

PREVENTION METHODS FOR ANGLERS: Whirling Disease

What is Whirling Disease?

Myxobolus cerebralis (Mc) is a parasite that infiltrates the head and spinal cartilage of fingerling trout where it multiplies rapidly, causing the fish to swim erratically and, in severe cases, die. When an infected fish dies, millions of tiny indestructible Mc spores (each about the size of a red blood cell) are released to the water where they can survive in this "dormant" form for up to 30 years. When Mc spores are ingested by Tubifex worms, the spore changes inside the worm and is released from the worm in a highly infective form, the Triactinomyxon (Tam). Tams are free-floating in the water until they infect trout, causing spinal deformities and decreased abilities for feed. Whirling disease is most infective to rainbow and cutthroat trout, but can infect all salmonid species.



Sick fish



Mc spore



Tubifex worms



Tams

What does an infected fish look like?

Typical signs of whirling disease include a darkened tail, twisted spine and deformed head (shortened, twisted jaw). Young fish may also swim erratically (whirl). However, other diseases and even genetic conditions can cause these signs as well. If you see fish with these signs in an area where whirling disease has not been reported, you should contact your state fisheries agency.

How has whirling disease spread?

Stocking or natural movement of live, infected fish is the primary route by which whirling disease is disseminated. However, there are other ways that the parasite can be spread, including by birds and humans – particularly boaters and anglers

Is there anything anglers and boaters can do to help prevent further spread?

Anglers, boaters, and others can make a difference in reducing the chances of spreading whirling disease. Distribution of the parasite is expanding rapidly in some areas, so you should assume its presence if you don't know otherwise. Recommended precautions that will help prevent not only the spread of whirling disease, but also other disease-causing organisms and aquatic pests include:

1. **Never transport live fish from one water body to another.** (This is illegal in many states.)
2. **Do not use trout, whitefish, or salmon parts as cut bait.**
3. **Dispose of fish entrails and skeletal parts properly.** Never discard fish parts in or near streams or rivers. Because an infected fish may harbor tens of thousands of myxospores, simply disposing of infected fish parts in a clean drainage could provide enough spores to start an infection. Do not discard fish parts in a kitchen disposal. Whirling disease myxospores can survive most wastewater treatment systems. Instead, discard in dry waste that would go to a landfill.
4. **Rinse all mud and debris from equipment and wading gear, and drain water from boats** before leaving an infected drainage. This is good practice for preventing transfer of other aquatic hitchhikers as well.
5. Although the above precautions will remove most spores from your gear, you may want to **consider the following if fishing in heavily infected waters:**
 - Rinse, then thoroughly dry your boots, waders and other fishing equipment. This is generally sufficient to kill the TAM stage of the parasite.
 - Chlorine (regular household bleach) is a very effective disinfectant, and one of the few that can kill all stages of the parasite if used at the proper concentration. However, chlorine is a very strong chemical and can harm your equipment with prolonged exposure, so make sure you rinse the chlorine off your waders and other equipment after you disinfect, and dry in the shade.
 - To kill the TAM stage, use 1 part chlorine to 32 parts water. It must stay in contact for about 10 minutes to assure disinfection.
 - To kill the mature myxospore that may be found in the mud from an infected stream is much more difficult and hard on equipment.
 - 50% solution (1 part chlorine to 1 part water) - dip waders into a solution of the bleach or wipe or spray it on.
 - 10% solution (1 part chlorine to 9 parts water) and soak your equipment for 10 minutes.
 - Quaternary ammonium compounds are also effective in killing both parasite stages. These disinfectants are commercially available for disinfecting fishing equipment (Bright Water™) or for the pet/veterinary trade (Roccal-D™, Parvosol™).
 - Equally effective is water heated to nearly boiling (200°F) poured over your gear and allowed to cool.

What can state and federal agencies and outfitters do to help?

1. Provide clean water and a hose at boat ramps and popular fishing spots on heavily infected waters for rinsing equipment.
2. Provide some means for brushing boots, for example a simple boot scrubber like the one pictured here, near the hose.
3. Post maps of the known distribution of whirling disease at popular fishing sites so anglers know if they are either fishing in a heavily infected water or have come from one
4. Post instructions for preventing the spread of Mc and other aquatic nuisance species.

