



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE



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### **2015 Annual Report to the Great Lakes Fish Health Committee from Fish and Wildlife Service Northeast Region; Region 5**

**January 15, 2016**

A fish health inspection was conducted at the Allegheny NFH in Warren, Pennsylvania on August 18, 2015. This inspection, including the testing of ovarian fluids at spawning (October 2015) marks the fourth consecutive annual fish health inspection without the isolation of a listed pathogen, thereby obtaining the hatchery classification of A-1. Warmer than historical water temperatures (well water supply) during the last two years is suspected of causing low egg viabilities. Additionally, a presently unexplained mortality event began in late 2015. Clinical signs include gill damage, exophthalmia, and apparent anemia. Tests for all known pathogens, including EEDv and Nucleospora have been negative. Investigations into toxins in the water and feed deficiencies have yielded no possible answers. USGS – Leetown Science Center is running Next Gen Sequencing to try and find a possible pathogen. USGS- Western Fisheries Research Center in Seattle is processing samples for electron microscopy. Results of these latest investigations have not yet been received.

Both Berkshire NFH (MA) and Dwight D Eisenhower NFH (VT) are inspected in compliance with the Great Lakes Fish Disease Control Policy and Model Program, as they have taken up supplemental roles of the USFWS Region 5 Lake Trout program. Having transferred the Seneca strain future brood to Allegheny NFH, Berkshire now rears Klondike strain Lake Trout brood and future brood. The fish health inspection of all lots at Berkshire (Brook Trout and Lake Trout) took place on April 1, 2015 and as indicated by the A-2 classification, all results were negative for listed pathogens.

The Dwight D. Eisenhower (formerly Pittsford) NFH also continues to contribute to the Great Lakes program and possesses a long history of disease free status. The annual fish health inspection, including the Lake Trout fingerlings and yearlings occurred on March 31, 2015 and all lots (LAT, BKT, and LAS) were also negative for listed pathogens, giving the station the A (Great Lakes A-1) classification.

The U.S. Fish and Wildlife Service continues to perform pathogen surveillance on free ranging fish as part of the National Wild Fish Health Survey. In 2015, the Lamar Fish Health Center has performed many investigations on free ranging fish throughout the Northeast for listed fish pathogens, including largemouth bass virus, spring viremia of carp virus, infectious salmon anemia virus, and most applicable to the Great Lakes Basin, viral hemorrhagic septicemia virus (VHS). Screening for Great Lakes emerging fish pathogens (i.e. *Nucleospora* and EEDv) is also conducted where applicable, under the Great Lakes Restoration Initiative (GLRI) and the USFWS National Wild Fish Health Survey.

The Great Lakes watershed proper for Region 5 consists of a small area in extreme northwest Pennsylvania and the northern border of New York. Since most of Pennsylvania's (and a great deal of New York's) waters do not flow into the basin, surveillance efforts have been directed to attempt to demonstrate VHS-free "zones", as well as track the movement of this pathogen in the Great Lakes.

In 2014, 36 sites were sampled. Over 2,200 fish, from over 30 species were tested via the National Wild Fish Health Survey in New York and Pennsylvania. The Lamar Fish Health Center did not isolate VHS virus from fish collected in the Lower Great Lakes Basin in 2013. Likewise, *Nucleospora salmonis* was not identified from any tests this past year. Lake Trout herpesvirus, (salmonid herpesvirus 3) also known as epizootic epitheliotropic disease virus or EEDv, was found by molecular techniques (PCR) from Lake Trout populations in Lake Erie (PA) and Seneca Lake (NY). Additional lake trout testing outside of the Great Lakes drainage found EED (salmonid herpesvirus -3) from lakes in New Hampshire and in Vermont. A newly identified and similar virus, salmonid herpesvirus 5, was found by molecular techniques in that same Lake Erie and Seneca Lake populations as well as other Lake Trout populations in Lake Erie and Lake Ontario. These findings indicate the need for further, continued surveillance, which is planned to continue in 2016.

Although coolwater fish have been added to the Model Program, no USFWS facility participating in the Great Lakes program in the Northeast, cultures these species. The Lamar Fish Health Center has been assisting the Pennsylvania Fish and Boat Commission with viral testing on wild warm and cool water broodstocks and their hatchery offspring. Additionally, cold, cool, and warm water fish continue to be tested in the National Wild Fish Health survey. Largemouth bass virus was isolated in 2015 from smallmouth outside of the Great Lakes drainage.

The Lamar Fish Health Center continues to participate in the US Fish and Wildlife Service Fish Health Center Ring Test Program, and in 2015 coordinated the testing of samples for *Renibacterium salmoninarum*.

## 2015 HATCHERY CLASSIFICATION REPORT

Report Period Jan. 1, 2015– Dec 31, 2015 Report Date: Jan 15, 2016

Hatchery Name Location Pathogen Acronym

Allegheny NFH Warren, PA A-1 08/18/2015

D.D. Eisenhower NFH Bethal, VT A-1 03/31/2015 U-V treated

Berkshire NFH Great Barrington, MA A-2 04/01/2015

Report Prepared by: John A. Coll

Title: Project Leader, Lamar Fish Health Center

Phone Number: 570-726-6611 x 221

### EMERGENCY FISH DISEASES

Disease	Disease Pathogen	Disease Acronym	Pathogen Acronym
viral hemorrhagic septicemia	virus	VHS	VE
infectious hematopoietic necrosis	virus	IHN	VH
ceratomyxosis	<i>Ceratomyxa shasta</i> protozoan	CS	SC*
proliferative kidney disease	sporozoan	PKD	SP*

### RESTRICTED FISH DISEASES

whirling disease	<i>Myxobolus cerebralis</i> protozoan	WD	SW
infectious pancreatic necrosis	virus	IPN	VP
bacterial kidney disease	<i>Renibacterium salmoninarum</i> bacteria	BKD	BK
furunculosis	<i>Aeromonas salmonicida</i> bacterium	BF	BF
enteric redmouth	<i>Yersinia ruckeri</i> bacterium	ERM	BR
epizootic epitheliotropic disease	virus	EED	VL**

\* Inspectors within the Great Lakes basin do not need to include these pathogens unless importations of fish from enzootic areas are known to have been made.

\*\* Field diagnostic test not available.

**SALMONID IMPORTATION REPORT**

Agency U.S. Fish and Wildlife Service Region5, Lamar, PA

Reporting Period 01/01/13 – 12/31/13

I. A. Known importations since last report.

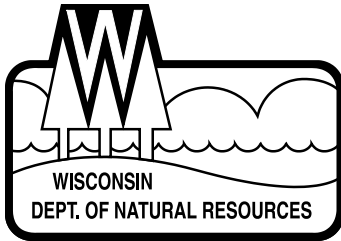
	<u>Source</u>	<u>Species/Number</u>	<u>Fish/Eggs Size</u>	<u>Fish Health Status</u>	<u>Certification Date</u>	<u>Certifying Official</u>	<u>Lake Basin</u>	<u>Imported to:</u>
1.	Eisenhower NFH N. Chittendon, VT	Lake trout - Champlain/Seneca 115,601	yearling	A-1	03/18/2014 (03/31/2015)	Barbash/Coll	Ontario	Stony Point, NY Oak Orchard, NY Lake Ontario
2.	Eisenhower NFH N. Chittendon, VT	Lake trout - Champlain/Seneca 121,965	fingerling	A-1	03/18/2014 (03/31/2015)	Barbash/Coll	Ontario	Oak Orchard, NY Lake Ontario
3.								

B. Proposed importations:

	<u>Source</u>	<u>Species/Number</u>	<u>Fish/Eggs Size</u>	<u>Fish Health Status</u>	<u>Certification Date</u>	<u>Certifying Official</u>	<u>Lake Basin</u>	<u>Imported to:</u>
1	Eisenhower NFH N. Chittendon, VT	Lake trout - Champlain/Seneca 120,000	yearling	A-1	03/31/2015	Barbash/Coll	Ontario	Oak Orchard, NY Lake Ontario

II. Lab Findings

III. Other



## State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott Walker, Governor  
Cathy Stepp, Secretary

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4 January 2016

Annual Report to the GLFHC for the year 2015

### **Hatchery inspection program**

The WDNR fish health program inspects all lots of fish cultured in the state hatchery system, assesses all broodstock populations, both captive and wild-sourced, and investigates morbidity and mortality events. In 2015, we conducted 28 hatchery inspections, 6 co-op pond inspections, 9 captive broodstock assessments, and 20 disease investigations. Three of our hatcheries are surface water fed (from 4 lake locations). On an annual basis, VHS susceptible species are collected (150 fish/lake) from these lake sources and a full viral disease screening is performed. No certifiable pathogens were detected at any of the hatcheries.

The *Aeromonas salmonicida salmonicida* vaccine (Kennebec River Biosciences, Maine, USA) was administered to brown trout (Seeforellen and domestic Wild Rose strains) and coho before and after transfer to our two open water supply hatcheries (Brule River and Thunder River hatcheries).

### **Fathead minnow (forage fish)**

Virology testing of forage fish purchased from vendors for our muskellunge and walleye stocking programs has continued. Fathead minnow nidovirus, golden shiner virus, and fathead minnow picornavirus were detected this year. There has been no morbidity or mortality in the muskellunge or walleye associated with these viruses. However, there was a small die-off in walleye and muskellunge as a result of an *Argulus* infection, which was most likely introduced in a shipment of minnows.

### **Wild/Feral Broodstock**

This year we conducted 12 broodstock inspections. In addition, we performed virology testing on ovarian fluids collected from broodstock at 27 locations (inland lake trout, coolwater species, and white sucker forage). EEDv was detected in 11 lake trout kidney samples collected from the Apostle Islands in Lake Superior. *Renibacterium salmoninarum* was detected in kidney bacterial cultures from three coho collected from the Besadny Anadromous Fisheries Facility (BAFF). Iodophor-disinfected eggs from these fish were transferred to the Wild Rose Great Lakes State Fish Hatchery. *Aeromonas salmonicida salmonicida* was detected in kidney bacterial cultures from 6 coho at the Root River Steelhead Facility, 5 chinook at the Strawberry Creek Spawning Facility, and 5 Seeforellen brown trout at BAFF.

## **Hatchery diagnostic cases**

*Flavobacterium columnare*: In 2015, columnaris disease appeared in our hatchery, co-op facilities, and a net pen. Oxytetracycline dihydrate (Terramycin 200) medicated feed treatment was required for systemic infections in lake sturgeon fingerlings (Milwaukee Streamside Rearing Facility) and brown trout (Timber Coulee strain) fingerlings (Purdy co-op pond), and two bath treatments of Oxytetracycline HCl (Pennox 343) were required to treat walleye fry (Lake Mills State Hatchery). Hydrogen peroxide (35% Perox-Aid) was an effective treatment for external columnaris in sturgeon fingerling at Kewaunee Streamside Rearing Facility. Chinook fingerlings were released from a net pen in the Kewaunee River to prevent increasing mortality during a columnaris outbreak, and immediate release parameters were updated in the net pen protocol.

Other hatchery diagnostic cases included: 1) possible *Hexamita* infection in steelhead (Ganaraska strain) fry that was successfully treated with Epsom salt coated feed (Kettle Moraine Springs State Hatchery), 2) spontaneous intervertebral disc rupture with spinal cord compression in brook trout (domestic St. Croix strain), for which the primary etiology is still under investigation, but possibly *Flavobacterium psychrophilium* infection, genetics, nutrition, and/or environmental factors play a role (St. Croix Falls State Hatchery), 3) acute cardiac insufficiency with chronic dilated cardiomyopathy in brown trout (domestic St. Croix strain), for which the primary etiology is still under investigation, but possibly genetics and/or environmental factors play a role (St. Croix Falls State Hatchery), and 4) kidney samples from lake trout and splake fingerlings at Les Voigt State Hatchery were negative for EEDv during surveillance for this pathogen.

## **Fish die-off/disease investigations**

22 cases of morbidity and mortality were investigated this year. Bacterial infection due to motile *Aeromonas* septicemia and *Flavobacterium columnare* were the most frequently detected bacteria and likely cause of die-offs. *Heterosporis* was detected in yellow perch from Long Lake, Three Lakes Chain, WI, thereby extending the range of known occurrence. Black Crappie Sarcoma-like lesions were detected in fish from 6 additional locations, and has thus now been confirmed in 5 counties. The etiology is still under investigation, but viral particles have been observed in affected tissue. A novel virus was detected during a die-off investigation of adult largemouth bass (Pine Lake, Forest County, WI). Identification studies using next-generation sequencing are ongoing.

*Salmincola californiensis*, a gill lice species that was not previously known to occur in WI, caused a fish mortality event in rainbow trout in a private pond. During a follow-up investigation, this parasite was also found in nearby surface waters. The gill louse appears to have been introduced in rainbow trout imported from California to a private hatchery, and has likely been transported by private commerce around WI.

During several fishing tournaments in Lake Michigan in July, steelhead were observed to be in extremely poor body condition. Necropsy of three of these fish revealed a complete lack of fat stores, inflamed intestinal mucosa, and no ingesta within the GI tract.

## HATCHERY CLASSIFICATION REPORT Wisconsin

**Report Period:** January 1 to December 31 2015      **Report Date:** January 4, 2016

Hatchery Name	Location	Pathogen Acronym
Art Oehmcke	Woodruff	A-1
Les Voigt (formerly Bayfield)	Bayfield	B-(VL)
Brule	Brule	A-2
Gov Thompson	Spooner	A-1
Kettle Moraine Springs	Adell	A-
Lake Mills	Lake Mills	A-2 (Bluegill virus in water supply)
Lakewood	Lakewood	Not in operation in 2014
Langlade	White Lake	Not in operation 2014
Nevin	Fitchburg	A-1 (CTV isolated 11/2012)
Osceola	Osceola	A-1
St. Croix Falls	St.Croix Falls	A-1 (CTV isolated 12/2015)
Thunder River	Crivitz	A-2
Wild Rose Great Lakes	Wild Rose	B-(BK)
Wild Rose Inland	Wild Rose	A-1

**Report Prepared by:**     Megan Finley      
**Title:**     Fish Health Veterinarian      
**Phone Number:**     608.266.2871    

### EMERGENCY FISH DISEASES

Disease	Disease Pathogen	Disease Acronym	Pathogen Acronym
viral hemorrhagic septicemia	virus	VHS	VE
infectious hematopoietic necrosis	virus	IHN	VH
ceratomyxosis	<i>Ceratomyxa shasta</i>	CS	SC*
proliferative kidney disease	sporozoan	PKD	SP*

### RESTRICTED FISH DISEASES

whirling disease	<i>Myxobolus cerebralis</i>	WD	SW
infectious pancreatic necrosis	virus	IPN	VP
bacterial kidney disease	<i>Renibacterium salmoninarum</i>	BKD	BK
furunculosis	<i>Aeromonas salmonicida</i>	BF	BF
enteric redmouth	<i>Yersinia ruckeri</i>	ERM	BR
epizootic epitheliotropic disease	virus	EED	VL**

\* Inspectors within the Great Lakes basin do not need to include these pathogens unless importations of fish from enzootic areas are known to have been made.

\*\* based on UC-Davis EEDv PCR assay

## HATCHERY CLASSIFICATION REPORT Wisconsin Wild Broodfish

**Report Period:** January 1 to December 31 2014      **Report Date:** January 4, 2015

Hatchery Name	Location	Pathogen Acronym
Besadny Fisheries Facility	Kewaunee	B-BF, BK
Root River	Racine	B-BF (VE detected in coho 11/2014)
Strawberry Creek	Sturgeon Bay	B-BF
Lake Superior	Apostle Islands	B-VL

<sup>1</sup>Negative by culture, low prevalence by ELISA

**Report Prepared by:** Megan Finley  
**Title:** Fish Health Veterinarian  
**Phone Number:** 608.266.2871

### EMERGENCY FISH DISEASES

Disease	Disease Pathogen	Disease Acronym	Pathogen Acronym
viral hemorrhagic septicemia	virus	VHS	VE
infectious hematopoietic necrosis	virus	IHN	VH
ceratomyxosis	<i>Ceratomyxa shasta</i>	CS	SC*
proliferative kidney disease	sporozoan	PKD	SP*

### RESTRICTED FISH DISEASES

whirling disease	<i>Myxobolus cerebralis</i>	WD	SW
infectious pancreatic necrosis	virus	IPN	VP
bacterial kidney disease	<i>Renibacterium salmoninarum</i>	BKD	BK
furunculosis	<i>Aeromonas salmonicida</i>	BF	BF
enteric redmouth	<i>Yersinia ruckeri</i>	ERM	BR
epizootic epitheliotropic disease	virus	EED	VL**

\* Inspectors within the Great Lakes basin do not need to include these pathogens unless importations of fish from enzootic areas are known to have been made.

\*\* based on UC-Davis EEDv PCR assay



# SALMONID IMPORTATION REPORT

## WISCONSIN

**Agency:** WI Department of Natural Resources

**Reporting Period:** January 1 to December 31 2015

**I A.. Known importations since last report.**

	<u>Source</u>	<u>Species/Number</u>	<u>Fish/Egg Size</u>	<u>Fish Health_ Status</u>	<u>Certification Date</u>	<u>Certifying Official</u>	<u>Lake Basin</u>
1.	Erwin NFH	Arlee RBT	eggs	Class A	6-12-2015	Norm Heil	Michigan
2.	Sullivan Creek NFH	Seneca Lake LAT	eggs	Class A	10-23-2015	Ryan Katona	Superior
3.	Wolf Lake SFH	GL Spotted MUE	fingerlings	Class A	8-3-2015	Tom Loch	Michigan
4.							
5.							

**B. Proposed importations for 2016**

	<u>Source</u>	<u>Species/Number</u>	<u>Fish/Egg Size</u>	<u>Fish Health_ Status</u>	<u>Certification Date</u>	<u>Certifying Official</u>	<u>Lake Basin</u>
1.	Erwin NFH	Arlee RBT	eggs				Michigan
2.	Sullivan Creek NFH	Seneca Lake LAT	eggs				Superior
3.	Wolf Lake SFH	GL Spotted MUE	fingerlings				Michigan
4.							

# NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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## NYSDEC Agency Report to the Great Lakes Fish Health Committee for 2015

January 13, 2016

### Statewide Fish Health

Two separate pathogen surveillance programs are conducted annually in New York. The first is an ongoing statewide survey to identify waters where regulated pathogens may be present in fish populations. Cornell University Aquatic Animal Health Program, in Ithaca, NY performs the second survey through a program to investigate diseases in wild fish.

*Wild Fish Pathogen Surveillance Program:* For the statewide survey, a wide range of fish species were collected from 30 locations (1,991 fish) and clinical testing was performed at the USFWS Fish Health Center in Lamar, PA. Pathogens of interest isolated from fish in New York waters in 2015 included Namaycush Herpes Virus (NaHV), Epizootic Epitheliotropic Disease Virus (EEDV), Largemouth Bass Virus (LMBV), and *Myxobolus articus*. NaHV was isolated from Lake Ontario Lake Trout in sampling events in April (5 out of 27) and September (5 out of 40). EEDV was isolated from Lake Trout in Seneca Lake where it had been isolated previously. LMBV was isolated from Smallmouth Bass in the Susquehanna River and Rushford Lake and from Largemouth Bass in Chautauqua Lake. *Myxobolus articus* was isolated from Brook Trout in Bay Pond (County) and again in the Connetquot River. *M. articus* is not considered a risk at this time. Bay Pond will soon be stocked with heritage strain Brook Trout for use in future egg propagation projects.

*Wild Fish Disease Investigations:* Cornell conducted 20 fish disease investigations in 2015. Viral Hemorrhagic Septicemia was isolated from Round Gobies (8 of 66) in the St. Lawrence River near Clayton New York in June as part of a routine monitoring program. Last year (2014), VHS was detected from Lake Erie Gizzard Shad in Dunkirk Harbor, so VHS continues to be routinely isolated from New York waters.

In the largest investigation of the year, a massive Atlantic Menhaden kill was reported in May from many locations on the eastern U.S. coast from New Jersey to Maine. In New York, kills were evident all around Long Island and far up the Hudson River. Fish were collected from Upper Nyack on the Hudson, the mouth of Peconic Bay on the far eastern end of Long Island, and Port Washington on the western end of Long Island Sound. An unidentified virus was isolated from all fish tested and identification is still pending. Hypoxia due to oxygen depletion contributed to the kill in both Long Island locations.

Other cases included sturgeon injury by boat propellers at two locations on the Hudson River. Several springtime cases of common spawning-related Saprolegnia were investigated in Round Gobies and various centrarchid species at many locations.

Thiamine deficiency was problematic in Steelhead migrating up the Salmon River near Pulaski in 2014, as guides and anglers reported seeing hundreds of dead fish from November through January. But 2015 was very different as only a few lethargic fish were reported. The FDCU, Lake Ontario Unit, Region 7 fisheries and the Salmon River SFH staff, along with Federal, Provincial and academic researchers continue to monitor and investigate the situation.

## **Hatchery Fish Health and INAD Projects**

The overall health of fish in our hatchery system has been good for several years. Many diseases routinely encountered in previous years, such as prominent Saprolegnia in our trout brood stock, Gyrodactylus infestations in our Brook Trout, and the furunculosis epizootic at Rome in 2012 have been mostly resolved. Also, our hatchery system has been free of program viruses, such as IPN, for decades. We do have recurring common bacterial disease issues that are addressed routinely.

*Progress of Furunculosis Abatement at Rome SFH-* In the summer of 2012, a serious epizootic of furunculosis occurred at the Rome hatchery and was linked to the importation of very susceptible Brown Trout lot from Virginia. By September, an abatement plan was developed that included (1) destroying 800,000 still infected fish, (2) bi-annual inspections of all lots at 2% prevalence interval for two years, and (3) only Rome strain trout could be cultured on site. Rome strain Brook and Brown Trout on site during the event were spared because they were largely unharmed during the epizootic. *Aeromonas salmonicida* was not detected in 2013 or 2014 inspections, so the hatchery classification was upgraded to 'A' in September. However, during spawning activities at Rome Field Station in November, clinical furunculosis was evident in a few dozen adult Rome Strain Brown Trout. In 2015, clinical furunculosis reappeared in about a dozen spawning Brown Trout, but losses were minimal and subsequent testing of all production lots at Rome Hatchery and other Rome Lab lots were negative. Rome Hatchery continues to be classified 'As', but there has been no sign of the pathogen other than the spawning activities taking place at Rome Lab in the late fall. Because the hatchery and lab are on a shared property with no biosecure boundary between them, the downgrade is necessary. It appears that the metabolic demands of spawning over the last few years have allowed latent furunculosis to become lytic. This phenomenon was not seen in our brood stock prior to the 2012 furunculosis epizootic and may be related to the introduction of the Virginia strain of *A. salmonicida*.

*Flavobacterial Diseases:* In 2015, the usual epizootics of bacterial gill disease, bacterial cold water disease, and columnaris disease appeared throughout our hatchery system along with other undescribed, yet very similar Flavobacteria. These comprise the majority of our clinical hatchery work. In our quest to reduce Terramycin use in 2014, we did have success using Perox-Aid and Chloramine T in combatting columnaris

disease and bacterial coldwater disease on several occasions. This approach was continued in 2015 with success. We found the key was early detection and early drug administration.

*INAD Work-* INAD projects included Chloramine T (INAD 9321) and Aqui-S (11-741) this year and we plan to include Oxytetracycline in our 2016 work. With the Chloramine T approval being limited to certain fish species and diseases, we collaborated with the AADAP group to study Chloramine T efficacy against *F. columnare* in Tiger Muskellunge at our South Otselic Fish Hatchery. In 2014, we conducted a study whereby naturally infected fish were treated with Chloramine T (20 mg/L). A control group was untreated. After 17 days, the treated group had a cumulative mortality of 12.6% versus 81.8% for the control group. The study report was submitted to the FDA for review and the results accepted in 2015 as part of a mission to eventually expand the drug label to include 'all fish'. In 2015, we intended to conduct trials to evaluate OTC-343 efficacy at South Otselic against *F. columnare*, but the bacterial strain was resistant to the drug so the trial was aborted.

### **Hatchery Inspection Program**

The DEC's Fish Disease Control Unit (FDCU) annually inspects all lots of fish in DEC culture programs, both domestic and from wild sources. In 2015, our inspections included domestic trout cultured in our hatcheries, plus various species of wild fish used in egg collections intended for hatchery propagation. In all, we conducted 55 inspections totaling 4,209 fish. *Aeromonas salmonicida* was isolated from adult Coho Salmon (1/60) during egg collections at the Salmon River, but not Chinook. In 2014, an atypical variant of *Yersinia ruckeri* was isolated from wild Brook Trout from Big and Little Hill Ponds in the Adirondacks, but was not detected from the same population in 2015. These fish are used as gamete sources for our heritage Brook Trout program and the fish are never removed from the site. No other program pathogens were detected in our hatcheries.

Andrew D. Noyes  
Pathologist 2 (Aquatic)

# New York State Fish Hatchery Disease Classification Report

Report Period: Jan 1, 2015 to Dec 31, 2015

Hatchery	Location	Classification
Adirondack	Saranac Lake, NY	A-2
Bath	Bath, NY	A-2
Caledonia	Caledonia, NY	A-2
Catskill	Livingston Manor, NY	A-2
Cedar Springs	Caledonia, NY	A-2
Chateaugay	Chateaugay, NY	A-2
Chautauqua	Mayville, NY	A-2
Oneida	Constantia, NY	A-2
Randolph	East Randolph, NY	A-2
Rome	Rome, NY	<b>As-2 (11/14)</b>
Salmon River Culture Facility	Altmar, NY	A-2
Salmon River Spawning Station	Altmar, NY	<b>As-2 (10/15)</b>
South Otselic	South Otselic, NY	A-2
Van Hornesville	Van Hornesville, NY	A-1
<b>Wild Broodstock</b>		
Coho Salmon - Lake Ontario	Altmar, NY	<b>As-2 (10/15)</b>
Chinook Salmon - Lake Ontario	Altmar, NY	<b>As-2 (10/14)</b>
Steelhead Salmon- Lake Ontario	Altmar, NY	A-2
Walleye-Oneida Lake	Constantia, NY	A-2
LLS - Little Clear Lake	Saranac Inn	A-2
Lake Trout - Cayuga Lake	Cayuga Lake	A-2
Lake Trout – Raquette Lake	Raquette Lake	A-2
Rainbow Trout	Cayuga Lake	A-2
Round Whitefish	Little Moose Pond	A-2
Brook Trout	Twin Ponds	A-2
Brook Trout	Boot Tree Pond	A-2
Brook Trout	Big Hill Pond	<b>Yr-2 (10/14)</b>
Brook Trout	Mountain Pond	A-2
Brook Trout	Deer Pond	A-2
Brook Trout	Fish Brook	A-2
Cisco	Lake Ontario	A-2
Sturgeon	St. Lawrence River	A-2

Report Prepared by: Andrew D. Noyes, Pathologist 2 (Aquatic)

Phone: 315-337-0910

Report Date: Jan 13, 2015

Classification Designation:

- A-1 Closed water supply, free of fish, no serious infectious disease
- A-2 Open water supply, fish present, no serious infectious disease
- B One or more serious infectious diseases present
- C No inspection or clinical disease data available for the last twelve months

Disease Identification (acronym):

- VP Viral infectious pancreatic necrosis (IPN)
- VH Viral hemorrhagic septicemia (VHS)
- WD Whirling Disease
- BF Bacterial furunculosis
- BK Bacterial kidney disease (BKD)
- BR Bacterial redmouth disease (ERM)

Example:

**As-2 (11/01):** Furunculosis detected within the last 12 months and date of isolation in parentheses. Above example applies to classifications in 2002 when BF was isolated in most recent inspection.

**A-2 (BF)(11/01):** Furunculosis not present during previous inspection, but present within last three inspections. Above example applies to 2003 and 2004 classifications **IF** BF was not detected. If no BF was isolated in 2005, parenthetical disease acronyms and dates are dropped and hatchery is upgraded to A-2.

**As-2-T:** A hatchery with an 'A' classification is downgraded to **B-BF-T** if it receives fish from a hatchery classified as B-BF. Note that a B-BF facility may transfer disinfected eggs to an 'A' facility without downgrading the receiving hatchery classification.



Fisheries  
and Oceans

Pêches  
et Océans

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**Institut des eaux douces**

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Your file *Votre référence*

Our file *Notre référence*

14 January 2016

## Department of Fisheries and Oceans Annual Report to the Great Lakes Fish Health Committee January 2016

### Overview – DFO Activities (Central and Arctic Region)

#### 1) National Aquatic Animal Health Program (NAAHP)

##### a) Diagnostics

Winnipeg Fish Health Laboratory has received ISO 17025 accreditation for the following test methods.

- 1) NAT-PROT-RT-qPCR-VHSV-1: Reverse Transcription Quantitative PCR for the Detection of Viral Hemorrhagic Septicemia Virus (VHSV)
  - 2) NAT-PROT-RT-qPCR-IPNV-1: Reverse transcription quantitative PCR assay for the detection of infectious pancreatic necrosis virus (IPNV) nucleic acid
  - 3) NAT-PROT-RT-qPCR-ISAV-1: RT-qPCR Test Method Protocol using TaqMan Universal PCR Master Mix for the Detection of Infectious Salmon Anemia Virus
  - 4) NAT-PROT-RT-qPCR-IHNV-1: Reverse Transcription Quantitative PCR for the Detection of Infectious Hematopoietic Necrosis Virus (IHNV)
  - 5) NAT-PROT-VI-1: Isolation of Viral Agents (IPNV, IHNV, EHN, ISAV, & VHSV) from Finfish by Cell Culture \*
- \*IPNV

Additionally, lab has capability to conduct testing for Koi Herpes virus (KHV), Spring Viremia of Carp Virus (SVCV), Salmon Pancreatic Disease (SPDV) and White Sturgeon Iridovirus (WSIV)

## Summary of samples as of Dec 31, 2015 for Winnipeg laboratory

	<b>Total</b>
<b>Total submissions</b>	25
<b>Total samples submitted</b>	3847
<b>Total tests results reported</b>	5125

To date Testing for all samples has been completed. Depending upon the reason of submission (export, import, surveillance etc.), samples were tested for: IPNV, VHSV, IHN, ISAV, SPDV, KHV, SVCV, WSIV.

### **b) Research**

Winnipeg lab is a reference laboratory for IPNV, KHV, SVCV, WSIV, RSBIV and EHN and is responsible for developing and validating diagnostic assays as per OIE standards for these pathogens. Validation of diagnostic assays for IPNV, KHV and WSIV has been completed and last year's focus was to work on the diagnostic assays for SVCV and RSBIV, both of these projects will be continued in next year.

## **2) Fish Health Certification Program**

Last year two Ontario and one Manitoba based private sector hatcheries continue to participate in the hatchery inspection/certification program under the Fish Health Protection Regulations (FHPR). Both facilities were found to be clean for the regulated pathogens

As of Dec 31, 2015, CFIA has taken over the domestic movement control program as a result DFO is not conducting any testing under the authority of FHPR and FHPR will be repealed in the coming months.

## **3) Response to wild fish kills**

No fish kills were reported to Winnipeg lab this year.

Sunita Khatkar  
Department of Fisheries and Oceans  
Winnipeg, MB





### Pennsylvania Fish and Boat Commission

#### Annual Hatchery Disease Classification and Importation Report

January 1, 2015 –December 31, 2015

#### **Restricted Pathogens**

*Aeromonas salmonicida* with varying antibiotic resistance has been confirmed at several PFBC hatcheries in 2015. Detections were made while conducting diagnostic examinations and fish health inspections. Additionally, improved biosecurity and changes in hatchery standard operation procedures (SOPs) including a vaccination program initiated in 2010 have had positive results and are helping to control mortality due to *Aeromonas salmonicida*.

**Infectious pancreatic necrosis (IPNV)** has been detected at 9 PFBC hatcheries during 2015, these detections were made while conducting fish health inspections and diagnostic examinations. Significant Brook Trout fry mortality was attributed to IPNV at 2 facilities in 2015. Pair spawning, improved SOP's, importation and isolation IPNV free eggs and an increased emphasis on biosecurity are being implemented at several hatcheries in an attempt to reduce the incidences of IPNV.

*Myxobolus cerebralis* was not detected at any PFBC facilities in 2015, the pathogen was detected a single facility in 2014.

*Renibacterium salmoninarum* was detected at 3 PFBC hatcheries in 2015. Mortality was only associated with the pathogen at the Oswayo SFH.

**Viral Hemorrhagic Septicemia (VHSv)** No detections were documented in the PFBC hatchery system or by the PFBC in 2015.

#### **Cutthroat Trout Virus (CTV)**

Cutthroat Trout Virus was detected at one PFBC facilities in 2015. CTV was detected in 2 hatcheries in 2014 and was first detected in the PFBC hatchery system in late 2012. The PFBC is currently monitoring for the virus, however no management plan has been developed.

### **PFBC Cooperative Nurseries**

2015 Fish Health Inspections have been completed at the eight PFBC cooperative nurseries within the Lake Erie Basin. IPNV was detected at several Cooperative Nurseries in 2011. The nurseries were depopulated and disinfected in 2012. To date, results from all nurseries have been negative for IPNV and other Emergency and Restricted pathogens since 2012.

### **Lake Erie Winter Steelhead**

Ovarian fluid and milt samples are currently being collected from Lake Erie Winter Steelhead Trout brood stock. Samples are analyzed at the Penn State University Animal Diagnostic Laboratory (PSUADL). To date no fish have tested positive for IPNV. IPNV was detected in several wild fish in 2014. The 2014 detections were the first since 2007.

### **Wild Brood Monitoring**

Depending on the species and the availability of fish, lethal or non-lethal sampling techniques were employed to monitor for viral pathogens in all lots of wild brood fish used for production by the PFBC. To date, wild brood stock monitoring has taken place in seven bodies of water located in the Delaware River Basin, the Ohio River Basin and the Lake Erie Basin. Species sampled include Steelhead Trout, Walleye, Yellow Perch, White Crappie, Bluegill, Muskellunge, Northern Pike, American Shad, and Golden Shiner. Except for steelhead, all species sampled were collected from waters outside of the Lake Erie Basin. However, since neither these fish nor their eggs are being brought into the PFBC production system, this preventative activity is applicable to this report.

### **Egg Disinfection**

Currently, all PFBC hatcheries involved in the production of cool/warm water species are following the GLFHC Basinwide Coolwater Egg Disinfection Protocol.



## Pennsylvania Fish & Boat Commission

### Pennsylvania Fish and Boat Commission Annual Salmonid Importations

#### Salmonid Importations 2015

Source	Species/Number	Fish/Egg Size	Fish Health Status	Certification		Lake Basin
				Date	Official	
Tout Lodge	RBT 240,000	Eggs	A	6/17/2015	S. Nepper	Inland
NY Randolph Hatchery	BNT 200,000	Eggs	A-2	10/31/2014	A. Noyes	Erie
Paint Brook NFH	BKT 200,000	Eggs	A	9/9/2014	G. Glenney	Inland
White sulfur Springs NFH	RBT 275,000	Eggs	A	3/10/2015	G. Glenney	Inland
Sullivan Creek NFH	LAT 175,000	Eggs	A	10/23/2015	C. Puzach	Inland
Maine- Enfield SFH	BKT 300,000	Eggs	A	12/12/2015	D. Russel	Inland
NH Salsburg FCS	BKT 800,000	Eggs	A	10/21/2014	T. Jones	Inland

#### Proposed Salmonid Importations 2016

Source	Species/Number	Fish/Egg Size	Fish Health Status	Certification		Lake Basin
				Date	Official	
Tout Lodge	RBT 240,000	Eggs	A	6/17/2015	S. Nepper	Inland
NY Randolph Hatchery	BNT 200,000	Eggs	A-2	10/31/2014	A. Noyes	Erie
Paint Brook NFH	BKT 200,000	Eggs	A	9/9/2014	G. Glenney	Inland
White sulfur Springs NFH	RBT 275,000	Eggs	A	3/10/2015	G. Glenney	Inland
Sullivan Creek NFH	LAT 175,000	Eggs	A	10/23/2015	C. Puzach	Inland
Maine- Enfield SFH	BKT 300,000	Eggs	A	12/12/2015	D. Russel	Inland
NH Salsburg FCS	BKT 800,000	Eggs	A	10/21/2014	T. Jones	Inland

**Pennsylvania Fish and Boat Commission  
2015 GLFHC Hatchery Classification report**

<b>Hatchery</b>	<b>Location</b>	<b>Disease Classification</b>	<b>Date</b> (*Results Pending)
Bellefonte SFH	Bellefonte	B- AS15,RS14, MC14, IPN15, CTV14	12/30/2015
Benner Spring SFH	State College	B- AS15, IPNv 15	10/20/2015
Corry SFH	Corry	B- AS15,RS14, IPN15	8/20/2015
Fairview SFH	Fairview	B- IPNv 15	8/20/2015
Huntsdale SFH	Huntsdale	B- As15, IPN15	11/19/15
Linesville SFH	Linesville	B-IPN 14	1/23/2015
Oswayo SFH	Oswayo	B- IPN15, RS15	9/17/2015
Pleasant Gap SFH	Pleasant Gap	B- AS15, RS15, IPN15, CTV13	5/27/2015
Pleasant Mount SFH	Pleasant Mount	B- AS13 ror, IPN14	8/26/2015
Reynoldsdale SFH	Reynoldsdale	B- (AS 16), IPN15	3/18/2015
Tionesta SFH	Tionesta	A- (IPN 15)	9/1/2015
Tylersville SFH	Tylersville	B- AS14, IPN15, CTV14	6/30/2015
Union City SFH	Union City	B – AS 14	8/13/2015
Van Dyke SFH	Van Dyke	A-2	6/11/2015

**Lake Erie Drainage Cooperative Nurseries**

Albion	Fairview	B	8/28/2014
Mitchel 3CU	Girard	B	8/13/2015
Ro-Ze 3CU	Girard	B	8/13/2015
Mission 3CU	Girard	B	8/13/2015
Peck 3CU	Fairview	B	10/22/2014
Kendra	Girard	B	10/22/2014
Tom Ridge Environmental Center	Erie	B	12/4/2015
Wesleyville	Wesleyville	B	10/2/2015

**Wild Brood**

Steelhead	Lake Erie	C – IPNV 15	2/3/2016*
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<b>Disease</b>	<b>Pathogen</b>	<b>Abbreviation</b>
Whirling disease	<i>Myxobolus cerebralis</i>	MC
Infectious Pancreatic Necrosis	IPN virus	IPN
Cutthroat Trout Virus	CTV Virus	CTV
Bacterial Kidney Disease	<i>Renibacterium salmonarum</i>	RS
Epizootic Epitheliotropic Disease	<i>EED virus</i>	EED
Furunculosis	<i>Aeromonas salmonicida</i>	AS

TMR -Terramycin Resistant, ROR-Romet Resistant  
( ) indicates transfer of fish from positive Hatchery

Report Prepared By: Coja Yamashita  
Title: Fisheries Biologist, Fish Health Unit Leader  
Phone Number: (814) 355-4837



# Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

*Division of Wildlife*  
*Raymond Petering, Chief*  
2045 Morse Road, Bldg. G-3  
Columbus, Ohio 43229

January 22, 2016

TO: Great Lakes Fishery Commission – Great Lakes Fish Health Committee  
FROM: Ohio Department of Natural Resources – Division of Wildlife (ODNR-DOW)  
SUBJECT: 2015 Fish Health Report

In 2015, the ODNR-DOW once again cooperated with the Ohio State University to sub-contract Jim Brick, DVM, to oversee fish health inspection procedures. Dr. Brick accompanied ODNR-DOW staff on all collections in 2015. Samples were examined and tested at the U.S. Fish and Wildlife Service's LaCrosse Fish Health Center. All fish lots to be stocked by the ODNR-DOW into Ohio waters were tested for reportable diseases following the guidelines in the Great Lakes Fishery Commission – Great Lakes Fish Health Committee (GLFHC) Model Fish Health Program. Two ODNR-DOW fish hatchery employees are pursuing the AFS Aquatic Animal Health Inspector certification.

## Pre-Stocking Fingerlings

Six salmonid bacterial lots, 6 salmonid DFAT lots, and 4 salmonid whirling lots (60 fish per lot) from three Ohio State Fish Hatcheries were tested prior to stocking in 2015. The species tested included one lot of brown trout (*Salmo trutta*) and five lots of rainbow trout (*Oncorhynchus mykiss*). ODNR-DOW did not maintain salmonid broodstock in 2015; salmonid eggs are acquired from external partners and private aquaculture operations. Twenty-seven viral lots from six Ohio State Fish Hatcheries were tested prior to stocking in 2015. These included rainbow trout, steelhead trout, brown trout, muskellunge (*Esox masquinongy*), hybrid striped bass (*Morone chrysops x Morone saxatilis*), bluegill sunfish (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*), largemouth bass (*Micropterus salmoides*), yellow perch (*Perca flavescens*), saugeye (*Sander vitreus x Sander canadensis*), walleye (*Sander vitreus*), and hybrid bluegill sunfish (*Lepomis macrochirus x Lepomis cyanellus*). In 2015, no pathogens were detected in the pre-stocking fish health testing.

## Feral Broodstock

In 2015, seven brood fish lots (150 fish per lot) were tested from the following water bodies: Maumee River, Rocky Fork, Berlin Lake, Clearfork Reservoir, Mosquito Reservoir, Ohio River, and Leesville Reservoir. The ODNR-DOW collected feral sauger, walleye, common carp, and muskellunge from the aforementioned water bodies. No pathogens were detected in 2015 feral broodstock testing from Great Lakes Basin waterbodies; however, largemouth bass virus and bluegill virus were isolated in samples collected from two Ohio River Basin reservoirs for a second consecutive year.

## VHSV Surveillance

In 2015, there were no detections of VHSV in Ohio fish sampled. The last detection occurred in spring 2009 at Clear Fork Reservoir in north central Ohio.



# Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

## Great Lakes Restoration Initiative Project

The St. Marys State Fish Hatchery lies on the eastern shore of Grand Lake St. Marys (GLSM). GLSM has been identified as a connection between the Mississippi River basin and the Great Lakes basin. Historically, and presently, the fish hatchery has used lake water for fish hatchery production and discharged the water into a tributary of the St. Marys River within the Great Lakes (GL) basin. A consulting firm was hired to assess closure options at St. Marys State Fish Hatchery. The preferred option to eliminate the inter-basin connection was a post-treatment (i.e., water filtration) alternative. With this alternative, the hatchery will continue to use water from GLSM, but some water will be returned back to GLSM, and other water going into the GL basin and any water leaving GLSM bound for the GL basin will be treated and screened prior to being released into the GL basin. Modifications to the hatchery infrastructure have begun including:

- installation of a new two new wells
- installation of two new sand (iron) filters
- raceway modifications and expansion of the hatching house.

These renovations are scheduled to be completed by April 2016.

Other planned modifications on site include:

- replacement of pumps to return lake water used by the hatchery water to GLSM
- engineering design and construction of a process to filter and screen GLSM lake water that maintains critical flows in the canal and river system that is destined for the GL basin.

This part of the project is in the design phase and the anticipated completion date is late 2017/mid 2018 (State FY 2018).

## Baitfish Importation

In response to the increased demand for baitfish along the Lake Erie shore fisheries, the ODNR DOW and Ohio Department of Agriculture reviewed the existing baitfish regulations pertaining to emerald shiners and discussed importation of Lake Erie emerald shiners from other states without VHS testing into bait dealers in the Lake Erie (VHS-positive) zone. The following letter was sent to Ohio licensed bait dealers on 08/19/2015 from Scott Zody, Chief of the ODNR, Division of Wildlife:

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August 19, 2015

To Bait Dealer and Transportation Permit holders:

The Ohio Department of Natural Resources, Division of Wildlife (ODNR-DOW) has received confirmation from Tony Forshey, DVM, State Veterinarian, Ohio Department of Agriculture (ODA) regarding an allowance to the February 3, 2015 Viral Hemorrhagic Septicemia (VHS) Proclamation.

Beginning immediately, emerald shiners *Notropis atherinoides* collected from all United States waters of Lake Erie, including Michigan, Pennsylvania, and New York will no longer require testing and disease-free certification for VHS as a condition for importation into Ohio when their final destination is north of the Proclamation Line within the State (north of a line that that follows US Highway 6 from the Indiana border to the intersection of US Highway 6 and Interstate 90 continuing along Interstate 90 along Interstate 90 to the Pennsylvania border).



# Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

This exception to the ODA VHS Proclamation applies only to emerald shiners under the conditions specified. Standard importation permits from ODA and specifications for testing of other species continue to be in effect as identified in the VHS Proclamation. The current VHS Proclamation is effective until December 31, 2019.

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This proclamation allowed bait dealers to access emerald shiners from bait operations in neighboring states in the Lake Erie region in time for the bulk of the Lake Erie yellow perch sport fishery season. No changes in the protocol are anticipated for 2016 – importation of emerald shiners within the defined Lake Erie watershed zone will be allowed.



## 2015 Minnesota DNR Fish Health Report 01-29-15

### Annual State Coldwater Hatchery fish health inspections

Annual inspections were performed at all five DNR coldwater fish hatcheries. The inspection program includes lethal sampling of all fish lots at the time of inspection and ovarian fluid sampling during spawning. A total of 1,865 fish were inspected. No certifiable pathogens were detected. Ovarian fluid (1,521) samples were screened for *Renibacterium salmoninarium* and viruses this fall at all five DNR hatcheries. French River Hatchery continues to have low level (6%) detection of *R. salmoninarium*. No *R. salmoninarium* or viruses were detected at the other four hatcheries.

### Wild Egg Takes

Kamloop and steelhead rainbow trout eggs were taken from Lake Superior this spring at French River Hatchery. Pair spawning was performed in an effort to cull for *Renibacterium salmoninarum*. A total of 169 kamloop, and 76 French River wild steelhead ovarian fluids were tested for *R. salmoninarum* and viruses. About 3% of the kamloop and 3.9% of the steelhead ovarian fluids tested positive for *R. salmoninarum* by ELISA. Positive results were confirmed with Fluorescent Antibody Technique tests and bacterial culture. No viruses were detected. Eggs from fish that tested positive for *R. salmoninarum* were discarded.

Thirty kamloop fish were tested for certifiable pathogens including *A. salmonicida*, *Y. ruckeri*, *R. salmoninarum* and various viruses. None were detected.

### Crystal Springs Hatchery Depopulation

*Aeromonas salmonicida* was detected in lake trout broodstock at the Crystal Springs Hatchery in July of 2014. Terramycin medicated feed was administered in August of 2014, but the pathogen was again detected in October of 2014. Aquaflor medicated feed was administered in November 2014, and other lake trout broodstock at the hatchery were vaccinated by injection or immersion in August of 2015. *A. salmonicida* was not detected at the hatchery during their 2015 annual inspection. In October 2015, the pathogen resurfaced in the Brook Trout broodstock during spawning at the hatchery. The mortality started in one raceway and quickly spread to the adjacent raceway due bio-security lapses and hatchery design flaws. The fish displayed characteristic lesions associated with furunculosis and *A. salmonicida* was confirmed to be the cause. The bacteria were found to be susceptible to Terramycin and a medicated feed treatment was administered to four raceways (because of detection and likely contamination). However, the treatment did not stop the spread. We considered several options ranging from continuing to treat the infected fish, to destroying only the infected fish lots, to complete depopulation of the hatchery. After careful consideration, the hard decision was made to depopulate the hatchery.

[mndnr.gov](http://mndnr.gov)





The depopulation was completed in late December of 2015. The hatchery is currently undergoing major repair to address bio-security issues and being systematically decontaminated.

### **Hatchery Diagnostic Cases**

Seventeen cases were submitted to the MN DNR pathology laboratory for diagnostic testing. These samples comprised of submissions from each of the five DNR coldwater hatcheries, and included 8 cases from Crystal Springs Hatchery which were related to the furunculosis outbreak. Other pathogens isolated from these diagnostic cases were: *Pseudomonas*; motile *Aeromonas spp*; and *Flavobacterium spp*. Antibiotic sensitivity testing was performed as appropriate and treatment was recommended for some of the cases.

### **Wild Stream Brook Trout screening**

Brook Trout from seven streams in southeastern MN were inspected in an effort to find a disease-free source of brood fish to be used in developing a heritage strain for future hatchery propagation. One stream is completed with no detection of certifiable pathogens and the other six streams are still ongoing.

### **Channel Catfish screening**

Ninety channel catfish from two waterbodies were tested for *Edwardsiella ictaluri*, Channel Catfish Virus and VHS. There was no detection of these pathogens.

### **Cool Water Fish Testing for VHS Surveillance**

VHS surveillance and regulatory testing continues in MN. A total of 19,800 VHS-susceptible specimens were tested, including specimen from 8 high-use recreational waters. No virus was detected.

### **Fish Kills**

No major fish kills reported this year were due to pathogenic causes.

A fish kill in the South Branch of the Whitewater River was reported and investigated by the DNR and other state agencies. Multiple species were involved including, but not limited to brown trout; rainbow trout; dace; sculpin; and white suckers. The number of fish affected was estimated to be ~9,000. Scientific analysis, including fish necropsy and water quality analysis, was unable to conclusively determine the cause of this fish kill, as a combination of biological, chemical, and environmental conditions may have led to this event. An internal DNR committee was convened to revise the agency's fish kill investigation protocols with new emphasis on kills caused by chemical spills and agricultural runoff.

## Hatchery Classification Report

Report Period: January 1 to December 31, 2015

Report Date: January 29, 2016

Hatchery Name	Location	Pathogen Acronym
Crystal Springs	Altura	C
Lanesboro	Lanesboro	A
French River	Duluth	B-BK
Peterson	Peterson	A
Spire Valley	Remer	B-BK

Report prepared by: Ling Shen  
 Title: Fish Pathology Lab Supervisor  
 Phone Number: 651-259-5138

### Emergency Fish Diseases

Disease	Disease Pathogen	Disease Acronym	Pathogen Acronym
viral hemorrhagic septicemia	virus	VHS	VE
infectious hematopoietic necrosis	virus	IHN	VH
ceratomyxosis	<i>Ceratomyxa shasta</i> protozoan	CS	SC*
proliferative kidney disease	sporozoan	PKD	SP*

### Restricted Fish Diseases

Disease	Disease Pathogen	Disease Acronym	Pathogen Acronym
whirling disease	<i>Myxobolus cerebralis</i> protozoan	WD	SW
infectious pancreatic necrosis	virus	IPN	VP
bacterial kidney disease	<i>Renibacterium salmoninarum</i> bacterium	BKD	BK
furunculosis	<i>Aeromonas salmonicida</i> bacterium	BF	BF
enteric redmouth	<i>Yersinia ruckeri</i> bacterium	ERM	BR
epizootic epitheliotropic disease	virus	EED	VL**

\* Inspectors within the Great Lakes basin do not need to include these pathogens unless importations of fish from enzootic areas are known to have been made.

\*\* Field diagnostic test not available.

Ministry of  
Natural Resources and Forestry

Provincial Services Division  
Fish and Wildlife Services Branch  
P.O. Box 7000, 300 Water Street  
Peterborough, ON K9J 3C7

Ministère des  
Richesses naturelles et des Forêts

Division des services provinciaux  
Direction des services de gestion de la pêche et de la faune  
300, rue Water, C.P. 7000  
Peterborough (Ontario) K9J 3C7

## Ontario Ministry of Natural Resources and Forestry (OMNRF) 2015 Annual Report for the Great Lakes Fish Health Committee

January 2016

The Ontario Ministry of Natural Resources and Forestry (OMNRF) is actively involved in assessing fish health in the province by means of its Fish Culture Program (routine monitoring; disease investigations; spawn collections) and various programs for wild fish monitoring and disease diagnosis (Broadscale Monitoring; Fish Die Off Reporting). Program details and pathogen detections for 2015 are outlined below.

### OMNRF Fish Culture Program

OMNRF operates nine Fish Culture Stations (FCS) throughout the province (Figure 1), raising more than 7 million fish each year for stocking in local waterways for species restoration, wild population enhancement and recreational fishing opportunities.



**Figure 1.** Location of OMNRF Fish Culture Stations. Ringwood Fish Culture Station is currently being operated by a partner.

Fish health testing is completed by the University of Guelph Fish Health Laboratory - a relationship that has been in place for more than 30 years, under the supervision of Dr. Roselynn Stevenson and Dr. Lucy Mutharia. The lab provides services to OMNRF fish culture stations including:

- Routine fish health monitoring
- Disease/mortality investigations
- Screening of wild fish and gametes for spawn collections

**Emergency pathogen detections:**

There were no detections of emergency pathogens in fish submitted as part of the Fish Culture Program in 2015.

**Restricted pathogen detections:**

*Renibacterium salmoninarum* is considered to be endemic in Ontario and is present in OMNRF Fish Culture Stations at low levels. Detections for 2015 are reported in Table 1. None of these detections were associated with clinical disease or gross lesions.

**Table 1.** *Renibacterium salmoninarum* detections by IFAT in 2015.

Location	Month	Species	Detection Details
Chatsworth FCS Substation	February	Brown trout	Low numbers in 1 of 127 fish
Blue Jay Creek FCS	February	Lake trout	Low numbers in 1 of 25 fish
Harwood FCS	September	Atlantic salmon	Low numbers in 1 of 3 fish
Tarentorus FCS	November	Splake	Low numbers in 1 of 22 fish

*Aeromonas salmonicida* was detected in 2 of 688 reproductive fluids and carcasses sampled from adult Chinook salmon and 3 of 128 Coho salmon carcasses collected on the Credit River during the fall 2015 wild egg collection. *Aeromonas salmonicida* was detected in 6 of 94 reproductive fluids and carcasses sampled from adult Chinook salmon on the Ganaraska River during the fall 2015 collection. Detections for 2015 are reported in Table 2.

**Table 2.** *Aeromonas salmonicida* detections in 2015.

Location	Month	Species	Detection Details
Chatsworth FCS	May	Rainbow Trout	Wild Collection – Saugeen River 1 positive of 22 fish
Tarentorus FCS	July	Brook Trout	Disease investigation 6 positive of 6 fish
Tarentorus FCS	August	Splake	Routine Monitoring 1 positive of 10 fish
Harwood FCS	October	Chinook	Wild Collection – Ganaraska River 2 positive of 12 fish
Harwood FCS	October	Chinook	Wild Collection – Ganaraska River 4 positive of 18 fish
Normandale FCS	October	Chinook	Wild Collection – Credit River 2 positive of 20 fish
Ringwood (partner) Hatchery	November	Coho	Wild Collection – Credit River 3 positive of 128 fish

*Yersinia ruckeri* detections for 2015 are reported in Table 3. This isolate displayed an API that was not typical of *Y. ruckeri*, confirmation by 16s PCR. Detection was not associated with clinical disease or gross lesions.

**Table 3.** *Yersinia ruckeri* detections in 2015.

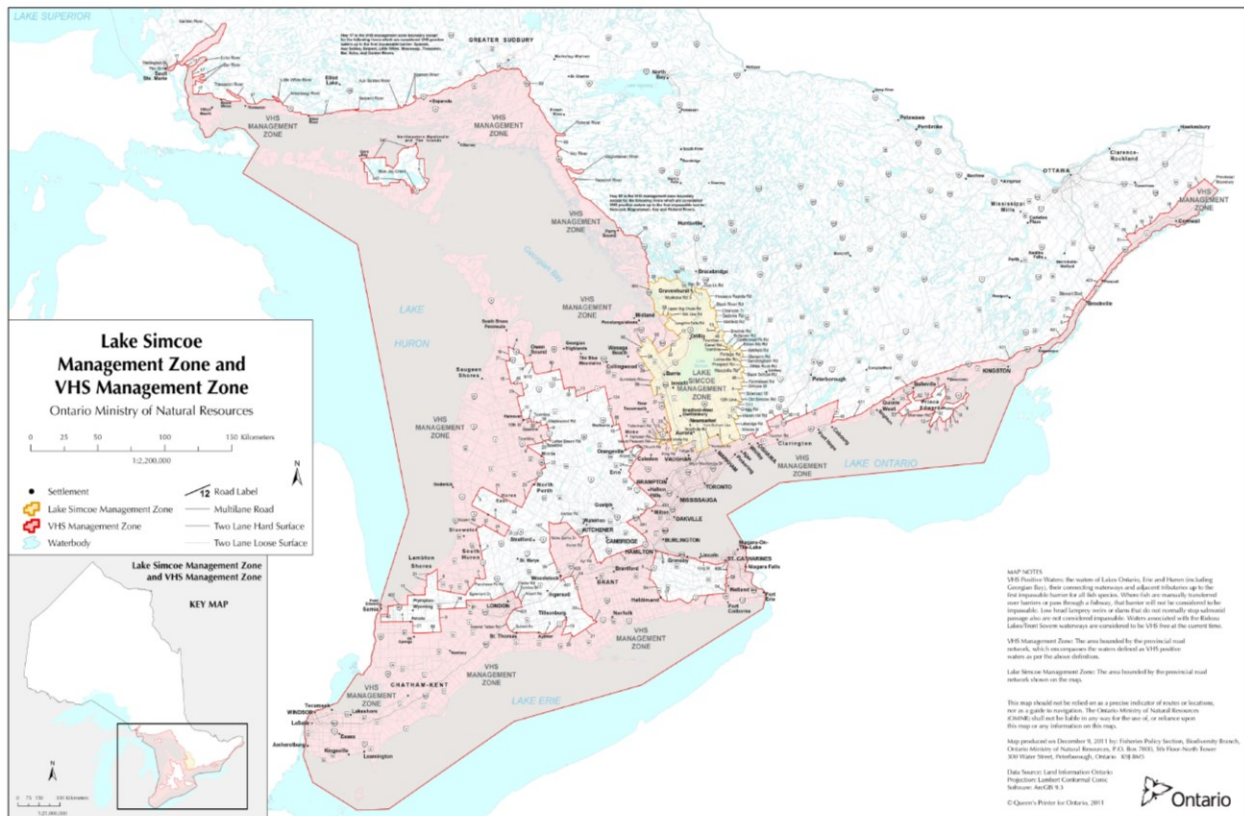
Location	Month	Species	Detection Details
North Bay FCS	December	Rainbow Trout	Routine Monitoring 1 positive of 17 fish

### OMNRF Wild Fish Monitoring and Disease Diagnosis

OMNRF monitors wild fish populations for pathogens via the BROADSCALE Monitoring Program and the Fish Die Off Reporting Program. Samples are collected from specific water bodies and submitted for screening – primarily to detect the potential spread of VHS. OMNRF also oversees a direct phone line for public reporting of wild fish die-offs, with samples being submitted for disease diagnosis when applicable.

Fish health testing is performed by the Fish Pathology Laboratory at the University of Guelph under the direction of Dr. John Lumsden.

In 2015, no evidence was detected of further spread of VHS across the province, therefore no changes have been made to either the Lake Simcoe Management Zone or VHS Management Zone (Figure 2).



**Figure 2.** Lake Simcoe Management Zone and VHS Management Zone.

**Emergency pathogen detections:**

There were no detections of emergency pathogens in fish submitted as part of any wild fish monitoring program in 2015.

**Restricted pathogen detections:**

*Aeromonas salmonicida* was detected in one White sucker submitted for testing from Waseosa Lake. This fish exhibited gross lesions consistent with Furunculosis.

**Miscellaneous Detections:**

*Bafinivirus* was detected in 72 of 688 samples tested from the Chinook wild collection on the Credit River.

*Flavobacterium branchiophilum* was found in bacterial gill disease outbreaks at several Fish Culture Stations in 2015.

*Flavobacterium psychrophilum* was detected at several Fish Culture Stations in 2015.

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**January 2016**

Prepared by Kerry Hobden, Fish Health Coordinator  
Fish Culture Section, OMNRF  
kerry.hobden@ontario.ca



**2015  
Indiana Fish Health Report  
To The  
Great Lakes Fish Health Committee**

One Model Program (M/P) pathogen was detected in production fish in 2015 among Indiana's cold-water production facilities. This pathogen was *Aeromonas salmonicida*. No viral infections were detected in any of Indiana's cool or warm-water hatcheries. Bacteria testing of cool and warm water species are not done routinely. There was one case of bronchitis with secondary infection in two month old channel catfish at a prison fish rearing facility. Surveillance of wild populations for viruses detected no VHSv but two lakes were found positive for LMBv. There was one reported case of a white bass kill in Brookville Reservoir. There were two submissions involving brown bullhead with melanoma as a diagnosis for both. Unfertilized eggs from summer-run steelhead were submitted for thiamine concentration analysis.

*Aeromonas salmonicida* was detected at Mixsawbah State Fish Hatchery during a routine inspection on March 30. Prevalence was 10%. No clinical sign of disease was noted and the lot was stocked on schedule two months later in May.

There were 28 virus-only screenings among all eight of Indiana DNR's fish production facilities. There were 17 cases for cool and warm water species and 11 submittals for trout and salmon species. No viral agents were found. Cool and warm water species are tested prior to stocking or transfer to another facility. Some lots will be tested multiple times when a transfer or change in rearing conditions has occurred. For the cold water species, each lot is tested at least twice for virus. The first time is a virus screening submission a few weeks after first feeding. The second time is during a routine fish health inspection for M/P pathogens. A third routine inspection is done for any lot that will be more than a year old at stocking. Whirling disease testing is done on six month old summer-run steelhead.

Cikana State Fish Hatchery manages walleye and channel catfish production at a prison. A few weeks after two month old channel catfish were transferred to the prison rearing facility, the lot went off feed and became moribund. Fish and water was submitted for analysis. Diagnosis was bronchitis most likely due to high ammonia levels. There was also a secondary infection of two *Aeromonas* species. Pool filters are used filled with biofilter media, for ammonia removal. There may be a problem with this strategy especially if the detention time in each filter is too short. There may also be a problem with carbon dioxide and nitrate build-up. No means of mechanical aeration is used anywhere in the system. Oxygen is added to the tanks by pumping air through Point Four diffusers on the bottom of each tank, each with a water depth of 30 inches.

Three water bodies were screened for VHSv. They were Brookville Reservoir, Lake Webster and Dogwood Lake. Brookville Reservoir is the State's walleye brood source. Milt from 60 males was tested in five-fish pools. They tested negative. Lake Webster is the State's Muskie brood source. Rather than sacrifice mature fish, susceptible species are analyzed. No VHSv was detected but a pooled sample of five largemouth bass kidney and spleen tested positive for LMBv. Other fish tested were 25 bluegill, 15 black crappie, 10 redear sunfish and five brown bullhead. Dogwood Lake is an impoundment and water supply for the East Fork State Fish Hatchery. A total of 60 largemouth bass

and bluegill were submitted for viral testing. One pooled sample was positive for LMBv.

A small white bass fish kill occurred in Brookville Reservoir mid May. Diagnosis was bronchitis with probable systemic bacterial infection from two *Aeromonas* species.

During the VHSV screening of Lake Webster early April, several brown bullhead were observed to have multiple irregularly shaped black blotches on their skin. One of these fish was submitted for testing. The black hyper-pigmented spots were found to be melanomas. Interestingly enough, a report came in about a brown bullhead caught by an angler having a tar-like substance all over its body. The black material was wiped off with a rag and the fish released. The rag was sent to Purdue so the dried material could be analyzed. Melanoma cells were identified. In 2011, a picture of a brown bullhead with a raised black area on its head was e-mailed for an opinion. At the time, going by just a picture, no plausible explanation could be rendered. Putting these three cases together, is it possible melanoma in brown bullhead starts as a smooth black blotch that with time becomes raised? Later, could the elevated melanoma reach some critical mass and rupture?

All harvested adult summer-run steelhead in 2014 were given an injection of thiamine mononitrate. For harvests in previous years, thiamine hydrochloride was administered. Regardless of the form, the serum was made from 1.83 grams of thiamine dissolved in 100 ml of sterile saline. The thiamine hydrochloride was difficult to work with as the pH of the serum had to be brought up to between 6.7 and 6.9 (Honeyfield, personal communication). This was done using 6N NaOH and a fine tip transfer pipette. It was easy to overshoot the endpoint. To eliminate the need for pH adjustment, the mononitrate form of thiamine was used (Honeyfield, personal communication) for the first time on the 2014 lot of summer-run steelhead broodstock. Unfertilized green eggs were tested for total thiamine from fish collected in 2012 when thiamine hydrochloride was used and from fish collected in 2014. Average total thiamine for the 2012 lot was 18.8 nmol/gm while the concentration for the 2014 lot was only 7.1 nmol/gm. To increase the concentration in eggs collected in 2016, adults collected summer of 2015 were given 50% more serum. Circumstances did not allow for testing of eggs this spawning season. As an observation, survival of the current 2015 lot of spawners has exhibited one of the highest rates to-date. Also, eye-up for the first two egg takes this season were above average at 82% and 91%. For the future, either thiamine mononitrate will continue to be used for the injection serum or commercially prepared veterinary grade thiamine hydrochloride serum will be administered if a high enough concentration can be found.