upgraded for summer traffic aswell, the dock needs to be closer to the launch pad
Need to fix design of boat ramp at syringa park to shelter boats from wind when launching. More length would also help at low water. Need to extend secondary boat launch at syringa park, cement further into lake as during low water is inaccessible it would be used more if extended.
A more organized boat launch facility on the renata side would be such an asset. For safety in storms & protecting boats from storm damage
Thanks!
Try to keep water levels from fluctuating quickly
Boat launch should be longer. Water level on website should be more accurate for changes
We would like to see the mouth of the dog creek managed, with the low water & sand flooding the mouth opening = salmon cannot get up
The syringa boat launch needs to be upgraded for summer traffic aswell, the dock needs to be closer to the launch pad

**Table 54.** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes? – Edgewood Community Park Boat Launch

<b>EDGEWOOD COMMUNITY PARK</b>
<b>Pre-construction (n = 80)</b>
Don't wreck this paradise
Inconsistent water levels affect the warming of the lake for swimming. water levels also affect nesting for birds.
Keep water level same up & down
I love Edgewood
Areas set aside for ATVs Proper boat docks at Edgewood Fauquier Burton! Hydro rate compensation for water table activities for power generation for residents
Born in Nakusp, raised in Edgewood. Keep big developers out and campgrounds small and simple. preserve the peaceful and relatively unpopulated feeling
We need a marina
Very beautiful- i'll be back
I like it the way it is. Further "development" brings pollution unavoidably. I lived in Muskoka, Ontario and watched development ruin the land and waterways. Gas and Diesel fuels should be stored as far away as possible. no fuel pumps should be allowed near the reservoir. Preserve the natural beauty of the place.
BC hydro needs to upgrade boat launch and perhaps establish small marina in edgewood's natural bay.
Eagle Creek needs attention for spawning fish
I love it here
Boat ramp needs to be maintained & accessible all year round, including snow removal and sanding
More fish would be nice
Not really
Better water access would be better. Sometime have to go to ferry ramp to put in.
Could use a boat dock and breakwater.
I don't recommend commercial development anywhere along the lakes, will greatly reduce many people's enjoyment of the area, keep it simple. Not for sale! limit camp site useage to 10 consecutive days.
I like it the way it is
Need a year round boat launch
Least amount of level fluctuation is best
I love it!
Maybe we will when we get back
We love the arrow lakes (edgewood campground) and will be back annually
Great place, never crowded
We need a new ramp in edgewood and better camp grounds

**Table 54 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>EDGEWOOD COMMUNITY PARK (cont'd)</b>
<b>Pre-construction (n = 80)</b>
Would liketo see no sea-doods <> beaches everywhere- water not to high
Erosion is an issue from eagle creek
Looking forward for my first time visit
I trust bc hydro will make the right decision to upgrade the edgewood campground boat launch to be on par with those in such places as burton and fauquier
Edgewood needs a dock and wind break
Improve docking, swimming area for kids
Provide more forestry camp sites that provide privacy
I love it!
We need a new ramp in edgewood and better camp grounds
It would be nice to see some shore stops along the lakes. <> clean & Safe <> signage about the history, wildlife etc.
Once you lose the recreation values its hard to regain
Lets get a functional ramp please
We are lucky
Fix the boat ramp to the specifications of your on judgement. put the new boat ramp at kilarney (old log dump) across from edgewood on south side across eagle creek
Fix our boat ramp facility <> stabilize the lake level more
Improve docking, swimming area for kids
We would love to see this area remain the same as it is now, thank you!
Fix our boat ramp facility <> stabilize the lake level more
Stabalize the water level a little more
Please upgrade edgewood boat launch to the standard of faquier & burton asap, thank you
Marina-docks much needed <> walk way along beach maintained, this is a beautiful pristine area
We need a new boat ramp
We need lights (beacons, washrooms, sani-dump for boats on the new dock and a marina)
Don't commercialize it
Boat ramp: wharf needs upgrade
More water more access
Edgewood needs a dock and wind break
Keep making it better for locals all year long
Excited about new docks & lake access
Power generation with consideration of the folks trying to enjoy

**Table 54 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>EDGEWOOD COMMUNITY PARK (cont'd)</b>
<b>Pre-construction (n = 80)</b>
Power generation with consideration of the folks trying to enjoy
We have been enjoying our stay
Need new dock!
Great place, try to keep water levels more stable <> build a bigger boat launch in the same location
They should rebuild the dock and add another one across from it
The anger, trauma, frustration originating with initial flooding is still an under current in this community, understandably, also creates a profound lack of trust with bc hydro
Love it here
Extremely difficult for elderly folk to manage launching on the ridiculous condition of the ramp!!
We can hardly wait for a decent dock that is in the water year round
A stabalized water level or at least not such drastic minus level
The edgewood boat launch unusable in its current condition and at some points dangerous
We need a new dock and breakwater!
A wharf would be really great, and fish ladders on eagle creek or dredging for spawning
The facilities at the campground are not in as good a condition as they were back in the 80\'s & 90\'s
Need better ramp <> docks
Sandy areas for canoe/kayak launches with a gradual slope into the water
Our rec area has gotton too small to handle our population plus tourists. we have no council or government or reg. district to cover big expenses, it leave sit for volunteers to apply for grant monies
We need a dock at the boat launch
Well done
Nice and peaceful here
New dock is very important
A decent boat launch and breakwater would be nice!
Water levels on beach lower for hiking
We need a new boat ramp
<b>Post-construction (n = 32)</b>
Beautiful
Ban the motorized noisy wave jumpers/jet ski boats from all areas of arrow lakes. need more local fish management
Smaller lakes like sugar lake and smaller should only allow electric motors or canoe kayak etc, especially if used for drinking/resev
The lake is clean and well looked after always enjoy our stay on arrow lakes
Important to keep clean and habitant friendly concrete blocks, eyesore should not be seen

**Table 54 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

**EDGEWOOD COMMUNITY PARK (cont'd)**

**Post-construction (n = 32)**

I like it. its quiet.
Bury those cement blocks
The cement blocks on peninsula are very ugly, as a hike would like to see them buried. is the expanse or native concerns
Leave lake level so we can enjoy our many lovely beaches
Keep up the great work
Getting better
It is a beautiful place to come as you can go all day and maybe see one other boat on the lake. we just love to see all the wildlife and scenery
I have noticed no change in the use of the lake or anything else
We are so lucky to live here
Life is good on the arrow lakes
Good job keeping water level accessible the past year or two. Its very important to us to be able to get on the water 365 days of the year. Maybe enforcement of proper dock ettiquite.
Water levels to low needs to raise 30ft
Best place on earth
Keep jetskis & other noise at home
Its much better
Please preserve the area
Spent many summers here with family. My wife & son are visiting for the first time. My 9 year old son loves the lake
Usage definitely increasing every year. More facilities will be shortly
More signs, trucks and trailers only, no more mooring beyond this point (on boat launch warf)
Less extreme water levels would be great
The main beach is a huge summer attraction. The water levels fluctuate way too much! the beams need to be in the water for all of june, july and august! the dock too. If the water level is regularly going to be low then the booms need to be taken out farther.
Beautiful pristine lake. Lets keep it that way
This area is a rare ge. It is just busy enough & does not need to be adverted as a recreation area. Fast fluctuation of water in this area in summer months can lead to grounding of boats while camping/picnicking
Easier access for limited mobility persons
Stable water levels
I (we) prefer a moderate water level - too low is not good & too high it takes away recreation
Dock becomes unusable in low water/winter

**Table 55.** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes? – Fauquier Community Park Boat Launch

<b>FAUQUIER COMMUNITY PARK BOAT LAUNCH</b>
<b>Pre-construction (n = 11)</b>
This boat ramp requires complete overhaul and when completed has to have a maintenance budget to insure ramp remains useable.
Water level to stay with 10ft to 15ft drop over the year
Clean up the wood on the shores before raising water level. floating wood causes boating problems.
Boating and swimming should be seperated floats for swimmingdocks for boats
Really would like to see the level remain more constant
Less fluctuation of water levels a well maintained recreation site with ramp, docks, warfs, picnic tables, garbage bins and an outhouse
Great for proper facilities - including all weather all season warfs and breakwater
All the boat ramps in all small towns on Arrow Lakes need Attention right now
If the equipment is here we will use it.
Year round access and docks
There would be more people using the area if there was a proper boat launch to access instead of a sanded in ramp
<b>Post-construction (n = 29)</b>
Reopen hill creek facility
The new boat ramp is great!!
Good fishing
A steady shoreline would be better, more fish!
Love it!
Beautiful ramp
Always enjoyable, never very crowded
Please complete boat ramp as shown in plans presented
Things are good now
All is well
Dock needs to be extended to be used in winter months or keep the reservoir higher during the winters months
We love it!!
Have concerns with high water levels. i believe bringing water up to 1446\ ' level will adversely affect (damage) the Fauquier golf course
The recreational facilities are rapidly coming to an end, if the cbi does not change or come to an end , there will no longer be any lake, only at the whim of the usa
Please keep water at a mid stable level during june, july, august
Complete lack of economic development due to a lack of services available to boaters from castlegar to revelstoke - no gas



**Table 55 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>FAUQUIER COMMUNITY PARK BOAT LAUNCH (cont'd)</b>
<b>Post-construction (n = 29)</b>
Stabilize the lake
Need more fish, more dock
Enjoy it as much today as when i first saw it, the reservoir is better managed today than it was then.
Great lake
The quality of fishing since the flooding of arrow lakes has continued to be neg. impacted that the suckers and squaw fish will soon be leaving
This lake could really use mooring buoys thru out its length for cruisers to over night on, we have about 100 in the okanagon,and they\'re super valuable
Love the area
More for the plants & animals near lake, more habitat, spawning streams most important
End of ramp & cement gets dry & leave mud flats hard to load boats, use old
Fluctuating water levels make it very difficult to "groom" and provide nice beach areas
We love the pristine environment we are curious about the fluctuation in the lake levels from year to year
Beautiful
We love arrow lakes - so clean/fresh & beautiful but would prefer less fluctuation on water levels.

**Table 56.** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes? – McDonald Creek Provincial Park Boat Launch

<b>MCDONALD CREEK PROVINCIAL PARK</b>	
<b>Pre-construction (n = 6)</b>	
	Limited motor traffic on water would be nice
	This is a wonderful part of BC. It is like going back in time - it is so relaxing and enjoyable. Thanks for taking care of it.
	Save the lakes from the idiots regulate number of visitors
	Nice area/will come back for longer
	It is fantastic!
	We moved here from the Okanagan to find a smaller community and a lake with fewer people
<b>Post-construction (n = 94)</b>	
	It looks like a lot is being done to make it user friendly- the McDonald campsite is so lovely- we will come back to go fishing and kayaking.
	The BC Parks are all closed too early and open too late. Bad in many ways.
	The peace and quiet, lack of built up facilities, cleanliness- no litter, makes it a perfect spot.
	Beautiful!
	Absolutely beautiful scenery and the water level is the best i have seen it. when it is lower the submerged town sites are almost visible and one worries about safety clearance
	Nice area
	Wouldnt mind seeing the beach/shoreline not so full of driftwood and logs, thanx
	Fishing is not as good as it once was
	Great lake and facilities. only change i would suggest is 1-2 more provincial campsites
	We love the peacefulnes, quiet and relaxing atmosphere, nice soft sand. fish are great here
	We continue to enjoy our visits here. it has become our favourite camping location (mcdonald creek)
	I'm not local and havn\'t frequented much but recreation possibilities have always seemed available here ie, fishing, swimming, camping,. I grew up windsurfing and have in the back of my mind thought about checking spots around here.
	We found 1999 accidently a quiet, peaceful place at mcdonald creek. we are very disappointed by the development into a noisy marina like spot
	Would be nice to have more \"dog friendly\" beaches, as lots of people travel with dogs
	The water seems clear & clean, the area is beautiful. <> we camp at a large variety of bc parks- both on the island and off...on trips like this one we\'re on this summer we don\'t have specific destinations in mind so its a fluke that we found this park- it maybe years before we ever come back but not because we don\'t like it.
	Perfect & enjoyable
	It would be nice if more campsites could be available
	Lower h2o is better <> better informing of when h2o will be lower high & for how long

**Table 56 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>MCDONALD CREEK PROVINCIAL PARK (cont'd)</b>
<b>Post-construction (n = 94)</b>
Please keep the mcdonald creek campsite (on the lake) primitive, possibly expand into donnley beach
We have always been very happy about mcdonald campground in all aspects
This survey is based on frequent users, not 1 day passing through campers as we are!
Opportunities are endless, more boat launches needed; 1. halfway river area, 2. north end of lake east side
Campsites are well kept, clean & private. beautiful views and peaceful surroundings have us looking forward to returning here
I would like to see more camp grounds similar to mcdonald creek park (beautiful place!)
International jewel, preserve! <> valuable as a recreational resource is unimaginable!
Don't have the water come much higher than it is today (Aug 15/11)
Extend the camp ground
We are camping at mcdonald creek , 1st time in this area and all is very good
Lower the levels!!
Beautiful, very friendly attendants
Lower camping costs for parks & more reasonable rates <> -6
Its lovely, its tranquill and love the peace and quiet....will come here for many years to come
I enjoy pristine areas that are not overly developed and crowded with people
We keep coming back
Had to answer some questions as it is our first time here. lovely area, wish the lake level was lower so lake was accessible. will come back next year and try another prov. park
Little less water
A beautiful place
Clean up the excess debris on the beaches
We look forward to our two week of vacation we get each year. this year we are sad that our short vacation time is not being spent as we hope all year to spend it. if the water level remains this high we will not spend the \$ or time to come here in the future
It is really beautiful here and if i should visit canada again i would think about coming here again
Jet boats, seadoos and waterskiers (speedboats) are to close to the beach at times
The water was much higher than normal, and there was a lot of debris and wood in the water. much of the banks were/are collapsing and there are no beach areas. our boat launch has to be cleared every day before we could use it
We believe that every effort should be made to preserve the opportunity to experience a remote and unspoiled camping experience. we feel strongly that the existing facility should not be expanded or further developed

**Table 56 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

**MCDONALD CREEK PROVINCIAL PARK (cont'd)**

**Post-construction (n = 94)**

Coming here each year we have look at purchasing real estate here, we enjoy the area. anything done has been an improvement.

Like to see lake levels more stable

Water level is too high. mcdonald creek campground is known for its beaches, there were none. <> it\'s also very difficult to get reservations at mcdonald creek campground. first time in three years that we were able to, why? there seems to be issues with reservation system. BC residents get first priority??

We were planning to buy property on the lake but have reconsidered given the water levels that can happen and the debris that comes with it

More reservable campsites! showers at mcdonald creek provincial park

I'm happy

BC parks should not have reserved camp sites and where ever possible they should expand as the needs of the local community are not being met. <> the water levels of the lake should try and be more consistent level so there are no surprises for the visitors to the area.

Thank you for being here

Nice parks and facilities

Great lake

Nice to see funds spent to upgrade camping facilities in arrow lakes (mcdonald creek) would like to see syringa campsite expanded also

I think monies from the treaty should be used to enhance the beautiful parks that are here and make even more, tulip ck is a prime example. rather than taking advantage of a nice camp and installing outhouses and picnic table so that it could be a park assets they ditched the road so now its boat access with no services

Water levels too inconsistent, too much debris, too cold (warm it up) (jk)

It is the beautiful surroundings, the very clean campsite (although it was full due to the weekend of canada day) so we are 110% happy

This campground (mcdonald creek) is a bit pricey. \$7.00 for 10 quartered logs for firewood. always wet, not a fair price for a provincial park, especially after paying \$31.50 for a night of camping

Great, best part its not crowded

Not yet

Its beautiful, do not let industry destroy what we covet so dearly, our beautiful province we live in the greatest place on earth, bc. keep bc beautiful

More mountain biking trails would be an attraction. beach at macdonald have to many pointy objects sticking out of the sand in and out of the water

We would ride our horses if there were facilities available. also a noise by-law (music-loud motors on boats, bikes etc) would be good

Not enough experience here (3 days) to comment

<b>Table 56 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?
<b>MCDONALD CREEK PROVINCIAL PARK (cont'd)</b>
<b>Post-construction (n = 94)</b>
Removal of logs and washed up drift wood would make the shorelines more user friendly
We love this part of the kootenays. full of history, attractions, great food, beautiful scenery and low key
Have camped here since a child and keep coming back, can't beat nakusp
Nakusp warf and marina need another break water
Love the area
Not well known yet, very happy here. lots of room and it is beautiful
Just keep it all running as best you can, some are good years some are bad as far as water levels go, but i've never gone home disappointed
We love to come here to watch the osprey and bald eagles soar and catch their food as well as explore the other side which is uninhabited. we appreciate all the different condition which exist here but especially the quiet
Need to make people bear aware, bear campsite policy to protect the bears
Nakusp beach is so clean and we love the shady spot that we can bring the dogs, too volleyball net is a real hit with the kids
Very good camping experience
My chances of coming back would be increased if there were shower facilities. however i appreciate not having such facilities might help to keep visitor numbers more manageable
Big trucks destroying nesting areas, garbage left by people
Its a beautiful well maintained park. the host people are helpful and friendly some play in sites would be great. also more water outlets close to washrooms facilities
Don't want it to be like okanagan or shuswap where people are unsafe, unkind, swimming too close together.
No other comments
Nice if the water level was more contant. Gas station on the lake
Managing shoreline erosion and situation a large concern. Natural (storms) course considerable dams in zone
Bylaw enforcement, building permits, aggressive dog control, disrespectful use of wetland
Nakusp marine is in shambles and needs replacing. Water levels should be stable in summer months
Fish populations seem to be declining and more effort is required to sustain and improve
Great place to boat/fish and be with family on the lake & beach
Launch at burton does get very low. Concerns about revelstoke boat launch at the ball park - it is in disrepair
Great lake and wonderful marina
Would be much better if water level did not fluctuate as much as they do

<b>Table 56 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?
<b>MCDONALD CREEK PROVINCIAL PARK (cont'd)</b>
<b>Post-construction (n = 94)</b>
Would like to see unregulated camping on the beaches & boat launches stopped. Too much garbage/feces/dangerous activity
Please keep seadoos off the lake
Its great
Water levels in summer months should not fluctuate so much. Keep levels more constant (say about 439m) for atleast 6-8 weeks. Driftwood management and shoreline tree erosion should be more actively manages by BC hydro or/and interior. Fisheries management needs to improve. social considerations should improve
Love it here

**Table 57.** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes? – Nakusp Boat Launch

<b>NAKUSP BOAT LAUNCH</b>
<b>Pre-construction (n = 83)</b>
Please try to keep the water at a reasonable level!
Continue the good work.
Security non-existent! No fuel available Why aren't there some marine bouys in the bay for visiting boaters?
We feel the boat launch facilities and the marina should be upgraded to attract more tourists
Full reservoir is not ideal for wildlife. Water right to the forest leaves very little shore. Ideally the levels should be stabilized at some "mid" level. This would leave shoreline and allow vegetation to establish.
Lots of logging driftwood at times (reservoir)
The water level should be level. I no longer live in Edgewood
Love it, thank you!
Log salvage needs to be carried out. Logging companies to clean up wood they lose. Private salvors could sell back to company, as on coast, less debris.
1. We need more restocking of the Arrow Lakes 2. an additional ramp north of Nakusp
Beautiful spot
Release water from Revelstoke dam to keep our water level constant.
I think BC Hydro should live up to their commitments and obligations that they originally agreed to.
Fishing is very poor and declining
Nice relaxing place to visit
A new launching ramp must include a float for loading unloading of vessels!
When the water is low there is a lot of logging cables etc
Driftwood
Please put a sani-dump station on this lake.
Great place - we'll be back!
Surprised at the evidence of how low the water is at the moment.
Try to improve the fishing - should not have been allowed to take out the Hill Creek hatchery
More education for tourists and locals
Needs sanitation pump out for boats and fuel
What a beautiful place.
Fish enhancement projects are needed
Management of the lake is run quite well
It is always peaceful and quiet where we live on the lake, the water level is my only concern. It is an incredible place to live.
More boat launch more access to lake
Really relaxing

**Table 57 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>NAKUSP BOAT LAUNCH</b>
<b>Pre-construction (n = 83)</b>
Why close down hatchery at Hills Creek?
Since the Hill Creek hatchery has been closed i have seen a deterioration in the fishing. The next step was to cancel the creel census. It appears to me that there is little motivation to maintain the fish population. The hatchery should be re-opened and the creel census started again to monitor the fishery.
This summer was great for water levels!
The boat launch area in Nakusp is great. the water levels would be better kept up to the max for June, July & Aug. instead of going down in July.
Consistent water level yearly!
Since they shut down the hatchery at Hill Creek, the trout fishing has gone down hill bad. If they do not do something soon it will be too late. We have to have the hatchery back \"now\"
Maintain the high water level, without it the village of Nakusp would not be as attractive to tourists/ investment opportunities.
Nakusp needs better boat launching facilities
I am concerned with the fish population in the lake as this is [-7] activity of my family and friends.
We love it here because it is not as crazy as Okanagan lake where we came from.
Beautiful area
It would be wonderful if the water level could be kept constant- even thou i know that is not possible!
Control tourism <> control jet skis
In some places there is littering
Too much driftwood <> keep water level constant!
Fish needs to improve
Parking could be easier to find
Need more fish in arrow lakes
So far this small community seems friendly, clean & peaceful
The marina needs more spots for mooring
Would like to see more sailing clubs and opportunities. possible charters
We are enjoying our stay at arrow lake
1. nice and quiet 2. uncommercialized
Enjoy the beaches sandy
Thanks for asking
Have a great day
1. Huge fluctuation in water level is detrimental to the shore and wildlife <> 2. very high reservoir levels is eroding/eliminating beaches <> 3. if reservoir is always kept high, the flood control is negated



**Table 57 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>NAKUSP BOAT LAUNCH (cont'd)</b>
<b>Pre-construction (n = 83)</b>
Fishing- very poor <> fish hatchery closed <> no real evidence of fish enhancement (only spin)
I like it when the reservoir is at or near full capacity in the summer
Good facilities, trash, rest areas clean. roads are good
A great place to fish and lounge around
No- why are you doing this survey?
Nakusp needs to grow and this is the best place to start
Shutting down the trout hatchery has reduced numbers of larger (4lbs+) gerrards. kootney lake once lagged behind us in this area but now have superior catches regarding larger gerrards....sad.
Yes you need to fix our boat launch and realise that fish stocks are down and your high level is causing dangerous conditions on this lake with drift wood
Dont over commercialize like Shaswap or Okanagan- keep it pristine!
Please fix ramp and improve fishing, thanks.
The fishing here is not as good as it used to be in this area. the planted \"dust control\" is very disruptive To boat motors and campers.
When the lake is full there is a lot of debrea floating and no shore line
Boat ramp in too be replaced
Very nice place to visit
Boat launch- needs a wash station for boats
Very nice lake
Love it here!!
We'll be back for years to come
Please help the nakusp launch club marina repair the breakwater etc. (at same time as re-doing the boat launch)
I would like hydro to clean up the driftwood at arrow park
No boat gas on water, need facility!!
Great experience
Hydro needs to help fund projects that affect this lake as a reservoir and help funds with improvements to the boat launch club
Need a bridge
Wonderful area to explore and scenery is excellent. summer time ferry crossings can be frustrating due to wait times
Bring the water level down!

**Table 57 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>NAKUSP BOAT LAUNCH (cont'd)</b>
<b>Post-construction (n = 120)</b>
A more constant level would be my request
The new ramp at nakusp is a joke, we got nothing since they flooded the lake
Lets have fun
No thanks
Yes sometimes i have noticed boaters spill fuel in the lake, but otherwise its a great place to visit, not as crowded as others, i.e kelowna
Debris is to often hitting boat
I think its a shame that the new boat launch in nakusp was not allowed to be finished, before hydro start raising the water level. if it is not usable at low water next year, some body should lose a job.
Need year around boat access
Would really like the water level to stay consistent
Not enough places to boat launch, cables are dangerous
Yes, keep this place secretive and relatively unknown. development will spoil the serenity of this jewel
Would like more conservation and stable water levels
This is the best place!
No fisheries enhancement
Lake level should be kept much higher, with less fluctuation
I feel the recreation on the arrow lakes are very enjoyable, i would like to see things maintained for future generations
I love the trees that are planted and well maintained, good job nakusp
Let the dams go and let the water run free, dont screw with any more water for power, money
Water levels should be stabilized to allow for establishment of a riparian zone. when high water recedes, local beaches are littered with debris and floating logs. friends at selena bay with a cabin on the beach are selling out because of mess left on their beach last year after extremely high water levels
The boat ramp is too short and will become unusable shortly, as a lakeshore owner like to see more stable water levels
Yes, keep this place secretive and relatively unknown. development will spoil the serenity of this jewel
Would like more conservation and stable water levels
This is the best place!
No fisheries enhancement
Lake level should be kept much higher, with less fluctuation
I feel the recreation on the arrow lakes are very enjoyable, i would like to see things maintained for future generations

**Table 57 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

**NAKUSP BOAT LAUNCH (cont'd)**

**Post-construction (n = 120)**

I love the trees that are planted and well maintained, good job nakusp
Let the dams go and let the water run free, dont screw with any more water for power, money
Water levels should be stabilized to allow for establishment of a riparian zone. when high water recedes, local beaches are littered with debris and floating logs. friends at selena bay with a cabin on the beach are selling out because of mess left on their beach last year after extremely high water levels
The boat ramp is too short and will become unusable shortly, as a lakeshore owner like to see more stable water levels
Consistent water level during summer
Water too high in early summer
Keep up the appearances
1. better access for swimming everywhere 2. better public access everywhere 3. get rid of the private property signs
More camping sites, and more places to put your boat in
Beautiful peaceful area to visit, hope it doesn't become too well known
We found the new docks at anderson point and fauquir very useful
Dock should have a ladder
It is such a beautiful spot to swim and feel connected to our natural world. People are so friendly + quick to offer help-the boardwalk is especially lovely-someone cares for it obviously. Thanks.
I wish the water levels would stay the same so local/private beaches would be more enjoyable-would be nice if they stayed higher.
The rainbow population seems to be in steady decline. Stabilize the elevation so that riparian/ creek spawning habitat can be rehabilitated. Everything else follows a stable, full pool elevation (or close to it). 435m would be nice.
Bch needs to put in a new breakwater + a new marina
My husband and I are hoping to retire in the nakusp area. We really like the community + people.
Like seeing the water high, much more appealing. Beautiful scenery.
The grass floating in lake during high water. Drift wood on lake sometimes challenging. Fertilizing lake @ galena bay ferry improves fishing.
Beautiful!
Changes and improvements continue. More camp sites with spots available to locals
The levels of the lake fluctuate abruptly and go way too high and way too low. As a result fishing is highly affected, a lot of debris, a lot of random logging debris from the past. Needs of outhouse and garbage facilities and no fuel on the lake available.
The water should stay high during recreation seasons
Too quiet. Wonderful spot but no promotion of the potential and not enough tourism related facilities or maintenance

<b>Table 57 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?
<b>NAKUSP BOAT LAUNCH (cont'd)</b>
<b>Post-construction (n = 120)</b>
More stable lake levels would improve all activities
Nice place
Appriciate the trash & washroom & picnic facilities
Closing mortans beach for local use, lack of camping is huge concern for family and friends. Mcdonald creek camp is often booked up, when lakes are high no beach is available when low the wharfs are not useable and some areas are not accessible
Bring back galena bay hatchery not enough trout, no where to spawn
If it is not broken don't try fixing it
More fish stocking would be nice
Boaters should not fuel up at the dock- as always they spill fuel- must do on land. Have fun and relay
Need a boat launch between nakusp + galena bay and steady lake level 1425 ft level-fishing funds-fish hatchery for the rainbows + bull trout, kokanee-more sport fishery. Bigger fish like kootenay.
I am very concerned about the chemicals that are dumped into the lake that are designed to produce algae blumes. Maintaining a mid level of water is a better way to feed the fish.
Nakusp dock is falling apart
We really need a stable lake level in the summer. I drove down the columbia river on the us side last summer and the river was very high (also full of milfoil weed, which made it unpleasant to swim in) we should be able to have a swimming beach all summer
Cement pier out into the arrow lakes. Providing a (water break) break water- a place to anchor boats especially for low water levels
I wish the fish hatchery was still in service
love the ferry
Keeping shoreline water levels as consistant as possible is very important. As much as practical, higher levels in summer (june-sept) is very helpful for water sports, tourism
All good
We enjoy the nakusp area, we come with family every year for 2 week summer vacation. We enjoy the community and water sports. Debris in water or lack of effect a major reason we keep coming back
Client lived in nakusp for 1 yr on a teachers exchange at 2010
There should be a survey for local residents (specifically)
It would be nice to see less fluctuation in water levels
It is great and underutilized, would be great to have remote boat in campsites along lake
Marina/boat launch requires breakwater

<b>Table 57 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?
<b>NAKUSP BOAT LAUNCH (cont'd)</b>
<b>Post-construction (n = 120)</b>
Stable water level!
The breakwater at the nakusp marina needs repairing and gas needs to be available on the lake at nakusp
We love our walk way
I would like to see the water level kept more stable
keep the water levels up pls.
Steadier water level - better maintained, more mountain bike trails
Keep water levels sufficiently high from june to sept 30 to support recreation and fish levels
Better job could be done on fish management
Keep updating and maintaining! Thank you!
Love this high water
Nakusp marine needs urgent professionally engineered and constructed upgrading!!! Break waters are sinking! Boat stalls are only for small boats. Upgraded nakusp marina could be profitable! Present marina is loosing money and is practically closed for new members. i am on "waiting list" for 4 years and see no chance
Keep water levels higher so fish can access creeks and spawn
Recreation facilities appear to be better maintained today as compared to 20 years ago. I hope this continues.
Don't like noisy skidoos
The erosion control on the arrow lakes reservoir has never been successful and still has not been addressed
Need a bridge at needles
Beautiful lake, not crowded, great facilities very close to ramp.
Beautiful scenery and people. Keep it that way!
Consistency is important
The boardwalk is new since my last visit (1982). I would encourage further efforts to develop the waterfront.
Keep lake at one level
Beautiful here!
Lets take a hard line with the u.s. in negotiating the columbia river treaty. If they won't pay downstream benefits then they get no control over the river flow! It may take a little time but we can win this fight, as their resovoirs drop ours can still be full.
Please keep the water levels up during the summer season. And please keep the beaches clean.
The marina needs to be rebuilt and break water please

<b>Table 57 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?
<b>NAKUSP BOAT LAUNCH (cont'd)</b>
<b>Post-construction (n = 120)</b>
I fished the kootenay most of my life. But prefer the calmer waters of nakusp. The rainbows are smaller but when you don't get beat up twice a day it is much better and you only need a small boat.
Even in the '80s when the dam system had been established for 15+ years, we could count on useable swimming levels. Why not now? Why is it that, even though we live right on a lake/reservoir, swimming conditions have deteriorated so badly?
When water is high = no shoreline = no habitat for migrating birds. -extremely low water = negative impacts to fish spawning + access upstream. -lake debris needs cleaning off of shores etc. -low water = no beach. -everyone complains that the breakwater is "broken".
I love this area and the outdoor activities that it provides.
Enjoyed the beautiful lakeside gardens
Like water higher than what it is now and a swimming pool
Steady lake levels could provide docks and ramps to be built at a lower cost
I am concerned about the birds ability to reproduce on this lake. They raise the water levels too fast and high for this time and the nests get flooded. This year I noticed the canadian geese tried nesting on top of the hydro polls in the old osprays nests that is a concern to look into
Since the arrow lakes are damned, the shorelines just don't feel natural. I prefer slocan lake.
Needs a stable lake level. Spawning on the shore is non-existent and fish have a terrible time getting to stream channels due to low water levels. High water in spring wipes out the shore birds nests & there are no beach activity with no beach.
With reservoir flooding the riparian zone has been irreversably decimated. Driftwood is a boating hazard. Rise and fall makes arrow lakes less desireable, the shoreline to high water at low water is a wasteland.
Low lake levels have affected all the wildlife in a detrimental way. Also affects real estate values, air quality and scenic views.
I use to do all kinds of boating
Kids
We love nakusp and will be living here within 12 months
Bathrooms are appreciated
For summer use ie beaches, it would be nice if the level was high enough for great beach access well into the fall
We need a boat launch between nakusp & galena bay
Keep levels higher & more consistent
The erosion must be managed!
Please fix the revelstoke boat launch and shelter bay parking lot road

<b>Table 57 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?
<b>NAKUSP BOAT LAUNCH (cont'd)</b>
<b>Post-construction (n = 120)</b>
One of the best things. The dropping of the res does is uncovering historical & native artifacts & also we have very few mosquitos & on the negative side the lake and shore seems very sterile hardly any birds
I moved from the okanaganâ€¦ too busyâ€¦ too many boats, loudmusic, & people, love the quiet kootenays :) I hope to retire soon and explore around the kootenays
Need to control all levels better. Not as much fluctuation in lake levels
Absolutely beautiful!!!
Especially important during height of summer to have water up high enough to get a good swim to the logs
Would prefer for water levels to fluctuate much less
Would appreciate the repair of slides/culverts on the rail trail leaving town. This is a great trail for bike access to gold course and many miles of trails.
Love this place
Fishing was my main interest but do not fish anymore
More attention should be paid to creek mouths clogged with logs & debris so spawning kokanee & trout can make it upstream to spawn.
Consistent and higher water levels wouldn't destroy my deck and make launching water craft easier and safer

**Table 58.** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes? – Shelter Bay Boat Launch

<b>SHELTER BAY BOAT LAUNCH</b>
<b>Pre-construction (n = 82)</b>
Great spot to camp/fish (Shelter Bay). Need to make improvement to campsites, parking, definitely boat launch/ramp. *camp fees increased to \$16.00 per nite/and no visible improvement to the sites.
Please do not allow houseboats to ruin this lake
It is imperative that we have a marina on the water at Shelter Bay - Proper parking, breakwater, sewage disposal, fueling facility etc
Keep the caampgrounds season only pricedd. In off season we always leave the campground tidy when no attendant on duty.
Need to improve the site since the price went up more parking, more camp sites
Keep it clean and pristine for future generations - keep BC Hydro in BC!!
It is a great facility and should be well maintained to continue to allow access
Nude beach
To keep the lake quiet no Albertans or development of the lake shores.
Shorelines should be cleared of debris.boat launch at shelter Bay redone & expand parking area.
Ramp break water needs to be replaced, what is there is a joke.Fish fertilization needs to be ongoing.
More warning of water hazards
A marina at Shelter Bay would be a vaulable asset. Thank you
More access to the water and more boat ramps
It's nice not to have houseboats
Remove the ferries, build a bridge
Fishing has gotten poorer every year sinced the fish hatchery was shhut down.boat launch is not plowed for winter fishing which is my busy time of year.
The area above [Raller?] Bay.This type of robbing should not be aloud.They have cleared the hillside right down to the water's edge.Without doubt there will be slides into lake from a big run-off.
Not any more. i first fish the Salkchuck of -7 Slake Lkae in AB.BC charge for non residents is to high as it limits us from fishing the interior.
The lake water is cold all year long which makes the fish great
Require boat access at blanket creek. more trailer parking at shelter bay. more site control to limit occupancy time (more on revelstoke lake).
Beautiful!
Love the bc parks
Great, the best!
We travelled from Castlegar to Revelstoke fairy and found no where to put in a big boat with motorhome, leave it in the water and go find a camping spot. locals were very helpful with info and helping pull boat every night
Favourite lake to visit <> clean, refreshing, great fishing and lots of nature hikes to explore



**Table 58 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>SHELTER BAY BOAT LAUNCH</b>
<b>Pre-construction (n = 82)</b>
Try to keep it from becoming another Okanagan. i never stop there anymore.
Just the bug control if the water goes up and down daily
Eagle bay forest rec site- picnic tables in poor condition. boat ramp too short so can only be used in high water levels
Speed signs
Hope we can keep coming here for the next 20 years
Pretty campsites, we come back every year
Sites could be more level- ours #2 was out 4". make sites longer for longer rigs
Decommission the hugh keenlyside dam!
Lovely the way it is!
Boat ramps need shelter from wind/wave action <> floating debris management
Could use fish cleaning table and disposal site <> logs in water at shore causing debris and no fish in area
Bear proof lockers would be nice to store food for cyclists like myself
Lower the water!!
Not at this time
Why are you doing the survey? what are you planning?
it would be nice to have a boat launch at galena bay
We feel this is imperative (boat ramp) to all camping and relaxing outdoor life!
Nil
No cell service and it might be a safety issue
Small washroom for kids
Too much driftwood (poor for shore fishing and boating hazard)
Tent sites need better gravel/dirt to put tent pegs in
Love to fish here then go to halcyon hot springs to clean up!
Fix the boat ramps
B.c residents should camp for free, albertans charge double
Stock lake with rainbow trout
Clean up more of debris and deadheads
Just be consistent, been out when it will drop and leave you beached overnight, a couple months in the summer would be nice
Loving the water, environment, people and fresh air
Smarten up the smelly toilets, try to maintain more average lake level
Make it a clothing optional paradise

**Table 58 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

**SHELTER BAY BOAT LAUNCH (cont'd)**

**Pre-construction (n = 82)**

For years we have been promised year round access to our reservoir . i fish all year round we have no accessing in winter. the boat ramp at shelter bay is a disgrace
Certain areas of exposed shoreline should be non-motorized zones, e.g. montane slough to illecillewater river <>dramatic seasonal water level variations is the biggest issue
Better year round fee for seniors (half price)
Boat ramp at eagle bay should be improved it is a great camping spot
Protected boat launch
We need more camping facilities or overfull areas at shelter bay campsite, not enough sites
We would like shore fishing habitat as well as boat fishing. kids are starting to learn/love to fish
It would be nice to bring the floating wood pile close to camp sites, the park is lacking grass to plant tents
We need more camping spots, getting really busy
Love it here
Keep the good work
Huge opportunity for more recreation if areas provided to smoke. great to see more small rec sites from camping/car top boats access open to small fee at rec sites for these services . hydro historically had more rec sites at their installations
Stop killing the kokanee
Waters beautiful, plenty of good times to be had in the forest
No i love it, out houses need to be cleaned more often
The shelter bay park could use enlargements, needs nice sites like other provincial parks, not a parking lot and many more sites for the number of campers who want to stay here, we couldn\'t get a site. make a provincial park and pools at halcyon so everyone can enjoy it
I wish there were more facilities on the lake that were run provincially and not privately
Campground too crowded, not enough privacy, bad for tenting, poor facilities
Could use a fish cleaning station
No its great
Improve boat launch
Great weather
Clean up the shore line of floating debris (drift wood)
More boat launch/ marina facilities near revelstoke that are safe. more camping sites with shower facilities. would like to fish in winter months, but too risky in the current facilities to launch our boat
I know its impossible but i wish the water levels were in a tighter range

**Table 58 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>SHELTER BAY BOAT LAUNCH (cont'd)</b>
<b>Post-construction (n = 66)</b>
All good until people with not nice dog attacked our friends dog/cleats on both sides of dock would be good and a ladder on the end of the dock for getting out of water, people speed through campsite from coming off ferry a more larger speed control sign would be good
Need a boat ramp at blanket creek
Marking of the ferry lane would help us navigate
It is our favourite place to come. We enjoy the fishing and love the scenery. It is a beautiful spot!! The camp attendants are friendly and the campsite is clean.
Increase bull trout limit
Could develop between the dock and make a nice sandy beach. Plus add a bumper on the pole side of the dock so more people can tie up their boats for overnight. Pave north side of campground. Put up a slow sign at campground/boat launch entrance.
Signage about off season camping could be a little clearer
Need cell service
Would be nice to have a boat launch on the galena bay site
Better fishing
Love the plan
The fishing has noticeably deteriorated over the years we have come.
People drive too fast in campground
Pretty awesome for the most part. Debris management in the spring could improve. Maintain higher water levels so useable docks are in the water.
Hydro should be more considerate of nesting shore birds, raising + lowering the levels only pleases below the border. Keep water levels constant (lower) persons can enjoy area better.
Water could stay up longer in summer- fall!
Water levels are not steady
Lets maintain stable habitat for all the local critters and characteren
The reservoir exists for power generation + flood control, but it's nice to have recreational opps.
Great new dock
Maintain adequate stovks of recreational fish like rainbow, bull trout and kokanee
Nice facilities. We will return
Could use a ladder off the end of the dock for swimmers
Keep tourists away there wrekcng it for the locals
Born & raised in revelstoke. Visit many times
Should allow A&O & side by sides. More camp sites/firepits, maybe some pull thru sites. This is mostly our experience in shelter bay

**Table 58 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>SHELTER BAY BOAT LAUNCH (cont'd)</b>
<b>Post-construction (n = 66)</b>
More info on water elevations!
Commercial activities are encroaching on recreational activities
The bc hydro provincial campground is ok, but its fully crowded. Not looking for "glamping" - just more space between sites
We would not chance anything we will be back in the spring
First day all good
Beautiful!
Winter use is up by fishermen, ramp should be plowed getting crowded at ferry terminal with boats. Launching can be difficult at times.
The place is nice
Are there any boat ramps between shelter bay and nakusp? Is it at mt horiel (new rec site)?
I'm concerned about water fluctuation between shelter bay and revelstoke. We need a fuller consistent level year round. Safety reason concerns.
Pier on the north side of the poles. Would be nice to see a larger campground going north, additional parking for boats & trucks, improvements to breakwater
Please continue to allow generator usage between the hours of 7am to 10pm at arrow lakes provincial park. Cell service would be greatly appreciated
Love it here, slowly seeing civilization moving it - guess that was bound to happen
Feed more of the lake to increase the kokanee and fishermen will come
It's a beautiful lake with lots of areas to explore
I would like to see this boat ramp plowed sanded and maintained during winter months. Thanks!
Most times we enjoy our trips here
Camping too expensive to stay more
Would be nice if there were no seadoos around. There should be another exit from the campground at the north end in case of fire. Also there should be fire pertection for the whole campground during camping months.
Love it! Preserve it!
The spring water level is too low to launch a boat at syringa
Always peaceful experiences!
Keep it simple - don't encourage water sports
Boat ramp stayed in water all year round. People not obeying sign when water is down, park on bottom. Beautiful ramp. Nice if you could tie up both sides of dock.

<b>Table 58 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?
<b>SHELTER BAY LAUNCH (cont'd)</b>
<b>Post-construction (n = 66)</b>
More police presence on or near the boating & launch area!!
Beautiful lake, great camping, great fishing. Be good to see a winter boat launch
Better system to ensure camp spots that are paid for cannot be removed, there needs to be proof of payment on receipt so far this is not the case. Boat parking instead of pulling out every night
Would be nice to have the old river bed marked for safe navigation. Especially revelstoke south to akokolex narrows and a boat launch at blanket creek
Could use more parking for trailers at rec site
Love the lake
The fishing could be better
Keep up the good work and thank you for the beautiful dock & parking !!
There has been very little attention to fish enhancement. Fish stocks appear to be dwindling, especially dolly up
Great place
Desperately need speedbumps in the campground
I think there needs to be cell service here. At least 20km or more off the highway here has no cell service and emergency services cant be contacted
We enjoyed to stay here, but if there were electricity and a shower we would stay for more than one day
Looks great around here
Thank you
Warf needs to be extended & launch

**Table 59.** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes? – Syringa Creek Park Boat Launch

<b>SYRINGA CREEK PARK BOAT LAUNCH</b>
<b>Pre-construction (n = 90)</b>
Would like to see 7 fluctuation in levels. Particularly like to see the water stay at a high level for longer in the summer and early fall.
Water level fluctuates too much, some times too high, some times too low.
Need all season ramp
Keep up the great work!
Its awesome!!
Constant higher water elevation would be good
Need another wharf on other boat ramp
Clean up the beaches of debris, boat campsites need brushing
Keep it the way it is
It's nice when full in summer and also Kokanee spawning season.
Shifting water levels too quick is poor. a lot of debris in water makes boating dangerous
Logs in the water should be cleaned up more. there should be a houseboat dump station- no one will pay \$500 to remove their houseboat from the lake to dump. its ridiculous that we have been denied by the government a proper way to handle this.
I would like to see more priority on water levels on our lake during summer season. This would not only benefit locals but also encourage tourism. As this is always very important to the BC economy. We live in the most beautiful place in the world. More priority should be put on our lake than catering to the US and Rosivelt lake!!!
Dont like the idea of people being allowed to build homes on the beach. used to camp more at Syringa park before it got so busy & they started having to reserve sites.
Beach very rocky
Park needs to be open sooner when weather is nice
Flag, deadheads, log booms
It would be nice to be able to use the other old boat launch at this site and be able to access by road the area by tulip falls
1. Not satisfied with camping opportunities beyond summer break 2. no regard for disabled access to day use facility at Syringa
The people in the community of Shields would like to have a boat launch +/- or a dock that would go up or down with the fluctuating water levels. It is extremely frustrating to find docks that have gone aground over-night or if you have been away for one or two days and the lake has been lowered.
Its too rocky
Keep the water level higher! Fluctuating water levels create hazardous conditions due to wood in the water

**Table 59 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>SYRINGA CREEK PARK BOAT LAUNCH</b>
<b>Pre-construction (n = 90)</b>
There should be a pump house for boaters to empty their waste/black water instead of into the lake. no options for houseboats, or bigger boats with toilets etc..clean up of logs in water.
My husband has worked as a tug boat captain for 37 years
Dogs not being allowed in day use area or on beach is stupid. we always travel with our dogs so we don't use those beaches ever. we are considering paying for launch access at new condos as the launch and dock are protected from bad weather and syringa is not, and our boat has been slammed a few times at the dock
Yes! a distinct lack of fire pits!
The water could be a little lower
Just love it!
Please try to keep water levels consistent, thanks
Dock needs to be increased in length for low water use
No condo's please <> didn't like Pope & Talbo\'s sneaky selling of the properties on the lake
Keep stocking fish
Clear the debris off the lake, especially july & aug
Keep boat launch open after 10 pm. awesome place, thanks!
Level fluctuations in summer cause a few problems at beach (water usually colder as it goes up and down through spring to fall seasons)
Thank you
The husbands want the surveyors job!<> All good, keep up the good work!
West ramp. extend ramp to low water mark <> boat launch at camp ground required
Ramp & docking facilities unsuitable & unusable at low water levels
Its time to spend some tax dollars or grant money and get this boat ramp and parking concern dealt with! its long over due!
Yes: we are not coming back to camp in syringa again. we have about 12 other people that will never come back again. its like a retirement home, we were not even allowed to sit and quietly talk in our campsite. its sad when you pay top dollar for a site that has no running water, power or showers and then you are treated like children and told to go to bed at 10pm. we have camped all over bc and this place is the worst ever. they stock the campsite and see how many people there are if you have visitors watch out! <> we have a baby so we were being quiet and not to wake her, they were still coming round telling us to shhh.
Fix the concrete ramp
Need another set of washrooms <> need water close to washrooms (pumps?) tap? to wash hands
Raise the limit on kokanee's to 15 again like slokan lake <> there are lots and it only took 45 mins to catch our quota <> has been a steady increase and size is not too bad also

**Table 59 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

**SYRINGA CREEK PARK BOAT LAUNCH (cont'd)**

**Pre-construction (n = 90)**

Continue to preserve public areas and limit building/development on the arrow lakes. no industry beyond the current. too much already. paper and metal mills limit enjoyment and overall quality of natural environment.
Love the arrow lakes
Need more boat traile parking and another ramp
Thank you for the pie-made hotdog sticks! great job!
Keep it clean!
Feel very sad for young families when there is limited beaches for children to enjoy
Maybe you could put another wharf on the north side of the boat ramp it would give more room, faster launches (instead of waiting 1 hour to put boat in or out of water) it would also act as breakwater so you don\\\'t bash your boat on the wharf in a south wind. either leave water levels so wharfs are in water all year so fall + winter + spring can be done or put in moveable wharfs that can move with water levels up or down ramp so wharfs are in water all year long
Drift wood is my main concern
It would be nice to have another boat ramp in the syringa camp ground
Moorage pins needed @ bowman beach and more @ sunshine bay
Amount of debris in water
Debris was outrageous till beginning of august, thats unacceptable!!
Beautiful!
Dumping sites for houseboats?
Its time to spend some money on a great recreation area, i think it would benefit castlegar and area
Be nice to develop public access
Need more marine campsites
More sandy beaches please
Requires overnight recreation sites along the lake
Fire excisting management <> camping cost to high
To many logs in the water
Dock needs slow/no wake marker bouys to prevent large boat wakes
Need to build a dock on east side
There are too many floating logs, this needs to be cleaned up every week, many people are having boat damage from logs.. also many people are talking about a class action law suit for boat damage and to much floating logs
Longer dock, better fishing
Please put in a forestry camp site, increase current camp sites



**Table 59 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

**SYRINGA CREEK PARK BOAT LAUNCH (cont'd)**

**Post-construction (n = 90)**

Need more boat launches (deer park) and a marina, more sheltered boat launch & slow/no-wake bouys near entrance to the boat launch
Pick up loose logs- safety issue <> early season - extended dock
More fertiliser for fishing
Keep debris off the water, keep water levels at one level
Need more campsites and boat launch facilities
Concerned about illegal access road from c & W rail trail to coykendahl lakeside community that is to be "water access only" and rumour has it they plan to expand. concerned about route of power lines (underground, under water or through forest) to service deer park community.
Keep up the good work!!
Its a shame when the water level is cept so high, ruining the beach areas and docking sites!
Boat launch is too busy at times, need a second one or even wider and bigger one and more parking
Should be more of a gradual drop in levels, woke up several morning and almost had our boat high and dry (beached) and stuck
A sani pump station is needed for public, boats, house boat accessible. wider cement ramp and extended dock at syringa pbl would allow for year round use
Dock to far from water, break water to low, need dock at west ramp
The syringa boat ramp is not a 24/7 ramp, bc hydro promised a any time boat launch when the high arrow dam was built. the launch is closed from 10 pm to 7 am in spring and summer months which is inexcusable. the parking is very poor and not monitored
Debris and logs are a hazard
Too large of fluctuation in water levels
Would like to see the loose wood cleaned up as well as the dead heads interfor should help with this
Put tenting only sites at campsite, put -7 at campsite
Need more mooring bouys, need more auto parking at syringa boat launch, access available to ramp 24/7, creek channels need to be defined for spawning, lake levels stabilized during spawning season, breakwater for launching ramps
A frisbee golf course would be greatly appreciated
If it is possible to make boat launch longer in lower water

**Table 59 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

**SYRINGA CREEK PARK LAUNCH (cont'd)**

**Post-construction (n = 53)**

Move medal warf to the first part on beach & extend the warf. Thank you.
Very nice
Need a breakwater/ 2 docks
Love it!
Please stop messing with the ecosystem in this lake and respect the columbia river treaty pls.
I wish we would put more effort into fishing habitat, better water level, clean up drift logs in water, hold mills more responsible for their mess. (dangerous)
Obviously there are logistically limitations with water levels, but ensuring clean accessible beaches + boat launch amenities are key to enjoying the arrow lakes.
For safety there should be cell phone service
Need more fish!!
Please keep the water levels up in the summer!
I understand that the levels have to fluctuate but it would be great if during our summer months we could think about the bc residences and store some water so we could enjoy the lake or at least be able to use the dock
It would be nice to have more buoys to tie up to for pleasure use
We lived in nakusp for 25 years and used the lake often. The boat launches are fabulous! The water levels can be frustrating but doesn't deter us!
Please look at fixing the boat launch
Please a little more recreation and access, not too much though
We rarely come to syringa (arrow lake) due to low water levels and boat ramp trutch & trailer lack of parking. Its very sad as we live only 10 minutes away and we rather drive & camp/boat at slocan lake
Build incoming boat ramp & parking
BC hydro should start funding people to get solar panels and allow the fish to return to the waters
Make it work
Love this area!!
So beautiful!
Everythings good
It would be better if the dock was closer to the paved ramp
Lake level is my main concern both for the economy of my town, my personal use & health of fish & shoreline species
Its nice because it isnt so busy like kootenay lake or the okanagon

**Table 59 (cont'd).** Do you have any additional comments about recreation on the water or onshore of the Arrow Lakes?

<b>SYRINGA CREEK PARK LAUNCH (cont'd)</b>
<b>Post-construction (n = 53)</b>
I hope to see the water levels as high as they are now, in the future
Keep it clean, keep it beautiful, bring back the salmon
The lake is warmer than kootenay lake
Awesome
Make it easier to salvage firewood!
Syringa boat launch needs to have a breakwater and get rid of the metals parts on the warf as ive seen lots of people slip and get hurt
No thank you :)
Park in parking spots. Not boat ramp turn around spots
Please allow responsible pet owner access!!
Water level consistency, fish cannot migrate through dams
Keep up the good work
Wish it was more consistent all year round, need more parking for vehicles and boat trailers
Its clean and well cared for
Great atmosphere. Free boat launch
Again the low level is annoying like I keep mentioning the floats high & dry - a piss off to say the least!
Its beautiful here & everyone deserves to enjoy
Love it here! Thank you
Its clean
Thank you
Need ash tray dumpers
Love the area, less rocks, more sand
Great place to visit, need more availability for camping
Good idea to have survey! Nice people in charge of survey. Very friendly
As a small business onwer, seeing all the other sites and clubs get pumped with \$\$ we try to keep up the "mainstay" man on "scotties" safe and in good shape and we even don't get a dime! We deal with the water levels more than anyone!
Robson boat launch is very dangerous the gaps on the boat launch have sprained ankle and caused ankles & boats no protection on side of boat launch dock for morrage
Well maintained services
Proud to be able to share our experiences with friends and family from other areas and urban areas
Need more camping on south end of lake. Dumping station for boats. Double docks at syringa

**Table 60.** Do you have any additional comments about recreation on the water or onshore of Kinbasket Lake? – Bush Harbour Boat Launch

<b>BUSH HARBOUR<sup>†</sup></b>
<b>Post-construction (n = 39)</b>
There is too much debris on the lake, its a big hazard to all users.
Clean the dirt wood up!dead heads suck!
Extreme amount of debris on the lake
Water levels fluctuate too extreme for boat use in Spring & using docks.
No!
To tell you the honest truth, i know nothing about this area. i only came here to park and use the roads for atving and seeing my country on my atv. you have great roads and spectacular scenery
Teach people how to be respectful campers - both of others & the environment
Keep the water level below high water!
Very dissappointed about gathering debris and leaving it til water is so high it washes back in to lake???!?! wasting tax and hydro dollars
I like access to entire lake and would not like to see any measures to control water height that would prevent this access
Floating debris is a serious danger to boating
Love it!
Swim area would make it better
Kinbasket kicks ass!
More fish please
Keep it just the way it is!!
Debris! no dock!
More snowmobile trails
Beautiful spot for relaxing and enjoying the real outdoors in your own backyard, appreciate it and don\'t ruin it
This is a beautiful lake which is being destroyed by mismanagement (overpool) by bc hydro, where is the corporate social responsibility of this company (CSR)? money isn\'t everything folks!
Keep up the good work, keep our valleys and lakes clean
To many shit heads
Handicaped camping should be close to the water with access to you fishing boat by your campsite by wheelchair, campsites should have more space in between them
It would be beneficial to have a chart of the lake or boat access to campsites
Lots of shore erosion, better management of water levels needed plus shore stabilization
Keep cleaning the lake its slowly getting better, try to minimize water level fluctuations
More debris taken out, camping facilities

<b>Table 60 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of Kinbasket Lake?
<b>BUSH HARBOUR<sup>†</sup> (cont'd)</b>
<b>Post-construction (n = 39)</b>
B.C hydro will get sued over boat ramp and dock
A-leave the people with placed on the causeway island. alone-quit trying to move them out. leave people alone that bring their trailer out for more than a few days. ongoing debris cleanup is good.
Put a dam in at surprise rapids and hold 75 at bush harbor
Open up the island
The causeway to the island should opened and the island should leave a sec site/ the toilets are full more tiolets are needed
Open the island up again as people are using it anyways. The bathrooms pumped. Have a sign at the top of ramp stating "no parking on boat ramp"
We need better camping facilities on the shore @ bush harbour in the island if the causeway to the island ever gets destroyed the harbour would be unusable need the maintenance on the road in spring to the harbour
Keep the water level even
Its good that it has been cleaned up of logs and debris. It used to be bad it took a long time to go anywhere for logs and james using a pick pole to clean a path. Great now
The various old tugs should be monitored & displayed at the historical informatio. Narry jack is still on the shore but no name left on the boat. Donâ€™t let it rest or not tell people the history
Put in proper campground, empty out houses sewers
Bush harbour is a diamond in the rough with on site management, campsite development, including removing the "jersey blocks" this area could become a very good site
<sup>†</sup> No pre-construction data was collected at Bush Harbour

**Table 61.** Do you have any additional comments about recreation on the water or onshore of Kinbasket Lake? – Valemount Boat Launch

<b>VALEMOUNT</b>
<b>Pre-construction (n = 27)</b>
The outhouse was constantly out of toilet paper
The playground is a life saver for families with children, the parents dont have to worry.
Fish are small, under fed. Pollies are protected too much, eating everything.
Nice job cleaning debris out of the lake.could use more frequent refills of toilet paper in the outhouses
Better roadshandi-capped bathroomswood at campgrounds
Firewoodextra washroom/wheelchair accessboat ramp.....(Griffin camp site)
Need better road conditions
The years i have been coming here there is always debris which is hard on boat, motor & props.also safety of people in use on the water.
The dust is a big issue, and the water levels in spring.
Need hanycapped toilets, they need bigger boat ramp at Grffin camp site.
A weir would be nice to control the water level, the dust problem would be solved in Valemount.
We really appreciate the road to be graded (we have had to drive in cars and would come more often)
Need to develop campgrounds, more parking at marina, possibly develop lake lots for purchase
Clean debris
Enjoy the view and scenary, and meeting new friends while walking the dog along the waterfront, and the water is so peaceful.
Marina boat launch needs to be bigger.
Roads to be graded more.property should be leased to town people.lake should be developed Valemount end where water levels stays same year round.
Its all good
Hope levels could remain at higher levels in spring
Roads to be graded more properly should be leased or sold to town people.Lake should be developed where water level stys the same year round.
Should have better road to bring RVs in on, because Rvs are expensive clear debris on the lake for safety
Road improvement
Would like to have more fish stockedmore water in the lake
It would be nice to see a higher level of water earlier in the year. very well run by the caretakers.
Need more water
Would like to see more derby\'s as well as the lake stocked often.campground @ Horse Creek is very well maintained, clean bathrooms and grounds.higher water levels
Longer ramp please
<b>Post-construction (n = 98)</b>
Very enjoyable experience
Keep up the good work
Clean up debris from the lake. hazardous to boaters

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<b>Table 61 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of Kinbasket Lake?
<b>VALEMOUNT (cont'd)</b>
<b>Post-construction (n = 98)</b>
Lots of debris in the water
Thank you for the wonderful times, i\ll be back
Road access is rough most of the season, grader work more often, particularly before may long weekend & after sept. long weekend to allow RVs a gentler ride in & out
Give us a full lake year round
I love it here
Great lake. only downer is debris (loose wood) on lake. keeping that clear would make the perfect place!
It would be so wonderful to get the deadheads and floaters out of the lake, then you could do more watersports, ie. water skiing, tubing etc..
We need a weir at are end like we were promised years ago. golden & revelstoke get all benefits, we need water here early in the year and water to stay higher longer
Keep facilities the way they presently exist
Lets keep this lake the way it has been for the last x years
We need more! more things to do and see but keep it natural!
Develop the beautiful mill site
Nice area with lots of riding and good fishing
The area is absolutely beautiful
Kinbasket lake is an excellent recreation facility with views second to none. only issue is floating debris should be able to buy nessesites, like ice. sites could use some shade and grass areas. showers would be Nice
Too much floating wood in the water
Lovely!
Would like to see motorized recreation, atv, quads and motorbikes managed to reduce environmental damage and potential conflict with hikers and campers
Amazing lake, just to cluttered with debris to really enjoy or fee safe
It would be nice to have a place to store a kayak on kinbasket without having to pay a high monthly fee
Seems all good to me
Would be nice to paddle earlier in the spring/summer (no h2o)
If the driftwood was removed from the lake people would enjoy it better
Good place to look for rocks when level is low
Clearing debris off water would be nice
Better management of campsites
Too many motor boats or atv\'s (motorized vehicles) would depreciate the value of the wilderness experience for me. i think the valemount area should put in more infrastructure for family camping, backpacking, hiking,. the marina is one area to start but the entire kinbasket valley could serve recreation needs. i would also like to use the road into marina and beyond for cyclng
Long drive down but beautiful scenery
Beautiful area

**Table 61 (cont'd).** Do you have any additional comments about recreation on the water or onshore of Kinbasket Lake?

<b>VALEMOUNT (cont'd)</b>
<b>Post-construction (n = 95)</b>
More bc hydro & bc forestry services support
Beautiful place, will come again
Nice people here
Good to have debris cleared from lake
We need consistent water at this end of the lake and to better manage the wood supply so more recreational opportunities on the lake
Love the area
To much debree in the water makes unsafe boating (hard on boats and props)
Beautiful scenery
Would like and have searched for maps (topographical/geographical) of kinbasket lake
Hydro needs to take more responsibility when they flood the lake like this. campsites being wrecked, roads collapsing is not acceptable
Nice lake
Beautiful and friendly, fantastic fishing derby, clean well maintained campground
Showers required. too much debris creates unsafe boating and beach conditions. not child friendly, no grass or trees for comfort.
Too many logs floating on water/ fuel supply
I'm thankful for the amount of effort and money bc hydro puts into our marina for local and tourist use
This is a great place for family, i wouldn't want to see it become to commercialized but a little busier would be nice
The road in and out of here is troublesome to larger camping units which limit their access down here
It would be nice to have a hand pump where people could get fresh water for daily use
Please have hydro clean wood out of lake
It's great!
Wood debris is horrific!!!
If the logs were removed it would be safer and easier boating/fishing. this would attract more visitors to bring boats here
Great place, lots of things to do! <> staff are friendly and helpful <> this place really needs to keep running!
Please get flushing toilets, log booms around the marina so wood cant get in the loading dock
I think it would be to the benefit of the marina and community to have hydro put in a weir
Get new docks and spend some money on the right things
A weir should be installed to maintain water level at this end, a boom should be put around boat ramp to keep it clear of debris as it was years ago
I find the people who use this facility are friendly and courteous and all enjoy their time here
Need a weir at valemount end for longer use



<b>Table 61 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of Kinbasket Lake?
<b>VALEMOUNT (cont'd)</b>
<b>Post-construction (n = 98)</b>
Drift wood is bad, mainly around boat launch area
The lake levels need to be higher and more consistent
We really need new dock and manage the logs in the water
Could use more parking for trucks and boat trailers
Clean to bathrooms better like put enzymes in toilet
More consistent water levels, a weir would allow consistent water levels
Low water levels in spring and early summer as well as debris hamper the recreation suitability of the lake
Increased water levels by marina would be a definite asset so landing boats would happen sooner than later. possibly a weir would be a definite asset, docks that are more reliable and new would also be a definite asset
At some time when the new generation have been installed it would be advantageous for the marina to keep upper water levels to 3 meters below maximum high water. the dock system will work better because they will not get stranded on the rock wall of the break water when levels decrease in winter.
Not really, however there is one a hole that thinks he owns the place
Need more reliable docks that can be utilized when water levels are low also floating debris is very dangerous
Please clean the debris from the lake
Enjoyable, would love there to be boat rental facilities and proper washroom facilities
Keeping west lake and east lake roads in good enough shape to travel 4x4 and quads
Please repair bridge on forestry hydro road
Marina could use boom sticks
Please repair bridge on forestry hydro road
Needs to be more clean up efforts from b.c hydro. way to much wood on water. they built a boom drag on this end and used it once and we haven't seen it since
Repair bridge on forestry hydro rd
Have the bridge repaired on forestry hydro road
It is a very beautiful place and i hope its kept intact please for my children and my childrens children, thanx
Well thought out questionnaire and kudos (shout out) to maker. psst. i am @ ian canadian and i love valemount, these mountains truly move my canadian soul.
Beautiful
I have noticed today that there is a lot of debris around the boat launch at the marina. also at horse creek. i think bc hydro needs to do cleanup in the fall as well as in the summer
Valemount area is beautiful great recreational opportunities
Reliable docks
Very badly need log wind barriers around boat launch

<b>Table 61 (cont'd).</b> Do you have any additional comments about recreation on the water or onshore of Kinbasket Lake?
<b>VALEMOUNT (cont'd)</b>
<b>Post-construction (n = 98)</b>
Great place and people
The floating debris is a problem especially at the marina some boom sticks or something to keep the debris out would be good
Would have liked to spend more time here. we'll be back next year
Keep on with recreation development, but with caution to attract respectful people, not loud, messy disrespectful
Scrap metal at 10km and 12km needs to be cleaned up for safety. road should also be given guard rails in places. plus for signage along road for 10km-12km.
Has anyone safely wakeboarded or tubed behind a boat on kin basket lake. i know a lot of ppl that would like to try b/c they dont fish. better docking to launch boat in a timely matter.
Keep taking wood out of lake. Higher water in spring so docks can be used
All lake debris travels north & ends up in valemount when lake is down the dust effects the whole town. As a result of this it would be nice if BC hydro increased their efforts to make our community more comfortable with these events happening
Beauty of a lake

# APPENDIX E – Observational Data Forms and Definitions

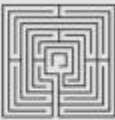


## Arrow Lakes Recreation Study Site and Survey Log

Date <small>(dd/mm/yr)</small>	Location	Time of env record	Sky Cond (1-14)	Wind (8-12)	Wind Dir (from)	Water Surface Cond (1-5)	Air Temp (°C)	Water Temp (°C)	# BC Plates	# Other Canada Plates	# Intn'l Plates	# Parties	Total # People visiting site	# invited to take survey	# prev taken survey this yr	# who decline taking survey	# complet ed surveys	# surveys to be mailed in	Staff Initials	Comment

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**Arrow Lakes Recreation Study – Detailed Daily Sample Summary**

Date: \_\_\_\_\_ Sample Site: \_\_\_\_\_ Surveyor: \_\_\_\_\_ Page \_\_\_\_ of \_\_\_\_

Total # in Group	Gender	Age Range									Activities	Comments
	Total M/F	1 – 10	11 – 15	16 – 20	21 – 30	31 – 40	41 – 50	51 – 60	61 – 70	71 +		

Version: September 7, 2009

#509 318 Homer Street Vancouver, BC V6B 2V2 | fax: 604 899 3805 | email: elee@elac.bc.ca

## **Observational Data Definitions**

**1 - Wind Condition Definitions**

**2 - Water Surface Condition Definitions**

**3 - Forecasting Terminology**

**4 - Sky Conditions Definitions**

**5 - Air and Water Temperature Data Collection Procedures**

**Boat Ramp Use Study  
Wind Condition  
Definitions**



<b>International Description</b>	<b>Specifications</b>	<b>Beaufort Number</b>	<b>MPH</b>	<b>Knots</b>
Calm	<ul style="list-style-type: none"> <li>• Calm, smoke rises vertically</li> </ul>	0	< 1	< 1
Light air	<ul style="list-style-type: none"> <li>• Direction of wind shown by smoke drift but not by wind vanes</li> </ul>	1	1 - 3	1 - 3
Light Breeze	<ul style="list-style-type: none"> <li>• Wind felt on face</li> <li>• Leaves rustle</li> <li>• Vanes moved by wind</li> </ul>	2	4 - 7	4 - 6
Gentle Breeze	<ul style="list-style-type: none"> <li>• Leaves and small twigs in constant motion</li> <li>• Wind extends light flag</li> </ul>	3	8 - 12	7 - 10
Moderate	<ul style="list-style-type: none"> <li>• Raises dust, loose paper</li> <li>• Small branches moved</li> </ul>	4	13 - 18	11 - 16
Fresh	<ul style="list-style-type: none"> <li>• Small trees in leaf begin to sway</li> <li>• Crested wavelets form on inland waters</li> </ul>	5	19 - 24	17 - 21
Strong	<ul style="list-style-type: none"> <li>• Large branches in motion</li> <li>• Whistling heard in telegraph wires</li> <li>• Umbrellas used with difficulty</li> </ul>	6	25 - 31	22 - 27
Near Gale	<ul style="list-style-type: none"> <li>• Whole trees in motion</li> <li>• Inconvenience felt walking against wind</li> </ul>	7	32 - 38	28 - 33
Gale	<ul style="list-style-type: none"> <li>• Breaks twigs off trees</li> <li>• Impedes progress</li> </ul>	8	39 - 46	34 - 40
Strong Gale	<ul style="list-style-type: none"> <li>• Slight structural damage occurs</li> </ul>	9	47 - 54	41 - 47
Storm	<ul style="list-style-type: none"> <li>• Trees uprooted</li> <li>• Considerable damage occurs</li> </ul>	10	55 - 63	48 - 55
Violent Storm	<ul style="list-style-type: none"> <li>• Wide Spread Damage</li> </ul>	11	64 - 72	56 - 63
Hurricane	<ul style="list-style-type: none"> <li>• Wide Spread Damage</li> </ul>	12	73 - 82	64 - 71

Source: Oregon Emergency Management Net – Net Protocol

**Boat Ramp Use Study  
Water Surface Condition  
Definitions**



<b>Water Condition</b>	<b>Description</b>
1. Calm	Flat surface – some ripples, no noticeable breeze
2. Gentle	Noticeable breeze; low gentle waves
3. Small waves	Light winds – larger waves but no white caps
4. Moderate waves	Moderate winds; choppy water; white caps
5. Stormy	Strong winds; steep waves



**Boat Ramp Use Study  
Forecasting Terminology**

Condition	Description
<b>Duration of Precipitation</b>	<ul style="list-style-type: none"> <li>• Brief - short, sudden showers or periods of rain</li> <li>• Intermittent - on and off intervals, not continuous</li> <li>• Occasional - irregular, infrequent intervals of precipitation</li> <li>• Frequent - persistent short intervals, happening regularly and often</li> <li>• Periods of precipitation - rain or snow falling most of the time with breaks</li> </ul>
<b>Distribution of Precipitation, as in showers</b>	<ul style="list-style-type: none"> <li>• Isolated - showers separated during a given period of time</li> <li>• Few - indicated in time, not over an area</li> <li>• Local - restricted to a smaller area</li> <li>• Patchy - irregularly occurring in an area</li> <li>• Scattered - not widespread but of greater occurrence than isolated showers</li> </ul>
<b>Precipitation Intensity</b>	<ul style="list-style-type: none"> <li>• Light - each drop or small flake of precipitation can be easily seen, puddles form slowly, some water flow in gutters</li> <li>• Moderate - water puddles quickly, roads and other surfaces collect water, rain streams down windows</li> <li>• Heavy - numerous flakes or sheets of rain, large puddles form, flooding can occur, visibility reduced</li> </ul>
<b>Cloud Cover</b>	<ul style="list-style-type: none"> <li>• Clear or sunny - free of clouds or less than one tenth cloudy</li> <li>• Partly cloudy or partly sunny - three tenths to six tenths of the sky is clouded</li> <li>• Mostly cloudy - the sky is predominantly clouded or seven tenths to eight tenths of the sky has clouds</li> <li>• Cloudy or overcast - the sky is covered with clouds from nine tenths to a hundred percent cloud covered</li> </ul>
<b>Showers vs. Rain: A Difference of Duration and Intensity</b>	<ul style="list-style-type: none"> <li>• Rain - forms from stratus clouds, more widespread over larger area, uniformly steady, less intense</li> <li>• Showers - forms from cumulus clouds, more isolated, short-lived, affects a smaller area, sometimes more intense</li> </ul>
<b>Partly Cloudy vs. Partly Sunny</b>	<p>According to the <a href="http://www.noaa.gov">National Oceanic and Atmospheric Administration</a> there is no official difference between the two terms. One or the other may be emphasized, to help clarify the meaning of the term used.</p>

Read more: [http://weatherforecasting.suite101.com/article.cfm/meteorologist\\_forecasting\\_terms#ixzz0QBMAiiTT](http://weatherforecasting.suite101.com/article.cfm/meteorologist_forecasting_terms#ixzz0QBMAiiTT)



**Boat Ramp Use Study  
Sky Condition  
Definitions**



Sky Condition	Description
1. Clear (Sunny)	< 10% cloud cover
2. Partly Cloudy (mostly sunny)	30 - 60% cloud cover
3. Mostly Cloudy (partly sunny)	70-80 % cloud cover
4. Overcast	≥ 90% cloud cover
5. Fog	Report visibility in tenths of a kilometer ( <i>e.g.</i> , 100m, 200m, etc.)
6. Trace of Rain or Snow	Not enough to measure
7. Light Rain	from stratus (layers/blanket) clouds, more widespread, steady, less intense; each drop of precipitation can be easily seen, puddles form slowly, some water flow in gutters
8. Moderate Rain	water puddles quickly, roads and other surfaces collect water, rain streams down windows
9. Heavy Rain	numerous sheets of rain, large puddles form, flooding can occur, visibility reduced
10. Showers	forms from cumulus clouds, more isolated, short-lived, affects a smaller area, sometimes more intense
11. Drizzle	Fine consistent light rain, <1mm droplet size (no wind)
12. Light Snow	Visibility is > 1 km; often very little accumulation results
13. Moderate Snow	Visibility between 400m - 1km; < 10 cm in 12 hours
14. Heavy Snow	Numerous flakes, visibility <400m; 10 cm in 12 hrs or 15 cm in 24 hrs

Source: [http://weatherforecasting.suite101.com/article.cfm/meteorologist\\_forecasting\\_terms](http://weatherforecasting.suite101.com/article.cfm/meteorologist_forecasting_terms)

**Boat Ramp Use Study  
Air and Water Temperature  
Data Collection Procedures**



Field staff should take air and water temperature readings any time between 11:00 am and 2:00 pm on each survey day. First collect air temperatures then water temperatures.

**Summary of procedure for air temperature readings**

1. Expose the thermometer to the air yet suspended away from any other material that may affect an accurate air temperature reading. The thermometer should be sheltered from direct solar radiation and other weather-related influences.
2. Allow the thermometer to equilibrate before reading.
3. Read temperature.
4. Record temperature in the field form, along with ancillary information such as site, date, and time.

**Summary of procedure for near surface water temperature readings**

1. Select a representative area of the water body 2m from shore and hold the thermometer directly in the water 10 cm below the surface (*e.g.*, attach thermometer to a fishing line and pole and hang so as to have thermometer bulb about 10cm below surface).
2. Allow the immersed thermometer to equilibrate before reading (hold in water about 2 minutes).
3. Read temperature. If the thermometer is unreadable while it is immersed in the water, pull the thermometer out and check the reading quickly. Do this multiple times until an accurate reading is achieved (the lowest reading for a reading from cold water when the air is hot and still, or the highest reading if the water is warm and a wind is cooling the wet thermometer).
4. Record temperature in the field form, along with ancillary information such as site, date, and time.
5. If temperature readings are unstable (which can occur in lakes or poorly mixed streams), take multiple readings.

**Suggested tips for taking the water-temperature measurements**

Be careful not to break your thermometer and keep it in the shade at all times. While reading temperature, avoid warming the thermometer bulb or water sample with your hands or by the sun. Read the temperature measurements to the nearest ½ degree C.

**Source:** Adapted from SFU Water Studies (<http://www.educ.sfu.ca/nbcr/tempprot.html>), and Washington State Department of Ecology Environmental Assessment Program Standard Operating Procedures for Instantaneous Measurements of Temperature in Water ([http://www.ecy.wa.gov/programs/eap/ga/docs/ECY\\_EAP-SOP\\_011InstantMeasureofTempinWater.pdf](http://www.ecy.wa.gov/programs/eap/ga/docs/ECY_EAP-SOP_011InstantMeasureofTempinWater.pdf))

**Note:** Thermometers used in study: waterproof pocket thermometer (-30/+50c), not calibrated.

## APPENDIX F – Sampling Schedules

### Arrow Lakes Reservoir Spring 2010 Sampling Schedule

Day	Date	Upper Arrow Lakes Reservoir		Middle Arrow Lakes Reservoir		Lower Arrow Lakes Reservoir	
Friday	April 2, 2010	Shelter Bay	PM	Nakusp Boat Launch	PM	Anderson Point	AM
Sunday	April 4, 2010	Eagle Bay	PM	McDonald Creek Park	PM	Anderson Point	PM
Saturday	April 10, 2010	Revelstoke Boat Launch	AM	Edgewood Park	AM	Syringa Boat Launch	PM
Friday	April 16, 2010	Eagle Bay	PM	Fauquier Boat Launch	AM	Anderson Point	PM
Monday	April 26, 2010	Eagle Bay	AM	Burton Historical Park	AM	Syringa Creek Day Use	PM
Wednesday	May 12, 2010	Shelter Bay	PM	McDonald Creek Park	AM	Syringa Creek Day Use	PM
Monday	May 17, 2010	Revelstoke Boat Launch	PM	Nakusp Boat Launch	AM	Syringa Creek Day Use	PM

**Spring sampling hours**  
AM: 8:30 AM – 2:30 PM  
PM: 10:30 AM – 4:30 PM

### Arrow Lakes Reservoir Summer 2010 Sampling Schedule

Day	Date	Upper Arrow Lakes Reservoir		Middle Arrow Lakes Reservoir		Lower Arrow Lakes Reservoir	
		Location	Time	Location	Time	Location	Time
Friday	April 2, 2010	Shelter Bay	PM	Nakusp Boat Launch	PM	Anderson Point	AM
Sunday	April 4, 2010	Eagle Bay	PM	McDonald Creek Park	PM	Anderson Point	PM
Saturday	April 10, 2010	Revelstoke Boat Launch	AM	Edgewood Park	AM	Syringa Boat Launch	PM
Friday	April 16, 2010	Eagle Bay	PM	Fauquier Boat Launch	AM	Anderson Point	PM
Monday	April 26, 2010	Eagle Bay	AM	Burton Historical Park	AM	Syringa Creek Day Use	PM
Wednesday	May 12, 2010	Shelter Bay	PM	McDonald Creek Park	AM	Syringa Creek Day Use	PM
Monday	May 17, 2010	Revelstoke Boat Launch	PM	Nakusp Boat Launch	AM	Syringa Creek Day Use	PM

**Spring sampling hours**  
 AM: 8:30 AM – 2:30 PM  
 PM: 10:30 AM – 4:30 PM

### Arrow Lakes Reservoir Fall 2010 Sampling Schedule

Day	Date	Upper Arrow Lakes Reservoir		Middle Arrow Lakes Reservoir		Lower Arrow Lakes Reservoir	
Sunday	October 3, 2010	Eagle Bay	PM	McDonald Creek Park	AM	Anderson Point	PM
Tuesday	October 5, 2010	Revelstoke Boat Launch	AM	Nakusp Boat Launch	AM	Syringa Boat Launch	PM
Saturday	October 9, 2010	Revelstoke Boat Launch	AM	Edgewood Park	PM	Syringa Boat Launch	AM
Monday	October 11, 2010	Shelter Bay	PM	Burton Historical Park	PM	Syringa Boat Launch	PM
Wednesday	October 13, 2010	Shelter Bay	PM	Fauquier Boat Launch	PM	Syringa Creek Day Use	AM

**Fall sampling hours**

AM: 8:30 AM – 2:30 PM

PM: 10:30 AM – 4:30 PM

### Kinbasket Reservoir 2010 Sampling Schedule

Spring Season		
None due to snow and water levels		
Summer Season		
Thursday	June 17	8:00 am to 2:00 pm
Tuesday	July 20	1:00 pm to 7:00 pm
Saturday	July 24	1:00 pm to 7:00 pm
Monday	August 9	8:00 am to 2:00 pm
Sunday	September 5	1:00 pm to 7:00 pm
Monday	September 6	1:00 pm to 7:00 pm
Tuesday	September 28	8:00 am to 2:00 pm
Fall Season		
Saturday	October 9	8:30 am to 2:30 pm

### Arrow Lakes Reservoir Spring 2011 Sampling Schedule

Day	Date	Upper Arrow Lakes Reservoir		Middle Arrow Lakes Reservoir		Lower Arrow Lakes Reservoir	
Sunday	October 3, 2010	Eagle Bay	PM	McDonald Creek Park	AM	Anderson Point	PM
Tuesday	October 5, 2010	Revelstoke Boat Launch	AM	Nakusp Boat Launch	AM	Syringa Boat Launch	PM
Saturday	October 9, 2010	Revelstoke Boat Launch	AM	Edgewood Park	PM	Syringa Boat Launch	AM
Monday	October 11, 2010	Shelter Bay	PM	Burton Historical Park	PM	Syringa Boat Launch	PM
Wednesday	October 13, 2010	Shelter Bay	PM	Fauquier Boat Launch	PM	Syringa Creek Day Use	AM

**Fall sampling hours**

AM: 8:30 AM – 2:30 PM

PM: 10:30 AM – 4:30 PM

### Arrow Lakes Reservoir Summer 2011 Sampling Schedule

Day	Date	Lower Arrow Lakes Reservoir	Middle Arrow Lakes Reservoir	Upper Arrow Lakes Reservoir
Saturday	June 4, 2011	Syringa Creek Day Use AM	Nakusp Boat Launch PM	Revelstoke Boat Launch AM
Sunday	June 12, 2011	Syringa Boat Launch AM	Fauquier Boat Launch AM	Shelter Bay PM
Tuesday	June 14, 2011	Syringa Boat Launch AM	Nakusp Boat Launch AM	Eagle Bay AM
Friday	July 1, 2011	Anderson Point PM	Edgewood Park AM	Revelstoke Boat Launch PM
Thursday	July 7, 2011	Syringa Boat Launch AM	Edgewood Park AM	Shelter Bay AM
Saturday	July 9, 2011	Syringa Creek Day Use PM	Nakusp Beach AM	Eagle Bay AM
Saturday	July 23, 2011	Syringa Boat Launch PM	Edgewood Park AM	Revelstoke Boat Launch PM
Friday	July 29, 2011	Anderson Point AM	McDonald Creek Park PM	Shelter Bay PM
Tuesday	August 2, 2011	Syringa Creek Day Use PM	Fauquier Boat Launch PM	Revelstoke Boat Launch AM
Friday	August 5, 2011	Syringa Boat Launch PM	Nakusp Boat Launch PM	Shelter Bay PM
Monday	August 8, 2011	Syringa Creek Day Use PM	Burton Historical Park AM	Eagle Bay PM
Monday	August 15, 2011	Syringa Boat Launch AM	McDonald Creek Park PM	Revelstoke Boat Launch PM
Saturday	August 27, 2011	Anderson Point AM	Nakusp Beach AM	Eagle Bay AM
Sunday	September 4, 2011	Syringa Creek Day Use PM	Fauquier Boat Launch PM	Shelter Bay AM
Monday	September 5, 2011	Anderson Point PM	Burton Historical Park PM	Eagle Bay AM
Sunday	September 11, 2011	Anderson Point PM	McDonald Creek Park AM	Revelstoke Boat Launch PM
Thursday	September 22, 2011	Syringa Creek Day Use AM	Burton Historical Park AM	Eagle Bay PM
Sunday	September 25, 2011	Anderson Point AM	Nakusp Beach PM	Shelter Bay AM

**Summer sampling hours**

AM: 8:00 AM – 2:00 PM

PM: 1:00 PM – 7:00 PM



### Arrow Lakes Reservoir Fall 2011 Sampling Schedule

Day	Date	Upper Arrow Lakes Reservoir		Middle Arrow Lakes Reservoir		Lower Arrow Lakes Reservoir	
Sunday	October 9, 2011	Revelstoke Boat Launch	AM	Nakusp Boat Launch	AM	Nakusp Boat Launch	PM
Monday	October 10, 2011	Shelter Bay	AM	Fauquier Boat Launch	PM	Fauquier Boat Launch	AM
Wednesday	October 12, 2011	Shelter Bay	AM	Edgewood Park	PM	Edgewood Park	PM
Saturday	October 15, 2011	Eagle Bay	PM	McDonald Creek Park	AM	McDonald Creek Park	AM
Wednesday	October 19, 2011	Eagle Bay	PM	Burton Historical Park	AM	Burton Historical Park	AM

**Fall sampling hours**

AM: 8:30 AM – 2:30 PM

PM: 10:30 AM – 4:30 PM

### Kinbasket Reservoir Spring/Summer 2011 Sampling Schedule

Day	Date	Sample Site
Monday	May 30, 2011	Valemount AM Bush Harbour PM
Friday	July 1, 2011	Valemount PM Bush Harbour AM
Thursday	July 28, 2011	Valemount PM Bush Harbour AM
Sunday	August 7, 2011	Valemount PM Bush Harbour PM
Thursday	August 11, 2011	Valemount AM Bush Harbour PM
Saturday	September 3, 2011	Valemount AM Bush Harbour AM
Thursday	September 22, 2011	Valemount AM Bush Harbour PM

#### Spring/summer sampling hours

AM: 8:00 am to 2:00 pm

PM: 1:00 pm to 7:00 pm

### Kinbasket Reservoir Fall 2011 Sampling Schedule

Day	Date	Sample Site
Saturday	October 29, 2011	Valemount AM Bush Harbour PM

#### Fall sampling hours

AM: 8:30 am to 2:30 pm

PM: 10:30 am to 4:30 pm

### Arrow Lakes Reservoir Summer 2012 Sampling Schedule<sup>7</sup>

Day	Date	Upper Arrow Lakes Reservoir		Middle Arrow Lakes Reservoir		Lower Arrow Lakes Reservoir	
Monday	June 18, 2012	Eagle Bay	AM	Edgewood Park	PM	Syringa Creek Day Use	PM
Thursday	June 21, 2012	Shelter Bay	AM	Fauquier Boat Launch	AM	Syringa Creek Boat Launch	PM
Saturday	June 23	Shelter Bay	AM	Burton Historical Park	AM	Syringa Creek Day Use	AM
Wednesday	June 27	Revelstoke Boat Launch	PM	Nakusp Beach	PM	Syringa Creek Day Use	AM
Monday	July 2	Shelter Bay	AM	Edgewood Park	AM	Syringa Creek Boat Launch	AM
Thursday	July 5	Revelstoke Boat Launch	AM	Fauquier Boat Launch	AM	Anderson Point	PM
Sunday	July 15	Shelter Bay	AM	Nakusp Boat Launch	PM	Anderson Point	AM
Saturday	July 21	Revelstoke Boat Launch	PM	McDonald Creek Park	PM	Syringa Creek Boat Launch	AM
Sunday	July 29	Revelstoke Boat Launch	AM	Burton Historical Park	PM	Anderson Point	PM
Sunday	August 5	Eagle Bay	PM	Nakusp Beach	PM	Syringa Creek Day Use	AM
Monday	August 6	Eagle Bay	PM	Burton Historical Park	AM	Syringa Creek Boat Launch	PM
Saturday	September 1	Eagle Bay	AM	McDonald Creek Park	PM	Syringa Creek Day Use	AM
Sunday	September 2	Revelstoke Boat Launch	PM	Nakusp Boat Launch	AM	Syringa Creek Boat Launch	PM
Saturday	September 8	Eagle Bay	PM	Nakusp Beach	AM	Syringa Creek Boat Launch	PM
Monday	September 10	Shelter Bay	PM	McDonald Creek Park	PM	Anderson Point	AM
Friday	September 21	Revelstoke Boat Launch	PM	Edgewood Park	PM	Syringa Creek Day Use	PM
Thursday	September 27	Shelter Bay	PM	Nakusp Boat Launch	AM	Anderson Point	AM
Friday	September 28	Eagle Bay	AM	Fauquier Boat Launch	AM	Anderson Point	PM

**Summer sampling hours**

AM: 8:00 AM – 2:00 PM

PM: 1:00 PM – 7:00 PM

<sup>7</sup> The 2012 sampling start date was deferred per request by BC Hydro.

### Arrow Lakes Reservoir Fall 2012 Sampling Schedule

Day	Date	Upper Arrow Lakes Reservoir	Middle Arrow Lakes Reservoir	Lower Arrow Lakes Reservoir
Wednesday	October 3, 2012	Revelstoke Boat Launch AM	Nakusp Beach PM	Syringa Boat Launch PM
Monday	October 8, 2012	Shelter Bay PM	Edgewood Park PM	Anderson Point PM
Saturday	October 13, 2012	Eagle Bay PM	Nakusp Boat Launch AM	Syringa Boat Launch AM
Sunday	October 21, 2012	Revelstoke Boat Launch AM	Fauquier Boat Launch PM	Anderson Point PM
Monday	October 29, 2012	Shelter Bay PM	McDonald Creek Park AM	Syringa Park Day Use AM

**Fall sampling hours**

AM: 8:30 AM – 2:30 PM

PM: 10:30 AM – 4:30 PM

### Kinbasket Reservoir Summer 2012 Sampling Schedule

Day	Date	Valemount	Sample Site	PM	Bush Harbour	PM
Monday	June 18	Valemount	PM	Bush Harbour	PM	
Tuesday	June 19	Valemount	AM	Bush Harbour	PM	
Saturday	July 21	Valemount	PM	Bush Harbour	PM	
Sunday	August 26	Valemount	PM	Bush Harbour	AM	
Monday	September 3	Valemount	AM	Bush Harbour	PM	
Thursday	September 6	Valemount	PM	Bush Harbour	AM	
Friday	September 14	Valemount	AM	Bush Harbour	AM	

**Summer sampling hours**

AM: 8:00 am to 2:00 pm

PM: 1:00 pm to 7:00 pm

### Kinbasket Reservoir Fall 2012 Sampling Schedule

Day	Date	Valemount	Sample Site	AM	Bush Harbour	AM
Wednesday	October 24	Valemount	AM	Bush Harbour	AM	

**Fall sampling hours**

AM: 8:30 am to 2:30 pm

PM: 10:30 am to 4:30 pm

### Arrow Lakes Reservoir Spring 2013 Sampling Schedule

Day	Date	Upper Arrow Lakes Reservoir	Middle Arrow Lakes Reservoir	Lower Arrow Lakes Reservoir
Saturday	April 6, 2013	Revelstoke Boat Launch PM	Edgewood Park AM	Syringa Creek Day Use PM
Tuesday	April 16, 2013	Eagle Bay AM	Fauquier Boat Launch PM	Syringa Creek Day Use PM
Friday	April 19, 2013	Shelter Bay PM	Nakusp Boat Launch AM	Syringa Boat Launch AM
Sunday	May 5, 2013	Shelter Bay AM	Burton Historical Park AM	Syringa Creek Day Use AM
Monday	May 13, 2013	Revelstoke Boat Launch AM	Nakusp Beach PM	Anderson Point PM
Wednesday	May 15, 2013	Eagle Bay AM	McDonald Creek Park PM	Syringa Boat Launch PM
Monday	May 20, 2013	Revelstoke Boat Launch AM	Nakusp Boat Launch PM	Anderson Point AM

**Spring sampling hours**

AM: 8:30 AM – 2:30 PM

PM: 10:30 AM – 4:30 PM

### Arrow Lakes Reservoir Summer 2013 Sampling Schedule

Day	Date	Upper Arrow Lakes Reservoir		Middle Arrow Lakes Reservoir		Lower Arrow Lakes Reservoir	
Saturday	May 25	Revelstoke Boat Launch	AM	Edgewood Park	PM	Syringa Creek Day Use	AM
Friday	June 7	Revelstoke Boat Launch	AM	Nakusp Boat Launch	PM	Anderson Point	AM
Monday	June 17	Eagle Bay	AM	Nakusp Boat Launch	PM	Syringa Creek Boat Launch	AM
Tuesday	June 18	Shelter Bay	PM	Edgewood Park	AM	Anderson Point	PM
Monday	July 1	Eagle Bay	PM	McDonald Creek Park	AM	Syringa Creek Day Use	PM
Saturday	July 6	Eagle Bay	PM	Nakusp Boat Launch	AM	Syringa Creek Boat Launch	PM
Sunday	July 14	Eagle Bay	AM	McDonald Creek Park	AM	Syringa Creek Day Use	AM
Sunday	July 21	Revelstoke Boat Launch	PM	Nakusp Beach	PM	Anderson Point	PM
Monday	July 29	Revelstoke Boat Launch	PM	Nakusp Beach	PM	Syringa Creek Boat Launch	PM
Saturday	August 3	Shelter Bay	PM	Fauquier Boat Launch	AM	Syringa Creek Day Use	PM
Friday	August 9	Shelter Bay	AM	Nakusp Beach	PM	Syringa Creek Day Use	AM
Friday	August 16	Shelter Bay	AM	Fauquier Boat Launch	AM	Anderson Point	AM
Sunday	August 18	Eagle Bay	AM	McDonald Creek Park	AM	Syringa Creek Day Use	AM
Wednesday	August 21	Revelstoke Boat Launch	AM	Fauquier Boat Launch	PM	Syringa Creek Boat Launch	AM
Sunday	September 1	Eagle Bay	PM	Burton Historical Park	PM	Syringa Creek Day Use	PM
Monday	September 2	Revelstoke Boat Launch	AM	Burton Historical Park	PM	Anderson Point	AM
Sunday	September 15	Shelter Bay	PM	Edgewood Park	AM	Syringa Creek Boat Launch	PM
Thursday	September 19	Shelter Bay	PM	Burton Historical Park	AM	Anderson Point	AM

**Summer sampling hours**

AM: 8:00 AM – 2:00 PM

PM: 1:00 PM – 7:00 PM

### Arrow Lakes Reservoir Fall 2013 Sampling Schedule

Day	Date	Upper Arrow Lakes Reservoir		Middle Arrow Lakes Reservoir		Lower Arrow Lakes Reservoir	
Friday	October 4	Revelstoke Boat Launch	AM	Burton Historical Park	AM	Syringa Creek Day Use	AM
Saturday	October 12	Eagle Bay	PM	Nakusp Boat Launch	PM	Anderson Point	AM
Monday	October 14	Shelter Bay	AM	Fauquier Boat Launch	PM	Anderson Point	PM
Sunday	October 20	Shelter Bay	PM	McDonald Park	AM	Syringa Creek Day Use	AM
Thursday	October 24	Revelstoke Boat Launch	PM	Edgewood Park	PM	Syringa Boat Launch	AM

**Fall sampling hours**

AM: 8:30 AM – 2:30 PM

PM: 10:30 AM – 4:30 PM



### Kinbasket Reservoir Spring/Summer 2013 Sampling Schedule

Day	Date	Sample Site				
Sunday	May 26	Valemount	PM	Bush Harbour	AM	
Saturday	June 29	Valemount	PM	Bush Harbour	PM	
Wednesday	July 10	Valemount	PM	Bush Harbour	AM	
Tuesday	July 23	Valemount	AM	Bush Harbour	PM	
Friday	August 13	Valemount	PM	Bush Harbour	PM	
Thursday	August 29	Valemount	PM	Bush Harbour	PM	
Monday	September 2	Valemount	AM	Bush Harbour	AM	

#### Spring/Summer sampling hours

AM: 8:00 am to 2:00 pm

PM: 1:00 pm to 7:00 pm

### Kinbasket Reservoir Fall 2013 Sampling Schedule

Day	Date	Sample Site				
Monday	October 24	Valemount	PM	Bush Harbour	AM	

#### Fall sampling hours

AM: 8:30 am to 2:30 pm

PM: 10:30 am to 4:30 pm

### Arrow Lakes Reservoir 2017 Sampling Schedule

Season	Day	Date	Time
Spring	Friday	April 28, 2017	AM
	Monday	May 22, 2017	PM
Summer	Monday	June 19, 2017	AM
	Tuesday	July 11, 2017	PM
	Monday	August 7, 2017	PM
	Sunday	September 3, 2017	AM
Fall	Sunday	October 1, 2017	PM
	Tuesday	October 24, 2017	AM

<b>Spring sampling hours</b> AM: 8:30 am to 2:30 pm PM: 10:30 am to 4:30 pm	<b>Summer sampling hours</b> AM: 8:00 am to 2:00 pm PM: 1:00 pm to 7:00 pm	<b>Fall sampling hours</b> AM: 8:30 am to 2:30 pm PM: 10:30 am to 4:30 pm
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Sample Days are the same for each of the three sample sites (Syringa, Nakusp, and Shelter Bay)

### Arrow Lakes Reservoir Spring 2019 Sampling Schedule

Day	Date	Lower Arrow Lake		Middle Arrow Lake		Upper Arrow Lake	
Tuesday	April 09	Syringa Creek Boat Launch	PM	Nakusp Boat Launch	AM	Shelter Bay Boat Launch	AM
Friday	April 19	Syringa Creek Boat Launch	AM	Edgewood Boat launch	AM	Shelter Bay Boat Launch	AM
Saturday	April 27	Anderson Point Boat Launch	AM	Fauquier Boat Launch	PM	Shelter Bay Boat Launch	PM
Sunday	May 05	Syringa Creek Boat Launch	PM	MacDonald Creek Boat Launch	AM	Shelter Bay Boat Launch	AM
Thursday	May 09	Syringa Creek Boat Launch	PM	Nakusp Boat Launch	PM	Shelter Bay Boat Launch	AM
Wednesday	May 15	Anderson Point Boat Launch	AM	Burton South Boat Launch	PM	Shelter Bay Boat Launch	PM
Monday	May 20	Anderson Point Boat Launch	PM	Burton Boat launch	PM	Shelter Bay Boat Launch	PM

**Spring sampling hours**

AM: 8:30 am to 2:30 pm

PM: 10:30 am to 4:30 pm

### Arrow Lakes Reservoir Summer 2019 Sampling Schedule

Day	Date	Lower Arrow Lake		Middle Arrow Lake		Upper Arrow Lake	
Tuesday	June 04	Anderson Point Boat Launch	AM	Burton Boat Launch	PM	Shelter Bay Boat Launch	PM
Thursday	June 13	Syringa Creek Boat Launch	PM	Nakusp Boat Launch	PM	Shelter Bay Boat Launch	AM
Wednesday	June 19	Syringa Creek Boat Launch	AM	Fauquier Boat Launch	PM	Shelter Bay Boat Launch	AM
Friday	June 28	Syringa Creek Boat Launch	AM	Fauquier Boat Launch	AM	Shelter Bay Boat Launch	PM
Saturday	July 13	Syringa Creek Boat Launch	PM	MacDonald Creek Boat Launch	AM	Shelter Bay Boat Launch	AM
Wednesday	July 17	Anderson Point Boat Launch	PM	Edgewood Boat Launch	AM	Shelter Bay Boat Launch	PM
Sunday	July 21	Syringa Creek Boat Launch	PM	Burton South Boat Launch	PM	Shelter Bay Boat Launch	AM
Thursday	July 25	Anderson Point Boat Launch	AM	Burton South Boat Launch	AM	Shelter Bay Boat Launch	AM
Sunday	July 28	Anderson Point Boat Launch	PM	MacDonald Creek Boat Launch	PM	Shelter Bay Boat Launch	AM
Monday	August 05	Anderson Point Boat Launch	AM	Burton Boat Launch	AM	Shelter Bay Boat Launch	PM
Friday	August 16	Syringa Creek Boat Launch	PM	Nakusp Boat Launch	PM	Shelter Bay Boat Launch	PM
Tuesday	August 20	Anderson Point Boat Launch	PM	Edgewood Boat Launch	AM	Shelter Bay Boat Launch	PM
Monday	August 26	Anderson Point Boat Launch	PM	Fauquier Boat Launch	AM	Shelter Bay Boat Launch	PM
Saturday	August 31	Anderson Point Boat Launch	PM	Burton South Boat Launch	PM	Shelter Bay Boat Launch	AM
Monday	September 09	Syringa Creek Boat Launch	AM	MacDonald Creek Boat Launch	PM	Shelter Bay Boat Launch	PM
Friday	September 20	Syringa Creek Boat Launch	AM	Burton Boat Launch	PM	Shelter Bay Boat Launch	PM
Wednesday	September 25	Anderson Point Boat Launch	AM	Edgewood Boat Launch	AM	Shelter Bay Boat Launch	AM
Thursday	September 26	Syringa Creek Boat Launch	AM	Nakusp Boat Launch	AM	Shelter Bay Boat Launch	AM

**Summer sampling hours**

AM: 8:00 am to 2:00 pm

PM: 1:00 pm to 7:00 pm

### Arrow Lakes Reservoir Fall 2019 Sampling Schedule

Day	Date	Lower Arrow Lake		Middle Arrow Lake		Upper Arrow Lake	
Tuesday	October 01	Anderson Point Boat Launch	AM	Edgewood Boat Launch	PM	Shelter Bay Boat Launch	PM
Saturday	October 05	Anderson Point Boat Launch	PM	Burton South Boat Launch	AM	Shelter Bay Boat Launch	PM
Thursday	October 10	Syringa Creek Boat Launch	AM	MacDonald Creek Boat Launch	AM	Shelter Bay Boat Launch	AM
Monday	October 14	Syringa Creek Boat Launch	PM	Burton Boat Launch	PM	Shelter Bay Boat Launch	AM
Wednesday	October 23	Anderson Point Boat Launch	AM	Fauquier Boat Launch	AM	Shelter Bay Boat Launch	PM

**Fall sampling hours**

AM: 8:30 am to 2:30 pm

PM: 10:30 am to 4:30 pm

### Kinbasket Reservoir Spring/Summer 2019 Sampling Schedule

Day	Date	Sample Site				
Wednesday	May 08	Valemount Boat Launch	PM	Bush Harbour Boat Launch	AM	
Tuesday	June 04	Valemount Boat Launch	AM	Bush Harbour Boat Launch	PM	
Monday	July 08	Valemount Boat Launch	PM	Bush Harbour Boat Launch	AM	
Sunday	August 25	Valemount Boat Launch	PM	Bush Harbour Boat Launch	AM	
Thursday	September 12	Valemount Boat Launch	AM	Bush Harbour Boat Launch	PM	
Saturday	September 14	Valemount Boat Launch	AM	Bush Harbour Boat Launch	PM	

#### Spring/Summer sampling hours

AM: 8:00 am to 2:00 pm

PM: 1:00 pm to 7:00 pm

### Kinbasket Reservoir Fall 2019 Sampling Schedule

Day	Date	Sample Site				
Monday	October 14	Valemount Boat Launch	AM	Bush Harbour Boat Launch	PM	

#### Fall sampling hours

AM: 8:30 am to 2:30 pm

PM: 10:30 am to 4:30 pm

## **APPENDIX G – Control Sites Comparison**

## Comparison of Pre- and Post-Construction Mean Visitation at Improved Boat Ramps

### Methods

1. Vehicle counter data was used for analysis.
2. Pre-construction, active-construction, and post-construction dates were identified for each improved site.
3. Descriptive statistics were calculated for each improved site and for the control site<sup>8</sup>; the construction period (*i.e.*, pre-, active, and post-) used for each improved site was also applied to the control site so that the number of visitors could be compared using similar periods.
4. Independent sample t-tests were performed to assess whether pre- and post-construction visitation differed for the improved site and for the control site.
5. The mean number of pre- and post-construction visits was graphed for the improved site and for the control site.
6. The ratio of pre-construction visits to post-construction visits was determined as an indicator of the impact of ramp improvements to visitation.
7. An approximate before-after control-impact (BACI) comparison is made to see if the change between the pre- and post-periods is the same for both launches. A small *P*-value would indicate evidence of a differential change, *i.e.*, there is a change in usage after adjusting for temporal effects. The BACI analysis is approximate because it did not account for data collected on the same day in the various ramps. A more formal BACI analysis was not undertaken because of the sparsity of data at the individual day level.

### Kinbasket Reservoir Sites

No analyses could be performed on the two Kinbasket Reservoir sites, as there was no vehicle counter data available at the Esplanade Bay (*i.e.*, the control site) until 2011-08-26 (Table 62). Thus, there was no pre-construction vehicle counter data at the control site to compare improved sites to.

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<sup>8</sup> Control sites (*i.e.*, Burton and Esplanade Bay) appear to be low-use sites; as such limited conclusions can be drawn in comparison to non-low-use sites as there may be some bias when comparing moderate- to high-use sites to the control sites. Thus, results should be interpreted with caution.



**Table 62.** Kinbasket Reservoir construction periods (Years 1 - 10)

Location	Construction Period
Esplanade Bay	No construction: control site.
Bush Harbour	2010-04-12 to 2010-08-09
Valemount	2011-04-01 to 2011-06-27

### Arrow Lakes Reservoir Sites

No analysis could be performed for Burton South, as there was no construction period data available (Table 63).

**Table 63.** Arrow Lakes construction periods (Years 1 - 10)

Location	Construction Period		
Anderson Point	2012-05-14 2012-10-31	to	2012-06-12 2013-04-26
Burton Historic Park	No construction: control site		
Burton South	Construction period data not available		
Edgewood	2013-03-11	to	2013-05-17
Fauquier	2010-05-31	to	2010-09-21
McDonald Creek	2010-05-16	to	2010-07-01
Nakusp	2013-02-04	to	2013-05-17
Shelter Bay	2015-01-01	to	2016-04-01
Syringa	2015-01-01	to	2016-04-01

### Vehicle Data Collection overlaid with Construction Period Data

Figure 46 shows when vehicle counter data was collected with construction periods overlaid. The coloured line indicates when construction at the boat ramps took place.

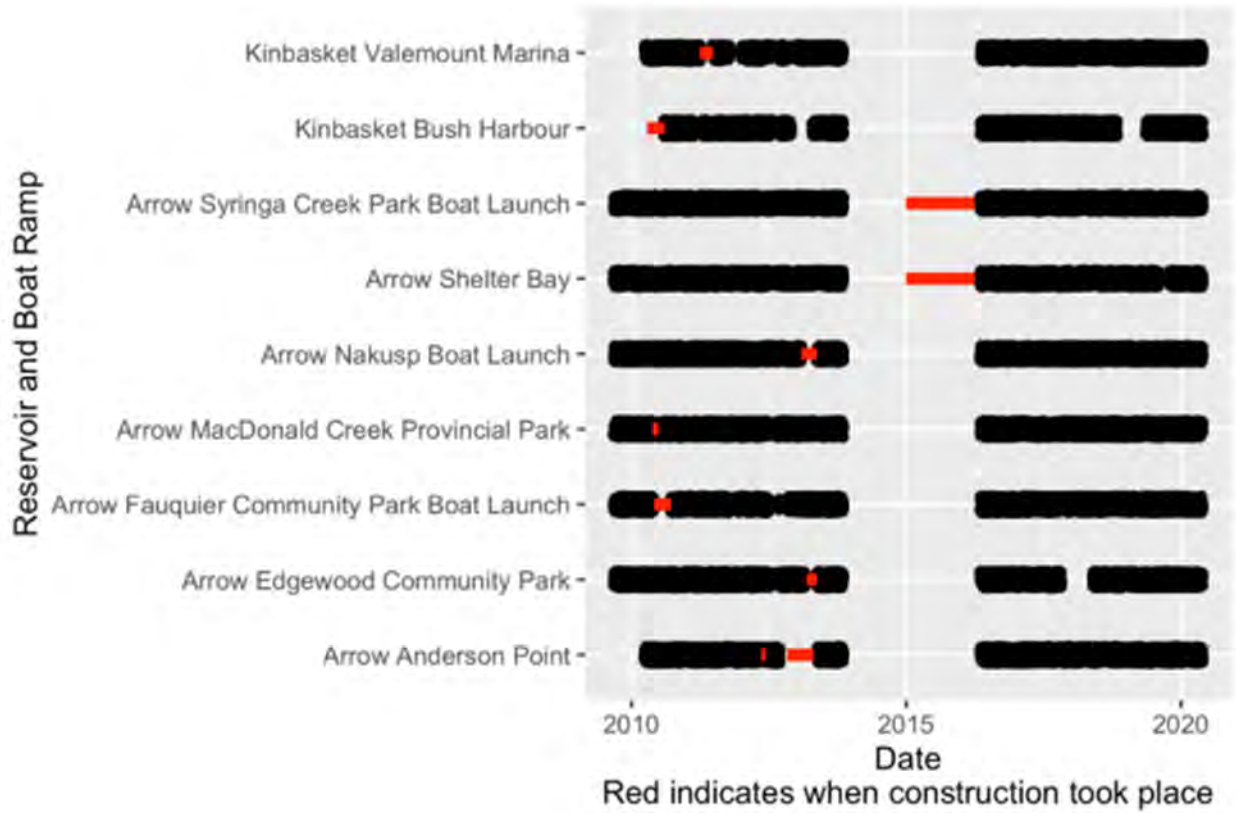


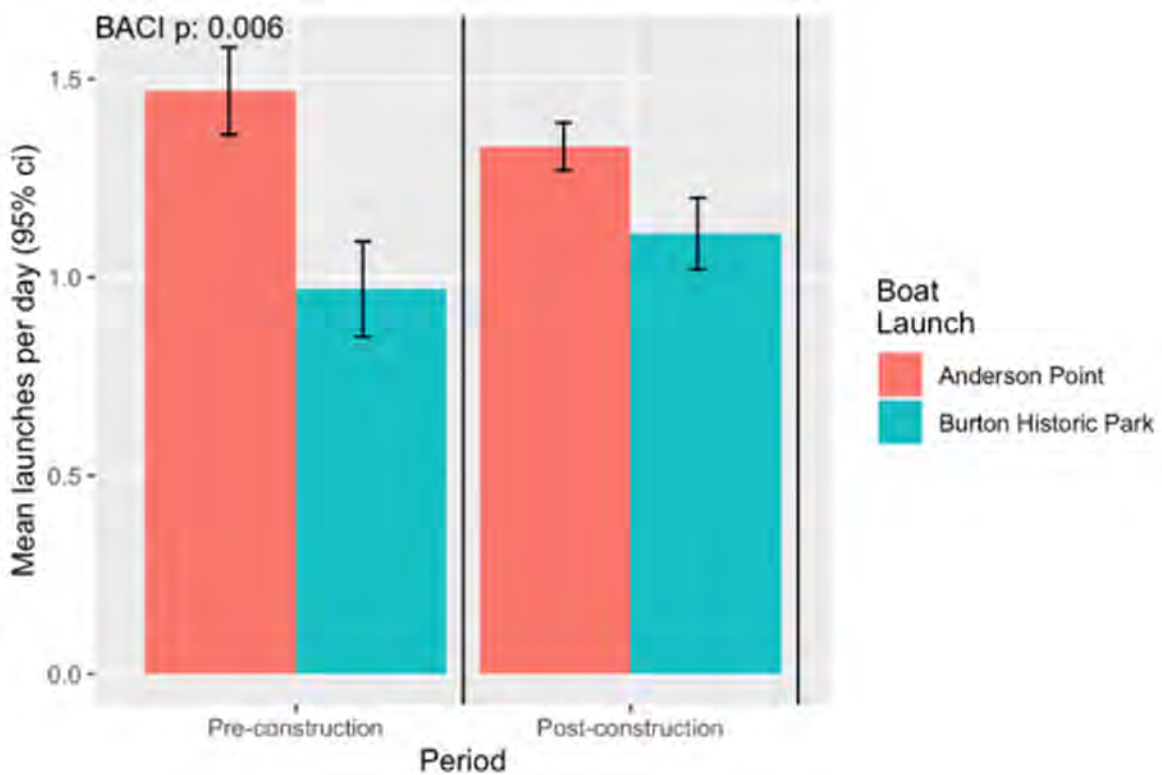
Figure 46. Vehicle counter data collection (black dots) and construction periods (red).

*Anderson Point Boat Launch*

Mean post-construction visits to Anderson Point were significantly lower than mean pre-construction visits (Table 64; Figure 47); using those same periods, mean post-construction visits to Burton Historical Park were significantly higher than mean pre-construction visits. On average, for every pre-construction visit to Anderson Point, there were 0.9 post-construction visits; using the same periods, on average, for every pre-construction visit to Burton, there were 1.1 post-construction visits. There is evidence ( $p=.006$ ) that the change in mean visitation between the two periods was different for the two ramps.

**Table 64.** Anderson Point and Burton visitation compared.

Construction Period	Boat Launch	n	Min	Max	Median	Mode	Mean	SD	95% CI	p-value	Ratio	BACI p-value
Pre	Anderson	767	0	9	1	0	1.47	1.52	0.11	<0.001	1.5	
	Burton	941	0	14	0	0	0.97	1.88	0.12			
Post	Anderson	1,711	0	8	1	1	1.33	1.28	0.06	<0.001	1.2	
	Burton	1,876	0	15	0	0	1.11	2.01	0.09			



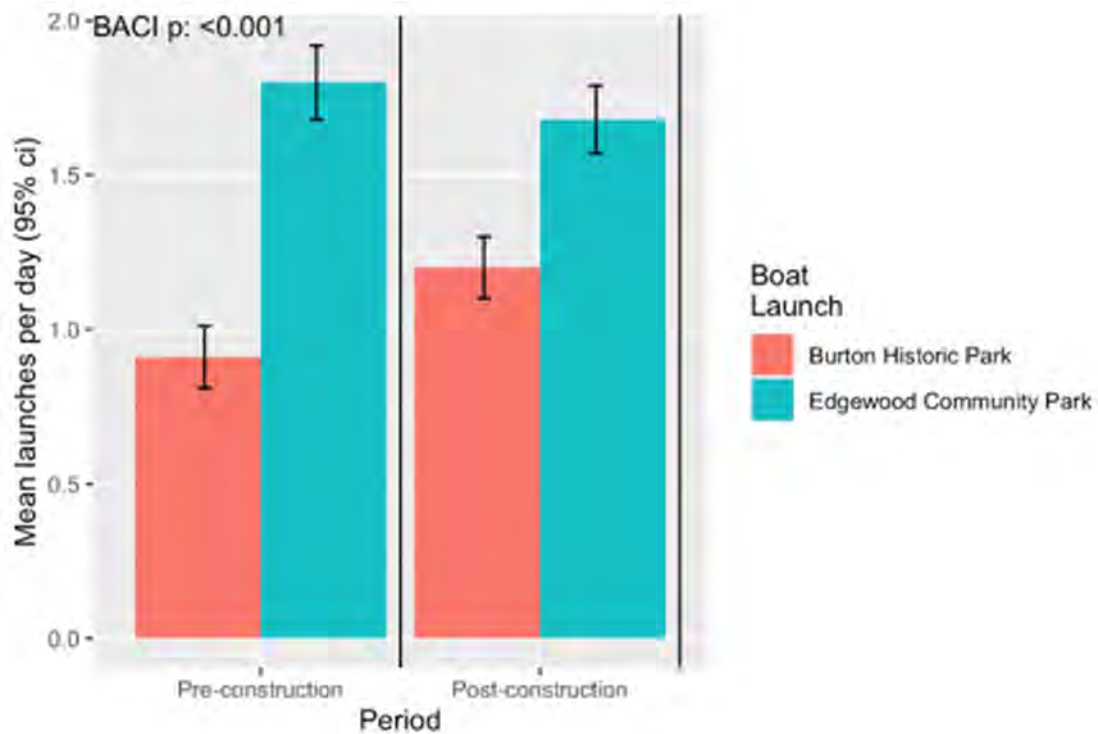
**Figure 47.** Comparison of pre- and post-construction mean visits to Anderson Point and Burton.

*Edgewood Community Park Boat Launch*

Mean post-construction visits to Edgewood were significantly lower than mean pre-construction visits (Table 65; Figure 48); using those same periods, mean post-construction visits to Burton Historical Park were significantly higher than mean pre-construction visits. On average, for every pre-construction visit to Edgewood, there were 0.9 post-construction visits; using the same periods, on average, for every pre-construction visit to Burton, there were 1.3 post-construction visits. There is evidence ( $p < .001$ ) that the change in mean visitation between the two periods was different for the two ramps.

**Table 65.** Edgewood and Burton visitation compared.

Construction Period	Boat Launch	n	Min	Max	Median	Mode	Mean	SD	95% CI	P-value	Ratio	BACI P-value
Pre	Burton	1,193	0	14	0	0	0.91	1.79	0.10			
	Edgewood	1,209	0	15	1	0	1.80	2.09	0.12	<0.001	2.0	
Post	Burton	1,596	0	15	0	0	1.20	2.09	0.10			
	Edgewood	1,409	0	28	1	0	1.68	2.04	0.11	<0.001	1.4	<.001



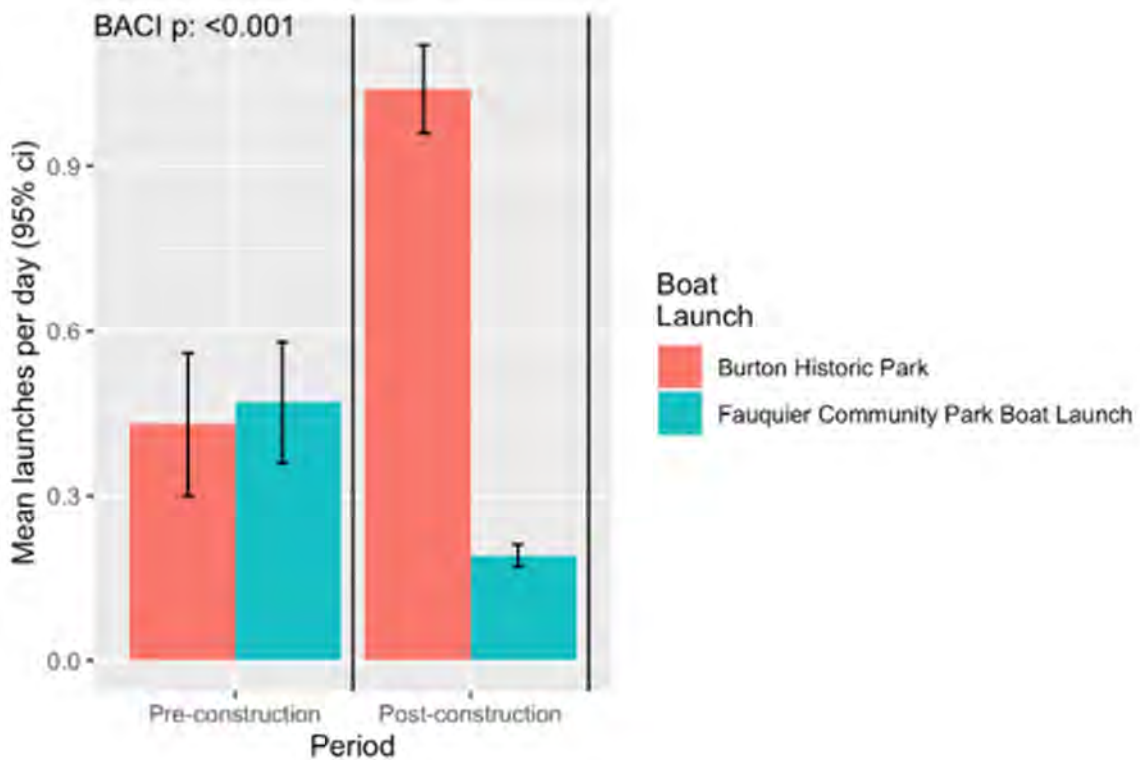
**Figure 48.** Comparison of pre- and post-construction mean visits to Edgewood and Burton.

*Fauquier Boat Launch*

Mean post-construction visits to Fauquier were significantly lower than mean pre-construction visits (Table 66; Figure 49); using those same periods, mean post-construction visits to Burton Historical Park were significantly higher than mean pre-construction visits. On average, for every pre-construction visit to Fauquier, there were 0.4 post-construction visits; using the same periods, there, on average, for every pre-construction visit to Burton, there were 2.4 post-construction visits. There is evidence ( $p < .001$ ) that the change in mean visitation between the two periods was different for the two ramps.

**Table 66.** Fauquier and Burton visitation compared.

Construction Period	Boat Launch	n	Min	Max	Median	Mode	Mean	SD	95% CI	P-value	Ratio	BACI P-value
Pre	Burton	243	0	7	0	0	0.43	1.04	0.13	0.659	1.1	
	Fauquier	257	0	5	0	0	0.47	0.91	0.11			
Post	Burton	2,489	0	15	0	0	1.04	1.95	0.08	<0.001	0.2	<.001
	Fauquier	2,350	0	3	0	0	0.19	0.45	0.02			



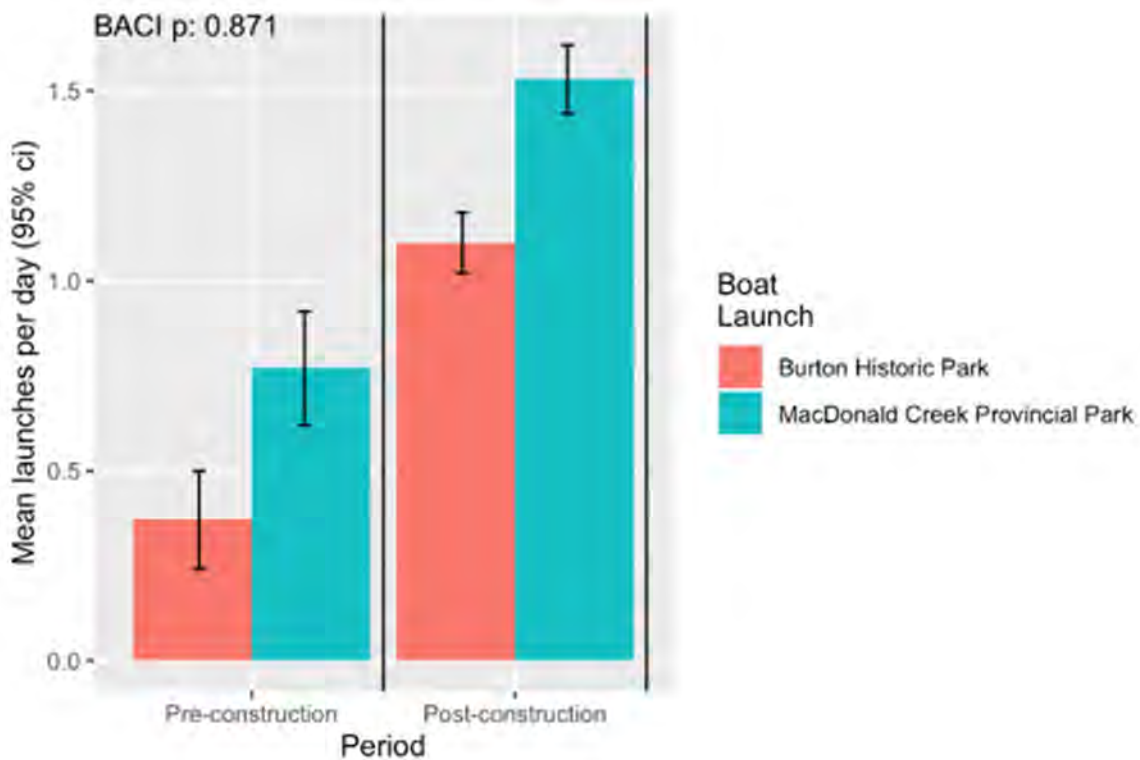
**Figure 49.** Comparison of pre- and post-construction mean visits to Fauquier and Burton.

*McDonald Creek Provincial Park Boat Launch*

Mean post-construction visits to McDonald Creek were significantly higher than mean pre-construction visits (Table 67; Figure 50); using those same periods, mean post-construction visits to Burton Historical Park were significantly higher than mean pre-construction visits. On average, for every pre-construction visit to McDonald Creek, there were 2.0 post-construction visits; using the same periods, on average, for every pre-construction visit to Burton, there were 3.0 post-construction visits. There is NO evidence ( $p=.871$ ) that the change in mean visitation between the two periods was different for the two ramps.

**Table 67.** McDonald and Burton visitation compared.

Construction Period	Boat Launch	n	Min	Max	Median	Mode	Mean	SD	95% CI	P-value	Ratio	BACI P-value
Pre	Burton	229	0	7	0	0	0.37	0.98	0.13			
	McDonald	245	0	6	0	0	0.77	1.18	0.15	<0.001	2.1	
Post	Burton	2,571	0	15	0	0	1.10	2.00	0.08			
	McDonald	2,618	0	23	1	0	1.53	2.38	0.09	<0.001	1.4	.871



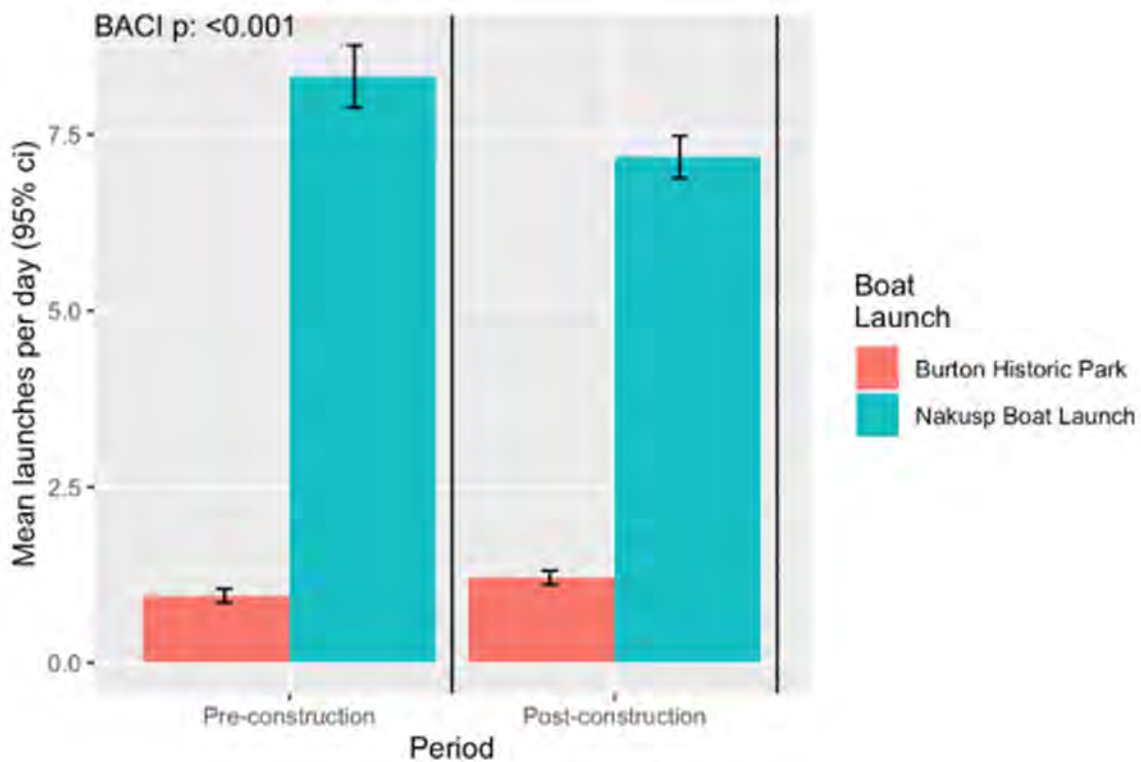
**Figure 50.** Comparison of pre- and post-construction mean visits to McDonald Creek and Burton.

*Nakusp Boat Launch*

Mean post-construction visits to Nakusp were significantly lower than mean pre-construction visits (Table 68; Figure 51); using those same periods, mean post-construction visits to Burton Historical Park were significantly higher than mean pre-construction visits. On average, for every pre-construction visit to Nakusp, there were 0.9 post-construction visits; using the same periods, on average, for every pre-construction visit to Burton, there were 1.3 post-construction visits. There is evidence ( $p < .001$ ) that the change in mean visitation between the two periods was different for the two ramps.

**Table 68.** Nakusp and Burton visitation compared.

Construction Period	Boat Launch	n	Min	Max	Median	Mode	Mean	SD	95% CI	P-value	Ratio	BACI P-value
Pre	Burton	1,158	0	14	0	0	0.94	1.81	0.10			
	Nakusp	1,234	0	58	6	4	8.32	7.91	0.44	<0.001	8.9	
Post	Burton	1,596	0	15	0	0	1.20	2.09	0.10			
	Nakusp	1,636	0	59	5	4	7.18	6.23	0.30	<0.001	6.0	<.001



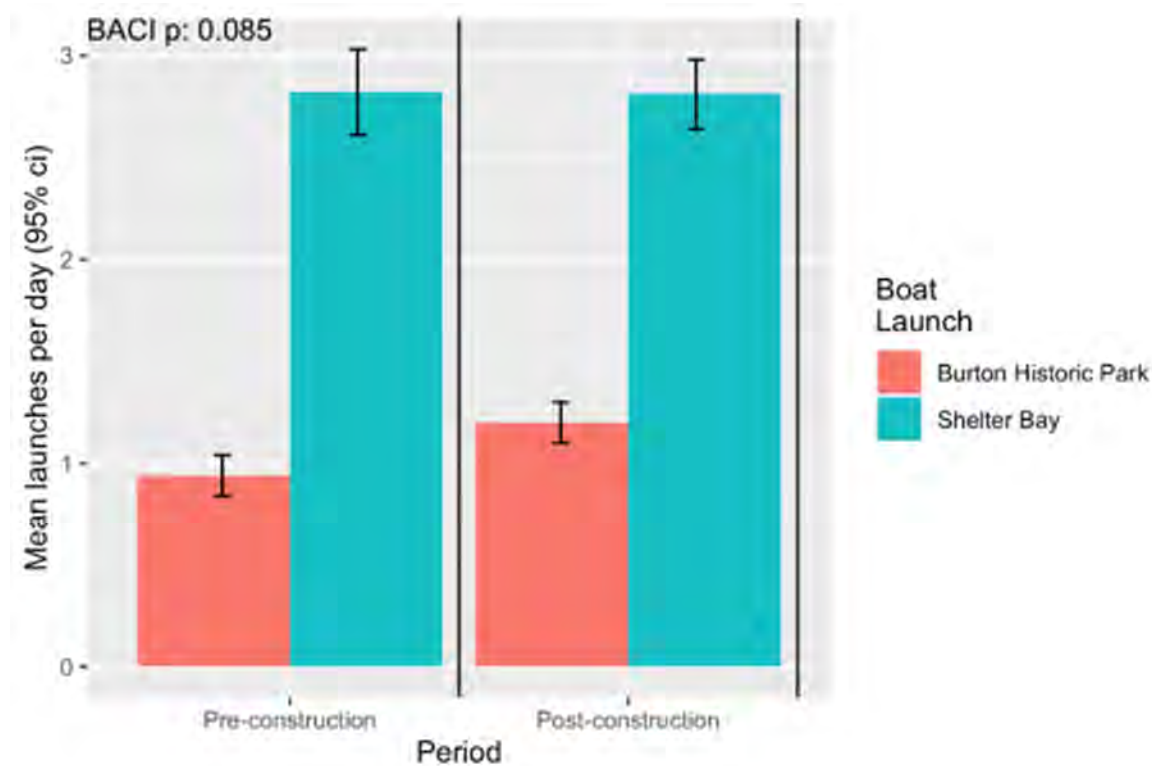
**Figure 51.** Comparison of pre- and post-construction mean visits to Nakusp and Burton.

*Shelter Bay Boat Launch*

Mean post-construction visits to Shelter Bay were not significantly different than mean pre-construction visits (Table 69; Figure 52); using those same periods, mean post-construction visits to Burton Historical Park were significantly higher than mean pre-construction visits. On average, for every pre-construction visit to Shelter Bay, there were 1.0 post-construction visits; using the same periods, on average, for every pre-construction visit to Burton, there were 1.3 post-construction visits. There is NO evidence ( $p=.085$ ) that the change in mean visitation between the two periods was different for the two ramps.

**Table 69.** Shelter Bay and Burton visitation compared.

Construction Period	Boat Launch	n	Min	Max	Median	Mode	Mean	SD	95% CI	P-value	Ratio	BACI P-value
Pre	Burton	1,158	0	14	0	0	0.94	1.81	0.10			
	Shelter Bay	1,193	0	22	2	0	2.82	3.79	0.21	<.001	3.0	
Post	Burton	1,596	0	15	0	0	1.20	2.09	0.10			
	Shelter Bay	1,556	0	25	2	0	2.81	3.46	0.17	<.001	2.3	.085



**Figure 52.** Comparison of pre- and post-construction mean visits to Shelter Bay and Burton.

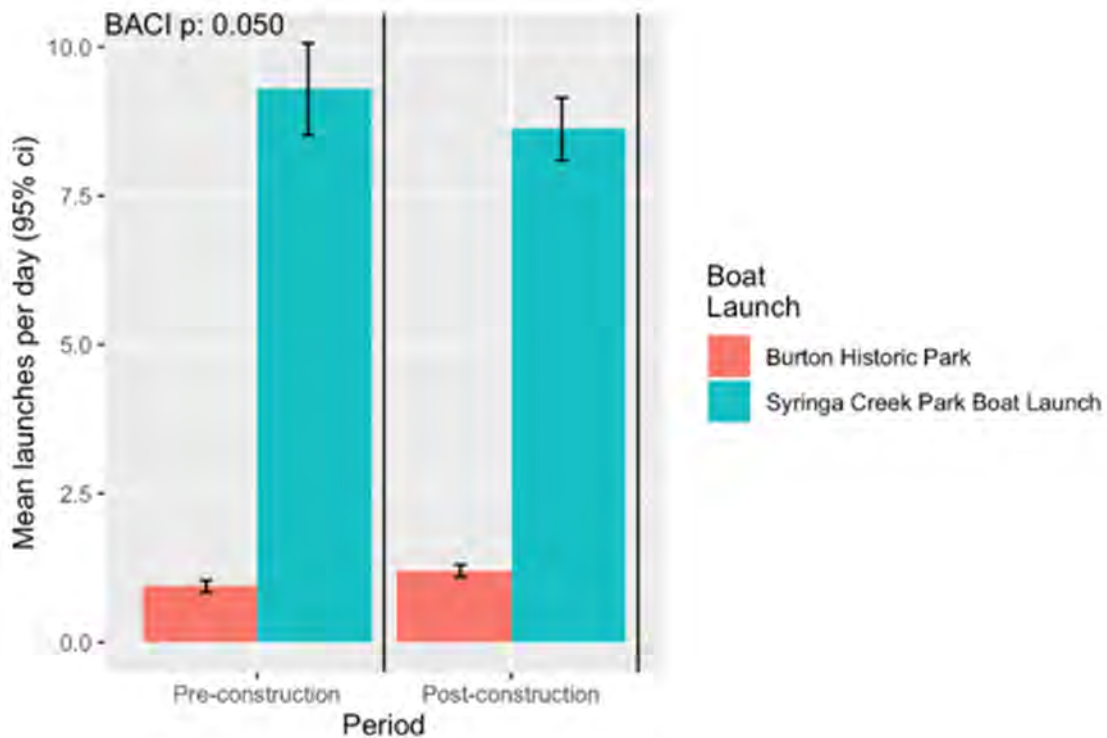


*Syringa Creek Park Boat Launch*

Mean post-construction visits to Syringa were significantly lower than mean pre-construction visits (Table 70; Figure 53); using those same periods, mean post-construction visits to Burton Historical Park were significantly higher than mean pre-construction visits. On average, for every pre-construction visit to Syringa, there were 0.9 post-construction visits; using the same periods, on average, for every pre-construction visit to Burton, there were 1.3 post-construction visits. There is weak evidence ( $p=.050$ ) that the change in mean visitation between the two periods was different for the two ramps.

**Table 70.** Syringa and Burton visitation compared.

Construction Period	Boat Launch	n	Min	Max	Median	Mode	Mean	SD	95% CI	P-value	Ratio	BACI P-value
Pre	Burton	1,158	0	14	0	0	0.94	1.81	0.10			
	Syringa	1,225	0	92	4	2	9.29	13.72	0.77	<.001	9.9	
Post	Burton	1,596	0	15	0	0	1.2	2.09	0.10			
	Syringa	1,636	0	72	4	1	8.62	10.96	0.53	<.001	7.2	.050



**Figure 53.** Comparison of pre- and post-construction mean visits to Syringa and Burton.

### **Conclusion – Control Sites Comparison**

The impact of boat ramp improvements on volume of public use at sites on the Arrow Lakes Reservoir was mixed. Mean post-construction visitation was higher than mean pre-construction visitation at McDonald Creek. Mean post-construction visitation was lower than mean pre-construction visitation at five sites: Anderson Point, Edgewood, Fauquier, Nakusp and Syringa Creek. There was no difference between mean pre-construction and mean post-construction visitation at Shelter Bay.

Using the construction periods for each improved boat ramp, there is evidence that the change in mean visitation between the two periods was different for the study ramp and control site at four locations: Anderson Point, Edgewood, Fauquier and Nakusp. There was no evidence of a change at two locations: McDonald Creek and Shelter Bay. There was weak evidence of a change for Syringa Creek.

The comparison of boat ramp improvements on Kinbasket Reservoir could not be assessed, as there was no pre-construction vehicle counter data at the control site to compare improved sites to.

## APPENDIX H – Management Question 2: Individual Results for Each Boat Ramp

*MQ2. If there is an increasing use of new or improved facilities, is it due to existing users visiting more often or new users being attracted to the area?*

### 1.1 Anderson Point Boat Launch

The *P*-value was 0.183 indicating no evidence of a change in the distribution of the usual boat launch for respondents encountered at Anderson Point Boat Launch.

**Table 71.** Anderson Point: Which boat ramp facility do you usually use on Arrow Lake?

Boat Launch	Pre-construction (n = 58)		Post-construction (n = 74)		diff	diff.se
	n	%	n	%	p.p.	p.p.
Anderson Point	32	55%	34	46%	-9	10
Deer Park	0	0%	5	7%	7	4
Multiple sites	10	17%	12	16%	-1	7
Renata	5	9%	3	4%	-5	5
Scotties Marina	1	2%	2	3%	1	3
Shelter Bay	6	10%	4	5%	-5	6
Syringa Creek Park Boat Launch	4	7%	12	16%	9	6
Syringa Creek Park Day Use	0	0%	1	1%	1	2
Valemount Marina	0	0%	1	1%	1	2
<b>TOTAL</b>	<b>58</b>		<b>74</b>			

1.2 Edgewood Community Park Boat Launch

The *P*-value was 0.013 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at Edgewood Community Park Boat Launch.

It appears that respondents have shifted from using multiple sites to primarily using the Edgewood launch in the post-construction periods.

**Table 72.** Edgewood Community Park: Which boat ramp facility do you usually use on Arrow Lake?

Boat Launch	Pre-construction (n = 144)		Post-construction (n = 44)		diff	diff.se
	n	%	n	%	p.p.	p.p.
Above Revelstoke Dam	1	1%	0	0%	-1	1
Arrow Park Ferry	2	1%	0	0%	-1	2
Edgewood Community Park	102	71%	38	86%	16	7
Fauquier Community Park	2	1%	0	0%	-1	2
McDonald Creek Provincial Park	1	1%	0	0%	-1	1
Multiple sites	36	25%	2	5%	-20	6
Nakusp Beach	0	0%	2	5%	2	3
Nakusp Boat Launch	0	0%	1	2%	2	3
Shelter Bay	0	0%	1	2%	2	3
Syringa Creek Park Boat Launch	1	1%	0	0%	2	3
<b>TOTAL</b>	<b>144</b>		<b>44</b>			

1.3 Fauquier Community Park Boat Launch

The *P*-value was <0.001 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at Fauquier Community Park Boat Launch.

It appears that users have shifted from using the Needles and Arrow Park Ferry launches to using the Fauquier Launch.

**Table 73.** Fauquier Community Park: Which boat ramp facility do you usually use on Arrow Lake?

Boat Launch	Pre-construction (n = 23)		Post-construction (n = 55)		diff	diff.se
	n	%	n	%	p.p.	p.p.
Arrow Park Ferry	6	26%	1	2%	-24	11
Edgewood Community Park	1	4%	4	7%	3	7
Fauquier Community Park Boat Launch	11	48%	46	84%	36	13
Multiple sites	2	9%	3	5%	-3	8
Nakusp Boat Launch	0	0%	1	2%	2	3
Needles	3	13%	0	0%	-13	9
<b>TOTAL</b>	<b>23</b>		<b>55</b>			

1.4 McDonald Creek Provincial Park Boat Launch

The *P*-value was 0.398 indicating no evidence of a change in the distribution of the usual boat launch for respondents encountered at McDonald Creek Provincial Park boat launch. However, the sample size in the pre-construction period was extremely small, so this survey has little power to detect any changes in the distribution.

**Table 74.** McDonald Creek Provincial Park: Which boat ramp facility do you usually use on Arrow Lake?

Boat Launch	Pre-construction (n = 10)		Post-construction (n = 162)		diff	diff.se
	n	%	n	%	p.p.	p.p.
Arrow Park Ferry	1	10%	0	0%	-10	12
Burton Historic Park	0	0%	7	4%	4	4
Eagle Bay	0	0%	1	1%	1	1
McDonald Creek Provincial Park	2	20%	61	38%	18	16
Multiple sites	6	60%	65	40%	-20	19
Nakusp Boat Launch	1	10%	18	11%	1	10
Needles	0	0%	1	1%	1	1
Revelstoke Boat Launch	0	0%	1	1%	1	1
Shelter Bay	0	0%	4	2%	2	2
Syringa Creek Park Boat Launch	0	0%	4	2%	2	2
<b>TOTAL</b>	<b>10</b>		<b>162</b>			

1.5 Shelter Bay Boat Launch

The *P*-value was 0.006 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at the Shelter Bay boat launch.

It appears that users indicated an increase in usage of Shelter Bay with a reduction in the proportion who use multiple sites.

**Table 75.** Shelter Bay: Which boat ramp facility do you usually use on Arrow Lake?

Boat Launch	Pre-construction (n = 171)		Post-construction (n = 117)		diff	diff.se
	n	%	n	%	p.p.	p.p.
Arrow Park Ferry	1	1%	2	2%	1	2
Eagle Bay	3	2%	0	0%	-2	1
Fauquier Community Park Boat Launch	1	1%	0	0%	-1	1
Galena Bay	0	0%	1	1%	1	1
MacDonald Creek Provincial Park	0	0%	1	1%	1	1
Multiple sites	45	26%	17	15%	-12	5
Nakusp Boat Launch	0	0%	2	2%	2	2
Revelstoke Boat Launch	2	1%	0	0%	-1	1
Shelter Bay	119	70%	92	79%	9	6
Syringa Creek Park Boat Launch	0	0%	2	2%	2	2
<b>Total</b>	<b>171</b>		<b>117</b>			

1.6 Syringa Creek Park Boat Launch

The *P*-value was 0.094 indicating no evidence of a change in the distribution of the usual boat launch for respondents encountered at the Syringa Boat Launch despite a large increase in the proportion that use this launch post-construction and a reduction in the proportion that use Shelter Bay.

**Table 76.** Syringa: Which boat ramp facility do you usually use on Arrow Lake?

Boat Launch	Pre-construction (n = 181)		Post-construction (n = 136)		diff	diff.se
	n	%	n	%	p.p.	p.p.
Above Revelstoke Dam	1	1%	0	0%	-1	1
Anderson Point	0	0%	1	1%	1	1
Bush Harbour	1	1%	0	0%	-1	1
Deer Park	0	0%	1	1%	1	1
Multiple sites	31	17%	19	14%	-3	4
Nakusp Boat Launch	0	0%	1	1%	1	1
Scotties Marina	10	6%	5	4%	-2	3
Shelter Bay	64	35%	35	26%	-10	5
Syringa Creek Park Boat Launch	71	39%	72	53%	14	6
Syringa Creek Park Day Use	3	2%	1	1%	-1	2
Valemount Marina	0	0%	1	1%	1	1
<b>TOTAL</b>	<b>181</b>		<b>136</b>			



1.7 Nakusp Boat Launch

The *P*-value was <0.001 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at Nakusp Boat Launch.

It appears that users indicated an increase in usage of Nakusp Boat Launch, with a reduction in the proportion who use multiple sites.

**Table 77.** Nakusp: Which boat ramp facility do you usually use on Arrow Lake?

Boat Launch	Pre-construction (n = 176)		Post-construction (n = 207)		diff	diff.se
	n	%	n	%	p-p.	p-p.
Arrow Park Ferry	2	1%	1	0%	-1	1
Burton Historic Park	5	3%	2	1%	-2	2
Edgewood Community Park	3	2%	1	0%	-1	1
Fauquier Community Park Boat Launch	1	1%	2	1%	0	1
Galena Bay	0	0%	1	0%	0	1
MacDonald Creek Provincial Park	3	2%	5	2%	1	2
Multiple sites	52	30%	52	25%	-4	5
Nakusp Boat Launch	108	61%	141	68%	7	5
Shelter Bay	0	0%	2	1%	1	1
Syringa Creek Park Boat Launch	2	1%	0	0%	-1	1
<b>TOTAL</b>	<b>176</b>		<b>207</b>			

### 1.8 Bush Harbour Boat Launch

No analysis for change between pre- and post-construction is possible because of the lack of pre-construction data. The information in the table below is presented for information only. Only about 1/2 of respondents indicated that Bush Harbour is their usual ramp.

**Table 78.** Bush Harbour: Which boat ramp facility do you usually use on Kinbasket Lake<sup>†</sup>?

Boat Launch	Post-construction (n = 63)	
	n	%
Bush Harbour	34	54%
Esplanade Bay	8	13%
Multiple sites	20	32%
Valemount Marina	1	2%
<b>TOTAL</b>	<b>63</b>	

<sup>†</sup> Pre-construction boat launch counter data was not collected for Bush Harbour.

### 1.9 Valemount Boat Launch

The *P*-value was 0.017 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at Valemount Marina boat launch.

It appears that shift of usage toward the Valemount Marina has occurred.

**Table 79.** Valemount: Which boat ramp facility do you usually use on Kinbasket Lake?

Boat Launch	Pre-construction (n = 40)		Post-construction (n = 112)		diff	diff.se
	n	%	n	%	p.p.	p.p.
Griffin	3	8%	0	0%	-8	5
Multiple sites	17	42%	38	34%	-9	10
Scotties Marina	0	0%	1	1%	1	1
Valemount Marina	20	50%	73	65%	15	10
<b>TOTAL</b>	<b>40</b>		<b>112</b>			

## APPENDIX I – Management Question 4: Individual Results for Each Boat Ramp

*MQ4. Is there a need for installation of additional facilities to satisfy the needs of boat users on Kinbasket Reservoir and Arrow Lakes Reservoir?*

### *1.1 Anderson Point Boat Launch*

The *P*-value was <0.001 indicating evidence of a change in the distribution of the dislikes about the boat ramp for respondents encountered at Anderson Point boat launch.

Table 80 suggests that boat ramp improvements addressed most respondents' concerns, although there is an indication that more parking may be needed. The percentage of respondents reporting no problems or providing a positive comment increased substantially.

**Table 80.** Anderson Point: What do you like least about the boat ramp facility that you visited today?

Response Categories	Pre-construction (n = 50)		Post-construction (n = 82)	
	n	%	n	%
Debris	0	0%	3	4%
Hard to get to	1	2%	0	0%
Hard to use	2	4%	0	0%
Improvements needed for all components	5	10%	0	0%
More parking needed	3	6%	7	9%
Multiple	4	8%	0	0%
No boat launch	5	10%	1	1%
No boat tie-ups	1	2%	0	0%
No problems/positive comment	1	2%	48	59%
Not enough room to turn around/load/unload	6	12%	0	0%
Not safe	1	2%	0	0%
Not well maintained/not clean	1	2%	1	1%
Other	2	4%	8	10%
Problems with dock/dock ramp	7	14%	5	6%
Problems with parking lot	0	0%	4	5%
Ramp not long enough	2	4%	0	0%
Rough launch	1	2%	0	0%
Rough road	1	2%	1	1%
Too crowded	4	8%	2	2%
Too high	0	0%	1	1%
Washrooms needed	2	4%	0	0%
Water levels	1	2%	1	1%
<b>TOTAL</b>	<b>50</b>		<b>82</b>	

1.2 Edgewood Community Park Boat Launch

The *P*-value was <0.001 indicating evidence of a change in the distribution of the dislikes about the boat ramp for respondents encountered at Edgewood Community Park Boat Launch.

Table 81 suggests that boat launch improvements addressed the majority of respondents' concerns. The percentage of respondents reporting no problems or providing a positive comment increased substantially.

**Table 81.** Edgewood Community Park: What do you like least about the boat ramp facility that you visited today?

Response Categories	Pre-construction (n = 100)		Post-construction (n = 59)	
	n	%	n	%
Debris	1	1%	1	2%
Did not use today	1	1%	0	0%
Docks too far from shore	1	1%	0	0%
Improvements needed for all components	10	10%	1	2%
More parking needed	0	0%	1	2%
Multiple	4	4%	1	2%
Needs barrier-free access	2	2%	0	0%
No boat launch	3	3%	0	0%
No problems/positive comment	14	14%	37	63%
No wharf	1	1%	0	0%
Not safe	2	2%	1	2%
Not well maintained/not clean	7	7%	0	0%
Other	17	17%	6	10%
Problems with breakwater	6	6%	0	0%
Problems with dock/dock ramp	21	21%	4	7%
Problems with parking lot	0	0%	1	2%
Ramp angle too steep	1	1%	1	2%
Ramp not long enough	3	3%	0	0%
Too crowded	0	0%	1	2%
Washrooms needed	2	2%	0	0%
Water levels	4	4%	4	7%
<b>TOTAL</b>	<b>100</b>		<b>59</b>	

1.3 Fauquier Boat Launch

The *P*-value was <0.001 indicating evidence of a change in the distribution of the dislikes about the boat ramp for respondents encountered at Fauquier Boat Launch.

Table 82 suggests that post-construction, more people indicated problems with the breakwater; over half of post-construction visitors provided a positive comment or indicated that they did not experience any problems with the Fauquier Boat Launch.

**Table 82.** Fauquier: What do you like least about the boat ramp facility that you visited today?

Response Categories	Pre-construction (n = 27)		Post-construction (n = 46)	
	n	%	n	%
Debris	1	4%	0	0%
Improvements needed for all components	4	15%	0	0%
Needs picnic area	0	0%	1	2%
No problems/positive comment	0	0%	31	67%
Not well maintained/not clean	1	4%	0	0%
Other	0	0%	5	11%
Problems with breakwater	0	0%	3	7%
Problems with dock/dock ramp	11	41%	0	0%
Problems with parking lot	1	4%	0	0%
Ramp angle too steep	0	0%	1	2%
Ramp not long enough	2	7%	0	0%
Too crowded	1	4%	0	0%
Too narrow/not wide enough	0	0%	1	2%
Too sandy/muddy	1	4%	3	7%
Water levels	5	19%	1	2%
<b>TOTAL</b>	<b>27</b>		<b>46</b>	

1.4 McDonald Creek Provincial Park Boat Launch

The *P*-value was <0.001 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at McDonald Creek Provincial Park Boat Launch.

Table 83 suggests that the percentage of respondents reporting no problems or providing a positive comment increased substantially; however, the limited number of pre-construction respondents implies that any changes should be viewed with caution.

**Table 83.** McDonald Creek Provincial Park: What do you like least about the boat ramp facility that you visited today?

Response Categories	Pre-construction (n = 3)		Post-Construction (n = 118)	
	n	%	n	%
Debris	0	0%	1	1%
More parking needed	0	0%	8	7%
Multiple	0	0%	1	1%
No boat tie-ups	0	0%	1	1%
No problems/positive comment	1	33%	89	75%
Not well maintained/not clean	0	0%	0	0%
Other	1	33%	10	8%
Problems with dock/dock ramp	1	33%	2	2%
Problems with parking lot	0	0%	1	1%
Too crowded	0	0%	2	2%
Too narrow/not wide enough	0	0%	2	2%
Water levels	0	0%	1	1%
TOTAL	3		118	

1.5 Nakusp Boat Launch

The *P*-value was <0.001 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at Nakusp Boat Launch.

Table 84 suggests that boat ramp improvements addressed most respondents' concerns. Over half of post-construction visitors provided a positive comment or indicated that they did not experience any problems with the Nakusp Boat Launch.

**Table 84.** Nakusp: What do you like least about the boat ramp facility that you visited today?

Response Categories	Pre-construction (n =149)		Post-Construction (n = 154)	
	n	%	n	%
Debris	11	7%	1	1%
Did not use today	1	1%	0	0%
Docks too far from shore	4	3%	0	0%
Hard to get to	1	1%	0	0%
Improvements needed for all components	1	1%	0	0%
More parking needed	6	4%	1	1%
Multiple	9	6%	3	2%
No boat tie-ups	0	0%	1	1%
No problems/positive comment	32	21%	85	55%
Not well maintained/not clean	2	1%	0	0%
Other	14	9%	15	10%
Problems with breakwater	10	7%	4	3%
Problems with dock/dock ramp	13	9%	15	10%
Problems with parking lot	2	1%	2	1%
Ramp angle too steep	1	1%	1	1%
Ramp not long enough	6	4%	1	1%
Too crowded	14	9%	14	9%
Too high	1	1%	0	0%
Too narrow/not wide enough	2	1%	1	1%
Water levels	19	13%	10	6%
<b>TOTAL</b>	<b>149</b>		<b>154</b>	



1.6 Shelter Bay Boat Launch

The *P*-value was <0.001 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at the Shelter Bay Boat Launch.

Table 85 suggests that boat ramp improvements addressed most respondents' concerns; however, there was a slight increase in the percentage of respondents that indicated problems with the parking lot. Over half of post-construction visitors provided a positive comment or indicated that they did not experience any problems with the Shelter Bay Boat Launch.

**Table 85.** Shelter Bay: What do you like least about the boat ramp facility that you visited today?

Response Categories	Pre-construction (n =112)		Post-Construction (n = 122)	
	n	%	n	%
Debris	6	5%	2	2%
Did not use today	0	0%	1	1%
Improvements needed for all components	4	4%	0	0%
More parking needed	5	4%	0	0%
Multiple	5	4%	0	0%
No boat tie-ups	2	2%	1	1%
No problems/positive comment	34	30%	76	62%
Not well maintained/not clean	6	5%	1	1%
Other	14	12%	16	13%
Problems with breakwater	9	8%	0	0%
Problems with dock/dock ramp	14	12%	7	6%
Problems with parking lot	1	1%	5	4%
Ramp angle too steep	1	1%	0	0%
Ramp not long enough	0	0%	2	2%
Rough road	1	1%	0	0%
Too crowded	3	3%	6	5%
Too narrow/not wide enough	4	4%	0	0%
Washrooms needed	1	1%	0	0%
Water levels	2	2%	5	4%
<b>TOTAL</b>	<b>112</b>		<b>122</b>	

1.7 Syringa Creek Park Boat Launch

The *P*-value was <0.001 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at the Syringa Creek Park Boat Launch Boat Launch.

Table 86 suggests that boat ramp improvements addressed most respondents' concerns. Over half of post-construction visitors provided a positive comment or indicated that they did not experience any problems with the Nakusp Boat Launch.

**Table 86.** Syringa Creek Park: What do you like least about the boat ramp facility that you visited today?

Response Categories	Pre-construction (n =149)		Post-Construction (n = 154)	
	n	%	n	%
Debris	11	7%	1	1%
Did not use today	1	1%	0	0%
Docks too far from shore	4	3%	0	0%
Hard to get to	1	1%	0	0%
Improvements needed for all components	1	1%	0	0%
More parking needed	6	4%	1	1%
Multiple	9	6%	3	2%
No boat tie-ups	0	0%	1	1%
No problems/positive comment	32	21%	85	55%
Not well maintained/not clean	2	1%	0	0%
Other	14	9%	15	10%
Problems with breakwater	10	7%	4	3%
Problems with dock/dock ramp	13	9%	15	10%
Problems with parking lot	2	1%	2	1%
Ramp angle too steep	1	1%	1	1%
Ramp not long enough	6	4%	1	1%
Too crowded	14	9%	14	9%
Too high	1	1%	0	0%
Too narrow/not wide enough	2	1%	1	1%
Water levels	19	13%	10	6%
<b>TOTAL</b>	<b>149</b>		<b>154</b>	

1.8 Bush Harbour Boat Launch

No analysis is possible because of the lack of pre-construction data. Post-construction data indicates that about half of respondents reported a positive comment or indicated that they did not experience any problems with the Bush Harbour Boat Launch.

**Table 87.** Bush Harbour: What do you like least about the boat ramp facility that you visited today?

Response Categories	Post-construction (n = 67)	
	n	%
Debris	6	9%
Docks too far from shore	1	1%
Hard to get to	2	3%
Improvements needed for all components	0	0%
More parking needed	2	3%
Multiple	1	1%
Needs picnic area	1	1%
No boat tie-ups	1	1%
No problems/positive comment	31	46%
Not safe	1	1%
Other	6	9%
Problems with dock/dock ramp	8	12%
Problems with parking lot	1	1%
Ramp angle too steep	2	3%
Too crowded	1	1%
Too sandy/muddy	0	0%
Water levels	3	4%
<b>TOTAL</b>	<b>67</b>	

1.9 Valemount Boat Launch

The *P*-value was <0.001 indicating evidence of a change in the distribution of the usual boat launch for respondents encountered at Valemount Boat Launch.

Table 88 suggests that post-construction, more people indicated problems with the dock/dock ramp and debris; however, fewer people indicated that the ramps were too narrow/not wide enough, too

crowded, and that barrier-free access was needed at the post-construction ramps at the Valemount Boat Launch. The percentage of respondents reporting no problems or providing a positive comment doubled.

**Table 88.** Valemount: What do you like least about the boat ramp facility that you visited today?

Response Categories	Pre-construction (n = 39)		Post-construction (n = 152)	
	n	%	n	%
Debris	2	5%	35	23%
Did not use today	0	0%	4	3%
Docks too far from shore	1	3%	0	0%
Hard to use	0	0%	1	1%
Improvements needed for all components	0	0%	1	1%
More parking needed	1	3%	1	1%
Multiple	0	0%	7	5%
Needs barrier-free access	2	5%	0	0%
No problems/positive comment	6	15%	59	39%
Not enough room to turn around/load/unload	2	5%	0	0%
Not well maintained/not clean	2	5%	1	1%
Other	2	5%	7	5%
Problems with breakwater	1	3%	3	2%
Problems with dock/dock ramp	2	5%	18	12%
Problems with parking lot	1	3%	1	1%
Ramp not long enough	3	8%	0	0%
Rough road	0	0%	1	1%
Too crowded	5	13%	1	1%
Too narrow/not wide enough	5	13%	2	1%
Too sandy/muddy	1	3%	0	0%
Washrooms needed	1	3%	1	1%
Water levels	2	5%	9	6%
<b>TOTAL</b>	<b>39</b>		<b>152</b>	