

THE NATIONAL WILD FISH HEALTH SURVEY:

SELECTED FINDINGS AND LIMITATIONS

All 9 USFWS Fish Health Centers
And our partners!

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What is the NWFHS?

USFWS sponsored program that examines free-ranging fish to better understand the national distribution of specific fish pathogens.



An associated database stores, compiles, and permits queries of information gathered during fish examinations.



Target Pathogens

Bacteria

- *Aeromonas salmonicida*
- *Yersinia ruckeri*
- *Renibacterium salmoninarum*
- *Edwardsiella ictaluri*

Parasites

- *Myxobolus cerebralis*
- *Ceratomyxa shasta*
- *Bothriocephalus acheilognathi*

Viruses

- Infectious Pancreatic Necrosis Virus
- Infectious Hematopoietic Necrosis Virus
- Viral Hemorrhagic Septicemia Virus
- Channel Catfish Virus
- *Oncorhynchus masou* Virus
- Largemouth Bass Virus
- Infectious Salmon Anemia Virus
- White Sturgeon Iridovirus
- White Sturgeon Herpes Virus
- Spring Viremia of Carp Virus

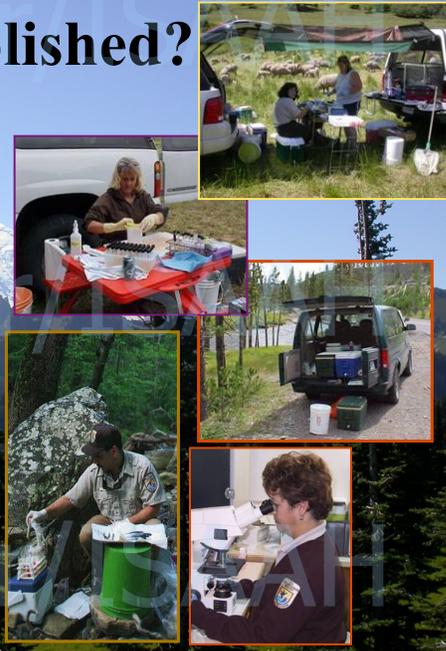
How Are Fish Collected?

- We obtain fish from Tribal, State, non-profit groups, public utilities, other federal agencies, and others
- Fish can be collected via traps, electrofishing, hook and line, netting (fyke, gill, seine) with appropriate permits



How is it Accomplished?

- Temporary field sampling stations
- Fish sent to labs by partners
- Samples sent to lab are tested according to standardized laboratory procedures.



Where are we?

- Since 1995 with the help of 77 partnering agencies/groups we have sampled:
 - >2500 Waterbodies
 - 262 Different Species
 - Approx. 220,000 Fish

As of September 2010



What have we found?

- Wild fish do harbor pathogens!
 - **Emerging Pathogens**
 - **“Exotic” Pathogens**
- Pathogens in areas we didn't expect
- Pathogens in species we didn't expect

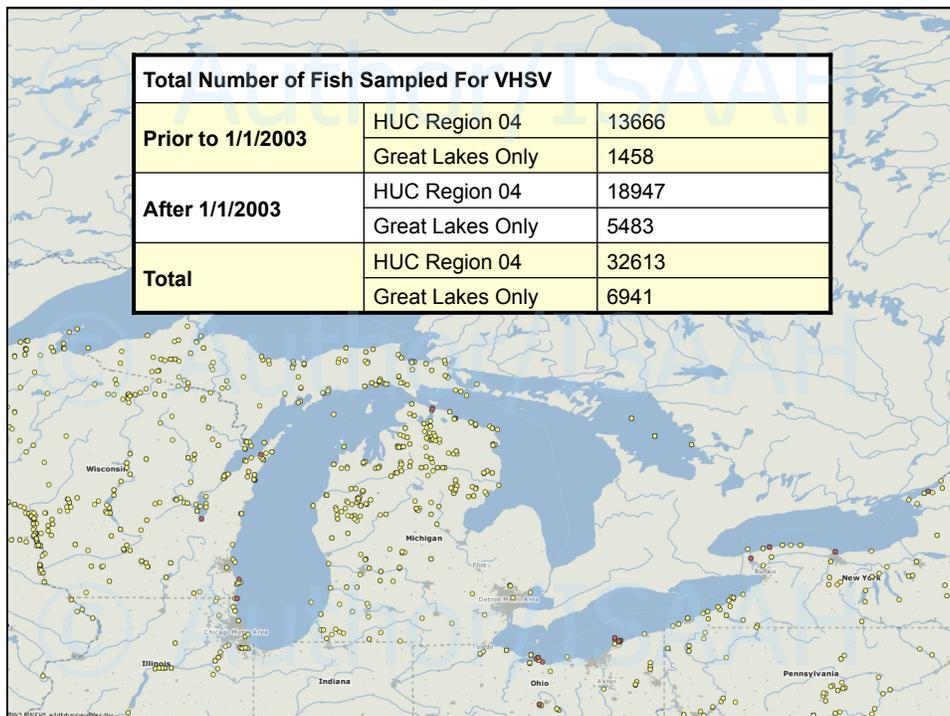
Emerging Diseases in Wild Fish- Viral Hemorrhagic Septicemia Virus (VHSV)

- Can cause significant mortalities in a wide variety of fish species (28 susceptible species listed by APHIS)
 - **49% decrease in adult musky in St. Lawrence River**
Casselman et al. 138th Annual Meeting AFS 2008)
 - **In Lake Ontario an estimated 20-30,000 Freshwater drum (*Aplodinotus grunniens*) died in a 35-40 day period (90 metric tons)**
Lumsden et al. DAO Vol. 76: 99-111, 2007

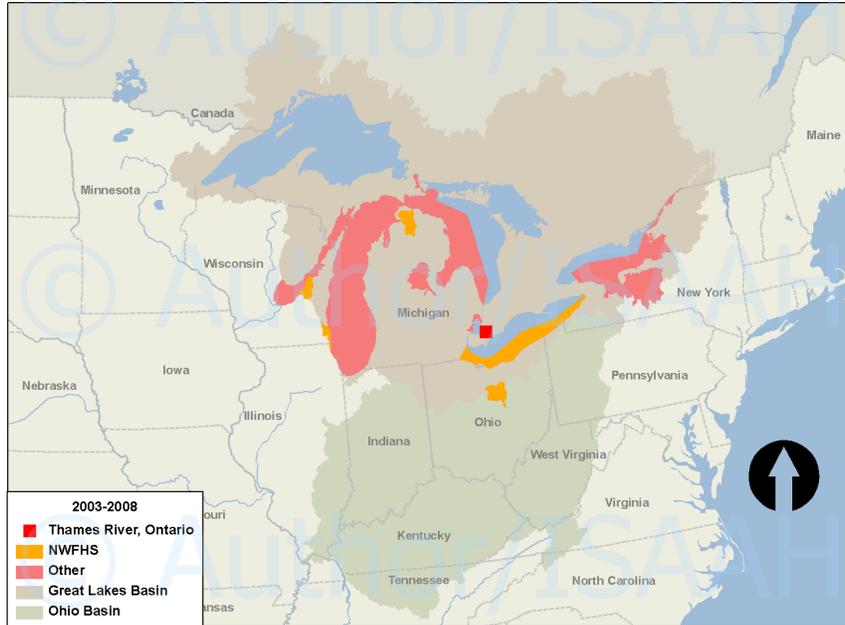


VHSV Partnerships

- OH Division of Wildlife,
Columbia (MO) FWCO, APHIS
- First detection VHSV in Lake Erie
- First detections of VHSV in
emerald shiners (*Notropis atherinoides*)
trout-perch (*Percopsis omiscomaycus*)
walleye (*Sander vitreus*)
white bass (*Morone chrysops*)
sea lamprey (*Petromyzon marinus*)



Detections of Viral Hemorrhagic Septicemia Virus-IVb



“Exotic” Pathogens

4 Detections
MN, IL, 2 in OH

Along with our State partners, APHIS and others, we are monitoring for Spring Viremia of Carp Virus

NWFHS Findings: Pathogens in Areas we didn't Expect



First isolation of VHSV
outside the Great
Lakes Basin (Clear Fork
Reservoir, Ohio River drainage)

- Infectious Pancreatic Necrosis Virus in Rainbow trout from two sites in North Carolina and brook trout from one site in New Mexico
- *M. cerebralis* found in Yellowstone National Park
- *M. cerebralis* found in 5 watersheds in the Colville National Forest, WA

NWFHS Findings: Pathogens We Didn't Expect in this Species



- Spring Viremia of Carp Virus was isolated from Bluegill and Large Mouth Bass
- Largemouth Bass Virus was isolated from smallmouth, spotted, rock and Suwannee bass, blue gill, redear and redbreast sunfish, white perch, freshwater drum, black crappie, and muskellunge
- Infectious Pancreatic Necrosis Virus was isolated from a blacknosed dace

NWFHS Findings: Pathogens We Didn't Expect in this Species

- *R. salmoninarum* in Alabama hogsucker, white crappie, channel catfish, blugegill, gizzard shad, Utah chub, dace spp, and shiners spp.
- Redside dace and torrent suckers were positive for *R. salmoninarum* where cohabitating brook trout were also tested and *R. salmoninarum* was not detected.
- *Vibrio vulnificus* was found in Pacific lamprey ammocoetes from Eagle Creek and Clackamas River, OR.



Limitations of the NWFHS (We're working to improve...)

- Sampling locations are often opportunistic, dependent on partners and funding
- Fish collection methods vary dramatically
- Sampling may have only occurred once at one location, and many times at other locations
- Numbers of fish collected vary per location



Collecting “Diseased” Wild Fish can be Difficult



Future directions

- With the help of partners, strategically set up index sites:
 - **Sample multiple times/year**
 - **Over many years**
 - **Using more than one fish collection method**
- Continued improvement of our database and web interface





Conclusions

- We have learned:
 - **Wild fish do harbor pathogens!**
 - **Pathogens in areas we didn't expect**
 - **Pathogens in species we didn't expect**
 - **We have much more to learn!**