

Investigator: *Leo F. Marnell and Mac Donofrio*

Project Title: *Biology of the Bull Trout (*Salvelinus confluentus*) in Upper Kintla Lake, Glacier National Park, Montana*

Summary:

The bull trout (*Salvelinus confluentus*) is being considered for possible designation as a threatened or endangered species by the U.S. Fish and Wildlife Service. A unique population of this species occurs in Upper Kintla Lake in the northernmost drainage of the Flathead River in Glacier National Park (GNP). This relic population of charrs is the only species of fish in the lake. Evidently they were able to ascend the cascade falls 3 km downstream from the lake outlet during the late stages of glacial withdrawal when temporary ice dams probably existed. Similar conditions may have occurred during more recent times as a result of periodic avalanches in the Long Knife Creek area.

Genetic examination of these charrs does not support their classification as a distinct subspecies. However, the presence of anomalous biochemical alleles suggests long-term isolation from other bull trout. They have probably been reproductively isolated from their conspecifics in the Flathead River basin for 7,000 to 12,000 years. These fish appear to have evolved some unusual life-history adaptations to cope with isolation in this remote headwaters lake. Tentatively the Upper Kintla Lake charr population is considered to represent a distinct "race" of bull trout.

Objectives of this research are to:

1. document the food habits, age and growth characteristics, movements,

reproductive biology, pathology, and parasites associated with this charr population;

2. establish the true taxonomic status of the population and identify special life-history adaptations unique to these fish; and
3. recommend management actions to minimize human impacts in order to ensure continued survival of these charrs.

Gill nets were set in shallow shoreline areas of Upper Kintla Lake during the fall of 1991 and 1992 to collect juvenile charrs (age II and III fish) for food habits and age/growth analyses. A mid-summer electrofishing survey was made in 1992 along a 1 km reach of the outlet creek to establish the age classes of stream resident fish, and to document the status of fluvial adult charrs. Ten gravid female bull trout were collected during 1991 (3) and 1992 (7) for studies of reproductive physiology and fecundity.

Work in 1993 will focus on the measurement of "microhabitat" parameters important for the selection of spawning sites. Special attention will be given to substrate types, gravel sizes, current velocities over redds, water depths, and distance to protective cover. Field work for this study is expected to be completed in 1993.

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Project Title: *Lake McDonald Fishery Investigations*

Summary:

This project is the fisheries portion of a planned multi-year fisheries-limnology investigation in the Lake McDonald basin, Glacier National Park. Limited fisheries studies on Lake McDonald were supported during 1990-91 by the Montana EPSCOR Program. Additional work planned for six smaller lakes and several streams in the basin has been

temporarily suspended due to a lack of funds. Limited fisheries work on Lake McDonald is continuing under the auspices of Glacier National Park's Global Climate Change Program.

The Lake McDonald basin was selected for this work because lakes and streams within its confines exhibit problems