

# Red Dog Mine and Fort Knox Mine Fish and Aquatic Bio- monitoring

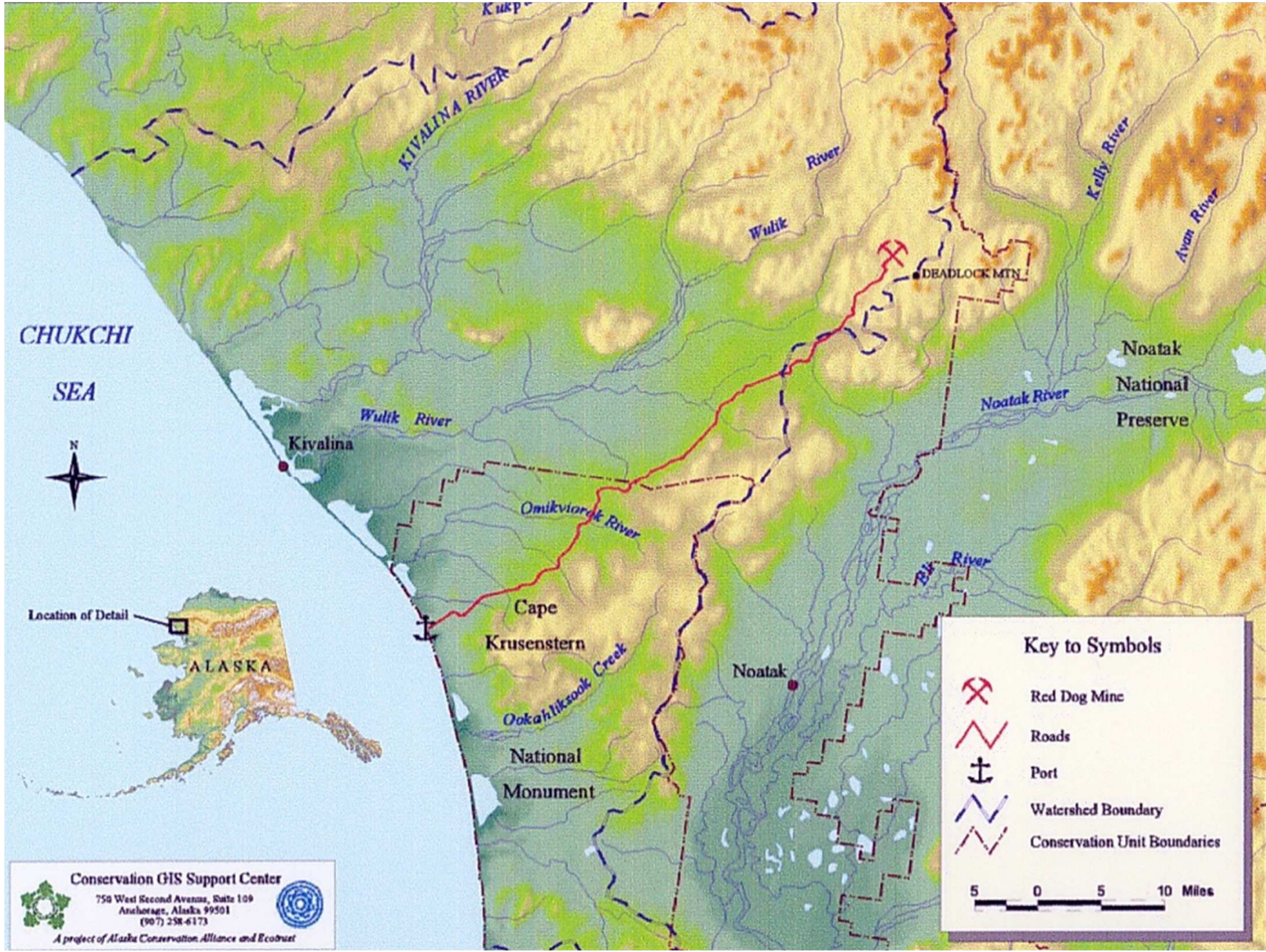


Bill Morris, Alaska Department of Fish and Game,  
Division of Habitat








# Presentation Overview

- Red Dog Mine Bio-monitoring
  - Sampling program
  - Results
  - Conclusions
- Fort Knox Mine
  - History
  - Sampling program
  - Results and Conclusions



**Key to Symbols**

-  Red Dog Mine
-  Roads
-  Port
-  Watershed Boundary
-  Conservation Unit Boundaries

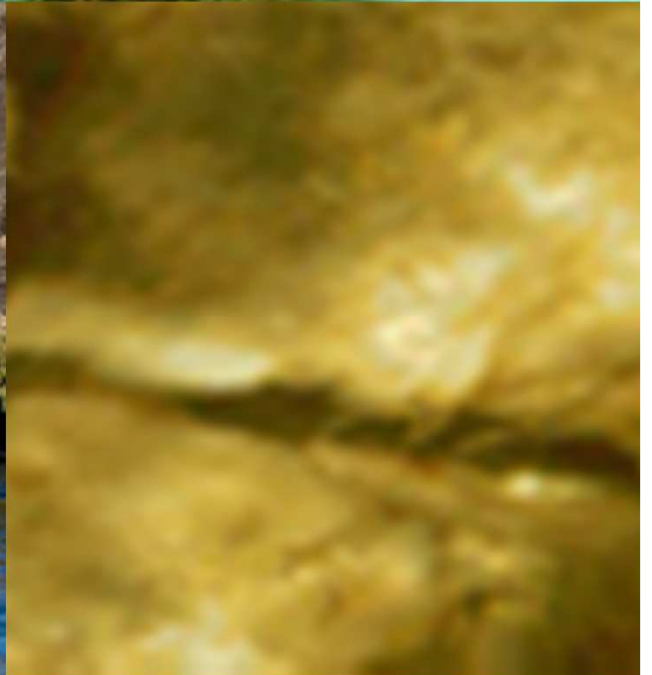
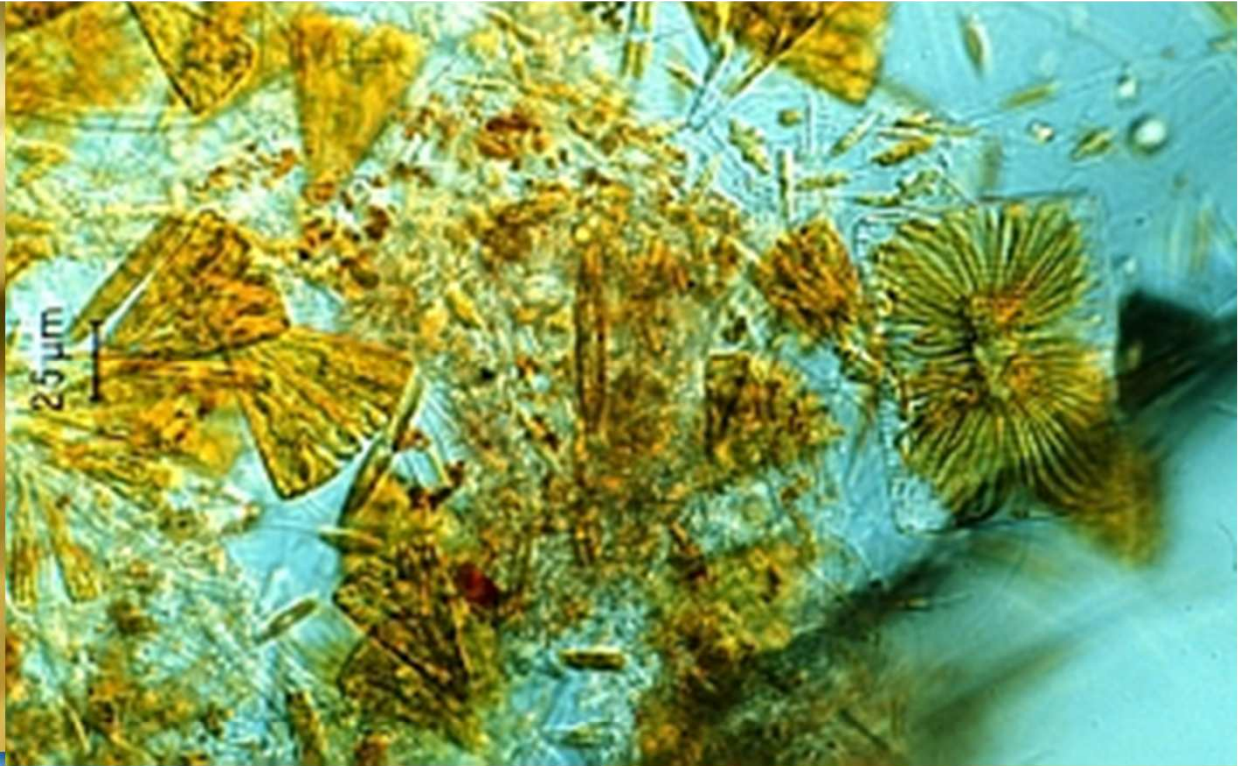
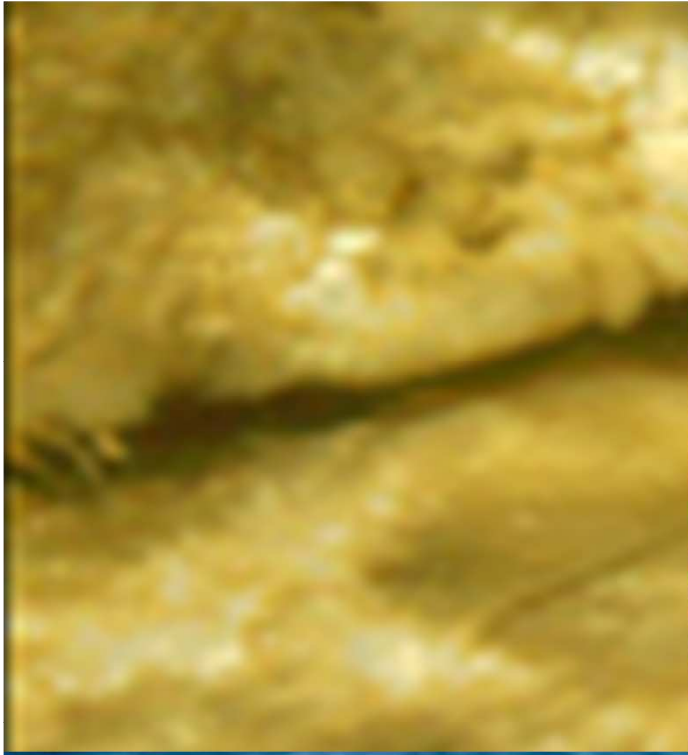
5 0 5 10 Miles

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 750 West Second Avenue, Suite 109  
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 (907) 258-6173

*A project of Alaska Conservation Alliance and Ecotrust*

# Periphyton Sampling





# Invertebrate Sampling









# Fish Sampling

JUN 1 2005





# Fish Sampling

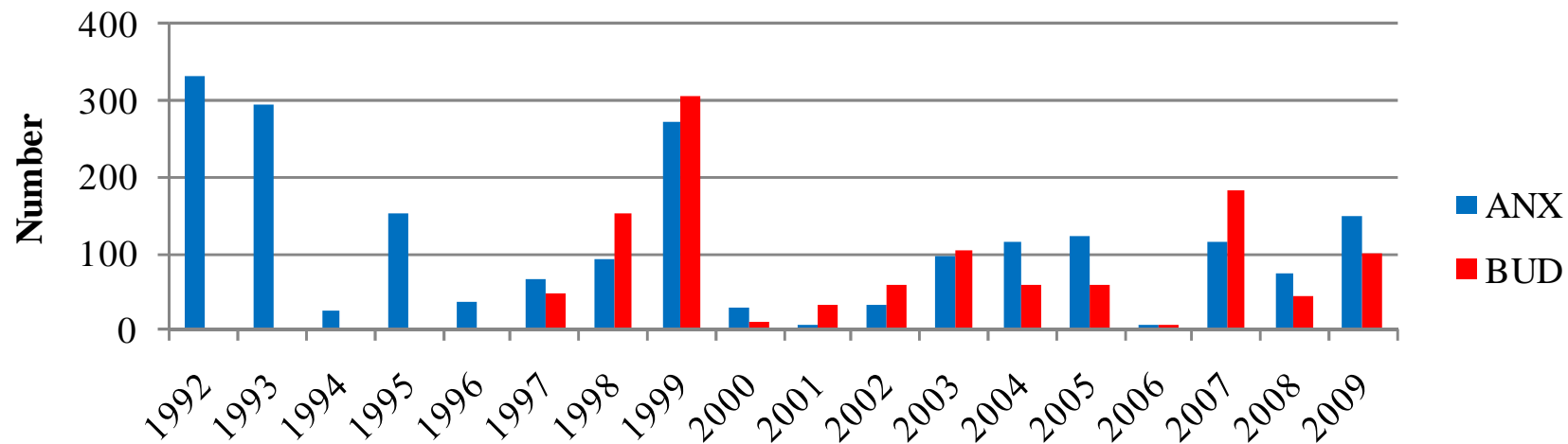


# Tissue Sampling

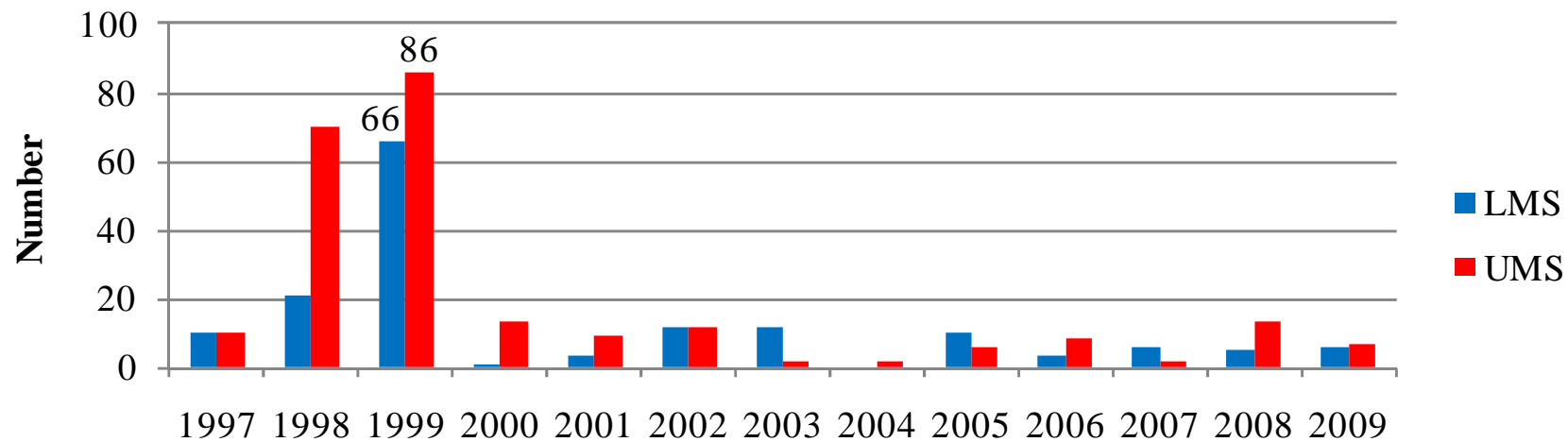


# Bons/Buddy Summary

## Juvenile Dolly Varden



## Juvenile Dolly Varden

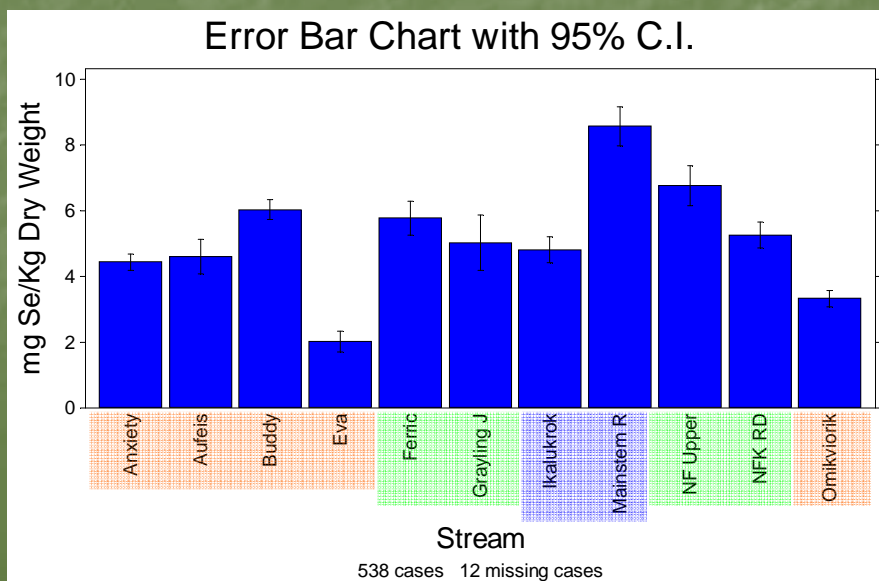
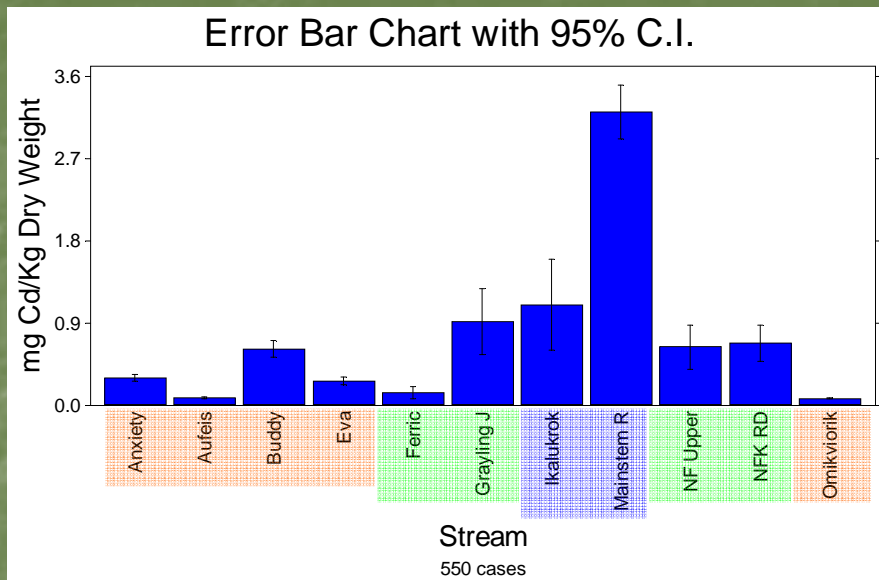


# Multi-Site Comparisons

Road Sites

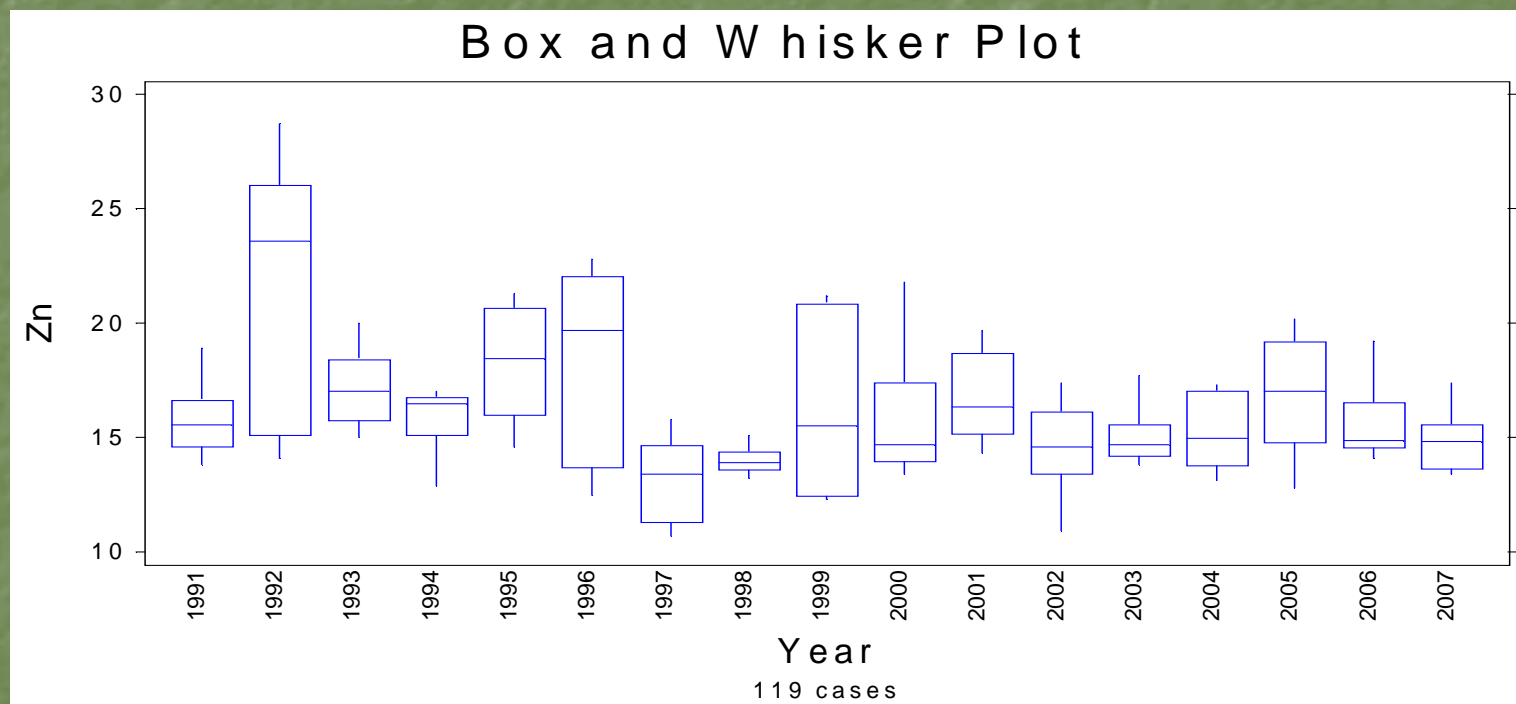
Natural Sites

Mine Effluent and Natural



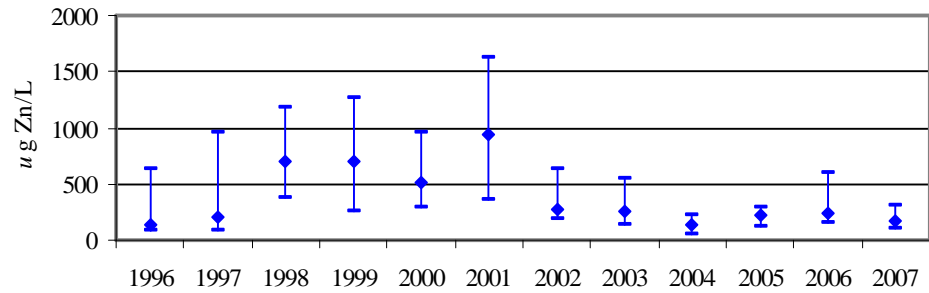
# Long Term Data Adult Dolly Varden – Wulik River

Spring - Mg Zn/Kg Muscle Tissue

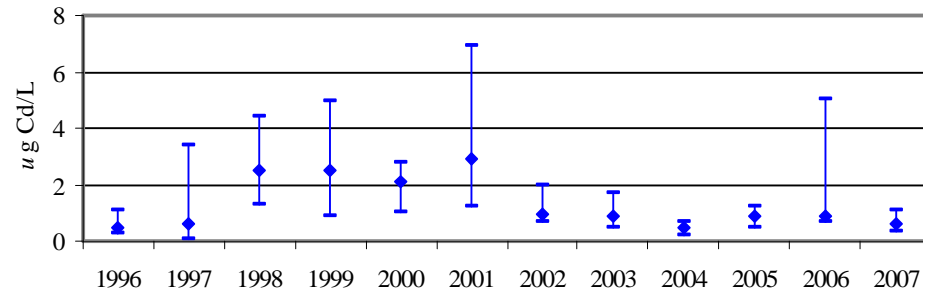


# Long Term Data Upper Ikalukrok Creek

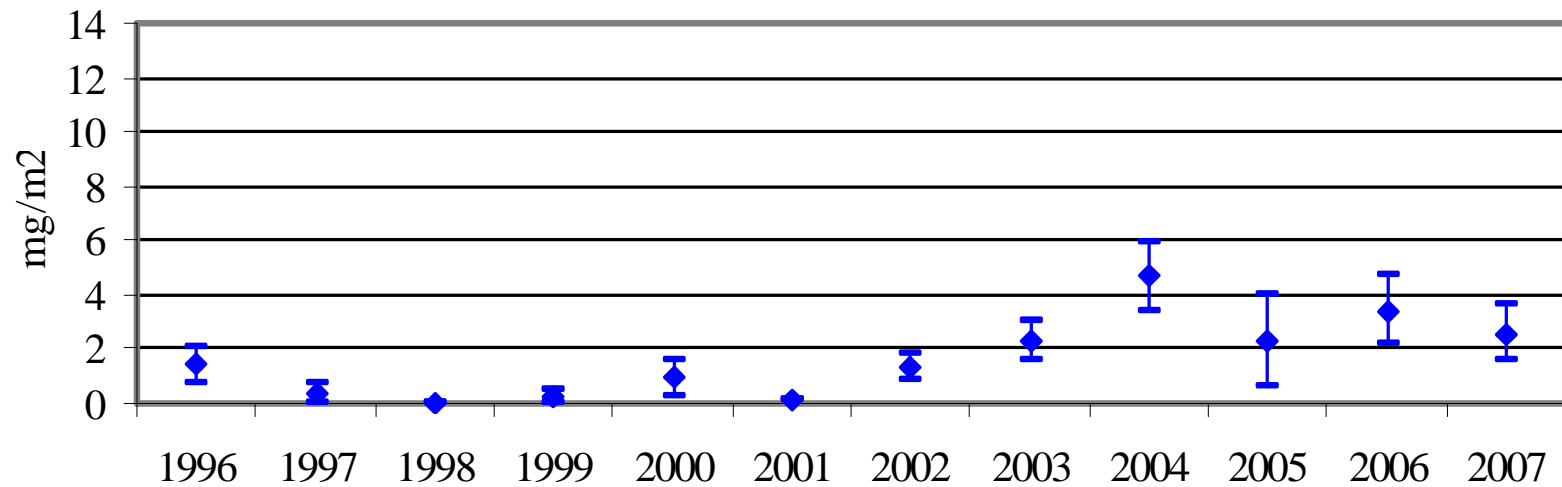
Ikalukrok Creek, Station 9, Zinc



Ikalukrok Creek, Station 9, Cadmium



Chlorophyll-a Concentrations, Ikalukrok Creek (Station 9)







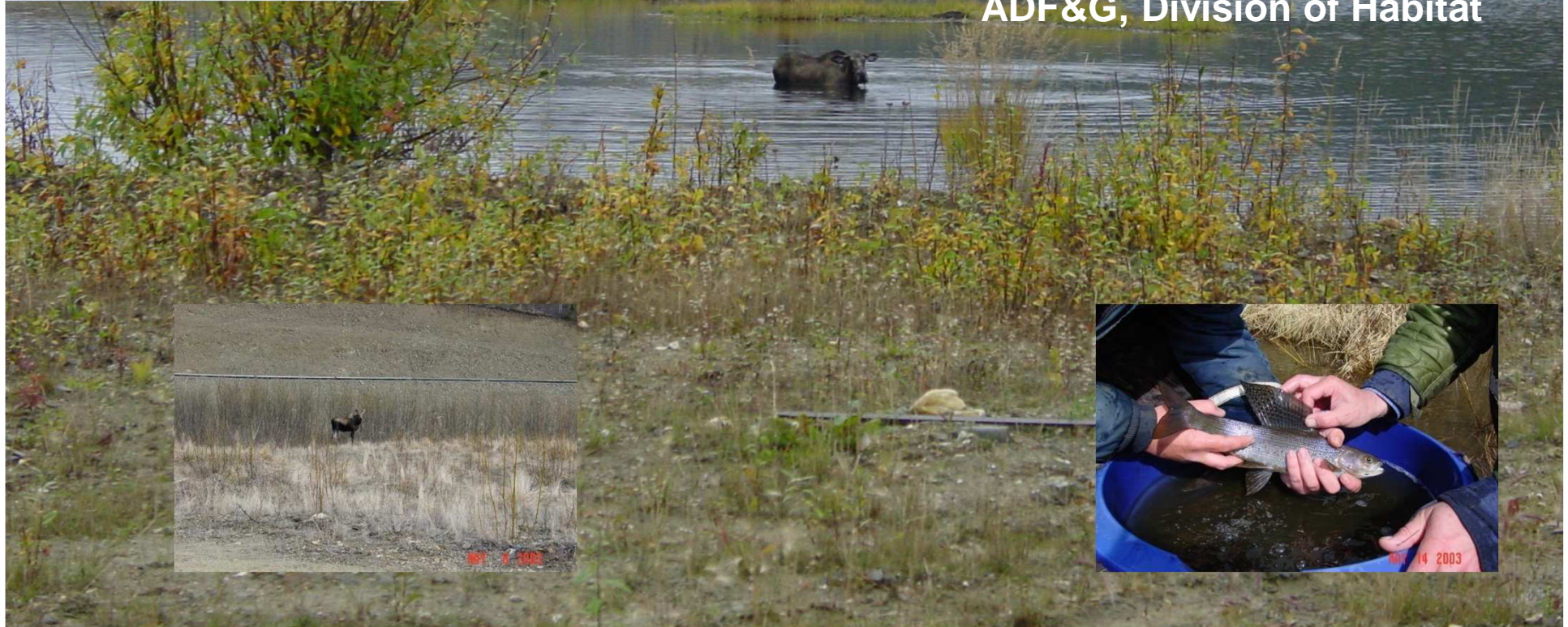
# Conclusions

- Variations in metals concentrations in water and fish appear largely related to severity and temporal occurrence of natural seeps – road effects have been seen and corrected
- Long term trends do not suggest appreciable increases in metals or decreases in productivity

# Fort Knox Bio-monitoring



Presented by:  
ADF&G, Division of Habitat



WLD 5274 UADP-5  
No. 03331 03108

MLA FT. KNOX

5-16-07

Successful Concurrent Reclamation  
FGMI and ADF&G Recipients of Multiple Reclamation Awards  
Most recent – 2009 Tileston Award

Date: 05/16/07 UTC 18:49:45 Scale: 000000 11m 000 Trk 327 Lat: 65.0071 Lon: -114.71818 GPS Aerial Services Inc.





# Concurrent Reclamation

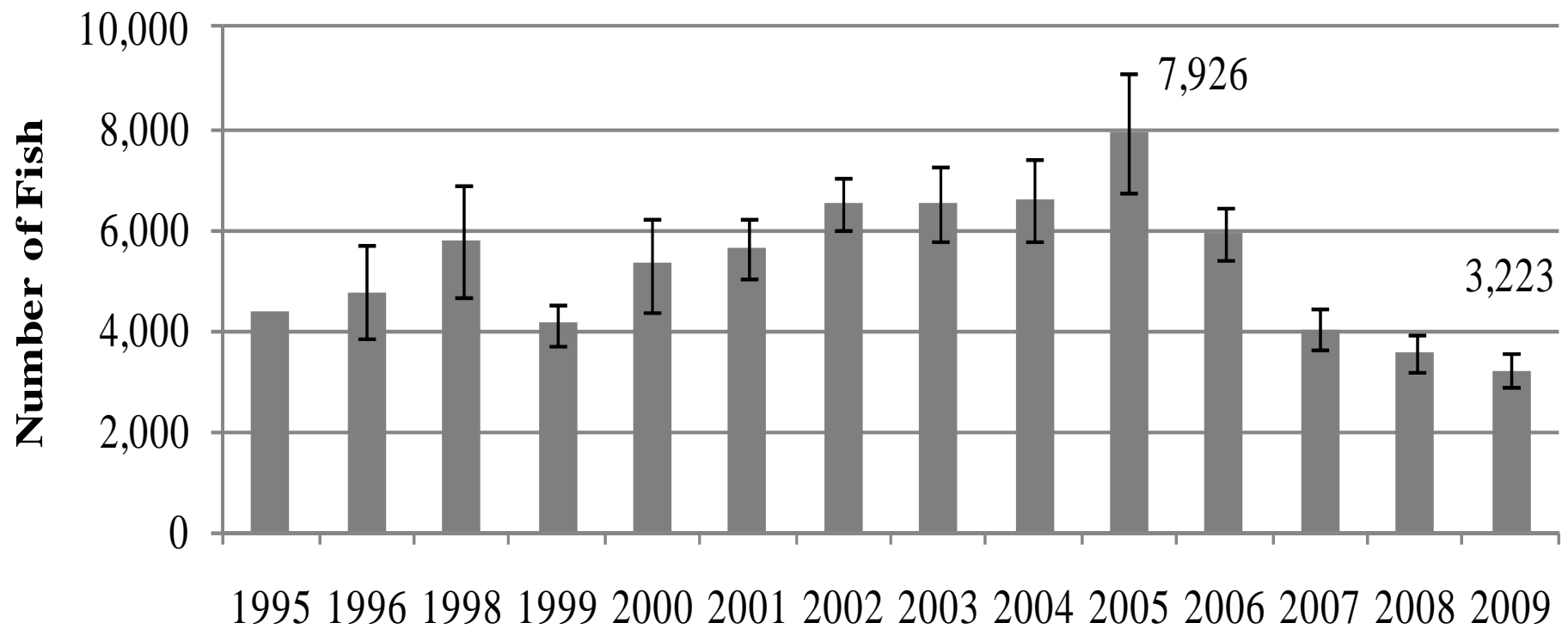


# Arctic Grayling



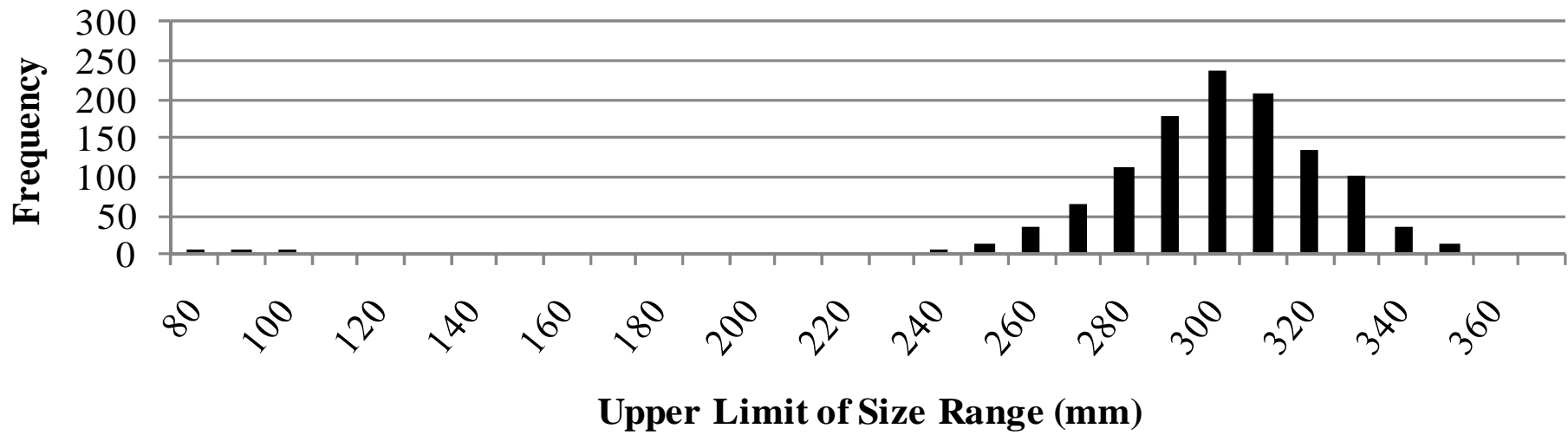
# Population Size

Arctic Grayling Population Estimates (95% CI)

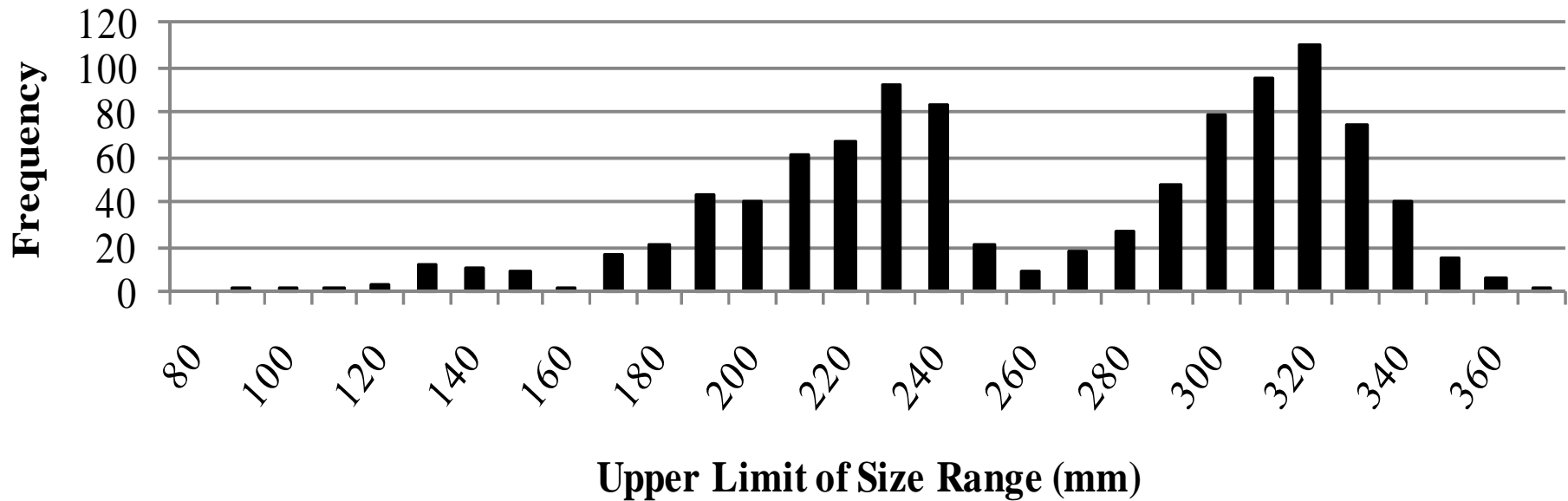




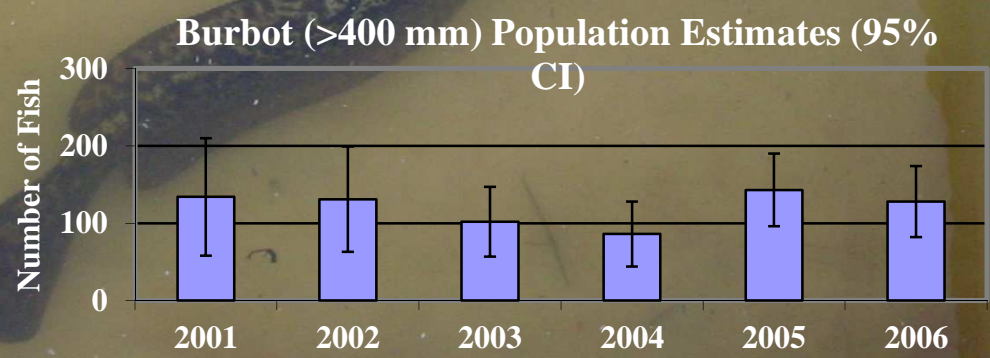
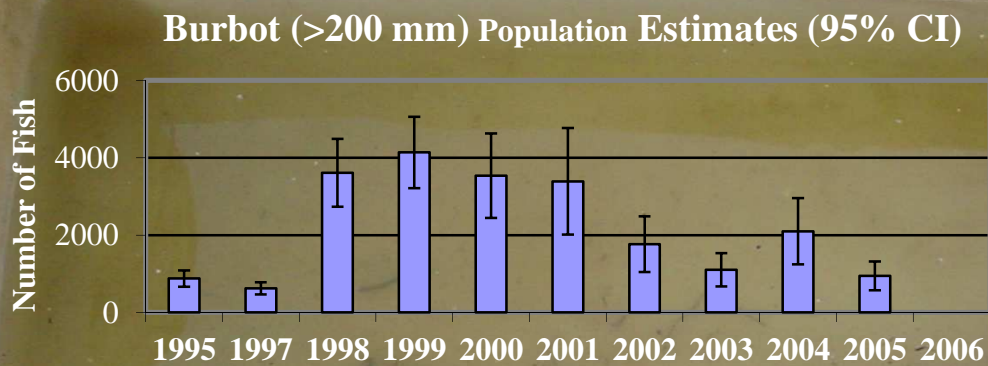
**Arctic Grayling, Spring 2009 (n = 1,182)**



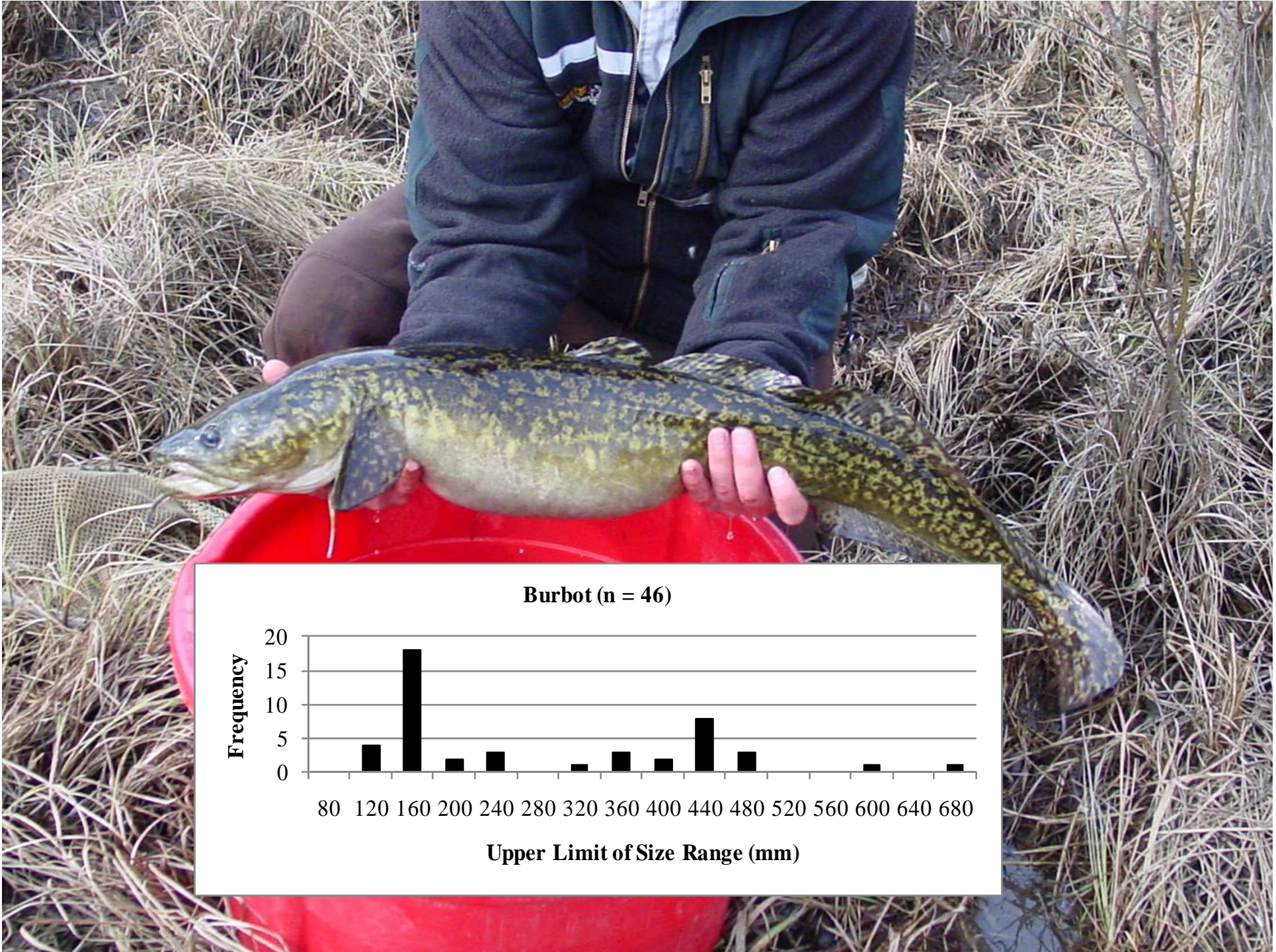
**Arctic Grayling, Spring 2010 (n = 1,016)**



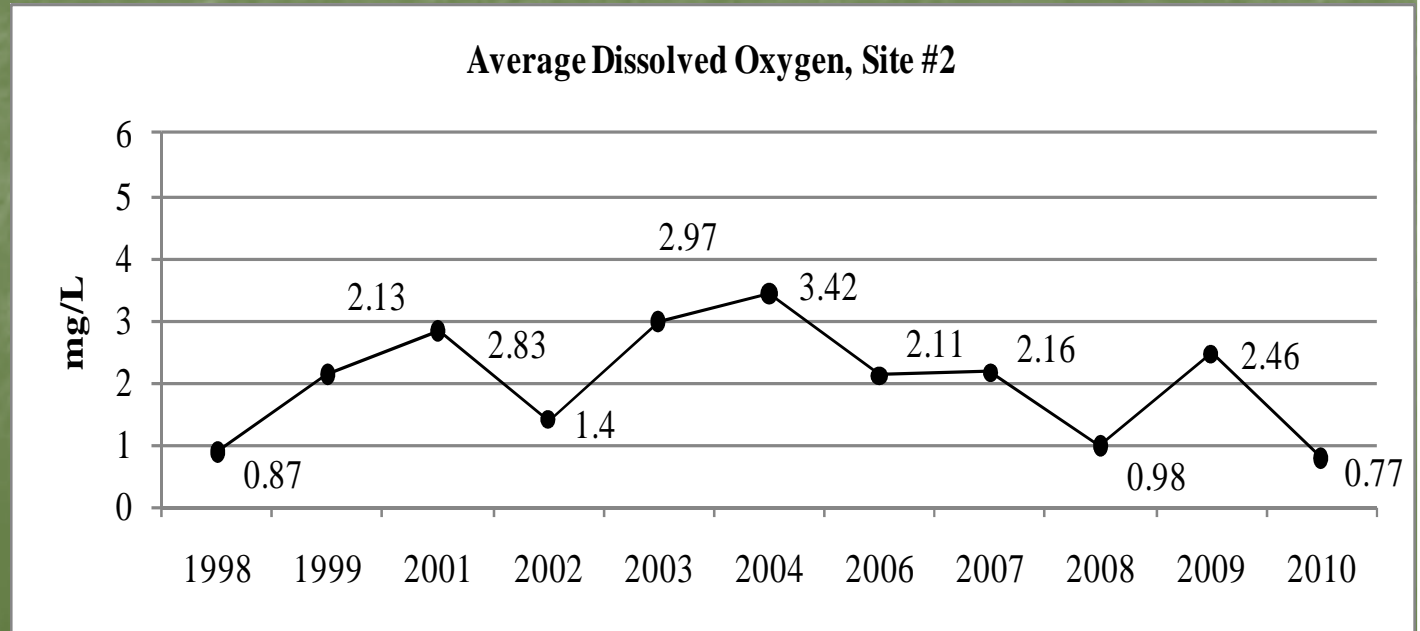
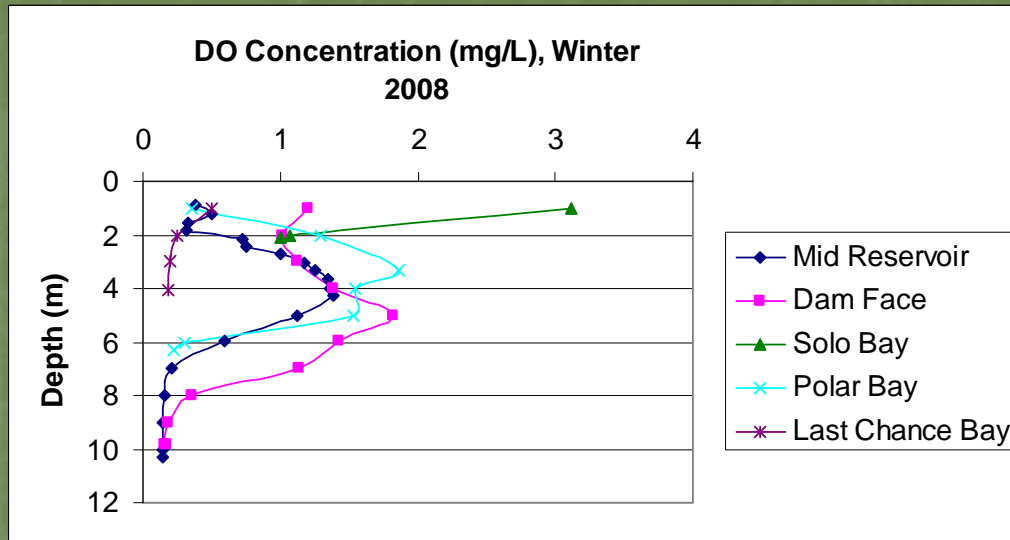
# Burbot



OCT 2 2003



# Water Quality



# Conclusions

## ■ Fish—

### ■ Arctic Grayling

- Population goal for closure already exceeded

- Developed wetlands are the key

- Strong growth

- Responding to beaver management

### ■ Burbot

- Population of large fish appears stable, but low

## ■ Water Quality Still Poor – but adequate

- South bank organic additions

- Removal of the Gil Causeway – improve winter water quality

Questions?

