

## **Bridge-Seton Water Use Plan**

### **Monitoring Program Terms of Reference**

- BRGMON-16 Lower Bridge River Spiritual and Cultural Value Monitoring

**July 17, 2012**

## **Bridge-Seton Water Use Plan Monitoring Program No. BRGMON-16 Lower Bridge River Spiritual and Cultural Value Monitoring**

### **1 Monitoring Program Rationale**

#### **1.1 Background**

The Bridge-Seton Consultative Committee (BRG WUP CC) and more recent Bridge River Technical Working group recommended that as part of the Water Use Plan the current flow testing program now underway at Terzaghi Dam be continued and expanded to a second flow level to empirically document the response of the ecosystem to instream flow changes in Lower Bridge River. A long term test flow release program was recommended with monitoring programs to empirically measure the environmental benefits that could arise from two alternative instream flow release regimes considered by the Bridge River Technical working group. The flow regimes differ in the relative shape of the delivered hydrograph and the annual water budget delivered (referred to as: 3 cms/y, 6 cms/y treatments). The 3 cms/y treatment occurred from August 2000 to April 2011, and the 6 cms/y treatment started in May 2011.

St'át'imc elders speak of the "spirit" or "voice" of the lower Bridge River. They have observed that in moving from a water budget of 0 to 3 cms-y there have been noticeable improvements in conditions for tangible outcomes like fish, wildlife, and riparian vegetation. But in addition, and distinct from these, there have been improvements in the "spirit" or "voice" of the river. Across the range of proposed flows (including a doubling of the average flows, from 3 cms-y to 6 cms-y), it is anticipated that there is potential for additional beneficial change to these important spiritual and cultural values

To obtain information to better define the spiritual and cultural objective, during the Technical Working Group (TWG) review process, input was collected from interviews with St'át'imc TWG members, from discussions with other members of the St'át'imc community, and from a workshop held in Lillooet to hear the views of invited St'át'imc elders and resource users. From these meetings, four key components of Cultural and Spiritual Quality were defined:

**Sound**, including:

- The voice of the water
- Birdsong

**Smell**, including:

- The smell of the water itself
- The ambient smell at water's edge

**Movement**, including:

- Movement of water (seasonally appropriate)
- Diversity of movement (pools/riffles)

**Interaction** (of people and water), including:

- Shore access
- “Wade-ability” (the ability to walk in and/or across the river at certain locations)

These four components clearly do not provide a universal definition of cultural or spiritual quality. They define the aspects of cultural and spiritual quality thought to be relevant for the evaluation by St’át’imc of a suite of alternative flow regimes on the Lower Bridge River, within the (average annual) range of 0 to 6 cms / y.

This monitoring program will document these spiritual and cultural values under the 6 cms/y flow regime. This information on spiritual and cultural values will provide an important measure that will be used along other social and environmental measures in an overall evaluation of the 6 cms / y flow regime.

## 1.2 Management Questions

The primary management question that will be addressed by this monitoring program is:

- 1) Does the smell, sound, movement and interaction (of people and water) on the lower Bridge River improve under the 6 cms / y flow regime, relative to the 3 cms / y and 0 cms / y flow regimes?

## 1.3 Hypotheses Tested by the Monitoring

The primary management question will be tested using the following hypothesis:

H<sub>10</sub>: The smell, sound, movement and interaction (of people and water) on the lower Bridge River under the 6 cms / y flow regime does not differ from the 3 cms / y and 0 cms / y flow regimes.

## 1.4 Key Water Use Decision Affected

The key water use decision affected by this monitoring program is the long term flow regime for the lower Bridge River. Information from this program will be used along with other social and environmental performance measures to evaluate the 6 cms / y flow regime.

## **2 Monitoring Program Proposal**

### **2.1 Objective**

The objective of this program is to collect the information needed on the smell, sound, movement and interaction of the lower Bridge River under the 6 cms / y flow regime that is needed to help evaluate the overall benefits of this flow regime.

### **2.2 Approach**

The overall approach is to conduct observations of the lower Bridge River several times per year, score each component during the observations, and summarize the information. To improve consistency and transparency in assessment, a Cultural and Spiritual Quality Scale and a protocol for measuring it is proposed, given the qualitative nature of these measures, the approach includes:

- a committee of 3 to 8 St'át'imc members to act as observers;
- observations to be taken four times per year under a range of test flows;
- observations to be taken at two sites per reach over Reaches 4, 3 and 2;
- a simple and transparent scoring system for assigning scores to each component in each reach; and
- a plan for aggregating scores across observers, components, reaches and seasons.

Although implementation suggestions are provided in the table shown below, it is recognized that at present this remains a draft procedure because some aspects may change over time as experience is gained in the implementation of the measure and its ability to convey useful information.

### **2.3 Methods**

#### **Task 1 Program 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) logistical coordination, and 4) technical oversight in field and analysis components.

#### **Task 2 River Observations**

River observations will include:

**Who:** 3 to 8 members of the St'át'imc community. Continuity in membership is desired, as is the designation of a lead person, to the extent that consistency in the conduct of measurements is essential.

**When:** Four times per year, at flows and seasons that represent a range of conditions:

- September (low flows, spawning fish present)
- February (low flows, winter conditions)
- April (moderate flows, spring conditions)
- July (peak flows, summer conditions, relatively low fish abundance/visibility)

**Where:** Two sites per reach, for each of Reaches 4, 3 and 2.

**Individual Reach Scoring:** On the designated date and site, each observer will assign a score of 0 to 2 for each of the four components (sound, smell, movement, interaction), where 0 = low quality, 1 = moderate quality, and 2 = high quality. Component scores will be summed for each individual across the two sites per reach and an overall reach score will be calculated, according to the following scale: Poor 0-1, Fair 2-3, Good 4-5, Very Good 6-7, Excellent 8.

**Aggregating Across Observers:** Observers will discuss individual scoring results and assign group Component Scores and Reach Scores. In the absence of consensus, a simple average of scores across observers will be used, assuming equal weighting of observers and components.

**Aggregating Across Reaches:** Observers will discuss the three group Reach Scores and assign an aggregated score for the river. In the absence of consensus, a River Score will be calculated by summing the Reach scores, assuming either equal weights for the reaches or differential weights that reflect the relative importance of each reach.

**Aggregating Across Seasons and Years:** Observers will discuss the four seasonal measures and assign an annual score for the river. In the absence of consensus, an annual River Score will be calculated by summing the seasonal scores, assuming either equal weight for seasons or differential weights that reflect the relative importance of each season.

**Supporting Documentation:** Conditions at each site will be recorded by video camera and still photography. Note that still photography is also being collected under BRGMON-1, and may provide additional supporting documentation.

### **Task 3 Reporting**

The methods and results will be documented in a technical document.

## **2.4 Interpretation of Monitoring Program Results**

Scoring from this Cultural and Spiritual Quality scale will be used along with other social and environmental measures in an overall assessment of the 6 cms / y flow regime. These Cultural and Spiritual Quality results should not be interpreted as an overall or aggregate assessment of St'át'imc concerns. Along with other TWG members, St'át'imc will be monitoring results for objectives relating to salmon, river health, riparian health, learning, and so forth in addition to monitoring results for cultural and spiritual quality. It is conceivable that there will be trade-offs among

objectives – for example, one flow alternative may prove to be less beneficial for salmon but more beneficial from the perspective of cultural and spiritual quality, in which case choices will need to be made based on the preferred balance across objectives.

## **2.5 Schedule**

Observations will occur four times per year, as described in the Methods section. These observations will be repeated for 5 years (Years 1 to 5) to account for potential differences in conditions across years.

## **2.6 Budget**

Total Program Cost: \$450,965.

## **3 References Cited**

No references cited.