

## **Project Summary**

### **Rocky Mountains Cooperative Ecosystem Studies Unit**

**Project Title:** Use of Lake Trout Genetics to Monitor and Enhance Success of Suppression on Yellowstone Lake

**Type of Project:** Technical Assistance  
**Discipline:** Natural Resources  
**Funding Agency:** National Park Service  
**Cooperators:** University of Montana  
**Effective Dates:** 7/1/2014 - 9/30/2016  
**Funding Amount:** \$29,258

**Investigators and Agency Representative:**

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**Project Abstract:**

Non-native species of fish threaten native fishes throughout North America. In Yellowstone National Park, introduced populations of invasive lake trout increasingly threaten native populations of fish including Yellowstone cutthroat trout. Prior to the recent invasion of non-native lake trout, the streams around Yellowstone Lake held thousands more YCT than today. These declines are directly attributed to the invasion and establishment of introduced lake trout.

In response, the YNP initiated a project to reduce or eliminate lake trout (Koel et al. 2005). To date, results seem promising but underscore the urgency to (1) continue suppression to prevent continued loss of remaining native fish populations but as importantly to (2) evaluate the success of the experimental suppression of lake trout to help improve restoration and preservation of cutthroat trout. This project and numerous others throughout the western United States would greatly benefit from a better understanding of the effectiveness of suppression activities in invasive species research, such as determining the number of spawning adults each year.

This project will employ recent, powerful molecular genetic tools and novel statistical techniques (Waples et al. 2013, 2014) to estimate the number of adult spawners that have successfully contributed offspring to each of several year classes (cohorts) of lake trout. These estimates should be useful for detecting changes in adult population size and evaluating whether gill net suppression has been effective at reducing the number of spawning lake trout.

We hypothesize the lake trout population size and spawner abundance has significantly declined since 2011 due to intensive suppression of lake trout, which began in 2011. We also hypothesize that there are no genetically-distinct (partially isolated) spawning groups because lake trout movement (dispersal or straying) between spawning areas is high (homing to spawn in natal area is not exceedingly high).

**Outcomes with Completion Dates:**

Database, Collections/Specimens, Archives, and Maps provided to the NPS ATR or Technical Expert - 30 JUNE 2015  
Draft Final Report - 31 DECEMBER 2015  
Final Report - 31 JUNE 2016

**Keywords:** genetic tools, invasive lake trout, native populations, Yellowstone cutthroat trout, Yellowstone National Park, University of Montana