Bridge-Seton Water Use Plan

Monitoring Program Terms of Reference

- BRGMON-5 Downton Reservoir Riparian Vegetation Monitoring
1 Monitoring Program Rationale

1.1 Background

The Bridge Seton Water Use Plan Consultative Committee (BRG CC) had consensus that a primary environmental goal for the management of the Downton Reservoir was the protection of the high quality wildlife habitats present in the western end of the reservoir. As a result of its unique qualities on the delta of the free flowing Upper Bridge River and immediate adjacent drawdown zone in the reservoir (regional scarcity, remoteness, existing habitat conditions) this area has been identified as significant habitat for regionally threatened grizzly bear populations. This goal was also found to be consistent with other regional land use planning initiatives conducted by the provincial government including the Land and Resource Management Plan (LRMP – Lillooet Region).

In the development of operating alternatives the BRG CC elected to take no direct action to protect or enhance this area to improve wildlife values, but rather, sought an alternative that would preserve this high quality habitat without causing or inflicting any change to riparian habitat conditions in the area.

1.2 Management Questions

The fundamental management questions that therefore arose during the development of the selected operating strategy were related to the anticipated response of the riparian vegetation to alternative operating strategies of Downton Reservoir. These questions were:

1) Will implementation of the N2-P alternative have negative, neutral or positive impacts on the quality and quantity (species composition, biological productivity, spatial area) of riparian area on the Upper Bridge River Fan and the in the immediately adjacent drawdown zone of Downton Reservoir?

2) Has there been a negative impact on riparian vegetation and the overall quality of the habitat for wildlife in the area? What activities could be undertaken to preserve this critical habitat area?

1.3 Detailed Hypotheses about the Impacts of Downton Reservoir Operation on Riparian Vegetation

The fundamental management question resulted in the development of a single primary hypotheses (and sub hypotheses) associated effects of the selected alternative on the critical habitat area. The hypothesis is associated with providing the assurance that the implemented reservoir operating strategy has met its fundamental management objective. This hypothesis was then decomposed into three testable sub hypotheses associated with the spatial extent, community species composition and relative productivity of riparian vegetation community associated with the critical habitat area on the fan and the adjacent area in the drawdown zone. These hypotheses are:
H$_1$: Implementation of the chosen alternative will not result in an alteration of the critical wildlife areas located on the Upper Bridge River Fan and the adjacent areas in the drawdown zone of Downton Reservoir

H$_{1A}$: There is no significant change in the spatial extent of the vegetated area on the fan or in the adjacent drawdown zone.

H$_{1B}$: There is no significant change in the species composition of the plant community in the vegetated area on the fan or in the adjacent drawdown zone.

H$_{1C}$: There is no significant change in the relative productivity of the plant community in the vegetated area on the fan or in the adjacent drawdown zone.

1.4 Key Water Use Decision Affected
The decision by the BRG CC to recommend Alternative N2-P over Alternative 03-2 was based on the assumption that there would be no reduction in quality and quantity of riparian conditions from current conditions, thus preservation of the critical wildlife habitat area. Based on the technical information available it was believed that adopting Alternative N2-P would not alter the critical area. If it was found through monitoring that the implementation of N2-P had a negative impact on riparian communities of the critical wildlife areas on the Upper Bridge River Fan and in the adjacent drawdown zone of Downton Reservoir, it would likely alter future decisions regarding reservoir operating strategy because of the high value placed on protecting this area.

2 Monitoring Program Proposal

2.1 Objective
The objective of this monitoring program is to document the impacts of reservoir operation under Alternative N2-P on riparian vegetation surrounding Downton Reservoir.

2.2 Approach
The proposed monitoring program has two components. The first component is the quantification of the spatial extent, species composition, and relative productivity of the riparian area surrounding Downton Reservoir to allow quantification of changes that occur as a result of changes in the operating strategy of the reservoir. The second is the analysis of the field data to draw inferences on the overall effect of the operational changes on riparian conditions. The program is to be conducted over approximately a 10-year period.

2.3 Methods
The proposed monitoring program has the following primary tasks:

Task 1 Project Coordination
Project coordination involves the general administrative and technical oversight of the program. This will include but not be limited to: 1) budget management, 2) staff selection, 3) logistic coordination, 4) technical oversight in field and analysis components; and 5) liaison with regulatory and first nations groups.
Task 2 Riparian Vegetation Mapping and Analysis

Aerial Photography

To assess the impacts of the N2-P reservoir operating alternative on the spatial extent of riparian vegetation adjacent to and within Downton Reservoir drawdown zone it is proposed that aerial photography be conducted in the first year of the program and immediately prior to proposed the review of the WUP in approximately 10 years. Low level spatial geo-referenced color air photos will be used to develop GIS based maps of the riparian vegetation and to compute changes in the spatial extent and location of vegetation occurring after 10 years. The observed patterns will be interpreted based on inundation frequencies imposed by the implemented reservoir operations and by site specific habitat conditions within the drawdown zone.

Vegetation Transect Surveys

Transect surveys are proposed to 1) to ground truth assessments of general changes in species composition occurring over the entire spatial area of the reservoir; 2) provide detailed geo-referenced topographic data of the transect, and 3) to provide a detailed assessment of the changes in species composition and relative productivity of riparian habitats resulting from the implementation of the new Downton Reservoir operating strategy. During the baseline data collection in 2000, approximately 30 transect surveys were conducted in Downton Reservoir to establish baseline conditions for species composition and elevation patterns of establishment associated with reservoir inundation history. The following activities are proposed for this task: 1) permanent benchmarking of the baseline transects to allow repeated surveys through time, 2) supplemental sampling at the baseline transects to quantify relative riparian productivity (biomass sampling); 3) repeating baseline vegetation surveys (including the biomass sampling) after approximately 10 years, 4) based on the data collected undertake a quantitative assessment of the changes in species composition with particular attention to spatial changes in riparian vegetation along elevation gradients in relation to inundation history within the drawdown zone.

Task 3 Reporting

A detailed technical report will be prepared prior to the review of the Water Use Plan that outlines the findings from the program as they relate to the primary components described above.

2.4 Interpretation of Monitoring Program Results

The data and information collected in the proposed monitoring programs would ultimately be used to assess the degree to which management objectives and technical expectations were met by the implementation of the operational change. Upon completion of the program and synthesis of data, a report will be prepared for use in the next review of the BRG Water Use Plan. This synthesis will include, but may not be limited to:

1) Quantitative assessment of the changes in spatial extent, species composition, and relative productivity of riparian vegetation surrounding Downton Reservoir associated with the implementation of the N2-P alternative.

2) Evaluation of the extent to which management objectives for protection and enhancement of the riparian areas surrounding Downton Reservoir, with particular reference to the critical area located on the fan of the Upper Bridge
River and in the adjacent drawdown zone of the reservoir, were achieved by the implementation of the reservoir operational changes.

2.5 Schedule
The schedule for the annual activities is necessarily phased to accommodate the requirements of the program. The first year of the program will be utilized to obtain further required baseline data on the system. In Years 2 through 9 no specific activities are proposed. In the final year of the program immediately prior to the review of the Water Use Plan, aerial photography and baseline vegetation transect surveys will repeated to allow a final assessment of observed changes in the riparian area surrounding Downton Reservoir.

2.6 Budget
The total estimated cost of the Downton Reservoir Riparian Vegetation Monitoring Program for the 10-year period is $328,834.