

## WHIRLING DISEASE IN YELLOWSTONE NATIONAL PARK<sup>MAS</sup>

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The European parasite *Myxobolus cerebralis* (the cause of salmonid whirling disease) exhibits a complex two-host life cycle involving an aquatic oligochaete (*Tubifex tubifex*) and a salmonid fish. This pathogen was first detected in Yellowstone cutthroat trout (YCT) from Yellowstone Lake in 1998. Between 1999 and 2001, a large-scale investigation to determine severity and spatial extent of *M. cerebralis* in the lake and its tributaries revealed that prevalence of the parasite ranged (in 1999) from greater than 20 percent in the northern section of Yellowstone Lake to 5 percent in the West Thumb. Sentinel fry exposures detected mild infection in Clear Creek in 2000 and in the Yellowstone River proper in 2001, and moderate to severe infection in fry exposed in Pelican Creek in 2000 and 2001. The present investigation began in 2002 focusing on these three YCT spawning tributaries described as *M. cerebralis*-positive using sentinel fry, collection of wild fry, collection of oligochaetes, prevalence of infection in oligochaetes, and measurement of physico-chemical features of the streams. Polymerase chain reaction (PCR) analyses have detected *M. cerebralis*-positive sentinel YCT from all study reaches in Pelican Creek but no infection in sentinel or wild fry from the study reaches in each of the Yellowstone River and Clear Creek. We collected 1020 live oligochaetes from the sentinel study reaches in 2002, four of which released actinospores that PCR tests failed to classify as *M. cerebralis*. About 150 oligochaetes that were not producing actinospores were also tested, two of which (from Pelican Creek) tested positive for *M. cerebralis*. Part of the environmental assessment data from each of the study reaches will be processed during spring 2003, but some physico-chemical characteristics (e.g., water temperature, conductivity) appear correlated to distribution and abundance of *M. cerebralis* in

tributaries to Yellowstone Lake. The goal is to identify potential factors influencing incidence of whirling disease in YCT to aid the park's fish biologists and other regional fisheries managers to develop possible management strategies for this invasive pathogen threatening native YCT and other salmonid populations.