

RM-CESU Project Report - Assessment of Tubificid Assemblages, Abundance, and Prevalence of Disease in worms as a part of the Yellowstone National Park Whirling Disease Study

1) A sentence summarizing the purpose of the project.

The purpose of this project was to conduct field sampling to collect tubificid worms from sentinel cage sites in the upper Yellowstone basin and throughout the entire period in which young cutthroat trout are rearing in tributary pools. The collections will be used to determine species composition, abundances, and degree of infection of tubificid worms. Since variation in infection potential exists among genetic strains of tubificid worms, we will determine the geographic isolate of *T. tubifex* worms in lake tributaries.

2) A brief description of what was accomplished during the year. Please note if this is part of a larger project, and what "leveraged"

Field sampling was completed to collect tubificid worms from sentinel cage sites in the upper Yellowstone basin and throughout the entire period in which young cutthroat trout are rearing in tributary pools. Field samples were collected three times around the time that the fish sentinel cages were in place. Six samples were taken in each of three study reaches on each of the streams known from previous work to be infected by *Myxobolus cerebralis*, the causative agent of whirling disease.

To determine the species composition, abundances, and degree of infection of tubificid worms, all worm samples have been prepared in the laboratory and identification is currently underway at Montana State University. To determine the geographic isolate of *T. tubifex* worms that were collected alive, samples are being sent to the U.G. Geological Survey Western Fisheries Research Center for PCR analyses.

To relate *T. tubifex* infection to infection in native cutthroat trout we collected worms from each study reach in association with trout exposure cages and watched for production on *M. cerebralis* TAMs in the NPS fisheries laboratory at Lake. All invertebrates have been picked from the oligochaete samples, and the worms are in the process of being mounted for identification. 185 live oligochaetes were collected from streams in YNP with 112 worms collected from the three intensive study reaches. Of these, 46 out of 185 and 4 out of 112 were found to be releasing actinospores; however, PCR tests showed that none of the actinospores were *M. cerebralis*. Although the PCR tests for most of the remaining worms have not been completed, we recently found two worms (one from the Yellowstone River and one from Pelican Creek) that tested positive for *M. cerebralis* using PCR.

Analyses of landscape-scale attributes of 52 spawning tributary basins has been completed. Important thermal, hydrological, and sediment characteristics of streams will be related to tubificid assemblage composition and *T. tubifex* infection by collection of field data during summer 2003.

The assessment of tubificid assemblages in Yellowstone National Park is a part of a much larger study on whirling disease of native cutthroat trout in the upper Yellowstone basin. Funds from CESU have been matched by substantial contributions from the Whirling Disease Initiative, the Whirling Disease Foundation, the Yellowstone Park Foundation, the Center for Resources Fisheries Program in Yellowstone National Park.

3) Product that resulted from the project dollars - or when we can expect to see the product (e.g. video, final report, outreach brochure)

The products of this research will be presented in the form of a peer-reviewed publication in the scientific literature.

4) How these funds contributed to the park's need for research, technical assistance or education

Without the funding from CESU, we would not have been able to conduct any work on the alternate host of *M. cerebralis* in Yellowstone National Park.

5) PHOTOS: Include, if possible, one or two photos of activities conducted during the project - jpeg preferred