



**Independent Environmental
Monitoring Agency**

Introduction to the Panda Diversion Channel

Ekati's Environmental Monitoring And Management Programs

Workshop - March 16th and 17th, 2004

March 16th, Afternoon Session

- Background to the Panda Diversion Channel Special Effects Monitoring Program
- Findings of the 2003 field season
- IEMA comments on the findings

Introduction to The Panda Diversion Channel Special Effects Monitoring Program

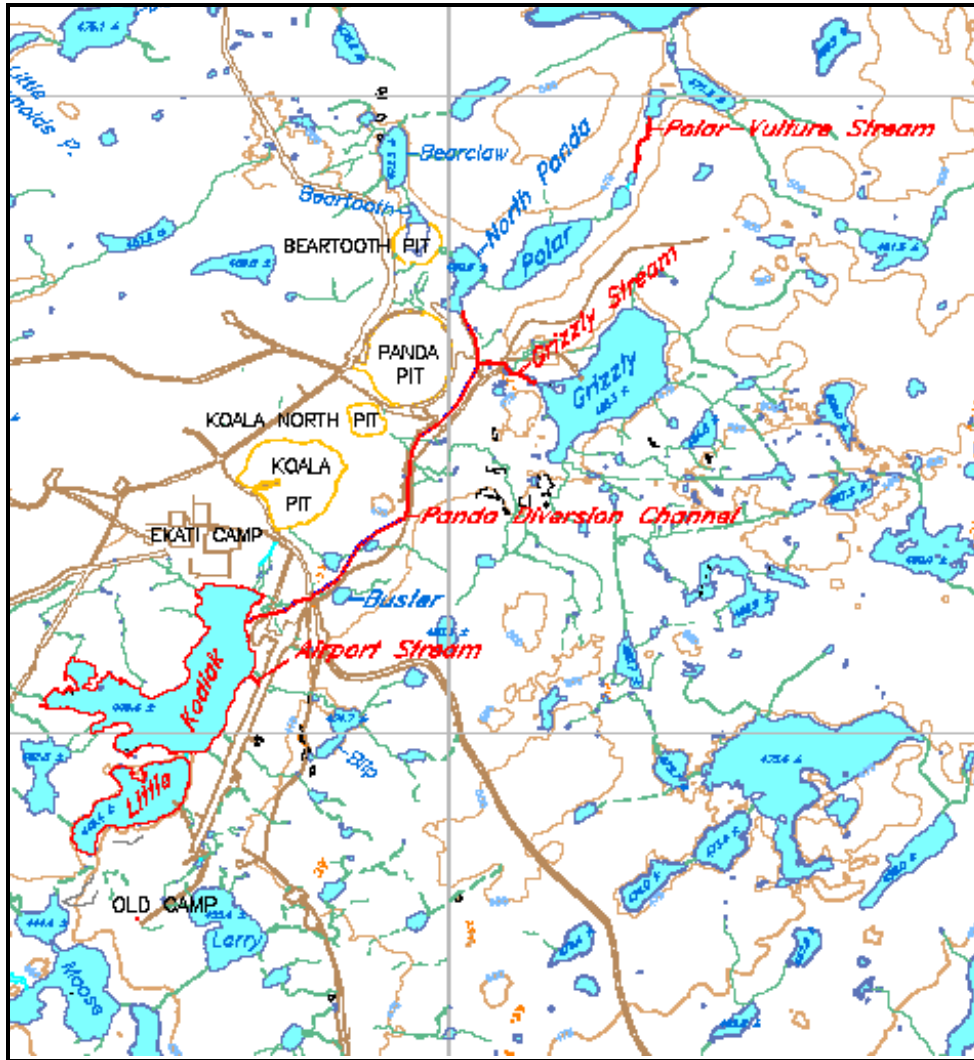
Photo: Lower
reach of the PDC
during freshet,
2003



About the Panda Diversion Channel (PDC):

- Built from 1996-1998
- Reconnects the lakes above the main mine site to the lakes downstream of the LLCF
- Diverts water around the Panda and Koala pits into Kodiak Lake
- Designed to replace fish habitat lost from the draining of lakes and streams

Map of the Panda Diversion Channel



Source:
PDC 2003

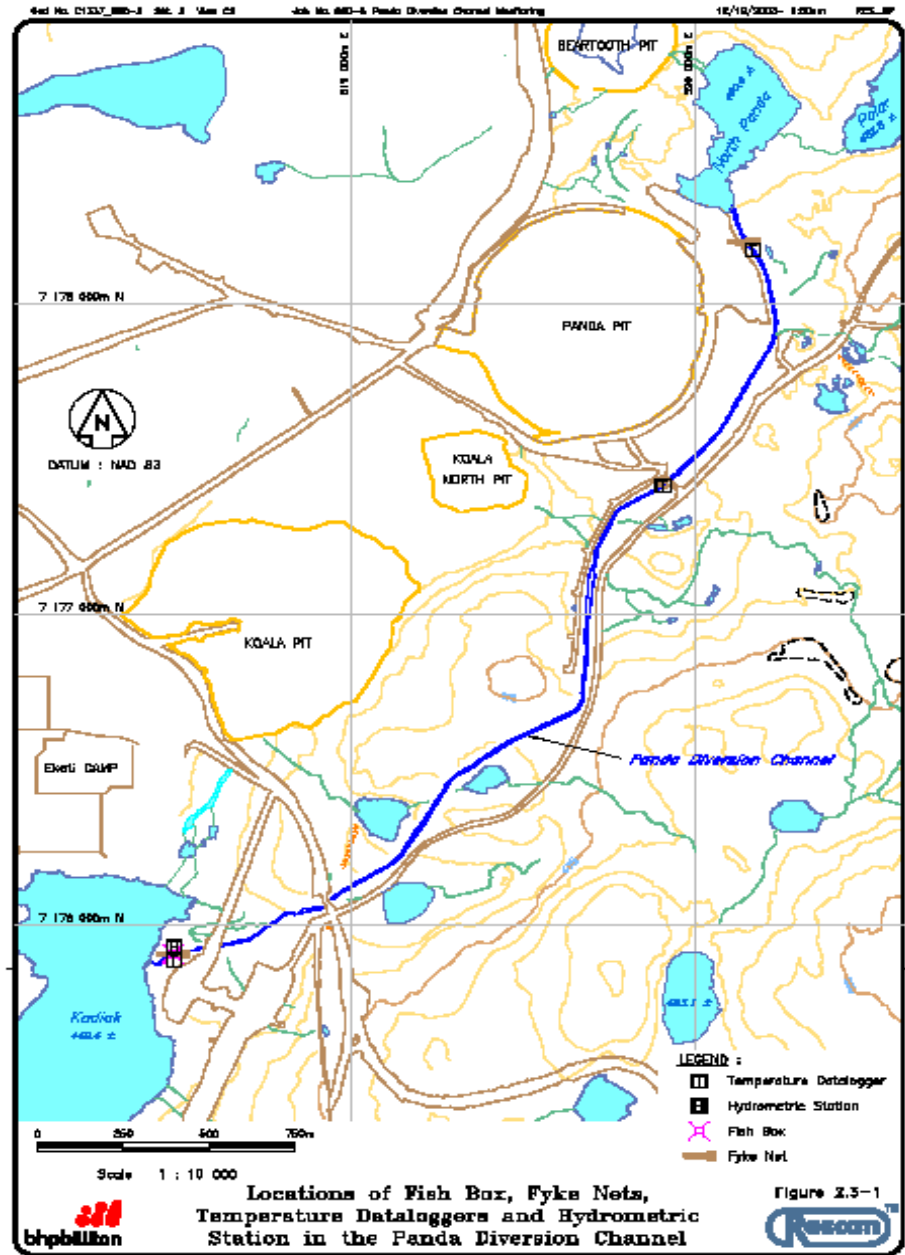
Monitoring locations along the Panda Diversion Channel

Legend:

Fyke Net – brown line

Fish Box – pink X

Temperature logger and hydrometric station – black boxes



Source: PDC 2003

The Outlet of the Panda Diversion Channel



Photo: The
outlet of the
PDC into
Kodiak Lake

Basic Facts about the PDC:

- 3.3 km long, between 2 and 10 metres wide
- Receives water from a variety of lakes and ponds
- Intent is to provide spawning, egg incubation and early rearing habitat for local fish species

Fish Box at the Panda Diversion Channel

Photo: Fish
box at freshet,
2003



Arctic Grayling

- Arctic grayling (or bluefish) are the most studied fish
- Most Arctic grayling enter the PDC from Kodiak Lake in early spring to spawn
- The focus of 2003 monitoring shifted to look more closely at young grayling

Measurements used to see how the PDC and Arctic grayling interact

- Monitoring Stations and Fish boxes were enhanced (smaller mesh size was used to capture fry)
- Other streams were monitored for comparison to PDC
- Arctic grayling fry leaving the PDC were marked to see if they survive the winter and come back to the PDC
- Adult grayling were looked at in Kodiak Lake

Panda Diversion Channel (PDC)

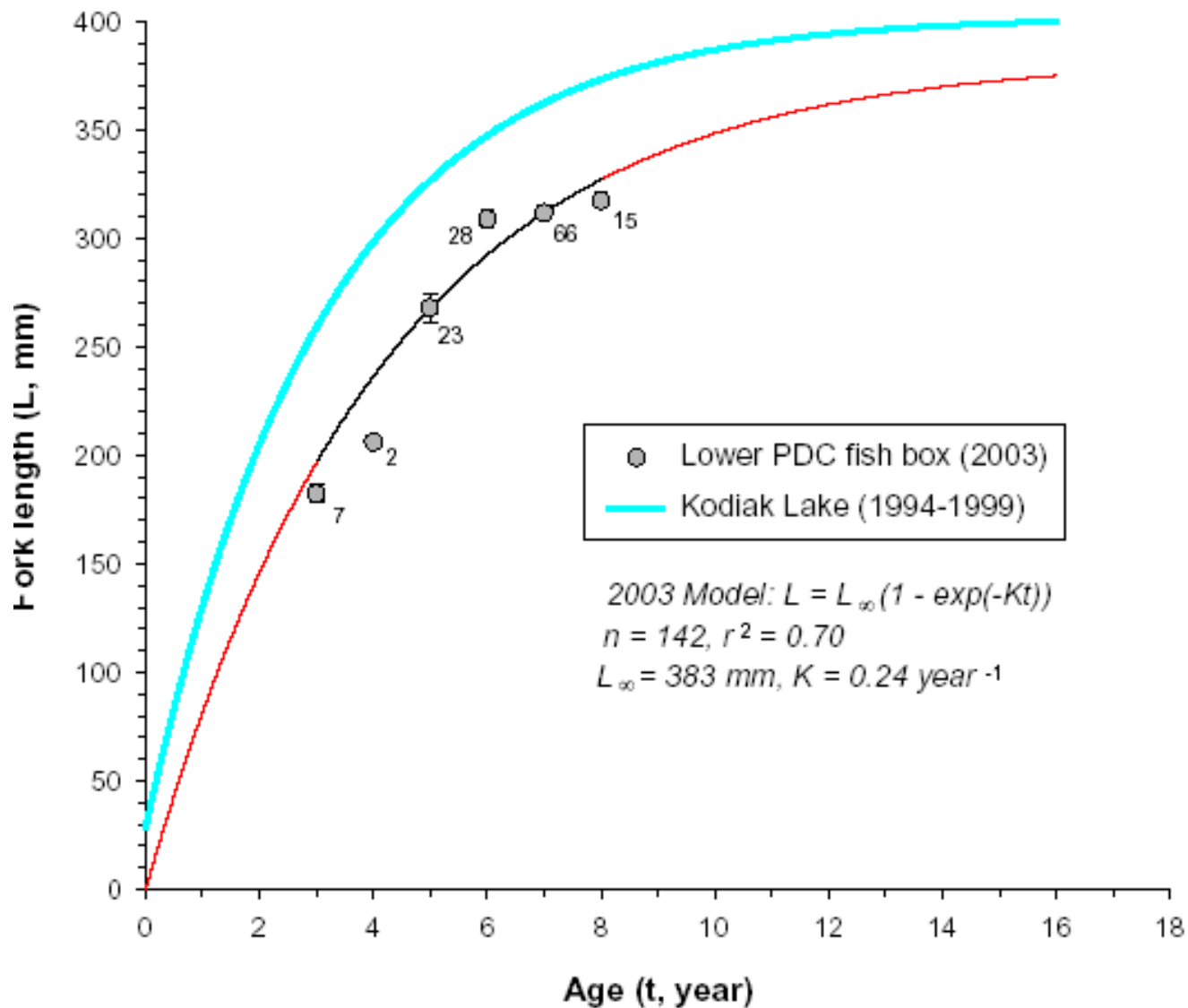
- Arctic grayling continue to use the channel (95% of total of 764 fish)
- Grayling using the PDC ranged in age from 3 to 8 years of age, averaging 6 years.
- Spawning habitat became available in 1998.
- More grayling spawners (351) used the PDC than used reference streams.
- May be approaching the capacity of the PDC to produce and support grayling.

PDC: Grayling Spawning

- Of the grayling that were repeat spawners, more were males than females
- This was also the case for first time grayling spawners
- Females may not be surviving the rigors of spawning in the PDC as well as males, or this could be that not enough samples were taken to identify the cause

PDC: Grayling Growth Rate

- Growth rate slower than for grayling caught in Kodiak Lake in 1995-1999
- Possible causes:
 - More nutrients into Kodiak Lake caused by sewage discharge in the late 1990s created greater supply of food plankton.
Result: bigger Kodiak fish
 - Less food plankton in PDC.
Result: “runt” PDC fish



Notes: Numbers are sample sizes for each age
 Error bars are one standard error of the average
 Red lines indicate predictions outside of the range of age data

Measuring grayling Fry survival

- The adipose fin of some grayling fry moving out of the PDC was clipped
- In total 1668 fry had their fins clipped (19% of the total fry)
- In five or six years some of these fry may return to the PDC to spawn