ENVIRONMENTAL DYNAMICS INC.
*Natural Resource Consultants*

# Whitestone River Juvenile Chinook/Coho Assessment

**CRE-15-04**

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## ABSTRACT

During mid August 2004, an assessment of juvenile chinook (*Oncorhynchus tshawytscha*) and coho salmon (*Oncorhynchus kisutch)* use and habitat was carried out in the Whitestone River. The Whitestone is one of three major tributaries forming the upper Porcupine River. A total of twenty-nine juvenile chinook were captured at four of the ten sampling sites. All juvenile chinook were captured within the upper portion of the Whitestone River, above McParlon Creek. There were no juvenile coho captured during this project. In addition to fish capture data, water temperature, site characteristics, and some habitat information was gathered.

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## 1.0 INTRODUCTION

The Porcupine River[1] is one of the larger tributaries in the Yukon River system. It extends from its mouth at Fort Yukon, Alaska, across the Canada/U.S. border where it drains a large portion of the north Yukon and most of the Vuntut Gwitchin First Nation's Traditional Territory. The Porcupine has a number of large tributaries in Canada, including three significant rivers forming its headwaters: the Whitestone, Miner, and Fishing Branch Rivers. The only settlement[2] within the Porcupine River watershed is the village of Old Crow, located approximately 80 kilometres east of the Canada/U.S. border at the mouth of the Old Crow River. Old Crow has a population of roughly three hundred, mainly Vuntut Gwitchin First Nation members.

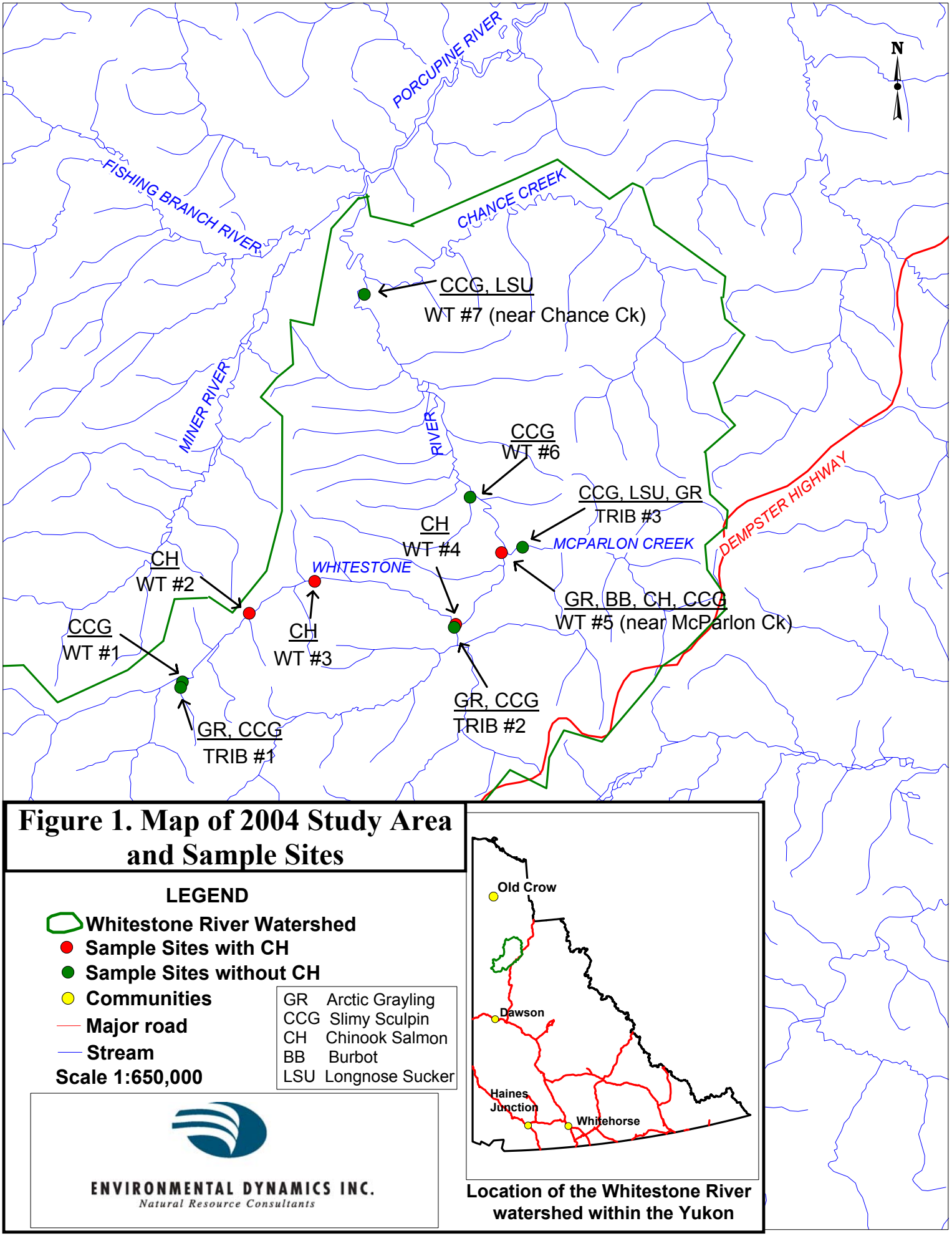
Three species of salmon migrate up the Porcupine River. These include a chinook run that passes Old Crow mainly during the month of July, a chum run that passes Old Crow mainly in September, and a coho run that passes Old Crow between early October and late January. The coho and chinook salmon runs in the Porcupine River system are an important food fish to the Vuntut Gwitchin; the preferred chinook being a large summer salmon, while coho is caught during the late fall/winter. Vuntut Gwitchin Citizens fish both runs in the vicinity of Old Crow. The coho run is unique in two ways: it represents one of the most northern stocks of coho in North America, and it is the only confirmed coho stock in the Canadian portion of the Yukon River drainage basin. The Vuntut Gwitchin also depend on the chum run for a substantial subsistence fishery. There have also been limited reports of summer chum in the vicinity of Old Crow.

The Whitestone River is one of the three major tributaries forming the upper Porcupine River (others are the Fishing Branch and the Miner rivers). It drains a significant portion of the Nahoni Range and flows generally north into the Porcupine River about 9 km northeast of the confluence of the Fishing Branch and Miner rivers (Figure 1).

Research completed in 2001, 2002, and 2003 has established that chinook salmon do currently spawn in the upper portions of the Whitestone River. However, results for coho salmon have been thus far been inconclusive. A juvenile assessment conducted during 2001 focused on the lower 50-60 km of the Whitestone River; however, a Territory-wide spawning failure that year is thought to have affected results. Results from aerial surveys and radio telemetry work have indicated that chinook spawn above the upstream limit of the work conducted in 2001 (Anderton, 2001, 2002, 2003(1)). Major tributaries to the Whitestone River in this study area include Chance Creek (WSC 818-1158) and McParlon Creek (no WSC assigned). Twelve species of fish have been previously documented within the Whitestone River watershed (Anderton, 2004). See Table 1 below for further details.

[1] Watershed Code (WSC): 818

[2] Eagle Plains, a permanently staffed service centre along the Dempster Highway, is also located within the Porcupine watershed (upper portion).




# Figure 1. Map of 2004 Study Area and Sample Sites

**LEGEND**

- Whitestone River Watershed
- Sample Sites with CH
- Sample Sites without CH
- Communities
- Major road
- Stream

**Scale 1:650,000**

| | |
|---|---|
| GR | Arctic Grayling |
| CCG | Slimy Sculpin |
| CH | Chinook Salmon |
| BB | Burbot |
| LSU | Longnose Sucker |

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**Location of the Whitestone River watershed within the Yukon**

**Table 1.** Fish species previously documented in the Whitestone River watershed (Anderton, 2004).

| Stream Name | Watershed Code[1] | Documented Fish Species (Common name) | Scientific Name |
|---|---|---|---|
| Whitestone River | 818-0000 | chum salmon[2]<br>chinook salmon<br>arctic grayling<br>lake chub<br>least cisco<br>longnose sucker<br>slimy sculpin<br>broad whitefish<br>lake whitefish<br>inconnu<br>northern pike<br>round whitefish | *Oncorhynchus keta*<br>*Oncorhynchus tshawytscha*<br>*Thymallus arcticus*<br>*Couesius plumbeus*<br>*Coregonus sardinella*<br>*Catostomus catostomus*<br>*Cottus cognatus*<br>*Coregonus nasus*<br>*Coregonus clupeaformis*<br>*Stenodus leucichthys*<br>*Esox lucius*<br>*Prosopium cylindriceum* |

[1]As listed in FISS (2004); [2]Current presence unconfirmed

Local and regional managers have identified a lack of information regarding chinook and coho salmon stocks in the Porcupine River system as an issue that needs to be addressed. Filling such information gaps has been identified as a priority to ensure the future success of stock and habitat management.

Although the only historic industrial activity in the watershed has been seismic assessment and exploratory drilling, this will likely change in the near future. Renewed interest in oil and gas development has already brought new exploration, and, with the settlement of land claims further resource development will likely begin in the foreseeable future. In order to ensure the future conservation of Porcupine River salmon populations and their habitat, an adequate understanding of the migration patterns, spawning areas, and rearing areas of these runs is necessary.

Objectives of the project include the following:

- Inspire and build community capacity and stewardship for the conservation, restoration, and enhancement of salmon stocks in the Porcupine River sub-basin.
- Provide information regarding the presence or absence of juvenile chinook and coho in the Whitestone River.
- Provide employment and experience to a number of interested community members who will become a pool of trained and experienced community habitat researchers and stewardship advocates.

## 2.0 METHODS

Extremely low water levels and extensive forest fires during 2004 resulted in a significant change in logistical methodology of the project. The initial plan involved a crew of four being flown by helicopter into the upper portion of the Whitestone River to conduct sampling for juvenile salmon while traveling downstream by boat over the course of ten days during mid-July. However, due to the low water levels and forest fires, this was not possible and a revised plan was developed "in season." Rather than traveling downstream by boat, selected sampling sites throughout the Whitestone River watershed were accessed solely by helicopter. This sampling was carried out between August 7th, 2004 and August 9th, 2004.

Sampling for juvenile fish was conducted using Gee-Type minnow traps[1], backpack electrofishing, and some beach seining. Sampling locations were chosen to include microhabitats determined to be suitable for both juvenile chinook and/or coho salmon. Seven sampling sites were located on the Whitestone River mainstem and an additional three sites were located in the lower reaches of three tributaries (see Figure 1). Fish were measured and observations were made concerning the capture location. All juvenile chinook captured were also weighed using calibrated digital scales.

All sampling for this project was carried out under Fish Collection License 04-20, issued by the Department of Fisheries and Oceans (DFO) on July 5th, 2004.

## 3.0 RESULTS

Results of fish sampling efforts in the Whitestone River are outlined in the following sections.

### 3.1 Fish Captured

Five fish species were captured, including juvenile chinook salmon (See Table 2). Twenty-nine juvenile chinook were captured at four sites, all of which were located in the Whitestone River mainstem (see Figure 1 & Table 3). No coho salmon were captured during this project. All data recorded during this project, including site descriptions, is located in Appendix 1.

The capture of a juvenile burbot in the Whitestone River near the mouth of McParlon Creek is the first record of this species within Whitestone system. The presence of all other species captured during this project have been previously recorded in the Whitestone River watershed (see Tables 1 & 2), however, this project does represent the first documented capture of juvenile chinook salmon.

[1] Minnow trapping was completed as per Fisheries and Oceans Canada Protocol for Yukon.

**Table 2.** Summary of fish species captured.

| Species of fish captured | | | Number of sites captured at (9 sites sampled) |
|---|---|---|---|
| **Common Name** | **Scientific Name** | **Species Code** | |
| Arctic grayling | *Thymallus arcticus* | GR | 4 |
| slimy sculpin | *Cottus cognatus* | CCG | 7 |
| chinook salmon | *Oncorhynchus tshawytscha* | CH | 4 |
| burbot | *Lota lota* | BB | 1 |
| longnose sucker | *Catostomus catostomus* | LSU | 2 |

**Table 3.** Summary of juvenile chinook captured.

| Site Name | Number of chinook captured | Mean Length (mm) | Mean Weight (g) |
|---|---|---|---|
| **WT #2** | 11 | 88.4 | 4.8 |
| **WT # 3** | 13 | 84.3 | 4.7 |
| **WT # 4** | 4 | 91.5 | 5.7 |
| **WT # 5** | 1 | 70 | 6.2 |
| **Totals** | **29** | **86.4** | **4.9** |

### 3.2 Water Temperature

Water temperatures were averaged for the 7 sampling sites along the Whitestone River mainstem (see Figure 2) as well as for the 3 sample sites located in tributary streams (see Figure 3). Water temperature generally increased with travel downstream in the watershed. All temperatures were measured using Oakton Model 91300-00 waterproof digital thermometers.

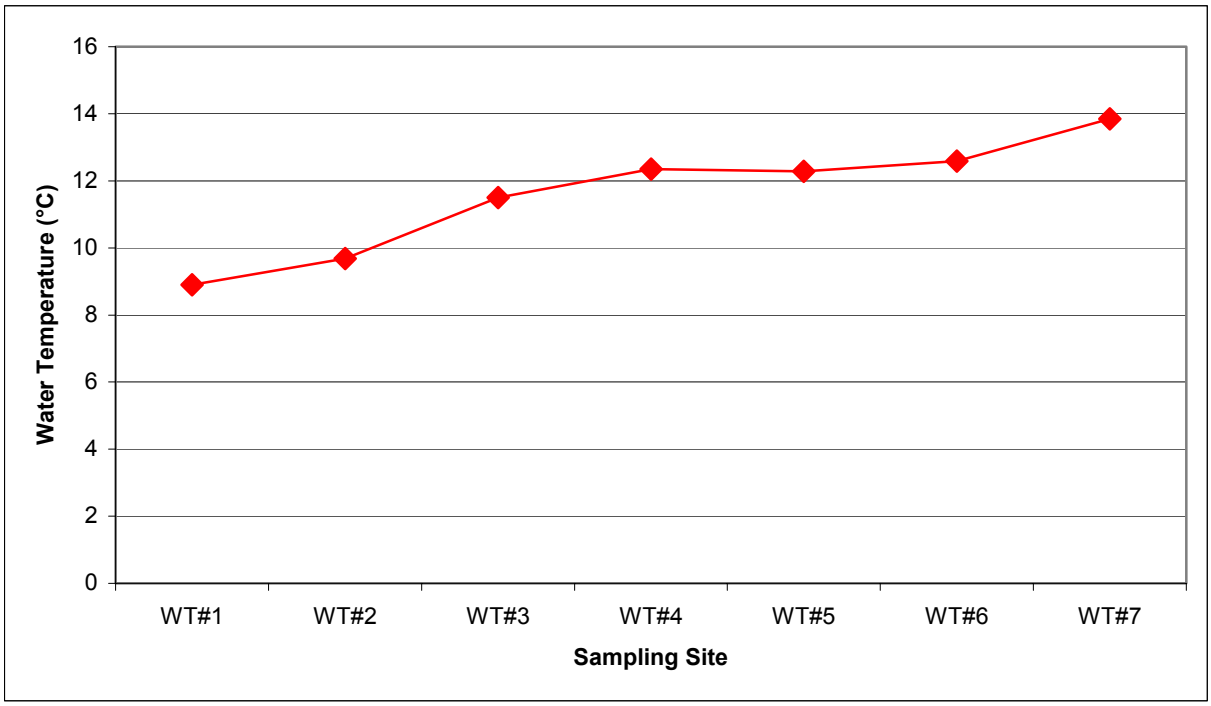


**Figure 2.** Average water temperatures recorded at sampling sites on the mainstem of the Whitestone River.

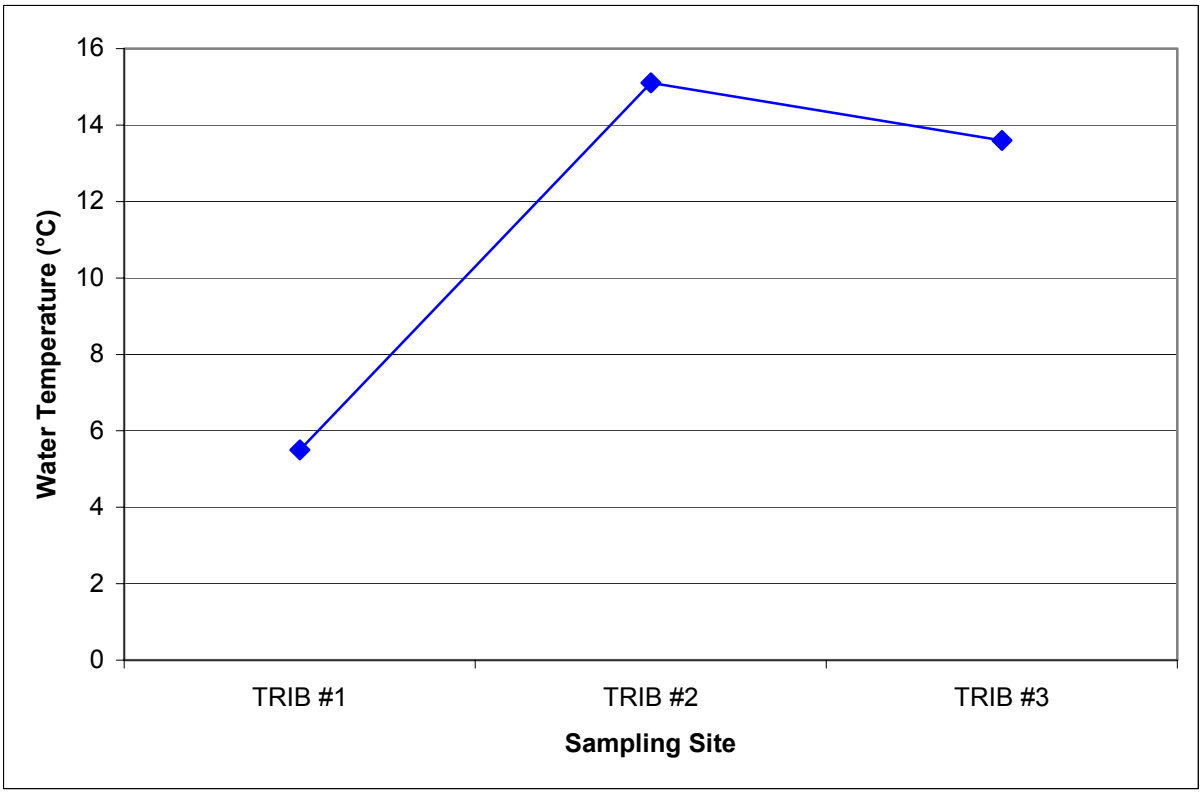


**Figure 3.** Average water temperatures recorded within the tributary streams sampled.

## 4.0 DISCUSSION

The capture of juvenile chinook salmon at four of the ten sampling sites in the Whitestone River watershed confirms the presence of a successfully spawning population of chinook in the Whitestone. However, the low number of juvenile chinook captured raises questions as to out-migration timing and behaviour. The nature of these results (low densities) is similar to those obtained in 2002 during sampling in the Miner River.

### 4.1 Presence/Absence of Chinook Salmon

All juvenile chinook captured in this project were at sites in the upper portion of the Whitestone River, above McParlon Creek (see Figure 1). Although only two sample sites were located below the mouth of McPharlon Creek, recent research has indicated that this portion of the river may not be utilised by chinook for spawning. As previously documented, the habitat below McPharlon Creek does not appear suitable in this regard. Generally the river is wider, less confined, with a gentler grade (slower moving) downstream of McPharlon Creek (Photo 1). As such there is less complexity of habitats (flow and cover) compared with the sites where juvenile chinook were captured (see photos 2 and 3).

**Photo 1.** Aerial view of typical stretch of Whitestone River downstream of McPharlon Creek.

**Photo 2.** Downstream view of sampling site (WT #4) where juvenile chinook salmon were captured.

**Photo 3.** Sample site (WT #5) where a juvenile chinook was captured.

Research conducted in 2003 located a radio tagged adult chinook as well as numerous spawning redds within the upper portion of the Whitestone River above McPharlon Creek (Anderton, 2003). The capture of juvenile chinook generally within this same area is therefore consistent with such findings.

The numbers of juvenile chinook captured within the Whitestone River were lower than the results of similar sampling conducted in 2002 on the Miner River (CRE-15-02). This is not surprising, as previous research has also indicated that a larger spawning population utilises the Miner River. However, the numbers of juvenile chinook captured within the Miner River were also found to be significantly lower than the numbers captured in similar habitats with what are suspected to be similar sized populations within the Upper Yukon River. For example a 1993 sampling of Croucher Creek (a small tributary stream of the upper Yukon River) resulted in average catches of 15 to 30 juvenile chinook per minnow trap during August. In another example, sampling of various tributaries of the Takhini River (a large tributary to the upper Yukon River) resulted in catches as high as 77 juvenile chinook in a single minnow trap. In contrast, a maximum of 8 juvenile chinook were caught in stations of three minnow traps in the Whitestone River. Further, in a 2002 sampling of the Miner River, a maximum of 21 juvenile chinook in stations of four minnow traps. Therefore, the results of this project may further indicate that the patterns of habitat use (specifically the timing of out-migration) for Porcupine River chinook stocks are significantly different than those of the upper Yukon River (Anderton, 2001 & 2002 & 2003) (Moodie et al, 1993) (Zurachenko & Finnson, 1998). It is therefore suspected that the majority of juvenile Porcupine River chinook are leaving (or being displaced by spring high water conditions) their natal streams earlier than those within the upper Yukon River Watershed. It remains unknown whether juvenile chinook exit the Porcupine watershed at an earlier age or whether rearing takes place further downstream in non-natal streams or the mainstem of the Porcupine River.

The size of the juvenile chinook captured in the Whitestone River is of further interest. With an average length of 86mm and weight of 4.9g, these are some of the larger juvenile chinook (0+)[1] found in the Yukon. In fact, the longest, at 101mm, is among the greatest lengths documented in the Yukon. For comparison, juvenile chinook captured in the Mayo River (tributary to the Stewart River—upper Yukon River watershed) during November 2004 averaged near 65mm in length (Tobler & Schonewille, 2005). Juvenile chinook captured in Croucher Creek (mentioned above) during August 1993 also averaged in this range (Moodie et al., 1993). Of note is that juvenile chinook captured in the Miner River during late July 2002 were smaller, with an average length of 68mm and weight of 3.2g (Anderton, 2002). The Forty Mile River, a tributary to the Yukon River in the Dawson City area shares some similar characteristics with the Whitestone River. It also drains an unglaciated area at a northern latitude, and the juvenile chinook that rear there are also large in size (documented up to 100mm), but quite low in numbers (Jaremovic & von Finster, 1988).

No juvenile chinook were captured in the three tributary streams sampled. This was not surprising given the low water levels and the nature of the tributary streams. For example McPharlon Creek, a major tributary stream, had intermittent flow during the time of survey. This, and many of the other streams, have a low gradient and drain areas of low-lying ground with near surface permafrost (Photo

[1] Fish captured are assumed to be 0+ due to overall large length structure in the population.

4). The slow flow and the wetland type habitat within these streams are not typically suited to chinook rearing (more suited to non-salmonid species). The tributary streams near and above the upstream limit of 2004 sampling drain more mountainous areas and as such may have more potential as chinook rearing streams.

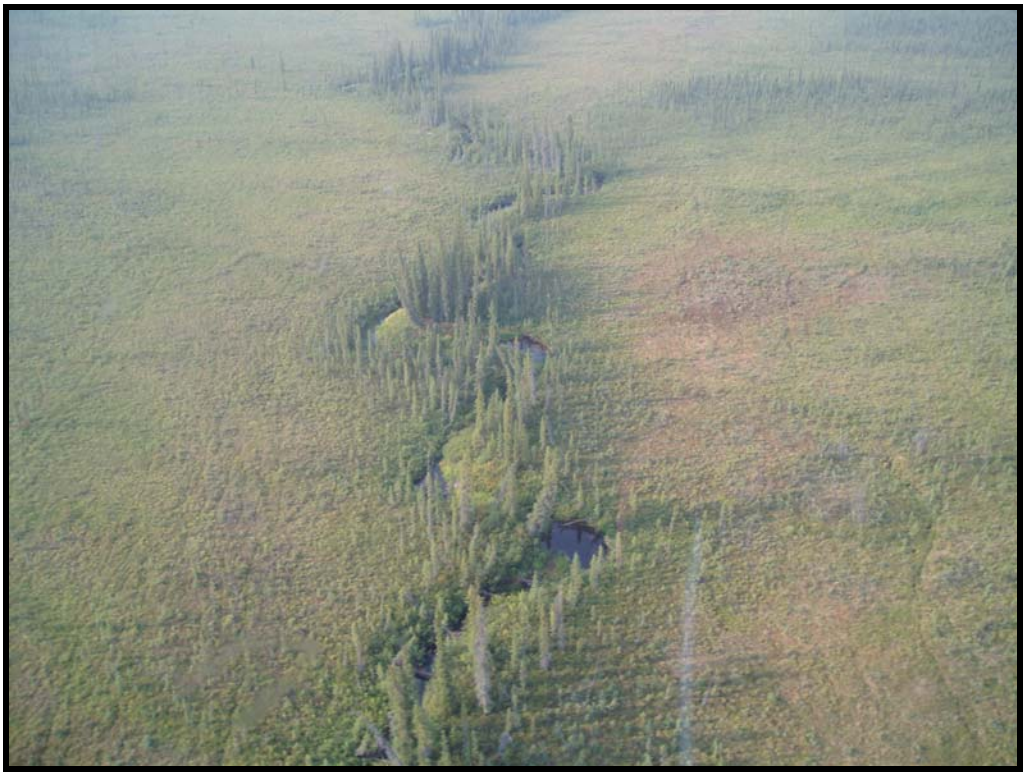

**Photo 4.** Typical tributary stream to the middle/lower portions of the Whitestone.

Within the Pacific region, two different races of chinook salmon with different life histories have been identified. Races of salmon are described as "subdivisions of a population that are geographically separated to some degree and between which gene flow is reduced" (Healey, 1991). The first is termed an "ocean-type" and has a short juvenile residence time in freshwater, migrating downstream within weeks of emerging from the gravel. The second race is termed "stream-type" and has a much longer and variable freshwater residence time, as well as being characterized as typical of individuals in northern rivers and in headwater reaches of watersheds. Yukon River chinook are considered to be composed of 100% "stream-type" stocks (Healey, 1991). However, considering the results of this and similar research conducted in the watershed as well as the documented presence of small numbers of chinook migrating past Old Crow as late as early October (ocean type chinook tend to migrate later in the year), it may be valuable to confirm that Porcupine River stocks are in fact 100% stream type stocks.

## 4.2 Water Temperatures

In the Whitestone mainstem, average water temperatures increased from site to site, moving downstream from WT#1 to WT#7. This trend is also consistent with results of similar sampling conducted in 2002 on the Miner River and suggests cooler ground and surface water sources originating in the North Olgilvie Mountains gradually warming due to solar radiation and mixing with other sources of water (Eagle Plains runoff) (Anderton, 2002).

In the tributary streams, average water temperatures can be related to their respective source. That is, TRIB #1 originates from sources in the North Olgilvie Mountains (likely mainly groundwater, considering low 2004 flows), and is relatively short, thereby limiting solar exposure. In contrast, TRIBS #2 & #3 are likely fed at least partly by runoff, and are relatively long, slow, meandering streams draining considerable portions of the Eagle Plains area, thereby allowing considerable opportunity for solar heating.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Chinook Salmon

The results of this project in combination with similar recent work confirm the presence of an established and successfully spawning population of chinook salmon utilising the Whitestone River. The locations of capture for juvenile chinook were consistent with previous results/observations regarding the location of chinook spawning habitat in the Whitestone River (Anderton, 2001 & 2002 & 2003(1)). The large size of juvenile chinook captured in the Whitestone is of note, including the longest on record in the Yukon (Jaremovic & von Finster, 1988). The following recommendations can be made to gain a better understanding of chinook salmon within the Whitestone River.

- Sampling to assess the extent of downstream migration of juvenile chinook shortly after break-up.
- Assessment of the presence/absence of juvenile chinook in smaller, non-natal tributaries to the Porcupine River.
- Further sampling within the tributaries of the Whitestone River to assess the degree of habitat utilization during periods of normal or high water flows.
- Further aerial sampling to investigate the locations of adult chinook and evidence of spawning (redds).
- Further investigation of the degree of habitat utilization by juvenile chinook in the headwaters of the Whitestone River.
- Further sampling for juvenile chinook throughout the Whitestone River watershed during the spring and summer months to better assess the absence / presence of rearing chinook. This would assist in determining the different life history patterns of Porcupine River chinook in comparison to those within the upper Yukon River.

### 5.2 Coho Salmon

The results of the juvenile assessment for coho salmon were inconclusive. No juvenile coho were captured in the Whitestone River system (even though suitable habitat exists and was sampled). Considering the current lack of information regarding Porcupine River coho stocks, there is little that can be extrapolated in these circumstances. However, these results are consistent with similar sampling conducted in the Miner and Bell River watersheds during recent years (Anderton, 2002 & 2003(2)).

The following recommendations can be made to gain a better understanding of coho salmon within the Whitestone River:

- Development of a program to track the migration of returning adult coho salmon;
- Further sampling of Porcupine River tributaries to gain knowledge of the habitat usage within the Porcupine River Watershed;

## 6.0 ACKNOWLEDGEMENTS

Funding for this project was provided by the Yukon River Panel's Restoration and Enhancement (R&E) Fund. The R&E fund was established under the Yukon River Agreement to conserve salmon stocks originating from Yukon River. Al von Finster (Fisheries and Oceans Canada) provided technical support to the project; William Josie (Vuntut Gwitchin First Nation – Natural Resources) provided general project direction and assistance with logistics. Field crewmembers Stan Njootli Jr., Kibbe Tetlichi and Philip Rispin provided the effort and practical input to ensure the project's success.

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# APPENDIX 1: SUMMARY OF SAMPLING DATA

| Stream Name | Watershed Code | UTM | Date | Sampling Methods | Sampling Effort | # of traps used | Sampling Location | Fish Species Captured | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Whitestone River Mainstem #1 | 818-0000 | 07 0596738 7309731 | August 7/04 | Backpack electrofishing | 320 seconds electrofish | NA | Gravel bar with very little woody derbis | slimy sculpin | Potential spawning area |
| Whitestone River Mainstem #2 | 818-0000 | 07 0605021 7320053 | August 7/04 | Minnow traps | 11 hours 23 minutes | 3 | Main channel of river with banks composed of gravel and vegetation | juvenile chinook salmon | |
| | | | | | 12 hours | 3 | Deep pool containing woody debris | juvenile chinook salmon | |
| | | | | | 11 hours 15 minutes | 3 | Gravel bar containing large woody debris | juvenile chinook salmon slimy sculpin | |
| | | | | | 11 hours 38 minutes | 3 | Back channel of river main stem | none | |
| Whitestone River Mainstem #3 | 818-0000 | 07 0613590. 7325305 | August 7/04 | Minnow traps | 11 hours 5 minutes | 3 | Back channel of mainstem | juvenile chinook salmon | Traps set in shallow, clear pool |
| | | | | | 11 hours 7 minutes | 3 | In mainstem pool with undercut bank | juvenile chinook salmon | |
| | | | | | 11 hours 7 minutes | 3 | Mainstem of river along bank between boulders and gravel bars | none | |
| | | | | | 11 hours 4 minutes | 3 | Mainstem where side channel joins | none | |

| Stream Name | Watershed Code | UTM | Survey Date | Sampling Methods | Sampling Effort | # of traps used | Sampling Location | Fish Species Captured | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Whitestone River Mainstem #4 | 818-0000 | 07 0633596. 7321040 | August 7/04 | Minnow traps | 10 hours 29 minutes | 3 | Slow moving tributary of river | none | |
| | | | | | 10 hours | 3 | Upstream from tributary mouth | none | |
| | | | | | 10 hours 15 minutes | 3 | Mainstem of river near back channel | juvenile chinook salmon | |
| | | | | | 11 hours 33 minutes | 3 | Confluence of tributary to river main stem | none | |
| Whitestone River Mainstem #5 (McParlon Creek) | 818-0000 | 08 0367723. 7331409 | August 9/04 | Minnow Traps Backpack electrofish | 23 hours 55 minutes | 3 | Mouth of creek | none | Area currently a back channel due to low flow; many sucker fry observed |
| | | | | | 23 hours 50 minutes | 3 | Back eddy in river mainstem downstream of creek mouth | none | |
| | | | | | 23 hours 55 minutes<br>150 seconds electrofish | 3 | Upstream of creek mouth in woody debris along outside bend | Arctic grayling burbot juvenile chinook salmon slimy sculpin | Fish shocked in small channel between mainstem channels in pool containing woody debris |
| | | | | | 23 hours 30 minutes | 3 | Downstream of creek mouth along the margins of a large pool of the river's main stem | slimy sculpin | |

| Stream Name | Watershed Code | UTM | Survey Date | Sampling Methods | Sampling Effort | # of traps used | Sampling Location | Fish Species Captured | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Whitestone River Mainstem #6 | 818-0000 | 07 0633856. 7338918 | August 9/04 | Minnow traps Beach seine | 18 hours 15 minutes | 3 | Along gravel bar in main channel | slimy sculpin | |
| | | | | | NA | Beach seine | In the main channel | slimy sculpin | |
| | | | | | 9 hours 25 minutes | 3 | Along the main channel | none | Potential as a spawning location |
| | | | | | 9 hours 25 minutes | 3 | On main stem, between gravel bars | slimy sculpin | |
| | | | | | 8 hours 38 minutes | 3 | Confluence of river mainstem and back channel | slimy sculpin | |
| Whitestone River Mainstem #7 (Chance Creek) | 818-0000 | 07 0616631. 7365398 | August 9/04 | Minnow traps | 18 hours 52 minutes | 4 | Currently unconnected back channel | none | No flow at time of sampling |
| | | | | | 18 hours 40 minutes | 4 | Small back water area at mouth of creek | longnose sucker | |
| | | | | | 18 hours 45 minutes | 8 | Margin of river mainstem along vegetated bank | slimy sculpin | |
| Whitestone River Tributary #1 | None assigned | 07 0596572 7308944 | August 7/04 | Backpack electrofishing | 380 seconds electrofish | NA | Small tributary with little flow | arctic grayling slimy sculpin | Good rearing habitat, fish may easily become stranded |
| Whitestone River Tributary #2 | None assigned | 07 0633384 7320828 | August 7/04 | Backpack electrofishing | 121 seconds electrofish | NA | Large tributary | arctic grayling slimy sculpin | |
| Whitestone River Tributary #3 (McParlon Creek) | None assigned | 08 0369505 7331709 | August 8/04 | Backpack electrofishing | 744 seconds electrofish | NA | Large tributary | arctic grayling slimy sculpin longnose sucker | Low flow through gravel bars, many fish in this area |

# APPENDIX 2: FISH CAPTURE DATA

**Sampling Site: Whitestone River #1 (WT #1)**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | slimy sculpin | 40 | no weight |
| | | 33 | no weight |
| | | 77 | no weight |
| | | 60 | no weight |

**Sampling Site: Whitestone River #2 (WT #2)**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | juvenile chinook salmon | 93 | 4.9 |
| 2 | juvenile chinook salmon | 89 | 5.2 |
| | | 81 | 4.8 |
| | | 87 | 4.9 |
| 3 | juvenile chinook salmon | 101 | 4.7 |
| | | 86 | 4.6 |
| | | 86 | 4.2 |
| | | 86 | 4.6 |
| | | 86 | 5.3 |
| | | 87 | 4.6 |
| | | 92 | 5.1 |
| | slimy sculpin | 125 | 14.7 |
| 4 | no fish captured | NA | NA |

**Sampling Site: Whitestone River #3 (WT #3)**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | juvenile chinook salmon | 87 | 4.4 |
| | | 78 | 2.8 |
| | | 86 | 4.4 |
| | | 76 | 2.5 |
| | | 89 | 4.2 |
| 2 | juvenile chinook salmon | 84 | 2.8 |
| | | 82 | 2.2 |
| | | 87 | 5.9 |
| | | 90 | 4.3 |
| | | 83 | 3.8 |
| | | 78 | 2.3 |
| | | 86 | 3.7 |
| | | 92 | 4.8 |
| 3 | no fish captured | NA | NA |
| 4 | no fish captured | NA | NA |

**Sampling Site: Whitestone River #4 (WT #4)**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | no fish captured | NA | NA |
| 2 | no fish captured | NA | NA |
| 3 | juvenile chinook salmon | 90 | 5.6 |
| | | 85 | 4.2 |
| | | 100 | 7.4 |
| | | 91 | 5.5 |
| 4 | no fish captured | NA | NA |

**Sampling Site: Whitestone River #5 (WT #5)**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | no fish captured | NA | NA |
| 2 | no fish captured | NA | NA |
| 3 | juvenile chinook salmon | 70 | 6.2 |
| | burbot | 160 | 38.3 |
| | arctic grayling | 90 | 11.4 |
| 4 | slimy sculpin | 46 | 0.6 |
| | | 43 | 0.5 |

**Sampling Site: Whitestone River #6 (WT #6)**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | slimy sculpin | 60 | 1.7 |
| | | 44 | 2 |
| | | 46 | 1 |
| 2 | slimy sculpin | 86 | 4.2 |
| | | 74 | 2.8 |
| | | 81 | 3.1 |
| 3 | no fish captured | NA | NA |
| 4 | slimy sculpin | 86 | 4.4 |
| 5 | slimy sculpin | 40 | no weight |

**Sampling Site: Whitestone River #7 (WT #7)**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | no fish captured | NA | NA |
| 2 | longnose sucker | 50 | 1.4 |
| 3 | slimy sculpin | 25 | no weight |

**Sampling Site: Tributary Stream #1 (TRIB #1)**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | arctic grayling | 130 | 30 |
| | slimy sculpin | 60 | 6.5 |
| | | 55 | 5.8 |
| | | 77 | 11.2 |
| | | 55 | 6.2 |
| | | 66 | no weight |
| | | 60 | no weight |
| | | 50 | no weight |

**Sampling Site: Tributary Stream #2 (TRIB #2)**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | arctic grayling | 32 | 3.4 |
| | slimy sculpin | 68 | 2.4 |
| | | 44 | 0.9 |
| | | 40 | 0.7 |

**Sampling Site: Tributary Stream #3 (TRIB #3)**

| Trap Set # | Species (number) | Length (mm) | Weight (g) |
|---|---|---|---|
| 1 | slimy sculpin (54)<br><br>(only 30 measured) | 62 | no weight |
| | | 55 | no weight |
| | | 35 | no weight |
| | | 40 | no weight |
| | | 35 | no weight |
| | | 36 | no weight |
| | | 37 | no weight |
| | | 40 | no weight |
| | | 15 | no weight |
| | | 35 | no weight |
| | | 40 | no weight |
| | | 40 | no weight |
| | | 35 | no weight |
| | | 40 | no weight |
| | | 35 | no weight |
| | | 35 | no weight |
| | | 35 | no weight |
| | | 45 | no weight |
| | | 40 | no weight |
| | | 45 | no weight |
| | | 30 | no weight |
| | | 35 | no weight |
| | | 30 | no weight |
| | | 40 | no weight |

TABLE Continued…

**Sampling Site: Tributary Stream #3 (TRIB #3) Continued…**

| Trap Set # | Species | Length (mm) | Weight (g) |
|---|---|---|---|
| | slimy sculpin (continued,,,) | 50 | 2.1 |
| | | 57 | 2.9 |
| | | 40 | 1.3 |
| | | 45 | 2.1 |
| | | 43 | 2 |
| | | 35 | 0.8 |
| | longnose sucker | 39 | no weight |
| | | 30 | no weight |
| | | 37 | no weight |
| | | 27 | no weight |
| | | 30 | no weight |
| | | 37 | 1.1 |
| | | 37 | 1.1 |
| | | 32 | 0.8 |
| | | 30 | 0.5 |
| | | 32 | 0.8 |
| | | 32 | 0.8 |
| | | 32 | 0.8 |
| | | 35 | 1 |
| | | 32 | 0.7 |
| | | 32 | 0.9 |
| | | 25 | 0.3 |
| | | 35 | 1 |
| | | 32 | 0.8 |
| | arctic grayling | 30 | 1.8 |
| | | 35 | 1.2 |
| | | 45 | 1.7 |
| | | 50 | 1.7 |
| | | 45 | 1.1 |

*Please note all fish captured via electrofishing at this site.*

# APPENDIX 3: WATER TEMPERATURE DATA

| Sampling Site | Trap Set # | Temperature at Set (°C) | Temperature at Pull (°C) | Presence of Juvenile Chinook |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Whitestone #1 | 1 | no temp | 8.9 | no |
| Whitestone #2 | 1 | 1.1 | 9.6 | yes |
| | 2 | 9.2 | 9.6 | yes |
| | 3 | 9.8 | 9.7 | yes |
| | 4 | 9.8 | 10.1 | no |
| Whitestone #3 | 1 | 11.7 | 11.3 | yes |
| | 2 | 11.3 | 11.3 | yes |
| | 3 | 11.8 | 11.3 | no |
| | 4 | 11.9 | 11.4 | no |
| Whitestone #4 | 1 | 11 | 12.7 | no |
| | 2 | 13.1 | 11.1 | no |
| | 3 | 13.6 | 12.1 | yes |
| | 4 | 13.3 | 11.9 | no |
| Whitestone #5 | 1 | 11.4 | 11.9 | no |
| | 2 | 12.5 | 12.4 | no |
| | 3 | 12.5 | 12.4 | yes |
| | 4 | 12.6 | 12.6 | no |
| Whitestone #6 | 1 | 14.9 | no temp | no |
| | 2 | no temp | 10.6 | no |
| | 3 | 14.8 | 9.1 | no |
| | 4 | 9.3 | 13.4 | no |
| | 5 | 14.8 | 13.8 | no |
| Whitestone #7 | 1 | 12.8 | 11.6 | no |
| | 2 | 15 | 14.2 | no |
| | 3 | 15.1 | 14.4 | no |
| Tributary #1 | 1 | no temp | 5.5 | no |
| Tributary #2 | 1 | no temp | 15.1 | no |
| Tributary #3 | 1 | 13.6 | no temp | no |