Northern Rocky Mountain Science Center
U.S. Department of the Interior
Geological Survey

Preservation of Threatened Bull Trout in Glacier National Park.

Background:

Prior to the recent invasion of nonnative lake trout, Glacier National Park (GNP) supported approximately one-third of the remaining natural habitat supporting bull trout, *Salvelinus confluentus*, the parks greatest native aquatic predator. However, bull trout are at high risk of extinction in several lakes along the western slopes of the Continental Divide. The decline is directly attributed to the invasion and establishment of introduced lake trout, which consistently displace bull trout. Unless research-based management is implemented, these ecologically unique populations will continue to decline and the few remaining interconnected populations may possibly go extinct.

In response, the National Park Service (NPS) is developing an action plan to protect a remaining intact bull trout population from recent invasion of lake trout in the Quartz Lake system of GNP. NPS is partnering with researchers from the U.S. Geological Survey (USGS)—Northern Rocky Mountain Science Center (NOROCK) to determine the demographics of lake trout population and location of their spawning areas. Researchers will use that information to begin implementing targeted removal and control alternatives in the Quartz Lake system. The goal is to reduce or eliminate competitive interactions between these two fish species. The tools from this project will be used in management of other lakes in GNP, and potentially throughout the U.S.

Study Area:

The project study area is located in the northern regions of GNP and includes a series of lakes that feed down the Quartz Creek drainage. The uppermost lake is Cerulean, in which bull trout are present and lake trout have not yet been detected. The outflow from Cerulean Lake feeds Upper Quartz Lake, the primary focus of the project and where lake trout have recently been detected. Water from Upper Quartz flows downstream to Lower Quartz Lake, an area with well-documented lake trout presence.

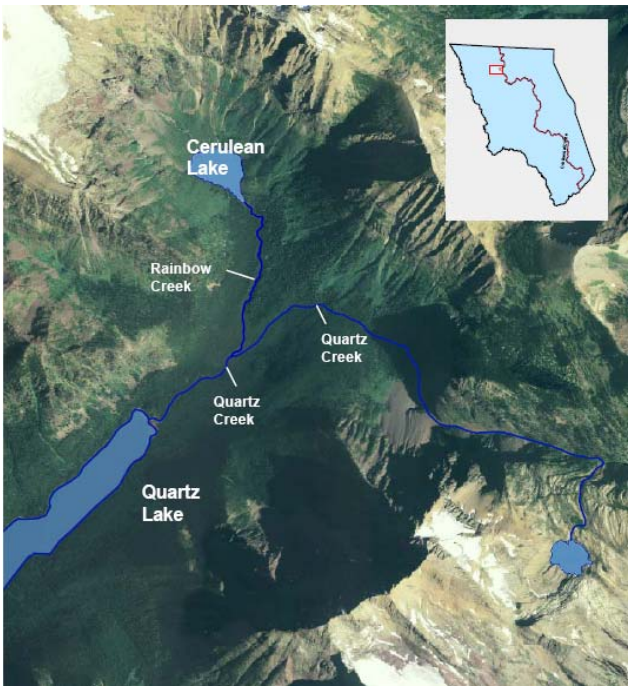

Figure 1. Map of the project study area in Glacier National Park. Adapted from Tennant, 2008.

Project:

The objectives of the project are to:

1. Assess lake trout demographic characteristics (abundance, age, survival and growth) to determine current lake trout population status and to quantify changes in population dynamics as a result of removal efforts.
2. Identify timing and location of spawning by lake trout to target the best locations for passive and terminal netting removal efforts.
3. Implement a removal program at lake trout spawning areas to remove lake trout during the fall spawn.
4. Participate in experimental and innovative techniques that may increase effectiveness of the overall suppression program.
5. Assess effectiveness of removal techniques on the lake trout population growth to provide a view of the project's successes or limitations.
6. Model different population scenarios to estimate what steps would be needed in other lake ecosystems.

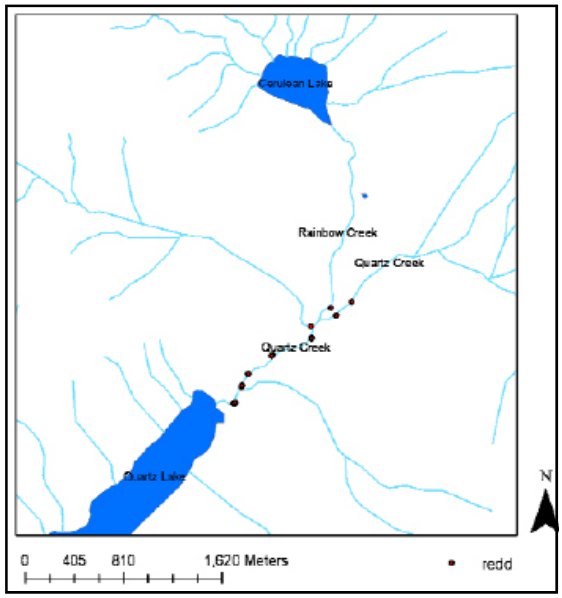

Figure 2. General bull trout spawning locations (redd) in study area. Adapted from Tennant, 2008.

Deliverables:

- Database of all seasonal distribution and habitat information for lake and bull trout.
- Maps defining distributions of lake trout for each season.
- Open file report and a scientific journal article that synthesizes work.
- Development of a series of workshops and meetings with resource managers in GNP and other parks in the U.S. with similar issues.
- Final report with recommendations and models on the most effective means of removing lake trout, as well as population structure data on lake trout and bull trout.

Lake trout (Salvelinus namaycush).

Outreach:

Because this project is supported by the NPS, interpretive materials for public outreach are essential in educating park visitors and the general public on natural resource issues. These issues include the value that society places on threatened species, the ecological impact of nonnative species, and the value people place on recreation stemming from fish and wildlife resources. In addition, educational resources can instill an appreciation for fully natural and healthy ecosystems throughout the U.S.

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The Northern Rocky Mountain Science Center is located in Bozeman, Montana and includes three field stations in Montana and one duty station in Wyoming. For more information on NOROCK's research, please visit http://nrmsc.usgs.gov or contact the Center Director: Jeff Kershner 406-994-5304 or jkershner@usgs.gov