

**GREAT LAKES FISH HEALTH COMMITTEE**

**Agency Reports 2014**

Michigan Department of Natural Resources ..... 2

Minnesota Department of Natural Resources..... 10

New York State Department of Environmental Conservation ..... 13

Pennsylvania Fish and Boat Commission..... 18

U.S. Fish and Wildlife Service – La Crosse, WI..... 22

U.S. Fish and Wildlife Service – Lamar, PA..... 25

Wisconsin Department of Natural Resources ..... 29



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January 29, 2015

TO: Great Lakes Fishery Commission - Great Lakes Fish Health Committee  
FROM: Michigan Department of Natural Resources, Fisheries Division (MDNR)  
SUBJECT: 2014 Michigan DNR Fish Health Report

In 2014, MDNR continued the partnership with the Michigan State University Aquatic Animal Health Laboratory at the Colleges of Veterinary Medicine and Agriculture and Natural Resources. All fish lots to be stocked by MDNR in Michigan public waters were examined and tested for emergency and restricted fish pathogens as outlined in the Great Lakes Fish Health Commission – Great Lakes Fish Health Committee (GLFHC) Model Program for Fish Health Management and guided by the laboratory protocols of the American Fishery Society – Fish Health Section (AFS-FHS) Blue Book and the World Organization for Animal Health (OIE). Selected public waters were also evaluated for emergency and restricted fish pathogens.

### **A. Spring 2014 Inspections**

#### **Pre-Stocking Fingerlings**

Twenty-one lots (60 fish per lot) of eight salmonid species from six State of Michigan hatcheries and the Lake Superior State University Aquatic Research Laboratory (LSSU-ARL) were tested for emergency and restricted fish pathogens prior to stocking in spring 2014. This included six lots of Brown Trout (*Salmo trutta*, three strains), four lots of Rainbow Trout (*Oncorhynchus mykiss*; steelhead and Eagle Lake strains), three lots of Chinook Salmon (*O. tshawytscha*), two lots of Atlantic Salmon (*Salmo salar*), one lot of Coho Salmon (*O. kisutch*), two lots of Lake trout (*Salvelinus namaycush*; two strains), two lots of Brook Trout (*Salvelinus fontinalis*), and one lot of splake (*Salvelinus namaycush* X *Salvelinus fontinalis*).

*Renibacterium salmoninarum*, the causative agent of Bacterial Kidney Disease (BKD), was detected using a quantitative enzyme linked immunosorbent assay (Q-ELISA) in one lot of splake from Marquette State Fish Hatchery (MSFH) at low antigen levels at a prevalence of 10%. Additionally, 60 Chinook Salmon per rearing unit from two hatcheries were tested as part of a study examining the efficacy of thiamine treatments for combatting early mortality syndrome. All were found to be negative for *R. salmoninarum* by Q-ELISA, including 360 Chinook Salmon from six rearing units at Platte River State Fish Hatchery (PRSFH) and 420 Chinook Salmon from seven rearing units at Wolf Lake State Fish Hatchery (WLSFH).

The *Aeromonas salmonicida* Vaccine (AquaTactics Fish Health, Washington, USA) was administered to fish to prevent infections caused by *A. salmonicida salmonicida* (furunculosis agent). Neither *A. salmonicida salmonicida* nor *Yersinia ruckeri* (enteric redmouth disease agent) were isolated during spring production inspections in 2014. Non-reportable bacteria that were isolated during these inspections included: *Serratia* sp.; motile *Aeromonas* spp.; *Shewanella* sp.; and *Y. intermedia*. In addition, seven representative lots from these hatcheries were examined and found to be negative for *Myxobolus cerebralis*, the causative agent of

whirling disease. *Nucleospora salmonis* was detected in kidney and/or gill samples from MSFH, WLSFH, PRSFH, Thompson State Fish Hatchery (TSFH), Oden State Fish Hatchery (OSFH), and Harrietta State Fish Hatchery (HSFH) at a prevalence ranging from one to twelve out of twelve pools (5 fish per pool). Skin and gill scrapings revealed parasites that included: monogeneans (e.g., *Gyrodactylus* spp. in MSFH Brook Trout, splake and Lake Trout and in TSFH steelhead and Brown Trout); sessile ciliates (e.g., *Apiosoma* spp. and/or *Ambiphrya* spp. in MSFH Brook Trout and OSFH Rainbow Trout); and protozoans (e.g., *Trichodina* spp. in MSFH Brook Trout). Epizootic epitheliotropic disease virus (EEDV) was not detected at MSFH in any lots, despite its confirmed presence in two strains of Lake Trout in 2013 via quantitative polymerase chain reaction (qPCR). Infectious pancreatic necrosis virus (IPNV) was detected in MSFH Brook Trout and in OSFH Brown Trout. No other viruses were detected in fish sampled from these lots and included negative results for Viral Hemorrhagic Septicemia Virus (VHSV), Infectious Pancreatic Necrosis Virus (IPNV), and Infectious Hematopoietic Necrosis Virus (IHNV).

#### Captive Salmonid Broodstock

The reproductive fluids (e.g., milt and ovarian fluid) from two lots of captive broodstock were collected during spawning and tested for *R. salmoninarum* (Q-ELISA) and for viruses (cell culture) in January 2014. This included samples from 60 fish each from two year classes of Eagle Lake strain Rainbow Trout. No *R. salmoninarum* or viruses were detected in these fish.

#### Feral Broodstock

Thirty pairs of steelhead returning to the Little Manistee River Weir (LMRW) were examined. No *A. salmonicida*, *R. salmoninarum* or *Y. ruckeri* were detected. The non-reportable bacterium, *Flavobacterium psychrophilum*, was detected in kidney cultures at a prevalence of 7%. Other non-reportable bacteria that were isolated included motile *Aeromonas* spp. (prevalence of 3%) and *Providencia* sp. (prevalence of 2%). No viruses were detected. Skin and gill scrapings revealed the presence of *Gyrodactylus* sp., *Trichodina* sp., and *Tetrahymena* sp.

### **B. Fall 2014 Inspections**

#### Pre-Stocking Fingerlings (salmonids and muskellunge)

Nine lots of production fish (60 fish per lot) from MDNR hatcheries were inspected prior to stocking in Summer/Fall 2014. These included steelhead trout and Muskellunge at WLSFH; Assinica strain Brook Trout and Seneca strain Lake Trout at MSFH; steelhead trout and Gilchrist strain Brown Trout at TSFH; Eagle Lake strain Rainbow Trout at OSFH; Atlantic Salmon at PRSFH; and Atlantic Salmon at LSSU-ARL. *R. salmoninarum* was detected in 2% of TSFH steelhead at low titers. No other reportable pathogens were detected.

#### Captive Broodstock

*Inspections.* The *Aeromonas salmonicida* vaccine was administered to fish to prevent infections caused by *A. salmonicida salmonicida*. Fourteen lots of captive broodstock were inspected in fall 2014. From MSFH, two lots of Assinica strain Brook Trout and two lots of Lake Superior strain lean Lake Trout were inspected in August. From OSFH, two lots of

Gilchrist Creek strain Brown Trout, three lots of Sturgeon River strain Brown Trout, three lots of Wild Rose strain Brown Trout, and two lots of Eagle Lake strain Rainbow Trout were inspected in September. *R. salmoninarum* was detected in two lots of fish from OSFH at 2% prevalence (medium titer in Eagle Lake strain Rainbow Trout and low titer in Sturgeon River strain Brown Trout). No other reportable pathogens were detected. Skin and gill scrapings revealed monogeneans (e.g., *Gyrodactylus* sp.), and ciliated protozoans in some lots.

*Preventative measures to minimize the vertical transmission of R. salmoninarum.* Gametes were collected in the fall of 2014 from ten lots of salmonid broodstock at OSFH and MSFH. Gametes from sixty fish each were collected from six lots of Brown Trout (Gilchrist, Sturgeon River, and Wild Rose strains) and two lots of Eagle Lake strain Rainbow Trout at OSFH. *R. salmoninarum* was detected by Q-ELISA in one pool (5 fish per pool) of ovarian fluid from Eagle Lake strain Rainbow Trout (high titer level). Post-spawn gametes from 364 Assinica strain Brook Trout at MSFH were held in isolation for 24-hours pending laboratory results while milt or ovarian fluid samples from each fish were tested for the presence of *R. salmoninarum* using Q-ELISA in order to minimize vertical transmission and incidence of *R. salmoninarum* in hatchery stocks. *R. salmoninarum* was not detected in any of the tested Brook Trout gametes.

Additionally, all gametes were tested for the presence of VHSV, IPNV, and IHNV. All completed test results were negative for viruses.

### Feral Broodstock

*Chinook and Coho Salmon.* Thirty pairs of Chinook Salmon returning to each of the Little Manistee River (LMRW) and Swan River Weirs (SRW) and thirty pairs of Coho Salmon returning to the Platte River Weir (PRW) were examined. *R. salmoninarum* was not detected in any of the tested samples. Prevalence for *A. salmonicida* was 20% in the LMRW, 2% in the PRW, and was not detected at the SRW. *Y. ruckeri* was not detected. Non-reportable bacteria that were detected included: *F. psychrophilum* (prevalence of 17% in SRW and 57% in LMRW); *F. columnare* (prevalence of 43% in SRW, 2% in LMRW, and 25% in PRW); and motile *Aeromonas* spp. (prevalence of 20% in LMRW and 2% in PRW). No viruses were detected.

*Atlantic Salmon.* Thirty pairs of Atlantic Salmon returning to the St. Mary's River, LSSU-ARL were examined. Bacteria isolated include reportable *A. salmonicida* (prevalence of 2%) and non-reportable *F. psychrophilum* (prevalence of 63%). No other reportable bacterial or viral pathogens were detected in the thirty pairs of fish examined. Other isolated non-reportable bacteria included motile *Aeromonas* spp. (prevalence of 25%).

### **C. Coolwater Broodstock Inspections**

Inspections were conducted on all coolwater broodstock populations in the spring of 2014 (242 fish). These included full examinations on Walleye from the Tittabawassee River (n=60), Muskegon River (n=60), and Little Bay de Noc (n=60); full examinations (n=10) and non-lethal inspections (n=28) on Muskellunge from the Detroit River; and non-lethal

inspections on Lake Sturgeon from Black Lake (n=21) and the Menominee River (n=3). No reportable pathogens or *Heterosporis* sp. were detected. Non-reportable bacteria isolated included: *Klebsiella* sp. (Walleye, Muskegon River, 2% prevalence); motile *Aeromonas* spp. (Walleye, Muskegon River, 2% prevalence); non-motile *Aeromonas* spp. (Walleye, Little Bay de Noc, 2% prevalence); and *Providencia* sp. (Muskellunge, Detroit River, 20% prevalence). Skin and gill scrapings revealed parasites that included: monogeneans (e.g., *Gyrodactylus* spp. in Walleye from Tittabawassee River and Little Bay de Noc); sessile ciliates (e.g., *Apiosoma* spp., *Epistylis* spp. and/or *Ambiphrya* spp. in Walleye from Muskegon River and Little Bay de Noc, and Muskellunge from the Detroit River); protozoans (e.g., *Trichodina* spp. in Walleye from the Tittabawassee River, Muskegon River and Little Bay de Noc); *Henneguya* spp. in Muskellunge, Detroit River); and crustaceans (e.g., *Argulus* spp. in Walleye from the Tittabawassee River and Little Bay de Noc).

#### **D. Private Aquaculture Farms and Bait Fish**

For private aquaculture facilities to stock private fish in public waters, fish must be certified free of IPNV, VHSV, IHNV and *M. cerebralis*. Only IPNV was detected in samples from one private aquaculture facility.

To control the spread of VHSV, the bait industry is required to certify bait that is marketed statewide as VHSV-free certified free bait. No positive VHSV detections were found during the certification process.

#### **E. Response to 2014 Fish Kills Reports**

No fish were submitted for testing in 2014 due to wild fish kills. Fish kills, other than a few winterkill mortalities, were rare in 2014. This is likely attributable to the relatively mild open water conditions.

#### **F. VHSV Surveillance**

The Michigan DNR VHSV surveillance was initiated in 2006. During 2014, 26 cases of Walleye fry and Muskellunge fry (11,639 fry) were submitted for VHSV testing. No VHSV was detected.

#### **G. Diagnosis of Clinical Cases**

Fish were submitted by MDNR hatcheries for thirteen clinical cases from production lots and two clinical cases from broodstock lots for laboratory diagnoses following episodes of elevated mortality and/or morbidity. *Flavobacterium* spp. were most commonly associated pathogen with these disease events. Other pathogens associated with mortality included *R. salmoninarum*, which was detected in two diagnostic cases at 5-10% prevalence, as well as IPNV and motile *Aeromonas* spp. Antibiotic sensitivity testing was performed as appropriate, and Investigational New Animal Drugs (INAD) or other approved FDA treatments were recommended, and fish treated following INAD or label requirements.

IPNV was detected in February and March in three OSFH lots of production Brown Trout (Wild Rose and Sturgeon River strains), including at least one lot of fry that experienced mortality and disease signs associated with IPNV infection. Additional sample collections and subsequent testing of Brown Trout fingerlings (no signs of disease) by rearing unit failed to yield any cytopathic effect (CPE) on cell culture or to detect the virus via PCR, thereby confirming initial suspicions that viral titers were extremely low in these fish. During the same period, one lot of future Brown Trout brood stock (Wild Rose strain) reared at OSFH also experienced a mortality event associated with IPNV and was eventually destroyed. IPNV was also detected in MSFH in 2014, a facility that had never tested positive for IPNV from 1970-2013, though sampling of wild Brook Trout inhabiting Cherry Creek, the main hatchery water source, detected IPNV in 2013. For this reason, production Brook Trout were sampled by rearing unit (60 fish per rearing unit, 6 rearing units) in order to detect IPNV if present at a low prevalence. The results from this testing revealed that one of the six rearing units was positive for IPNV at detectable levels (CPE within 28 days on cell culture and positive via PCR) despite the absence of disease signs in the sampled fish. Additionally, 720 fish from OSFH, MSFH, and HSFH were tested specifically for IPNV, all of which were negative.

## **H. Wild Inspections**

Ten cases (383 fish) were submitted for examination from surface water supplies for PRSFH and MSFH. The fish species tested included Brown Trout, Brook Trout, Rainbow Trout, and Mottled Sculpin. All submitted fish were tested for the presence of IPNV, VHSV and IHNV. Additionally, submitted salmonids were tested for the presence of *R. salmoninarum* and *M. cerebralis*. *R. salmoninarum* was detected in Brown and Brook Trout from the Cherry Creek at a prevalence of 1-2%. *M. cerebralis* was not detected in any of the sites tested in 2014. EEDV was not detected in wild fish in 2014, despite its detection during 2013 in Mottled Sculpin (*Cottus bairdii*) from Cherry Creek.

Seven species (Rock Bass, Bluegill, Largemouth Bass, Brown Trout, Brook Trout, Yellow Perch, and Brook Silversides) were inspected from multiple sites in six inland lakes and rivers (960 total fish) and examined for viruses (IPNV, VHSV, IHNV, and/or LMBV), *R. salmoninarum*, *M. cerebralis*, and *Heterosporis* sp. None of the aforementioned viruses were detected at 15°C or 25°C. *R. salmoninarum* and *M. cerebralis* were detected in brown and brook trout collected from multiple AuSable River sites. *R. salmoninarum* prevalence ranged from 2-17% in the six AuSable River sites that were positive. *M. cerebralis* was detected at two sites in the AuSable River, with prevalence ranging from one out of three pools to two out of four pools (n=5 fish per pool). *Heterosporis* sp. was not detected in any waterbody.



## HATCHERY CLASSIFICATION REPORT

**Report Period:** 01-01-13 to 12-31-14      **Report Date:** 01-6-15

HATCHERY NAME	Location	Pathogen Acronym
Harrietta SFH	Harrietta	B
Marquette SFH	Marquette	B-BK, VL, VP
Oden SFH	Oden	B-BK, VP
Platte River SFH	Beulah	B-BK
Thompson SFH	Thompson (Manistique)	B-BK
Wolf Lake SFH	Mattawan	B-BK
LSSU-ARL	Sault Ste. Marie	B

Report Prepared by: Martha Wolgamood  
 Title: Hatchery Manager  
 Phone Number: 269-668-2696

### EMERGENCY FISH DISEASES

<u>Disease</u>	<b>Disease Pathogen</b>	<b>Disease Acronym</b>	<b>Pathogen Acronym</b>
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

<u>Disease</u>	<b>Disease Pathogen</b>	<b>Disease Acronym</b>	<b>Pathogen Acronym</b>
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.



## HATCHERY CLASSIFICATION REPORT

**Report Period:** 01-01-13 to 12-31-14      **Report Date:** 01-6-15

FERAL STOCKS	Location	Pathogen Acronym
Coho salmon (MI)	Platte River Weir, Beulah	B-BF
Chinook salmon	Little Manistee River Weir	B-BF
Chinook salmon	Swan River Weir, Rogers City	B
Steelhead trout	Little Manistee River Weir	B-BK
Lake trout (lean)	Lake Superior	B
Atlantic salmon	Lake Superior State University	B-BK, BF

Report Prepared by: Martha Wolgamood  
 Title: Hatchery Manager  
 Phone Number: 269-668-2696

### EMERGENCY FISH DISEASES

<u>Disease</u>	<b>Disease Pathogen</b>	<b>Disease Acronym</b>	<b>Pathogen Acronym</b>
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

<u>Disease</u>	<b>Disease Pathogen</b>	<b>Disease Acronym</b>	<b>Pathogen Acronym</b>
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.



## SALMONID IMPORTATION REPORT

Agency State of Michigan

Reporting Period 01/01/14– 12/31/14

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.	Sullivan NFH Brimley, MI	Lake trout Seneca 310,912	10,563/L	A	09/23/2014	Kenneth Phillips	Lake Superior	MSFH
2.								
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.	Sullivan NFH Brimley, MI	Lake trout Seneca 300,000		A			Lake Superior	MSFH

II. Lab Findings

III. Other



## Agency Fish Health Annual Report to Great Lakes Fish Health Committee for 2014 01-27-15

### State Coldwater Hatchery fish health inspection

Annual fish health inspections were performed at all five of Minnesota's state coldwater hatcheries. The inspection program includes lethal sampling of all lots of fish at the time of inspection as well as ovarian fluid sampling during spawning. A total of 2,484 fish were inspected. French River hatchery continues to have low level detection of *Renibacterium salmoninarium*. No other certifiable pathogens were detected at any of the hatcheries. This fall, ovarian fluid from 1,521 fish was screened for *R. salmoninarium* and viruses at 4/5 of the state hatcheries. No *R. salmoninarium* or viruses were detected.

### Wild Egg Takes

Kamloop, steelhead rainbow trout eggs were taken from Lake Superior this spring at French River hatchery. Pair spawning was performed in an effort to cull fish positive for *R. salmoninarum*. Ovarian fluid from 127 kamloop and 11 French River wild steelhead were tested for *R. salmoninarum* and viruses. Using ELISA, we detected *R. salmoninarum* in 3.93% of kamloop and 27% of steelhead. No viruses were detected. *R. salmoninarum* positive eggs were discarded.

### Hatchery Diagnostic Cases

#### Crystal Springs State Fish Hatchery

- Slow mortality occurred in LAT-08 and LAT-11 broodstock this summer (July). The fish displayed a few clinical signs of disease including hemorrhagic open sores on the gill operculum and tail area, muscle lesions, and cataracts of the eye. Bacterial culture from the lesion and the kidney were identified as *Aeromonas salmonicida*. Terramycin medicated feed was ordered and fed to the fish. After the first treatment, one more brood fish died and *A. salmonicida* was subsequently isolated from that fish. Following the isolation, the fish were given second treatment of terramycin medicated feed. One more mortality was observed almost three months later displaying a hemorrhagic intestine and vent. Again, *A. salmonicida* was isolated. Florfenicol medicated feed was ordered and fed to the entire raceway once all fish were back on feed post spawning. No mortality occurred after last treatment. We are considering vaccinating the young of the year.



## Lanesboro State Fish Hatchery

- Moderate mortality was seen in rainbow trout fingerlings this summer. Fish displayed heavy mucus on the skin, cataracts of the eye, and eroded and frayed tails. Gills were hyperplastic with heavy mucus. Internal organs appeared normal. *Flavobacterium spp.* was isolated from the tails. Two treatments of terramycin were given. The mortality rate was reduced from the 1.24% to 0.25-0.5%. Fish then was moved to hatchery pond and no mortality was observed thereafter.

## Cool Water Fish Testing for VHS:

VHS susceptible fish species continue to be screened for VHS in MN. A total of 13,000 specimens were tested. No virus was detected.

## Fish Kill Investigation

Four fish kill cases were brought in for investigation during the summer season. Bacterial infection due to *Flavobacterium spp.* and *A. hydrophilia* were the likely cause of the kills.

## VHS Testing Requirement change

Testing requirements for harvesting VHS susceptible minnow species from waters of the state for sale or use within the state have changed slightly. The minnow dealer may now choose between real time Reverse Transcriptase - Polymerase Chain Reaction (rRT-PCR) or Viral Isolation (VI) as the test method.

Testing requirements for moving VHS susceptible fish species from licensed waters (rearing waters) to destinations within the state of Minnesota are now dependent on the location of the licensed source water body. Two zones have been established: 1) Lake Superior watershed; and 2) outside of Lake Superior watershed. If a licensed water body falls into more than one zone, the more stringent (Lake Superior watershed) requirements will apply. These testing requirements do not pertain to fish originating from wild sources or to fish being moved outside of the state.

The chart below summarizes the revised testing requirements for VHS susceptible fish species being moved from licensed waters to destinations within the state of Minnesota:

	Lake Superior Watershed	Outside of Lake Superior Watershed
<b>Period of validity for test results</b>	one year from the date of sampling	two years from the date of sampling
<b>Number of fish to be tested (single species)</b>	60*	60*
<b>Number of fish to be tested (multiple species)</b>	150*	150*
<b>Test method to be used</b>	Choice of: VI (28 days) or rRT-PCR	Choice of: VI (14 days) or rRT-PCR

\* Numbers represent a 95% confidence level of detecting 5% incidence of disease. This number is dependent on the size of the population being tested.

## Cold Water Hatchery Classification

### Hatchery Classification Report

Minnesota

Report Period: January 1 to December 31, 2014

Report Date: January 10, 2015

Hatchery Name	Location	Pathogen Acronym
Crystal Springs	Altura	B-BK(3/12)BF(07/14)
Lanesboro	Lanesboro	B-BK(10/11)
French River	Duluth	B-BK(5/12)
Peterson	Peterson	B-BK(9/12)
Spire Valley	Remer	B-BK(3/12)

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>	CS	SC*
proliferative kidney disease	sporozoan	PKD	SP*

#### RESTRICTED FISH DISEASES

Disease	Disease Pathogen	Disease Acronym	Pathogen Acronym
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.

\*\* Field diagnostic test not available.

January 29, 2015

## **Agency Report to the Great Lakes Fish Health Committee for 2014**

### **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 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 20 locations (1,407 fish) and clinical testing was done at the USFWS fish health center in Lamar, PA. Three different pathogens were isolated this year, all from salmonids. EEDv was isolated from one location this year, from Lake Trout in Otsego Lake. In previous years, EEDv was isolated from several locations annually, and consistently from Lake Ontario. Newly discovered Salmonid Herpesvirus 5 (NaHV) was identified from Lake Trout in two different locations, including Lake Ontario and Otsego Lake. In fact, the previous reports of EEDv in Lake Ontario were probably NaHV instead. The two viruses share similar homologies and couldn't be distinguished by the previous PCR method. Finally, *Myxobolus articus* was isolated from Brook Trout at two different locations, Slush Pond in the Adirondack Mountains, and the Connetquot River in Long Island. None of New York's eight regulated fish pathogens were detected in our wild fish collections. Also not found in 2014 was *Nucleospora salmonis* which has been consistently found in previous years.

*Wild Fish Disease Investigations:* Cornell conducted 16 fish disease investigations in 2014. Viral Hemorrhagic Septicemia was isolated from Gizzard Shad in Dunkirk Harbor, Lake Erie in March. The investigation was initiated as a result of a prominent fish kill. Epizootics like this are common with shad in spring, yet VHS isn't always found. Alewives collected during concurrent fish kills at two different locations on Lake Ontario were negative for VHS in May. In those cases, lesions were consistent with VHS, although no cause was identified. Many other cases were fish with commonly occurring diseases and were often small scale events. This included a small scale kill of Yellow Perch and Rock Bass due to a *F. columnare* outbreak on Canandaigua Lake in June and Lymphosarcoma in Northern Pike in Lake Ontario in October. In November, anglers reported seeing lethargic Steelhead Salmon listlessly floating down the Salmon River. Thiamine deficiency was determined to be the cause and an effort was made to inject all feral adults arriving at the hatchery with thiamine. As of this report, 1,153 fish have been injected in four different trials. The mortality rate so far is 30% and largely due to gluco-regulatory collapse where those fish simply lacked the energy to recover from the trauma of handling.

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

The overall health of fish in our hatchery system has been good. Many diseases we routinely encountered in previous years, such as prominent Saprolegnia in our trout brood stock and Gyrodactylus infestations in our Brook Trout have been mostly resolved. Also, our hatchery system has been free of program viruses, such as IPN, for decades. We do have recurring 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. These 4-yr old fish were on site during the 2012 event and we speculate that the rigors of spawning may simply have triggered disease activity in latent fish. After eggs were successfully collected, the entire year class of fish was destroyed. All other lots, including Brook Trout, were retested and no *A. salmonicida* was isolated which demonstrates the resiliency of the strain. It's worth noting that NONE of the fish in Rome Hatchery production tested positive at any time this year. Rome Hatchery, was downgraded to 'AS' for two more years and fish may not be transferred from Rome to other hatcheries.

*Flavobacterial Diseases:* In 2014, the usual epizootics of bacterial gill disease, bacterial cold water disease, and columnaris disease appeared throughout our hatchery system along with other undescribed Flavobacteria. These comprise the majority of our clinical hatchery work. In our quest to reduce Terramycin use, we did have success using Perox-Aid and Chloramine T in combatting columnaris disease and bacterial coldwater disease on several occasions. 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 2015 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 columnaris in Tiger Muskellunge at our South Otselic Fish Hatchery. The fish were naturally infected, and one group was treated with Chloramine T (20 mg/L) and the 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 has been submitted to the FDA for review. In 2015, we plan to conduct a similar study using OTC-343 at South Otselic.

## **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 2014, 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 56 inspections in 2012 totaling 5,196 fish. *Aeromonas salmonicida* was isolated from chinook and coho adults during egg collections at the Salmon River and production fish at the Rome State Fish Hatchery in 2014 and an atypical variant of *Yersinia ruckeri* was isolated from wild Brook Trout from Big and Little Hill Ponds in the Adirondacks. These fish are used as gamete sources for our heritage Brook Trout program and the fish are not 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, 2014 to Dec 31, 2014

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 (11/14)</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 (10/14)</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 29, 2014



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.



### **Pennsylvania Fish and Boat Commission**

### **Annual Hatchery Disease Classification and Importation Report**

January 1, 2014 –December 31, 2014

#### **Restricted Pathogens**

*Aeromonas salmonicida* with varying antibiotic resistance has been confirmed at several PFBC hatcheries in 2013. Detections were made while conducting diagnostic examinations and fish health inspections. The only notable detection occurred at the Union City State Fish Hatchery (SFH), *Aeromonas salmonicida* was isolated from Northern Pike adult brood that were collected in the wild and transported to the facility. This was the first detection at the facility and resulted in a change in its classification. Vaccination programs have been implemented at most PFBC salmonid facilities and results have been good to date. Additionally, improved biosecurity and changes in hatchery standard operation procedures (SOPs) have had positive results and are helping to control mortality due to *Aeromonas salmonicida*.

**Infectious pancreatic necrosis (IPNv)** has been detected at 11 PFBC hatcheries during 2014, these detections were made while conducting fish health inspections and diagnostic examinations. Significant Brook Trout fry mortality was attributed to IPNv at 3 facilities in 2014. Pair spawning, improved SOP's and an increased emphasis on biosecurity are being implemented at several hatcheries in an attempt to reduce the incidences of IPNv.

*Myxobolus cerebralis* was detected at the Bellefonte Hatchery in 2014

*Renibacterium salmoninarum* was detected at 4 PFBC hatcheries in 2014. Mortality was 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 2014.

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

Cutthroat Trout Virus was detected in a single lot of fingerling Brown Trout at the Bellefonte SFH and a single lot of adult BNT at the Tylersville SFH. CTV 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. 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 6 pools have tested positive for IPNV. This is the first time since 2007 that fish from Lake Erie tested positive for IPNV. All egg associated with the positive detections were discarded.

### **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 and Boat Commission Annual Salmonid Importations

### Salmonid Importations 2014

Source	Species/Number	Fish/Egg Size	Fish Health Status	Certification		Lake Basin
				Date	Official	
Tout Lodge	RBT 240,000	Eggs	A	5/2013	S. Nepper	Inland
NY Randolph Hatchery	BNT 200,000	Eggs	A-2	9/30/14	A. Noyes	Erie
Paint Brook NFH	BKT 150,000	Eggs	A	7/16/2013	J. Coll	Inland
White sulfur Springs NFH	RBT 275,000	Eggs	A	7/17/2013	J. Coll	Inland
Allegheny NFH	LAT 175,000	Eggs	A	8/16/14	J. Coll	Inland
Maine	BKT	Eggs	A	3/10/2014	DIFW	Inland

### Proposed Salmonid Importations 2014

Source	Species/Number	Fish/Egg Size	Fish Health Status	Certification		Lake Basin
				Date	Official	
NY Randolph Hatchery	BNT 200,000	Eggs	A-2	9/30/14	A. Noyes	Erie
Allegheny NFH	LAT 175,000	Eggs	A	8/16/14	J. Coll	Inland

**Pennsylvania Fish and Boat Commission  
2014 GLFHC Hatchery Classification report**

<b>Hatchery</b>	<b>Location</b>	<b>Disease Classification</b>	<b>Date</b> (*Results Pending)
Bellefonte SFH	Bellefonte	B- AS14 <sup>ROR</sup> ,RS14, MC14, IPN14, CTV14	12/10/2014
Benner Spring SFH	State College	B- AS14, IPNv 15	1/12/2015
Corry SFH	Corry	B- AS14,RS14, IPN14	7/24/2014
Fairview SFH	Fairview	B- IPNv 14	5/1/2014
Huntsdale SFH	Huntsdale	B- IPN14	11/4/2013
Linesville SFH	Linesville	B-IPN 14	1/23/2015
Oswayo SFH	Oswayo	B- IPN14, RS14, IPN14	9/24/2014
Pleasant Gap SFH	Pleasant Gap	B- AS14, RS14, IPN14, CTV13	3/26/2014
Pleasant Mount SFH	Pleasant Mount	B- AS13 (ror)IPN14	12/11/2014
Reynoldsdale SFH	Reynoldsdale	B- AS12 <sup>TMR</sup> , IPN14	12/22/2014
Tionesta SFH	Tionesta	A- (IPN 15)	6/13/2014
Tylersville SFH	Tylersville	B- AS, IPN14, CTV15	12/22/2014
Union City SFH	Union City	B – AS 14	10/23/2014
Van Dyke SFH	Van Dyke	A-2	6/11/2014

**Lake Erie Drainage Cooperative Nurseries**

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

**Wild Brood**

Steelhead	Lake Erie	C – IPNV 14	2/12/2014
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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

Report Prepared By: Coja Yamashita  
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**U.S. Fish and Wildlife Service—Midwest Region**  
**2014 Agency Report to the**  
**Great Lakes Fish Health Committee**  
(Prepared: January 27, 2015)



The La Crosse Fish Health Center (LFHC) provides fish health and diagnostic services for the eight-state U.S. Fish and Wildlife Service's (USFWS) Midwest Region. The center processed 269 cases in 2014, including fish health inspections at Federal and tribal fish hatcheries, post-mortem diagnostics, assistance to state agencies, and wild fish sampling as part of the National Wild Fish Health Survey.

### **HATCHERY INSPECTIONS**

**Federal Facilities.** The LFHC conducted two fish health inspections in 2014 at each of the National Fish Hatcheries (NFH) within the Midwest Region. More than 6000 fish tissue and fluid samples were screened at the La Crosse Fish Health Center for the fish pathogens as listed in the USFWS Aquatic Animal Health Policy, as well as the applicable fish pathogens from the Model Program for Fish Health Management in the Great Lakes. *Yersinia ruckeri* was detected in lake sturgeon at the Genoa NFH Warm and Cool Water Rearing Facility; clinical disease was not observed with this detection. No additional pathogens were detected at Genoa. Following two detections in 2011, 2014 was the third consecutive year that *Aeromonas salmonicida* was not detected at the Iron River NFH, allowing the facility to again attain Class A (specific pathogen free) status. The remaining facilities in the Midwest Region remained SPF (Class A). The Iron River NFH, Jordan River NFH, Pendills Creek, and Sullivan Creek NFH are located within the Great Lakes Basin, while the Genoa NFH and Neosho NFH are located outside of the Great Lakes Basin.

Walleye reared at the Rydell NWR in Eskine, MN were screened for fish pathogens prior to harvest. No pathogens were detected. Walleye reared at Rydell NWR are primarily stocked into tribal waters of Minnesota.

**Tribal Facilities.** The LFHC conducted a fish health inspection at each of the following tribal fish hatcheries in 2014: Grand Portage (Grand Portage, MN), Keweenaw Bay (L'Anse, MI), Lac du Flambeau (Lac Du Flambeau, WI), Little Traverse Bay Band of Odawa, (Levering, MI), and Red Cliff (Bayfield, WI). Fish pathogens were not detected during the fish health inspections at the tribal hatcheries in 2014. The Grand Portage, Keweenaw Bay, Lac Du Flambeau, and Red Cliff facilities maintained their SPF (Class A) The Little Traverse Bay Band of Odawa facility does not have a status because it is a new facility, and the 2014 inspection was its first.

## **DIAGNOSTIC CASES**

Nine (9) diagnostic cases from Federal, state and tribal rearing facilities were investigated by La Crosse FHC staff and involved the following species: bluegill, brook trout, lake sturgeon, lake trout, and walleye. The La Crosse FHC also assisted with the investigation of three (3) wild fish diagnostic cases involving bluegill, channel catfish, and common carp. Environmental conditions, nutritional issues, or the bacteria *Aeromonas hydrophila* and *Flavobacterium psychrophilum* were identified as the causative agents.

## **WILD FISH HEALTH SURVEY**

The La Crosse FHC collected tissue and fluid samples from more than 5700 warm, cool, and cold water fish. The fish were collected from 67 different sites in the Great Midwest Region.

Included in these numbers are fish captured in the surface water bodies that supply water to Iron River NFH (Schacte Creek), Jordan River NFH (5 & 6 Tile), Pendills Creek (Videans Creek and Pendills Lake), and Sullivan Creek NFH (Sullivan Creek). The tissues were screened for pathogens listed in the USFWS Aquatic Animal Health Policy and the applicable pathogens from the Model Program for Fish Health Management in the Great Lakes Model. No pathogens were detected.

## **ASSISTANCE TO STATES**

Primarily through reimbursable agreements, the La Crosse FHC provided laboratory support state natural resource agencies in Illinois, Iowa, Ohio, and Wisconsin. State personnel send fish tissue samples to the La Crosse FHC to screen for bacterial, viral, and/or parasitic fish pathogens as required by the applicable policies, including the USFWS Aquatic Animal Health Policy, Model Program for Fish Health Management in the Great Lakes, and numerous state policies.

Prepared by:

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# HATCHERY CLASSIFICATION REPORT

## U.S. FISH AND WILDLIFE SERVICE

### MIDWEST REGION

Report Period: January 1, 2014 to December 31, 2014 Report Date: 01/27/2015

<b>Hatchery Name</b>	<b>Location</b>	<b>Classification</b>
Genoa NFH (Cold Water)	Genoa, WI	SPF (Class A)
Genoa NFH (Quarantine—A)	Genoa, WI	NA (received eggs Fall 2014)
Genoa NFH (Quarantine—B)	Genoa, WI	NA (received eggs Fall 2014)
Genoa NFH (Warm & Cool Water)	Genoa, WI	YR (07/30/2009)
Grand Portage TFH	Grand Portage, MN	SPF (Class A)
Iron River NFH	Iron River, WI	SPF (Class A)
Jordan River NFH	Elmira, MI	SPF (Class A)
Neosho NFH	Neosho, MO	SPF (Class A)
Pendills Creek NFH	Brimley, MI	SPF (Class A)
Lac Du Flambeau TFH	Lac du Flambeau, WI	SPF (Class A)
Little Traverse Bay Band TFH	Levering, MI	NA (first inspection in 2014)
Keweenaw Bay TFH	L'Anse, MI	SPF (Class A)
Sullivan Creek NFH	Brimley, MI	SPF (Class A)
Red Cliff TFH	Red Cliff, WI	SPF (Class A)





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE



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### **2014 Annual Report to the Great Lakes Fish Health Committee from Fish and Wildlife Service Northeast Region; Region 5**

**January 29, 2015**

A fish health inspection was conducted at the Allegheny NFH in Warren, Pennsylvania on August 19, 2014. This inspection, including the testing of ovarian fluids at spawning (October 2014) marks the fourth consecutive annual fish health inspection without the isolation of a listed pathogen, thereby obtaining the hatchery classification of A-1.

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 stain future brood to Allegheny NFH, the station now rears Klondike strain Lake Trout future brood. The fish health inspection of all lots at Berkshire (Atlantic Salmon, Brook Trout, Rainbow Trout, and Lake Trout) took place on March 19, 2014 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 18, 2014 and all lots 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 2014, 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.

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 a Lake Trout population in Otsego Lake. A newly identified and similar virus, salmonid herpesvirus 5, was found by molecular techniques in that same Otsego Lake population as well as Lake Trout populations in Lake Ontario. These findings indicate the need for further, continued surveillance, which is planned to continue in 2015.

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 2014 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 2014 isolated an aquareovirus in cell culture and confirmed a bacterial culture as *Yersinia ruckeri*.

2014 HATCHERY CLASSIFICATION REPORT

Report Period Jan. 1, 2014– Dec 31, 2014 Report Date: Jan 29 , 2015

Hatchery Name Location Pathogen Acronym

Allegheny NFH Warren, PA A-1 08/19/2014

D.D. Eisenhower NFH Bethal, VT A-1 03/18/2014 U-V treated

Berkshire NFH Great Barrington, MA A-2 03/19/2014

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.

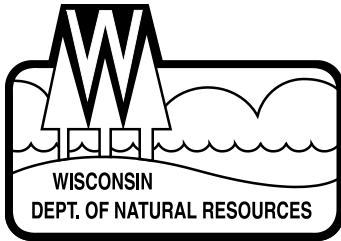
	<u>Source</u>	<u>Species/Number</u>	<u>Fish/Eggs Size</u>	<u>Fish Health Status</u>	<u>Certification Date</u>	<u>Certifying Official</u>	<u>Lake Basin</u>	<u>Imported to:</u>
1.	Eisenhower NFH N. Chittendon, VT	Lake trout - Seneca 31,000	yearling	A-1	03/18/2014	Barbash/Coll	Ontario	Stony Point, NY Lake Ontario
2.								Osego, 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>
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II. Lab Findings

III. Other



## State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott Walker, Governor  
Cathy Stepp, Secretary

101 S. Webster St.  
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29 January 2015

Annual Report to the GLFHC for the year 2014

### Fish Health Program

All fish lots to be stocked into Wisconsin waters were examined and tested for disease following either OIE or AFS Blue Book protocols. In addition, all fish collected from the wild as broodstock were tested.

**Cutthroat Trout Virus:** CTV continues to be observed in domestic brown trout at the Nevin and St. Croix Falls hatcheries, as well as the Seeforellen brown trout at the Wild Rose hatchery. With current biosecurity practices in place, there is no exchange of equipment or CTV + fish between these affected facilities and other WI DNR facilities. No clinical signs or adverse effects have been observed in the fish populations that have tested positive. Regular surveillance for CTV will continue in all samples from wild and hatchery fish during 2015.

**Orthomyxovirus:** A novel orthomyxovirus was discovered on April 23 in ovarian fluids collected from Chamber's Creek Steelhead at the Besadny Anadromous Fisheries Facility (BAFF). Eggs from these fish were raised at Kettle Moraine Springs State Fish Hatchery prior to receiving results. Cytopathic effect was detected during routine virology testing at the USFWS – La Crosse Fish and Wildlife Health Center, but no virus was confirmed with PCR. Samples were thus sent to Dr. Thomas Waltzek at the University of Florida – College of Veterinary Medicine for next generation sequencing. Dr. Waltzek determined that the unknown virus was in the family orthomyxoviridae, with only 40% similarity to ISA, but 90+% similarity to a virus isolated from rainbow trout in Washington State. Health risks posed by this virus are as yet still unknown. Preventative action was taken and the fertilized eggs from the affected lot were destroyed.

**Viral Hemorrhagic Septicemia:** VHS was discovered in ovarian fluids collected on October 20 from feral Coho at the Root River. Fertilized eggs from this spawning date and 3 subsequent samplings were transferred to Kettle Moraine Springs State Fish Hatchery Annex Building (KMSH Annex). Chinook eggs from the Strawberry Creek egg collection facility were also housed at KMSH Annex at the same time as the first Coho eggs from the first spawning date. Chinook and all Coho eggs were picked on shared equipment that was not disinfected between egg batches. KMSH Annex discharges into Mink Creek, which is upstream of the first impassable barrier on the Milwaukee River, which is generally considered to be VHS negative.

Half of the coho eggs from the first spawning date (October 20) were transferred to Les Voigt State Hatchery (LVH) after another disinfection process. At LVH, the Coho eggs were housed in the same building with LAT and splake eggs and yearlings (no shared equipment). WI DNR was then notified on November 25 by the USFWS LaCrosse Fish Health Center that 2 (5-fish) pools of ovarian fluid samples from the first spawning date were positive for VHS.

Eggs from the positive spawning date at both hatcheries were euthanized and subsequently incinerated. Additionally eggs taken on the October 23 and November 3 sampling dates that had no virology sampling were also destroyed. Both hatcheries were subsequently quarantined and disinfected and a review of biosecurity protocols and disinfection procedures was conducted. Facility and virology inspections for KMSH Annex was conducted on December 10 and January 5, 2015, and all remaining coho and chinook fry were VHS negative. On December 29, virology testing of the LAT and splake fry at LVH was performed, and results were also VHS negative. In Spring 2015, VHS surveillance will be performed at Mink Creek.

**Fathead Minnow (forage fish):** Virology testing of forage fish purchased from vendors for our muskellunge and walleye stocking programs has continued. Fathead minnow nidovirus and golden shiner virus were detected in several batches of fish collected during the year. There has been no morbidity or mortality in the muskellunge or walleye associated with these viruses.

***Aeromonas salmonicida* vaccination program:** Vaccination with an autogenous dip vaccine made by Kennebec River Biosciences continues to work very well to control this disease in brown trout held at our two open water supply hatcheries (Brule River and Thunder River hatcheries). Feeding a boosted diet 2 weeks before and after vaccination has also helped to enhance the immune response in these fish. An interesting aside: feral Coho broodstock at BAFF had a high incidence of furunculosis (26/60 fish), and no Seeforellen BNT broodstock were present at BAFF this year.

### **Wild Fish Concerns**

Black Crappies located in Barron County continue to be affected with masses referred to as “Black Crappie Sarcoma”. Many fish have been sampled in previous years with no success at isolating a pathogenic cause with the exception of an unknown virus detected in one fish. Further investigation into the etiology of this disease will be pursued this winter.

Gill lice (*Salmincola* sp) numbers have been steadily increasing over the past few years. Numbers in some water bodies have reached > 20 on all ages of brook trout examined, with many being as high as 80 per fish. Further consideration of management options are being conducted at this time.

### **Other News**

Drs. Bridget Baker and Megan Finley joined WI DNR this Fall, following Sue Marcquenski's retirement. David Giehtbrock has accepted WI DNR's Fish Culture Section Chief position following Al Kaas' retirement. They are all looking forward to collaborating with GLFHC members and other neighboring institutions on all issues related to fish health.

## HATCHERY CLASSIFICATION REPORT Wisconsin

**Report Period:** January 1 to December 31 2014      **Report Date:** January 29, 2015

Hatchery Name	Location	Pathogen Acronym
Art Oehmcke	Woodruff	A-2 (Bluegill virus in water supply)
Les Voigt (formerly Bayfield)	Bayfield	B-(VL)
Brule	Brule	A-2
Gov Thompson	Spooner	A-2 (Bluegill virus in water supply)
Kettle Moraine Springs	Adell	B-(BK)
Lake Mills	Lake Mills	A-2
Lakewood	Lakewood	Not in operation in 2013
Langlade	White Lake	Not in operation 2013
Nevin	Fitchburg	A-1 (CTV isolated 11/2012)
Osceola	Osceola	A-1
St. Croix Falls	St. Croix Falls	A-1 (CTV isolated 10/2012)
Thunder River	Crivitz	A-2
Wild Rose Great Lakes	Wild Rose	B-(BK) (CTV isolated 08/2013)
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 2013      **Report Date:** January 21, 2014

Hatchery Name	Location	Pathogen Acronym
Besadny Fisheries Facility	Kewaunee	B-BF, BK (CTV isolated 12/2012 and 12/2013; novel orthomyxovirus isolated 4/2014)
Root River	Racine	B-BF, BK, VE
Strawberry Creek	Sturgeon Bay	A-2
Lake Superior	Apostle Islands	B- (VL) (EEDv historically present)

<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 2014

### 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 TN	Arlee RBT ~150,000	eggs	Class A	12-9-2014	Norm Heil	Michigan
2.	Sullivan Creek NFH	Seneca Lake LAT	eggs	Class A	11-14-2014	Terry Ott	Superior
3.	Wolf Lake SFH	GL Spotted MUE	fingerlings	Class A	8-11-2014	Tom Loch	Michigan
4.							
5.							

### B. Proposed importations for 2015

	<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 TN	Arlee RBT ~176,000	eggs				Michigan
2.	Sullivan Creek NFH	Seneca Lake LAT	eggs				Superior
3.	Wolf Lake SFH	GL Spotted MUE	fingerlings				Michigan
4.							