Preservation and Recovery of Bull trout in Glacier National Park

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Upper Flathead River drainage

A bull trout stronghold

Bull Trout Migratory Life History

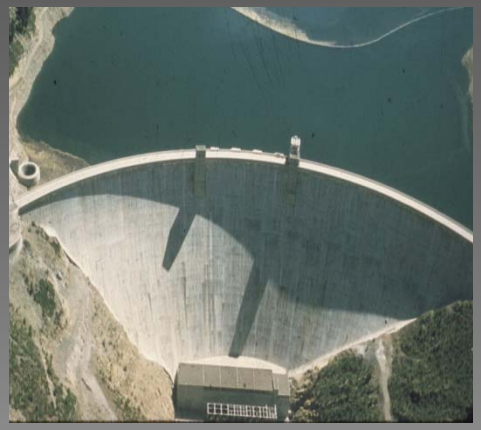
Spawning and incubation

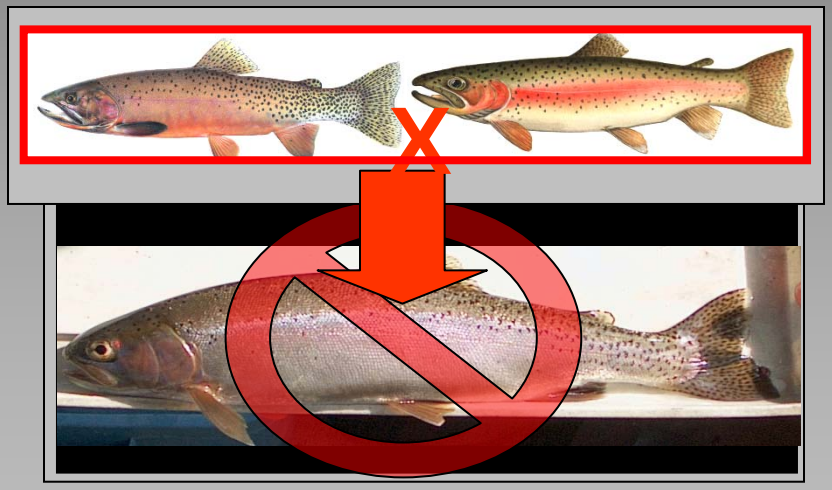
Juvenile rearing

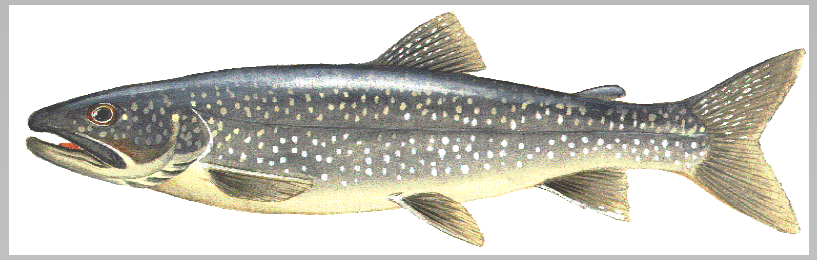
Adult movements

Subadult rearing

Native Species Declines



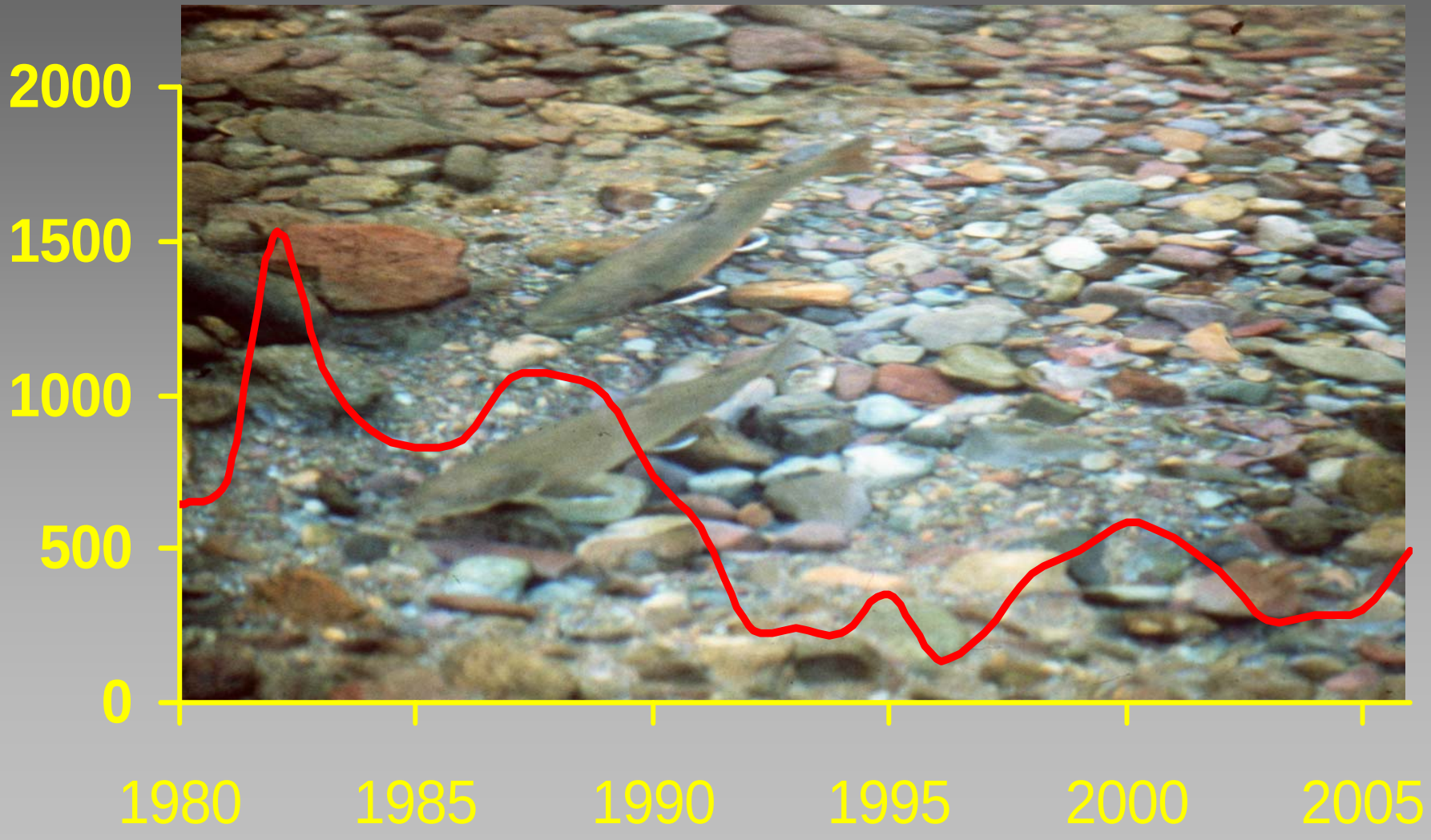




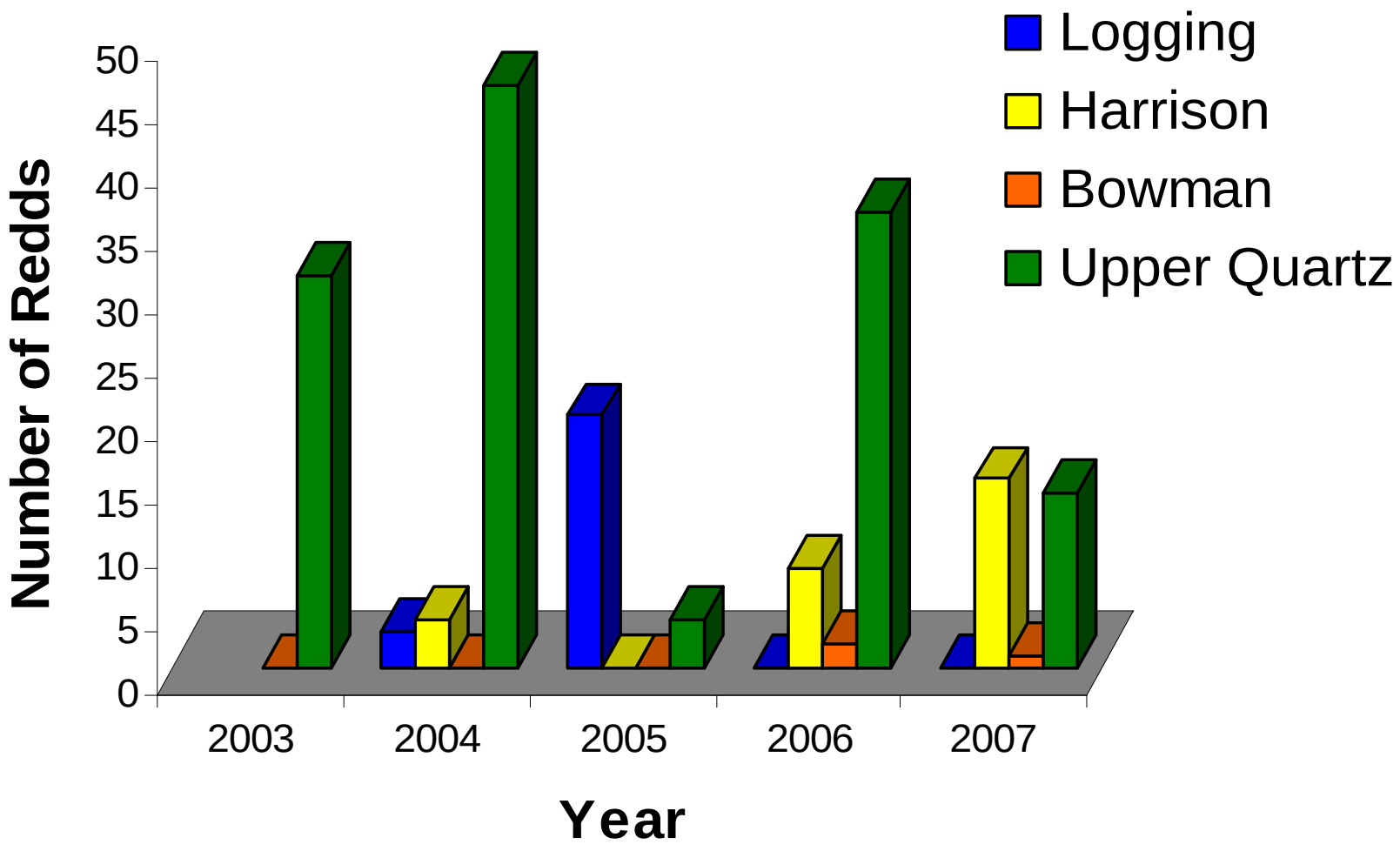
Bull trout redd counts

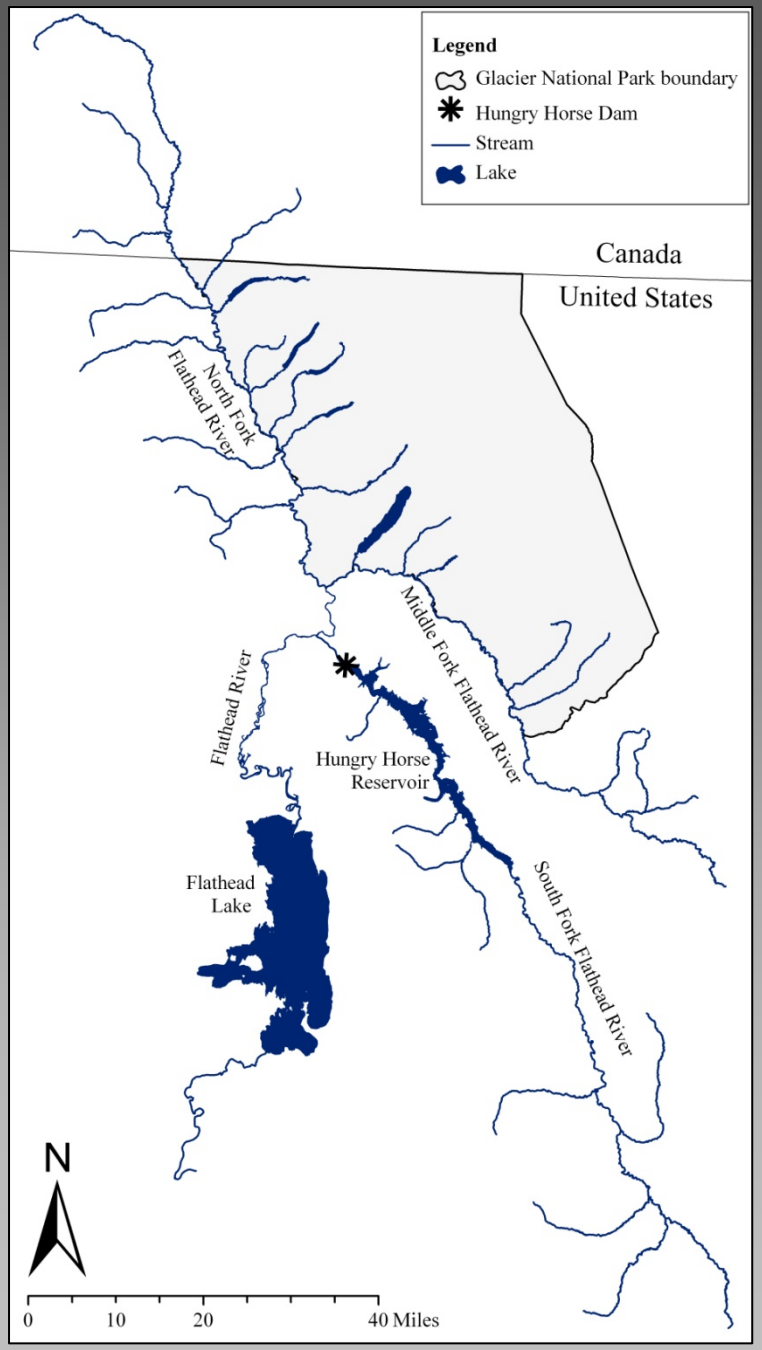
Bull Trout Redd Counts

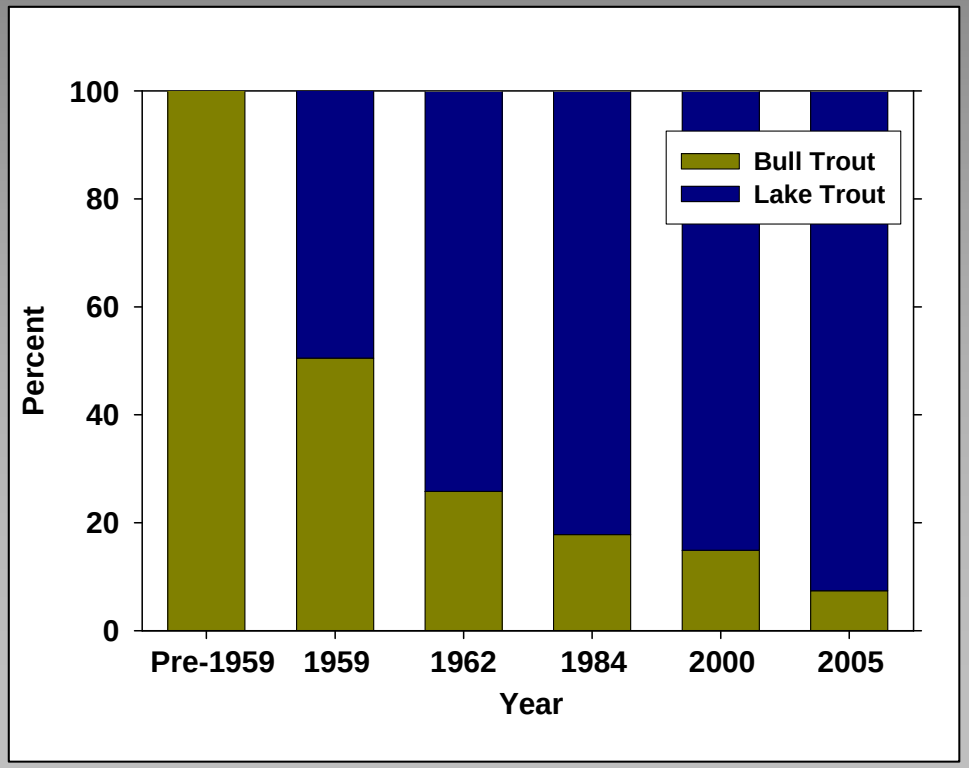
INDEX STREAMS - FLATHEAD RIVER



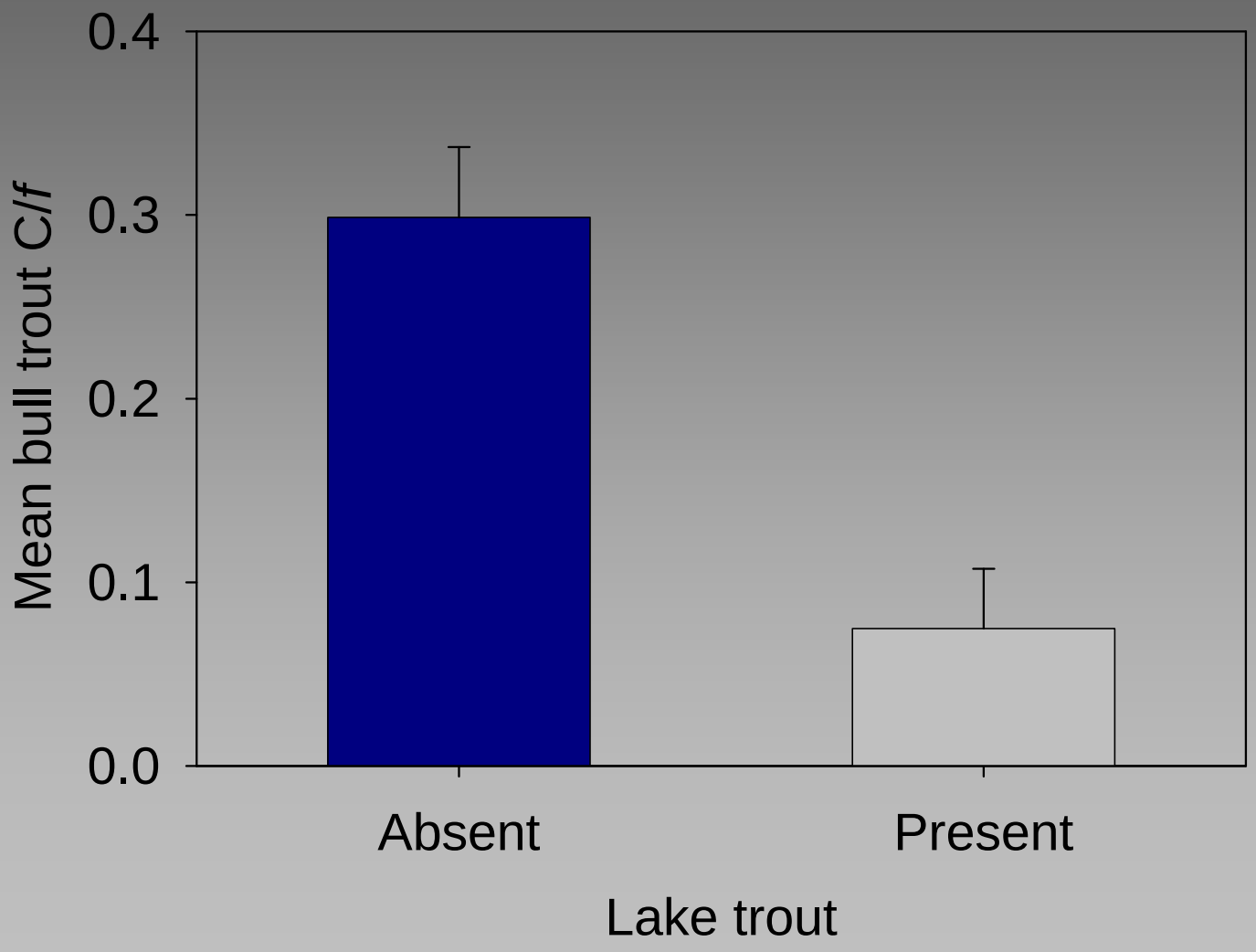
GNP Redd Counts

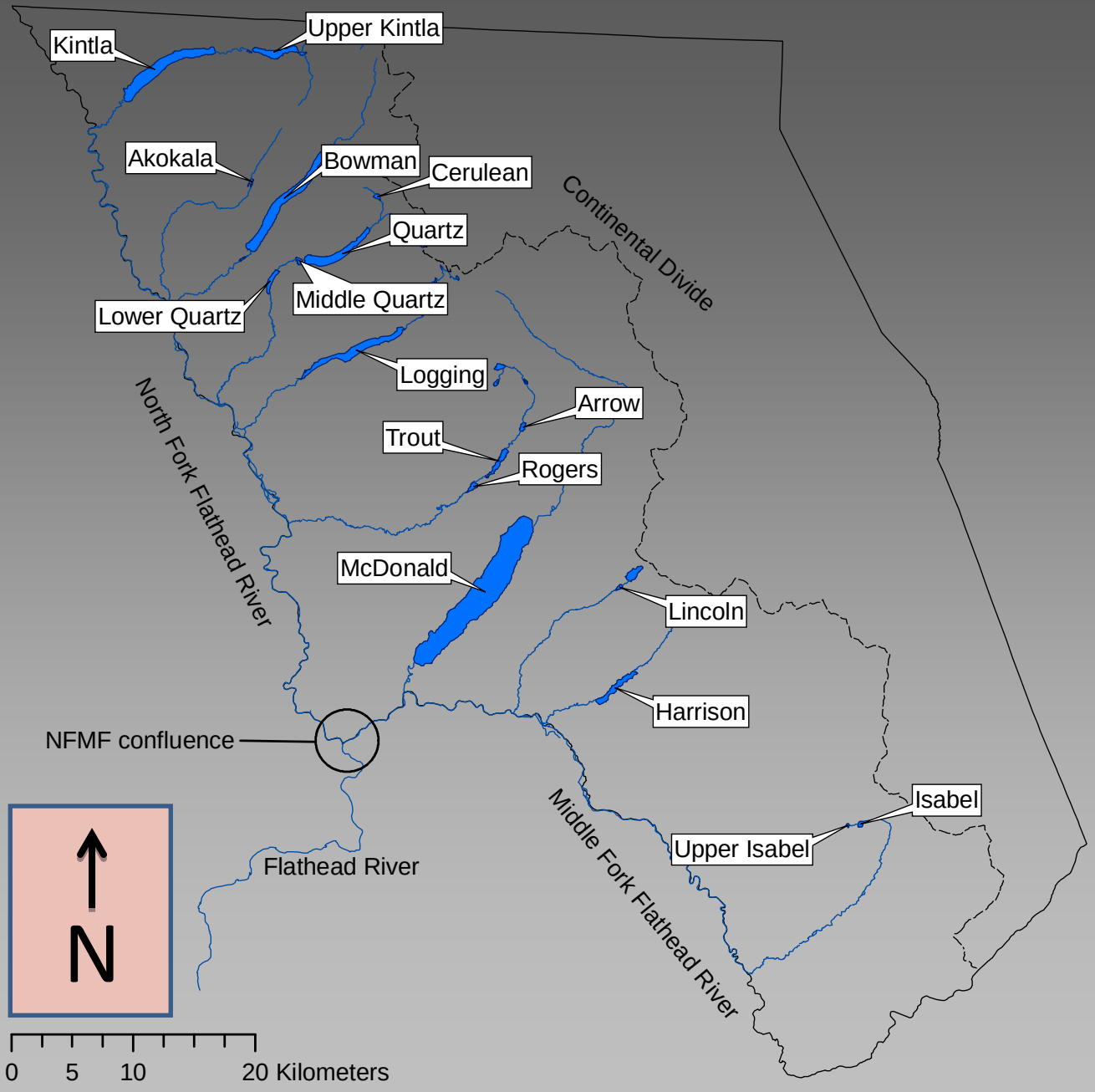



Legend
Glacier National Park boundary
Hungry Horse Dam
Stream
Lake
Canada
United States
North Fork Flathead River
Middle Fork Flathead River
Flathead River
Hungry Horse Reservoir
Flathead Lake
South Fork Flathead River
N
0
10
20
40 Miles


Percent
100
80
60
40
20
0
Bull Trout
Lake Trout
Pre-1959
1959
1962
1984
2000
2005
Year

Bull trout declines- GNP Lakes




Upper Kintla
Kintla
Akokala
Bowman
Cerulean
Quartz
Middle Quartz
Lower Quartz
Continental Divide
Logging
Arrow
Trout
Rogers
North Fork Flathead River
McDonald
Lincoln
Harrison
NFMF confluence
Isabel
Upper Isabel
Middle Fork Flathead River
Flathead River
N
0 5 10 20 Kilometers

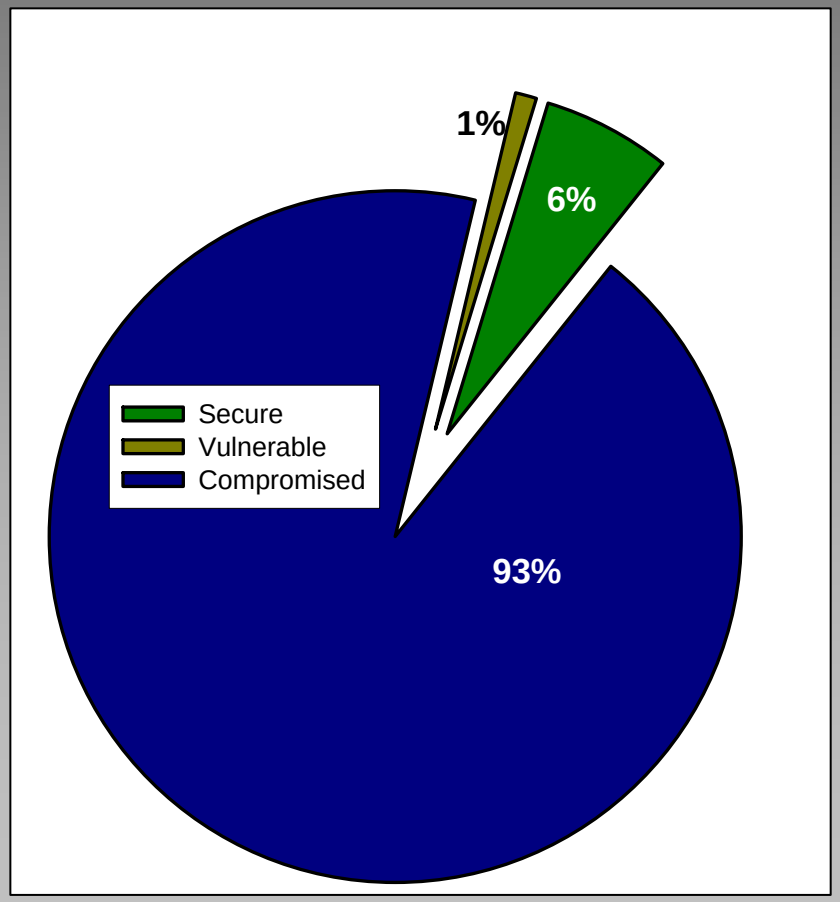
Action Plan

All lakes were placed in one of three threat categories:

Secure

Vulnerable

Compromised



Action Plan

Secure Lakes

Relatively small backcountry lakes with the documented presence of fish passage barriers. Thus, these lakes have the most secure populations of bull trout in the Park.

Action Plan

Vulnerable Lakes

High likelihood that these lakes could become compromised from potential invasion by lake trout or brook trout.

Action Plan

Compromised Lakes

Bull trout are potentially vulnerable to extirpation because of the presence of lake trout or brook trout. Bull trout abundance in these lakes has declined through time.

Action Plan

Priority Levels

Within each category, each lake is assigned a priority level. These levels reflect the relative importance that should be placed on that bull trout resource.

Action Plan

Management Priority Level	Lake Categories		
	Compromised	Vulnerable	Secure
High	Quartz Logging	Cerulean	Upper Kintla Trout Arrow Isabel Upper Isabel
Medium	Middle Quartz Lower Quartz Bowman Harrison Lincoln	Akokala	
Low	Kintla McDonald Rogers		

Action Plan

Management Priority Level	Lake Categories		
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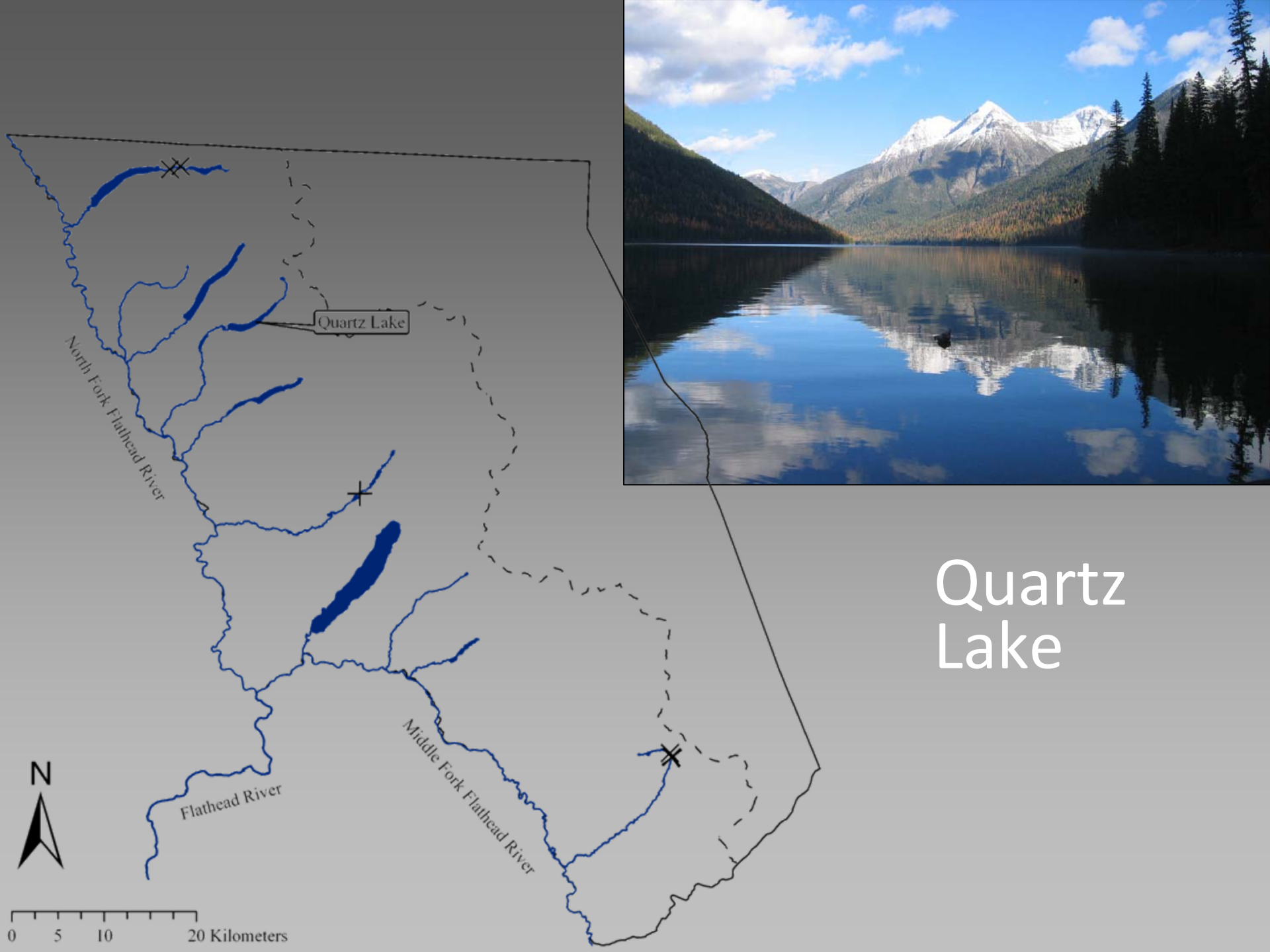
Quartz Lake
North Fork Flathead River
Flathead River
Middle Fork Flathead River
N
0
5
10
20 Kilometers

Quartz Lake

Quartz Lake

Compromised – High Priority

- High relative abundance of bull trout
- Suitable spawning habitat and abundant bull trout redds
- No natural dispersal barriers in drainage

Quartz Lake

Compromised – High Priority

- Lake trout documented in 2005
- May be a suitable system for lake trout suppression/removal efforts
- Must consider connectivity

Spawning Demographics and Early Life History of Bull Trout (*Salvelinus confluentus*) in Quartz Lake, Glacier National Park, Montana

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GLACIER NATIONAL PARK FUND

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MONTANA STATE UNIVERSITY

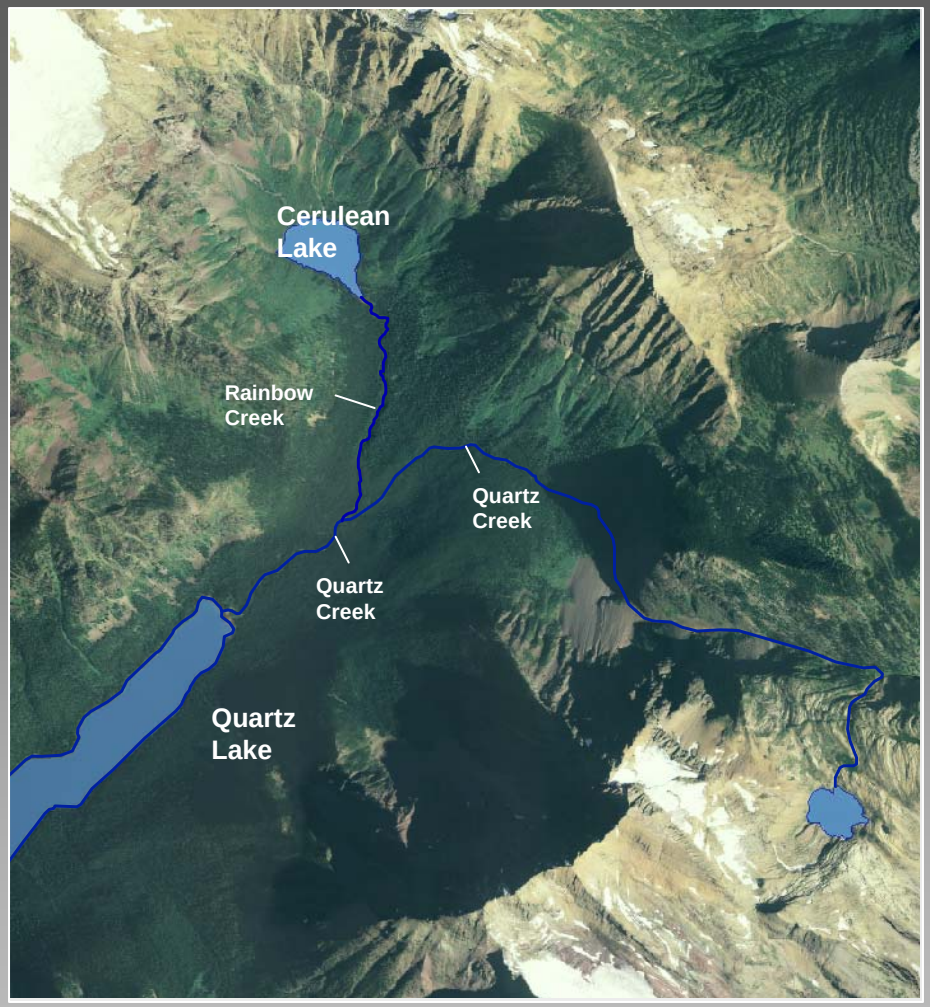
Goal:

Determine the spawning demographics and early life history characteristics

Objectives:

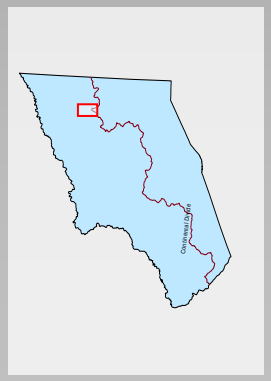
- Characterize spawning areas
- Relate water temperature and stream discharge to spawning dynamics, and
- Evaluate relationships among habitat characteristics and juvenile bull trout distribution, abundance and life history

Study Area



Upper Quartz Lake drainage in Glacier National Park

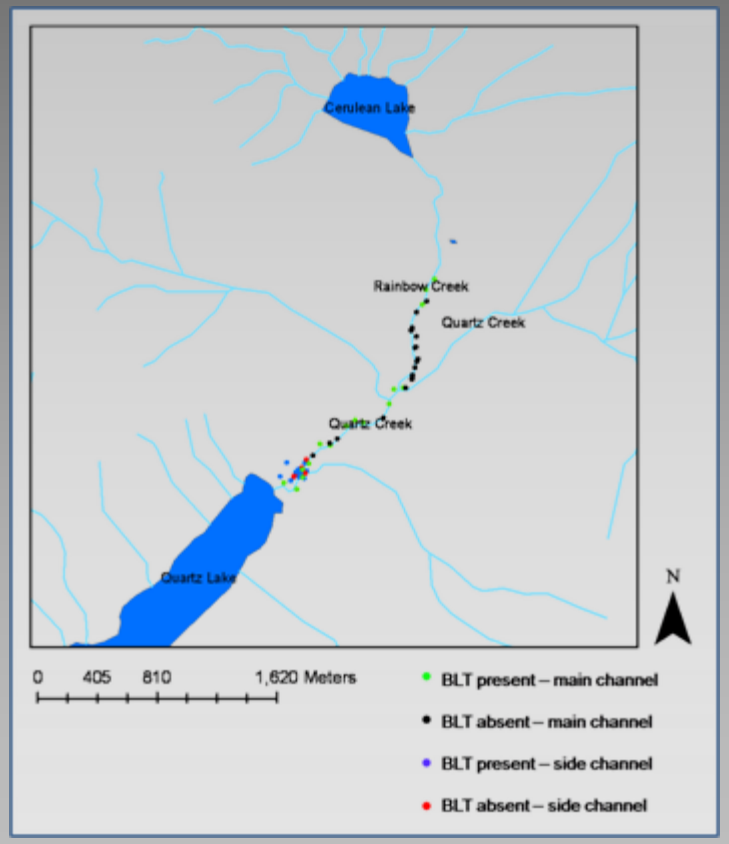
Logjam in Quartz Creek



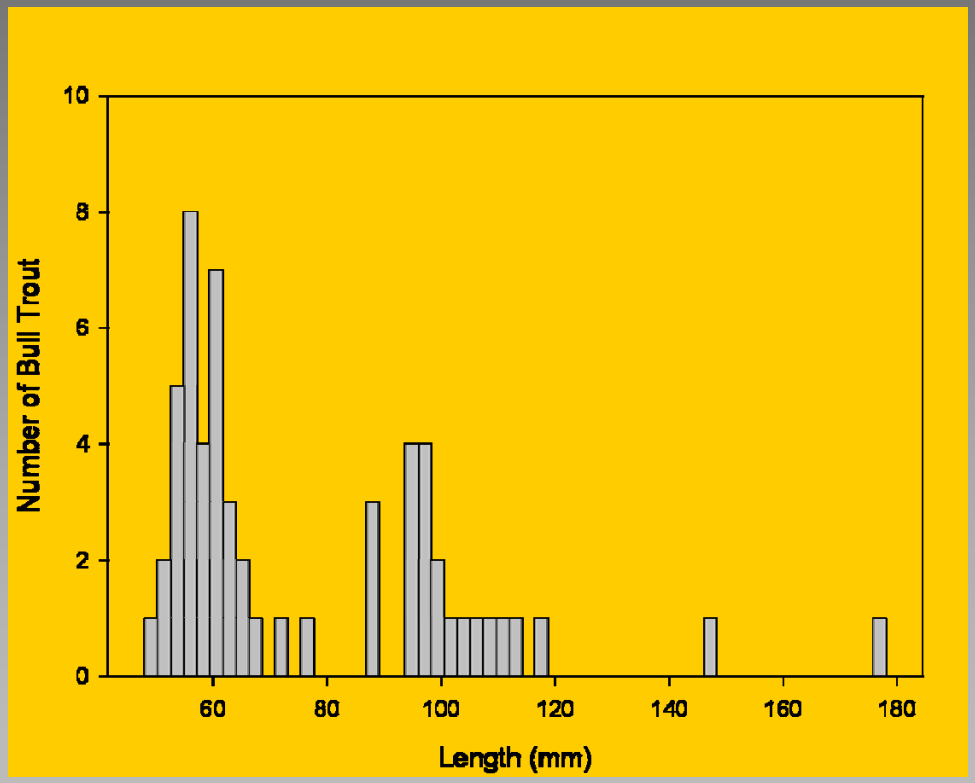
Quartz Creek above Quartz Lake

Early Life History

- Single pass electrofishing was used to collect juvenile bull trout in Quartz and Rainbow creeks. .
- Physical habitat was assessed in Quartz and Rainbow creeks.



Juvenile bull trout electrofishing sites on Quartz and Rainbow creeks in 2007.



Length-frequency of juvenile bull trout captured in Quartz and Rainbow creeks in 2008.

Spawning Demographics

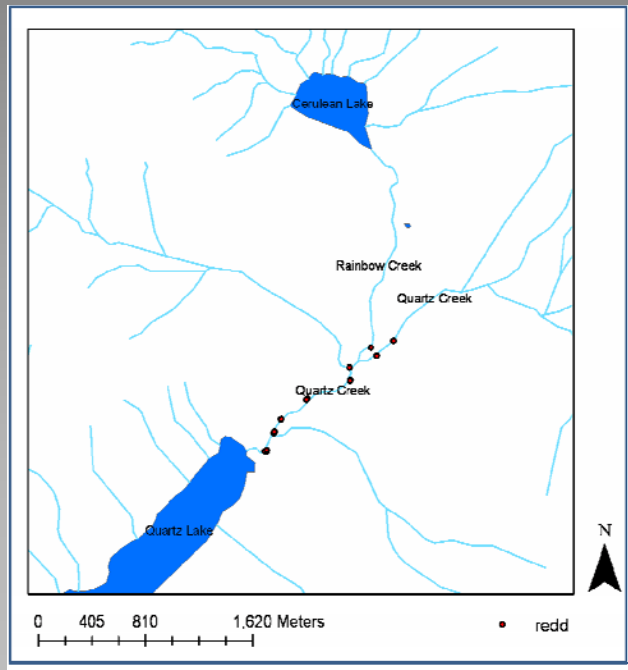
- A bi-directional weir was used to capture adult bull trout spawners
- Temperature loggers were placed throughout the stream network.

- A staff gauge was placed in the inlet to monitor flow.

- Bull trout redds were visually identified, characterized and geo-spatially referenced

Bi-directional weir trap at Quartz Lake, 2007.

Adult male bull trout captured in upstream weir trap at Quartz Lake, 2007.



Bull trout redds identified in Quartz and Rainbow creeks, 2007.

Lake Trout Suppression- Upper Quartz

The likelihood of success is good:

- **Small lakes that lack complexity**
- **Recently invaded**
- **Isolated from downstream sources**
- **No mysis shrimp**

Lake Trout Suppression- Upper Quartz

Objectives:

- **Assess the lake trout demographic characteristics**
- **Identify the timing and location of spawning by lake trout.**
- **Implement a removal program**
- **Assess the effectiveness of removal techniques**
- **Model different population scenarios to estimate effort needed for continued remedial actions.**

GNP Fisheries Database

- Preserving and updating aquatic information (fish stocking-present)
- Functional tool for GNP managers and cooperators
- Recreational/fisheries tool for anglers (MFISH)

CBM and Coal Mining

Objective: Collect baseline fisheries information in GNP and the NFBC