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Julia Beyerle
and
John G. Hnath



MICHIGAN DEPARTMENT OF NATURAL RESOURCES FISHERIES DIVISION

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**HISTORY OF FISH HEALTH INSPECTIONS
STATE OF MICHIGAN
1970-1999**

Julia Beyerle and John G. Hnath

*Michigan Department of Natural Resources
Fish Health Laboratory
Wolf Lake State Fish Hatchery
34270 C.R. 652
Mattawan, Michigan 49071*

Abstract.—This report is an update to: Hnath, J. G., and J. Zischke. 1991. Fish Health Inspection History for Michigan State Fish Hatcheries and Wild Salmonid Stocks for the Period 1972-1991. Michigan Department of Natural Resources, Fisheries Technical Report 91-13. As such it presents a concise summary of fish health inspections performed on State of Michigan public fish hatcheries and associated feral stocks for the period of 1970-1999. The report summarizes the results chronologically, and discusses the ways in which the inspection program has been of benefit to the Great Lakes fishery. It concludes with the following. “Because of the enormous value of the Great Lakes fishery stocks, it is imperative that the State of Michigan be knowledgeable and current in its information about infectious diseases in its stocks. Therefore, a constant vigilance must be maintained on hatchery fish and associated feral stocks destined for Great Lakes and tributary plants in order to protect these resources from potentially serious disease. In order to be knowledgeable and current, both an annual fish health inspection program and fish health diagnostic services must be continued as they have been under this study.”

Fisheries Division has a charge to “...protect the public trust in aquatic resources...” Part of that trust is to assure the optimum quality of fish health in hatchery-reared fish destined for public waters. Since the continued success in management of the fishery resources of the state is strongly dependent upon hatchery-reared fish, the success of the hatchery program is of paramount importance. A part of the hatchery success depends upon the capability to rear healthy fish free from disease-induced mortalities, and to minimize the spread of diseases into natural waters.

The only effective way to control the spread of specific fish diseases is through wise management based upon annual fish health

inspections of production fish and broodstocks to ascertain what diseases the stocks have, and thereby take appropriate control measures.

Since 1970, the State of Michigan in cooperation with the U.S. Fish and Wildlife Service, Fish Disease Control Center at Lacrosse, Wisconsin, has been inspecting Michigan hatcheries and anadromous salmonid stocks for specific serious fish pathogens. In 1973, the Great Lakes Fishery Commission established a Fish Disease Control Committee. This committee developed a fish disease control policy and recommended measures to reduce disease-induced mortalities of hatchery stocks of fish, minimize the spread of fish diseases into the Great Lakes basin, and protect against the

introduction of exotic fish diseases. The State of Michigan endorsed these recommendations and has been working towards the goals established by the committee (Hnath 1993).

The guidelines used for conducting fish health inspections were established by the Great Lakes Fish Health Committee, formerly the Great Lakes Fish Disease Control Committee (Appendix 1). This has led to a classification of disease agents of concern and their acronyms (Table 1). Some of the guidelines for classifying hatchery and feral populations have been modified slightly from the original recommendation. Two groups of diseases are identified: emergency and restricted. Emergency fish diseases are caused by certain virulent pathogens that have not been detected within waters of the Great Lakes basin. 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.

Table 2 is a summary of the results of annual fish health inspections of salmonid fish at State of Michigan fish hatcheries and spawning weirs, as well as routine and non-routine inspections of various feral salmonid populations. The original laboratory reports are on file at the Fish Health Laboratory, Fisheries Division, Michigan Department of Natural Resources. The fish health inspections play an important role in achieving and maintaining the health of fish in state hatcheries and in feral stocks.

This report is an update of Fisheries Technical Report 91-13, which covered the period 1972 through 1991 (Hnath and Zischke 1991).

Methods

Inspections were made of each production fish hatchery and each wild spawning population of anadromous salmonids used as egg sources for hatchery production. Hatcheries and broodstock were inspected annually for those specific pathogens of concern to the Great Lakes Fish Health Committee. The pathogens examined for were: hemorrhagic septicemia virus, infectious hematopoietic necrosis virus, infectious pancreatic necrosis virus (VP),

whirling disease (*Myxobolus cerebralis*), bacterial kidney disease (*Renibacterium salmoninarum*), furunculosis (*Aeromonas salmonicida*), and enteric redmouth (*Yersinia ruckeri*). The inspection procedures used are described in Hnath (1993) and Thoesen (1994).

Each hatchery was classified on the basis of the inspection data, and an annual report was submitted to the Great Lakes Fishery Commission and all member agencies in the United States and Canada.

In addition to these routine inspections, on-site diagnostic services were performed in cases of fish mortalities or disease problems at hatcheries in order to keep abreast of problems and to keep hatchery classifications current.

Diagnostic services were also performed for problems occurring in fish populations in the wild and for private aquaculturists.

Results

One of the goals of the Fish Production Section of the Fisheries Division, Michigan Department of Natural Resources is to rear and stock fish that are healthy and free of the most serious fish pathogens. Over the years of the fish health inspection program, Michigan has seen the elimination of several of these pathogens from our hatchery system (VP and epizootic epitheliotropic disease [EED] viruses, and whirling disease) and the elimination of other pathogens from specific hatcheries.

Infectious pancreatic necrosis virus has not been found in any hatchery or feral stock used for hatchery egg source since 1984. The Lake Michigan steelhead stock has tested negative for this virus since 1976.

Since 1986 Harrietta State Fish Hatchery has remained free of all pathogens of concern, and the Oden facility has likewise remained free of these pathogens since 1985.

The pathogenic agent for whirling disease has not been detected in any state-owned hatchery since the Sturgeon River Rearing Station was closed in 1975.

The most commonly detected pathogens of concern are bacterial kidney disease and furunculosis, both of which are found in feral fish that are believed to be the sources of hatchery infections.

The results of annual fish health inspections permitted a hatchery classification system based on diseases detected, and served as a guideline for transfers between hatcheries, for stocking in the wild, and for shipment to other state hatchery programs. Using the hatchery classifications obtained, Michigan hatchery personnel have been able to control the spread of certain infectious diseases to other stations, and prevent the stocking of fish carrying certain pathogens into waters not known to have these infectious agents.

Discussion

Through the course of this study, annual fish health inspections of state fish hatcheries and anadromous salmonid spawning populations were performed. The results of these inspections enabled the Michigan Department of Natural Resources to set up a statewide hatchery classification system based on the history of fish health inspections. This hatchery and stock classification system has been useful in many ways.

1. The Michigan Department of Natural Resources was able to manage its hatchery stocks in such a manner that certain diseases found in one station were not transferred to other stations without those diseases. Because of such restriction, Harrietta State Fish Hatchery is classified as a specific-pathogen-free hatchery. Likewise, the Marquette State Fish Hatchery was specific-pathogen-free until the advent of the epizootic epitheliotropic disease virus (EEDV) of lake trout.
2. Other states have used our hatchery and stock classifications to determine whether or not they wish to take any of our stocks for their needs, based upon the pathogens involved and whether or not such uses would pose a risk to their fishery resources.
3. The diagnostic services provided identification of pathogens, which led to treatment or control

measures. In the case of lake trout EEDV, the diagnostics eventually led to the identification by a university researcher of a new viral agent. And this knowledge led to stringent control measures, including station disinfections and stock destructions. Fish with signs of the viral agent which caused high losses in lake trout production at the Marquette State Fish Hatchery in the past have not been seen at the hatchery since the chlorine disinfection of the facility in the spring of 1989.

Two restricted diseases continue to be found in state fish hatcheries and some wild stocks: bacterial kidney disease, and bacterial furunculosis. The former continues to be found in stocks of chinook salmon from Lake Michigan and has been implicated in mortalities in the lake. BKD has also been found in feral coho salmon, steelhead, and brown trout from Lake Michigan. Control measures and strategies are now being implemented to bring this disease under control.

Bacterial furunculosis continues to cause mortalities in brook trout at the Marquette State Fish Hatchery. Improved fish husbandry and the use of commercial vaccines minimize losses.

Conclusions and Recommendations

Because of the enormous value of the Great Lakes fishery stocks, it is imperative that the State of Michigan be knowledgeable and current in its information about infectious diseases in its stocks. Therefore, a constant vigilance must be maintained on hatchery fish and associated feral stocks destined for Great Lakes and tributary plants in order to protect these resources from potentially serious disease. In order to be knowledgeable and current, both an annual fish health inspection program and fish health diagnostic services must be continued as they have been under this study.

Table 1.–Emergency diseases, disease pathogens, disease acronyms, and pathogen acronyms used in hatchery classification for emergency and restricted fish diseases. The classification is based on the Disease Control Policy and Model Program, Great Lakes Fishery Commission, (Hnath 1993).

| Disease | Disease Pathogen | Disease Acronym | Pathogen Acronym |
|-----------------------------------|---|-----------------|------------------|
| Emergency Diseases | | | |
| Viral hemorrhagic septicemia | Virus | VHS | VE |
| Infectious hematopoietic necrosis | Virus | IHN | VH |
| Ceratomyxosis | <i>Ceratomyxa shasta</i> | | |
| Protozoan | | CS | SC ¹ |
| Proliferative kidney disease | Sporozoan | PKD | SP ¹ |
| Restricted Diseases | | | |
| Whirling diseases | <i>Myxobolus cerebralis</i> protozoan | WD | SW |
| Infectious pancreatic necrosis | Virus | IPN | VP |
| Bacterial kidney disease | <i>Renibacterium salmoninarum</i> bacterium | BKD | BK |
| Furunculosis | <i>Aeromonas salmonicida</i> bacterium | BF | BF |
| Enteric redmouth | <i>Yersinia ruckeri</i> bacterium | ERM | BR |
| Epizootic epitheliotropic disease | Virus | EED | VL ² |

¹ 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.

² Field diagnostic test not available.

Table 2.–Station/stock histories of fish health inspections in Michigan. The key to hatchery classifications are taken from the Great Lakes Fish Disease Control Policy and Model Program as shown in Appendix 1. The key to disease and pathogen acronyms is given in Table 1.

| Station | Species/Stock | Date | Classification |
|---|---|----------|---------------------------|
| Harrietta State Fish Hatchery 6801 Thirty Mile Road Harrietta, MI 231-389-2211 | Trout and Salmon (species vary year to year) | 3/15/99 | A-1 |
| | | 3/16/98 | A-1 |
| | | 2/10/97 | A-1 |
| | | 3/5/96 | A-1 |
| | | 2/28/95 | A-1 |
| | | 3/28/94 | A-1 |
| | | 3/15/93 | A-1 |
| | | 3/16/92 | A-1 |
| | | 4/2/91 | A-1 |
| | | 3/19/90 | A-1 |
| | | 3/27/89 | A-1 |
| | | 3/14/88 | A-1 |
| | | 3/2/87 | A-1 |
| | | 3/18/86 | A-1 |
| | | 4/25/85 | B-(BF) |
| | | 5/3/84 | B-(BF,BK) |
| | | 3/3/83 | B-BK,BF,(VP) |
| | | 3/8/82 | B-BK,BF,(VP) |
| | | 2/19/81 | B-BK,BF,(VP) |
| | | 9/22/80 | B-BK,BF,(VP) |
| | | 3/18/80 | B-BK,BF,(VP) ¹ |
| 1979 | under construction | | |
| 1978 | under construction | | |
| 1977 | under construction | | |
| | | 10/12/76 | B-BK,BF |
| | | 11/4/75 | B-BK,BF |
| | | 10/7/74 | B-BK,BF |
| | | 11/2/73 | B-BF |
| | | 7/11/72 | B-BF |
| | | | none previous |
| Marquette State Fish Hatchery 488 Cherry Creek Road Marquette, MI 49855 906-249-1611 | Trout and Salmon (species vary year to year) | 10/26/99 | B-BF |
| | | 4/20/99 | B-BF |
| | | 10/27/98 | B-BF |
| | | 5/26/98 | B-BF |
| | | 10/27/97 | B-BF |
| | | 4/29/97 | B-BF |
| | | 10/28/96 | B-BF |
| | | 5/21/96 | A-2 |
| | | 4/29/96 | A-2 |
| | | 10/31/95 | A-2 |
| | | 5/1/95 | A-2 |
| | | 10/25/94 | A-2 |
| | | 4/25/94 | A-2 |
| 10/26/93 | A-2 | | |
| 4/27/93 | A-2 | | |

Table 2.—continued.

| Station | Species/Stock | Date | Classification |
|---|---|----------|------------------------|
| Marquette continued | | 10/27/92 | B-(BK) ² |
| | | 5/12/92 | B-(BK) ² |
| | | 10/29/91 | B-(BK) ² |
| | | 5/7/91 | B-(BK) ² |
| | | 10/30/90 | A-2 ³ |
| | | 4/24/90 | B-(BF) ³ |
| | | 6/15/89 | disinfected |
| | | 10/25/88 | B-(BF) ³ |
| | | 10/20/87 | B-BF ³ |
| | | 10/28/86 | C-(A-2) ³ |
| | | 10/29/85 | C-(A-2) ⁴ |
| | | 10/23/84 | A-2 |
| | | 6/5/84 | C-(A-2) ⁴ |
| | | 10/25/83 | C-(A-2) ⁴ |
| | | 6/5/83 | C-(A-2) ⁴ |
| | | 10/19/82 | A-2 |
| | | 10/27/81 | A-2 |
| | | 10/22/80 | A-2 |
| | | 10/23/79 | A-2 |
| | | 10/17/78 | A-2 |
| | | 10/18/77 | A-2 |
| | | 10/19/76 | A-2 |
| | | 10/20/75 | A-2 |
| | | 10/22/74 | A-2 |
| | | 10/17/73 | B-(BK) |
| | | 10/24/72 | B-BK |
| | | 10/19/71 | C |
| 12/10/70 | C | | |
| | none previous | | |
| Oden State Fish Hatchery 3377½ Oden Road Oden, MI 49764 231-347-4689 | Trout and Salmon (species vary year to year) | 11/16/99 | A-2 |
| | | 3/25/99 | A-2 |
| | | 11/16/98 | A-2 |
| | | 3/30/98 | A-2 |
| | | 11/5- | |
| | | 12/3/97 | A-2 |
| | | 4/21/97 | A-2 |
| | | 10/1- | |
| | | 11/25/96 | A-2 |
| | | 3/26/96 | A-2 |
| | | 11/7/95 | A-2 |
| | | 3/27/95 | A-2 |
| | | 10/5/94 | A-2 |
| | | 5/11/94 | A-2 |
| | | 11/29/93 | A-2 |
| | | 4/19/93 | B-(BK,BF) ⁵ |
| | | 10/13/92 | B-(BK,BF) ⁵ |
| 4/21/92 | B-(BK,BF) ⁵ | | |
| 10/21/91 | B-(BK,BF) ⁵ | | |

Table 2.—continued.

| Station | Species/Stock | Date | Classification | |
|----------------|---|---|------------------------|------------------------|
| Oden continued | | 10/16/90 | B-(BK,BF) ⁵ | |
| | | 4/2/90 | B-(BK,BF) ⁵ | |
| | | 4/19/89 | A-2 | |
| | | 6/14/88 | A-2 | |
| | | 12/1/87 | A-2 | |
| | | 11/5/86 | B-(BK,BF) | |
| | | 11/6/85 | B-BK,BF | |
| | | 12/4/84 | B-BK,BF | |
| | | 3/23/83 | B-BK,BF | |
| | | 11/3/82 | B-BK,BF | |
| | | 11/4/81 | B-BK,BF | |
| | | 8/25/81 | | |
| | | (partial) | B-BK,BF | |
| | | 2/18/81 | | |
| | | (partial) | B-BK,BF | |
| | | 11/20/80 | B-BK,BF | |
| | | 9/12/79 | B-BK,(BF,VP) | |
| | | 3/27/79 | B-BF,(BK,VP) | |
| | | 10/31/78 | B-BK,BF,(VP) | |
| | | 4/19/78 | B-VP,BF,(BK) | |
| | | 3/9/77 | B-BK,(BF) | |
| | | 3/3/76 | B-BF,(BK) | |
| | | 2/12/75 | B-BK | |
| | | 2/13/73 | B-BK,(VP,BF) | |
| | | 2/18/72 | B-BF,VP,(BK) | |
| | | 1/20/71 | B-BK,BF | |
| | | | none previous | |
| | Platte River State Fish Hatchery 15200 Honor Highway Beulah, MI 49617 231-325-4611 | Trout and Salmon (species vary year to year) | 3/30/99 | B-BK,BF |
| | | | 4/1/98 | B-BK,BF |
| | | | 3/18/97 | B-(BK,BF) ⁷ |
| 4/8/96 | | | B-BK,BF | |
| 3/15/95 | | | B-BK,(BF) ⁶ | |
| 4/5/94 | | | B-BK,(BF) ⁶ | |
| 3/30/93 | | | B-BK,(BF) ⁶ | |
| 3/24/92 | | | B-BK | |
| 4/15/91 | | | B-BK,(BF) | |
| 5/1/90 | | | B-BK,BF | |
| 4/11/89 | | | B-BK,(BF) ⁶ | |
| 4/18/88 | | | B-BK,(BF) ⁶ | |
| 3/24/87 | | | B-BK,BF ⁶ | |
| 3/25/86 | | | B-BK | |
| 4/18/85 | | | B-BK,(VP) ⁸ | |
| 4/18/84 | | | B-BK,(BF) | |
| 4/26/83 | | | B-BK,BF | |
| 4/20/82 | | | B-BK,BF,(VP) | |
| 3/17/81 | | | B-BK,BF,VP | |
| 4/29/80 | | | B-BK,(BF,VP) | |

Table 2.—continued.

| Station | Species/Stock | Date | Classification |
|---|---|---------|-------------------------|
| Platte River continued | | 5/1/79 | B-BK,BF,VP |
| | | 5/16/78 | B-BK,BF,(VP) |
| | | 2/9/77 | B-BK,BF,VP |
| | | 2/10/76 | B-BK,BF,VP,(SW) |
| | | 7/7/75 | B-BK,BF,VP,SW |
| | | 8/19/74 | B-BK,BF,VP |
| | | 2/2/73 | B-VP |
| | | 3/8/72 | B-BK |
| | | 2/5/71 | B-BK |
| | | | none previous |
| Thompson State Fish Hatchery R#2 Box 2534, M-149 Manistique, MI 49854 906-341-5587 | Trout and Salmon (species vary year to year) | 4/27/99 | B-BK |
| | | 5/5/98 | B-(BK,BF) ¹⁰ |
| | | 8/19/97 | B-BK |
| | | 4/22/97 | B-BK |
| | | 5/22/96 | B-(BK) ⁹ |
| | | 4/30/96 | B-(BK) ⁹ |
| | | 5/3/95 | B-(BK) ⁹ |
| | | 4/26/94 | B-BK,(BF) |
| | | 4/28/93 | B-BF,(BK) |
| | | 5/13/92 | B-(BK) ⁹ |
| | | 4/23/91 | B-(BK) |
| | | 4/25/90 | B-(BK) |
| | | 5/2/89 | B-BK |
| | | 5/3/88 | B-BK,(BF) |
| | | 4/20/87 | B-BK,BF |
| | | 5/6/86 | B-BK |
| | | 5/21/85 | B-BK,(BF) |
| | | 5/17/84 | B-BF |
| | | 5/17/83 | B-BF |
| | | 5/5/82 | B-BF,(BK) |
| | | 5/5/81 | B-BK |
| | | 2/27/80 | B-BK |
| | | 9/10/79 | C-(A-2) |
| | | 5/22/79 | C-(A-2) |
| | | 1978 | under construction |
| | | 11/1/77 | B-BK,(BF,VP) |
| | | 8/10/76 | B,VP,(BF,BK) |
| 8/12/75 | B,VP,(BF) | | |
| 8/26/74 | B-BK,BF,(VP) | | |
| 3/12/73 | B-VP,BK,BF | | |
| 5/31/72 | B-VP,BK,BF | | |
| 4/28/71 | B-BK,BF | | |
| | none previous | | |

Table 2.—continued.

| Station | Species/Stock | Date | Classification |
|--|---|----------|----------------------------|
| Wolf Lake State Fish Hatchery 34270 CR 652 Mattawan, MI 49071 616-668-2696 | Trout and Salmon (species vary year to year) | 2/8/99 | B-(BF,BK,VP) ¹³ |
| | | 3/3/98 | B-(BK) ¹¹ |
| | | 2/18/97 | B-(BK) |
| | | 2/20/96 | B-(BK) |
| | | 2/21/95 | B-BK |
| | | 3/15/94 | B-BK,(BF) |
| | | 3/2/93 | B-BK,BF |
| | | 3/3/92 | B-BK,(BF) |
| | | 3/5/91 | B-BK,BF |
| | | 1/23/91 | B-BK,BF |
| | | 2/21/90 | B-BK,(BF) |
| | | 3/22/89 | B-BK,BF |
| | | 2/23/88 | B-BK,BF |
| | | 2/18/87 | B-BK,BF,(BR) ¹² |
| | | 3/6/86 | B-BF,(BK) |
| | | 11/14/85 | B-BK,BF |
| | | 2/25/85 | B-BK,(BF) |
| | | 2/24/84 | B-BK,BF |
| | | 2/4/83 | B-BF,(VP,BK) |
| | | 2/22/82 | C-(VP,BF) |
| | | 1981 | under construction |
| | | 1980 | under construction |
| | | 2/13/79 | B-VP,BF,(BK) |
| | | 7/17/78 | B-BF |
| | | 7/7/77 | B-BF,(BK,VP) |
| | | 11/23/76 | B-BF,BK,VP |
| | | 6/17/75 | B-BF,(VP) |
| 11/5/74 | B-VP,BF | | |
| 8/20/73 | B-VP | | |
| 1/10/73 | B-BF,(VP) | | |
| 5/18/72 | B-VP,BF | | |
| 6/15/71 | B-BF | | |
| | none previous | | |
| Lake Superior State University Aquatics Lab Sault Ste. Marie, MI 49783 906-635-1949 | Trout and Salmon (species vary year to year) | 9/14/99 | B-(BF,BK) ¹⁴ |
| | | 9/15/98 | B-(BF,BK) ¹⁴ |
| | | 8/19/97 | B-(BF,BK) ¹⁴ |
| | | 9/17/96 | B-(BF,BK) ¹⁴ |
| | | 8/29/95 | B-(BF,BK) ¹⁴ |
| | | 9/20/94 | B-(BF) |
| | | 8/17/93 | B-BF,(BK) |
| | | 9/22/92 | B-(BF) |
| | | 8/22/89 | B-BF |
| | | 8/16/88 | B-BF |
| | | 8/18/87 | B-BF |
| 9/3/86 | C | | |
| | none previous | | |

Table 2.—continued.

| Station | Species/Stock | Date | Classification |
|---|---|----------|-----------------------|
| Charlevoix Great Lakes Station 96 Grant Street Charlevoix, MI 49712 231-547-6065 | Trout and Salmon (species vary year to year) | 4/11/90 | A-2 |
| | | 11/14/89 | C-(A-2) ¹⁵ |
| | | 10/4/88 | C-(A-2) |
| | | 4/28/88 | C-(A-2) |
| | | 10/28/87 | C-(A-2) |
| | | 4/15/87 | C-(A-2) |
| | | 10/22/86 | C-(A-2) |
| | | 4/23/86 | C-(A-2) |
| | | 11/6/85 | C-(A-2) |
| | | 5/8/85 | C-(A-2) |
| | | 11/1/84 | C-(A-2) |
| | | 1/19/84 | C-(A-2) |
| | | 2/21/78 | B-(BK) |
| | | 9/14/77 | B-(BK) |
| | | 3/22/77 | B-(BK) |
| | | 3/3/76 | B-BK |
| | | 2/12/75 | A-2 |
| 10/29/74 | A-2 | | |
| 2/13/73 | C | | |
| 1/29/71 | C | | |
| | | | none previous |
| Sturgeon River Rearing Station Wolverine, MI 49712 | Trout and Salmon (species vary year to year) | 2/12/75 | B-VP,SW ¹⁶ |
| | | 3/12/73 | B-VP,(BK,BF) |
| | | 9/5/72 | B-VP,BF,BK |
| | | | none previous |
| Boardman River Weir Traverse City, MI Lake Michigan | Chinook salmon | 10/6/99 | B-BK,BF |
| | | 10/3/90 | B-BK,(BF) |
| | | 10/11/89 | B-BK,(BF) |
| | | 10/12/88 | B-BK,(BF) |
| | | | none previous |
| Little Manistee Weir Lake Michigan | Chinook salmon | 10/4/99 | B-BK,BF |
| | | 9/29/98 | B-BK,BF |
| | | 10/9/97 | B-BK,BF |
| | | 10/1/96 | B-BK,BF |
| | | 10/10/95 | B-BK,BF |
| | | 10/3/94 | B-BK,BF |
| | | 10/3/93 | B-BK,BF |
| | | 10/8/92 | B-BK,BF |
| | | 10/8/91 | B-BK,BF |
| | | 10/1/90 | B-BK,BF |
| | | 9/26/89 | B-BK,BF |
| | | 10/4/88 | B-BK,BF |
| | | 10/7/87 | B-BK,(BF) |
| | | 9/30/86 | B-BK,BF |
| | | 10/8/85 | B-BF,(BK) |
| 10/3/84 | B-(BF,BK) | | |

Table 2.—continued.

| Station | Species/Stock | Date | Classification | | |
|--------------------------------|--------------------------|---------------|----------------------|-------------------------|--|
| Little Manistee Weir continued | Chinook salmon continued | 10/10/83 | B-BF,(BK) | | |
| | | 10/8/82 | B-BK,(BF) | | |
| | | 10/12/81 | B-BF | | |
| | | 10/8/80 | B-BF | | |
| | | 10/10/79 | A-2 | | |
| | | 10/10/78 | A-2 | | |
| | | 10/5/77 | A-2 | | |
| | | 10/20/76 | A-2 | | |
| | | 10/14/75 | A-2 | | |
| | | 10/9/74 | A-2 | | |
| | | 10/10/73 | A-2 | | |
| | | 10/17/72 | A-2 | | |
| | | 11/16/71 | C | | |
| | | 10/14/70 | C | | |
| | | Coho salmon | none previous | | |
| | | | 10/20/92 | B-BK,(BF) ¹⁷ | |
| | | | 10/19/88 | B-BK,BF | |
| | 10/19/81 | | B-BF,(BK) | | |
| | 10/7/80 | | B-(BK) | | |
| | 10/9/79 | | B-BK,(VP) | | |
| | 10/5/77 | | B-VP | | |
| | 10/24/73 | | C | | |
| | Steelhead | 11/8/72 | C | | |
| | | none previous | | | |
| | | 4/12/99 | B-(BK) ¹⁸ | | |
| | | 4/7/98 | B-BK | | |
| | | 4/15/97 | B-BK | | |
| | | 4/16/96 | B-(BK) ¹⁸ | | |
| | | 4/11/95 | B-BK | | |
| | | 4/13/94 | B-BK | | |
| | | 4/12/93 | B-BK | | |
| | | 4/9/92 | B-BK | | |
| | | 4/6/92 | B-BK | | |
| | | 4/8/91 | B-BK | | |
| | | 4/16/90 | B-BK | | |
| | | 4/17/89 | B-BK | | |
| | | 4/6/88 | B-BK | | |
| | | 4/4/87 | A-2 | | |
| 4/8/86 | | A-2 | | | |
| 4/9/85 | | A-2 | | | |
| 3/30/84 | | A-2 | | | |
| 3/23/83 | | A-2 | | | |
| 4/6/82 | A-2 | | | | |
| 4/6/81 | A-2 | | | | |
| 4/8/80 | A-2 | | | | |
| 4/11/79 | A-2 | | | | |
| 4/4/78 | A-2 | | | | |

Table 2.—continued.

| Station | Species/Stock | Date | Classification |
|---|-----------------|----------|----------------|
| Little Manistee Weir continued | | 4/6/77 | B-(BF) |
| | | 4/6/76 | B-BF,(VP) |
| | | 4/7/75 | B-VP |
| | | 4/15/74 | B-(BK) |
| | | 4/2/73 | B-(BK) |
| | | 4/6/72 | B-BK |
| | | | none previous |
| Platte River State Fish Hatchery Spawning Weir | Chinook salmon | 10/18/88 | C-BK,(BF) |
| | | | none previous |
| 15200 Honor Highway Beulah, MI 49617 231-325-4611 | Coho salmon | 10/18/99 | B-BK,BF |
| | | 10/20/98 | B-BK,BF |
| | | 10/21/97 | B-BK,BF |
| | | 10/15/96 | B-BK,BF |
| | | 10/17/95 | B-BK,BF |
| | | 10/17/94 | B-BK,BF |
| | | 10/18/93 | B-BK,BF |
| | | 10/15/91 | B-BK,(BF) |
| | | 10/23/90 | B-BK,BF |
| | | 10/17/89 | B-BK,(BF) |
| | | 10/17/88 | B-BK,(BF) |
| | | 10/13/87 | B-BK,BF |
| | | 10/22/86 | B-BK,BF |
| | | 10/17/85 | B-BF,(VP,BK) |
| | | 10/23/84 | B-VP,(BK,BF) |
| | | 10/17/83 | B-BK,BF |
| | | 10/26/82 | B-BK,BF |
| | | 10/14/81 | B-BF,(VP,BK) |
| | | 10/28/80 | B-BF,VP,(BK) |
| | | 10/31/79 | B-BK,(VP) |
| | | 10/26/78 | B-BK,VP,(BF) |
| | | 10/25/77 | B-VP,(BF,BK) |
| | | 10/26/76 | B-BK,VP |
| 10/21/75 | B-VP | | |
| 10/28/74 | B-BK,(VP) | | |
| 10/24/73 | B-VP | | |
| 10/31/72 | B-VP | | |
| 12/22/71 | B-VP,BF | | |
| 10/28/70 | C ¹⁹ | | |
| | | | none previous |
| Swan River Weir Rogers City, MI Lake Huron | Chinook salmon | 10/12/99 | B-BK,(BR,BF) |
| | | 10/13/98 | B-BK,BR,(BF) |
| | | 10/7/97 | B-BK,BF |
| | | 10/7/96 | B-BK |
| | | 10/3/95 | B-BK |
| | | 9/26/94 | B-BK |
| | | 9/20/93 | B-BK,(BF) |

Table 2.—continued.

| Station | Species/Stock | Date | Classification |
|--|---|--|--|
| Swan River Weir continued | | 10/8/90 10/4/89 | B-BK,(BF) B-BK,(BF) ²⁰ none previous |
| Au Sable Weir | Brown trout, Brook trout and Rainbow trout | 9/12/95 9/5/95 | B-SW ²¹ B-SW ²¹ none previous |
| Gilchrist Creek Lewiston, MI | Brown trout | 11/8/94 1/25/94 11/5/90 | C C C none previous |
| Gull Lake Richland, MI Wolf Lake State Fish Hatchery 616-668-2696 | Atlantic salmon | 11/16/93 11/17/92 11/12/91 11/13/90 11/13/89 11/18/88 | B-(BF,BK) ²² B-BF,(BK) ²² B-(BF,BK) ²² B-(BF,BK) ²² B-BF,(BK) ²² B-(BF,BK) ²² |
| Hunt Creek Lewiston, MI | Brown trout | 6/29/99 6/30/98 7/22/97 7/9/96 | A-2 A-2 C C none previous |
| Iron River Iron County, Crystal Falls | Brook trout | 9/6/94 | C none previous |
| Lake Superior Several locations | Coho salmon | 11/2/94 | B-BK none previous |
| Pere Marquette River Lake Michigan | Steelhead | 4/17/89 | B-BK ²³ none previous |
| Little Manistee River Lake Michigan | Steelhead feral yearlings | 3/17/99 | B-SW,(BK) ²⁴ none previous |
| Pigeon River Research Lakes Vanderbilt, MI | Brook trout | 11/7/79 11/8/78 3/7/77 | B-(BK) B-(BK,BF) B-BK,(BF) ²⁵ none previous |
| Pine River Luther, MI | Rainbow trout | 6/27/95 | C none previous |
| Thompson Creek Thompson, MI | Alaskan coho salmon | 10/30/75 10/14/74 10/18/73 | B-VP,BF,BK B-VP,BF,BK B-VP,BF,BK none previous |

Table 2.–continued.

| Station | Species/Stock | Date | Classification |
|--------------------------------|--|----------|-------------------------------------|
| Thompson Creek continued | New York coho salmon (Hinchenbrooke) | 11/10/98 | B-BK,BF |
| | | 11/4/97 | B-BK,BF |
| | | 10/22/96 | B-BK |
| | | | none previous |
| White River Cleveland Creek | Chinook salmon (Lake Michigan feral spawners) | 10/13/88 | B-BK ²⁶ none previous |

¹ VP was found in the parent stock of one lot of fish (Platte River coho).

² Eggs were received from a hatchery that was subsequently found to be BK+.

³ High losses in production lake trout in 1986-88 were presumed to be due to EEDV, a newly discovered virus.

⁴ Classified C because fish from wild, unclassified stocks were being reared in isolation at the hatchery.

⁵ Parenthetical BK,BF since transfers were made from Wolf Lake Fish Hatchery, B-BK(BF).

⁶ Although BF was not found in this inspection, it is known to be present in the fish stocks in the river which supplies water to the hatchery.

⁷ BK was not detected from inspection samples using FAT; however, it is in both the coho and chinook spawners. BF was not detected, but is known to be in the river water supply.

⁸ VP was detected in the coho spawners in October 1984.

⁹ Chinook spawners were positive for BK.

¹⁰ Parenthetical BF because fish were transferred from a B-(BF) facility.

¹¹ Continue to carry (BK) because parent stocks are positive carriers.

¹² Classified parenthetical BR because the enteric redmouth organism was detected by Canadian fish health officials in the Skamania steelhead spawners from Lake Michigan.

¹³ Parenthetical BK because BKD is present in the parent chinook stock. Parenthetical VP and BF because fish had been transferred from Mixsawbah SFH in Indiana, which is B-VP,(BF).

¹⁴ Parenthetical BF,BK as both pathogens are known to be in the river water supply.

¹⁵ Carried C classification for several years because fish and eggs were brought in from facilities or sources that weren't class A.

¹⁶ Station was abandoned due to presence of whirling disease (SW).

¹⁷ Chinook salmon spawners in the river simultaneously were also BF+.

¹⁸ BK was not detected from the inspection samples using FAT (fluorescent antibody technique) on kidney/spleen pools and individual ovarian fluids. However, BK was detected via FELISA (field enzyme-linked immunosorbant assay) in the ovarian fluid of some fish during egg take.

¹⁹ Virology only.

²⁰ Fish had been reared at a BF+ hatchery.

²¹ Not a complete inspection – no virology.

²² Since the stock is from the Wolf Lake State Fish Hatchery (B-BK,BF), it carries the parenthetical classification.

²³ Not a complete inspection.

²⁴ Parenthetical BK because BKD is present in the parent stock.

²⁵ Fish were inspected while at Oden Hatchery, which was classified B-BK,(BF).

²⁶ This was a BKD exam only.

References

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James C. Schneider, Reviewer

Paul W. Webb, Editor

Deborah L. MacConnell and Ellen S. Grove, Desktop Publishing

Approved by Paul W. Seelbach

Appendix 1.—Exerpts from GLFDCC report upon which current classification of disease agents is based (Hnath 1993).

GREAT LAKES FISH DISEASE CONTROL POLICY AND MODEL PROGRAM
Great Lakes Fishery Commission Special Publication 93-1:1-38 (Hnath, J.G. [Ed.], 1993)

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-1

The A-1 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-1 classification, but do not hasten its assignment.
3. To maintain A-1 status, hatcheries must assure that all fish (includes eggs—see Section 1 in the original document) have been obtained only from properly inspected Class A-1 or A-2 sources.

Class A-2

The A-2 classification differs from A-1 only when the hatchery has an open water supply (such as a stream or lake) with resident fish. The A-2 classification is also assigned to discrete spawning populations of free-ranging fish that have met all other Class A-1 inspection requirements.

Class B (Modified from the published document)

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-1 (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 confirmed, 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 will place any pathogens not currently detected in parentheses B-(BF), BK, VP and 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 when 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 (Modified from the published document)

Hatchery and free-ranging fish 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 if no pathogens have been found. If a pathogen is found, the classification becomes B.

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. If a listed pathogen is detected, the classification will immediately be changed to B with the pathogen acronym.