

Peace River Water Use Plan

Monitoring Program Terms of Reference

- **GMSMON-20 Reservoir Recreation Use**

July 30, 2008

Terms of Reference for the Peace River Water Use Plan Monitoring Program: Reservoir Recreation Use

1.0 Monitoring Rationale

1.1 Background

The Peace Water Use Plan Committee (hereafter known as the Committee) recommended a survey to assess recreational activity on Williston Reservoir. As part of the physical works projects within the Access, Navigation, and Safety Management Plan of the Peace WUP, construction of new boat launches and modification of existing boat launches are expected to increase access to the reservoir at all elevations. In turn, an increase in recreational use is expected throughout the reservoir. As part of the Access, Navigation, and Safety Management Plan (BC Hydro 2003), the Committee recommended that a reservoir recreation use survey be carried out to determine if in fact recreational use does increase in response to the greater boat access opportunities and whether the results will support future decisions regarding the construction or improvement of additional boat ramps.

1.2 Management Questions

The key management questions are:

- 1) Does the recreational use of the Williston Reservoir boat ramps increase after boat access has been improved?
- 2) What is the frequency of use of newly constructed boat ramps?

1.3 Summary of Impact Hypotheses

The primary hypotheses¹ to be tested are:

- H₁: Recreational use of boat ramps has increased following improvements to boat access.
- H₂: Timing (e.g., by month) of boating parties for recreational activities changes following improvements to boat access.

Recreational use of boat ramps may increase with improved boating access to the reservoir. Seasonal timing of recreational activities may also change with improved access to new areas of the reservoir as well as improved access during periods of low elevation.

¹ For clarity, the hypotheses are stated as the alternate hypotheses. Analyses will test the null hypotheses of no effect or difference.

1.4 Key Water Use Decision Affected

No key water use decision is affected by the results of this monitoring program.

2.0 Monitoring Program Proposal

2.1 Objective and Scope

The objectives of the monitoring program are to address the management questions identified in Section 1.2 by collecting the data necessary to draw inferences and to test the hypotheses outlined in Section 1.3. Study site locations will include newly constructed boat ramps and sites that will undergo improvement on Williston Reservoir as implemented by physical works projects within the Access, Navigation, and Safety Management Plan of the Peace WUP. Monitoring will also occur at a minimum of three additional boat ramps that are not targeted for improvement within the WUP; these sites will act as study control sites. Monitoring at study sites will occur annually during the 10-year study period from May to October. Reporting will include annual reports and a single final report at the conclusion of the monitoring program.

The monitoring program will not include an assessment of the recreational experience of boat ramp users, such as identification of the type of recreational activity (e.g., camping, hunting, fishing, etc.) or the collection of angling data. The budget assigned by the Committee is inadequate to implement a program that has survey agents at multiple boat ramps conducting interviews with boat ramp users on the weekends from May to October. Lower cost methods of collecting the information were considered. Firstly, a voluntary survey posted in the local newspapers is unlikely to be a sufficient method of collecting data because (i) response rate would likely be low, (ii) the pool of respondents would likely not be representative of the population using the boat ramps (iii) respondents may have difficulty recollecting the information that the survey requires and inaccurate information would be submitted. Secondly, a voluntary survey posted at boat ramp sites for users to fill out may get high response rate initially; however, after a couple of years, boat ramp users would likely lose interest and the response rate would be very low.

2.2 Approach

Vehicle counters will be put in place from May to October annually at the head of boat ramp sites to census the number of vehicles that use the boat ramps. An annual report will be prepared that describes the outcome of the field program. A final report will be prepared at the end of the monitoring program that summarizes the results of the entire monitoring program and presents conclusions concerning the management questions and impact hypotheses in Sections 1.2 and 1.3, respectively.

2.3 Methods

2.3.1 Task 1: Project Coordination

Project coordination will involve the general administrative and technical oversight of the monitoring program. This task will include but not be limited to: 1) budget

management, 2) study team management, 3) logistic coordination, 4) technical oversight of field and analysis components, and 5) facilitation of data transfer among other investigators associated with the Access, Navigation, and Communications Plan.

In particular, coordination is necessary between this monitoring program and those implementation projects that are constructing boat ramps to verify site selection and timing.

2.3.2 Task 2: Study Design of Field Program

Vehicle counters will be installed at selected boat ramp sites in May of each year. Prior to purchase and installation of vehicle counters, the project coordinator will contact the project coordinator(s) responsible for managing the construction of the proposed boat ramps as the schedule (Table 20-1) for implementation of boat ramp improvements is subject to change. Based on the current schedule, sites designated for improvement/construction will be monitored over the study period. Monitoring will occur annually over the 10-year period at selected boat ramp sites where scheduled improvement occurs between Years 1 and 5 (high and medium priority sites according to schedule). Sites where improvements will be implemented after Year 5 (low priority sites scheduled for Year 8) will be monitored in Years 6 to 10. A minimum of three new/improved boat ramps (high and medium priority sites) will be monitored beginning in Year 1 and a minimum of two sites (listed as low priority in schedule) will be added to the program in Year 6. Three additional sites that have not undergone site improvement as part of the WUP will be monitored for experimental control over the entire 10-year period. Ideally, a control site will be located in each arm of the reservoir.

Table 20-1: Proposed Schedule for Reservoir Access Improvements (BC Hydro 2003)

High Priority (proposed for Year 1)	Medium Priority (proposed for Year 4)	Low Priority (proposed for Year 8)
Dunlevy – new site (Peace Reach)	Elizabeth Creek –site improvement (Peach Reach)	Tsay Keh Village – site improvement (Finlay Reach)
Finlay Bay at 76 Mile – site improvement (Parsnip Reach)	Cutthumb Bay at 38 Mile – site improvement (Parsnip Reach)	Alexander Mackenzie's Landing at 22 Mile – site improvement (Parsnip Reach)
Ingenika – new site (Finlay Reach)	6 Mile Bay – site improvement (Parsnip Reach)	Black Water/Manson Dump – site improvement (Parsnip Reach)
		Strandberg – site improvement (Parsnip Reach)

2.3.3 Task 3: Field Program

The field program will collect data on the usage of boat ramps via vehicle counters. Between May and October of each year, vehicle counters will census vehicle usage and record date of usage at selected boat ramp sites. At the beginning of May, a vehicle counter will be installed at the head of the boat ramp site such that it will detect a vehicle using the boat ramp. Vehicle counters that are designed to be buried underground should be considered to prevent risk of theft or vandalism. Downloading

of data and equipment maintenance will occur every 1-2 months and equipment removed by mid-October.

2.3.4 Task 5: Data Entry and Analysis

The proponent will develop a Microsoft Access database to enter, check and store all data collected during the field season. Analyses will test the hypotheses to determine if boat ramp usage is increasing and if seasonal timing of activities is changing over time. Correlation analysis will be used to assess for significant increasing trends in boat ramp use over time. Analyses will assess if boat ramp use at improved sites is significantly different than the boat ramp use at control sites. Tests for homogeneity of variances will be tested and where possible ANOVA will be used; otherwise data will be tested using non-parametric tests.

2.3.5 Task 5: Reporting

Project reporting will consist of a series of annual data reports and a single final report at the conclusion of the monitoring program. The data report will document the methods, findings of the year and will include a discussion on how the year's data compare with that collected in previous years. Included in this discussion will be the results of all pertinent hypothesis testing.

A final report will be compiled following the conclusion of the monitoring program in Year 10 that collates all of the data and includes:

- a) an executive summary of the project;
- b) field methods, including maps that indicate sampling locations, and photos;
- c) analytical methods used in assessing trends of recreational use at boat ramps as well as any assumptions made;
- d) results of field program in terms of boat ramp usage in graphical and tabular form where appropriate;
- e) an assessment of the findings as they relate to the management question and hypotheses;
- f) any recommendations towards future monitoring (if any) needed.

A report will be provided in hard-copy and as Microsoft Word and Adobe Acrobat (*.pdf) format. The required maps and figures will included as embedded objects in the report. All maps and figures will also be provided in their native format as separate files. Raw data will be submitted in a Microsoft Access database. All photos will be submitted electronically.

2.4 Interpretation of Monitoring Program Results

The monitoring program will determine if recreational use of boat ramps increases following construction of new boat ramps and boat ramp improvements. If an increase in recreational boat ramps is observed then this will support future decisions to improve boat access such as the development of additional boat ramps. If the recreational use does not increase then this may indicate that additional factors are impacting recreation on the reservoir.

2.5 Schedule

Monitoring of boat ramp sites is scheduled to occur annually during the 10-year study period during the months of May to October. Sites will be checked and data collected 2-3 times during the field season to ensure proper functioning of equipment.

2.6 Budget

The total cost for the monitoring program is \$153,846. Table 19-1 summarizes the budget estimated in 2007 dollars.

Table 19-1: Estimated costs for the Reservoir Recreational Use monitoring program.

Sub-total		\$128,800
Inflation	2%	\$17,720
Contingency	5%	\$7,326
Total		\$153,846

2.7 References

BC Hydro. 2003. Consultative committee report: Peace River water use plan. Prepared by the Peace River water use plan consultative committee.