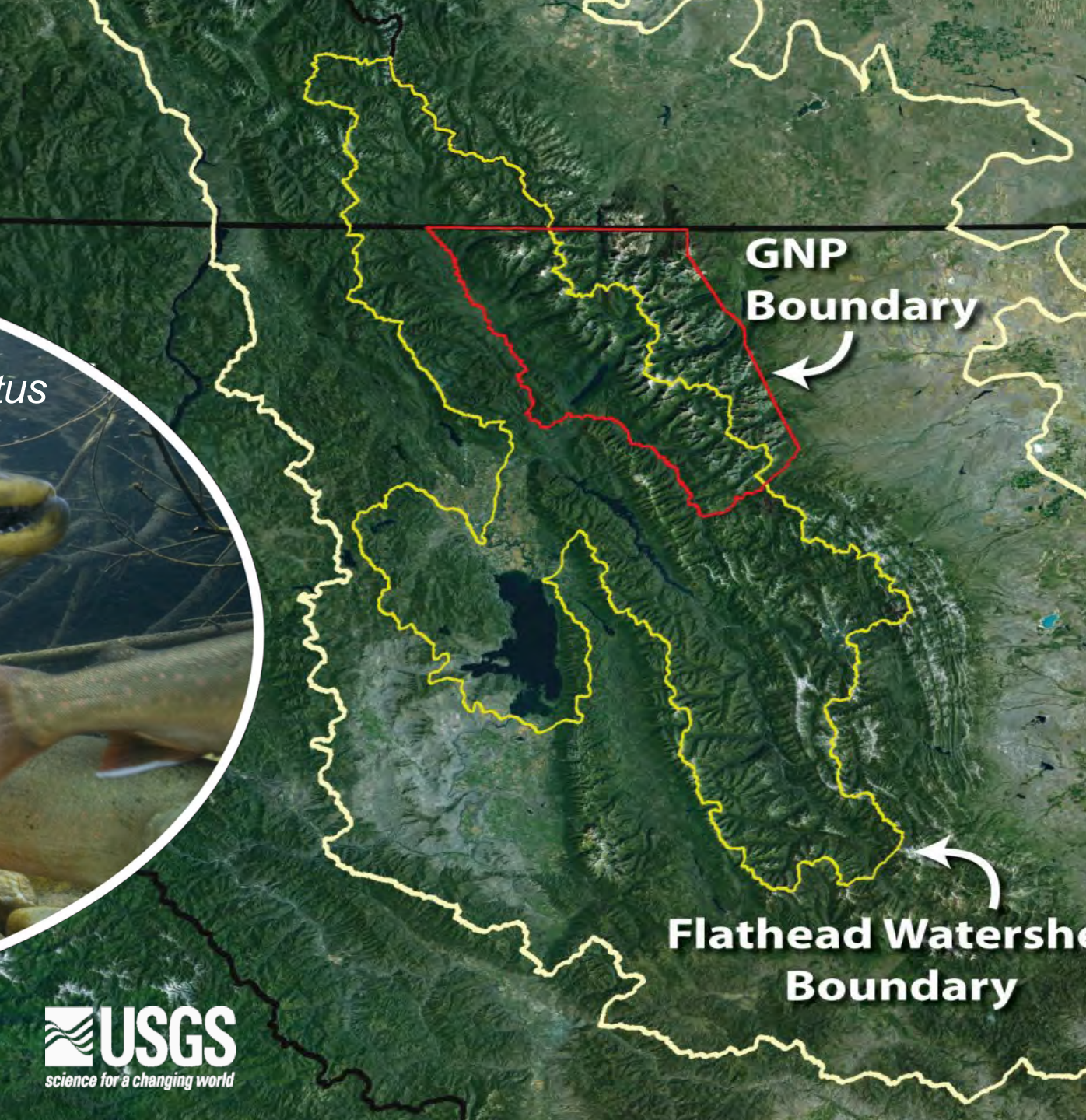
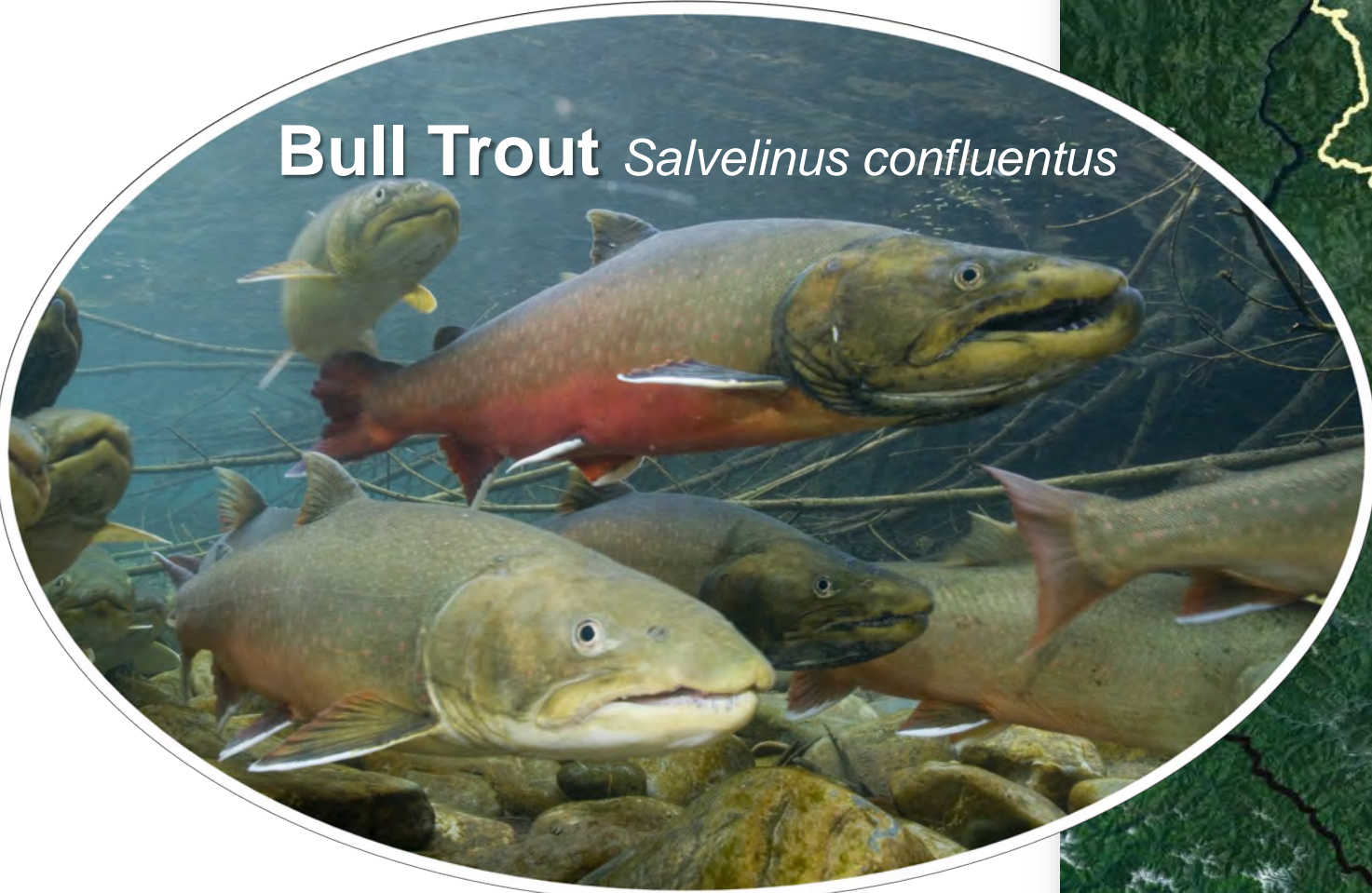


Char Wars: Glacier's Bull Trout Strike Back



Glacier Park is a Range-wide Stronghold

Bull Trout *Salvelinus confluentus*



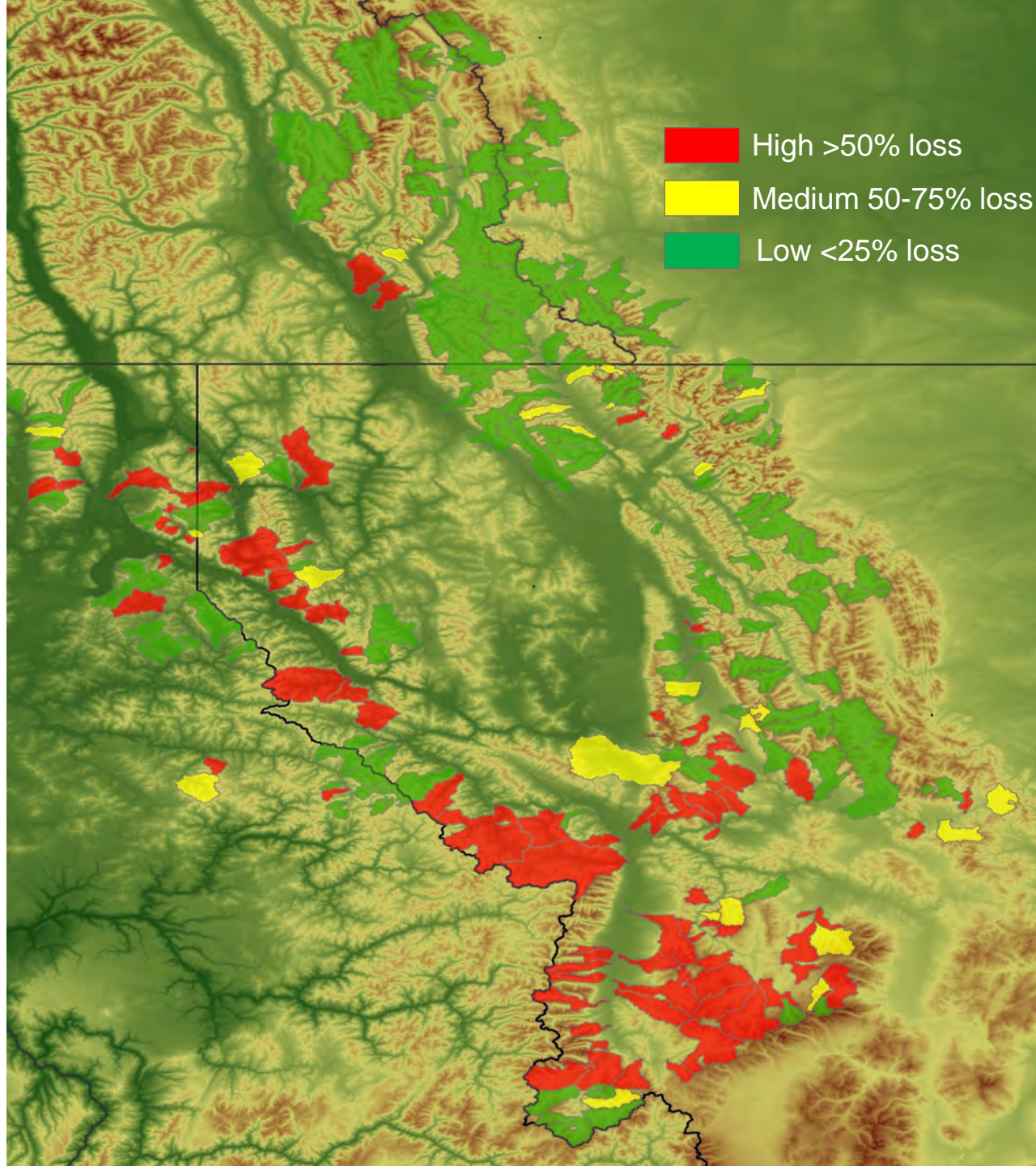
**GNP
Boundary**



**Flathead Watershed
Boundary**



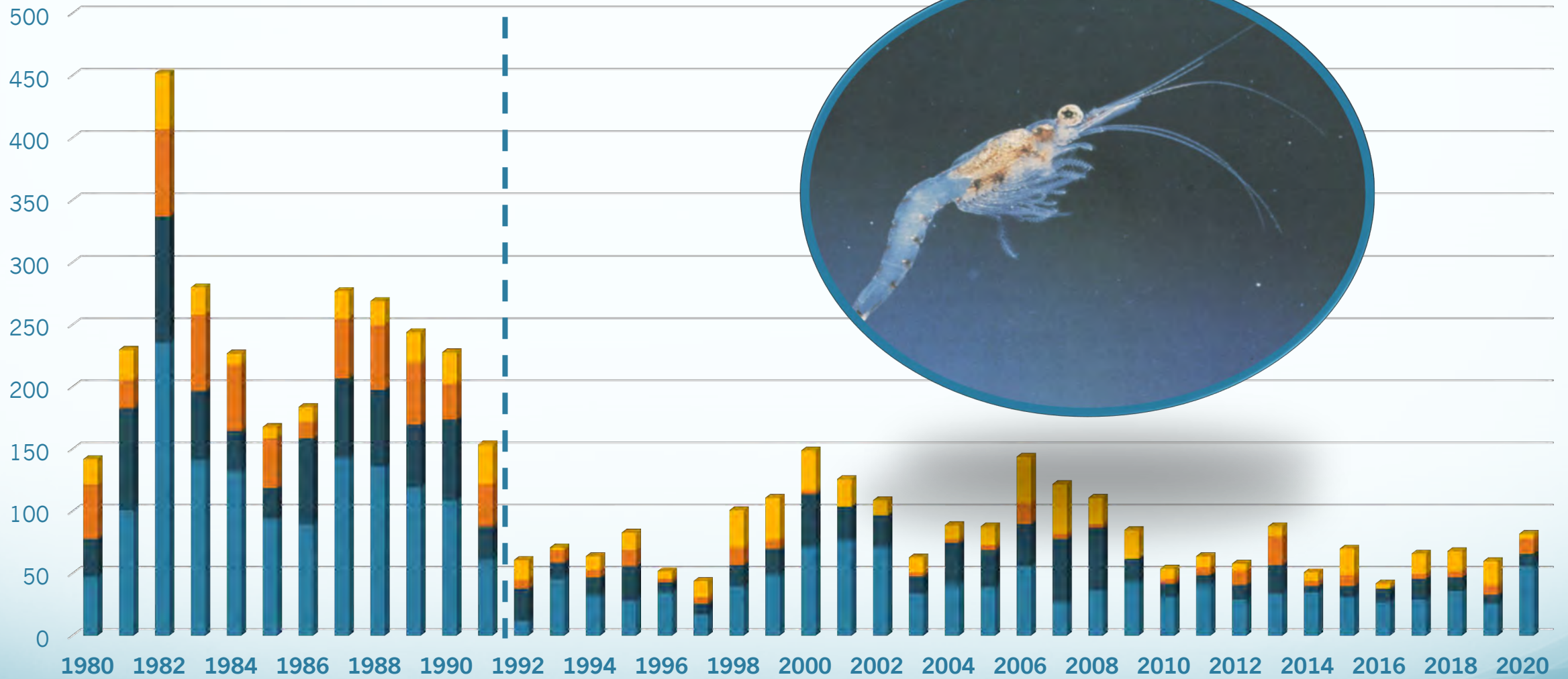
Bull Trout Climate Change Risk is Low in Glacier Park



Char Wars: Lake Trout Invasion



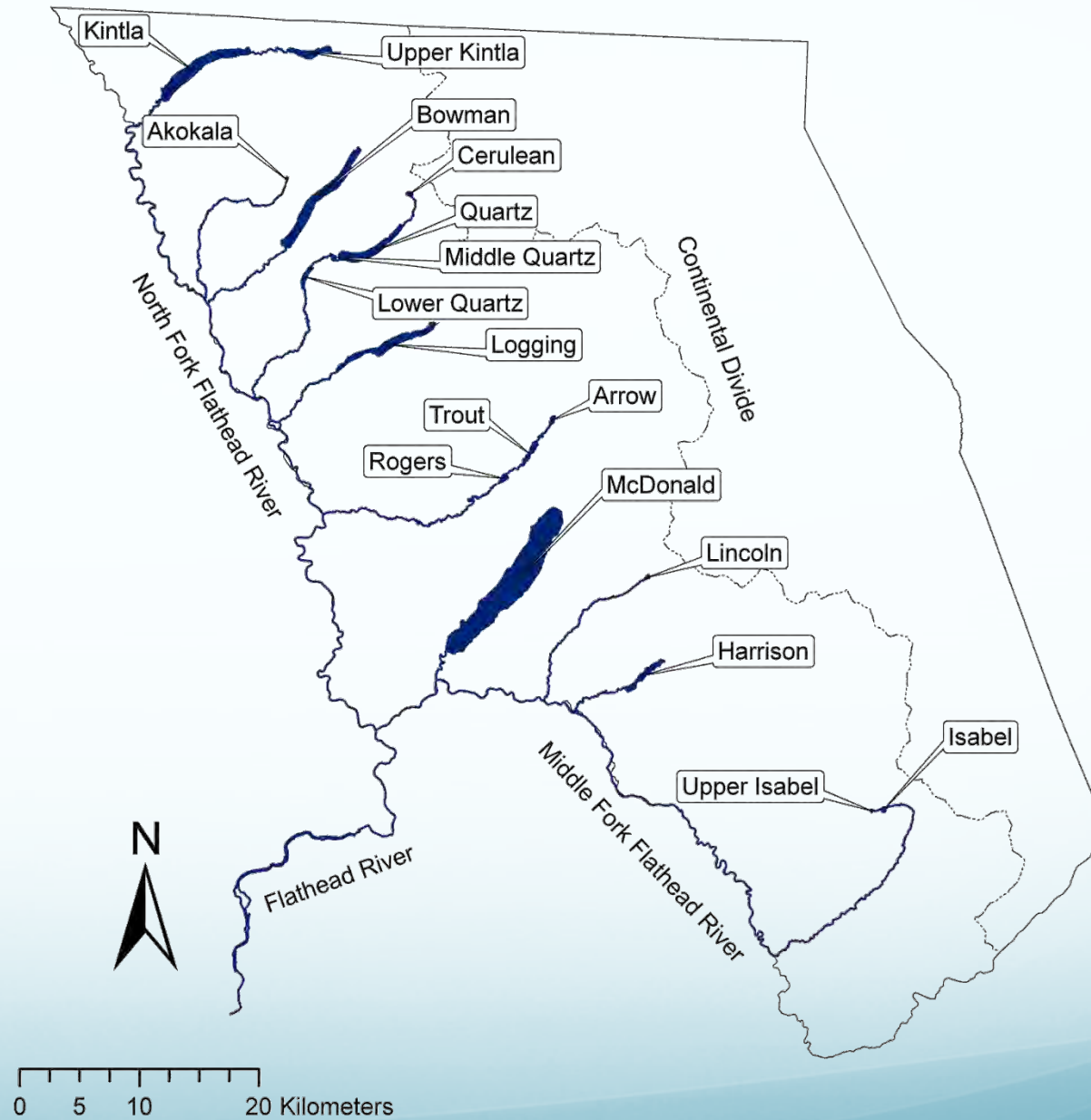
North Fork Bull Trout Redd Counts



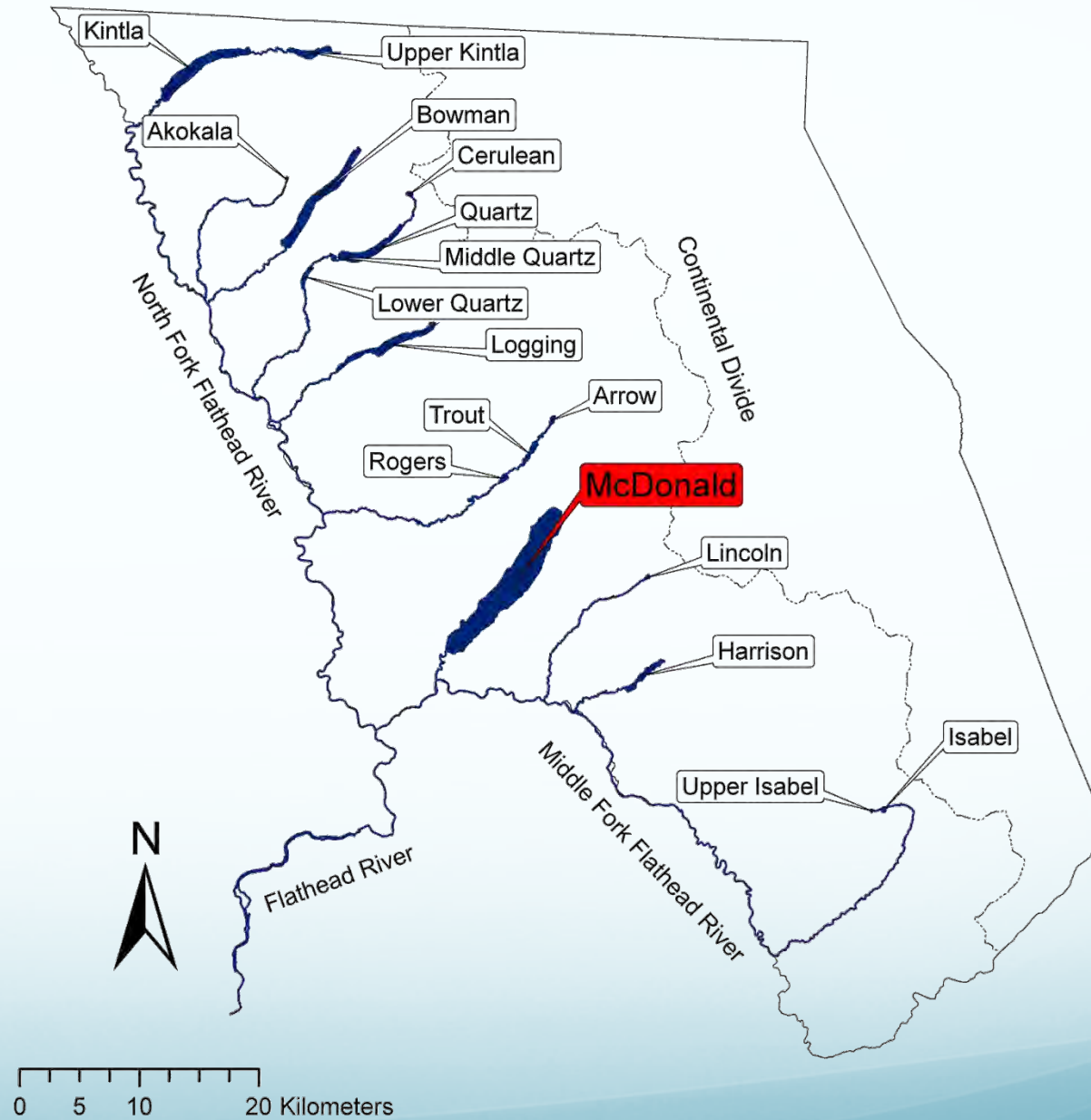
Lake Trout Expansion from Flathead Lake



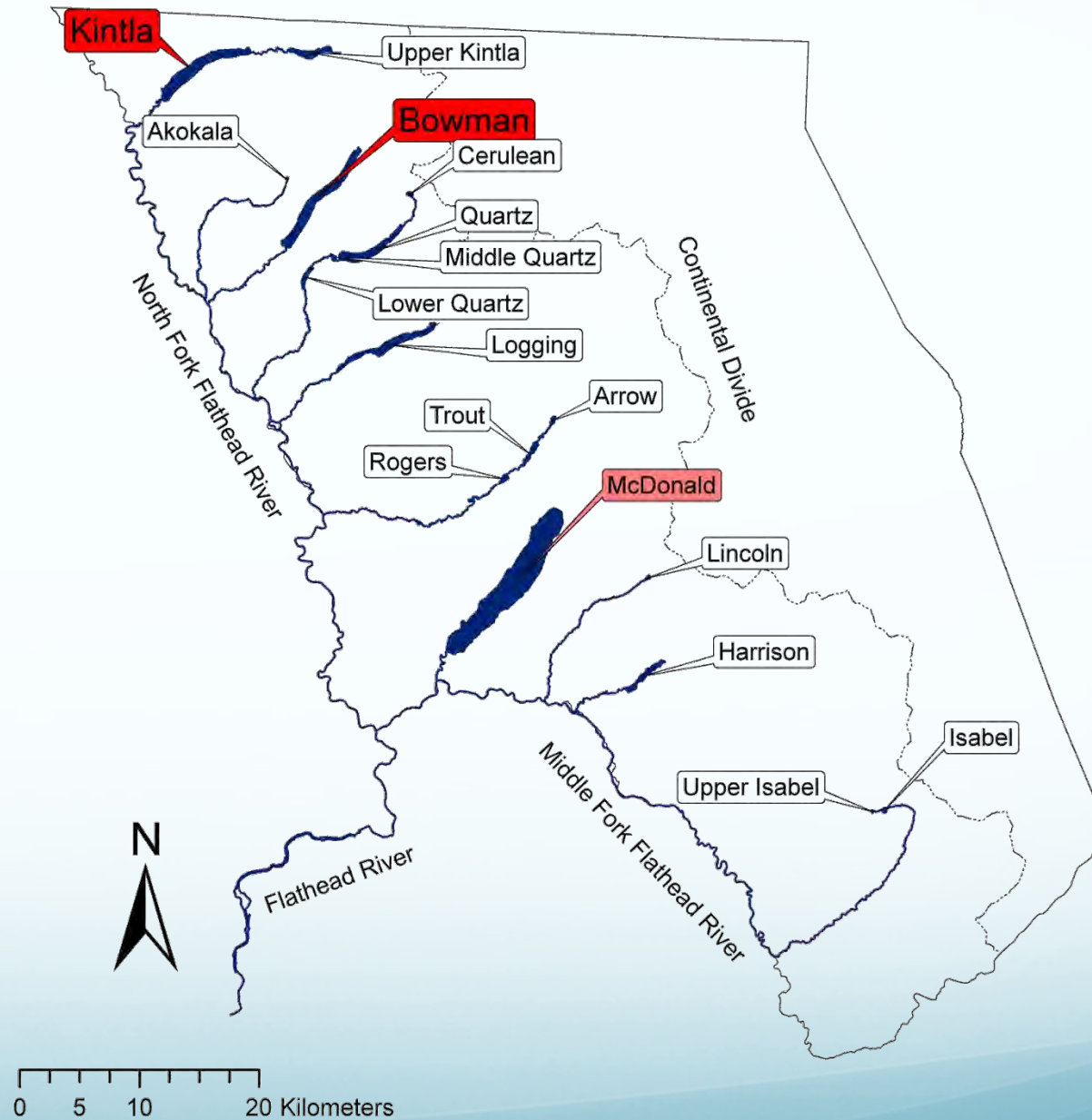
- **1905
Flathead System**



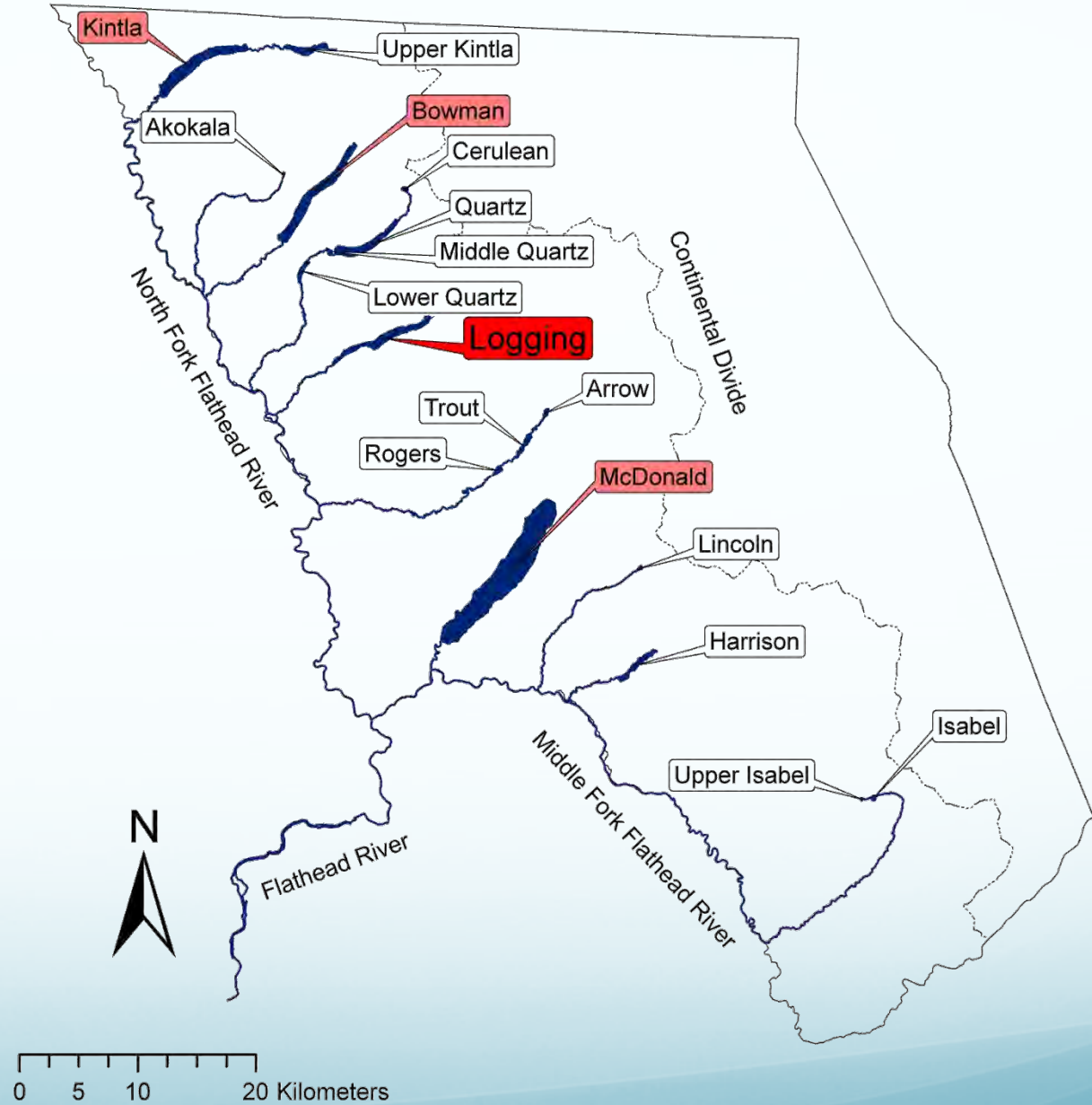
- 1905
Flathead System
- 1959
Lake McDonald



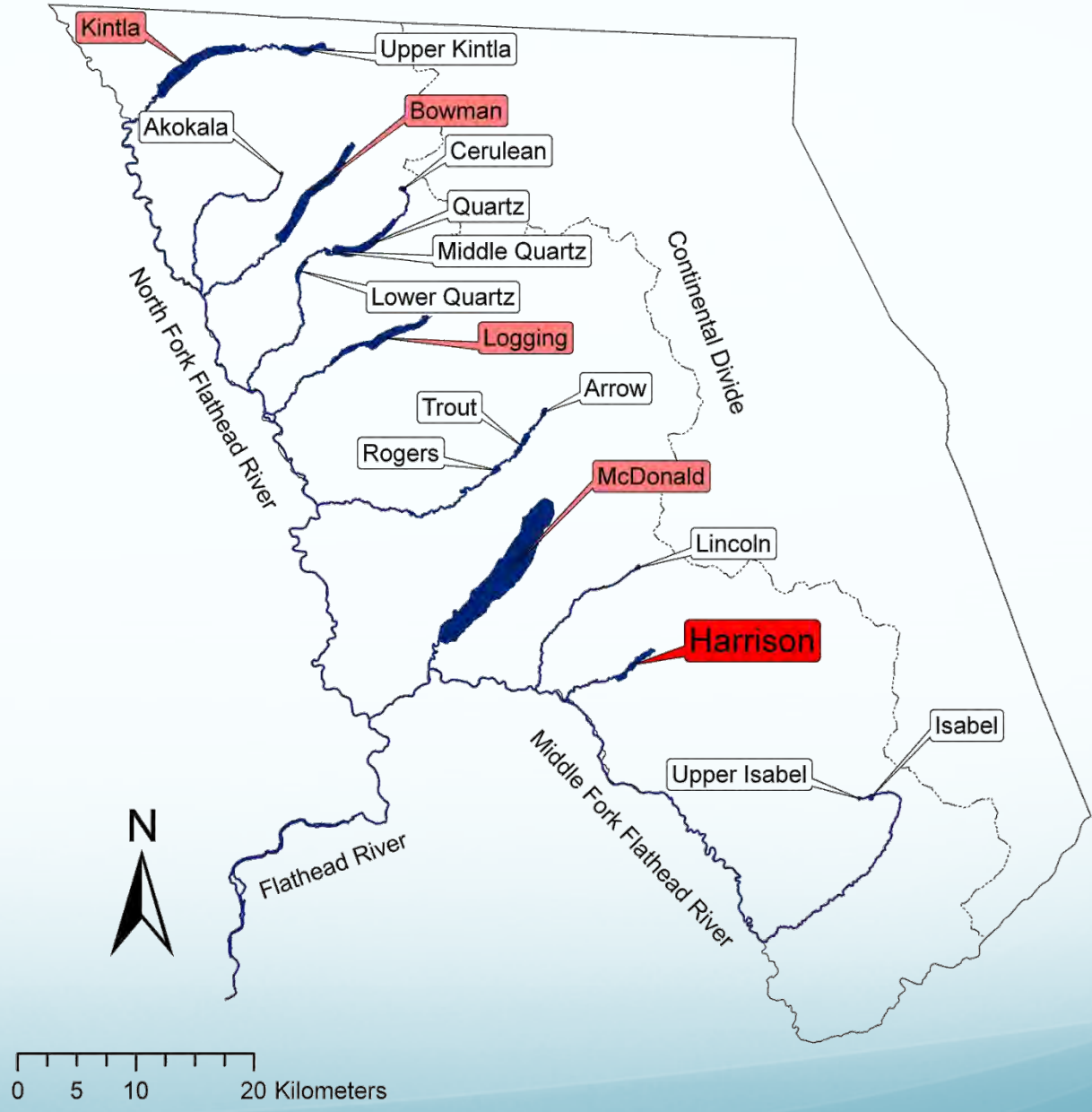
- 1905
Flathead System
- 1959
Lake McDonald
- 1962
Bowman Lake
Kintla Lake



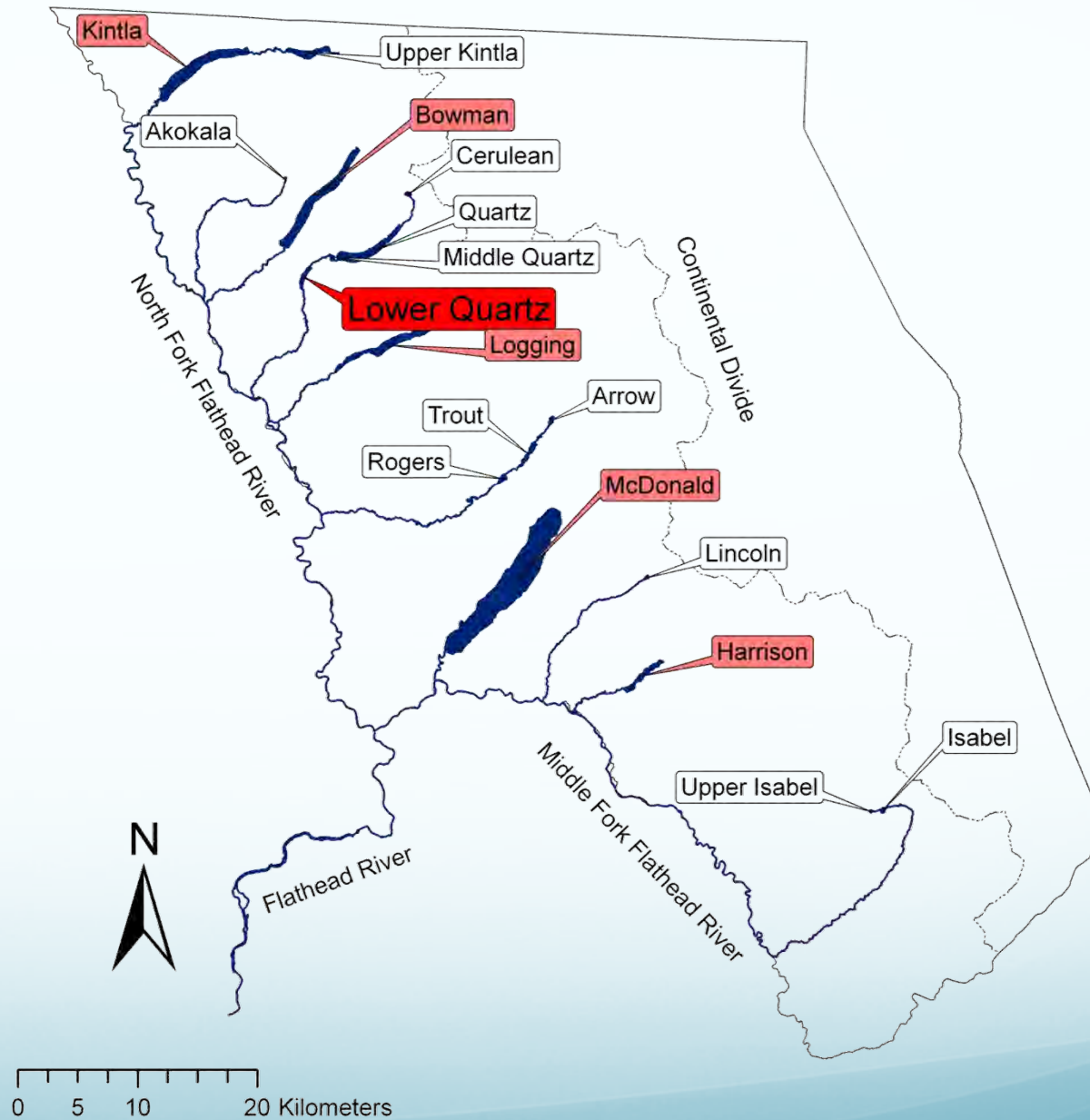
- 1905
Flathead System
- 1959
Lake McDonald
- 1962
Bowman Lake
Kintla Lake
- 1984
Logging Lake



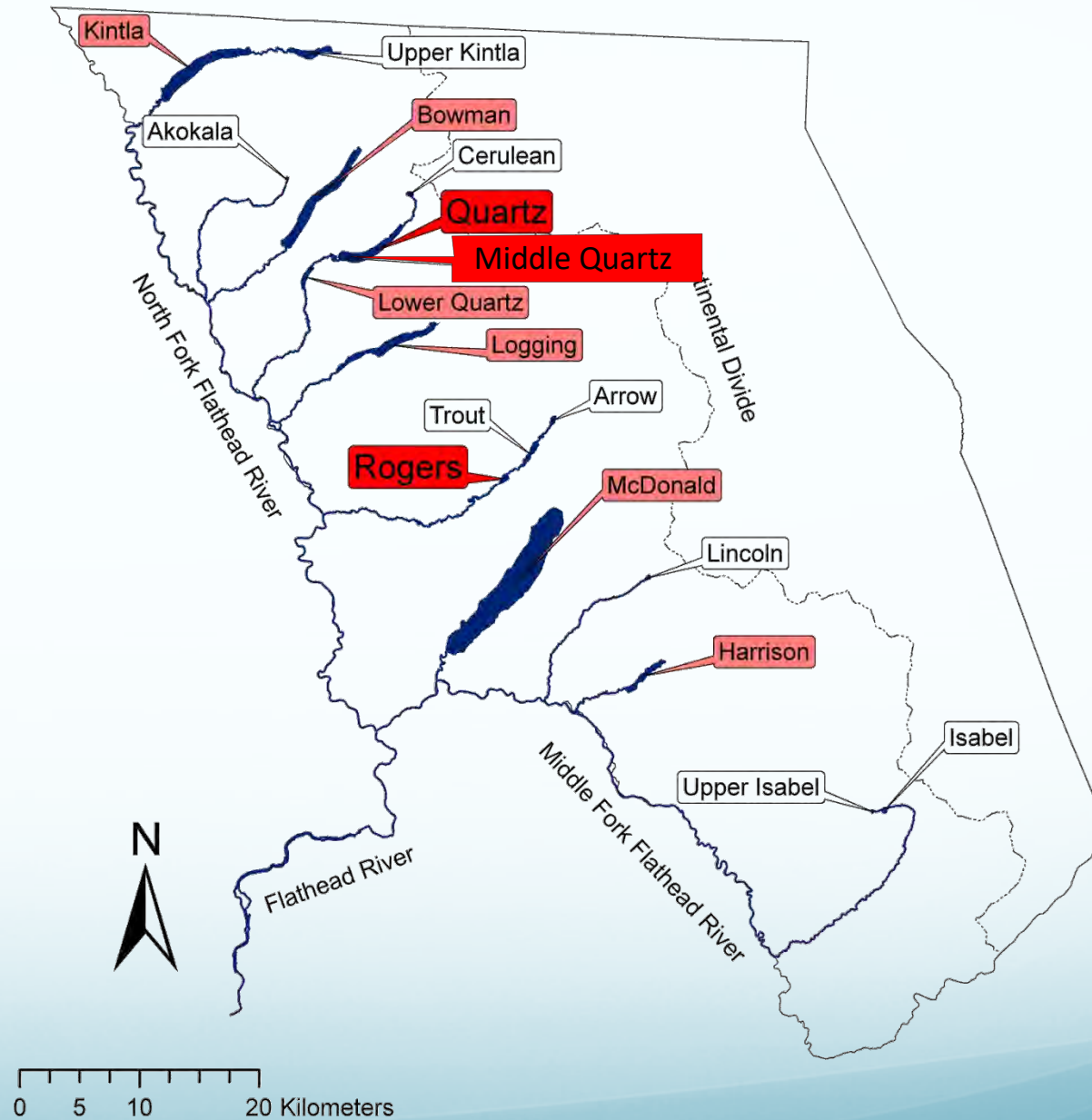
- 1905
Flathead System
- 1959
Lake McDonald
- 1962
Bowman Lake
Kintla Lake
- 1984
Logging Lake
- 2000
Harrison Lake



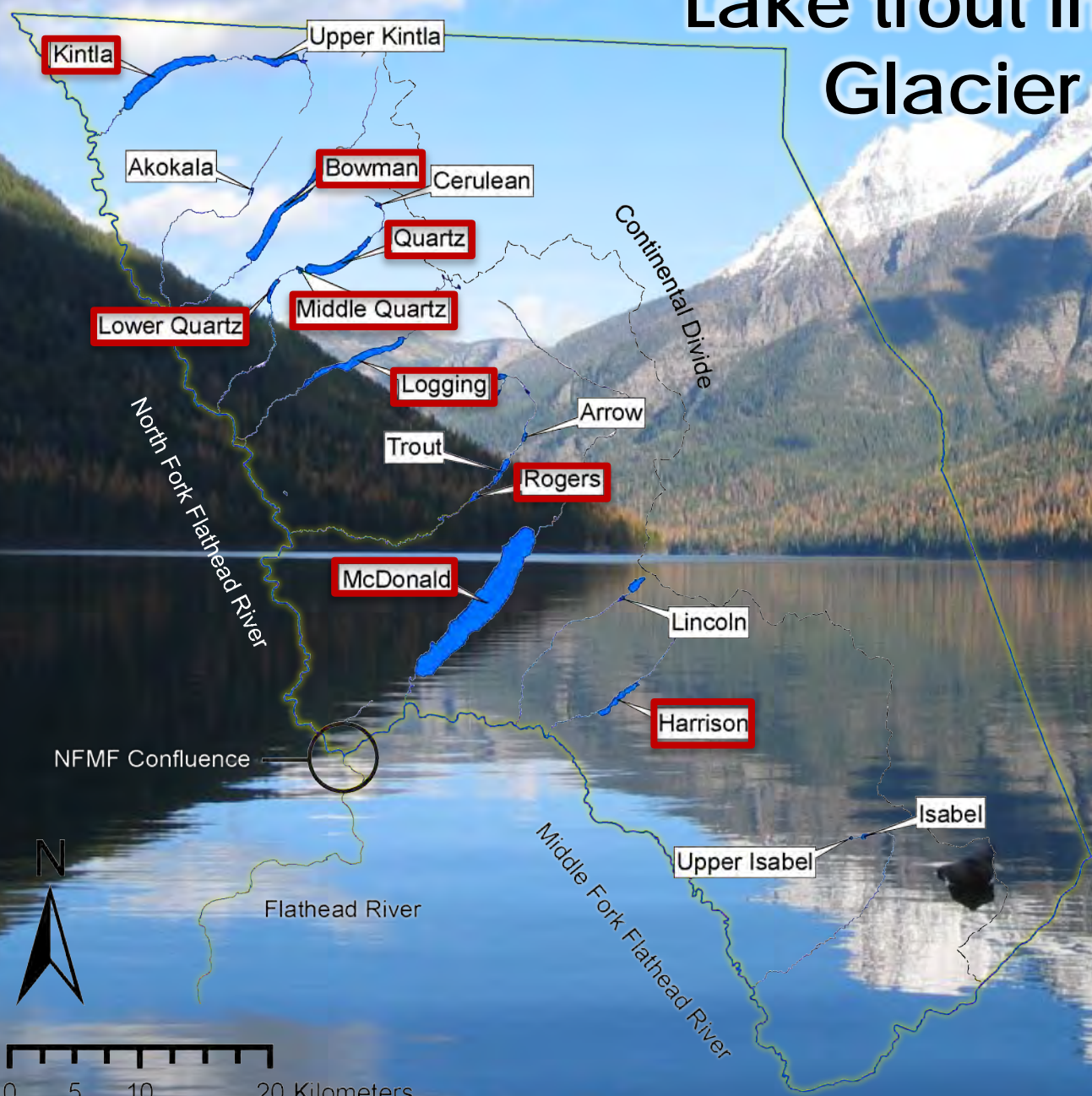
- **1905**
Flathead System
- **1959**
Lake McDonald
- **1962**
Bowman Lake
Kintla Lake
- **1984**
Logging Lake
- **2000**
Harrison Lake
- **2003**
Lower Quartz Lake



- 1905
Flathead System
- 1959
Lake McDonald
- 1962
Bowman Lake
Kintla Lake
- 1984
Logging Lake
- 2000
Harrison Lake
- 2003
Lower Quartz Lake
- 2005
Quartz Lake
Rogers Lake



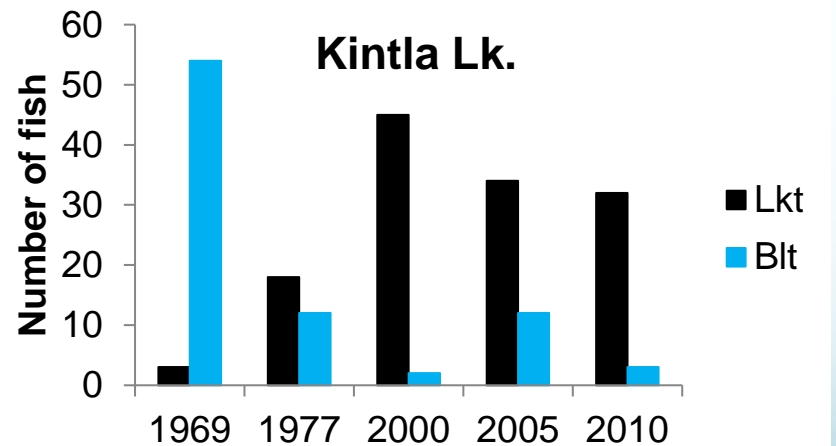
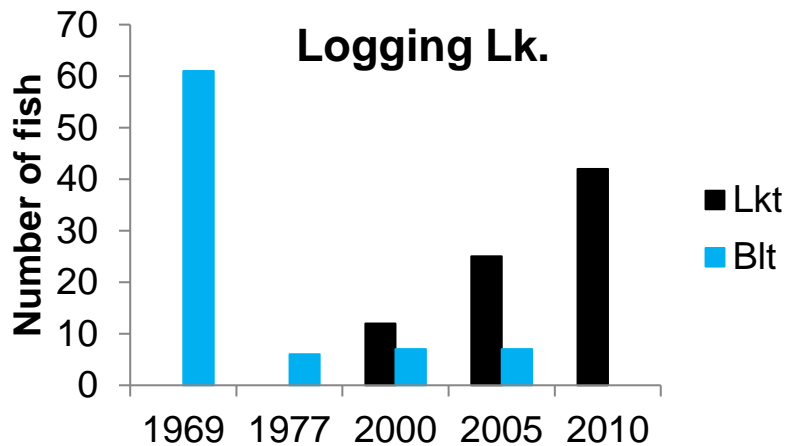
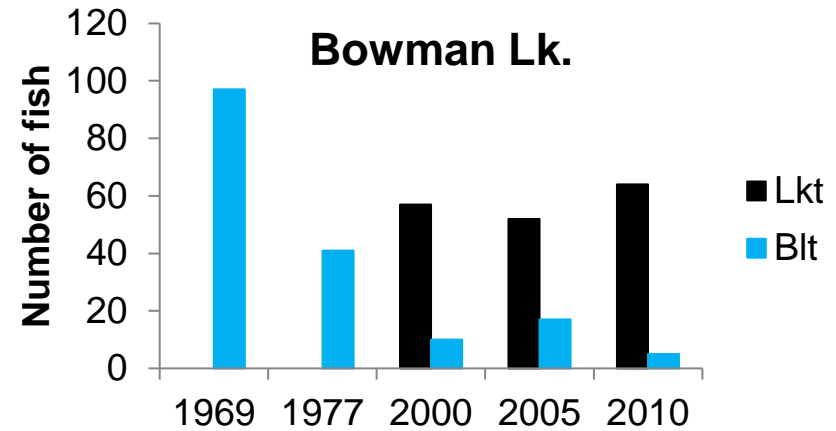
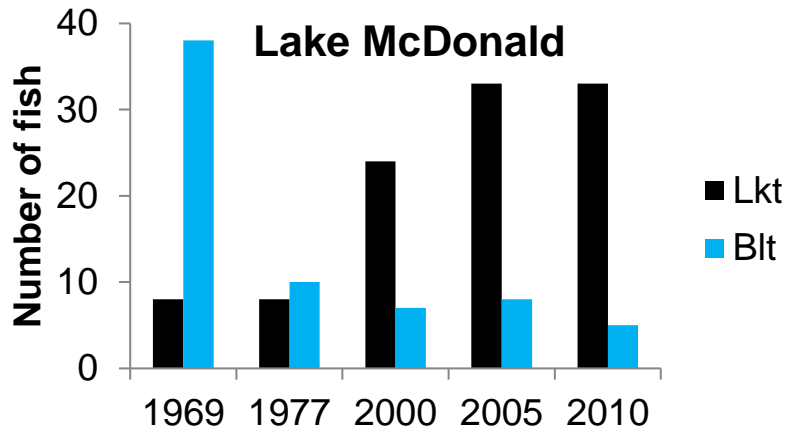
Lake trout invasion in western Glacier National Park



Bull Trout Lakes:
9 of 12 invaded
8 functionally extinct



Lake Trout Conversion



Lake Trout Displace Bull Trout and Disrupt Food Webs

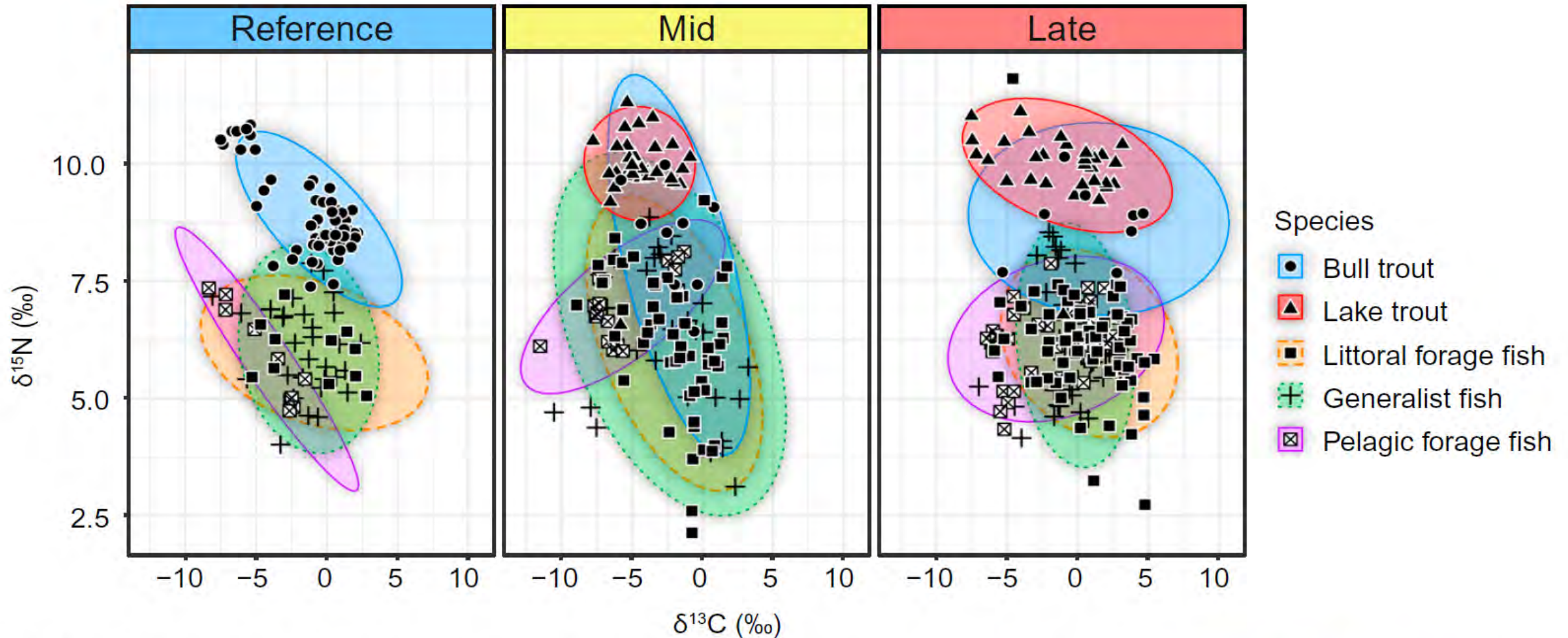


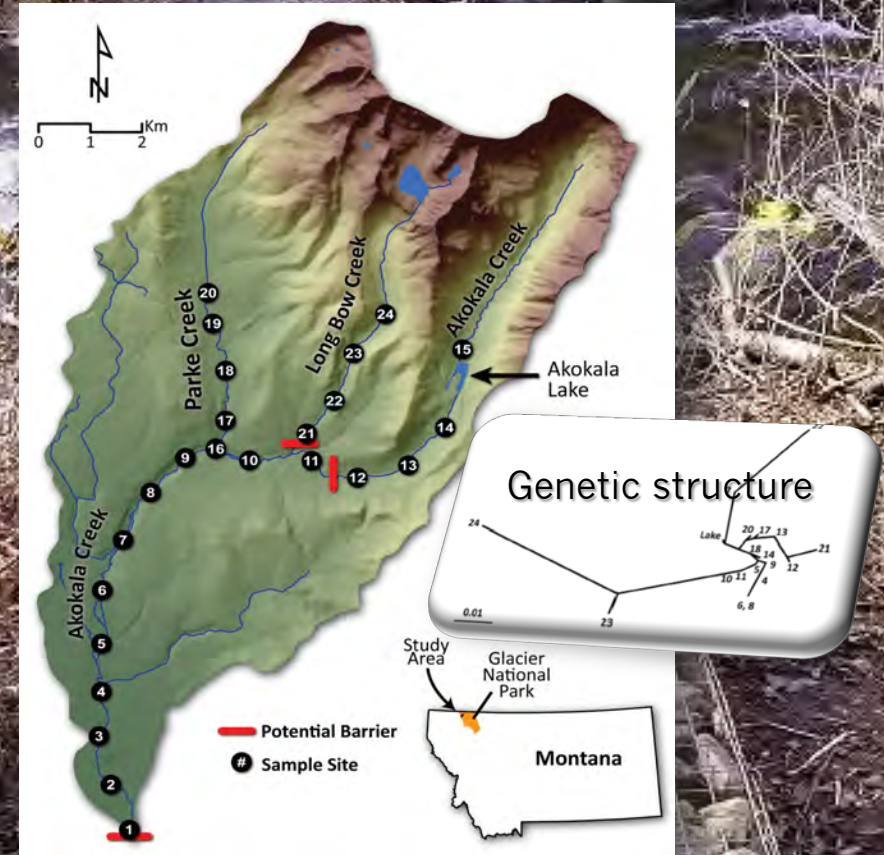
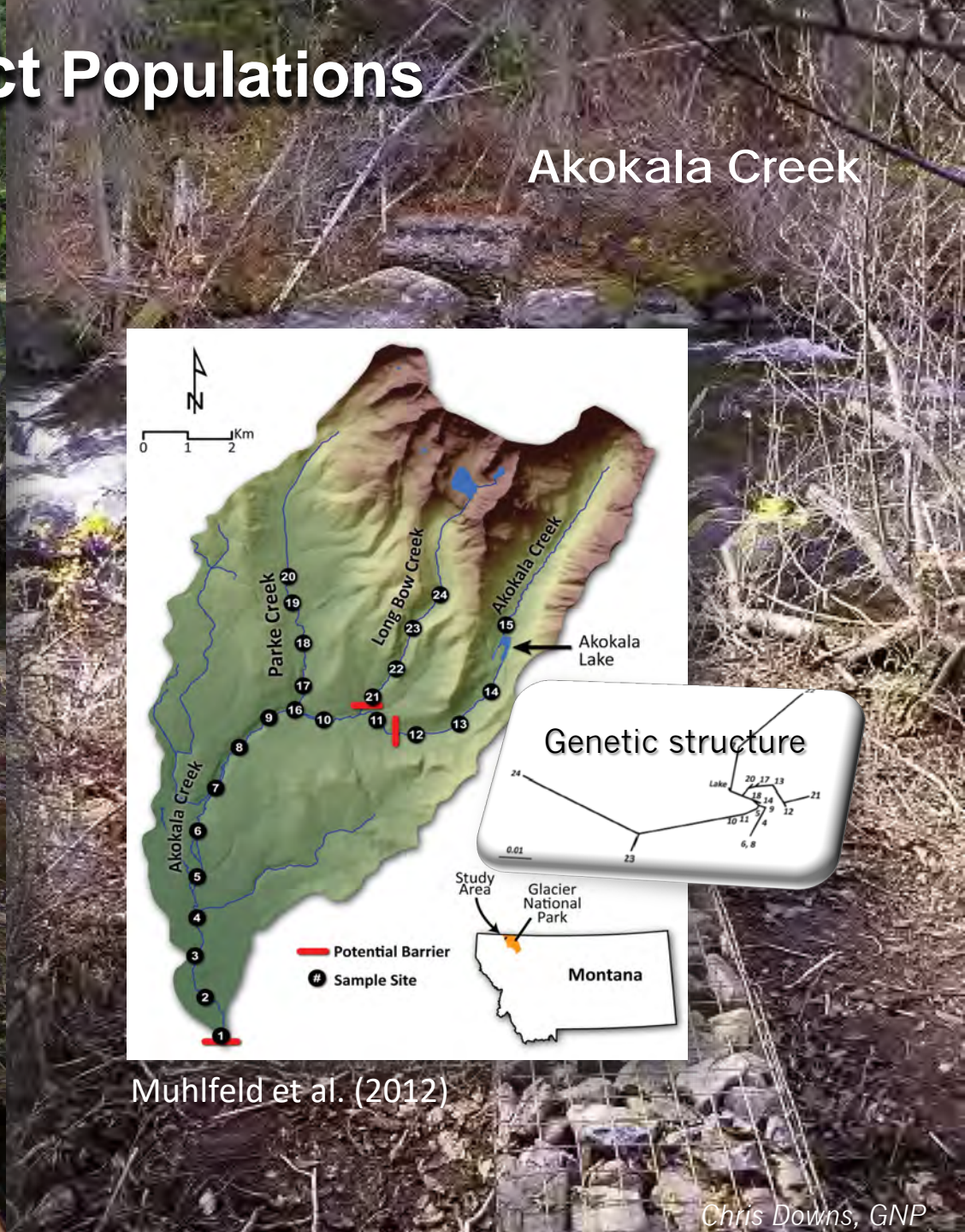
Fig. 1. Food web structure of uninvaded and invaded lakes. Baseline-corrected $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ for fish (points; $n = 437$; *SI Appendix, Table S1*) from lakes representing reference, middle (Mid), and late stages of lake trout invasion (*SI Appendix, Table S2*). Mesopredator fish species were aggregated to functional groups (*SI Appendix, Table S3*). Ellipses are 95% CIs around mean $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ for each fish species or functional group.

Using Barriers to Protect Populations

Quartz Creek

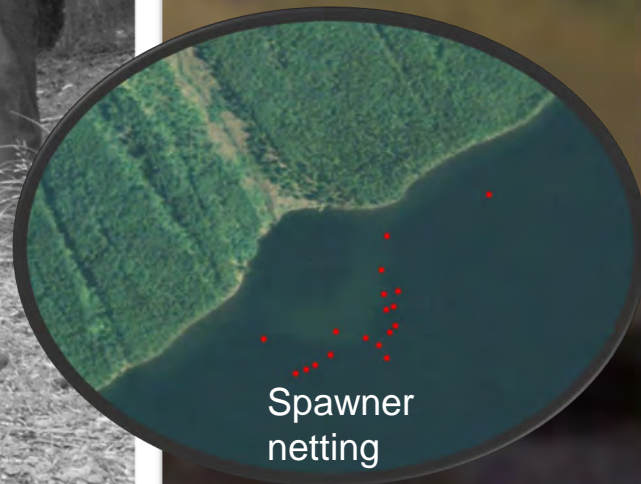
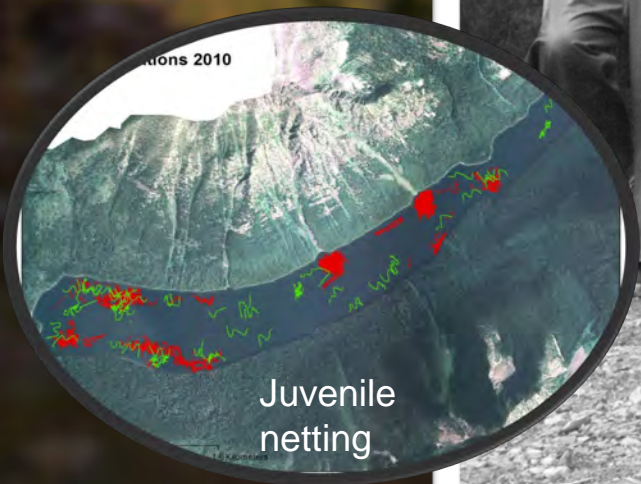


Akokala Creek



Muhlfeld et al. (2012)

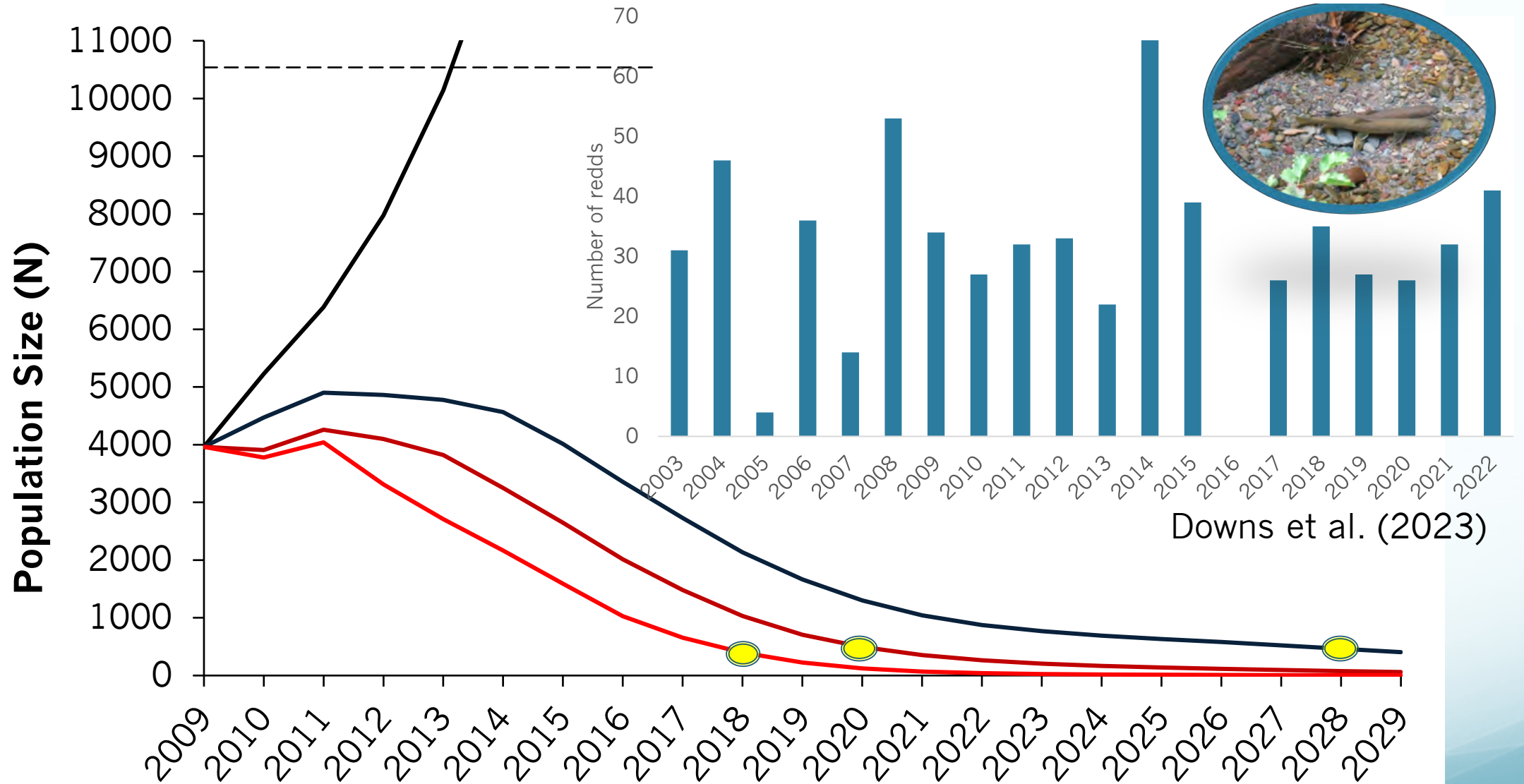
Lake Trout Suppression – Quartz Lake



Lake Trout Spawning Areas Quartz Lake

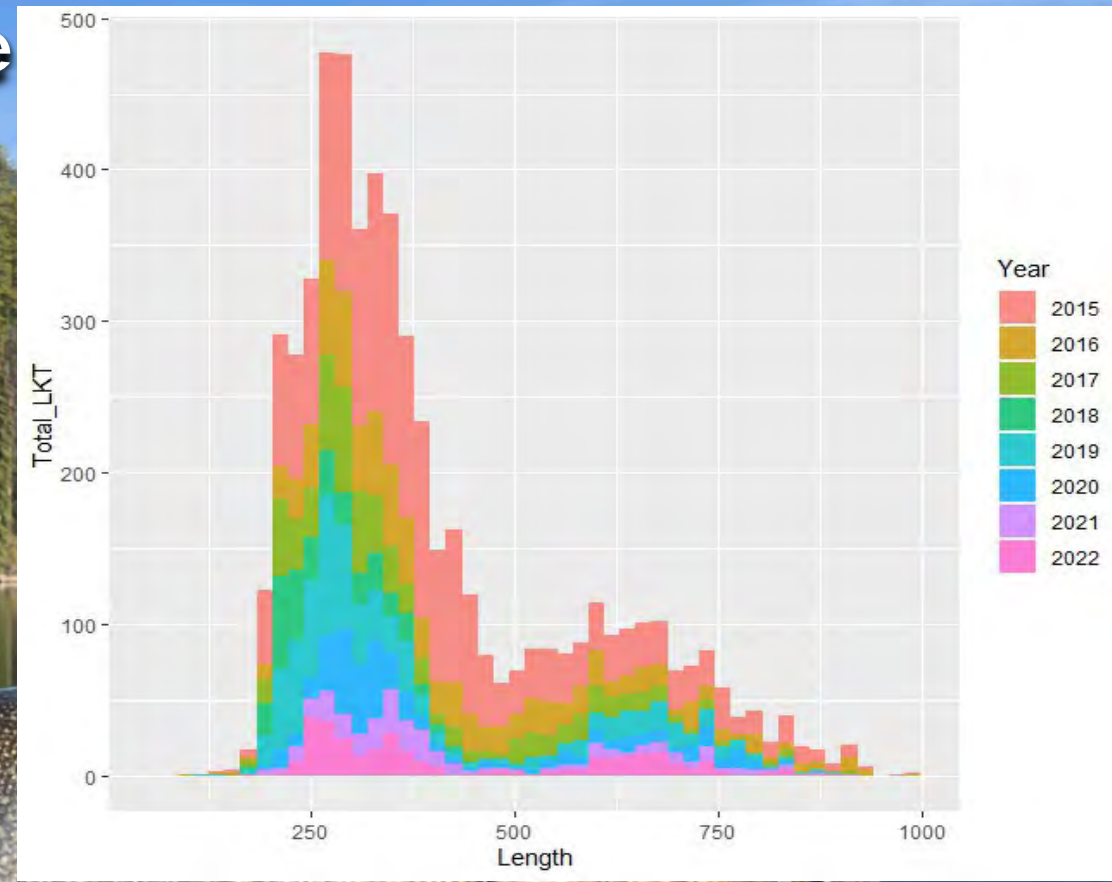


Lake Trout Suppression in Quartz Lake



Downs et al. (2023)

Lake Trout Suppression – Logging Lake



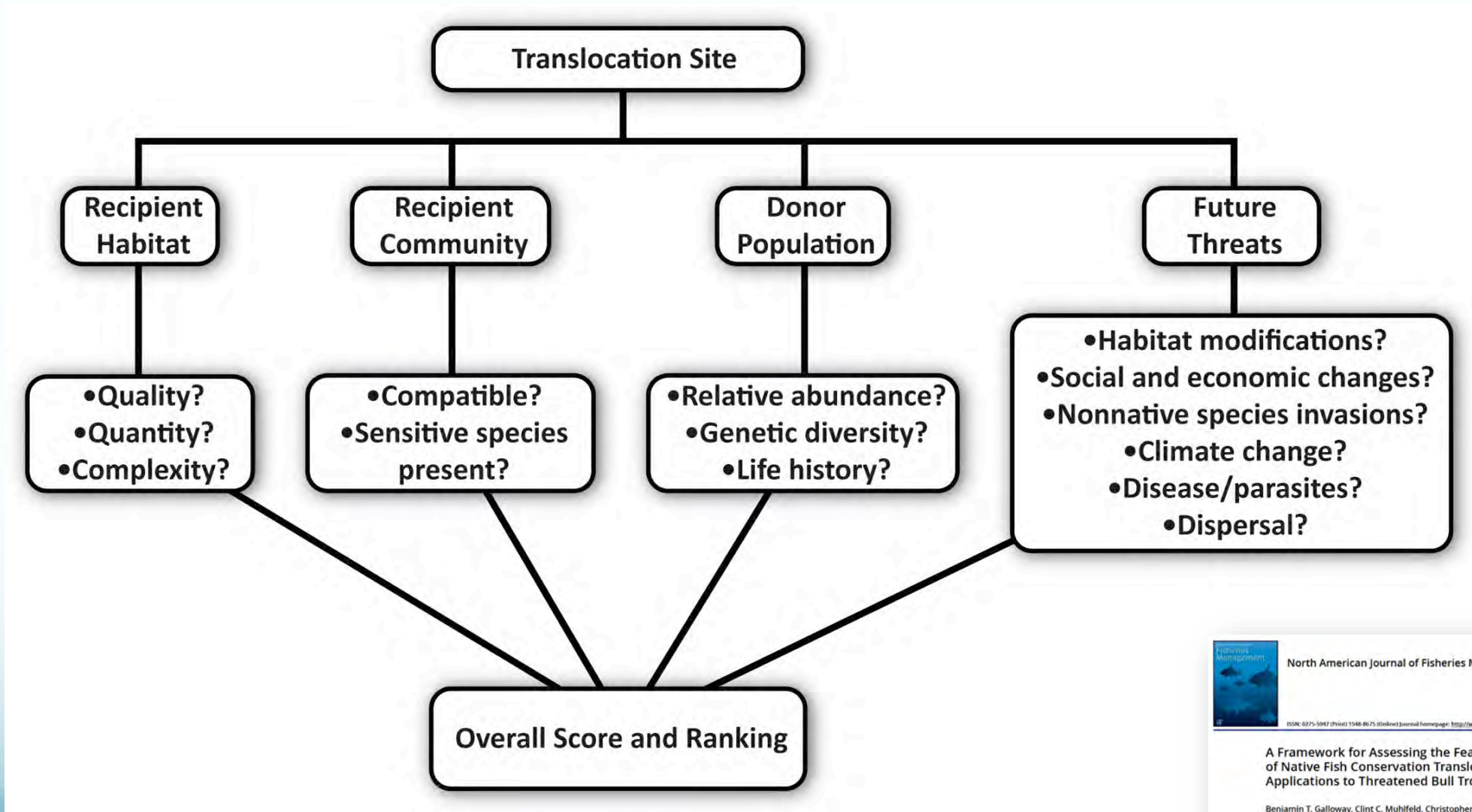
Bull Trout Fight Back in Logging Lake



Translocation of Imperiled Bull Trout – Grace Lake



Framework for Assessing the Feasibility of Native Fish Conservation Translocations

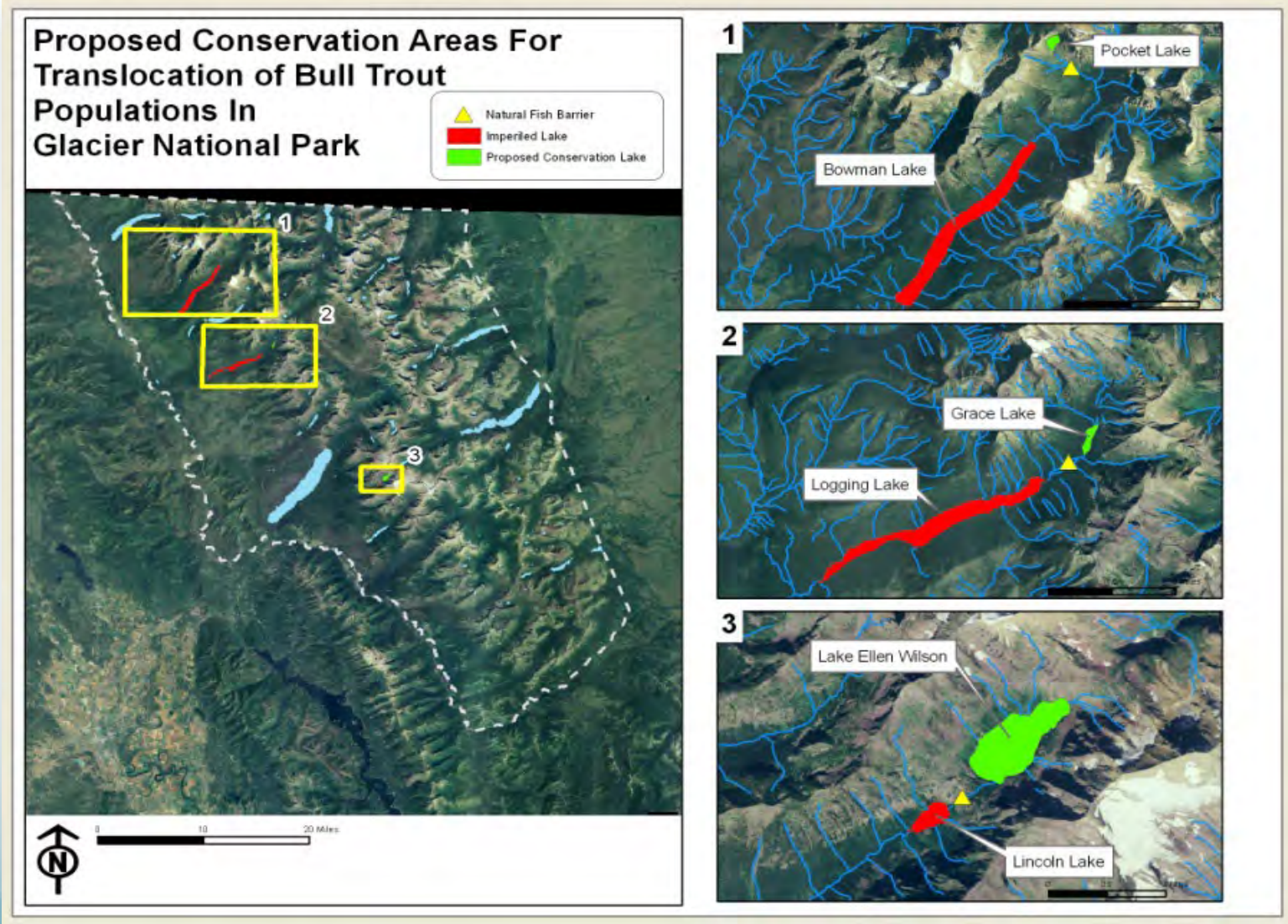


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A Framework for Assessing the Feasibility of Native Fish Conservation Translocations: Applications to Threatened Bull Trout

Benjamin T. Galloway, Clint C. Muhlfeld, Christopher S. Guy, Christopher C. Downs & Wade A. Fredenberg

Proposed Bull Trout Translocation Sites in GNP

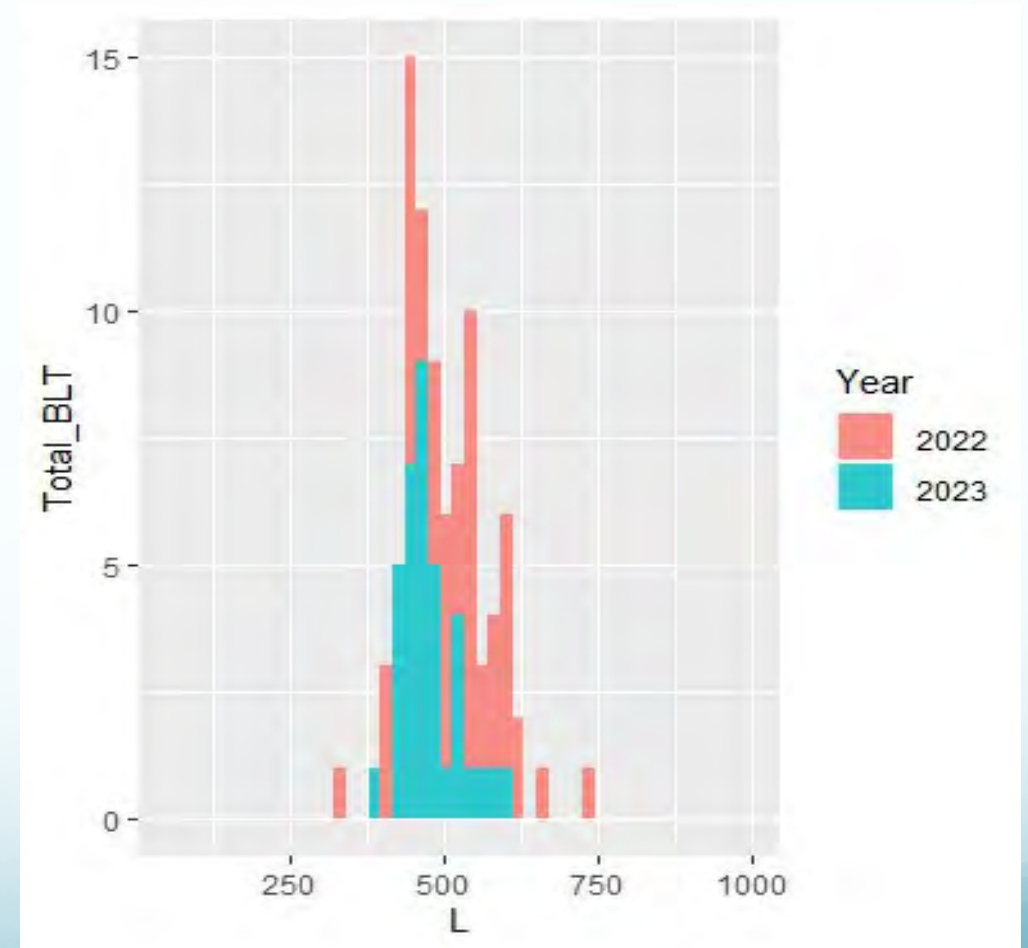


Grace Lake Bull Trout Translocation

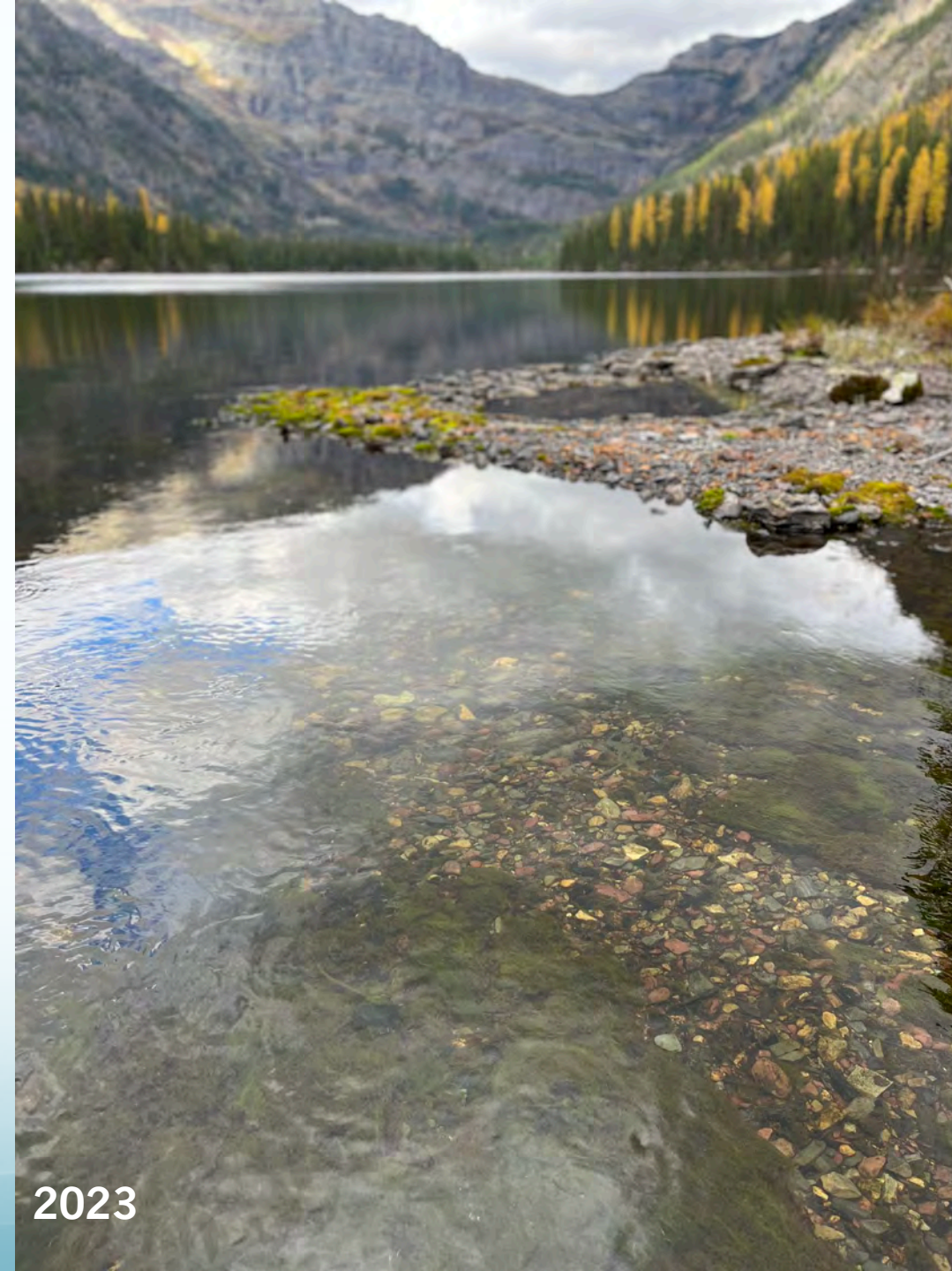


Bull Trout Population Appears Healthy in Grace Lake

Year Stocked	Age	Total	No. PIT Marks	No. Gen Marks
2017	0	750	0	750*
2018	0	1676	0	1676*
2018	1	200	200	200**
2019	0	802	0	802*
2019	1	203	200	203**
2020	1	201	201	201**
Total		3832	601	3832



Bull Trout are Reproducing in Grace Lake



2023

Creating Native Fish Reserves

Evangeline Lake



Camas Lake



GUNSIGHT LAKE PROJECT

- NON-NATIVE RAINBOW TROUT THREATENING DOWNSTREAM NATIVE FISH POPULATIONS
- OPPORTUNITY TO CREATE A NATIVE FISH REFUGE
- REMOVED RAINBOW TROUT IN SEPTEMBER 2023
- PLANT GENETICALLY PURE LOCAL STOCK WESTSLOPE CUTTHROAT TROUT, BULL TROUT, AND MOUNTAIN WHITEFISH IN 2024-2030
- ESTABLISH NEW CONSERVATION POPULATIONS SECURE FROM NON-NATIVE FISH AND WITH ADDITIONAL SECURITY FROM CLIMATE CHANGE



