

MI/DEQ/WB-04/080

**MICHIGAN FISH CONTAMINANT MONITORING PROGRAM  
2003 Annual Report**

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## SECTION 1.0

### INTRODUCTION

The Michigan Department of Environmental Quality-Water Bureau (MDEQ-WB) has analyzed over 16,000 fish tissue samples collected since 1980. The MDEQ-WB conducts fish contaminant monitoring to address four goals. The first goal is to support the development of the Michigan Department of Community Health's (MDCH's) *Michigan Fish Advisory*. Edible-portion sample results are used by the MDCH to issue general and specific advisories against eating certain sport fish from Michigan's surface waters. The second goal is to support the regulation of commercial fisheries in the waters of the state. The Michigan Department of Agriculture (MDA) uses edible-portion monitoring results to regulate sales of the commercial catch. The third goal of the fish contaminant monitoring is to identify spatial differences and temporal trends in the quality of Michigan's surface waters. Temporal trends and spatial differences are examined by collecting whole-fish and caged-fish samples in addition to the edible-portion samples. Finally, the fourth goal is to evaluate whether existing pollution prevention, regulatory, and remedial programs are effectively reducing chemical contamination in the aquatic environment. To achieve this goal, fish tissue samples are used to identify waters that are attaining or not attaining the designated uses described in Michigan's Water Quality Standards (MWQS), identify sources of pollutants, and track the effectiveness of remedial actions. Fish contaminant analyses are limited to chemicals with high bioaccumulation potential in fish tissue. The presence of even extremely low concentrations of some bioaccumulative pollutants in surface water can result in fish tissue concentrations that pose a human or wildlife health risk.

Several state and federal agencies and tribal organizations assist with the MDEQ-WB's fish contaminant monitoring efforts by collecting or analyzing samples and data. These include the Michigan Department of Natural Resources (MDNR), the MDCH, the MDA, the United States Environmental Protection Agency (USEPA), the United States Fish and Wildlife Service (USFWS), the Grand Traverse Bay Band of Chippewa and Ottawa, and the Great Lakes Indian Fish and Wildlife Commission (GLIFWC). In addition, sample collection plans and analytical results are reviewed by Michigan's Fish and Wildlife Contaminant Advisory Committee (FAWCAC). The FAWCAC members include representatives from all Michigan agencies involved in fish and wildlife contaminant monitoring (MDEQ-WB, MDCH, MDA, and MDNR). The primary role of the FAWCAC is to coordinate fish and wildlife monitoring conducted by state agencies. Also, the FAWCAC reviews fish and wildlife consumption advisories proposed by state agencies in Michigan.

Fish contaminant data are presented annually in staff reports. The objectives of the Fish Contaminant Monitoring 2003 Annual Report are as follows:

1. Summarize the results of the available edible-portion fish tissue analyses, identify sites where modifications to the MDCH's *Michigan Fish Advisory* should be considered, identify waterbodies monitored in 2002 that are not meeting the designated use described in the MWQS, and identify contaminant trends where possible.
2. Summarize the results of whole-fish tissue analyses and identify any spatial or temporal contaminant trends.

3. Identify spatial or temporal trends that can be attributed to specific pollution control activities.

Prior to 1986, Michigan conducted fish contaminant studies on a demand basis primarily to address specific problems. In 1986, a comprehensive program was initiated to assess the degree of chemical contamination in fish from the surface waters of the state. Historical fish contaminant data are available in staff reports (MDNR, 1986a, 1986b, and 1989; Duling, 1988; Duling and Benzie, 1989 and 1990; Waggoner, 1991 and 1992; Wood, 1993 and 1994; Wood et. al., 1995; Day and Holden, 1996; Day, 1997, 1998, 1999, and 2002; and Day and Walsh, 2000 and 2001). In addition, inventories of fish contaminant monitoring locations sampled between 1980 and 2002 are provided in Appendices A, B, and C.

## SECTION 2.0

### METHODS

The Michigan Fish Contaminant Monitoring Program 2003 Annual Report includes the analytical results available by May 1, 2004, for samples collected prior to January 1, 2003, which were not presented in earlier annual reports. A list of waterbodies and species included in this annual report is provided in Appendix D. Raw data from these sites are included in Appendix E (available upon request).

A total of 1,702 fish were collected from inland lakes, rivers, and the Great Lakes and connecting channels during calendar year 2002. Many of these fish were combined into composite samples and a total of 714 samples were analyzed. The samples included 16 species collected from 79 locations. Approximately 68 percent (%) of the samples were processed as edible portions to support the development and review of fish consumption advisories. The remaining samples were collected to support the other goals of the Fish Contaminant Monitoring Program (FCMP).

#### **2.1 EDIBLE-PORTION AND WHOLE-FISH COLLECTION AND PROCESSING**

The MDNR-Fisheries Division and the MDEQ-WB collected the majority of the fish using standard fish sampling techniques determined appropriate for individual waterbodies. These techniques included electrofishing, trap nets, gill nets, and trawling. In addition, sport anglers, commercial anglers, volunteers, universities, private consultants, federal agencies, and tribal organizations collected samples for the program.

The MDEQ-WB processed fish in accordance with the Great Lakes and Environmental Assessment Section's (GLEAS's) Procedure 31 (available upon request). Each fish was measured (total length) and weighed. Fish were prepared as standard edible portions (Table 1) or whole fish. Each sample was individually wrapped in aluminum foil, placed in a plastic bag, appropriately labeled, and frozen until analyzed.

##### **2.1.1 Edible-Portion Monitoring**

In 2002, 486 fish were collected from 34 locations and processed as edible-portion samples. These samples included 16 species of fish. Sample locations are illustrated in Figure 1. Edible-portion sampling was often targeted toward sites of known or suspected contamination, sites popular with sport anglers, and sites with public access.

##### **2.1.2 Whole-Fish Trend Monitoring**

The MDEQ-WB coordinates the collection and analysis of whole fish from 26 locations as part of an effort to measure spatial and temporal trends in contaminant concentrations (Table 2 and Figure 2). Samples are collected from each site every 2 to 5 years. Consistent size ranges of larger adult fish of select species are targeted for collection and analyses. Species and locations were selected to complement and avoid duplication with the USEPA's Great Lakes whole-fish trend monitoring program.

A total of 107 fish tissue samples were collected from 10 trend sites in 2002 (Appendix E, available upon request). Largemouth bass were collected from Gull and Gun Lakes; carp were collected from the St. Clair, Muskegon, and St. Joseph Rivers, as well as Lake St. Clair and

Lake Erie at Brest Bay; lake trout were collected from Higgins Lake; and walleye were collected from Lake St. Clair, Lake Gogebic and Lake Michigan at Little Bay de Noc. All 26 trend sites have been sampled at least 3 times since 1990, except the Manistee, Manistique, and Menominee Rivers. Trend monitoring sites, collection dates, and species are listed in Appendix B.

Since 1990, whole lake trout, walleye, and largemouth bass were collected from 8 inland lake trend monitoring sites (Table 2). Gun and Gull Lakes were sampled 6 times; South Manistique Lake, Lake Gogebic, and Higgins Lake were sampled 5 times; Pontiac and Houghton Lakes were sampled 4 times; and Grand Sable Lake was sampled 3 times.

Whole carp were collected from 8 river trend monitoring sites since 1990 (Table 2). The Kalamazoo and Muskegon Rivers were monitored 6 times; the St. Joseph River was monitored 5 times; the Grand and Raisin Rivers were monitored 4 times; the Manistee River was monitored 2 times; and the Manistique and Menominee Rivers were monitored once.

Ten trend monitoring sites were established in the Great Lakes or connecting channels (Table 2). Carp were monitored at 9 locations, walleye were collected from 8 locations, and lake trout were collected from 3 locations since 1990.

## **2.2 CAGED-FISH BIOCONCENTRATION STUDIES**

The MDEQ-WB uses caged fish as a tool to identify sources of bioaccumulative contaminants and identify spatial trends in contaminant concentrations. Caged-fish studies are a particularly useful water quality monitoring tool because the test fish are exposed to the water column under relatively controlled conditions. Some contaminants accumulate in the test fish at levels that may be orders of magnitude above the concentrations in the ambient water. The relatively high concentrations in the test fish tissue are easier and cheaper to measure than the relatively low concentrations typically found in the ambient water.

The MDEQ-WB performed all caged-fish studies in accordance with GLEAS Procedure 62 (available upon request). The channel catfish used as test organisms in the experiments were purchased from a commercial fish farm. Control samples were obtained at the beginning of the test period by randomly selecting a subset of channel catfish and combining them into 4 composite samples of whole fish. The remaining channel catfish were held in stainless steel cages at the test sites for 28 days. The fish were removed from the cages and divided into 4 composite samples of whole fish. Each sample had a minimum total weight of 40 grams, and the number of fish per composite was determined by the size of the fish and the number surviving to the end of the 28-day test. Each composite sample was wrapped individually in aluminum foil, placed in a separate plastic bag, labeled, and frozen until analyzed.

Caged-fish studies were conducted in the Black (Van Buren Co.), Galien, Huron, Manistique, Muskegon and Raisin River Watersheds in 2002. Clean Michigan Initiative funds were used to fund analyses of caged fish tissue samples at a contract laboratory. Research Productivity Council (RPC) is conducting the analyses and the results were not available for inclusion in the 2003 Annual Report. These data will either be summarized in separate reports or in the 2004 Annual Report.

An inventory of all caged-fish bioconcentration studies conducted since 1987 is presented in Appendix C.

## 2.3 CHEMICAL ANALYSES

Fish tissue samples collected in 2002 were analyzed by several laboratories, including the MDCH-Health Risk Assessment Laboratory (HRAL), Triangle Laboratories, the University of Minnesota, and RPC. Each of these analytical laboratories has quality assurance programs and use peer-reviewed methods of digestion, extraction, and quantification.

The MDCH-HRAL analyzed the majority of the fish tissue samples collected in 2002. A total of 480 samples were submitted for analyses. Ten edible-portion samples were analyzed for mercury only. The remaining fish tissue samples were analyzed for mercury, percent lipids, 25 organic chemicals (Table 3), and polychlorinated biphenyl (PCB) congeners (Table 4). Analyses of 224 samples were completed by May 1, 2004, and are summarized in this report. The remaining samples will be summarized in the 2004 Annual Report.

Analyses of chlorinated dioxin and dibenzofuran congeners (Table 5) were performed on a subset of edible portion fish tissue samples. Triangle Laboratories analyzed dioxin and dibenzofuran congeners in 22 samples and the results are summarized in Section 3.1.

The RPC is analyzing mercury and organic contaminants in 140 caged fish tissue samples collected in 2002. In addition, Triangle Laboratories analyzed chlorinated dioxin and dibenzofuran congeners in 50 caged fish tissue samples collected in 2002. These analytical results were not available for inclusion in the 2003 Annual Report. The caged fish tissue samples will either be summarized in separate reports or in the 2004 Annual Report.

A total of 29 chinook salmon and 60 coho salmon were collected from 6 Lake Huron and Lake Michigan tributaries as part of a Great Lakes trend monitoring program implemented by state and federal agencies. The chinook salmon were combined into 6 edible-portion composite samples and the coho salmon were combined into 12 edible-portion composite samples. These samples were sent to the University of Minnesota for analyses. The results were not available for inclusion in this report.

Total mercury is referred to as "mercury" throughout the report. In addition, the MDCH trigger levels for mercury (Section 2.5) are based on total mercury concentrations.

Toxaphene is referred to as "apparent toxaphene" throughout the report. The MDCH-HRAL analytical method can identify a residue with chromatographic characteristics similar to toxaphene. However, the method cannot specifically identify the residue as the pesticide toxaphene.

Finally, the MDCH-HRAL does not report concentrations below the quantification level but above the detection level for mercury and the organic parameters listed in Table 3. As a result, concentrations of these parameters that are below the quantification level are coded with a "K" in Appendix E (available upon request). In these cases, the "K" coded concentrations represent the MDCH-HRAL's quantification levels. However, "K" codes assigned to dioxin, furan, and PCB congeners indicate that concentrations were below the detection level while "J" or "NQ" codes indicate that concentrations were above the detection level but did not meet all of the quantification requirements. In these cases, the "K" coded concentrations represent the laboratory detection level.

## 2.4 SUMMARY STATISTICS

The average and median contaminant concentrations were calculated for each species from each site (Appendix E, available upon request). In some cases, one or more samples from a particular site had contaminant concentrations that were less than the quantification level. In these cases, calculating the true average contaminant concentration was not possible. Therefore, average contaminant concentrations were calculated using half of the quantification level in place of the sample concentrations that were below the quantification level. The calculated average was then marked with a footnote to indicate that estimated values were used when quantitative concentrations were not available. If all of the concentrations were below the quantification level, then the mean was reported as half of the quantification level and the median was reported as less than the quantification level.

Total PCB concentration was estimated by summing the concentrations of PCB congeners. Individual congeners below the detection level were assigned a concentration equal to 0 for the purpose of calculating a total PCB concentration. Also, congener analyses that did not meet retention time criteria or were subject to analytical interference were assigned a concentration equal to 0 for the purpose of calculating a total PCB concentration. If the results of an individual congener analysis did not meet all of the quantification requirements, then the congener was assigned a concentration equal to the estimated quantification level for the purpose of calculating a total PCB concentration. If all of the congeners were below the detection level, then the total PCB concentration was reported as less than the detection level of the individual congeners.

Total chlordane concentration was estimated by summing the concentrations of 5 isomers: *alpha*-chlordane, *gamma*-chlordane, *cis*-nonachlor, *trans*-nonachlor, and oxychlordane. In some cases, individual isomers were below the quantification level. Individual isomers below the quantification level were assigned a concentration equal to 0 for the purpose of calculating a total chlordane concentration. If all 5 isomers were below the quantification level, then the total chlordane concentration was reported as less than the quantification level of the individual isomers.

Total dichlorodiphenyl trichloroethane (DDT) concentrations were calculated by summing concentrations of the para, para' and ortho, para' forms of the following chemicals: DDT dihydrochloride (DDE), and 1,1-bis(4-chlorophenyl)-2,2-dichloroethane (DDD). Individual chemicals below the quantification level were assigned a concentration equal to 0 for the purpose of calculating a total DDT concentration. If all 6 components were below the quantification level, then the total DDT concentration was reported as less than the lowest quantification level of the metabolites.

Total 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxic equivalents were calculated pursuant to the 1989 update of the "Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and Dibenzofurans" (USEPA, 1989). The concentrations of individual dioxin and dibenzofuran congeners in a fish sample were multiplied by toxic equivalency factors and the resulting products summed to calculate a 2,3,7,8-TCDD toxic equivalent (TEQ) concentration. Individual congener concentrations less than the detection level were assigned a value of 0 for the purpose of calculating the dioxin TEQ.

Calculated values presented in Appendix E (available upon request) were not rounded to significant figures. All calculated values are identified in Appendix E and additional information about the precision of the calculated values will be provided upon request.

## **2.5 FISH CONSUMPTION ADVISORY TRIGGER LEVELS**

The MDCH is responsible for establishing, modifying, or removing sport fish consumption advisories in Michigan. The MDCH uses fish consumption advisory “trigger levels” to assess the need for advisories (Table 6). These trigger levels have a variety of origins. The United States Food and Drug Administration (USFDA) developed most of the trigger levels for chlorinated organic chemicals. Dioxin TEQ and mercury trigger levels were developed by MDCH. Finally, the Great Lakes states and the USEPA developed the total PCB trigger levels used to establish advisories for women of childbearing age and children less than 15 years of age. The underlying risk assumptions used to develop each of these trigger levels are different and the criteria used to determine consumption advisories vary with the contaminant and segment of population covered by the advisory.

The fish consumption advisories are developed based on an evaluation of the relationship between contaminant concentrations and trigger levels across all size ranges of fish of a given species taken from specific locations. In a few cases, linear regression analyses are used to predict lengths at which the concentrations in fish species are likely to exceed trigger levels. However, contaminant concentrations and fish total length data do not often conform to the underlying assumptions of this statistical method. In some cases, the percentage of samples exceeding the trigger level is used to determine the appropriate advisory. However, in other cases, median concentrations are used to develop advisories.

The MDCH prefers a data set with a minimum of 10 samples before establishing or modifying fish consumption advisories. However, best professional judgment is applied when evaluating smaller data sets.

The MDCH trigger levels and procedures are described in further detail below:

### **2.5.1 Fish Consumption Advisory Trigger Levels for Most Chlorinated Organic Contaminants and Dioxin TEQ**

The MDCH issues fish consumption advisories based on either linear regression analyses or the percentage of samples that exceed the trigger levels presented in Table 6. The general population is advised to eat no more than 1 meal per week when concentrations in more than 10% of the samples from a particular species of fish of a given length range exceed the trigger level. A “no consumption” advisory is issued if concentrations in 50% or more of the fish sampled exceed the trigger level. In addition, the MDCH advises women and children against eating any fish when concentrations in more than 10% of a particular species of fish of a given length exceed the trigger level.

Either linear regression analyses or percentages were used to make recommendations to the MDCH regarding specific changes to the *Michigan Fish Advisory*. If the fish contaminant and total length data were suitable for linear regression analyses, then the results were presented in Section 3.1. However, in most cases the data were not suitable and the percentages of samples exceeding trigger levels were calculated and presented in Section 3.1.

### **2.5.2 Fish Consumption Advisory Trigger Levels for Total PCB**

The MDCH uses the USFDA’s 2.0 parts per million (ppm) trigger level for total PCB concentrations when developing advisories for the general population. The MDCH advises the

general population to eat no more than 1 meal per week when concentrations in more than 10% of the samples from a particular species of fish of a given length range exceed the trigger level. In addition, the MDCH advises the general population against eating any fish when concentrations in 50% or more of the samples exceed the trigger level.

Again, either linear regression analyses or percentages were used to make recommendations to the MDCH regarding specific changes to the *Michigan Fish Advisory*. If the fish contaminant and total length data were suitable for linear regression analyses, then the results were presented in Section 3.1. However, in most cases the data were not suitable and the percentages of samples exceeding trigger levels were calculated and presented in Section 3.1.

In 1998, the MDCH adopted a new advisory protocol for women of child bearing age and children less than 15 years old. The protocol includes 5 consumption advisory categories based on concentrations of total PCB. Fish species and size classes are placed into the consumption advisory categories based on linear regression analyses or median total PCB concentrations. Linear regression analyses or median concentrations are presented in Section 3.1.

### **2.5.3 Fish Consumption Advisory Trigger Levels for Mercury**

The MDCH uses 2 trigger levels to assess the need for fish consumption advisories based on mercury (Table 6). Mercury concentrations are plotted with respect to length. A “restrict consumption” advisory is issued for lengths above which the mercury concentrations exceed the 0.5 ppm trigger level. A “no consumption” advisory is issued for lengths above which the mercury concentrations exceed 1.5 ppm. Lines fitted to the data may be used to determine these lengths where the data conform to the underlying assumptions of linear regression. In other cases, median concentrations are used to place species and size classes into appropriate advisory categories. In either case, the results are presented in Section 3.1.

The MDCH advises the general population to eat no more than 1 meal per week of fish covered by a “restrict consumption” advisory. Women of child bearing age and children under age 15 are advised against eating more than 1 meal per month of fish covered by a “restrict consumption” trigger level.

Finally, the MDCH has issued a statewide advisory covering certain predator species from all inland lakes and reservoirs. According to the MDCH, no one should eat more than 1 meal per week of fish of the following species and sizes: rock bass, yellow perch, or crappies over 9 inches in length; and largemouth bass, smallmouth bass, walleye, northern pike, or muskellunge of any size. Also, the MDCH advises mothers who are breast feeding, pregnant women, women who intend to have children, and children under age 15 against eating more than 1 meal per month of these fish.

## SECTION 3.0

### RESULTS AND DISCUSSION

#### 3.1 EDIBLE-PORTION MONITORING

The Michigan Fish Contaminant Monitoring 2003 Annual Report includes the analytical results available by May 1, 2004, for edible-portion fish samples collected in 2002. Most of the edible portion samples were not available for inclusion in this report as a result of laboratory delays. However, a total of 117 edible-portion fish tissue samples are summarized in this report. The samples include 8 species from 7 locations. These locations are highlighted in bold on Figure 1.

##### 3.1.1 General Highlights

- Several chemicals analyzed were not quantified in any of the fish samples, including aldrin, lindane, heptachlor, heptachlorostyrene, hexachlorostyrene, pentachlorostyrene, and terphenyl. However, the breakdown products of aldrin (i.e., dieldrin) and heptachlor (i.e., heptachlor epoxide) were quantified in fish tissue samples from 5 of 6 locations in which they were analyzed (Table 7).
- Mercury, total PCBs, 4,4'-DDE, and dioxin TEQ were quantified in every sample in which they were analyzed (Table 7).
- Dioxin TEQ concentrations were quantified at both locations from which samples were analyzed for dioxin and dibenzofuran congeners (Table 7). However, the quantification levels for dioxin and dibenzofuran congeners are 3 to 4 orders of magnitude lower than the quantification levels for other organic contaminants (Tables 3 and 5). Therefore, dioxin and dibenzofuran congeners were quantified more frequently than many of the other organic contaminants.
- The maximum concentrations of chlorinated organic contaminants were often found in fish from the Great Lakes or locations with access to the Great Lakes (Table 7). Lake Superior lake trout had the highest concentrations of several organic contaminants. These fish were relatively large, had relatively high percentages of body fat, and thus readily accumulate the bioaccumulative organic chemicals present in the Great Lakes system.
- The highest mercury concentrations were found primarily in top predator species.
- Total PCB concentrations declined in fish from the Rouge River at Newburgh Lake following the removal of PCB contaminated sediments from the impoundment.

##### 3.1.2 Comparison to the MDCH Sport Fish Consumption Advisory Trigger Levels

Contaminant concentrations in edible-portion samples were compared to trigger levels to assist the MDCH with their annual review of the sport fish consumption advisories. Species and sites covered by existing advisories were highlighted when new concentration data did not exceed respective trigger levels. In addition, species and sites were identified when new concentration data exceeded trigger levels. Plots of contaminant concentration versus fish total length were

generated to assist with data analysis in cases where either contaminant concentrations exceeded trigger levels or the site and species are covered by an existing advisory.

In a few cases, linear regression analyses were used to determine the need for an advisory. However, the contaminant and length data did not often conform to the underlying assumptions of linear regression. In some cases, median concentrations were calculated and compared to trigger levels to determine the need for consumption advisories, while percentages of samples exceeding trigger levels were calculated in other cases. A more detailed discussion of the trigger levels and criteria used to develop advisory recommendations is presented in Section 2.5.

### 3.1.2.1 General Highlights of the Trigger Level Comparisons

General highlights of the trigger level comparisons are presented below followed by site-specific evaluations and recommendations:

- Apparent toxaphene, heptachlor+heptachlor epoxide, dieldrin, total DDT, and mirex trigger levels were not exceeded in any sample analyzed.
- Total PCB concentrations were greater than or equal to the women and children trigger level in 91 of 107 (85%) samples. Concentrations were greater than or equal to the women and children trigger levels in fish from 6 of 6 (100%) locations (Table 8). The 2003 MDCH *Fish Consumption Advisory* includes women and children advisories covering all 6 locations.
- Total PCB concentrations were greater than or equal to the general population trigger level in 6 of 107 (6%) samples. Concentrations were greater than or equal to the general population trigger level in fish from 3 of (50%) locations (Table 8). The 2003 MDCH *Fish Consumption Advisory* includes general population advisories covering all 3 locations.
- Total PCB concentrations declined dramatically in Newburgh Lake white sucker and northern pike following the removal of PCB contaminated sediments from the impoundment.
- Mercury concentrations were greater than or equal to the “restrict consumption” trigger levels in 4 of 117 (3%) samples from 2 of 7 locations (Table 9). Neither location is covered by an advisory due to mercury. None of the samples had mercury concentrations at or above the “no consumption” trigger level.
- None of the samples collected from the 3 inland lakes or reservoirs included in this report had mercury concentrations greater than the “restrict consumption” trigger level.
- Dioxin TEQ concentrations exceeded the trigger level in 3 of 22 (14%) samples. Concentrations exceeded the trigger level in fish from both locations (Table 10). The 2003 MDCH *Fish Consumption Advisory* includes an advisory based on dioxin covering 1 of 2 locations.
- Total chlordane concentrations exceeded the trigger level in 1 of 107 (2%) samples from 2 of 6 locations. The 2003 MDCH *Fish Consumption Advisory* includes an advisory based on chlordane covering 1 of 2 locations.

### 3.1.2.2 Lake Erie Watershed

#### **Lake Erie, Western Basin (ID# 2002045) *Channel Catfish***

Existing MDCH Advisory: No one should eat channel catfish from Lake Erie due to elevated concentrations of PCBs and dioxin.

Comparison to Trigger Levels: Ten channel catfish were collected from Lake Erie in 2002. Total PCB concentrations exceeded the general population trigger level in 5 of 10 (50%) fish (Table 8). Total PCB concentrations in 5 of 10 fish were in the women and children “6 meals per year” range and 5 fish exceeded the women and children “no consumption” trigger level. A total of 20 channel catfish were collected from Lake Erie since 1993 (Figure 3). Total PCB concentrations exceeded the general population trigger level in 9 of the 20 (45%) catfish. The median total PCB concentration in all 20 fish was 1.977 ppm.

Dioxin TEQ concentrations exceeded the trigger level in 1 of 10 (10%) channel catfish collected in 2002 (Table 10 and Figure 4).

Recommendations: No changes to the advisory are recommended. Additional Lake Erie channel catfish should be collected to review the need for the advisory based on dioxin.

#### **Rouge River, Middle Branch, Wayne County (ID# 2002084) *White Sucker***

Existing MDCH Advisory: Women and children should eat no more than 1 meal per month of Rouge River, Middle Branch white sucker less than 14 inches, and no more than 6 meals per year of white sucker greater than 14 inches due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten white sucker were collected from the Rouge River, Middle Branch at Inkster Road in 2002. The total PCB concentration in 1 fish was below women and children trigger levels, 7 fish were in the women and children “1 meal per week” range, and 2 fish were in the “1 meal per month” range (Table 8). A total of 31 white sucker were collected from the Middle Branch of the Rouge River since 1995 (Figure 5). The median total PCB concentration was 0.213 ppm in white sucker less than 14 inches, and 0.805 ppm in those greater than 14 inches.

Recommendations: No changes to the advisory are recommended. Additional fish should be collected from the Middle Branch of the Rouge River to review the need for changes to the advisory based on total PCBs.

#### **Rouge River, Newburgh Lake, Wayne County (ID# 2002085) *Carp, Channel Catfish, Northern Pike, and White Sucker***

Existing MDCH Advisory: Women and children should not eat more than 6 meals per year of Newburgh Lake carp of any size, and no more than 1 meal per month of channel catfish 12 inches or greater due to elevated concentration of PCBs. Northern pike are covered by the statewide mercury advisory. White sucker are not covered by an advisory.

Comparison to Trigger Levels: Ten carp were collected from the Rouge River at Newburgh Lake in 2002. The total PCB concentration in 1 fish was below women and children trigger

levels, 4 fish were in the women and children “1 meal per week” range, and 5 fish were in the “1 meal per month” range (Table 8). Twenty carp were collected from Newburgh Lake since 2001 (Figure 6). The total PCB concentration exceeded the general population trigger level in 1 of 20 (5%) fish. The median total PCB concentration in carp less than 18 inches was 0.075 ppm and 0.956 ppm in carp greater than 18 inches.

Nine channel catfish were collected from Newburgh Lake in 2002. The total PCB concentration in 2 fish was in the women and children “1 meal per week” range and 7 fish were in the “1 meal per month” range (Table 9). Nineteen channel catfish were collected since 2001 (Figure 7). The median total PCB concentration was 0.218 ppm in channel catfish less than 18 inches and 0.602 ppm in those greater than 18 inches.

Eight northern pike were collected from Newburgh Lake in 2002. Total PCB concentrations in 4 fish were in the women and children “1 meal per week” range and 4 were in the “1 meal per month” range (Table 8). Twenty-five northern pike were collected since 1988 (Figure 8). Total PCB concentrations were substantially lower in 2002. The median concentration was 0.215 ppm in the 8 northern pike collected in 2002 while the median concentration in the 17 fish collected prior to 2002 was approximately 11 times higher at 2.44 ppm.

Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 8 northern pike collected in 2002 (Table 9). Eighteen northern pike collected since 1993 were analyzed for mercury (Figure 9). The median mercury concentration was 0.27 ppm in all 18 fish.

Ten white sucker were collected from Newburgh Lake in 2002. Total PCB concentrations in 2 white sucker were below women and children trigger levels, 1 fish was in the women and children “1 meal per week” range, and 7 were in the “1 meal per month” range (Table 8). Twenty-five white sucker were collected from Newburgh Lake since 1988 (Figure 10). Total PCB concentrations were substantially lower in 2002. The median concentration was 0.256 ppm in the 10 white sucker collected in 2002 while the median concentration in the 15 fish collected prior to 2002 was approximately 25 times higher at 6.5 ppm.

Newburgh Lake and Evans Ditch (a tributary to the impoundment) contained sediments that were heavily contaminated with PCBs. The impoundment was drained and approximately 450,000 cubic yards of contaminated sediments were removed in 1999. The impoundment was refilled and restocked with largemouth bass, channel catfish, crappies, and bluegill.

Recommendations: The MDCH should consider relaxing the women and children advisory on carp from the Rouge River at Newburgh Lake to no more than 1 meal per week of carp less than 18 inches.

The MDCH should consider removing the mercury advisory on Newburgh Lake northern pike. Also, the MDCH should consider advising women and children to eat no more than 1 meal per month of northern pike from the Rouge River at Newburgh Lake due to elevated concentrations of PCBs.

The MDCH should consider advising women and children to eat no more than 1 meal per week of white sucker from Newburgh Lake due to elevated concentrations of PCBs.

Additional channel catfish should be collected from the Rouge River at Newburgh Lake to evaluate the need for revisions to the advisory based on total PCBs.

### 3.1.2.3 Lake Michigan Watershed

#### Lake Michigan, Green Bay (ID# 2003148, 2002054, and 2001066)

##### *Brown Trout*

Existing MDCH Advisory: No one should eat Green Bay brown trout greater than 18 inches due to elevated concentrations of PCBs. Women and children should not eat more than 6 meals per year of brown trout between 14 and 18 inches and no more than 1 meal per month of brown trout less than 14 inches. The general population should not eat more than 1 meal per week of brown trout less than 18 inches due to elevated concentrations of PCBs.

Comparison to Trigger Levels: A total of 12 brown trout were collected from Green Bay between 2001 and 2003. Total PCB concentrations in 4 brown trout were in the women and children “1 meal per month” range and 8 fish were in the “6 meals per year” range (Table 8). Twenty-four brown trout were collected since 1992 (Figure 11). Total PCB concentrations exceeded the general population trigger level in 5 of 24 (21%) fish and the median concentration was 1.19 ppm in all brown trout collected since 1992.

Mercury concentrations were below the MDCH “restrict consumption” trigger level in 11 of the 12 fish collected between 2001 and 2003. Mercury was analyzed in 24 brown trout collected since 1992 (Figure 12). The median concentration was 0.07 ppm in fish less than 18 inches, 0.165 ppm in fish between 18 and 26 inches, and 0.39 ppm in fish that were 26 inches or longer.

Dioxin TEQ concentrations exceeded the MDCH trigger level in 2 of 12 (17%) brown trout collected since 2001 (Table 10 and Figure 13).

Recommendations: The MDCH should consider relaxing the general population advisory on brown trout from Lake Michigan at Green Bay to no more than 1 meal per week.

Also, the MDCH should consider advising women and children against eating any brown trout from Lake Michigan at Green Bay due to elevated levels of dioxin.

#### **Kalamazoo River, Plainwell Reservoir (ID# 2001048), Otsego Dam (ID# 2001050), Trowbridge Dam (ID# 2001051 and 2003142), City of Allegan Dam (ID# 2001052), and Lake Allegan (ID# 2001053), Kalamazoo and Allegan Counties**

##### *Carp*

Existing MDCH Advisory: No one should eat carp from the Kalamazoo River between Morrow Dam and Allegan Dam due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Carp were collected from the Kalamazoo River between Morrow Dam and Allegan Dam. CDM collected these samples at the request of the MDEQ-RRD and the samples were analyzed for dioxin and lipids by Triangle Laboratories Inc. (TLI). These samples were collected as part of the MDEQ-RRD’s long-term monitoring plan for the Kalamazoo River superfund site.

A total of 21 carp were collected in 2001 and 2003. Ten fish were collected from 5 locations between Morrow Dam and Allegan Dam in 2001, and 11 carp were collected from above the Trowbridge Dam in 2003. Dioxin TEQ concentrations exceeded the general population trigger

level in 5 of 10 (50%) of the fish collected in 2001 (Table 10; Figure 14). None of the carp collected from the Trowbridge impoundment in 2003 had dioxin TEQ levels exceeding the trigger level.

Dioxin TEQ concentrations exceeded the trigger level in 1 of 14 (7%) carp between 18 and 26 inches and in 4 of 7 (57%) carp 26 inches or longer.

Recommendations: The MDCH should consider adding dioxin to the list of contaminants causing the no consumption advisory.

### **Muskegon Lake, Muskegon County (ID# 2002071)** ***Carp and Walleye***

Existing MDCH Advisory: Women and children should not eat Muskegon Lake carp greater than 26 inches and no more than 1 meal per month of carp less than 26 inches due to elevated concentrations of PCBs. The general population should not eat Muskegon Lake carp greater than 30 inches and eat no more than 1 meal per week of carp 26 to 30 inches due to elevated concentrations of PCBs. Also, women and children should not eat more than 6 meals per year of walleye greater than 22 inches and no more than 1 meal per month of walleye less than 22 inches due to elevated concentrations of PCBs and mercury. The general population should not eat more than 1 meal per week of walleye greater than 18 inches.

Comparison to Trigger Levels: Ten carp were collected from Muskegon Lake in 2002. Total PCB concentrations exceeded the general population trigger level in 2 of 10 (20%) carp (Table 8). Concentrations in 2 of the 10 carp were in the women and children “1 meal per week” range, 5 were in the “1 meal per month” range, 1 was in the “6 meals per year” range, and 2 fish exceeded the “no consumption” trigger level (Table 8). A total of 15 carp were collected since 1993 (Figure 15). Total PCB concentrations exceeded general population trigger level in both fish greater than 30 inches and in 1 of 13 (8%) carp less than 30 inches. The median concentration in carp less than 30 inches was 0.54 ppm and 8.054 in those greater than 30 inches.

The total chlordane concentration in 1 of 10 (10%) carp collected in 2002 exceeded the MDCH trigger level (Table 11). Total chlordane was analyzed in 15 carp collected since 1993 (Figure 16). The total chlordane concentration exceeded the MDCH trigger level in 1 of 2 (50%) carp greater than 30 inches. Concentrations were below the trigger level in all 13 carp less than 30 inches.

Seven walleye were collected from Muskegon Lake in 2002. Total PCB concentrations in 2 fish were in the women and children “1 meal per week” range and 5 fish were in the “1 meal per month” range (Table 8). Twenty-eight walleye were collected since 1987 (Figure 17). The median total PCB concentration was 0.45 ppm in walleye less than 22 inches and 0.753 ppm in those greater than 22 inches.

Mercury concentrations in all 7 walleye collected in 2002 were below the MDCH “restrict consumption” trigger level (Table 8). Mercury was analyzed in 28 walleye collected since 1987 (Figure 18). The median mercury concentration was 0.26 ppm in walleye less than 22 inches and 0.50 ppm in those greater than 22 inches.

Recommendations: The MDCH should consider relaxing the women and children advisory on Muskegon Lake carp less than 30 inches to no more than 1 meal per month. Also, the MDCH

should consider adding total chlordane to the list of contaminants causing the Muskegon Lake carp advisory.

The MDCH should consider relaxing the women and children advisory on all sizes of Muskegon Lake walleye to no more than 1 meal per month. Also, the MDCH should consider removing the general population advisory on Muskegon Lake walleye less than 22 inches.

Additional Muskegon Lake walleye greater than 22 inches should be collected to assess the need for an advisory due to mercury.

**Portage Creek, Bryant Mill Pond, Kalamazoo County (ID# 2002108)**  
***Carp***

Existing MDCH Advisory: Women and children should not eat more than one meal per month of carp from Portage Creek at Bryant Mill Pond.

Comparison to Trigger Levels: Carp were collected from Portage Creek at the Bryant Mill Pond. Camp, Dresser & McKee (CDM) collected these samples at the request of the MDEQ Remediation and Redevelopment Division (RRD) and the samples were analyzed by NEA. These samples were collected as part of the MDEQ-RRD's long-term monitoring plan for the Kalamazoo River superfund site and analyzed for PCB Aroclors and lipids only.

Eleven carp were collected from Bryant Mill Pond in 2002. All the carp had detectable levels of PCB but none of the fish exceeded the general population trigger level for the contaminant (Table 8). Concentrations in 7 carp were in the women and children "1 meal per week" range and concentrations in 4 fish were in the "1 meal per month" range. A total of 43 carp were collected from Bryant Mill Pond since 1987 (Figure 19). The median total PCB concentration was 1.38 ppm in the 10 fish collected in 1987 and 0.22 ppm in the 33 carp collected since 1999. This reduction follows the removal of approximately 100,000 cubic yards of PCB contaminated sediments from Bryant Mill Pond in 1998.

Recommendations: No changes to the advisory are recommended.

**3.1.2.4 Lake Superior Watershed**

**Lake Superior, Marquette County (ID# 2002060)**  
***Lake Trout and Lake Whitefish***

Existing MDCH Advisory: Women and children should not eat Lake Superior lake trout greater than 18 inches, and no more than 1 meal per week of lake trout is less than 18 inches due to elevated concentrations of PCBs and chlordane. The general population should not eat Lake Superior lake trout greater than 30 inches and no more than 1 meal per week of lake trout between 18 and 30 inches due to elevated concentrations of PCBs and chlordane. Also, women and children should not eat more than 1 meal per week of Lake Superior lake whitefish due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten lake trout were collected from Lake Superior in 2002. Total PCB concentrations exceeded the general population trigger level in 1 of 10 (10%) lake trout. Concentrations in 3 fish were in the women and children "1 meal per week" range, 6 fish were in the "1 meal per month" range, and 1 fish was in the "no consumption" range (Table 8). A total of 126 lake trout were collected since 1987 and PCB concentrations appear to have declined

(Figure 20). Total PCB concentrations were below the general population trigger level in all 27 lake trout less than 30 inches collected since 1996. Concentrations exceeded the general population trigger level in 1 of 3 (33%) lake trout greater than 30 inches collected since 1996. The median concentration was 0.129 ppm in lake trout less than 26 inches, 0.441 in 26 to 30 inch fish, and 0.67 ppm in fish greater than 30 inches collected since 1996.

The mercury concentrations in 3 of 10 lake trout collected in 2002 exceeded the MDCH “restrict consumption” trigger level (Table 9). Mercury was analyzed in 126 lake trout collected since 1987 (Figure 21). The median mercury concentration in lake trout less than 30 inches was 0.18 ppm and 0.66 ppm in fish greater than 30 inches.

The total chlordane concentration in 1 of 10 (10%) lake trout collected in 2002 exceeded the MDCH trigger level (Table 11). Total chlordane was analyzed in 126 lake trout collected since 1987 and concentrations appear to have declined (Figure 22). Total chlordane concentrations were below the MDCH trigger level in all 27 lake trout less than 30 inches collected since 1996. Concentrations exceeded the general population trigger level in 1 of 3 (33%) lake trout greater than 30 inches collected since 1996.

Eleven lake whitefish were collected from Lake Superior in 2002. The total PCB concentrations in 7 of 11 fish were below the women and children trigger levels and 4 of 11 fish were in the women and children “1 meal per week” range (Table 8). Fifty-eight lake whitefish were collected since 1992 and concentrations appear to have declined (Figure 23). The median total PCB concentration was 0.046 ppm in 26 Lake Superior lake whitefish collected since 2000.

Recommendations: The MDCH should consider relaxing the women and children advisory on Lake Superior lake trout to no more than 1 meal per week of lake trout less than 26 inches and no more than 1 meal per month of lake trout between 26 and 30 inches. Also, the MDCH should consider removing the general population advisory on lake trout less than 30 inches and relaxing the general population advisory on lake trout greater than 30 inches to no more than 1 meal per week.

The MDCH should consider adding mercury to the list of contaminants causing the Lake Superior lake trout advisory.

The MDCH should consider removing the advisory on Lake Superior lake whitefish less than 22 inches. Additional lake whitefish greater than 22 inches should be collected to assess the need for an advisory on larger fish.

### **Lake Gogebic, Gogebic/Ontonagon County (ID# 2002046)** **Walleye**

Existing MDCH Advisory: Lake Gogebic walleye are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten Lake Gogebic walleye were collected in 2002 and analyzed for mercury only. Concentrations in all 10 walleye were below the MDCH “restrict consumption” trigger level (Table 8). Linear regression analysis indicates that walleye less than 26 inches will likely have mercury concentrations less than the “restrict consumption” trigger level (Figure 24). Only one fish greater than 18 inches was collected, however.

Lake Gogebic rock bass were collected in 2003 and those results will be summarized in the 2004 annual report.

Recommendations: The MDCH should consider removing the advisory on Lake Gogebic walleye less than 18 inches.

### **3.1.3 Summary of Recommendations**

The MDCH should consider relaxing fish consumption advisories at 5 sites and adding or expanding advisories at 4 sites. Also, additional monitoring is recommended at 4 waterbodies.

#### **3.1.3.1 Summary of Recommendations for Relaxed Advisories**

- The MDCH should consider relaxing the women and children advisory on carp from the Rouge River at Newburgh Lake to no more than 1 meal per week of carp less than 18 inches.
- The MDCH should consider removing the mercury advisory on Newburgh Lake northern pike.
- The MDCH should consider relaxing the general population advisory on brown trout from Lake Michigan at Green Bay to no more than 1 meal per week.
- The MDCH should consider relaxing the women and children advisory on Muskegon Lake carp less than 30 inches to no more than 1 meal per month.
- The MDCH should consider relaxing the women and children advisory on all sizes of Muskegon Lake walleye to no more than 1 meal per month. Also, the MDCH should consider removing the general population advisory on Muskegon Lake walleye less than 22 inches.
- The MDCH should consider relaxing the women and children advisory on Lake Superior lake trout to no more than 1 meal per week of lake trout less than 26 inches and no more than 1 meal per month of lake trout between 26 and 30 inches. Also, the MDCH should consider removing the general population advisory on lake trout less than 30 inches and relaxing the general population advisory on lake trout greater than 30 inches to no more than 1 meal per week.
- The MDCH should consider removing the advisory on Lake Superior lake whitefish.
- The MDCH should consider removing the advisory on Lake Gogebic walleye less than 26 inches.

#### **3.1.3.2 Summary of Recommendations for Expanded Advisories**

- The MDCH should consider advising women and children to eat no more than 1 meal per month of northern pike from the Rouge River at Newburgh Lake due to elevated concentrations of PCBs.

- The MDCH should consider advising women and children to eat no more than 1 meal per week of white sucker from Newburgh Lake due to elevated concentrations of PCBs.
- The MDCH should consider advising women and children against eating any brown trout from Lake Michigan at Green Bay due to elevated levels of dioxin.
- The MDCH should consider adding total chlordane to the list of contaminants causing the Muskegon Lake carp advisory.
- The MDCH should consider adding mercury to the list of contaminants causing the Lake Superior lake trout advisory.

### **3.1.3.3 Summary of Recommendations for Additional Monitoring**

Additional monitoring should be considered at the following sites:

- Additional Lake Erie channel catfish should be collected to review the need for the advisory based on dioxin.
- Additional fish should be collected from the Middle Branch of the Rouge River to review the need for changes to the advisory based on total PCBs.
- Additional channel catfish should be collected from the Rouge River at Newburgh Lake to evaluate the need for revisions to the advisory based on total PCBs.
- Additional Muskegon Lake walleye greater than 22 inches should be collected to assess the need for mercury advisories.

## **3.2 CAGED-FISH BIOCONCENTRATION STUDIES**

Caged-fish bioconcentration monitoring was conducted at 39 locations in 6 watersheds in 2002. The analytical results were not available for inclusion in the 2003 annual report. These data will either be summarized in separate reports or in the 2004 annual report.

## **3.3 TREND MONITORING**

Several agencies in the Great Lakes basin are monitoring fish contaminant trends. Michigan's fish contaminant trend monitoring effort was initiated in 1990 to identify temporal trends and spatial differences in contaminant levels in whole fish from the Great Lakes and connecting channels, inland lakes, and rivers. Also, the USEPA collects and analyzes whole lake trout or walleye from the open waters of each of the Great Lakes. Finally, the Great Lakes states and the USEPA work cooperatively to collect and analyze coho and chinook salmon from select Great Lakes tributaries during the fall spawning migration. The coho and chinook salmon are analyzed as composites of skin-on fillets.

Highlights of the 3 trend monitoring programs are presented below:

### **3.3.1 USEPA- Great Lakes Whole-Fish Trend Monitoring**

The USEPA-Great Lakes National Program Office collects and analyzes whole lake trout or walleye from the Great Lakes. Samples continue to be collected and contaminant data have been released as they become available. Contaminant data are now available for whole lake trout from Lakes Michigan (1970-2000), Superior (1977-2000), Huron (1978-2000), and Ontario (1986-2000) (DeVault et al., 1996; USEPA unpublished data). Also, contaminant concentrations in whole Lake Erie walleye are available from samples collected between 1986 and 2000 (DeVault et al., 1996; USEPA unpublished data).

General conclusions are presented below:

- The USEPA's lake trout data for Lakes Superior, Michigan, Huron, and Ontario indicate that total PCB and total DDT concentrations in all four lakes declined between the 1970's and 2000 (Figures 25 and 26). Also, Lake Michigan lake trout had higher levels of total PCB and total DDT than lake trout from the other Great Lakes.
- Total PCB and total DDT concentrations in Lake Superior lake trout showed no consistent trend between the late 1980's and 2000. Total PCB and total DDT concentrations in lake trout from Lakes Huron, Michigan and Ontario continued to decline between 1986 and 2000 but at a slower rate than the declines observed between 1974 and 1986.
- Total chlordane concentrations declined at a fairly steady rate in lake trout from Lakes Huron and Ontario between 1986 and 2000 (Figure 27). Total chlordane levels in Lake Superior lake trout remained fairly constant from 1986 to 1995 but increased between 1997 and 2000. Lake trout from Lake Michigan exhibited a slow decline in total chlordane concentrations from 1986 to 2000.
- Apparent toxaphene concentrations declined between 1986 and 1998 in lake trout from each of the 4 Great Lakes monitored (Figure 28). The increases seen in the 2000 samples are due at least in part to a change in lab reporting methods (D. Swackhamer, pers. comm.).
- Contaminant concentrations in Lake Superior lake trout were lower than concentrations in lake trout from the other Great Lakes with the exception of apparent toxaphene. The relatively high apparent toxaphene concentrations in Lake Superior lake trout compared to Lake Ontario lake trout may be a result of local sources or variability in lake overflow rates, productivity, climate, and the relative efficiencies of internal removal processes (Eisenreich, 1996).
- Average total DDT and total PCB concentrations in Lake Erie walleye declined since 1977 while no trend in total chlordane concentrations is apparent between 1986 and 2000 (Figure 29).

### **3.3.2 Federal-State Chinook and Coho Salmon Fillet Trend Monitoring**

Chinook and coho salmon fillets were collected and analyzed as part of a cooperative program administered by state and federal agencies. Samples were collected by state agencies and analyzed by federal contract laboratories. Although samples continue to be collected, recent results were not available for inclusion in this report.

The average total PCB, total DDT, and total chlordane concentrations in coho and chinook salmon fillet samples collected in Michigan's portion of Lake Michigan between 1983 and 1998 are presented in Figure 30. Average total chlordane, total PCB, and total DDT concentrations increased in Lake Michigan coho salmon until the mid-1990's and then began to decrease. Average total DDT, total PCB, and total chlordane concentrations decreased in Lake Michigan chinook salmon between 1983 and 1997.

The average total PCB, total DDT, and total chlordane concentrations in coho and chinook salmon fillet samples collected in Michigan's portion of Lake Huron between 1983 and 1998 are presented in Figure 31. Average total PCB and total DDT concentrations decreased in both coho and chinook salmon between 1983 and 1998. Also, total chlordane concentrations decreased in Lake Huron chinook salmon between 1991 and 1998.

However, conclusions regarding changes in average contaminant concentrations over time may be influenced by changes in the size of the fish over time. Contaminant concentrations in chinook and coho salmon collected during spawning runs are dependent on the length of the fish and the salmon collected in recent years were smaller than salmon collected during the 1980's and early 1990's (Day and Walsh, 2000).

### **3.3.3 Michigan's Whole-Fish Trend Monitoring**

Trends analyses were conducted on a total of 32 data sets collected as part of Michigan's whole-fish trend monitoring program. These data sets included species and sites for which data were available from a minimum of three sampling events (Table 2). These include carp from 5 inland rivers; lake trout, walleye or largemouth bass from 8 inland lakes; and 19 carp, walleye or lake trout data sets from 10 Great Lake or connecting channel stations. A significant increase or decrease in at least one selected contaminant was detected in 29 of 32 data sets.

Often strong relationships exist between lipids and organic contaminant concentrations and length and contaminant concentrations. Therefore, multiple linear regression analyses were used to evaluate relationships between the natural log of contaminant concentrations and these potential explanatory variables. Natural log transformed contaminant concentrations (wet weight) were used to fit the data into exponential decay rate models and obtain estimates of annual rates of change. The trend model for each subset of data was developed using an iterative process. The initial multiple linear regression model included length and collection date as explanatory variables for mercury concentrations. The model for organic contaminant concentrations used length, lipids and collection date as explanatory variables. A final multiple linear regression model was developed for each subset by successively eliminating variables that did not have a statistically significant relationship ( $p < 0.05$ ) to contaminant concentration.

Minimum detectable trends were calculated in cases where the regression model failed to detect a significant trend in contaminant concentrations. The statistical significance of slope (or trend) in a linear regression model is calculated using a t-test. The minimum detectable trend can be calculated by rearranging the t-test, establishing a desired significance level ( $p = 0.05$ ), and obtaining the standard error of the slope from the regression analyses (Exponent, 2003). The minimum detectable trend is the smallest possible trend that could have been detected with the available data for each contaminant, species and site. For example, a minimum detectable trend of  $\pm 2.6\%$  per year in Houghton Lake largemouth bass mercury concentrations (Table 12) indicates that no mercury trend was detected and the data were sufficient to detect a trend with an absolute value greater than  $2.6\%$  per year. Therefore, the absolute value of the real trend (if any) was  $2.6\%$  per year or less.

Statistically significant changes in mercury concentrations were detected in 14 of 32 data sets (Figure 32 and Table 12). Where trends could be detected, concentrations tended to increase in fish from the Great Lakes or connecting channels and decrease in fish from inland lakes and rivers. Mercury concentrations declined in fish from 7 of 9 inland lakes or inland rivers. The average and median rates of change in fish from the 9 inland lakes or inland rivers was -2.4% per year and -2.3% per year, respectively. Significant trends were found in 1 species at each of 5 sites monitored in the Great Lakes and connecting channels. Mercury concentrations increased in 4 of the 5 datasets in which significant trends were detected. The average and median rates of change in these 5 data sets were +3.0% per year and +5.8% per year, respectively. Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-0.8% per year to +/- 8.6% per year.

Statistically significant changes in total PCB concentrations were detected in 15 of 32 data sets (Figure 33 and Table 12). Total PCB concentrations decreased in 14 of the 15 data sets where changes were statistically significant. Where trends could be detected, concentrations tended to decrease faster in fish from inland lakes and rivers compared to fish from the Great Lakes and connecting channels. Total PCB concentrations declined in fish from 8 of 9 inland lakes or inland rivers. The average and median rates of change in fish from all 9 sites were -9.8% per year and -10.7% per year, respectively. Concentrations declined in at least 1 species of fish from 5 sites in the Great Lakes or connecting channels. The average and median rates of change in these data sets were -6.0% per year and -5.4% per year, respectively. Minimum detectable PCB trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-2.2% per year to +/-21.0% per year.

Changes in total DDT concentrations were detected in 24 of 32 data sets (Figure 34 and Table 12). Total DDT concentrations decreased in 22 of the 24 data sets where changes were statistically significant. Where trends could be detected, concentrations tended to decrease faster in fish from inland lakes and rivers compared to fish from the Great Lakes and connecting channels. Concentrations declined in fish from 8 of 9 inland lakes or inland rivers. The average and median rates of change in fish from all 9 sites were -7.6% per year and -7.9% per year, respectively. Concentrations changed in 15 data sets collected from 10 locations in the Great Lakes and connecting channels. The average and median rates of change in fish from these sites were -6.1% per year and -6.6% per year, respectively. Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-3.1% per year to +/-20.0% per year.

Changes in total chlordane concentrations were observed in 20 of 30 data sets (Figure 35 and Table 12). Total chlordane concentrations decreased in all 20 data sets where changes were statistically significant. Where trends could be detected, concentrations tended to decrease faster in fish from inland lakes and rivers compared to fish from the Great Lakes and connecting channels. Total chlordane concentrations declined in fish from 6 inland lakes or inland rivers. The average and median rates of change in fish from these 6 sites were -10.6% per year and -9.8% per year, respectively. Concentrations of total chlordane changed in 14 data sets collected from 9 locations in the Great Lakes and connecting channels. The average and median rates of change in fish from these sites were -8.9% per year and -9.4% per year, respectively. Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/- 3.9% per year to +/- 22.5% per year.

Changes in Dioxin TEQ concentrations were measured in fish from 1 of 4 sites (Table 12). Concentrations declined 5.4% per year in Thunder Bay lake trout. The minimum detectable trend ranged from +/-6.4% per year to +/-7.6% per year in the remaining 3 data sets.

Mercury and total DDT concentrations increased in Saginaw Bay walleye collected between 1990 and 1998. While mercury concentrations increased at other sites, total DDT concentrations did not increase at any other Great Lake or connecting channel site. It is unlikely that loads of DDT to Saginaw Bay are increasing without a corresponding increase to other Great Lake or connecting channel sites. The increases in total DDT concentrations in Saginaw Bay walleye may have been due to other factors such as changes in the food web rather than changes in loads of these contaminants to the Bay. Similar situations were observed in Grand River carp and Grand Sable Lake lake trout. Mercury and total DDT increased in the Grand River carp while mercury and total PCBs increased in the Grand Sable Lake lake trout. Increases in multiple contaminants in fish from these sites may have been due to factors other than increased contaminant loads.

The minimum detectable trends in all data sets ranged from +/-0.8% per year to +/-22.5% per year. Approximately 13% of the minimum detectable trends were greater than +/-10% per year and over half were less than +/-5% per year (Table 12). Therefore, Michigan's whole fish contaminant trend monitoring program was sufficient to either detect statistically significant trends or estimate minimum detectable trends of less than +/-5% per year in 73% of the trends analyses conducted. The program was sufficient to either detect statistically significant trends or estimate minimum detectable trends of less than +/-10% per year in 94% of the trends analyses conducted.

In addition, the following general conclusions can be made:

- Lindane, terphenyl, PBB, heptachlor, and aldrin were not quantified in any of the fish sampled. However, heptachlor epoxide, and dieldrin (breakdown products of heptachlor and aldrin) were quantified in most of the samples analyzed.
- In addition to heptachlor epoxide and dieldrin, several chemicals were quantified in fish consistently, indicating that they are ubiquitous in the aquatic environment. These include mercury, HCB, total PCB, total chlordane, and total DDT.
- Apparent toxaphene was found primarily in walleye and lake trout from the Great Lakes and connecting channels. However, lake trout collected from Higgins Lake in 1991 (Site 91001) had quantifiable levels of apparent toxaphene while samples collected in 1995, 1998, and 2001 had concentrations below the quantification level. The highest concentrations of apparent toxaphene were quantified in lake trout from Lake Superior. The relatively high concentration in Lake Superior lake trout is consistent with the results reported by DeVault (1996) and discussed in Section 3.3.1.
- Largemouth bass and walleye from inland lakes tended to have the highest concentration of mercury. Fish from inland lakes tended to have higher concentrations of mercury than the same species from the Great Lakes or connecting channels.
- All species from the Great Lakes and connecting channels tended to have higher concentrations of chlorinated organic contaminants than the same species from inland lakes.

- Average total PCB concentrations were highest in carp from the Kalamazoo River site. The Kalamazoo River has a known total PCB contamination problem that is being addressed under state and federal programs.
- Carp and walleye from the St. Marys River had lower concentrations of organic contaminants than carp from Lake St. Clair and Detroit Rivers. Carp and walleye from the St. Marys River had higher concentrations of mercury than carp and walleye from Lake St. Clair and the Detroit River.

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## SECTION 4.0

### REFERENCES

- Day, R. 2002. Michigan Fish Contaminant Monitoring Program: 2002 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQD-03/084.
- Day, R. 2000. Mercury concentrations in fish collected from the Carp River, Deer Lake, Nawakwa Lake and Greenwood Reservoir, Michigan in 1999. MDEQ-SWQD Report #MI/DEQ/SWQD-00/46.
- Day, R. 1999. Michigan Fish Contaminant Monitoring Program: 1999 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQD-99/164.
- Day, R. 1998. Michigan Fish Contaminant Monitoring Program: 1998 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-98/091.
- Day, R. 1997. Michigan Fish Contaminant Monitoring Program: 1997 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-97/125.
- Day, R. and S. Holden. 1996. Michigan Fish Contaminant Monitoring Program: 1996 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-96/112.
- Day, R. and S. Walsh. 2001. Michigan Fish Contaminant Monitoring: 2001 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-02/035.
- Day, R. and S. Walsh. 2000. Michigan Fish Contaminant Monitoring Program: 2000 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-00/122.
- DeVault, D.S., R. Hesselberg, P.W. Rodgers, T.J. Feist. 1996. Contaminant Trends in Lake Trout and Walleye from the Laurentian Great Lakes. J. Grt. Lks. Res. 22(4):884-895.
- Duling, L. 1988. Fish Contaminant Monitoring Program - 1988 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-88/090.
- Duling, L. and S. Benzie. 1990. Fish Contaminant Monitoring Program - 1990 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-90/077.
- Duling, L. and S. Benzie. 1989. Fish Contaminant Monitoring Program - 1989 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-89/168.
- Earth Tech. 2002. Focused Feasibility Study, Deer Lake Impoundment, Ishpeming, Michigan. Prepared for MDEQ-SWQD.
- Exponent. 2003. Fish Contaminant Monitoring Program: Review and Recommendations. Prepared for MDEQ-WD.
- Eisenreich, S.J. 1996. Toxaphene in the Great Lakes: Concentrations, Trends and Pathways. Proceedings of a March 27-29, 1996 Workshop. 23 pp.

Michigan Department of Natural Resources (MDNR). 1989. Fish Contaminant Monitoring in Michigan - 1984. MDNR-SWQD Report #MI/DNR/SWQ-89/071.

Michigan Department of Natural Resources (MDNR). 1986a. Fish Contaminant Monitoring Program - 1986 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-91/294.

Michigan Department of Natural Resources (MDNR). 1986b. Fish Contaminant Monitoring in Michigan - 1985. MDNR-SWQD Report #MI/DNR/SWQ-87/055.

United States Environmental Protection Agency. 1989. Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and Dibenzofurans (CDDs and CDFs) and 1989 Update. EPA/625/3-89/016.

Waggoner, C.A. 1992. Michigan Fish Contaminant Monitoring Program: 1992 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-92/292.

Waggoner, C.A. 1991. Michigan Fish Contaminant Monitoring Program 1991 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-91/273.

Wood, C.A. 1994. Michigan Fish Contaminant Monitoring Program: 1994 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-94/074.

Wood, C.A. 1993. Michigan Fish Contaminant Monitoring Program: 1993 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-93/059.

Wood, C.A., R. Day, and S. Holden. 1995. Michigan Fish Contaminant Monitoring Program: 1995 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-95/087.

Table 1. Standard edible portions of Michigan's sport and commercial fishes.

Standard Edible Portion	Common Name	Scientific Name	
Skin-on	Yellow Perch	<i>Perca flavescens</i>	
	Walleye	<i>Sander vitreus</i>	
	Sauger	<i>Sander canadensis</i>	
	Largemouth Bass	<i>Micropterus salmonids</i>	
	Smallmouth Bass	<i>Micropterus dolomieu</i>	
	Bluegill	<i>Lepomis macrochirus</i>	
	Pumpkinseed	<i>Lepomis gibbosus</i>	
	Rock Bass	<i>Ambloplites rupestris</i>	
	Fillet	White Bass	<i>Morone chrysops</i>
		Black Crappie	<i>Pomoxis nigromaculatus</i>
		White Crappie	<i>Pomoxis annularis</i>
		Green Sunfish	<i>Lepomis cyanellus</i>
		Longear Sunfish	<i>Lepomis peltastes</i>
		Warmouth	<i>Lepomis gulosus</i>
Sucker Family		Catostomidae	
Lake Whitefish		<i>Coregonus clupeaformis</i>	
Lake Trout (lean & ciscowet)		<i>Salvelinus namaycush</i>	
Rainbow Trout (Steelhead)		<i>Oncorhynchus mykiss</i>	
Brown Trout	<i>Salmo trutta</i>		
Brook Trout	<i>Salvelinus fontinalis</i>		
Splake	<i>Salvelinus fontinalis</i> X <i>Salvelinus namaycush</i>		
Atlantic Salmon	<i>Salmo salar</i>		
Coho Salmon	<i>Oncorhynchus kisutch</i>		
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>		
Pink Salmon	<i>Oncorhynchus gorbuscha</i>		
Skin-off	Black Bullhead	<i>Ameiurus melas</i>	
	Brown Bullhead	<i>Ameiurus nebulosus</i>	
	Yellow Bullhead	<i>Ameiurus natalis</i>	
	Channel Catfish	<i>Ictalurus punctatus</i>	
	Muskellunge	<i>Esox masquinongy</i>	
	Northern Pike	<i>Esox lucius</i>	
	Round Whitefish (Menominee)	<i>Prosopium cylindraceum</i>	
	Lake Herring	<i>Coregonus artedii</i>	
	Chubs	<i>Coregonus</i> sp	
	Carp	<i>Cyprinus carpio</i>	
Fillet	Freshwater Drum (Sheepshead)	<i>Aplodinotus grunniens</i>	
	Buffalo	<i>Ictiobus cyprinellus</i>	
	Burbot	<i>Lota lota</i>	
	Quillback	<i>Carpiodes cyprinus</i>	
Skin-off Steak	Sturgeon	<i>Acipenser fulvescens</i>	
Headless, Guttled	Rainbow Smelt	<i>Osmerus mordax</i>	

Table 2. Whole-fish trend monitoring locations, target species and years monitored.

WATERBODY	SPECIES COLLECTED*	YEARS MONITORED
<b>GREAT LAKES AND CONNECTING CHANNELS</b>		
Lake Michigan		
Little Bay de Noc	Carp	1992, 94, 00
	Walleye	1992, 94, 97, 00, 02
Grand Traverse Bay	Carp	1993, 95, 00
	Lake Trout (P/D)	1990, 92, 95, 98, 01
Lake Huron		
Saginaw Bay	Carp (P/D)	1990, 92, 94, 98, 01
	Walleye	1990, 91, 92, 94, 98
Thunder Bay	Carp	1992, 94, 95, 99, 01
	Lake Trout (P/D)	1992, 94, 95, 98, 01
	Walleye	1991, 95, 98, 01
Lake Superior		
Keweenaw Bay	Lake Trout (P/D)	1991, 93, 96, 99, 01
Lake St. Clair		
L'Anse Creuse Bay	Carp (P)	1990, 92, 94, 98, 02
	Walleye	1990, 92, 94, 98, 02
Lake Erie		
Brest Bay	Carp (P)	1990, 92, 94, 97, 98, 02
	Walleye	1990, 92, 94, 98
St. Marys River		
Munuscong Bay	Carp (P)	1993, 95, 98
	Walleye	1991, 93, 95, 98, 01
St. Clair River		
Algonac	Carp (P)	1992, 94, 02
	Walleye	1992
Detroit River		
Grassy Island	Carp (P)	1990, 92, 94, 96, 98, 01
	Walleye	1990, 94, 96, 98, 01
<b>INLAND RIVERS</b>		
Grand River	Carp	1990, 92, 95, 00
Kalamazoo River	Carp (P)	1990, 92, 94, 97, 99, 01
Manistee River	Carp	1992, 94
Manistique River	Redhorse Sucker	1993
Menominee River	Carp (D)	1991
	Redhorse Sucker	1994
Muskegon River	Carp	1991, 93, 95, 97, 00, 02
River Raisin	Carp (P)	1991, 94, 97, 00
St. Joseph River	Carp (P)	1991, 93, 97, 00, 02
<b>INLAND LAKES</b>		
Grand Sable Lake	Lake Trout (P)	1991, 93, 95
Lake Gogebic	Walleye	1992, 94, 97, 00, 02
South Manistique Lake	Walleye	1991, 93, 95, 98, 01
Higgins Lake	Lake Trout (P)	1991, 95, 97, 00, 02
Houghton Lake	Largemouth Bass	1992, 94, 98, 01
Gull Lake	Largemouth Bass	1991, 93, 95, 97, 00, 02
Gun Lake	Largemouth Bass	1990, 92, 94, 97, 00, 02
Pontiac Lake	Largemouth Bass	1992, 94, 97, 99

\* Designations in parenthesis indicate chemicals analyzed in addition to standard analyte list: P = PCB congeners, D = dioxin and furan congeners.

Table 3. Chlorinated organic chemicals and mercury quantified in fish tissue samples.

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<u>Standard Analyses</u>	<u>Level of Quantification</u>
Hexachlorobenzene	0.001 ppm
<i>gamma</i> -BHC (Lindane)	0.001 ppm
Aldrin	0.001 ppm
Dieldrin	0.001 ppm
4,4'-DDE	0.001 ppm
4,4'-DDD	0.001 ppm
4,4'-DDT	0.001 ppm
2,4'-DDD	0.001 ppm
2,4'-DDT	0.001 ppm
Heptachlor Epoxide	0.001 ppm
Mercury	0.010 ppm
Oxychlorane	0.001 ppm
<i>gamma</i> -Chlordane	0.001 ppm
<i>trans</i> -Nonachlor	0.001 ppm
<i>alpha</i> -Chlordane	0.001 ppm
<i>cis</i> -Nonachlor	0.001 ppm
Octachlorostyrene	0.001 ppm
Hexachlorostyrene	0.001 ppm
Heptachlorostyrene	0.001 ppm
Pentachlorostyrene	0.001 ppm
Heptachlor	0.001 ppm
Terphenyl	0.250 ppm
Toxaphene	0.050 ppm
Mirex	0.001 ppm
PBB (FF-1, BP-6)	0.001 ppm

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Table 4. Polychlorinated biphenyl (PCB) structure and corresponding identification number of congeners quantified in fish tissue samples.

BZ#	Structure	BZ#	Structure
	TRICHLOROBIPHENYLS		HEXACHLOROBIPHENYLS
17	2,2',4	128	2,2',3,3',4,4'
18	2,2',5	130	2,2',3,3',4,5'
22	2,3,4'	132	2,2',3,3',4,6'
25	2,3',4	135	2,2',3,3',5,6'
26	2,3',5	136	2,2',3,3',6,6'
28	2,4,4'	137	2,2',3,4,4',5
31	2,4',5	138	2,2',3,4,4',5'
32	2,4',6	141	2,2',3,4,5,5'
33	2',3,4	144	2,2',3,4,5',6
37	3,4,4'	146	2,2',3,4',5,5'
	TETRACHLOROBIPHENYLS	149	2,2',3,4',5',6
40	2,2',3,3'	151	2,2',3,5,5',6
42	2,2',3,4'	153	2,2',4,4',5,5'
44	2,2',3,5'	156	2,3,3',4,4',5
45	2,2',3,6	157	2,3,3',4,4',5'
47	2,2',4,4'	158	2,3,3',4,4',6
49	2,2',4,5'	163	2,3,3',4',5,6
52	2,2',5,5'	167	2,3',4,4',5,5'
56	2,3,3',4'		HEPTACHLOROBIPHENYLS
60	2,3,4,4'	170	2,2',3,3',4,4',5
63	2,3',4',5	171	2,2',3,3',4,4',6
64	2,3,4',6	172	2,2',3,3',4,5,5'
66	2,3',4,4'	174	2,2',3,3',4,5,6'
70	2,3',4',5	175	2,2',3,3',4,5',6
71	2,3',4',6	177	2,2',3,3',4',5,6
74	2,4,4',5	178	2,2',3,3',5,5',6
77	3,3',4,4'	179	2,2',3,3',5,6,6'
	PENTACHLOROBIPHENYLS	180	2,2',3,4,4',5,5'
82	2,2',3,3',4	182	2,2',3,4,4',5,6'
84	2,2',3,3',6	183	2,2',3,4,4',5',6
87	2,2',3,4,5'	185	2,2',3,4,5,5',6
90	2,2',3,4',5	187	2,2',3,4',5,5',6
91	2,2',3,4',6	190	2,3,3',4,4',5,6
92	2,2',3,5,5'	193	2,3,3',4',5,5',6
95	2,2',3,5',6		OCTACHLOROBIPHENYLS
97	2,2',3',4,5	194	2,2',3,3',4,4',5,5'
99	2,2',4,4',5	195	2,2',3,3',4,4',5,6
100	2,2',4,4',6	196	2,2',3,3',4,4',5,6'
101	2,2',4,5,5'	198	2,2',3,3',4,5,5',6
105	2,3,3',4,4'	199	2,2',3,3',4,5,6,6'
110	2,3,3',4',6	201	2,2',3,3',4,5,5',6'
118	2,3',4,4',5	203	2,2',3,4,4',5,5',6
126	3,3',4,4',5	205	2,3,3',4,4',5,5',6
			NONACHLOROBIPHENYLS
		206	2,2',3,3',4,4',5,5',6

BZ# = identification numbers adopted by the International Union of Pure and Applied Chemists (IUPAC).

Table 5. Chlorinated dibenzo-p-dioxin (CDD) and chlorinated dibenzofuran (CDF) congeners quantified in fish tissue samples.

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<u>CDD</u>	<u>Level of Quantification</u>
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1.0 ppt
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PCDD)	1.0 ppt
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	1.0 ppt
1,2,3,6,7,8-HxCDD	1.0 ppt
1,2,3,7,8,9-HxCDD	1.0 ppt
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	1.0 ppt
1,2,3,4,5,6,7,8,9,-Hexachlorodibenzo-p-dioxin (OCDD)	1.0 ppt
<u>CDF</u>	
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.0 ppt
1,2,3,7,8-Pentachlorodibenzofuran (PCDF)	1.0 ppt
2,3,4,7,8-PCDF	1.0 ppt
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.0 ppt
1,2,3,6,7,8-HxCDF	1.0 ppt
1,2,3,7,8,9-HxCDF	1.0 ppt
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.0 ppt
1,2,3,4,7,8,9-HpCDF	1.0 ppt
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	1.0 ppt

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Table 6. Trigger levels used by the Michigan Department of Community Health (MDCH) to establish sport fish consumption advisories.

Chemical	MDCH Trigger Level
Total Chlordane	0.3 ppm (= mg/kg)
Total DDT	5.0 ppm
Dieldrin	0.3 ppm
Dioxin Toxic Equivalent <sup>#</sup>	10.0 ppt (= ng/kg)
Heptachlor (+Heptachlor Epoxide)	0.3 ppm
Mercury	
Restrict Consumption	0.5 ppm
No Consumption	1.5 ppm
Mirex	0.1 ppm
Total PCB	
General Population	2.0 ppm
Women of Child Bearing Age and Children Under 15 Years	
One Meal Per Week	0.05 ppm
One Meal Per Month	0.2 ppm
Six Meals Per Year	1.0 ppm
No Consumption	1.9 ppm
Toxaphene	5.0 ppm

<sup>#</sup> The MDCH advisory trigger level for dioxin applies to total 2,3,7,8-TCDD toxic equivalent concentrations.

Table 7. Summary of chemicals quantified in edible-portion fish tissue samples.

Chemical*	# of Sites Monitored	# of Sites Quantified	Concentration Range (ppm)	Location and Species with Maximum Concentration
a-Chlordane	6	6	0.001K – 0.072	Muskegon Lake - Carp
g-Chlordane	6	6	0.001K – 0.041	Muskegon Lake - Carp
cis-Nonachlor	6	6	0.001K – 0.19	Lake Superior - Lake Trout
trans-Nonachlor	6	6	0.001K – 0.233	Lake Superior - Lake Trout
Oxychlordane	6	6	0.001K – 0.073	Lake Superior - Lake Trout
Total Chlordane	6	6	0.001K – 0.535	Lake Superior - Lake Trout
4,4'-DDD	6	6	0.001K – 0.269	Muskegon Lake - Carp
4,4'-DDE	6	6	0.012 – 3.008	Muskegon Lake - Carp
4,4'-DDT	6	6	0.001K – 0.095	Newburgh Lake - Channel Catfish
2,4'-DDT	6	4	0.001K – 0.027	Muskegon Lake - Carp
2,4'-DDD	6	5	0.001K – 0.026	Newburgh Lake - Channel Catfish
Total DDT	6	6	0.012 – 3.327	Muskegon Lake - Carp
Mirex	6	2	0.001K – 0.027	Lake Superior - Lake Trout
Dieldrin	6	5	0.001K – 0.031	Lake Superior - Lake Trout
Heptachlor Epoxide	6	5	0.001K – 0.013	Lake Superior - Lake Whitefish
Hexachlorobenzene	6	6	0.001K – 0.007	Lake Superior - Lake Trout
Mercury	7	7	0.02 – 0.90	Lake Superior - Lake Trout
Octachlorostyrene	6	4	0.001K – 0.010	Lake Erie - Channel Catfish
PBB	6	1	0.001K – 0.002	Lake Michigan - Brown Trout
Total PCB	6	6	0.024 – 8.054	Muskegon Lake - Carp
Apparent Toxaphene	6	4	0.050K – 0.466J	Muskegon Lake - Carp
Dioxin TEQ	2	2	3.47 – 14.15 ppt	Lake Erie - Channel Catfish

K = Unquantified at the level shown.

J = Estimated value, value may not be precise.

\* Aldrin, Lindane, Heptachlor, Heptachlorostyrene, Hexachlorostyrene, Pentachlorostyrene, and Terphenyl were not quantified at any of the sites monitored.

Table 8. Edible-portion fish tissue samples with total PCB concentrations exceeding the Michigan Department of Community Health's (MDCH) sport fish consumption advisory trigger levels.

				Number of Fish in Each Consumption Advisory Category*				General Population Trigger Level	Current Advisory
				Women and Children Consumption Advisory Categories					
Visit ID	Location	Species	Median Conc. ppm	One meal/week 0.05-0.2 ppm	One meal/month 0.2-1.0 ppm	Six meals/year 1.0-1.9 ppm	No Cons. > 1.9 ppm	2.0 ppm	
2002045	Lake Erie, Western Basin	Channel Catfish	1.702			5/10	5/10	5/10	Yes
2001066	Lake Michigan, Green Bay	Brown Trout	0.919		2/4	2/4			Yes
2002054	Lake Michigan, Green Bay	Brown Trout	0.909		2/4	2/4			Yes
2003148	Lake Michigan, Green Bay	Brown Trout	1.161			4/4			Yes
2002060	Lake Superior, Marquette County	Lake Trout Whitefish	0.441 0.047	3/10 4/11	6/10		1/10	1/10	Yes Yes
2002071	Muskegon Lake Muskegon County	Carp Walleye	0.545 0.329	2/10 2/7	5/10 5/7	1/10	2/10	2/10	Yes Yes
2002108	Portage Creek, Bryant Mill Pond Kalamazoo County	Carp	0.22	7/11	4/11				Yes
2002084	Rouge River, Middle Branch	White Sucker	0.098	7/10	2/10				Yes
2002085	Rouge River, Newburgh Lake	Carp Channel Catfish Northern Pike White Sucker	0.190 0.357 0.201 0.256	4/10 2/9 4/8 1/10	5/10 7/9 4/8 7/10				Yes Yes Yes No

\* Number of samples exceeding trigger level/number of samples analyzed.

# Covered by the statewide mercury advisory or an advisory based on contaminants other than total PCBs.

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Table 9. Edible-portion fish tissue samples with mercury concentrations exceeding the Michigan Department of Community Health's (MDCH) sport fish consumption advisory trigger level.

Visit ID	Location	Species	Species Median Concentration (ppm)	Range (ppm)	Exceedance* Rate	Current Advisory
2002046	Lake Gogebic Gogebic and Ontonagon Counties	Walleye	0.195	0.14 – 0.48	0/10	Yes (a)
2002060	Lake Superior	Lake Trout	0.375	0.18 – 0.9	3/10	Yes #
2002071	Muskegon Lake Muskegon County	Walleye	0.27	0.22 – 0.45	0/7	Yes (a)
2002085	Rouge River Newburgh Lake	Northern Pike	0.21	0.19 – 0.27	0/10	Yes (a)
2001066	Lake Michigan Green Bay	Brown Trout	0.160	0.11 – 0.17	0/4	Yes#
2002054	Lake Michigan Green Bay	Brown Trout	0.235	0.20 – 0.43	0/4	Yes#
2003148	Lake Michigan Green Bay	Brown Trout	0.310	0.20 – 0.54	1/4	Yes#

\* Number of samples exceeding trigger levels/number of samples analyzed.  
a The species and waterbody are covered by the statewide mercury advisory.  
# Covered by an advisory based on contaminants other than mercury.

Table 10. Dioxin TEQ concentrations in edible portion samples.

Visit ID	Location	Species	Species Median Concentration (ppt)	Range (ppt)	Exceedance* Rate	Current Advisory
2001048 2001050 2001051 2001052 2001053	Kalamazoo River Lake Allegan upstream to Morrow Dam	Carp	7.82	1.20 – 30.89	5/10	Yes#
2003142	Trowbridge Imp.	Carp	2.52	0.43 – 7.82	0/11	Yes#
2002045	Lake Erie Western Basin	Channel Catfish	6.38	3.47 – 14.15	1/10	Yes
2001066	Lake Michigan Green Bay	Brown Trout	5.26	4.93 – 11.94	1/4	Yes#
2002054	Lake Michigan Green Bay	Brown Trout	5.20	3.67 – 12.13	1/4	Yes#
2003148	Lake Michigan Green Bay	Brown Trout	4.98	3.80 – 6.75	0/4	Yes#

\* Number of samples exceeding trigger level/number of samples analyzed.

# Advisory based on contaminants other than dioxin.

Table 11. Edible portion fish tissue samples with total chlordane concentrations exceeding the Michigan Department of Community Health's (MDCH) sport fish consumption advisory trigger level.

Visit ID	Location	Species	Species Median Concentration (ppt)	Range (ppt)	Exceedance* Rate	Current Advisory
2002060	Lake Superior	Lake Trout	0.099	0.044 – 0.535	1/10	Yes
2002071	Muskegon Lake Muskegon County	Carp	0.026	0.008 – 0.304	1/10	Yes#

\* Number of samples exceeding trigger level/number of samples analyzed.

# Advisory based on contaminants other than chlordane.

Table 12. Annual rates of change in contaminant concentrations measured in whole fish collected from fixed station trend monitoring sites.

WATERBODY	SPECIES	RATE OF CHANGE (%) AND PROBABILITY (p)									
		Mercury		Total PCB		Total DDT		Total Chlordane		Dioxin TEQ	
		%	p	%	p	%	p	%	p	%	p
<b>GREAT LAKES AND CONNECTING CHANNELS</b>											
<b>Lake Michigan</b>											
Little Bay de Noc	Carp	*+/-7.5		+/-9.2		-14.3	<0.001	-11.7	<0.01		
	Walleye	3.3	<0.05	-4.9	<0.05	-7.0	<0.01	-10.1	<0.001		
Grand Traverse Bay	Carp	+/-4.3		+/-10.8		+/-9.1		+/-9.4			
	Lake Trout	7.6	<0.001	+/-2.2		-5.1	<0.05	-4.6	<0.01	+/-6.4	
<b>Lake Huron</b>											
Saginaw Bay	Carp	+/-3.8		-7.3	<0.01	-6.9	<0.05	-7.3	<0.01	+/-6.9	
	Walleye	5.8	<0.05	+/-4.5		7.3	<0.01	+/-5.4			
Thunder Bay	Carp	+/-6.2		+/-5.4		+/-4.8		-10.2	<0.001		
	Lake Trout	+/-3.3		-5.5	<0.05	-4.8	<0.01	-9.8	<0.001	-5.4	<0.05
	Walleye	+/-3.3		-5.3	<0.05	-6.6	<0.01	-7.5	<0.001		
<b>Lake Superior</b>											
Keweenaw Bay	Lake Trout	+/-2.5		-4.4	<0.01	-9.8	<0.001	-8.5	<0.001	+/-7.6	
<b>Lake Erie</b>											
Brest Bay	Carp	7.4	<0.01	+/-5.1		+/-4.3		-6.0	<0.001		
	Walleye	+/-6.0		+/-6.9		-6.6	<0.05	-9.9	<0.01		
<b>Lake St. Clair</b>											
L'Anse Creuse Bay	Carp	+/-3.7		+/-5.6		-5.7	<0.05	-7.2	<0.001		
	Walleye	+/-0.8		-8.4	<0.001	-12.0	<0.001	-12.5	<0.001		
<b>St. Clair River</b>											
Algonac	Carp	+/-8.6		+/-21.0		-12.1	<0.10	+/-17.1			
<b>Detroit River</b>											
Grassy Island	Carp	-8.9	<0.001	+/-4.8		-3.7	<0.05	+/-4.7			
	Walleye	+/-2.5		+/-3.0		-3.9	<0.05	-8.9	<0.001		
<b>St. Marys River</b>											
Munuscong Bay	Carp	+/-4.5		+/-14.9		+/-20.0		+/-22.5			
	Walleye	+/-3.1		+/-4.1		-8.1	<0.05	-10.0	<0.001		
	Average**	3.0		-6.0		-6.1		-8.9			
	Median**	5.8		-5.4		-6.6		-9.4			

\*+/- indicates that no significant trend was measured (p>0.05) and the value presented is an estimate of the minimum detectable trend.

\*\*Average and median concentrations were calculated using only Great Lakes and Connecting Channels and species with significant trends.

Table 12. Continued

WATERBODY	SPECIES	RATE OF CHANGE (%) AND PROBABILITY (p)									
		Mercury		Total PCB		Total DDT		Total Chlordane		Dioxin TEQ	
		%	p	%	p	%	p	%	p	%	p
<b>INLAND RIVERS</b>											
Grand River	Carp	4.1	<0.05	+/-4.1		10.5	<0.001	+/-5.7			
Kalamazoo River	Carp	-2.3	<0.05	-16.2	<0.001	-12.6	<0.001	-11.0	<0.001		
Muskegon River	Carp	-5.8	<0.005	-23.6	<0.001	-16.3	<0.001	-18.5	<0.001		
River Raisin	Carp	+/-2.8		+/-7.4		+/-5.2		+/-3.9			
St. Joseph River	Carp	-1.8	<0.10	-5.7	<0.01	-7.9	<0.005	+/-4.7			
<b>INLAND LAKES</b>											
Grand Sable Lake	Lake Trout	7.6	<0.01	9.1	<0.001	+/-4.3		-8.6	<0.05		
Lake Gogebic	Walleye	-8.7	<0.001	-19.0	<0.001	-6.2	<0.001	#NA			
South Manistique Lake	Walleye	-4.7	<0.001	+/-3.6		+/-3.1		NA			
Higgins Lake	Lake Trout	-2.1	<0.10	-10.7	<0.001	-14.7	<0.001	-7.4	<0.005		
Houghton Lake	Largemouth Bass	+/-2.6		-11.0	<0.001	-7.8	<0.001	+/-5.6			
Gull Lake	Largemouth Bass	+/-1.2		-6.4	<0.001	-9.1	<0.001	-12.8	<0.001		
Gun Lake	Largemouth Bass	+/-1.7		-4.6	<0.05	-4.6	<0.05	-5.3	<0.05		
Pontiac Lake	Largemouth Bass	-8.1	<0.001	+/-5.1		+/-8.8		+/-21.9			
	Average**	-2.4		-9.8		-7.6		-10.6			
	Median**	-2.3		-10.7		-7.9		-9.8			

\*+/- indicates that no significant trend was measured ( $p>0.05$ ) and the value presented is an estimate of the minimum detectable trend.

\*\*Average and median concentrations were calculated using only inland rivers and lakes and species with significant trends.

#Trend estimates were not available because contaminant concentrations were below the analytical detection level.

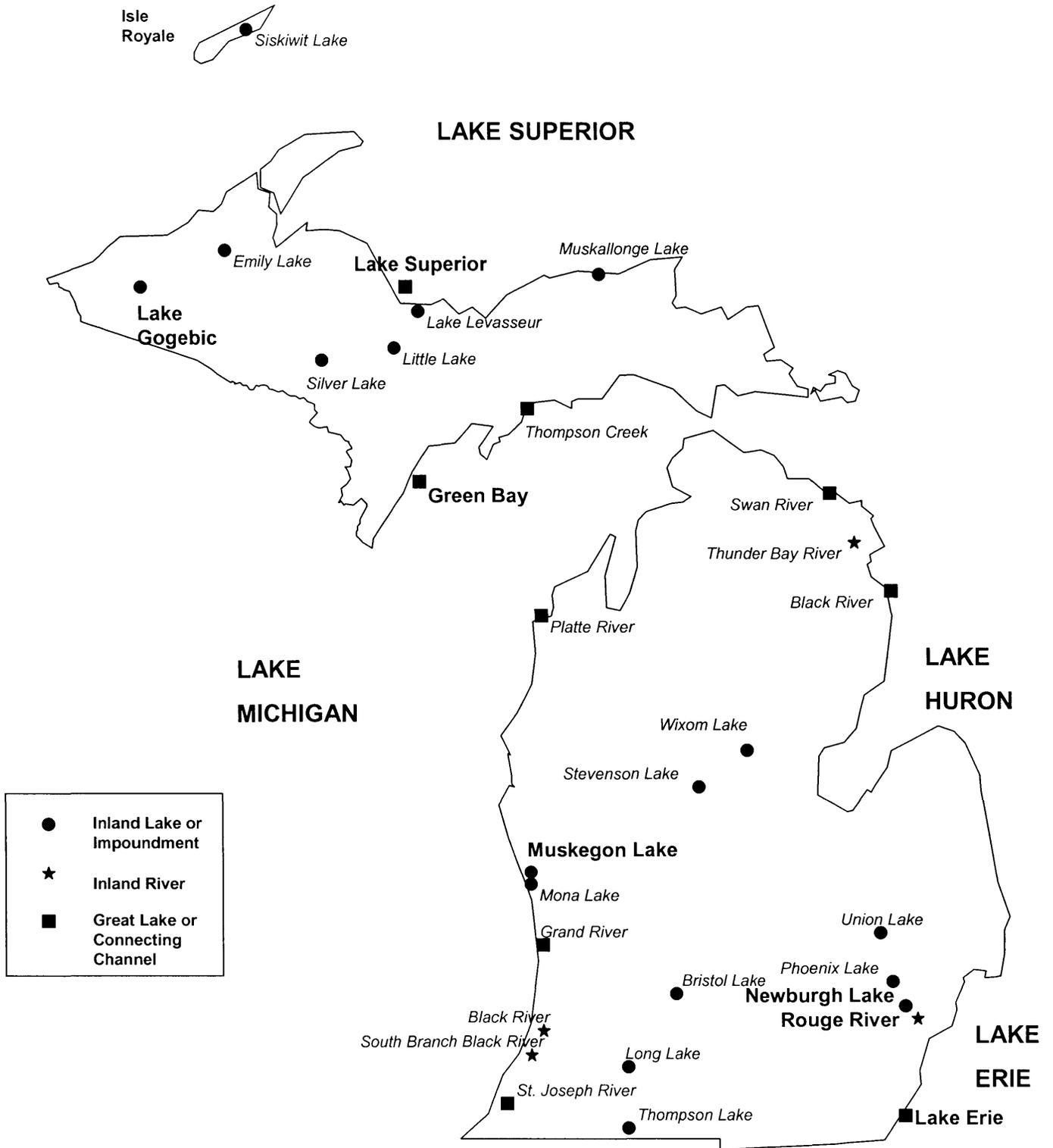


Figure 1. 2002 edible portion fish sample locations. Analytical results from the 7 sites labeled in bold letters are summarized in the 2003 annual report. Data from the remaining sites will be summarized in future reports.

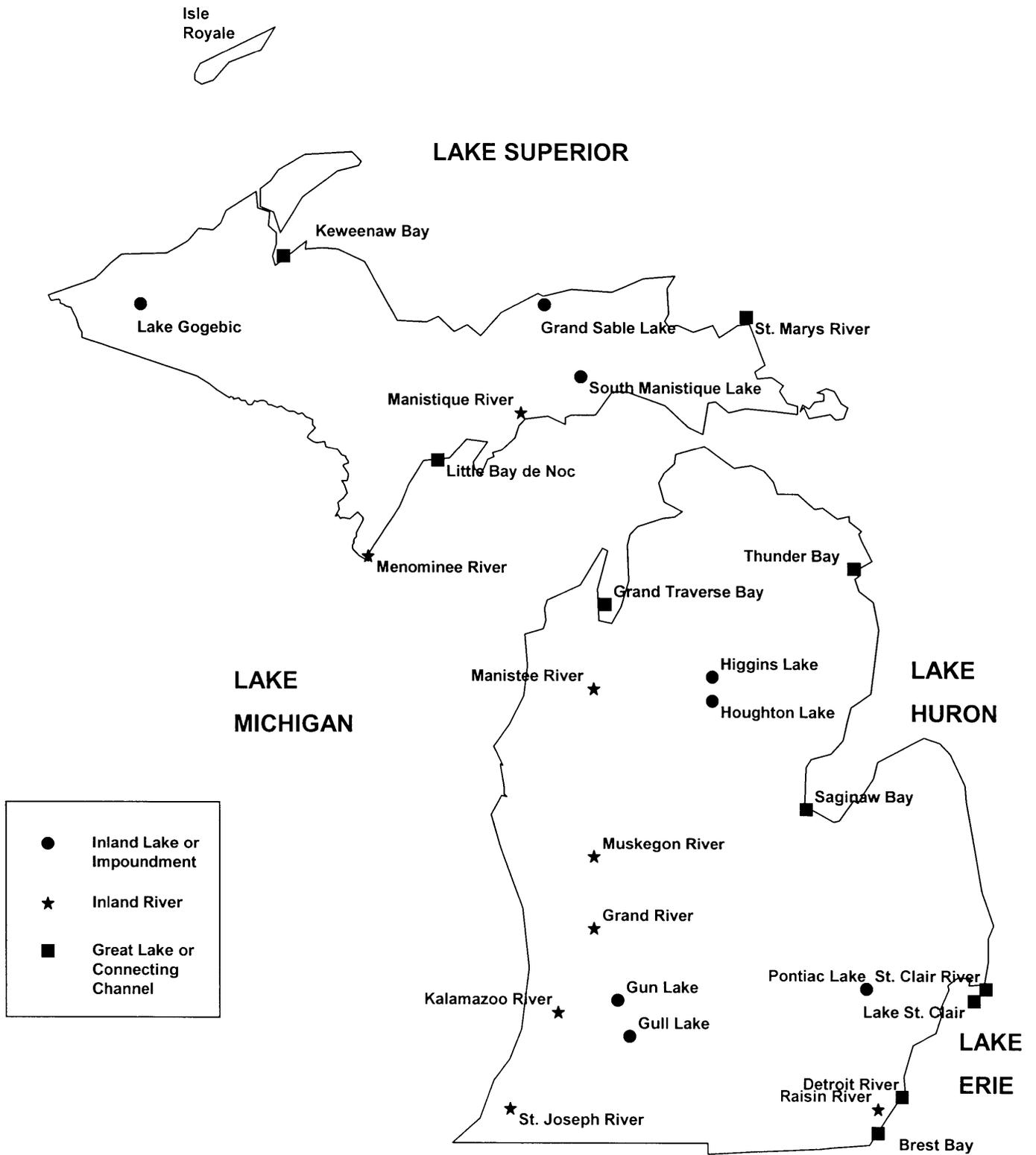


Figure 2. Whole-fish trend monitoring sites.

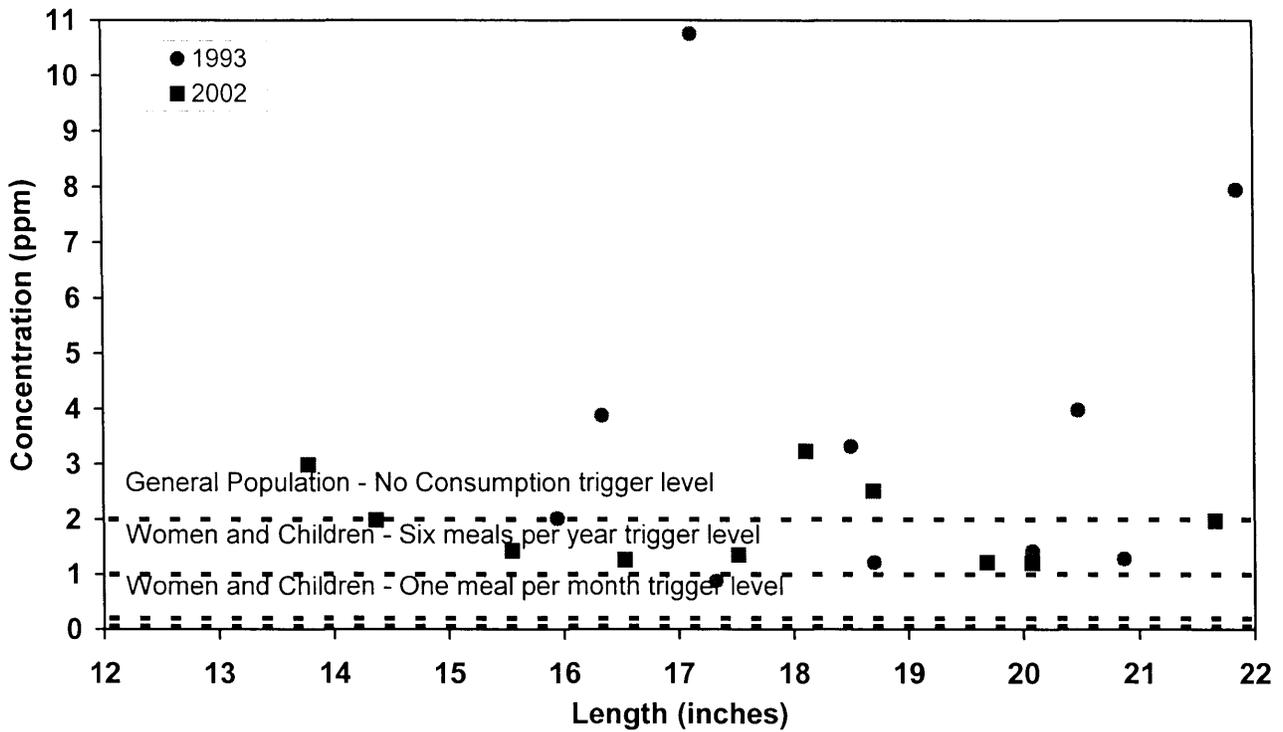


Figure 3. Total length versus total PCB concentration in channel catfish collected from Lake Erie in 1993 (ID 93082) and 2002 (ID 2002045).

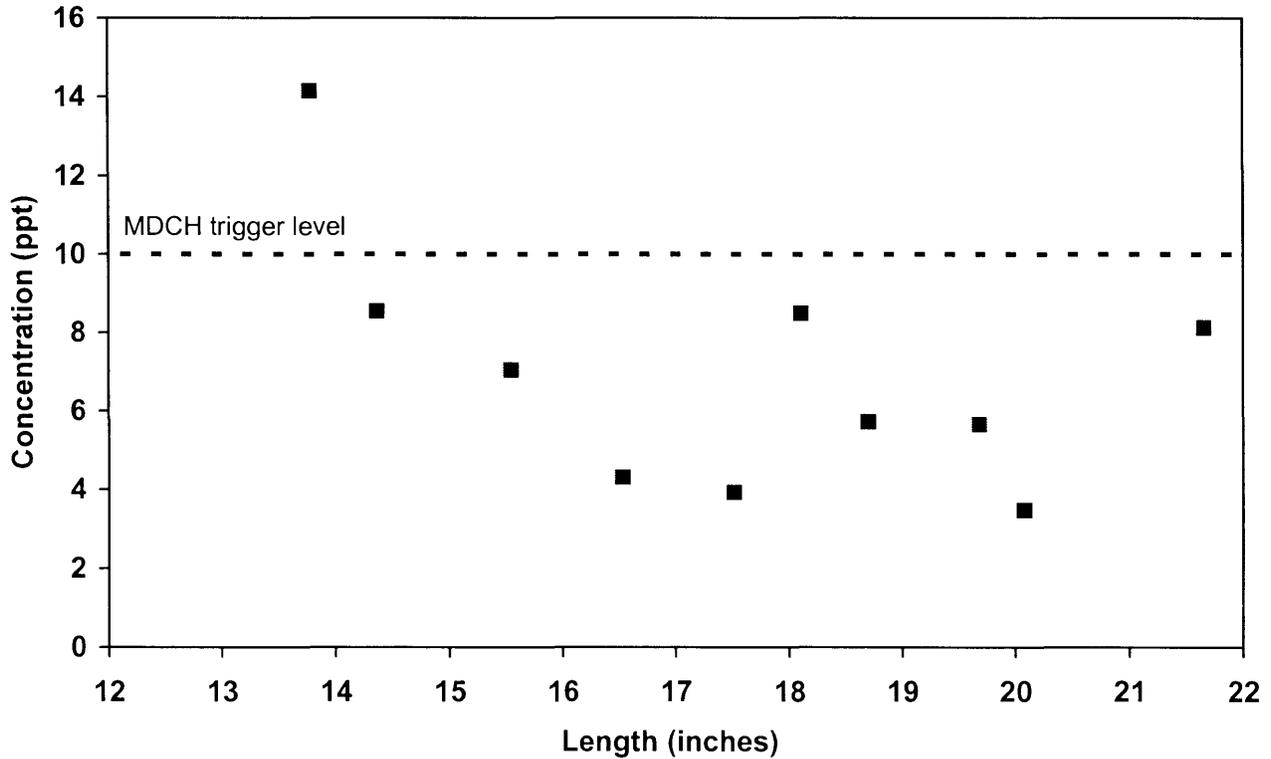


Figure 4. Total length versus dioxin TEQ concentration in channel catfish collected from Lake Erie in 2002 (ID 2002045).

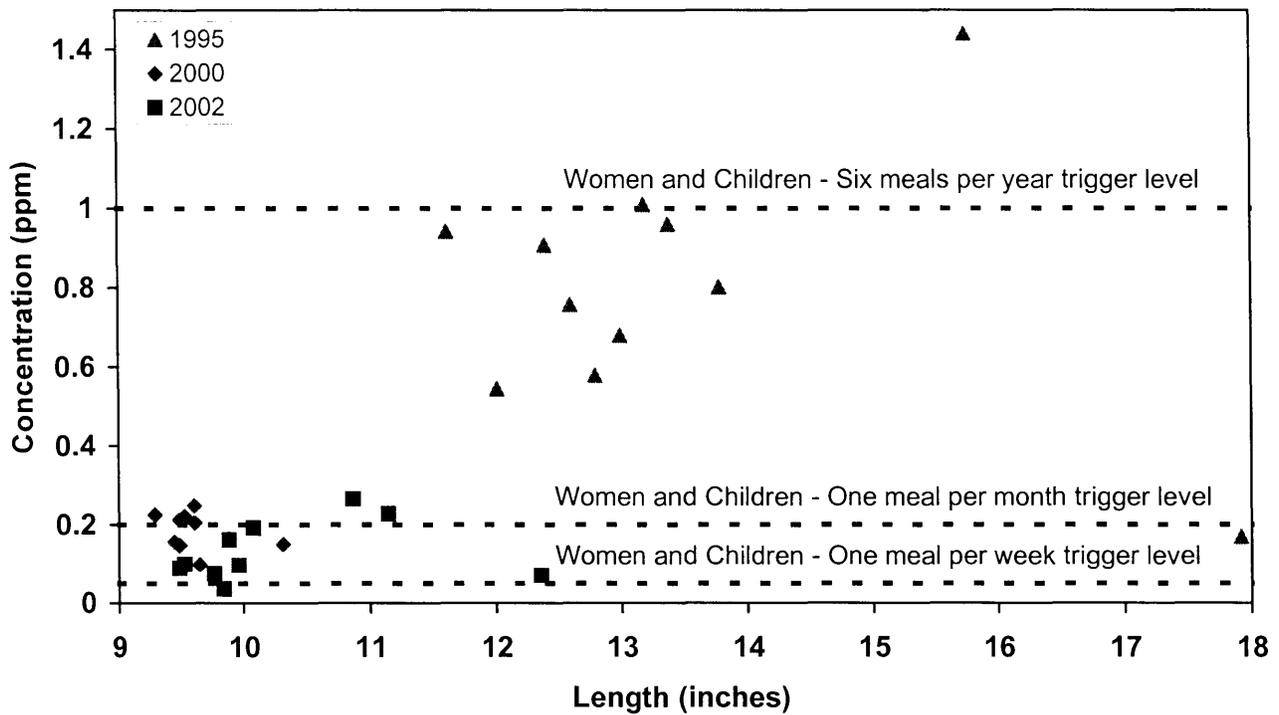


Figure 5. Total length versus total PCB concentration in white sucker collected from the Rouge River, Middle Branch in 1995 (ID 95059), 2000 (ID 2000083), and 2002 (ID 2002084).

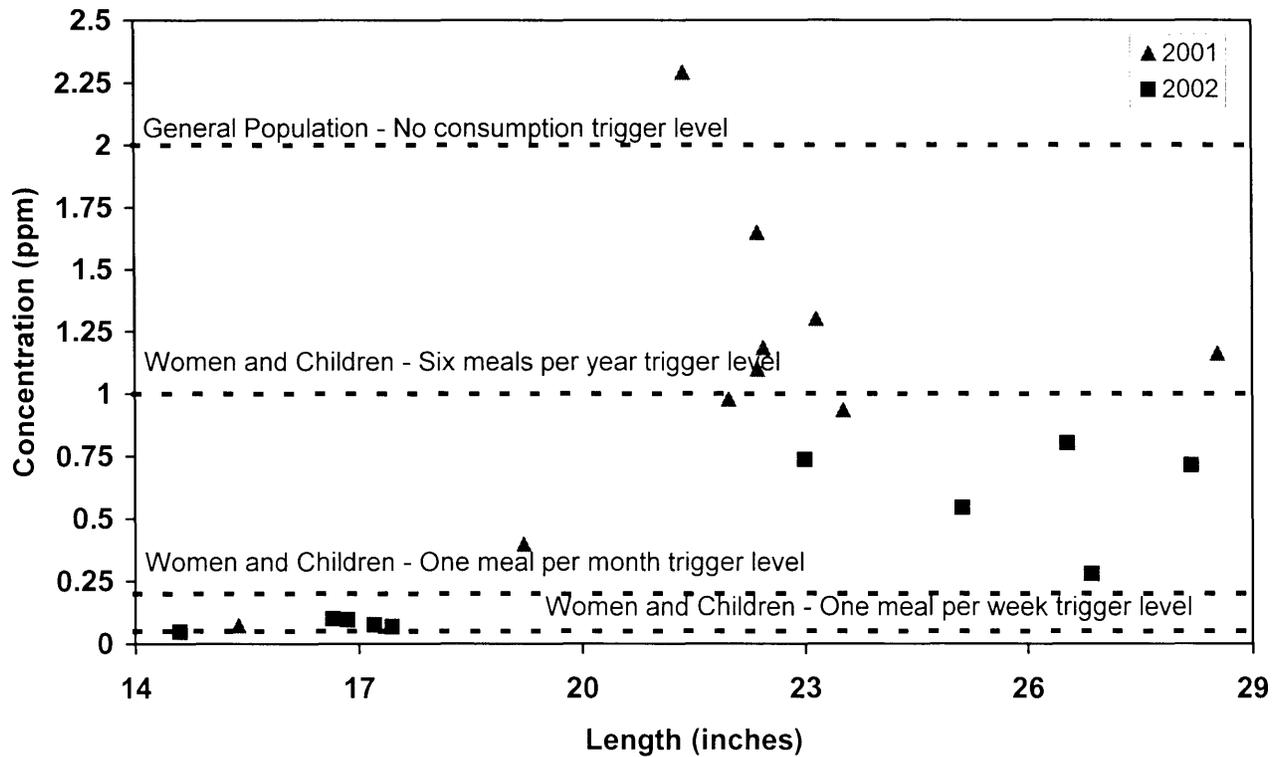


Figure 6. Total length versus total PCB concentration in carp collected from the Rouge River, Newburgh Lake in 2001 (ID 2001097) and 2002 (ID 2002085).

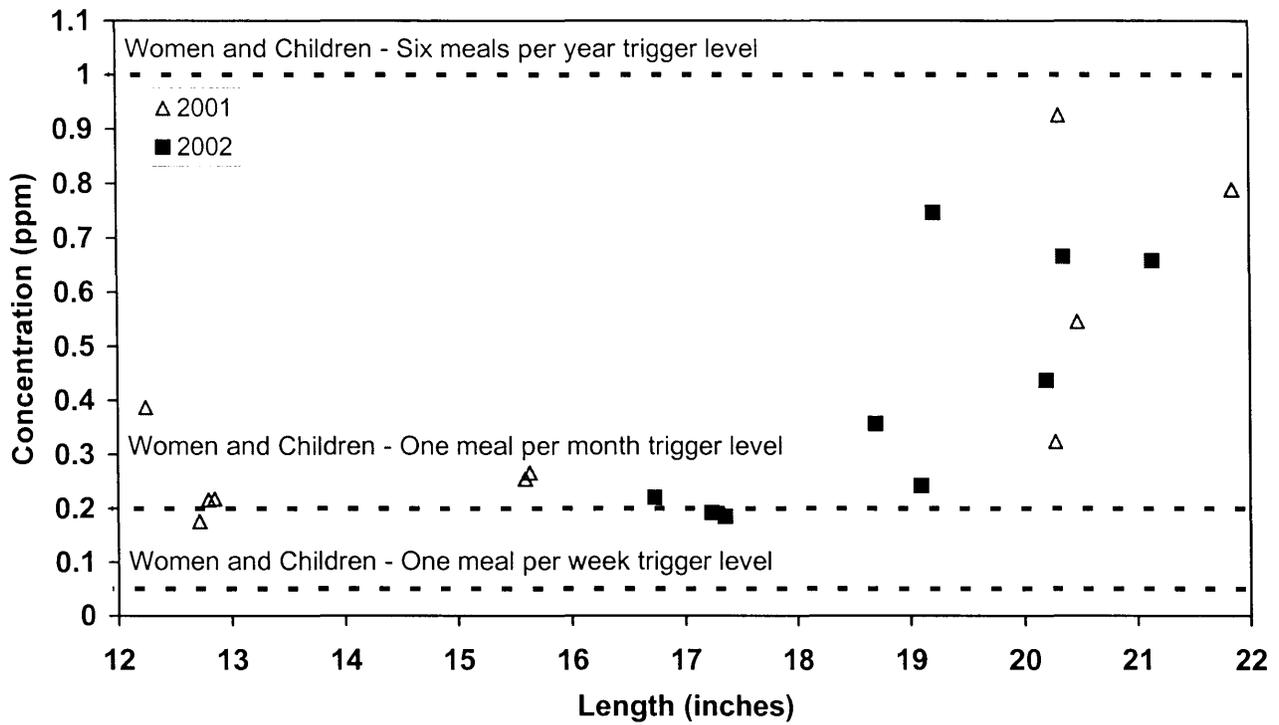


Figure 7. Total length versus total PCB concentration in channel catfish collected from the Rouge River, Newburgh Lake in 2001 (ID 2001097) and 2002 (ID 2002085).

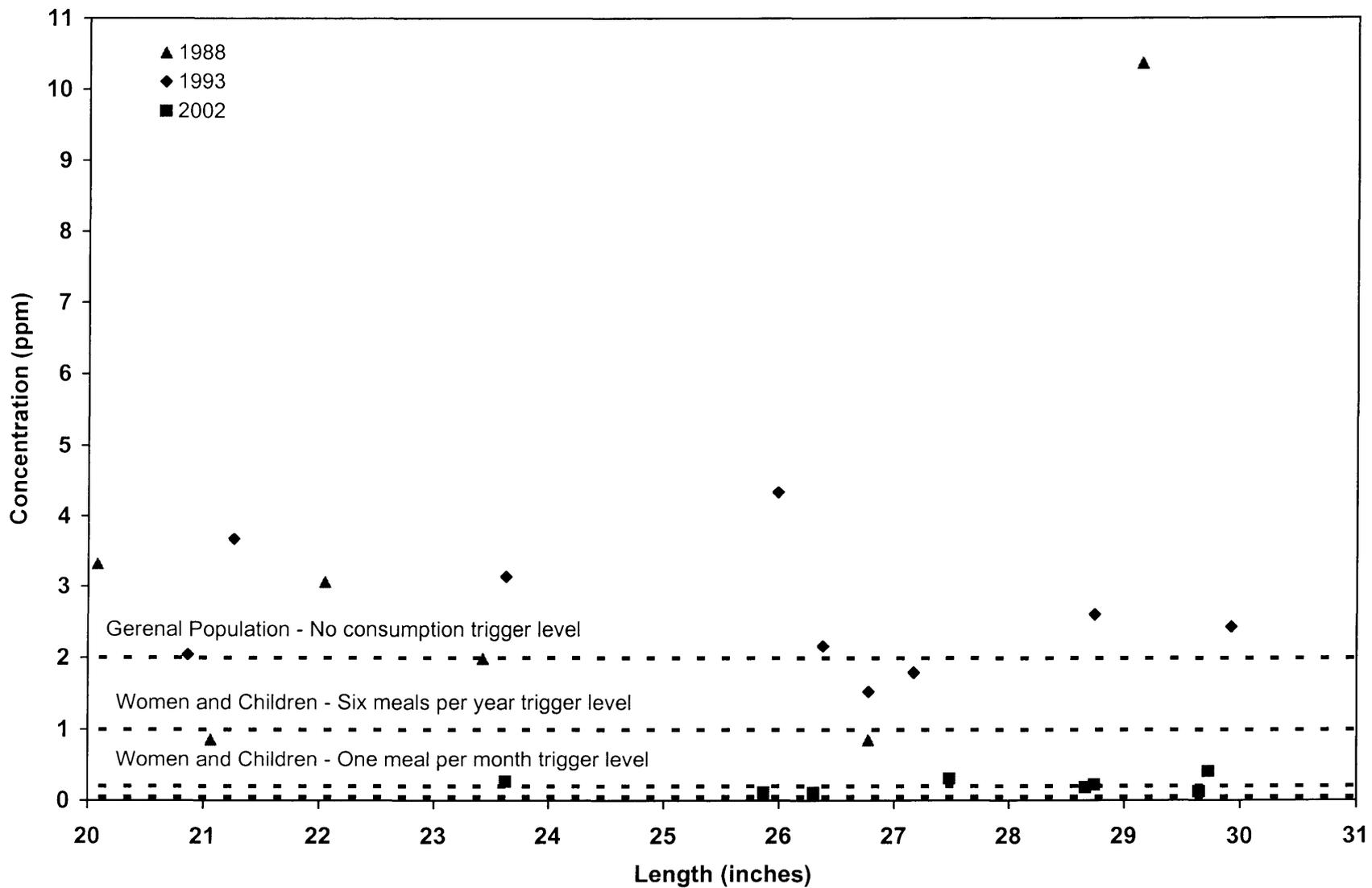


Figure 8. Total length versus total PCB concentration in northern pike collected from the Rouge River, Newburgh Lake in 1988 (ID 88011), 1993 (ID 93014), and 2002 (ID 2002085).

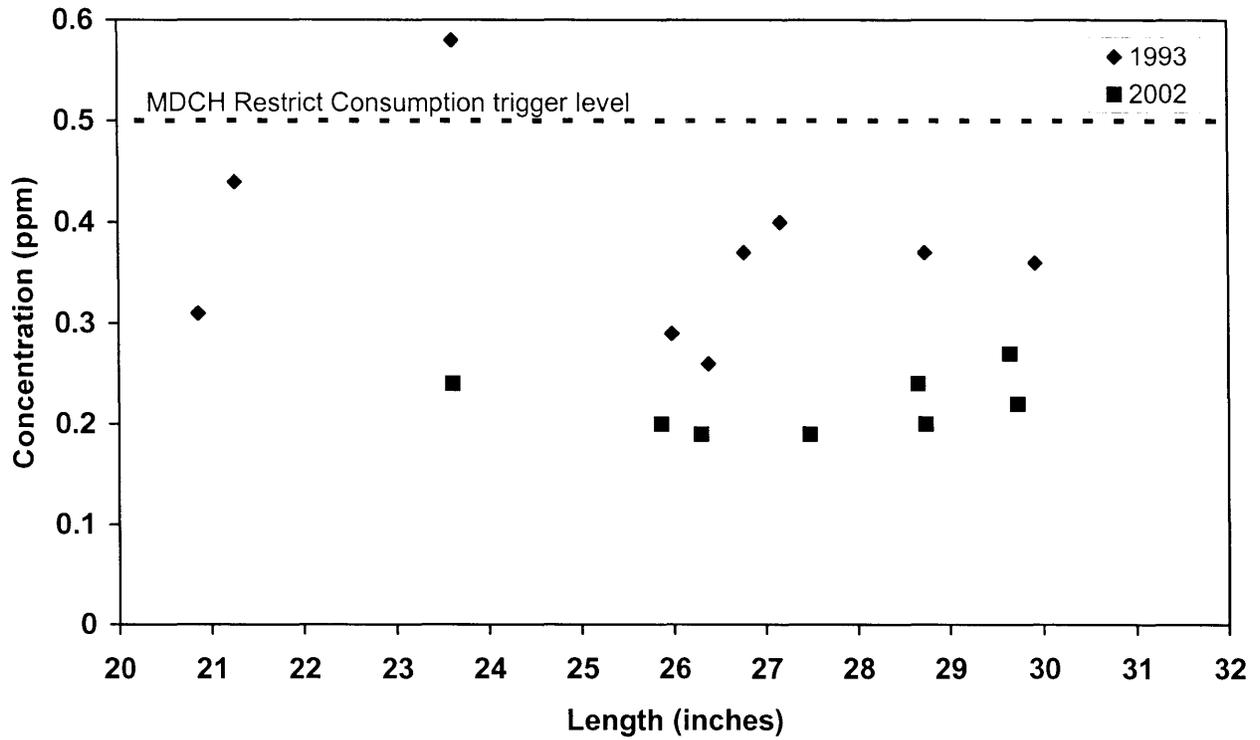


Figure 9. Total length versus mercury concentration in northern pike collected from Rouge River, Newburgh Lake in 1993 (ID 93014) and 2002 (ID 2002085).



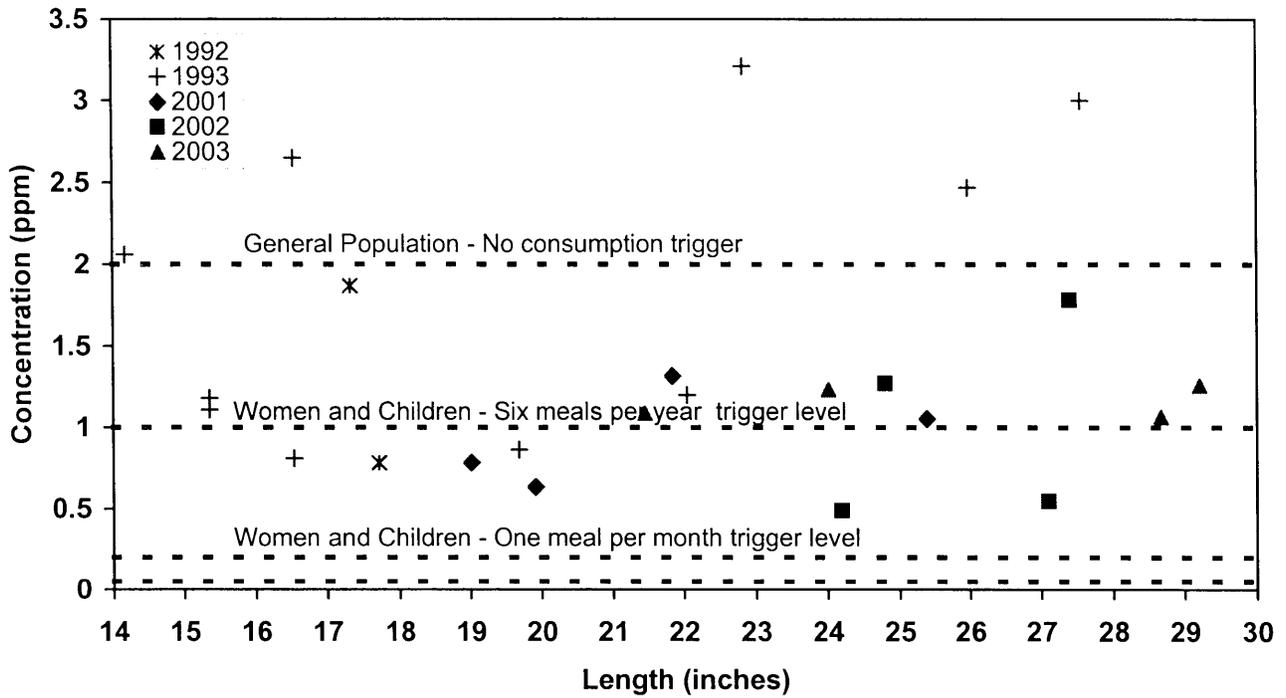


Figure 11. Total length versus total PCB concentration in brown trout collected from Lake Michigan, Green Bay in 1992 (ID 92022), 1993 (ID 93078), 2001 (ID 2001066), 2002 (ID 2002054), and 2003 (ID 2003148).

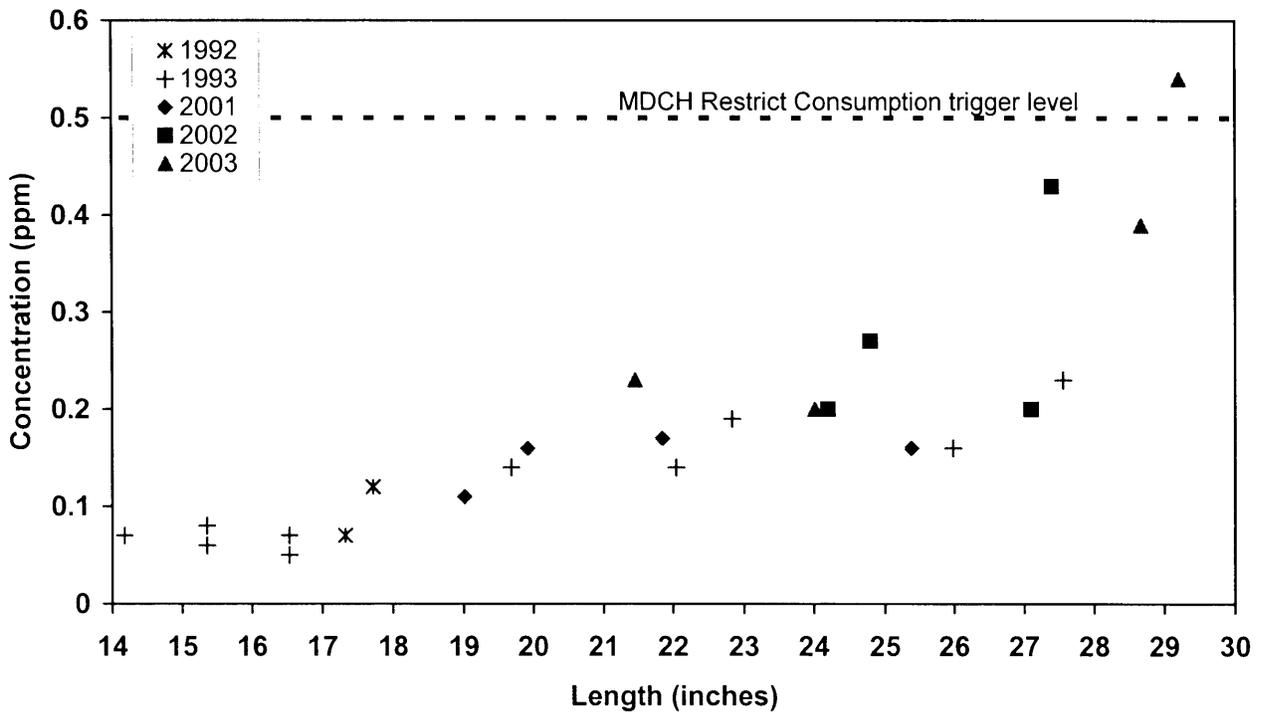


Figure 12. Total length versus mercury concentration in brown trout collected from Lake Michigan, Green Bay in 1992 (ID 92022), 1993 (ID 93078), 2001 (ID 2001066), 2002 (ID 2002054), and 2003 (ID 2003148).

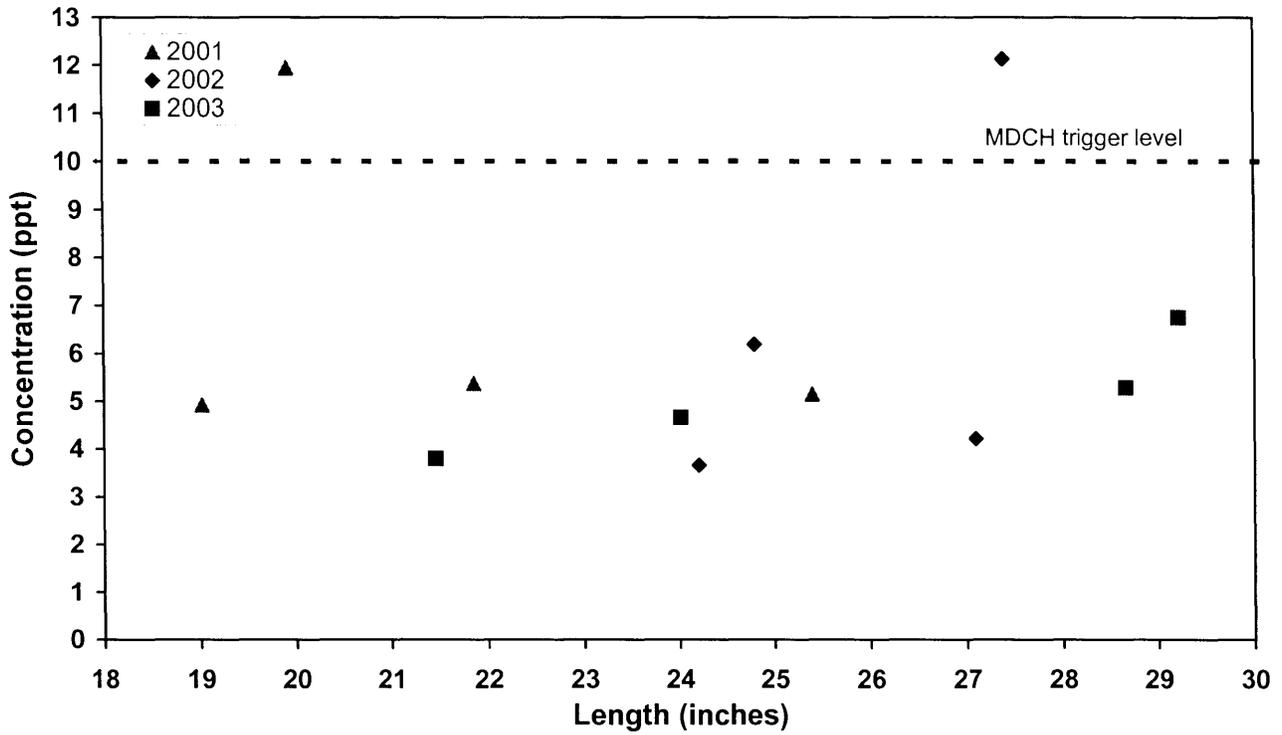


Figure 13. Total length versus dioxin TEQ concentration in brown trout collected from Lake Michigan, Green Bay in 2001 (ID 2001066), 2002 (ID 2002054), and 2003 (ID 2003148).

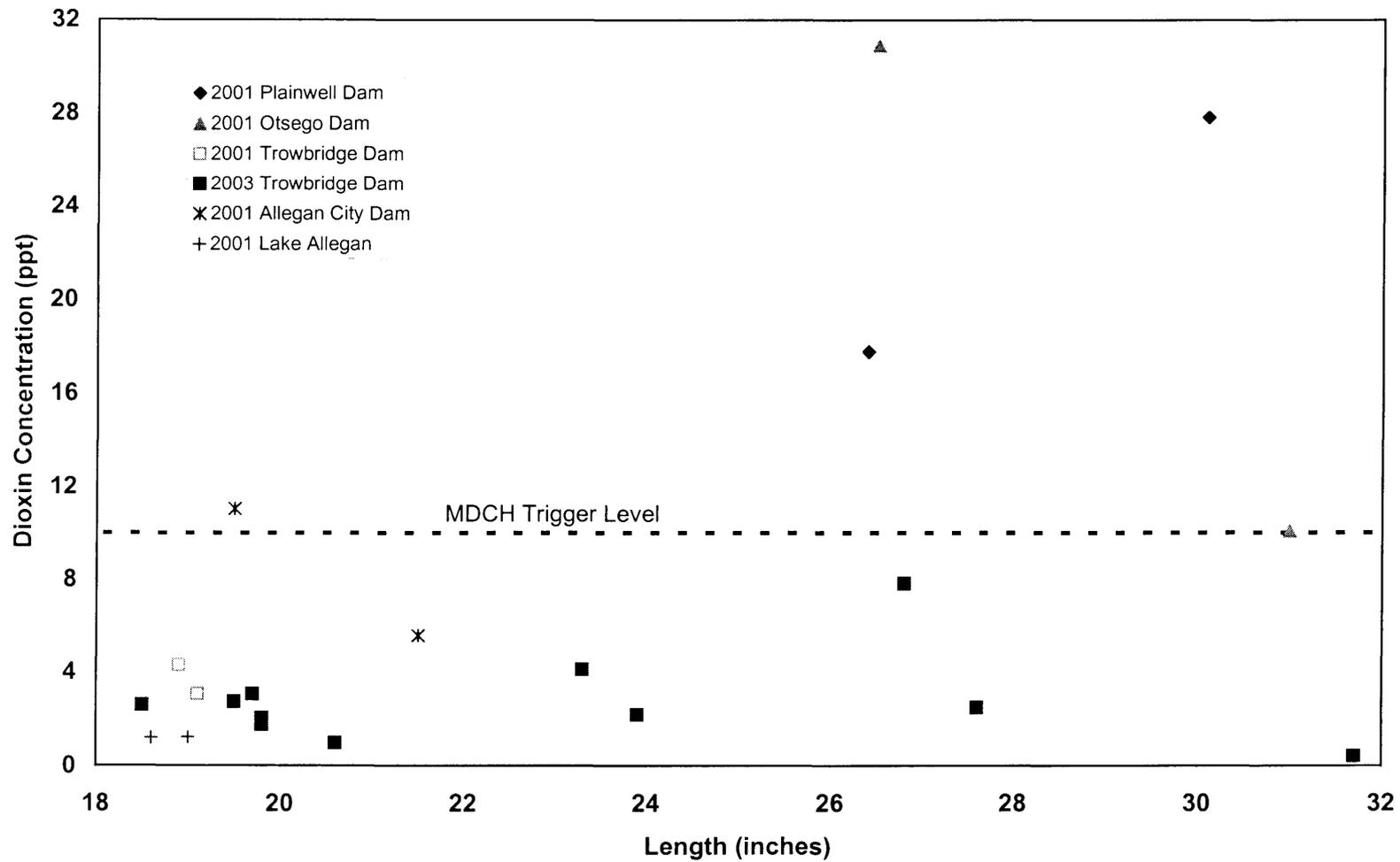


Figure 14. Total length versus dioxin TEQ concentration in carp collected from the Kalamazoo River between Morrow Dam and Lake Allegan in 2001 and 2003.

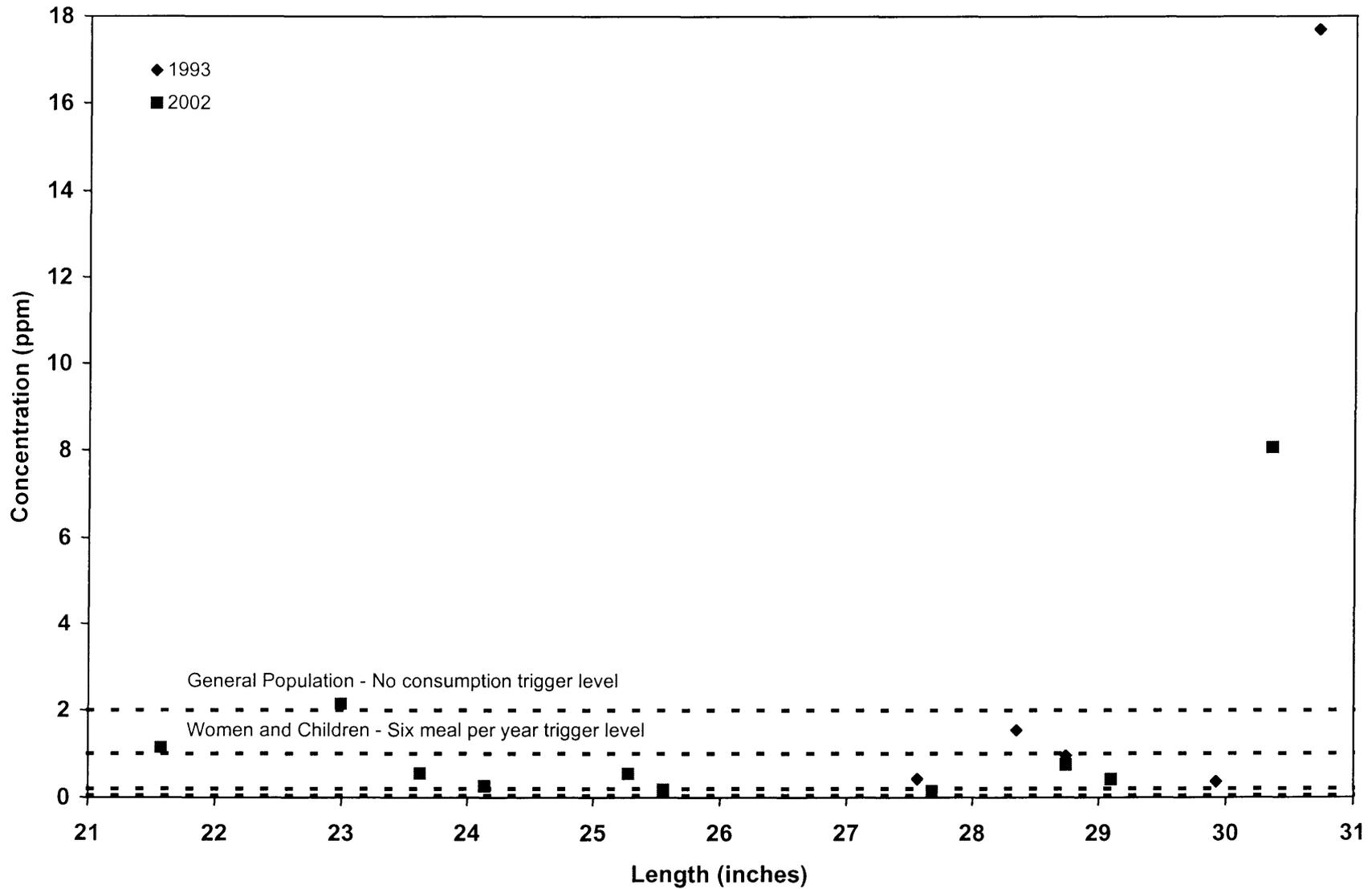


Figure 15. Total length versus total PCB concentration in carp collected from Muskegon Lake, Muskegon County in 1993 (ID 93071) and 2002 (ID 2002071).

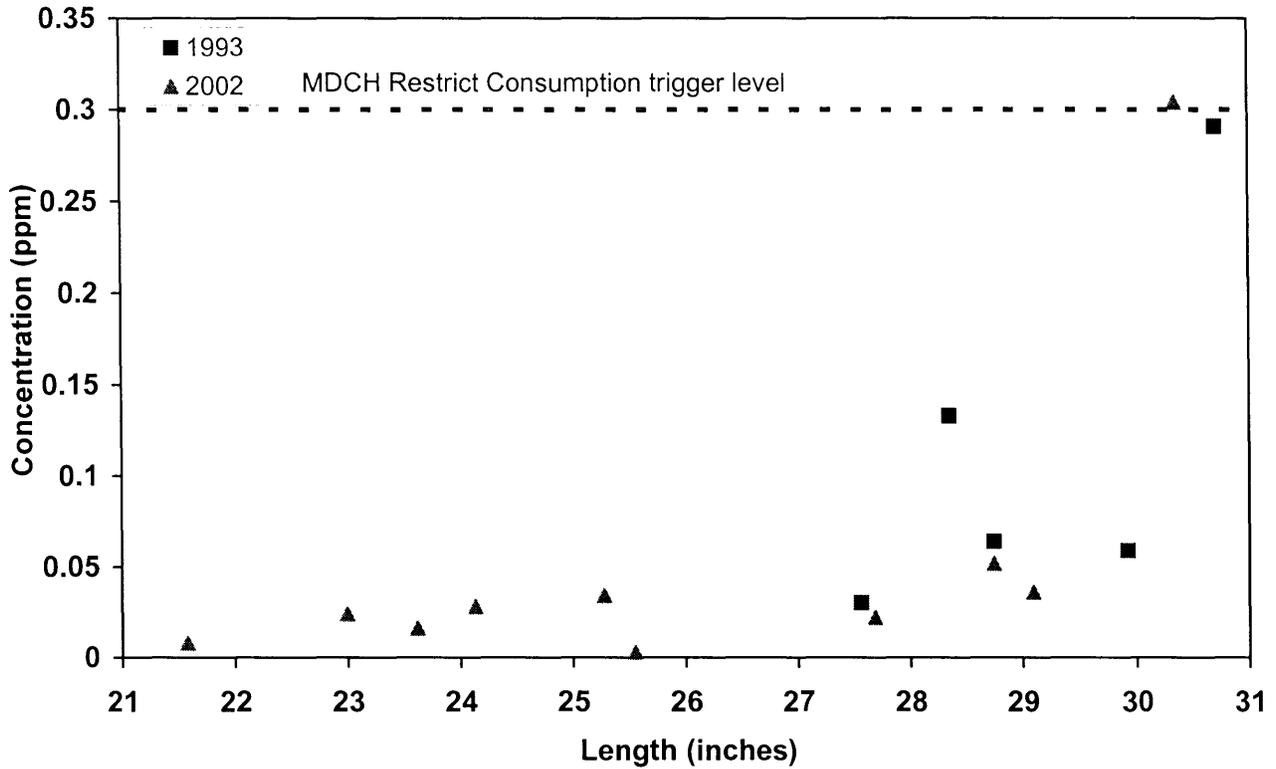


Figure 16. Total length versus total chlordane concentration in carp collected from Muskegon Lake, Muskegon County in 1993 (ID 93071) and 2002 (ID 2002071).

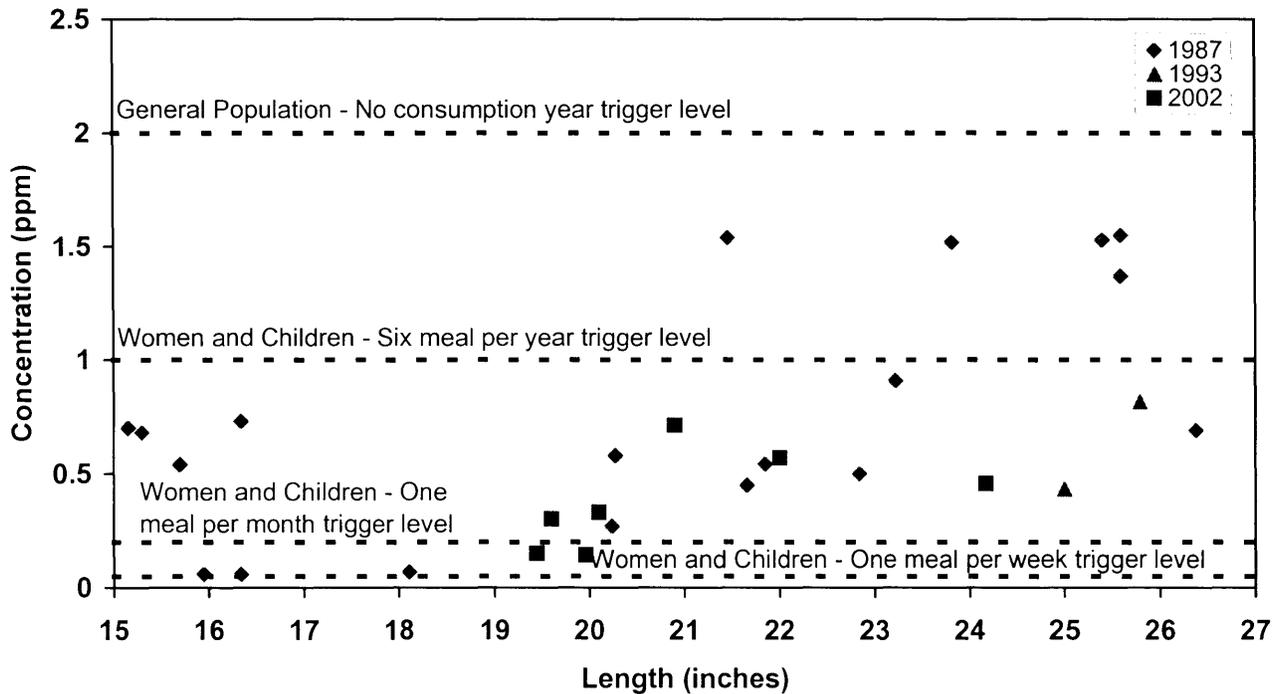


Figure 17. Total length versus total PCB concentration in walleye collected from Muskegon Lake, Muskegon County in 1987 (ID 87054), 1993 (ID 93071), and 2002 (ID 2002071).

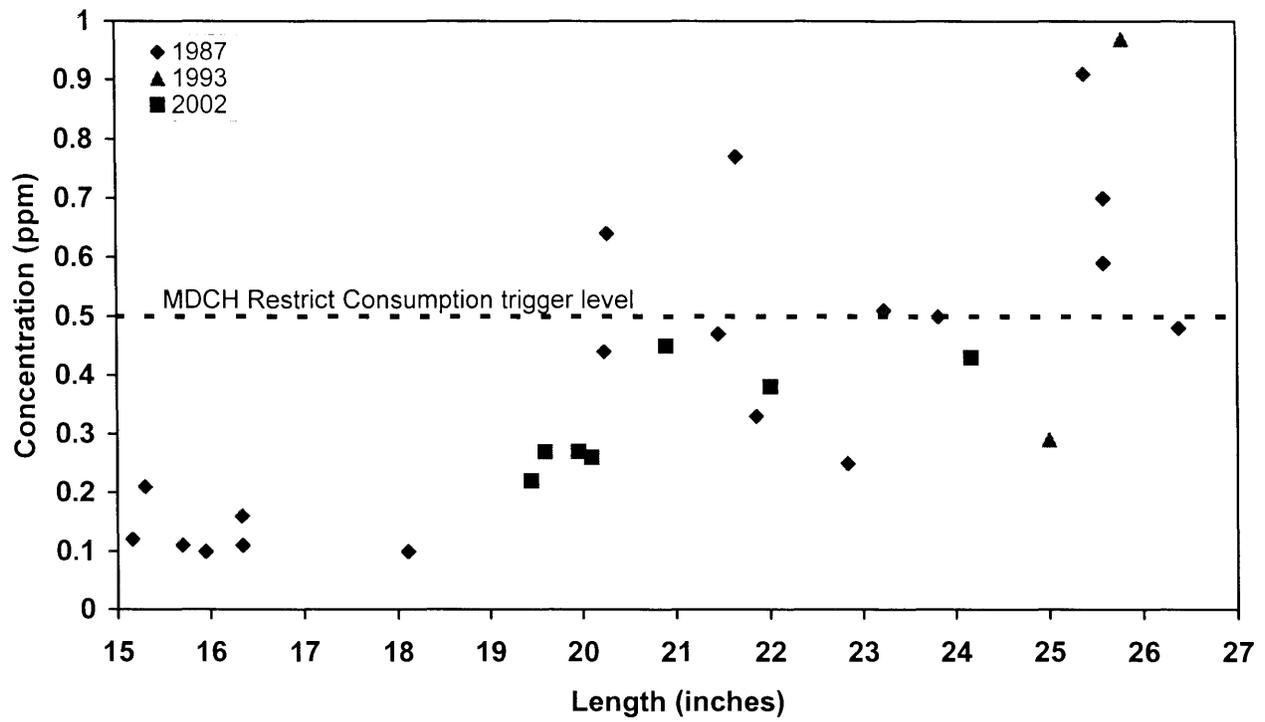


Figure 18. Total length versus mercury concentration in walleye collected from Muskegon Lake, Muskegon County in 1987 (ID 87054), 1993 (ID 93071), and 2002 (ID 2002071).

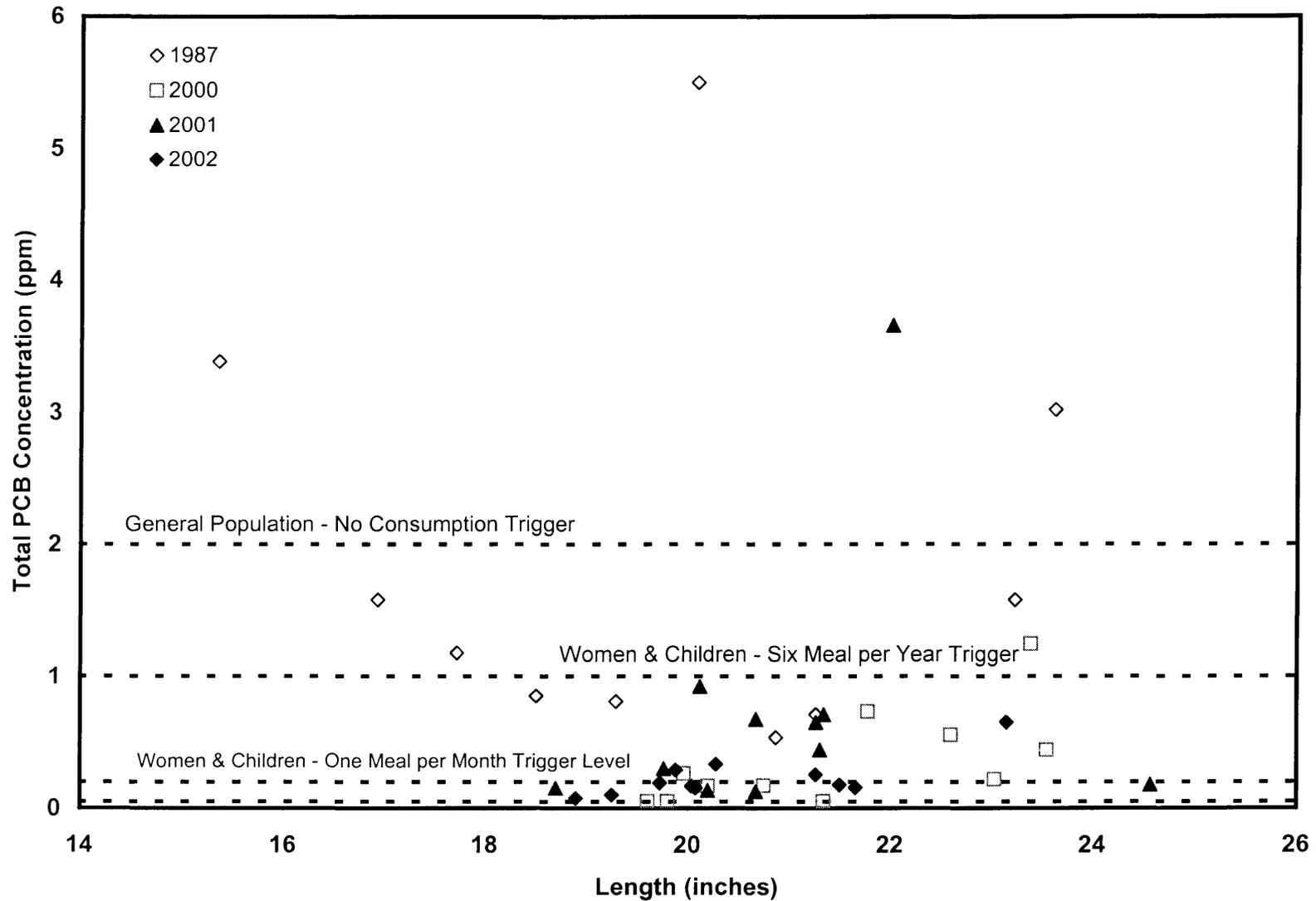


Figure 19. Total length versus total PCB concentration in carp collected from Portage Creek at Bryant Mill Pond in 1987 (ID 87047), 2000 (ID 2000121), 2001 (ID 2001044) and 2002 (ID# 2002108).

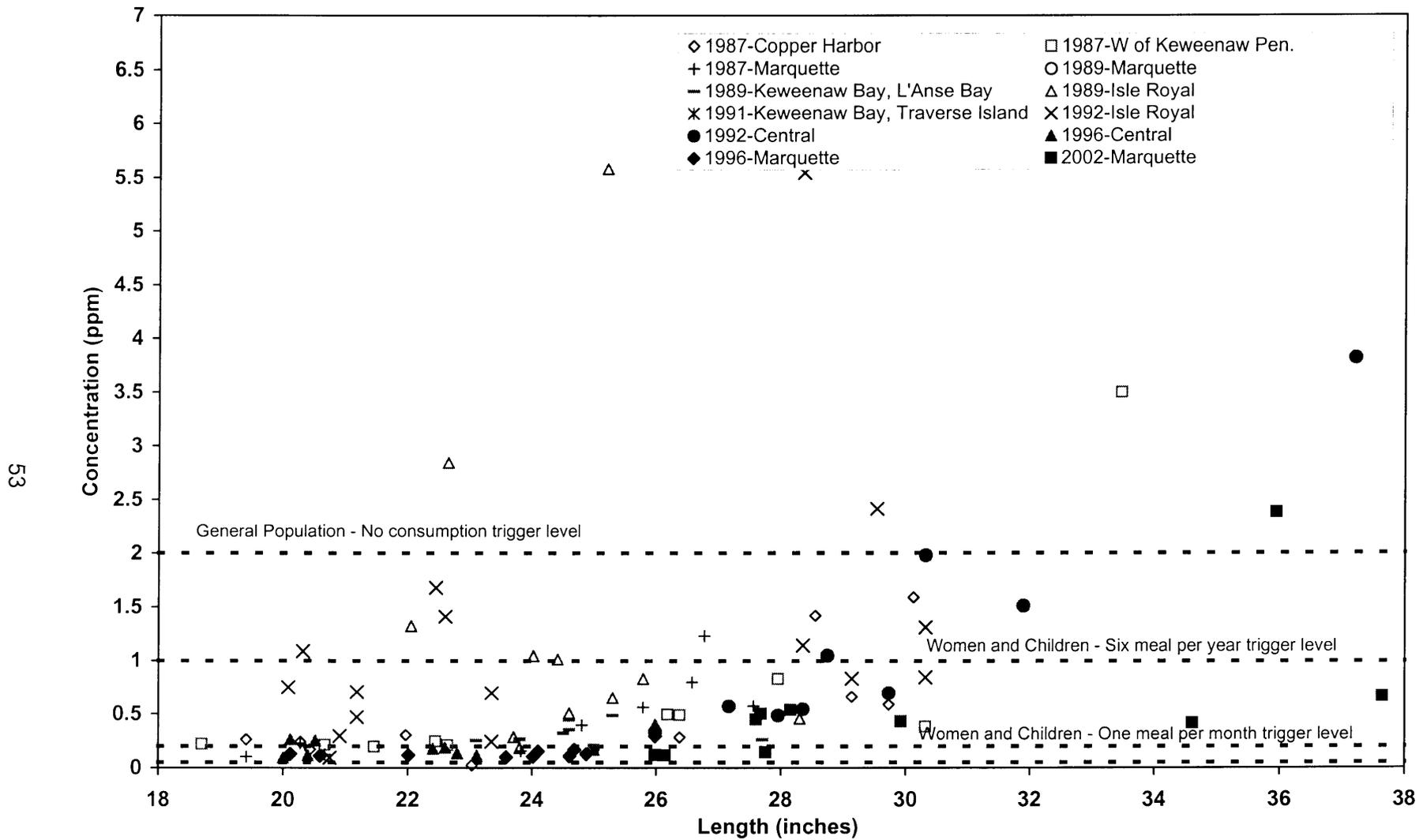


Figure 20. Total length versus total PCB concentration in lake trout collected from Lake Superior in 1987 (ID 87007, 87008, and 87009), 1989 (ID 89028, 89029, and 89046), 1991 (ID 91060), 1992 (ID 92063 and 92076), 1996 (ID 96034 and 96038), and 2002 (ID 2002060).

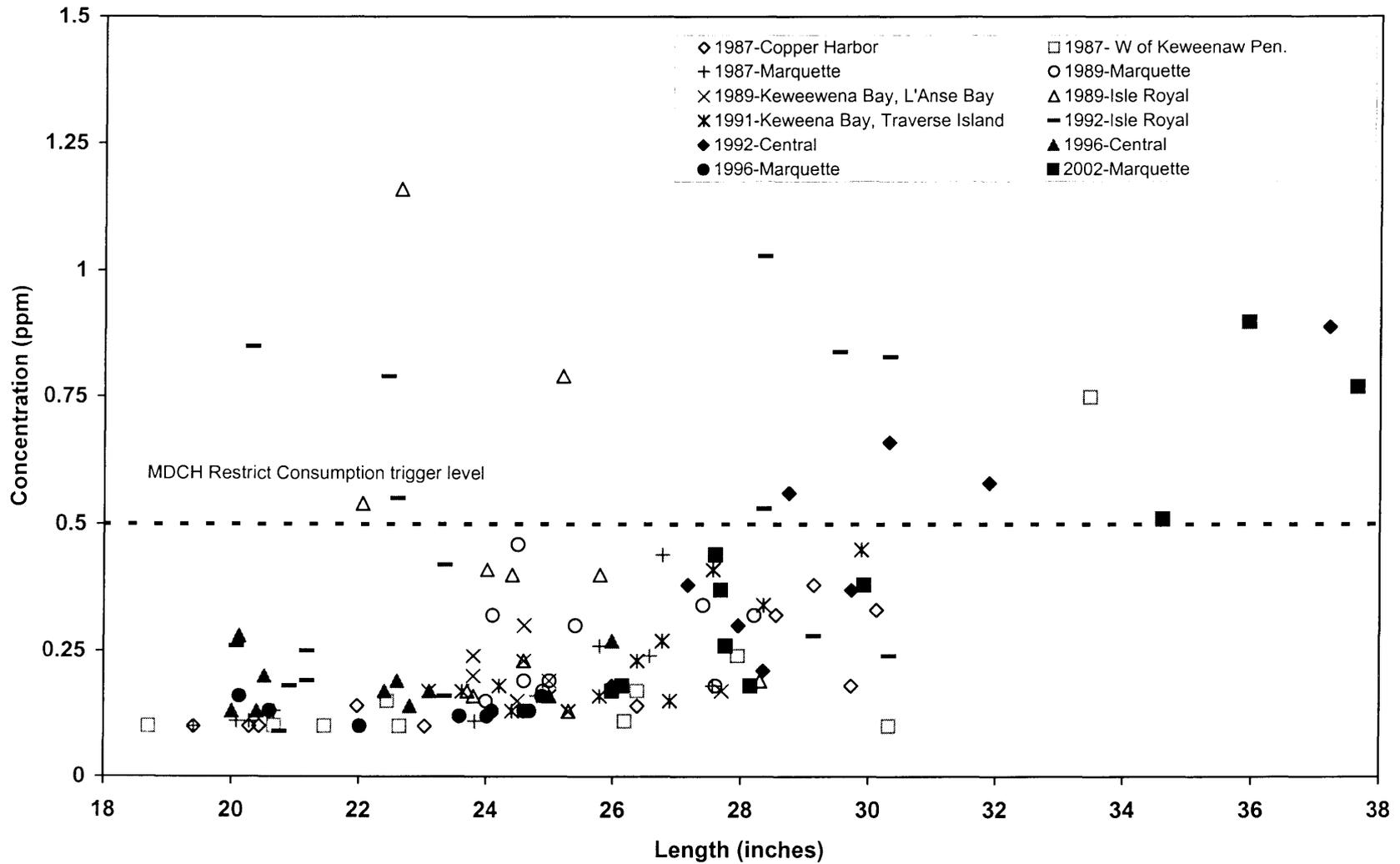


Figure 21. Total length versus mercury concentration in lake trout collected from Lake Superior in 1987 (ID 87008, 87007, and 87009), 1989 (ID 89028, 89029, and 89046), 1991 (ID 91060), 1992 (ID 92063 and 92076), 1996 (ID 96034 and 96038), and 2002 (ID 2002060).

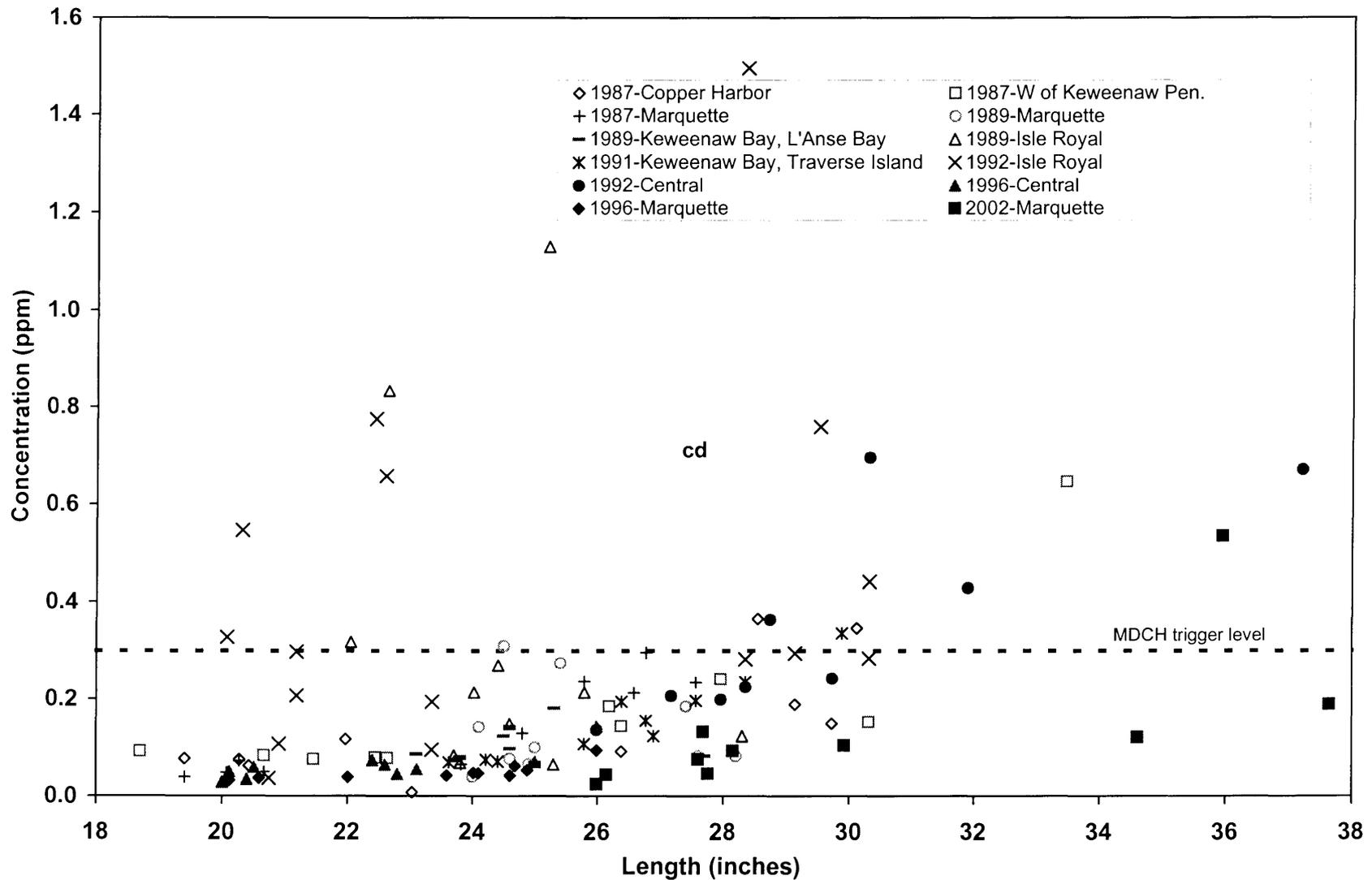


Figure 22. Total length versus total chlordane concentration in lake trout collected from Lake Superior in 1987 (ID 87007, 87008, and 87009), 1989 (ID 89028, 89029, and 89046), 1991 (ID 91060), 1992 (ID 92063 and 92076), 1996 (ID 96034 and 96038), and 2002 (ID 2002060).

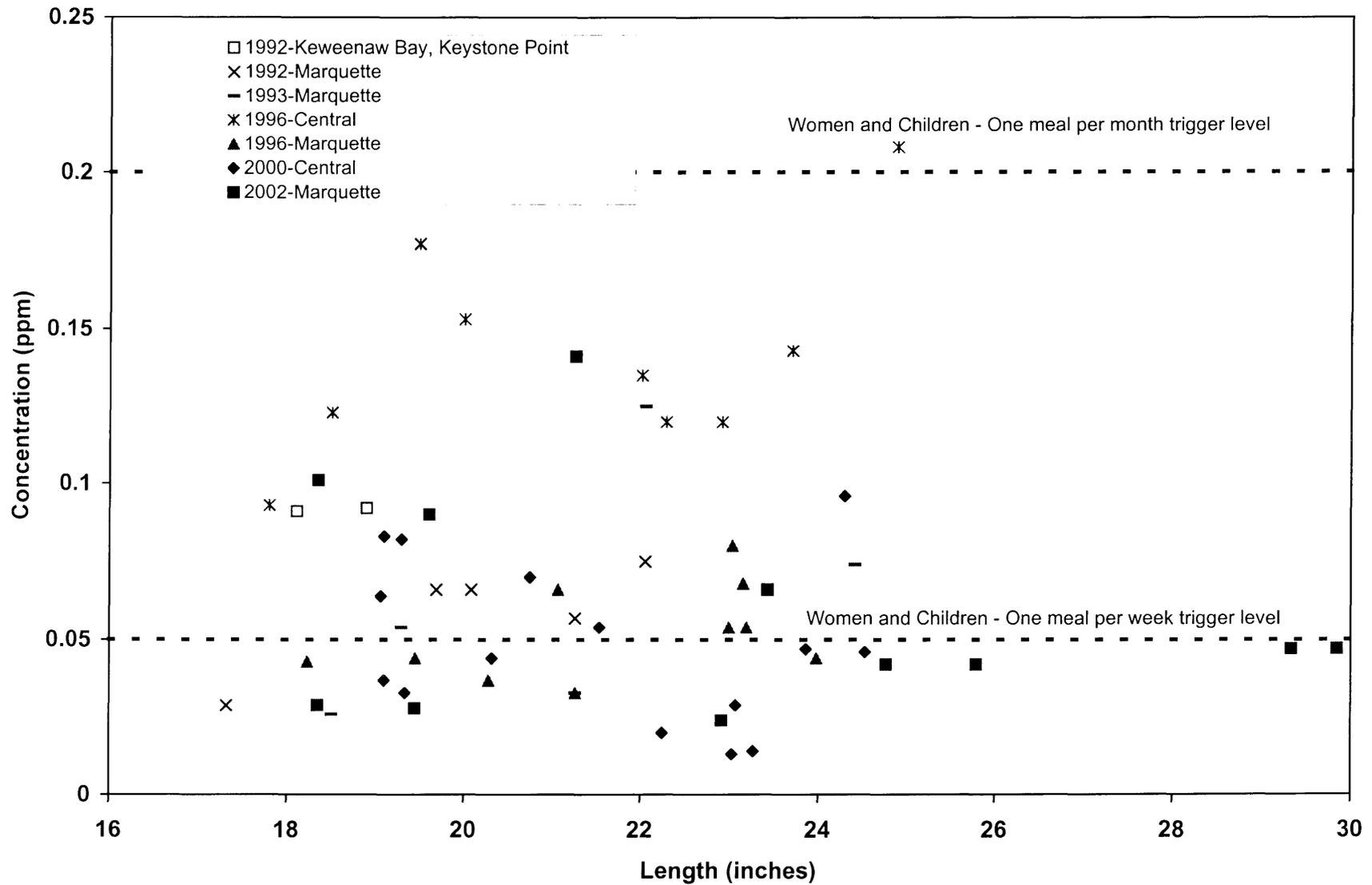


Figure 23. Total length versus total PCB concentration in lake whitefish collected from Lake Superior in 1992 (ID 92073 and 92074), 1993 (ID 93089), 1996 (ID 96034 and 96038), 2000 (ID 2000046), and 2002 (ID 2002060).

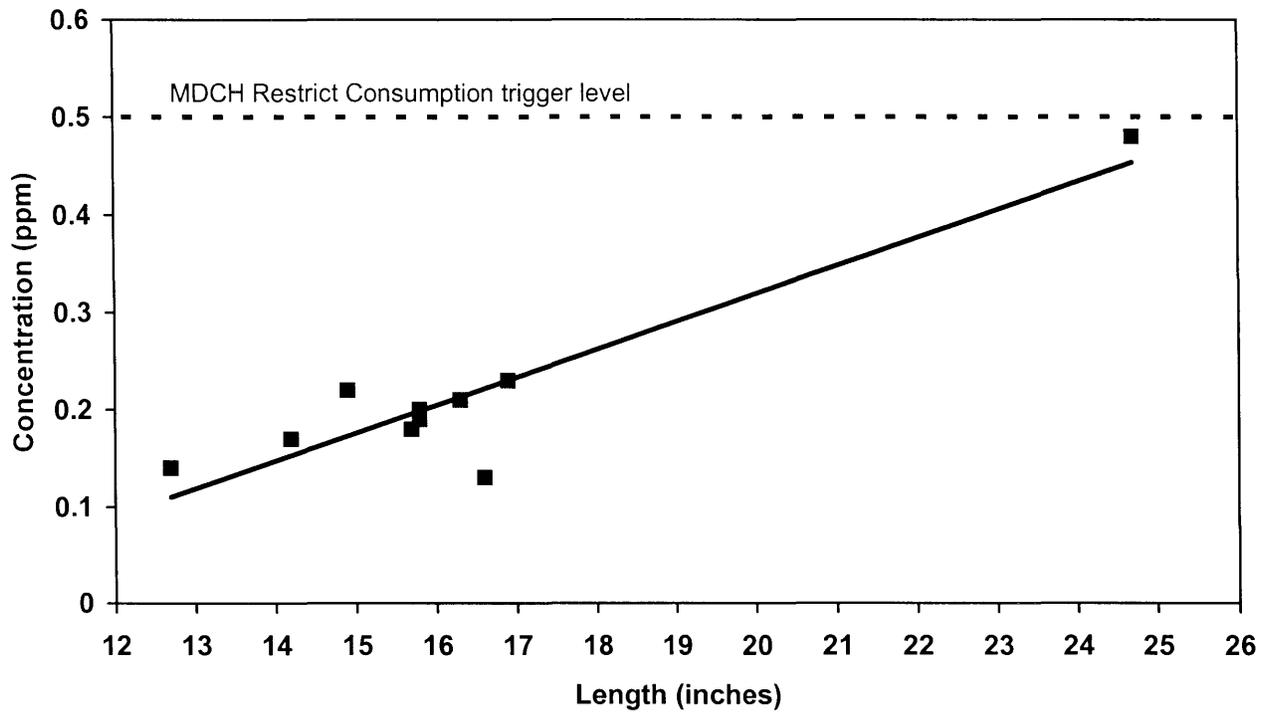


Figure 24. Total length versus mercury concentration in walleye collected from Lake Gogebic, Gogebic and Ontonagon Counties in 2002 (ID 2002046).

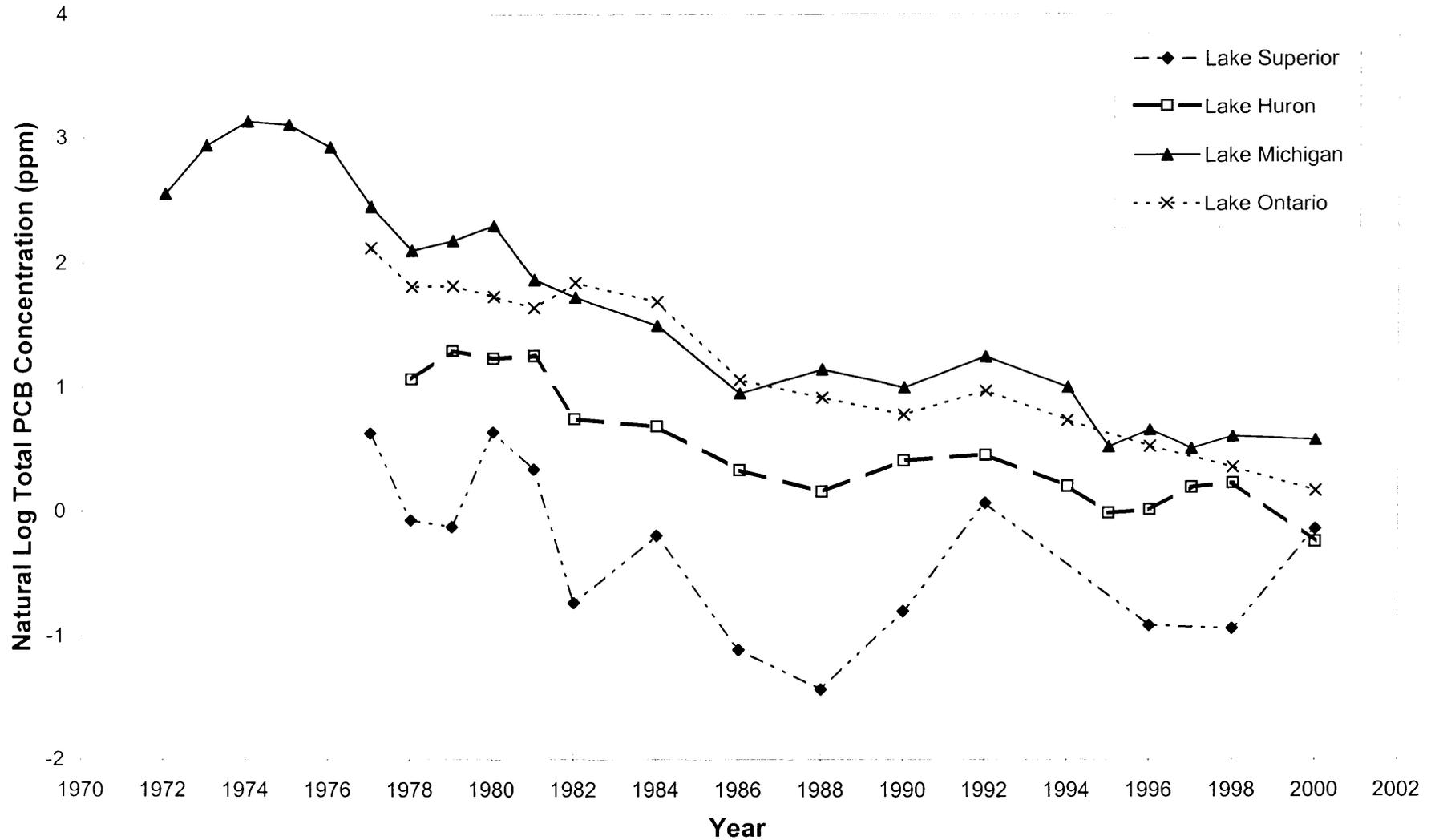


Figure 25. Natural log of average total PCB concentrations in whole lake trout from the Great Lakes, 1970-2000 (DeVault et al. 1996; USEPA unpublished data).

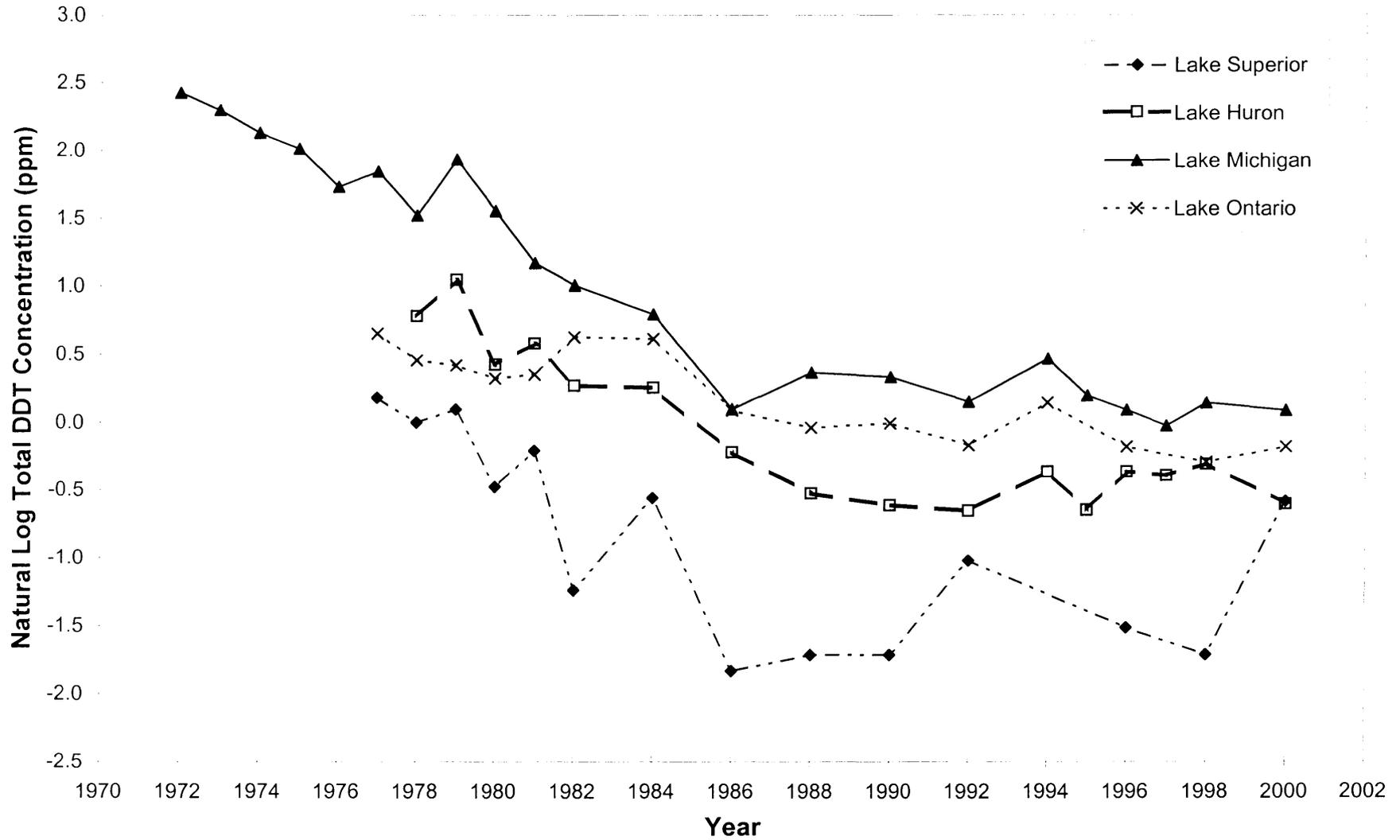


Figure 26. Natural log of average total DDT concentrations in whole lake trout from the Great Lakes, 1970-2000 (DeVault et al. 1996; USEPA unpublished data).

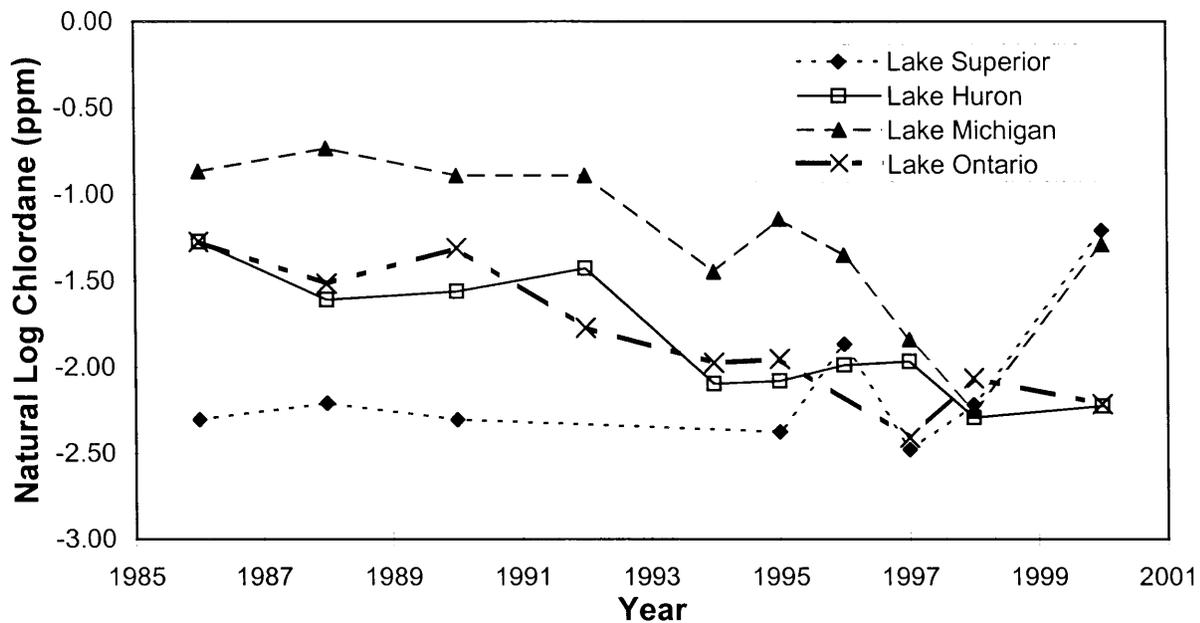


Figure 27. Natural log of average total chlordane concentrations in whole lake trout from the Great Lakes, 1986-2000 (DeVault et al. 1996, USEPA unpublished data).

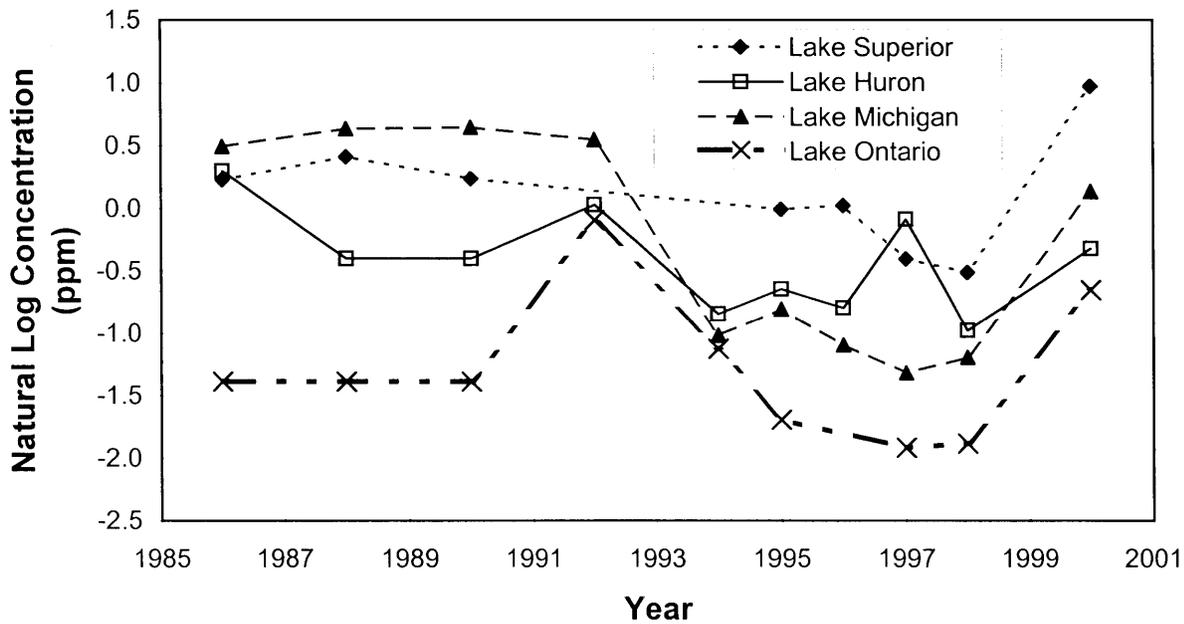


Figure 28. Natural log of average apparent toxaphene concentrations in whole lake trout from the Great Lakes, 1986-2000 (DeVault et al. 1996; USEPA unpublished data). Concentrations were below the quantification level in Lake Ontario fish collected between 1986 and 2000.

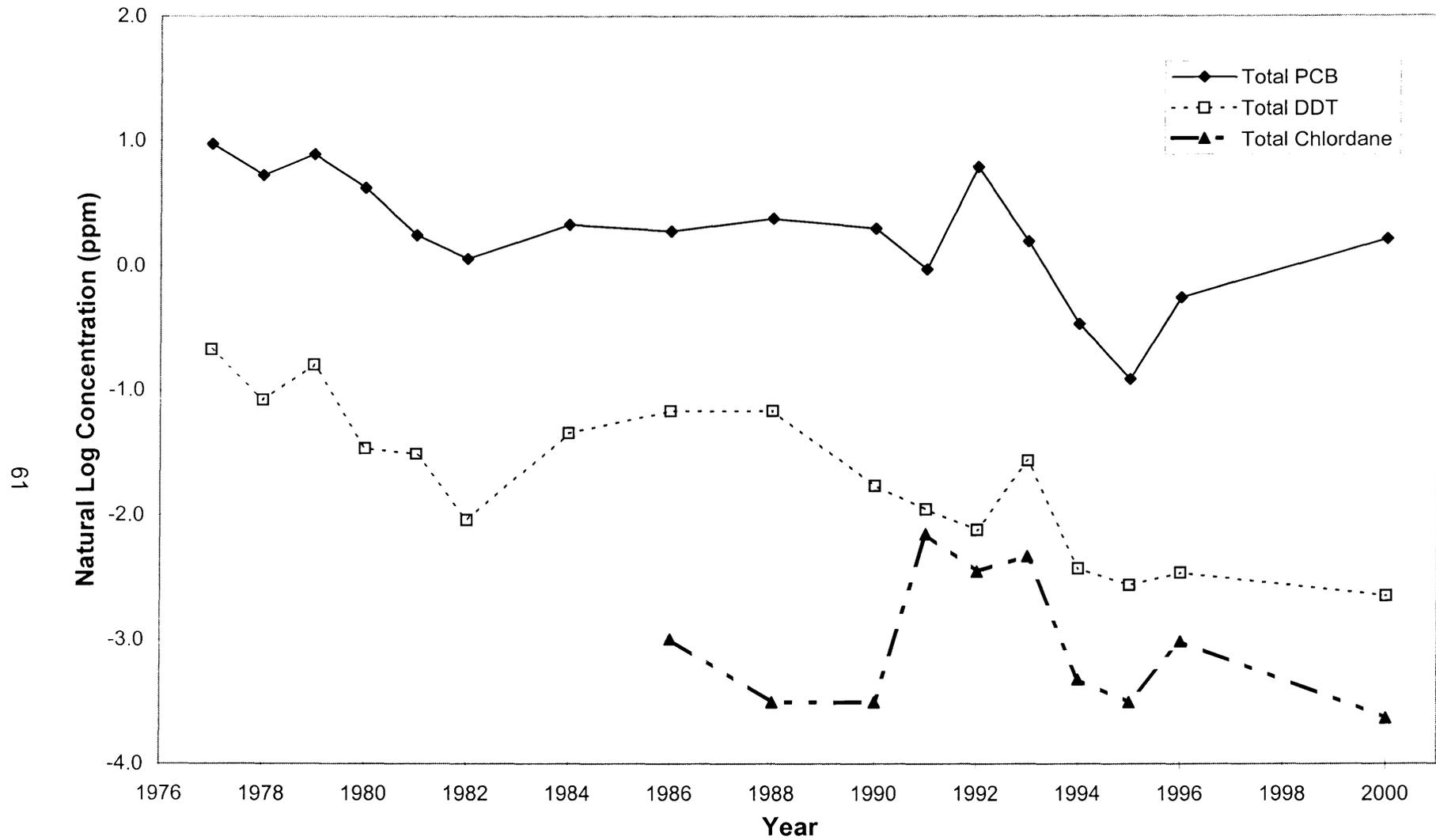


Figure 29. Natural log of average total PCB, total DDT and total chlordane concentrations in whole walleye from Lake Erie 1986-2000 (DeVault et al. 1996; USEPA unpublished data).

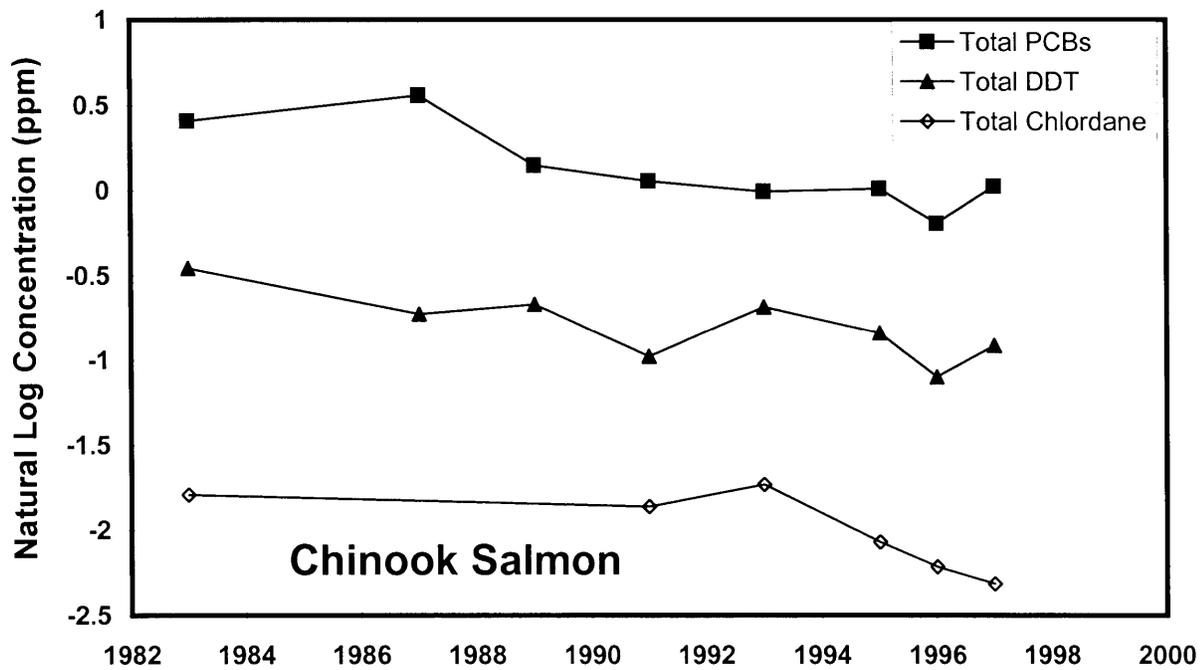
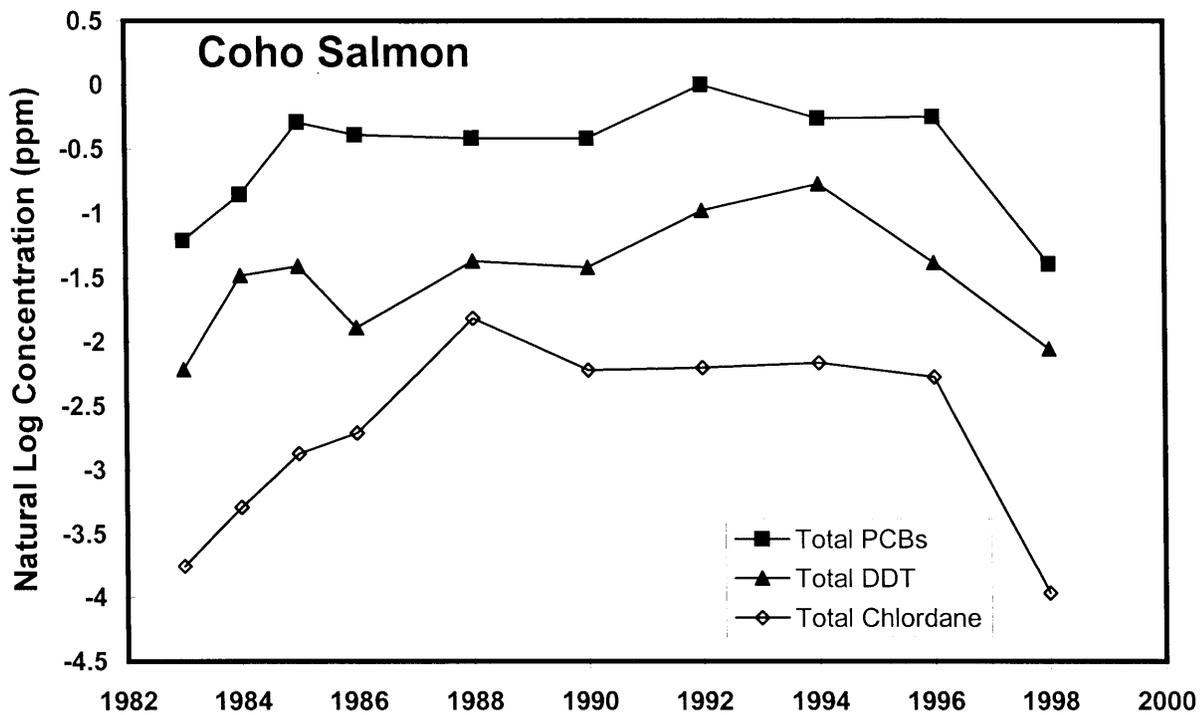


Figure 30. Natural log of average total PCB, total DDT and total chlordane concentrations in coho and chinook salmon fillet samples from Lake Michigan.

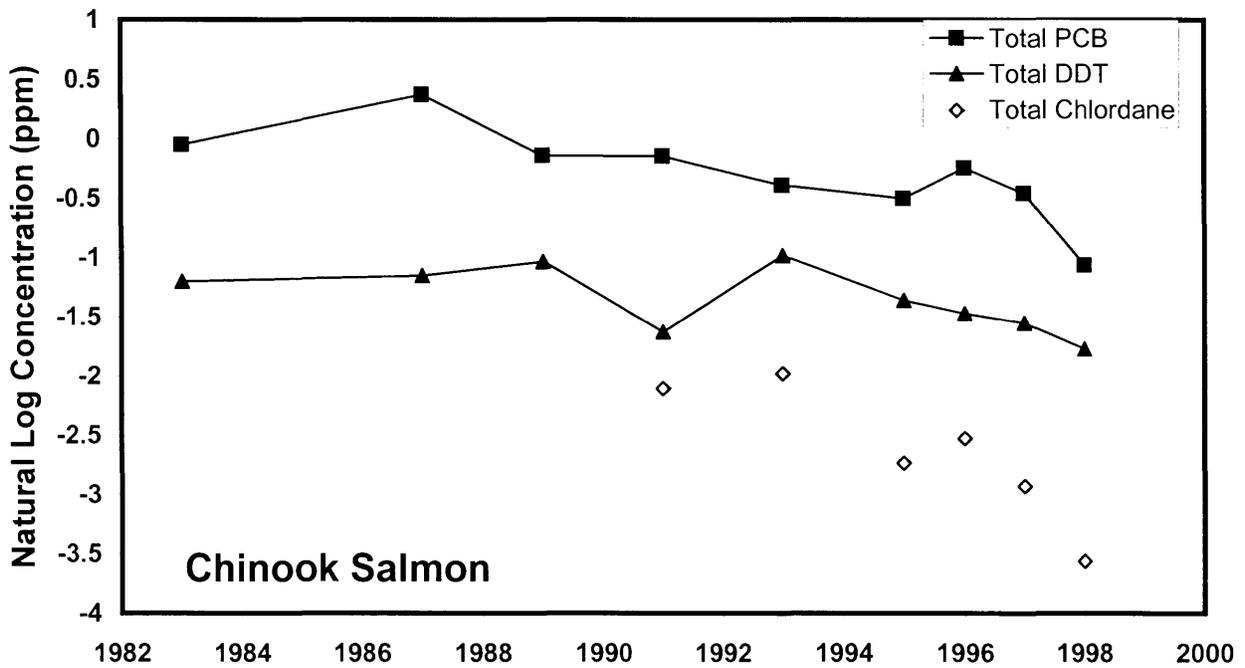
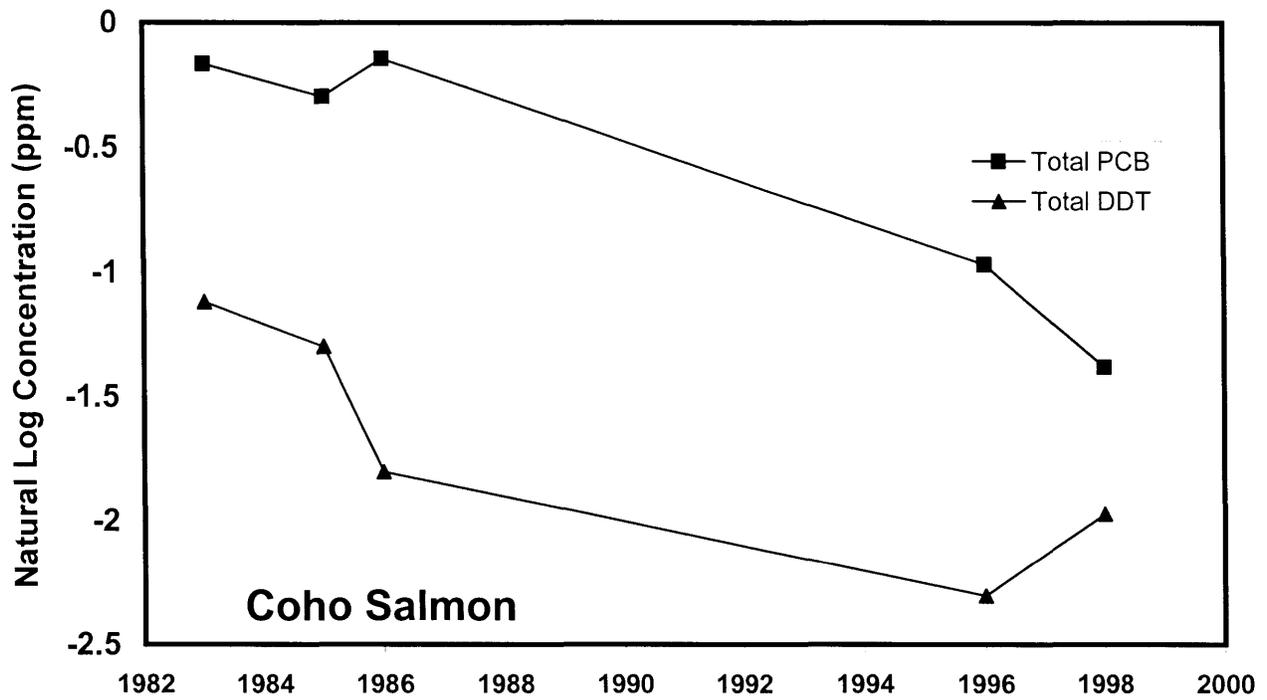


Figure 31. Natural log of average total PCB, total DDT and total chlordane concentrations in coho and chinook salmon fillet samples from Lake Huron.

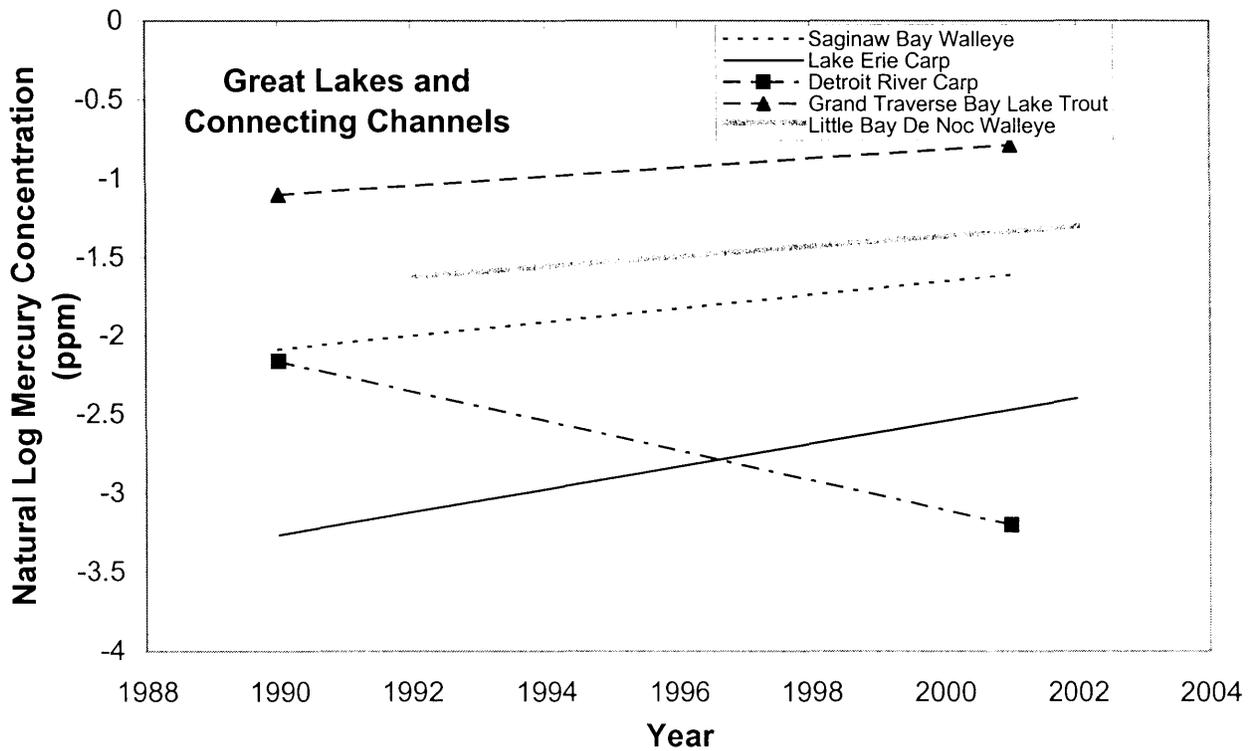
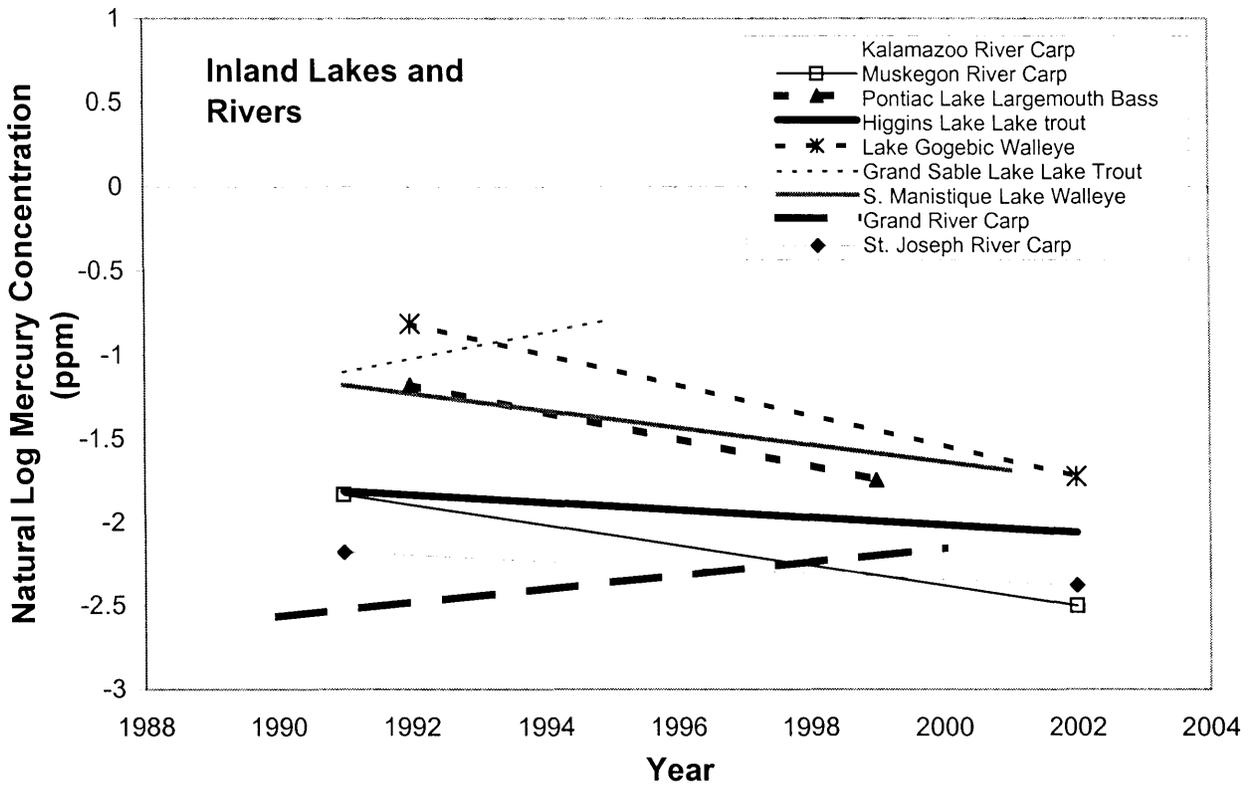


Figure 32. Temporal changes in mercury concentrations at selected whole-fish trend monitoring sites.

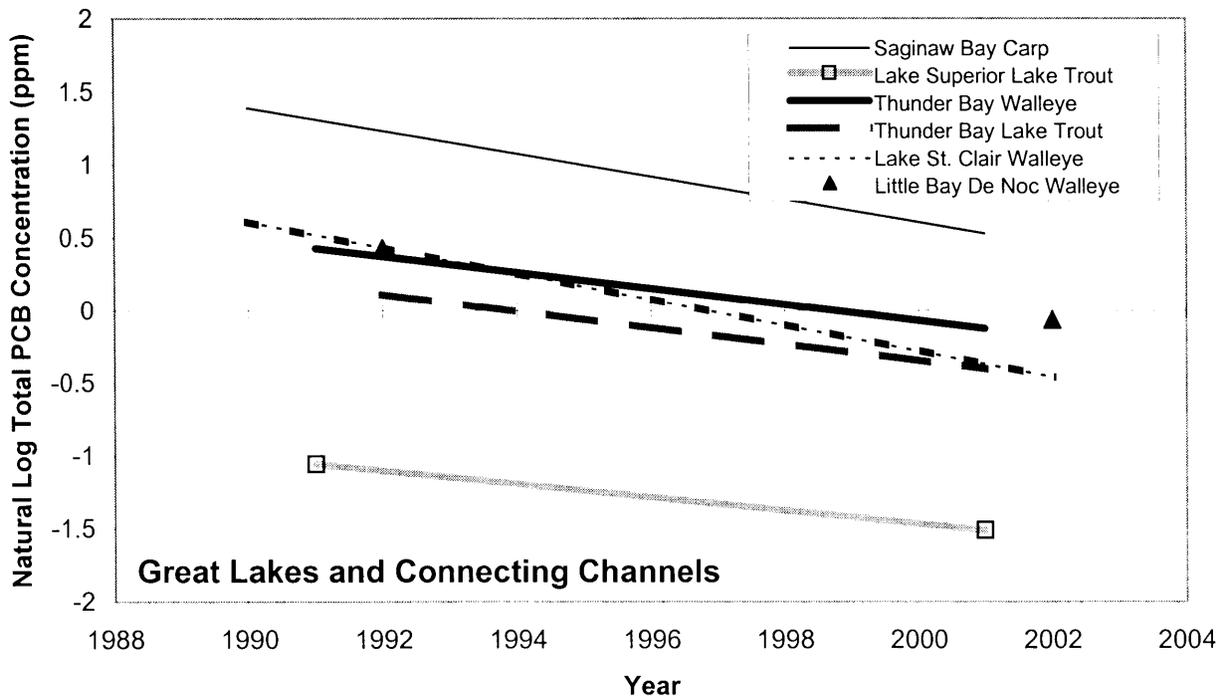
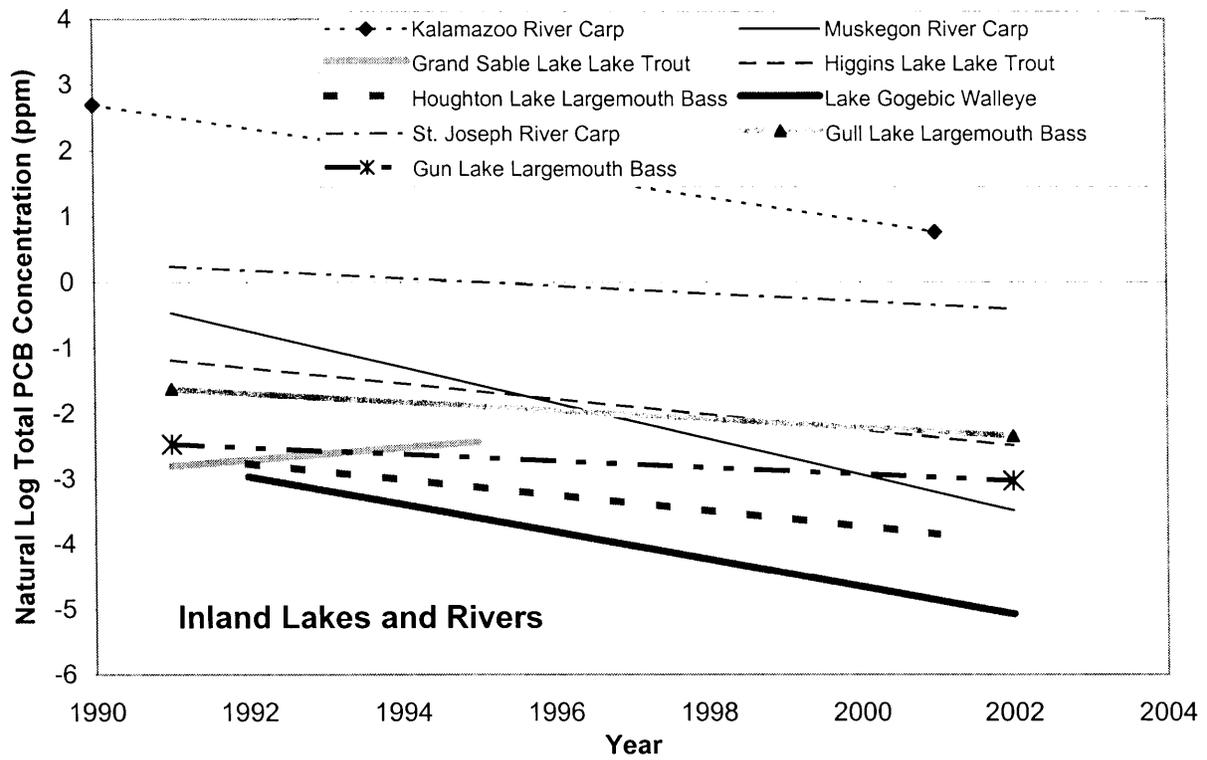


Figure 33. Temporal changes in total PCB concentrations at selected whole-fish trend monitoring sites.

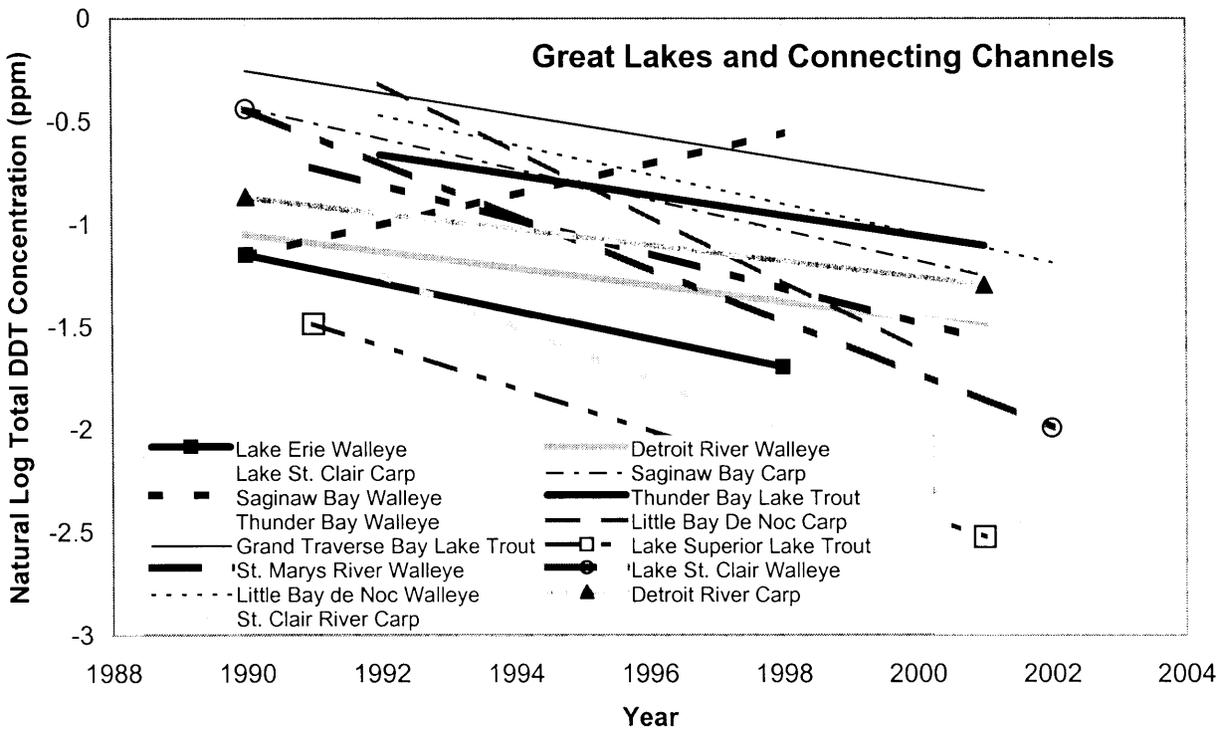
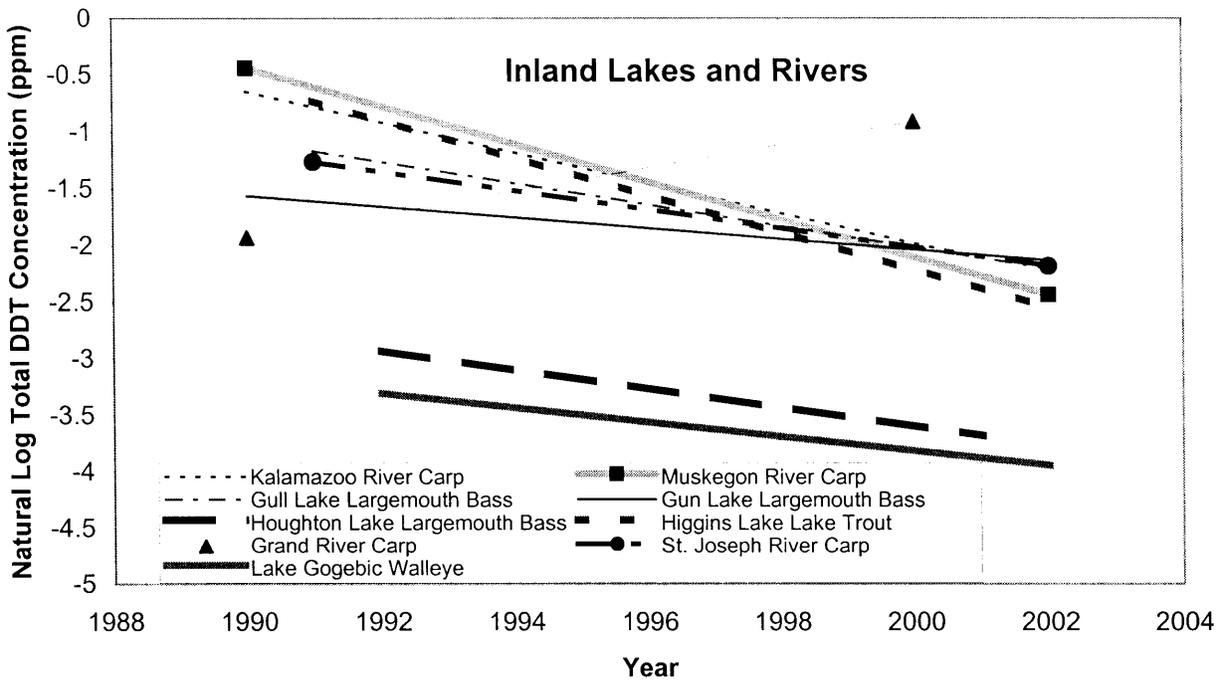


Figure 34. Temporal changes in total DDT concentrations at selected whole-fish trend monitoring sites.

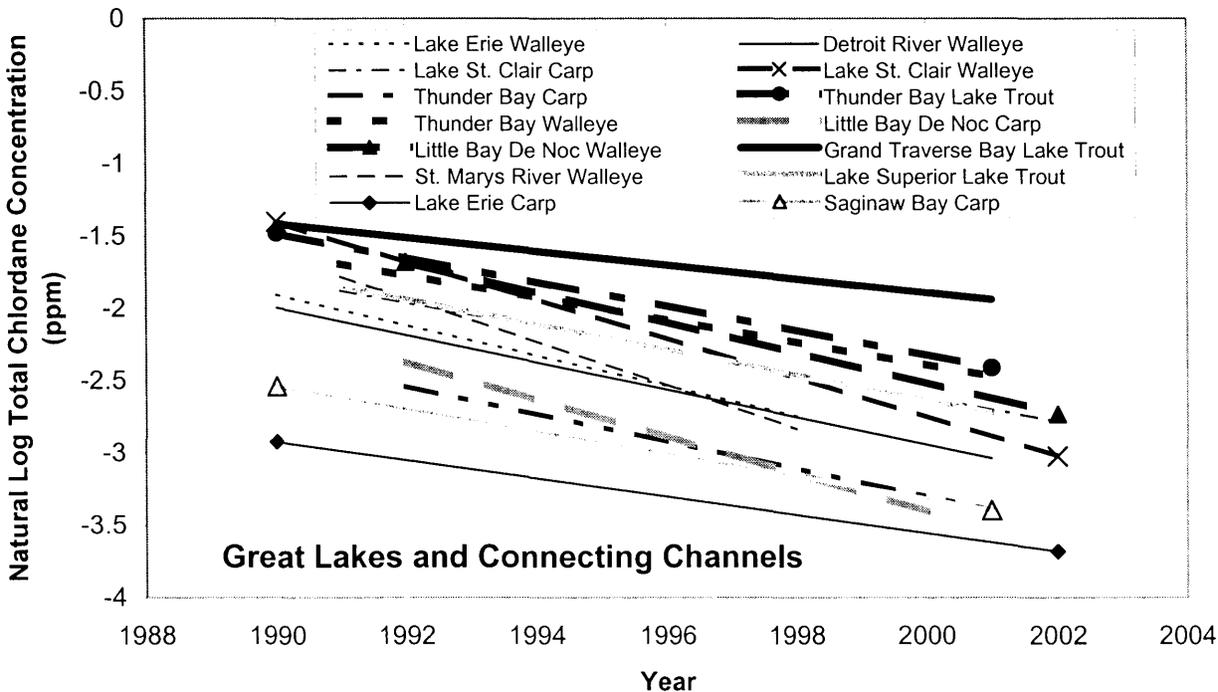
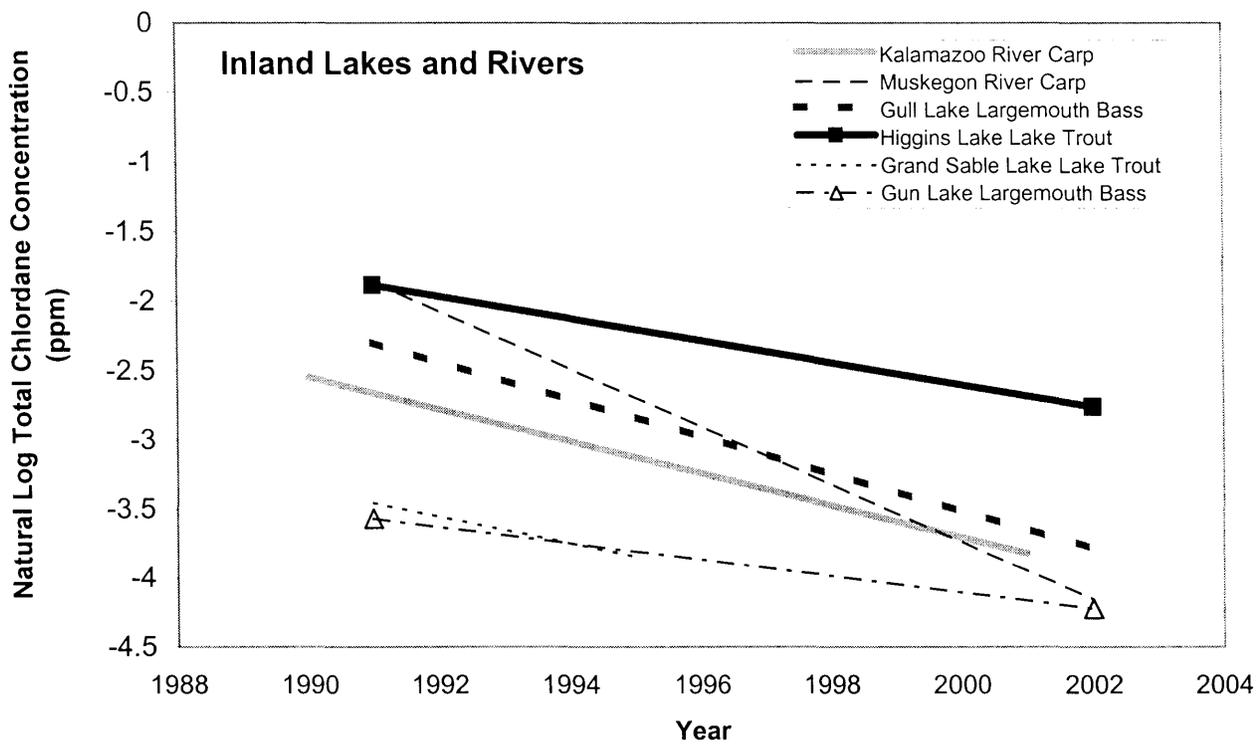


Figure 35. Temporal changes in total chlordane concentrations at selected whole-fish trend monitoring sites.

APPENDIX A

INVENTORY OF FISH CONTAMINANT MONITORING SITES AND SPECIES, 1980-2002

Waterbody	Location	Visit ID#	Date	Species
Adrian Lake	Lenawee County	90007	Jun/13/1990	Carp, Northern Pike
Antoine Lake	Dickinson County	88004	May/24/1988	Largemouth Bass, Smallmouth Bass, Walleye
Arbutus Lake	Grand Traverse County	93066	May/11/1993	Northern Pike
Au Gres River	Au Gres, river mouth	91002	Sep/03/1991	Channel Catfish
Au Sable River	Chase River Road	1998136	Aug/25/1998	Brown Trout, White Sucker
Au Sable River	Oscoda	86037	Jul/31/1986	Carp
Au Sable River	Oscoda	97001	May/21/1997	Carp, Walleye
Au Sable River	Oscoda	1999001	Sep/20/1999	Carp, Walleye
Au Sable River	Oscoda, river mouth	91003	Sep/03/1991	Channel Catfish
Au Sable River	Oscoda, river mouth	96002	Aug/19/1996	Channel Catfish
Au Sable River	Thendara Road	1998144	Sep/08/1998	Brown Trout, White Sucker
Au Sable River, Middle Branch	Alcona County, above Alcona Pond	1998073	May/20/1998	Walleye, White Sucker
Au Sable River, North Branch	Lovells	96003	Sep/10/1996	Brown Trout
Au Sable River, North Branch	Otsego County, Dam #2	88039	Nov/03/1988	Brown Trout
Au Train Basin	Alger County	90060	Aug/30/1990	Northern Pike, Yellow Perch
Au Train Lake	Alger County	87003	Apr/14/1987	Northern Pike, Walleye
Au Train Lake	Alger County	93048	May/11/1993	Northern Pike, Walleye
Austin Lake	Kalamazoo County	93091	May/04/1993	Carp, Largemouth Bass
Bad River	Saginaw County	94034	Aug/30/1994	Channel Catfish, Northern Pike
Barton Lake	Kalamazoo County	91057	Oct/01/1991	Carp, Largemouth Bass, Northern Pike
Bass Lake	Grand Traverse County	95063	Jun/20/1995	Bluegill, Northern Pike, Yellow Perch
Battle Creek River	Battle Creek, Davison St.	91004	Oct/24/1991	Carp, Smallmouth Bass
Bear Lake	Kalkaska County	87036	Jun/24/1987	Brown Trout, Smallmouth Bass
Bear Lake	Muskegon County	86062	Oct/29/1986	Carp, Largemouth Bass, Northern Pike
Bear Lake	Muskegon County	93002	Nov/02/1993	Northern Pike, Walleye
Bear River	Emmet County	1998006	Aug/04/1998	Brown Trout, White Sucker
Beatons Lake	Gogebic County	87005	Apr/28/1987	Largemouth Bass, Rainbow Trout
Beaufort Lake	Baraga County	87039	Jun/17/1987	Northern Pike, Walleye
Beaver Lake	Alpena County	87022	Jun/03/1987	Northern Pike, Smallmouth Bass
Bellaire Lake	Antrim County	87095	Sep/16/1987	Splake, Walleye
Belle River	Marine City	97002	Sep/17/1997	Channel Catfish
Big Blue Lake	Muskegon County	88054	Oct/06/1988	Largemouth Bass, Northern Pike
Big Creek, West Branch	Crawford County, County Road 612	88059	Nov/03/1988	Brown Trout
Big Portage Lake	Jackson County	89042	May/23/1989	Black Crappie, Largemouth Bass, Northern Pike
Big Shag Lake	Marquette County	2001003	May/01/2001	Northern Pike
Bills Lake	Newaygo County	88055	Oct/05/1988	Largemouth Bass, Walleye
Bird Lake	Hillsdale County	87019	May/27/1987	Bluegill, Northern Pike, Yellow Perch
Bishop Lake	Livingston County	87014	May/12/1987	Largemouth Bass, Northern Pike
Bishop Lake	Livingston County	89010	Jun/28/1989	Largemouth Bass, Northern Pike
Black Creek	Lenawee County	91005	Jun/13/1991	Carp
Black Creek	Muskegon County, US-31	87013	May/05/1987	Brown Trout, Carp, White Sucker
Black Lake	Cheboygan County	90052	Feb/01/1989	Lake Sturgeon
Black River	Mouth	2002007	Jul/02/2002	Channel Catfish
Black River	Port Huron, river mouth	93003	Aug/31/1993	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Black River	Sanilac County, Croswell Impoundment	89017	Apr/20/1989	Carp
Black River	South Haven	92016	Aug/25/1992	Carp, Northern Pike
Black River, South Branch	Bangor	89020	Jul/07/1989	Carp, Largemouth Bass, Northern Pike, Rock Bass, White Sucker
Black River, South Branch	Upstream of Bangor Dam	2002106	Sep/23/2002	Carp, Northern Pike, White Sucker
Boardman Lake	Grand Traverse County	91006	Sep/26/1991	Northern Pike, Walleye, White Sucker
Bob Lake	Houghton County	2001134	Oct/03/2001	Walleye
Boston Pond	Houghton County	2000105	Jul/11/2000	White Sucker, Yellow Perch
Boyne River	Charlevoix County	1998011	Aug/05/1998	Brown Trout, White Sucker
Brevoort Lake	Mackinac County	89033	May/01/1989	Rock Bass, Walleye
Bristol Lake	Barry County	2002009	May/15/2002	Largemouth Bass, White Sucker
Burt Lake	Cheboygan County	90061	May/07/1990	Northern Pike, Walleye
Burt Lake	Cheboygan County	2001005	Oct/10/2001	Walleye, White Sucker
Cable Lake	Iron County	88005	May/26/1988	Largemouth Bass, Walleye
Caribou Lake	Chippewa County	86004	May/21/1986	Rock Bass, Walleye
Carney Lake	Dickinson County	89031	May/08/1989	Northern Pike, Walleye
Carp Lake	Chippewa County	87089	Oct/23/1987	Northern Pike, Walleye
Carp River	Carp River Basin	1999003	Aug/20/1999	Brook Trout, Northern Pike
Carp River	Eagle Mills Pump House	88068	Oct/06/1988	Northern Pike, Yellow Perch
Carp River	Eagle Mills Pump House	93074	Jul/23/1993	Brook Trout, Northern Pike
Carp River	M-35	84012	Sep/27/1984	Brook Trout, White Sucker, Yellow Perch
Cary Lake	Branch County	2001140	Oct/02/2001	Largemouth Bass, White Sucker
Cass Lake	Oakland County	91007	Sep/26/1991	Northern Pike, Smallmouth Bass, Walleye
Cass River	Above Caro	88008	May/30/1988	Carp, Northern Pike
Cass River	Bridgeport	85003	Aug/29/1985	Black Bullhead, Channel Catfish
Cass River	Bridgeport	92035	Jul/21/1992	Carp, Channel Catfish, Largemouth Bass, Northern Pike
Cass River	Caro Impoundment	1998019	Oct/27/1998	Carp, Largemouth Bass
Cass River	Saginaw County, Dixie Highway	85039	Jan/31/1985	Carp, Freshwater Drum, Smallmouth Bass
Cass River	Saginaw County, M-13	88025	Aug/02/1988	Channel Catfish
Cass River	Saginaw County, M-13	2002024	Jul/16/2002	Channel Catfish
Cass River	Tuscola County, above Frankenmuth	88009	Jun/07/1988	Redhorse Sucker, Rock Bass, Smallmouth Bass
Cedar Lake	Alcona County	90067	Oct/09/1990	Largemouth Bass, Northern Pike
Cedar River	Antrim County	1998020	Aug/17/1998	Brown Trout, White Sucker
Chaney Lake	Gogebic County	87037	Jun/08/1987	Black Crappie, Northern Pike
Chaney Lake	Gogebic County	93049	Jun/03/1993	Northern Pike, Yellow Perch
Chaney Lake	Gogebic County	1998147	Oct/01/1998	Northern Pike, Walleye
Chaney Lake	Gogebic County	2000003	Apr/26/2000	Northern Pike, Walleye, Yellow Perch
Cheboyganing Creek	Saginaw County	89058	Aug/02/1989	Carp, Northern Pike
Cheboyganing Creek	Saginaw County	94035	Aug/01/1994	Carp
Chicagon Lake	Iron County	86006	May/22/1986	Rock Bass, Smallmouth Bass, Walleye
Chicagon Lake	Iron County	94022	Apr/27/1994	Walleye
Chicagon Lake	Iron County	2001007	Nov/22/2000	Lake Whitefish
Chippewa River	9 Mile Road	2000004	Jul/20/2000	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Chippewa River	Midland County	84007	Sep/08/1984	Black Crappie, Channel Catfish, Redhorse Sucker, Smallmouth Bass, White Sucker
Chippewa River	Midland County, M-20	85005	Jun/08/1985	Carp
Chippewa River	Nature Center	2000005	Jul/25/2000	Channel Catfish
Chippewa River	Nature Center	2000071	Sep/18/2000	Redhorse Sucker
Chippewa River	Nature Center	2002015	Jul/16/2002	Channel Catfish
Chippewa River	Upstream of Lake Isabella, Roland/Drew	97005.2	Aug/13/1997	Rock Bass
Chippewa River	Upstream of Lake Isabella, Wyman Road	97005.1	Aug/13/1997	Carp, White Sucker
Cisco Lake	Gogebic County	88030	Jul/11/1988	Northern Pike, Walleye
Cisco Lake	Gogebic County	1999005	Apr/19/1999	Walleye
Cisco Lake	Gogebic County, Cisco Lake Chain	95031	Aug/14/1995	Bluegill, Walleye
Clark Lake	Jackson	88043	Sep/29/1988	Black Crappie, Largemouth Bass, Rock Bass
Clear Spring Lake	Macomb County	1999088	Sep/20/1999	Largemouth Bass
Clinton River	Mt. Clemens, VFW Hall	2001116	Aug/29/2001	Channel Catfish
Clinton River	Adams Road	2000009	Aug/28/2000	Channel Catfish
Clinton River	Bridgeview Road	1999070	Aug/06/1999	Channel Catfish
Clinton River	Bridgeview Road	2000015	Aug/28/2000	Channel Catfish
Clinton River	Cass Road	1999072	Aug/06/1999	Channel Catfish
Clinton River	Crystal Lake	2000007	Aug/28/2000	Channel Catfish
Clinton River	Harris Lake	1999074	Aug/06/1999	Channel Catfish
Clinton River	M-97	2000012	Aug/28/2000	Channel Catfish
Clinton River	Macomb Co above Utica, Avon Road	86044	Aug/26/1986	Carp, Walleye
Clinton River	Macomb County above I-94 overpass	83003	Apr/15/1983	Carp, Walleye, White Sucker
Clinton River	Macomb County above I-94 overpass	97007	Sep/17/1997	Channel Catfish
Clinton River	Macomb County above I-94 overpass	1999071	Aug/06/1999	Channel Catfish
Clinton River	Macomb County above I-94 overpass	2000014	Aug/28/2000	Channel Catfish
Clinton River	Macomb County, Mt. Clemens	83045	Apr/26/1983	Carp
Clinton River	Macomb County, Mt. Clemens	86015	Jun/16/1986	Carp, Largemouth Bass, Smallmouth Bass, Walleye
Clinton River	Moravian/Belleview Road	2000013	Aug/28/2000	Channel Catfish
Clinton River	Mt. Clemens, City Park	2001115	Aug/29/2001	Channel Catfish
Clinton River	Mt. Clemens, Firehouse	2001117	Aug/29/2001	Channel Catfish
Clinton River	Mt. Clemens, Market Street	97006	Sep/17/1997	Channel Catfish
Clinton River	Mt. Clemens, river mouth	89023.1	Aug/29/1989	Channel Catfish
Clinton River	Mt. Clemens, river mouth	92003.1	Aug/17/1992	Channel Catfish
Clinton River	Mt. Clemens, river mouth	96005	Aug/20/1996	Channel Catfish
Clinton River	Mt. Clemens, river mouth	97008	Sep/17/1997	Channel Catfish
Clinton River	Mt. Clemens, river mouth	1999069	Aug/06/1999	Channel Catfish
Clinton River	Mt. Clemens, river mouth	2000016	Aug/28/2000	Channel Catfish
Clinton River	Opdyke Road	2000008	Aug/28/2000	Channel Catfish
Clinton River	Ryan Road, Utica	84014	Sep/23/1984	Carp, White Sucker
Clinton River	Ryan Road, Utica	94003	May/25/1994	Carp, Rock Bass, White Sucker
Clinton River	Ryan Road, Utica	1999073	Aug/06/1999	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Clinton River	Spillway Mouth	89023.2	Aug/29/1989	Channel Catfish
Clinton River	Spillway Mouth	92003.2	Aug/17/1992	Channel Catfish
Clinton River, North Branch	Macomb County	96006	Jun/17/1996	Rock Bass, Smallmouth Bass
Coldwater Lake	Branch County	88061	Oct/31/1988	Largemouth Bass, Northern Pike, Rock Bass
Coldwater Lake	Branch County	93067	Oct/04/1993	Largemouth Bass, Northern Pike
Coldwater Lake	Branch County	94019	Apr/12/1994	Bluegill, Largemouth Bass, Northern Pike
Coldwater Lake	Isabella County	89061	Aug/09/1989	Largemouth Bass, Walleye
Coldwater River	Brown Road	1998021	Jul/14/1998	White Sucker
Craig Lake	Baraga County	89074	Aug/23/1989	Walleye
Craig Lake	Baraga County	91028	Jun/04/1991	Northern Pike, Walleye
Crego Park Pond	Lansing	86033	Jul/29/1986	Black bullhead, Bluegill, Goldfish
Crooked Lake	Emmet County	89057	Jun/04/1989	Largemouth Bass, Walleye
Crystal Lake	Benzie County	89077	Aug/01/1989	Brown Trout, Lake Trout, Yellow Perch
Crystal Lake	Benzie County	97061	Jul/23/1997	Lake Trout, White Sucker
Crystal Lake	Benzie County	2000017	Sep/06/2000	Lake Trout, White Sucker
Dead River	Forestville Basin	96007	Jun/06/1996	Smallmouth Bass, Walleye
Dead River	Forestville Basin	97075	Sep/08/1997	Smallmouth Bass, Walleye
Deer Lake	Marquette County	84011	Oct/09/1984	Northern Pike, White Sucker, Yellow Perch
Deer Lake	Marquette County	87099	Oct/26/1987	Brown Bullhead, Northern Pike, Walleye, Yellow Perch
Deer Lake	Marquette County	88067	Oct/06/1988	Brook Trout, Northern Pike, Yellow Perch
Deer Lake	Marquette County	91032	Nov/02/1990	Walleye
Deer Lake	Marquette County	93083	Sep/14/1993	Northern Pike, Walleye
Deer Lake	Marquette County	96008	Oct/02/1996	Walleye
Deer Lake	Marquette County	97070	Oct/02/1997	Northern Pike, Walleye, Yellow Perch
Deer Lake	Marquette County	1998024	Oct/09/1998	Northern Pike, Walleye, Yellow Perch
Deer Lake	Marquette County	1999006	May/04/1999	Northern Pike, Walleye, Yellow Perch
Deer Lake	Marquette County	2001008	May/01/2001	Northern Pike, Walleye, Yellow Perch
Deer Lake	Marquette County	2003161	Sep/16/2003	Northern Pike, Walleye
Detroit River	Belle Isle	85009	Jun/19/1985	Carp
Detroit River	Belle Isle	90031	Aug/27/1990	Freshwater Drum, Walleye
Detroit River	Fighting Island	86063	Jun/03/1986	Carp
Detroit River	Gibraltar Bay	86011	Jun/03/1986	Carp
Detroit River	Grassy Island	85010	Jun/19/1985	Carp
Detroit River	Grassy Island	86064	Jun/03/1986	Walleye
Detroit River	Grassy Island	90033	Aug/28/1990	Carp, Walleye
Detroit River	Grassy Island	92033	Aug/17/1992	Carp, Walleye
Detroit River	Grassy Island	94018	Aug/25/1994	Carp
Detroit River	Grassy Island	94050	Aug/25/1994	Carp, Walleye
Detroit River	Grassy Island	96009	Jul/12/1996	Carp, Walleye
Detroit River	Grassy Island	1998025	Sep/22/1998	Carp, Walleye
Detroit River	Grassy Island	2001009	Oct/18/2001	Carp, Walleye
Detroit River	Grassy Island	2001010	Oct/30/2001	Walleye
Detroit River	Michigan waters	93068	Apr/01/1993	Lake Sturgeon

Waterbody	Location	Visit ID#	Date	Species
Detroit River	Trenton Channel	90032	Aug/30/1990	Carp, Freshwater Drum, Walleye
Detroit River	Trenton Channel	93020	Sep/01/1993	Freshwater Drum, Northern Pike, Redhorse Sucker, Yellow Perch
Detroit River	Wyandotte	1999007	Oct/29/1999	Walleye
Dowagiac Creek	Dutch Settlement Road	1998027	Sep/02/1998	Brown Trout, White Sucker
Dowagiac River	Cass County, M-51	91008	Jul/18/1991	Carp
Dowagiac River	Cass County, Sink Road	2000020	Sep/18/2000	Carp
Duck Creek	Gogebic County	1998135	Jun/04/1998	Brook Trout, White Sucker
Duck Lake	Calhoun County	94011	May/23/1994	Bluegill, Largemouth Bass, Redear Sunfish, Walleye, Yellow Perch
Duck Lake	Gogebic County	86029	Jul/08/1986	Northern Pike, Rock Bass, Walleye
Duck Lake	Gogebic County	1999009	Apr/22/1999	Walleye
Echo Lake	Grand Isle, Alger County	95060	Jun/21/1995	Northern Pike, Yellow Perch
Elk Lake	Grand Traverse/Antrim County	90023	Sep/12/1990	Lake Trout
Elk Lake	Grand Traverse/Antrim County	96059	Dec/01/1996	Lake Trout
Elk Lake	Grand Traverse/Antrim County	97076	Dec/30/1997	Lake Trout
Ellsworth Lake	Antrim County	85065	Nov/27/1985	Bluegill, Largemouth Bass, Northern Pike, Rock Bass, Yellow Perch
Ellsworth Lake	Antrim County	86009	May/28/1986	Largemouth Bass, Northern Pike, White Sucker
Ellsworth Lake	Antrim County	94063	Jun/09/1994	Brown Bullhead, Largemouth Bass, White Sucker
Emily Lake	Iron County	88006	May/25/1988	Largemouth Bass, Walleye
Erickson Power Plant Pond	Eaton County	86003	May/14/1986	Brown Bullhead, Sunfish, Yellow Perch
Escanaba River	Delta County, between Dams 1 & 2	88047	Oct/04/1988	Northern Pike, White Sucker
Escanaba River	Delta County, between Dams 1 & 2	90071	Nov/13/1990	Northern Pike, White Sucker
Escanaba River	Delta County, between Dams 1 & 2	93075	Aug/12/1993	Northern Pike, Yellow Perch
Escanaba River	Delta County, Dam 3	85029	Jun/26/1985	Rock Bass
Escanaba River	Escanaba, river mouth	86065	Jul/30/1986	Walleye
Escanaba River	Escanaba, river mouth	93032	Jun/02/1993	Carp
Escanaba River	Escanaba, river mouth	93040	Jun/30/1993	Channel Catfish
Escanaba River	Greenwood Reservoir	92045	Jul/30/1992	Black Crappie, Largemouth Bass, Northern Pike
Escanaba River	Greenwood Reservoir	1999077	May/04/1999	Northern Pike
Fawn River	St. Joseph County, Stubey Road	90016	Jul/18/1990	Carp, Redhorse Sucker, Smallmouth Bass, White Sucker
Fawn River	St. Joseph County, Stubey Road	2000021	Sep/06/2000	Redhorse Sucker, Rock Bass
Fenner Lake	Allegan County	92072	Aug/04/1992	Carp, Largemouth Bass
First Sister Lake	Washtenaw County	94062.2	Sep/20/1994	Brown Bullhead, White Crappie
Fish Lake	Barry County	91034	Sep/04/1991	Largemouth Bass, Northern Pike
Fish Lake	Marquette County	88046	Oct/04/1988	Largemouth Bass, Northern Pike, Sunfish, Yellow Perch
Five Lakes	Clare County	91009	Apr/16/1991	Largemouth Bass, Northern Pike
Flat River	Fallasberg Park	1998035	Oct/27/1998	Carp
Flat River	Ingalls Road	1998037	Jul/30/1998	Rock Bass
Flat River	Long Lake Road	1998036	Jul/30/1998	Rock Bass
Flat River	Lowell	2001017	Jul/23/2001	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Flint River	Birch Run Road	93005	Aug/30/1993	Carp
Flint River	Flushing	1998038	Oct/08/1998	Carp, Smallmouth Bass
Flint River	Genessee County, Elms Road	85030	Jun/17/1985	Black Crappie, Carp, Walleye
Flint River	Holloway Reservoir	89041	May/18/1989	Black Crappie, Channel Catfish, Largemouth Bass, Smallmouth Bass
Flint River	Mott Reservoir	96011	Apr/16/1996	Carp, Walleye
Flint River	Saginaw County, river mouth	88022	Aug/02/1988	Channel Catfish
Flint River	Saginaw County, river mouth	2002023	Jul/16/2002	Channel Catfish
Fortune Lake	Iron County	90012	May/29/1990	Largemouth Bass, Smallmouth Bass
Four Mile Lake	Washtenaw County	2000022	May/12/2000	Northern Pike
Fremont Lake	Newaygo County	90062	Oct/26/1990	Carp
Fumee Lake	Dickinson County	90011	May/25/1990	Smallmouth Bass
Galien River	Mouth	2002031	Aug/02/2002	Channel Catfish
Galien River	New Buffalo	92017	Aug/06/1992	Carp, Largemouth Bass, Rock Bass
Glen Lake	Leelanau County	90053	Oct/18/1990	Lake Trout, Smallmouth Bass
Goose Lake	Marquette County	88045	Oct/06/1988	Northern Pike, Walleye, Yellow Perch
Goose Lake	Marquette County	2001011	May/01/2001	Northern Pike, Walleye, Yellow Perch
Grand Lake	Presque Isle County	95015	May/22/1995	Rock Bass, Smallmouth Bass, Walleye
Grand River	Below Jackson, Thompkins Road	2001014	Jul/23/2001	Channel Catfish
Grand River	Below Lansing, Clintonia Road	2001016	Jul/23/2001	Channel Catfish
Grand River	Clinton County, State Road	83053	May/11/1983	Carp, Largemouth Bass, Smallmouth Bass, Yellow Bullhead
Grand River	Clinton County, State Road	84006	Aug/29/1984	Carp, Largemouth Bass, Smallmouth Bass
Grand River	Clinton County, State Road	85004	Jul/24/1985	Carp
Grand River	Clinton County, State Road	90022	Sep/06/1990	Carp, Largemouth Bass, Smallmouth Bass
Grand River	Eaton Rapids, Gale Road/Waverly Road	2001021	Oct/03/2001	Carp, Largemouth Bass, Walleye, White Sucker
Grand River	Grand Haven, river mouth	86039	Aug/04/1986	Carp, Largemouth Bass, Walleye
Grand River	Grand Haven, river mouth	90018	Sep/04/1990	Channel Catfish
Grand River	Grand Haven, river mouth	93036	Jun/09/1993	Carp
Grand River	Grand Haven, river mouth	93043	Jul/01/1993	Channel Catfish
Grand River	Grand Haven, river mouth	2001020	Jul/23/2001	Channel Catfish
Grand River	Grand Rapids, below 6th Street dam	1998148	Mar/05/1998	Northern Pike, Redhorse Sucker, Walleye
Grand River	Jackson County, Maple Grove Road	90021	Aug/14/1990	Carp, Walleye
Grand River	Jackson, above Jackson WWTP	90025	Sep/05/1990	Channel Catfish
Grand River	Jackson, below Jackson WWTP	90024	Aug/08/1990	Channel Catfish
Grand River	Kent County, above 6th St. Dam	90030	Aug/22/1990	Carp
Grand River	Kent County, above 6th St. Dam	92053	Oct/01/1992	Carp

Waterbody	Location	Visit ID#	Date	Species
Grand River	Kent County, above 6th St. Dam	94002	Jun/23/1994	Carp
Grand River	Kent County, above 6th St. Dam	1999011	Mar/17/1999	Northern Pike
Grand River	Kent County, above 6th St. Dam	2000024	Oct/25/2000	Carp
Grand River	Kent County, below Grand Rapids	90029	Aug/23/1990	Carp
Grand River	Kent County, below Grand Rapids	91036	Mar/20/1991	Walleye
Grand River	M-21	2001018	Jul/23/2001	Channel Catfish
Grand River	Maple Grove Road	2002113	Oct/03/2002	Northern Pike
Grand River	Moore's River Impoundment	89054	Jul/27/1989	Channel Catfish, Largemouth Bass, Northern Pike, Smallmouth Bass, Walleye
Grand River	Moore's River Impoundment	96013	May/07/1996	Carp, Largemouth Bass
Grand River	Portland Impoundment	92051	Oct/01/1992	Carp
Grand River	Upstream Jackson, Reed Road	2001013	Jul/23/2001	Channel Catfish
Grand River	Upstream Knapp St. Bridge	96058	Aug/15/1996	Unionidae
Grand River	Upstream M-21	96057	Aug/15/1996	Unionidae
Grand Sable Lake	Alger County	87088	Oct/22/1987	Lake Trout, Northern Pike
Grand Sable Lake	Alger County	91010	May/20/1991	Lake Trout
Grand Sable Lake	Alger County	93006	Jun/01/1993	Lake Trout
Grand Sable Lake	Alger County	95047	Sep/07/1995	Lake Trout
Gratiot Lake	Keweenaw County	87038	Jan/01/1987	Rock Bass, Smallmouth Bass
Green Lake	Grand Traverse County	93065	May/11/1993	Northern Pike, White Sucker
Gull Lake	Kalamazoo County	89073	Nov/01/1989	Largemouth Bass, Northern Pike
Gull Lake	Kalamazoo County	91058	Sep/12/1991	Largemouth Bass
Gull Lake	Kalamazoo County	93063	Jun/10/1993	Largemouth Bass
Gull Lake	Kalamazoo County	93064	Jun/10/1993	Largemouth Bass, Northern Pike
Gull Lake	Kalamazoo County	95035	Jun/01/1995	Largemouth Bass
Gull Lake	Kalamazoo County	97011	Jun/15/1997	Largemouth Bass
Gull Lake	Kalamazoo County	2000025	Jul/11/2000	Largemouth Bass
Gull Lake	Kalamazoo County	2002034	Jun/30/2002	Largemouth Bass
Gulliver Lake	Schoolcraft County	90015	May/15/1990	Northern Pike, Smallmouth Bass, Walleye
Gun Lake	Barry County	90006	Jul/01/1990	Largemouth Bass
Gun Lake	Barry County	92066	Jun/15/1992	Largemouth Bass
Gun Lake	Barry County	94023	Jul/17/1994	Largemouth Bass
Gun Lake	Barry County	97012	Jul/17/1997	Largemouth Bass
Gun Lake	Barry County	2000026	Jul/25/2000	Largemouth Bass
Gun Lake	Barry County	2002035	Jun/06/2002	Largemouth Bass
Hagerman Lake	Iron County	88050	Oct/12/1988	Smallmouth Bass, Walleye
Hamilton Lake	Dickinson County	94024	Apr/19/1994	Northern Pike, Walleye
Hamlin Lake	Mason County	90070	Feb/05/1991	Black Crappie, Northern Pike
Hawk Lake	Oakland County	90004	May/01/1990	Brown Bullhead, Northern Pike
Heron Lake	Oakland County	2000027	Jul/08/2000	Largemouth Bass
Hersey River	Osceola County, Diamond Road	85035	May/15/1985	Brown Trout, White Sucker
Hersey River	Osceola County, Reed City	86013	Jun/09/1986	Brown Trout, Northern Pike, White Sucker
Hersey River	Osceola County, Reed City	1998041	Jul/08/1998	Brown Trout

Waterbody	Location	Visit ID#	Date	Species
Hess Lake	Newaygo County	97062	Aug/26/1997	Carp, Largemouth Bass, Mirror Carp
Higgins Lake	Roscommon County	88038	Oct/27/1988	Brown Trout, Lake Herring, Lake Trout
Higgins Lake	Roscommon County	91001	May/02/1991	Lake Trout
Higgins Lake	Roscommon County	95057.1	Oct/31/1995	Lake Herring, Lake Trout
Higgins Lake	Roscommon County	95057.2	Oct/31/1995	Lake Trout
Higgins Lake	Roscommon County	97013	Oct/22/1997	Lake Trout, Yellow Perch
Higgins Lake	Roscommon County	1998042	Nov/25/1998	Lake Trout
Higgins Lake	Roscommon County	2000028	Oct/11/2000	Lake Trout
Higgins Lake	Roscommon County	2002037	Oct/02/2002	Lake Trout
Hopkins Lake	Shiawassee County	91033	Sep/04/1991	Largemouth Bass
Houghton Lake	Roscommon County	87063	Aug/05/1987	Carp, Northern Pike, Walleye
Houghton Lake	Roscommon County	92037	Jun/13/1992	Largemouth Bass
Houghton Lake	Roscommon County	93050	Jun/01/1993	Walleye
Houghton Lake	Roscommon County	94006	Jun/07/1994	Largemouth Bass
Houghton Lake	Roscommon County	1998126	Jun/16/1998	Largemouth Bass
Houghton Lake	Roscommon County	1998127	Jun/16/1998	Carp
Houghton Lake	Roscommon County	2001026	Oct/11/2001	Largemouth Bass
Hubbard Lake	Alcona County	89076	Oct/16/1989	Northern Pike, Walleye
Hudson Lake	Lenawee County	89003	Apr/03/1989	Carp, Muskellunge, Northern Pike
Hudson Lake	Lenawee County	2000032	Jul/21/2000	Carp, Largemouth Bass
Huron River	Barton Pond	92021	May/07/1992	Carp, Smallmouth Bass
Huron River	Belleville Lake	88003	May/10/1988	Carp, Walleye
Huron River	Belleville Lake	1999014	May/19/1999	Carp, Gizzard Shad, Walleye, White Sucker
Huron River	Downstream Belleville Lake	2002041	Aug/20/2002	Channel Catfish
Huron River	Downstream Ford Lake	2002040	Aug/20/2002	Channel Catfish
Huron River	Ford Lake	83002	Sep/12/1983	Black Crappie, Brown Bullhead, Carp, Largemouth Bass, Walleye, White Sucker
Huron River	Ford Lake	89026	May/02/1989	Black Crappie, Walleye
Huron River	Ford Lake	92020	May/05/1992	Carp, Walleye
Huron River	Ford Lake	1999015	May/19/1999	Black Crappie, Carp, Channel Catfish, Walleye
Huron River	Rockwood, river mouth	91012	Sep/06/1991	Channel Catfish
Huron River	Rockwood, river mouth	96015	Aug/20/1996	Channel Catfish
Huron River	Rockwood, river mouth	2002042	Aug/20/2002	Channel Catfish
Huron River	Upstream Dexter	2002039	Aug/20/2002	Channel Catfish
Huron River	Wayne County, Flat Rock	83043	Apr/21/1983	Carp
Intermediate Lake	Antrim County	90044	Sep/19/1990	Rock Bass, Smallmouth Bass, Walleye
Iron River	Above Wild River Road	1998045	Jun/04/1998	Brown Trout
Jordan Lake	Ionia/Barry County	89047	Jun/21/1989	Largemouth Bass
Kalamazoo River	Above Otsego City Dam	93073.3	Oct/11/1993	Walleye
Kalamazoo River	Above Otsego City Dam	1999085	Oct/13/1999	Carp, Smallmouth Bass
Kalamazoo River	Above Otsego City Dam	1999096	Sep/08/1999	Channel Catfish
Kalamazoo River	Above Otsego City Dam	2001049	Sep/20/2001	Carp, Smallmouth Bass
Kalamazoo River	Below Lake Allegan Dam	1999020	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Otsego Dam	1999023	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Trowbridge Dam, 26th St. Bridge	1999022	Sep/08/1999	Channel Catfish
Kalamazoo River	Ceresco (12 Mile Road)	1999099	Sep/08/1999	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Kalamazoo River	Ceresco (12 Mile Road)	2000114	Oct/04/2000	Channel Catfish
Kalamazoo River	Ceresco Impoundment, 12 Mile Road	1999082	Oct/07/1999	Carp, Smallmouth Bass
Kalamazoo River	Ceresco Impoundment, 12 Mile Road	2000120	Sep/21/2000	Carp, Smallmouth Bass
Kalamazoo River	Ceresco Impoundment, 12 Mile Road	2001042	Oct/11/2001	Carp, Smallmouth Bass
Kalamazoo River	Ceresco Impoundment, 15 Mile Road	87048	Jul/22/1987	Carp, Largemouth Bass, Smallmouth Bass
Kalamazoo River	City of Allegan Dam	1999092	Nov/09/1999	Carp, Smallmouth Bass
Kalamazoo River	City of Allegan Dam	2001052	Sep/17/2001	Carp, Smallmouth Bass
Kalamazoo River	City of Allegan, M-89	1999021	Sep/08/1999	Channel Catfish
Kalamazoo River	D-Avenue	2000112	Oct/04/2000	Channel Catfish
Kalamazoo River	D-Avenue	2000123	Aug/31/2000	Carp, Smallmouth Bass
Kalamazoo River	Galesburg, 35th St. Bridge	1999098	Sep/08/1999	Channel Catfish
Kalamazoo River	Kalamazoo Avenue	2000113	Oct/04/2000	Channel Catfish
Kalamazoo River	Kalamazoo Avenue	2000122	Aug/29/2000	Carp, Northern Pike, Rock Bass, Smallmouth Bass
Kalamazoo River	Kalamazoo Lake	83008	Jul/01/1984	Carp
Kalamazoo River	Kalamazoo Lake	85054	Jul/01/1985	Carp, Largemouth Bass, Smallmouth Bass
Kalamazoo River	Kalamazoo Lake	86027	Jul/09/1986	Carp, Largemouth Bass
Kalamazoo River	Kalamazoo Lake	87010	Mar/31/1987	Black Crappie, Bluegill, Brown Trout, Channel Catfish, Fith. Catfish, Freshwater Drum, Largemouth Bass, N. Pike Eggs, Northern Pike, Rainbow Trout, Rock Bass, Walleye, White Sucker, Yellow Perch
Kalamazoo River	Kalamazoo Lake	87046	Jul/13/1987	Carp
Kalamazoo River	Kalamazoo Lake	93035	Jun/08/1993	Carp
Kalamazoo River	Kalamazoo Lake	93073.6	Oct/09/1993	Walleye
Kalamazoo River	Kalamazoo Lake	1999095	Oct/19/1999	Brown Trout, Carp, Smallmouth Bass
Kalamazoo River	Kalamazoo Lake	2001055	Oct/03/2001	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Lake Allegan	83007	Jul/01/1983	Carp
Kalamazoo River	Lake Allegan	83034	May/01/1983	Largemouth Bass, Sunfish
Kalamazoo River	Lake Allegan	83046	May/12/1983	Carp
Kalamazoo River	Lake Allegan	85053	Jul/01/1985	Carp, Largemouth Bass, Smallmouth Bass
Kalamazoo River	Lake Allegan	86026	Jul/07/1986	Carp
Kalamazoo River	Lake Allegan	87045	Jul/14/1987	Carp, Northern Pike, Smallmouth Bass
Kalamazoo River	Lake Allegan	90050	Oct/11/1990	Carp
Kalamazoo River	Lake Allegan	90073	Oct/11/1990	Carp
Kalamazoo River	Lake Allegan	92018	Oct/27/1992	Carp
Kalamazoo River	Lake Allegan	92019	Oct/27/1992	Carp
Kalamazoo River	Lake Allegan	93073.1	Sep/16/1993	Walleye
Kalamazoo River	Lake Allegan	94012	Jun/22/1994	Carp
Kalamazoo River	Lake Allegan	94025	Jun/22/1994	Carp
Kalamazoo River	Lake Allegan	97016	Aug/28/1997	Carp
Kalamazoo River	Lake Allegan	1999016	Aug/05/1999	Carp
Kalamazoo River	Lake Allegan	1999087	Oct/05/1999	Carp, Channel Catfish, Smallmouth Bass

Waterbody	Location	Visit ID#	Date	Species
Kalamazoo River	Lake Allegan	2000110	Jan/04/2000	Channel Catfish
Kalamazoo River	Lake Allegan	2000124	Sep/18/2000	Black Crappie, Carp, Largemouth Bass, Smallmouth Bass, Walleye
Kalamazoo River	Lake Allegan	2001053	Aug/23/2001	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Lake Allegan	2001056	Aug/23/2001	Carp
Kalamazoo River	Morrow Pond	85049	Jul/01/1985	Carp, Largemouth Bass, Smallmouth Bass
Kalamazoo River	Morrow Pond	86022	Jul/07/1986	Carp
Kalamazoo River	Morrow Pond	87043	Jul/14/1987	Carp, Smallmouth Bass
Kalamazoo River	Morrow Pond	93073.2	Oct/15/1993	Walleye
Kalamazoo River	Morrow Pond	1999083	Jul/28/1999	Carp, Smallmouth Bass
Kalamazoo River	Morrow Pond	2001043	Aug/17/2001	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Mosel Avenue	83006	Jul/01/1983	Carp
Kalamazoo River	Mosel Avenue	85051	Jul/01/1985	Carp, Smallmouth Bass
Kalamazoo River	Mosel Avenue	86024	Jul/07/1986	Carp
Kalamazoo River	Mosel Avenue	93073.5	Oct/15/1993	Walleye
Kalamazoo River	Mosel Avenue	2001046	Sep/25/2001	Smallmouth Bass
Kalamazoo River	New Richmond	93073.4	Sep/21/1993	Walleye
Kalamazoo River	New Richmond	1999094	Nov/18/1999	Carp, Channel Catfish, Largemouth Bass, Smallmouth Bass
Kalamazoo River	New Richmond	2001054	Oct/16/2001	Carp, Flathead Catfish, Smallmouth Bass
Kalamazoo River	Otsego Dam Impoundment	1999086	Oct/29/1999	Carp, Smallmouth Bass
Kalamazoo River	Otsego Dam Impoundment	2001050	Sep/18/2001	Carp, Smallmouth Bass
Kalamazoo River	Plainwell Dam Reservoir	83005	Jul/01/1983	Carp
Kalamazoo River	Plainwell Dam Reservoir	85052	Jul/01/1985	Carp, Smallmouth Bass
Kalamazoo River	Plainwell Dam Reservoir	86025	Jul/08/1986	Carp
Kalamazoo River	Plainwell Dam Reservoir	87044	Jul/14/1987	Carp
Kalamazoo River	Plainwell Dam Reservoir	1999084	Oct/12/1999	Carp, Smallmouth Bass
Kalamazoo River	Plainwell Dam Reservoir	2001048	Sep/05/2001	Carp, Smallmouth Bass
Kalamazoo River	Plainwell, M-89	2000111	Oct/04/2000	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	90019	Aug/07/1990	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	93044	Jul/01/1993	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	96016	Aug/21/1996	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	1999019	Sep/08/1999	Channel Catfish
Kalamazoo River	Trowbridge Dam Impoundment	1999093	Nov/03/1999	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Trowbridge Dam Impoundment	2001051	Oct/09/2001	Carp, Smallmouth Bass
Kalamazoo River	Trowbridge Dam Impoundment	2003142	Aug/18/2003	Carp, Smallmouth Bass
Kalamazoo River, South Branch	Hillsdale County	1998103	Apr/22/1998	White Sucker
Kawkawlin River	Bay County, M-247	88027	Aug/04/1988	Carp, Northern Pike
Kawkawlin River	Route 13 (S. Huron Road)	2001127	Jul/23/2001	Channel Catfish
Kawkawlin River	Wheeler Road	2001128	Jul/23/2001	Channel Catfish
Kearsley Creek	Kearsley Reservoir	2000029	Jul/07/2000	Carp, Largemouth Bass
Kent Lake	Oakland County	90017	Jul/18/1990	Black Crappie, Largemouth Bass, Smallmouth Bass, Walleye

Waterbody	Location	Visit ID#	Date	Species
Kent Lake	Oakland County	1998050	Jul/27/1998	Carp, Largemouth Bass, Smallmouth Bass
Klinger Lake	St. Joseph County	90034	Oct/02/1990	Largemouth Bass
Klinger Lake	St. Joseph County	2001145	Aug/22/2001	Largemouth Bass
Lake 27	Otsego County	95033	Jun/10/1995	Northern Pike
Lake Ann	Benzie County	89013	May/31/1989	Northern Pike, Smallmouth Bass
Lake Charlevoix	Charlevoix County	90051	Nov/01/1990	Brown Trout, Lake Trout
Lake Erie	Brest Bay	90003	Apr/09/1990	Carp, Walleye
Lake Erie	Brest Bay	92026	Apr/10/1992	Carp, Walleye
Lake Erie	Brest Bay	92062	Oct/15/1992	Walleye
Lake Erie	Brest Bay	94026	Apr/19/1994	Carp, Walleye
Lake Erie	Brest Bay	97017	Apr/21/1997	Carp
Lake Erie	Brest Bay	1998051	Apr/15/1998	Carp, Walleye
Lake Erie	Brest Bay	2002044	Apr/26/2002	Carp
Lake Erie	Huron River, Flat Rock	84050	Jan/01/1984	Coho
Lake Erie	Huron River, Flat Rock	97018	Oct/17/1997	Chinook, Steelhead
Lake Erie	N. Maumee Bay	95008	Apr/26/1995	Carp
Lake Erie	Off Monroe	86002	Apr/22/1986	Carp, Channel Catfish, Walleye
Lake Erie	Off Monroe	87093	Oct/20/1987	Walleye
Lake Erie	Off Monroe	94027	Apr/19/1994	Walleye
Lake Erie	Off Monroe	95040	Apr/26/1995	Freshwater Drum, White Bass, White Perch
Lake Erie	Off Monroe	2000030	Apr/04/2000	Carp
Lake Erie	Western Basin	93082	Apr/01/1993	Carp, Channel Catfish, Gizzard Shad, White Bass, Yellow Perch
Lake Erie	Western Basin	95058	Oct/11/1995	Walleye
Lake Erie	Western Basin	97019	Apr/15/1997	Lake Whitefish, Smallmouth Bass, Yellow Perch
Lake Erie	Western Basin	2002045	Apr/05/2002	Channel Catfish
Lake Fenton	Genesee County	87059	Jul/22/1987	Largemouth Bass
Lake Fenton	Genesee County	89037	May/09/1989	Largemouth Bass
Lake Fenton	Genesee County	90005	May/23/1990	Largemouth Bass, Northern Pike, Walleye
Lake Geneserath	Charlevoix County, Beaver Island	90072	Jun/01/1990	Largemouth Bass, Northern Pike
Lake Gogebic	Gogebic/Ontonagon County	85062	Jul/30/1985	Walleye, White Sucker
Lake Gogebic	Gogebic/Ontonagon County	92043	May/05/1992	Walleye
Lake Gogebic	Gogebic/Ontonagon County	94028	Apr/29/1994	Walleye
Lake Gogebic	Gogebic/Ontonagon County	97020	May/04/1997	Walleye, Yellow Perch
Lake Gogebic	Gogebic/Ontonagon County	2000031	Apr/18/2000	Walleye
Lake Gogebic	Gogebic/Ontonagon County	2002046	Apr/28/2002	Walleye
Lake Gogebic	Gogebic/Ontonagon County	2002047	Apr/28/2002	Walleye
Lake Huron	Alpena	85024	Oct/10/1985	Brown Trout
Lake Huron	Au Sable River	83014	Oct/11/1983	Chinook
Lake Huron	Au Sable River	83041	Oct/08/1983	Chinook
Lake Huron	Au Sable River	84046	Sep/19/1984	Chinook
Lake Huron	Au Sable River	86052	Sep/26/1986	Chinook
Lake Huron	Au Sable River	87079	Sep/17/1987	Chinook
Lake Huron	Au Sable River	89062	Oct/11/1989	Chinook
Lake Huron	Au Sable River	91048	Sep/30/1991	Chinook
Lake Huron	Au Sable River	93060	Oct/12/1993	Chinook
Lake Huron	Au Sable River	97022	Oct/06/1997	Chinook

Waterbody	Location	Visit ID#	Date	Species
Lake Huron	Black River	95053	Oct/18/1995	Chinook
Lake Huron	Black River	96018	Oct/15/1996	Coho
Lake Huron	Black River	1998052	Oct/14/1998	Coho
Lake Huron	East of Bois Blanc Island	83025	Nov/08/1983	Lake Trout
Lake Huron	Grindstone City	89050	May/30/1989	Lake Trout
Lake Huron	Hammond Bay	83018	Oct/25/1983	Lake Trout, Lake Whitefish
Lake Huron	Harbor Beach	89068	Nov/01/1989	Brown Trout
Lake Huron	Les Cheneaux Islands	95003	Apr/17/1995	Yellow perch
Lake Huron	Lexington	85027	Oct/22/1985	Brown Trout
Lake Huron	Marquette Island	83024	Nov/08/1983	Lake Trout
Lake Huron	Nunns Creek	93051	Apr/25/1993	Rainbow Smelt
Lake Huron	Oscoda	85025	Oct/10/1985	Brown Trout
Lake Huron	Port Austin	86007	May/27/1986	Lake Trout
Lake Huron	Port Austin	91052	May/20/1991	Lake Trout
Lake Huron	Port Austin	96019	May/16/1996	Lake Trout, Lake Whitefish
Lake Huron	Port Sanilac	85026	Oct/23/1985	Brown Trout
Lake Huron	Rock Falls Creek	91023	Apr/26/1991	Rainbow Trout
Lake Huron	Rock Falls Creek	92006	Apr/09/1992	Rainbow Trout
Lake Huron	Rockport	86021	Jun/19/1986	Lake Trout
Lake Huron	Rockport	89049	May/15/1989	Lake Trout
Lake Huron	Saginaw Bay	85031	May/23/1985	Channel Catfish
Lake Huron	Saginaw Bay	90063	Apr/24/1990	Carp, Walleye
Lake Huron	Saginaw Bay	91041	Oct/02/1991	Walleye
Lake Huron	Saginaw Bay	92028	May/19/1992	Carp, Walleye
Lake Huron	Saginaw Bay	94037	Sep/26/1994	Carp, Walleye
Lake Huron	Saginaw Bay	1998139	Sep/21/1998	Carp, Walleye
Lake Huron	Saginaw Bay	2001059	Aug/22/2001	Carp
Lake Huron	Saginaw Bay, Au Gres	87017	Jun/22/1987	Carp, Channel Catfish, Walleye, Yellow Perch
Lake Huron	Saginaw Bay, Au Gres	91037	Sep/25/1991	Carp, Channel Catfish, Walleye, White Sucker, Yellow Perch
Lake Huron	Saginaw Bay, Bay Port	84043	Jul/31/1984	Carp
Lake Huron	Saginaw Bay, Bay Port	87015	May/12/1987	Carp, Channel Catfish, Walleye, Yellow Perch
Lake Huron	Saginaw Bay, Caseville	86028	Jun/25/1986	Channel Catfish, Walleye
Lake Huron	Saginaw Bay, Charity Island	84044	Sep/27/1984	Walleye
Lake Huron	Saginaw Bay, Fish Point	91038	Oct/01/1991	Carp, Channel Catfish, Walleye, White Sucker, Yellow Perch
Lake Huron	Saginaw Bay, near Saginaw River mouth	84042	Jun/04/1984	Carp, Channel Catfish
Lake Huron	Saginaw Bay, near Saginaw River mouth	85032	May/31/1985	Walleye
Lake Huron	Saginaw Bay, near Saginaw River mouth	85034	May/28/1985	Carp, Channel Catfish
Lake Huron	Saginaw Bay, near Saginaw River mouth	92054	Sep/23/1992	Lake Whitefish, Walleye
Lake Huron	Saginaw Bay, near Saginaw River mouth	93069	Jun/04/1993	Alewife, Brown Trout, Carp, Lake Trout, Northern Pike, White Bass, Yellow Perch
Lake Huron	Saginaw Bay, near Saginaw River mouth	94038	Sep/27/1994	Walleye, White Perch
Lake Huron	Saginaw Bay, near Saginaw River mouth	1998140	Sep/21/1998	Carp, Channel Catfish, Walleye

Waterbody	Location	Visit ID#	Date	Species
Lake Huron	Saginaw Bay, near Saginaw River mouth	1999089	Oct/21/1999	Channel Catfish
Lake Huron	Saginaw Bay, off Saginaw River	87016	May/17/1987	Carp, Channel Catfish, Walleye, Yellow Perch
Lake Huron	Saginaw Bay, Pinconning	86068	Jun/23/1986	Carp, Channel Catfish
Lake Huron	Saginaw Bay, Rifle River	93009	Apr/19/1993	Rainbow Trout, White Sucker
Lake Huron	Saginaw Bay, Sand Point	83032	May/01/1983	Walleye
Lake Huron	Saginaw Bay, Sebewaing	86069	Apr/22/1986	Channel Catfish
Lake Huron	Saginaw Bay, Wildfowl Bay	85033	May/23/1985	Carp
Lake Huron	Saginaw Bay, Wildfowl Bay	85063	Sep/25/1985	Carp
Lake Huron	Saginaw Bay, Wildfowl Bay	85064	Apr/26/1985	Carp, Channel Catfish
Lake Huron	Saginaw Bay, Wildfowl Bay	86070	Apr/21/1986	Carp
Lake Huron	Saginaw Bay, Wildfowl Bay	86071	May/12/1986	Channel Catfish
Lake Huron	Saginaw Bay, Wildfowl Bay	86072	Jul/21/1986	Carp
Lake Huron	Saginaw Bay, Wildfowl Bay	88010	Jun/14/1988	Carp, Channel Catfish, Walleye, Yellow Perch
Lake Huron	South Point	92055	Jun/02/1992	Lake Trout, Lake Whitefish
Lake Huron	Swan River	84054	Sep/30/1984	Coho
Lake Huron	Swan River	86055	Oct/07/1986	Chinook
Lake Huron	Swan River	86067	Oct/10/1986	Coho
Lake Huron	Swan River	87080	Sep/18/1987	Chinook
Lake Huron	Swan River	88090	Sep/01/1988	Chinook
Lake Huron	Swan River	89064	Oct/20/1989	Chinook
Lake Huron	Swan River	91047	Sep/30/1991	Chinook
Lake Huron	Swan River	93052	Oct/13/1993	Chinook
Lake Huron	Swan River	95048	Oct/10/1995	Chinook
Lake Huron	Swan River	96021	Oct/18/1996	Chinook
Lake Huron	Swan River	97021	Oct/13/1997	Chinook
Lake Huron	Swan River	1998053	Oct/01/1998	Chinook
Lake Huron	Tawas Bay	90068	Oct/10/1990	Burbot
Lake Huron	Tawas River	83009	Oct/11/1983	Chinook, Coho
Lake Huron	Tawas River	84056	Oct/01/1984	Coho
Lake Huron	Tawas River	85056	Oct/08/1985	Coho
Lake Huron	Tawas River	86051	Sep/26/1986	Chinook, Coho
Lake Huron	Thunder Bay	86046	Jul/23/1986	Brown trout
Lake Huron	Thunder Bay	90069	Oct/15/1990	Brown Trout
Lake Huron	Thunder Bay	91053	Jun/19/1991	Brown Trout
Lake Huron	Thunder Bay	91054	Jun/25/1991	Walleye
Lake Huron	Thunder Bay	92056	Jun/04/1992	Carp, Lake Trout
Lake Huron	Thunder Bay	92057	Jun/01/1992	Brown Trout, Lake Whitefish
Lake Huron	Thunder Bay	93070	Jun/14/1993	Alewife, Brown Trout, Carp, Channel Catfish, Chub, Lake Trout, Walleye
Lake Huron	Thunder Bay	94029	Jun/27/1994	Carp, Lake Trout
Lake Huron	Thunder Bay	95036	Jun/16/1995	Carp, Lake Trout, Spottail Shiner, Walleye
Lake Huron	Thunder Bay	96022	Jun/26/1996	Lake Trout, Lake Whitefish
Lake Huron	Thunder Bay	1998054	Aug/22/1998	Lake Trout, Walleye
Lake Huron	Thunder Bay	1998055	Aug/20/1998	Lake Whitefish
Lake Huron	Thunder Bay	1999028	Sep/28/1999	Carp, Yellow Perch
Lake Huron	Thunder Bay	1999029	Aug/03/1999	Carp, Lake Whitefish, Walleye
Lake Huron	Thunder Bay	2001061	Jul/02/2001	Carp

Waterbody	Location	Visit ID#	Date	Species
Lake Huron	Thunder Bay	2001062	Jun/13/2001	Carp, Lake Trout, Walleye
Lake Huron	Thunder Bay River	89051	Jun/29/1989	Carp, Channel Catfish, Walleye
Lake Independence	Marquette County	89034	May/08/1989	Northern Pike, Walleye
Lake Independence	Marquette County	95009	May/09/1995	Lake Herring, Northern Pike, Walleye
Lake Lansing	Ingham County	89036	Jun/07/1989	Black Crappie, Largemouth Bass
Lake Macatawa	Ottawa County	80002	Jan/01/1980	Black Crappie, Bluegill, Carp, Channel Catfish, Northern Pike, Smallmouth Bass, Walleye, White Sucker, Yellow Perch
Lake Macatawa	Ottawa County	84002	Apr/10/1984	Carp, Walleye
Lake Macatawa	Ottawa County	87061	Jul/16/1987	Carp, Walleye
Lake Macatawa	Ottawa County	95006	May/05/1995	Carp, Walleye
Lake Margrethe	Crawford County	95002	Mar/31/1995	walleye
Lake Michigamme	Marquette County	84019	Aug/22/1984	Northern Pike, Rock Bass, Walleye, White Sucker, Yellow Perch
Lake Michigamme	Marquette County	97023	Jun/07/1997	Lake Herring, Northern Pike, White Sucker
Lake Michigan	Big Bay De Noc	90059	May/30/1990	Lake Whitefish
Lake Michigan	Bridgeman	2002112	Oct/03/2001	Lake Sturgeon
Lake Michigan	Charlevoix	86012	Jun/06/1986	Brown Trout, Chinook, Lake Trout
Lake Michigan	Charlevoix	96027	Aug/27/1996	Lake Trout
Lake Michigan	Charlevoix/Little Traverse Bay	89043	May/17/1989	Lake Trout
Lake Michigan	Epoufette	83019	Nov/08/1983	Lake Whitefish
Lake Michigan	Glen Haven	83022	Oct/20/1983	Lake Trout
Lake Michigan	Glen Haven	84040	Jun/04/1984	Chub
Lake Michigan	Grand Haven	86001	Apr/04/1986	Lake Trout, Yellow Perch
Lake Michigan	Grand Haven	87011	Apr/07/1987	Lake Trout
Lake Michigan	Grand Haven	96025	May/29/1996	Lake Trout
Lake Michigan	Grand Haven	97030	Apr/11/1997	Yellow Perch
Lake Michigan	Grand River, Grand Rapids	84055	Sep/28/1984	Coho
Lake Michigan	Grand River, Grand Rapids	94059	Oct/01/1994	Rainbow Trout
Lake Michigan	Grand River, Webber Dam	83015	Oct/06/1983	Chinook, Coho
Lake Michigan	Grand River, Webber Dam	85057	Sep/27/1985	Coho
Lake Michigan	Grand River, Webber Dam	86050	Oct/03/1986	Coho
Lake Michigan	Grand River, Webber Dam	87086	Sep/23/1987	Chinook
Lake Michigan	Grand River, Webber Dam	88041	Sep/19/1988	Coho
Lake Michigan	Grand River, Webber Dam	90046	Sep/25/1990	Coho
Lake Michigan	Grand River, Webber Dam	91045	Oct/10/1991	Chinook
Lake Michigan	Grand River, Webber Dam	92052	Sep/22/1992	Coho
Lake Michigan	Grand River, Webber Dam	93077	Sep/21/1993	Chinook
Lake Michigan	Grand River, Webber Dam	94043	Sep/15/1994	Coho
Lake Michigan	Grand River, Webber Dam	95054	Oct/12/1995	Chinook
Lake Michigan	Grand River, Webber Dam	97024	Sep/29/1997	Chinook
Lake Michigan	Grand River, Webber Dam	1998056	Oct/28/1998	Coho
Lake Michigan	Grand Traverse Bay	83016	Aug/16/1983	Lake Whitefish
Lake Michigan	Grand Traverse Bay	83026	Nov/29/1983	Lake Trout
Lake Michigan	Grand Traverse Bay	90074	Jun/20/1990	Lake Trout
Lake Michigan	Grand Traverse Bay	91061	Oct/29/1991	Lake Whitefish
Lake Michigan	Grand Traverse Bay	92059	Jul/15/1992	Lake Trout

Waterbody	Location	Visit ID#	Date	Species
Lake Michigan	Grand Traverse Bay	92060	Aug/05/1992	Brown Trout, Lake Whitefish
Lake Michigan	Grand Traverse Bay	93010	Aug/12/1993	Carp
Lake Michigan	Grand Traverse Bay	95050	Jul/19/1995	Carp, Lake Trout
Lake Michigan	Grand Traverse Bay	97025	Oct/02/1997	Lake Trout
Lake Michigan	Grand Traverse Bay	97077	Dec/30/1997	Lake Whitefish
Lake Michigan	Grand Traverse Bay	1998057	Oct/07/1998	Lake Trout
Lake Michigan	Grand Traverse Bay	1998141	Sep/09/1998	Lake Trout
Lake Michigan	Grand Traverse Bay	2000036	Sep/13/2000	Carp
Lake Michigan	Grand Traverse Bay	2001065	Aug/15/2001	Lake Trout
Lake Michigan	Grand Traverse Bay, East Arm	84031	Mar/01/1984	Lake Trout
Lake Michigan	Grand Traverse Bay, East Arm	90065	Nov/11/1990	Lake Whitefish, Yellow Perch
Lake Michigan	Grand Traverse Bay, East Arm	96024	Dec/05/1996	Lake Whitefish
Lake Michigan	Grand Traverse Bay, East Arm	96060	Dec/05/1996	Lake Whitefish
Lake Michigan	Grand Traverse Bay, East Arm	96061	Mar/01/1996	Lake Whitefish
Lake Michigan	Grand Traverse Bay, West Arm	84032	Mar/20/1984	Lake Trout
Lake Michigan	Grand Traverse Bay, West Arm	84037	May/29/1984	Lake Trout
Lake Michigan	Grand Traverse Bay, West Arm	90066	Jun/20/1990	Lake Whitefish
Lake Michigan	Grand Traverse Bay, West Arm	93088	Jun/07/1993	Brown Trout, Lake Whitefish
Lake Michigan	Green Bay	93078	Apr/18/1993	Brown Trout, Splake
Lake Michigan	Green Bay	1999032	Aug/02/1999	Lake Whitefish
Lake Michigan	Green Bay	2001066	Apr/13/2001	Brown Trout
Lake Michigan	Green Bay	2002054	Apr/11/2002	Brown Trout
Lake Michigan	Green Bay	2003148	Apr/10/2003	Brown Trout
Lake Michigan	Green Bay, Cedar River	88057	Jul/19/1988	Longnose Sucker, White Sucker
Lake Michigan	Green Bay, Cedar River	92022	Apr/29/1992	Brown Trout, Chinook, Rainbow Trout, Smallmouth Bass, Splake, Walleye
Lake Michigan	Green Bay, Cedar River	2000037	Apr/10/2000	Carp
Lake Michigan	Leland	84049	Aug/06/1984	Chub
Lake Michigan	Little Bay De Noc	83017	Oct/20/1983	Lake Trout, Lake Whitefish
Lake Michigan	Little Bay De Noc	87004	Apr/14/1987	Northern Pike, Walleye
Lake Michigan	Little Bay De Noc	89032	Apr/10/1989	Carp
Lake Michigan	Little Bay De Noc	90001	Feb/28/1990	Burbot
Lake Michigan	Little Bay De Noc	91022	Apr/16/1991	Longnose Sucker, Walleye
Lake Michigan	Little Bay De Noc	92046	Jun/04/1992	Carp, Walleye
Lake Michigan	Little Bay De Noc	92049	Jun/04/1992	Walleye
Lake Michigan	Little Bay De Noc	93079	Apr/27/1993	Carp, Yellow Perch
Lake Michigan	Little Bay De Noc	94041	Apr/20/1994	Carp, Walleye
Lake Michigan	Little Bay De Noc	94042	Apr/20/1994	White Sucker
Lake Michigan	Little Bay De Noc	95016	Feb/12/1995	Lake Sturgeon
Lake Michigan	Little Bay De Noc	97026	Apr/28/1997	Walleye, Yellow Perch
Lake Michigan	Little Bay De Noc	2000039	Oct/05/2000	Carp, Walleye
Lake Michigan	Little Bay De Noc	2002055	Apr/19/2002	Walleye
Lake Michigan	Little Manistee River Weir	85021	Sep/09/1985	Brown Trout

Waterbody	Location	Visit ID#	Date	Species
Lake Michigan	Little Manistee River Weir	86053	Oct/06/1986	Brown trout, Chinook, Rainbow trout
Lake Michigan	Little Manistee River Weir	94044	Nov/07/1994	Rainbow Trout
Lake Michigan	Little Traverse Bay	83021	Sep/27/1983	Lake Trout
Lake Michigan	Little Traverse Bay	84036	May/02/1984	Lake Trout
Lake Michigan	Ludington	90058	Oct/21/1990	Yellow Perch
Lake Michigan	Ludington	2000118	Jul/19/1999	Lake Sturgeon
Lake Michigan	Manistee	83029	May/12/1983	Chub
Lake Michigan	Manistee River	83020	Sep/20/1983	Chinook
Lake Michigan	Manistee River	84045	Sep/06/1984	Chinook, Coho
Lake Michigan	Manistee River	84047	Sep/19/1984	Chinook
Lake Michigan	Manistee River	85066	Sep/25/1985	Chinook
Lake Michigan	Manistee River	86066	Oct/10/1986	Chinook, Coho
Lake Michigan	Manistee River	88092	Sep/10/1988	Chinook, Chinook Eggs, Coho
Lake Michigan	Manistee River	97069	May/15/1997	Lake Sturgeon
Lake Michigan	Manistique River	85036	May/15/1985	Rainbow Trout
Lake Michigan	Manitou Islands	83031	Oct/20/1983	Chub
Lake Michigan	Menominee River	88052	Oct/12/1988	Brown Trout
Lake Michigan	Millecoquins River	2000115	Dec/14/2000	Lake Sturgeon
Lake Michigan	Muskegon	88060	Jun/01/1988	Carp, Walleye
Lake Michigan	Muskegon	90009	May/30/1990	Lake Whitefish
Lake Michigan	Muskegon	97027	Jul/01/1997	Lake Whitefish
Lake Michigan	Northern Lake Michigan	97028	Mar/26/1997	Lake Whitefish
Lake Michigan	Northern Lake Michigan	2001132	Oct/31/2001	Burbot
Lake Michigan	Norwood	84033	Mar/20/1984	Lake Trout
Lake Michigan	Pentwater	83028	May/06/1983	Chub
Lake Michigan	Pentwater	84034	Apr/09/1984	Lake Trout
Lake Michigan	Pentwater	84041	Aug/02/1984	Chub
Lake Michigan	Pentwater	89039	May/02/1989	Lake Trout
Lake Michigan	Pentwater	91025	Apr/12/1991	Brown Trout, Lake Trout
Lake Michigan	Platte River	83011	Oct/07/1983	Chinook, Coho
Lake Michigan	Platte River	83040	Sep/20/1983	Coho
Lake Michigan	Platte River	84048	Sep/30/1984	Coho
Lake Michigan	Platte River	84053	Oct/09/1984	Coho
Lake Michigan	Platte River	85022	Sep/25/1985	Brown Trout
Lake Michigan	Platte River	85055	Sep/25/1985	Coho
Lake Michigan	Platte River	85068	Sep/25/1985	Coho
Lake Michigan	Platte River	86054	Oct/06/1986	Coho
Lake Michigan	Platte River	87091	Oct/06/1987	Chinook
Lake Michigan	Platte River	88066	Sep/26/1988	Coho
Lake Michigan	Platte River	88091	Sep/10/1988	Coho, Coho Eggs
Lake Michigan	Platte River	89067	Oct/30/1989	Chinook
Lake Michigan	Platte River	90048	Oct/01/1990	Coho
Lake Michigan	Platte River	91055	Oct/09/1991	Chinook
Lake Michigan	Platte River	92068	Sep/23/1992	Coho
Lake Michigan	Platte River	92069	Oct/21/1992	Brown Trout
Lake Michigan	Platte River	93053	Sep/29/1993	Chinook
Lake Michigan	Platte River	94045	Oct/01/1994	Coho
Lake Michigan	Platte River	94046	Oct/15/1994	Rainbow Trout
Lake Michigan	Platte River	95049	Oct/09/1995	Chinook

Waterbody	Location	Visit ID#	Date	Species
Lake Michigan	Platte River	96028	Oct/01/1996	Coho
Lake Michigan	Platte River	97029	Oct/15/1997	Chinook
Lake Michigan	Platte River	1998059	Sep/24/1998	Coho
Lake Michigan	Platte River Hatchery	94060	Oct/19/1994	Coho
Lake Michigan	Point Betsie	84035	Apr/15/1984	Lake Trout
Lake Michigan	South Fox Island	83027	Nov/29/1983	Lake Trout
Lake Michigan	South Haven	83030	Aug/08/1983	Chub
Lake Michigan	South Haven	86008	Jun/07/1986	Brown Trout, Chinook, Rainbow Trout
Lake Michigan	South Haven	87034	Jun/13/1987	Lake Trout
Lake Michigan	South Haven	90041	Sep/11/1990	Yellow Perch
Lake Michigan	South Haven	1998060	Apr/23/1998	Rainbow Smelt
Lake Michigan	Southern	94057	Jul/01/1994	Lake Sturgeon
Lake Michigan	Southern	95064	Sep/24/1995	Lake Sturgeon
Lake Michigan	Southern	1998152	Sep/25/1998	Rainbow Smelt
Lake Michigan	St. Joseph River, Berrien Springs	83010	Oct/05/1983	Chinook, Coho
Lake Michigan	St. Joseph River, Berrien Springs	84051	Oct/03/1984	Coho
Lake Michigan	St. Joseph River, Berrien Springs	85023	Sep/20/1985	Brown Trout
Lake Michigan	St. Joseph River, Berrien Springs	85059	Sep/19/1985	Coho
Lake Michigan	St. Joseph River, Berrien Springs	86048	Sep/15/1986	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	86049	Sep/15/1986	Coho
Lake Michigan	St. Joseph River, Berrien Springs	87001	Apr/07/1987	Rainbow Trout
Lake Michigan	St. Joseph River, Berrien Springs	87084	Sep/30/1987	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	87085	Sep/30/1987	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	88032	Sep/15/1988	Coho
Lake Michigan	St. Joseph River, Berrien Springs	89065	Oct/27/1989	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	89066	Oct/27/1989	Brown Trout
Lake Michigan	St. Joseph River, Berrien Springs	90042	Sep/19/1990	Brown Trout
Lake Michigan	St. Joseph River, Berrien Springs	90043	Sep/20/1990	Coho
Lake Michigan	St. Joseph River, Berrien Springs	91043	Sep/30/1991	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	92067	Sep/22/1992	Coho
Lake Michigan	St. Joseph River, Berrien Springs	93061	Sep/09/1993	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	94047	Sep/29/1994	Coho
Lake Michigan	St. Joseph River, Berrien Springs	94048	Sep/12/1994	Rainbow Trout
Lake Michigan	St. Joseph River, Berrien Springs	95055	Oct/13/1995	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	96030	Oct/22/1996	Chinook

Waterbody	Location	Visit ID#	Date	Species
Lake Michigan	St. Joseph River, Berrien Springs	97031	Oct/31/1997	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	1998061	Sep/25/1998	Coho
Lake Michigan	Sturgeon Bay	83023	Oct/20/1983	Lake Trout
Lake Michigan	Thompson Creek	83012	Oct/31/1983	Chinook, Coho
Lake Michigan	Thompson Creek	84052	Oct/17/1984	Coho
Lake Michigan	Thompson Creek	85020	Oct/15/1985	Brown Trout
Lake Michigan	Thompson Creek	85058	Sep/19/1985	Coho
Lake Michigan	Thompson Creek	86060	Oct/17/1986	Coho
Lake Michigan	Thompson Creek	87094	Oct/01/1987	Chinook
Lake Michigan	Thompson Creek	88048	Sep/18/1988	Coho
Lake Michigan	Thompson Creek	89071	Oct/01/1989	Brown Trout
Lake Michigan	Thompson Creek	89072	Oct/01/1989	Chinook
Lake Michigan	Thompson Creek	96031	Oct/01/1996	Coho
Lake Michigan	Thompson Creek	97032	Oct/14/1997	Chinook
Lake Michigan	Thompson Creek	1998062	Oct/20/1998	Coho
Lake Mitchell	Wexford County	89012	Jun/14/1989	Largemouth Bass, Walleye
Lake Nepessing	Lapeer County	97033	Sep/11/1997	Largemouth Bass
Lake Orion	Oakland County	87021	May/29/1987	Largemouth Bass
Lake Orion	Oakland County	89005	Jun/07/1989	Largemouth Bass, Northern Pike
Lake Orion	Oakland County	2001071	May/01/2001	Carp, Largemouth Bass
Lake Ovid	Clinton County	89011	Apr/28/1989	Black Bullhead, Black Crappie, Largemouth Bass, Northern Pike, Tiger Muskie, Yellow Bullhead
Lake Paradise	Emmet County	2001073	Oct/09/2001	Largemouth Bass, Smallmouth Bass, White Sucker
Lake Ponemah	Genesee County	2000044	Jul/07/2000	Carp, Largemouth Bass
Lake St. Clair	Bouvier Bay	86017	Jun/17/1986	Carp, Smallmouth Bass
Lake St. Clair	L'Anse Creuse Bay	90002	Apr/02/1990	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	92029	Jun/04/1992	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	94049	Aug/24/1994	Bluegill, Brown Bullhead, Channel Catfish, Freshwater Drum, Largemouth Bass, Northern Pike, Rock Bass, Smallmouth Bass, Yellow Perch
Lake St. Clair	L'Anse Creuse Bay	94058	Jul/13/1994	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	97034	Jun/01/1997	Black Crappie, Bluegill, Northern Pike, Pumpkinseed, Walleye, White Bass
Lake St. Clair	L'Anse Creuse Bay	1998063	Jun/15/1998	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	1998064	Jun/15/1998	Bluegill, Carp, Channel Catfish, Freshwater Drum, Walleye
Lake St. Clair	L'Anse Creuse Bay	2002059	May/23/2002	Carp, Walleye
Lake St. Clair	Michigan waters	85014	Sep/10/1985	Muskellunge
Lake St. Clair	Michigan waters	87035	Jun/18/1987	Bluegill, Channel Catfish, Freshwater Drum, Largemouth Bass, Rock Bass, Smallmouth Bass, Walleye
Lake St. Clair	Michigan waters	88026	Aug/19/1988	Bluegill, Freshwater Drum, Smallmouth Bass, White Bass, Yellow Perch
Lake St. Clair	Michigan waters	90054	Jul/15/1990	Lake Sturgeon
Lake St. Clair	Michigan waters	91056	Oct/28/1991	Lake Sturgeon, Walleye
Lake St. Clair	Michigan waters	2000108	Aug/28/2000	Lake Sturgeon

Waterbody	Location	Visit ID#	Date	Species
Lake St. Clair	Michigan waters	2001077	Jun/26/2001	Carp, Muskellunge, Smallmouth Bass, Walleye
Lake St. Clair	St. Johns Marsh	85013	Jul/15/1985	Carp
Lake Superior	Carp River	95021	Oct/04/1995	Coho
Lake Superior	Carp River	97036	Oct/01/1997	Chinook, Coho
Lake Superior	Carp River	2000045	Oct/12/2000	Chinook
Lake Superior	Central	92076	Aug/19/1992	Lake Trout
Lake Superior	Central	96034	May/23/1996	Ciscowet, Lake Trout, Lake Whitefish
Lake Superior	Central	2000046	Apr/30/2000	Lake Herring, Lake Whitefish
Lake Superior	Chink Creek	95022	Oct/26/1995	Coho
Lake Superior	Chocolay River	94061	Nov/02/1994	Coho
Lake Superior	Copper Harbor	87007	Apr/29/1987	Lake Trout
Lake Superior	Grand Marais	84005	Jun/15/1984	Lake Trout
Lake Superior	Isle Royale	89046	Aug/09/1989	Lake Trout
Lake Superior	Isle Royale	92063	Aug/04/1992	Lake Trout
Lake Superior	Keewenaw Bay	93054	May/19/1993	Rainbow Smelt
Lake Superior	Keweenaw Bay	91024	May/01/1991	Lake Trout
Lake Superior	Keweenaw Bay	93055	May/03/1993	Lake Trout
Lake Superior	Keweenaw Bay	96035	May/23/1996	Lake Trout
Lake Superior	Keweenaw Bay	1999039	May/13/1999	Lake Trout
Lake Superior	Keweenaw Bay	2001078	Apr/30/2001	Lake Trout
Lake Superior	Keweenaw Bay, Keystone Point	92073	Jul/31/1992	Ciscowet, Lake Whitefish
Lake Superior	Keweenaw Bay, L'Anse Bay	89029	Apr/24/1989	Lake Trout
Lake Superior	Keweenaw Bay, Traverse Island	91060	May/01/1991	Lake Trout
Lake Superior	Keweenaw Bay, Traverse Island	2001079	Jun/08/2001	Ciscowet
Lake Superior	Laughing Whitefish River	88036	Sep/27/1988	Chinook
Lake Superior	Manitou Island	87072	Jun/26/1987	Ciscowet
Lake Superior	Marquette	86031	Jun/06/1986	Lake Trout, Lake Whitefish
Lake Superior	Marquette	87009	Apr/27/1987	Lake Trout
Lake Superior	Marquette	89028	Apr/27/1989	Lake Trout
Lake Superior	Marquette	92042	Jun/19/1991	Ciscowet
Lake Superior	Marquette	92074	Aug/18/1992	Ciscowet, Lake Whitefish
Lake Superior	Marquette	93089	Jul/01/1993	Lake Whitefish
Lake Superior	Marquette	95065	Dec/13/1995	Ciscowet
Lake Superior	Marquette	96038	Jun/10/1996	Ciscowet, Lake Trout, Lake Whitefish
Lake Superior	Marquette	2002060	May/13/2002	Lake Trout, Lake Whitefish
Lake Superior	Middle Branch Ontonagon River	1999040	Nov/15/1999	Brown Trout
Lake Superior	Mineral River	1998134	Jun/07/1998	Longnose Sucker
Lake Superior	Munising	87069	Aug/10/1987	Ciscowet
Lake Superior	Munising	94056	Dec/16/1994	Lake Herring
Lake Superior	Munising	95066	Jul/27/1995	Lake Herring
Lake Superior	Ontonagon	85028	Aug/01/1985	Lake Trout, Lake Whitefish, White Sucker
Lake Superior	Otter River Fish Ladder	2000119	May/27/2000	Lake Sturgeon
Lake Superior	Pendills Creek	96037	Sep/15/1996	Coho
Lake Superior	Tahquamenon River	84003	May/10/1984	Lake Whitefish

Waterbody	Location	Visit ID#	Date	Species
Lake Superior	West of Keweenaw Peninsula	87008	Apr/28/1987	Lake Trout
Lake Superior	West of Keweenaw Peninsula	87071	Jun/25/1987	Ciscowet
Lake Superior	West of Keweenaw Peninsula	92077	Jul/13/1992	Ciscowet
Lake Superior	Whitefish Bay	93090	Jul/30/1993	Yellow Perch
Lakeville Lake	Oakland County	2000047	Apr/22/2000	Carp, Largemouth Bass
Langford Lake	Gogebic County	86030	Jul/08/1986	Bluegill, Northern Pike, Walleye
Langford Lake	Gogebic County	94051	Jul/20/1994	Northern Pike, Walleye
LeFarge Corp. Discharge Canal	Below quarry	94033	May/19/1994	Channel Catfish
Lily Lake	Clare County	90064	Aug/23/1990	Largemouth Bass, Northern Pike
Lincoln Lake	Kent County	88033	Sep/14/1988	Northern Pike, Rock Bass, Walleye
Little S. Br. Pere Marquette River	Taylor Bridge	94032	Aug/17/1993	Brown Trout
Littlefield Lake	Isabella County	95014	May/24/1995	Bluegill, Largemouth Bass
Long Lake	Ionia County	90035	Oct/01/1990	Largemouth Bass
Long Lake	Iosco County	90036	Jun/12/1990	Largemouth Bass, Northern Pike
Long Lake	St. Joseph County	2001142	Nov/19/2001	Brown Bullhead, Largemouth Bass
Looking Glass River	Dewitt	1998132	May/20/1998	Rock Bass, White Sucker
Loon Lake	Oakland County	2000050	Jul/20/2000	Carp, Largemouth Bass, Smallmouth Bass
Lower Trout Lake	Oakland County	90049	Sep/27/1990	Largemouth Bass, Northern Pike
Lower Trout Lake	Oakland County	93062	May/27/1993	Largemouth Bass
Maceday Lake	Oakland County	91049	Sep/16/1991	Northern Pike
Maceday Lake	Oakland County	96040	Apr/24/1996	Northern Pike
Manistee Lake	Manistee County	91015	Jun/19/1991	Smallmouth Bass, Walleye
Manistee Lake	Manistee County	92027	May/12/1992	Black Crappie, Largemouth Bass, Rock Bass
Manistee Lake	Manistee County	95019	Jun/07/1995	Bluegill
Manistee River	Above Hodenpyl Dam	92034	Jun/09/1992	Carp
Manistee River	Above Hodenpyl Dam	94030	Jun/15/1994	Carp
Manistee River	Cameron Bridge	1998069	Aug/26/1998	Brown Trout
Manistee River	M-72	1998123	Aug/27/1998	White Sucker
Manistee River	Manistee, river mouth	90026	Aug/21/1990	Channel Catfish
Manistee River	Manistee, river mouth	95028	Jul/24/1995	Channel Catfish
Manistique River	Manistique, above Dam	87090	Oct/21/1987	Northern Pike, Redhorse Sucker
Manistique River	Manistique, above Dam	93056	Jun/03/1993	Redhorse Sucker
Manistique River	Manistique, river mouth	86035	Jul/31/1986	Carp, Walleye
Manistique River	Manistique, river mouth	90028.1	Sep/24/1990	Channel Catfish
Manistique River	Manistique, river mouth	2002067	Aug/21/2002	Channel Catfish
Manistique River	Manistique, US-2 Bridge	84009	Oct/18/1984	Redhorse Sucker, Walleye, White Sucker
Manistique River	Manistique, US-2 Bridge	85008	Jun/01/1985	Carp, Largemouth Bass, Walleye
Manistique River	Manistique, US-2 Bridge	88017	Aug/03/1988	Channel Catfish
Manistique River	Manistique, US-2 Bridge	93033	Jun/02/1993	Carp
Manistique River	Soo Line RR Bridge	90028.2	Sep/24/1990	Channel Catfish
Manistique River	Soo Line RR Bridge	2002066	Aug/21/2002	Channel Catfish
Mann Creek	Moraine Lake	92041.2	Oct/21/1992	Northern Pike
Mann Creek	Sloan Lake	92041.1	Oct/21/1992	Northern Pike
Mann Creek	Sloan Lake	94001	May/25/1994	Bluegill, Northern Pike
Marion Lake	Gogebic County	87070	Jul/29/1987	Rock Bass, Walleye
Marten Lake	Iron County	85019	Oct/25/1985	Brown Bullhead, Northern Pike

Waterbody	Location	Visit ID#	Date	Species
Menominee River	Badwater Impoundment	92024	Apr/17/1992	Walleye
Menominee River	Below Grand Rapids Dam	97038	May/27/1997	Carp, Redhorse Sucker
Menominee River	Below Quinnesec	88053	Oct/11/1988	Northern Pike, Redhorse Sucker, Smallmouth Bass, Walleye
Menominee River	Below Quinnesec	1999080	May/25/1999	Northern Pike
Menominee River	Below Sturgeon Falls Dam	92048	Jul/28/1992	Carp, Walleye
Menominee River	Below White Rapids Dam	97039	May/27/1997	Redhorse Sucker
Menominee River	Big Quinnesec Falls Flowage	95034	Apr/17/1995	Rock Bass, Walleye, White Sucker
Menominee River	Chalk Hills Impoundment	91030	Jul/08/1991	Carp, Walleye
Menominee River	Chalk Hills Impoundment	96041	Oct/13/1996	Carp, Redhorse Sucker, Walleye
Menominee River	Chalk Hills Impoundment	97040	May/27/1997	Redhorse Sucker
Menominee River	Dickenson County, Vulcan	86058	Oct/09/1986	Northern Pike, Redhorse sucker, Smallmouth Bass, Walleye
Menominee River	Dickinson County, below Piers Gorge	89078	Sep/12/1989	Redhorse Sucker, Walleye
Menominee River	Dickinson County, Little Quinnesec Flowage	89079	Apr/21/1989	Carp, Walleye, White Sucker
Menominee River	Iron County	84017	Aug/01/1984	Rock Bass
Menominee River	Lower Scott Flowage, between Dams 1 and 2	90055	Oct/01/1990	Rock Bass, Walleye
Menominee River	Lower Scott Flowage, between Dams 1 and 2	91039	Jun/26/1991	Carp
Menominee River	Lower Scott Flowage, between Dams 1 and 2	94052	Jun/13/1994	Redhorse Sucker
Menominee River	Menominee, river mouth	88007	May/26/1988	Carp, Walleye
Menominee River	Menominee, river mouth	91040	Apr/20/1991	Lake Sturgeon
Menominee River	Menominee, river mouth	93031	Jun/01/1993	Carp
Menominee River	Menominee, river mouth	93039	Jun/30/1993	Channel Catfish
Menominee River	Menominee, river mouth	2001146	Oct/10/2000	Lake Sturgeon
Menominee River	Sturgeon Falls Impoundment	1999080	May/25/1999	Northern Pike
Menominee River	Upper Scott Flowage, Chappee Rapids	90057	Sep/20/1990	Rock Bass, Walleye
Menominee River	Upper Scott Flowage, Highway JJ	90056	Sep/27/1990	Rock Bass, Walleye
Menominee River	White Rapids Flowage	1999091	Oct/18/1999	Redhorse Sucker
Michigamme River	Iron County	84022	Aug/31/1984	Walleye
Michigamme River	Iron County, Michigamme Falls Impoundment	84025	Aug/24/1984	Black Crappie, Northern Pike, Pumpkinseed, Smallmouth Bass, Walleye, Yellow Perch
Michigamme River	Marquette County	84021	Aug/16/1984	Northern Pike, Walleye
Michigamme River	Michigamme Reservoir	84026	Jun/01/1984	Northern Pike, Walleye, White Sucker
Michigamme River	Michigamme Reservoir	92075	Sep/14/1992	Northern Pike, Walleye
Michigamme River	Michigamme Reservoir	95061	Oct/03/1995	Northern Pike, Walleye
Michigamme River	Michigamme Reservoir	1998072	Sep/29/1998	Northern Pike, Walleye
Michigamme River	Michigamme Reservoir	2000052	Sep/13/2000	Northern Pike, Walleye
Michigamme River	Peavy Pond	84023	Aug/10/1984	Northern Pike, Rock Bass, Walleye, White Sucker, Yellow Perch
Michigamme River	Peavy Pond	97043	Oct/30/1997	Burbot, Walleye
Michigamme River	Peavy Pond	1998145	Oct/13/1998	Lake Whitefish, Northern Pike, Rock Bass, Smallmouth Bass, Walleye, White Sucker, Yellow Perch

Waterbody	Location	Visit ID#	Date	Species
Milakokia Lake	Mackinac County	85061	Jun/18/1985	Walleye, White Sucker
Milakokia Lake	Mackinac County	94031	Jun/21/1994	Walleye, White Sucker, Yellow Perch
Mill Creek	Washtenaw County	89021	Jul/24/1989	White Sucker
Millecoquin Lake	Mackinac County	89038	May/11/1989	Northern Pike, Walleye
Millecoquin Lake	Mackinac County	92071	Aug/05/1992	Lake Sturgeon
Mona Lake	Muskegon County	87056	Jul/14/1987	Carp, Smallmouth Bass
Mona Lake	Muskegon County	2000055	Oct/25/2000	Carp, Smallmouth Bass, Walleye
Morrison Lake	Ionia County	88002	May/03/1988	Carp, Largemouth Bass, Walleye, White Sucker
Morrison Lake	Ionia County	1998076	Oct/27/1998	Largemouth Bass
Mullett Lake	Cheboygan County	88035	Oct/18/1988	Northern Pike, Smallmouth Bass, Walleye
Muskegon Lake	Muskegon County	83052	May/27/1983	Carp, Northern Pike
Muskegon Lake	Muskegon County	86061	Oct/29/1986	Carp, Largemouth Bass, Northern Pike, Walleye
Muskegon Lake	Muskegon County	87054	Jul/07/1987	Largemouth Bass, Smallmouth Bass, Walleye
Muskegon Lake	Muskegon County	93071	Aug/19/1993	Carp, Walleye
Muskegon Lake	Muskegon County	2001082	Sep/13/2001	Largemouth Bass, Smallmouth Bass
Muskegon Lake	Muskegon County	2002071	Sep/04/2002	Carp, Walleye
Muskegon River	M-82 at High Rollaway	2002074	Aug/20/2002	Channel Catfish
Muskegon River	Maple Island Road	2002075	Aug/20/2002	Channel Catfish
Muskegon River	Muskegon, river mouth	90020	Aug/07/1990	Channel Catfish
Muskegon River	Muskegon, river mouth	93038	Jun/09/1993	Carp
Muskegon River	Muskegon, river mouth	93042	Jul/01/1993	Channel Catfish
Muskegon River	Newaygo County, below Croton Dam	89002	Apr/10/1989	Walleye Eggs
Muskegon River	Newaygo County, below Croton Dam	93011	Apr/04/1993	Walleye
Muskegon River	Newaygo County, below Croton Dam	96042	Mar/29/1996	Redhorse Sucker, Walleye
Muskegon River	Newaygo County, Croton Dam Pond	91029	Apr/04/1991	Carp
Muskegon River	Newaygo County, Croton Dam Pond	93080	Jun/28/1993	Carp
Muskegon River	Newaygo County, Croton Dam Pond	95041	Sep/27/1995	Carp
Muskegon River	Newaygo County, Croton Dam Pond	97047	Sep/30/1997	Walleye, White Sucker
Muskegon River	Newaygo County, Croton Dam Pond	97048	Sep/30/1997	Carp, Yellow Perch
Muskegon River	Newaygo County, Croton Dam Pond	2000058	Sep/06/2000	Carp, Yellow Perch
Muskegon River	Newaygo County, Croton Dam Pond	2002076	Jul/08/2002	Carp
Muskegon River	Vance Road	2002073	Aug/20/2002	Channel Catfish
Nawakwa Lake	Alger County	89055	Jun/20/1989	Northern Pike, Walleye
Nawakwa Lake	Alger County	1999076	May/06/1999	Northern Pike, Walleye
Net River	Iron County, The Wide Waters	89030	May/01/1989	Northern Pike, Walleye
Nettie Lake	Presque Isle County	95032	Jun/05/1995	Largemouth Bass, Northern Pike
North Manistique Lake	Luce County	89048	Jun/07/1989	Northern Pike, Walleye, Yellow Perch
Norvell Lake	Jackson County	2001084	Oct/17/2001	Carp, Largemouth Bass

Waterbody	Location	Visit ID#	Date	Species
Nottawa River	Calhoun County	1998080	Jul/29/1998	Brown Trout, N. Hogsucker, White Sucker
Ontonagon River	Bond Falls	1999047	Apr/18/1999	Walleye
Ontonagon River	Ontonagon, river mouth	92008	Aug/04/1992	Channel Catfish
Ontonagon River	Victoria Impoundment	88065	Jul/06/1988	Northern Pike, Walleye
Ontonagon River	Victoria Impoundment	2000060	May/17/2000	Walleye
Orchard Lake	Oakland County	87087	Sep/25/1987	Largemouth Bass, Northern Pike
Orchard Lake	Oakland County	89006	Jun/07/1989	Largemouth Bass, Northern Pike, Smallmouth Bass
Orchard Lake	Oakland County	94036	May/10/1994	Northern Pike
Osmun Lake	Oakland County	1999048	Jul/07/1999	Carp, Largemouth Bass
Ottawa Lake	Iron County	86005	May/22/1986	Northern Pike, Rock Bass, Walleye
Ottawa River	Mouth	93047	Sep/29/1993	Carp, Largemouth Bass
Otter Lake	Houghton County	2000061	May/25/2000	Walleye, White Sucker
Ox Creek	Berrien County	96043	Aug/06/1996	Largemouth Bass, White Sucker
Ox Creek	Mouth	2001092	Jul/30/2001	Channel Catfish
Paint Creek	Oakland County	1998081	Aug/19/1998	White Sucker
Paint River	Paint River Pond	84024	Aug/28/1984	Muskellunge, Rock Bass, Walleye, Yellow Perch
Palmer Lake	St. Joseph County	2001141	Aug/30/2001	Largemouth Bass
Parker Creek	Grand Traverse County	1998048	Jul/09/1998	Brown Trout
Paw Paw River	Above Ox Creek	2001093	Jul/30/2001	Channel Catfish
Paw Paw River	Below Ox Creek	2001094	Jul/30/2001	Channel Catfish
Pearl Lake	Benzie County	97050	Jan/01/1997	Northern Pike
Perch Lake	Iron County	88051	Oct/12/1988	Northern Pike, Walleye
Perch Lake	Marquette County	84020	Aug/16/1984	Lake Whitefish, Longnose Sucker, Northern Pike, Rock Bass, Smallmouth Bass, White Sucker, Yellow Perch
Pere Marquette Lake	Mason County	89075	Aug/23/1989	Largemouth Bass, Northern Pike
Pere Marquette River	Ludington, river mouth	90027	Sep/18/1990	Channel Catfish
Pere Marquette River	Ludington, river mouth	93037	Jun/09/1993	Redhorse Sucker
Pere Marquette River	Ludington, river mouth	93041	Jul/01/1993	Channel Catfish
Pickerel Lake	Dickinson County	87082	Sep/24/1987	Largemouth Bass, Northern Pike
Pickerel Lake	Emmet County	89069	May/23/1989	Largemouth Bass, Smallmouth Bass, Walleye
Pike Lake	Luce County	89056	Jun/28/1989	Walleye
Pine Lake	Barry County	95001	Mar/20/1995	black crappie, Northern Pike
Pine Lake	Manistee County	87042	Jun/02/1987	Brown Trout, Largemouth Bass, Rock Bass
Pine River	Above Alma	1998085	Oct/15/1998	Rock Bass, White Sucker
Pine River	Alma Impoundment	95018	Jun/07/1995	Carp, Largemouth Bass
Pine River	Below Alma Dam	97060	Jul/29/1997	Carp, Largemouth Bass
Pine River	Gordonville Road	2000070	Jul/20/2000	Channel Catfish
Pine River	Gordonville Road	2002014	Jul/16/2002	Channel Catfish
Pine River	Gratiot County, Alma	83047	May/31/1983	Carp
Pine River	Gratiot County, below St Louis Dam	83001	Oct/31/1983	Brown Bullhead, Carp, Common Shiner, Rock Bass, Smallmouth Bass, White Sucker
Pine River	Gratiot County, below St Louis Dam	85007	Aug/06/1985	Carp
Pine River	Gratiot County, below St Louis Dam	94021	Aug/23/1994	Carp

Waterbody	Location	Visit ID#	Date	Species
Pine River	Gratiot County, below St Louis Dam	97072	Oct/16/1997	Carp
Pine River	Harrison Road	1999049	Jun/24/1999	Channel Catfish
Pine River	Harrison Road	2000066	Jul/20/2000	Channel Catfish
Pine River	Harrison Road	2002011	Jul/16/2002	Channel Catfish
Pine River	M-46	1999050	Jun/24/1999	Channel Catfish
Pine River	M-46	2000067	Jul/20/2000	Channel Catfish
Pine River	M-46	2002012	Jul/16/2002	Channel Catfish
Pine River	Midland County, Homer Road	85060	Apr/11/1985	Carp, Smallmouth Bass, White Sucker
Pine River	Mill Street	2000068	Jul/20/2000	Channel Catfish
Pine River	Montcalm County, Edmore	86041	Jul/29/1986	Brown trout, Hognose sucker, Redhorse sucker, White Sucker
Pine River	Nine Mile Road	1999053	Jun/24/1999	Channel Catfish
Pine River	St. Clair	97051	Sep/17/1997	Channel Catfish
Pine River	St. Clair County, Griswold Road	92009	Jul/30/1992	Carp
Pine River	St. Louis	96500	Oct/15/1996	Muskrat, Raccoon
Pine River	St. Louis Impoundment	86042	Aug/07/1986	Carp, Crappie, Largemouth Bass, Northern Pike, Smallmouth Bass
Pine River	St. Louis Impoundment	89027	Apr/27/1989	Black Crappie, Carp, Largemouth Bass
Pine River	St. Louis Impoundment	95005	Apr/24/1995	Black Crappie, Carp
Pine River	St. Louis Impoundment	97071	Oct/17/1997	Carp, Smallmouth Bass
Pine River	St. Louis Impoundment	2002103	Jul/16/2002	Channel Catfish
Pine River	WWTP Bridge	1999052	Jun/24/1999	Channel Catfish
Pine River	WWTP Bridge	2000069	Jul/20/2000	Channel Catfish
Pine River	WWTP Bridge	2002013	Jul/16/2002	Channel Catfish
Platte River	Burnt Mill Road, Benzie County	1998087	Aug/05/1998	Brown Trout, White Sucker
Plum Creek	Monroe	1999090	Nov/01/1999	Black Buffalo, Carp, Channel Catfish, White Bass
Pomeroy Lake	Gogebic County	97052	Apr/30/1997	Walleye
Pomeroy Lake	Gogebic County	1999055	Apr/28/1999	Walleye
Pontiac Lake	Oakland County	92070	Jul/27/1992	Largemouth Bass
Pontiac Lake	Oakland County	94007	Oct/01/1994	Largemouth Bass
Pontiac Lake	Oakland County	97053	May/22/1997	Largemouth Bass
Pontiac Lake	Oakland County	1999056	Apr/06/1999	Largemouth Bass
Pontiac Lake	Oakland County	1999079	Apr/06/1999	Channel Catfish
Pontiac Lake	Oakland County	2003094	Jun/25/2003	Largemouth Bass
Portage Creek	Bryant Mill Pond	85050	Jul/01/1985	Carp
Portage Creek	Bryant Mill Pond	86023	Jul/08/1986	Carp
Portage Creek	Bryant Mill Pond	87047	Jul/14/1987	Carp
Portage Creek	Bryant Mill Pond	2000121	Aug/10/2000	Brown Trout, Carp
Portage Creek	Bryant Mill Pond	2001044	Aug/29/2001	Carp, White Sucker
Portage Creek	Bryant Mill Pond	2002108	Aug/19/2002	Carp
Portage Creek	Kalamazoo, Crosstown Pkwy.	89059	Aug/30/1989	Channel Catfish
Portage Creek	Monarch Pond	2001045	Oct/17/2001	Carp
Portage Creek	Mouth, Alcott St.	1999097	Sep/08/1999	Channel Catfish
Portage Lake	Houghton County	88016	Aug/04/1988	Brown Trout, Northern Pike, Walleye
Portage Lake	Houghton County	1998151	Sep/15/1998	Walleye, White Sucker

Waterbody	Location	Visit ID#	Date	Species
Portage Lake	Manistee County	90008	Jun/12/1990	Largemouth Bass, Northern Pike, Smallmouth Bass
Portage Lake	Washtenaw/Livingston County	89009	May/10/1989	Largemouth Bass, Walleye
Prairie River Lake	St. Joseph County	86043	Aug/12/1986	Largemouth Bass
Rainbow Lake	Montcalm County	90045	Sep/21/1990	Largemouth Bass, Northern Pike
Raisin River	Above Monroe Dam	91050	Sep/25/1991	Carp
Raisin River	Above Monroe Dam	94010	Jun/10/1994	Carp
Raisin River	Above Monroe Dam	97054	Oct/02/1997	Carp
Raisin River	Above Monroe Dam	2000072	Oct/12/2000	Carp
Raisin River	Below Turning Basin	1998091	Sep/10/1998	Channel Catfish
Raisin River	Monroe County, above Monroe Dam	87024	Jun/09/1987	Carp, Smallmouth Bass
Raisin River	Monroe, below Winchester Bridge	83044	Apr/22/1983	Carp
Raisin River	Monroe, below Winchester Bridge	84015	Jun/28/1984	Carp, Largemouth Bass, Rock Bass, Smallmouth Bass
Raisin River	Monroe, below Winchester Bridge	86019	Jun/19/1986	Carp, White Bass
Raisin River	Monroe, below Winchester Bridge	1998089	Sep/18/1998	Carp, Freshwater Drum, Smallmouth Bass
Raisin River	Monroe, river mouth	91018	Sep/06/1991	Channel Catfish
Raisin River	Monroe, river mouth	1998090	Sep/10/1998	Channel Catfish
Raisin River	Near Grand Trunk RR Bridge	1998092	Sep/10/1998	Channel Catfish
Raisin River, South Branch	Lenawee County, below Adrian	91051	Aug/29/1991	Carp, Northern Pike, Redhorse Sucker
Randall Lake Chain	Craig Lake	90014.2	Jun/27/1990	Largemouth Bass, Northern Pike
Randall Lake Chain	Randall Lake	90014.1	Jun/27/1990	Black Crappie, Largemouth Bass, Northern Pike
Rapid River	Kalkaska County	1998137	Sep/01/1998	Brown Trout
Red Cedar River	Gramer Road	91019.2	Jun/27/1991	Carp
Red Cedar River	Gregory Road	91019.1	Jun/27/1991	Carp, Northern Pike
Red Cedar River	M-52	91019.3	Jun/27/1991	Carp, Northern Pike
Red Cedar River	Mouth	2001015	Jul/23/2001	Channel Catfish
Red Cedar River	MSU	2000075	Aug/01/2000	Carp, Northern Pike, Rock Bass, Smallmouth Bass
Red Cedar River	MSU	2001096	Apr/27/2001	Carp, Northern Pike, Rock Bass
Reed's Lake	Kent County	89070	Sep/20/1989	Largemouth Bass, Northern Pike
Reed's Lake	Kent County	1998094	Oct/30/1998	Northern Pike, Walleye
Rice Lake	Houghton County	91027	May/02/1991	Northern Pike, Walleye
Rifle River	Arenac County	88040	Aug/22/1988	Redhorse Sucker, Rock Bass
Robinson Creek	Roscommon	89053	Jul/12/1989	Brook Trout, Brown Trout
Rogue River	11 Mile/Granger	1998095	Aug/17/1998	Brown Trout, White Sucker
Rogue River	Kent County, above Rockford Dam	93072	Nov/01/1993	White Sucker
Roland Lake	Houghton County	87040	Jun/30/1988	Rock Bass, Smallmouth Bass
Rouge River	Bell Branch	92040	Aug/25/1992	Channel Catfish
Rouge River	Below M-153	95059	Apr/24/1995	Carp, Northern Pike, White Sucker
Rouge River	Below Newburgh Lake	2000116	Oct/04/2000	Channel Catfish
Rouge River	Below Phoenix Lake	2000077	Aug/28/2000	Channel Catfish
Rouge River	Dearborn, river mouth	86016	Jun/24/1986	Carp
Rouge River	Dearborn, river mouth	92010	Aug/25/1992	Channel Catfish
Rouge River	Dearborn, river mouth	95044	Oct/09/1995	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Rouge River	Dearborn, river mouth	2000079	Aug/28/2000	Channel Catfish
Rouge River	Dearborn, river mouth	2000117	Oct/04/2000	Channel Catfish
Rouge River	Evergreen Road	95042	Oct/09/1995	Channel Catfish
Rouge River	Greenfield Road	95043	Oct/09/1995	Channel Catfish
Rouge River	Oakland County, Lahser Road	87029	Jun/17/1987	Carp, Rock Bass, White Sucker
Rouge River	Wayne County, above turning basin	85012	Jun/19/1985	Carp
Rouge River	Wayne County, below Jefferson Ave	85011	Jun/19/1985	Carp
Rouge River	Wayne County, Eliza Howell Park	87031	Jun/17/1987	White Sucker
Rouge River	Wayne County, Eliza Howell Park	94015	Sep/13/1994	White Sucker
Rouge River, Lower Branch	Wayne County, Gulley Road	87025	Jun/16/1987	Carp
Rouge River, Middle Branch	Inkster Road below Newburgh Lake	2002084	Sep/06/2002	White Sucker
Rouge River, Middle Branch	Newburgh Lake	88011	Jul/19/1988	Largemouth Bass, Northern Pike, White Sucker
Rouge River, Middle Branch	Newburgh Lake	93014	Nov/17/1993	Northern Pike, White Sucker
Rouge River, Middle Branch	Newburgh Lake	95024	May/30/1995	Bluegill, Largemouth Bass
Rouge River, Middle Branch	Newburgh Lake	2001097	Oct/30/2001	Carp, Channel Catfish, Largemouth Bass, White Sucker
Rouge River, Middle Branch	Newburgh Lake	2002085	Sep/24/2002	Carp, Channel Catfish, Northern Pike, White Sucker
Rouge River, Middle Branch	Oakland County, 9 Mile Road	87028	Jun/16/1987	Brown bullhead, Carp, Channel Catfish, Rock Bass, White Sucker
Rouge River, Middle Branch	Phoenix Lake	88012	Jul/19/1988	Carp, Northern Pike, White Sucker
Rouge River, Middle Branch	Phoenix Lake	95023	Jun/13/1995	Bluegill, Carp
Rouge River, Middle Branch	Phoenix Lake	2001098	Oct/30/2001	Carp, Channel Catfish, Northern Pike
Rouge River, Middle Branch	Wayne County, Haggerty/Hines Drain	87027	Jun/16/1987	Rock Bass, Smallmouth Bass, White Sucker
Rouge River, Middle Branch	Wayne County, Inkster Road	87026	Jun/16/1987	Goldfish
Rouge River, Middle Branch	Wayne County, Merriman Road	2000083	Jul/24/2000	White Sucker
Rouge River, Upper Branch	Oakland County, Powers Road	87032	Jun/17/1987	White Sucker
Rouge River, Upper Branch	Wayne County, 7 Mile Road	87030	Jun/17/1987	White Sucker
Round Lake	Delta County	87083	Sep/23/1987	Northern Pike, Walleye
Ruddiman Creek	Lagoon	2001131	Sep/13/2001	Carp, Largemouth Bass
Runkle Lake	Iron County	85018	Jun/11/1985	Northern Pike
Saginaw River	Bay County	86014	Jun/10/1986	Carp, Walleye
Saginaw River	Bay County, LaFayette	84013	Aug/09/1984	Carp, Northern Pike, White Bass
Saginaw River	Bay County, river mouth	88020	Aug/01/1988	Channel Catfish
Saginaw River	Bay County, river mouth	92011	Aug/12/1992	Channel Catfish
Saginaw River	Bay County, river mouth	1998096	Sep/04/1998	Channel Catfish
Saginaw River	Bay County, river mouth	2002028	Jul/16/2002	Channel Catfish
Saginaw River	Saginaw County, Crow Island	92036	Jul/15/1992	Carp
Saginaw River	Saginaw County, Saginaw	88021	Aug/01/1988	Channel Catfish
Saginaw River	upstream of Middle Ground Isle	1998097	Sep/04/1998	Channel Catfish
Saginaw River	upstream of Middle Ground Isle	2002027	Jul/16/2002	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Saginaw River	Zilwaukee Bridge	1998098	Sep/04/1998	Channel Catfish
Saginaw River	Zilwaukee Bridge	2002026	Jul/16/2002	Channel Catfish
Sand Lake	Newaygo County	92058	May/22/1992	Black Crappie, Largemouth Bass
Schweitzer Creek	Schweitzer Reservoir	92047	Aug/07/1992	Northern Pike, Smallmouth Bass, Walleye
Sebewaing River	Huron County	88037	Oct/20/1988	Carp, Northern Pike
Second Sister Lake	Washtenaw County	94062.1	Sep/20/1994	Brown Bullhead
Selkirk Lake	Allegan County	93057	May/20/1993	Largemouth Bass, Yellow Bullhead
Shiawassee River	City of Byron	95039	Jun/22/1995	Carp, Northern Pike
Shiawassee River	Fergus Road	2002022	Jul/16/2002	Channel Catfish
Shiawassee River	Genesee County, Duffield Road	81007	Jun/03/1981	Carp, Hognose Sucker, Northern Pike, Rock Bass, Sunfish
Shiawassee River	Henderson	92012	Sep/22/1992	Carp, Smallmouth Bass
Shiawassee River	Mouth	1998099	Sep/04/1998	Channel Catfish
Shiawassee River	Mouth	2002025	Apr/16/2002	Channel Catfish
Shiawassee River	Oakland County, Fish Lake Road	87062	Jul/28/1987	Carp, Largemouth Bass, Rock Bass
Shiawassee River	Saginaw County below Chesaning	87064	Aug/05/1987	Carp, Rock Bass, Smallmouth Bass
Shiawassee River	Saginaw County, Miller Road	88024	Aug/18/1988	Channel Catfish
Shiawassee River	Shiawassee County, Bryon Road	81006	Jun/03/1981	Black Crappie, Carp, Northern Pike, Redhorse sucker, Rock Bass, Sunfish
Shiawassee River	Shiawassee County, Bryon Road	85002	Jul/17/1985	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass
Shiawassee River	Shiawassee County, New Lothrop Road	81008	Jun/03/1981	Black Crappie, Carp, Hognose Sucker, Minnow, Rock Bass, Sunfish, White Sucker
Shiawassee River	Shiawassee County, New Lothrop Road	85001	Jul/17/1985	Carp, Crappie, Rock Bass
Shiawassee River	Shiawassee County, New Lothrop Road	87066	Jul/30/1987	Carp, Northern Pike, Smallmouth Bass
Shiawassee River	Shiawassee Pond	81009	Jun/03/1981	Black Bullhead, Carp, Sunfish
Shiawassee River, South Branch	Livingston County, Bowen Road	81002	Jun/03/1981	Black Bullhead, Minnow, Northern Pike, Sunfish, White Sucker
Shiawassee River, South Branch	Livingston County, Bowen Road	84008	Jun/02/1984	Black Crappie, Grass Pickerel, Northern Pike, Rock Bass, White Sucker
Shiawassee River, South Branch	Livingston County, Chase Lake Road	81004	Jun/03/1981	Carp, Minnow, Northern Pike, Rock Bass, Sunfish, White Sucker, Yellow Bullhead
Shiawassee River, South Branch	Livingston County, Chase Lake Road	86036	Jul/30/1986	Carp, Northern Pike, Rock Bass, White Sucker
Shiawassee River, South Branch	Livingston County, Grand River Road	81001	Jun/03/1981	Minnow, Sunfish, White Sucker
Shiawassee River, South Branch	Livingston County, Marr Road	81003	Jun/03/1981	Carp, Minnow, Northern Pike, Sunfish, White Sucker, Yellow Bullhead
Shiawassee River, South Branch	Livingston County, Marr Road	87065	Jul/29/1987	Rock Bass, White Sucker
Shiawassee River, South Branch	Livingston County, Oak Grove Road	81005	Jun/03/1981	Black Crappie, Carp, Rock Bass, White Sucker
Shupac Lake	Crawford County	89044	May/23/1989	Largemouth Bass, Rainbow Trout, Smallmouth Bass, Yellow Perch
Silver Lead Creek	Marquette County, K.I. Sawyer AFB	96056	Nov/04/1996	Brook Trout
Siskiwit Lake	Isle Royale	87033	Jun/17/1987	Lake Trout

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Siskiwit Lake	Isle Royale	93029	May/20/1993	Lake Trout, Lake Whitefish, Northern Pike
Siskiwit Lake	Isle Royale	96049	Aug/09/1996	Lake Trout
Siskiwit Lake	Isle Royale	96050	Aug/09/1996	Lake Trout
Siskiwit Lake	Isle Royale	2002105	Jun/29/2002	Lake Trout
Six Mile Lake	Houghton County	95012	May/16/1995	Bluegill, Walleye
Smokey Lake	Iron County	86056	Oct/07/1986	Lake Trout, Rock Bass, Smallmouth Bass, White Sucker
South Branch Black River	Downstream of Bangor	2002006	Jul/02/2002	Channel Catfish
South Branch Black River	Upstream Bangor	2002005	Aug/02/2002	Channel Catfish
South Lake	Washtenaw County	87020	Jun/09/1987	Largemouth Bass, Northern Pike, Rock Bass
South Lake	Washtenaw County	88062	Sep/19/1988	Largemouth Bass, Northern Pike
South Lake	Washtenaw County	89008	Jun/28/1989	Largemouth Bass, Northern Pike
South Manistique Lake	Mackinac County	88034	Sep/20/1988	Rock Bass, Walleye
South Manistique Lake	Mackinac County	91016	Apr/24/1991	Walleye
South Manistique Lake	Mackinac County	93027	Apr/28/1993	Walleye
South Manistique Lake	Mackinac County	95056	Apr/27/1995	Walleye
South Manistique Lake	Mackinac County	1998105	Apr/06/1998	Walleye
South Manistique Lake	Mackinac County	2001099	Nov/11/2001	Walleye
Sporley Lake	Marquette County	93058	Jun/01/1993	White Sucker
Spring Brook	Kalamazoo County	1998106	Aug/19/1998	Brown Trout
Squaw Lake	Dickinson/Marquette County	89018	May/08/1989	Rainbow Trout, Splake, Yellow Perch
Squaw Lake	Dickinson/Marquette County	93059	May/18/1993	Largemouth Bass, White Sucker
St. Clair River	Algonac	83049	Jul/27/1983	Carp
St. Clair River	Algonac	86018	Jun/18/1986	Carp, Walleye
St. Clair River	Algonac	92061	Jun/21/1992	Carp, Walleye
St. Clair River	Algonac	94009	Aug/25/1994	Carp
St. Clair River	Algonac	2002093	May/24/2002	Carp
St. Clair River	Marine City	91031	May/14/1991	Walleye
St. Clair River	Port Huron	86038	Jul/31/1986	Freshwater Drum, Walleye
St. Clair River	Rivermouth, North Channel	94008	Aug/25/1994	Carp, Freshwater Drum
St. Clair River	St. Clair	85006	Oct/10/1985	Walleye
St. Joseph River	Above Niles	2001086	Jul/30/2001	Channel Catfish
St. Joseph River	Above Niles Dam	95052	Jul/07/1995	Carp
St. Joseph River	Above Paw Paw River	2001090	Jul/30/2001	Channel Catfish
St. Joseph River	Below Buchanan	97065	Sep/16/1997	Channel Catfish
St. Joseph River	Below Buchanan	2001087	Jul/30/2001	Channel Catfish
St. Joseph River	Below Niles	97066	Sep/16/1997	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	89022	Aug/28/1989	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	93034	Jun/08/1993	Carp
St. Joseph River	Benton Harbor, river mouth	93045	Jul/01/1993	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	97063	Sep/16/1997	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	2001091	Jul/30/2001	Channel Catfish
St. Joseph River	Berrien Springs, below Dam	84004	Oct/03/1984	Carp, Smallmouth Bass
St. Joseph River	Berrien Springs, below Dam	87096	Nov/18/1987	Carp, Smallmouth Bass, Walleye
St. Joseph River	Berrien Springs, below Dam	97064	Sep/16/1997	Channel Catfish
St. Joseph River	Berrien Springs, below Dam	2001089	Jul/30/2001	Channel Catfish
St. Joseph River	Chapin Lake	83033	May/01/1983	Redhorse Sucker, Smallmouth Bass
St. Joseph River	Chapin Lake	83042	May/10/1983	Carp

Waterbody	Location	Visit ID#	Date	Species
St. Joseph River	Chapin Lake	87097	Nov/19/1987	Carp, Smallmouth Bass
St. Joseph River	Chapin Lake	91044	Aug/20/1991	Carp
St. Joseph River	Chapin Lake	93081	Oct/06/1993	Carp
St. Joseph River	Chapin Lake	95051	Jul/06/1995	Carp, Smallmouth Bass
St. Joseph River	Chapin Lake	2000088	Oct/17/2000	Carp
St. Joseph River	Chapin Lake	2002094	Oct/21/2002	Carp
St. Joseph River	Constantine Impoundment	1998110	Jun/24/1998	Channel Catfish, Redhorse Sucker
St. Joseph River	St. Joseph County, Constantine	92031	Apr/02/1992	Carp, Walleye
St. Joseph River	St. Joseph County, Three Rivers	92032	Apr/03/1992	Walleye
St. Joseph River	State Line, Berrien County	97067	Sep/16/1997	Channel Catfish
St. Marys River	Michigan Waters	95046	Aug/01/1995	Northern Pike, Walleye, Yellow Perch
St. Marys River	Munuscong Bay	86045	Aug/26/1986	Northern Pike, Walleye
St. Marys River	Munuscong Bay	91021	Apr/23/1991	Walleye
St. Marys River	Munuscong Bay	91059	Apr/23/1991	Walleye
St. Marys River	Munuscong Bay	93015	Apr/27/1993	Carp, Walleye
St. Marys River	Munuscong Bay	95004	Apr/17/1995	carp, walleye
St. Marys River	Munuscong Bay	1998112	Apr/29/1998	Carp, Walleye
St. Marys River	Munuscong Bay	2001102	Apr/23/2001	Walleye
St. Marys River	N. Drummond Island	89035	May/11/1989	Yellow Perch
St. Marys River	Sugar Island	87049	Sep/11/1987	Northern Pike, Walleye, White Sucker
Stanley Lake	Iron County	90013	May/31/1990	Largemouth Bass, Smallmouth Bass, Walleye
Stanley Lake	Iron County	2001143	Sep/10/2001	Walleye
Stony Creek Impoundment	Macomb County	89025	Apr/16/1989	Crappie, Northern Pike, Walleye
Sudden Lake	Ontonagon County	2001144	Oct/03/2001	Walleye
Sunset Lake	Iron County	88049	Oct/11/1988	Northern Pike, Walleye
Swan Creek	Monroe County	86059	Oct/09/1986	White Sucker
Tahquamenon River	Dollarville	1998114	Jul/06/1998	Walleye, White Sucker
Tahquamenon River	Luce County, Slater's Landing	88028	Aug/08/1988	Northern Pike, Walleye
Tannery Creek	Emmet County	87058	Jul/21/1987	Brook Trout
Tawas River	Iosco County	88058	Oct/14/1988	Northern Pike, White Sucker
Terry Lake	Oakland County	1999064	Jul/07/1999	Carp, Largemouth Bass
Thompson Lake	Livingston County	86010	Jun/03/1986	Carp, Northern Pike, Yellow Perch
Thompson Lake	Livingston County	95038	Jun/13/1995	Black Crappie, Carp
Thornapple River	Gresham Highway	1998117	Jul/02/1998	White Sucker
Thornapple River	Mouth	2001019	Jul/23/2001	Channel Catfish
Thornapple River	Thornapple Lake, Barry County	93016	May/12/1993	Largemouth Bass, Redhorse Sucker
Thousand Island Lake	Gogebic County	1999065	Apr/23/1999	Walleye
Thread Creek	Genesee County	93017	Aug/30/1993	Carp, Northern Pike
Thread Creek	Thread Lake	2000092	Sep/28/2000	Carp, Largemouth Bass
Thunder Bay River	Alpena County, Lake Besser	89052	Jun/29/1989	Carp, Redhorse Sucker, Smallmouth Bass, Walleye
Thunder Bay River	Alpena County, Lake Besser	93018	Oct/15/1993	Carp
Thunder Bay River	Alpena, river mouth	89024	Sep/02/1989	Channel Catfish
Thunder Bay River	Alpena, river mouth	96053	Aug/19/1996	Channel Catfish
Tittabawassee River	Cook Road	2002016	Jul/16/2002	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Tittabawassee River	Freeland	2002019	Jul/16/2002	Channel Catfish
Tittabawassee River	Midland County, below Dow Dam	84010	Apr/03/1984	Carp, Walleye, White Sucker
Tittabawassee River	Midland County, below Dow Dam	87002	Apr/07/1987	Walleye
Tittabawassee River	Midland County, below Dow Dam	89001	Apr/06/1989	Walleye Eggs
Tittabawassee River	Midland County, below Dow Dam	92064	Oct/30/1992	Carp, Walleye
Tittabawassee River	Midland County, below Dow Dam	95013	Apr/06/1995	White Bass, White Sucker
Tittabawassee River	Midland County, below Dow Dam	1999066	May/26/1999	Carp, Smallmouth Bass
Tittabawassee River	Midland County, below Dow Dam	2000093	Jul/05/2000	Smallmouth Bass, Walleye
Tittabawassee River	Midland County, Smiths Road	83054	Aug/23/1983	Carp, Channel Catfish, Smallmouth Bass, Walleye
Tittabawassee River	Midland County, Smiths Road	85015	Apr/17/1985	Walleye
Tittabawassee River	Midland County, Smiths Road	85016	May/23/1985	Black Crappie, Northern Pike, Smallmouth Bass, White Bass
Tittabawassee River	Midland County, Smiths Road	85017	Jul/16/1985	Walleye
Tittabawassee River	Midland County, Smiths Road	2000095	Jul/20/2000	Channel Catfish
Tittabawassee River	Midland County, Smiths Road	2002017	Jul/16/2002	Channel Catfish
Tittabawassee River	Midland County, Smiths Road	2003132	Apr/02/2003	Carp, Channel Catfish, Smallmouth Bass, Walleye, White Bass
Tittabawassee River	Mouth	1998119	Sep/04/1998	Channel Catfish
Tittabawassee River	Mouth	2002021	Jul/16/2002	Channel Catfish
Tittabawassee River	RR Bridge below Dow	2002018	Jul/16/2002	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	88023	Aug/02/1988	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	2002020	Jul/16/2002	Channel Catfish
Tittabawassee River	Sanford Lake	89004	Apr/07/1989	Black Crappie, Northern Pike, Walleye
Tittabawassee River	Sanford Lake	92065	Sep/15/1992	Carp
Tittabawassee River	Sanford Lake	1999081	May/20/1999	Black Crappie, Channel Catfish, Rock Bass
Todd Lake	Osceola County	87041	Jul/02/1987	Largemouth Bass, Northern Pike
Tonquish Creek	Above Wayne Road, South of Joy Road	92039	Sep/14/1992	Channel Catfish
Topico Wetland	Bay County	96054	May/21/1996	Carp, Northern Pike
Torch Lake	Antrim County	91035	Sep/11/1991	Lake Trout, Smallmouth Bass
Torch Lake	Antrim County	93085	Nov/03/1993	Brown Trout, Lake Trout
Torch Lake	Antrim County	94054	Jul/15/1994	Lake Whitefish
Torch Lake	Antrim County	2000125	Mar/07/1996	Lake Trout
Torch Lake	Antrim County	2001110	Oct/08/2001	Lake Whitefish, Yellow Perch
Torch Lake	Houghton County	88015	Aug/23/1988	Northern Pike, Smallmouth Bass, Walleye
Torch Lake	Houghton County	2000096	May/03/2000	Northern Pike, Smallmouth Bass, Walleye
Two Hearted River	Mouth	92013	Aug/04/1992	Channel Catfish
Union Lake	Branch County	91026	Jun/12/1991	Carp, Channel Catfish, Crappie, Northern Pike

Waterbody	Location	Visit ID#	Date	Species
Union Lake	Oakland County	2002100	May/29/2002	Largemouth Bass, Smallmouth Bass
Unnamed Lake	Washtenaw County	89007	May/02/1989	Bullhead, Largemouth Bass
Van Etten Lake	Iosco County, Oscoda	90010	Jun/06/1990	Carp, Channel Catfish, Walleye
Vandercook Lake	Jackson County	88042	Sep/27/1988	Carp
Vermilac Lake	Baraga County	88029	May/16/1988	Northern Pike, Yellow Perch
Vermilac Lake	Baraga County	2001135	Oct/04/2001	Walleye
W. Branch Maple River	Emmet County	1998070	Jul/28/1998	Brown Trout, White Sucker
Wabascon Creek	Bedford	1998133	May/18/1998	Rock Bass, White Sucker
Wabasis Lake	Kent County	90047	Sep/25/1990	Largemouth Bass, Northern Pike
Walkup Lake	Newaygo County	1999075	Jun/21/1999	Bluegill
Walled Lake	Oakland County	88031	Aug/24/1988	Carp, Northern Pike
Walloon Lake	Charlevoix County	87023	Jun/04/1987	Smallmouth Bass
Walloon Lake	Charlevoix County	2000099	Oct/10/2000	Rock Bass, White Sucker, Yellow Bullhead, Yellow Perch
Wamplers Lake	Jackson/Lenawee County	89040	May/19/1989	Black Crappie, Largemouth Bass, Northern Pike
Wamplers Lake	Jackson/Lenawee County	94055	Oct/17/1994	Largemouth Bass, Northern Pike
White Lake	Muskegon County	80001	Jul/02/1980	Carp, Largemouth Bass, Northern Pike, Redhorse Sucker, Smallmouth Bass, White Sucker, Yellow Perch
White Lake	Muskegon County	84001	Jul/24/1984	Carp, Northern Pike, Redhorse Sucker, Smallmouth Bass, Walleye
White Lake	Muskegon County	87057	Jul/14/1987	Smallmouth Bass, Walleye
White Lake	Muskegon County	91046	Aug/21/1991	Carp, Walleye
White Lake	Oakland Co.	2001111	Oct/18/2001	Brown Bullhead, Rock Bass
White River	White Lake outlet, river mouth	92014	Aug/18/1992	Channel Catfish
Whitmore Lake	Livingston County	92038	Jun/09/1992	Carp, Largemouth Bass, Northern Pike
Wixom Lake	Gladwin County	2002102	May/16/2002	Channel Catfish, Northern Pike
Wolf Creek	Montcalm County, Grove Road	2000103	Sep/18/2000	White Sucker
Wolf Creek	Montcalm County, Vickeryville Road	92015	Jun/01/1992	Brown Trout, Rock Bass
Woodland Lake	Livingston County	2000104	May/02/2000	Carp, Largemouth Bass

APPENDIX B

INVENTORY OF WHOLE-FISH TREND MONITORING SITES AND SPECIES

Waterbody	Location	Visit ID#	Date	Species
Detroit River	Grassy Island	90033	Aug/28/1990	Carp, Walleye
Detroit River	Grassy Island	92033	Aug/17/1992	Carp, Walleye
Detroit River	Grassy Island	94050	Aug/25/1994	Carp, Walleye
Detroit River	Grassy Island	96009	Jul/12/1996	Carp, Walleye
Detroit River	Grassy Island	1998025	Sep/22/1998	Carp, Walleye
Detroit River	Grassy Island	2001009	Oct/18/2001	Carp, Walleye
Grand River	Kent County, above 6th St. Dam	90030	Aug/22/1990	Carp
Grand River	Kent County, above 6th St. Dam	92053	Oct/01/1992	Carp
Grand River	Kent County, above 6th St. Dam	94002	Jun/23/1994	Carp
Grand River	Kent County, above 6th St. Dam	2000024	Oct/25/2000	Carp
Grand Sable Lake	Alger County	91010	May/20/1991	Lake Trout
Grand Sable Lake	Alger County	93006	Jun/01/1993	Lake Trout
Grand Sable Lake	Alger County	95047	Sep/07/1995	Lake Trout
Gull Lake	Kalamazoo County	91058	Sep/12/1991	Largemouth Bass
Gull Lake	Kalamazoo County	93063	Jun/10/1993	Largemouth Bass
Gull Lake	Kalamazoo County	95035	Jun/01/1995	Largemouth Bass
Gull Lake	Kalamazoo County	97011	Jun/15/1997	Largemouth Bass
Gull Lake	Kalamazoo County	2000025	Jul/11/2000	Largemouth Bass
Gull Lake	Kalamazoo County	2002034	Jun/30/2002	Largemouth Bass
Gun Lake	Barry County	90006	Jul/01/1990	Largemouth Bass
Gun Lake	Barry County	92066	Jun/15/1992	Largemouth Bass
Gun Lake	Barry County	94023	Jul/17/1994	Largemouth Bass
Gun Lake	Barry County	97012	Jul/17/1997	Largemouth Bass
Gun Lake	Barry County	2000026	Jul/25/2000	Largemouth Bass
Gun Lake	Barry County	2002035	Jun/06/2002	Largemouth Bass
Higgins Lake	Roscommon County	91001	May/02/1991	Lake Trout
Higgins Lake	Roscommon County	95057.2	Oct/31/1995	Lake Trout
Higgins Lake	Roscommon County	97013	Oct/22/1997	Lake Trout, Yellow Perch
Higgins Lake	Roscommon County	2000028	Oct/11/2000	Lake Trout
Higgins Lake	Roscommon County	2002037	Oct/02/2002	Lake Trout
Houghton Lake	Roscommon County	92037	Jun/13/1992	Largemouth Bass
Houghton Lake	Roscommon County	94006	Jun/07/1994	Largemouth Bass
Houghton Lake	Roscommon County	1998126	Jun/16/1998	Largemouth Bass
Houghton Lake	Roscommon County	2001026	Oct/11/2001	Largemouth Bass
Kalamazoo River	Lake Allegan	90073	Oct/11/1990	Carp
Kalamazoo River	Lake Allegan	92018	Oct/27/1992	Carp
Kalamazoo River	Lake Allegan	94012	Jun/22/1994	Carp
Kalamazoo River	Lake Allegan	97016	Aug/28/1997	Carp
Kalamazoo River	Lake Allegan	1999016	Aug/05/1999	Carp
Kalamazoo River	Lake Allegan	2001056	Aug/23/2001	Carp
Lake Erie	Brest Bay	90003	Apr/09/1990	Carp, Walleye
Lake Erie	Brest Bay	92026	Apr/10/1992	Carp, Walleye
Lake Erie	Brest Bay	94026	Apr/19/1994	Carp, Walleye
Lake Erie	Brest Bay	97017	Apr/21/1997	Carp
Lake Erie	Brest Bay	1998051	Apr/15/1998	Carp, Walleye
Lake Erie	Brest Bay	2002044	Apr/26/2002	Carp
Lake Gogebic	Gogebic/Ontonagon County	92043	May/05/1992	Walleye

Waterbody	Location	Visit ID#	Date	Species
Lake Gogebic	Gogebic/Ontonagon County	94028	Apr/29/1994	Walleye
Lake Gogebic	Gogebic/Ontonagon County	97020	May/04/1997	Walleye, Yellow Perch
Lake Gogebic	Gogebic/Ontonagon County	2000031	Apr/18/2000	Walleye
Lake Gogebic	Gogebic/Ontonagon County	2002047	Apr/28/2002	Walleye
Lake Huron	Saginaw Bay	90063	Apr/24/1990	Carp, Walleye
Lake Huron	Saginaw Bay	91041	Oct/02/1991	Walleye
Lake Huron	Saginaw Bay	92028	May/19/1992	Carp, Walleye
Lake Huron	Saginaw Bay	94037	Sep/26/1994	Carp, Walleye
Lake Huron	Saginaw Bay	1998139	Sep/21/1998	Carp, Walleye
Lake Huron	Saginaw Bay	2001059	Aug/22/2001	Carp
Lake Huron	Thunder Bay	91054	Jun/25/1991	Walleye
Lake Huron	Thunder Bay	92056	Jun/04/1992	Carp, Lake Trout
Lake Huron	Thunder Bay	94029	Jun/27/1994	Carp, Lake Trout
Lake Huron	Thunder Bay	95036	Jun/16/1995	Carp, Lake Trout, Spottail Shiner, Walleye
Lake Huron	Thunder Bay	1998054	Aug/22/1998	Lake Trout, Walleye
Lake Huron	Thunder Bay	1999028	Sep/28/1999	Carp, Yellow Perch
Lake Huron	Thunder Bay	2001062	Jun/13/2001	Carp, Lake Trout, Walleye
Lake Michigan	Grand Traverse Bay	90074	Jun/20/1990	Lake Trout
Lake Michigan	Grand Traverse Bay	92059	Jul/15/1992	Lake Trout
Lake Michigan	Grand Traverse Bay	93010	Aug/12/1993	Carp
Lake Michigan	Grand Traverse Bay	95050	Jul/19/1995	Carp, Lake Trout
Lake Michigan	Grand Traverse Bay	1998057	Oct/07/1998	Lake Trout
Lake Michigan	Grand Traverse Bay	2000036	Sep/13/2000	Carp
Lake Michigan	Grand Traverse Bay	2001065	Aug/15/2001	Lake Trout
Lake Michigan	Little Bay De Noc	92046	Jun/04/1992	Carp, Walleye
Lake Michigan	Little Bay De Noc	94041	Apr/20/1994	Carp, Walleye
Lake Michigan	Little Bay De Noc	97026	Apr/28/1997	Walleye, Yellow Perch
Lake Michigan	Little Bay De Noc	2000039	Oct/05/2000	Carp, Walleye
Lake Michigan	Little Bay De Noc	2002055	Apr/19/2002	Walleye
Lake St. Clair	L'Anse Creuse Bay	90002	Apr/02/1990	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	92029	Jun/04/1992	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	94058	Jul/13/1994	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	1998063	Jun/15/1998	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	2002059	May/23/2002	Carp, Walleye
Lake Superior	Keweenaw Bay	91024	May/01/1991	Lake Trout
Lake Superior	Keweenaw Bay	93055	May/03/1993	Lake Trout
Lake Superior	Keweenaw Bay	96035	May/23/1996	Lake Trout
Lake Superior	Keweenaw Bay	1999039	May/13/1999	Lake Trout
Lake Superior	Keweenaw Bay	2001078	Apr/30/2001	Lake Trout
Manistee River	Above Hodenpyl Dam	92034	Jun/09/1992	Carp
Manistee River	Above Hodenpyl Dam	94030	Jun/15/1994	Carp
Manistique River	Manistique, above Dam	93056	Jun/03/1993	Redhorse Sucker
Menominee River	Lower Scott Flowage, between Dams 1 and 2	91039	Jun/26/1991	Carp
Menominee River	Lower Scott Flowage, between Dams 1 and 2	94052	Jun/13/1994	Redhorse Sucker
Muskegon River	Newaygo County, Croton Dam Pond	91029	Apr/04/1991	Carp
Muskegon River	Newaygo County, Croton Dam Pond	93080	Jun/28/1993	Carp

Waterbody	Location	Visit ID#	Date	Species
Muskegon River	Newaygo County, Croton Dam Pond	95041	Sep/27/1995	Carp
Muskegon River	Newaygo County, Croton Dam Pond	97048	Sep/30/1997	Carp, Yellow Perch
Muskegon River	Newaygo County, Croton Dam Pond	2000058	Sep/06/2000	Carp, Yellow Perch
Muskegon River	Newaygo County, Croton Dam Pond	2002076	Jul/08/2002	Carp
Pontiac Lake	Oakland County	92070	Jul/27/1992	Largemouth Bass
Pontiac Lake	Oakland County	94007	Oct/01/1994	Largemouth Bass
Pontiac Lake	Oakland County	97053	May/22/1997	Largemouth Bass
Pontiac Lake	Oakland County	1999056	Apr/06/1999	Largemouth Bass
Pontiac Lake	Oakland County	2003094	Jun/25/2003	Largemouth Bass
Raisin River	Above Monroe Dam	91050	Sep/25/1991	Carp
Raisin River	Above Monroe Dam	94010	Jun/10/1994	Carp
Raisin River	Above Monroe Dam	97054	Oct/02/1997	Carp
Raisin River	Above Monroe Dam	2000072	Oct/12/2000	Carp
South Manistique Lake	Mackinac County	91016	Apr/24/1991	Walleye
South Manistique Lake	Mackinac County	93027	Apr/28/1993	Walleye
South Manistique Lake	Mackinac County	95056	Apr/27/1995	Walleye
South Manistique Lake	Mackinac County	1998105	Apr/06/1998	Walleye
South Manistique Lake	Mackinac County	2001099	Nov/11/2001	Walleye
St. Clair River	Algonac	92061	Jun/21/1992	Carp, Walleye
St. Clair River	Algonac	94009	Aug/25/1994	Carp
St. Clair River	Algonac	2002093	May/24/2002	Carp
St. Joseph River	Chapin Lake	91044	Aug/20/1991	Carp
St. Joseph River	Chapin Lake	93081	Oct/06/1993	Carp
St. Joseph River	Chapin Lake	95051	Jul/06/1995	Carp, Smallmouth Bass
St. Joseph River	Chapin Lake	2000088	Oct/17/2000	Carp
St. Joseph River	Chapin Lake	2002094	Oct/21/2002	Carp
St. Marys River	Munuscong Bay	91059	Apr/23/1991	Walleye
St. Marys River	Munuscong Bay	93015	Apr/27/1993	Carp, Walleye
St. Marys River	Munuscong Bay	95004	Apr/17/1995	carp, walleye
St. Marys River	Munuscong Bay	1998112	Apr/29/1998	Carp, Walleye
St. Marys River	Munuscong Bay	2001102	Apr/23/2001	Walleye

APPENDIX C

INVENTORY OF CAGED-FISH BIOCONCENTRATION STUDIES

Waterbody	Location	Visit ID#	Date	Species
Au Gres River	Au Gres, river mouth	91002	Sep/03/1991	Channel Catfish
Au Sable River	Oscoda, river mouth	91003	Sep/03/1991	Channel Catfish
Au Sable River	Oscoda, river mouth	96002	Aug/19/1996	Channel Catfish
Belle River	Marine City	97002	Sep/17/1997	Channel Catfish
Black River	Mouth	2002007	Jul/02/2002	Channel Catfish
Black River	Port Huron, river mouth	93003	Aug/31/1993	Channel Catfish
Cass River	Saginaw County, M-13	88025	Aug/02/1988	Channel Catfish
Cass River	Saginaw County, M-13	2002024	Jul/16/2002	Channel Catfish
Chippewa River	9 Mile Road	2000004	Jul/20/2000	Channel Catfish
Chippewa River	Nature Center	2000005	Jul/25/2000	Channel Catfish
Chippewa River	Nature Center	2002015	Jul/16/2002	Channel Catfish
Clinton River	Mt. Clemens, VFW Hall	2001116	Aug/29/2001	Channel Catfish
Clinton River	Adams Road	2000009	Aug/28/2000	Channel Catfish
Clinton River	Bridgeview Road	1999070	Aug/06/1999	Channel Catfish
Clinton River	Bridgeview Road	2000015	Aug/28/2000	Channel Catfish
Clinton River	Cass Road	1999072	Aug/06/1999	Channel Catfish
Clinton River	Crystal Lake	2000007	Aug/28/2000	Channel Catfish
Clinton River	Harris Lake	1999074	Aug/06/1999	Channel Catfish
Clinton River	M-97	2000012	Aug/28/2000	Channel Catfish
Clinton River	Macomb County above I-94 overpass	97007	Sep/17/1997	Channel Catfish
Clinton River	Macomb County above I-94 overpass	1999071	Aug/06/1999	Channel Catfish
Clinton River	Macomb County above I-94 overpass	2000014	Aug/28/2000	Channel Catfish
Clinton River	Moravian/Belleview Road	2000013	Aug/28/2000	Channel Catfish
Clinton River	Mt. Clemens, City Park	2001115	Aug/29/2001	Channel Catfish
Clinton River	Mt. Clemens, Firehouse	2001117	Aug/29/2001	Channel Catfish
Clinton River	Mt. Clemens, Market Street	97006	Sep/17/1997	Channel Catfish
Clinton River	Mt. Clemens, river mouth	89023.1	Aug/29/1989	Channel Catfish
Clinton River	Mt. Clemens, river mouth	92003.1	Aug/17/1992	Channel Catfish
Clinton River	Mt. Clemens, river mouth	96005	Aug/20/1996	Channel Catfish
Clinton River	Mt. Clemens, river mouth	97008	Sep/17/1997	Channel Catfish
Clinton River	Mt. Clemens, river mouth	1999069	Aug/06/1999	Channel Catfish
Clinton River	Mt. Clemens, river mouth	2000016	Aug/28/2000	Channel Catfish
Clinton River	Opdyke Road	2000008	Aug/28/2000	Channel Catfish
Clinton River	Ryan Road, Utica	1999073	Aug/06/1999	Channel Catfish
Clinton River	Spillway Mouth	89023.2	Aug/29/1989	Channel Catfish
Clinton River	Spillway Mouth	92003.2	Aug/17/1992	Channel Catfish
Escanaba River	Escanaba, river mouth	93040	Jun/30/1993	Channel Catfish
Flat River	Lowell	2001017	Jul/23/2001	Channel Catfish
Flint River	Saginaw County, river mouth	88022	Aug/02/1988	Channel Catfish
Flint River	Saginaw County, river mouth	2002023	Jul/16/2002	Channel Catfish
Galien River	Mouth	2002031	Aug/02/2002	Channel Catfish
Grand River	Below Jackson, Thompkins Road	2001014	Jul/23/2001	Channel Catfish
Grand River	Below Lansing, Clintonia Road	2001016	Jul/23/2001	Channel Catfish
Grand River	Grand Haven, river mouth	90018	Sep/04/1990	Channel Catfish
Grand River	Grand Haven, river mouth	93043	Jul/01/1993	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Grand River	Grand Haven, river mouth	2001020	Jul/23/2001	Channel Catfish
Grand River	Jackson, above Jackson WWTP	90025	Sep/05/1990	Channel Catfish
Grand River	Jackson, below Jackson WWTP	90024	Aug/08/1990	Channel Catfish
Grand River	M-21	2001018	Jul/23/2001	Channel Catfish
Grand River	Upstream Jackson, Reed Road	2001013	Jul/23/2001	Channel Catfish
Huron River	Downstream Belleville Lake	2002041	Aug/20/2002	Channel Catfish
Huron River	Downstream Ford Lake	2002040	Aug/20/2002	Channel Catfish
Huron River	Rockwood, river mouth	91012	Sep/06/1991	Channel Catfish
Huron River	Rockwood, river mouth	96015	Aug/20/1996	Channel Catfish
Huron River	Rockwood, river mouth	2002042	Aug/20/2002	Channel Catfish
Huron River	Upstream Dexter	2002039	Aug/20/2002	Channel Catfish
Kalamazoo River	Above Otsego City Dam	1999096	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Lake Allegan Dam	1999020	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Otsego Dam	1999023	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Trowbridge Dam, 26th St. Bridge	1999022	Sep/08/1999	Channel Catfish
Kalamazoo River	Ceresco (12 Mile Road)	1999099	Sep/08/1999	Channel Catfish
Kalamazoo River	Ceresco (12 Mile Road)	2000114	Oct/04/2000	Channel Catfish
Kalamazoo River	City of Allegan, M-89	1999021	Sep/08/1999	Channel Catfish
Kalamazoo River	D-Avenue	2000112	Oct/04/2000	Channel Catfish
Kalamazoo River	Galesburg, 35th St. Bridge	1999098	Sep/08/1999	Channel Catfish
Kalamazoo River	Kalamazoo Avenue	2000113	Oct/04/2000	Channel Catfish
Kalamazoo River	Lake Allegan	2000110	Jan/04/2000	Channel Catfish
Kalamazoo River	Plainwell, M-89	2000111	Oct/04/2000	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	90019	Aug/07/1990	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	93044	Jul/01/1993	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	96016	Aug/21/1996	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	1999019	Sep/08/1999	Channel Catfish
Kawkawlin River	Route 13 (S. Huron Road)	2001127	Jul/23/2001	Channel Catfish
Kawkawlin River	Wheeler Road	2001128	Jul/23/2001	Channel Catfish
Lake Huron	Saginaw Bay	85031	May/23/1985	Channel Catfish
LeFarge Corp. Discharge Canal	Below quarry	94033	May/19/1994	Channel Catfish
Manistee River	Manistee, river mouth	90026	Aug/21/1990	Channel Catfish
Manistee River	Manistee, river mouth	95028	Jul/24/1995	Channel Catfish
Manistique River	Manistique, river mouth	90028.1	Sep/24/1990	Channel Catfish
Manistique River	Manistique, river mouth	2002067	Aug/21/2002	Channel Catfish
Manistique River	Soo Line RR Bridge	90028.2	Sep/24/1990	Channel Catfish
Manistique River	Soo Line RR Bridge	2002066	Aug/21/2002	Channel Catfish
Menominee River	Menominee, river mouth	93039	Jun/30/1993	Channel Catfish
Muskegon River	M-82 at High Rollaway	2002074	Aug/20/2002	Channel Catfish
Muskegon River	Maple Island Road	2002075	Aug/20/2002	Channel Catfish
Muskegon River	Muskegon, river mouth	90020	Aug/07/1990	Channel Catfish
Muskegon River	Muskegon, river mouth	93042	Jul/01/1993	Channel Catfish
Muskegon River	Vance Road	2002073	Aug/20/2002	Channel Catfish
Ontonagon River	Ontonagon, river mouth	92008	Aug/04/1992	Channel Catfish
Ox Creek	Mouth	2001092	Jul/30/2001	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Paw Paw River	Above Ox Creek	2001093	Jul/30/2001	Channel Catfish
Paw Paw River	Below Ox Creek	2001094	Jul/30/2001	Channel Catfish
Pere Marquette River	Ludington, river mouth	90027	Sep/18/1990	Channel Catfish
Pere Marquette River	Ludington, river mouth	93041	Jul/01/1993	Channel Catfish
Pine River	Gordonville Road	2000070	Jul/20/2000	Channel Catfish
Pine River	Gordonville Road	2002014	Jul/16/2002	Channel Catfish
Pine River	Harrison Road	1999049	Jun/24/1999	Channel Catfish
Pine River	Harrison Road	2000066	Jul/20/2000	Channel Catfish
Pine River	Harrison Road	2002011	Jul/16/2002	Channel Catfish
Pine River	M-46	1999050	Jun/24/1999	Channel Catfish
Pine River	M-46	2000067	Jul/20/2000	Channel Catfish
Pine River	M-46	2002012	Jul/16/2002	Channel Catfish
Pine River	Mill Street	2000068	Jul/20/2000	Channel Catfish
Pine River	Nine Mile Road	1999053	Jun/24/1999	Channel Catfish
Pine River	St. Clair	97051	Sep/17/1997	Channel Catfish
Pine River	St. Louis Impoundment	2002103	Jul/16/2002	Channel Catfish
Pine River	WWTP Bridge	1999052	Jun/24/1999	Channel Catfish
Pine River	WWTP Bridge	2000069	Jul/20/2000	Channel Catfish
Pine River	WWTP Bridge	2002013	Jul/16/2002	Channel Catfish
Portage Creek	Kalamazoo, Crosstown Pkwy.	89059	Aug/30/1989	Channel Catfish
Portage Creek	Mouth, Alcott St.	1999097	Sep/08/1999	Channel Catfish
Raisin River	Below Turning Basin	1998091	Sep/10/1998	Channel Catfish
Raisin River	Monroe, river mouth	91018	Sep/06/1991	Channel Catfish
Raisin River	Monroe, river mouth	1998090	Sep/10/1998	Channel Catfish
Raisin River	Near Grand Trunk RR Bridge	1998092	Sep/10/1998	Channel Catfish
Red Cedar River	Mouth	2001015	Jul/23/2001	Channel Catfish
Rouge River	Bell Branch	92040	Aug/25/1992	Channel Catfish
Rouge River	Below Newburgh Lake	2000116	Oct/04/2000	Channel Catfish
Rouge River	Below Phoenix Lake	2000077	Aug/28/2000	Channel Catfish
Rouge River	Dearborn, river mouth	92010	Aug/25/1992	Channel Catfish
Rouge River	Dearborn, river mouth	95044	Oct/09/1995	Channel Catfish
Rouge River	Dearborn, river mouth	2000079	Aug/28/2000	Channel Catfish
Rouge River	Dearborn, river mouth	2000117	Oct/04/2000	Channel Catfish
Rouge River	Evergreen Road	95042	Oct/09/1995	Channel Catfish
Rouge River	Greenfield Road	95043	Oct/09/1995	Channel Catfish
Saginaw River	Bay County, river mouth	88020	Aug/01/1988	Channel Catfish
Saginaw River	Bay County, river mouth	92011	Aug/12/1992	Channel Catfish
Saginaw River	Bay County, river mouth	1998096	Sep/04/1998	Channel Catfish
Saginaw River	Bay County, river mouth	2002028	Jul/16/2002	Channel Catfish
Saginaw River	Saginaw County, Saginaw	88021	Aug/01/1988	Channel Catfish
Saginaw River	upstream of Middle Ground Isle	1998097	Sep/04/1998	Channel Catfish
Saginaw River	upstream of Middle Ground Isle	2002027	Jul/16/2002	Channel Catfish
Saginaw River	Zilwaukee Bridge	1998098	Sep/04/1998	Channel Catfish
Saginaw River	Zilwaukee Bridge	2002026	Jul/16/2002	Channel Catfish
Shiawassee River	Fergus Road	2002022	Jul/16/2002	Channel Catfish
Shiawassee River	Mouth	1998099	Sep/04/1998	Channel Catfish
Shiawassee River	Mouth	2002025	Apr/16/2002	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Shiawassee River	Saginaw County, Miller Road	88024	Aug/18/1988	Channel Catfish
South Branch Black River	Downstream of Bangor	2002006	Jul/02/2002	Channel Catfish
South Branch Black River	Upstream Bangor	2002005	Aug/02/2002	Channel Catfish
St. Joseph River	Above Niles	2001086	Jul/30/2001	Channel Catfish
St. Joseph River	Above Paw Paw River	2001090	Jul/30/2001	Channel Catfish
St. Joseph River	Below Buchanan	97065	Sep/16/1997	Channel Catfish
St. Joseph River	Below Buchanan	2001087	Jul/30/2001	Channel Catfish
St. Joseph River	Below Niles	97066	Sep/16/1997	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	89022	Aug/28/1989	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	93045	Jul/01/1993	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	97063	Sep/16/1997	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	2001091	Jul/30/2001	Channel Catfish
St. Joseph River	Berrien Springs, below Dam	97064	Sep/16/1997	Channel Catfish
St. Joseph River	Berrien Springs, below Dam	2001089	Jul/30/2001	Channel Catfish
St. Joseph River	State Line, Berrien County	97067	Sep/16/1997	Channel Catfish
Thornapple River	Mouth	2001019	Jul/23/2001	Channel Catfish
Thunder Bay River	Alpena, river mouth	89024	Sep/02/1989	Channel Catfish
Thunder Bay River	Alpena, river mouth	96053	Aug/19/1996	Channel Catfish
Tittabawassee River	Cook Road	2002016	Jul/16/2002	Channel Catfish
Tittabawassee River	Freeland	2002019	Jul/16/2002	Channel Catfish
Tittabawassee River	Midland County, Smiths Road	2000095	Jul/20/2000	Channel Catfish
Tittabawassee River	Midland County, Smiths Road	2002017	Jul/16/2002	Channel Catfish
Tittabawassee River	Mouth	1998119	Sep/04/1998	Channel Catfish
Tittabawassee River	Mouth	2002021	Jul/16/2002	Channel Catfish
Tittabawassee River	RR Bridge below Dow	2002018	Jul/16/2002	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	88023	Aug/02/1988	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	2002020	Jul/16/2002	Channel Catfish
Tonquish Creek	Above Wayne Road, South of Joy Road	92039	Sep/14/1992	Channel Catfish
Two Hearted River	Mouth	92013	Aug/04/1992	Channel Catfish
White River	White Lake outlet, river mouth	92014	Aug/18/1992	Channel Catfish

APPENDIX D

INVENTORY OF CONTAMINANT MONITORING SITES, AND  
SPECIES SUMMARIZED IN THE MICHIGAN FISH CONTAMINANT MONITORING  
2003 ANNUAL REPORT

Waterbody	Location	Visit ID#	Date	Species
Gull Lake	Kalamazoo County	2002034	Jun/30/2002	Largemouth Bass
Gun Lake	Barry County	2002035	Jun/06/2002	Largemouth Bass
Higgins Lake	Roscommon County	2002037	Oct/02/2002	Lake Trout
Kalamazoo River	City of Allegan Dam	2001052	Sep/17/2001	Carp, Smallmouth Bass
Kalamazoo River	Lake Allegan	2001053	Aug/23/2001	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Otsego Dam Impoundment	2001050	Sep/18/2001	Carp, Smallmouth Bass
Kalamazoo River	Plainwell Dam Reservoir	2001048	Sep/05/2001	Carp, Smallmouth Bass
Kalamazoo River	Trowbridge Dam Impoundment	2001051	Oct/09/2001	Carp, Smallmouth Bass
Kalamazoo River	Trowbridge Dam Impoundment	2003142	Aug/18/2003	Carp, Smallmouth Bass
Lake Erie	Brest Bay	2002044	Apr/26/2002	Carp
Lake Erie	Western Basin	2002045	Apr/05/2002	Channel Catfish
Lake Gogebic	Gogebic/Ontonagon County	2002046	Apr/28/2002	Walleye
Lake Gogebic	Gogebic/Ontonagon County	2002047	Apr/28/2002	Walleye
Lake Michigan	Green Bay	2001066	Apr/13/2001	Brown Trout
Lake Michigan	Green Bay	2002054	Apr/11/2002	Brown Trout
Lake Michigan	Green Bay	2003148	Apr/10/2003	Brown Trout
Lake Michigan	Little Bay De Noc	2002055	Apr/19/2002	Walleye
Lake St. Clair	L'Anse Creuse Bay	2002059	May/23/2002	Carp, Walleye
Lake Superior	Marquette	2002060	May/13/2002	Lake Trout, Lake Whitefish
Muskegon Lake	Muskegon County	2002071	Sep/04/2002	Carp, Walleye
Muskegon River	Newaygo County, Croton Dam Pond	2002076	Jul/08/2002	Carp
Portage Creek	Bryant Mill Pond	2002108	Aug/19/2002	Carp
Rouge River, Middle Branch	Inkster Road below Newburg Lake	2002084	Sep/06/2002	White Sucker
Rouge River, Middle Branch	Newburgh Lake	2002085	Sep/24/2002	Carp, Channel Catfish, Northern Pike, White Sucker
St. Clair River	Algonac	2002093	May/24/2002	Carp
St. Joseph River	Chapin Lake	2002094	Oct/21/2002	Carp