

**POPULATION CHARACTERISTICS OF LAKE TROUT IN LAKE
MCDONALD, GLACIER NATIONAL PARK:
IMPLICATIONS FOR REMOVAL^{AFS}**

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Native species, particularly bull trout (*Salvelinus confluentus*), have suffered dramatic population declines since the establishment of nonnative lake trout (*Salvelinus namaycush*) in Lake McDonald, Glacier National Park (GNP). In an attempt to prevent the further decline of these populations GNP is considering a lake trout removal program. This study was conducted to examine the population characteristics of lake trout and model the effects of varying exploitation on lake trout abundance and yield. Sagittal otoliths were removed from 157 lake trout captured from May through September 2003. Otoliths were sectioned and aged by two readers using a compound microscope. Mean length at age varied from 235 mm at age 5 to 465 mm at age 10 and time to reach 450 mm was 9.3 years. The von Bertalanffy growth model was used to estimate theoretical maximum length (730 mm), growth coefficient (0.104), and the time when length would theoretically equal 0 mm (0.102). The overall (i.e., sexes pooled) weight-length model was $\log_{10} \text{weight} = -5.44 + 3.11(\log_{10} \text{length})$. Growth in length and weight was typically lower than lake trout in Flathead Lake, Montana. Our model simulations for a population of 100,000 individuals indicated that an exploitation of 73 percent was needed to reduce the number of 450 mm lake trout to zero. Growth overfishing only occurred at 20 percent exploitation when conditional natural mortality was 10 percent. These data illustrate that complete removal of lake trout in Lake McDonald is unlikely; however, moderate levels of exploitation did reduce yield estimates when natural mortality was low.