

2000 REPORT TO CONGRESS

Whirling Disease Initiative

submitted by the

**Whirling Disease Steering Committee
of the
National Partnership
for the Management of Wild and Native Coldwater Fisheries**

January 29, 2001

Montana University System Water Center

Gretchen Rupp, Director

101 Huffman Building

Montana State University

Bozeman, Montana 59717-2690

406/994-6690

wwwrc@montana.edu

<http://water.montana.edu>

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BACKGROUND

Over the past decade, the microscopic parasite *Myxobolus cerebralis*, which causes whirling disease in many salmonid fish species, has been spreading and infecting hundreds of river and stream reaches in the Western United States. The impacts of this parasite on susceptible trout can be dramatic: darkening of the tail, skeletal deformities, frenzied tail chasing (thus the name “whirling” disease), and death. This microbe is extremely hardy and long-lived, with a life cycle that employs both a fish host and an aquatic worm host known as *Tubifex tubifex*.

A Eurasian native, *M. cerebralis* made its way to North America in the 1950s. It was once believed to be relatively harmless to wild fish, but research in the mid-1990s found that it was decimating rainbow trout populations in some of the Rocky Mountain region’s finest river fisheries, from Montana’s Madison River to the Gunnison River in Colorado. Native cutthroat trout and whitefish have been found to be susceptible. Whirling disease is therefore a major threat both to biodiversity and to the multi-million dollar fishing and tourism economy.

The whirling disease parasite has been reported from 23 states, from New York to California, and has generated great concern among anglers, scientists, and fisheries managers.

THE WHIRLING DISEASE INITIATIVE

In 1997, the Whirling Disease Initiative was established under the National Partnership for the Management of Wild and Native Coldwater Fisheries. The Initiative’s purpose is to promote, prioritize, and help fund cooperative research with direct implications for whirling disease afflicting wild trout populations. The program is administered by the Montana Water Center, which convenes a Whirling Disease Steering Committee made up of representatives from multiple states and agencies. The Committee prepares an annual research plan, issues Requests for Proposals based on identified priorities, selects and approves projects for funding following scientific peer review, and distributes the research results within the scientific and fishery management communities, and to other stakeholders. This competitive grants program began in 1997 and since then has continued to fund new research projects in every year.

The Steering Committee has chosen to support a mix of projects, from basic research (providing the building blocks for management solutions) to applied research geared more directly at testing potential management solutions. Early projects were principally aimed at explicating the biology of whirling disease. In 2000, the Steering Committee shifted the priority toward field research more closely tied to possible management strategies. Supporting both sets of research needs enhances the opportunities for finding both short-term and long-term solutions to the whirling disease problem.

For the 1999-2000 cycle, 16 different research projects and one program grant were funded with a total of \$576,588 in Federal dollars, leveraging an additional \$600,381 in non-Federal match. Research teams include 30 investigators from seven states. These projects have been characterized by excellent cooperation among all the stakeholders.

HIGHLIGHTS OF THE 1999-2000 RESEARCH RESULTS

Salmon and Trout Susceptibility

This study was undertaken to examine the effect of the whirling disease parasite among the native populations of trout and salmon in the Lostine River, Oregon. Fish became infected throughout the river, but incidence of infection was highest in the lower river. Experiments to determine the susceptibility to infection of Chinook salmon indicated that they do become infected within the river, but they may be somewhat resistant to fully developing the disease there.

Water Quality and Parasite Survival

These Utah experiments evaluated the effects of fundamental water chemistry characteristics on the survivorship of the infectious form of the disease known as the TAM. Several parameters showed an affect on TAM viability, especially water acidity / alkalinity. This may partially account for differences in the severity of whirling disease among geographic regions.

Susceptibility of the Worm Host

If environmental conditions could be controlled to favor worm hosts that are not susceptible to whirling disease, its spread could be somewhat inhibited. In this project, Montana researchers developed worm strains from different areas, characterized them genetically, and evaluated their susceptibility to whirling disease. The next step will be to characterize the environmental conditions that favor the disease-resistant strains.

Spawning Sites

The parasite exposure a fish experiences largely determines its likelihood of developing the disease. During spawning season trout move upstream, sometimes for great distances. Field and laboratory observations by Wyoming investigators established that trout which spawn at highly-infected locations are more likely to develop the disease than others spawning where exposures are less.

SUMMARY

While little hope exists for the eradication of whirling disease, research sponsored by the Initiative has made great strides in elucidating the basic biology of the disease and beginning to identify management approaches that offer promise for containing and decreasing its impact. In the coming year, the Initiative will increase its focus on experimental management efforts, to begin testing some of the more promising strategies, while continuing to support vital basic research to enhance our overall understanding of this disease.

The Steering Committee particularly thanks Montana's Congressional delegation – Senator Conrad Burns, Senator Max Baucus, and Congressman Rick Hill – for their advocacy of this research; and the

Representatives of the National Partnership for their time and guidance.

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