



## Viral Hemorrhagic Septicemia (VHS) in New York

### What is VHS?

Viral hemorrhagic septicemia (VHS) virus is a serious pathogen of fresh and saltwater fish that is causing an emerging disease in the Great Lakes region of the United States and Canada. VHS virus is a rhabdovirus (rod shaped virus) that affects fish of all size and age ranges. It does not pose any threat to human health. VHS can cause hemorrhaging of fish tissue, including internal organs, and can cause the death of infected fish. Once a fish is infected with VHS, there is no known cure. Not all infected fish develop the disease, but they can carry and spread the disease to other fish. VHS has been blamed for fish kills in Lake Michigan, Lake Huron, Lake St. Clair (MI), Lake Erie, Lake Ontario, the St. Lawrence River, Skaneateles Lake, Seneca-Cayuga Canal, Conesus Lake, a private pond in Ronsomville and several inland lakes in Wisconsin and Michigan. The World Organization of Animal Health has categorized VHS as a transmissible disease with the potential for profound socio-economic consequences. Because of this, they list VHS as a disease that should be reported to the international community as an exceptional epidemiological (study of diseases in large populations) occurrence.

### What is the history of VHS?

VHS was first discovered in the mid 20th Century in Europe where it was originally a significant and costly disease of cultured rainbow trout. Since its initial discovery in Europe, four strains of the VHS virus have been identified, including both freshwater and marine strains. In 1988, VHS was reported in spawning salmon in the Pacific Northwest and was determined to be a new strain of the virus (Type IV) that appears to be a North American strain. It is widespread in the Pacific herring and Pacific cod populations in the Pacific Northwest and has also been found in Atlantic herring and Greenland halibut in the Atlantic Ocean.

In 2005, a very large die-off of freshwater drum in Lake Ontario and a muskellunge kill in Lake St. Clair were linked to VHS, representing the first documentation of the disease in freshwater in the western hemisphere. A subsequent test of an archived muskellunge collected from Lake St. Clair in 2003 tested positive for the virus, indicating that the virus was present, but undetected in the Great Lakes system for at least two years. The drum and muskellunge virus isolates were determined to be different than those from infected fish from other regions and were categorized as a unique strain of the virus (Type IVb).

In 2006, additional fish kills in Lake Huron, Lake Erie, Lake Ontario, the St. Lawrence River and Conesus Lake were linked to VHS. Species involved in fish kills linked to VHS included

muskellunge, smallmouth bass, northern pike, freshwater drum, lake whitefish, gizzard shad, yellow perch, black crappie, bluegill, rock bass, white bass, redhorse sucker, round goby, burbot and walleye. Other freshwater fish species that have tested positive for VHS are chinook salmon, bluntnose minnows and emerald shiners.

In 2007, VHS continued to spread throughout the Great Lakes region. Lake Michigan became the fourth Great Lake with VHS-positive fish. Fish kills from inland waters in New York (Skaneateles Lake, Seneca-Cayuga Canal, and private pond in Ransomville), Wisconsin (Lake Butte des Morts, Lake Winnebago), and Michigan (Budd Lake) were also found to be linked to VHS. In addition, the virus was detected in several new fish species including lake trout, rainbow trout, and common carp.

## What are the clinical signs of VHS?

The clinical signs of VHS may include tissue hemorrhaging (bleeding), unusual behavior, anemia, bulging eyes, bloated abdomens, and the rapid onset of death; however, these symptoms could apply to many different fish diseases. There is no clear visual diagnostic to confirm VHS.

Additionally, not all fish infected show any signs and may become carriers of the disease. The only way to confirm VHS is to test the fish in a lab.

## How is VHS spread?

VHS can be spread from one waterbody to the next through a variety of means, not all of which are known at this time. One known method of spreading VHS is moving fish from one waterbody to another. This can be done by importation, stocking, or the use of bait fish. Other potential sources of VHS spreading are natural fish movements, recreational boating/angling, bird assistance, ballast water discharge, and sampling activities.

## Where is VHS found in New York?

VHS has been found in the following waters in New York:

- Lake Ontario
- St. Lawrence River
- Lake Erie
- Conesus Lake
- Skaneateles Lake
- Seneca-Cayuga Canal
- Private Pond in Ransomville

## What can be done to prevent the spread of VHS?

To reduce the likelihood of spreading VHS in New York State, DEC encourages anglers and

boaters to abide by the following guidelines:

- Do not transport fish from one body of water to another! Note that this practice is illegal without a DEC fish stocking permit;
- Only release bait fish into the waterbody it was taken from. Bait purchased commercially should not be released into any body of water;
- Do not dispose of fish carcasses or by-products in any body of water.
- Remove all mud, aquatic plants and animals from all gear, boats, motors and trailers before leaving a body of water;
- Drain your live well, bilge and bait tanks before leaving the water you are fishing or boating on. Anglers or boaters using any waterbody known to be infected with the VHS virus should disinfect their live wells and bait wells with a 10 percent chlorine/water solution. Rinse well to remove all residual chlorine;
- Follow all [fish health regulations](#). Please note that due to the timing of this fish health emergency, the fish health emergency regulations were not in the printed 2006-2008 New York State Freshwater Fishing Regulations Guide; and
- Inform your friends about the [fish health regulations](#). It will take the cooperation of ALL anglers to help prevent the spread of VHS.

## USDA-APHIS Federal Order Prohibiting Importation of Certain Species of Live Fish

Due to the potential adverse effects of this disease to fish populations and the desire to prevent or delay its spread to other states, the Animal and Plant Health Inspection Service (APHIS) issued a Federal Order on October 24, 2006, that prohibits the importation of certain species of live fish from Ontario and Quebec and interstate movement of the same species from eight states bordering the Great Lakes, effective immediately. The states included are Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin.

Fish species included in the federal prohibition are: black crappie, bluegill, bluntnose minnow, brown bullhead, brown trout, burbot, channel catfish, chinook salmon, emerald shiner, freshwater drum, gizzard shad, lake whitefish, largemouth bass, muskellunge, northern pike, pumpkinseed, rainbow trout, rock bass, round goby, silver redhorse, smallmouth bass, trout perch, walleye, white bass, white perch, and yellow perch. Additional fish may be added to the order as they are confirmed to be carriers of this disease. Additional information on the Federal Order can be found on the APHIS website at [www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/aquaculture/](http://www.aphis.usda.gov/animal_health/animal_dis_spec/aquaculture/).

## What happens to the fish population in a body of water once VHS is present?

The impact of the Type IVb strain of the VHS virus on fish populations is uncertain. It has caused fish mortalities ranging from a few fish to thousands.

## What steps are the DEC taking in response to VHS?

The DEC filed [fish health regulations](#) on June 6, 2007, in response to VHS. These regulations were filed to halt the spread of VSH and other fish diseases into un-infected waters in New York.

Additionally, the DEC, in cooperation with the College of Veterinary Medicine at Cornell University, is sampling fish from a number of waters across the state, including all waters used as sources of brood stock for DEC hatchery activities, to help determine how far the disease has spread in New York.

## What to do if you find sick/dead fish

If you witness a large number of dead or dying fish (usually 100 or more), please contact the nearest DEC regional office and ask for the Bureau of Fisheries. Questions about VHS and potential DEC actions to prevent its spread can be e-mailed to [fwfish@gw.dec.state.ny.us](mailto:fwfish@gw.dec.state.ny.us) or by calling 518-402-8896. The public is also advised to regularly check the Department website for updated information on VHS in New York State.