



Whirling Disease

RESOURCE BRIEF

Importance

*Myxobolus cerebralis*, the parasite from Europe that causes whirling disease in some salmonid species, has been detected in 25 states. During the parasite’s life cycle, it takes on two different forms as spores and requires two hosts: a common aquatic worm (*Tubifex tubifex*) and a susceptible fish. Cutthroat trout are susceptible, especially during the first months of life; grayling and lake trout may carry the parasite but appear immune to the disease. *M. cerebralis* feeds on the fish’s cartilage, and the infection can cause skeletal deformities, a blackened tail, and whirling behavior. Because the fish cannot feed normally and are more vulnerable to predation, whirling disease can be fatal. No practical means exists of eradicating *M. cerebralis* from a body of water in which it has become established.



Above, juvenile fish with whirling disease; Right, *Tubifex tubifex*, a host for the whirling disease parasite.



Status

Whirling disease has not been found in Grand Teton as of 2007. It was first detected in Yellowstone in 1998 in juvenile and adult cutthroat trout from Yellowstone Lake. In the lake, the infection has spread to about 20% of the cutthroat trout. *M. cerebralis* is present throughout the lake, but is most prevalent in the two known infected tributaries, Pelican Creek and the Yellowstone River downstream of the lake. Infection has been most severe in Pelican Creek, which once supported nearly 30,000 upstream-migrating cutthroat trout. Significant declines in Pelican Creek’s spawning population have been attributed to the combination of whirling disease and predation by non-native lake trout in Yellowstone Lake. The continued finding of adult fish in the lake with *M. cerebralis* spores that survived their initial infection suggests some resilience of Yellowstone cutthroat trout to whirling disease. Drought effects in recent years also confound our ability to quantify the impacts of *M. cerebralis*.

Discussion

Yellowstone National Park’s spawning streams, which vary widely in thermal, hydrological, and geological characteristics in an area without the confounding effects of land use, provide an exceptional opportunity to study whirling disease in native trout. Park staff have been working with Montana State University’s Department of Ecology to quantify the infection risk in Pelican Creek, measure the variation in infection rate among tubificids and habitat, and

examine the possible role of certain fish-eating birds (great blue herons, double-crested cormorants, and American white pelicans) as dispersal vectors for *M. cerebralis*. Infected fish may be eaten without apparent harm to the consumer, but the effect of avian digestion on the production of parasite spores remains unclear. However, research has shown that some birds, such as great blue herons, can pass *M. cerebralis* through their gastrointestinal tract without loss of viability of the disease.

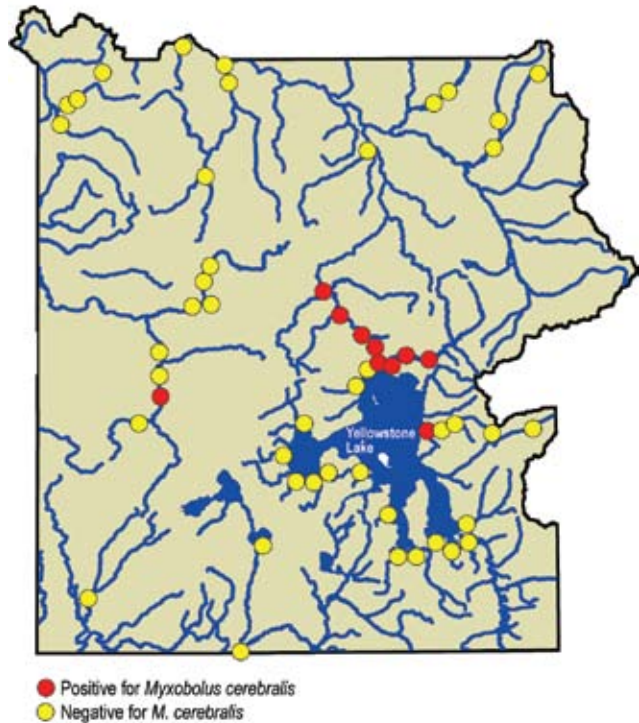


Figure 1. Stream sites in Yellowstone examined by the U.S. Fish and Wildlife Service Wild Fish Health Survey or by sentinel cutthroat trout fry exposures, 1995–2005.

