

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Prevalence and severity of Myxobolus cerebralis infection related to water temperature and flow regimes of native cutthroat trout <i>Onchorynchus clarki bouvieri</i> spawning tributaries of Yellowstone Lake
Type of Project: Research
Funding Agency: National Park Service
Other Partners/Cooperators: Montana State University
Effective Dates: August 15, 2001-- December 31, 2003
Funding Amount: \$ 20,000
Investigators and Agency Representative: NPS CONTACT: Todd Koel, Supervisory Fisheries Biologist, Yellowstone National Park, POB 168, Yellowstone National Park, WY 82190; 307-344-2281, Todd_koel@nps.gov UNIVERSITY CONTACT: Billie Kerans, Associate Professor, Department of Ecology, Montana State University, Bozeman, MT 59717; 406-994-3725; bkerans@montana.edu
Project Abstract: The following task set describes the steps that would be followed accomplishing the proposed research during the course of the research project. This project is expected to include field sampling as described below during years 2002 and 2003. The overall goal of this project is to clearly define the relationships between temperature and stream flow regimes in the cutthroat trout spawning tributaries to Yellowstone Lake and the rate and intensity of whirling disease infections. Once these relationships are established, management of whirling disease in trout streams of the greater Yellowstone region can be focused on those with a high probability of infection severity. Cutthroat trout in Yellowstone Lake spawn in lake tributaries or downstream in the Yellowstone River. Post-hatch cutthroat fry typically spend several months in tributaries before moving downstream into the lake. Because of the wide range in environmental characteristics of Yellowstone Lake tributaries, the research tasks are: 1. Install and monitor temperature data loggers in cutthroat trout spawning tributaries to Yellowstone Lake to determine the daily and seasonal thermal regimes of these streams. 2. Characterize cutthroat trout spawning tributaries by obtaining information regarding seasonal runoff patterns, slope aspect, bed gradient, drainage basin area, substrate types, and flow. Analyze and display tributary characteristics using geographic information systems. 3. Classify spawning streams based on basin environmental characteristics using multivariate statistical methods. 4. Establish a statistically-valid sampling protocol for exposure of cutthroat fry by placing sentinel cages in a wide range of stream types to determine variation of whirling disease infection severity within each stream class. 5. Place sentinel cages and Yellowstone cutthroat trout fry in a sub-sample of streams repeatedly throughout each summer to determine the infection-timing and seasonal/thermal relationships. 6. Correlate whirling disease infection severity of Yellowstone cutthroat trout with tributary environmental characteristics, and with results of on-going research of <i>T. tubifex</i> worms and tributary sediments. Develop a technical report describing research results.
Outcomes with completion dates: Final Product due: December 31, 2003 All information collected during this study will be provided in electronic format to the Fisheries and Aquatic Sciences Section, Yellowstone Center for

Resources. Final product describing overall research results will be in the form of a technical report or draft M.S. thesis.

Keywords: Myxobolus cerebralis, infection, water temperature, flow regimes, native cutthroat trout, Onchorynchus clarki bouvieri, spawning tributaries, Yellowstone Lake, Montana State University, Yellowstone National Park

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Date Annual Report Received:

Date Final Report Received:

Publications, etc. on file: