

The microscopic parasite *Myxobolus cerebralis* causes whirling disease in many species of salmon and trout and has spread to hundreds of river and stream reaches throughout the United States. Originating in Europe, the parasite made its way to North America in the 1950s. Initially it was not considered a threat to wild fish. Then in the mid-1990s, whirling disease was identified as the primary cause of major rainbow trout population declines in some of the Rocky Mountain region's finest river fisheries.

The effects of this parasite on susceptible trout are dramatic: darkening of the tail, skeletal deformities, frenzied tail chasing (thus the name "whirling" disease), and death. Whirling disease has become a major threat both to biological diversity and to the Nation's multi-billion-dollar fishing and tourism economy—and has generated great concern among anglers, scientists, and fisheries managers.



Photo courtesy of the Whirling Disease Foundation

### What can anglers do?

**DON'T** transport live fish, insects, live bait or plants from one body of water to another without proper authorization. This practice could spread disease or other exotic species.

**DON'T** dispose of fish heads, skeletons or entrails in any body of water. Fish parts should be disposed of in the garbage, by deep burying or by total burning.

**DO** contact your local fish and wildlife agency if you observe signs of whirling disease in fish or observe illegal stocking.

**DO** obtain certified disease-free fish for any private stocking projects.

**DO** clean all equipment such as boats, trailers, waders, boots, float tubes and fins of mud before leaving an area when fishing. **Thoroughly cleaning and drying equipment is the best course of action to deal with all aquatic exotics.**



Photo courtesy of Kiza Gates

### For more information

The Whirling Disease Initiative—  
<http://whirlingdisease.montana.edu/>

The Whirling Disease Foundation—  
<http://www.whirling-disease.org/>

Invasive Species—  
<http://www.invasivespecies.gov/>

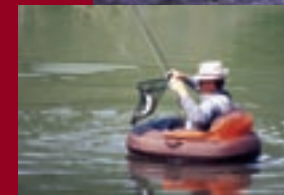
Stop Aquatic Hitchhikers—  
<http://www.protectyourwaters.net>

#### Whirling Disease Initiative

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# Whirling Disease: What You Need to Know





**How does whirling disease spread?**

*Myxobolus cerebralis*, the parasite that causes whirling disease, is primarily spread through the movement of infected fish, either naturally or by humans. Researchers suspect that anglers and birds can spread the parasite as well.

**Does whirling disease affect people?**

No, the disease only affects members of the trout and salmon family. The infective stage of the disease is not capable of penetrating human skin and tissues, and cannot survive at human body temperature. Whirling disease is totally harmless to humans—eating an infected fish has no harmful effects.

**Can fish be cured of whirling disease?**

No, at this time there is no known treatment or cure for fish infected with the whirling disease parasite. Whirling disease can be controlled in hatchery environments with careful management. Its effects on wild fish cannot be controlled.

**What are fishery managers and researchers doing?**

State agencies, fishery managers, and researchers have worked hard to investigate the problem, and develop management solutions. Successes include: the implementation of management practices to stop the spread, hatchery and pond cleanup to prevent new infections, and resistant trout research. Additionally, there is hope in managing the habitat and the worms that are the parasite's alternate host.



Photo courtesy of Leah Steinbach Elwell



Photo courtesy of Todd Koel, Yellowstone National Park

**Where is whirling disease in my state? Is it in the drainages I want to fish?**

The whirling disease parasite's range is expanding in the United States and the impacts vary from river to river. For more information, call your local fish and wildlife agency, or visit the web sites listed on this brochure.

**How long has whirling disease been around?**

Whirling disease was first introduced into the eastern United States in the late 1950s. The parasite is now widespread. In the 1990s, national attention was directed at the problem when whirling disease was linked to shocking declines in trout populations in the Intermountain West.

**Does whirling disease always destroy trout populations?**

Not always. Although the parasite is established in hundreds of waters, its presence doesn't always mean whirling disease will cause dramatic population losses.

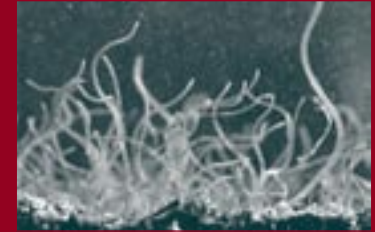


Duane Raver, USFWS

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- 1. *M. cerebralis* spores exist in sediment.
- 2. Tubifex worms ingest spores.



- 3. Infected worms produce *M. cerebralis* TAMs and release them into the water column.



- 4. TAMs enter through the skin of fish.
- 5. Parasite travels to the head and cartilage of fish.



- 6. After several weeks, fish exhibit signs of whirling disease.
- 7. Mature spores are released from fish and cycle begins again.



Photos courtesy of (top to bottom): the Whirling Disease Foundation; Maria Markiw, U.S. Geological Survey; Mansour ElMatbouli; and the U.S. Geological Survey