

fish

Arctic Char or Dolly Varden Char?

There is some confusion over whether the char found in the upper Peel watershed are Arctic Char (*Salvelinus alpinus*) or Dolly Varden Char (*Salvelinus malma*). In the various reports and surveys reviewed for this project, researchers seemed to differ in opinions. However, in 1999 and 2000 the YTG Fisheries Biologist, Susan Thompson, took adipose fin samples from char found in the upper Bonnet Plume River and sent them to the University of British Columbia for DNA analysis. The analysis showed that all char sampled were Dolly Varden char (Thompson, 2002). In the account here we have listed species as they were reported by individual researchers. Keep in mind that Arctic Char may in fact be Dolly Varden.

Eighteen different species of fish are known to use the Peel River watershed for some portion of their life cycles (MacDonald Environmental Services Ltd., 1995). Map 19 illustrates known locations where fish have been sampled by different researchers over the last 23 years. Arctic grayling, round whitefish, dolly varden and slimy sculpin were the most common species found at these locations.

Fishing activities in the watershed are very limited. There are no commercial fisheries activities in the area shown on the map. There is, however, a domestic fishery operating out of Fort McPherson, further north on the Peel River (MacDonald Environmental Services Ltd., 1995).

A fish survey conducted by YTG Fisheries Biology staff in 2000 found that Bonnet Plume Lake had an excellent abundance of lake trout compared with other lakes of similar size surveyed in the Yukon. As well, the lake trout

had a larger mean weight compared to other lakes. Similarly, Duo Lake had good abundance of lake trout and heavier lake trout compared to other lakes (Thompson, 2002).

In 1996, CPAWS hired Indigo River Consulting to conduct a fish habitat assessment of the Snake River. Indigo River Consulting concluded that the smaller tributaries in the upper half of the Snake River played an important role in the life cycle of arctic char and arctic grayling. They found a significant proportion of the tributaries were capable of fish production (Indigo River Consulting, 1996). This was contrary to earlier speculations by researchers who thought the tributaries would be too steep to sustain fish populations (Elson, 1974). When all tributaries were considered together, Indigo River Consulting found they added up to a significant amount of fish rearing and spawning habitat.

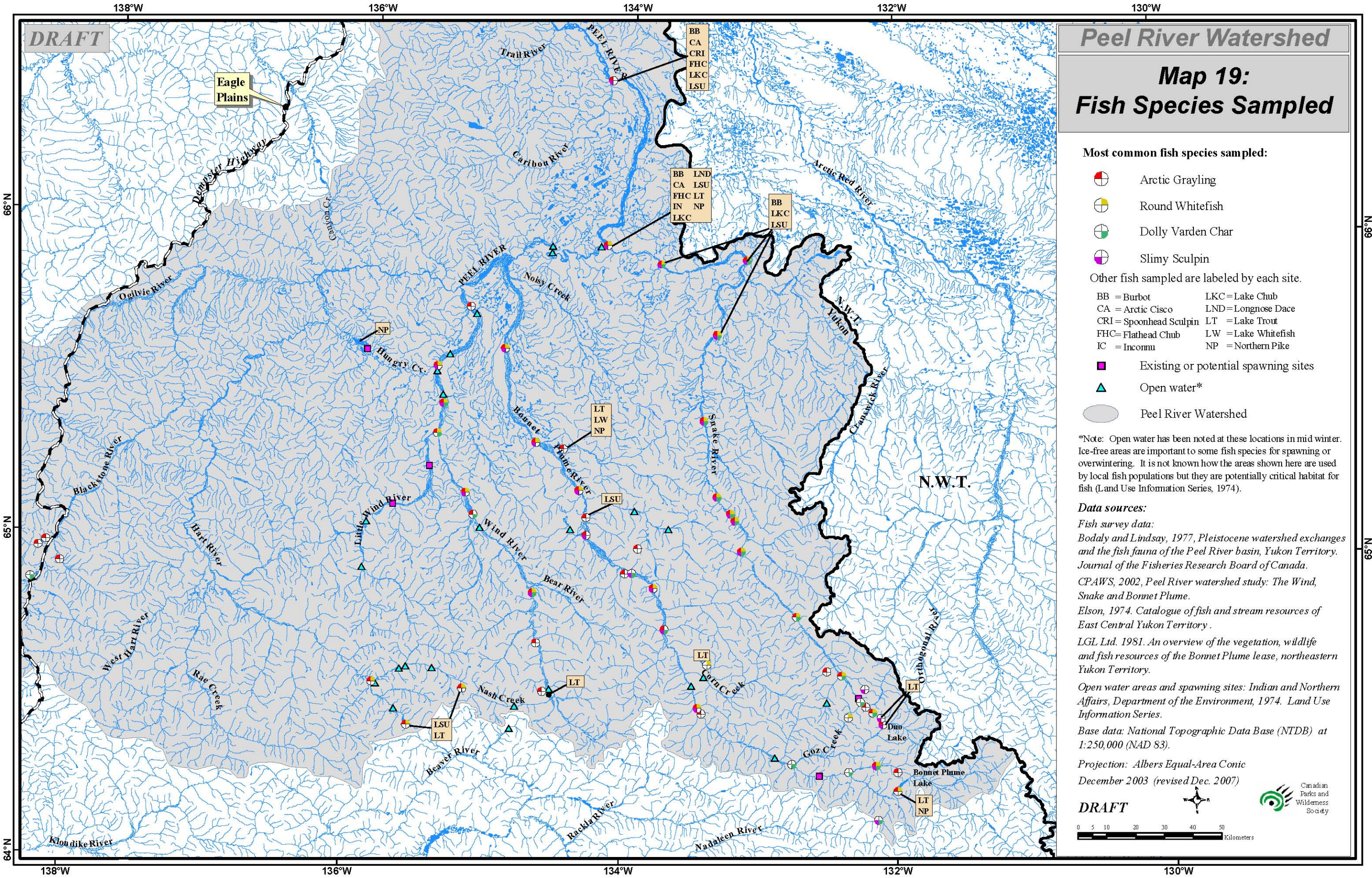
Furthermore, Indigo River Consulting found

A fisheries technician samples for fish on a CPAWS research trip on the Snake River. [JP]



evidence that suggested adult char and grayling may overwinter in the Wind River watershed. This too was contrary to some of the traditional views that these fish migrate out of the Wind River system to over-winter in the Peel River (LGL Ltd., 1981). The consultants came to this conclusion because early in the summer they found juvenile fish farther up the Wind River than believed possible if the juvenile fish had migrated from the Peel River that same year. They therefore speculated that adults and juveniles may spend winters in the deeper pockets of lakes and along the river to avoid winter freeze-up and then are able to access good habitat early in spring. If this is the case, these deeper pockets of water would be a critical habitat of fish in the upper Peel River watershed (Indigo River Consulting, 1996). The map highlights a few locations throughout the watershed where open water has been known to occur in winter. These areas, too, may be crucial for overwintering fish.

The Peel River watershed's unique glacial history has interesting implications for the fish that inhabit this watershed. During the Pleistocene glaciations, on at least two occasions, the Peel River's channel to the Mackenzie River was blocked by a wall of ice. This meant that the water from the Peel River was diverted to the northwest, flowing into the Porcupine River and eventually the Yukon River (whereas it currently flows into the Mackenzie River and the Arctic Ocean). As a result, there was a two-way transfer of aquatic organisms between the Mackenzie and Yukon River systems. There are at least six fish species that now live in the Peel system which are genetically different from those in the rest of the Mackenzie River system. These six species either came from the Yukon River system during the exchange, or developed in unglaciated parts of the Peel system. They include the northern pike, arctic grayling, lake whitefish, pygmy whitefish, slimy sculpin, and lake trout (Bodaly and Lindsey, 1977).



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Peel River Watershed

Map 19: Fish Species Sampled

- Most common fish species sampled:**
- Arctic Grayling
 - Round Whitefish
 - Dolly Varden Char
 - Slimy Sculpin
- Other fish sampled are labeled by each site.
- | | |
|-------------------------|---------------------|
| BB = Burbot | LKC = Lake Chub |
| CA = Arctic Cisco | LND = Longnose Dace |
| CRI = Spoonhead Sculpin | LT = Lake Trout |
| FHC = Flathead Chub | LW = Lake Whitefish |
| IC = Incommu | NP = Northern Pike |
- Existing or potential spawning sites
 - Open water*
 - Peel River Watershed

*Note: Open water has been noted at these locations in mid winter. Ice-free areas are important to some fish species for spawning or overwintering. It is not known how the areas shown here are used by local fish populations but they are potentially critical habitat for fish (Land Use Information Series, 1974).

Data sources:

Fish survey data:
 Bodaly and Lindsay, 1977, Pleistocene watershed exchanges and the fish fauna of the Peel River basin, Yukon Territory. *Journal of the Fisheries Research Board of Canada.*
 CPAWS, 2002, Peel River watershed study: The Wind, Snake and Bonnet Plume.
 Elson, 1974. Catalogue of fish and stream resources of East Central Yukon Territory.
 LGL Ltd. 1981. An overview of the vegetation, wildlife and fish resources of the Bonnet Plume lease, northeastern Yukon Territory.

Open water areas and spawning sites: Indian and Northern Affairs, Department of the Environment, 1974. *Land Use Information Series.*

Base data: National Topographic Data Base (NTDB) at 1:250,000 (NAD 83).

Projection: Albers Equal-Area Conic
 December 2003 (revised Dec. 2007)

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