



Fish Habitat Management System for Yukon Placer Mining

Water Quality Objectives Monitoring Report (2008)

Prepared by

**The Yukon Placer
Water Quality Working Group**

June 2009

WATER QUALITY OBJECTIVES MONITORING REPORT (2008)

The water quality objectives monitoring program is governed by the Water Quality Objectives Monitoring Protocol. The Protocol describes the locations, timing, frequency and methods employed during sampling, as well as the methods used to analyze sampling data. Precipitation data was collected from a variety of sources to assist in the interpretation of results.

The water quality objectives monitoring program relies upon both continuous sampling and grab sampling. Continuous sampling is performed by automated instruments that pump water from the creek or river at a preset volume and at precise times each day. Grab samples are taken by personnel at a selected location, depth and time. Normally the quantity of water taken is sufficient for all the physical and chemical analyses that will be done on the sample. Grab sampling is also performed during sampling “blitzes”, when single grab samples are collected from as many sites as possible within a short timeframe in order to get a snapshot of the water quality in a watershed over a 24 hour period.

It should be noted that with the exception of water use licenses issued after April 11, 2008, the new fish habitat management system did not result in reduced sediment discharge standards or stricter site management practices in 2008. Consequently, the water quality objectives monitoring results for 2008 are an assessment of the *status quo*, as opposed to the beneficial influence of the new rules for Yukon placer mining.

In 2008 water quality objectives were monitored in the following watersheds: Yukon River North, 40 Mile River, Klondike River, Indian River, 60 Mile River, Stewart River, McQuesten River, Mayo River, White River, Yukon River South, and Big Creek.

With specific exceptions, cases where the water quality objectives were exceeded in 2008 can likely be attributed to rain fall, either localized or basin-wide. This increased the amount of surface runoff and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters.

Increases in the volume of sediment laden ground and surface water entering the system added to the amount of sediment in the monitored watercourses. The ability of the receiving waters to dilute these inputs of sediment was negated by the re-suspension of streambed material and by the further erosion of stream banks that occurs with the increased flows that are generated by these rain events. These events lead to an increase in total suspended solids concentration and a decrease in water quality.

A more detailed description of the monitoring results for watersheds where the water quality objectives were exceeded is attached to this report. Results from monitored watersheds where the water quality was not exceeded are not included.

Hydrologic and Geomorphic Characteristics of the Big Creek Drainage Basin

Big Creek, a major tributary to the Yukon River, drains an area of approximately 1750 square kilometers and has an overall channel length of approximately 77 km. The drainage basin is located west-south-west of Minto and north-west of Carmacks.

Big Creek has its headwaters in the Dawson Range and eventually drains into the Yukon River below the old town site of Minto. There are several areas of exposed bedrock forming high rock bluffs along the creek. Above the WSC gauging station, the creek is entrenched within a narrow valley, while below the gauging station the creek flows through a low flat area before entering the Yukon River. The creek banks are generally lined with spruce, willows and poplars. Most of the creek flows over a bed of coarse gravel, underlain by shallow bedrock. There has been very little channel migration evident along the lower portion of the creek, below the confluence with Seymour Creek, but above this point, Big Creek has been prone to heavy flooding and substantial migration has occurred.

The Water Survey of Canada (WSC) gauging station (09AH003) is located 9.7 km from the confluence of Big Creek with the Yukon River.

Topographical drainage Basin	1750 Sq. Kilometers
Area of Lakes	0%
Area of Forest	98%
Channel Length	77 Kilometers
Terrain	75% non-glaciated / 25% glaciated

In 2008, water samples were collected at 17 different sites in the Big Creek basin. Sampling commenced on June 10th, 2008 and a total of 448 samples were collected up until the end of the season on August 21st, 2008. A combination of automatic composite sampling and grab sampling methods were used in the basin.

Atmospheric data was collected using four portable weather stations; one located near the mouth of Big Creek, the second on upper Big Creek, another above all mining on Mechanic Creek and the last at the mouth of Seymour Creek

Basin total flow data was provided to us by the Water Survey of Canada station located near the mouth of Big Creek. Flow data for the individual tributaries to Big Creek 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.

In 2008, the effluent discharge standards for the Big Creek Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including Big Creek, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

Site Codes and Global Position of Water Quality Sampling Locations in the Big Creek Watershed

SITE CODE	LOCATION	LAT_Y	LONG_X
BC 01	Big Creek mouth	62.59901	-137.01318
BC 02	Big Creek u/s of Seymour Creek	62.35579	-137.17790
BC 02A	Big Creek u/s Happy Creek and d/s Boliden Creek	62.34543	-137.25592
BC 03	Big Creek d/s of Mechanic Creek and bridge	62.35129	-137.29741
BC 04	Upper Big Creek u/s Mechanic Creek	62.34840	-137.30298
BC 05	Upper Big Creek	62.37486	-137.38141
BC BOL 01	Boliden Creek mouth	62.34525	-137.25809
BC BOW 01	Bow Creek mouth	62.30600	-137.21629
BC HAP 01	Happy Creek mouth	62.34672	-137.23535
BC MEC 01	Mechanic Creek mouth	62.34764	-137.30185
BC MEC 02	Mechanic Creek above Gow's mining	62.34085	-137.31169
BC MEC 03	Mechanic Creek at road crossing to Hank Farr camp	62.33065	-137.31941
BC MEC 04	Mechanic Creek Above All Mining (AAM)	62.32771	-137.32123
BC REV 01	Revenue Creek mouth	62.34504	-137.27414
BC REV 02	Revenue Creek above Whirlwind Creek	62.33569	-137.27481
BC SEY 01	Seymour Creek mouth	62.35560	-137.17700
BC SEY 02	Seymour at road crossing	62.30057	-137.21416
BC SEY 03	Seymour Creek Above All Mining (AAM)	62.27880	-137.17442
BC WHI 01	Whirlwind Creek mouth	62.33558	-137.27507
BC WHI 02	Whirlwind Creek Above All Mining (AAM)	62.33235	-137.28101

Water Quality Objective monitoring, Big Creek Watershed – Summary

Between 1998 and 2000, this basin was extensively monitored, providing us with a vast amount of baseline information at the time. Placer activities in this watershed have recently increased. Due to the greater interest in the area, and recent changes in mining locations and levels of activity, the Big Creek Watershed was designated a ‘*major*’ watershed for monitoring in 2008. This meant that a major proportion of our monitoring efforts were spent in the basin, that more than one third of our monitoring equipment inventory was deployed in the Big Creek area, and that our seasonal monitoring schedule included many repeat visits throughout the season.

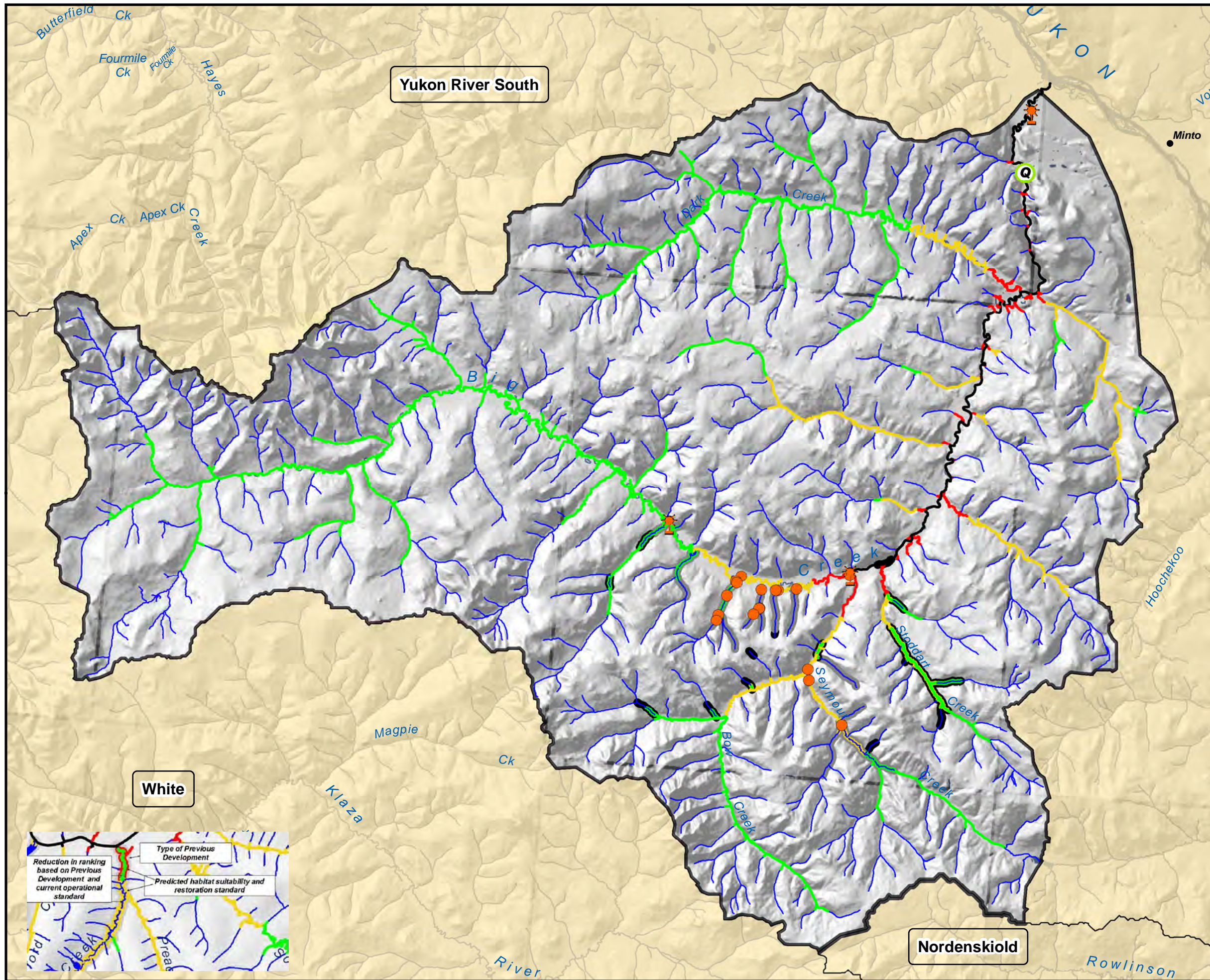
A total of eight, automatic water sampling stations were set up and maintained from June 10th until shutdown on August 21st as well as four portable weather monitoring stations. From the data obtained by these instruments and through on site visits and sampling conducted by CS&I staff, the following observations regarding the water quality in the basin can be made:

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 environmental conditions and the volume of solids in the water was observed.

In all cases, rain fall, either as localised events or basin wide occurrences, increased the amount of surface run off and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. These increases occurred simultaneously at the time of the rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in the volume of sediment laden ground and surface water entering the system add to the amount of sediment in the water course. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

All of these factors; precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, lead to an increase in suspended solids concentrations and a decrease in water quality.



Water Quality Objective Monitoring Sites Big Creek Watershed (Category A)

- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
 - Energy, Mines and Resources Sampling Site
 - Water Survey of Canada Station Flow Station
 - Highways & Public Works Weather Station

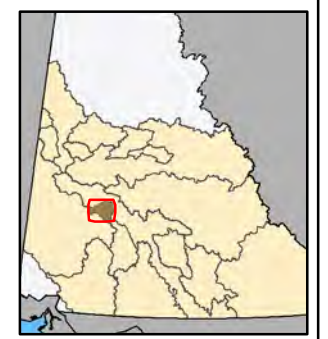
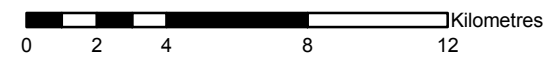
- Stream Reach Classification**
- Water Quality
 - Freshwater Fisheries Production Zone
 - Moderate-Low Suitability
 - Moderate-Moderate Suitability
 - Moderate-High Suitability
 - Chinook Salmon Production
 - Areas of Special Consideration (Ecological)
 - Areas of Special Consideration (Cultural)

- Development**
- Current
 - Historical
 - Extensive



This map is provided to depict the location of water quality and weather monitoring sites in relation to streams classified using the Yukon Habitat Suitability Model, and is not intended for any other use. Under no circumstances will the Government of Canada, or Yukon Government be liable to any person or business entity for any direct, indirect, special, incidental, consequential, or other damages based on any use of information contained on this map, including, without limitation, any lost profits, business interruption, or loss of information.

Map Compiled: May 30, 2008



The Forty Mile River Watershed

The Forty Mile River, a tributary to the Yukon River, drains an area of approximately 16,600 square kilometres and has an overall channel length of approximately 97 km. The drainage basin is located 96 km north west of Dawson.

In 2008, water samples were collected at 5 different sites in the Forty Mile River basin. The site upstream of Marten Creek was not accessible at the time of sampling. Sampling commenced on May 24th, 2008 and a total of 15 samples were collected up until the end of the season on August 21st, 2008. A grab sampling method was used in the basin

Flow data for the individual tributaries to the Forty Mile 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.

In 2008, the effluent discharge standards for the Forty Mile River Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the Forty Mile, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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

SITE CODE	LOCATION	LAT_Y	LONG_X
40M 01	Forty Mile River mouth	64.42394	-140.55965
40M 02	Forty Mile Creek u/s Clinton Creek	64.36924	-140.73253
40M 03	Forty Mile River u/s Marten Creek	64.35772	-140.79825
40M 04	Forty Mile River Above All Mining (AAM)	64.32178	-140.93283
40M CLI 01	Clinton Creek mouth	64.40357	-140.59813
40M MAR 01	Marten Creek mouth	64.35361	-140.81006

Water Quality Objective monitoring, Yukon River North Watershed – Summary

The overall water quality in the basin, met the objectives set under the *Fish Habitat Management System* throughout the monitoring season. None of the 15 samples collected exceeded the Water Quality Objectives.





**The Fish Habitat Management System - Forty Mile River Watershed (Category B)
Sample Results that Exceed Water Quality Objectives for 2008**

Sampling Station	40M 01	40M CLI 01	40M 02	40M 03	40M 04	Other	Other	Other	Other	Other
Location Description	Mouth	Mouth	u/s 40M CLI 01	u/s 40M MAR 01	AAM					
Sample Type	Grab	Grab	Grab	Grab	Grab					
Lat Y	64.42394	64.40357	64.36924	64.35772	64.32178					
Long X	-140.55965	-140.59813	-140.73253	-140.79825	-140.93283					
Habitat Classification	Area of special consideration	Area of special consideration	Area of special consideration	Area of special consideration	Area of special consideration					
Water Quality Objective (mg/L)	100	100	100	100	100					
Date of Sampling										
	No samples exceeded the Water Quality Objectives									
Total Seasonal Average TSS (mg/L) by site	7.5	1.8	7.5		10.1					
Number of days sampled	4	3	3	0	3					

Legend Not continuously monitored
Water Samples that are: Above / Below the Water Quality Objectives

Water Quality Objective Monitoring Sites Forty Mile River Watershed (Category B)




Monitoring Sites

-  Energy, Mines and Resources Weather Station and Sampling Site
-  Energy, Mines and Resources Sampling Site
-  Water Survey of Canada Station Flow Station
-  Highways & Public Works Weather Station

Stream Reach Classification

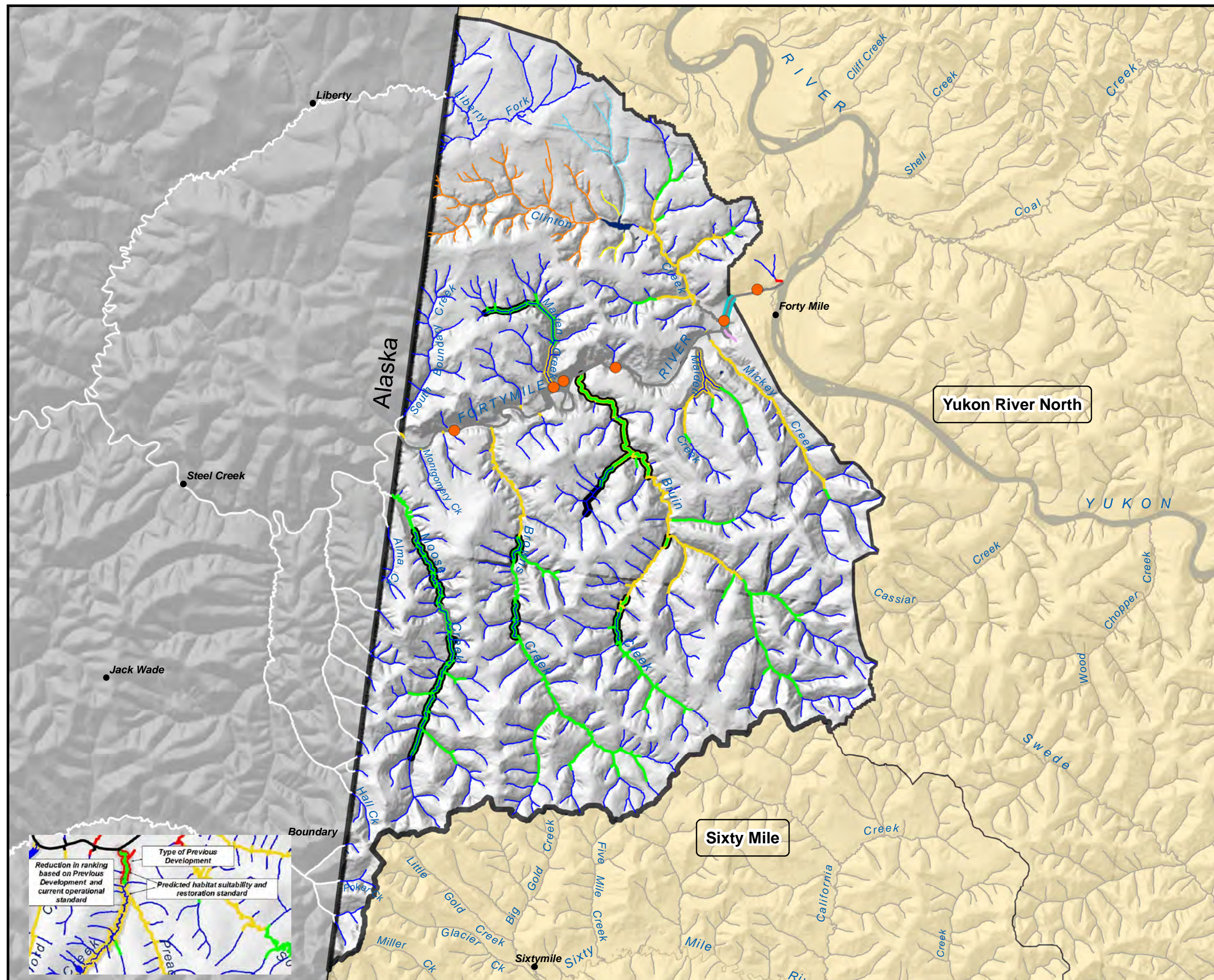
-  Water Quality
-  Freshwater Fisheries Production Zone
-  Moderate-Low Suitability
-  Moderate-Moderate Suitability
-  Moderate-High Suitability
-  Chinook Salmon Production
-  Areas of Special Consideration (Ecological)
-  Areas of Special Consideration (Cultural)

Development

-  Current
-  Historical
-  Extensive

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Map Compiled: May 30, 2008



Hydrologic and Geomorphic Characteristics of the Indian River Drainage Basin

The Indian River, a major tributary to the Yukon River, drains an area of approximately 2220 square kilometers and has an overall channel length of approximately 120 km. The drainage basin is located 60 km south of Dawson.

Indian River, a gravel bed stream, is a tributary of Yukon River. The Indian River basin lies within the Klondike Plateau, a gently sloping upland south of Tintina Trench consisting of accordant summits (e.g., King Solomon Dome, Australia Mountain). The present flood plain descends about 53 m over a distance of 33 km with an overall gradient of about 1.6 m/km between the confluences of Dominion Creek and Ruby Creek.

The Water Survey of Canada (WSC) gauging station (09EB003) is located 1.5 km from the confluence of the Indian River with the Yukon River.

Topographical drainage Basin	2220 Sq. Kilometers
Area of Lakes	0%
Area of Forest	85%
Channel Length	120 Kilometers
Terrain	non-glaciated

In 2008, water samples were collected at 34 different sites in the Indian River basin. Sampling commenced on May 14th, 2008 and a total of 154 samples were collected up until the end of the season on August 25th, 2008. A combination of automatic composite sampling and grab sampling methods were used in the basin.

Atmospheric data was collected using two portable weather stations, one located near the mouth of the Indian River and the other located at a background site on the Indian River.

Basin total flow data was provided to us by the Water Survey of Canada station located near the mouth of the Indian River. Flow data for the individual tributaries to the Indian 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.

In 2008, the effluent discharge standards for the Indian River Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the Indian River, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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

SITE CODE	LOCATION	LAT_Y	LONG_X
IND 01	Indian River at mouth	63.77794	-139.70927
IND 02	Indian River u/s of Nine Mile Ck, d/s of Ophir Ck	63.77337	-139.34888
IND 03	Indian River d/s of Ruby Ceek	63.76852	-139.31589
IND 04	Indian River d/s of Quartz Ceek	63.74484	-139.15034
IND 05	Indian River d/s of Gimlex bridge	63.73735	-139.07439
IND 05A	Indian River d/s Montana Creek	63.69810	-138.97296
IND 06	Indian River d/s of Tamarack mine drain	63.69385	-138.93163
IND 07	Indian River u/s of Tamarack mine drain	63.64296	-138.87100
IND 08	Indian River at bridge over to Eureka (background)	63.61241	-138.72108
IND AUS 01	Australian Creek mouth	63.62037	-138.68327
IND DOM 01	Dominion Creek mouth u/s of Sulphur Ceek	63.62565	-138.69148
IND DOM 02	Gold Run Creek mouth	63.69152	-138.59724
IND DOM 03	Grant Pup Creek mouth	63.70445	-138.57770
IND DOM 04	Dominion Creek u/s Gold Run Ck, d/s Burnham Ck	63.71686	-138.54523
IND DOM 05	Burnham Creek mouth	63.72881	-138.52914
IND DOM 06	Dominion Creek u/s of Burnham, d/s Arkansas Ck	63.73349	-138.52496
IND DOM 07	Arkansas Creek mouth	63.74499	-138.51467
IND DOM 08	Kentucky Creek mouth	63.75940	-138.51349
IND DOM 09	Jensen Creek mouth	63.77149	-138.53495
IND DOM 10	Nevada Creek mouth	63.80472	-138.60658
IND DOM 11	Champion Pup Creek mouth	63.82743	-138.68361
IND DOM 12	Chapman Pup Creek mouth	63.83091	-138.69487
IND DOM 13	8 below Pup Creek mouth	63.83350	-138.71324
IND DOM 14	Troublesome Pup Creek mouth	63.83500	-138.74991
IND DOM 15	Almeda Pup Creek mouth	63.83905	-138.78414
IND DOM 16	Caribou Creek mouth	63.84294	-138.80054
IND DOM 17	Mummie Pup Creek mouth	63.85705	-138.85352
IND DOM 18	Lombard Pup Creek mouth	63.85677	-138.85347
IND EUR 01	Eureka Creek Below All Mining (BAM)	63.60483	-138.83099
IND MON 01	Montana Creek mouth	63.69810	-138.97296
IND NIN 01	Nine Mile Creek mouth	63.79533	-139.40988
IND QUA 01	Quartz Creek mouth	63.74271	-139.13976
IND QUA 02	Quartz Creek at dredge	63.75333	-139.12445
IND RUB 01	Ruby Creek mouth	63.76226	-139.29227
IND SUL 01	Sulphur Creek mouth u/s of Dominion Ck	63.63774	-138.68327
IND SUL 02	Sulphur Creek u/s of large culverts	63.65632	-138.67613
IND SUL 03	Sulphur Creek at Brimstone Gulch	63.74023	-138.84891
IND SUL 04	Sulphur Creek right fork headwaters	63.82285	-138.92863
IND TAM 01	Tamarack mine drain	63.64308	-138.87200

Water Quality Objective monitoring, Indian River Watershed – Summary

This basin has been extensively monitored for the past 5 years providing us with a vast amount of information regarding the state of the water quality in a historically mined watershed. The Indian River basin is a heavily diverse watershed, with vast areas of active mining as well as inactive, reclaimed and partially reclaimed, sections. Placer activities in this watershed have remained consistent over the last decade. Due to the great interest in the area, and recent changes in mining locations and levels of activity, the Indian River Watershed was once again designated a 'major' watershed for monitoring in 2008. This meant that a major proportion of our monitoring efforts were spent in the basin, and that our monitoring schedule included many repeat visits throughout the season.

One automatic water sampling station and two weather stations were set up and maintained from May 14th until shutdown on August 25th. From the data obtained by these instruments and through on site visits and sampling conducted by CS&I staff, the following observations regarding the water quality in the basin can be made:

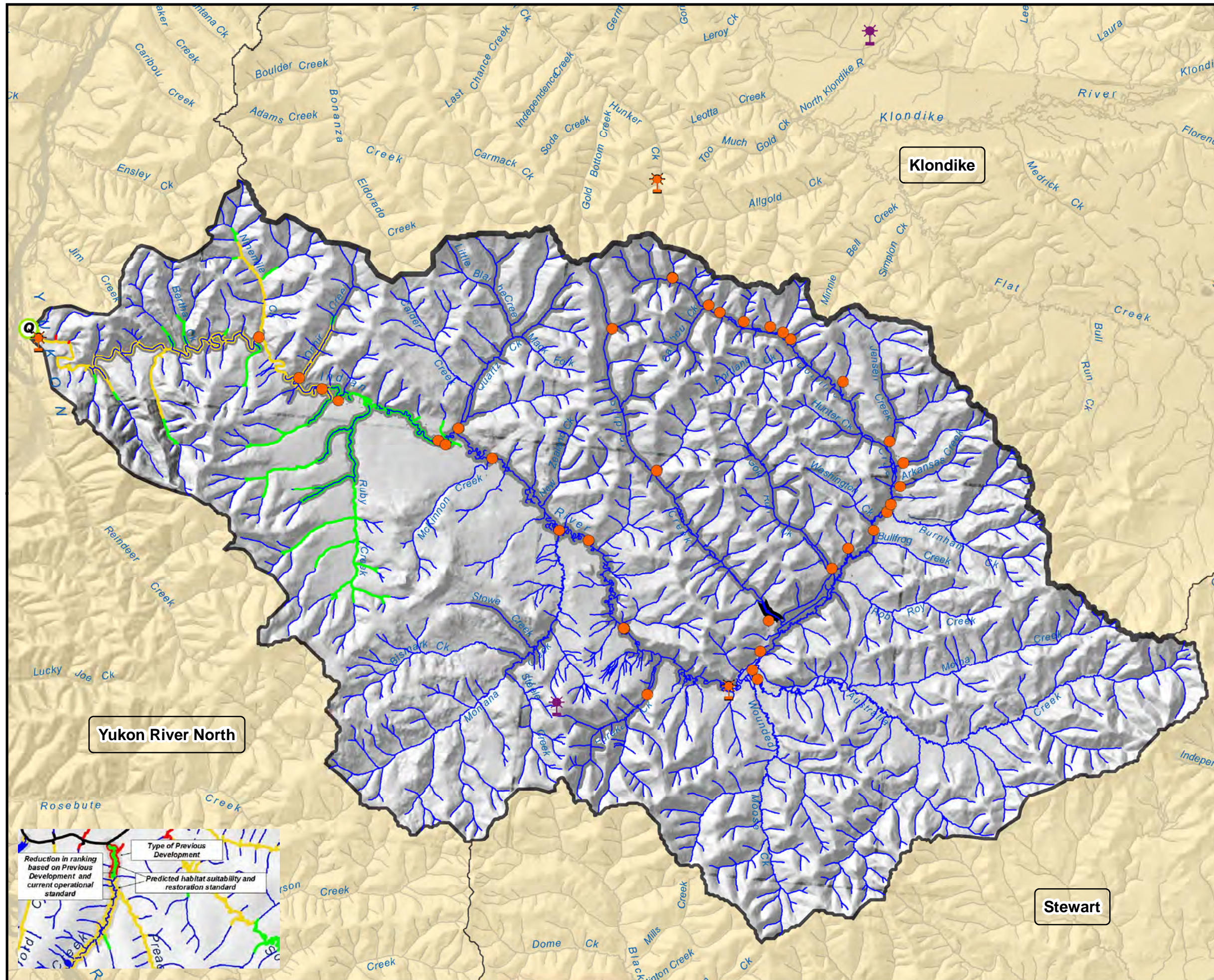
The overall water quality in the basin, met the minimum objectives set under the *Fish Habitat Management System* throughout the monitoring season. On those occasions when the WQO were not met and the Total Suspended Solids levels were greater than the objectives, there is a direct correlation to environmental conditions influencing the amount of solids concentrations in the water.

In all cases, rain fall, either as localised events or basin wide occurrences, increased the amount of surface run off and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. These increases occurred simultaneously at the time of the rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in sediment laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

All of these factors; precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, lead to an increase in suspended solids concentrations and a decrease in water quality.

Water Quality Objective Monitoring Sites Indian River Watershed (Category B)



- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
 - Energy, Mines and Resources Sampling Site
 - Water Survey of Canada Station Flow Station
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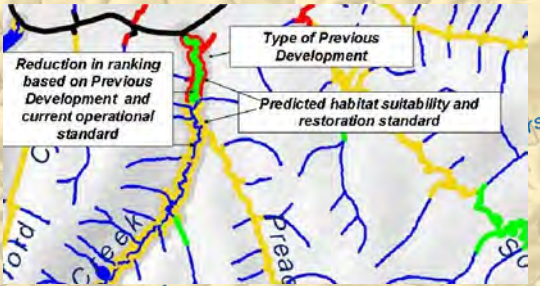
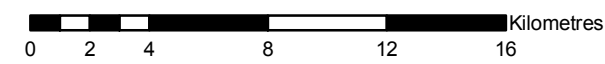
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 - Moderate-Low Suitability
 - Moderate-Moderate Suitability
 - Moderate-High Suitability
 - Chinook Salmon Production
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Map Compiled: May 30, 2008



Hydrologic and Geomorphic Characteristics of the Klondike River Drainage Basin

The Klondike River, a major tributary to the Yukon River, drains an area of approximately 7800 square kilometers and has an overall channel length, including the North Klondike River, of approximately 160 Km.

The North Klondike River, a tributary of the Klondike River, drains an area of approximately 1100 square kilometers. From its headwaters in the Ogilvie Mountains, the North Klondike flows in a southerly direction for approximately 75 kilometers until its confluence with the Klondike. It then flows west, down the valley as the Klondike for approximately 42 kilometers until it joins the Yukon River near Dawson.

The North Klondike, for its first 58 kilometers, flows through a narrow valley entrenched between high mountains. The remaining length of the river, all the way to the mouth of the Klondike, flows south through relatively flat topography. The banks of the river are stable with relatively little erosion except during flood periods.

Water Survey of Canada's gauging stations are located near the mouth of the north Klondike (09EA004, Km 9.5 Dempster Highway), and at the mouth of the Klondike River (09EA003) near Dawson.

North Klondike

Topographical drainage Basin	1100 Sq. Kilometers
Area of Lakes	<2%
Area of Forest	<44%
Channel Length	76.5 Kilometers
Terrain	glaciated

Klondike

Topographical drainage Basin	7800 Sq. Kilometers
Area of Lakes	<1%
Area of Forest	<30%
Channel Length	160 Kilometers
Terrain	Left Limit: non-glaciated Right Limit: glaciated

In 2008, water samples were collected at 37 different sites in the Klondike River basin. Sampling commenced on May 13th, 2008 and a total of 363 samples were collected up until the end of the season on August 26th, 2008. A combination of automatic composite sampling and grab sampling methods were used in the basin.

Atmospheric data was collected using two portable weather stations, one located near the mouth of Bonanza Creek, the other above all mining near the headwaters of Hunker Creek. Additional information was provided through the Yukon Government Community Services weather station at the Klondike Fire Center, located at the Dawson City Airport.

Basin total flow data was provided to us by the Water Survey of Canada station located near the mouth of the Klondike River. Flow data for the individual tributaries to the Klondike 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.

In 2008, the effluent discharge standards for the Klondike River Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the Klondike, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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

SITE CODE	LOCATION	LAT_Y	LONG_X
K 01	Klondike River at mouth	64.05348	-139.43961
K 02	Klondike River at bridge u/s of Bonanza Creek	64.08163	-139.40922
K 03	Klondike River at Marcel's Sauna	64.04693	-139.12772
K 04	Klondike River d/s of Goring Ck and u/s of Hunker Creek	64.05810	-139.03092
K 05	Klondike River at Dempster hwy	63.99030	-138.74612
K 06	Klondike River d/s of Too Much Gold Ck bridge	63.95778	-138.69030
K 07	Klondike River u/s of Too Much Gold Creek	63.95131	-138.66690
K 08	Klondike River at highway washout d/s of Flat Creek	63.95782	-138.69005
K ADAM 01	Adams Gulch Creek mouth	63.93412	-139.33099
K ALLG 01	All Gold Creek Below All Mining (BAM)	63.94263	-138.61734
K ELDO 01	Eldorado Creek mouth	63.91909	-139.31386
K ELDO 01A	Eldorado Creek Left Fork	63.86261	-139.24573
K ELDO 01B	Eldorado Creek Right Fork	63.86261	-139.24573
K ELDO 02	Eldorado Creek d/s of French Gulch	63.91267	-139.31483
K ELDO 03	Eldorado Creek u/s of French Creek	63.90855	-139.31382
K ELDO 04	Upper Eldorado Creek background	63.86187	-139.24578
K FLAT 01	Flat Creek Below All Mining (BAM)	64.02940	-139.17860
K FREN 01	French Gulch mouth	63.90865	-139.31442
K GOLDB 01	Gold bottom Creek mouth	63.96247	-138.96675
K LAST 01	Last Chance Creek mouth	64.01028	-139.09018
K TOO 01	Too Much Gold Creek mouth	63.95132	-138.66708
K VICT 01	Victoria Creek mouth	63.91262	-139.20933
KB 01	Bonanza Creek Below All Mining (BAM)	64.04054	-139.40814
KB 02	Lower Bonanza Creek (DFO site)	64.01295	-139.37022
KB 03	Lower Bonanza Creek d/s of bridge	63.97027	-139.35472
KB 04	Bonanza Creek d/s of Adams Gulch	63.93550	-139.32798

KB 05	Bonanza Creek u/s of Adams Gulch	63.93415	-139.32977
KB 07	Bonanza Creek d/s of Eldorado Creek	63.92047	-139.31600
KB 08	Upper Bonanza Creek u/s of Eldorado Creek	63.91963	-139.31329
KB 09	Upper Bonanza Creek u/s of Victoria Creek	63.91282	-139.20921
KH 01	Hunker Creek Below All Mining (BAM)	64.02943	-139.17859
KH 02	Hunker Creek d/s of Henry Gulch	64.02838	-139.17522
KH 04	Hunker Creek d/s of Last Chance Creek	64.01103	-139.08967
KH 05	Hunker Creek u/s of Last Chance Creek	64.01015	-139.09148
KH 06	Hunker Creek d/s of Gold bottom Creek	63.96833	-138.97324
KH 08	Hunker Creek u/s of Gold bottom Creek	63.96833	-138.97324
KH 09	Hunker Creek Above All Mining (AAM) left fork	63.91105	-138.88522
KH 10	Hunker Creek Above All Mining (AAM) right fork	63.89025	-138.92522
KH 11	Hunker Creek Above All Mining (AAM), d/s of forks	63.91319	-138.88727

Water Quality Objective monitoring, Klondike River Watershed – Summary

Because of extensive monitoring activities conducted in this watershed between 2004 and 2007 which provided vast amounts of data for comparative purposes, and due to large number of both active and historic mines in the drainage area, the Klondike River Watershed was once again designated a ‘major’ watershed for monitoring in 2008.

Two automatic water sampling stations were set up and maintained from May 13th until shutdown on August 26th as well as two portable weather monitoring stations. Water sampling sites in the Klondike received multiple visits during the monitoring season due to their close proximity to Dawson and their location along the access route to the Indian River Watershed.

From the data obtained by these instruments and through on site visits and sampling conducted by CS&I staff, the following observations regarding the water quality in the basin can be made:

The water quality objectives, set under the *Fish Habitat Management System*, were not met at all sites throughout the 2008 monitoring season. On those occasions when the WQO were not met and the Total Suspended Solids levels were greater than the objectives, there is a direct correlation to environmental conditions influencing the amount of solids concentrations in the water.

In all cases, rain fall, either as localised events or basin wide occurrences, increased the amount of surface run off and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. These increases occurred simultaneously at the time of the rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in sediment laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

All of these factors; precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, lead to an increase in suspended solids concentrations and a decrease in water quality.

The Fish Habitat Management System - Klondike River Watershed (Category A)
Sample Results that Exceed Water Quality Objectives for 2008

Sampling Station	K 01	KB 01	K 02	KH 01	K 04	K 05	K 06	K FLAT 01	Other	Other
Location Description	Mouth	BAM	u/s KB 01	BAM	u/s KH 01	at dempster hwy	u/s dempster hwy	Mouth		
Sample Type	Grab	Auto/Grab	Grab	Auto/Grab	Grab	Grab	Grab	Grab		
Lat Y	64.05348	64.04054	64.04237	64.02943	64.05810	63.99030	63.95778	63.94316		
Long X	-139.43961	-139.40814	-139.40956	-139.17859	-139.03092	-138.74612	-138.69030	-138.60188		
Habitat Classification	Area of special consideration	Moderate-L	Area of special consideration	Moderate-L	High	High	High	Moderate-L		
Water Quality Objective (mg/L)	25	80	25	80	25	25	25	80		
Date of Sampling										
05/27/08	25.7	7.8	24.6	14.6		25.6		4.3		
06/11/08		3.0		88.6						
07/01/08		968.8		12.8						
07/02/08		258.0		834.0						
07/03/08		56.3		157.4						
07/05/08		161.5		31.6						
07/06/08		3210.5								
07/07/08		1421.0								
07/08/08		520.5	520.3	3390.5		40.0	36.9	133.6		
07/09/08		110.9		2046.7	62.9					
07/11/08		45.4		177.5						
07/12/08		30.6		150.0						
07/13/08		16.1		80.8						
07/17/08		2199.0		42.7						
07/18/08		1944.5		2528.0						
07/19/08		467.5		2336.5						
07/20/08		698.3		987.0						
07/21/08		341.0		865.5						
07/22/08		148.8		451.0						
07/23/08		268.8		499.5						
07/24/08		183.3		848.8						
07/25/08		161.0		416.5						
07/26/08		95.3								
07/28/08		92.0		132.2						
07/29/08		333.6								
07/30/08	4.1	62.2	7.1	141.8		3.0		1.6		
07/31/08		45.3		232.5						
08/01/08		56.2		114.8						
08/02/08		29.8		82.2						
08/03/08		34.3		96.0						
08/04/08		27.0		124.2						
08/05/08		81.0		86.2						
08/07/08		63.5		92.2						
08/08/08		144.5		72.6						
08/09/08		84.3		571.7						
08/10/08		64.0		561.0						
08/11/08		63.3		148.5						
08/12/08		23.4		169.3						
08/13/08		29.3		96.3						
08/14/08		162.0		82.3						

Water Quality Objective Monitoring Sites Klondike River Watershed Overview (Category A)

Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- Chinook Salmon Production
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)

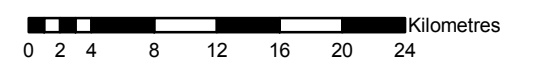
Development

- Current
- Historical
- Extensive



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Map Compiled: May 30, 2008



Yukon River North

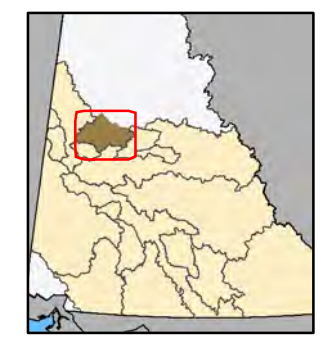
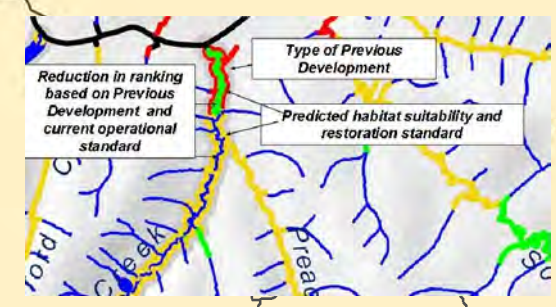
Watershed Based Authorizations Do Not Apply

Dawson City
Bear Creek
Rock Creek

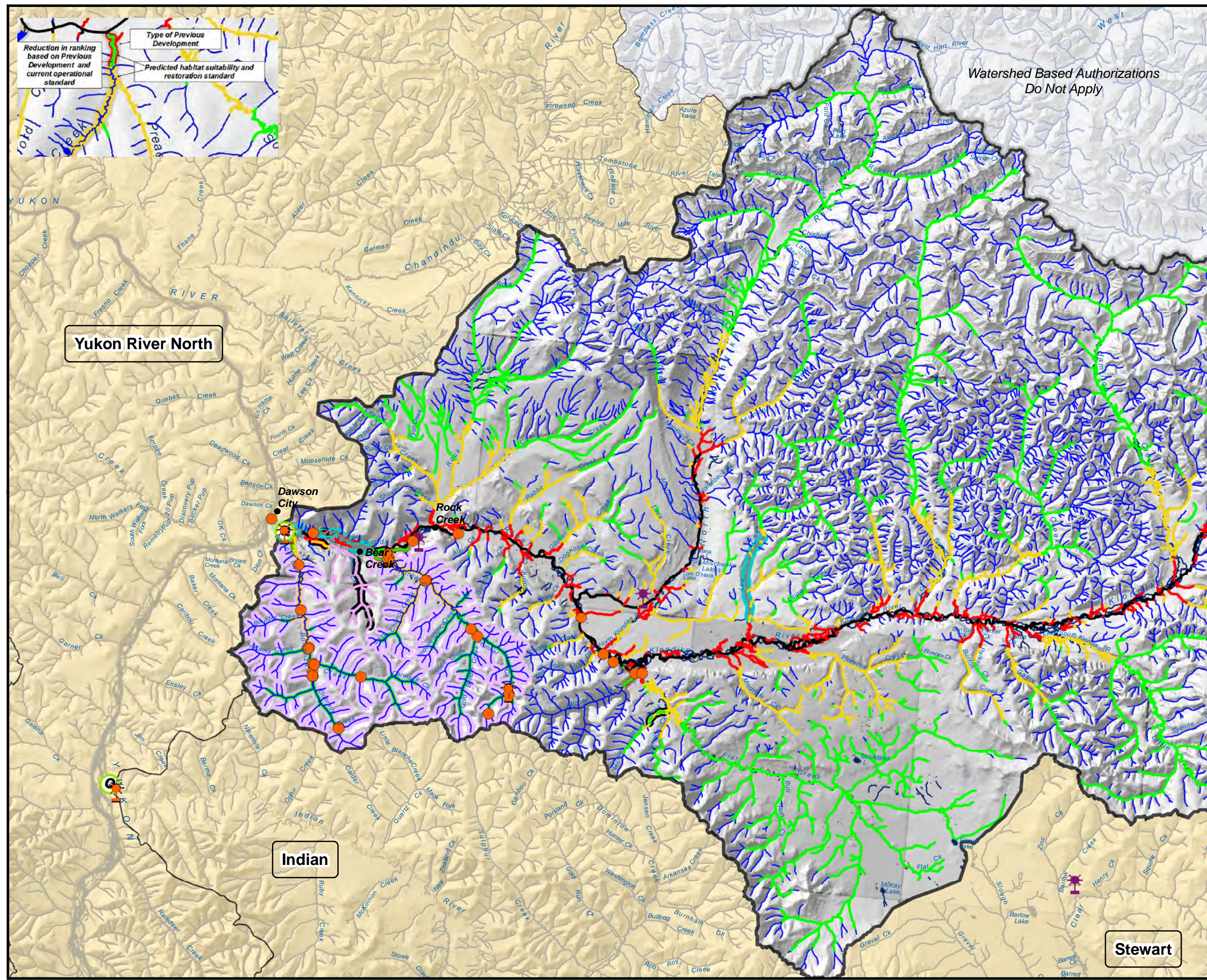
Indian

McQuesten

Stewart



Water Quality Objective Monitoring Sites Klondike River Watershed Map 1 of 2 (Category A)



Reduction in ranking based on Previous Development and current operational standard

Type of Previous Development

Predicted habitat suitability and restoration standard

Watershed Based Authorizations Do Not Apply

Yukon River North

Indian

Stewart

- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
 - Energy, Mines and Resources Sampling Site
 - Water Survey of Canada Station Flow Station
 - Highways & Public Works Weather Station

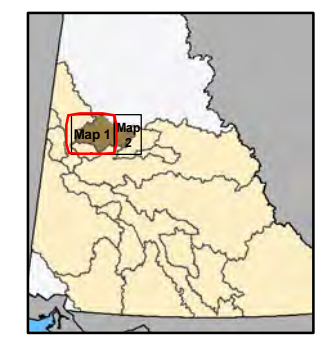
- Stream Reach Classification**
- Water Quality
 - Freshwater Fisheries Production Zone
 - Moderate-Low Suitability
 - Moderate-Moderate Suitability
 - Moderate-High Suitability
 - Chinook Salmon Production
 - Areas of Special Consideration (Ecological)
 - Areas of Special Consideration (Cultural)

- Development**
- Current
 - Historical
 - Extensive



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Map Compiled: May 30, 2008



Mayo Lake Watershed

In 2008, water samples were collected at 6 different sites in the Mayo Lake basin. Sampling commenced on May 22nd, 2008 and a total of 96 samples were collected up until the end of the season on August 28th, 2008. A combination of automatic composite sampling and grab sampling methods were used in the basin.

Atmospheric data was collected using two portable weather stations, one located near the mouth of Highet Creek and the other near the mouth of Duncan Creek.

Basin total flow data was provided to us by the Yukon Energy station located at the Mayo Lake Outlet. Flow data for the individual tributaries to the Mayo 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.

In 2008, the effluent discharge standards for the Mayo Lake Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the Mayo, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

Site Codes and Global Position of Water Quality Sampling Locations in the Mayo Lake Watershed

SITE CODE	LOCATION	LAT_Y	LONG_X
M 01	Mayo River mouth	63.59297	-135.90965
M 04	Mayo River u/s Highet Creek	63.73728	-135.75497
M 06	Mayo River d/s bridge u/s Davidson	63.76857	-135.44739
M DCN 01	Duncan Creek Below All Mining (BAM)	63.78395	-135.50555
M DVN 01	Davidson Creek mouth	63.76793	-135.45035
M HIGH 01	Highet Creek mouth	63.72393	-136.07204
M MIN 01	Minto Creek mouth	63.70271	-135.87244

Water Quality Objective monitoring, Mayo Lake Watershed – Summary

Because of the low number of active operations in the area, the Mayo Lake Watershed was designated a '*minor*' watershed for monitoring in 2008. This meant that a limited amount of time and only a small proportion of our monitoring efforts were spent in the basin, and that only one automated water sampling station and one weather station from our available inventory was deployed in the area. From the analysis of the data obtained by these instruments and through on site visits and sampling conducted by CS&I staff, the following observations regarding the water quality in the basin can be made:

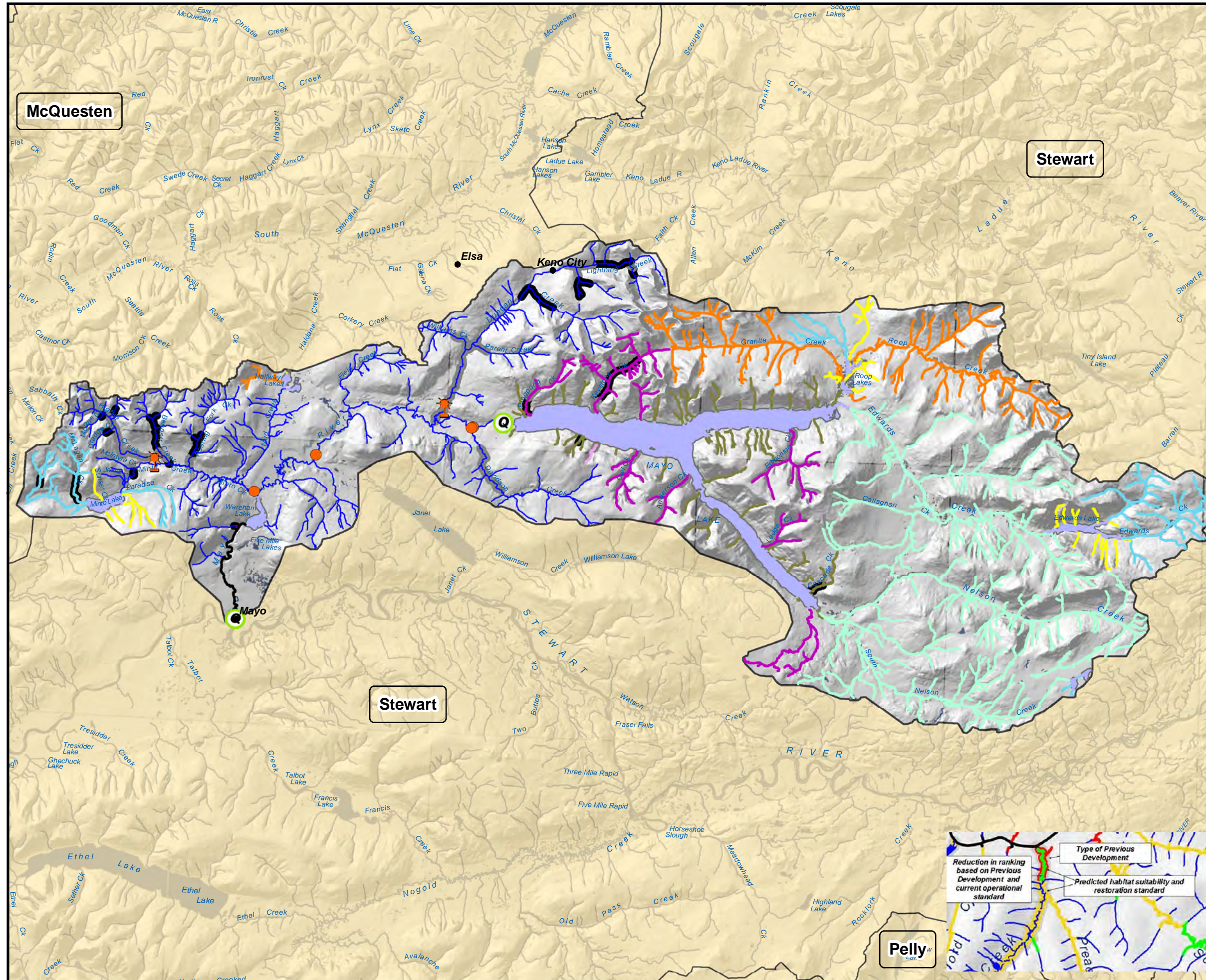
On average, the water quality in the basin, met the minimum objectives set under the *Fish Habitat Management System* throughout the monitoring season. On those occasions when the WQO were not met and the Total Suspended Solids levels were greater than the objectives, a direct correlation between environmental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

In all cases, rain fall, either as localised events or basin wide occurrences, increased the amount of surface run off and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. These increases occurred simultaneously at the time of the rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in the volume of sediment laden ground and surface water entering the system add to the amount of sediment in the water course. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

All of these factors; precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, lead to an increase in suspended solids concentrations and a decrease in water quality.

Water Quality Objective Monitoring Sites Mayo Lake Watershed (Category B)



Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- Chinook Salmon Production
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)

Development

- Current
- Historical
- Extensive

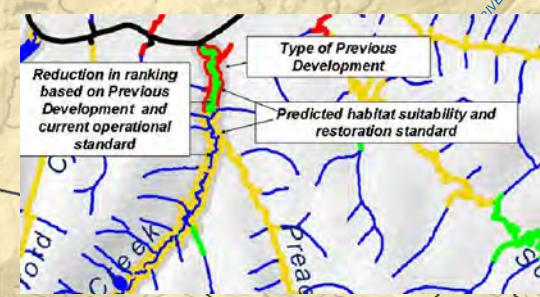
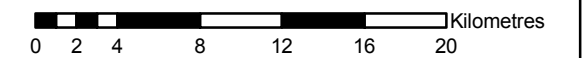
Tributary to Lake Score:

- Small Tributary to Small Lake Trout Lake
- Medium Tributary to Small Lake Trout Lake
- Large Tributary to Small Lake Trout Lake
- Small Tributary to Large Lake Trout Lake
- Medium Tributary to Large Lake Trout Lake
- Large Tributary to Large Lake Trout Lake
- Lakes



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Map Compiled: May 30, 2008



McQuesten River Watershed

In 2008, water samples were collected at 12 different sites in the McQuesten River basin. Sampling commenced on May 21st, 2008 and a total of 44 samples were collected up until the end of the season on June 24th, 2008. A combination of automatic composite sampling and grab sampling methods were used in the basin.

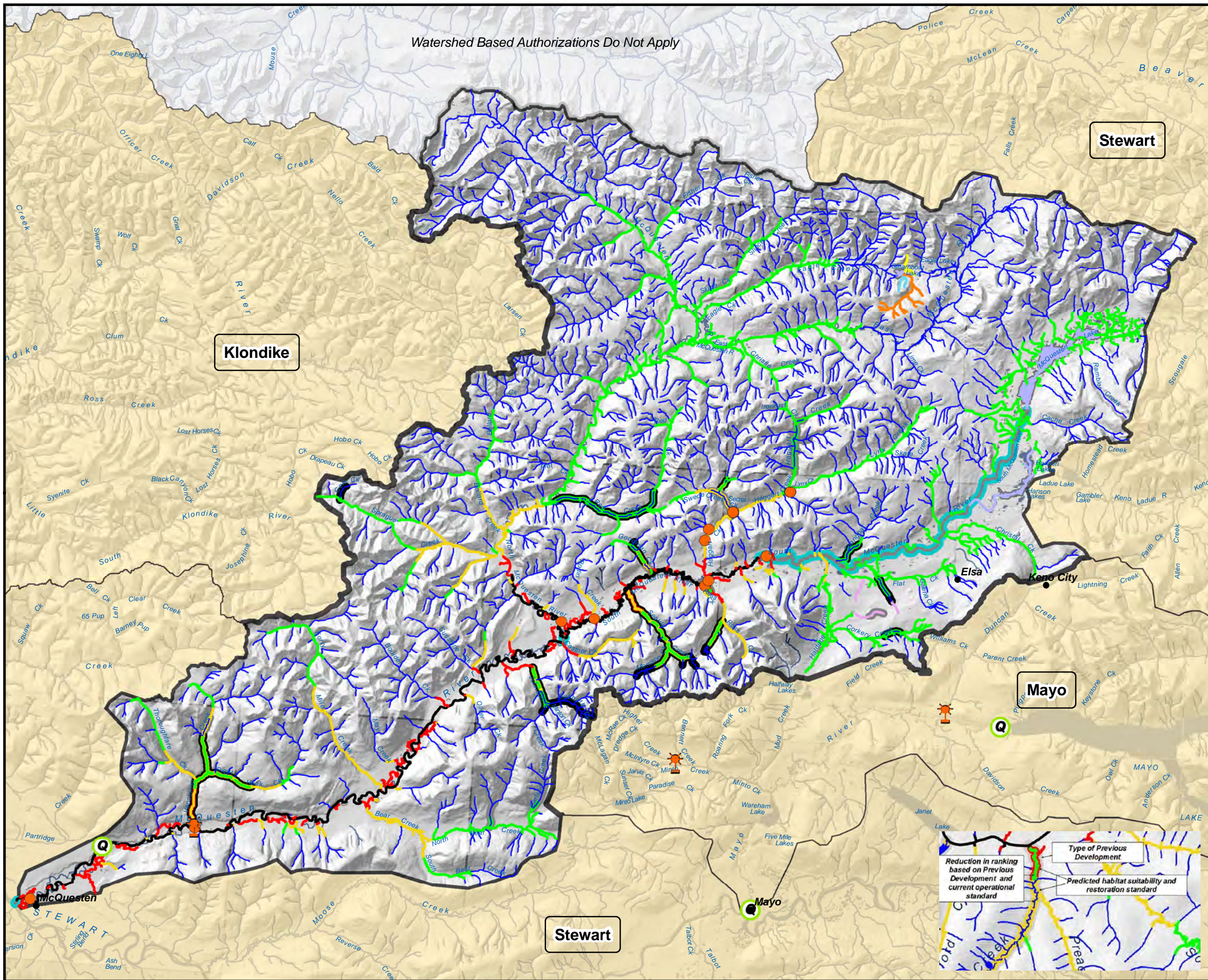
Atmospheric data was collected using a portable weather stations located near the mouth of Vancouver Creek.

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.

In 2008, the effluent discharge standards for the McQuesten River Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the McQuesten, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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 u/s Murphy's Pup 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 Sites McQuesten River Watershed (Category A)

Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- Chinook Salmon Production
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)

Development

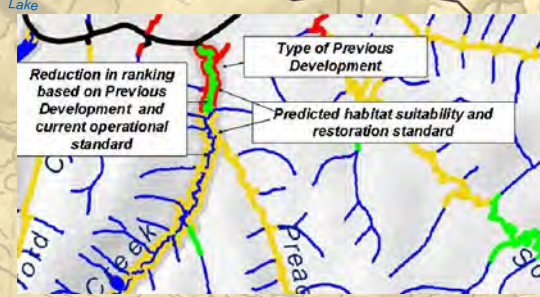
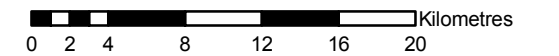
- Current
- Historical
- Extensive

Tributary to Lake Score:

- Small Tributary to Small Lake Trout Lake
- Medium Tributary to Small Lake Trout Lake
- Large Tributary to Small Lake Trout Lake
- Small Tributary to Large Lake Trout Lake
- Medium Tributary to Large Lake Trout Lake
- Large Tributary to Large Lake Trout Lake
- Lakes

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Map Compiled: May 30, 2008



Yukon
Energy, Mines and Resources

YUKON
PLACER
SECRETARIAT



Sixty Mile River Watershed

This basin has been extensively monitored for the past 5 years providing us with a vast amount of information regarding the state of the water quality in a historically mined watershed. The Sixty Mile River basin is a heavily diverse watershed, with vast areas of active mining as well as inactive, reclaimed and partially reclaimed, sections. Placer gold was discovered in the Sixty mile River area in 1892 by C. Miller. The principal creeks mined were Miller, Glacier, Big Gold, Little Gold and Bedrock creeks. In 1915 and 1916, the North American Trading and Transportation Co. dredged near the mouth of Miller Creek.

The dredge was refurbished by the Holbrook Dredging Co., which mined in the Sixty mile Valley below Miller Creek between 1929 and 1941. A new dredge was constructed by Yukon Exploration and Yukon Placer Mining Co., which mined the lower reaches of Glacier and Big Gold Creeks and part of the Sixty Mile River from 1947 to 1959. Mining in the basin still continues to date and has been very active over the last decade.

In 2008, water samples were collected at 16 different sites in the Sixty Mile River basin. Sampling commenced on May 24th, 2008 and a total of 86 samples were collected up until the end of the season on August 27th, 2008. A combination of automatic composite sampling and grab sampling methods were used in the basin.

Atmospheric data was collected using two portable weather stations, one located near the mouth of the Sixty Mile River, the other on the Upper Sixty Mile River downstream of Miller Creek.

Basin total flow data was provided to us by the Water Survey of Canada station located near the mouth of the Sixty Mile River. Flow data for the individual tributaries to the Sixty Mile 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.

In 2008, the effluent discharge standards for the Sixty Mile River Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the Sixty Mile, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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

SITE CODE	LOCATION	LAT_Y	LONG_X
60M 01	Sixty Mile River at Mouth	63.54735	-139.79333
60M 01A	Sixty Mile River d/s Twenty Mile Creek	63.60892	-140.03517
60M 02	Lower Sixty Mile River u/s of Water Survey Station	63.69286	-140.16948
60M 02A	Sixty Mile River u/s confluence with Matson Creek	63.71880	-140.19047
60M 03	Sixty Mile River u/s of Fifty Mile Creek	63.79314	-140.19731
60M 04	Sixty Mile River d/s of California Creek	64.02219	-140.34203
60M 05	Sixty Mile River d/s of Eldorado Placers	64.03903	-140.61754
60M 06	Sixty Mile River d/s of Big Gold Creek	64.01604	-140.69462
60M 07	Sixty Mile River u/s of Big Gold Creek	64.01576	-140.69718
60M 08	Sixty Mile River d/s Miller Creek	63.98712	-140.78941
60M 09	Sixty Mile River u/s Miller Creek	63.98687	-140.79218
60M 10	Sixty Mile River d/s of Bedrock Ceek	63.96442	-140.85784
60M 11	Sixty Mile River Above All Mining (AAM)	63.96247	-140.86173
60M BED 01	Bedrock Creek mouth	63.96424	-140.86285
60M BIG 01	Big Gold Creek mouth	64.01657	-140.69893
60M BIG 02	Big Gold Creek u/s of confluence with Glacier Creek	64.02708	-140.74985
60M CAL 01	California Creek mouth	64.02017	-140.35150
60M FIF 01	Fifty Mile Creek mouth	63.79360	-140.20285
60M GLA 01	Glacier Creek mouth	64.01418	-140.72046
60M GLA 02	Glacier Creek at road crossing	64.02293	-140.74994
60M MAT 01	Matson Creek mouth	63.71928	-140.19861
60M MAT 02	Upper Matson Creek	63.70507	-140.29218
60M MIL 01	Miller Creek mouth	63.98746	-140.79268
60M TEN 01	Ten Mile Creek mouth	63.54755	-139.79327
60M TWEL 01	Twelve Mile Creek mouth	63.60890	-140.03750
60M TWEN 01	Twenty Mile Creek mouth	63.60890	-140.03750

Water Quality Objective monitoring, Sixty Mile River Watershed – Summary

Due to the great interest in the area, and recent changes in mining locations and levels of activity, the Sixty Mile Watershed was once again designated a ‘major’ watershed for monitoring in 2008. This meant that a major proportion of our monitoring efforts were spent in the basin, and that our monitoring schedule included many repeat visits throughout the season.

One automatic water sampling station and two weather stations were set up and maintained from May 24th until shutdown on August 27th. From the data obtained by these instruments and through on site visits and sampling conducted by CS&I staff, the following observations regarding the water quality in the basin can be made:

The overall 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, there is a direct correlation to environmental conditions influencing the amount of solids concentrations in the water.

In all cases, rain fall, either as localised events or basin wide occurrences, increased the amount of surface run off and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. These increases occurred simultaneously at the time of the rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in sediment laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

All of these factors; precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, lead to an increase in suspended solids concentrations and a decrease in water quality.

Water Quality Objective Monitoring Sites Sixty Mile River Watershed (Category B)

- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
 - Energy, Mines and Resources Sampling Site
 - Water Survey of Canada Station Flow Station
 - Highways & Public Works Weather Station

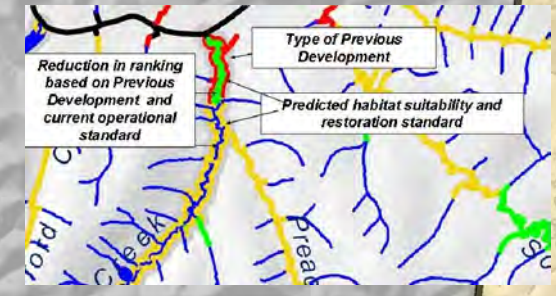
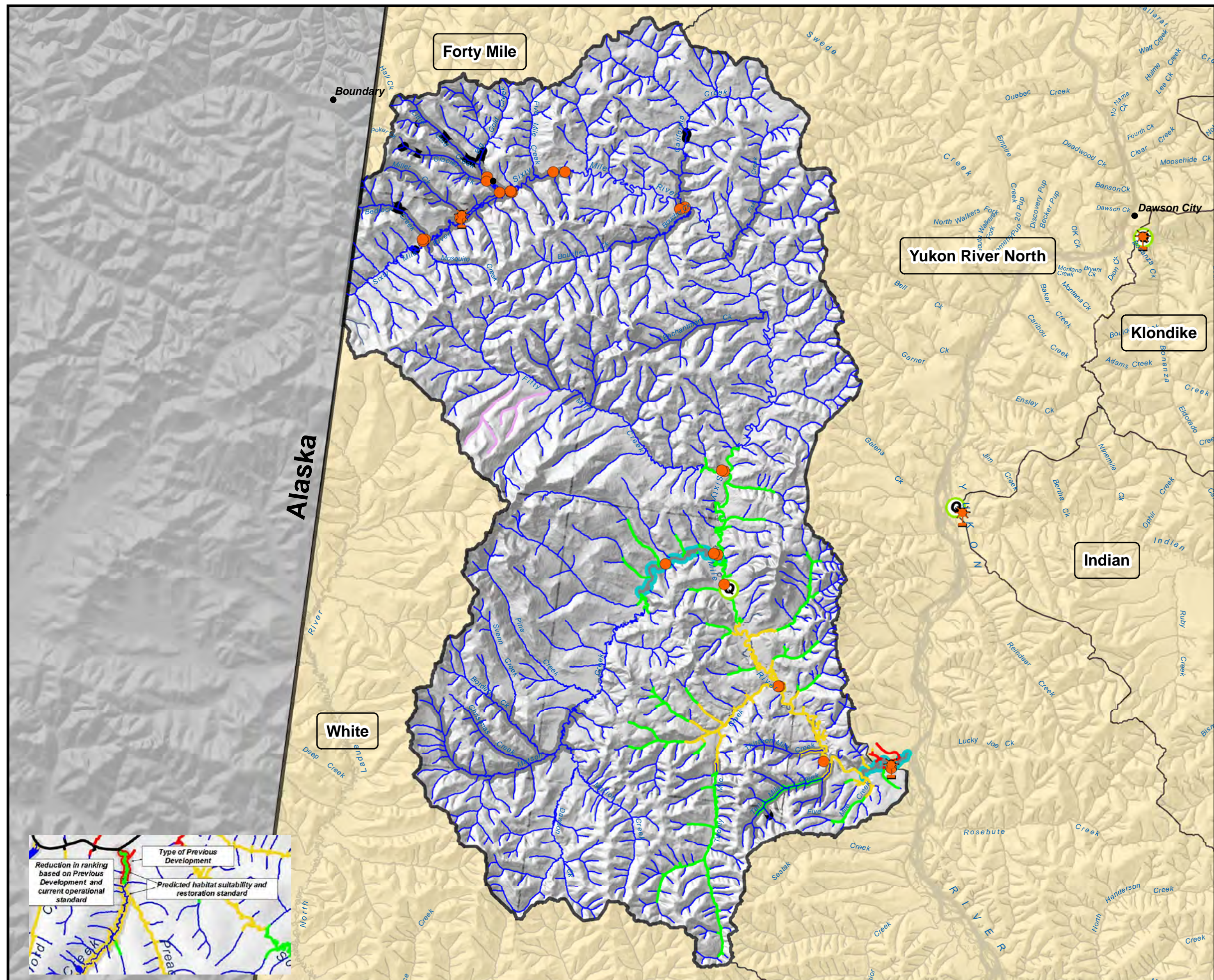
- Stream Reach Classification**
- Water Quality
 - Freshwater Fisheries Production Zone
 - Moderate-Low Suitability
 - Moderate-Moderate Suitability
 - Moderate-High Suitability
 - Chinook Salmon Production
 - Areas of Special Consideration (Ecological)
 - Areas of Special Consideration (Cultural)

- Development**
- Current
 - Historical
 - Extensive



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Map Compiled: May 30, 2008



Stewart River Watershed

The Stewart River, a major tributary to the Yukon River, drains an area of approximately 51,000 square kilometres and has an overall channel length of approximately 533 km. The Stewart River is one of the principal tributaries of the Yukon River, flowing more than 480 kilometres from its headwaters in the Mackenzie Mountains and joining the Yukon River 112 kilometres above Dawson City. The river is navigable for most of its length and is a transportation route for lead ore from its upper reaches. It was explored (1850) by Robert Campbell of the Hudson's Bay Company

In 2008, water samples were collected at 7 different sites in the Stewart River basin. Sampling commenced on June 22nd, 2008 and a total of 231 samples were collected up until the end of the season on August 28th, 2008. A combination of automatic composite sampling and grab sampling methods were used in the basin.

Atmospheric data was collected using a portable weather station located near the mouth of Clear Creek.

Basin total flow data was provided to us by the Water Survey of Canada station located near the mouth of the Stewart River. Flow data for the individual tributaries to the Stewart 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.

In 2008, the effluent discharge standards for the Stewart River Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the Stewart, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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

SITE CODE	LOCATION	LAT_Y	LONG_X
ST 06	Stewart River u/s Clear Creek	63.61183	-137.63992
ST 05	Stewart River u/s Maisy May Creek	63.23539	-138.81273
08-0729	unnamed LL trib for Stewart	63.20464	-138.82657
ST 04	Stewart River u/s Scroggie Creek	63.19949	-138.85118
ST 03	Stewart River u/s Barker Creek	63.18350	-138.90445
ST 02	Stewart River u/s Henderson Creek	63.35333	-139.46181
ST 01	Stewart River mouth	63.29113	-139.41042
ST BAR 01	Barker Ck Below All Mining BAM	63.17785	-138.89928
ST BLAC 01	Black Hills Creek Below All Mining (BAM)	63.32137	-138.76973

ST CLEA 01	Clear Creek	63.62825	-137.60947
ST CLEA 02	Clear CreeK u/s highway bridge	63.62825	-137.60947
ST MAIS 01	Maisy May Creek mouth	63.25449	-138.84766
ST SCR 01	Scroggie Creek mouth	63.18696	-138.83366

Water Quality Objective monitoring, Stewart River Watershed – Summary

The overall 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, there is a direct correlation to environmental conditions influencing the amount of solids concentrations in the water. Many large tributary rivers and streams flow into the catchment area of the Yukon River basin.

In all cases, rain fall, either as localized events or basin wide occurrences, increased the amount of surface run off and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. These increases occurred simultaneously at the time of the rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in sediment laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

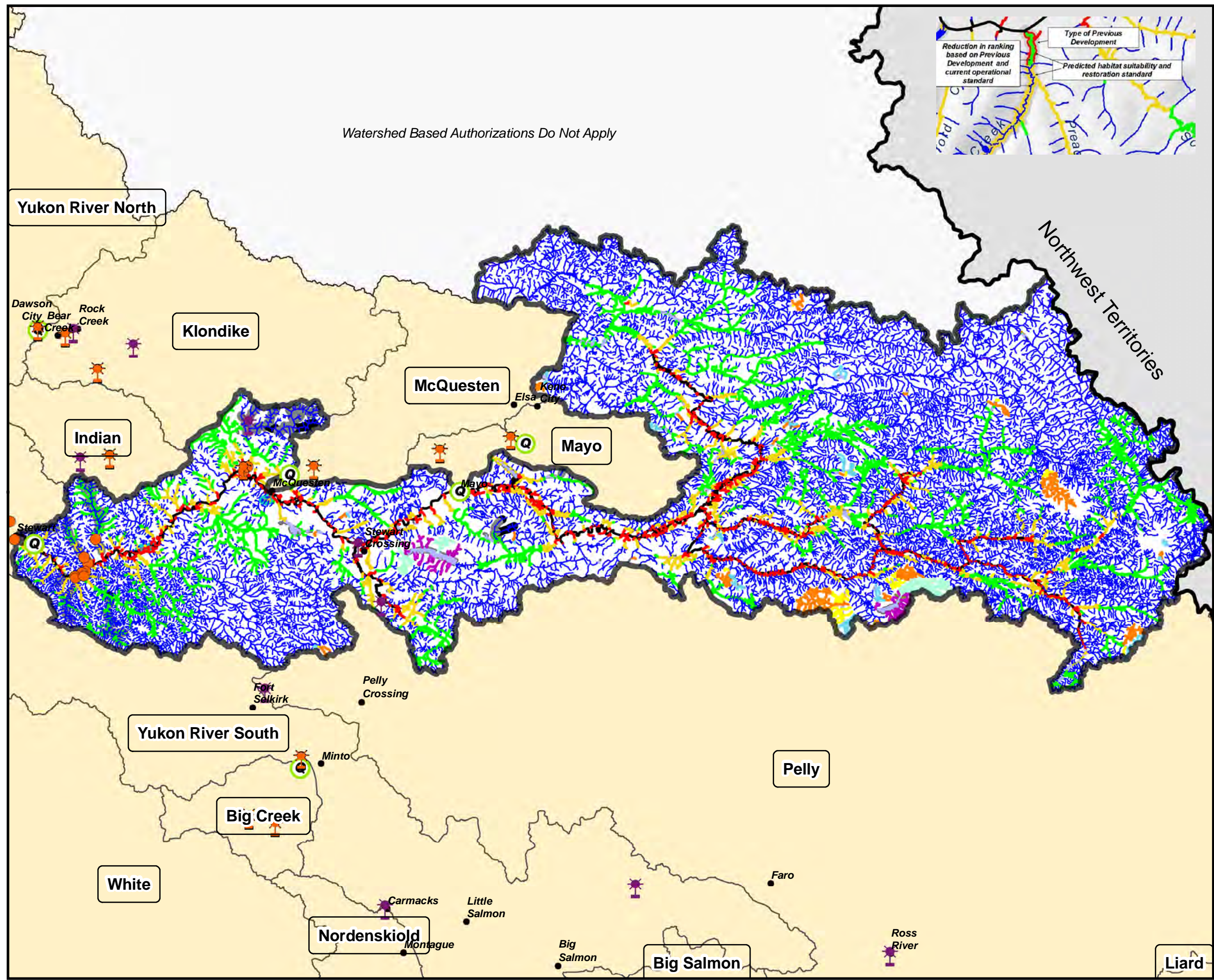
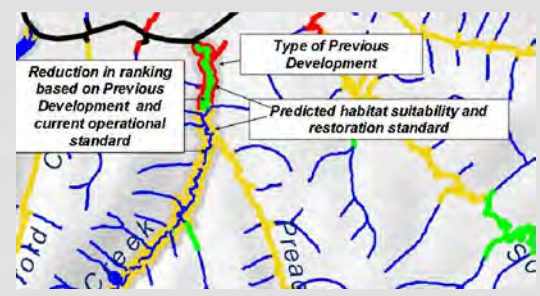
All of these factors; precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, lead to an increase in suspended solids concentrations and a decrease in water quality.

The Fish Habitat Management System -Stewart River Watershed (Category A)
Sample Results that Exceed Water Quality Objectives for 2008

Sampling Station	ST 01	ST 02	ST BAR 01	ST 03	ST SCR 01	ST 04	ST CLEA 01	ST 06	Other	Other
Location Description	Mouth	u/s YN HEN 01	BAM	u/s ST BAR 01	Mouth	u/s ST SCR 01	Mouth	u/s ST CLEA 01		
Sample Type	Grab	Grab	Auto/Grab	Grab	Auto/Grab	Grab	Auto/Grab	Grab		
Lat Y	63.29113	63.35333	63.17785	63.18350	63.18696	63.19949	63.61630	63.61183		
Long X	-139.41042	-139.46181	-138.89928	-138.90445	-138.83366	-138.85118	-137.64114	-137.63992		
Habitat Classification	Moderate-H	Moderate-H	Moderate-L	High	Moderate-M	High	Moderate-H	High		
Water Quality Objective (mg/L)	25	25	80	25	50	25	25	25		
Date of Sampling										
07/02/08			2.0		3.4		273.4			
07/03/08			2.2		3.4		180.0			
07/04/08			2.0		5.2		32.0			
07/06/08			154.8		6.0		9.6			
07/07/08			479.0		28.0		112.6			
07/08/08			128.6		50.2		112.6			
07/09/08			148.8		22.6					
07/12/08			89.5		15.2		18.9			
07/20/08			372.0				34.8			
07/21/08			1538.3				249.1			
07/22/08			448.5				118.1			
07/23/08							30.6			
07/24/08			91.0				14.2			
07/30/08			837.0	22.6	11.8	18.5	5.5	19.5		
08/04/08			3095.0		3.8		2.4			
08/05/08	14.9		113.3				3.3			
08/06/08			163.5				11.0			
08/07/08			105.5				8.7			
08/08/08			1004.0				22.7			
08/09/08			1658.7				7.2			
08/10/08			986.0				1.8			
08/11/08			1348.0				3.7			
08/12/08			649.0				1.0			
08/13/08			1526.0				3.0			
08/14/08			1736.0				4.2			
08/15/08			1366.0				3.7			
08/16/08			3714.0				23.2			
08/17/08			1266.5				15.3			
08/18/08			1130.0				69.3			
08/19/08			416.5				38.3			
08/20/08			807.0		236.5		17.7			
08/21/08			318.0				11.8			
08/22/08	76.5		1272.0		240.3		4.9			
08/28/08			412.0				4.2			
Total Seasonal Average TSS (mg/L) by site	31.8	24.5	515.6	22.6	30.3	18.5	19.1	19.5		
Number of days sampled	4	1	54	1	24	1	60	1		

Legend Not continuously monitored
Water Samples that are: Above / Below the Water Quality Objective

Watershed Based Authorizations Do Not Apply



Water Quality Objective Monitoring Sites Stewart River Watershed Overview (Category A)

Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- Chinook Salmon Production
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)



Development

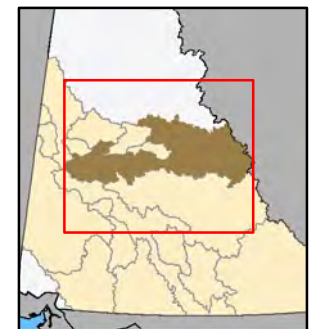
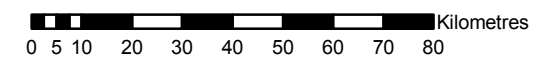
- Current
- Historical
- Extensive

Tributary to Lake Score:

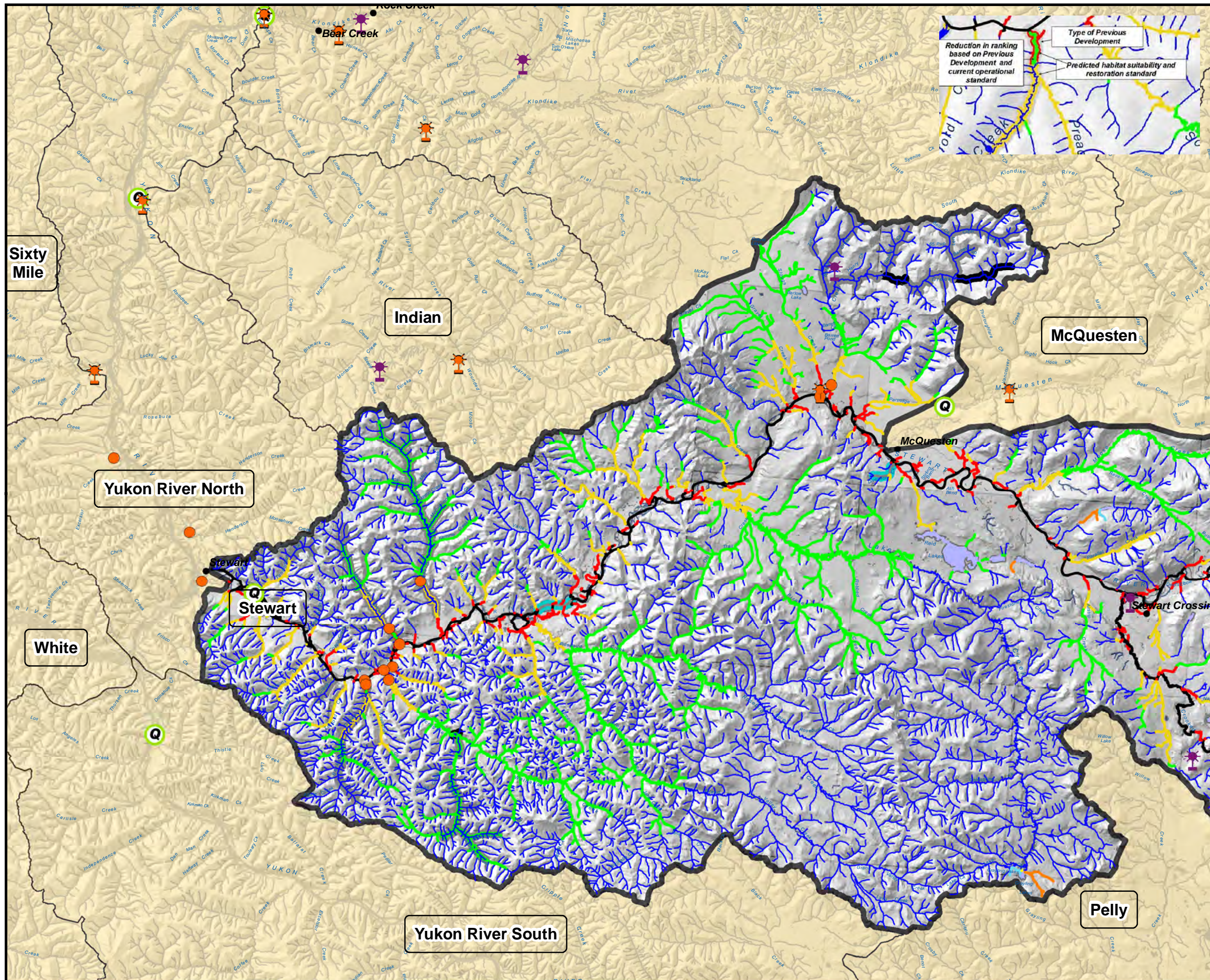
- Small Tributary to Small Lake Trout Lake
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- Large Tributary to Large Lake Trout Lake
- Lakes

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Map Compiled: May 30, 2008



Water Quality Objective Monitoring Sites Stewart River Watershed Map 1 of 7 (Category A)



Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- Chinook Salmon Production
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)

Development

- Current
- Historical
- Extensive

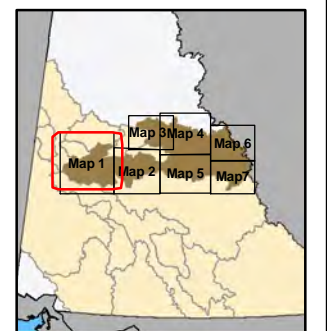
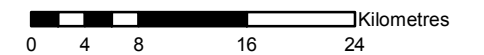
Tributary to Lake Score:

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- Medium Tributary to Small Lake Trout Lake
- Large Tributary to Small Lake Trout Lake
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- Medium Tributary to Large Lake Trout Lake
- Large Tributary to Large Lake Trout Lake
- Lakes



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Map Compiled: May 30, 2008



White River Watershed

The White River, with a drainage area of about 50,504 square kilometres, adds vast amounts of silt and sediment from glacier and mountain runoff to Yukon River. Many large tributary rivers and streams flow into the catchment area of the White River basin. The confluence of the White River with the Yukon River creates the point that delineates the Yukon River North from the Yukon River South

In 2008, while making routine inspections in the White River area, CS&I staff collected 9 grab samples for water quality monitoring at 7 different locations in the basin.

In 2008, the effluent discharge standards for the White River Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the White River, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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

SITE CODE	LOCATION	LAT_Y	LONG_X
W 01	White River mouth	63.19370	-139.59580
W ARC 01	Arch Creek mouth	61.49255	-139.72307
W BUR 01	Burwash Creek Below All Mining (BAM)	61.44270	-139.21507
W DISC 01	Discovery Creek Mouth	62.07384	-137.22852
W DISC 03	Discovery Creek Above All Mining (AAM)	62.07954	-137.18932
W DOLL 02	Dolly Creek Below All Mining (BAM)	62.06233	-137.22121
W DOLL 03	Dolly Creek Above All Mining (AAM)	62.06499	-137.21320
W DON 01	Donjek River at hwy bridge	61.67894	-139.75711
W DUK 01	Duke River	61.37777	-139.13460
W GLAD 01	Gladstone Creek mouth	61.31580	-138.64999
W NAN 01	Nansen Creek mouth	61.98049	-137.19904
W NAN 02	Nansen Creek Below All Mining (BAM)	61.98052	-137.19963
W NAN 03	Nansen Creek East fork Above All Mining (AAM)	62.09598	-137.19000
W NISL 02	Nisling River d/s of Klaza River	62.09641	-138.49236
W NISL 03	Nisling River d/s of Nansen Creek at class change	61.84616	-137.47952
W NISL 04	Nisling River u/s Nansen Creek	61.98049	-137.19904
W QUIL 01	Quill Creek Below All Mining (BAM)	61.50624	-139.33156
W SAN 01	Sanpete Creek mouth	62.08206	-140.76778
W SWJ 01	Swede Johnson Creek Below All Mining (BAM)	61.59196	-139.42787
W VIC 02	Victoria Creek left fork Below All Mining (BAM)	62.02619	-137.05630
W VIC 03	Victoria Creek left fork Above All Mining (AAM)	62.09759	-137.14679

Water Quality Objective monitoring, White River Watershed – Summary

The overall 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, there is a direct correlation to environmental conditions influencing the amount of solids concentrations in the water.

In all cases, rain fall, either as localised events or basin wide occurrences, increased the amount of surface run off and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. These increases occurred simultaneously at the time of the rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in sediment laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

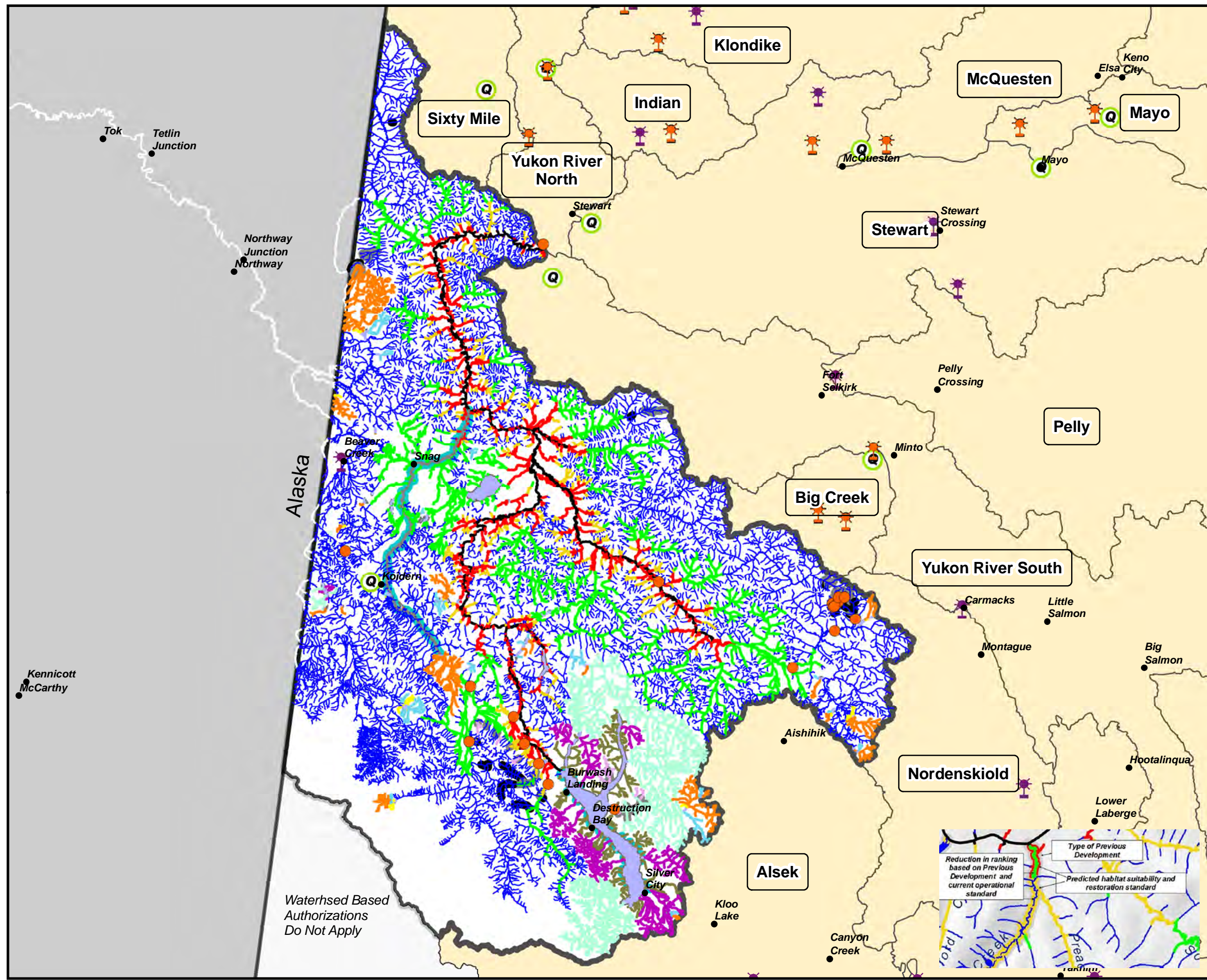
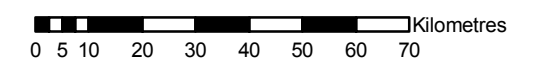
All of these factors; precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, lead to an increase in suspended solids concentrations and a decrease in water quality.

Water Quality Objective Monitoring Sites White River Watershed Overview (Category B)

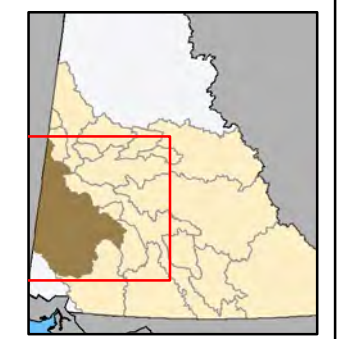
- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
 - Energy, Mines and Resources Sampling Site
 - Water Survey of Canada Station Flow Station
 - Highways & Public Works Weather Station
- Stream Reach Classification**
- Water Quality
 - Freshwater Fisheries Production Zone
 - Moderate-Low Suitability
 - Moderate-Moderate Suitability
 - Moderate-High Suitability
 - Chinook Salmon Production
 - Areas of Special Consideration (Ecological)
 - Areas of Special Consideration (Cultural)
- Development**
- Current
 - Historical
 - Extensive
- Tributary to Lake Score:**
- Small Tributary to Small Lake Trout Lake
 - Medium Tributary to Small Lake Trout Lake
 - Large Tributary to Small Lake Trout Lake
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Map Compiled: May 30, 2008



Waterhsed Based Authorizations Do Not Apply



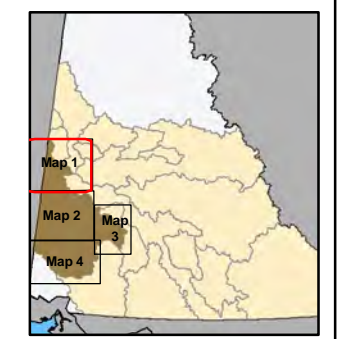
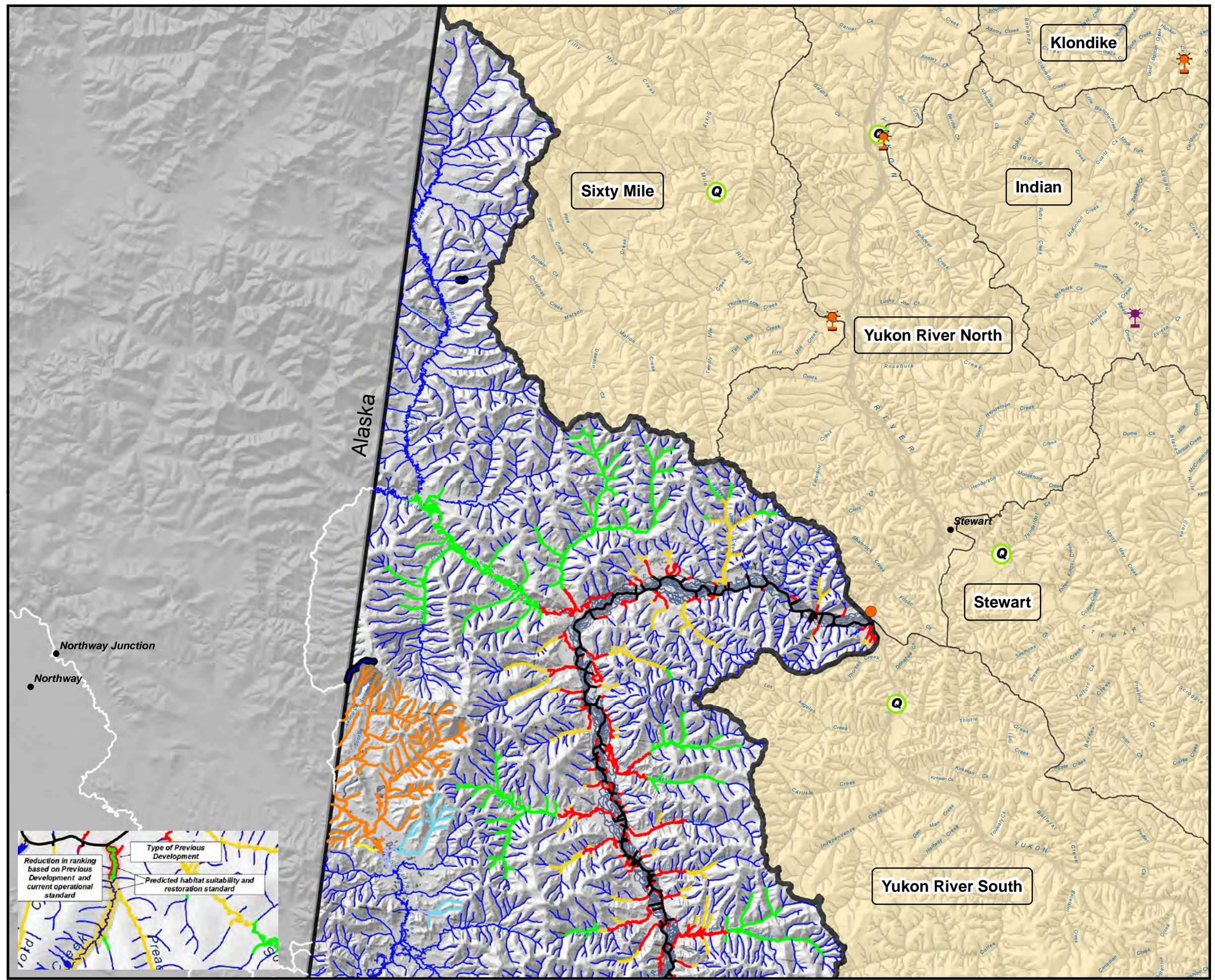
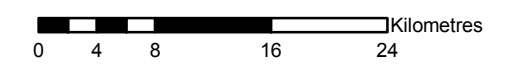
Water Quality Objective Monitoring Sites White River Watershed Map 1 of 4 (Category B)

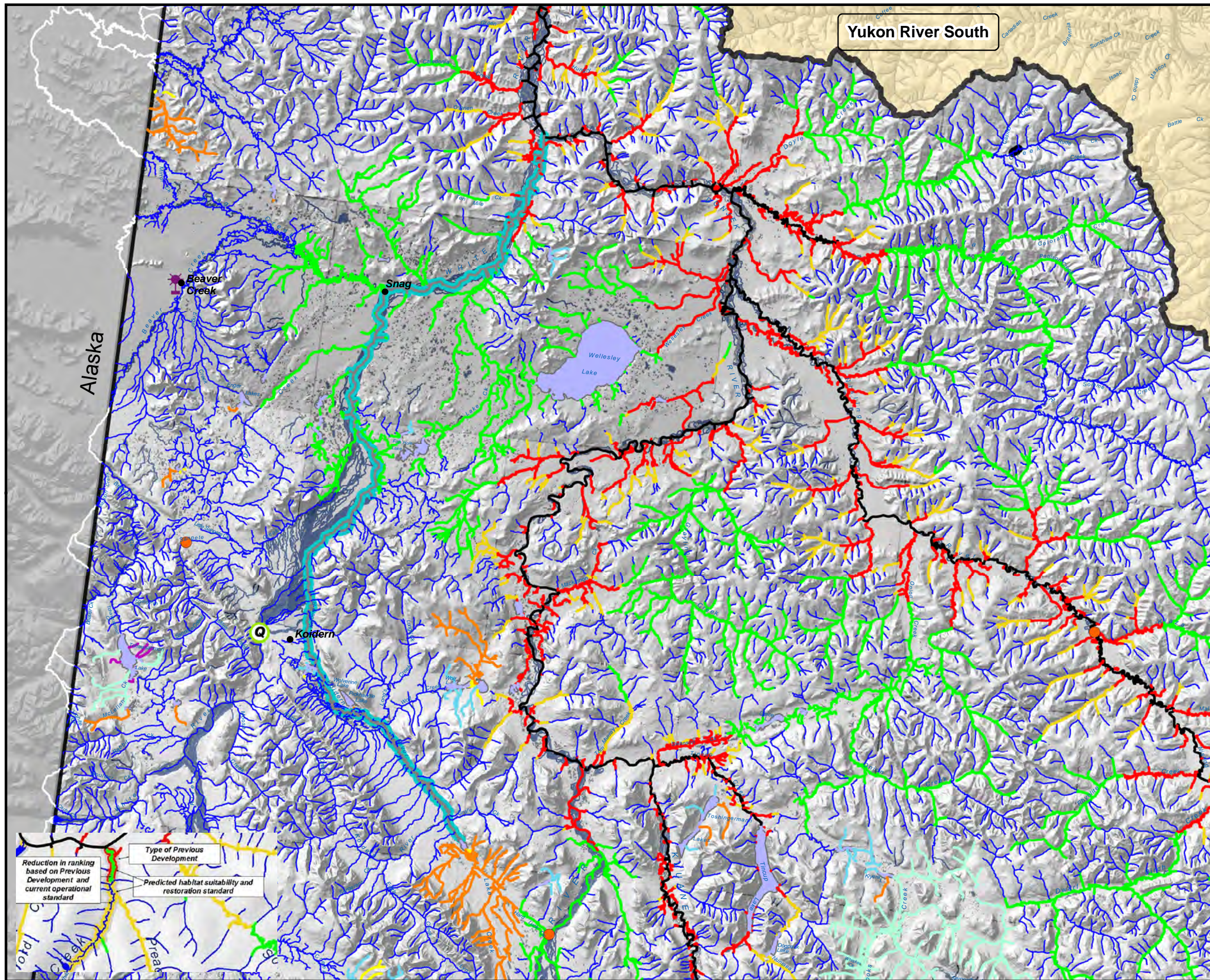
- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
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 - Highways & Public Works Weather Station
- Stream Reach Classification**
- Water Quality
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 - Chinook Salmon Production
 - Areas of Special Consideration (Ecological)
 - Areas of Special Consideration (Cultural)
- Development**
- Current
 - Historical
 - Extensive
- Tributary to Lake Score:**
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Map Compiled: May 30, 2008





Yukon River South

Alaska

Water Quality Objective Monitoring Sites White River Watershed Map 2 of 4 (Category B)

- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
 - Energy, Mines and Resources Sampling Site
 - Water Survey of Canada Station Flow Station
 - Highways & Public Works Weather Station

- Stream Reach Classification**
- Water Quality
 - Freshwater Fisheries Production Zone
 - Moderate-Low Suitability
 - Moderate-Moderate Suitability
 - Moderate-High Suitability
 - Chinook Salmon Production
 - Areas of Special Consideration (Ecological)
 - Areas of Special Consideration (Cultural)

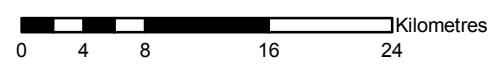


- Development**
- Current
 - Historical
 - Extensive

- Tributary to Lake Score:**
- Small Tributary to Small Lake Trout Lake
 - Medium Tributary to Small Lake Trout Lake
 - Large Tributary to Small Lake Trout Lake
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 - Lakes

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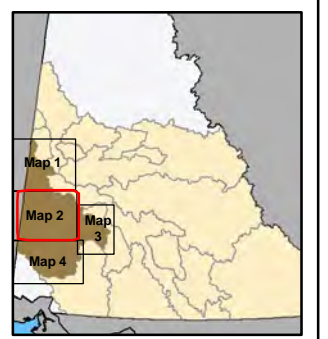
Map Compiled: May 30, 2008



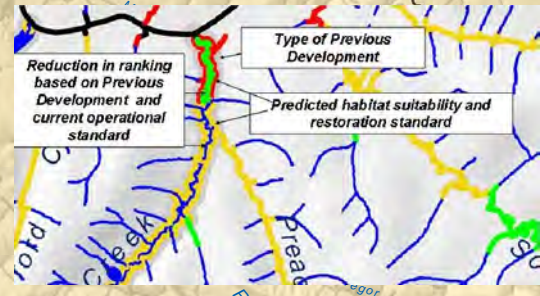
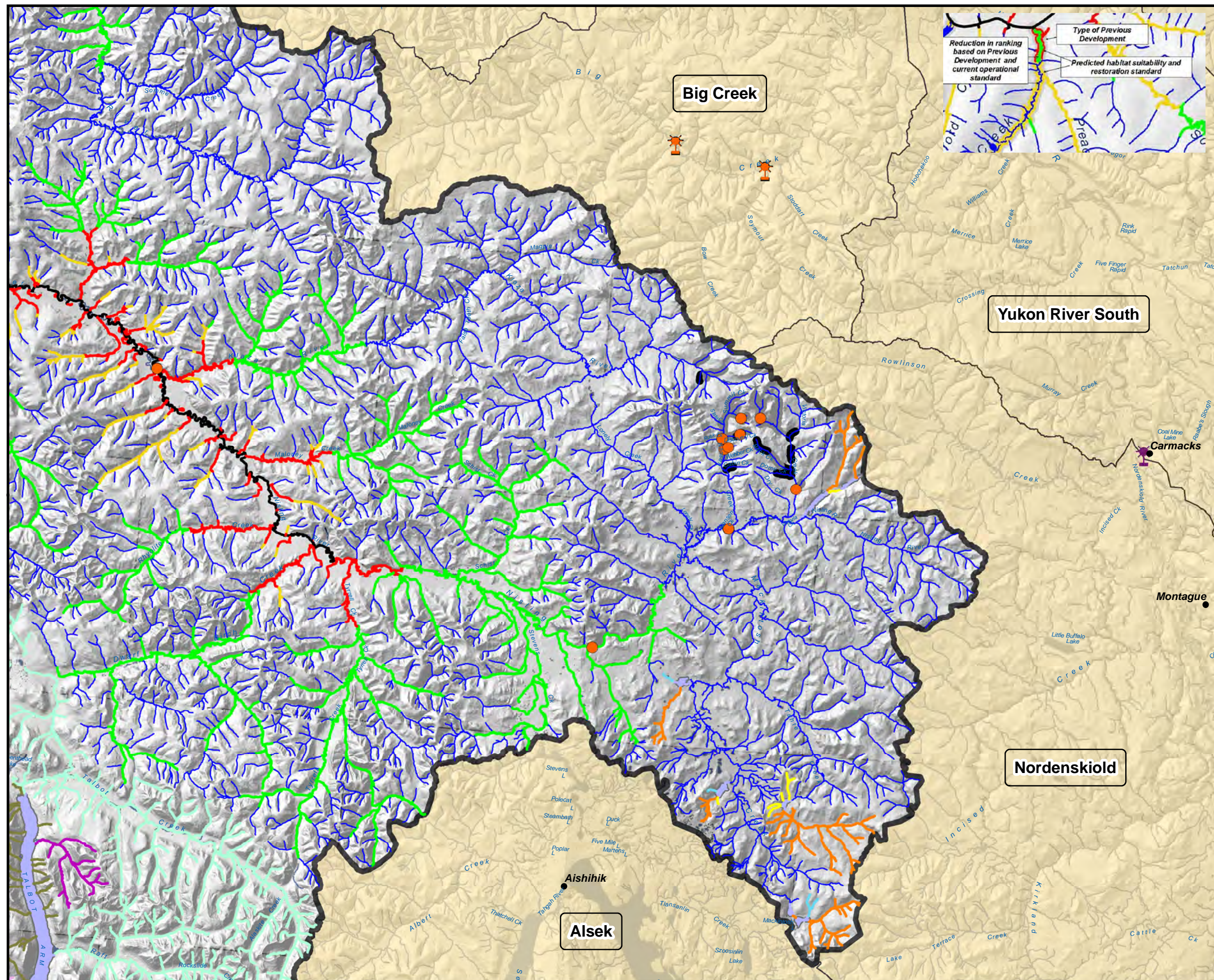
Reduction in ranking based on Previous Development and current operational standard

Type of Previous Development

Predicted habitat suitability and restoration standard



Water Quality Objective Monitoring Sites White River Watershed Map 3 of 4 (Category B)



- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
 - Energy, Mines and Resources Sampling Site
 - Water Survey of Canada Station Flow Station
 - Highways & Public Works Weather Station

- Stream Reach Classification**
- Water Quality
 - Freshwater Fisheries Production Zone
 - Moderate-Low Suitability
 - Moderate-Moderate Suitability
 - Moderate-High Suitability
 - Chinook Salmon Production
 - Areas of Special Consideration (Ecological)
 - Areas of Special Consideration (Cultural)

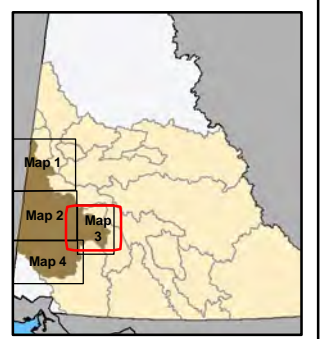
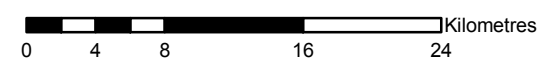
- Development**
- Current
 - Historical
 - Extensive

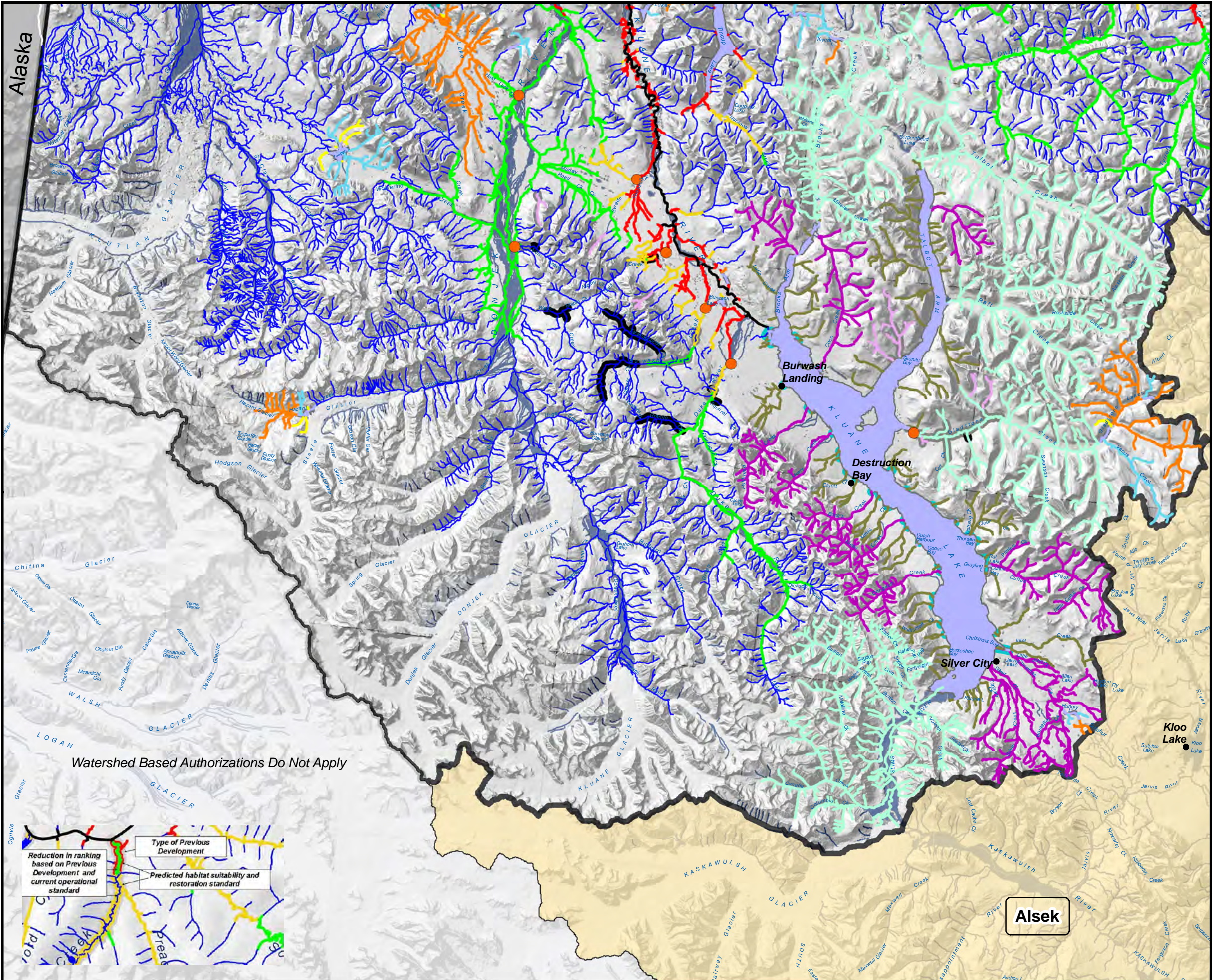
- Tributary to Lake Score:**
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 - Medium Tributary to Small Lake Trout Lake
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Water Quality Objective Monitoring Sites White River Watershed Map 4 of 4 (Category B)

- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
 - Energy, Mines and Resources Sampling Site
 - Water Survey of Canada Station Flow Station
 - Highways & Public Works Weather Station

- Stream Reach Classification**
- Water Quality
 - Freshwater Fisheries Production Zone
 - Moderate-Low Suitability
 - Moderate-Moderate Suitability
 - Moderate-High Suitability
 - Chinook Salmon Production
 - Areas of Special Consideration (Ecological)
 - Areas of Special Consideration (Cultural)

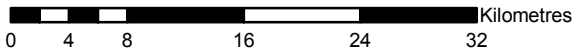
- Development**
- Current
 - Historical
 - Extensive

- Tributary to Lake Score:**
- Small Tributary to Small Lake Trout Lake
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 - Medium Tributary to Large Lake Trout Lake
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 - Lakes

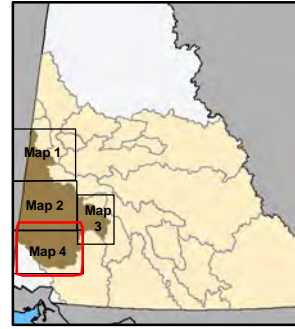
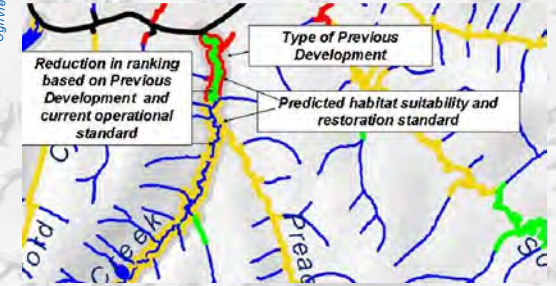


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Watershed Based Authorizations Do Not Apply



Alsek

Yukon River North Watershed

The Yukon River is a major watercourse of north western North America. Over half of the river lies in the U.S. state of Alaska, with most of the other portion lying in and giving its name to Canada's Yukon Territory, and a small part of the river starts near the rivers source in British Columbia. The river is 3,700 km long and empties into the Bering Sea at the Yukon-Kuskokwim Delta. The average flow is 6,430 m³/s. The total drainage area is 832,700 km² of which 323,800 km² is in Canada. By comparison, the total area is more than 25% larger than the province of Alberta.

The Yukon River is divided into two sections, the North Yukon section, downstream from the Yukon Rivers confluence with the White River and the South Yukon, the section of the Yukon River upstream from its confluence with the White River. The average water quality of the North Yukon River is much more turbid and higher in suspended solids concentrations than that of the South Yukon due to the huge contribution of sediment and glacial material entering the Yukon River from the White River drainage. Total suspended solids concentrations in the North Yukon can be 10-25 times higher than those found in the South Yukon. Many large tributary rivers and streams flow into the catchment area of the Yukon River basin.

In 2008, 57 grab samples were taken by inspection staff on behalf of the Water Quality Team at 57 different locations in the Yukon River North basin. Basin total flow data was provided to us by the Water Survey of Canada station located on the Yukon River above the White River. Flow data for the individual tributaries to the Indian 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.

In 2008, the effluent discharge standards for the Yukon River North Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the Yukon River North, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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

SITE CODE	LOCATION	LAT_Y	LONG_X
08-0702	unknown LL Creek	63.26939	-139.47041
08-0737	Yukon River u/s Stewart River	63.27946	-139.41748
08-0741	Yukon River u/s Swede Creek	64.02007	-139.57184
08-0742	Yukon River u/s OK Creek	64.02329	-139.52451
08-0745	Yukon River u/s Cliff Creek	64.52887	-140.47661
08-0747	Yukon River u/s Shell Creek	64.49828	-140.42120
08-0749	Yukon River u/s Coal Creek	64.47665	-140.43954
08-0751	Yukon River u/s Forty Mile River	64.42408	-140.52603

08-0754	Yukon River u/s Cassiar	64.32884	-140.16194
08-0756	Yukon River u/s Wood Chopper Creek	64.32170	-140.00537
08-0758	Yukon River u/s Fifteen Mile River	64.28041	-139.81335
08-0760	Yukon River u/s Fresno Creek	64.27250	-139.79930
08-0762	Yukon River u/s Quebec Creek	64.17162	-139.54102
08-0765	Yukon River u/s Deadwood Creek	64.10433	-139.46320
08-0766	Yukon River u/s Clear Creek	64.10801	-139.45413
08-0768	Yukon River u/s Moosehide	64.09351	-139.43628
YN 01	Yukon River d/s of Cassiar Creek	64.33194	-140.21059
YN 02	Yukon River u/s of Klondike River	64.02574	-139.46721
YN 03	Yukon River d/s Ensley Creek	63.92620	-139.70016
YN 04	Yukon River u/s Ensley Creek	63.73400	-139.68927
YN 05	Yukon River u/s Reindeer Creek	63.69801	-139.73257
YN 06	Yukon River d/s Sixtymile River left Bank	63.57132	-139.74707
YN 07	Yukon River d/s of Sixty Mile right limit	63.57077	-139.74094
YN 08	Yukon River u/s of Sixtymile River	63.55500	-139.75714
YN 09	Yukon River d/s Rosebute Creek	63.51890	-139.70337
YN 10	Yukon River u/s of Rosebute Creek	63.50501	-139.69879
YN 11	Yukon River d/s Sestak Creek	63.49162	-139.72768
YN 12	Yukon River u/s Sestak Creek	63.47845	-139.73273
YN 13	Yukon River d/s of Stewart River	63.34033	-139.49336
YN 14	Yukon River d/s Frisco, u/s Stewart River	63.24504	-139.49696
YN 15	Yukon River d/s of White River, u/s Frisco Creek	63.21980	-139.54309
YN 16	Yukon River u/s of the White River	63.17187	-139.56998
YN BAL 01	Ballarat Creek North mouth	64.28518	-139.64308
YN BEL 01	Bell Creek mouth	63.95970	-139.74794
YN CAS 01	Cassiar Creek mouth	64.32935	-140.16624
YN CHA 01	Chandindu River mouth	64.25319	-139.71492
YN CHR 01	Chris Creek mouth	63.34833	-139.62254
YN CLF 01	Cliff Creek mouth	64.52947	-140.47823
YN CLR 01	Clear Creek mouth	64.11076	-139.45007
YN COA 01	Coal Creek mouthh	64.47765	-140.42995
YN DAWSON	Yukon River at Dawson City ferry landing	64.07402	-139.42513
YN DEA 01	Deadwood Creek mouth	64.10506	-139.46524
YN ENS 01	Ensley Creek mouth	63.89738	-139.71614
YN ENS 02	Ensley Creek u/s mouth	63.89693	-139.71489
YN EXC 01	Excelsior Creek mouth	63.37097	-139.79335
YN FIF 01	Fifteen Mile River mouth	64.79417	-139.81349
YN FOR 01	Forty Mile River mouth	64.42268	-140.56477
YN FRE 01	Fresno Creek mouth	64.27278	-139.80246
YN FRS 01	Frisco Creek mouth	63.21962	-139.54034
YN GAL 01	Galena Creek mouth	63.79417	-139.77724
YN HEN 01	Henderson Creek Below All Mining (BAM)	63.35162	-139.41206

YN JOE 01	Lucky Joe Creek mouth	63.57226	-139.72383
YN MOS 01	Moosehide Creek mouth	64.09401	-139.43771
YN OK 01	OK Creek mouth	64.02760	-139.52306
YN QUE 01	Quebec Creek mouth	64.17254	-139.54402
YN REN 01	Reindeer Creek mouth	63.71360	-139.68056
YN ROS 01	Rosebute Creek Below All Mining (BAM)	63.50066	-139.68410
YN SES 01	Sestak Creek mouth	63.48120	-139.73581
YN SHL 01	Shell Creek mouth	64.49932	-140.41846
YN SWE 01	Swede Creek mouth	64.02510	-139.57346
YN WOD 01	Wood Chopper Creek mouth	64.31986	-140.00548

Water Quality Objective monitoring, Yukon River North Watershed – Summary

The overall 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, there is a direct correlation to environmental conditions influencing the amount of solids concentrations in the water.






In all cases, rain fall, either as localised events or basin wide occurrences, increased the amount of surface run off and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. These increases occurred simultaneously at the time of the rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in sediment laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.









All of these factors; precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, lead to an increase in suspended solids concentrations and a decrease in water quality.

Water Quality Objective Monitoring Sites Yukon River North Watershed Overview (Category B)

Monitoring Sites

-  Energy, Mines and Resources
-  Weather Station and Sampling Site
-  Energy, Mines and Resources Sampling Site
-  Water Survey of Canada Station Flow Station
-  Highways & Public Works Weather Station

Stream Reach Classification

-  Water Quality
-  Freshwater Fisheries Production Zone
-  Moderate-Low Suitability
-  Moderate-Moderate Suitability
-  Moderate-High Suitability
-  Chinook Salmon Production
-  Areas of Special Consideration (Ecological)
-  Areas of Special Consideration (Cultural)

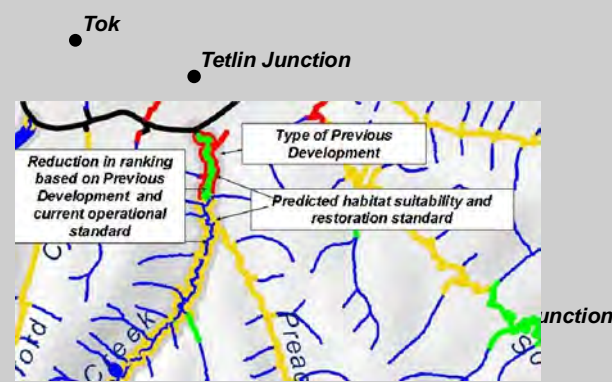
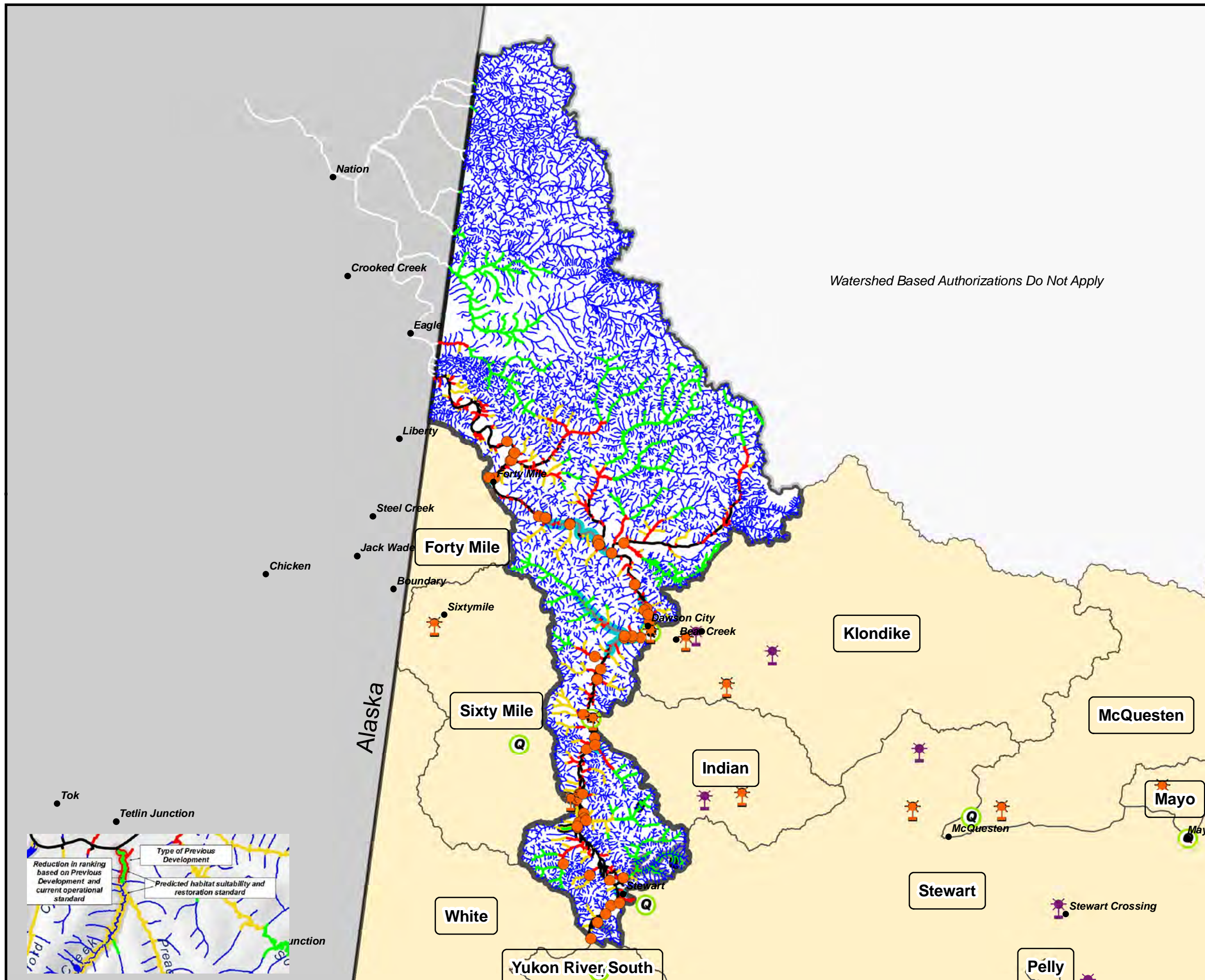
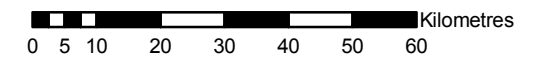
Development

-  Current
-  Historical
-  Extensive



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Map Compiled: May 30, 2008



Water Quality Objective Monitoring Sites Yukon River North Watershed Map 2 of 3 (Category B)

Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- Chinook Salmon Production
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)

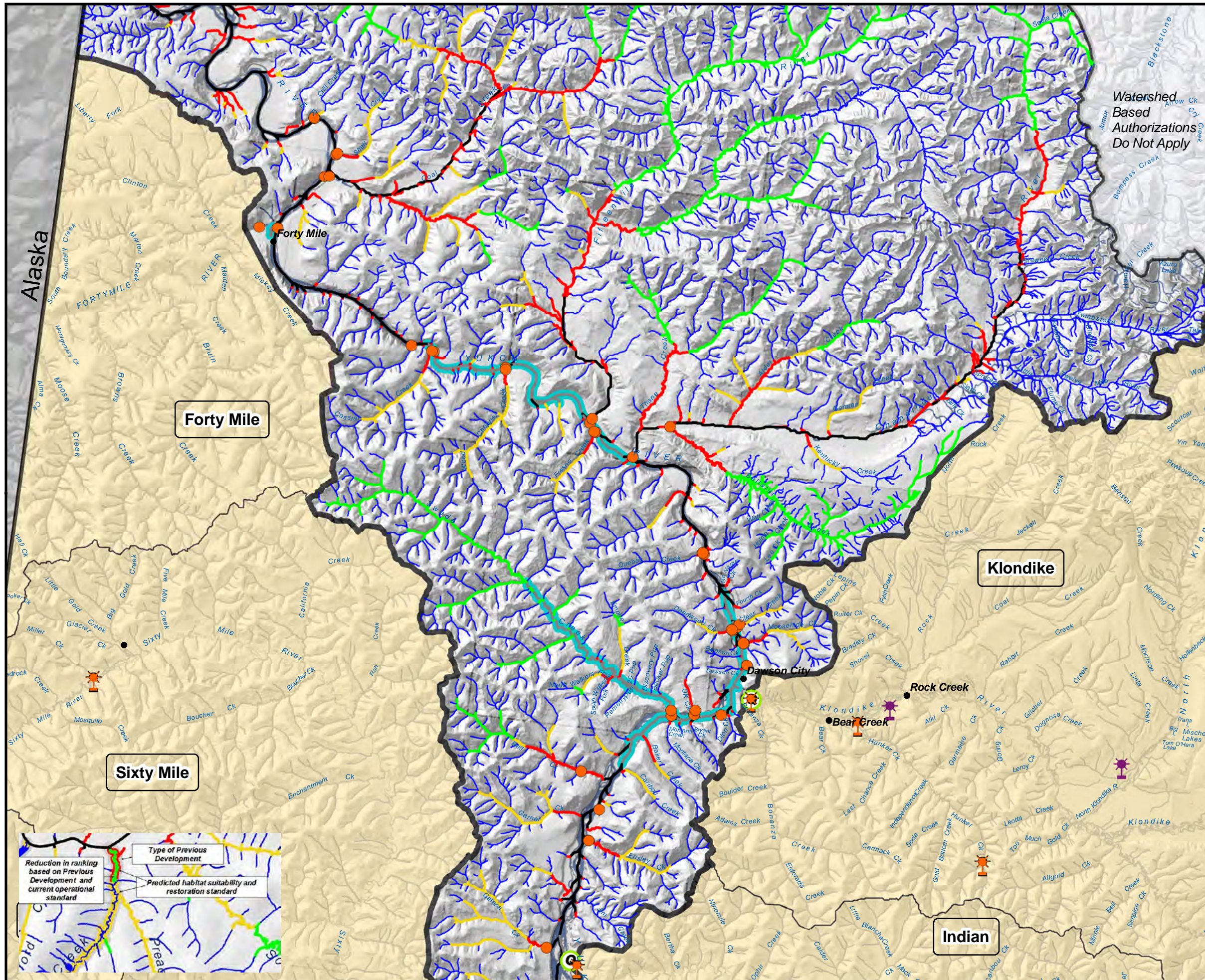
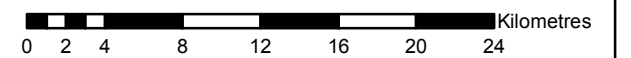
Development

- Current
- Historical
- Extensive



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Map Compiled: May 30, 2008



Forty Mile

Klondike

Sixty Mile



Water Quality Objective Monitoring Sites Yukon River North Watershed Map 3 of 3 (Category B)

Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
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- Moderate-Moderate Suitability
- Moderate-High Suitability
- Chinook Salmon Production
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- Areas of Special Consideration (Cultural)

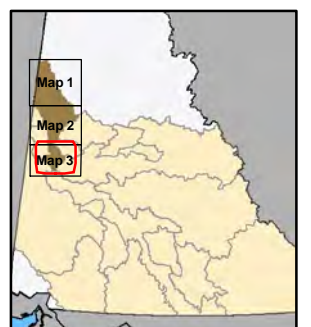
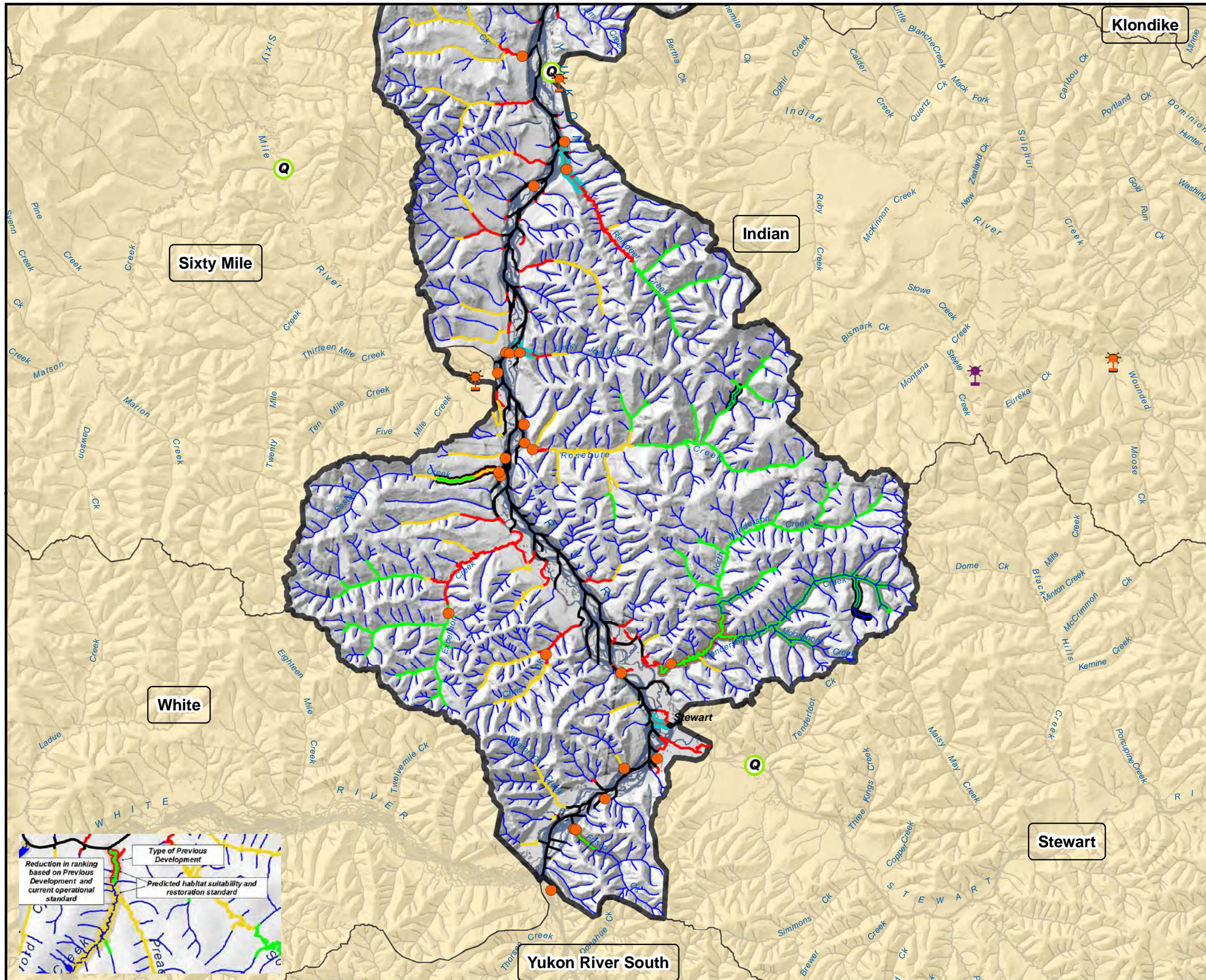
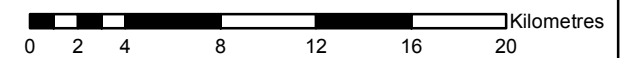
Development

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- Historical
- Extensive



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Map Compiled: May 30, 2008



Yukon
Energy, Mines and Resources

YUKON
PLACER
SECRETARIAT

Yukon River South Watershed

The Yukon River is a major watercourse of north western North America. Over half of the river lies in the U.S. state of Alaska, with most of the other portion lying in and giving its name to Canada's Yukon Territory, and a small part of the river starts near the rivers source in British Columbia. The river is 3,700 km long and empties into the Bering Sea at the Yukon-Kuskokwim Delta. The average flow is 6,430 m³/s. The total drainage area is 832,700 km² of which 323,800 km² is in Canada. By comparison, the total area is more than 25% larger than the province of Alberta.

The Yukon River is divided into two sections, the North Yukon section, downstream from the Yukon Rivers confluence with the White River and the South Yukon, the section of the Yukon River upstream from its confluence with the White River. The average water quality of the North Yukon River is much more turbid and higher in suspended solids concentrations than that of the South Yukon due to the huge contribution of sediment and glacial material entering the Yukon River from the White River drainage. Total suspended solids concentrations in the North Yukon can be 10-25 times higher than those found in the South Yukon. Many large tributary rivers and streams flow into the catchment area of the Yukon River basin.

In 2008, 28 grab samples were taken by inspection staff on behalf of the Water Quality Team at 28 different locations in the Yukon River South basin.

In 2008, the effluent discharge standards for the Yukon River South Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the Yukon River South, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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

SITE CODE	LOCATION	LAT_Y	LONG_X
08-0678	Yukon River d/s Pedlar Creek	62.87356	-138.78517
08-0682	unknown LL Creek	62.88438	-138.95703
08-0683	Upstream unknown LL Creek	62.88437	-138.95552
08-0684	Ballarat d/s on Yukon River	62.89671	-138.99060
YS 01	Yukon River u/s of the White River	63.17276	-139.56602
YS 02	Yukon River d/s Los Angeles Creek, u/s Thistle Creek	63.07411	-139.50436
YS 03	Yukon River d/s Kirkman Creek, u/s Thistle and u/s LA Creek	63.00394	-139.47209
YS 04	Yukon River u/s Kirkman Creek	62.98285	-139.31924
YS 05	Yukon River u/s Sparkling Creek	62.92245	-139.17300
YS 06	Yukon River u/s Coffee Creek, d/s Ballarat Creek	62.91109	-139.03923
YS 07	Yukon River u/s Ballarat, d/s Pedlar Creek	62.88658	-138.85291

YS 08	Yukon River u/s Pedlar Creek, d/s Britannia Creek	62.87306	-138.77945
YS 09	Yukon River u/s Britannia Creek	62.87556	-138.68182
YS 10	Yukon River d/s Selwyn River	62.82779	-138.44238
YS 11	Yukon River u/s Selwyn River	62.80207	-138.25978
YS 12	Yukon River d/s Pelly River	62.81443	-137.48848
YS 13	Yukon River u/s Pelly River	62.75300	-137.30100
YS 14	Yukon River u/s Big Creek	62.61576	-136.99323
YS BAL 01	Ballarat Creek South Below All Mining (BAM)	62.89784	-138.96138
YS BRIT 01	Britannia Creek Below All Mining (BAM)	62.87063	-138.68726
YS CAR 01	Carlisle Creek mouth	63.00539	-139.49359
YS COF 01	Coffee Creek mouth	62.90965	-139.04201
YS KIR 01	Kirkman Creek mouth	62.99714	-139.46533
YS LOS 01	Los Angeles Creek mouth	63.04897	-139.52612
YS PED 01	Pedlar Creek mouth	62.87419	-138.77946
YS SEL 01	Selwyn River Below All Mining (BAM)	62.74988	-138.28221
YS SPA 01	Sparkling Creek mouth	62.92348	-139.17473
YS THI 01	Thistle Ck Below All Mining (BAM)	63.07133	-139.46533
08-0739	Yukon River u/s Excelsior Ck	63.43961	-139.70804

Water Quality Objective monitoring, Yukon River South Watershed – Summary

The overall 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, there is a direct correlation to environmental conditions influencing the amount of solids concentrations in the water. Many large tributary rivers and streams flow into the catchment area of the Yukon River basin.

In all cases, rain fall, either as localised events or basin wide occurrences, increased the amount of surface run off and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. These increases occurred simultaneously at the time of the rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in sediment laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

All of these factors; precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, lead to an increase in suspended solids concentrations and a decrease in water quality.

Water Quality Objective Monitoring Sites Yukon River South Watershed Overview (Category A)

Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- Chinook Salmon Production
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)



Development

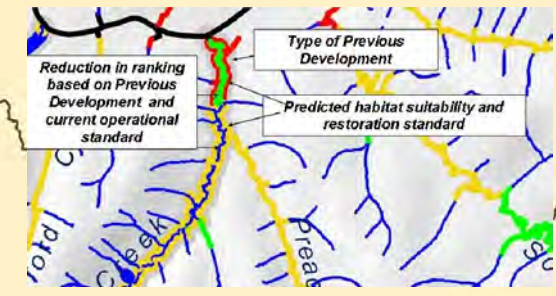
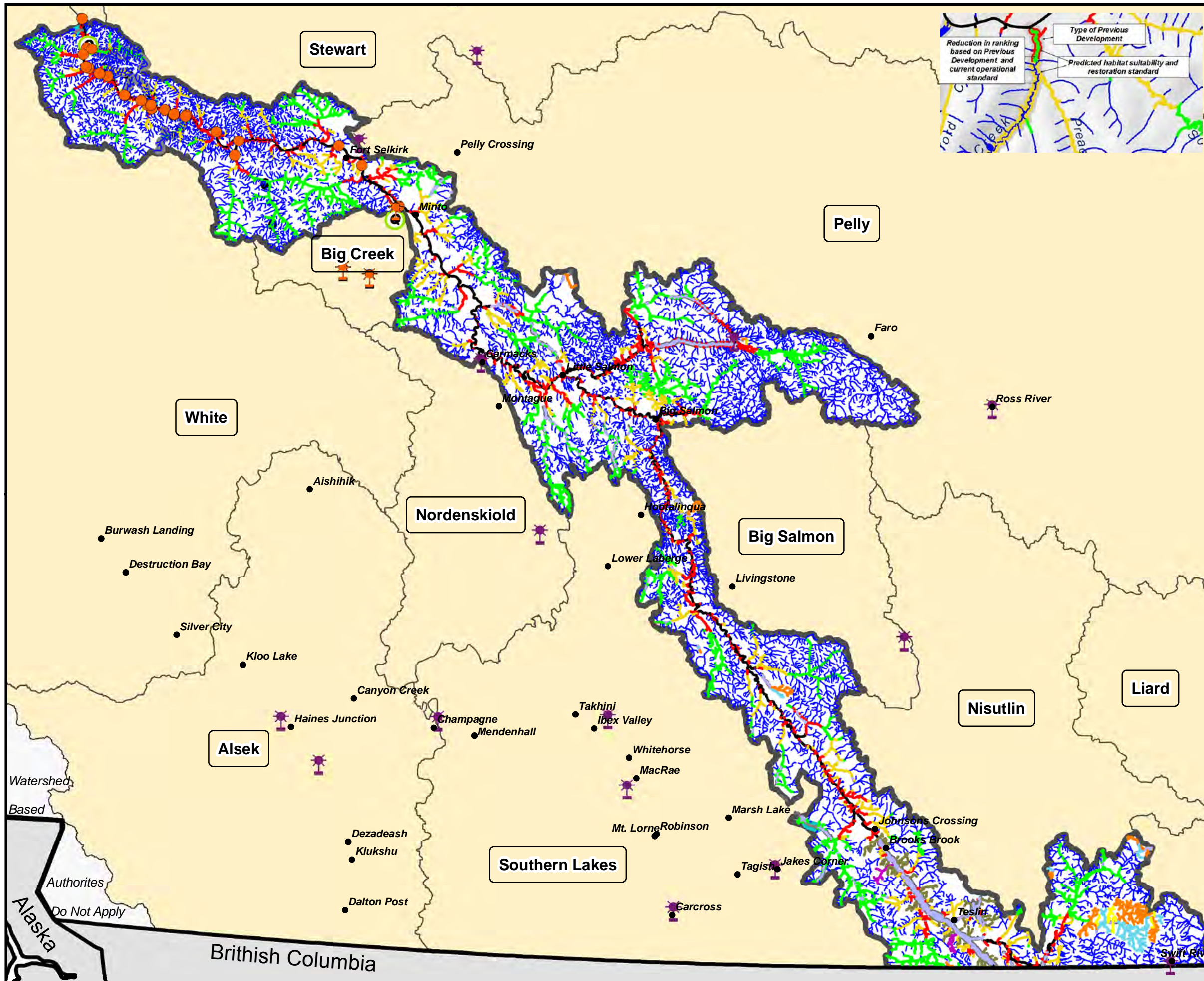
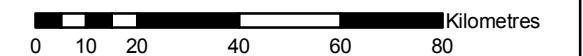
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- Historical
- Extensive

Tributary to Lake Score:

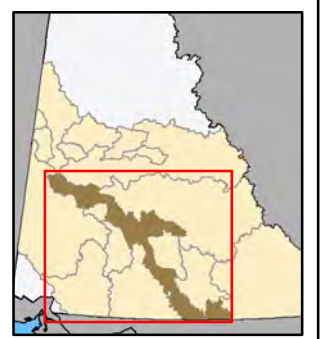
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- Medium Tributary to Large Lake Trout Lake
- Large Tributary to Large Lake Trout Lake
- Lakes

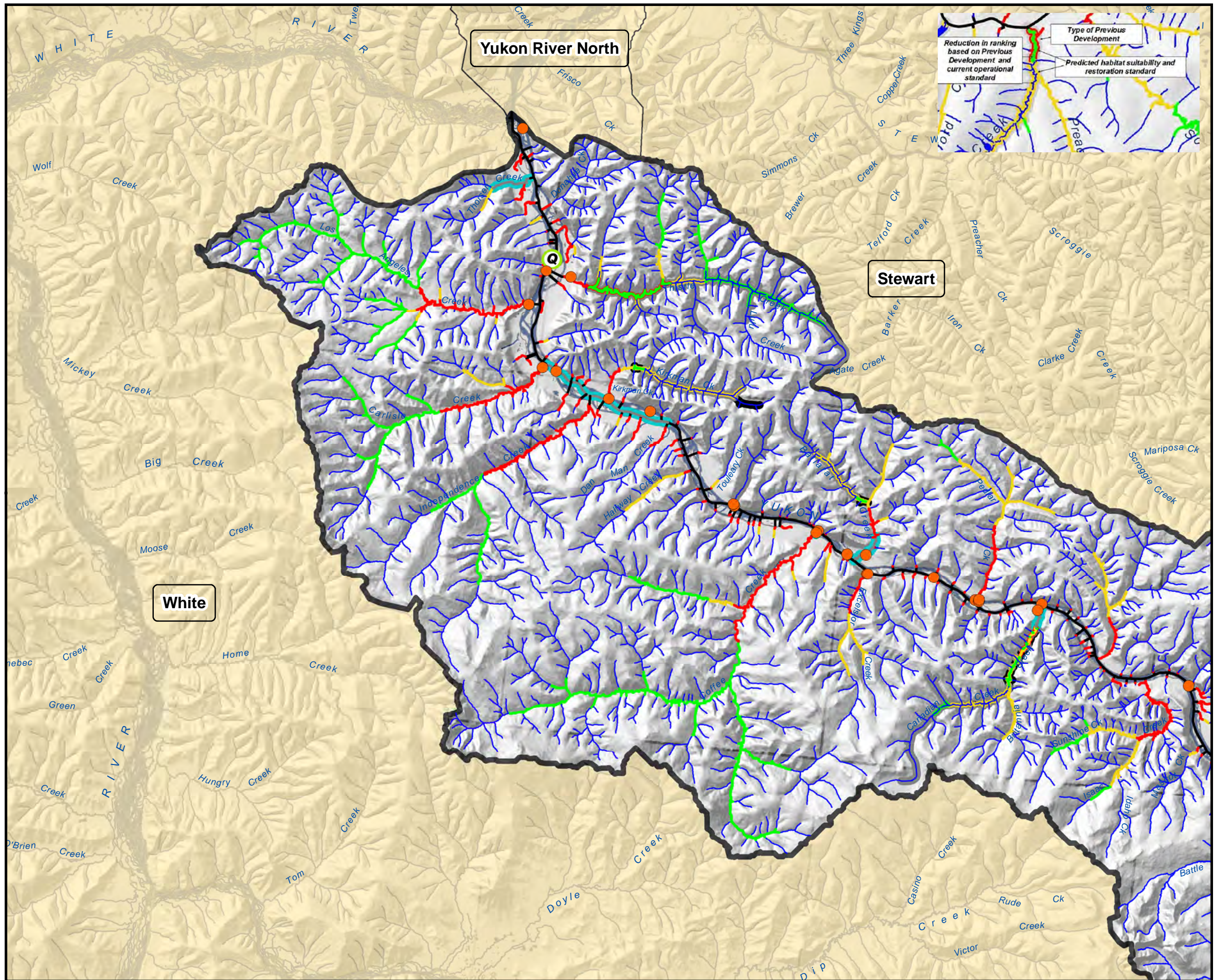
This map is provided to depict the location of water quality and weather monitoring sites in relation to streams classified using the Yukon Habitat Suitability Model, and is not intended for any other use. Under no circumstances will the Government of Canada, or Yukon Government be liable to any person or business entity for any direct, indirect, special, incidental, consequential, or other damages based on any use of information contained on this map, including, without limitation, any lost profits, business interruption, or loss of information.

Map Compiled: May 30, 2008



Watershed Based on Authorities Do Not Apply
Alaska
British Columbia





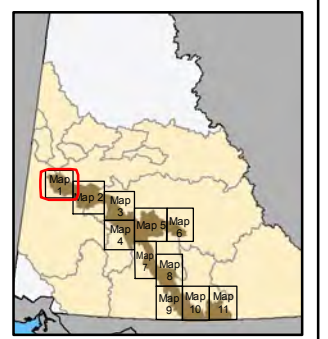
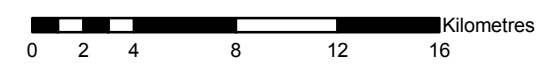
Water Quality Objective Monitoring Sites Yukon River South Watershed Map 1 of 11 (Category A)

- Monitoring Sites**
- Energy, Mines and Resources Weather Station and Sampling Site
 - Energy, Mines and Resources Sampling Site
 - Water Survey of Canada Station Flow Station
 - Highways & Public Works Weather Station
- Stream Reach Classification**
- Water Quality
 - Freshwater Fisheries Production Zone
 - Moderate-Low Suitability
 - Moderate-Moderate Suitability
 - Moderate-High Suitability
 - Chinook Salmon Production
 - Areas of Special Consideration (Ecological)
 - Areas of Special Consideration (Cultural)
- Development**
- Current
 - Historical
 - Extensive
- Tributary to Lake Score:**
- Small Tributary to Small Lake Trout Lake
 - Medium Tributary to Small Lake Trout Lake
 - Large Tributary to Small Lake Trout Lake
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 - Medium Tributary to Large Lake Trout Lake
 - Large Tributary to Large Lake Trout Lake
 - Lakes

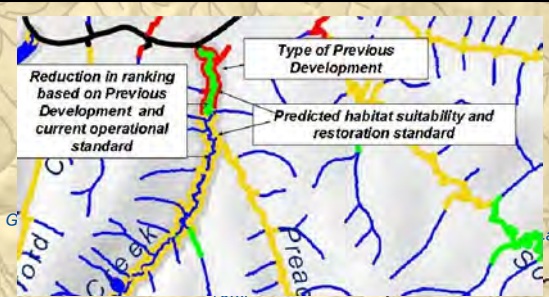
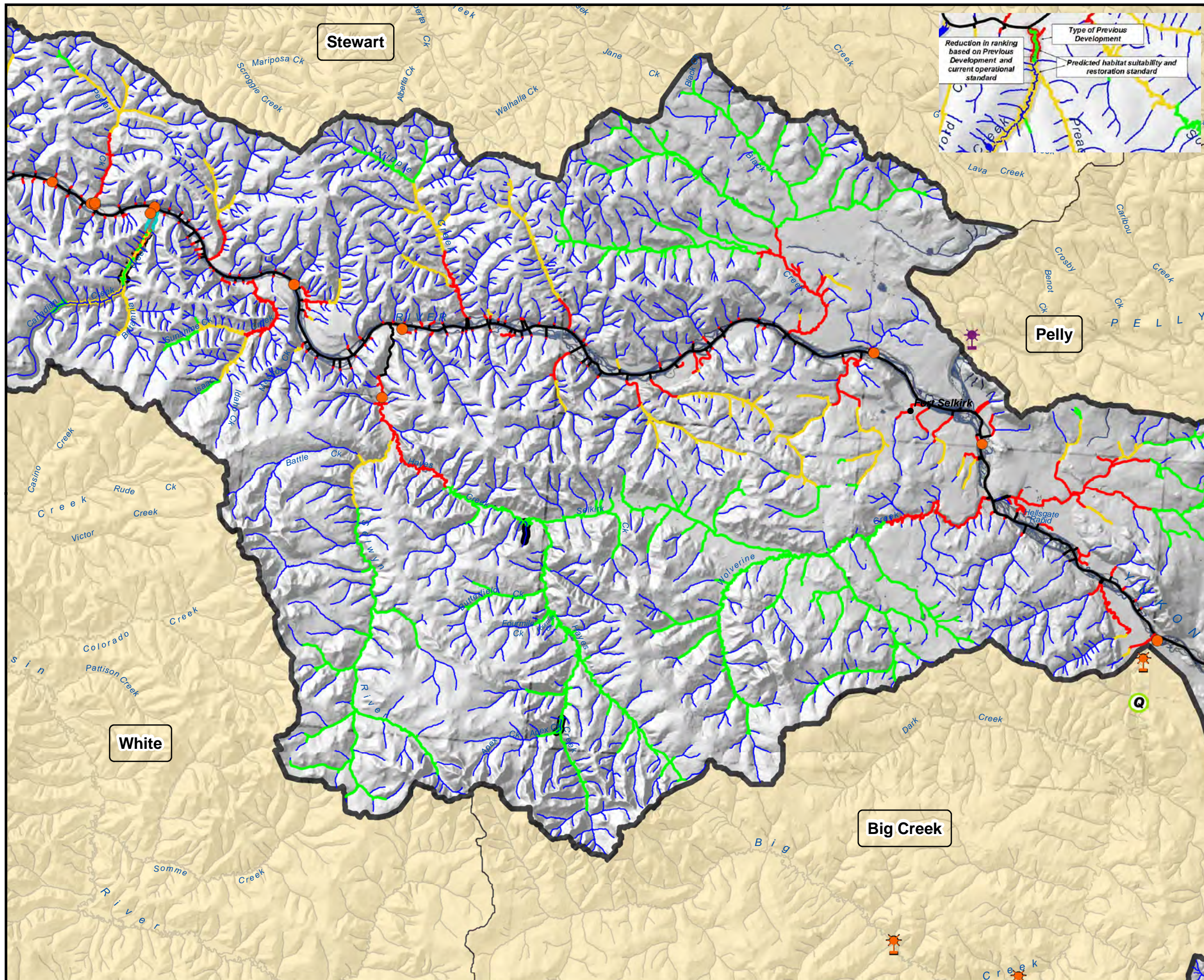


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Map Compiled: May 30, 2008



Water Quality Objective Monitoring Sites Yukon River South Watershed Map 2 of 11 (Category A)



Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- Chinook Salmon Production
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)



Development

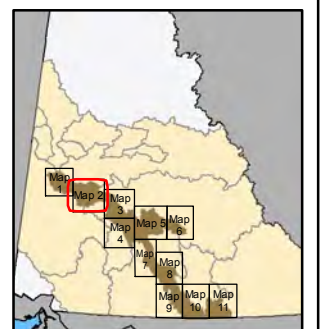
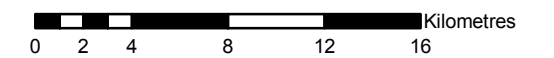
- Current
- Historical
- Extensive

Tributary to Lake Score:

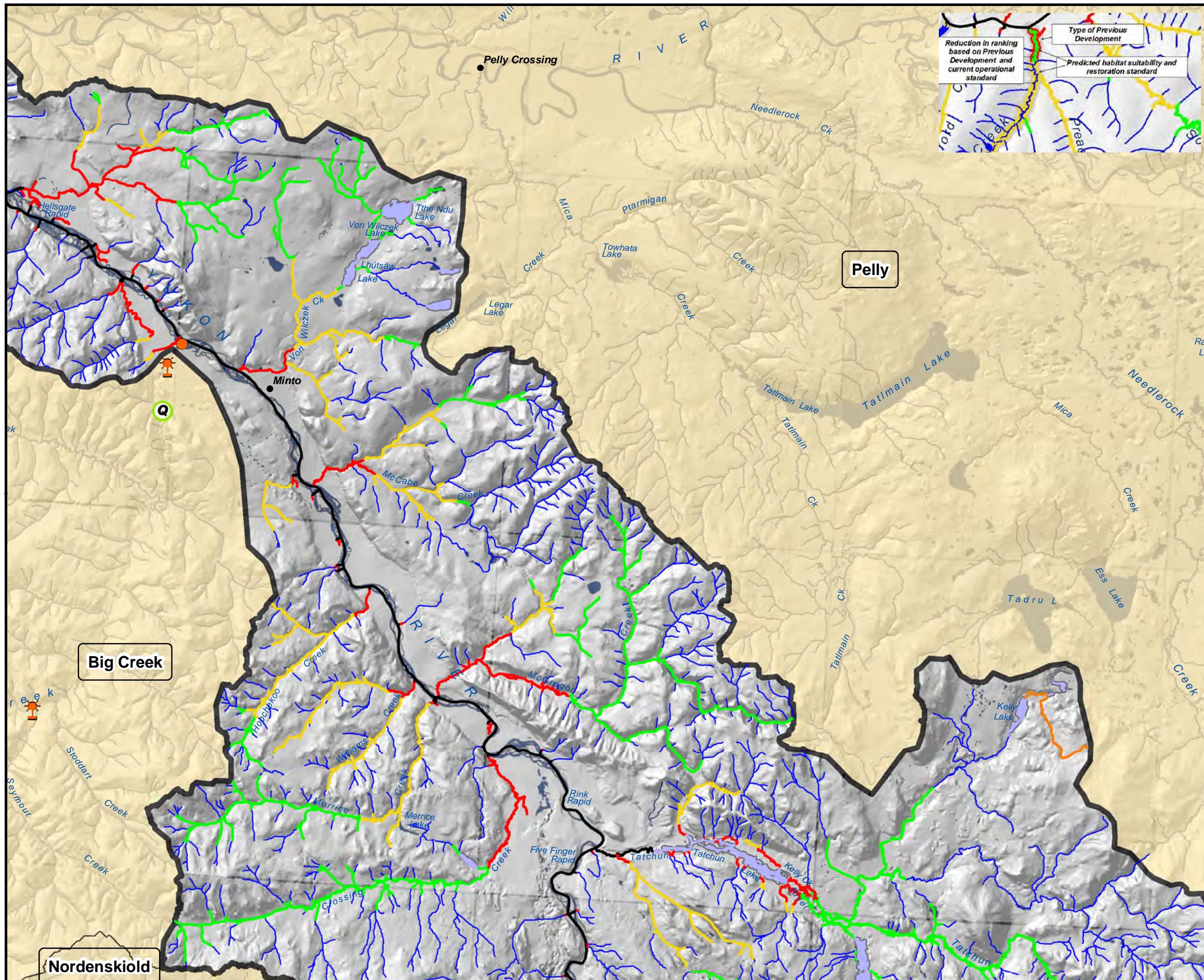
- Small Tributary to Small Lake Trout Lake
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Map Compiled: May 30, 2008



Water Quality Objective Monitoring Sites Yukon River South Watershed Map 3 of 11 (Category A)



Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station Flow Station
- Highways & Public Works Weather Station

Stream Reach Classification

- Water Quality
- Freshwater Fisheries Production Zone
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Development

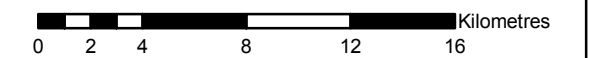
- Current
- Historical
- Extensive

Tributary to Lake Score:

- Small Tributary to Small Lake Trout Lake
- Medium Tributary to Small Lake Trout Lake
- Large Tributary to Small Lake Trout Lake
- Small Tributary to Large Lake Trout Lake
- Medium Tributary to Large Lake Trout Lake
- Large Tributary to Large Lake Trout Lake
- Lakes

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