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## **II. RESOLUTION OF THE NEW ENGLAND FISH HEALTH COMMITTEE PERTAINING TO FISH DISEASE CONTROL IN NEW ENGLAND**

WHEREAS, efficient propagation of salmonids may be severely affected by the occurrence of fish diseases and major disease outbreaks have caused serious losses in fish culture facilities and in fish populations of New England; and

WHEREAS, disease problems have resulted in reduced survival of stocked fish and caused significant losses of fish to the public and diminished economic returns to New England communities; and

WHEREAS, introduction of diseases hitherto not found in New England can be prevented through adequate inspection and restriction of imports; and

WHEREAS, it is technically possible to restrict or eliminate pathogens already introduced; and

WHEREAS, existing diagnostic techniques are adequate to initiate effective disease control.

NOW, THEREFORE, BE IT RESOLVED that the New England Fish Health Committee encourage each state and federal fish and wildlife agency to:

- Maintain the New England Fish Health Committee (NEFHC) of recognized fish health inspectors to review annually the fish health status of all fish cultural facilities within New England,
- Prevent the release of clinically diseased fish,
- Discourage the rearing of diseased fish,
- Prevent the importation into, or transfer within New England, of fish infected with certain listed pathogens as defined in Annex III,
- Eradicate fish pathogens wherever practicable,
- Formally adopt and apply the following guidelines,
- Develop legislative authority and/or regulations as required to manage and/or eradicate fish pathogens.

### III. INTRODUCTION

Fish pathogen control in New England is the responsibility of the natural resource agencies managing the fisheries resources. The New England Fish Health Committee (NEFHC) of the New England Atlantic Salmon Committee (NEASC) has developed these model guidelines designed to unify and coordinate the fish pathogen control efforts of member agencies. These guidelines set forth the essential requirements for the prevention and control of serious fish pathogens. These include a system for inspecting fish culture facilities and references to the technical procedures to be used.

The NEFHC has utilized the following documents as sources of information:

- "Great Lakes Fish Disease Control Policy and Model Program," (Great Lakes Fishery Commission 1993)
- "Colorado River Fish and Wildlife Council Program,"
- "Fish Health Policy and Implementation Guidelines" of the U.S. Fish and Wildlife Service,
- "Suggested Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens" developed by the Fish Health Section of the American Fisheries Society. (AFS-FHS 2004)
- "Fish Health Protection Manual of Compliance" of the Department of Fisheries and Oceans of Canada,
- "Canadian Maritimes Policy Guidelines for the Movement of Salmonid Stocks,"
- "St. Croix River Fish Disease Control Policy and Fish Health Management Plan" and United States Title 50 CFR 16.13.

### IV. DEFINITIONS

Words and phrases used in these guidelines, unless otherwise provided in the individual document section, will be construed to mean as follows:

**NEFHC:** The New England Fish Health Committee, a subcommittee of and appointed by the New England Atlantic Salmon Committee to address fish health of salmonids in New England;

**Committee:** The New England Atlantic Salmon Committee represented by the executive officers (or their designees) charged with the management of the fisheries resources of the states of Vermont, Connecticut, Massachusetts, New Hampshire, Maine, Rhode Island, the United States Fish and Wildlife Service and the National Marine Fisheries Service (each referred to as a member agency) and by whose authority the NEFHC was authorized to recommend for adoption by each state the comprehensive salmonid health guidelines;

**New England:** That geographic area encompassing the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont;

**Fish:** Live fish, viable fish eggs, viable sperm, offal or other fish products which have not been so processed as to render them incapable of transmitting a listed fish pathogen;

**Fish facility:** Any fish culture station, hatchery, rearing pond, net pen, container which holds, rears or releases salmonids for sale and/or distribution in either marine or fresh waters of New England;

**Listed fish pathogen:** Certain infectious pathogens (Annex III) of fish caused by viral, bacterial, or other parasitic agents which are transmissible, directly or indirectly, from one fish to another;

**Report:** Fish health inspection report as referred to in Section F and exhibited in Annex I.

**Inspectors:** An accredited, licensed veterinarian, a certified fish health inspector or persons recognized by federal or state agencies with responsibility for fish health or transfer in the state from which the fish or gametes originate upon approval of the Commissioner. No owner or employee with direct supervisory authority over a facility may serve as an inspector for their fish culture facility.

**Accredited licensed veterinarian** means a veterinarian holding a current veterinary license who has also fulfilled the accreditation requirements of the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA/APHIS).

**Certified fish health inspector** means an individual certified by the American Fisheries Society/Fish Health Section (AFS/FHS) as a Fish Health Inspector or Fish Pathologist.

**Clinical:** A condition that is readily apparent, overt, or obvious by gross inspection.

**Inspection:** On site, statistically based sampling of all lots of fish in the facility, performed or supervised by a fish health inspector, with subsequent examination of the collected tissues and fluids for the detection of listed pathogens in accordance with procedures set forth in these guidelines.

**Lot:** A group of fish of the same species and age which originated from the same broodstock during the same year, and are being raised on the same water source.

**Pathogen:** Any disease producing microorganism or material.

*Revised 5/12/2000*

## V. RESPONSIBILITIES OF COMMITTEE AND CHAIR

### Committee responsibilities

1. Meet annually

### Chairperson responsibilities

1. Lead annual meeting.
2. Maintain liaison with Northeast Fishery Directors
3. Maintain archive of meeting minutes.
4. ???

## VI. GUIDELINES FOR FISH FAMILIES

1. Catastomidae.

### Section A. Definitions.

Words and phrases used in these guidelines, unless otherwise provided, will be construed to mean as follows:

#### **Catastomid means**

**Lot:** A group of fish of the same species and age which originated from the same broodstock during the same year, and are being raised on the same water source.

*Revised 9/27/2001*

### Section B. Basic obligation.

The member agencies will take all appropriate measures including the development of legislative authority and regulations, where necessary, to restrict the spread of listed fish pathogens, to contain them within their known geographic ranges, and to strive for their elimination in accordance with the provisions of these guidelines.

### Section C. Application

The provisions of these guidelines apply to:

*Revised 1/20/2000*

- All salmonids held, reared or transferred in or between New England fish culture facilities;
- All salmonid populations used in fish culture management;

Fish pathogens included but not limited to those listed in Annex III;

Fish pathogen research and development facilities on which fish infected with, or exposed to, listed fish pathogens and/or in the possession of listed fish pathogens are capable of causing disease.

The provisions of these guidelines will not apply to:

Fish and/or the water used in the transport of fish in transit through New England which are not released from their original shipping containers;

Fish and/or specimens from fish imported or exported for purposes of diagnostic or inspection services and related laboratory tests or research provided that biological containment measures used at each laboratory to eliminate any dissemination of fish pathogens are approved by the NEFHC.

Fish in transit from within or without member agencies' geographic area that are being utilized for the purpose of restaurant or grocery store sales and will not be released or discarded into New England waters.

Nothing in these guidelines shall derogate from the right of the member agencies to apply additional measures of inspection, quarantine, and/or eradication for the control of fish pathogens.

#### Section C. Traffic in fish.

*Revised 8/9/2001*

Except as provided in Section C, paragraph (2), no salmonids may be imported into New England, transferred between fish culture facilities within New England or released into state waters unless:

1. In the case of salmonids imported into New England or transferred between fish culture facilities within New England the source fish culture facility possesses a valid fish health inspection report issued by a fish health inspector in accordance with Section F.
2. In the case of salmonids imported from outside the jurisdiction of member agencies, the salmonids are accompanied by a fish health inspection report giving equivalent assurance as to the state of health of the fish that is prepared and signed by a fish health inspector in accordance with Section F. When the source is inspected by other than the NEFHC inspector, that inspector prior to shipment, will furnish to the appropriate member agency's representative to NEFHC a statement confirming that the source of the gametes, fertilized eggs or fish has been inspected for the presence of each listed pathogen under the provisions of this program within one year of shipping date. The member agency's representative will, if he/she determines that inspection procedures used meet NEFHC standards, approve the inspection report by countersigning. The member agency's representative will report in an annual report his/her decision to the NEFHC Chairman.
3. No live fish, gametes, fertilized eggs, or fish products from stocks known to be infected with Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Oncorhynchus Masou virus, *Ceratomyxa shasta* or the causative agent of Proliferative Kidney Disease may be imported into New England. Refer to Annex VI.
4. No live fish or fish products known to be infected with *Myxobolus cerebralis* may be imported into New England. Properly disinfected eggs (Annex VI) and transport water of well origin may be transferred to facilities without altering the disease classification of the receiving facility.
5. In the case of areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus, (See "Suggested Procedures for

New England Fish Health Guidelines



the Detection and Identification of Certain Finfish and Shellfish Pathogens, 1994 Version I" for Endemic Areas) and/or facilities receiving salmonid fish, gametes, fertilized eggs, or fish products from areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus:

No live salmonid fish, gametes, fertilized eggs, or fish products may be imported from the areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Virus and Oncorhynchus Masou Virus.

No live salmonid fish, gametes, fertilized eggs or fish products may be imported from facilities which have received live salmonid fish, gametes, fertilized eggs, or fish products from endemic areas unless the following conditions are met:

All lots of fish at the source must be tested and found negative for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus, either annually for a minimum of three consecutive years, or if the past number of consecutive years equal to the age of the oldest spawning fish is longer than three years, for that period of time prior to importation.

All lots, using the oldest age classes first, of sexually mature fish will be sampled at the 2% incidence level utilizing ovarian fluid and pellet collected at spawning time or from post-spawned fish.

Kidney/spleen samples will also be collected at the 5% incidence level from post-spawned broodstock and from all lots of sexually immature fish.

All cell cultures will be observed for a minimum of 14 days.

All lots of fish at the source must be negative for all other vertically transmitted pathogens in addition to Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus.

Fertilized eggs to be imported are properly surface disinfected with PVP iodine and/or water hardened in an iodine solution.

Eggs are incubated in a water supply free of listed pathogens.

Only properly disinfected eggs may be imported. Eggs shall be disinfected for 10 minutes in PVP iodine at 100 ppm and then in formalin at 2000 ppm for 15 minutes prior to shipment to New England. The eggs will be disinfected again according to this procedure before being placed in a New England hatchery.

Fish are hatched and reared in an approved quarantine facility (effluent should be appropriately disinfected) for 6 months after hatching and fry subjected to at least one fish health inspection.

*Revised 9/27/2001*

#### Section D. Release of fish.

1. No fish cultural facility may release salmonids into waters of New England until a current fish health inspection report has been issued in compliance with these guidelines.
2. No salmonids known to be infected with the causative agents of Viral Hemorrhagic Septicemia, Infectious Hematopoietic Necrosis, Oncorhynchus Masou Virus, Proliferative

Kidney Disease, Whirling Disease, Infectious Salmon Anemia, Hitra Disease, and Ceratomyxosis may be released into the waters of New England.

3. No salmonids with clinical signs of any disease may be released into the waters of New England.

*Revised 1/20/2000*

#### Section E. Fish Health Inspection Reports.

4. Fish health inspection reports of listed fish pathogens, (Annex III) shall be in the form prescribed in Annex I.
5. Reports may only be issued by fish health inspectors acceptable to the NEFHC as described in Section G.
6. Current fish health inspection reports are required of all fish cultural facilities that must be inspected annually by means of the procedures set forth in Annex II.
7. If at any time a fish health inspector detects the presence of any listed or exotic fish pathogen at a fish cultural facility he/she shall notify the inspected facility and the appropriate member agency. Agency confidentiality will be maintained within applicable laws. A new fish health inspection report will be issued.
8. Fish health inspection reports and on-site fish culture facility inspections shall be used to support a fish culture station facility classification plan such as described in Annex V for the purpose of fish pathogen control.

*Revised 1/20/2000*

#### Section F. Inspectors.

1. Each member agency shall identify by name fish health inspectors who are acceptable for carrying out inspections within the jurisdiction of the agency in accordance with these guidelines and issuing fish health inspection reports. No owner, immediate family member or employee may serve as fish health inspector of a commercial or private facility.
2. Competence of fish health inspectors shall be based upon standards set forth by the Fish Health Section of the American Fisheries Society.
3. Each member agency shall inform the Chairman of the NEFHC of the identity of fish health inspectors for the compilation and distribution of a list of qualified individuals.
4. Fish health inspectors shall submit copies of all fish health inspection forms to the appropriate member agency under whose jurisdiction the inspected fish culture facility lies, and appropriate state and/or federal agencies needing information for proposed importation.

#### Section G. Inspection procedures and methods of diagnosis.

2. Centrarchidae.

Section A. Definitions.

Words and phrases used in these guidelines, unless otherwise provided, will be construed to mean as follows:

**NEFHC:** The New England Fish Health Committee, a subcommittee of and appointed by the New England Atlantic Salmon Committee to address fish health of salmonids in New England;

**Committee:** The New England Atlantic Salmon Committee represented by the executive officers (or their designees) charged with the management of the fisheries resources of the states of Vermont, Connecticut, Massachusetts, New Hampshire, Maine, Rhode Island, the United States Fish and Wildlife Service and the National Marine Fisheries Service (each referred to as a member agency) and by whose authority the NEFHC was authorized to recommend for adoption by each state the comprehensive salmonid health guidelines;

**New England:** That geographic area encompassing the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont;

**Fish:** Live fish, viable fish eggs, viable sperm, offal or other fish products which have not been so processed as to render them incapable of transmitting a listed fish pathogen;

**Fish cultural facility:** Any fish culture station, hatchery, rearing pond, net pen, container which holds, rears or releases salmonids for sale and/or distribution in either marine or fresh waters of New England;

**Salmonid:** All species and hybrids of the family Salmonidae covered by the AFS checklist special publication No. 12, "A List of Common and Scientific Names of Fishes from the United States and Canada."

**Listed fish pathogen:** Certain infectious pathogens (Annex III) of fish caused by viral, bacterial, or other parasitic agents which are transmissible, directly or indirectly, from one fish to another;

**Report:** Fish health inspection report as referred to in Section F and exhibited in Annex I.

**Inspectors:** An accredited, licensed veterinarian, a certified fish health inspector or persons recognized by federal or state agencies with responsibility for fish health or transfer in the state from which the fish or gametes originate upon approval of the Commissioner. No owner or employee with direct supervisory authority over a facility may serve as an inspector for their fish culture facility.

Accredited licensed veterinarian” means a veterinarian holding a current veterinary license who has also fulfilled the accreditation requirements of the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA/APHIS).

“Certified fish health inspector” means an individual certified by the American Fisheries Society/Fish Health Section (AFS/FHS) as a Fish Health Inspector or Fish Pathologist.

**Clinical:** A condition that is readily apparent, overt, or obvious by gross inspection.

**Inspection:** On site, statistically based sampling of all lots of fish in the facility, performed or supervised by a fish health inspector, with subsequent examination of the collected tissues and

fluids for the detection of listed pathogens in accordance with procedures set forth in these guidelines.

**Lot:** A group of fish of the same species and age which originated from the same broodstock during the same year, and are being raised on the same water source.

**Pathogen:** Any disease producing microorganism or material.

*Revised 9/27/2001*

#### Section B. Basic obligation.

The member agencies will take all appropriate measures including the development of legislative authority and regulations, where necessary, to restrict the spread of listed fish pathogens, to contain them within their known geographic ranges, and to strive for their elimination in accordance with the provisions of these guidelines.

#### Section C. Application

The provisions of these guidelines apply to:

*Revised 1/20/2000*

All salmonids held, reared or transferred in or between New England fish culture facilities;

All salmonid populations used in fish culture management;

Fish pathogens included but not limited to those listed in Annex III;

Fish pathogen research and development facilities on which fish infected with, or exposed to, listed fish pathogens and/or in the possession of listed fish pathogens are capable of causing disease.

The provisions of these guidelines will not apply to:

Fish and/or the water used in the transport of fish in transit through New England which are not released from their original shipping containers;

Fish and/or specimens from fish imported or exported for purposes of diagnostic or inspection services and related laboratory tests or research provided that biological containment measures used at each laboratory to eliminate any dissemination of fish pathogens are approved by the NEFHC.

Fish in transit from within or without member agencies' geographic area that are being utilized for the purpose of restaurant or grocery store sales and will not be released or discarded into New England waters.

Nothing in these guidelines shall derogate from the right of the member agencies to apply additional measures of inspection, quarantine, and/or eradication for the control of fish pathogens.

*Revised 8/9/2001*

#### Section C. Traffic in fish.

Except as provided in Section C, paragraph (2), no salmonids may be imported into New England, transferred between fish culture facilities within New England or released into state waters unless:

1. In the case of salmonids imported into New England or transferred between fish culture facilities within New England the source fish culture facility possesses a valid fish health inspection report issued by a fish health inspector in accordance with Section F.
2. In the case of salmonids imported from outside the jurisdiction of member agencies, the salmonids are accompanied by a fish health inspection report giving equivalent assurance as to the state of health of the fish that is prepared and signed by a fish health inspector in accordance with Section F. When the source is inspected by other than the NEFHC inspector, that inspector prior to shipment, will furnish to the appropriate member agency's representative to NEFHC a statement confirming that the source of the gametes, fertilized eggs or fish has been inspected for the presence of each listed pathogen under the provisions of this program within one year of shipping date. The member agency's representative will, if he/she determines that inspection procedures used meet NEFHC standards, approve the inspection report by countersigning. The member agency's representative will report in an annual report his/her decision to the NEFHC Chairman.
3. No live fish, gametes, fertilized eggs, or fish products from stocks known to be infected with Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Oncorhynchus Masou virus, *Ceratomyxa shasta* or the causative agent of Proliferative Kidney Disease may be imported into New England. Refer to Annex VI.
4. No live fish or fish products known to be infected with *Myxobolus cerebralis* may be imported into New England. Properly disinfected eggs (Annex VI) and transport water of well origin may be transferred to facilities without altering the disease classification of the receiving facility.
5. In the case of areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus, (See "Suggested Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens, 1994 Version I" for Endemic Areas) and/or facilities receiving salmonid fish, gametes, fertilized eggs, or fish products from areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus:

No live salmonid fish, gametes, fertilized eggs, or fish products may be imported from the areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Virus and Oncorhynchus Masou Virus.

No live salmonid fish, gametes, fertilized eggs or fish products may be imported from facilities which have received live salmonid fish, gametes, fertilized eggs, or fish products from endemic areas unless the following conditions are met:

All lots of fish at the source must be tested and found negative for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus, either annually for a minimum of three consecutive years, or if the past number of consecutive years equal to the age of the oldest spawning fish is longer than three years, for that period of time prior to importation.

All lots, using the oldest age classes first, of sexually mature fish will be sampled at the 2% incidence level utilizing ovarian fluid and pellet collected at spawning time or from post-spawned fish.

Kidney/spleen samples will also be collected at the 5% incidence level from post-spawned broodstock and from all lots of sexually immature fish.

All cell cultures will be observed for a minimum of 14 days.

All lots of fish at the source must be negative for all other vertically transmitted pathogens in addition to Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus.

Fertilized eggs to be imported are properly surface disinfected with PVP iodine and/or water hardened in an iodine solution.

Eggs are incubated in a water supply free of listed pathogens.

Only properly disinfected eggs may be imported. Eggs shall be disinfected for 10 minutes in PVP iodine at 100 ppm and then in formalin at 2000 ppm for 15 minutes prior to shipment to New England. The eggs will be disinfected again according to this procedure before being placed in a New England hatchery.

Fish are hatched and reared in an approved quarantine facility (effluent should be appropriately disinfected) for 6 months after hatching and fry subjected to at least one fish health inspection.

*Revised 9/27/2001*

#### Section D. Release of fish.

1. No fish cultural facility may release salmonids into waters of New England until a current fish health inspection report has been issued in compliance with these guidelines.
2. No salmonids known to be infected with the causative agents of Viral Hemorrhagic Septicemia, Infectious Hematopoietic Necrosis, Oncorhynchus Masou Virus, Proliferative Kidney Disease, Whirling Disease, Infectious Salmon Anemia, Hitra Disease, and Ceratomyxosis may be released into the waters of New England.
3. No salmonids with clinical signs of any disease may be released into the waters of New England.

*Revised 1/20/2000*

#### Section E. Fish Health Inspection Reports.

Fish health inspection reports of listed fish pathogens, (Annex III) shall be in the form prescribed in Annex I.

Reports may only be issued by fish health inspectors acceptable to the NEFHC as described in Section G.

Current fish health inspection reports are required of all fish cultural facilities that must be inspected annually by means of the procedures set forth in Annex II.

If at any time a fish health inspector detects the presence of any listed or exotic fish pathogen at a fish cultural facility he/she shall notify the inspected facility and the appropriate member agency. Agency confidentiality will be maintained within applicable laws. A new fish health inspection report will be issued.

Fish health inspection reports and on-site fish culture facility inspections shall be used to support a fish culture station facility classification plan such as described in Annex V for the purpose of fish pathogen control.

Section F. Inspectors.

1. Each member agency shall identify by name fish health inspectors who are acceptable for carrying out inspections within the jurisdiction of the agency in accordance with these guidelines and issuing fish health inspection reports. No owner, immediate family member or employee may serve as fish health inspector of a commercial or private facility.
2. Competence of fish health inspectors shall be based upon standards set forth by the Fish Health Section of the American Fisheries Society.
3. Each member agency shall inform the Chairman of the NEFHC of the identity of fish health inspectors for the compilation and distribution of a list of qualified individuals.
4. Fish health inspectors shall submit copies of all fish health inspection forms to the appropriate member agency under whose jurisdiction the inspected fish culture facility lies, and appropriate state and/or federal agencies needing information for proposed importation.

**Table 1 Guidelines for conducting fish health inspections on Centrarchidae.**

Target Pathogen (classification code)	Centrarchidae Lots/Populations to Sample	Target Sample Tissues/Methods	Sample level Assumed detectable incidence (95% Confidence)	Lab Methods: Screening/Confirmation	Comments
<b>Viral Pathogens:</b> Largemouth Bass Virus (LV) Viral Hemorrhagic Septicemia virus (VE), Infectious Pancreatic Necrosis virus (VP)	Fish Facility;  Production lots, Broodstock lots (All bass >12 in. combined)	Kidney/spleen In 5-fish pools,  Or for smaller fish, whole fish or viscera	2% with a minimum of 60 fish per species on site  5%, or 60 fish per bass lot on site	Cell culture on EPC and FHM 0r BK-2 cell lines  PCR confirmation of CPE	<b>Any filterable agent causing cytopathic effect in cell culture assays will be reported and investigated</b>
<b>Bacterial Pathogens:</b>  <i>Aeromonas salmonicida</i> (BF), <i>Yersinia ruckeri</i> (BR)	Fish Facility, Production lots, Broodstock lots,	Kidney inoculum on TSA	5%, or 60 fish total to include a minimum of 30 fish per species	Bacterial culture and phenotypical characterization/ Serological or PCR confirmation	<b>Any bacterial colony exhibiting predominance will be identified and reported</b>
<b>Parasitic Pathogens:</b> <i>Heterosporis</i> (PH),  Bass Tapeworm???	Fish Facility, Production lots, Broodstock lots,	Fillets – gross observation	5%, or 60 fish total to include a minimum of 30 fish per species	Histology/PCR	<b>All other parasites observed will be noted and reported</b>

\* Fish health inspections are required during June, July or August

Section G. Inspection procedures and methods of diagnosis.



### 3. Cyprinidae.

#### Section A. Definitions.

Definitions that are used consistently throughout the document are listed in section IV. Words and phrases with specific meaning within this chapter, unless otherwise provided, will be construed to mean as follows:

**Cyprinid fish facility:** Any fish culture station, hatchery, rearing pond, net pen, container which holds, rears or releases salmonids for sale and/or distribution in either marine or fresh waters of New England;

**Cyprinid.** All species and hybrids of the family Cyprinidae covered by the AFS checklist special publication No. 12, "A List of Common and Scientific Names of Fishes from the United States and Canada."

**Inspection:** On site, statistically based sampling of all lots of fish in the facility, performed or supervised by a fish health inspector, with subsequent examination of the collected tissues and fluids for the detection of listed pathogens in accordance with procedures set forth in these guidelines.

**Lot:** A group of fish of the same species and age which originated from the same broodstock during the same year, and are being raised on the same water source.

**Wild caught minnows (JOEL BADER) discourage harvest of wild minnows.**

**Discourage movement of wild minnows out of drainage.**

**Aquatic Nuisance Species (Aquatic Invasive Species).**

*Revised 8/14/2007*

#### Section B. Basic obligation.

The member agencies will take all appropriate measures including the development of legislative authority and regulations, where necessary, to restrict the spread of listed fish pathogens, to contain them within their known geographic ranges, and to strive for their elimination in accordance with the provisions of these guidelines.

#### Section C. Application

*Revised 8/14/2007*

The provisions of these guidelines apply to:

All cyprinids held, reared or transferred in or between New England fish culture facilities;

All cyprinids populations used in fish culture management;

Fish pathogens included but not limited to those listed in Annex III;

Fish pathogen research and development facilities on which fish infected with, or exposed to, listed fish pathogens and/or in the possession of listed fish pathogens are capable of causing disease.

The provisions of these guidelines will not apply to:

Fish and/or the water used in the transport of fish in transit through New England which are not released from their original shipping containers;

Fish and/or specimens from fish imported or exported for purposes of diagnostic or inspection services and related laboratory tests or research provided that biological containment measures used at each laboratory to eliminate any dissemination of fish pathogens are approved by the NEFHC.

Fish in transit from within or without member agencies' geographic area that are being utilized for the purpose of restaurant or grocery store sales and will not be released or discarded into New England waters.

Nothing in these guidelines shall derogate from the right of the member agencies to apply additional measures of inspection, quarantine, and/or eradication for the control of fish pathogens.

Revised 8/14/2007

### Section C. Traffic in fish.

Except as provided in Section C, paragraph (2), no cyprinids may be imported into New England, transferred between fish culture facilities within New England or released into state waters unless:

1. In the case of cyprinids imported into New England or transferred between fish culture facilities within New England the source fish culture facility possesses a valid fish health inspection report issued by a fish health inspector in accordance with Section F.
2. In the case of cyprinids imported from outside the jurisdiction of member agencies, the cyprinids are accompanied by a fish health inspection report giving equivalent assurance as to the state of health of the fish that is prepared and signed by a fish health inspector in accordance with Section F. When the source is inspected by other than the NEFHC inspector, that inspector prior to shipment, will furnish to the appropriate member agency's representative to NEFHC a statement confirming that the source of the gametes, fertilized eggs or fish has been inspected for the presence of each listed pathogen under the provisions of this program within six months of shipping date. The member agency's representative will, if he/she determines that inspection procedures used meet NEFHC standards, approve the inspection report by countersigning. The member agency's representative will report in an annual report his/her decision to the NEFHC Chairman.
3. No live fish, gametes, fertilized eggs, or fish products from stocks known to be infected with Viral Hemorrhagic Septicemia or Spring Viremia of Carp virus may be imported into New England. Refer to Annex VI.
4. No live fish or fish products known to be infected with Spring Viremia of Carp or Viral Hemorrhagic Septicemia virus may be imported into New England.
5. Transport water must be free of aquatic nuisance species as defined by the receiving authority.
6. In the case of areas endemic for Spring Viremia of Carp or Viral Hemorrhagic Septicemia (to include infected watersheds in the eastern states of VA, NC, IL, WI, NY, MI, OH, PA and the Great Lakes Basin or facilities receiving cyprinid fish, gametes, fertilized eggs, or fish products from areas endemic for these pathogens:

- a. No live cyprinid fish, gametes, fertilized eggs, or fish products may be imported from the areas endemic for Spring Viremia of Carp or Viral Hemorrhagic Septicemia, Virus.
- b. No live cyprinid fish, gametes, fertilized eggs or fish products may be imported from facilities which have received live cyprinid fish, gametes, fertilized eggs, or fish products from endemic areas unless the following conditions are met:
  - i. All lots of fish at the source must be tested and found negative for Spring Viremia of Carp and Viral Hemorrhagic Septicemia either semi-annually for a minimum of three consecutive years, or if the past number of consecutive years equal to the age of the oldest spawning fish is longer than three years, for that period of time prior to importation.
  - ii. Samples for inspection should be collected during the spring and fall months when the facility water temperatures are between 10 and 17°C
  - iii. All lots, using the oldest age classes first, of sexually mature fish will be sampled at the 2% incidence level utilizing ovarian fluid and pellet collected at spawning time or from post-spawned fish.
  - iv. Kidney/spleen samples will also be collected at the 5% incidence level from post-spawned broodstock and from all lots of sexually immature fish.
  - v. All cell cultures will be observed for a minimum of 14 days.
  - vi. All lots of fish at the source must be negative for all other vertically transmitted pathogens.
  - vii. Fertilized eggs to be imported are properly surface disinfected with PVP iodine and/or water hardened in an iodine solution.
  - viii. Eggs are incubated in a water supply free of listed pathogens.
  - ix. Only properly disinfected eggs may be imported. Eggs shall be disinfected for 30 minutes in PVP iodine at 50-100 ppm. The eggs will be disinfected again according to this procedure before being placed in a New England hatchery.
  - x. Fish are hatched and reared in an approved quarantine facility (effluent should be appropriately disinfected) for 6 months after hatching and fry subjected to at least one fish health inspection.

*Revised 8/14/2007*

Section D. Release of fish.

9. No fish facility may release cyprinids into waters of New England until a current fish health inspection report has been issued in compliance with these guidelines.
10. No cyprinids known to be infected with the causative agents of Spring Viremia of Carp or Viral Hemorrhagic Septicemia may be released into the waters of New England.
11. No cyprinids with clinical signs of any disease may be released into the waters of New England.

Section E. Fish Health Inspection Reports.

*Revised 8/14/2007*

1. Fish health inspection reports of listed fish pathogens, (Annex III) shall be in the form prescribed in Annex I.
2. Reports may only be issued by fish health inspectors acceptable to the NEFHC as described in Section G.
3. Current fish health inspection reports are required of all fish cultural facilities that must be inspected annually by means of the procedures set forth in Annex II.
4. If at any time a fish health inspector detects the presence of any listed or exotic fish pathogen at a fish facility he/she shall notify the inspected facility and the appropriate member agency. Agency confidentiality will be maintained within applicable laws. A new fish health inspection report will be issued.
5. Fish health inspection reports and on-site fish facility inspections shall be used to support a fish facility classification plan such as described in Annex V for the purpose of fish pathogen control.

*Revised 8/14/07*

Section F. Inspectors.

1. Each member agency shall identify by name fish health inspectors who are acceptable for carrying out inspections within the jurisdiction of the agency in accordance with these guidelines and issuing fish health inspection reports. No owner, immediate family member or employee may serve as fish health inspector of a commercial or private facility.
2. Competence of fish health inspectors shall be based upon standards set forth by the Fish Health Section of the American Fisheries Society.
3. Each member agency shall inform the Chairman of the NEFHC of the identity of fish health inspectors for the compilation and distribution of a list of qualified individuals.
4. Fish health inspectors shall submit copies of all fish health inspection forms to the appropriate member agency under whose jurisdiction the inspected fish culture facility lies, and appropriate state and/or federal agencies needing information for proposed importation.

Section G. Inspection procedures and methods of diagnosis.

WHY NO 1-4 HERE?

**Table 2 Guidelines for conducting fish health inspections on cyprinids.**

Target Pathogen (classification code)	Centrarchidae Lots/Populations to Sample	Target Sample Tissues/Methods	Sample level Assumed detectable incidence (95% Confidence)	Lab Methods: Screening/Confirmation	Comments
<b>Viral Pathogens:</b> Spring Viremia of Carp virus (SV?) Viral Hemorrhagic Septicemia virus (VE),	Fish Facility;  Production lots, Broodstock lots (All bass >12 in. combined)	Kidney/spleen In 5-fish pools,  Or for smaller fish, whole fish or viscera	2% with a minimum of 60 fish per species on site  5%, or 60 fish per bass lot on site	Cell culture on EPC and FHM 0r BK-2 cell lines  PCR confirmation of CPE	<b>Any filterable agent causing cytopathic effect in cell culture assays will be reported and investigated</b>
<b>Bacterial Pathogens:</b>					
<b>Parasitic Pathogens:</b> ?					

4. Esocidae.

Section A. Definitions.

Words and phrases used in these guidelines, unless otherwise provided, will be construed to mean as follows:

**NEFHC:** The New England Fish Health Committee, a subcommittee of and appointed by the New England Atlantic Salmon Committee to address fish health of salmonids in New England;

**Committee:** The New England Atlantic Salmon Committee represented by the executive officers (or their designees) charged with the management of the fisheries resources of the states of Vermont, Connecticut, Massachusetts, New Hampshire, Maine, Rhode Island, the United States Fish and Wildlife Service and the National Marine Fisheries Service (each referred to as a member agency) and by whose authority the NEFHC was authorized to recommend for adoption by each state the comprehensive salmonid health guidelines;

**New England:** That geographic area encompassing the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont;

**Fish:** Live fish, viable fish eggs, viable sperm, offal or other fish products which have not been so processed as to render them incapable of transmitting a listed fish pathogen;

**Fish cultural facility:** Any fish culture station, hatchery, rearing pond, net pen, container which holds, rears or releases salmonids for sale and/or distribution in either marine or fresh waters of New England;

**Salmonid:** All species and hybrids of the family Salmonidae covered by the AFS checklist special publication No. 12, "A List of Common and Scientific Names of Fishes from the United States and Canada."

**Listed fish pathogen:** Certain infectious pathogens (Annex III) of fish caused by viral, bacterial, or other parasitic agents which are transmissible, directly or indirectly, from one fish to another;

**Report:** Fish health inspection report as referred to in Section F and exhibited in Annex I.

**Inspectors:** An accredited, licensed veterinarian, a certified fish health inspector or persons recognized by federal or state agencies with responsibility for fish health or transfer in the state from which the fish or gametes originate upon approval of the Commissioner. No owner or employee with direct supervisory authority over a facility may serve as an inspector for their fish culture facility.

Accredited licensed veterinarian” means a veterinarian holding a current veterinary license who has also fulfilled the accreditation requirements of the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA/APHIS).

“Certified fish health inspector” means an individual certified by the American Fisheries Society/Fish Health Section (AFS/FHS) as a Fish Health Inspector or Fish Pathologist.

**Clinical:** A condition that is readily apparent, overt, or obvious by gross inspection.

**Inspection:** On site, statistically based sampling of all lots of fish in the facility, performed or supervised by a fish health inspector, with subsequent examination of the collected tissues and fluids for the detection of listed pathogens in accordance with procedures set forth in these guidelines.

**Lot:** A group of fish of the same species and age which originated from the same broodstock during the same year, and are being raised on the same water source.

**Pathogen:** Any disease producing microorganism or material.

#### Section B. Basic obligation

The member agencies will take all appropriate measures including the development of legislative authority and regulations, where necessary, to restrict the spread of listed fish pathogens, to contain them within their known geographic ranges, and to strive for their elimination in accordance with the provisions of these guidelines.

*Revised 9/27/2001*

#### Section C. Application

The provisions of these guidelines apply to:

*Revised 1/20/2000*

All salmonids held, reared or transferred in or between New England fish culture facilities;

All salmonid populations used in fish culture management;

Fish pathogens included but not limited to those listed in Annex III;

Fish pathogen research and development facilities on which fish infected with, or exposed to, listed fish pathogens and/or in the possession of listed fish pathogens are capable of causing disease.

The provisions of these guidelines will not apply to:

Fish and/or the water used in the transport of fish in transit through New England which are not released from their original shipping containers;

Fish and/or specimens from fish imported or exported for purposes of diagnostic or inspection services and related laboratory tests or research provided that biological containment measures used at each laboratory to eliminate any dissemination of fish pathogens are approved by the NEFHC.

Fish in transit from within or without member agencies' geographic area that are being utilized for the purpose of restaurant or grocery store sales and will not be released or discarded into New England waters.

Nothing in these guidelines shall derogate from the right of the member agencies to apply additional measures of inspection, quarantine, and/or eradication for the control of fish pathogens.

#### Section B. Traffic in fish.

*Revised 8/9/2001*

Except as provided in Section C, paragraph (2), no salmonids may be imported into New England, transferred between fish culture facilities within New England or released into state waters unless:

7. In the case of salmonids imported into New England or transferred between fish culture facilities within New England the source fish culture facility possesses a valid fish health inspection report issued by a fish health inspector in accordance with Section F.

8. In the case of salmonids imported from outside the jurisdiction of member agencies, the salmonids are accompanied by a fish health inspection report giving equivalent assurance as to the state of health of the fish that is prepared and signed by a fish health inspector in accordance with Section F. When the source is inspected by other than the NEFHC inspector, that inspector prior to shipment, will furnish to the appropriate member agency's representative to NEFHC a statement confirming that the source of the gametes, fertilized eggs or fish has been inspected for the presence of each listed pathogen under the provisions of this program within one year of shipping date. The member agency's representative will, if he/she determines that inspection procedures used meet NEFHC standards, approve the inspection report by countersigning. The member agency's representative will report in an annual report his/her decision to the NEFHC Chairman.
9. No live fish, gametes, fertilized eggs, or fish products from stocks known to be infected with Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Oncorhynchus Masou virus, *Ceratomyxa shasta* or the causative agent of Proliferative Kidney Disease may be imported into New England. Refer to Annex VI.
10. No live fish or fish products known to be infected with *Myxobolus cerebralis* may be imported into New England. Properly disinfected eggs (Annex VI) and transport water of well origin may be transferred to facilities without altering the disease classification of the receiving facility.

11. In the case of areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus, (See "Suggested Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens, 1994 Version I" for Endemic Areas) and/or facilities receiving salmonid fish, gametes, fertilized eggs, or fish products from areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus:

No live salmonid fish, gametes, fertilized eggs, or fish products may be imported from the areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Virus and Oncorhynchus Masou Virus.

No live salmonid fish, gametes, fertilized eggs or fish products may be imported from facilities which have received live salmonid fish, gametes, fertilized eggs, or fish products from endemic areas unless the following conditions are met:

All lots of fish at the source must be tested and found negative for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus, either annually for a minimum of three consecutive years, or if the past number of consecutive years equal to the age of the oldest spawning fish is longer than three years, for that period of time prior to importation.

All lots, using the oldest age classes first, of sexually mature fish will be sampled at the 2% incidence level utilizing ovarian fluid and pellet collected at spawning time or from post-spawned fish.

Kidney/spleen samples will also be collected at the 5% incidence level from post-spawned broodstock and from all lots of sexually immature fish.

All cell cultures will be observed for a minimum of 14 days.



All lots of fish at the source must be negative for all other vertically transmitted pathogens in addition to Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus.

Fertilized eggs to be imported are properly surface disinfected with PVP iodine and/or water hardened in an iodine solution.

Eggs are incubated in a water supply free of listed pathogens.

Only properly disinfected eggs may be imported. Eggs shall be disinfected for 10 minutes in PVP iodine at 100 ppm and then in formalin at 2000 ppm for 15 minutes prior to shipment to New England. The eggs will be disinfected again according to this procedure before being placed in a New England hatchery.

Fish are hatched and reared in an approved quarantine facility (effluent should be appropriately disinfected) for 6 months after hatching and fry subjected to at least one fish health inspection.

*Revised 9/27/2001*

#### Section C. Release of fish.

6. No fish cultural facility may release salmonids into waters of New England until a current fish health inspection report has been issued in compliance with these guidelines.
7. No salmonids known to be infected with the causative agents of Viral Hemorrhagic Septicemia, Infectious Hematopoietic Necrosis, Oncorhynchus Masou Virus, Proliferative Kidney Disease, Whirling Disease, Infectious Salmon Anemia, Hitra Disease, and Ceratomyxosis may be released into the waters of New England.
8. No salmonids with clinical signs of any disease may be released into the waters of New England.

*Revised 1/20/2000*

#### Section D. Fish Health Inspection Reports.

9. Fish health inspection reports of listed fish pathogens, (Annex III) shall be in the form prescribed in Annex I.
10. Reports may only be issued by fish health inspectors acceptable to the NEFHC as described in Section G.
11. Current fish health inspection reports are required of all fish cultural facilities that must be inspected annually by means of the procedures set forth in Annex II.
12. If at any time a fish health inspector detects the presence of any listed or exotic fish pathogen at a fish cultural facility he/she shall notify the inspected facility and the appropriate member agency. Agency confidentiality will be maintained within applicable laws. A new fish health inspection report will be issued.
13. Fish health inspection reports and on-site fish culture facility inspections shall be used to support a fish culture station facility classification plan such as described in Annex V for the purpose of fish pathogen control.

## Section E. Inspectors.

5. Each member agency shall identify by name fish health inspectors who are acceptable for carrying out inspections within the jurisdiction of the agency in accordance with these guidelines and issuing fish health inspection reports. No owner, immediate family member or employee may serve as fish health inspector of a commercial or private facility.
6. Competence of fish health inspectors shall be based upon standards set forth by the Fish Health Section of the American Fisheries Society.
7. Each member agency shall inform the Chairman of the NEFHC of the identity of fish health inspectors for the compilation and distribution of a list of qualified individuals.
8. Fish health inspectors shall submit copies of all fish health inspection forms to the appropriate member agency under whose jurisdiction the inspected fish culture facility lies, and appropriate state and/or federal agencies needing information for proposed importation.

## Section F. Inspection procedures and methods of diagnosis.

## 5. Percidae.

## Section A. Definitions.

Words and phrases used in this section, unless otherwise noted below, will be defined as in Definitions (on page 5).

**Fish facility:** Any fish station, hatchery, rearing pond, net pen, container which holds, rears or releases perches for sale and/or distribution in either marine or fresh waters of New England;

**Perch:** All species and hybrids of the family Percidae as covered by (Nelson, Crossman et al. 2004).

**Inspection:** On site, statistically based sampling of all lots of fish in the facility, performed or supervised by a fish health inspector, with subsequent examination of the collected tissues and fluids for the detection of listed pathogens in accordance with procedures set forth in these guidelines.

**Lot:** A group of fish of the same species and age which originated from the same broodstock, (or water body) during the same year, and are being raised on the same water source.

## Section B. Basic obligation.

*Revised 1/16/2007*

The member agencies will take all appropriate measures including the development of legislative authority and regulations, where necessary, to restrict the spread of listed fish pathogens and aquatic nuisance species, to contain them within their known geographic ranges, and to strive for their elimination in accordance with the provisions of these guidelines.

## Section C. Application.

*Revised 2/19/2007*

The provisions of these guidelines apply to:

1. All perches held, reared or transferred in or between New England fish culture facilities;
2. All perch populations used in fish culture management;
3. Fish pathogens included but not limited to those listed in Table 3 Guidelines for conducting fish health inspections on Percidae fishes.);
4. Fish pathogen research and development facilities on which fish infected with, or exposed to, listed fish pathogens and/or in the possession of listed fish pathogens are capable of causing disease.

The provisions of these guidelines will not apply to:

1. Fish and/or the water used in the transport of fish in transit through New England which are not released from their original shipping containers;
2. Fish and/or specimens from fish imported or exported for purposes of diagnostic or inspection services and related laboratory tests or research provided that biological containment measures used at each laboratory to eliminate any dissemination of fish pathogens are approved by the [member agency's regulatory body](#).

3. Fish in transit from within or without member agencies' geographic area that are being utilized for the purpose of restaurant or grocery store sales and will not be released or discarded into New England waters.

Nothing in these guidelines shall derogate from the right of the member agencies to apply additional measures of inspection, quarantine, and/or eradication for the control of fish pathogens.

Revised 8/9/2001

#### Section D. Traffic in fish.

Except as provided in Section C (above), no perches may be imported into New England, transferred between fish facilities within New England or released into state waters unless:

1. In the case of perches imported into New England or transferred between fish culture facilities within New England the source fish culture facility possesses a valid fish health inspection report issued by a fish health inspector in accordance with Section F.
2. In the case of perches imported from outside the jurisdiction of member agencies, the perches are accompanied by a fish health inspection report giving equivalent assurance as to the state of health of the fish that is prepared and signed by a fish health inspector in accordance with Section F. When the source is inspected by other than the NEFHC inspector, that inspector prior to shipment, will furnish to the appropriate member agency's representative to NEFHC a statement confirming that the source of the gametes, fertilized eggs or fish has been inspected for the presence of each listed pathogen under the provisions of this program within one year of shipping date. The member agency's representative will, if he/she determines that inspection procedures used meet NEFHC standards, approve the inspection report by countersigning. The member agency's representative will report in an annual report his/her decision to the NEFHC Chairman.
3. No live fish, gametes, fertilized eggs, or fish products from stocks known to be infected with Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Oncorhynchus Masou virus, *Ceratomyxa shasta* or the causative agent of Proliferative Kidney Disease may be imported into New England. Refer to Annex VI.
4. No live fish or fish products known to be infected with *Myxobolus cerebralis* may be imported into New England. Properly disinfected eggs (Annex VI) and transport water of well origin may be transferred to facilities without altering the disease classification of the receiving facility.
5. In the case of areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus, (AFS-FHS 2004)?? and/or facilities receiving salmonid fish, gametes, fertilized eggs, or fish products from areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus:
  - a. No live perch fish, gametes, fertilized eggs, or fish products may be imported from the areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Virus and Oncorhynchus Masou Virus.
  - b. No live perch fish, gametes, fertilized eggs or fish products may be imported from facilities which have received live perch fish, gametes, fertilized eggs, or fish products from endemic areas unless the following conditions are met:

- c. All lots of fish at the source must be tested and found negative for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus, either annually for a minimum of three consecutive years, or if the past number of consecutive years equal to the age of the oldest spawning fish is longer than three years, for that period of time prior to importation.
- d. All lots, using the oldest age classes first, of sexually mature fish will be sampled at the 2% incidence level utilizing ovarian fluid and pellet collected at spawning time or from post-spawned fish.
- e. Kidney/spleen samples will also be collected at the 5% incidence level from post-spawned broodstock and from all lots of sexually immature fish.
- f. All cell cultures will be observed for a minimum of 14 days.
- g. All lots of fish at the source must be negative for all other vertically transmitted pathogens in addition to Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus.
- h. Fertilized eggs to be imported are properly surface disinfected with PVP iodine and/or water hardened in an iodine solution.
- i. Eggs are incubated in a water supply free of listed pathogens.
- j. Only properly disinfected eggs may be imported. Eggs shall be disinfected for 10 minutes in PVP iodine at 100 ppm prior to shipment to New England. The eggs will be disinfected again according to this procedure before being placed in a New England hatchery.
- k. Fish are hatched and reared in an approved quarantine facility (effluent should be appropriately disinfected) for 6 months after hatching and fry subjected to at least one fish health inspection.

Section E. Release of fish (Revised 1/20/07).

- 1. No fish cultural facility may release perches into waters of New England until a current fish health inspection report has been issued in compliance with these guidelines.
- 2. No perches known to be infected with the causative agents of Viral Hemorrhagic Septicemia, Infectious Hematopoietic Necrosis, Oncorhynchus Masou Virus, Proliferative Kidney Disease, Whirling Disease, Infectious Salmon Anemia, Hitra Disease, and Ceratomyxosis may be released into the waters of New England.
- 3. No perches with clinical signs of any disease may be released into the waters of New England.

Section F. Fish Health Inspection Reports (Revised 1/20/07).

Fish health inspection reports of listed fish pathogens, (Annex III; on page 38) shall be in the form prescribed in Annex I.

- 1. Reports may only be issued by fish health inspectors acceptable to the NEFHC as described in Section G.

2. Current fish health inspection reports are required of all fish cultural facilities that must be inspected annually by means of the procedures set forth in Annex II.
3. If at any time a fish health inspector detects the presence of any listed or exotic fish pathogen at a fish cultural facility he/she shall notify the inspected facility and the appropriate member agency. Agency confidentiality will be maintained within applicable laws. A new fish health inspection report will be issued.
4. Fish health inspection reports and on-site fish culture facility inspections shall be used to support a fish culture station facility classification plan such as described in Annex V for the purpose of fish pathogen control.

Section G. Inspectors (Revised 1/20/07).

1. Each member agency shall identify by name fish health inspectors who are acceptable for carrying out inspections within the jurisdiction of the agency in accordance with these guidelines and issuing fish health inspection reports. No owner, immediate family member or employee may serve as fish health inspector of a commercial or private facility.
2. Competence of fish health inspectors shall be based upon standards set forth by the Fish Health Section of the American Fisheries Society.
3. Each member agency shall inform the Chairman of the NEFHC of the identity of fish health inspectors for the compilation and distribution of a list of qualified individuals.
4. Fish health inspectors shall submit copies of all fish health inspection forms to the appropriate member agency under whose jurisdiction the inspected fish culture facility lies, and appropriate state and/or federal agencies needing information for proposed importation.

Section H. Inspection procedures and diagnostic methods (Revised 1/20/07).

1. Each member agency shall appoint a representative to the NEFHC. The agency representative should be a recognized fish health professional if possible.
2. Member agencies shall present to each annual meeting of the NEFHC a report covering the status of fish pathogens, the measures adopted for their control, the activities and problems of their fish health inspectors and such other information as may be requested to enhance the effectiveness of this program. Detailed information on the fish health status of specific cultural facilities will not be included to maintain the anonymity, except to agencies needing information for importations.
3. The chairperson of the NEFHC shall maintain records of the annual reports and call emergency meetings as needed.

**Table 3 Guidelines for conducting fish health inspections on Percidae fishes.**

Target Pathogen (classification code)	Centrarchidae Lots/Populations to Sample	Target Sample Tissues/Methods	Sample level Assumed detectable incidence (95% Confidence)	Lab Methods: Screening/Confirmation	Comments
<b>Viral Pathogens</b>					
Largemouth Bass Virus (LV) Viral Hemorrhagic Septicemia virus (VE), Infectious Pancreatic Necrosis virus (VP)	Fish Facility;  Production lots, Broodstock lots (All bass >12 in. combined)	Kidney/spleen In 5-fish pools,  Or for smaller fish, whole fish or viscera	2% with a minimum of 60 fish per species on site  5%, or 60 fish per bass lot on site	Cell culture on EPC and FHM 0r BK-2 cell lines  PCR confirmation of CPE	<b>Any filterable agent causing cytopathic effect in cell culture assays will be reported and investigated</b>
<b>Bacterial Pathogens</b>					
<i>Aeromonas salmonicida</i> (BF), <i>Yersinia ruckeri</i> (BR)	Fish Facility, Production lots, Broodstock lots,	Kidney inoculum on TSA	5%, or 60 fish total to include a minimum of 30 fish per species	Bacterial culture and phenotypical characterization/ Serological or PCR confirmation	<b>Any bacterial colony exhibiting predominance will be identified and reported</b>
<b>Parasitic Pathogens</b>					
<i>Heterosporis</i> (PH),	Fish Facility, Production lots, Broodstock lots,	Fillets – gross observation	5%, or 60 fish total to include a minimum of 30 fish per species	Histology/PCR	<b>All other parasites observed will be noted and reported</b>

\* Fish health inspections are required during June, July or August

6. Salmonidae.

Section A. Definitions.

Words and phrases used in these guidelines, unless otherwise provided, will be construed to mean as follows:

**NEFHC:** The New England Fish Health Committee, a subcommittee of and appointed by the New England Atlantic Salmon Committee to address fish health of salmonids in New England;

**Committee:** The New England Atlantic Salmon Committee represented by the executive officers (or their designees) charged with the management of the fisheries resources of the states of Vermont, Connecticut, Massachusetts, New Hampshire, Maine, Rhode Island, the United States Fish and Wildlife Service and the National Marine Fisheries Service (each referred to as a member agency) and by whose authority the NEFHC was authorized to recommend for adoption by each state the comprehensive salmonid health guidelines;

**New England:** That geographic area encompassing the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont;

**Fish:** Live fish, viable fish eggs, viable sperm, offal or other fish products which have not been so processed as to render them incapable of transmitting a listed fish pathogen;

**Fish cultural facility:** Any fish culture station, hatchery, rearing pond, net pen, container which holds, rears or releases salmonids for sale and/or distribution in either marine or fresh waters of New England;

**Salmonid:** All species and hybrids of the family Salmonidae covered by the AFS checklist special publication No. 12, "A List of Common and Scientific Names of Fishes from the United States and Canada."

**Listed fish pathogen:** Certain infectious pathogens (Annex III) of fish caused by viral, bacterial, or other parasitic agents which are transmissible, directly or indirectly, from one fish to another;

**Report:** Fish health inspection report as referred to in Section F and exhibited in Annex I.

**Inspectors:** An accredited, licensed veterinarian, a certified fish health inspector or persons recognized by federal or state agencies with responsibility for fish health or transfer in the state from which the fish or gametes originate upon approval of the Commissioner. No owner or employee with direct supervisory authority over a facility may serve as an inspector for their fish culture facility.

Accredited licensed veterinarian” means a veterinarian holding a current veterinary license who has also fulfilled the accreditation requirements of the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA/APHIS).

“Certified fish health inspector” means an individual certified by the American Fisheries Society/Fish Health Section (AFS/FHS) as a Fish Health Inspector or Fish Pathologist.

**Clinical:** A condition that is readily apparent, overt, or obvious by gross inspection.

**Inspection:** On site, statistically based sampling of all lots of fish in the facility, performed or supervised by a fish health inspector, with subsequent examination of the collected tissues and fluids for the detection of listed pathogens in accordance with procedures set forth in these guidelines.



**Lot:** A group of fish of the same species and age which originated from the same broodstock during the same year, and are being raised on the same water source.

**Pathogen:** Any disease producing microorganism or material.

*Revised 9/27/2001*

Section B. Basic obligation.

The member agencies will take all appropriate measures including the development of legislative authority and regulations, where necessary, to restrict the spread of listed fish pathogens, to contain them within their known geographic ranges, and to strive for their elimination in accordance with the provisions of these guidelines.

*Revised 1/20/2000*

Section C. Application.

1. The provisions of these guidelines apply to:
  - a. All salmonids held, reared or transferred in or between New England fish culture facilities;
  - b. All salmonid populations used in fish culture management;
  - c. Fish pathogens included but not limited to those listed in Annex III;
  - d. Fish pathogen research and development facilities on which fish infected with, or exposed to, listed fish pathogens and/or in the possession of listed fish pathogens are capable of causing disease.
2. The provisions of these guidelines will not apply to:
  - a. Fish and/or the water used in the transport of fish in transit through New England which are not released from their original shipping containers;
  - b. Fish and/or specimens from fish imported or exported for purposes of diagnostic or inspection services and related laboratory tests or research provided that biological containment measures used at each laboratory to eliminate any dissemination of fish pathogens are approved by the NEFHC.
  - c. Fish in transit from within or without member agencies' geographic area that are being utilized for the purpose of restaurant or grocery store sales and will not be released or discarded into New England waters.
3. Nothing in these guidelines shall derogate from the right of the member agencies to apply additional measures of inspection, quarantine, and/or eradication for the control of fish pathogens.

*Revised 8/9/2001*

Section D. Traffic in fish.

Except as provided in Section C, paragraph (2), no salmonids may be imported into New England, transferred between fish culture facilities within New England or released into state waters unless:

1. In the case of salmonids imported into New England or transferred between fish culture facilities within New England the source fish culture facility possesses a valid fish health inspection report issued by a fish health inspector in accordance with Section F.

New England Fish Health Guidelines

2. In the case of salmonids imported from outside the jurisdiction of member agencies, the salmonids are accompanied by a fish health inspection report giving equivalent assurance as to the state of health of the fish that is prepared and signed by a fish health inspector in accordance with Section F. When the source is inspected by other than the NEFHC inspector, that inspector prior to shipment, will furnish to the appropriate member agency's representative to NEFHC a statement confirming that the source of the gametes, fertilized eggs or fish has been inspected for the presence of each listed pathogen under the provisions of this program within one year of shipping date. The member agency's representative will, if he/she determines that inspection procedures used meet NEFHC standards, approve the inspection report by countersigning. The member agency's representative will report in an annual report his/her decision to the NEFHC Chairman.
3. No live fish, gametes, fertilized eggs, or fish products from stocks known to be infected with Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Oncorhynchus Masou virus, *Ceratomyxa shasta* or the causative agent of Proliferative Kidney Disease may be imported into New England. Refer to Annex VI.
4. No live fish or fish products known to be infected with *Myxobolus cerebralis* may be imported into New England. Properly disinfected eggs (Annex VI) and transport water of well origin may be transferred to facilities without altering the disease classification of the receiving facility.
5. In the case of areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus, (See "Suggested Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens, 1994 Version I" for Endemic Areas) and/or facilities receiving salmonid fish, gametes, fertilized eggs, or fish products from areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia and Oncorhynchus Masou Virus:
  - a. No live salmonid fish, gametes, fertilized eggs, or fish products may be imported from the areas endemic for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, Virus and Oncorhynchus Masou Virus.
  - b. No live salmonid fish, gametes, fertilized eggs or fish products may be imported from facilities which have received live salmonid fish, gametes, fertilized eggs, or fish products from endemic areas unless the following conditions are met:
    - i. All lots of fish at the source must be tested and found negative for Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus, either annually for a minimum of three consecutive years, or if the past number of consecutive years equal to the age of the oldest spawning fish is longer than three years, for that period of time prior to importation.
    - ii. All lots, using the oldest age classes first, of sexually mature fish will be sampled at the 2% incidence level utilizing ovarian fluid and pellet collected at spawning time or from post-spawned fish.
    - iii. Kidney/spleen samples will also be collected at the 5% incidence level from post-spawned broodstock and from all lots of sexually immature fish.
    - iv. All cell cultures will be observed for a minimum of 14 days.

- v. All lots of fish at the source must be negative for all other vertically transmitted pathogens in addition to Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia, and Oncorhynchus Masou Virus.
- vi. Fertilized eggs to be imported are properly surface disinfected with PVP iodine and/or water hardened in an iodine solution.
- vii. Eggs are incubated in a water supply free of listed pathogens.
- viii. Only properly disinfected eggs may be imported. Eggs shall be disinfected for 10 minutes in PVP iodine at 100 ppm and then in formalin at 2000 ppm for 15 minutes prior to shipment to New England. The eggs will be disinfected again according to this procedure before being placed in a New England hatchery.
- ix. Fish are hatched and reared in an approved quarantine facility (effluent should be appropriately disinfected) for 6 months after hatching and fry subjected to at least one fish health inspection.

*Revised 9/27/2001*

#### Section E. Release of fish.

1. No fish cultural facility may release salmonids into waters of New England until a current fish health inspection report has been issued in compliance with these guidelines.
2. No salmonids known to be infected with the causative agents of Viral Hemorrhagic Septicemia, Infectious Hematopoietic Necrosis, Oncorhynchus Masou Virus, Proliferative Kidney Disease, Whirling Disease, Infectious Salmon Anemia, Hitra Disease, and Ceratomyxosis may be released into the waters of New England.
3. No salmonids with clinical signs of any disease may be released into the waters of New England.

*Revised 1/20/2000*

#### Section F. Fish Health Inspection Reports.

1. Fish health inspection reports of listed fish pathogens, (Annex III) shall be in the form prescribed in Annex I.
2. Reports may only be issued by fish health inspectors acceptable to the NEFHC as described in Section G.
3. Current fish health inspection reports are required of all fish cultural facilities that must be inspected annually by means of the procedures set forth in Annex II.
4. If at any time a fish health inspector detects the presence of any listed or exotic fish pathogen at a fish cultural facility he/she shall notify the inspected facility and the appropriate member agency. Agency confidentiality will be maintained within applicable laws. A new fish health inspection report will be issued.
5. Fish health inspection reports and on-site fish culture facility inspections shall be used to support a fish culture station facility classification plan such as described in Annex V for the purpose of fish pathogen control.

Section G. Inspectors.

1. Each member agency shall identify by name fish health inspectors who are acceptable for carrying out inspections within the jurisdiction of the agency in accordance with these guidelines and issuing fish health inspection reports. No owner, immediate family member or employee may serve as fish health inspector of a commercial or private facility.
2. Competence of fish health inspectors shall be based upon standards set forth by the Fish Health Section of the American Fisheries Society.
3. Each member agency shall inform the Chairman of the NEFHC of the identity of fish health inspectors for the compilation and distribution of a list of qualified individuals.
4. Fish health inspectors shall submit copies of all fish health inspection forms to the appropriate member agency under whose jurisdiction the inspected fish culture facility lies, and appropriate state and/or federal agencies needing information for proposed importation.

Section H. Inspection procedures and diagnostic methods.

1. Each member agency shall appoint a representative to the NEFHC. The agency representative should be a recognized fish health professional if possible.
2. Member agencies shall present to each annual meeting of the NEFHC a report covering the status of fish pathogens, the measures adopted for their control, the activities and problems of their fish health inspectors and such other information as may be requested to enhance the effectiveness of this program. Detailed information on the fish health status of specific cultural facilities will not be included to maintain the anonymity, except to agencies needing information for importations.
3. The chairperson of the NEFHC shall maintain records of the annual reports and call emergency meetings as needed.

**VII. AMENDMENTS OF THE GUIDELINES AND THE ANNEXES** *Revised 1/20/2000*

Amendment to these guidelines or the annexes may be proposed by any member agency or by the NEFHC. Any such proposal made by a member agency shall be submitted to the NEFHC for its comments and recommendations at the annual meeting. The proposed amendment, together with the comments and recommendations of the NEFHC, shall be communicated to the committee for consideration.

ANNEX I. Fish Health Inspection Reports

*Revised 1/20/2000*

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ANNEX II. Importation Guidelines for the Northeastern Fisheries Directors

**Northeast Fish Health Committee**  
**Guidelines**  
**for**  
**Fish Importation**  
**March 2008 Draft**

**RESOLUTIONS OF THE NORTHEAST FISHERIES  
ADMINISTRATORS ASSOCIATION CONCERNING FISH  
HEALTH MANAGEMENT**

WHEREAS, fish diseases have caused serious losses in wild populations; and

WHEREAS, disease problems have resulted in reduced survival of wild and stocked fish, caused significant losses of fish to the public and diminished economic returns: and

WHEREAS, efficient propagation of fishes may be severely affected by the occurrence of fish diseases and major disease outbreaks, and have caused serious fish losses at aquaculture facilities; and

WHEREAS, the movement of fish can transfer pathogens and diseases; and

WHEREAS, introduction of fish pathogens hitherto not found in the northeast states can be prevented or curtailed through adequate inspection and restriction of imports; and interstate transfers; and

WHEREAS, it is technically possible to restrict or eliminate pathogens already introduced; and

WHEREAS, existing diagnostic techniques are adequate to initiate effective disease control; and

WHEREAS, the Northeast states include the following jurisdictions: Connecticut, Delaware, Pennsylvania, New York, Maine, Maryland, New Hampshire, West Virginia, Virginia, New Jersey, Rhode Island, Vermont, Massachusetts and federal agencies with natural resource mandates including National Marine Fisheries Service, United States Department of

Agriculture Animal Plant Health Inspection Service, and United States Fish and Wildlife Service.

NOW, THEREFORE, BE IT RESOLVED that the Northeast Fisheries Administrators Association encourages state and federal fish and wildlife agencies to:

Maintain a Northeast Fish Health Committee of fish health professionals to review annually the fish health status of the Northeast states and develop regional guidelines that allow agencies to:

Prevent the importation into, or transfer among member states, of fish infected with pathogens,

Require fish health inspections on all imported fish lots being introduced into the region's waters,

Develop statutes and/or regulations to manage the importation of fish in ways that minimize the movement of pathogens based upon these regional guidelines.



## INTRODUCTION

The Northeast Fisheries Administrators Association has developed these regional guidelines to coordinate the fish health management (fish disease management) efforts for importation of fishes. These guidelines set forth the essential requirements which include a fish health inspection system and references to the technical diagnostic procedures for the prevention and control of fish pathogens.

### Basic Obligation

Each member agency should take appropriate measures including the development of statutes and regulations based on these regional guidelines to restrict the spread of fish pathogens, to contain them within their known geographic ranges, and to strive for their elimination in the Northeast.

### Application

The guideline provisions apply to:

All fishes imported into any member state that may be placed into waters of that state or held in waters discharged into waters of that state;

Fish pathogens included, but are not limited to, those listed in the “Guidelines for Conducting Fish Health Inspections” for the appropriate family (Tables 1 - 8);

Fish pathogen research and development facilities in which fish infected with, or exposed to, pathogens or a facility in the possession of pathogens capable of causing disease.

The provisions of these guidelines do not apply to:

Fish or water in transit through member states not released from their original shipping containers;

Diagnostic samples submitted to a state approved laboratory.

Fish transported for the purpose of restaurant or grocery store sales provided that fish and/or transport water will not be released or discarded into member state waters.

Fishes used in the pet trade provided that the fish and/or the water will not be released to the member state waters.

Nothing in these guidelines shall prevent member agencies from applying additional measures for the control of fish pathogens.

#### Traffic in Fish

Fish imported into a member state must be accompanied by a fish health inspection report prepared and signed by a qualified AFS fish health inspector or qualified licensed veterinarian. Prior to shipment the inspector will furnish to the receiving member state a statement confirming that the source of the gametes, fertilized eggs or fish has been inspected for the presence of each listed pathogen.

No fish or fish products from a facility or water body known to be infected with Infectious Hematopoietic Necrosis Virus, Viral Hemorrhagic Septicemia Virus, Heterosporis, Infectious Salmon Anemia Virus, Spring Viremia of Carp, *Myxobolus cerebralis*, *Ceratomyxa shasta*, *Tetracapsula bryozoa*, may be imported.

A member state may impose additional importation restrictions for pathogens.

Disinfected eggs from *M. cerebralis* positive broodfish (that test negative for other pathogens) transported in pathogen-free water may be imported.

No susceptible wild fishes from a water infected with family specific pathogens may be imported except those to state approved research facilities with appropriate disinfection and management control practices in place.

#### Fish Health Inspections

Fish health inspection reports must include results of the examinations for family specific pathogens listed (Tables 1 – 8).

Sample collection and sample lots must follow family specific testing requirements listed in Tables 1-8.

Sample collections and fish health certification reports must be made by a qualified fish health inspector. Methods used for collections and fish health inspections must be recognized by either the American Fisheries Society or the World Organization of Animal Health.

#### Definitions

Term	Meaning
Clinical signs	- gross pathology, either internal or external signs and/or

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	behavioral changes, associated with disease.
Disease	– a pathological condition of the fish that presents a group of signs indicating the existence of an abnormal histological or physiological condition.
Disinfection	– a process that will destroy infective agents.
Emerging disease or pathogen	- recognizes that the development of new techniques, along with the culture of new species, may result in the detection of new diseases or pathogens. Upon detection of such an emerging disease or pathogen the Northeast Fish Health Committee should be notified for the purpose of conducting an emerging disease evaluation action plan.
Exotic disease or pathogen	- refers to an aquatic animal disease or pathogen strain not previously known to occur in a Member state's watershed and requires a historical absence of the pathogen or disease using adequate detection methods as determined by the Northeast Fish Health Committee.
Fish	- Live fish, viable fish eggs, viable sperm, offal or other fish products which have not been processed so as to render them incapable of transmitting a listed fish pathogen.
Qualified Inspectors	Inspectors: An accredited, licensed veterinarian, a certified fish health inspector or persons recognized by federal or state agencies with responsibility for fish health or transfer in the state from which the fish or gametes originate upon approval of the Commissioner. No owner or employee with direct supervisory authority over a facility may serve as an inspector for their fish culture facility.  Accredited licensed veterinarian means a veterinarian holding a current veterinary license who has also fulfilled the accreditation requirements of the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA/APHIS).

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	<p>Certified fish health inspector means an individual certified by the American Fisheries Society/Fish Health Section (AFS/FHS) as a Fish Health Inspector or Fish Pathologist.</p>
Lot	<p>- a lot of fish on a fish culture facility is a group of fish of the same species of the same age that have continuously shared a common water source throughout their life history.</p> <p>For the purposes of collecting wild fish, a "lot" of fish is a pooled collection of a single species that is held in a self contained holding structure with a pathogen free water source. A new lot of fish is formed every time untested fish are added to an existing "lot." When fish from distinct lots are combined, they form a newly distinct lot. Unless coming from an inspected/certified source, adding fish to a fish health tested lot will render the receiving lot untested.</p>
Listed Pathogen	<p>- an aquatic animal pathogen causing or associated with diseases and listed in these Guidelines.</p>
Member State	<p>– any of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia</p>
Northeast Fish Health Committee (NESHC)	<p>- is a subcommittee of and appointed by the Directors with the responsibility of the natural resource agencies managing the fisheries resources in the Northeast states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia to address fish health of fish in the Northeastern USA.</p> <p>.</p>
Pathogen	<p>- Any infectious disease producing microorganism.</p>

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Tables

Table 4 NEFHC Guidelines for Annual (July/August) Fish Health Inspections for Centrarchidae Fishes (e.g., black bass). HAVE TO INSPECT FOR:

Target Pathogen	Facility Inspection	Wild Fish Inspection	Comments
<u>Viral Pathogens:</u>			
Largemouth bass virus	150 fish minimum from the facility with no less than 60 of each species. 3 years of inspection on facility.	60 fish per species; 3 years of inspection on source population.	Any filterable agent causing CPE will be reported and investigated
Viral hemorrhagic septicemia virus			
Infectious pancreatic necrosis virus			
<u>Bacterial Pathogens:</u>			
<i>Aeromonas salmonicida</i>	60 fish minimum from the facility with no less than 30 fish per species. 3 years of inspection on facility.	60 fish per species; 3 years of inspection on source population.	Any bacterial colony exhibiting predominance will be identified and reported
<i>Yersinia ruckerii</i>			
<u>Parasitic Pathogens:</u>			
<i>Heterosporis sp.</i>	60 fish minimum from the facility with no less than 30 fish per species. 3 years of inspection on facility.	60 fish per species; 3 years of inspection on source population.	All other parasites observed will be noted and reported
<i>Bothriocephalus opsarichthydis</i>			

Table 2 NEFHC Guidelines for Annual Fish Health Inspections for Percichthyidae Fishes (e.g., striped basses). HAVE TO INSPECT FOR:

Target Pathogen	Facility Inspection	Wild Fish Inspection	Comments
<u>Viral Pathogens:</u>			
Largemouth bass virus	150 fish minimum from the facility with no less than 60 of each species. 3 years of inspection on facility.	60 fish per species; 3 years of inspection on source population.	Any filterable agent causing CPE will be reported and investigated
Viral hemorrhagic septicemia virus			
Infectious pancreatic necrosis virus			
Spring viremia of carp			

<u>Bacterial Pathogens:</u> <i>Aeromonas salmonicida</i> <i>Yersinia ruckerii</i> <i>Photobacterium damsela</i> <i>Streptococcus spp.</i>	60 fish minimum from the facility with no less than 30 fish per species. 3 years of inspection on facility.	60 fish per species; 3 years of inspection on source population.	Any bacterial colony exhibiting predominance will be identified and reported
<u>Parasitic Pathogens:</u> none			All other parasites observed will be noted and reported

Table 3 NEFHC Guidelines for Annual Fish Health Inspections for Salmonidae Fishes (e.g., trout, salmon, char). HAVE TO INSPECT FOR:

Target Pathogen	Facility Inspection	Wild Fish Inspection	Comments
<u>Viral Pathogens:</u>	150 fish minimum from the facility	60 fish per species; 3 years of	Any filterable agent causing CPE
Infectious salmon anemia virus	with no less than 60 of each species. 3	inspection on source population.	will be reported and investigated
Viral hemorrhagic septicemia virus	years of inspection on facility.		
Infectious pancreatic necrosis virus			
Oncorhynchus masou virus			
Infectious hematopoietic necrosis virus			
<u>Bacterial Pathogens:</u>	60 fish minimum from the facility with	60 fish per species; 3 years of	Any bacterial colony exhibiting
<i>Aeromonas salmonicida</i>	no less than 30 fish per species. 3	inspection on source population.	predominance will be identified and
<i>Yersinia ruckerii</i>	years of inspection on facility.		reported
<i>Renibacterium salmonarum</i>			
<u>Parasitic Pathogens:</u>	60 fish minimum from the facility with	60 fish per species; 3 years of	All other parasites observed will be
<i>Heterosporis sp.</i>	no less than 30 fish per species. 3	inspection on source population.	noted and reported
<i>Myxobolus cerebralis</i>	years of inspection on facility.		

Table 4 NEFHC Guidelines for Annual Fish Health Inspections for Percidae Fishes (e.g., walleye, yellow perch). HAVE TO INSPECT FOR:

Target Pathogen	Facility Inspection	Wild Fish Inspection	Comments
<u>Viral Pathogens:</u>	150 fish minimum from the facility	60 fish per species; 3 years of	Any filterable agent causing CPE
Infectious hematopoietic necrosis virus	with no less than 60 of each species. 3	inspection on source population.	will be reported and investigated
Infectious pancreatic necrosis virus	years of inspection on facility.		

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Viral hemorrhagic septicemia virus

Bacterial Pathogens:

*Aeromonas salmonicida*

*Yersinia ruckerii*

Parasitic Pathogens:

*Heterosporis sp.*

60 fish minimum from the facility with no less than 30 fish per species. 3 years of inspection on facility.

60 fish minimum from the facility with no less than 30 fish per species. 3 years of inspection on facility.

60 fish per species; 3 years of inspection on source population.

60 fish per species; 3 years of inspection on source population.

Any bacterial colony exhibiting predominance will be identified and reported

All other parasites observed will be noted and reported

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Table 5 NEFHC Guidelines for Semi-Annual Fish Health Inspections for Cyprinidae Fishes (e.g., minnows). HAVE TO INSPECT FOR:

Target Pathogen	Facility Inspection	Wild Fish Inspection	Comments
<u>Viral Pathogens:</u>	150 fish minimum from the facility	150 fish minimum with no less	Any filterable agent causing CPE
Viral hemorrhagic septicemia virus	with no less than 60 of each species. 3	than 60 fish per species; 3 years of	will be reported and investigated
Infectious pancreatic necrosis virus	years of inspection on facility.	inspection on source population.	
Infectious hematopoietic necrosis virus			
Spring viremia of carp			
Koi herpes virus			
<u>Bacterial Pathogens:</u>	60 fish minimum from the facility with	150 fish minimum with no less	Any bacterial colony exhibiting
<i>Aeromonas salmonicida</i>	no less than 30 fish per species. 3	than 60 fish per species; 3 years of	predominance will be identified and
<i>Yersinia ruckerii</i>	years of inspection on facility.	inspection on source population.	reported
<u>Parasitic Pathogens:</u>	60 fish minimum from the facility with	150 fish minimum with no less	All other parasites observed will be
<i>Heterosporis sp.</i>	no less than 30 fish per species. 3	than 60 fish per species; 3 years of	noted and reported
<i>Bothriocephalus opsarichthydis</i>	years of inspection on facility.	inspection on source population.	

Table 6 NEFHC Guidelines for Annual Fish Health Inspections for Esocidae Fishes (e.g., pikes). HAVE TO INSPECT FOR:

Target Pathogen	Facility Inspection	Wild Fish Inspection	Comments
<u>Viral Pathogens:</u>	150 fish minimum from the facility	60 fish per species; 3 years of	Any filterable agent causing CPE
Infectious hematopoietic necrosis virus	with no less than 60 of each species. 3	inspection on source population.	will be reported and investigated
Viral hemorrhagic septicemia virus	years of inspection on facility.		
Infectious pancreatic necrosis virus			

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Lymphosarcoma virus

Bacterial Pathogens:

*Aeromonas salmonicida*

*Yersinia ruckerii*

Parasitic Pathogens:

*Heterosporis sp.*

60 fish minimum from the facility with no less than 30 fish per species. 3 years of inspection on facility.

60 fish minimum from the facility with no less than 30 fish per species. 3 years of inspection on facility.

60 fish per species; 3 years of inspection on source population.

60 fish per species; 3 years of inspection on source population.

Any bacterial colony exhibiting predominance will be identified and reported

All other parasites observed will be noted and reported

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Table 7 NEFHC Guidelines for Annual Fish Health Inspections for Ictaluridae Fishes (e.g., catfishes). HAVE TO INSPECT FOR:

Target Pathogen	Facility Inspection	Wild Fish Inspection	Comments
<b>Viral Pathogens:</b>	150 fish minimum from the facility with no less than 60 of each species. 3 years of inspection on facility.	60 fish per species; 3 years of inspection on source population.	Any filterable agent causing CPE will be reported and investigated
Infectious hematopoietic necrosis virus			
Viral hemorrhagic septicemia virus			
Infectious pancreatic necrosis virus			
Channel catfish virus			
Catfish herpesvirus			
<b>Bacterial Pathogens:</b>	60 fish minimum from the facility with no less than 30 fish per species. 3 years of inspection on facility.	60 fish per species; 3 years of inspection on source population.	Any bacterial colony exhibiting predominance will be identified and reported
<i>Aeromonas salmonicida</i>			
<i>Yersinia ruckerii</i>			
<i>Edwardsiella tarda</i>			
<i>Edwardsiella ictaluri</i>			
<b>Parasitic Pathogens:</b>	60 fish minimum from the facility with no less than 30 fish per species. 3 years of inspection on facility.	60 fish per species; 3 years of inspection on source population.	All other parasites observed will be noted and reported
<i>Heterosporis sp.</i>			

Table 8 NEFHC Guidelines for Annual Fish Health Inspections for Clupeidae Fishes (e.g., herring, shad). HAVE TO INSPECT FOR:

Target Pathogen	Facility Inspection	Wild Fish Inspection	Comments
<b>Viral Pathogens:</b>	150 fish minimum from the facility with no less than 60 of each species. 3 years of inspection on facility.	60 fish per species; 3 years of inspection on source population.	Any filterable agent causing CPE will be reported and investigated

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Infectious hematopoietic necrosis virus	years of inspection on facility.		
Viral hemorrhagic septicemia virus			
<u>Bacterial Pathogens:</u>	60 fish minimum from the facility with	60 fish per species; 3 years of	Any bacterial colony exhibiting
<i>Vibrio anguillarum</i>	no less than 30 fish per species. 3	inspection on source population.	predominance will be identified and
	years of inspection on facility.		reported
<u>Parasitic Pathogens:</u>	60 fish minimum from the facility with	60 fish per species; 3 years of	All other parasites observed will be
none	no less than 30 fish per species. 3	inspection on source population.	noted and reported
	years of inspection on facility.		

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List of disease agents covered by the guidelines.

Emergency A.

Emergency refers to those pathogens that have not been detected in salmonid fishes reared in New England waters.

Table 5 Emergency A Pathogens

Emergency A: Pathogens		
Acronym	Pathogen	Disease
VE	Viral Hemorrhagic Septicemia virus	Viral Hemorrhagic Septicemia (VHS)
VH	Infectious Hematopoietic Necrosis virus	Infectious Hematopoietic Necrosis (IHN)
VM	Oncorhynchus Masou virus	Oncorhynchus Masou Virus (OMV)
SC	<i>Ceratomyxa shasta</i>	Ceratomyxosis <sup>2</sup> (CS)
SP	PKX	Proliferative Kidney Disease agent <sup>1</sup> (PKD)
VA	Infectious Salmon Anemia virus	Infectious Salmon Anemia (ISA) <sup>2</sup>

Emergency-Limited distribution.

Those pathogens that have been detected in salmonid fishes reared in specified New England waters. Those pathogens the NESFHC has established by name as unique pathogens with specific reporting or management requirements.

Table 6 Emergency B Pathogens

Emergency B: Pathogens		
Acronym	Pathogen	Disease
SW	<i>Myxobolus cerebralis</i>	Whirling Disease
SSSV	Salmon Swimbladder Sarcoma virus	Undetermined

<sup>1</sup> Inspections within New England need not include these pathogens unless there have been known importations of fish from endemic areas.

<sup>2</sup> Inspections within New England need not include this pathogen unless there has been an epidemiological link to VA-positive or suspect ISA fishes.

## Restricted

Those pathogens that have been detected in salmonid fishes reared in New England waters, but whose geographic range is limited or undetermined. Appropriate action should be taken to further reduce their range.

Table 7 Restricted pathogens.

Restricted: Pathogens		
Acronym	Pathogen	Disease
VP	Infectious Pancreatic Necrosis virus	Infectious Pancreatic Necrosis (IPN)
BK	<i>Renibacterium salmoninarum</i>	Bacterial Kidney Disease
BF	<i>Aeromonas salmonicida</i>	Furunculosis
BR	<i>Yersinia ruckerii</i>	Enteric Redmouth Disease

*Revised 9/27/2001*

. Guidelines for the control and management of infectious disease agents.

These fish disease agent management guidelines are based on: prevention, containment, reduction and pathogen eradication. These guidelines attempt to prevent the introduction of exotic pathogens with in the waters of New England by limiting the introduction of fishes potentially carrying pathogens. These guidelines attempt to contain pathogens with in regions of New England where they already exist. These guidelines attempt to reduce the incidence of diseases in fish by stressing good fish health management and biosecurity practices.

## Emergency A

These pathogens have not been detected in fishes reared in New England waters. No salmonids, gametes or fertilized eggs from any source, unless the source has been regularly inspected and found to have a history of freedom from the following pathogens for the past 2 years, shall be imported into New England. In the event any of the following pathogens confirmed in any fish population under propagation, immediate steps shall be initiated to eradicate this pathogen from the facility and adjacent water as authorized by the member agency with jurisdiction (Annex VII):

Table 8 Emergency A pathogens.

Acronym	Pathogen	Disease
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VE	Viral Hemorrhagic Septicemia virus	Viral Hemorrhagic Septicemia (VHS) <sup>3</sup>
VH	Infectious Hematopoietic Necrosis virus	Infectious Hematopoietic Necrosis (IHN) <sup>1</sup>
VM	Oncorhynchus Masou virus	Oncorhynchus Masou Virus (OMV) <sup>3</sup>
SC	<i>Ceratomyxa shasta</i>	Ceratomyxosis <sup>2</sup> (CS)
SP	PKX	Proliferative Kidney Disease agent <sup>3</sup> (PKD) <sup>4</sup>
VA	Infectious Salmon Anemia virus	Infectious Salmon Anemia (ISA) <sup>5</sup>

Emergency B- Limited distribution.

Those pathogens that have been detected in salmonid fishes found in certain specific New England waters. These pathogens require submission and review of a management plan.

Table 9 Emergency B pathogens

Acronym	Pathogen	Disease
SW	<i>Myxobolus cerebralis</i>	Whirling Disease
<p>APPROPRIATE ACTION (S):</p> <p>Disinfected eggs and spore-free transport well water may be transferred to facilities without altering the disease classification of the receiving station (Annex VI).</p> <p>A facility biosecurity and Whirling Disease Best Management Practices Plan should be developed, implemented, and monitored by facility managers with the help of licensed veterinarians and/or other fish health professionals.</p>		

Table 10 Emergency B pathogen.

Acronym	Pathogen	Disease
SSSV	Salmon Swimbladder Sarcoma virus	Undetermined

Appropriate Actions:

<sup>3</sup> Under no circumstances will salmonids, gametes, or fertilized eggs be imported from areas endemic for VE, VH, or VM.

<sup>4</sup> Inspections within New England need not include CS and SP, unless there have been known importations of fish from endemic areas.

<sup>5</sup> Testing is not necessary for VA unless there is a reasonable suspicion of an epidemiological link to VA or ISA suspect fishes.

A facility biosecurity and Salmon Swimbladder Sarcoma Virus Best Management Practices Plan should be developed, implemented, and monitored by facility managers with the help of licensed veterinarians and/or other fish health professionals.

Support continued research on pathogen.

Restricted.

These pathogens have been detected in fishes reared in New England waters. Appropriate actions should be taken to contain these pathogens and reduce their range if possible. Appropriate actions should be taken to decrease these pathogens ability to cause disease within fish populations of New England.

Restricted Pathogen		
Acronym	Pathogen	Disease
VP	Infectious Pancreatic Necrosis virus	Infectious Pancreatic Necrosis (IPN)
<p>APPROPRIATE ACTION (S):</p> <p>No salmonid gametes, fertilized eggs, or fish from VP positive facilities shall be transferred to facilities where VP virus has not been detected within the past two years.</p> <p>A facility biosecurity and Infectious Pancreatic Necrosis virus Best Management Practices Plan should be developed, implemented, and monitored by facility managers with the help of licensed veterinarians and/or other fish health professionals.</p>		

Restricted Pathogen		
Acronym	Pathogen	Disease
BK	<i>Renibacterium salmoninarum</i>	Bacterial Kidney Disease (BKD)



APPROPRIATE ACTION (S):

No salmonid gametes, fertilized eggs, or fish from BK positive facilities shall be transferred to facilities where BK has not been detected within the past two years.

A facility biosecurity and Bacterial Kidney Disease Best Management Practices Plan should be developed, implemented, and monitored by facility managers with the help of licensed veterinarians and/or other fish health professionals.

Restricted Pathogen

Acronym	Pathogen	Disease
BF	<i>Aeromonas salmonicida</i>	Furunculosis

APPROPRIATE ACTION (S):

No salmonid gametes, fertilized eggs, or fish from BF positive facilities shall be transferred to facilities where BF has not been detected within the past two years.

Disinfect eggs and transport water may be transferred to facilities with out altering the classification of the receiving station (Annex VI).

A facility biosecurity and Furunculosis Best Management Practices Plan should be developed, implemented, and monitored by facility managers with the help of licensed veterinarians and/or other fish health professionals.

Restricted Pathogen

Acronym	Pathogen	Disease
BR	<i>Yersinia ruckerii</i>	Enteric Redmouth Disease

APPROPRIATE ACTION (S):

No salmonid gametes, fertilized eggs, or fish from BR positive facilities shall be transferred to facilities where BR has not been detected within the past two years.

Disinfect eggs and transport water may be transferred to facilities with out altering the classification of the receiving station (Annex VI).

A facility biosecurity and Enteric Redmouth Disease Best Management Practices Plan should be developed, implemented, and monitored by facility managers with the help of licensed veterinarians and/or other fish health professionals.

Other.

The NESFHC recognizes that it is impossible to anticipate future diseases and pathogens to affect the salmonid fishes of New England; therefore, the task before the NESFHC today is to adopt and adapt epidemiological principles to increase our understanding of the nature of salmonid fish diseases. Fish in confined and feral conditions are subject to many biotic and abiotic factors potentially associated with episodes of noninfectious and infectious diseases. Disease outbreak investigations require the skills of individuals from a variety of disciplines, including but not limited to, microbiology, pathology, physiology, toxicology, limnology, veterinary medicine, ecology, and epidemiology. Epidemiological disease investigations focus on the identification of environment-, host-, husbandry- and agent-related factors associated with disease outbreaks (Stoskopf 1994; Klontz 1979). There are several fundamental steps to the process of describing the “who, what, when, where, and how” of a disease episode. These steps should serve as the basis for future development of Biosecurity Plans and Disease or Pathogen Best Management Plans:

Confirm the nature of the problem. An important first step is to establish a definitive diagnosis of the disease entity being studied based on the clinical signs or laboratory tests. Establish a definitive diagnosis or diagnostic criteria for the disease.

Characterize the events. Document the historical aspects of the disease events. Collect data on the clinical, environmental, husbandry, and other factors that precede or are concomitant with the disease.

Identify the population at risk. Catalog the age, size, and year-class of affected and unaffected individuals, when the cases occurred, and when they were observed.

Establish proportions, rates, and ratios of morbidity and mortality.

Identify the suspected associated causal factors.

Formulate and test hypotheses.

Present recommendations for biosecurity, diagnostic procedures, treatment, eradication, and fish movement, etc.

Cooperate with other NESFHC members to manage future fish health management problems to protect both federal and cultured salmonid fish populations in New England.

In the event of detection of any other fish pathogen not known to occur in New England Fish fishes, that the NEFHC determines serious, the NESFHC may specify the guidelines for the future importation, control, and/or stock management.

#### OTHER PATHOGENS

Other pathogens recognized as potentially major pathogens.

Hitra Disease, (*Vibrio salmonicida*)

In the event of the detection of this potentially major pathogen the pathogen must be reported on the annual fish health inspection report, and to the NEFHC chair.

#### LITERATAURE CITED

Klontz, G. W. (1979). Fish Health Management. Vol. II: Concepts and Methods of Fish Disease Epidemiology. Office of Continuing Education, University of Idaho, Moscow.

Stoskopf, M.K. (1993). Fish Medicine. WB Saunders Company, Philadelphia.

*Revised 9/27/2001*

Fish cultural facility disease classification guidelines.

Fish cultural facility disease classification guidelines.

### A. PATHOGENS

Each cultural facility rearing salmonids and non-salmonids on a salmonid hatchery, and each salmonid spawning population, whether wild or domesticated, will be inspected for the following:

Emergency A: Pathogens		
Acronym	Pathogen	Disease
VIRAL		
VE	Viral Hemorrhagic Septicemia virus	Viral Hemorrhagic Septicemia (VHS)
VH	Infectious Hematopoietic Necrosis virus	Infectious Hematopoietic Necrosis (IHN)
VA	Infectious Salmon Anemia virus <sup>2</sup>	Infectious Salmon Anemia (ISA)
VP	Infectious Pancreatic Necrosis virus	Infectious Pancreatic Necrosis (IPN)
VM	Oncorhynchus Masou virus	Oncorhynchus Masou Virus (OMV)
BACTERIAL		
BK	<i>Renibacterium salmoninarum</i>	Bacterial Kidney Disease (BKD)
BF	<i>Aeromonas salmonicida</i>	Furunculosis
BR	<i>Yersinia ruckeri</i>	Enteric Redmouth Disease
PARASITIC		
SC	<i>Ceratomyxa shasta</i> <sup>1</sup>	Ceratomyxosis (CS)
SP	PKX <sup>1</sup>	Proliferative Kidney Disease agent (PKD)
SW	<i>Myxobolus cerebralis</i>	

<sup>1</sup> Inspections within New England need not include these pathogens unless there have been known importations of fish from endemic areas.

<sup>2</sup> Inspections within New England need not include this pathogen unless there has been an epidemiological link to VA-positive or suspect ISA fishes.

## B. CLASSIFICATION

Class A: The A classification is assigned to those salmonid fish culture stations meeting the following criteria:

All fish lots reared in the facility must have been inspected annually and found negative for the listed pathogens. Three successive negative inspections over a continuous two-year period are required.

To maintain A status, cultural facilities must assure that all fish or eggs have been obtained only from facilities inspected in accordance with these guidelines and have been found free of pathogens listed by this program.

All free-ranging salmonid spawning populations must have been inspected and found to be free of all pathogens listed above annually over a continuous two-year period.

Class B: Salmonid facilities and free-ranging spawning populations are assigned a B classification when one or more of the pathogens listed above have been detected within the past two years. The abbreviation of the detected pathogen should be added to the B classification.

Examples: B - BK

B - BK, VP

B - BK, BF, VP

3. Class C: Facilities and free ranging spawning populations having an unknown pathogen history, have not been inspected for all pathogens listed, have undergone only one or two complete annual inspections, or received fish/eggs from an uninspected source, will be assigned a C classification. The abbreviation should be added to the C classification.

Examples: C - BK

C - BK, VP

### C. RESTRICTIONS

No shipments of fish or eggs will be made without prior approval of the receiving authorities whenever that shipment will downgrade the classification of the receiving facilities. Shipment of fish or eggs between facilities will be governed by the pathogen status of the facilities involved.

When uninspected wild broodstock, juveniles, gametes or fertilized eggs are introduced into a facility operating under this program, they must be isolated from other facility operations. Isolation at a minimum shall include physical separation from other production stocks and prevention of the effluent water from the uninspected stock from mixing with the production water. When this isolation is maintained, the classification of the facility remains independent of the pathogen status of the associated stock and shipments of production stock may be made. Whenever the newly introduced stock cannot be isolated from the production fish, no shipments of any kind can be

made until the appropriate fish health inspection has been completed and an appropriate classification has been assigned to the entire facility.

Under these guidelines a fish culture station may have a separate incubation/rearing facility (such as a hatch house) that is isolated from other fish rearing facilities on the station such that separate fish health classifications may be applicable to the individual facilities located on the station. In order for the individual facilities to receive a separate fish health classification they must each be inspected and accepted by qualified fish health personnel of the agency granting the classification. The following requirements must be met in order for one rearing facility within a culture station to be considered separate from other rearing facilities at the same station for the purposes of fish health classification:

The facility must be physically separate from the other fish cultural activities and facilities at the station; it must be completely enclosed and secure to prevent entry of birds, animals and unauthorized personnel.

The water supply to the facility must be known to be free of potential fish pathogens, for example, the source of water shall be from a well or properly sterilized.

Access to the facility should be limited to essential personnel. Footbaths with PVP iodine at 250-mg/l or other appropriate disinfectant must be properly used and maintained at all entrances to the facility. The facility must be fully supplied with essential equipment so that it will not be necessary to move any equipment from the facility to other locations. All equipment must thoroughly disinfected before being brought into the facility.

Effluent water from the enclosed facility must be properly disinfected and verified to be free of listed pathogens or otherwise be completely independent of the rest of the facility. If the effluent from the enclosed facility does not meet this requirement, any disease classification of the enclosed facility will also apply to the outdoor facility.

A biosecurity plan to maintain the separate fish health status of each facility within the culture station must be developed. Elements of the biosecurity plan should include at a minimum the following:

Movement of staff and visitors between facilities should be kept to the smallest number possible.

If the public is allowed in the fish culture station, they should not be allowed access to multiple facilities on the station without specific guidance from station staff. All station staff should be trained on how to maintain the integrity and fish health status of each separate facility within the fish culture station. This training should be regularly reinforced both through frequent re-training of staff as well as with highly visible signs posted at strategic locations on the station.

All personnel and public must thoroughly disinfect footgear before entering each isolated facility. Footbath should contain PVP. Iodine at 250mg/l (or equivalent).

Each facility must be fully supplied with all necessary equipment so that it will not be necessary to share equipment among the facilities. Equipment should not be shared between facilities, or

All equipment must be thoroughly disinfected or new before being brought into the facility.

Mortalities must be properly stored and disposed of (either incinerated or properly disposed of off station) to avoid contamination of other station rearing facilities.

*Revised 9/27/2001*



### Salmonid egg disinfection.

All fish culture facilities receiving eggs will properly disinfect these eggs as per the following:

Procedures: Disinfect in an area away from the fish culture station, where contaminated water and/or eggs can be isolated from fish or eggs already on the facility. Place eggs into netting suspended in a tub of water. Allow eggs to water harden for 30-60 minutes if freshly fertilized are shipped in air. Add oxygen with an air stone if necessary. Transfer drained eggs with the netting to a second tub containing 100 ppm iodine solution for 10 minutes (disinfect the netting equipment also). Prepare iodine bath in second tub using one of the following: 38 ml Argentyne per gallon; 38 ml Betadine per gallon, 38 g baking soda per gallon, or 24 ml Wescodyne per gallon, 38 g baking soda per gallon. After 10 minutes transfer eggs to third tub and rinse eggs in clean water. After rinsing, place eggs into incubators. Disinfect transport water with chlorine at a concentration of 200 ppm or greater. Disinfect work area and utensils with 200ppm or greater chlorine solution and rinse with clean water. Disinfect or dispose of shipping containers.

### Suggested materials needed.

3 tubs or troughs	Cheesecloth or fine netting to suspend eggs in tubs.
1 for water hardening/holding received eggs	
1 for actual disinfection	Clothespins or clips to hold netting.
1 for rinsing disinfected eggs	Argentyne, Betadine or Wescodyne.
	Baking soda (Sodium bicarbonate, NaHCO <sub>3</sub> )
	Chlorine
	Graduated cylinder, gram scale, sieve.

### Warnings.

Disinfection within 5 days of hatch may cause excessive mortality and/or premature hatching. Do not change egg temperatures more than 5 degrees Fahrenheit during any stage of the disinfection. Increasing or decreasing the water temperature of each tub by 5-degree increments can do this. Pay particular attention not to mix contaminated water, hands or utensils with uncontaminated water or eggs when tempering and disinfecting eggs. Avoid direct sunlight on the eggs if disinfecting outdoors.

*Revised 1/20/2007*

Emergency eradication plan.

Emergency eradication plan.

Viral Hemorrhagic Septicemia, Infectious Hematopoietic Necrosis Virus, Oncorhynchus masou virus, Ceratomyxosis caused by Ceratomyxa shasta, the myxosporidian parasite PKX the causative

agent of Proliferative Kidney Disease, and any other serious fish pathogen not known to occur in New England are currently considered Emergency Diseases. Oncorhynchus Masou Virus is presently considered enzootic in Japan and exotic to North America. Viral Hemorrhagic Septicemia is native to Europe and has only been found on a very limited basis in the Northwestern United States, and whirling disease, also native to Europe, is known to exist only in a few well defined areas of North America. Proliferative kidney disease has been a major problem in European fish farms and has recently appeared in western North America. Ceratomyxosis and IHNV also are serious diseases in the Northwest.

These incurable diseases may be spread by transporting infected fish or by transferring contaminated water or materials from contaminated areas. Control of these emergency pathogens depends upon prevention and eradication. Therefore, outbreaks of diseases in New England must be met with prompt containment and disease control of the entire facility involved. The following eradication plan is presented to the member agencies to serve as a guide if an emergency disease outbreak should occur within their jurisdiction.

1. Organization: Each agency with jurisdiction should have a contingency plan well in place before an emergency disease outbreak should occur. It should develop legal authority if necessary in order to act quickly if an outbreak should occur in federal, state or private fish cultural facilities. It is hoped that voluntary compliance will be prompt regardless of the ownership of the affected facility, but the lead agency must have legal authority to act quickly. This authority also includes the necessity to obtain permits to use appropriate chemicals in the quarantine zone, establish emergency fishing restrictions in the area, etc. The lead agency must be able to establish adequate funding to ensure that adequate equipment, manpower, and supplies are available to conduct the eradication program.

The lead agency must develop a task force to conduct the emergency disease eradication project. An experienced fish health worker should be in overall charge of field operations. The manager of the affected facility and sufficient fishery personnel should assist the project leader for the duration of the project.

2. Quarantine: Whenever an outbreak of an emergency disease is suspected at any fish cultural facility within the agency's jurisdiction, an immediate quarantine of all fish at the facility involved will be imposed. If suspect fish have been transferred from the affected facility to other fish cultural facilities within the past year, similar quarantines will be issued to those receiving facilities until

confirmatory inspection testing can be completed. The quarantine zone should apply to all waters within an area approximately determined by the lead agency surrounding the affected facility within that watershed and possibly further downstream if watershed conditions so indicate. All transfers of fish from the quarantine zone must be halted, including an emergency restriction of all fishing within the zone.

3. Investigation: The task force leader will obtain information on all shipments of fish, eggs, etc., from the suspect facility during the previous year. All recipients of suspect fish will be promptly notified.

Pathogen surveys will immediately be undertaken at the recipient station to confirm the presence or absence of the causative agent of the suspect emergency disease. Suspect samples will be sent to a second recognized fish health laboratory for confirmation. Surveys will be made of all lots of salmonids on the facility and within the quarantine zone. The size and location of survey sites will be determined on the basis of natural fish barriers, type of terrain, nature of the fish population, and characteristics of the disease outbreak itself. In addition, spot-check surveys should be scheduled to include all susceptible fish populations located within the surrounding buffer zone, an area extending five to seven miles outside the quarantine zone.

#### 4. Survey Procedures

A. Quarantine zone surveys: All salmonid fish populations must be sampled at the earliest possible time. If other fish facilities are located within the quarantine zone, the task force leader in charge will call on each facility, explain the reason for his visit, the location of the infected facility, the nature of the disease, how it is spread, and advise the personnel concerning precautions necessary to prevent the spread of the disease and to whom they should report any suspicious disease signs among their own fish. The personnel at these facilities should be informed that reliable current information will be available by whatever means has been devised and be asked to refrain from spreading rumors. Strict sanitary measures should be followed before entering or leaving fish facilities in the quarantine or buffer zones.

During the period in which initial survey information is being collected from within the quarantine zone, every effort must be made to observe all fish, both domesticated and wild, for signs of any emergency disease and to collect representative samples from each population. Samples of fish displaying signs of the disease should be collected and documented as to precise location on the facility or stream, date collected, species and size of fish, name of the collector, and any abnormalities noted. Samples should not be frozen but should be packed on ice and processed in the laboratory as soon as possible. Subsamples also should be frozen or preserved in 10% formalin or both for documentation and future reference.

Strict sanitary measures must be observed by all personnel working within the quarantine zone as certain emergency diseases can be spread with the dirt on shoes, boots, tires, and by other means. Protective, disposable plastic boots should be worn when working on the facility grounds or along streams where the viable disease agents may exist. Vehicles should not be driven into fish rearing areas. Each piece of equipment or clothing that may have become contaminated must be thoroughly cleaned and disinfected before it leaves the facility.

NOTE: Suspicious disease signs among salmonids must be reported immediately to the task force leader.

B. Buffer zone surveys: Inspectors assigned to survey salmonid fish populations in the buffer zone must inspect all susceptible fish populations in the zone at least once. There is no alternative to laboratory examination of fish samples. Any salmonid showing suspicious signs, whether typical for the emergency disease or not, shall cause the inspector to conduct a close examination and to collect samples with full documentation.

5. Disease Eradication and Fish Disposal: Upon confirmation of the diagnosis of an emergency disease, immediate steps shall begin to assure the orderly decontamination of the facility. All salmonid gametes, fertilized eggs and fish will be promptly destroyed and buried. A firm commitment to prompt action is essential to effective containment and eradication of emergency pathogens.

To prevent possible reinfection of decontaminated areas, all stocks must be destroyed. They should be killed with rotenone or HTH (chlorine) and buried in a deep pit or incinerated. The facility manager is in charge of stock disposal. He/she will secure the necessary equipment, materials, and permits to conduct the disposal operation. He/she will assign qualified personnel to operate digging equipment and instruct them in the preparation of the burial pit or arrange for transportation to an incinerator.

A fish disposal operation would consist of the following events:

Determination that a disposal operation is necessary (task force leader) and the method to be used.

Arrangement for the equipment and materials needed to carry out disposal (facility manager).

Preparation of the burial pit (facility manager).

Disposal of infected or exposed fish (facility manager).

These events should be carried out as soon as possible to limit any further spread of the disease, and further contamination of the facility, and any further discharge of infected facility effluent.

The site chosen for a burial pit should be within the grounds of the facility with easy access from rearing units but away from areas subject to flooding. The burial trench should be at least seven feet wide and not less than seven feet deep with the length determined by allowing fourteen square feet of floor space for each 1,000 pounds of fish to be buried. As the fish are placed in the trench, they should be covered with unslaked lime. Lime is to be applied at the rate of one barrel (850 pounds) for each 10,000 pounds of fish buried. This is to hasten decomposition and to discourage burrowing animals. The trench should be filled with earth without delay and the area should be included in the cleaning and disinfection procedures.

6. Cleaning and Disinfection: Cleaning and disinfection can start as soon as disposal is completed. The members of the task force involved in work in infected areas must be supplied with rubberized rain gear including boots, coat, hat and gloves. These outer garments will be removed and left in an appropriate location at the end of each day's work. These items should be thoroughly disinfected during the final phase of disinfection.

In addition to the chemicals required, the equipment listed below would be helpful in the disinfection of facilities:

1 high pressure spray unit	2 wire brushes
4 50-ft. lengths of hose for spraying	2 heavy brooms
6 pairs of rubber boots	5 five-gallon pails
6 sets of rain gear, complete	3 pairs of safety goggles
6 pairs of rubber gloves	6 respirators
1 ½-ton pickup truck	5 300-gallon stock tanks

All fish rearing facilities should be brushed clean of moss, algae, dirt, and organic wastes. Rearing tanks, incubators, troughs, outdoor raceways, and water supply head boxes and tail-race should all be thoroughly scrubbed. Consideration should be given to the treatment of the effluent from these cleaning operations to minimize the contamination problem. Earthen ponds should be drained and the entire bank area cleared of vegetation and debris. Earthen ponds should not be dried and should not be entered except under close control.

Disinfection can begin as soon as the facilities are cleaned and readied. All buildings and the equipment within them should be disinfected with chlorine, Imphal, or other appropriate disinfectants.

Streams, water supplies, pipeline systems and the facility effluent should be chlorinated. These are difficult to disinfect and success largely depends upon the length of time the disease organism is exposed to the disinfectant. In no case should chlorine be used at less than 200 parts per million for a period of less than one hour.

Scrubbed, hard-surface rearing units can be effectively disinfected by spraying them with a 1,000-ppm solution of Roccal or Hyamine 3500. There is a considerable residual effect with these compounds and all units treated with them should be thoroughly rinsed before use. Chlorine at 10,000 ppm or more may also be sprayed on hard surfaces where residual activity is not desired.

Earthen ponds, canals, and the like present special problems for disinfection. Several treatments with unslaked lime (CaO) at the rate of two tons per acre may be required. Unslaked lime is the compound of choice and it should be applied to freshly-drained ponds. The ponds should stand for a month or more. At that time, the muck should be removed and buried in a pit.

The ponds should then be refilled and tested with fingerlings of the species and age most susceptible to the emergency disease in live boxes for 120 days. The progress of any possible reinfection should be regularly monitored for at least 60 days through laboratory examination of representative fish. If the ponds are still infective, terminate the bio-assay and treat the ponds again. Consideration should be given to the complete renovation of contaminated earthen ponds.

Post Disinfection Surveys: After the facility has been cleaned and disinfected, a 30-day waiting period should be observed before actual live fish tests start. During this "cooling off" period, all rearing facilities should remain dry and, if possible, exposed to sunlight. The number of test fish should be determined by the size of the facility to be tested. Each rearing unit should be tested by placing a minimum of 100 fingerlings of the species and age most susceptible to the pathogen in question, in a live-box near the outlet of each rearing unit. The water in the rearing units should be held at the normal operational level. Samples of fish from various locations will be collected after 60 days' exposure for laboratory examination. All fish will be sacrificed after 120 days' exposure for laboratory examination. The test fish should be regularly fed and cared for during the exposure period.

After the completion of a negative 120-day test period, all concrete rearing units which are supplied with uninfected water may be restocked with pathogen-free fish or, preferably, eggs. These fish should be inspected for the causative agent resulting in the eradication at intervals of 90 days or less for at least one year. Earthen ponds, ditches, and streams should be retested a second time. At the completion of two negative tests, these units may be restocked and the quarantine released. In instances where earthen pond and cement raceways adjoin, no production program will be initiated until the earthen ponds are determined to be free of the organism, as described above.

*Revised 9/27/2001*

Guidelines for development of fish disease management plan for emergency –limited distribution pathogens.

Salmonids produced at a fish culture facility that has been classified as positive for a pathogen listed in ANNEX III as having “Emergency-Limited Distribution status” but do not exhibit clinical disease symptoms (as defined in Section A of these guidelines and the American Fisheries Society Bluebook) may be stocked if a management plan designed to limit the risk of spreading the pathogen to wild populations has been reviewed by the NEFHC. Stocking affected lots of fish classified, as “Emergency-Limited Distribution Status” under Annex III is a temporary measure and should only be one part of a long-term plan designed to eradicate the pathogen from the affected fish culture station (See Annex 4).

It is recognized that the specific protocols that will be required for development of a management plan for stocking lots of fish as defined in ANNEX III as having “Emergency-Limited Distribution Status” will be unique to each state and for each pathogen. The protocols listed below are intended to offer guidance in developing a management plan that will not only allow for proper and ethical use of the affected fish but will also be of minimal risk to wild salmonid populations.

Suggested management plan for stocking protocols.

Only fish showing no clinical signs of disease.

Only fish that are of legal size to creel should be released.

Fish should be released into waters that are known to have heavy angling pressure in order to maximize harvest.

Release dates should coincide with periods of maximum angling pressure.

Fish should not be stocked in interstate waters unless there is agreement on the stocking plan by the state agencies responsible for management of the fisheries resources among the affected states.

To minimize the potential spread of the pathogen in the wild, it is recommended that the fish (if they are cold-water species) be stocked in lakes or ponds that meet one or more of the following criteria:

There is not sufficient coldwater habitat for the fish to survive throughout the summer.

There are no outlets from the lake or pond.

If there is an outlet from the pond or lake, the receiving river or stream should not contain year-round salmonid habitat.



Rivers or streams that are selected to receive fish as part of a limited distribution management plan should not contain year-round salmonid habitat (if it is a cold water pathogen) and should not flow into waters that have year-round salmonid habitat or have wild salmonid populations.

Fish should not be stocked into waters in a watershed that has a fish culture facility located within it that relies on surface water for its water supply.

A database describing where the fish were stocked should be maintained.

*Revised 9/27/2001*

## VIII. NEW ENGLAND FISH HEALTH COMMITTEE MEMBERS LIST

The New England Fish Health Guidelines were developed by the New England Fish Health Committee, a subcommittee of and appointed by the New England Salmon Committee to address fish health of salmonids in New England. The following were contributors to the guidelines:

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D. Associate members.

Two (2) vacant industry positions - one inland and one marine.

Since the adoption of these guidelines on September 4, 1989, there have been technological advances in fish health and considerable growth in the commercial aquaculture industry. Let this revision be part of a continuing process to protect both the commercial aquaculture industry and our valuable fisheries resources. I want to extend my sincerest appreciation to all those who contributed to this New England wide cooperative effort.

In an effort to maintain all users of this document current the committee has decided to date these guidelines in the following format. Initially, the most current revision date will be on the front cover with all subsequent pages reflecting that date. In the future when a revision is made to a specific section, the cover page and those section pages will reflect the most current revision date. The Table of Contents will serve as the key to revisions with each section labeled with its most current revision date.

Thomas A. Wiggins, Chair

New England Fish Health Committee

*Revised 9/27/2001*

**IX. HISTORICAL RECORD OF DOCUMENT REVISIONS**

<b>SECTION</b>	<b>REVISION DATES</b>
RESOLUTION OF THE NEW ENGLAND SALMONID HEALTH COMMITTEE.....	1/20/00
NEW ENGLAND FISH HEALTH GUIDELINES .....	<del>1/20/00</del>
INTRODUCTION .....	<del>1/20/00</del>
Section A. Definitions .....	<del>1/20/00</del>
	8/09/01
	9/27/01
Section B. Basic Obligations .....	1/20/00
Section C. Application .....	<del>1/20/00</del>
	5/12/00
	8/09/01
Section D. Traffic in Fish .....	1/20/00
	9/27/01
Section E. Release of Fish .....	1/20/00
Section F. Fish Health Inspection Reports .....	<del>1/20/00</del>
Section G. Inspectors .....	<del>1/20/00</del>
	8/09/01
Section H. Reports by Member Agencies .....	<del>1/20/00</del>
Section I. Amendment of the Guidelines and the Annexes	1/20/00
ANNEX I. FISH HEALTH INSPECTION REPORT .....	1/20/00
ANNEX II. INSPECTION PROCEDURES AND METHODS OF DIAGNOSIS .....	5/12/00
	9/27/01

Section A. SECTION REVISION DATES

ANNEX III. LIST OF DISEASE AGENTS COVERED BY THE GUIDELINES_____	5/12/00 9/27/01
ANNEX IV. GUIDELINES FOR THE CONTROL AND MANAGEMENT OF DISEASE AGENTS _____	5/12/00
ANNEX V. FISH CULTURAL FACILITY DISEASE CLASSIFICATION GUIDELINES_____	5/12/00 9/27/01
ANNEX VI. EGG DISINFECTION_____	1/20/00
ANNEX VII. EMERGENCY ERADICATION PLAN _____	1/20/00 9/27/01
ANNEX VIII. GUIDELINES FOR DEVELOPMENT OF A FISH DISEASE MANAGEMENT PLAN FOR EMERGENCY-LIMITED DISTRIBUTION PATHOGENS _____	5/12/00 9/27/01
NEFHC MEMBER LIST _____	<i>Revised 9/27/2001</i> 1/20/00 9/27/01

**X. REFERENCES**

Great Lakes Fishery Commission 1993. Great Lakes Fish Disease Control Policy and Model Program (Special Publication: 93-1). J. G. Hnath, Ed. Great Lakes Fishery Commission, Ann Arbor, Michigan, USA. 1-37 pages.

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Nelson, J., S., E. J. Crossman, H. Espinosa-Perez, L. T. Findley, C. R. Gilbert, R. N. Lea and J. D. Williams (2004). Common and Scientific Names of Fishes from the United States, Canada and Mexico. American Fisheries Society, Bethesda, Maryland, USA