

NJDEP Division of Fish and Wildlife

Questions and Answers Concerning Furunculosis



What is Furunculosis?

Furunculosis is a disease caused by the bacterium *Aeromonas salmonicida*, which primarily affects coldwater species of fish such as trout. It is a serious infectious disease found in trout and salmon throughout the world. The disease is most commonly found in hatcheries where hatchery-related stress factors provide a favorable environment for furunculosis to grow. The bacterium has also been discovered in wild fish, particularly in the Northeastern and Northwestern parts of the United States. Brown, brook, and lake trout as well as Atlantic salmon are particularly susceptible, though all trout species can be affected. The New Jersey Division of Fish and Wildlife screens for furunculosis during annual health inspections of its hatcheries.

What are the symptoms?

Signs of furunculosis vary depending upon the disease's rate of progression. There are two distinct forms, acute and chronic. The acute form of the disease is most common in growing fish and mature adults. The onset is sudden (2-3 days) that results in high mortality. External signs of disease are often absent and may be limited to a darkening of color on the fish. Chronic furunculosis is most common in older fish and results in lower mortality. In this form, affected fish are slow-moving and often exhibit boils protruding through the skin.

What occurred at the Pequest Trout Hatchery?

During the fall of 2013, an outbreak of chronic furunculosis occurred in brook and brown trout affecting two-year-old specimens and older. This is the first time furunculosis has been documented at the Pequest Trout Hatchery since the hatchery began fish production in 1982. To control the fall outbreak, freshwater fisheries biologists humanely euthanized approximately 21,000 of the affected brook and brown trout. Despite these efforts however, the bacterium had also spread to the trout in some of the other outdoor raceways. These fish were treated with an oral antibiotic that effectively fought the disease, but in early December, symptoms reappeared with mortality occurring in a small number of these fish. As a result, a second course of antibiotic treatment was applied and no symptoms have been observed in any of the fish since that time. Symptoms again appeared in March, 2014, and treatment was applied. Approximately 114,000 affected trout were euthanized.

How did the disease reach the outdoor raceways at Pequest?

The disease was likely transferred to the raceways by ospreys or great blue herons. Freshwater fisheries biologists feel that these predatory birds, feeding on infected fish in the wild may have spread the bacteria when they attempted to feed on the hatchery-raised trout. Discouraging predatory birds from feeding in the raceways has always been a concern at the hatchery and for that reason, an elaborate deterrent system, including air cannons, electrified fencing and cables strung over the pools has been utilized, but the success of these methods is never guaranteed.

How is furunculosis treated?

Furunculosis can be treated with antibiotics to eliminate disease outbreaks within the hatchery. Once treated, the trout are held for a 15-day period allowing the antibiotics to be fully absorbed and eliminated before the fish are stocked. Trout that have been treated for the disease may become carriers of the bacterium. Under stressed conditions it is possible for furunculosis to reemerge in these fish. It is important to note that carriers pose a significantly less risk to transferring the bacterium to other fish than those actively exhibiting symptoms.

Has New Jersey stocked trout affected by furunculosis in the past?

Historic records of trout culture operations at the Hackettstown Hatchery indicate outbreaks of furunculosis. When those outbreaks occurred, fish were treated with antibiotics and released. As a result of these historical stockings there were never any reports of furunculosis in wild trout in New Jersey.

Does furunculosis pose any public health risks?

The bacterium does not pose any health risks to humans. It is not advisable however, to eat any species of fish or wildlife that appears to be diseased. Signs of furunculosis include darkening of the skin of affected fish as well as large boils and lesions. If you encounter any fish with these characteristics, please contact the Division of Fish and Wildlife's Fish Pathologist Dr. Jan Lovy at (908) 637-4173 ext. 120.

Will stocking trout exposed to, or that have been treated for furunculosis pose a risk to other species of fish already inhabiting these waters?

Fish that have been exposed to the bacterium or fish that have been treated for the disease may still carry the bacterium at extremely low levels; levels that cannot be detected in laboratory tests. The only fish that will be stocked into select waters are ones that have undergone testing and prove negative for the bacterium and the disease. Based on the experiences of other states that stock treated fish and the historic Hackettstown stockings, the Division of Fish and Wildlife believes there is little risk that there will be an reoccurrence of this disease after the fish are released into the wild.. Furunculosis is widely believed to be a hatchery-related disease and not commonly seen in the wild. Although there is always a risk that asymptomatic carrier fish can shed small amounts of bacteria, efficient spread of the bacterium would likely require fish with active infections. Because *A. salmonicida* is a cold-water pathogen that will not survive in temperatures above 74°F, it cannot survive the warm summer temperatures in most stocking areas.

Traditionally, furunculosis was thought to be exclusive to trout and salmon, but in the last decade it has been found in fish species other than trout. Many fish species, including minnows, goldfish, carp, perch, chub, pike, bullheads, catfish and several others have been discovered with non-typical strains of *Aeromonas salmonicida*. In many cases the bacterium does not cause disease, although ulcerations and skin infections are possible. The Pequest Trout Hatchery was exposed to the typical strain of the bacterium.

What is the Division doing to prevent future furunculosis outbreaks at the Pequest Hatchery?

Strict biosecurity measures are employed to avoid the introduction of disease by not allowing fish from any outside source into the hatchery and by dedicating equipment for hatchery-use only. Currently, thorough disinfection measures are being taken to eradicate the bacterium from the facility. In addition, the hatchery will increase the production of rainbow trout for the next several years as this species is resistant to the disease. The small number of brook and brown trout remaining at the facility will be immediately vaccinated to increase protection from the disease. In the future, these will be replaced with more furunculosis-resistant strains of brook and brown trout.