

# GREAT LAKES FISH HEALTH COMMITTEE

## Annual Agency Reports 2011

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**2011  
Indiana Fish Health Report  
To The  
Great Lakes Fish Health Committee**

Two program pathogens were detected in production fish in 2011 among Indiana's cold-water production facilities. Those pathogens were *Aeromonas salmonicida* and *Renibacterium salmoninarum*. They were also found in wild summer-run steelhead broodstock. No viral infections were detected in any of Indiana's cool or warm-water hatcheries. Surveillance of wild populations for VHSV detected no viral agents. Five bodies of water were inspected using APHIS grant money. Two of these water bodies were Webster Lake and Brookville Lake; broodstock waters for Muskie and walleye, respectively. Investigation of two carp kill events yielded the presence of Koi Herpes virus. Coho spawners from the Platte River Weir tested positive for IPNV in 2009 which resulted in the down grading of two hatcheries' classification for three reporting years. This will be the last year for the VP classification. A third facility took on the classification when rainbow trout swim-ups were transferred from a VP classified hatchery.

*Renibacterium salmoninarum* was detected at four of five facilities. These stations were Avoca State Fish Hatchery, Bodine SFH, Curtis Creek Trout Rearing Station and Mixsawbah SFH. At Avoca, yearling rainbow trout tested positive. At Bodine, yearling summer-run steelhead, young-of-year summer-run steelhead and y-o-y Coho salmon tested positive. At Curtis Creek, yearling rainbow trout and y-o-y rainbow trout tested positive. At Mixsawbah, yearling summer-run steelhead, y-o-y summer-run steelhead, y-o-y Coho salmon and y-o-y winter-run steelhead tested positive. Of 12 lot inspections that looked for *R. salmoninarum*, eleven were positive. Range of prevalence for the positive cases was 1 of 60 to 16 of 60 with six cases exceeding 10% prevalence. None of these lots exhibited clinical signs of disease.

*R. salmoninarum* was also detected in wild harvest summer-run steelhead broodstock. Prevalence was low at 5 of 60. Source of these spawners was the St. Joseph River. Two collection sites were utilized at Berrien Springs, MI and South Bend, IN.

The high incidence among hatcheries with relatively high prevalence of the BKD pathogen sparked an investigation into the validity of results stemming from the use of the FAT. Results indicated a high degree of false positives. Lab personnel have undergone additional training and future screening will involve PCR confirmation.

*Aeromonas salmonicida* was detected at four hatcheries. Yearling rainbow trout at Fawn River SFH tested positive at a prevalence of 4 of 30. Yearling rainbow trout at Curtis Creek TRS tested positive at a prevalence of 1 of 30. Young-of-year Chinook at Mixsawbah SFH tested positive at a prevalence of 1 of 30. Young-of-year summer-run steelhead at Bodine SFH tested positive at a prevalence of 4 of 30. These lots did not display clinical signs of disease and were later stocked without incident. Wild caught summer-run steelhead trout broodstock at Bodine SFH also tested positive. Prevalence was 1 of 30.

An outbreak of furunculosis occurred at the Curtis Creek TRS in June. The infected lot was brown trout recently transferred from a Federal hatchery in Kentucky. Medicated feed was administered and the fish recovered.

This was the fifth year for viral testing in Indiana's cool and warm-water. All tested negative for viral agents. Wild broodstock for Muskie and walleye were not tested this year. Instead, Indiana's Board of Animal Health, using APHIS funding, inspected susceptible species in the two water bodies that hold these broodstock. Results were negative.

Surveillance efforts examined 1,058 fish representing 18 species from 10 cases. Six of these cases were funded with an APHIS grant. No VHSV or Largemouth Bass virus was found. The other four cases were for two separate carp kill events. Three sampling events were conducted during a July carp kill on the St. Joseph River in St. Joseph County. A total of three redhorse and 18 carp were examined. All exhibited bacterial and parasitic infections. Additionally and most importantly, the carp were positive for Koi Herpes Virus (KHV). This was the first documented occurrence in Indiana. The fourth case, in September, was also a carp kill. It occurred in Raglesville Watershed Lake located in Daviess County. KHV was detected with some bacterial involvement.

**Hatchery Classification Report**  
**Indiana Department of Natural Resources**

**Report Period:** January – December, 2011

**Report Date:** 01/27/2012

<b>Hatchery Name</b>	<b>Location</b>	<b>Pathogen Acronym</b>
Avoca SFH	Avoca, IN	B-BK(1/11)
Bodine SFH	Mishawaka, IN	B-BF(8/11), BK(8/11), (VP[10/09])
Curtis Creek TRS	Howe, IN	B-BF(6/11),BK(6/10), (VP[10/09])
Fawn River SFH	Orland, IN	B-BF(2/11)
Mixsawbah SFH	Walkerton, IN	B-BF(2/11), BK(9/11), (VP[10/09])

Skamania Steelhead Broodstock (wild)	Mishawaka, IN	B-BF (1/11), B-BK (1/11)
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**Report Prepared By:** Dave Meuninck

**Title:** Hatchery Manager/Fish Health Coordinator

**Phone Number:** 574-255-4199

**EMERGENCY FISH DISEASES**

<b>Disease</b>	<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	Ceratomyxa Shasta 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> 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 know to have been made. \*\* Field diagnostic test not available.

## SALMONID IMPORTATION REPORT

Agency Indiana Department of Natural Resources

Reporting Period January – December, 2011

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

	<u>Source</u>	<u>Species/Numb</u>					
1.	Troutlodge, WA	RBT/106,920 Eyed-Eggs	8,910/L	A	10/7/11	Jim Thompson	Erie/Michigan/ Ohio River
2.	Wolf Creek NFH, KY	BNT/3000	9”	BF	12/8/10	Norman Heil	Michigan/Ohio River
3.	Jake Wolf SFH, IL	BNT/36,300	2.91”	BK	3/29/11	Ken Phillips	Michigan
4.							
5.							

**B. Proposed importations.**

	<u>Source</u>	<u>Species/Numb</u>					
1.	Troutlodge	RBT/110,000 Eyed-Eggs	10,000/L	A	Nov ‘12	Jim Thompson	Erie/Michigan Ohio River
2.	Jake Wolf SFH, IL	BNT/30-50,000	3”	BK	Mar ‘12	Ken Phillips	Michigan
3.							
4.							

**II. Lab Findings**

**III. Other**



STATE OF MICHIGAN

RICHARD D. SYNDER  
GOVERNOR

DEPARTMENT OF NATURAL RESOURCES  
LANSING

RODNEY STOKES  
DIRECTOR

January 6, 2012

TO: Great Lakes Fish Health Committee

FROM: Michigan Department of Natural Resources, Fisheries Division (MDNR) and  
Michigan State University Aquatic Animal Health Laboratory (MSU-AAHL)

SUBJECT: 2011 Fish Health Report

In 2011, MDNR continued the partnership with MSU Colleges of Veterinary Medicine and Agriculture and Natural Resources (Aquatic Animal Health Laboratory) to provide aquatic animal health services for Michigan. All lots were examined and tested for reportable diseases following the guidelines in the Great Lakes Fishery Commission – Great Lakes Fish Health Committee (GLFHC) Model Fish Health Program. A summary of their findings is below.

### **A. Spring 2011 Inspections**

#### Pre-Stocking

Twenty-seven lots of fish (60 fish per lot) from six State of Michigan Fish Production Facilities and the Lake Superior State University Aquatic Research Laboratory (LSSU-ARL) were tested prior to stocking in spring 2011. This included six lots of brown trout, four lots of rainbow trout, three lots of Chinook salmon, three lots of Atlantic salmon, one lot of coho salmon, five lots of lake trout, three lots of brook trout, one lot of splake, and one lot of lake herring. All lots were examined for reportable diseases as following the guidelines in the GLFHC Model Fish Health Program.

*Renibacterium salmoninarum*, the causative agent of Bacterial Kidney Disease and a GLFHC reportable pathogen, was detected using quantitative ELISA assay (Q-ELISA) in ten lots of fish at low and medium antigen levels, with prevalence ranging from 1.7% to 5%. *Aeromonas salmonicida salmonicida*, the causative agent of furunculosis and also reportable to GLFHC, was isolated for the first time in a Michigan State Fish Hatchery since 2005, despite MDNR putting great effort into its eradication with vaccinations and enhanced biosecurity. In addition, nine representative lots from these hatcheries were examined and found negative for *Myxobolus cerebralis* (whirling disease). Skin and gill scrapings revealed monogeneans, ciliates, and protozoans.

### Captive Broodstock

Gamete samples from captive broodstock lots at Oden State Fish Hatchery (OSFH) were submitted to MSU-AAHL for testing in January 2011 after spawning was completed. Gamete samples from 60 Sturgeon River brown trout and 60 Eagle Lake rainbow trout broodstock were submitted for Q-ELISA and virology testing. No *R. salmoninarum* or viruses were detected.

### Feral Broodstock

Sixty returning steelhead spawners from the Little Manistee River Weir (LMRW) were examined. No *Aeromonas salmonicida* or *Yersinia ruckeri* was detected. *R. salmoninarum* was detected at low antigen levels in the milt samples from one of thirty males tested. Non-reportable *Flavobacterium psychrophilum* was also detected.

## **B. Fall 2011 Inspections**

### Pre-Stocking

Fifteen lots of production fish (60 fish per lot) from MDNR fish production facilities were inspected prior to stocking in Fall 2011. These included steelhead trout and muskellunge at Wolf Lake State Fish Hatchery (WLSFH); Assinica brook trout at Marquette State Fish Hatchery (MSFH); steelhead and Atlantic salmon at Thompson State Fish Hatchery (TSFH); Wild Rose brown trout and Eagle Lake rainbow trout at OSFH, Wild Rose brown trout and Eagle Lake rainbow trout at Harrietta State Fish Hatchery (HSFH); coho salmon at Platte River State Fish Hatchery (PRSFH); Atlantic salmon at LSSU-ARL, lake sturgeon from Black River lake sturgeon stream-side rearing facility, and channel catfish from St. Mary's State Fish Hatchery, Ohio. All lots were examined for reportable diseases following the guidelines in the GLFHC Model Program. *R. salmoninarum* was found in eight lots from six hatcheries, ranging from 1.7% to 10% prevalence. No other reportable diseases were found. Non-reportable bacteria detected include motile *Aeromonas* spp., *Pseudomonas* spp., *Shewanella* sp., *Serratia* spp., *Carnobacterium* sp., *Chryseobacterium* sp., and *Flavobacterium* spp. Skin and gill scrapings revealed monogeneans and ciliates.

### Captive Broodstock

*Inspections.* Prior to spawning, the FDA approved vaccine Furogen® (Aqua Health, LTD) was administered to broodstock lots at OSFH and MSFH. This treatment and vaccination regime was used to effectively reduce *A. salmonicida*. Fourteen lots of captive broodstock were inspected in Fall 2011. From MSFH, three lots of Assinica strain brook trout and five lots of Lake Superior strain lean lake trout were inspected in August. From OSFH, one lot of Gilchrist Creek strain brown trout, two lots of Sturgeon River strain brown trout, one lot of Wild Rose strain brown trout, and two lots of Eagle Lake strain rainbow trout were inspected in November. *R. salmoninarum* prevalence was 10% in one lot of the Sturgeon River brown trout; 20% in one lot of the Assinica brook trout; and 20% and 40% in the two Eagle Lake rainbow trout lots. Erythromycin treatment following approved FDA labeling was recommended for lots that exceeded 10% prevalence and included fish with medium or high antigen levels. *R. salmoninarum* was not detected in the Gilchrist Creek or Wild Rose brown trout, or in the Lake Superior lake trout samples. No other reportable pathogens were

detected. Non-reportable bacteria detected include *F. psychrophilum* and *Carnobacterium* sp. Skin and gill scrapings revealed monogeneans, ciliates, copepods, and presumptive *Saprolegnia* spp.

*Additional Preventative Measures for Broodstock Screening R. salmoninarum.* Gametes were collected in the Fall 2011 from five lots of broodstock at OSFH and MSFH were tested for the presence of *R. salmoninarum* using Q-ELISA to minimize vertical transmission and incidence in hatchery stocks. This screening is done in addition to water hardening eggs in erythromycin, which is standard for all salmonid eggs in MDNR fish hatcheries. Gametes were collected from 617 fish and tested for *R. salmoninarum*. These included 437 Assinica brook trout from MSFH, and 60 brown trout each from the Wild Rose, Sturgeon River, and Gilchrist Creek strains from OSFH. Eggs from individual pairings were kept separate until Q-ELISA testing was completed. Only those fertilized eggs that tested negative for *R. salmoninarum* antigen were kept for development of future broodstock and production fish. *R. salmoninarum* was detected in Assinica brook trout gametes at 2% prevalence (low and medium antigen levels), and was not detected in the gametes from the brown trout. The brown trout gametes were also screened for viruses; none were detected.

#### Feral Broodstock

*Chinook and coho salmon.* Examinations were conducted on returning Chinook salmon spawners from LMRW and Swan River Weir (SRW), and on returning coho salmon spawners from the Platte River Weir (PRW). Prevalence for *R. salmoninarum* was 1% for LMRW and SRW, and 3% at PRW. Prevalence for *A. salmonicida* was 20% for LMRW, 4% for PRW, and was not detected at SRW. *Y. ruckeri* was not detected. Non-reportable bacteria isolated include *F. columnare*, *F. psychrophilum*, motile *Aeromonas* sp., and *Carnobacterium* sp. at LMRW; *F. columnare*, *F. psychrophilum*, motile *Aeromonas* sp., *Shewanella* sp., and *Pseudomonas* sp. at SRW; and motile *Aeromonas* sp., *F. columnare*, and *F. psychrophilum* at PRW.

*Atlantic salmon.* Returning Atlantic salmon spawners were examined from St. Mary's River, LSSU-ARL. *R. salmoninarum* prevalence was detected in approximately 50% of the fish tested. *A. salmonicida* was detected in 2% of adult Atlantic salmon examined. Additional pathogens found include motile *Aeromonas* spp., *Enterobacter* sp., *Carnobacterium* sp., and *F. psychrophilum*.

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

Full and non-lethal inspections were conducted on coolwater broodstock populations in the Spring of 2011 (509 fish). These included northern pike from Little Bay de Noc; walleye from the Muskegon River, Tittabawassee River, and Little Bay de Noc; and muskellunge from Lake St. Clair and Detroit River. No reportable pathogens or *Heterosporis* sp. were detected.

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

A total of 2,690 fish (17 species) from Michigan's private aquaculture farms and bait

collection facilities were inspected for health certifications, including viral and whirling disease screenings. IPNV was detected in samples from one private aquaculture facility that has a history of this pathogen.

### **E. Response to 2011 Fish Kills Reports**

In 2011, fish kills were reported in January from Lake St. Clair, in May from Budd Lake, and in common carp from Kent and Silver Lakes in June and August, respectively. While external and internal hemorrhages were observed on Lake St. Clair fish submitted for analysis, no pathogen was identified as the cause of these mortalities. Though VHSV was detected in Budd Lake during other late spring and summer sampling, moribund fish collected at the time of the fish kill were not found to harbor the virus. Koi herpes virus (KHV) was detected in the Kent Lake and Silver Lake samples, and identified as the likely cause of these mortality episodes.

### **F. VHSV Surveillance**

The Michigan DNR VHSV surveillance initiated in 2006 continued through 2011 with 8 cases (4,740 fish) submitted to the MSU-AAHL for testing. Additionally, 15 cases of walleye fry were submitted for VHSV testing. No VHSV was detected.

### **G. Diagnostics**

Eighteen cases of production lots and two broodstock lots were submitted by MDNR production facilities for clinical diagnoses following episodes of elevated mortalities, fin erosion, or other signs and behaviors suspect for disease. Findings included motile *Aeromonas* spp., *F. psychrophilum* and other *Flavobacterium* spp., *Carnobacterium* spp., and *Pseudomonas* sp. *A. salmonicida* was isolated in three cases of Atlantic salmon from PRFSH. *R. salmoninarum* was detected in two cases of Atlantic salmon from PRSFH and in one case of steelhead from WLSFH, though this was not considered to be the cause of the observed mortality episodes. Skin and gill scrapings revealed monogeneans, ciliates, fungal hyphae, and bacilli. Antibiotic sensitivity testing was performed as appropriate, and Investigational New Animal Drugs (INAD) or other approved FDA treatments were recommended.

### **H. Wild Inspections**

Thirteen cases (498 fish) were submitted for examination from waters supplying PRSFH, HSFH and MSFH, and from the HSFH effluent pond. *R. salmoninarum* was tested for the salmonid species submitted. In trout samples from waters supplying HSFH, *R. salmoninarum* was prevalent at 22%; prevalence from brown and rainbow trout in the HSFH effluent pond was 12%. For waters supplying PRSFH, *R. salmoninarum* was detected in 33% of brown and brook trout from Brundage Creek and 21% of brown and brook trout from Brundage Spring Pond; *R. salmoninarum* was not detected in the coho salmon tested from PRSFH. Brook trout tested from Cherry Creek supplying MSFH were found to have *R. salmoninarum* prevalence of 3%. Whirling disease screening was performed on salmonids submitted from these locations. No spores were observed, though *Myxobolus cerebralis*, the causative agent of

whirling disease, was detected by qualitative PCR in one pool of 20 fish from each of Slagle Creek brown trout, Harrietta Effluent Pond mixed brown and rainbow trout, and from Brundage Spring Pond brown trout. Non-reportable bacterial pathogens detected from fish submitted from these sites include motile *Aeromonas* spp., *Carnobacterium* sp., and *Serratia* sp. from Cherry Creek; motile *Aeromonas* spp., *Carnobacterium* sp., and *Enterobacter* sp. from HSFH waters; and motile *Aeromonas* spp., *Shewanella* sp., and *Enterobacter* sp. from waters supplying PRSFH.

Three cases (122 fish) of bluegill, largemouth bass, and rock bass from Shupac Lake were submitted frozen and examined for pre-transfer inspection. No VHSV was detected.

Brook trout were sampled from Cranberry Creek for whirling disease screening; no spores were observed.

Common carp from Wolverine and Kent Lakes were submitted for KHV testing. While the tissues were negative for the virus by tissue culture, KHV was detected in tissues from both sites via PCR.



## HATCHERY CLASSIFICATION REPORT

**Report Period:** 01-01-10 to 12-31-11      **Report Date:** 01-6-12

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

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

### 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.



## HATCHERY CLASSIFICATION REPORT

**Report Period:** 01-01-10 to 12-31-11      **Report Date:** 01-6-12

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

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**

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\*\* Field diagnostic test not available.

## SALMONID IMPORTATION REPORT

Agency State of Michigan

Reporting Period 01/01/11 – 12/31/11

I. A. Known importations since last report.

	<b>Source</b>	<b>Species/Number</b>	<u>Fish/Eggs Size</u>	<u>Fish Health Status</u>	<u>Certification Date</u>	<u>Certifying Official</u>	<b>Lake Basin</b>	<b>Imported to:</b>
1.	Sullivan NFH Brimley, MI	Lake trout Seneca 350,000	7,800/L	A	08/05/2008	Becky Lasee	Lake Superior	MSFH
2.								
3.								

B. Proposed importations:

	<b>Source</b>	<b>Species/Number</b>	<u>Fish/Eggs Size</u>	<u>Fish Health Status</u>	<u>Certification Date</u>	<u>Certifying Official</u>	<b>Lake Basin</b>	<b>Imported to:</b>
1.	Sullivan NFH Brimley, MI	Lake trout Seneca 450,000		A	July 28, 2009	Ken Phillips John Whitney	Lake Superior	MSFH

- II. Lab Findings
- III. Other



## Agency Fish Health Annual Report to Great Lakes Fish Health Committee for 2011 01-20-12

### **State Coldwater Hatchery Health Inspection**

Annual inspections were performed at all state coldwater fish hatcheries. The inspection program includes lethal sampling of all lots of fish at the time of inspection and ovarian fluid sampling during spawning. A total of 2,490 fish were inspected. *Renibacterium salmoninarum*, the causative agent of Bacterial Kidney Disease was identified at a low level from two hatcheries, using bacterial culture. No other certifiable pathogens were detected. During ovarian fluid screening this fall, *R. salmoninarum* was detected in one sample using ELISA and was confirmed by FAT and bacterial culture at one of our A-1 hatcheries. The hatchery was subsequently downgraded to a B-BK classification. We made a conscious decision to eliminating the lot of the broodstock from the hatchery by stocking the fish into several confined ponds. We also destroyed the batch of eggs from the positive fish in attempt to avoid transmitting the bacteria to the rest of the fish in the hatchery.

### **Wild Egg Takes**

Kamloop rainbow trout eggs were taken from Lake Superior. In an effort to avoid propagating fish infected with *Renibacterium salmoninarum*, pair spawning was performed. Ovarian fluid was tested for *R. salmoninarum*, VHS, IPN, and IHN. In all, 3 (1.84%) of the 163 fish spawned tested positive for *R. salmoninarum* using ELISA. No viruses were detected. All *R. salmoninarum* positive eggs were discarded. Thirty adult kamloops were also examined for certifiable pathogens. *R. salmoninarum* was detected in three of the fish. No other pathogens were detected.

### **Captive Broodstock**

Ovarian fluid from captive steelhead broodstock during the spawning season was screened for *R. salmoninarum*, VHS, IPN, and IHN. *R. salmoninarum* was found in 5 (1.6%) of 318 fish spawned. No viruses were found.

### **Renibacterium salmoninarum detection at Mountain Lake**

No lake trout eggs were taken from Mountain Lake this year. However to maintain the health history of our broodstock source lake, we sampled and performed fish health testing on 60 lake trout. For the first time, *R. salmoninarum* was detected in the waterbody (2 fish). No other certifiable pathogens were detected. The agency is deciding whether or not to continue using this as a broodstock source lake since the hatchery propagating these fish has an A-1 classification.

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

Minnesota law requires fish to be tested for VHS before they are allowed to move from one body of water to another. A total of 1,194 ovarian fluid samples from muskellunge, northern pike and walleye were tested for VHS. No virus was detected. Eggs from these fish were water hardened and disinfected prior to movement. A total of 186 walleye and muskie fingerling ponds were also tested for VHS this year. Again, no virus was detected.

### **USDA-APHIS cooperative VHS surveillance grant:**

We continued to perform VHS surveillance as a part of the USDA-APHIS cooperative grant throughout 2011, thirty-four waterbodies tested negative for VHS. A total of 5,196 fish were tested using viral isolation.

### **SVCv found at new location in MN**

A small fish kill, affecting 200-300 common carp, occurred in Minnehaha Creek. The MN-DNR's fish pathology laboratory received 2 moribund fish on June 16, 2011. A complete necropsy was performed on the fish. Externally exophthalmia, hemorrhaging of the eyes, anal orifice, and skin, and blood in the oral cavity were noted. Internal necropsy of the fish revealed blood in the swim bladder, accumulation of serosanguineous liquid in the abdominal cavity, and hemorrhaged organs. Bacterial culture and viral samples were taken for further testing. *Chryseobacterium* and *Aeromonas hydrophila* group 2 were isolated from the kidney. *Acinetobacter baumannii/calcoaceticus* was isolated from the eye. Spring Viremia of Carp virus was isolated from the kidney/spleen samples and was confirmed by the University of Minnesota Veterinary Diagnostic Laboratory, and subsequently by National Veterinary Services Laboratories (Ames, IA)

## Cold Water Hatchery Classification

### Hatchery Classification Report Minnesota

Report Period: January 1 December 31, 20011

Report Date: January 24,2011

Hatchery Name	Location	Pathogen Acronym
Crystal Springs	Altura	B-BK
Lanesboro	Lanesboro	B-BK
French River	Duluth	B-BK
Peterson	Peterson	A-1
Spire Valley	Remer	B-(BK)

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

#### EMERGENCY FISH DISEASES

Disease Acronym	Disease Pathogen	Disease Acronym	Pathogen
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.

\*\* **Field diagnostic test not available.**

January 10, 2012

## **Agency Report to the Great Lakes Fish Health Committee for 2011**

### **Wild Fish Pathogen Inspection Program**

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 populations.

For the statewide survey, a wide range of fish species were collected from 23 locations (1,490 fish) and clinical testing was done at the USFWS fish health center in Lamar, PA. No program pathogens were identified from any collection. Additional EEDv and *Nucleospora salmonis* screening was conducted of salmonids collected from Great Lakes waters and a low level of EEDv was detected in Lake Ontario lake trout by PCR. Cornell investigated four separate fish disease epizootics in 2011.

### **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 2011, 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 51 inspections in 2011 totaling 3,600 fish. *Aeromonas salmonicida* was isolated from chinook and coho adults during egg collections at the Salmon River State Fish Hatchery in 2011, but no other program pathogens were detected in our hatcheries.

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

The DEC participates in two INAD projects, Chloramine T (INAD 9321) to treat for bacterial gill disease and Oxytetracycline (INAD 10-321) to treat an assortment of bacterial diseases. A number of our hatchery culture programs have predictable BGD epizootics that include tiger muskellunge and South Otselic, walleye at Oneida, steelhead salmon at Salmon River and domestic trout at several hatcheries. For another year, poor diet quality issues plagued our production programs, leading to increased disease activity and added challenges in therapy. Persistent *F. branchiophilum* epizootics were typically rare in the DEC system, but were more common in 2011, probably as the result of this inadequate diet. One disease having less impact in 2011 was bacterial coldwater disease (BCWD). In 2006, we determined that clinical *F. psychrophilum* infections were common in most of our brown trout facilities by April, but cranial

*F. psychrophilum* infection is detectable in February. So, brown trout are typically medicated as soon as this bacterial isolation occurs, and the result has been a dramatic decline in BCWD.

For decades, *F. columnare* epizootics in walleye have been enhanced by poor water quality and poor fish health because these epizootics occurred while fish are transitioning from artemia to artificial diets, a process where fish often starve for days before adapting to new diet. We typically lose 70% of our fish at this point, but we lost 90% this year. But we are now stocking most of our walleye 50 days post hatch and are avoiding those losses in diet transition.

### **Personnel Changes Due to State Budget Concerns**

Mr. Geoffrey Ecklerlin was hired as our staff biologist, replacing Fred Henson who became the coldwater unit leader in our bureau. Geof is a Ph.D. candidate from SUNY ESF and is studying VHS cycling in St. Lawrence River smallmouth bass.

Andrew D. Noyes  
Pathologist 2 (Aquatic)

Ohio Division of Wildlife  
Annual Report to the Great Lakes Fish Health Committee  
January 24, 2012

Hatcheries

London SFH	C-(A-2)
Castalia SFH	A-2
Kincaid SFH	C-(A-2) 05/16/06 Golden Shiner Virus 06/23/09
St. Marys SFH	Suspect aquareovirus, no confirmation available 05/09
Senecaville SFH	No viruses detected
Hebron SFH	No viruses detected

November 4, 2011 Castalia SFH received 94, 677 rainbow trout (27.4 fish/lb.) from London SFH. These fish (eggs) originated from Trout Lodge. Steelhead trout (133.9 fish/lb.) were received by Castalia SFH from Michigan DNR (Wolf Lake SFH) October 11, 2011.

During 2011, Ohio tested 60 fish of each species being raised at each of the six state fish hatcheries. In addition, wild populations utilized for gametes were sampled at each specific locality. Samples at each location included 150 fish susceptible to VHS; 60 fish of this sample were target species utilized for gametes.

All samples (hatchery and wild populations) were negative for reportable pathogens. No significant mortalities were observed at state hatchery facilities; no significant VHSv mortalities were reported in Ohio waters.

Ministry of  
Natural Resources

Ministère des  
Richesses naturelles

## 2011 Annual Report to the Great Lakes Fish Health Committee

### ONTARIO MINISTRY OF NATURAL RESOURCES

Testing is completed for Ontario Ministry of Natural Resources (OMNR) by the University of Guelph Fish Health Laboratory under the supervision of Dr. R. Stevenson. Wild adult fish used for spawn collections and fish from ten (10) fish culture stations (FCS) (Fig. 1) are tested.

In 2007, the OMNR established a direct phone line for public reporting of fish die-offs and OMNR responds to many die-off reports using site visits and sample collections when possible. Samples collected from fish die-offs were sent to the University of Guelph using a partnership with the Fish Pathology Laboratory under the supervision of Dr. J. Lumsden. Dr. Lumsden's lab continues to process samples from wild die-offs as required.

In 2011, The Ministry of Natural Resources collected surveillance samples for Viral Hemorrhagic Septicemia (VHS) in Ontario in partnership with the Canadian Food Inspection Agency (CFIA) from 12-Mile Lake, Bella Lake, Gurd Lake, Paudash Lake and Lake Rousseau as part of the OMNR's fish community broadscale monitoring program. Samples were also taken from Lake Superior and Lake Simcoe and were processed at the Fish Health Laboratory.



Figure 1. Location in Ontario of nine Ministry of Natural Resources hatcheries and Ringwood Fish Culture Station run by the Metro East Anglers association.

## Emergency Fish Pathogens

### Viral Hemorrhagic Septicemia (VHS)

The Canadian Food Inspection Agency has confirmed the presence of VHS in Lake Simcoe in 2011 using quantitative PCR. To slow the spread of VHS to other watersheds, a new management zone has been established around Lake Simcoe and Commercial bait operators will be prohibited from moving baitfish, whether alive or dead, into or out of the Lake Simcoe Management Zone

## Restricted Fish Pathogens

### *Aeromonas salmonicida*

Furunculosis, caused by *Aeromonas salmonicida*, was detected in 8 of 62 adult Chinook Salmon collected from the Credit River and 5 of 12 Coho salmon between the 5<sup>th</sup> and 31<sup>st</sup> of October 2011 during routine testing. There were no clinical signs of disease.

### *Yersinia ruckeri*

Enteric redmouth disease (ERM) caused by the bacterial pathogen *Yersinia ruckeri*, was detected in the heart of one of 30 wild lake trout from Lake Manitou. ERM was also detected in the heart and liver of one of one lake trout from Red Lake. A serotype of *Y. ruckeri* not considered to be endemic was also found in the heart and kidney of one brown trout brood fish from Tarentorus FCS.

### *Renibacterium salmoninarum* and Bacterial Kidney Disease (BKD)

*Renibacterium salmoninarum* is considered to be endemic in Ontario and in OMNR fish culture facilities at low levels. Routine facility level monitoring is conducted annually using IFAT and detections are reported in Table 1 for 2011. There were no signs of bacterial kidney disease in fish with *R. salmoninarum* in 2011. Low numbers of bacteria were detected in fish from Blue Jay Creek, Hills Lake and Tarentorus Fish Culture Stations. High levels of bacteria were detected in two fingerling brook trout at Hill's Lake FCS.

**Table 1. *Renibacterium salmoninarum* detections by IFAT in 2011.**

<u>Fish Culture Station</u>	<u>Month</u>	<u>Species</u>	<u>Detection Details</u>
<u>Blue Jay Creek</u>	August	Lake trout	Low numbers in 1/10
<u>Hills Lake</u>	August	Brook trout	high numbers in 2/2 (fingerlings) and low numbers in 1/2 (adults)
<u>Tarentorus</u>	August	Brook trout, Brown trout	Low numbers in 1/44 Brown trout, and 2/11 Brook trout

## Miscellaneous Detections

### Novel bacilliform virus - Chinook salmon

In 2011, an unidentified bacilliform virus was found in pools of sample tissue that could represent up to 297 of the 599 Chinook salmon taken from the Credit River for spawn collections. A similar replicating, filterable agent was previously detected in the fall of 2008 from wild adult Chinook salmon from the Credit River spawn collection. In 2008, it was estimated that between eight and 45 adult fish were positive for this virus; again the exact number is not known because samples were pooled. The virus was not found in samples from 2009 or 2010.

The virus is an RNA enveloped bacilliform rhabdovirus approximately 45nm X 128-140nm in size, eliminating identification as IPNV, aquareovirus or Koi herpes virus. PCR test results with primers for VHSV, INNV and SVC were all negative. Several genome segments of the virus isolated in 2008 were amplified and sequenced with no significant homology to any published viral genome. Primers based on sequences from the 2008 isolate demonstrated that the 2011 isolate was related to the previous isolate. Work on the virus is continuing at the Fish Health Laboratory in Guelph.

### Bacterial Gill Disease (BGD)

*Flavobacterium branchiophilum* was found in bacterial gill disease outbreaks at the following OMNR fish culture stations in 2011: Harwood, Normandale and Blue Jay Creek main and substations.

### Chlamydia-like Organisms (CLO)

Yearling lake trout were diagnosed with Chlamydia-like Organisms (CLO) in August at Blue Jay Creek FCS. There is no known treatment for CLO. Experimental work in collaboration with the University of Guelph Fish Pathology Lab to better identify and find an effective treatment for CLO continues as mortality is high in lots of fish with CLO.

### *Flavobacterium columnare*

The causative agent of columnaris, *Flavobacterium columnare*, was detected in three walleye fingerlings at the Blue Jay Creek substation in August of 2011.

### Nodular Gill Disease (NGD)

One possible case of nodular gill disease, caused by an amoeba, was found in an adult Atlantic salmon in August at Harwood FCS. The sample was submitted to Dr. Lumsden's lab and the results have yet to be received.

Gyrodactylus sp.

A parasitic monogenetic fluke was found on adult brook trout at the Dorion substation in low concentrations in 2011. Treatments were administered as appropriate.

**Updates**

Aquareovirus detection – Chinook salmon

Wild Chinook salmon from the Credit River were used for a spawn collection in October, 2010. Due to the large number of fish used for this spawn collection samples were pooled for testing. Standard pool size was 5 fish, but in some cases pools contained as few as 2 fish. An aquareovirus was detected in one pool on each of four collection days. The eggs from these collections were water hardened in iodophor following standing procedure. Stress testing was used to determine that the virus was not present in the offspring and the fish were ultimately stocked. This virus was not detected in parent fish used for spawn collection in 2011.

Aquareovirus detection – Coho salmon

In early 2010, a replicating agent was reported from one wild male coho salmon from the Credit River used for a spawn collection in November of 2009. The virus was very slow growing and was identified as an Aquareovirus. This virus was not detected in 2011.

Coregonus hoyi culture at WKFCS

A species of deepwater cisco (*C. hoyi*) is currently being raised at the White Lake Fish Culture Station on an experimental basis. The fish were collected from Lake Michigan in 2011 and were screened for pathogens by the New York State Department of Environmental Conservation (NYSDEC). No pathogens were detected in the parent fish. The fish are currently being held in quarantine at the White Lake facility. The fish will be tested at least twice before any decision is made to move them out of quarantine.



## Pennsylvania Fish & Boat Commission

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### **Hatchery Classification and Importation Report**

January 1, 2011 – December 31, 2011

Annual fish health inspections were completed at all of the Pennsylvania Fish and Boat Commission's (PFBC) 14 state fish hatcheries (SFH) in 2011.

#### **Restricted Pathogens**

*Aeromonas salmonicida* with varying antibiotic resistance was confirmed at seven PFBC hatcheries in 2011. Detections were made while conducting diagnostic examinations and fish health inspections. These findings did not result in a change in hatchery classifications since the restricted pathogen was already known to be present. Vaccination, improved biosecurity, and changes in hatchery SOPs should help control mortality due to *Aeromonas salmonicida*.

**Infectious pancreatic necrosis (IPNV)** was detected at seven PFBC hatcheries in 2011. Detections occurred while conducting fish health inspections and diagnostic examinations. Pair spawning, improved SOP's and an increased emphasis on biosecurity are being implemented at several hatcheries to reduce the incidences of IPNV. IPNV was detected at several Cooperative Nurseries located within the Lake Erie basin. (See attachment for documentation).

*Myxobolus cerebralis* Whirling disease has not been detected in any sample collected in 2011; however the majority of the 2011 samples are still undergoing analysis.

*Renibacterium salmoninarum* (BKD) has been detected in three hatcheries in 2011; however the majority of the 2011 samples are still undergoing analysis

#### **PFBC Cooperative Nurseries.**

Viral monitoring was completed at 5 PFBC cooperative nurseries within the Lake Erie Basin and a complete fish health inspection was conducted at one nursery site. IPNV was detected at several Cooperative Nurseries (See attachment for documentation).

*Nucleospora salmonis* (NS) was also detected in two lots of STT (See *Nucleospora salmonis* detection)

#### **Lake Erie Winter Steelhead**

Ovarian fluid and milt samples were collected from 959 Lake Erie winter steelhead broodstock spawned at the Fairview SFH. Samples were analyzed at the Penn State

University Animal Diagnostic Laboratory (PSUADL). All samples were negative for IPNV and other viral fish pathogens. In addition, kidney and spleen tissues were sampled from 60 adult Lake Erie winter steelhead brood fish as part of the Fairview SFH annual fish health inspection. Samples were analyzed for viral pathogens at the USFWS Northeast Fish Health Center. One sample from the 60 fish tested was positive for *Nucleospora salmonis*. No other viral pathogens were detected in these samples. Whirling disease assay results are pending.

### **Wild Brood Monitoring**

Depending on the species and 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 broodstock 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, fathead minnow, American shad, and golden shiner. Except for steelhead, all other species sampled were collected from waters outside of the Lake Erie Basin. However, since either these fish and/or their eggs are being brought into the PFBC production system, this preventative activity is applicable to this report. No viral pathogens have been detected.

### **Nucleospora salmonis Detection**

*Nucleospora salmonis* (NS) was detected in Steelhead trout at the 3CU RoZe Cooperative Nursery and in a single lot of Steelhead at the shared PFBC and 3CU Fairview Mission Nursery. Both lots had also tested positive for IPNV. NS was also detected in production STT at the PFBC Fairview State Fish Hatchery in 2011. Detections were the result of monitoring and not in response to a mortality event. NS was also detected in a single wild brood STT from Lake Erie during 2010-2011 Fish Health inspection.

This is the first time PFBC production STT have been tested for NS. All samples were collected by PFBC staff and sent to the USFWS Northeast Fish Health Center. Given the lack of clinical disease, unknown historical presence within the PFBC production system and the uncertainty of its prevalence in the wild the PFBC is planning on stocking the NS positive fish located at the Fairview SFH. The two NS positive lots of STT that tested positive at the 3CU RoZe and Mission Cooperative nursery sites also tested positive for IPNV and will be destroyed. Additionally, the PFBC in cooperation with the USFWS is planning to sample the returning wild STT brood population in 2012 to determine the prevalence of NS in the wild.

## Salmonid Importation 2011

Source	Species/Number	Fish/Egg Size	Fish Health Status	Certification		Lake Basin
				Date	Official	
Vermont-Salisbury FCS	LAT 120,000	Eggs	B-BF	10/18/11	Tom Jones	Inland
USFWS N.E. Fisheries Center Lamar, PA	BKT 103,000 RBT 19,000	Yearling	BF, VP	8/23/11	John Coll	Inland
NY State Catskill Hatchery	BNT 100,00	Eggs	A	8/24/11	A. Noyes	Erie
Erwin National Fish Hatchery	RBT 150,000	Eggs	A	10/25/11	Norman Hiel	Inland

## Proposed Salmonid Importation 2012

Source	Species/Number	Fish/Egg Size	Fish Health Status	Certification		Lake Basin
				Date	Official	
NY State Hatchery Catskill	BNT 100,000	Eggs	A	8/24/11	A. Noyes	Erie
Vermont-Salisbury FCS	LAT 120,000	Eggs	B-BF	10/18/11	John Coll	Inland
Erwin National Fish Hatchery	RBT 140,000	Eggs	A	10/25/11	Norman Hiel	Inland

## Pennsylvania Fish and Boat Commission 2011 GLFHC Hatchery Classification report

Hatchery	Location	Disease Classification	Date (*Results Pending)
Bellefonte SFH	Bellefonte	C- BF11 <sup>ROR</sup> , BK11, SW10, VP11	6/13/2011*
Benner Spring SFH	State College	C- BF11 <sup>ROR</sup> , BK10, VP10, SW09	5/24/2011*
Corry SFH	Corry	C- BF11 <sup>TMR</sup> , BK11, VP11	7/12/2011*
Fairview SFH	Fairview	B- (BK09), NS11	2/1/2011
Huntsdale SFH	Huntsdale	C- BK08, VP11	10/25/2011*
Linesville SFH	Linesville	B- (BK09), (VP08)	5/19/2011
Oswayo SFH	Oswayo	C- BF11, BK11, VP11	7/25/2011*
Pleasant Gap SFH	Pleasant Gap	C- BF11 <sup>ROR</sup> , BK10, VP11	6/7/2011*
Pleasant Mount SFH	Pleasant Mount	B- VL09	5/17/11*
Reynoldsdale SFH	Reynoldsdale	C- BF11 <sup>TMR</sup> , SW06, VP11, BK08	9/20/2011*
Tionesta SFH	Tionesta	B- (BK09), (VP08)	5/19/2011
Tylersville SFH	Tylersville	C- BF11 <sup>ROR</sup> , BK10, VP11, SW09	8/30/2011*
Union City SFH	Union City	A-2	4/19/2011
Van Dyke SFH	Van Dyke	A-2	6/14/2011
Mitchel 3CU	Girard	C	10/19/2011
Ro-Ze 3CU	Girard	C -VP11, NS11	10/19/2011
Mission 3CU	Girard	C-VP11, NS11	10/19/2011
Peck 3CU	Fairview	C	10/19/2011
Wesleyville	Wesleyville	C-VP11	10/19/2011

**Wild Brood**

Steelhead	Lake Erie	C - BK09, NS11	2/1/2011
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<b>Disease</b>	<b>Pathogen</b>	<b>Abbreviation</b>
Whirling disease	<i>Myxobolus cerebralis</i>	SW
Infectious Pancreatic Necrosis	IPN virus	VP
Nucleospora	<i>Nucleospora salmonis</i>	NS
Bacterial Kidney Disease	<i>Renibacterium salmonarum</i>	BK
Epizootic Epitheliotropic Disease	<i>EED virus</i>	VL
Furunculosis	<i>Aeromonas salmonicida</i>	BF

TMR -Terramycin Resistant, ROR-Romet Resistant



## Pennsylvania Fish and Boat Commission Infectious Pancreatic Necrosis virus (IPNV) Detection in Lake Erie Steelhead and Brown Trout Cooperative Nursery Facilities

January 17, 2012

During the 2011-2012 Fish Health Inspections performed in October 2011, Infectious Pancreatic Necrosis virus (IPNV) was detected at three Pennsylvania Fish and Boat Commission (PFBC) Cooperative Nurseries. In total, approximately 47,000 Steelhead (STT) and 15,000 Brown Trout (BNT) tested positive from the Cooperative Nurseries. An additional 15,900 PFBC STT and 12,500 BNT were negative for IPNV but need to be considered positive because they are located at IPNV positive facilities. All fish at these facilities were to be stocked into Lake Erie and all facilities are within the Lake Erie Basin. IPNV was detected in Steelhead trout (STT) at the 3CU RoZe Cooperative Nursery and in a single lot of the 3CU Steelhead at the shared PFBC and 3CU Fairview-Mission Nursery. Brown trout at the Wesleyville Cooperative Nursery also tested positive for IPNV (Table 1). Fish were not exhibiting clinical signs of IPNV; the detections were the result of routine monitoring.

Table. 1 - IPNV positive facilities, species and total number of fish

Facility	Species	Number of fish	IPN (+/-)
Fairview Mission PFBC	STT	15,900	-
Fairview Mission COOP	STT	7,000	+
Fairview Mission COOP	BNT	12,500	-
RoZe COOP	STT	40,000	+
Peck COOP	BNT	7,000	-
Wesleyville COOP	BNT	15,000	+
	Total STT	62,900	
	Total BNT	34,500	

With the exception of the shared Fairview-Mission site, all lots of PFBC production STT have tested negative for IPNV. The PFBC has already stocked 43,000 IPNV free fingerling BNT from the Linesville State Fish Hatchery (SFH) into Lake Erie tributaries this year which is a little less than half of the combined PFBC/cooperative nursery

allotment of 100,000 BNT fingerlings per year. The steelhead situation is more positive. Even without the opportunity to stock the infected 62,900 steelhead the PFBC is projected to release between 909,000 to 1,000,000 IPNv free fingerling STT into the Lake Erie tributaries in the spring of 2012.

In addition to the Cooperative Nursery stockings, several Lake Erie tributaries receive annual BNT stocking from the PFBC Corry SFH. The Corry SFH is located outside the Lake Erie basin. Several lots of fish including BNT destined for the Lake Erie tributaries were found to be IPNv positive during the 2011 Corry Fish Health Inspection.

## **Background**

Starting in the 2007-2008 production year, the PFBC has been monitoring for viral pathogens in the Cooperative Nurseries that stock STT and BNT into the Lake Erie. This is the first time IPNv has been detected from any of these facilities. IPNv has not been detected in any wild STT brood since the 2007-2008 production year. This includes milt/ovarian fluid samples obtained from approximately 1000 lot spawned brood and kidney/spleen tissue collected from 60 wild adults each year. Kidney/spleen samples are collected by PFBC staff and sent to the US Fish and Wildlife Northeast Fish Health Center. Milt and ovarian fluid samples are collected by PFBC staff and submitted to the Pennsylvania State University. The PFBC STT Hatcheries are subjected to annual Fish Health Inspections. The last detection of IPNv in PFBC production STT was in 1999 at the Fairview SFH facility.

### **Steelhead**

All Cooperative Nursery STT that recently tested positive for IPNv originated from eggs collected by the PFBC in the winter of 2010. Milt and ovarian fluid samples were collected from all brood fish. No brood tested positive for IPNv. All PFBC production STT originated from the same brood and tested negative for IPNv at all PFBC STT production facilities in 2011. Thus, the IPNv must have originated from contact with infected water, fish or equipment.

### **Brown Trout**

The PFBC 2011 Lake Erie production BNT were first obtained as disease free eggs from the New York Department of Environmental Conservation's Randolph Hatchery. Eggs were hatched and raised to fingerling size at the PFBC Linesville SFH. The BNT lot was tested on 3/31/11 as part of the Linesville SFH annual Fish Health Inspection and found to be disease free. Once results from the testing were known, approximately 41,000 BNT were distributed to the 3CU and the Wesleyville Cooperative Nurseries. The BNT were tested again at each Cooperative Nursery on 10/19/11 and the BNT at the Wesleyville Cooperative nursery were found to be IPNv positive. Thus, these BNT became infected with IPNv after their arrival at the Wesleyville Cooperative Nursery. It is thought that the virus was introduced with the transfer of brook trout to the Wesleyville facility from an IPNv positive facility.

## **PFBC Response**

The following actions have or will take place in response to the detection of IPNV at the PFBC Cooperative nursery facilities.

1. PFBC will euthanize all IPNV positive STT and STT from IPNV positive facilities.
2. BNT lots that tested positive for IPNV will be destroyed; IPNV negative BNT lots located at IPNV positive facilities will be stocked into non-flowing waters within the Lake Erie Basin, if such waters cannot be found these BNT will also be destroyed.
3. IPNV positive fish from the Corry SFH will not be stocked into the Lake Erie Basin.
4. An attempt will be made to find IPNV free replacement BNT.
5. IPNV positive Cooperative Nursery facilities will be disinfected.
6. Influent at the positive hatcheries will be tested using IPNV free BKT.
7. Biosecurity plans will be developed specific to each Cooperative nursery. Plans will include the strict regulation of fish transfers into these facilities.
8. If production continues at the facilities fish will be tested at 95% confidence with an assumed incidence of detectable infection of 2% (150 fish).

Additionally, the PFBC hopes to eliminate IPNV from its Corry SFH. Proposed changes to the standard operating procedures including the importation of disease free eggs, and the construction of an additional water supply line which should be extremely beneficial in accomplishing this task. A successful bid award for the waterline construction from the Department of General Services is imminent. Until the Corry SFH can produce IPNV free fish, no fish from the Corry SFH will be stocked into the Great Lakes Basin or provided to Cooperative Nurseries within the Great Lakes Basin. PFBC staff will be working on trying to find workable alternatives to using fish from Corry during the 2-3 years it will take to get Corry up and running with IPNV free fish.



## State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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January 2012

### Annual Report to the GLFHC for the year 2011

The most significant news for 2011 was the isolation of VHSv from a fish kill of yearling gizzard shad that were near a “warm” water discharge near the Milwaukee Harbor in mid to late March. No other dead or moribund fish were observed in the area. This demonstrates the predictions of experts such as Jim Winton, who expected future VHS outbreaks to focus on naïve year classes of fish produced several years after the initial VHS outbreaks.

We also isolated VHSv in late June (late in the spawning period) from yellow perch offshore of Milwaukee. There was not a fish kill and there were few clinical signs of disease. We examined these fish because they had abnormally developed testes and the biologists were concerned about reproduction and recruitment. See attached photos for the severity of the condition.

We also continued our USDA-APHIS VHS surveillance and the virus was not detected in 18 inland waters. We only were able to sample 2/3 of the scheduled waters due to a lack of personnel when water temps were suitable for sampling.

We also noted a very skewed sex ratio (very few males vs females) in spawning Seeforellen brown trout which return to our Kewaunee and Root River weirs. We are working with Dr Rachel Klaper at the UW-Milwaukee WATER Institute to see if endocrine disruptors might be involved.

Our furunculosis vaccination program continues to work very well to control this disease at two of our hatcheries that have open water supplies. We have vaccinated fish for the past 15 years and in most years, we do not isolate *A. sal.* at all, despite vigilant testing of the few freshly dead mortis that occur. The vaccination uses a 30 second dip in an autogenous vaccine made for us by Kennebec River Biosciences (formerly Microtechnologies) in Richmond, Maine. As long as the skin and fins are not eroded or abraded at the time of challenge (*A. sal.* is present in the water supplies for the two hatcheries), we get excellent protection from infection by *A. sal.* in vaccinated fish. In 2011 we did not isolate *A. sal.* from the Thunder River hatchery or the Brule hatchery.

For the fourth consecutive year, we have not isolated or detected *R. sal.* in Coho reared at our new Wild Rose hatchery. I feel that this is related in part to rearing the fish under less crowded conditions during early rearing and having a very fast water velocity (short turnover times) during grow out, which may reduce the contact time between the bacteria and the fish, and thus impede successful infection of the fish. In 2010 and 2011, Coho broodstock (originally stocked from the Wild Rose hatchery in 2009 and 2010) were tested by culture on SKDM2 agar and *R. sal.* was not cultured from the adult spawners (240 total fish tested).

However, the prevalence of *A. sal.* in spawning Coho continues to fluctuate annually. In 2011, *A. sal.* was isolated from 1/60 Coho sampled at the Root River spawning facility in Racine and from 18/60 Coho

and 20/60 Seeforellen brown trout sampled at the Besadny spawning facility in Kewaunee. R sal was not isolated from any spawning Chinook, Coho or Seeforellen brown trout. However, we continue to see Ich infections in the spawning adults, which vary in intensity.

With the help of the La Crosse Fish Health Center we were able to test hatchery lake trout and splake from the Les Voigt (formerly Bayfield) hatchery and one group of wild lake herring from an inland lake for EEDv using the UC Davis PCR method. Surprisingly, 11/30 lake herring DNA extracts from kidneys produced a band in the correct location, however sequencing the bands indicated fish DNA, not EEDv. Some tweaking still needs to be done before using this tool widely. I believe staff at Lamar have been burning the midnight oil to improve this test.

We have been consistently monitoring fish at our coolwater water hatcheries for viruses since 2007. During that time we have isolated Aquareovirus almost every year from our muskies. We have detected an unknown pathogen in ovarian fluids from white suckers and one case of white sucker fry (eggs were surface disinfected in 100 ppm iodophor) and from muskies that consumed white sucker forage. We have also isolated FHM nidovirus from FHM purchased from vendors and from spotted muskies that co-habited with the FHM and consumed them. We are uncertain about the short and long term effects these pathogens have on the muskies. Muskies infected with the nidovirus had significant liver pathology, severely depressed serum protein (as low as 0.2 and 0.1), hematocrits as low as 2-11%. Some of these fish also were infected with *Contracecum* sp, and some fish had concurrent *A hydrophila* infections too. We have observed *Contracecum* infections in other inland muskies over the years without noticeable pathology (the parasite is just coiled on top of the GI tract), but in at least one infected spotted musky, there was a small clot of blood near some adhesions that were attached to the mouth of the parasite. I strongly recommend that the GLFHC support research on the effects of pathogens that are transferred from commercial or wild caught batfish to propagated fish. See attached liver histopathology photos and summary chart of viruses in coolwater fish.

One of our limited term employees, Anna Wilson, is working on her graduate research to develop a method to detect VHS antibodies in fish. Her test fish is the freshwater drum. If anyone has the chance to obtain some serum from freshwater drum from either a known VHS positive area or a VHS test negative area, Anna would very much appreciate 0.5 to 1 ml of frozen serum.

Respectfully submitted,

Susan Marcquenski

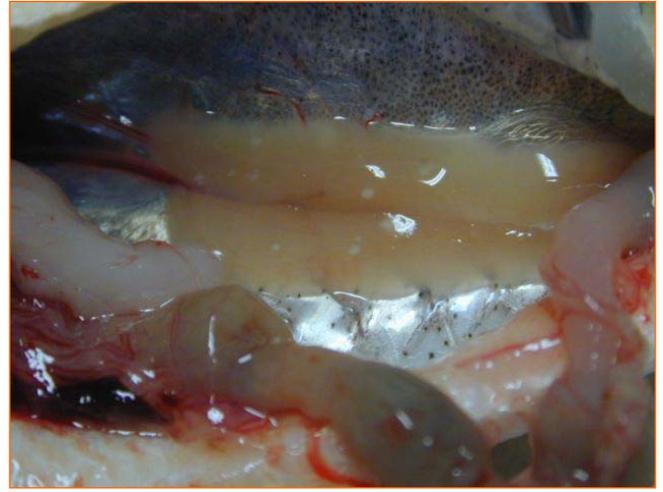
Yellow perch testes during June 2011 spawning period Lake Michigan offshore of Milwaukee

Upper left=rank 4, normal testes;

Upper right=rank 1 very little spermatogenic tissue (white spots)

Lower left=rank 3 “cottage cheese” clusters of active tissue

Lower right= rank 0 no active tissue



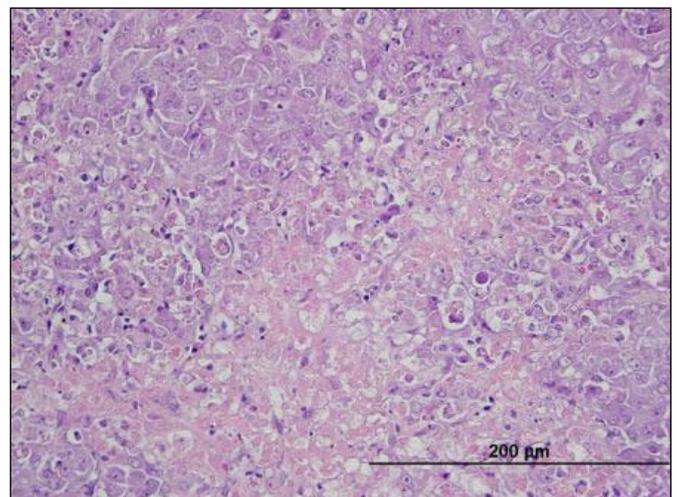
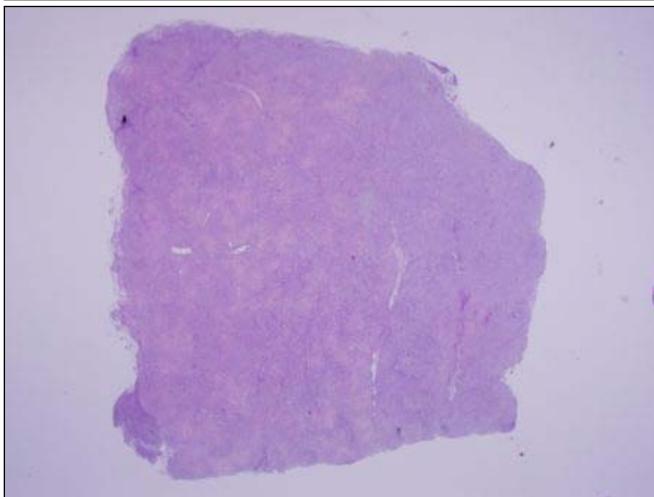
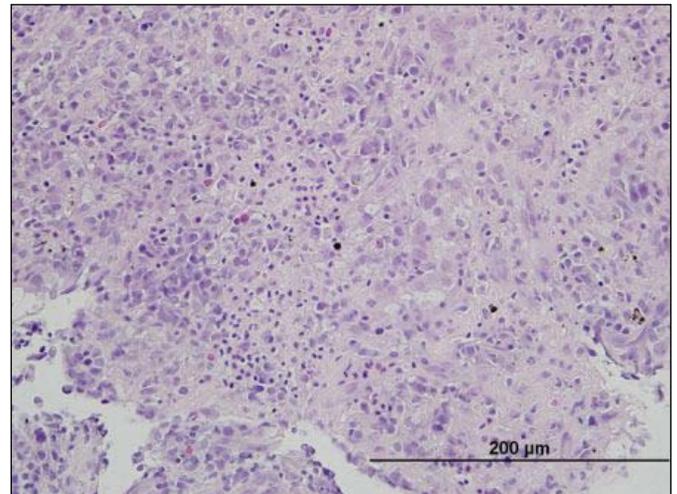
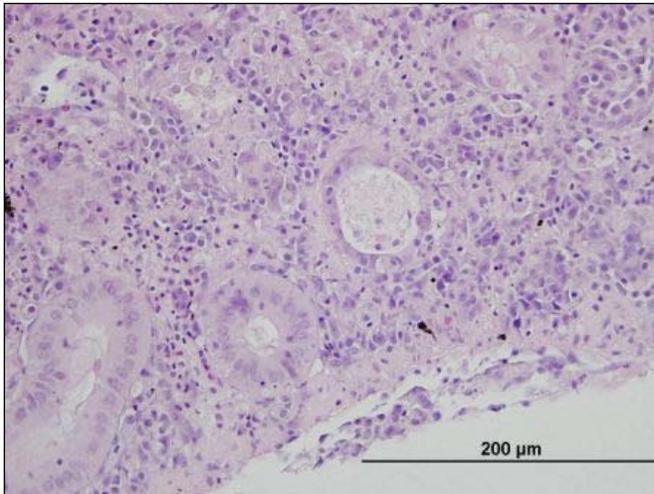
Kidney and liver pathology of spotted muskies infected with FHM nidovirus

Upper left 400X very thin epithelial cells of kidney tubules and necrotic cells

Upper right 400X necrosis in the kidney

Lower left 20X multi-focal areas of necrosis in the liver

Lower right 400X a focal area of necrosis



# HATCHERY CLASSIFICATION REPORT

Wisconsin

Report Period: January 1 to December 31 2011      Report Date: January 27, 2012

Hatchery Name	Location	Pathogen Acronym
Les Voigt (formerly Bayfield)	Bayfield	B-VL
Brule	Brule	A-2
Kettle Moraine Springs	Adell	B-(BK)
Lake Mills	Lake Mills	A-2
Lakewood	Lakewood	Not in operation in 2011
Langlade	White Lake	Not in operation 2011
Nevin	Fitchburg	A-1
Osceola	Osceola	A-1
St. Croix Falls	St.Croix Falls	A-1
Thunder River	Crivitz	A-2
Wild Rose Great Lakes	Wild Rose	B-(BK)
Wild Rose Inland	Wild Rose	C, A-1

Report Prepared by: Susan Marcquenski

Title: Fish Health Specialist

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 2011      **Report Date:** January 27, 2012

<b>Hatchery Name</b>	<b>Location</b>	<b>Pathogen Acronym</b>
Besadny Fisheries Facility	Kewaunee	B-BF
Root River	Racine	B-BF
Strawberry Creek	Sturgeon Bay	B-(BK) <sup>1</sup>
Lake Superior	Apostle Islands	B-(BK) (VL not tested yet)

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

**Report Prepared by:** Susan Marcquenski  
**Title:** Fish Health Specialist  
**Phone Number:** 608.266.2871

**EMERGENCY FISH DISEASES**

<b>Disease</b>	<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>	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 2011

### 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 ~176,000	eggs	SPF	April 2011	Norm Heil	Michigan
2.							
3.							
4.							
5.							

### B. Proposed importations for 2012

	<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			Norm Heil	Michigan
2.							
3.							
4.							

Coolwater fish health issues from 2007 to 2011

We have detected FHM nidovirus and an unknown agent in white sucker ovarian fluids and in one case, the unknown agent in white sucker fry. The original CPE seems to show up late in the testing period. It grows on EPC and FHM cells. We have also detected FHM nidovirus in FHM from Oswald bait.

Sucker lakes	2007	2008	2009	2010	2011
Sand Lake Polk Co	FHM nidovirus 1/5 ov pools	negative	negative	No eggs collected	No eggs collected
Trout Lake Vilas Co	negative	Unknown agent 1/12 pools	negative	negative	negative
Lake Tomahawk Oneida Co	negative	negative	negative	negative but fry at Dana Farm tested positive for unknown agent	negative
Lac Vieux Deserts Vilas Co	negative	negative	negative	negative	Unknown agent
Turtle- Flambeau Iron Co	Not sampled	negative	negative	negative	Unknown agent
Round Lake Sawyer Co	negative	negative	negative	Unknown agent 4/12 ov pools	negative
Nelson Lake Sawyer Co	No eggs collected	negative	negative	negative	Unknown agent
Oswald Bait		FHM nidovirus in FHM 3/12 pools sampled mid May	FHM nidovirus in FHM 1/12 pools sampled late April		

We have isolated Aquareovirus (mostly Golden Shiner Virus), FHM nidovirus and what the WVDL feels is the white sucker unknown from muskies and aquareovirus from one group of walleyes.

Hatchery	2007	2008	2009	2010	2011
GTH	GSV in musky and FHM tested in August delayed stocking.	GSV in musky 1/12 pools. Tested mid August	GSV in musky 1 of 2 pools tested mid July and 2/15 pools tested mid August	Unknown agent in musky 2/3 pools tested late June; GSV in musky 15/15 pools August delayed stocking	Unknown agent in 1/15 musky pools in mid July  GSV in 5/15 musky pools and 2/15 walleye pools mid July
AOH	GSV in musky 12/12 pools tested in August delayed stocking	Musky testing by Dr Smith and Micro-technologies in early July- no viruses	GSV in musky 3/10 pools; & non-GSV Aquareo 1/10 pools mid July	GSV in 2/15 musky pools; unknown agent in 5/15 pools mid July delayed stocking	Muskies and walleye negative for viruses tested mid July
Wild Rose	GSV in spotted musky 3 of 4 pools August				
Wild Rose Great Lakes					Unknown agent in inland musky 7/12 pools. August FHM nidovirus in spotted musky and FHM October; in FHM 8/12 pools in December (muskies neg)
Trump Pond		negative	Unknown agent in musky 1/12 pools June/July. Too few fish to stock (euthanized)	negative	
Bill's Pond		negative	negative	Unknown agent in musky 1/12 pools late June delayed stocking	
Albion Pond		negative	negative	Unknown agent in musky 1/12 pools GSV in musky 1/12 pools	
Dana Farm				Unknown agent in sucker fry (L Tomahawk) 11/12 pools early June; GSV in spotted musky 2/12 late July	GSV in spotted musky 8/12 pools early August

We have detected bluegill virus and an unknown agent from the hatchery water supplies

Water supply	2007	2008	2009	2010	2011
Spoooner Lake	Not sampled	Bluegill virus in BLG and Bl crappie April	Not sampled	Not sampled	Not sampled
Yellow River Fl	Not sampled	Not sampled	negative	negative	Unknown in BLG mid April
Madeline Lake	Not sampled	Bluegill virus in BLG April	negative	negative	negative
Rock Lake	Not sampled	negative	negative	negative	Unknown in BLG mid April



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE



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### **2011 Annual Report to the Great Lakes Fish Health Committee from Fish and Wildlife Service Northeast Region; Region 5**

**January 24, 2012**

Following the isolation of infectious pancreatic necrosis virus (IPNV) at the Allegheny NFH in 2005, the facility has been de-populated, disinfected, renovated, re-disinfected and an IPNV “challenge” was conducted. Following transfer and acclimation from White River NFH, 20,000 naïve fingerling brook trout were tested as sentinel/test fish for the presence of IPNV with sampling/testing of 150 fish on June 13, 150 fish on June 27 and 300 fish on July 18. An artificial stressor was planned, but inadvertently occurred May 29 when water flow stopped, resulting in the loss of 4,000 fish. No IPNV was detected.

Following this sentinel fish testing, the facility was again depopulated, renovations finalized, and once again disinfected. Five year Seneca strain old lake trout future broodstock, originating from Genoa NFH isolation and reared for several years at Berkshire NFH were transferred to Allegheny. Later in the fall, eggs from Sullivan Creek NFH were received. Facility will be inspected in fall of 2012, concurrent with spawning activities. Great Lakes lake trout production is once again occurring at the Allegheny NFH.

Both Berkshire NFH (MA) and White River NFH (VT) are inspected in compliance with the Great Lakes Fish Disease Control policy and Model Program, as they have taken up the roles of the Allegheny NFH during the renovations. As depicted on the Hatchery Classification Report, Berkshire is presently an A-2 facility. Having transferred the Seneca stain future brood, the station now rears Klondike strain lake trout future brood. The White River NFH has also a long history of disease free status, however in late August; tropical storm Irene flooded the facility, including its wells. Fish, pumps, and other equipment/controls were lost. Several follow-up fish health investigations coordinated through the Great Lakes Fish Health Committee (on the non-hatchery fish washed in, as well as all lots remaining on station) revealed no USFWS or Great Lakes Model Program listed pathogens. Due to concerns of the potential exposure and spread of the invasive algae, *Didymo*, it was decided in December to depopulate and not release fish into the Great Lakes. Over 649,000 lake trout were successfully stocked into Lake Erie and Lake Ontario from White River NFH in April and May 2011, prior to the flood in August. Rehab and renovations are planned to occur at the White River NFH in 2012.

The U.S. Fish and Wildlife Service continues to perform pathogen surveillance as part of the National Wild Fish Health Survey. The Lamar Fish Health Center has performed many investigations throughout the Northeast for listed fish pathogens, including emerging diseases such as 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). 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. VHS surveillance is probably a major reason that more states in the Northeast Region have developed an interest in providing samples for the USFWS National Wild Fish Health Survey. Among the species on the VHS susceptible species list, Black crappie, bluegill, brown bullhead, brown trout, emerald shiners, gizzard shad, largemouth bass, muskellunge, northern pike, pumpkinseed, rainbow trout, smallmouth bass, walleye, white perch, and yellow perch were tested. Additional species include brook trout, golden shiner, lake trout, and fathead minnow. For the third year in a row, no positive VHS findings occurred this year from routine fish collections in the Northeast US / Lower Great Lakes.

Following the report of *Nucleospora salmonis* in USFWS facilities, the Lamar FHC conducted screening for this microsporidean at federal and state fish culture stations as well as from several feral stocks in the Northeast. This molecular test (polymerase chain reaction or PCR) continues to be refined and additional surveillance continues. Another PCR assay has been developed (also at University of Cal-Davis) for EEDV, the lake trout herpesvirus causing mortalities in many upper lake hatcheries in the 1980s. Surveillance of wild lake trout for this agent has been initiated on free ranging lake trout at the Lamar Fish health Center. Testing for these emerging fish pathogens has been enhanced through a Great Lakes Restoration Initiative (GLRI) project, funded by the US EPA.

In the first year of these projects, using the 2010 GLRI funds, over 25 sites were sampled. 2498 fish, from 22 different taxonomic species were tested for VHS through cell culture (several cell lines) and molecular (DNA) assays for VHS as well as Great Lakes emerging pathogens. No new findings of VHS virus occurred from these collections. *Nucleospora salmonis* was identified from steelhead and brown trout from Lake Erie. Lake trout herpesvirus, (salmonid herpesvirus 3) also known as epizootic epitheliotropic disease virus or EEDV, was similarly found by molecular techniques (PCR) from a lake trout population in Lake Ontario. Although not specifically targeted in this project, *Renibacterium salmoninarum*, the causative agent of bacterial kidney disease (BKD) and largemouth bass virus (LMBV) were detected from Lake Ontario steelhead and Lake Erie largemouth bass, respectively. These initial findings, from collections which were conducted between October 21, 2010 and November 8, 2011, indicate the need for further, continued surveillance, which is planned in 2012.

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.

2011 HATCHERY CLASSIFICATION REPORT

Report Period Jan. 1, 2011– Dec 31, 2011 Report Date: Jan 24 , 2011

Hatchery Name	Location	Pathogen Acronym
<u>Allegheny NFH</u>	<u>Warren, PA</u>	<u>C 7-18-2011</u>
Newly renovated and disinfected facility housed sentinel brook trout examined June through July, 2011 presently has 5 year old lake trout broodstock and production sac fry.		
<u>White River NFH</u>	<u>Bethal, VT</u>	<u>A-2 3-15-2011 U-V treated 10-12-2011 post flood</u>
<u>Berkshire NFH</u>	<u>Great Barrington, MA</u>	<u>A-2 3-14-2011</u>

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 01/01/11 – 12/31/11

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.	White River NFH Bethel, VT	Lake trout Seneca 116,125		A	03/15/2011	John Coll	Lake Erie	Lake Erie
2.	White River NFH Bethel, VT	Lake trout Seneca 488,353		A	03/15/2011	John Coll	Lake Ontario	Lake Ontario
3.	Berkshire NFH Great Barrington, MA	Lake trout Seneca 2,300		A-2	03/14/2011	John Coll		Allegheny NFH Warren, PA

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.								

II. Lab Findings

III. Other