



# Viral Hemorrhagic Septicemia (VHSv) Fact Sheet

## What is Viral Hemorrhagic Septicemia (VHSv)?

VHSv is a highly contagious viral disease of fresh and saltwater fish that has caused several large scale fish kills in the Great Lakes area. It is an international reportable disease that requires notification of and action by the United States Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS) and the International Organization for Animal Health (OIE).

The virus is most active in cold water, which is why most mortality events associated with the virus occur in the spring or fall. Mortality is the greatest at temperatures ranging from 38-54°F, and is rarely seen once temperatures reach 60°F. The virus can persist for a period of 5 days in water at 39°F, but becomes inactive after 24 hours in water at 68°F. Once the virus has entered a fish it requires approximately a 7 to 15 day incubation period, depending on water temperature, before clinical signs or a kill may occur.

VHSv is **NOT** a human pathogen. There are no concerns in respect to human health associated with this virus and it **CAN NOT** infect humans even if they eat fish with the virus. However, it is generally recommended as a precaution to thoroughly cook all fish.

## Where has VHSv been found?

VHSv has been confirmed present in the Great Lakes area since 2003. It is unclear exactly how and when the virus was initially introduced to the Great Lakes-St. Lawrence River system. Currently the following states within the United States are considered to be VHSv positive: Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin, additionally two provinces in Canada are also VHSv positive, Quebec and Ontario. As of this date Lake Superior is the only remaining Great Lake that has not experienced a fish kill due to VHSv. Currently the virus is still continuing to spread; in 2007 two inland lakes in Wisconsin and one inland lake in Michigan had reported kills due to virus.

## How is VHSv transmitted?

The virus can be transmitted by urine, feces, and reproductive fluids of infected fish. Not all fish infected with the virus will die or even exhibit symptoms of the disease. Fish that survive infection can be carriers of the virus throughout their lives and can continue to spread the disease through fish to fish contact. The virus likely enters the fish through the gills or through wounds; oral transmission is unlikely.

## How does VHSv affect fish?

VHSv can affect multiple fish species at any age. Fish with VHSv may or may not exhibit any external signs of infection. Internally, the liver, spleen, and intestines may be congested with hemorrhages. Additionally, hemorrhaging may be seen in the swim bladder. The cause of death with most VHSv infected fish is usually due to internal organ failure, especially the kidneys, or inability to osmoregulate (control and balance of chemical elements in the body versus the water).

As with many other fish diseases, stress is an important factor in VHSv outbreaks. Stress suppresses the fishes' immune system, leading to infected fish becoming diseased. Stress factors include, but are not limited to: spawning hormones, poor water quality, lack of adequate forage, or excessive handling of fish.

## What are the signs of VHSv?

(Not all fish will exhibit symptoms)

- Bulging eyes
- Pale gills
- Darkening overall color
- Distended (fluid-filled) abdomen
- Bleeding around the eyes, bases of the fins, sides and head
- Corkscrew swimming behaviour

## What species are susceptible to VHSV?

(\* denotes fish species found in Arkansas)

- ➔ Atlantic cod
- ➔ Black Crappie\*
- ➔ Bluegill\*
- ➔ Bluntnose Minnow\*
- ➔ Brown Bullhead\*
- ➔ Brown Trout\*
- ➔ Burbot
- ➔ Channel Catfish\*
- ➔ Chinook salmon
- ➔ Coho salmon
- ➔ Chum Salmon
- ➔ Emerald Shiner\*
- ➔ Freshwater Drum\*
- ➔ Gizzard Shad\*
- ➔ Grayling
- ➔ Haddock
- ➔ Herring
- ➔ Japanese flounder
- ➔ Largemouth bass\*
- ➔ Muskellunge\*
- ➔ Pacific cod
- ➔ Pike
- ➔ Pink salmon
- ➔ Pumpkinseed
- ➔ Rainbow Trout\*
- ➔ Redhorse sucker\*
- ➔ Rock bass\*
- ➔ Rockling
- ➔ Round goby
- ➔ Smallmouth bass\*
- ➔ Sprat
- ➔ Turbot
- ➔ Walleye\*
- ➔ White bass\*
- ➔ White perch
- ➔ Whitefish
- ➔ Yellow perch

## What is the Arkansas Game and Fish Commission (AGFC) doing to prevent the introduction of VHSV to Arkansas?

Currently, the Arkansas Game and Fish Commission have issued an emergency fish health importation regulation regarding live fish and eggs entering Arkansas from VHSV positive states. The regulation requires shippers from VHSV positive states to obtain a Fish Farm Health Inspection Permit from AGFC prior to shipping fish into Arkansas.

The AGFC is also a participating partner in the U. S. Fish and Wildlife Services National Wild Fish Health Surveys. This program performs diagnostic tests and documents the locations and spread of important fish pathogens.

## What can anglers and boaters do to help stop the spread of VHSV and other aquatic invasive species?

- ➔ Clean boats, trailers, and other equipment thoroughly between fishing trips to keep from transporting fish pathogens or other organisms from one water body to another (Cleaning with hot soapy water, a high pressure washer, or a light bleach solution (1 cup for 10 gallons of water) works well for disinfection purposes)
- ➔ Allow boats, trailers, and other equipment to fully dry for 4 to 6 hours, preferably in the sun
- ➔ DO NOT move live fish or fish parts from one body of water to another
- ➔ Limit use of wild caught bait to the water body where it was collected
- ➔ DO NOT release live bait into any water body
- ➔ Handle fish as gently as possible if you intend to release them, and release them as quickly as possible
- ➔ Refrain from hauling fish for long periods in a live well if you intend to release them
- ➔ Report unusual numbers of dead or dying fish to Arkansas Game and Fish Commission Fisheries Division as soon as possible
- ➔ Educate other anglers and boaters about prevention and spread of fish diseases and other organisms

The Arkansas Game and Fish Commission Emergency Fish Health Importation Regulation can be found at:

<http://www.agfc.com/>

Additional information about VHSV and USDA-APHIS federal orders in place can be found at:

<http://www.aphis.usda.gov/vs/aqua/>

Additional information about prevention and limiting spread of aquatic diseases and invasive organisms can be found at:

<http://www.protectyourwaters.net/>

Additional information about the USFWS National Wild Fish Health Surveys can be found at:

<http://www.fws.gov/wildfishsurvey/>