GREAT LAKES FISH DISEASE
CONTROL POLICY AND MODEL PROGRAM

PROTOCOL TO MINIMIZE THE RISK OF INTRODUCING EMERGENCY DISEASE AGENTS WITH IMPORTATION OF SALMONID FISHES FROM ENZOOTIC AREAS

Great Lakes Fishery Commission

SPECIAL PUBLICATION 93-1

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The Commission is also required to publish or authorize the publication of scientific or other information obtained in the performance of its duties. In fulfillment of this requirement the Commission publishes the Technical Report Series, intended for peer-reviewed scientific literature; Special Publications, designed primarily for dissemination of reports produced by working committees of the Commission; and other (non-serial) publications. Technical Reports are most suitable for either interdisciplinary review and synthesis papers of general interest to Great Lakes fisheries researchers, managers, and administrators, or more narrowly focused material with special relevance to a single but important aspect of the Commission's program. Special Publications, being working documents, may evolve with the findings of and charges to a particular committee. Both publications follow the style of the *Canadian Journal of Fisheries and Aquatic Sciences*. Sponsorship of Technical Reports or Special Publications does not necessarily imply that the findings or conclusions contained therein are endorsed by the Commission.

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GREAT LAKES FISH DISEASE CONTROL POLICY AND MODEL PROGRAM

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TABLE OF CONTENTS

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ABSTRACT. Recognizing the risk of disease to cultured and wild fish, including losses of fish products and fishing opportunities to the public and diminished economic returns to Great Lakes communities, the Great Lakes Fishery Commission (GLFC) established a policy that (1) encourages agencies to work toward controlling fish diseases in the Great Lakes basin, and (2) coordinates the fish-disease control programs of the fish management agencies. To implement this policy, the GLFC's Great Lakes Fish Disease Control Committee developed a Model Program for achieving fish-disease control objectives in the Great Lakes. The Model Program calls upon member agencies to classify salmonid fish hatcheries based upon disease history of all lots of fish on the station. Categories' of infectious disease are established based upon their presence (restricted) or absence (emergency) in the Great Lakes basin. Agencies are counselled to undertake all available measures to prevent the introduction of diseases not yet established in the Great Lakes basin. Measures to minimize the spread of or prevent the introduction of diseases are also recommended. These measures include procedures for detection, treatment, and/or appropriate disposition of affected fish.

INTRODUCTION

Fish-disease control in the Great Lakes basin is the responsibility of those agencies that manage the fisheries resources. The Great Lakes Fish Disease Control Committee of the Great Lakes Fishery Commission (GLFC) has developed a Control Policy and Model Program to unify and coordinate the fish-disease control efforts of the member agencies. The Control Policy was revised and re-adopted by the Commission in 1985. The Model Program sets forth the essential requirements for the prevention and control of serious infectious diseases, and includes .a system for inspecting and classifying fish hatcheries as well as the technical procedures to be used during these evaluations.

The Committee does not seek fish-disease control authority. The recommendations advanced here are provided as an aid to the member agencies in the development of legislation and regulations. The Committee seeks the advice and counsel of these agencies in the continuing development of fish-disease control programs to assure that such programs are in the best interests of the fishery resources of the Great Lakes.

CONTROL POLICY[1]

Efficient propagation of fish may be severely affected by the occurrence of fish diseases. Disease outbreaks have caused serious losses in fish hatcheries and potential exists for such losses in feral Great Lakes fish populations. Disease problems have resulted in reduced survival of stocked fish, production cost increases of 20%-30% or more, significant losses of fish to the public, and diminished economic returns to Great Lakes communities.

The policy of the Great Lakes Fishery Commission encourages each agency to work toward the control of fish diseases in the Great Lakes basin by:

developing legislative authority and regulations to allow control and possible eradication of fish diseases,

preventing the release of seriously infected fish,

discouraging the rearing of diseased fish,

preventing the importation into the Great Lakes basin of fish infected with emergency diseases,

preventing the transfer within the Great Lakes basin of fish infected with restricted diseases, and

eradicating fish diseases, where practicable.

The Great Lakes Fishery Commission will strive to coordinate the fish-disease control program of the agencies. To this end, the Commission endorses and supports the Great Lakes Fish Disease Control Policy and Model Program as a guide for agency program development.

[1] Adopted by the Great Lakes Fishery Commission, 9 May 1985.

MODEL PROGRAM

Section 1. Definitions

Definitions for the purpose of this program are:

"Commission" means the Great Lakes Fishery Commission.

"Member agency" means each federal, provincial, and state government fishery management or conservation agency, or other interested parties normally participating in the activities of the Great Lakes Fish Disease Control Committee.

"Great Lakes basin" means the geographical area encompassing Lake Ontario (including the St. Lawrence River from Lake Ontario to the 45th parallel of latitude), Lake Erie, Lake Huron (including Lake St. Clair), Lake Michigan, Lake Superior, their interconnecting waters, and all tributaries to those lakes and waters.

"Fish" means live fish as listed in Annex I (Species Covered by the Model Program), their viable eggs, sperm, or products used for fish foods that have not been so processed as to render them incapable of transmitting an emergency or restricted fish-disease agent.

"Fish hatchery" means any facility that holds, rears, or releases fish of the species listed in Annex I (Species Covered by the Model Program) in the waters of the Great Lakes basin or whose effluent waters drain into the basin.

"Emergency fish disease" as listed in Annex II (List of Disease Agents Covered by the Model Program) means certain infectious diseases of fish that are transmissible directly or indirectly, from one fish to another, and are not known to exist in the Great Lakes basin.

"Restricted fish disease" as listed in Annex II (List of Disease Agents Covered by the Model Program) means any of a group of certain infectious diseases of fish that are transmissible, directly or indirectly, from one fish to another, and are currently known to exist within the Great Lakes basin, but whose geographic range is limited.

"Fish-Disease Inspection Report" means a document (see Annex III) giving evidence of inspections and diagnostic work performed as described in Section 4 (Fish Disease Inspection Report).

"Fish Health Official" means a fish health specialist who meets the requirements set forth in Section 7 (Fish Health Officials).

"Source" means any point or place of origin of fish or eggs including a fish hatchery or free-ranging spawning population.

Section 2. Basic Obligation

The member agencies shall, where necessary, take all appropriate measures, including the development of legislative authority and regulations, to prevent the introduction of emergency and restricted fish diseases, to contain them within their known geographic ranges, and to strive for their elimination in accordance with the provisions of this program.

Section 3. Application

The provisions of this Model Program apply to:

a) species of fish identified in Annex I (Species Covered by the Model Program),

b) emergency and restricted fish-disease agents as listed in Annex II (List of Disease Agents Covered by the Model Program), and

C) fish-disease research on fish infected with or exposed to emergency and restricted fish-disease agents or with the possession of such infectious agents.

The provisions of this Model Program shall not apply to:

a) fish in transit through the Great Lakes basin that are not released from their original shipping containers, and

b) specimens of fish imported or exported for purposes of diagnostic or inspection services and related laboratory tests provided that all necessary biological containment measures are taken to avoid any dissemination of fish-disease agents.

Nothing in this Model Program shall derogate from the right of the member agencies to apply additional measures of inspection, quarantine, and disease eradication for the control of fish diseases.

Section 4. Fish-Disease Inspection Report

A Fish-Disease Inspection Report listing the emergency and restricted fish diseases detected shall include the information prescribed in Annex III (Fish-Disease Inspection Report). Such reports may be issued only by a Fish Health Official (see Section 7). Fish hatcheries shall be classified on the basis of annual fish health inspections and other disease or diagnostic work performed in accordance with the plan described in Annex IV (Hatchery Classification).

Section 5. Importation

Fish imported from outside the jurisdiction of a member agency must be accompanied by a Fish-Disease Inspection Report or other document that gives equivalent assurance of the state of health of the fish. Such reports or documents must also be prepared and signed by a Fish Health Official in accordance with Section 4. Importations of salmonid fish from emergency disease enzootic areas should conform to the Protocol (pp. 39-54, this publication) developed by the Committee.

Regarding fish imported into the Great Lakes basin from either within or outside the jurisdiction of member agencies, the goal of the Great Lakes Fish Disease Control Committee shall be that no importation of fish with a record of either emergency or restricted disease will be permitted. For an interim period, importations of fish from facilities with restricted disease classifications may be permitted, provided such importations do not result in downgrading of the receiving facility's classification and meet with the requirements stated in Annex IV (Hatchery Classification).

Section 6. Transfer and Release of Fish Within the Great Lakes Basin

The following restrictions apply to transfer and release of fish within the Great Lakes basin:

a) No fish exhibiting overt signs of emergency or restricted diseases should be released.

b) No fish from a hatchery with a record of an emergency disease within the last two years should be transferred or released.

C) For guidelines on transfer and release of fish from hatcheries with a record of specific restricted diseases, refer to Annex V (Guidelines for the Control and Management of Disease Agents).

d) No lot of fish suffering excessive mortalities or epizootics should be transferred or released.

Section 7. Fish Health Officials

Each member agency shall identify, by name, to the chair of the Great Lakes Fish Disease Control Committee, those individuals who the agency recognizes to be responsible for conducting fish-hatchery inspections and the issuance of inspection reports in accordance with this policy. This recognition should include private fish health inspectors recognized also by the state or province in which they perform on-site inspections.

Competence of Fish Health Officials shall be based upon standards set forth by the Canadian Department of Fisheries and Oceans' "Fish Health Protection Regulations Manual of Compliance" (Miscellaneous Special Publication 31, Revised), that requires adequate laboratory facilities and qualified personnel to assure the prompt and accurate conduct of inspection and diagnoses under the procedures set forth in Annex VI (Inspection Procedures and Methods of Diagnosis), or the standards set forth by the Fish Health Section of the American Fisheries Society (AFS).

Fish Health Officials shall submit copies of all Fish-Disease Inspection Reports to the member agency under whose jurisdiction the inspected hatchery lies. The chair of the Great Lakes Fish Disease Control Committee shall be responsible for the compilation and distribution of current lists of Fish Health Officials. These lists should be updated annually.

Section 8. Other Reports by Member Agencies

1) General Report

Member agencies shall at each meeting of the Great Lakes Fish Disease Control Committee present a report covering the status of fish diseases, the measures adopted for their control, the activities and problems of their Fish Health Officials, and such other information as may be requested to enhance the effectiveness of the Model Program.

2) Hatchery Classification Report

a) Semiannually (on 30 June and 31 December), each member agency shall provide an updated classification covering all of its hatcheries to the chair of the Great Lakes Fish Disease Control Committee for compilation and distribution to all Committee members.

b) Changes in hatchery classifications concerning emergency diseases as listed in Annex II (List of Disease Agents Covered by the Model Program) shall be immediately submitted to the chair of the Great Lakes Fish Disease Control Committee for compilation and distribution as described above. A copy of the Hatchery Classification Report is shown in Annex VII.

3) Salmonid Importation Report

Each member agency shall provide semiannually (on 30 June and 31 December) an updated list of proposed and known importations of fish (includes eggs--see Section 1) from outside the Great Lakes or the Province of Ontario to the chair of the Committee for compilation and distribution as above. A copy of the Salmonid Importation Report is shown in Annex VIII.

4) Record Maintenance

The chair of the Great Lakes Fish Disease Control Committee, or designee, shall maintain records of the reports submitted.

Section 9. Amendment of the Model Program and Annexes

Amendments to this Model Program or its annexes may be proposed by any member agency or by the Great Lakes Fish Disease Control Committee. Any such proposal made by a member agency shall be submitted to the Committee for comments and recommendations. The proposed amendment, together with the comments and recommendations of the Committee, shall be communicated to the GLFC for consideration.

ANNEX I
SPECIES COVERED BY THE MODEL PROGRAM

All species and hybrids of the family Salmonidae are subject to provisions of the Great Lakes Fish Disease Control Policy and Model Program.

The Great Lakes Fish Disease Control Committee recommends that non-salmonid fish transferred to a salmonid fish hatchery be monitored for appropriate diseases listed in the Great Lakes Fish Disease Control Policy and Model Program.

Other species may be added as deemed appropriate by the Great Lakes Fish Disease Control Committee and as consistent with Section 9.

ANNEX II
LIST OF DISEASE AGENTS COVERED BY THE MODEL PROGRAM

Emergency Fish Diseases

Emergency fish diseases are caused by certain virulent pathogens that have not been detected within waters of the Great Lakes basin. The following list gives the name of the emergency disease, the disease pathogen, the disease acronym, and the two-letter pathogen acronym used in hatchery classification.

Disease	Disease Pathogen	Disease Acronym	Pathogen Acronym
viral hemorrhagic septicemia	virus	VHS	VE
infectious hematopoietic necrosis	virus	IHN	VH
ceratomyxosis	*Ceratomyxa shasta* protozoan	*c s*	*s c* *
proliferative kidney disease	sporozoan	PKD	sp*

Restricted Fish Diseases

Restricted pathogens are those currently enzootic within the Great Lakes basin, but whose geographic range is limited. Every appropriate action should be taken to further reduce their range. The following list gives the name of the disease, the disease pathogen, the disease acronym, and the two-letter pathogen acronym used in hatchery classification.

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

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

** Field diagnostic test not available.

Every effort should be made by member agencies to encourage diagnosticians, academic laboratories conducting fish-disease diagnostic work, and private fish health inspectors to report to a member agency the occurrence of any of the disease agents detected (listed above) within the Great Lakes basin.

ANNEX III
FISH-DISEASE INSPECTION REPORT

Each member agency should use the Fish-Disease Inspection Report (shown on the next page) to facilitate data retrieval. Contact the Great Lakes Fishery Commission to receive a supply of this report.

FISH-DISEASE INSPECTION REPORT

This report is **NOT** evidence of future disease status. To determine current status, contact the Fish Health Official listed below.

Report Number

Name of Fish Source	**Address or Location of Fish Source**	**Name of Owner or Manager**	**Inspection Date** Current / Prior	**Classification**

FISH EXAMINED					Pathogens Inspected for and Results[3]										
Species[1]	Lot Number	Age[2]	Number in Lot	Obtained as Eggs (E) or Fish (F) FROM:	BF	BR	BK	SW	VE	VH	VP	SC	SP	VL

Type of Fish Examined

☐ Hatchery ☐ Feral

☐ Salmonid ☐ Non-salmonid

Type of Water Supply (check all that apply)

☐ Spring ☐ Well ☐ UV treated

☐ Stream ☐ Lake of impoundment ☐ Other

☐ Enclosed ☐ Free of fish

Signature of Fish Health Official

Address and Telephone Number of Fish Health Official

Remarks

1--Use standard abbreviations (see back of this form).
2--For hatchery fish, give the age in months. For feral fish, use one of the following letters: e-eggs or fry; f-fingerlings; y-yearlings; b-older fish.
3--See list of pathogen acronyms on back of form. Report findings: Divide the number of fish examined by the results where "-" = negative and "+" = positive. Other pathogens should be listed in the "Remarks" section.

SUPPLEMENTAL INSPECTION INFORMATION

Date	Species	Lot #	Findings

SPECIES ABBREVIATIONS

AMP	Amur pike
ARG	Arctic grayling
ATS	Atlantic salmon
BCF	Blue catfish
BCFCCF	Blue x channel
BIB	Bigmouth buffalo
BKT	Brook trout
BLB	Black bullhead
BLC	Black crappie
BLG	Bluegill
BLP	Blue pike
BNT	Brown trout
BON	Bowfin
BRB	Brown bullhead
CAP	Carp
CCF	Channel catfish
CHS	Chum salmon
COS	Coho salmon
CUT	Cutthroat trout
DAR	Darters
DOV	Dolly varden
DOVBKT	Dolly varden x BKT
FCF	Flathead catfish
FCS	Fall chinook salmon
FHM	Fathead minnow
FRD	Freshwater drum
GAR	Gars
GIT	Gila trout
GOF	Goldfish
GOS	Golden shiner
GOT	Golden trout
GRC	Grass carp
GSF	Green sunfish
HEG	Herrings
KIH	Killifishes
KOE	Kokanee
LAS	Landlocked ATS
LAT	Lake trout
LAY	Lamprey
LIR	Livebearers
LMB	Largemouth bass
MOE	Mooneyes
MSC	Miscellaneous warm water
MUE	Muskellunge
MUW	Mudminnows
NOP	Northern pike
OCF	Other catfishes
OHT	Ohrid trout
OSA	Other salmonids
OSF	Other sunfishes
OTM	Other minnows
OTP	Other pikes
OTS	Other suckers
PAH	Paddlefish
PKS	Pink salmon
RBT	Rainbow trout
RBTSTT	Rainbow trout x steelhead
RSF	Redear sunfish
SAB	Smallmouth buffalo
SAR	Sauger
SCS	Spring chinook salmon
SMB	Smallmouth bass
SOS	Sockeye salmon
SPB	Spotted bass
STB	Striped bass
STK	Sticklebacks
STN	Sturgeons
STT	Steelhead trout
SVC	Silver carp
WAE	Walleye
WAESAR	Walleye x sauger
WAM	Warmouth
WCF	White catfish
WCS	Winter chinook salmon

Emergency Fish Diseases

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

Restricted Fish Diseases

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

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

** Field diagnostic test not available.

ANNEX IV
HATCHERY CLASSIFICATION

All salmonid fish hatcheries and wild spawning populations of salmonid fishes used for propagation will be inspected and classified for the emergency and restricted fish diseases in Annex II (List of Disease Agents Covered by the Model Program).

Classifications

Class A-l

The A-l classification is assigned to those fish hatcheries meeting the following criteria:

1) All fish cultural water must be obtained from enclosed sources such as springs or wells that are free of fish.

2) Samples of all fish lots reared at the station must have been inspected (at least annually) as described in Annex VI (Inspection Procedures and Methods of Diagnosis) for all pathogens listed in Annex II (List of Disease Agents covered by the Model Program). Three successive, negative, inspections over a continuous two-year period are required. The two-year period begins with the first complete, negative, inspection. For example, a hatchery is inspected in September 1981 and found to be free of all pathogens listed in Annex II (List of Disease Agents covered by the Model Program). This negative inspection starts the beginning of the two-year negative period required for Class-A status. Two more complete, negative, inspections are required, at approximately annual intervals, to qualify a hatchery as Class A in September 1983. More inspections during that two-year period lend support to the A-l classification but do not hasten its assignment.

3) To maintain A-l status, hatcheries must assure that all fish (includes eggs--see Section 1) have been obtained only from properly inspected Class A-l or A-2 sources.

Class A-2

The A-2 classification differs from A-l only when the hatchery has an open water supply (such as a stream or lake) with resident fish. The A-Z classification is also assigned to discrete spawning populations of free-ranging fish that have met all other Class A-l inspection requirements.

Class B

Hatchery and free-ranging spawning populations are assigned a B classification when one or more of the pathogens listed in Annex II (List of Disease Agents covered by the Model Program) were found within the past two years. The pathogen acronym becomes part of the classification. For example, a hatchery where *Aeromonas salmonicida* has been confirmed would be classified B-BF.

Pathogens diagnosed at a hatchery will continue to be observed for a period of two years after disinfection. This status will be indicated by placing the pathogen acronym in parentheses. For example, the classification of a B-BF, BK, VP hatchery would be changed to A-l (or A-2)-(BF, BK, VP) (4/81) after an April 1981 disinfection. These observational or parenthetical classifications will remain in effect until the disease is confirmed, or, if not confumed, for a period of two years after the date the stock responsible for the classification is removed from the hatchery. If three negative, complete, annual inspections are accomplished during this period, upgrading of the classification may be considered at the conclusion of the two-year anniversary date.

If a hatchery disinfection was not performed, the disease classification B-BF, BK, VP would remain until three consecutive, annual, disease inspections (which were negative for one or more of the previously detected pathogens) have been completed. The pathogen acronyms for those pathogens not detected would be deleted from the hatchery disease classification after the three inspections. For example, the hatchery classification would be changed from B-BF, BK, VP to B-BK, VP after three negative, annual inspections for BF, but positive for BK and VP.

Restated, a hatchery cannot have a higher classification than the source of its stock. An exception to this requirement may occur where suitably disinfected eggs and/or transport water are transferred from a source positive for furunculosis, enteric redmouth disease, or whirling disease. This action will not compromise the receiving hatchery's disease classification.

Class C

Hatchery and free-ranging spawning populations that have an unknown disease history, have not been inspected for all listed pathogens, or have undergone only one or two complete, annual inspections will be assigned a C classification. The pathogen acronym following the C will be used to identity the specific pathogen for which inspection data are not available. This notation will be followed by the regular classification for which inspections have been completed. For example, at a hatchery where *Myxobolus cerebralis* was not

included in the inspection, and inspection or diagnostic work revealed BF and BK, the classification would be C-SW, B-BF, BK.

Class C classifications will also apply to new hatcheries or to hatcheries with no classification record until the completion of three consecutive, negative, annual inspections. The classification of such a hatchery having an open-water supply would be C until found to be free of all listed pathogens, and would be changed to A-2 after completion of the third negative, complete, annual inspection.

Restrictions

Shipments of fish (includes eggs--see Section 1) between hatcheries will be governed by the status of the hatcheries involved. No shipments of fish will be made without prior approval of the receiving authorities whenever such shipment will knowingly downgrade the classification of the receiving hatchery. At least one inspection for each pathogen listed in Annex II (List of Disease Agents Covered by the Model Program), except as noted for ceratomyxosis, proliferative kidney disease, and epizootic epitheliotropic disease, will be conducted on all lots of salmonid fishes, regardless of age, prior to the transfer or stocking of fish (includes eggs--see Section 1).

ANNEX V
GUIDELINES FOR THE CONTROL AND MANAGEMENT OF DISEASE AGENTS

When the Great Lakes Fish Disease Control Policy and Model Program fails to give clear guidance to a member agency, such member should immediately contact the chair of the Great Lakes Fish Disease Control Committee. The chair or a designate will, at his or her discretion, schedule discussions of the problem through the most expedient means for the purpose of providing a consensus decision and appropriate recommendations. These recommendations shall be presented to the concerned member agency. In the interim, fish shall not be released or transferred.

Emergency Fish Diseases

When an emergency disease agent is confirmed in any fish stock under propagation, immediate steps shall be initiated to eradicate the agent from the facility and adjacent water as authorized by the member agency with jurisdiction. Refer to Chapter 14 in Great Lakes Fishery Commission Special Publication 83-2 for procedures. The following gives special procedures for specific diseases.

Viral Hemorrhagic Septicemia, Virus, VHS, VE

No fish (includes eggs--see Section 1) from any source, unless the source has been found to be free from viral hemorrhagic septicemia for three consecutive, annual inspections, should be imported into the Great Lakes basin. If fish are to be imported from a viral hemorrhagic septicemia enzootic area, then the "Protocol to Minimize the Risk of Introducing Emergency Disease Agents With Importation of Salmonid Fishes From Enzootic Areas" (pp. 39-54) shall apply.

Infectious Hematopoietic Necrosis, Virus, IHN, VH

No fish (includes eggs--see Section 1) from any source, unless the source has been found to be free from infectious hematopoietic necrosis in three consecutive, annual inspections, should be imported into the Great Lakes basin. If fish are to be imported from an infectious hematopoietic necrosis enzootic area, then the "Protocol to Minimize the Risk of Introducing Emergency Disease Agents With Importation of Salmonid Fishes From Enzootic Areas" (pp. 39-54) shall apply.

Ceratomyxosis, *Ceratomyxa shasta,* Protozoan, CS, SC*

No fish from any source, unless the source has been found to be free from ceratomyxosis for three consecutive, annual inspections, should be imported into the Great Lakes basin. If fish are to be imported from a ceratomyxosis enzootic area, then the "Protocol to Minimize the Risk of Introducing Emergency Disease Agents With Importation of Salmonid Fishes From Enzootic Areas" (pp. 39-54) shall apply. An exception may be made in the case of egg importation as the disease agent is not known to be transmitted via eggs.

Proliferative Kidney Disease, Sporozoan, PKD, SP*

No fish from any source, unless the source has been found to be free from proliferative kidney disease for three consecutive, annual inspections, should be imported into the Great Lakes basin. If fish are to be imported from a proliferative kidney disease enzootic area, then the "Protocol to Minimize the Risk of Introducing Emergency Disease Agents With Importation of Salmonid Fishes From Enzootic Areas" (pp. 39-54) shall apply. An exception may be made in the case of egg importation as the disease agent is not known to be transmitted via eggs.

Restricted Fish Diseases

Whirling Disease, *Myxobolus cerebralis,* Protozoan, WD, SW

No fish from any source (with the exception of disinfected eggs and spore-free transport water of well origin), unless the source has been regularly inspected and found to be free from detection or overt signs of whirling disease for the past two years, shall be imported into the Great Lakes basin. If whirling disease is confirmed in any hatchery, fish in the facility may not be stocked within the Great Lakes basin, nor may any fish be stocked from the affected station until it has undergone three consecutive, annual inspections demonstrating freedom from the disease pathogen.

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

Infectious Pancreatic Necrosis, Virus, IPN, VP

No fish (includes eggs--see Section 1) from any source, unless the source has been found to be free from infectious pancreatic necrosis for three consecutive, annual inspections, shall be imported into the Great Lakes basin. In the event infectious pancreatic necrosis is confirmed in any stock under propagation, every effort should be made not to release these fish into waters of the Great Lakes basin.

Bacterial Kidney Disease, *Renibacterium salmoninarum,* Bacterium, BKD, BK

Since this disease agent is enzootic within the Great Lakes basin, harsh restrictions on importation are unrealistic at this time. However, every effort should be made not to import or stock fish with overt signs of the disease.

Furunculosis, *Aeromonas salmonicida,* Bacterium, BF, BF

No salmonid fishes from furunculosis-positive facilities shall be transferred to facilities where furunculosis has not been detected in three consecutive, annual inspections. Disinfected eggs and transport water may be transferred to facilities without altering the disease classification of the receiving station. However, every effort should be made not to import or stock fish with overt signs of the disease.

Enteric Redmouth, *Yersinia ruckeri,* Bacterium, ERM, BR

No fish from enteric redmouth-positive facilities shall be transferred to facilities where enteric redmouth has not been detected in three consecutive, annual inspections, except that disinfected eggs and transport water may be transferred to facilities without altering the disease classification of the receiving station.

Epizootic Epitheliotropic Disease, Virus, EED, VL**

No fish from a facility where epizootic epitheliotropic disease has been detected shall be planted into waters of the Great Lakes basin. No fish (includes eggs--see Section 1) from such stations shall be transferred to stations or waters with no previous history of epizootic epitheliotropic disease. Year-classes produced during the two-year period immediately following a complete disinfection may be stocked into previously affected waters only. Transfers or stocking from disinfected stations into waters with no previous history of epizootic epitheliotropic disease shall be allowed only after a period of two years of freedom from detection or overt signs of the disease.

** Field diagnostic test not available.

ANNEX VI
INSPECTION PROCEDURES AND METHODS OF DIAGNOSIS

Inspection Procedures

Data obtained from inspections are an essential part of this program to control and improve the quality of fish produced at fish hatcheries. Therefore, all hatchery inspections should be conducted in accordance with the following procedures.

Sample Population

The following definitions apply to the designation of populations for sampling purposes.

1) The sample population for all fish except those being inspected for whirling disease is determined on the basis of lot and production environment. Lot is defined as those fish that originated from the same brood stock during the same year and that are being raised on the same water source. Example: Two egg shipments of fall-spawning rainbow trout *(Oncorhynchus* mykiss) received in September and December from the same hatchery are considered one lot. Similarly, all spring-spawning rainbow trout from the same source are another lot. However, when one part of the lot is held in an open water supply and the other in a closed water supply, each will be sampled as a separate population. All lots of brood stock of a single species held in the same water supply may be considered one population regardless of the age of the fish.

2) When inspecting for whirling disease, the sample population is defined as all fish in the hatchery held in the same water supply. Samples should be weighted towards the most susceptible species and ages of fish available. Whirling disease spores are difficult to detect in lake trout (Salvelinus *namaycush)* and coho salmon (0. *kisutch)* and in fish larger than 30 cm (12 in.) in length and younger than 160 days.

3) Wild brood stocks must be inspected at least once during the time that eggs are obtained for shipment to a hatchery in the Great Lakes basin. All brood stocks present at the time of inspection will constitute the sample population. The sample size should be large enough to detect diseases at an assumed incidence of infection of 2%. Where it is not feasible to sample wild brood stocks at the 2% level, a smaller sample may be taken at the discretion of the inspecting pathologist after all risks are considered.

Sample Size

For viral, bacterial, and parasitic disease agents, the number of samples to be collected from a given lot is based upon stratified random sampling that provides 95% confidence of detecting a pathogen with an assumed minimum incidence of detectable infection, depending upon conditions, of 2%-5%.

Minimum sample sizes for populations varying from 50 to infinity are:

Population or Lot Size	Sample Size Assumed Incidence	
	2%	*5%*
50	*50*	*30*
100	*75*	*45*
250	110	*50*
500	130	*55*
1,000	140	*55*
1,500	140	*55*
2,000	145	*60*
4,000	145	*60*
10,000	145	*60*
100,000 or greater	150	*60*

Sample sizes above are minimum. When a pathogen is suspected, larger samples may be necessary and should be taken at the discretion of the inspector.

Sample Collection

Moribund fish and those with clinical signs of disease should be sampled during all inspections. The method of collecting subsamples from rearing units to obtain a representative sample is left to the discretion of the inspector.

For bacterial diseases, sampling of brood-stock populations and production fish should be done on a continual basis throughout the year using moribund and dying fish whenever possible. Hatchery managers can send samples (fixed material) for the detection of Gram-positive *Renibacterium salmoninarum* to agency laboratories on a periodic basis. Training should be provided to hatchery managers in preparing cultured material for diagnosis of Gram-negative bacterial pathogens. Cultures can also be sent to agency laboratories for confirmation of the diagnosis. The annual case history of each designated lot should be compiled by the inspector using accumulated sampling data. The minimum number of samples is left to the discretion of the inspector.

Methods of Diagnosis

The most recent editions of "Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens," developed by the Fish Health Section (FHS) of the AFS, or the "Fish Health Protection Regulations Manual of Compliance" (Miscellaneous Special Publication 31, Revised) of the Department of Fisheries and Oceans, Canada, provide the basis for fish-hatchery inspections and certifications. More-sensitive or more-definitive procedures may be used, but any departures from the basic procedures set forth by the these manuals must be noted on Fish-Disease Inspection Reports. The Great Lakes Fish Disease Control Committee, in an effort to encourage the use of the best possible methods, should be notified of technical advances enhancing the implementation of the Model Program. Procedural changes issued by the FHS or by the Canadian National Registry of Fish Diseases will be incorporated into the program by the Committee as appropriate.

ANNEX VII
HATCHERY CLASSIFICATION REPORT

All salmonid fish hatcheries and wild spawning populations of salmonid fishes used for propagation will be inspected and classified. Information should be recorded using the Hatchery Classification Report (shown on the next page). Contact the Great Lakes Fishery Commission for a supply of this report.

HATCHERY CLASSIFICATION REPORT

Report Period: _____ Report Date: _____

Hatchery Name	Location	Pathogen Acronym

Report Prepared by: _____

Title: _____

Phone Number: _____

EMERGENCY FISH DISEASES

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

RESTRICTED FISH DISEASES

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

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

** Field diagnostic test not available.

ANNEX VIII
SALMONID IMPORTATION REPORT

Each member shall provide an updated list of proposed and known importations of fish (includes eggs--see Section 1). Information should be recorded using the Salmonid Importation Report (shown on the next page). Contact the Great Lakes Fishery Commission to receive a supply of this report.

SALMONID IMPORTATION REPORT

Agency_____ Reporting Period_____

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

	Source	Species/Number	Fish/Eggs Size	Fish Health Status	Certification Date	Certifying Official	Lake Basin
1.							
2.							
3.							
4.							
5.							

B. **Proposed importations.**

	Source	Species/Number	Fish/Eggs Size	Fish Health Status	Certification Date	Certifying Official	Lake Basin
1.							
2.							
3.							
4.							

II. Lab Findings

III. Other

ACKNOWLEDGMENTS

The Great Lakes Fish Disease Control Policy and Model Program is the product of past and present members of the Great Lakes Fish Disease Control Committee. Particularly valuable contributions were made by Jim Warren (U.S. Fish and Wildlife Service), Tim Carey (Department of Fisheries and Oceans), Jack Hammond (Michigan Department of Natural Resources), John Schachte (New York Department of Enviromnenal Conservation), and Rod Horner (Illinois Department of Conservation). The contribution of Gail Etter, Associate Editor (GLFC) is also acknowledged.

PROTOCOL TO MINIMIZE THE RISK OF INTRODUCING EMERGENCY DISEASE AGENTS WITH IMPORTATION OF SALMONID FISHES FROM ENZOOTIC AREAS

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ABSTRACT. The Great Lakes Fish Disease Control Committee was established by the Great Lakes Fishery Commission (GLFC) in 1973 to recommend measures to protect the health of fish in the Great Lakes basin. The Committee has representatives from private and governmental sectors concerned with aquaculture and/or fisheries in the basin. Because introductions of disease agents with importation of salmonid fishes from emergency disease enzootic areas are an increasing concern, the Committee established a Protocol to reduce risks associated with importation. This Protocol provides guidelines to be followed by federal, provincial, and state-agency members of the Committee. Private-sector operators are also encouraged to use the guidelines. The guidelines consist of an outline for a justification and proposal, inspection requirements for developing a history of disease agents in the donor stock and associated fishes, and procedures for quarantine. Conditions for importation, including the need for quarantine, are established. The Committee recommends that the GLFC conduct a formal review, assessing risks and benefits, of any proposal by a governmental-member agency for importation of salmonid fishes from emergency disease enzootic areas. The Protocol is published to encourage wide use and acceptance.

INTRODUCTION

The Great Lakes Fish Disease Control Committee was established by the Great Lakes Fishery Commission (GLFC) in 1973 to recommend measures to protect the health of cultured- and wild-fish populations in the Great Lakes basin. The Committee is comprised of representatives from state, provincial, and federal agencies involved with Great Lakes fishes and from private aquacultural interests. Decisions are made by a consensus of the membership. In 1985, the Committee

developed a Model Program for controlling fish diseases in the basin. This Model Program was subsequently adopted as a policy of the GLFC, and was updated and republished as a companion to this document (Hnath 1993).

Increasing national and international interest in importation of salmonid fishes for fisheries management and aquacultural purposes, and the damage caused by disease introductions (Rohovec et al. 1988) indicated that expanded guidelines were needed to protect the health of salmonid fish stocks within the Great Lakes basin. Consequently, the Committee recommended at first a ban on importations of salmonid fishes from regions where emergency diseases (see page 11 for a list of emergency fish diseases) were enzootic. For example, importations were banned from the U.S. and Canada west of the Continental Divide, areas where infectious hematopoietic necrosis virus (IHN) and the parasite Ceratomyxa shasta, neither of which are known to occur in the Great Lakes basin, are found.

Viewed from a trade perspective, however, bans may be seen as short-term measures until adequate safeguards can be undertaken. Hence, the Committee later developed this Protocol to provide for importation of salmonid fishes from areas where emergency diseases are enzootic. This Protocol applies to federal, provincial, and state-agency members' of the Committee who propose releases of salmonid fishes from emergency disease enzootic areas into waters under their jurisdiction. Private-sector members of the Committee are also encouraged to use it. This Protocol provides guidelines under which importations may be undertaken and establishes procedures for minimizing the associated risks. It is published here to encourage wide acceptance and use. Nothing in the Protocol is intended to supercede or change the intent of the Model Program (Hnath 1993).

JUSTIFICATION AND PROPOSAL

Importations are restricted to fish eggs only. A full written justification should be made available to the GLFC and its cooperators at least six months prior to any proposed importation of salmonid fish eggs from an emergency disease enzootic area outside the Great Lakes states or the Province of Ontario. This stipulation also applies to live salmonid fish eggs imported for research. This notification is consistent with the intent of A Joint Strategic Plan for Management of Great Lakes Fisheries (GLFC 1980) that states:

[2] Federal, provincial, and state-agency members of the Committee are: Canadian Department of Fisheries and Oceans, U.S. Fish and Wildlife Service, Ontario Ministry of Natural Resources, Illinois Department of Conservation, Indiana Department of Natural Resources, Michigan Department of Natural Resources, Minnesota Department of Natural Resources, New York Department of Environmental Conservation, Ohio Department of Natural Resources, Pennsylvania Fish and Boat Commission, and Wisconsin Department of Natural Resources.

> Each fishery agency should submit all substantive changes from existing practice to the appropriate lake committee before implementation. . . . Any agency proposal for change which other agencies believe will influence their interests may become the subject of negotiations within lake committees until consensus of affected agencies is achieved.

The proposal and justification for importation should include at least the following items:

1) species to be introduced,

2) strain,

3) number,

4) location of the donor brood stock,

5) proposed location of introduction,

6) a rationale for the introduction that outlines why the objective cannot be met through utilization of salmonid fish stocks present in the Great Lakes states or the Province of Ontario,

7) information on the strain's preferred habitat,

8) potential for infection from parasites and disease agents, for competition with other fish species in the Great Lakes basin, and for genetic impacts on resident salmonid fishes,

9) reference to previous importation and associated impacts, and

10) a follow-up plan to determine success in relation to objectives and to identify what parasites and disease agents are harbored by the imported fish or their progeny.

Following distribution of a full justification and proposal, the Committee recommends that the GLFC conduct a formal review to define the risks of the introduction in relation to the expected benefits. The Committee should be consulted as part of the review process. Committee members may seek information on the proposed importation in addition to the above items. A formal review is consistent with the Strategic Plan and will help ensure that the interests of GLFC's cooperators are protected. In developing a proposal, importers are advised that the policy of the GLFC under the Great Lakes Fish

Disease Control Policy and Model Program (see page 2) is to encourage each cooperating agency to work toward the control of fish diseases in the Great Lakes basin by:

developing legislative authority and regulations to allow control and possible eradication of fish diseases,

preventing the release of seriously infected fish,

discouraging the rearing of diseased fish,

preventing the importation into the Great Lakes basin of fish infected with emergency diseases,

preventing the transfer of fish within the Great Lakes basin of fish infected with restricted diseases, and

eradicating fish diseases, where practicable.

Every effort should be made to avoid importation by using resident salmonid fish stocks from the Great Lakes states or the Province of Ontario. If importation is deemed necessary, every effort should be made to import from areas where annual inspections (see Annex VI of the Great Lakes Fish Disease Control Policy and Model Program for inspection procedures) of donor brood stocks and associated salmonid fish stocks in the donor holding facility (captive donors) or in the watershed (wild donors) have been negative for viral hemorrhagic septicemia virus (VHS) and IHN for at least five years. The following procedures should be followed for all importations. However, the requirement for quarantine is waived if the five-year stipulation is met. Also, international importations require compliance with the Title 50 Code of Federal Regulations, Part 16, in the U.S. and with Canadian Fish Health Protection Regulations in Canada.

HISTORY OF DISEASE AGENTS IN THE DONOR BROOD STOCK, SOURCE WATERSHED, AND HOLDING FACILITIES

Cultured Salmonid Fishes

Disease Agents in Holding Facilities

All salmonid fish stocks in the donor's holding facility must have had at least three inspections during the past two years for all emergency and restricted disease agents (see Annex II of the Great Lakes Fish Disease Control Policy and Model Program for a list of emergency and restricted disease agents) by a recognized Fish Health Official. Inspections should conform to Annex VI (Inspection Procedures and Methods of Diagnosis) of the Great Lakes Fish Disease Control Policy and Model Program. The history of inspection must demonstrate the absence of emergency disease agents. Information on the detection of any restricted or other disease agents must also be documented.

Disease Agents in Parents

1) At the time of spawning, all parents must be sampled and inspected in conformance with Annex VI (Inspection Procedures and Methods of Diagnosis) of the Great Lakes Fish Disease Control Policy and Model Program. No eggs will be accepted for importation if emergency disease agents are detected.

2) If restricted disease agents are detected in the parents, acceptability of eggs will be based on Annex V (Guidelines for the Control and Management of Disease Agents) of the Great Lakes Fish Disease Control Policy and Model Program.

3) Following water hardening in suitable concentrations of an organic-iodine disinfectant and a second disinfection at the spawning site, imported eggs must be shipped directly to a quarantine facility for holding prior to release.

Wild Salmonid Fishes

Disease Agents in the Source Watershed

1) All salmonid fish species in the source watershed, including the donor stock, must have had at least two consecutive, annual inspections at the time of spawning for all emergency and restricted disease agents by a recognized Fish Health Official using procedures outlined in Annex VI (Inspection Procedures and Methods of Diagnosis) of the Great Lakes Fish Disease Control Policy and Model Program. The history of health inspection must demonstrate the absence of VHS and MN. Information on the detection of any restricted or emergency disease agents must be documented.

2) All salmonid fish-culture facilities in the watershed must be inspected as defined above for cultured salmonid fishes.

Disease Agents in Parents

1) All parent fish must be killed and sampled at the time of spawning. Inspection for emergency and restricted disease agents should conform to Annex VI (Inspection Procedures and Methods of Diagnosis) of the Great Lakes Fish Disease Control Policy and Model Program.

2) No eggs will be accepted for importation if VHS or MN is detected in parent fish or in other salmonid fish inhabiting the donor's watershed.

3) If other emergency or restricted disease agents are detected, acceptability of eggs will be based on Annex V (Guidelines for the Control and Management of Disease Agents) of the Great Lakes Fish Disease Control Policy and Model Program.

4) Following water hardening in suitable concentrations of an organic-iodine disinfectant and a second disinfection at the spawning site, imported eggs must be shipped directly to a quarantine facility for holding prior to release.

QUARANTINE

Facility Design

1) An approved quarantine facility is a physically separated, enclosed culture system that permits the isolation and maintenance of fish while preventing their introduction into the environment. The incoming water source should be from a groundwater supply. If a groundwater supply cannot be found, a closed surface-water supply is acceptable if it is free of fish and treated to be free of all fish pathogens associated with emergency and restricted diseases. All facility effluent must also be treated to prevent the transmission of fish pathogens. The quarantine facility must be physically separated and isolated from all other fish stocks. This separation includes personnel, equipment, and fish feed. Importers are encouraged to submit plans for quarantine facilities to the Committee for review.

2) Each quarantine facility should have an egg-receiving area that is isolated from rearing units. Rearing units should also be physically separated from each other. The receiving area may be installed as an isolated part of each rearing unit within the quarantine facility or it may be entirely separate from rearing units. Access should be designed to preclude contamination of rearing units when eggs are delivered. Imported eggs should be brought into the receiving area, surface disinfected, and transferred into a rearing unit where they will remain until quarantine is complete. Contact between personnel in the egg-receiving area and the remainder of the quarantine facility should be avoided. Anyone who is disinfecting eggs would not make transfers directly to anyone who is inside a rearing unit. Transfers would take place through a third person not in contact with the incoming eggs before disinfection. Disinfectant handwashes, footbaths, and appropriate clothing would be utilized by all staff inside each rearing unit and egg-receiving area. All packing materials and water shipped with eggs must be immediately incinerated or chlorine sterilized within the egg-receiving area.

3) Appropriate environmental agencies should be consulted regarding methodologies and procedures available to achieve a rearing-unit effluent free of fish pathogens. Each rearing unit should also have a backup system available to treat effluents in case the primary system fails. It should also have an alarm system to signal a failure of the primary system.

Facility Disinfection

1) Disinfection of the egg-receiving area and rearing unit is required preparatory to each delivery of eggs. These disinfections should proceed according to accepted protocols (Meyer et al. 1983).

2) If emergency or restricted disease agents are detected, procedures for disposal of fish and disinfection of the rearing unit are required as in Annex V (Guidelines for the Control and Management of Disease Agents) of the Great Lakes Fish Disease Control Policy and Model Program. If an emergency disease agent is detected, sentinel fish will be used to verify the effectiveness of required disinfections. At least 150 fish of a species and size susceptible to the disease agent(s) detected in the rearing unit will be used as sentinels. These fish will be held for at least 120 days following disinfection. All mortalities of sentinel fish must be monitored. If possible, surviving sentinel fish will be subjected to a heat stress test. All sentinel fish must be disposed of in the manner described in Chapter 14 of Meyer et al. (1983).

Operation and Maintenance

1) Personnel. Access to a quarantine facility should be limited to designated personnel. These personnel should be properly trained in operational procedures.

2) Records. A fully completed Salmonid Quarantine Report (see Appendix) must accompany each lot of fish held at a quarantine facility. A copy will be submitted to the Committee with the semiannual Hatchery Classification Report.

3) Disinfection Stations. Each rearing unit must have a disinfection station. This station must include the following: handwashes, footbaths (sunken preferred), and a change of outer clothing (laboratory coats and boots).

4) Equipment. Each egg-receiving area and rearing unit will be independent with respect to all equipment and supplies.

5) Disposal of Daily Mortalities. Guidelines for inspecting daily mortalities of fish in quarantine are provided in the next section. Daily mortalities not required for inspection must remain in the rearing unit and be placed in an appropriate disinfectant or fixative. These fish must then be bagged for removal from the quarantine facility and disposed of as described in Meyer et al. (1983).

6) Disinfection Procedures. Disinfecting solutions will be monitored daily to maintain an effective dose. Outer clothing should be cleaned after each use, and the entire quarantine facility should be routinely cleaned with disinfectants.

Duration of Quarantine

All fish should be quarantined for a minimum period of six months beginning after their first feeding.

INSPECTION AND MONITORING OF FISH

During Quarantine

Fish in quarantine should be monitored and inspected monthly for emergency and restricted disease agents. Daily mortalities need not be assayed unless they are unusual in number or exhibit clinical signs of disease.

In addition to monthly inspections, a heat stress test is required two months prior to the expected release date from quarantine. A minimum of 150 fish should be held for 14 to 21 days at an elevated temperature. All fish must be injected or fed with an immunosuppressant at the beginning of the test. The numbers of fish inspected for emergency and restricted disease agents (normally 150) must be adequate to demonstrate a 2% level of disease prevalence at a 95% confidence level.

Following Quarantine

1) All imported fish should receive a tag or unique mark before planting.

2) Tagging or marking of fish will occur only after all inspection results are known. Tagging and marking will not occur in a quarantine facility.

3) The results of all inspections, vaccinations, tagging, and final destination of fish will be described in the Salmonid Quarantine Report (see Appendix).

ASSESSMENT FOR DISEASE AGENTS IN IMPORTED FISH AFTER RELEASE

Monitoring Plan

An importer must prepare a plan for monitoring introduced fish for emergency disease agents after their release from quarantine. This plan should include isolating at least 300 of the imported fish in captivity to the end of the first generation, or to a maximum of three years for fish with longer life cycles. Annual inspection of captive fish for emergency and restricted disease agents is required and must be based on a statistically valid sample. An inspection at spawning is also desirable.

Response to Emergency Disease Agents

If emergency disease agents are detected in captive fish during a monitoring period, all fish in the associated rearing unit must be destroyed and that unit must be disinfected. Any released fish that are recaptured should also be destroyed.

STATUS OF FACILITIES RECEIVING FISH AFTER RELEASE FROM QUARANTINE

The disease classification of a facility receiving fish released from quarantine will be unchanged except where restricted or emergency disease agents are confirmed in released or captive fish. If these agents are not compatible with the disease classification of the receiving facility, that facility's classification will be revised in accordance with Annex IV (Hatchery Classification) of the Great Lakes Fish Disease Control Policy and Model Program.

STATUS OF QUARANTINE FACILITIES FOLLOWING THE QUARANTINE PERIOD AND DISINFECTION

The disease classification of a rearing unit should be consistent with Annex IV (Hatchery Classification) of the Great Lakes Fish Disease Control Policy and Model Program. Disinfection should follow procedures identified in Meyer et al. (1983). In addition, heat stress testing after disinfection is required if emergency disease agents are detected in a quarantine facility or in fish released from quarantine.

ACKNOWLEDGMENTS

This Protocol was developed over a period of several years by the members of the Great Lakes Fish Disease Control Committee, and their foresight, initiative, and perseverance are gratefully acknowledged. One Committee member, John Hnath, is singled out for his extensive efforts in coordinating the development of this Protocol. Also noteworthy was Great Lakes Fishery Commission staff support from Margaret Dochoda.

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APPENDIX
SALMONID QUARANTINE REPORT

Copies of the Salmonid Quarantine Report (shown on the next page) are available from the Great Lakes Fishery Commission.

SALMONID QUARANTINE REPORT

Quarantine Facility_____ Address_____

Manager_____ _____

Phone_____ _____

Species_____ Stock/Strain_____ Lot No._____

Origin and Health History_____

Dates in Quarantine: From_____ To_____
mo/day/year mo/day/year

Age of Fish Upon Release_____ Current Health Status_____

Marks or Tags Applied_____

Vaccinations_____

Location(s) Stocked or Facilities Transferred To_____

_____

Results of All Inspections While in Quarantine Unit

Date	Results	Inspector
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Prepared By_____
Name (print or type)

Signature_____ Address_____

Date _____ _____

Phone _____ _____