

## **4.5 Watershed Integrity Indicator 4. Co-ordinated Water Quality Monitoring**

### 4.5.1 Background:

The most obvious indication that watershed integrity may be at risk is significant changes (i.e. beyond natural levels) in the physical and chemical characteristics of water flowing from that watershed.

Historically, agencies and forest licensees have undertaken short and long-term water quality monitoring projects in an ad hoc fashion. In 2003, a Bulkley Aquatic Resource Committee (BARC), comprised of forest licensee and government agency representatives, was formed and tasked with a continuous and strategically focused water quality monitoring effort. Focused monitoring should enable identification of watershed integrity problems as they occur, and the committee structure will facilitate discussion and immediate response to issues. This structure also enables pooling of limited funding.

A draft strategy document has been prepared (BARS). It includes the following elements that will facilitate data gathering for the suggested future measure:

- watershed-level monitoring of water quality attributes for “sensitive” streams (e.g. temperature or sediment-sensitive spawning streams; streams with domestic use water licenses; areas of moderate or higher soil erosion potential, etc.).
- site-level monitoring, to assess short term impact of road building, harvest or other human-caused disturbances.

The draft strategy also includes other water quality indicators/measures, that may be reported on in future versions of the State of the Forest Report depending on the success of BARC strategy implementation:

- variations of Stream Crossing Quality Index (SCQI),
- percent fish passage on identified culverts,
- a modified indicator of Watershed Health (involving Equivalent Clearcut Area, Road Density and Number of Stream Crossings),
- compliance and enforcement statistics, and
- number of current studies.

In the interim, this section summarizes information on the location and status of past water quality monitoring efforts.

### 4.5.2 Interim Measure:

Status of historical water quality monitoring efforts in Bulkley TSA

### 4.5.3 Future Measure:

Comparison of water quality and/or quantity attributes against the natural range of variability for these attributes, for selected streams in sensitive watersheds.

#### 4.5.4 Results and Discussion:

Monitoring of various water quality attributes has been undertaken for many years in Bulkley TSA by agencies and forest licensees. Table 11 summarizes features of their monitoring programs. Figure 21 shows the location of past and current monitoring/study sites<sup>1</sup>.

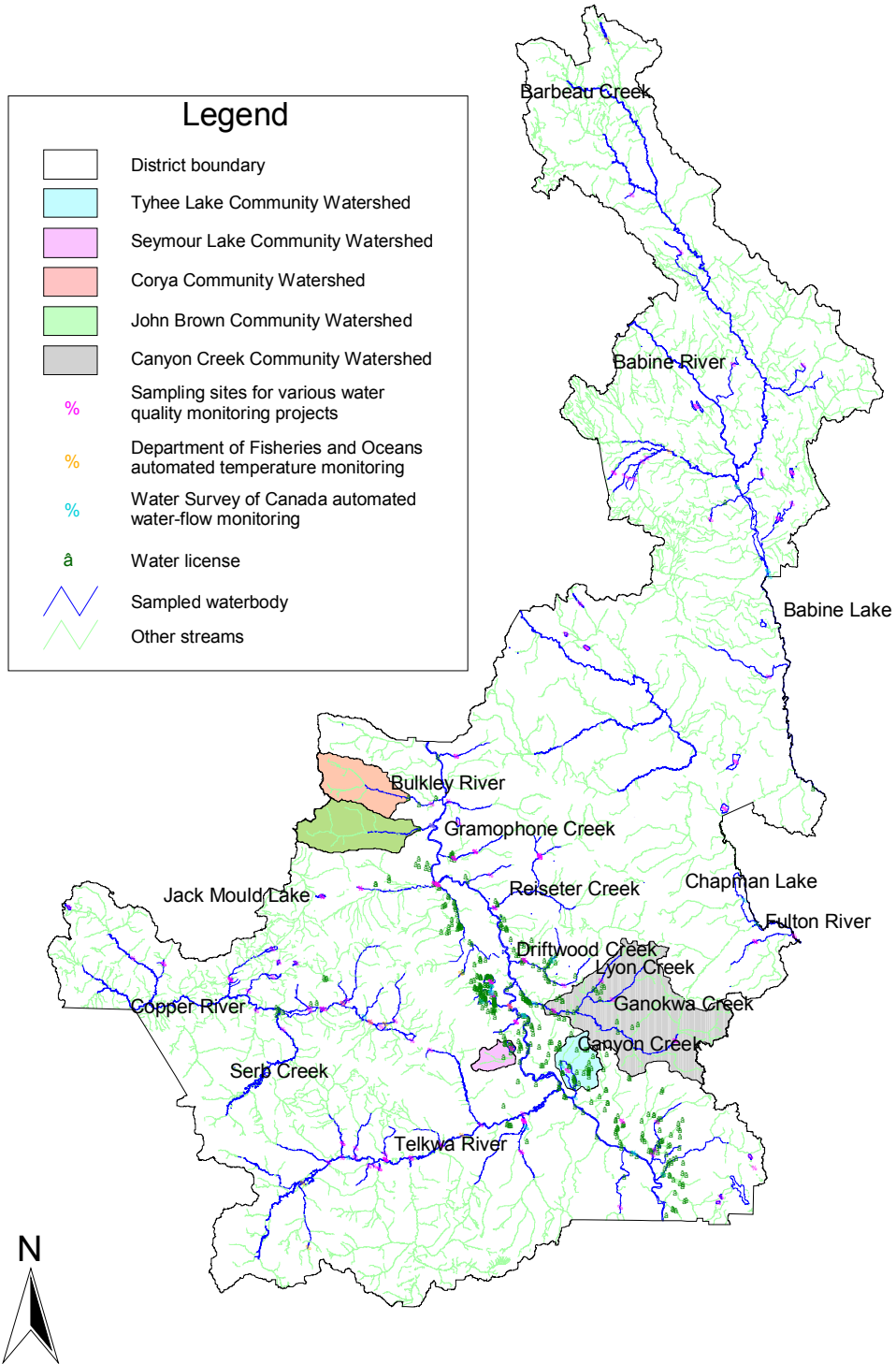
Table 11 – Water Quality Monitoring Program Features by Agency

Agency	Waterbody type	Monitored or Assessed Characteristic	Ad hoc or Continuous Basis	Objective
DFO	Major streams, rivers	Water temperature, Water chemistry	Both	Capability of supporting anadromous fish populations
Water Surveys of Canada	Major streams, rivers	Flow levels/depth	Continuous (for limited periods)	Peak flow
WLAP (formerly MELP), MSRM	Lakes, streams, rivers, wetlands	Suspended solids/turbidity, Coliform content, Benthic invertebrates, Water chemistry Sediment accumulation Water temperature	Both	Water quality against set quality objectives; development/ testing of “toolbox” of monitoring techniques
MOF, Forest licensees	Streams	Suspended solids/Turbidity Temperature Water chemistry (pH)	Ad hoc	Directly assessing impact of harvest or road related disturbance

<sup>1</sup> Relational database is available on request

Figure 21

# Water Quality Study Locations



The Bulkley LRMP identifies specific water bodies where water quality is considered to be of special concern. Those waterbodies not already protected within parks, LRMP SMZ1 zones or Core Ecosystems are listed in Table 12, along with a summary of values, past monitoring activities, and an assessment of whether LRMP value is addressed.

Table 12 – Status of Water Quality Monitoring for LRMP Identified Sensitive Areas

Waterbody	LRMP Value	Water Quality Monitoring Activity	Addresses Need
Babine River and tributaries	Water quality, clarity, and hydrologic stability	<ul style="list-style-type: none"> <li>▪ Main stem and tribs sampled for temp, pH from 1995-1997 (Triton)</li> <li>▪ Several locations (e.g. 1951-present at fish weir) autosampled for temp (DFO)</li> <li>▪ Long history of flow level autosampling (Water Survey of Canada)</li> </ul>	Partly <sup>2</sup>
Babine Lake	Water quality	<ul style="list-style-type: none"> <li>▪ Autosampled for depth 1972-1977 (Water Survey of Canada)</li> </ul>	No
Reiseter Creek, and tributaries with water licenses	Domestic water supply/quality	<ul style="list-style-type: none"> <li>▪ IBI sampling from 2000-2002 (WLAP)</li> <li>▪ Main stems and tribs sampled for temp, pH from 1995-1997 (Triton)</li> </ul>	Partly <sup>2</sup>
Driftwood Creek and tribs	Domestic water supply/quality	<ul style="list-style-type: none"> <li>▪ IBI sampling from 2000-2002 (WLAP)</li> <li>▪ Sampled for temp, pH from 1995-1997 (Triton)</li> </ul>	Partly <sup>2</sup>
Lyon Creek and tribs	Domestic water supply/quality	<ul style="list-style-type: none"> <li>▪ IBI sampling from 2000-2002 (WLAP)</li> <li>▪ Sampled for temp, pH from 1995-1997 (Triton)</li> </ul>	Partly <sup>2</sup>
Ganokwa Creek and tribs	Domestic water supply/quality	<ul style="list-style-type: none"> <li>▪ IBI sampling from 2000-2002 (WLAP)</li> <li>▪ Sampled for temp, pH from 1995-1997 (Triton)</li> </ul>	Partly <sup>2</sup>

<sup>2</sup> Past work may aid in establishing baseline water quality attribute measures. However, LRMP language presumes a continuous monitoring effort.

**Table 12 - continued**

Waterbody	LRMP Value	Water Quality Monitoring Activity	Addresses Need
Canyon Creek and tribs	Domestic water supply/quality; Community Watershed	<ul style="list-style-type: none"> <li>▪ Autosampled for flow levels 1973-1998 (Water Survey of Canada)</li> <li>▪ Sampled for temp, pH from 1995-1997 (Triton)</li> <li>▪ IBI sampling in 1997, 2000-2001 (WLAP)</li> <li>▪ Streambed sediment / suspended sediment assessment and chemical analysis in 1997</li> </ul>	Partly <sup>2</sup>
Gramophone Creek	Water licenses	<ul style="list-style-type: none"> <li>▪ Sampled for temp, pH from 1995-1997 (Triton)</li> <li>▪ IBI sampling from 2000-2002 (WLAP)</li> <li>▪ Streambed sediment assessment in 2002 (WLAP)</li> </ul>	Partly <sup>2</sup>
Chapman Lake	Water quality	<ul style="list-style-type: none"> <li>▪ Sampled for depth from 1967-1970 (Water Survey of Canada)</li> </ul>	No
Fulton River	Fisheries values	<ul style="list-style-type: none"> <li>▪ Sampled for flow levels from 1967-1970 (Water Survey of Canada)</li> <li>▪ Sampled for temp, pH from 1995-1997 (Triton)</li> </ul>	Partly <sup>2</sup>
Bulkley River	Water quality (maintain and restore)	<ul style="list-style-type: none"> <li>▪ Autosampled for flow levels, sediment and selected chemical attributes from 1946-2001 (Water Survey of Canada)</li> <li>▪ Sampled for temp, pH from 1995-1997 (Triton)</li> <li>▪ IBI sampling in 1999</li> </ul>	Partly <sup>2</sup>
Telkwa River, and tributaries important to fish spawning	Water quality (maintain and restore) Regionally significant spawning areas	<ul style="list-style-type: none"> <li>▪ Ad hoc sampling (1990-1995) of tribs for suspended sediment (MOF)</li> <li>▪ IBI sampling of several tribs, 2000-2002 (WLAP)</li> <li>▪ Telkwa R. autosampled for flow levels 1975-2001 (Water Survey of Canada)</li> <li>▪ Telkwa R. autosampled for temp 1995-2002 (DFO, WLAP)</li> <li>▪ Sampled for temp, pH from 1995-1997 (Triton)</li> </ul>	Partly <sup>2</sup>

**Table 12 - continued**

Waterbody	LRMP Value	Water Quality Monitoring Activity	Addresses Need
Tyhee Lake and tributaries	Domestic water supply; Community Watershed	<ul style="list-style-type: none"> <li>▪ Tyhee Lake sampled and assessed (in 1984 and again in 2001-2002) for temp, suspended sediment, colour, coliform, chemical attributes, against established water quality objectives</li> <li>▪ Tyhee Creek sampled for flow levels in 1983 (Water Survey of Canada)</li> </ul>	[Yes]
Seymour Lake and tributaries	Domestic water supply; Community Watershed	<ul style="list-style-type: none"> <li>▪ Seymour Lake sampled and assessed (in 1984 and again in 2001-2002) for temp, suspended sediment, colour, coliform, chemical attributes, against established water quality objectives</li> <li>▪ Seymour Creek sampled for temp and pH in 1996 (Triton)</li> </ul>	[Yes]
Corya Creek and tributaries	Domestic water supply; Community Watershed	<ul style="list-style-type: none"> <li>▪ IBI sampling in 2000</li> <li>▪ sampled for temp and pH in 1995-1997 (Triton)</li> </ul>	Partly <sup>2</sup>
John Brown Creek and tributaries	Domestic water supply; Community Watershed	<ul style="list-style-type: none"> <li>▪ IBI sampling in 2000 and 2001</li> <li>▪ sampled for temp and pH in 1995-1997 (Triton)</li> <li>▪ autosampled for flow levels 1947-1949 (Water Survey of Canada)</li> </ul>	Partly <sup>2</sup>
Serb Creek	Fish values	<ul style="list-style-type: none"> <li>▪ IBI sampling in 2000 (WLAP)</li> <li>▪ Sampled for temp, pH from 1995-1997 (Triton)</li> </ul>	Partly <sup>2</sup>
Copper River, and tributaries important to fish spawning (e.g. Passby Creek)	Water quality Regionally significant spawning areas	<ul style="list-style-type: none"> <li>▪ Many ongoing and historical studies. Full list available on request.</li> </ul>	Partly <sup>2</sup>

4.5.5 Data Sources:

Various water quality monitoring studies and report documents (list available on request)

Bulkley Land and Resource Management Plan (March 1998)

Draft Bulkley Aquatic Resource Strategy (November 2003)