



Muskellunge is one of at least 18 fish species in the Great Lakes affected by VHS.

ILLUSTRATION: DAMSTRA

VIRAL HEMORRHAGIC SEPTICEMIA (VHS) IN THE GREAT LAKES

VHS is a viral disease affecting more than 40 species of marine and freshwater fish in North America. Typically a marine fish virus, most recently VHS has emerged in 18 species of fish in the Great Lakes region of the United States and Canada. The VHS isolate found in the Great Lakes Basin is most similar to the VHS isolate previously found in the Canadian Maritime Region in Eastern North America and has been labeled Type IVb.

VHS is **not** a human pathogen. According to the Michigan Department of Natural Resources (MDNR), there are no concerns with respect to VHS and human health, and the virus cannot infect humans if they eat fish with the pathogen. VHS is, however, an international reportable animal disease that requires notification of and action by the United States Department of Agriculture — Animal and Plant Health Inspection Service (USDA-APHIS), Canadian Food Inspection Agency (CFIA), and the International Organization for Animal Health (OIE).

Where has VHS been found?

In the Great Lakes region, VHS has been confirmed in fish collected from the St. Clair River, Lake St. Clair, Lake Erie, Niagara River, Lake Ontario (Bay of Quinte, Ontario and Rochester, NY areas), the St. Lawrence River, and most recently Lake Huron (near Cheboygan, Rogers City and Alpena).

It is not known how VHS virus was transferred to the Great Lakes or how long it has been in the ecosystem. It is likely to have mutated from a marine form and become newly pathogenic to some freshwater fish species. Ballast water discharge is considered a likely means of introduction, given the distribution of VHS in the lakes and its likely origin from the Atlantic coast.

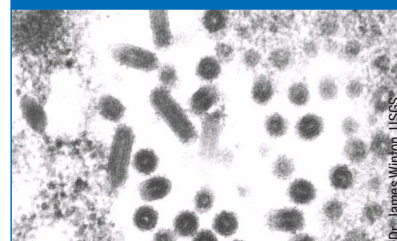
What fish species in the Great Lakes are affected by VHS?

VHS has been confirmed in at least 18 fish species in the Great Lakes, according to the MDNR.

VHS has caused large fish kills in freshwater drum (lakes Ontario and Erie), muskellunge (Lake St. Clair), round gobies (Lake Ontario), gizzard shad (St. Clair River), white bass (Lake Erie) and yellow perch (lakes Erie and Lake St. Clair). VHS has also been confirmed in smaller mortality events in lake whitefish (Lake Huron), walleye (Lake Huron), smallmouth bass (Lake St. Clair), black crappie (Lake St. Clair), and bluegill (Lake St. Clair).

According to the MDNR, a number of other species have been identified as carrying VHS although mortalities have not been seen in these species. These include: Chinook salmon (Lake Huron); rock bass (Lake St. Clair); silver redhorse (Lake St. Clair); northern pike (Lake St. Clair); shorthead redhorse (Lake St. Clair); burbot (Lake Ontario) silver redhorse (Lake St. Clair); spottail shiners (Lake St. Clair), and emerald shiners (Lake Erie and the Niagara River).

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How does VHS affect fish?

VHS Type IVb is most active in cold water (less than 15 degrees C), which is why mortalities are often seen in the spring. Fish exhibit hemorrhaging of the skin including large, red patches particularly on the sides and anterior portion of the head. However, the MDNR notes that infected fish will sometimes exhibit very minor external hemorrhaging or no external signs. Internally, organs are often congested with multiple hemorrhages in the liver, spleen, and intestines. The cause of death is usually internal organ failure, particularly the kidneys, or the inability to osmoregulate. Sick fish will often appear listless, swim in circles, or hang just below the surface, according to MDNR staff observations. Fish that survive infection can be carriers of the virus throughout their lives. VHS is transmitted by urine, feces, and reproductive fluids.

What is Michigan DNR doing about VHS?

Since VHS can cause large scale mortalities of valuable adult fish and it has a wide range of potential carriers, the MDNR stresses that it is critical to make every attempt to contain the pathogen and not allow a rapid spread of the disease to all Great Lakes and inland waters. Once a pathogen gets into a wild fish community, it is impossible to effectively eliminate, and control is unlikely. The MDNR is evaluating all potential human-caused means of spread and is taking appropriate steps to reduce this likelihood.

Michigan Sea Grant Initiatives

Sea Grant extension educators are working with aquaculture and baitfish industries in the Midwest to prevent the spread of VHS through AIS-HACCP. AIS-HACCP is a self-inspection system for reducing the risk of spreading aquatic invasive species through aquaculture, hatchery, scientific, natural resource, and baitfish harvesting activities. This adaptable system is based on HACCP (Hazard Analysis and Critical Control Point) methods required for the seafood industry and builds on Sea Grant's success in assisting industry compliance. AIS-HACCP offers an approach that could protect fisheries from the further spread of VHS while allowing these businesses to survive.

Sources:

Michigan Department of Natural Resources, news release, 2007. See: www.michigan.gov/dnr/0,1607,7-153-10371_10402-160980--,00.html

NOAA VHS Fact sheet: See: www.glerl.noaa.gov/res/Programs/ncrais/resources/VHSV-factsheet.pdf

USDA: Viral Hemorrhagic Septicemia in the Great Lakes, July 2006 Emerging Disease Notice.

See: www.aphis.usda.gov/vs/ceah/cei/taf/emergingdiseasenotice_files/vhsgreatlakes.htm

What can anglers and boaters do to help stop the spread of VHS?

Anglers and boaters can help prevent the spread of fish diseases and other aquatic invasive species by taking the following steps:

- Clean boats, trailers, and other equipment thoroughly between fishing trips to keep from transporting undesirable fish pathogens and organisms from one water body to another. Take special care to clean fishing equipment when fishing known locations of VHS. A light bleach solution is an excellent disinfectant for cleaning equipment (1 cup for 10 gallons of water).
- After cleaning, allow boats, trailers and other equipment to fully dry for four to six hours in the sun.
- Do not move fish or fish parts from one body of water to another.
- 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 live wells if you intend to release them.
- Report unusual numbers of dead or dying fish to Michigan Department of Natural Resources Fisheries Division offices.
- Educate other anglers about the measures they can take to prevent the spread of fish diseases and other aquatic nuisance species.