Water Quality Objective Monitoring, McQuesten River Watershed 2009

Hydrologic and Geomorphic Characteristics of the McQuesten River Drainage Basin

The McQuesten River flows into the Stewart River which eventually joins the Yukon River near Dawson. Mean monthly flows in the McQuesten River drop to a minimum in February, with maximum monthly runoff occurring in May or June in response to snowmelt (Water Survey of Canada 1988). Annual maximum daily flows result from snowmelt in the spring and intense rainstorms in July and August. The watershed is mostly forested with sediment sources located along the streams. Sediment loads vary seasonally, with the greatest load carried during the spring flood and the intense summer rainstorms.

The climate is characterized by extremely variable temperatures and moderate annual total precipitation. Haggart Creek is the site of most of the recent placer mining in the McQuesten basin. Mining often starts as early as March in some areas and continues to as late as November. Prior to mining, during spring melt in early May sediment concentrations are high in Haggart Creek. The South McQuesten River is significantly impacted by this sediment input from Haggart Creek. The South McQuesten River upstream of Haggart Creek is a low-energy, meandering stream with fine bed sediment, little suspended sediment and a marshy floodplain. The influx of coarse sediment from Haggart Creek has produced a large confluence bar extending across the South McQuesten River at the confluence. Between Haggart Creek and the North McQuesten River, the South McQuesten becomes a higher-energy meandering stream with a sand and gravel bed and a higher suspended solids concentration. The channel of the McQuesten River downstream of the North and South confluence becomes less sinuous and is dominated by gravel bed sediment.

In 2009, water samples were collected at the mouth of the McQuesten River basin during three Stewart River blitz sampling events on June 8th, July 27th and September 14th, 2009. An additional 45 samples were collected by E.M.R staff during routine mine inspections. Also, as part of the Aquatic Health Monitoring Protocol, samples were collected at 4 different sites on July 7th, 2009 in the McQuesten watershed.

Basin total flow data was provided to us by the Water Survey of Canada station located near the mouth of the McQuesten River. Flow data for the individual tributaries to the McQuesten River was collected at the time of sampling by the staff of E.M.R CS&I using the methodology outlined in the Yukon Placer Secretariats, Water Quality Monitoring Protocol.

Site Codes and Global Position of Water Quality Sampling Locations in the McQuesten River Watershed

SITE CODE	LOCATION	LAT_Y	LONG_X
MCQ 01	South McQuesten near mouth at hwy bridge	63.55655	-137.41273
MCQ 03	South McQuesten at bailey bridge	63.85497	-136.26122
MCQ 02	South McQuesten River u/s of Vancouver Creek	63.63532	-137.07706
MCQ 05	South McQuesten d/s of Haggart Creek Mouth	63.89156	-136.03003
MCQ 06	South McQuesten River u/s of Haggart Creek mouth	63.92272	-135.90289
MCQ HAG 01	Haggart Creek mouth	63.89646	-136.02348
MCQ HAG 02	Haggart Creek d/s of Murphy's Pup	63.93405	-136.03581
MCQ HAG 03	Haggart Creek d/s of Swede Creek Mouth	63.96153	-135.97848
MCQ HAG 04	Haggart Creek u/s of Swede Creek Mouth	63.96209	-135.97859
MCQ HAG 05	Haggart Creek d/s of Lynx Creek mouth	63.98390	-135.85982
MCQ HAG 06	Haggart Creek u/s of Lynx Creek mouth	63.98363	-135.85941
MCQ LYNX 01	Lynx Creek mouth	63.98359	-135.85910
MCQ MURP 01	Murphy's Pup	63.94465	-136.02872
MCQ NOR 01	North McQuesten near mouth	63.85030	-136.33049
MCQ SWE 01	Swede Creek u/s of culvert	63.96187	-135.97928
MCQ VAN 01	Vancouver Creek mouth	63.63572	-137.07922

Water Quality Objective monitoring, McQuesten River Watershed – Summary

On average, the water quality in the basin met the minimum objectives set under the *Fish Habitat Management System* throughout the monitoring season. On those occasions when the WQO were not met and the Total Suspended Solids levels were greater than the objectives, a direct correlation between physical / environmental conditions and the volume of solids in the water was observed.

Inadequate construction and monitoring of a temporary diversion channel at a Placer operation on Secret Creek resulted in an uncontrolled release of sediment into Swede Creek. This release increased both the suspended solids and settleable solids concentrations in the receiving waters of Swede Creek for a period of approximately 16 days from August 11th, 2009 until August 27th, 2009, when the situation was addressed by E.M.R inspection staff.

The Fish Habitat Management System - McQuesten River Watershed (Category A)
Sample Results that Exceed Water Quality Objectives for 2009

Sampling Station	MCQ 01	MCQ VAN 01	MCQ 02	MCQ NOR 01	MCQ 03	MCQ HAG 01	MCQ 06	Other	Other	Other
Location Description	Mouth	Mouth	u/s MCQ VAN 01	Mouth	at Bailey bridge	Mouth	u/s MCQ HAG 01			
Sample Type	Grab					Grab				
Lat Y	63.55655	63.63572	63.63532	63.85030	63.85497	63.89646	63.92272			
Long X	-137.41273	-137.07922	-137.07706	-136.33049	-136.26122	-136.02348	-135.90289			
Habitat Classification	High	Moderate-M	High	High	High	High	Area of special consideration			
Water Quality Objective (mg/L)	25	50	25	25	25	25	25			
Date of Sampling										
	No samples exceeded the Water Quality Objectives									
Total Seasonal Average TSS (mg/L) by site	5.2					1.0				
Number of days sampled	3					4				

Legend: Not continuously monitored

Water Samples that are: Above / Below the Water Quality Objective