Fish of the Dempster Country Project

Blackstone Basin: 2017 Results Report

YFWET Project # 2016-17-21

Prepared for: **Tr'ondëk Hwëch'in First Nation**

&

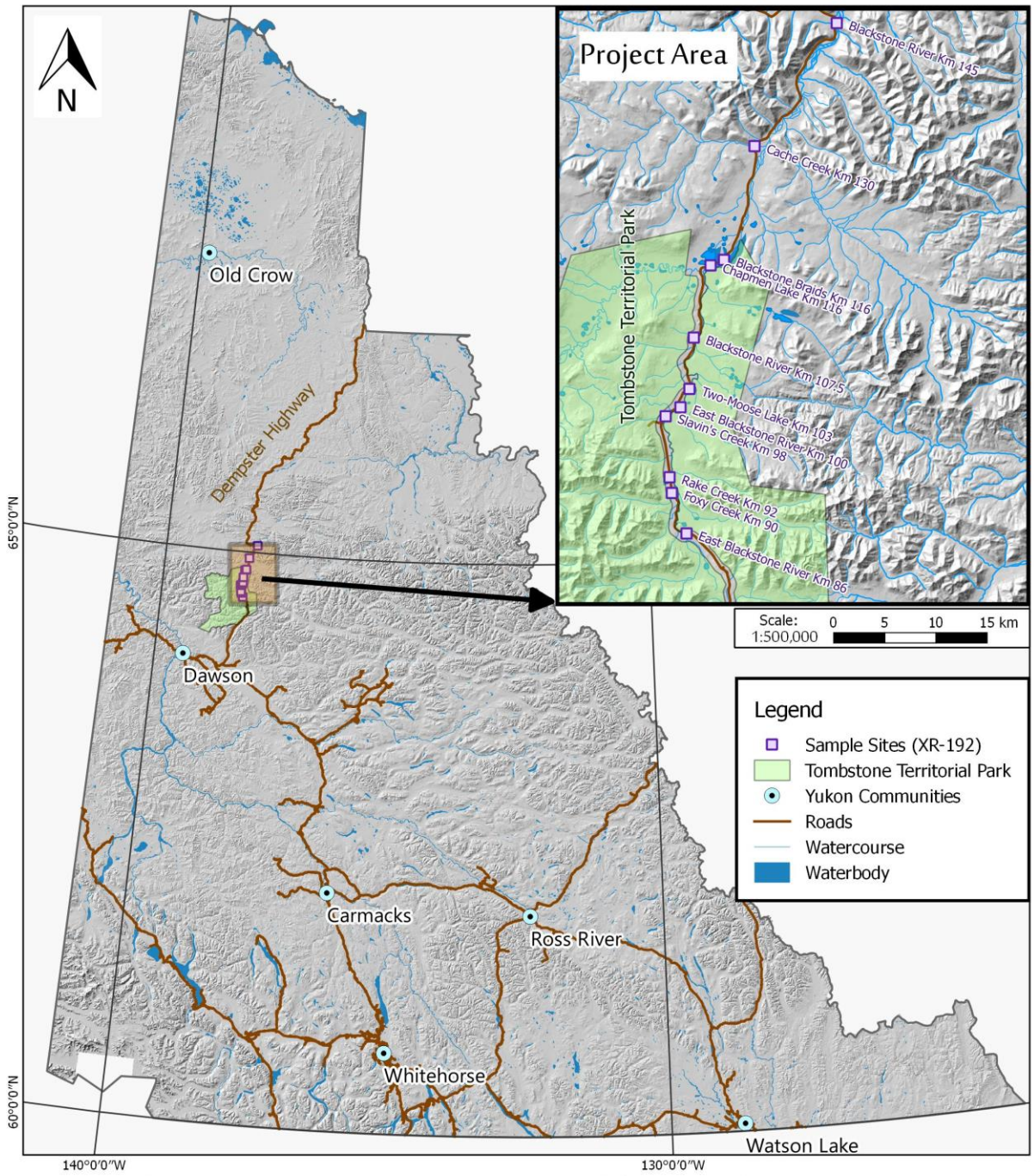
Yukon Fish and Wildlife Enhancement Trust

Prepared by: M.McHugh

~WILD-COUNTRY FISHERIES CONSULTING~

Fish of the Dempster Country Project

Thanks our funding and supporting partners:



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Fish of the Dempster Country Project 2016

Locator Map

Figure 1

50 0 50 100 150 200 250 km

Scale: 1:5,000,000

NAD83 || YT Albers || EPSG: 3578

Generated March 2017

Data Sources:
CanVec Topo
GeoBase
Yukon Geomatics

Background:

The Fish of the Dempster Country Project (FOD) was developed to gain a better understanding of fish and their respective habitat(s) within the southern Dempster region, near the City of Dawson, Yukon and within the Tombstone Territorial Park Highway Corridor. The project's objective is establishing base-line data in an area which little is known presently and involving First Nation youth as Stewards of natural resources within their Traditional Territory.

Project concepts and ideas were developed by means of partnering with Tr'ondëk Hwëch'in First Nation (THFN) Fish and Wildlife, through Traditional and Local Knowledge along with information gathered through previous studies in the region.

The project strives to maintain a priority in involving youth participation each year. In 2016 Tr'ondëk Hwëch'in - Fish and Wildlife Department staff and summer students took a lead role in the project field work and sampling and speaking to elders and community about the project. This involved selecting sampling locations important to THFN, enabling a direct association with the land in a scientific and traditional approach to gathering information. This helps create the respect and understanding needed for the next generation to govern our Fish and Wildlife resources into the future.

Introduction:

Fish of the Dempster Country Project completed the fourth (4th) project year in the summer of 2016. The FOD project continued the fishery assessment studies on the southern portion of the Dempster Highway Corridor, with a focus on sites within the (east arm and main-stem) Blackstone River. This concept was developed through past FOD project results and a growing interest in examining the unique productivity of fish and fish habitat in the Blackstone River Basin.

Project Activities:

- Continued collection of baseline data for fish and fish habitats within the Dempster Highway
- Direct involvement of the TH Fish and Wildlife staff and summer students, including project concepts, design and technical assistance with the field work.
- Incorporate Traditional and local Knowledge into the project working with Tr'ondëk Hwëch'in First Nation, youth and elders to establish an understanding of how fish populations in the Blackstone Basin were utilized in the past and how it is seen today
- GIS map(s) of the Blackstone River Project Area

Methods Used:

Various sampling and assessment techniques were utilized in order to represent fish and fish habitat characteristics for each site. Methods and equipment used varied from site to site, depending on which equipment was most the appropriate for that particular site and current condition and/or life stage and species of fish targeted.

Sampling methods and equipment used for the FOD 2016:

- Gee-Minnow traps:
- Electro-Fisher:
- Rod and Reel/angling:
- Dry Suit/snorkel swim:
- Visual Observations:

Sampling information was collected and recorded on all captured fish species, including, species ID, weight (g) and length (mm). Any notable comments regarding the environment and/or species health were noted at the time of sampling.

All sampling occurred within fifty (50) meters of either side of the highway corridor. Sampling efforts at sites with highway crossings such as culverts, were targeted up and down stream of the highway in attempt to represent trends in fish distribution, regarding life-stage(s) and behaviour.

A habitat assessment was completed on each site as a mean to measure fish habitat suitability. Sites which included a road crossing involving a culvert and/or bridge were assessed and monitored for fish passage. Measurements such as depth and stream width were recorded at a uniform station (marked with flagging) at each site visit in order to represent change and/or similarities, throughout the summer. A standardized "habitat assessment" form was created for the project based on water quality/quantity and specific habitat characteristics.

This included the following:

- Water Quantity: Temp, ave depth (cm), width (50 m tape) and a "Global" flow-meter
- Site Characteristics: such as bed material/water form & stage/vegetation present
- Site Characteristics: suitability of fish habitat, including rearing, spawning and migration routes
- GPS: lat/long coordinate and elevation
- Date/Time &Weather Conditions
- Notes: any notable features, including fish health, environmental changes in area and notes of interest to the project

*Temperature was recorded using a hand held thermometer, during each visit to the sample site.

11 sites were selected from the Blackstone River Basin, recognized as important indicator sites which represent the different life stages and cycles of fish utilizing the drainage. Specifically sites identified as important from Traditional and local Knowledge interviews, past FOD projects (2011-2013), government and non-government fishery assessments on the region and sites of general interest and/or of concern. Sites were also selected with respect to ease of access, located off the Dempster.

The following is a list of the sample site kilometer (Km) locations:

- **East Blackstone River-Km 86**
- **Foxy Creek-Jenson's Camp -Km 90**
- **Rake Lake/Creek-Km 92**
- **Blackstone River-Km 100**
- **Slavin's Creek-Km 98**
- **Two-Moose Lake- Km 103**
- **Blackstone River: Rest Area-Km107.5**
- **Chapmen Lake-Km 116**
- **Blackstone Braids-Km 116**
- **Cache Creek-Km 130**
- **Blackstone River-Km 145**

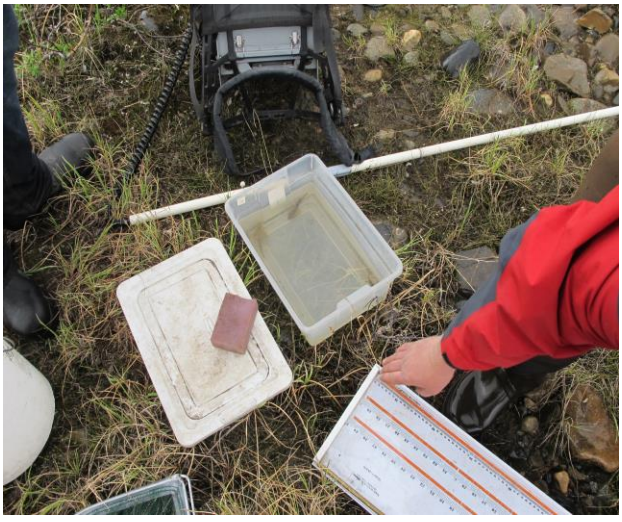
Sampling occurred on three (3) separate occasions throughout summer 2016, in June, August and September. Sampling dates were selected to represent any behaviour changes in fish presence or life stage during the summer. Several changes were made to schedules to allow both TH full time and summer student staff along with project coordinator to carry out the required work together.

The field work crew included:

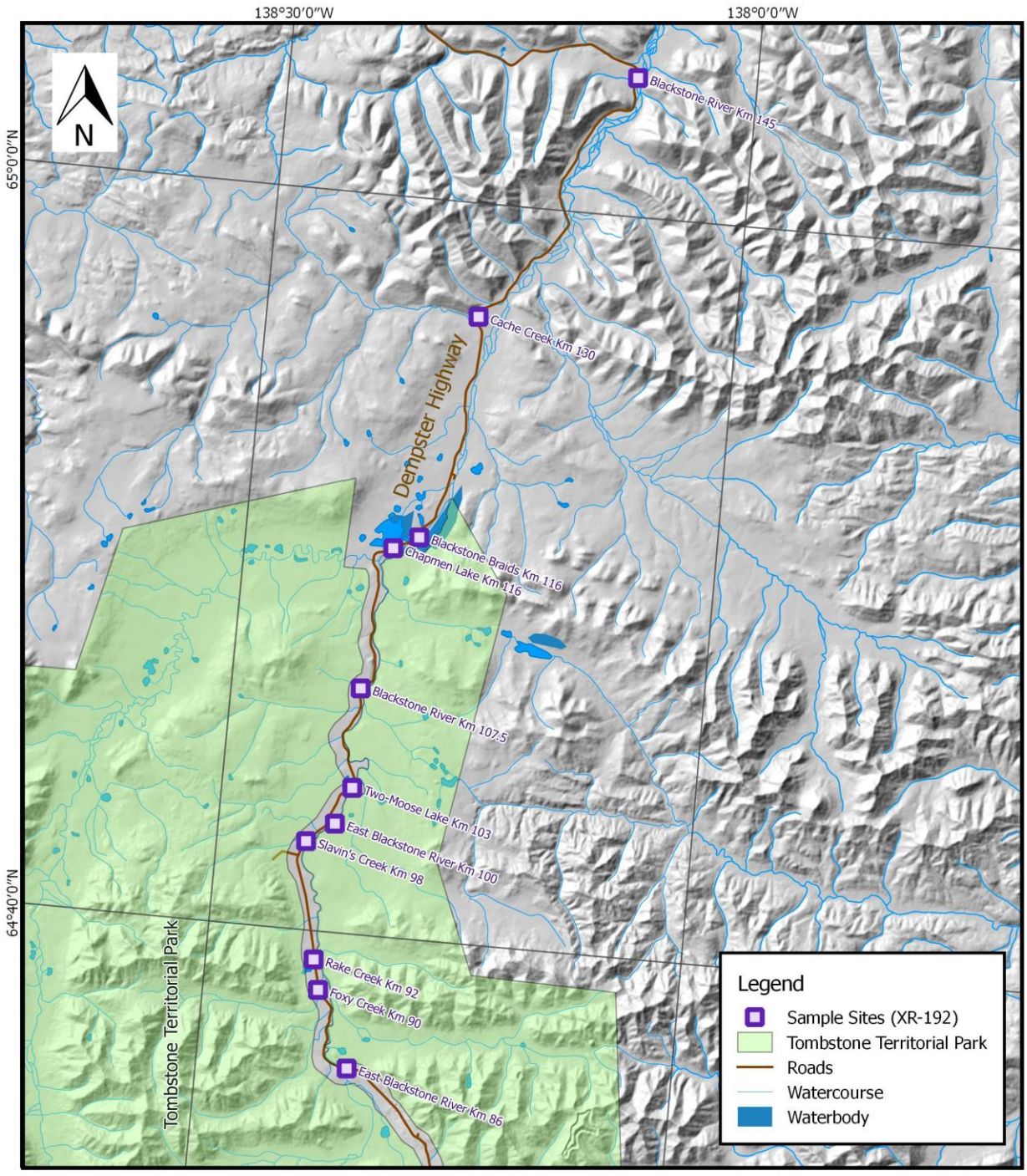
- Matthew McHugh-project coordinator
- Ryan Peterson-TH Fish and Wildlife Steward
- Chase Everitt-TH Fish and Wildlife Junior Steward
- Sammy Taylor-TH Fish and Wildlife summer student
- Adam Thom, TH Lands and Resources- Geospatial Technologist (added assistance)








FOD Field crew at work collecting samples during the August 2017 trip.



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Fish of the Dempster Country Project 2016

Site Reference

Figure 2

5 0 5 10 15 km

Scale: 1:250,000

NAD83 || YT Albers || EPSG: 3578

Generated March 2017

Data Sources:
CanVec Topo
GeoBase
Yukon Geomatics

Project Results:

The Blackstone Drainage offers a productive range of bio-diversity for fish and wildlife populations, considering its northern latitude and sub-arctic characteristics. As a result it was an important meeting ground and travel route for First Nations peoples in the past. Remnants of camps and settlements such Black City (Km 108 Dempster) along with grave sites is commonly found in the area. Evidence of fish traps could still be found in the Black City area into the mid 1960's.

Today the Blackstone Drainage is still regarded as important habitat for the bio-diversity of the area. It differs from all other Rivers within the Peel Drainage in that, it is accessible in large part via the Dempster Highway, which is traverses for most of its 140km reach to the Ogilvie River. It is also located less than two-hundred kilometers (200 Km) from Dawson City, Yukon, making it the most visited of the Peel Watershed tributaries. All types of user groups utilize the Blackstone River and Uplands, including but not limited to fishing, hunting, paddling, hiking, photography and wildlife viewing.

A significant area of the drainage is located within the Tombstone Territorial Park boundary, which is also experiencing a rise in both Yukon and out-side visitors. As a result, the Blackstone River receives the most impacts from human intervention, along the Highway Corridor. The largest impact to the fisheries stocks occur from angling pressures, at sites located right off the Dempster Highway. However the highway itself, especially during early construction isolated fish stocks through passage barriers such as raised culverts.

As a result, the Blackstone and its respective tributaries receive more pressures from human impact, such as many road crossings with use of culvert or bridge and angling pressures.

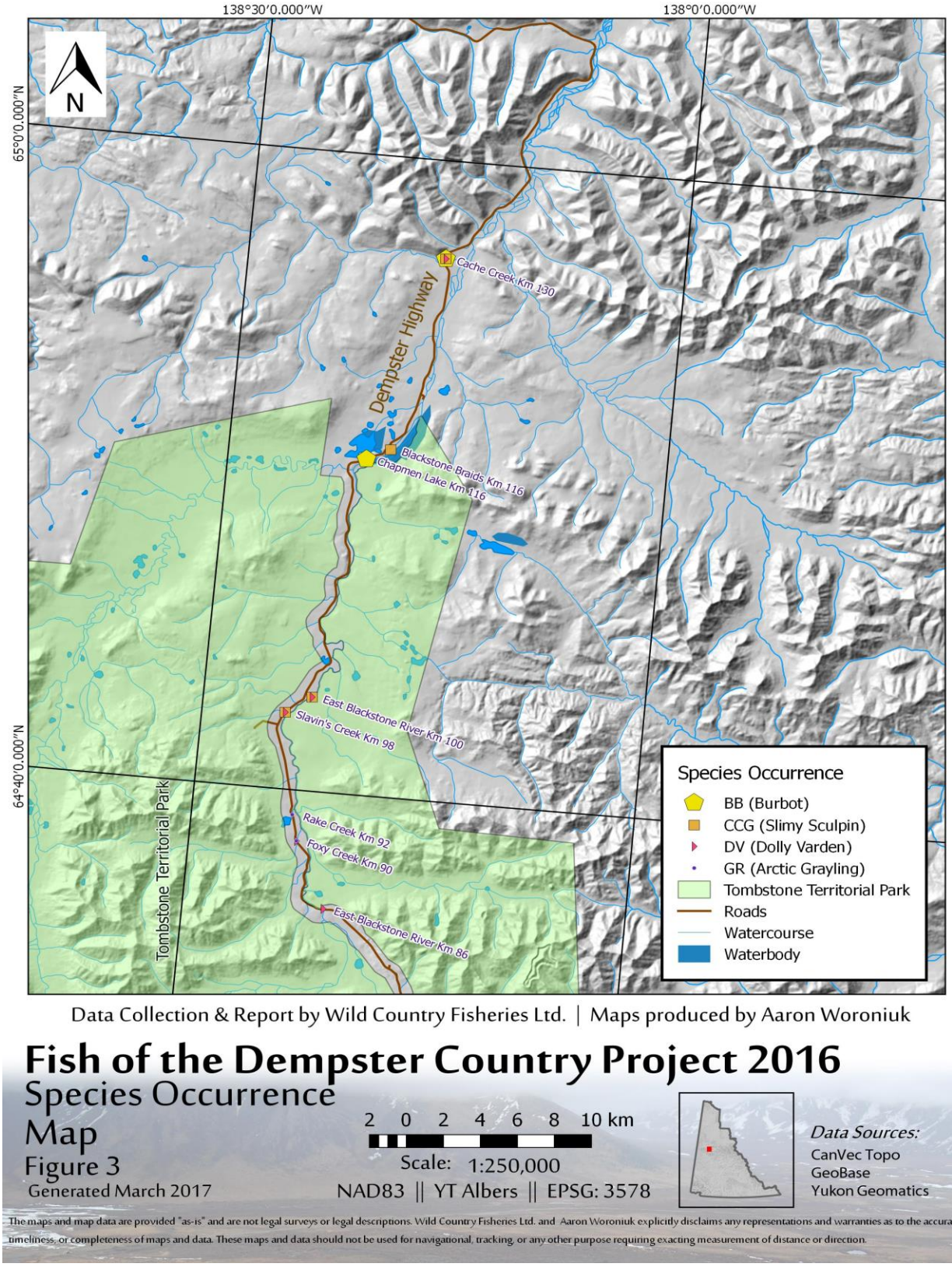
These pressures and the drainages importance to fish and wildlife populations have prompted monitoring through FOD 2016 at sites known to have these additional human pressures.

The Blackstone River, part of the greater Peel River Watershed (at its south-western extent), provides the necessary characteristics for healthy fish populations. A variety of fish species were live captured and sampled during the 2016 project including:

- Dolly Varden *Salvelinus malma*
- Arctic Grayling *Thymallus arcticus*
- Burbot *Lota lota*
- Slimy Sculpin *Cottus cognatus*

In previous FOD project years the following species were also captured:

- round whitefish *Prosopium cylindraceum*
- long-nosed sucker *Catostomus catostomus*
- lake chub *Couesius plumbus*



Data Collection & Report by Wild Country Fisheries Ltd. | Maps produced by Aaron Woroniuk

Fish of the Dempster Country Project 2016

Species Occurrence Map

Figure 3

Generated March 2017

2 0 2 4 6 8 10 km

Scale: 1:250,000

NAD83 || YT Albers || EPSG: 3578

Data Sources:
CanVec Topo
GeoBase
Yukon Geomatics

Juvenile fish captured during FOD investigations. Commonly found throughout the Blackstone River Drainage:

from top: Norther Dolly Varden, Arctic Grayling, Slimy Sculpin and Burbot

The most common species captured in the Blackstone were Dolly Varden *Salveninus malma*. Arctic Grayling are also abundant throughout, however Arctic Grayling were not captured as readily as Dolly Varden in 2016. Slimy Sculpin are also found throughout the drainage and are considered important fish for the project as individuals observed or captured indicates food availability, therefore indicating the possibility of other fish species being present at the specific site.

Listed as a species of special care by COSEWIC, Northern Dolly Varden *(Salveninus malma)*, and identifying the Blackstone River is important habitat for this species, Fish of Dempster intends to promote awareness through education.

A short species description of the Western Arctic populations is found below for reference.

Northern Dolly Varden:

Northern Dolly Varden found in the Blackstone Drainage are classed under the genus *Salveninus malma* and part of the Western Arctic population. The Blackstone Drainage Northern Dolly Varden are more susspetable to population decline due to ease of access from the Dempster Corridor (angling pressure/human impact) and isolation and limited habitat range, in that they are a non-anadromous population due to the impassable barrier upstream of the Peel at Aberdeen Canyon. Thus differ from populations residing below the falls which may be anadromous. Anadromous populations will migrate to sea to benefit from the rich oceanic food source during summer rearing (after three years-cosewic) before returning to freshwater to spawn and/or prepare for overwintering near to their natal streams.

The Western Arctic Populations in Yukon and North West Territories are considered in decline and have been listed under COSEWIC's Species of Special Concern. This may be due in

large part to the limited habitat these fish access, including the limited amount of locations for spawning and overwintering.

Northern Dolly Varden captured at Km 90-Aug 2017

Traditional and Local Knowledge:

During the project field work and afterwards in organized interviews information was collected from First Nation Elders and locals living in the Dawson region who have utilized the Blackstone area in the past and present time.

It should be noted, it was a challenge collecting Traditional Knowledge information through interviews specific to the Blackstone. Many of the First Nations who directly utilized the area have passed away. The few individuals, such as Percy Henry remaining and willing to speak about the area where young and did not have much information specific to the fish of the Blackstone area.

A more in-depth approach to collecting Traditional Knowledge information could be completed with more time and resources, involving extensive research and history into families and their ancestors who utilized the Blackstone area.

With that, I was able to speak with several Elders who had lived and/or traveled through the Blackstone area. We also gained valuable information from several local users of the area both First Nation and local community members who frequent the area from past until present.

The interviews suggested two major points regarding the area. There used to be more fish and less people utilizing the Blackstone Drainage.

In an interview with Percy Henry he expressed how rich this area was with fish. “So many fish, the Blackstone was black. It was easy to fish in Blackstone”. He went on to speak about the importance of the Blackstone River for other animals such as the caribou and moose,

for the First Nation people. Percy also noted “today, there is fewer fish and animals in Blackstone area than before”.

Percy spoke to the use of “fish traps, made from willows into cones, which caught Grayling, but also lingcod for food”.

Robert Alexie of Fort McPhearson, NT remembers fishing in the area with his brothers. “We would put line on stick, with hook and catch lots of fish every time we tried”.

We spoke with the head guide Clint Collins, of Tombstone Outfitters. Their base camp is located on the Dempster Highway at Km 90. One of the most productive FOD sites for Arctic Grayling and Northern Dolly Varden in both juvenile and adults life stages.

Kyler Mather, a life time resident of Dawson City, Yukon and avid hunter/fisherman has spent many hours fishing in the Blackstone River. He mentioned always remembering healthy stocks of Arctic Grayling in the Blackstone. “Every time we tried to fish, we caught something”. He remarked on the poor water quality last summer due to the heavy rains and observed Adult Arctic Grayling who appeared to have overwintered in the area because “the fish looked old and beat up”. He noted this was observed at a popular fishing hole off the Dempster.

Clint Collins, of Tombstone Outfitting has a base camp kilometer 90 Dempster Highway, which is also located right beside a FOD 2017 sample site. The camp backs on the Blackstone to the east. Clint has been guiding and fishing in the Blackstone area since 2006. “I’ve noticed a lot of Grayling up and down the river (Blackstone) through July, August and September, but seem to catch less in later September and fewer in October”.

Clint also commented on one of Tombstone Outfitting concession areas located near the headwaters of the Blackstone River, has a large presence of Dolly Varden. “You see in the small tributaries and Braided channels of the Blackstone River all around”.

Clint also commented on the increase of visitors to the area in recent years. He went ot say” I've noticed a lot of people fishing buy the base camp (Km 90). Typically more than 4 vehicles stopping per day”.

Discussion:

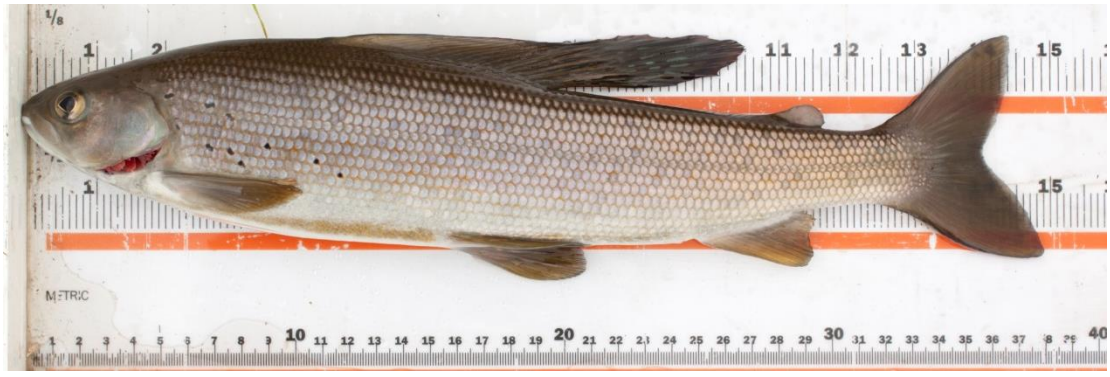
Completing the 2016 project year and specifically focusing on important sites along the Blackstone River, allowed for more time and efforts applied to the Blackstone Drainage, as opposed to previous project years.

The increase in sampling efforts did not result in any new fish species captured, but each site was evaluated in greater depth, therefore gaining a better understanding of the range of fish habitat throughout the Blackstone Drainage.

One of the largest challenges in capturing fish and completing habitat assessments for the field work crew in 2016 was the amount of heavy precipitation occurrence during the sampling periods. Heavy precipitation fall occurred before, during and/or after sampling on most sample dates, resulting in high water, flows and turbid water. This invariably affected fish presence and/or behaviour, therefore reducing live capture opportunities.

After completing four years of study on FOD sites, including the Blackstone River 2016 project, the data reflects a basic understanding of sample sites within both the North Klondike and Blackstone River Drainages. This includes a generalized understanding of spawning, rearing and potential over-wintering locations for a variety of fish species. Further investigation into each site would provide the necessary information for a full understanding of life cycles for a specific species.

Designing a study for next steps would most likely include a telemetry project, tracking individuals of a population in order to examine specific summer to winter migration patterns, including spawning and rearing areas. The North Klondike and Blackstone drainage, examined in the FOD 2011-2013&2016 would be a good candidate, focusing on Arctic Grayling and/or Northern Dolly Varden. Both species appear to have stable populations, are targeted by anglers and little information is documented regarding migration patterns of these fish.



A healthy looking adult Arctic Grayling capture by rod and reel at Km 90- June 2017

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Whitehorse, Yukon, Canada.

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Unpublished paper

Traditional Knowledge:

Percy Henry Interview, in person by Matthew McHugh. Feb 2012.
Robert Alexie Interview, over the phone by Matthew McHugh. Jan 2013.

Personal Communication:

Clint Collins, knowledge of Arctic Grayling and Dolly Varden in Blackstone River
In person at the Tombstone Outfitters base camp, Km 90 Dempster Highway. August 2016

Kyla Mather, local knowledge of Arctic Grayling fishing in Blackstone River.
Phone Conversation March 2017.

Pete Jenson, knowledge of fish and fish habitat around Jenson's Camp Km90
Telephone interview March 2014.