

**MI/DEQ/WD-03/084**

**MICHIGAN FISH CONTAMINANT MONITORING  
2002 Annual Report**



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- B. Inventory of Whole-Fish Trend Monitoring Sites and Species.
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- E. Contaminant Data Summarized in the Michigan Fish Contaminant Monitoring Program 2002 Annual Report.

## SECTION 1.0

### INTRODUCTION

The Michigan Department of Environmental Quality-Water Division (MDEQ-WD) has analyzed nearly 15,000 fish tissue samples collected since 1980. The MDEQ-WD 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 of the fish contaminant monitoring 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-WD'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 Geological Survey (USGS), 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-WD, 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 2002 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 2001 that are not meeting the fisheries designated use described in the MWQS, and identify contaminant trends where possible.
2. Summarize the results of available caged-fish tissue analyses, identify spatial contaminant trends, and identify potential sources of bioaccumulative chemicals to the waters of the state.
3. Summarize the results of whole-fish tissue analyses and identify any spatial or temporal contaminant trends.

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, and 1999; and Day and Walsh, 2000 and 2001). In addition, inventories of fish contaminant monitoring locations sampled between 1980 and 2001 are provided in Appendices A, B, and C.

## SECTION 2.0

### METHODS

The 2002 Annual Fish Contaminant Monitoring Report includes the analytical results available by October 1, 2002, for samples collected prior to January 1, 2002, that 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 1,603 fish were collected from inland lakes, rivers, and the Great Lakes and connecting channels during calendar year 2001. Many of these fish were combined into composite samples and a total of 1,006 samples were analyzed. The samples included 18 species collected from 89 locations. Approximately 73 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-WD 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, sportfishing anglers, commercial anglers, volunteers, universities, private consultants, federal agencies, and tribal organizations collected samples for the program.

The MDEQ-WD 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 2001, 798 fish were collected from 48 locations and processed as edible-portion samples. These samples included 17 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-WD 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/USGS Great Lakes whole-fish trend monitoring program.

A total of 120 fish tissue samples were collected from 9 trend sites in 2001 (Appendix E, available upon request). Largemouth bass were collected from Houghton Lake; carp were collected from the Detroit and Kalamazoo Rivers, as well as Lake Huron at Thunder Bay and Saginaw Bay; lake trout were collected from Lake Superior at Keweenaw Bay, Lake Huron at Thunder Bay, and Lake Michigan at Grand Traverse Bay; and walleye were collected from the

St. Marys and Detroit Rivers, as well as Lake Huron at Thunder Bay and South Manistique Lake. All 26 trend sites were sampled at least 3 times since 1990, except the St. Clair, 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). South Manistique, Gun, and Gull Lakes were sampled 5 times; Lake Gogebic, Pontiac, Houghton, and Higgins 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 River was monitored 6 times; the Muskegon River was monitored 5 times; the Grand, Raisin, and St. Joseph 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 CHEMICAL BIOCONCENTRATION STUDIES**

The MDEQ-WD 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-WD 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 site 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 Clinton, Grand, Kalamazoo, Kawkawlin, and St. Joseph River Watersheds in 2001. Three sites were monitored in the Clinton River in the vicinity of Mt. Clemens (Figure 3). Eight sites were monitored in the Grand River Watershed between Jackson and the mouth (Figure 4). Thirteen sites were monitored in the Kalamazoo River Watershed (including 2 sites in Portage Creek) between Ceresco and the mouth (Figure 5). Two sites were monitored in the Kawkawlin River near Bay City (Figure 6). Eight sites were monitored in the St. Joseph River Watershed (including Ox Creek and the Paw Paw River) between Niles and the mouth (Figure 7).

Net uptake of each contaminant was calculated based on the relationship between the concentrations in the control samples and the concentrations in the test samples. If contaminant concentrations in the control samples were below the quantification level, then these concentrations were assumed to be 0 and the average concentration in the test fish was calculated and presented as the net uptake. However, if control sample concentrations were

above the quantification level, then the difference between the test and control concentrations was evaluated statistically. If the test concentrations were statistically significantly higher than control concentrations ( $p < 0.05$ ), then net uptake was calculated by subtracting average concentrations in the control samples from average concentrations in the test samples.

Concentrations of organic contaminants were lipid normalized by dividing the lipid concentration (percent) by the contaminant concentration. Mercury concentrations were evaluated as wet weights.

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

## **2.3 CHEMICAL ANALYSES**

Fish tissue samples collected in 2001 were analyzed by several laboratories, including the MDCH-Health Risk Assessment Laboratory (HRAL), Triangle Laboratories, the University of Minnesota, and Northeast Analytical Laboratory. Each of these analytical laboratories have 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 2001. A total of 665 samples were submitted for analyses. Sixty-three 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 chlorinated dioxin and dibenzofuran congeners (Table 5) were performed on a subset of the fish tissue samples. Triangle Laboratories analyzed dioxin and dibenzofuran congeners in 79 fish tissue samples. Thirty-nine of these samples were edible-portions and the results are summarized in Section 3.1. The remaining 40 samples were whole fish tissue samples and the results are summarized in Section 3.3.

A total of 75 chinook salmon were collected from 5 Lake Huron and Lake Michigan tributary mouths as part of a Great Lakes trend monitoring program implemented by state and federal agencies. The chinook salmon were combined into 15 edible-portion composite samples and sent to the University of Minnesota for analyses. The results were not available for inclusion in this report.

A total of 51 caged fish samples from 13 sites (plus 4 day-0 control samples), 255 edible portion samples from 13 sites, and 10 whole fish samples from 1 site in the Kalamazoo River or Portage Creek were collected to assess baseline conditions in and around the Kalamazoo River/Portage Creek Superfund Site. All of these samples were analyzed for lipids and PCBs only and the analyses were completed by Northeast Analytical Laboratory (NEA). Some of the caged fish results are being rerun by the NEA and the caged fish results were not available for inclusion in this report. All of the edible portion samples are summarized in Section 3.1.2.4 and the whole fish tissue results are presented in Appendix E (available upon request).

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, 1 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. In a few cases, PCB Aroclors were analyzed and total PCB concentration was estimated by summing the concentrations of quantifiable PCB Aroclors. If all of the Aroclors were below the quantification level, then the total PCB concentration was reported as less than the quantification level of the individual Aroclors.

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 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 Fish Contaminant Monitoring 2002 Annual Report includes the analytical results available by October 1, 2002, for edible-portion fish samples collected in 2001. A total of 723 edible-portion fish tissue samples are summarized in this annual report. The samples include 16 species from 43 locations.

##### 3.1.1 General Highlights

- Several chemicals analyzed were not quantified in any of the fish samples, including aldrin, lindane, heptachlor, pentachlorostyrene, hexachlorostyrene, heptachlorostyrene, PBB, 2,4'-DDE, and terphenyl. However, the breakdown products of aldrin (i.e., dieldrin) and heptachlor (i.e., heptachlor epoxide) were quantified in fish tissue samples from 18 and 10 sites, respectively (Table 7). In addition, 4,4'-DDE was quantified in at least one sample from every site.
- Mercury was quantified in every sample in which it was analyzed (Table 7).
- Dioxin TEQ concentrations were quantified in samples from all 4 sites from which dioxin and dibenzofuran congeners were analyzed (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 organic contaminants.
- The maximum concentrations of chlorinated organic contaminants were often found in fish from the Great Lakes or connecting channels (Table 7). Lake Huron carp and Lake Superior cisco had the highest concentrations of several organic contaminants. These fish were relatively large, had relatively high percentages of body fat, and readily accumulate the bioaccumulative organic chemicals present in the Great Lakes system.
- The maximum concentrations of mercury were found primarily in top predator species, such as northern pike and walleye, from inland lakes and reservoirs.
- Total PCB concentrations declined in fish from the Rouge River at Newburgh Lake and Portage Creek at Bryant Mill Pond following the removal of PCB contaminated sediments from each 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.
- Contaminant concentrations were below MDCH trigger levels in all fish collected from 5 of 43 (12%) sites.
- Total PCB concentrations were greater than or equal to the women and children trigger level in 444 of 654 (68%) samples. Concentrations were greater than or equal to the trigger level in fish from 31 of 38 (82%) sites (Table 8). The 2002 MDCH *Fish Consumption Advisory* includes women and children advisories covering 25 of these 31 (81%) sites.
- Total PCB concentrations were greater than or equal to the general population trigger level in 74 of 654 (11%) samples. Concentrations were greater than or equal to the general population trigger level in fish from 13 of 38 (34%) sites (Table 8). The 2002 MDCH *Fish Consumption Advisory* includes general population advisories covering 12 of these 13 (92%) sites.
- Mercury concentrations were greater than or equal to the “restrict consumption” and “no consumption” trigger levels in 65 of 468 (14%) samples and 2 of 468 (0.4%) samples, respectively. Concentrations were greater than or equal to the “restrict consumption” trigger level in fish from 14 of 30 (47%) sites and concentrations were greater than or equal to the “no consumption” trigger level in fish from 2 of 30 (7%) sites (Table 9). Two of 14 (14%) sites were not covered by the statewide advisory or a specific advisory based on mercury.
- Ten of 20 (50%) inland lakes or reservoirs sampled in 2001 had 1 or more fish with mercury concentrations greater than the “restrict consumption” trigger level. This compares to 68% of the 233 inland lakes and reservoirs monitored at least once since 1985.
- Dioxin TEQ concentrations exceeded the trigger level in 14 of 39 (36%) samples. Concentrations exceeded the trigger level in fish from 3 of 4 (75%) sites (Table 10). Two of the 3 (67%) sites are covered by advisories based on dioxin.
- Total chlordane concentrations exceeded the trigger level in 3 of 399 (0.1%) samples. Concentrations exceeded the trigger level in fish from 2 of 25 (8%) sites. Neither site is covered by an advisory due to total chlordane.

### 3.1.2.2 Lake Erie Watershed

#### **Detroit River, Grassy Island, Wayne County (ID# 2001010)**

##### ***Walleye***

Existing MDCH Advisory: The general population should not eat more than 1 meal per week of Detroit River walleye over 22 inches due to elevated concentrations of mercury and PCBs. Women and children should not eat more than 1 meal per month of walleye of any size due to elevated levels of mercury and PCBs.

Comparison to Trigger Levels: Six walleye were collected from the Detroit River in 2001. Total PCB concentrations in 5 fish were in the women and children “1 meal per month” range and 1 fish was in the “6 meals per year” range (Table 8). A total of 50 walleye were collected from the Detroit River since 1986 (Figure 8). Total PCB concentrations exceeded the general population trigger level in 2 of 50 (4%) samples. The median total PCB concentration was 0.293 ppm in 14 to 18-inch fish, 0.482 ppm in 18 to 22-inch fish, and 0.306 ppm in walleye greater than 22 inches.

Mercury concentrations were below the “restrict consumption” trigger level in 5 walleye and equal to the trigger level in 1 walleye collected in 2001 (Table 9). The median mercury concentration was 0.19 ppm in 14 to 18-inch fish, 0.25 ppm in 18 to 22-inch fish, and 0.35 ppm in walleye greater than 22 inches.

Recommendations: The MDCH should consider removing the general population advisory on Detroit River walleye greater than 22 inches. In addition, the MDCH should consider removing mercury from the list of contaminants causing the women and children advisory.

#### **Lake Orion, Oakland County (ID# 2001071)**

##### ***Carp and Largemouth Bass***

Existing MDCH Advisory: The general population should not eat more than 1 meal per week and women and children should not eat more than 1 meal per month of largemouth bass from Lake Orion due to elevated concentrations of mercury and PCBs. Lake Orion carp are not covered by an advisory.

Comparison to Trigger Levels: Nine carp were collected from Lake Orion in 2001. Total PCB concentrations were below the trigger level in 5 carp. Three carp had concentrations in the women and children “1 meal per week” range and 1 fish had a concentration in the “1 meal per month” range (Table 8). Linear regression analyses indicate that carp greater than 21 inches are likely to have concentrations above the “1 meal per week” trigger level and carp greater than 26 inches will likely have concentrations above the “1 meal per month” trigger level (Figure 10).

Total chlordane concentrations exceeded the trigger level in 2 of 9 (22%) carp collected in 2002. Both of these carp were greater than 26 inches (Figure 11).

Eight largemouth bass were collected in 2001. Total PCB concentrations were below the trigger level in all 8 fish (Figure 12). Total PCB concentrations were analyzed in 16 largemouth bass collect since 1989. Total PCB concentrations were below the trigger level in 14 of 16 fish. The median concentration was 0.006 ppm in 10 largemouth bass greater than 14 inches. Also, concentrations were lower in fish collected in 2001 compared to fish collected in 1989.

Mercury concentrations exceeded the “restrict consumption” trigger level in 5 of 8 largemouth bass collected in 2001 (Table 9). Mercury concentrations were analyzed in 23 largemouth bass

collected since 1987 (Figure 13). The median concentration was 0.83 ppm in 13 largemouth bass greater than 14 inches.

Recommendations: The MDCH should consider a no consumption advisory on Lake Orion carp greater than 26 inches due to elevated levels of chlordane. In addition, the MDCH should consider advising women and children to eat no more than 1 meal per week of carp between 18 and 26 inches due to elevated concentrations of PCBs.

The MDCH should consider removing PCBs from the list of contaminants causing the advisory on Lake Orion largemouth bass.

Lake Orion northern pike should be collected to review the need for the advisory based on total PCBs. Lake Orion northern pike are covered by an advisory due to elevated concentrations of PCBs. The advisory is based on 4 northern pike collected in 1989 and the recent largemouth bass data indicates that PCB concentrations may be lower in Lake Orion fish.

**Norvell Lake, Jackson County (ID# 2001084)**  
***Carp and Largemouth Bass***

Existing MDCH Advisory: Norvell Lake largemouth bass are covered by the statewide mercury advisory. Carp are not covered by an advisory.

Comparison to Trigger Levels: Ten carp were collected from Norvell Lake in 2001. Total PCB concentrations in 8 fish were below women and children trigger levels and concentrations in 2 fish were in the “1 meal per week” range (Table 8 and Figure 14). The median concentration was 0.017 in carp less than 22 inches and 0.048 in carp greater than 22 inches.

Ten largemouth bass were collected from Norvell Lake in 2001 and contaminant concentrations in all 10 fish were below trigger levels. Three of the 10 fish were larger than the 14-inch legal size limit (Figure 15). The median mercury concentration in the 3 legal sized fish was 0.12 ppm.

Recommendations: The MDCH should consider removing the advisory on Norvell Lake largemouth bass less than 18 inches.

No additional monitoring is recommended.

**Lake St. Clair, Michigan Waters, Macomb County (ID# 2001077)**  
***Carp, Muskellunge, Smallmouth Bass, Walleye***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per week of Lake St. Clair carp between 18 and 22 inches and no more than 1 meal per month of carp greater than 22 inches due to elevated concentrations of PCBs.

No one should eat any muskellunge from Lake St. Clair due to elevated concentrations of mercury.

Women and children should not eat more than 1 meal per month of Lake St. Clair smallmouth bass due to elevated concentrations of mercury and PCBs. Also, the general population should not eat more than 1 meal per week of smallmouth bass due to elevated concentrations of mercury and PCBs.

Women and children should not eat more than 1 meal per week of Lake St. Clair walleye between 12 and 18 inches and no more than 1 meal per month of walleye greater than 18 inches due to elevated concentrations of mercury and PCBs. Also, the general population

should not eat more than 1 meal per week of walleye greater than 22 inches due to elevated concentrations of mercury and PCBs.

Comparison to Trigger Levels: Seven carp were collected from Lake St. Clair in 2001. Total PCB concentrations exceeded the general population trigger level in 2 of 7 fish (29%). One carp had a total PCB concentration in the “1 meal per week” range; 3 fish were in the “1 meal per month” range; 1 fish was in the “6 meals per year” range and 2 fish were above the women and children “no consumption” trigger level (Table 8). A total of 31 carp were collected from Lake St. Clair since 1985. Total PCB concentrations exceeded the general population trigger level in 6 of 31 (19%) fish (Figure 16). The median concentration in all 31 fish was 0.659 ppm.

One muskellunge was collected from Lake St. Clair in 2002. The total PCB concentration was in the women and children “6 meals per year” range (Table 8). A total of 8 muskellunge were collected from Lake St. Clair since 1985 and 5 of these fish were larger than the 42-inch legal size limit. Concentrations in 1 of 5 (20%) legal sized fish exceeded the general population trigger level (Figure 17). The median concentration in the 5 legal sized fish was 1.40 ppm.

The mercury concentration was above the “no consumption” trigger level in the muskellunge collected in 2001 (Table 9). The median concentration was 2.0 ppm in 5 of 8 muskellunge, larger than 42 inches, collected since 1985 (Figure 18).

Eleven smallmouth bass were collected from Lake St. Clair in 2001. Total PCB concentrations were below women and children trigger levels in 3 fish (Table 8). Concentrations in 7 fish were in the “1 meal per week” range and 1 fish was in the “1 meal per month” range. A total of 37 smallmouth bass were collected and analyzed for total PCBs since 1986. Concentrations were lower in fish collected in 2001 than in fish collected in 1986, 1987, and 1988 (Figure 19). The median concentration in all 11 fish collected in 2001 was 0.059 ppm.

Mercury concentrations exceeded the “restrict consumption” trigger level in 4 of 11 smallmouth bass collected in 2001 (Table 9). A total of 42 smallmouth bass were collected and analyzed for mercury since 1986 (Figure 20). The median concentration was 0.32 ppm in the 25 smallmouth bass between 14 and 18 inches and 0.60 ppm in the 4 smallmouth bass greater than 18 inches.

Twelve walleye were collected from Lake St. Clair in 2001. The total PCB concentration in 1 walleye was below the women and children trigger level (Table 8). Concentrations in 8 fish were in the “1 meal per week” range and 3 fish were in the “1 meal per month” range. A total of 35 walleye were collected and analyzed for total PCBs since 1987 (Figure 21). The median total PCB concentration in walleye 14 to 18 inches was 0.13 ppm, 0.19 ppm in walleye between 18 and 22 inches, and 0.31 in walleye greater than 22 inches.

Mercury concentrations exceeded the “restrict consumption” trigger level in 2 of 12 walleye collected in 2001 (Table 9). A total of 45 walleye were collected and analyzed for mercury since 1987 (Figure 22). The median mercury concentration in walleye 14 to 18 inches was 0.25 ppm, 0.36 ppm in walleye 18 to 22 inches, 0.57 ppm in walleye 22 to 26 inches, and 0.85 ppm in walleye greater than 26 inches.

Recommendations: The MDCH should consider advising the general population to eat no more than 1 meal per week of Lake St. Clair carp due to elevated concentrations of PCB. In addition, the MDCH should consider expanding the women and children “1 meal per month” advisory to include all sizes of carp.

The MDCH should consider adding PCBs to the list of contaminants causing the no consumption advisory on Lake St. Clair muskellunge.

The MDCH should consider relaxing the women and children advisory on Lake St. Clair walleye greater than 22 inches to no more than 1 meal per week.

Additional smallmouth bass should be collected from Lake St. Clair to assess the possibility of relaxing the advisory based on PCBs and mercury.

**Rouge River, Middle Branch, Newburgh Lake, Wayne County (ID# 2001097)**  
***Carp, Channel Catfish, Largemouth Bass***

Existing MDCH Advisory: No one should eat any carp, channel catfish, or largemouth bass from the Middle Branch of the Rouge River below Phoenix Lake (including Newburgh Lake) due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten carp were collected from Newburgh Lake in 2001. Total PCB concentrations exceeded the general population trigger level in 1 of 10 (10%) fish (Table 8). The concentration in 1 carp was in the women and children “1 meal per week” range, 3 were in the “1 meal per month” range, 5 were in the “6 meals per year” range, and 1 was above the women and children “no consumption” trigger level (Figure 23). The median concentration in all 10 fish was 1.13 ppm.

Ten channel catfish were collected in 2001. The total PCB concentration in 1 channel catfish was in the “1 meal per week” range and concentrations in 9 fish were in the “1 meal per month” range (Table 8). Linear regression analyses indicate that channel catfish greater than 12 inches will likely have total PCB concentrations above the “1 meal per month” trigger level (Figure 24). The legal size limit for channel catfish is 12 inches.

Ten largemouth bass were collected from Newburgh Lake in 2001. The total PCB concentration in one largemouth bass was below the women and children trigger levels. Concentrations in 5 fish were in the “1 meal per week” range and 4 fish were in the “1 meal per month” range (Table 8). A total of 21 largemouth bass were collected from Newburgh Lake since 1988 (Figure 25). Total PCB concentrations were substantially lower in 2001. The median concentration was 0.19 ppm in all 10 largemouth bass collected in 2001 while the median concentration in the 11 fish collected prior to 2001 was approximately 20 times higher at 3.91 ppm.

Mercury concentrations were below the “restrict consumption” trigger level in all 10 largemouth bass collected in 2001 (Table 9). A total of total of 20 largemouth bass were collected from Newburgh Lake since 1995 (Figure 26). Mercury concentrations were lower in fish collected in 2001 than in fish collected in 1995. The median concentration was 0.14 in the 4 fish, greater than the 14-inch legal size limit, collected in 2001, while the median concentration was 0.58 ppm in the 8 legal-sized fish collected in 1995.

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 modifying the existing Rouge River advisory to cover the “Middle Branch below Newburgh Lake and Main Branch below M-153/Ford Road.” Also, the MDCH should consider developing new advisories for the Rouge River at Newburgh Lake.

The MDCH should consider advising women and children to eat no more than 6 meals per year of carp from the Rouge River at Newburgh Lake.

The MDCH should consider advising women and children to eat no more than 1 meal per month of channel catfish from the Rouge River at Newburg Lake.

The MDCH should consider removing the general population advisory on largemouth bass from the Rouge River at Newburgh Lake. Also, the MDCH should consider advising women and children to eat no more than 1 meal per week of largemouth bass from the Rouge River at Newburgh Lake.

Carp, channel catfish, northern pike, and white suckers were collected from the Rouge River at Newburgh Lake in 2002. These samples were collected to assess the effectiveness of the contaminated sediment removal. The results will be presented in the 2003 Annual Report.

**Rouge River, Phoenix Lake, Wayne County (ID# 2001098)**  
***Carp, Channel Catfish, Northern Pike***

Existing MDCH Advisory: Women and children should not eat more than one meal per month of Phoenix Lake carp due to elevated levels of PCBs. Northern pike are covered by the statewide mercury advisory. Channel catfish are not covered by an advisory.

Comparison to Trigger Levels: The total PCB concentration in 1 carp collected from Phoenix Lake in 2001 was 0.023 ppm (Table 8). A total of 19 carp were collected from Phoenix Lake since 1988 (Figure 27). The median concentration in carp less than 18 inches was 0.043 ppm and 0.346 ppm in carp greater than 18 inches.

One 15.9-inch channel catfish was collected in 2001. The total PCB concentration was 0.176 ppm (Table 8).

Eight northern pike were collected in 2001 and 5 of them were larger than the 24-inch legal size limit (Figure 28). Total PCB concentrations in 3 of the legal-sized northern pike were below the women and children trigger level. Concentrations in 2 legal-sized northern pike were in the women and children "1 meal per month" range. A total of 15 northern pike were collected from Phoenix Lake since 1988. Total PCB concentrations were lower in the northern pike collected in 2001. The median concentration in 5 legal-sized northern pike collected in 2001 was 0.043 ppm. The only pike greater than 30 inches was collected in 1988 and had a PCB concentration of 0.656 ppm.

Mercury concentrations were below the "restrict consumption" trigger level in all 8 northern pike collected in 2001 (Table 9 and Figure 29). The median concentration in the 5 legal-sized fish was 0.18 ppm.

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

The MDCH should consider advising women and children to eat no more than 1 meal per month of northern pike greater than 30 inches from the Rouge River at Phoenix Lake due to elevated concentrations of PCBs.

Northern pike, carp, and white suckers were collected from the Rouge River at Phoenix Lake in 2002 and the results will be presented in the 2003 Annual Report. Additional channel catfish should be collected to assess the need for an advisory based on PCBs.

### **White Lake, Oakland County (ID# 2001111)**

#### ***Rock Bass***

Existing MDCH Advisory: White Lake rock bass greater than 9 inches are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten rock bass were collected from White Lake in 2001. Contaminant concentrations were below MDCH trigger levels in all 10 fish. The fish ranged in size from 7.7 to 8.8 inches.

Recommendations: No changes to the advisory or additional monitoring are recommended.

### **3.1.2.3 Lake Huron Watershed**

#### **Lake Huron, Thunder Bay (ID# 2001061)**

##### ***Carp***

Existing MDCH Advisory: No one should eat any carp from Thunder Bay greater than 18 inches due to elevated concentrations of PCBs and dioxin. Women and children should not eat more than 1 meal per month of carp less than 18 inches. Also, the general population should not eat more than 1 meal per week of carp less than 18 inches.

Comparison to Trigger Levels: Ten carp were collected from Thunder Bay in 2001. Total PCB concentrations exceeded the general population trigger level in 4 of 10 (40%) fish (Table 8). A total of 26 carp were collected from Thunder Bay and analyzed for total PCBs since 1993 (Figure 30). Eleven of 24 (45%) fish greater than 18 inches exceeded the general population trigger level. The median concentration was 0.075 ppm in carp less than 18 inches and 1.56 ppm in carp greater than 18 inches.

Dioxin TEQ concentrations exceeded the trigger level in 8 of 10 (80%) carp collected in 2001 (Table 10). A total of 16 carp were collected from Thunder Bay and analyzed for dioxin and furan congeners since 1999. The dioxin TEQ concentration exceeded the trigger level in 10 of 14 (71%) fish greater than 22 inches (Figure 31). Both carp less than 22 inches had dioxin TEQ concentrations below the trigger level.

Recommendations: The MDCH should consider removing the general population advisory on Thunder Bay carp less than 18 inches. In addition, the MDCH should consider relaxing the women and children advisory to no more than 1 meal per week of Thunder Bay carp less than 18 inches.

#### **Burt Lake, Cheboygan County (ID# 2001005)**

##### ***Walleye and White Sucker***

Existing MDCH Advisory: Burt Lake walleye are covered by the statewide mercury advisory. Burt Lake white sucker are not covered by an advisory.

Comparison to Trigger Levels: Ten walleye were collected from Burt Lake in 2001. The mercury concentration in 1 of 10 fish exceeded the "restrict consumption" trigger level (Table 9). A total of 16 walleye were collected from Burt Lake since 1990 (Figure 32). The median concentration was 0.33 ppm in walleye between 14 and 18 inches and 0.63 ppm in walleye greater than 18 inches.

Ten white suckers were collected in 2001. Contaminant concentrations were below MDCH trigger levels in all 10 fish.

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

No additional monitoring is recommended.

### **3.1.2.4 Lake Michigan Watershed**

#### **Lake Michigan, Northern Lake Michigan (ID# 2001132)**

##### ***Burbot***

Existing MDCH Advisory: Northern Lake Michigan burbot are not covered by an advisory. However, women and children should not eat more than 1 meal per week of Little Bay de Noc burbot less than 26 inches and no more than 1 meal per month of burbot greater than 26 inches due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten burbot were collected from northern Lake Michigan in 2000 and 2001. Total PCB concentrations were below women and children trigger levels in 6 fish, 3 fish were in the “1 meal per week” range, and 1 fish was in the “1 meal per month” range (Table 8). A total of 19 burbot were collected from northern Lake Michigan, including Little Bay de Noc, since 1990 (Figure 33). The median total PCB concentration in all fish less than 26 inches was 0.041 ppm and 0.156 ppm in burbot greater than 26 inches.

Mercury concentrations exceeded the “restrict consumption” trigger level in 3 of 10 fish collected in 2000 and 2001. The median mercury concentration was 0.35 ppm in 15 burbot less than 26 inches that were collected since 1990 (Figure 34). The median concentration in 4 burbot greater than 26 inches was 0.37 ppm.

Dioxin TEQ concentrations were below the trigger level in all 10 burbot collected in 2000 and 2001 (Table 10).

Recommendations: The MDCH should consider advising women and children to eat no more than 1 meal per week of northern Lake Michigan burbot greater than 26 inches due to elevated levels of PCBs.

The MDCH should consider removing the women and children advisory on Little Bay de Noc burbot less than 26 inches and relaxing the advisory on burbot greater than 26 inches to no more than 1 meal per week.

#### **Big Shag Lake, Marquette County (ID# 2001003)**

##### ***Northern Pike***

Existing MDCH Advisory: Big Shag Lake northern pike are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten northern pike were collected from Big Shag Lake in 2001. Mercury concentrations exceeded the “restrict consumption” trigger level in all 3 fish larger than the 24-inch legal size limit (Figure 35). Linear regression analyses indicate that northern pike greater than 24 inches will likely have mercury concentrations that exceed the “restrict consumption” trigger level.

Recommendations: No changes to the advisory or additional monitoring are recommended.

**Cary Lake, Branch County (ID# 2001140)**  
***Largemouth Bass and White Sucker***

Existing MDCH Advisory: Cary Lake largemouth bass are covered by the statewide mercury advisory. Cary Lake white sucker are not covered by an advisory.

Comparison to Trigger Levels: Ten largemouth bass were collected from Cary Lake in 2001. Contaminant concentrations were below MDCH trigger levels in all 10 fish. However, none of the largemouth bass were larger than the 14-inch legal size limit.

Ten white suckers were collected in 2001. Total PCB concentrations were below the women and children trigger levels in 9 of 10 fish (Table 8, Figure 36). The total PCB concentration in one fish was 0.065 ppm. The median concentration in all 10 fish was below the 0.001 ppm quantification level.

Recommendations: No changes to the advisory or additional monitoring are recommended.

**Chicagon Lake, Iron County (ID# 2001007)**  
***Lake Whitefish***

Existing MDCH Advisory: Chicagon Lake lake whitefish are not covered by a fish consumption advisory.

Comparison to Trigger Levels: Ten lake whitefish were collected from Chicagon Lake in 2000 and 2001. Contaminant concentrations in all 10 fish were below MDCH trigger levels.

Recommendations: No changes to the advisory or additional monitoring are recommended.

**Goose Lake, Marquette County (ID# 2001011)**  
***Northern Pike, Walleye, and Yellow Perch***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per month of Goose Lake northern pike due to elevated concentrations of PCBs, and no more than 1 meal per week of Goose Lake walleye and yellow perch due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Five northern pike were collected from Goose Lake in 2001. Total PCB concentrations in 3 fish were in the women and children "1 meal per week" range and the concentration in 1 fish was in the "1 meal per month" range (Table 8 and Figure 37). A total of 15 northern pike were collected from Goose Lake since 1988 and 10 of these fish were larger than the 24-inch legal size limit. The median concentration in the 10 legal-sized fish was 0.29 ppm.

The mercury concentration in 1 of 2 legal sized northern pike collected in 2001 was above the "restrict consumption" trigger level (Figure 38). The median mercury concentration was 0.24 ppm in all 10 legal-sized northern pike collected since 1988.

Eleven walleye were collected in 2001. Total PCB concentrations in 8 fish were in the women and children "1 meal per week" range and 3 fish were in the "1 meal per month" range (Table 8). A total of 16 walleye were collected from Goose Lake since 1988 and 10 of these were above the 15-inch legal size limit (Figure 39). The median total PCB concentration was 0.11 ppm in walleye between 15 and 18 inches and 0.13 ppm in fish larger than 18 inches.

Mercury concentrations were below the “restrict consumption” trigger level in all 11 walleye collected in 2001 (Table 9). The median mercury concentration was 0.20 ppm in all 10 legal sized walleye collected since 1988 (Figure 40).

Ten yellow perch were collected in 2001. Total PCB concentrations in 2 fish were below the women and children trigger levels and concentrations in 8 fish were in the “1 meal per week” range (Table 8). A total of 15 yellow perch were collected from Goose Lake since 1988 (Figure 41). The median total PCB concentration in all 15 fish was 0.087 ppm.

Mercury concentrations were below the “restrict consumption” trigger level in all 10 yellow perch collected in 2001 (Table 9 and Figure 42). The median mercury concentration was 0.12 ppm in all 15 yellow perch collected since 1988.

Recommendations: No changes to the advisory or additional monitoring are recommended.

**Grand River, Eaton Rapids, Gale Road/Waverly Road, Ingham County (ID# 2001021)  
*Carp, Largemouth Bass, Walleye, and White Sucker***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per month of carp and no more than 1 meal per week of walleye from the Grand River upstream of the Webber Dam due to elevated concentrations of PCBs. Largemouth bass and white sucker are not covered by an advisory.

Comparison to Trigger Levels: Ten carp were collected from the Grand River near Eaton Rapids in 2001. Total PCB concentrations in 8 carp were in the women and children “1 meal per month” range and 2 carp were in the “6 meals per year” range (Table 8). A total of 50 carp were collected from the Grand River upstream of the Webber Dam since 1990 (Figure 43). The median total PCB concentration was 0.63 ppm in all 50 fish.

Ten largemouth bass were collected in 2001. Total PCB concentrations in 7 fish were below women and children trigger levels and concentrations in 3 fish were in the “1 meal per week” range (Table 8). A total of 21 largemouth bass were collected from the Grand River upstream of the Webber Dam since 1989 (Figure 44). The median total PCB concentration was 0.040 ppm in all 21 fish.

Four walleye were collected in 2001. The total PCB concentration in 1 fish was below women and children trigger levels and concentrations in 3 fish were in the “1 meal per week” range (Table 8). A total of 11 walleye were collected from the Grand River upstream of the Webber Dam since 1989 (Figure 45). The median total PCB concentration was 0.09 ppm.

Ten white suckers were collected in 2001. Total PCB concentrations in 8 fish were in the “1 meal per week” range and 2 fish were in the “1 meal per month” range (Table 8 and Figure 46). The median total PCB concentration was 0.10 ppm.

Recommendations: The MDCH should consider advising women and children to eat no more than 1 meal per week of white sucker from the Grand River upstream of the Webber Dam due to elevated concentrations of PCBs.

**Kalamazoo River, Ceresco Impoundment, Calhoun County (ID# 2001042)  
*Carp and Smallmouth Bass***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per week of carp from the Ceresco Impoundment due to elevated concentrations of PCBs. Smallmouth bass are not covered by an advisory.

Comparison to Trigger Levels: Carp and smallmouth bass were collected from the Kalamazoo River at the Ceresco impoundment. 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 in 2001. The total PCB concentrations in 2 carp were in the "1 meal per week" range, concentrations in 8 carp were in the "1 meal per month" range, and 1 carp was in the "6 meals per year" range (Table 8). A total of 42 carp were collected from the Ceresco Impoundment since 1987 (Figure 47). The median total PCB concentration was 0.11 ppm in carp less than 22 inches and 0.23 ppm in carp greater than 22 inches.

Total PCB concentrations were below the quantification level in 9 of 11 smallmouth bass collected in 2001. Concentrations in 2 fish were in the women and children "1 meal per week" range (Table 8). Total PCB concentrations were below the quantification level in 20 of 33 smallmouth bass collected from the Ceresco Impoundment since 1999 (Figure 48). Also, total PCB concentrations were below the quantification level in 5 of 8 smallmouth bass that were larger than the 14-inch legal size limit.

Recommendations: The MDCH should consider advising women and children to eat no more than 1 meal per month of carp greater than 22 inches from the Kalamazoo River at the Ceresco Impoundment.

Additional monitoring may be scheduled as part of the Superfund process.

**Kalamazoo River, Morrow Pond, Kalamazoo County (ID# 2001043)  
*Carp, Smallmouth Bass, and Channel Catfish***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per month of carp from the Kalamazoo River between Battle Creek and Morrow Pond Dam due to elevated concentrations of PCBs. Morrow Pond smallmouth bass are covered by the statewide mercury advisory and channel catfish are not covered by an advisory.

Comparison to Trigger Levels: Carp, smallmouth bass and channel catfish were collected from the Kalamazoo River at Morrow Pond. CDM collected these samples at the request of the MDEQ-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 the Morrow Pond in 2001. The total PCB concentration in 1 fish was below women and children trigger levels, 8 fish were in the "1 meal per week" range, 1 fish was in the "6 meals per year" range, and 1 fish was above the women and children "no consumption" trigger level (Table 8). None of the carp had concentrations above the general population trigger level. A total of 30 carp were collected from Morrow Pond since 1987 (Figure 49). The median total PCB concentration was 0.43 ppm.

The total PCB concentration was 0.34 ppm in a 25.4 inch channel catfish collected in 2001 (Table 8).

Total PCB concentrations were below the quantification level in 7 of 11 smallmouth bass collected in 2001. Total PCB concentrations in 4 fish were in the women and children "1 meal per week" range (Table 8). A total of 32 smallmouth bass were collected from the Morrow Pond

since 1987 (Figure 50). However, only 1 fish was larger than the 14-inch legal size limit. The total PCB concentration in this 16.4 inch smallmouth bass was 0.12 ppm.

**Recommendations:** The MDCH should consider advising women and children to eat no more than 1 meal per week of smallmouth bass from the Kalamazoo River, between Battle Creek and Morrow Pond, due to elevated concentrations of PCBs.

The MDCH should consider advising women and children to eat no more than 1 meal per month of channel catfish from the Kalamazoo River, between Battle Creek and Morrow Pond, due to elevated concentrations of PCBs.

Additional monitoring may be conducted as part of the Superfund process.

**Kalamazoo River, Mosel Avenue (ID# 2001046), Plainwell Reservoir (ID# 2001048), Above Otsego City Dam (ID# 2001049), Otsego Dam (ID# 2001050), Trowbridge Dam (ID# 2001051), City of Allegan Dam (ID# 2001052), and Lake Allegan (ID# 2001053), Kalamazoo and Allegan Counties  
*Carp, Channel Catfish, and Smallmouth Bass***

**Existing MDCH Advisory:** No one should eat carp, smallmouth bass, or channel catfish from the Kalamazoo River between Morrow Dam and Allegan Dam due to elevated concentrations of PCBs.

**Comparison to Trigger Levels:** Carp, channel catfish and smallmouth bass 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 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.

A total of 66 carp were collected from 6 locations between Morrow Dam and Allegan Dam in 2001. Total PCB concentrations exceeded the general population trigger level in 46 of 66 (70%) carp (Table 8). A total of 202 carp were collected between Morrow Dam and Allegan Dam since 1987 (Figure 51). Total PCB concentrations exceeded the general population trigger level in 121 of 202 (60%) carp and the median concentration was 2.75 ppm.

Six channel catfish were collected from Lake Allegan in 2001. Total PCB concentrations were above the general population trigger level in 3 of 6 (50%) fish (Table 8). A total of 8 catfish were collected between Morrow Dam and Allegan Dam since 1999 (Figure 52). Total PCB concentrations exceeded the general population trigger level in 4 of 8 (50%) catfish and the median concentration was 2.11 ppm.

A total of 67 smallmouth bass were collected from 7 locations between Morrow Dam and Allegan Dam in 2001. Total PCB concentrations exceeded the general population trigger level in 1 of 67 (1.4%) smallmouth bass collected in 2001 (Table 8). Concentrations in 4 fish were in the women and children "1 meal per week" range, 53 fish were in the "1 meal per month" range, 8 fish were in the "6 meals per year" range, and the concentration in 1 fish exceeded the women and children "no consumption" trigger level. A total of 173 smallmouth bass were collected between Morrow Dam and Allegan Dam since 1987 and 33 of these fish were equal to or larger than the 14-inch legal size limit (Figure 53). Total PCB concentrations were above the general population trigger level in 7 of 33 (21%) legal-sized fish and the median concentration was 1.21 ppm.

**Recommendations:** No changes to the advisory are recommended. Additional monitoring may be scheduled as part of the Superfund process.

**Kalamazoo River, New Richmond (ID# 2001054) and Kalamazoo Lake (ID# 2001055),  
Allegan County  
Carp, Smallmouth Bass, Channel Catfish, and Flathead Catfish**

Existing MDCH Advisory: No one should eat carp or catfish from the Kalamazoo River below Allegan Dam due to elevated concentrations of PCBs. Also, women and children should not eat any smallmouth bass and the general population should not eat more than 1 meal per week.

Comparison to Trigger Levels: Carp, smallmouth bass, channel catfish and flathead catfish were collected from the Kalamazoo River downstream of Allegan Dam. CDM collected these samples at the request of the MDEQ-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.

A total of 22 carp were collected from 2 locations in the Kalamazoo River below Allegan Dam in 2001. Total PCB concentrations exceeded the general population trigger level in 8 of 22 (36%) carp and the median concentration was 1.57 ppm (Table 8). A total of 57 carp were collected from the Kalamazoo River below Allegan Dam since 1987 (Figure 54). Total PCB concentrations exceeded the general population trigger level in 24 of 57 (42%) carp and the median concentration was 1.78 ppm.

Two channel catfish were collected from Kalamazoo Lake and 4 flathead catfish were collected from New Richmond in 2001. Total PCB concentrations exceeded the general population trigger level in 4 of 6 (67%) catfish and the median concentration was 2.62 ppm. A total of 18 catfish were collected from the Kalamazoo River below Allegan Dam since 1987 (Figure 55). Total PCB concentrations exceeded the general population trigger level in 14 of 18 (78%) catfish and the median concentration was 3.80 ppm.

A total of 21 smallmouth bass were collected from 2 locations in the Kalamazoo River below Allegan Dam in 2001. Total PCB concentrations in 20 fish exceeded the women and children "1 meal per month" trigger level and the concentration in 1 fish was in the "6 meals per year" range (Table 8). A total of 51 smallmouth bass were collected from the Kalamazoo River below Allegan Dam since 1987 and 18 of these fish were larger than the 14-inch legal size limit (Figure 56). The total PCB concentration exceeded the general population trigger level in 1 of 18 (6%) fish and the median concentration was 0.78 ppm.

Recommendations: No changes to the advisory are recommended. Additional monitoring may be conducted as part of the Superfund process.

**Klinger Lake, St. Joseph County (ID# 2001145)  
Largemouth Bass**

Existing MDCH Advisory: Klinger Lake largemouth bass are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Eight largemouth bass were collected from Klinger Lake in 2001. The mercury concentration in 1 fish exceeded the "restrict consumption" trigger level and the median concentration in all 8 fish was 0.31 ppm (Table 9). A total of 13 largemouth bass were collected since 1990 and 4 of them were greater than the 14-inch legal size limit (Figure 57). The median mercury concentration in the 4-legal sized fish was 0.33 ppm.

Recommendations: The MDCH should consider removing the advisory on Klinger Lake largemouth bass less than 18 inches.

No additional monitoring is recommended.

**Lake Paradise, Emmet County (ID# 2001073)**  
***Largemouth Bass, Smallmouth Bass, and White Sucker***

Existing MDCH Advisory: Lake Paradise largemouth bass and smallmouth bass are covered by the statewide mercury advisory. Lake Paradise white sucker are not covered by an advisory.

Comparison to Trigger Levels: Three smallmouth bass, 7 largemouth bass and 6 white suckers were collected from Lake Paradise in 2001. Contaminant concentrations in all 16 fish were below MDCH trigger levels.

Eight of the bass were larger than the 14-inch legal size limit and mercury concentrations were below the “restrict consumption” trigger level in all of the fish (Figure 58). Linear regression indicates that fish less than 17.5 inches will likely have mercury concentrations less than the “restrict consumption” trigger level.

Recommendations: The MDCH should consider removing the advisory on Paradise Lake largemouth bass and smallmouth bass less than 18 inches.

No additional monitoring is recommended.

**Long Lake, St. Joseph County (ID# 2001142)**  
***Brown Bullhead and Largemouth Bass***

Existing MDCH Advisory: Long Lake largemouth bass are covered by the statewide mercury advisory. Brown bullhead are not covered by an advisory.

Comparison to Trigger Levels: Ten brown bullhead were collected from Long Lake in 2001. Total PCB concentrations were below women and children trigger levels in 8 fish (Table 8 and Figure 59). Concentrations in 2 fish were in the women and children “1 meal per week” range. The median concentration was 0.008 ppm in brown bullhead less than 12 inches and 0.04 ppm in fish greater than 12 inches

Ten largemouth bass were collected from Long Lake in 2001. Total PCB concentrations were below women and children trigger levels in 8 fish (table 8 and Figure 60). Concentrations in 2 fish were in the women and children “1 meal per week” range. Six of 10 largemouth bass were larger than the 14-inch legal size limit. The median concentration in these 6 fish was 0.018 ppm.

Mercury concentrations were below the “restrict consumption” trigger level in all 10 largemouth bass collected in 2001. The median concentration was 0.23 ppm in the 6 fish larger than 14 inches (Figure 61).

Recommendations: The MDCH should consider removing the advisory on Long Lake largemouth bass less than 18 inches.

No additional monitoring is recommended.

**Menominee River, Mouth, Menominee County (ID# 2001146)**

***Lake Sturgeon***

Existing MDCH Advisory: The general population should not eat more than 1 meal per week and women and children should not eat more than 1 meal per month of lake sturgeon from the Menominee River below Quinnesec due to elevated concentrations of mercury. Also, no one should eat lake sturgeon from Lake Michigan due to elevated levels of PCBs.

Comparison to Trigger Levels: Two lake sturgeon were found dead in the Menominee River below the Lower Menominee River Dam. MDNR personnel believe that the lake sturgeon died attempting to pass over the dam. Neither of these fish were longer than the 70-inch legal size limit for lake sturgeon from the Menominee River.

Total PCB concentrations in both fish were in the women and children “1 meal per month” range (Table 8). Total PCB concentrations were substantially higher in 6 lake sturgeon collected from the mouth of the Menominee River in 1991 (Figure 62). However, the fish collected in 1991 were probably Lake Michigan fish that had moved into the tributary mouth.

The mercury concentration in 1 of 2 lake sturgeon collected in 2001 was above the “restrict consumption” trigger level (Table 9 and Figure 63). The median mercury concentration in the 2001 fish was 0.36 ppm.

Recommendations: The MDCH should consider adding PCBs to the list of contaminants causing the Menominee River lake sturgeon advisory.

At the request of the MDNR, the MDEQ will continue to analyze samples from lake sturgeon that are found dead.

**Muskegon Lake, Muskegon County (ID# 2001082)**

***Largemouth Bass and Smallmouth Bass***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per month of largemouth bass from Muskegon Lake due to elevated concentrations of mercury and PCBs. Also, the general population should not eat more than 1 meal per week of Muskegon Lake largemouth bass.

Comparison to Trigger Levels: Ten largemouth bass and 10 smallmouth bass were collected from Muskegon Lake in 2001. Total PCB concentrations in 16 fish were in the “1 meal per week” range and concentrations in 4 fish were in the “1 meal per month” range (Table 8). A total of 40 largemouth bass and smallmouth bass were collected since 1986 and 33 of these fish were equal to or larger than the 14-inch legal size limit (Figure 64). The median total PCB concentration was 0.16 ppm in legal-sized bass.

Mercury concentrations exceeded the “restrict consumption” trigger level in 3 of 20 bass collected in 2001 (Table 9). Mercury concentrations exceeded the “restrict consumption” trigger level in 7 of 33 bass collected since 1986 (Figure 65). The median concentration was 0.34 ppm in all legal sized bass.

Recommendations: The MDCH should consider advising the general population to eat no more than 1 meal per week of Muskegon Lake smallmouth bass. Also, the MDCH should consider advising women and children to eat no more than 1 meal per month of Muskegon Lake smallmouth bass due to elevated concentrations of mercury and PCBs.

Additional carp and walleye were collected from Muskegon Lake in 2002 and the results will be summarized in the 2003 report.

**Palmer Lake, St. Joseph County (ID# 2001141)**  
**Largemouth Bass**

Existing MDCH Advisory: Palmer Lake largemouth bass are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten largemouth bass were collected from Palmer Lake in 2001. Contaminant concentrations in all 10 fish were below MDCH trigger levels. Nine of 10 fish were equal to or larger than the 14-inch legal size limit (Figure 66). The median mercury concentration was 0.36 ppm in all 9 legal sized fish.

Recommendations: The MDCH should consider removing the advisory on Palmer Lake largemouth bass less than 18 inches.

**Portage Creek, Bryant Mill Pond, Kalamazoo County (ID# 2001044)**  
**Carp**

Existing MDCH Advisory: No one should eat carp from Portage Creek below the Bryant Mill Pond due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Carp were collected from Portage Creek at the Bryant Mill Pond. CDM collected these samples at the request of the MDEQ-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 2001. The total PCB concentration in 1 of 11 (9%) carp exceeded the general population trigger level (Table 8). Concentrations in 4 fish were in the women and children "1 meal per week" range, concentrations in 6 fish were in the "1 meal per month" range, and 1 fish had a concentration above the women and children "no consumption" trigger level. A total of 31 carp were collected from Bryant Mill Pond since 1987 (Figure 67). The median total PCB concentration was 1.38 ppm in the 10 fish collected in 1987 and 0.28 ppm in the 22 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: The MDCH should consider removing the general population advisory on carp from Portage Creek below the Monarch Mill Pond and relaxing the women and children advisory to no more than 1 meal per month.

Additional carp were collected in 2001 as part of the Superfund process.

**Portage Creek, Monarch Pond, Kalamazoo County (ID# 2001045)**  
**Carp**

Existing MDCH Advisory: Carp from Portage Creek at Monarch Mill pond are not covered by a fish consumption advisory.

Comparison to Trigger Levels: Carp were collected from Portage Creek at the Monarch Mill Pond. CDM collected these samples at the request of the MDEQ-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 the Monarch Mill Pond in 2001. Total PCB concentrations were below the quantification level in 2 fish. Concentrations in 5 fish were in the women and children “1 meal per week” range and concentrations in 4 fish were in the “1 meal per month” range (Table 8 and Figure 68). The median concentration was 0.12 ppm.

Recommendations: The MDCH should consider advising women and children to eat no more than 1 meal per week of carp from Portage Creek at the Monarch Mill Pond due to elevated levels of PCBs.

Additional monitoring may be conducted as part of the Superfund process.

**Red Cedar River, Michigan State University, Ingham County (ID# 2001096)  
*Carp, Northern Pike, and Rock Bass***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per month of Red Cedar River carp greater than 18 inches and no more than 1 meal per week of carp less than 18 inches due to elevated concentrations of PCBs. Also, women and children should not eat more than 1 meal per week of northern pike greater than 26 inches. Rock bass are not covered by an advisory.

Comparison to trigger levels: Michigan State University students and staff collected fish for contaminant analyses as part of a comprehensive water quality study of the Red Cedar River in the vicinity of the campus. Ten smallmouth bass were collected in 2000 and the results were presented in the 2001 Fish Contaminant Monitoring Annual Report (Day and Walsh, 2002). A total of 10 carp, 10 northern pike and 10 rock bass were collected in 2000 and 2001 and the results are summarized below.

Nine carp were collected in 2001 from the Red Cedar River. The total PCB concentration in 1 fish was in the women and children “1 meal per week” range and 8 fish were in the “1 meal per month” range (Table 8). A total of 20 carp were collected from the Red Cedar River since 1991 (Figure 69). The median total PCB concentration was 0.08 ppm in carp less than 18 inches and 0.26 ppm in fish greater than 18 inches.

Two northern pike were collected in 2001. The total PCB concentration in 1 fish was in the women and children “1 meal per week” range. A total of 20 northern pike were collected from the Red Cedar River since 1991 (Figure 70). However, all 10 northern pike collected in 1991 were below the 24-inch legal size limit. The median total PCB concentration was 0.022 ppm in all 10 legal-sized fish.

Three rock bass were collected in 2001. Contaminant concentrations were below MDCH trigger levels in all 3 fish. Also, contaminant concentrations were below MDCH trigger levels in all 10 rock bass collected since 2000.

Recommendations: The MDCH should consider removing the advisory on northern pike from the Red Cedar River.

**Ruddiman Creek, Lagoon, Muskegon County (ID# 2001131)  
*Carp and Largemouth Bass***

Existing MDCH Advisory: Ruddiman Creek is not covered by a fish consumption advisory.

Comparison to Trigger Levels: Ten carp were collected from the Ruddiman Creek Lagoon in 2001. Total PCB concentrations exceeded the general population trigger level in 4 of 10 (40%) fish (Table 8). Concentrations in 5 fish were in the women and children “1 meal per month” range, 1 fish was in the “6 meals per year” range and 4 fish were above the women and children “no consumption” trigger level (Figure 71). The median total PCB concentration was 0.74 ppm in carp between 18 and 22 inches, 0.74 ppm in carp between 22 and 26 inches and 2.9 ppm in carp greater than 26 inches. Total PCB concentrations exceeded the general population trigger level in 2 of 5 (40%) fish between 22 and 26 inches and in both fish (100%) greater than 26 inches.

Total chlordane concentrations exceeded the trigger level in 1 of 10 (10%) carp (Table 11). The median concentration in all 10 carp was 0.12 ppm.

Ten largemouth bass were collected from the Ruddiman Creek Lagoon in 2001. Two of 10 fish were larger than the 14-inch legal size limit (Figure 72). Total PCB concentrations in 7 fish were in the women and children “1 meal per week” range and 3 fish were in the “1 meal per month” range (Table 8). The median concentration in all 10 fish was 0.14 ppm.

Recommendations: The MDCH should consider advising the general population to eat no more than 1 meal per week of 22 to 26 inch carp from Ruddiman Creek and no carp greater than 26 inches due to elevated levels of PCBs. Also, the MDCH should consider advising women and children to eat no more than 1 meal per month of carp less than 26 inches and no carp greater than 26 inches.

The MDCH should consider advising women and children to eat no more than 1 meal per week of Ruddiman Creek largemouth bass due to elevated levels of PCBs.

### **Stanley Lake, Iron County (ID) *Walleye***

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

Comparison to Trigger Levels: The GLIFWC collected 10 walleye from Stanley Lake in 2001. These fish were analyzed for mercury only and concentrations were below the MDCH trigger level (Figure 73). A total of 18 walleye were collected from Stanley Lake since 1990 and mercury concentrations were below the MDCH trigger level in all 18 fish. The median concentration was 0.20 ppm in fish less than 18 inches and 0.24 ppm in fish between 18 and 22 inches.

Recommendations: The MDCH should consider removing the advisory on Stanley Lake walleye.

No additional monitoring is recommended.

### **Torch Lake, Antrim County (ID# 2001110) *Lake Whitefish and Yellow Perch***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per week of Torch Lake lake whitefish less than 18 inches and no more than 1 meal per month of lake whitefish greater than 18 inches due to elevated concentrations of PCBs. Yellow perch are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten lake whitefish were collected from Torch Lake in 2001. Total PCB concentrations in 6 fish were in the women and children “1 meal per week” range and

the concentration in 1 fish was in the “1 meal per month” range (Table 8). A total of 20 lake whitefish were collected from Torch Lake since 1994 (Figure 74). The median total PCB concentration was 0.072 ppm in fish less than 18 inches and 0.22 ppm in fish that were 18 inches long or larger.

The lake whitefish samples were analyzed for dioxin and furan congeners. Dioxin TEQ concentrations exceeded the MDCH trigger level in 2 of 10 (20%) lake whitefish (Table 10). Dioxin TEQ concentrations were below the trigger level in all 4 fish less than 18 inches and exceeded the trigger level in 2 of 6 (33%) fish greater than 18 inches (Figure 75).

Six yellow perch were collected in 2001. Contaminant concentrations were below MDCH trigger levels in all 6 fish. The yellow perch ranged in size from 10.4 to 12.4 inches (Figure 76). Linear regression analyses indicate that mercury concentrations in 12-inch yellow perch would likely be below the “restrict consumption” trigger level.

Recommendations: The MDCH should consider advising the general population to eat no more than 1 meal per week of Torch Lake lake whitefish greater than 18 inches due to elevated levels of dioxin. Also, the MDCH should consider advising women and children against eating any lake whitefish greater than 18 inches.

The MDCH should consider removing the advisory on Torch Lake yellow perch less than 12 inches.

Torch Lake lake trout were unsuccessfully targeted for collection in 2001 and may be placed on the site list in 2003.

### **3.1.2.5 Lake Superior Watershed**

#### **Lake Superior, Keweenaw Bay, Baraga County (ID# 2001079) *Ciscowet***

Existing MDCH Advisory: No one should eat any Lake Superior ciscowet greater than 18 inches due to elevated concentrations of mercury, chlordane, PCBs, and dioxin. Women and children should not eat more than 1 meal per month of Lake Superior ciscowet less than 18 inches.

Comparison to Trigger Levels: Nine ciscowet were collected from the Keweenaw Bay in 2001. Total PCB concentrations were below the general population trigger level in all 9 fish. Concentrations in 5 fish were in the women and children “1 meal per week” range and concentrations in 4 fish were in the “1 meal per month” range (Table 8). A total of 127 ciscowet were collected from Lake Superior since 1987 (Figure 77). Total PCB concentrations have declined and concentrations have not exceeded the general population trigger level since 1987. A total of 28 fish were collected since 1996. The median concentration in these fish was 0.40 ppm in fish between 18 and 22 inches and 0.54 ppm in fish between 22 and 26 inches.

Mercury concentrations were below the MDCH trigger level in all 9 ciscowet collected in 2001. A total of 109 ciscowet collected since 1987 were analyzed for mercury and concentrations have declined since 1987 (Figure 78). A total of 28 fish were collected since 1996. The median concentration was 0.18 ppm in 18 to 22-inch fish collected since 1996 and 0.30 ppm in 22 to 26-inch fish collected since 1996.

Total chlordane concentrations were below the MDCH trigger level in all 9 ciscowet collected in 2001. A total of 127 ciscowet were collected from Lake Superior since 1987 and concentrations have declined since 1987 (Figure 79). A total of 28 fish were collected since 1996. Total

chlordane concentrations were below the trigger level in all 13 of these fish that were between 18 and 22 inches. Concentrations exceeded the trigger level in 4 of 15 (27%) fish, between 22 and 26 inches, collected since 1996.

Dioxin and furan congeners were analyzed in the 9 ciscowet collected in 2001. Dioxin TEQ concentrations were below the MDCH trigger level in 4 of 9 (44%) fish (Table 10). Dioxin TEQ concentrations exceeded the trigger level in 9 of 19 (47%) fish collected since 1995 (Figure 80). All 19 of these fish were between 18 and 22 inches long.

Recommendations: The MDCH should consider removing mercury from the list of contaminants causing the Lake Superior ciscowet advisory.

Additional ciscowet should be collected from Lake Superior and analyzed for dioxin and furan congeners to determine whether the advisory could be relaxed.

**Bob Lake, Houghton County (ID# 2001134)**  
***Walleye***

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

Comparison to Trigger Levels: The GLIFWC collected 10 walleye from Bob Lake in 2001. These fish were analyzed for mercury only and concentrations were above the “restrict consumption” trigger level in 8 of 10 fish (Table 9 and Figure 81). The median concentration was 0.60 ppm.

Recommendations: No changes to the advisory or additional monitoring are recommended.

**Deer Lake, Marquette County (ID# 2001008)**  
***Northern Pike, Walleye, and Yellow Perch***

Existing MDCH Advisory: All Deer Lake fish are covered by a no consumption advisory due to elevated concentrations of mercury.

Comparison to Trigger Levels: Six northern pike, 12 walleye and 11 yellow perch were collected from Deer Lake in 2001 and analyzed for mercury only. Fish contaminant monitoring has been conducted in Deer Lake since the early 1980’s with northern pike monitored most frequently. Mercury concentrations in northern pike remain elevated compared to other waterbodies in the state (Day, 2000).

Concentrations in 4 of 6 northern pike exceeded the “restrict consumption” trigger level and the concentration in 1 fish was at the “no consumption” trigger level (Table 9). A total of 158 northern pike were collected from Deer Lake since 1993 and 62 of these fish were at or above the 24-inch legal size limit (Figure 82). The median mercury concentration was 1.7 ppm in fish 24 to 26 inches, 1.7 ppm in fish 26 to 30 inches, and 3.1 ppm in fish larger than 30 inches.

Mercury concentrations exceeded the “restrict consumption” trigger level in 10 of 12 walleye collected in 2001 (Table 9). None of the walleye collected in 2001 had concentrations exceeding the “no consumption” trigger level. A total of 123 walleye were collected from Deer Lake since 1991 and 102 of these fish were at or above the 15-inch legal size limit (Figure 83). The median mercury concentration was 0.80 ppm in 15 to 18 inch walleye, 1.2 ppm in 18 to 22 inch walleye, and 1.3 ppm in walleye greater than 22 inches.

Mercury concentrations exceeded the “restrict consumption” trigger level in 3 of 11 yellow perch collected in 2001 (Table 9). None of the yellow perch collected in 2001 had concentrations

exceeding the “no consumption” trigger level. A total of 40 yellow perch were collected from Deer Lake since 1997. Linear regression analyses indicate that yellow perch greater than 12.5 inches will likely have mercury concentrations above the “restrict consumption” trigger level (Figure 84).

Deer Lake sediments are heavily polluted with mercury and there are ongoing sources of mercury to Deer Lake (Earth Tech, 2002). The MDEQ is currently working with the Cleveland Cliffs Iron Company to develop mitigation or remediation alternatives, as well as a monitoring strategy for Deer Lake. In addition, the MDNR manages Deer Lake as a trophy fishery and anglers are not allowed to keep their catch.

Recommendations: No changes to the advisory are recommended.

### **Sudden Lake, Ontonagon County (ID# 2001144)**

#### ***Walleye***

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

Comparison to Trigger Levels: The GLIFWC collected 9 walleye from Sudden Lake in 2001. These fish were analyzed for mercury only and concentrations were above the “restrict consumption” trigger level in 7 of 9 fish (Table 9 and Figure 85). The median mercury concentration was 0.70 ppm.

Recommendations: No changes to the advisory or additional monitoring are recommended.

### **Vermilac Lake, Baraga County (ID# 2001135)**

#### ***Walleye***

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

Comparison to Trigger Levels: The GLIFWC collected 10 walleye from Vermilac Lake in 2001. These fish were analyzed for mercury only and concentrations were above the “restrict consumption” trigger level in 3 of 10 fish (Table 9 and Figure 86). The median mercury concentration was 0.48 ppm.

Recommendations: No changes to the advisory or additional monitoring are recommended.

### **3.1.3 Summary of Recommendations**

The MDCH should consider relaxing fish consumption advisories at 18 sites and adding or expanding advisories at 12 sites. Also, additional monitoring is planned or recommended at 7 waterbodies.

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

- The MDCH should consider removing the general population advisory on Detroit River walleye greater than 22 inches. In addition, the MDCH should consider removing mercury from the list of contaminants causing the women and children advisory.
- The MDCH should consider removing PCBs from the list of contaminants causing the advisory on Lake Orion largemouth bass.

- The MDCH should consider removing the advisory on Norvell Lake largemouth bass less than 18 inches.
- The MDCH should consider relaxing the women and children advisory on Lake St. Clair walleye greater than 22 inches to no more than 1 meal per week.
- The MDCH should consider modifying the existing Rouge River advisory to cover the “Middle Branch below Newburgh Lake and Main Branch below M-153/Ford Road.” Also, the MDCH should consider developing new advisories for the Rouge River at Newburgh Lake.
- The MDCH should consider advising women and children to eat no more than 6 meals per year of carp from the Rouge River at Newburgh Lake.
- The MDCH should consider advising women and children to eat no more than 1 meal per month of channel catfish from the Rouge River at Newburgh Lake.
- The MDCH should consider removing the general population advisory on largemouth bass from the Rouge River at Newburgh Lake. Also, the MDCH should consider advising women and children to eat no more than 1 meal per week of largemouth bass from the Rouge River at Newburgh Lake.
- The MDCH should consider relaxing the women and children advisory on carp from the Rouge River at Phoenix Lake to no more than 1 meal per week of carp less than 18 inches.
- The MDCH should consider removing the general population advisory on Thunder Bay carp less than 18 inches. In addition, the MDCH should consider relaxing the women and children advisory to no more than 1 meal per week of Thunder Bay carp less than 18 inches.
- The MDCH should consider removing the advisory on Burt Lake walleye less than 18 inches.
- The MDCH should consider removing the women and children advisory on Little Bay de Noc burbot less than 26 inches and relaxing the advisory on burbot greater than 26 inches to no more than 1 meal per week.
- The MDCH should consider removing the advisory on Klinger Lake largemouth bass less than 18 inches.
- The MDCH should consider removing the advisory on Paradise Lake largemouth bass and smallmouth bass less than 18 inches.
- The MDCH should consider removing the advisory on Long Lake largemouth bass less than 18 inches.
- The MDCH should consider removing the advisory on Palmer Lake largemouth bass less than 18 inches.
- The MDCH should consider removing the general population advisory on carp from Portage Creek below the Monarch Mill Pond and relaxing the women and children advisory to no more than 1 meal per month.
- The MDCH should consider removing the advisory on northern pike from the Red Cedar River.

- The MDCH should consider removing the advisory on Stanley Lake walleye.
- The MDCH should consider removing the advisory on Torch Lake yellow perch less than 12 inches.
- The MDCH should consider removing mercury from the list of contaminants causing the Lake Superior cisco advisory.

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

- The MDCH should consider a no consumption advisory on Lake Orion carp greater than 26 inches due to elevated levels of chlordane. In addition, the MDCH should consider advising women and children to eat no more than 1 meal per week of carp between 18 and 26 inches due to elevated concentrations of PCBs.
- The MDCH should consider advising the general population to eat no more than 1 meal per week of Lake St. Clair Carp due to elevated concentrations of PCBs. In addition, the MDCH should consider expanding the women and children “1 meal per month” advisory to include all sizes of carp.
- The MDCH should consider adding PCBs to the list of contaminants causing the no consumption advisory on Lake St. Clair muskellunge.
- The MDCH should consider advising women and children to eat no more than 1 meal per month of northern pike greater than 30 inches from the Rouge River at Phoenix 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 northern Lake Michigan burbot greater than 26 inches due to elevated levels of PCBs.
- The MDCH should consider advising women and children to eat no more than 1 meal per week of white sucker from the Grand River upstream of the Webber Dam due to elevated concentrations of PCBs.
- The MDCH should consider advising women and children to eat no more than 1 meal per month of carp greater than 22 inches from the Kalamazoo River at the Ceresco Impoundment due to elevated concentrations of PCBs.
- The MDCH should consider advising women and children to eat no more than 1 meal per week of smallmouth bass from the Kalamazoo River, between Battle Creek and Morrow Pond, due to elevated concentrations of PCBs.
- The MDCH should consider advising women and children to eat no more than 1 meal per month of channel catfish from the Kalamazoo River, between Battle Creek and Morrow Pond, due to elevated concentrations of PCBs.
- The MDCH should consider adding PCBs to the list of contaminants causing the Menominee River lake sturgeon advisory.
- The MDCH should consider advising the general population to eat no more than 1 meal per week of Muskegon Lake smallmouth bass. Also, the MDCH should consider advising

women and children to eat no more than 1 meal per month of Muskegon Lake smallmouth bass due to elevated concentrations of mercury and PCBs.

- The MDCH should consider advising women and children to eat no more than 1 meal per week of carp from Portage Creek at the Monarch Mill Pond due to elevated levels of PCBs.
- The MDCH should consider advising the general population to eat no more than 1 meal per week of 22 to 26 inch carp from Ruddiman Creek and no carp greater than 26 inches due to elevated levels of PCBs. Also, the MDCH should consider advising women and children to eat no more than 1 meal per month of carp less than 26 inches and no carp greater than 26 inches.
- The MDCH should consider advising women and children to eat no more than 1 meal per week of Ruddiman Creek largemouth bass due to elevated levels of PCBs.
- The MDCH should consider advising the general population to eat no more than 1 meal per week of Torch Lake lake whitefish greater than 18 inches due to elevated levels of dioxin. Also, the MDCH should consider advising women and children against eating any lake whitefish greater than 18 inches.

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

Additional monitoring is already planned or should be considered at the following sites:

- Lake Orion northern pike should be collected to review the need for the advisory based on total PCBs.
- Additional smallmouth bass should be collected from Lake St. Clair to assess the possibility of relaxing the advisory based on PCBs and mercury.
- Carp, channel catfish, northern pike, and white suckers were collected from the Rouge River at Newburgh Lake in 2002. These samples were collected to assess the effectiveness of the contaminated sediment removal.
- Northern pike, carp, and white suckers were collected from the Rouge River at Phoenix Lake in 2002. Additional channel catfish should be collected to assess the need for an advisory based on PCBs.
- Additional carp and smallmouth bass will be collected from the Kalamazoo River and Portage Creek as part of the MDEQ-ERD's long-term monitoring strategy.
- Torch Lake lake trout were unsuccessfully targeted for collection in 2001 and may be placed on the site list in 2003.
- Additional ciscowet should be collected from Lake Superior and analyzed for dioxin and furan congeners to determine whether the advisory could be relaxed.

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

The 2002 Annual Fish Contaminant Monitoring Report includes the results of the caged-fish analyses completed prior to October 1, 2002. The Kalamazoo River Watershed results were not available for inclusion in this report since some of the samples are being reanalyzed by the NEA. Therefore, a total of 75 caged-fish samples from 21 sites are summarized in this annual

report. The raw data are presented in Appendix E (available upon request). General highlights of the caged-fish studies conducted in the Clinton, Kawkawlin, Grand, and St. Joseph River Watersheds include:

- Net uptake of total PCB was measured at 18 of the 21 caged-fish sites (Table 12). The highest net uptake of lipid normalized total PCBs was measured in fish from a cage located in the Clinton River.
- Net uptake of total chlordane was measured at 13 of 21 sites. The highest net uptake of lipid normalized total chlordane was measured in fish from a cage located in the Clinton River.
- Net uptake of total DDT was measured at 13 of 21 sites. The highest net uptake of lipid normalized DDT was measured in fish from a cage located in Ox Creek in the St. Joseph River Watershed.
- Net uptake of hexachlorobenzene (HCB) was measured at 5 of 21 sites. The highest net uptake of lipid normalized HCB was measured in fish from a cage located in the Clinton River.
- Net uptake of heptachlor epoxide was measured at 2 of 21 sites. The highest net uptake of lipid normalized heptachlor epoxide was measured in fish from a cage located in the Clinton River.
- Net uptake of dieldrin was measured at 2 of 21 sites. The highest net uptake of lipid normalized dieldrin was measured in fish from a cage located in the St. Joseph River.
- Net uptake of mercury was measured at 1 of 21 sites. Net uptake was measured in fish from a cage located in the Clinton River.

### **3.2.1 Clinton River Watershed Caged-Fish Study**

Cages were placed at 3 locations in the Clinton River, within the City of Mt. Clemens, in 2001 (Figure 3). The Clinton River is covered by a sport fish consumption advisory due to elevated concentrations of PCB. Also, caged fish studies conducted in the watershed in 1999 and 2000 along with caged fish studies conducted at the mouth of the Clinton River in 1989, 1992, 1996, and 1997 indicated that PCBs were relatively high at the mouth compared to other stations and widely distributed in the watershed (Day and Walsh, 2001). Caged fish monitoring was conducted in 2001 as part of a continuing effort to identify sources of PCB to the watershed and the 3 stations were selected to provide more complete coverage of the watershed. Substantial fish mortality occurred in cages from 2 sites and the number of surviving fish was insufficient to obtain 4 composite samples. Therefore, only 1 sample was obtained from Mt. Clemens at the City Park (Site 2001015) and only 2 samples were obtained from Mt. Clemens at the VFW Hall (2001016). Net uptake of lipid normalized PCB was measured at the City Park and at Mt. Clemens Firehouse (Site 2001017) with the highest concentration measured at the City Park (Table 12).

Since 1999, cages were placed at 14 locations in the Clinton River between Harris Lake and the mouth to identify sources of PCB (Figure 3). Net uptake of lipid normalized total PCB concentrations was detected at each of the 14 stations except at the Mt. Clemens Firehouse station (Figure 87). Concentrations were generally highest at the stations in the lower river. However, the caged fish monitoring does not provide evidence of a major source of PCBs to the watershed and seems to indicate that the watershed is subjected to diffuse or numerous small sources of PCB.

Wet weight total PCB uptake and lipid normalized uptake at the mouth of the Clinton River were compared to wet weight uptake and lipid normalized uptake from 25 Great Lakes tributary mouths sampled since 1987 (Figures 88 and 89). As noted above, net uptake of total PCB measured at the mouth of the Clinton River is relatively high compared to most of the 25 tributary mouths measured since 1987. Also, net uptake of total PCB in caged fish located at the mouth of the Clinton River was measured 6 times since 1989 and no clear trend is apparent. The Clinton River is designated as a Great Lakes Area of Concern.

Statistically significant uptake of mercury was detected at 1 station, total chlordane at 2 stations, total DDT at 2 stations, HCB at 3 stations, and heptachlor epoxide at 1 station in 2001 (Figure 90 and Table 12).

Statistically significant uptake of both mercury and total DDT was detected in 5 of the 6 stations sampled in 1999 (Day and Walsh, 2000). Also, statistically significant uptake of total chlordane and HCB was detected in fish from all 8 locations monitored in 2000 (Day and Walsh, 2001).

### **3.2.2 Grand River Watershed Caged-Fish Study**

Cages were placed at 8 locations in the Grand River Watershed in 2001 (Figure 4). The entire length of the Grand River is covered by sport fish consumption advisories due to elevated concentrations of PCBs and the caged-fish study was conducted to help identify sources of PCBs to the watershed. Substantial fish mortality occurred in 2 of the cages and the number of surviving fish was insufficient to obtain 4 composite samples (Table 12). Consequently, only 2 samples were analyzed from the Grand River at M-21 (Site 2001018) and only 3 samples were analyzed from the Grand River at the mouth (Site 2001020).

No PCB uptake was measured at the Reed Road site (Site 2001013) located upstream of the city of Jackson (Table 12 and Figure 90). However, net uptake was measured at the remaining 7 stations. Lipid normalized net total PCB concentrations were relatively constant at the 4 Grand River stations located between the city of Jackson and the river mouth at Grand Haven. Also, net uptake of lipid normalized concentrations was relatively low in the 3 Grand River tributaries compared to concentrations in the Grand River stations located downstream of each tributary.

Wet weight total PCB uptake and lipid normalized uptake at the mouth of the Grand River were compared to wet weight uptake and lipid normalized uptake from 25 Great Lakes tributary mouths sampled since 1987 (Figures 88 and 89). Net uptake of total PCB measured at the mouth of the Grand River is higher than uptake measured at most of the 25 tributary mouths measured since 1987 but substantially lower than uptake measured at the most contaminated tributary mouths. Also, since 1987, net uptake was measured 4 times at the mouth of the Grand River and no clear trend is apparent.

Statistically significant uptake of lipid normalized total DDT and total chlordane was measured at 4 sites each in the watershed (Table 12 and Figure 92). Net uptake of total DDT was measured in the Grand River at stations located downstream of Jackson (Site 2001014) and Lansing (Site 2001016) and at stations located at the mouth of the Red Cedar River (Site 2001015) and Flat River (Site 2001017). Net uptake of total chlordane was measured in the Grand River at stations located downstream of Jackson, downstream of Lansing and at the mouth, as well as the mouth of the Red Cedar River.

### **3.2.3 Kawkawlin River Watershed Caged-Fish Study**

Cages were placed at 2 sites in the Kawkawlin River in 2001 (Figure 6). The Kawkawlin River is covered by a sport fish consumption advisory due to elevated concentrations of PCBs and the caged-fish study was conducted to help identify sources of PCBs to the watershed. Net uptake of lipid normalized concentrations of total PCBs was measured at both sites (Table 12 and Figure 93). Net uptake at Wheeler Road (Site 2001128) was higher than net uptake at M-13 (Site 2001127) indicating that sources may be present between these stations. However, net uptake of lipid normalized concentrations of total PCBs were much lower at the Kawkawlin River stations than concentrations measured in the nearby Saginaw River mouth station (Figure 89). The MDEQ prepared and the USEPA approved a Total Maximum Daily Load (TMDL) for PCBs in the Kawkawlin River as required by Section 303(d) of the Federal Clean Water Act.

Net uptake of total DDT was measured at both sites (Table 12 and Figure 93). Concentrations were similar at both sites.

### **3.2.4 St. Joseph River Watershed Caged-Fish Study**

Cages were placed at 8 sites in the St. Joseph River Watershed in 2001 (Figure 7). The St. Joseph River is covered by sport fish consumption advisories due to elevated concentrations of PCBs and the caged fish study was conducted to help identify sources of PCBs to the watershed. Substantial fish mortality occurred in 1 of the cages and the number of surviving fish was insufficient to obtain 4 composite samples (Table 12). Consequently, only 3 samples were analyzed from the St. Joseph River upstream of the Paw Paw River (Site 2001090).

No PCB uptake was measured at the mouth of the St. Joseph River (Site 2001091) in 2001 (Table 12). However, net uptake was measured at the remaining 7 stations. Lipid normalized net total PCB concentrations were relatively high at the 4 upstream locations in the St. Joseph River compared to concentrations at the 3 stations located in either Ox Creek or the Paw Paw River (Figure 94). The difference between uptake at the upstream stations and the mouth of the St. Joseph River indicates that the river near the mouth may have been serving as a sink for PCBs in the St. Joseph River or perhaps Lake Michigan water was pushed up into the mouth of the St. Joseph River, as part of a seiche effect, during part of the study.

Total PCB uptake was measured 4 times at the mouth of the St. Joseph River since 1989. Net uptake was measured in 1989 and 1997 while no quantifiable uptake was measured in 1993 and 2000 (Figures 88 and 89). The wet weight total PCB uptake and lipid normalized total PCB uptake measured in 1989 and 1997 was relatively high compared to uptake at many of the 25 tributary mouths monitored since 1987 but substantially lower than uptake at the most contaminated tributary mouths.

Net uptake of lipid normalized concentrations of total chlordane was measured at 7 sites in the watershed; uptake of total DDT was measured at 5 sites; net uptake of dieldrin was measured at 2 sites; and net uptake of HCB was measured at 2 sites (Table 12 and Figure 95). Concentrations of HCB were relatively high at the mouth of Ox Creek (Site 2001092) compared to other sites.

## **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-USGS Great Lakes Whole-Fish Trend Monitoring**

The USEPA-Great Lakes National Program Office and USGS collect and analyze whole lake trout or walleye from the Great Lakes. Although samples are still being collected, no contaminant data have been released since 1998 due to laboratory delays. Contaminant data are available for whole lake trout from Lakes Michigan (1970-1998), Superior (1977-1998), Huron (1978-1998), and Ontario (1986-1998) (DeVault et al., 1996; USEPA unpublished data). Also, contaminant concentrations in whole Lake Erie walleye are available from samples collected between 1986 and 1996 (DeVault et al., 1996; USEPA unpublished data).

General conclusions are presented below:

- The USEPA's lake trout data indicate that total PCB and total DDT concentrations declined between the 1970's and 1998 (Figures 96 and 97). Also, Lake Michigan lake trout had higher levels of total PCB and total DDT than lake trout from the other Great Lakes.
- In some cases, concentrations of total PCB and total DDT did not decline between the late 1980's and 1998. Total PCB and total DDT concentrations did not decline in lake trout from Lake Huron and Lake Superior in the 1990's. Also, total DDT concentrations did not decline in Lake Michigan lake trout between 1986 and 1998 and declines in total PCB concentrations were slower than declines measured between 1974 and 1986.
- Total chlordane concentrations declined between 1986 and 1998 in lake trout from Lakes Huron, Michigan, and Ontario while they remained relatively constant in Lake Superior lake trout (Figure 98). Lake Michigan lake trout had higher levels of total chlordane than lake trout from the other Great Lakes over most of the 12-year period of record.
- Apparent toxaphene concentrations declined between 1986 and 1998 in lake trout from each of the 4 Great Lakes monitored (Figure 99).
- 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 elevated 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 1996 (Figure 100).

### **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 are collected by state agencies and analyzed by federal contract laboratories. Although samples continue to be collected, no contaminant data have been released since 1998 due to laboratory delays.

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 101. 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 102. 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 31 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 from 8 inland lakes; and 18 carp, walleye or lake trout data sets from 9 Great Lake or connecting channel stations. A significant increase or decrease in at least one selected contaminant was detected in 27 of 31 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 and length, lipids and collection date as explanatory variables for organic contaminant concentrations. 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 13) 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 13 of 31 data sets (Figure 103 and Table 13). 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 8 inland lakes or inland rivers was -3.1% per year and -3.6% per year, respectively. Mercury concentrations increased in 1 species of fish from 3 of 4 sites monitored in the Great Lakes or connecting channels. The average and median rates of change in these 4 data sets were +3.6% per year and +6.7% per year, respectively. Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-1.1% per year to +/- 7.5% per year.

Statistically significant changes in total PCB concentrations were detected in 11 of 31 data sets (Figure 104 and Table 13). Total PCB concentrations decreased in 10 of 11 data sets. 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 5 of 6 inland lakes or inland rivers. The average and median rates of change in fish from these 6 sites were -11.4% per year and -11.6% per year, respectively. Concentrations declined in at least 1 species of fish from 4 sites in the Great Lakes or connecting channels. The average and median rates of change in these 5 data sets were -7.2% per year and -5.5% per year, respectively. Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-2.2% per year to +/-14.9% per year.

Changes in total DDT concentrations were detected in 21 of 31 data sets (Figure 105 and Table 13). Total DDT concentrations decreased in 19 of 21 data sets. 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 DDT concentrations declined in fish from 6 of 7 inland lakes or inland rivers. The average and median rates of change in fish from these 7 sites were -7.1% per year and -7.8% per year, respectively. Concentrations 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 -6.2% per year and -6.8% per year, respectively. Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-3.3% per year to +/-20.0% per year.

Changes in total chlordane concentrations were observed 18 of 33 data sets (Figure 106 and Table 13). Total chlordane concentrations decreased in all 18 data sets. 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 5 inland lakes or inland rivers. The average and median rates of change in fish from these 5 sites were -12.5% per year and -11.0% per year, respectively. Concentrations 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 -9.1% per year and -9.0% 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 and furan concentrations were measured in fish from 1 of 4 sites (Table 13). 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 +/-1.1% per year to +/-22.5% per year. Only 8% of the minimum detectable trends were greater than +/-10% per year and approximately half were less than +/-5% per year (Table 13). 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 70% 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 96% 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 the heptachlor epoxide and dieldrin, several chemicals were quantified 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 3.2.1.
- 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

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

Standard Edible Portion	Common Name	Scientific Name
Skin-on Fillet	Yellow Perch	<i>Perca flavescens</i>
	Walleye	<i>Stizostedion vitreum</i>
	Sauger	<i>Stizostedion canadense</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>
	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 megalotis</i>
	Warmouth	<i>Lepomis gulosus</i>
	Sucker Family	<i>Catostomidae</i>
	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 Fillet	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 sp</i>
	Carp	<i>Cyprinus carpio</i>
	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.

<b>WATERBODY</b>	<b>SPECIES COLLECTED*</b>	<b>YEARS MONITORED</b>
<b>GREAT LAKES AND CONNECTING CHANNELS</b>		
<b>Lake Michigan</b>		
<i>Little Bay de Noc</i>	Carp	1992, 94, 00
	Walleye	1992, 94, 97, 00
<i>Grand Traverse Bay</i>	Carp	1993, 95, 00
	Lake Trout (P/D)	1990, 92, 95, 98, 01
<b>Lake Huron</b>		
<i>Saginaw Bay</i>	Carp (P/D)	1990, 92, 94, 98, 01
	Walleye	1990, 91, 92, 94, 98
<i>Thunder Bay</i>	Carp	1992, 94, 95, 99, 01
	Lake Trout (P/D)	1992, 94, 95, 98, 01
	Walleye	1991, 95, 98, 01
<b>Lake Superior</b>		
<i>Keweenaw Bay</i>	Lake Trout (P/D)	1991, 93, 96, 99, 01
<b>Lake St. Clair</b>		
<i>L'Anse Creuse Bay</i>	Carp (P)	1990, 92, 94, 98
	Walleye	1990, 92, 94, 98
<b>Lake Erie</b>		
<i>Brest Bay</i>	Carp (P)	1990, 92, 94, 97, 98
	Walleye	1990, 92, 94, 98
<b>St. Marys River</b>		
<i>Munuscong Bay</i>	Carp (P)	1993, 95, 98
	Walleye	1991, 93, 95, 98, 01
<b>St. Clair River</b>		
<i>Algonac</i>	Carp (P)	1992, 94
	Walleye	1992
<b>Detroit River</b>		
<i>Grassy Island</i>	Carp (P)	1990, 92, 94, 96, 98, 01
	Walleye	1990, 94, 96, 98, 01
<b>INLAND RIVERS</b>		
<i>Grand River</i>	Carp	1990, 92, 95, 00
<i>Kalamazoo River</i>	Carp (P)	1990, 92, 94, 97, 99, 01
<i>Manistee River</i>	Carp	1992, 94
<i>Manistique River</i>	Redhorse Sucker	1993
<i>Menominee River</i>	Carp (D)	1991
	Redhorse Sucker	1994
<i>Muskegon River</i>	Carp	1991, 93, 95, 97, 00
<i>River Raisin</i>	Carp (P)	1991, 94, 97, 00
<i>St. Joseph River</i>	Carp (P)	1991, 93, 97, 00
<b>INLAND LAKES</b>		
<i>Grand Sable Lake</i>	Lake Trout (P)	1991, 93, 95
<i>Lake Gogebic</i>	Walleye	1992, 94, 97, 00
<i>South Manistique Lake</i>	Walleye	1991, 93, 95, 98, 01
<i>Higgins Lake</i>	Lake Trout (P)	1991, 95, 97, 00
<i>Houghton Lake</i>	Largemouth Bass	1992, 94, 98, 01
<i>Gull Lake</i>	Largemouth Bass	1991, 93, 95, 97, 00
<i>Gun Lake</i>	Largemouth Bass	1990, 92, 94, 97, 00
<i>Pontiac Lake</i>	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'-DDE	0.001 ppm
2,4'-DDD	0.001 ppm
2,4'-DDT	0.001 ppm
Heptachlor Epoxide	0.001 ppm
Mercury	0.010 ppm
Oxychlordane	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 Equivalents#	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	
1 Meal Per Week	0.05 ppm
1 Meal Per Month	0.2 ppm
6 Meals Per Year	1.0 ppm
No Consumption	1.9 ppm
Toxaphene	5.0 ppm

# 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	25	16	K 0.001– 0.300	Lake Orion – Carp
g-Chlordane	25	13	K 0.001– 0.201	Lake Orion – Carp
cis-Nonachlor	25	18	K 0.001– 0.080	Lake Orion – Carp
Trans-Nonachlor	25	21	K 0.001– 0.020	Lake Orion – Carp
Oxychlordane	25	15	K 0.001– 0.026	Lake Superior – Ciscowet
Total Chlordane	25	22	K 0.001–0.789	Lake Orion – Carp
4,4'-DDD	25	21	K 0.001– 0.475	Ruddiman Creek – Carp
4,4'-DDE	25	25	K 0.001– 1.043	Lake Huron – Carp
4,4'-DDT	25	16	K 0.001– 0.058	Torch Lake – Lake Whitefish
2,4'-DDT	25	9	K 0.001–0.010	Lake Superior - Ciscowet
2,4'-DDD	25	13	K 0.001–0.125	Ruddiman Creek – Carp
Total DDT	25	25	K 0.001–1.412	Ruddiman Creek – Carp
Mirex	25	7	K 0.001 – 0.007	Grand River – Carp
Dieldrin	25	18	K 0.001– 0.094	Lake Superior – Ciscowet
Heptachlor Epoxide	25	10	K 0.001– 0.025	Lake Superior – Ciscowet
Hexachlorobenzene	25	15	K 0.001 – 0.067	Lake St. Clair – Carp
Mercury	30	30	0.01 – 1.91	Lake St. Clair – Muskellunge
Octachlorostyrene	25	7	K 0.001 – 0.508	Lake St. Clair – Carp
Total PCB	38	38	K 0.001 – 49.5	Kalamazoo River – Carp
Apparent Toxaphene	25	4	K 0.050 – J 0.583	Lake Superior – Ciscowet
Dioxin TEQ	4	4	0.00 – 45.4 ppt	Lake Huron – Carp

K = Unquantified at the level shown.

J = Estimated value, value may not be precise.

\* Aldrin, Lindane, 2,4'-DDE, Heptachlor, Heptachlorostyrene, Hexachlorostyrene, Pentachlorostyrene, PBB, 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*					
				Women and Children Consumption Advisory Categories				General Population Trigger Level	
Site ID	Location	Species	Median Conc. ppm	1 meal/week 0.05-0.2 ppm	1 meal/month 0.2-1.0 ppm	6 meals/year 1.0-1.9 ppm	No Cons. > 1.9 ppm	2.0 ppm	Current Advisory
2001010	Detroit River Grassy Island	Walleye	0.765		5/6	1/6			Yes
2001011	Goose Lake Marquette County	Northern Pike	0.151	3/5	1/5				Yes
		Walleye	0.120	8/11	3/11				Yes
		Yellow Perch	0.083	8/10					Yes
2001021	Grand River Eaton Rapids	Carp	0.629		8/10	2/10			Yes
		Largemouth Bass	0.040	3/10					No
		Walleye	0.090	3/4					Yes
		White Sucker	0.104	8/10	2/10				No
2001042	Kalamazoo River Ceresco Impoundment	Carp	0.337	2/11	8/11	1/11			Yes
		Smallmouth Bass	0.025K	2/11					No
2001043	Kalamazoo River Morrow Pond	Carp	0.59	1/11	8/11	1/11	1/11		Yes
		Channel Catfish	0.34		1/1				No
		Smallmouth Bass	0.025K	4/11					Yes
2001044	Portage Creek Bryant Mill Pond	Carp	0.444	4/11	6/11		1/11	/11	Yes
2001045	Portage Creek Monarch Mill Pond	Carp	0.122	5/11	4/11				No
2001046	Kalamazoo River Mosel Avenue	Smallmouth Bass	0.561		1/1				Yes
2001048	Kalamazoo River Plainwell Dam	Carp	10.61			1/11	10/11	10/11	Yes
		Smallmouth Bass	0.451		9/11	2/11			Yes
2001049	Kalamazoo River Otsego City Dam	Carp	2.518		2/11	3/11	6/11	6/11	Yes
		Smallmouth Bass	0.388	1/11	8/11	1/11			Yes

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Table 8. Continued

				Number of Fish in Each Consumption Advisory Category*					
				Women and Children Consumption Advisory Categories			General Population Trigger Level		
Site ID	Location	Species	Median Conc. ppm	1 meal/week 0.05-0.2 ppm	1 meal/month 0.2-1.0 ppm	6 meals/year 1.0-1.9 ppm	No Cons. > 1.9 ppm	2.0 ppm	Current Advisory
2001050	Kalamazoo River Otsego Dam	Carp Smallmouth Bass	5.426 0.580		10/11	1/11 1/11	10/11	10/11	Yes Yes
2001051	Kalamazoo River Trowbridge Dam	Carp Smallmouth Bass	3.514 0.973		6/11	3/11 4/11	8/11 1/11	8/11 1/11	Yes Yes
2001052	Kalamazoo River City of Allegan Dam	Carp Smallmouth Bass	4.385 0.541	1/11	1/11 10/11	1/11	9/11	9/11	Yes Yes
2001053	Kalamazoo River Lake Allegan	Carp Channel Catfish Smallmouth Bass	1.447 2.113 0.448		4/11 1/6 9/11	4/11 2/6	3/11 3/6	3/11 3/6	Yes Yes Yes
2001054	Kalamazoo River New Richmond	Carp Flathead Catfish Smallmouth Bass	1.101 1.96 0.580		5/11 1/4 10/10	1/11 1/4	5/11 2/4	5/11 2/4	Yes Yes Yes
2001055	Kalamazoo River Kalamazoo Lake	Carp Channel Catfish Smallmouth Bass	1.788 3.415 0.447	1/11	2/11 10/11	5/11 1/11	3/11 2/2	3/11 2/2	Yes Yes Yes
2001061	Lake Huron Thunder Bay	Carp	1.473		2/10	4/10	4/10	4/10	Yes
2001071	Lake Orion Oakland County	Carp Largemouth Bass	0.046 0.006	3/9	1/9				No Yes#
2001077	Lake St. Clair	Carp Muskellunge Smallmouth Bass Walleye	0.963 1.238 0.059 0.107	1/7 7/11 8/12	3/7 1/11 3/12	1/7 1/1	2/7	2/7	Yes Yes# Yes Yes
2001079	Lake Superior Keweenaw Bay	Ciscowet	0.192	5/9	4/9				Yes

Table 8. Continued

				Number of Fish in Each Consumption Advisory Category*					
				Women and Children Consumption Advisory Categories				General Population Trigger Level	
Site ID	Location	Species	Median Conc. ppm	1 meal/week 0.05-0.2 ppm	1 meal/month 0.2-1.0 ppm	6 meals/year 1.0-1.9 ppm	No Cons. > 1.9 ppm	2.0 ppm	Current Advisory
2001082	Muskegon Lake Muskegon County	Largemouth Bass Smallmouth Bass	0.077 0.174	10/10 6/10	4/10				Yes Yes#
2001084	Norvell Lake Jackson County	Carp Largemouth Bass	0.035 0.004	2/10					No Yes#
2001096	Red Cedar River MSU	Carp Northern Pike Rock Bass	0.671 0.044 0.008	1/9 1/2	8/9				Yes Yes No
52 2001097	Rouge River Newburgh Lake	Carp Channel Catfish Largemouth Bass	1.130 0.295 0.189	1/10 1/10 5/10	3/10 9/10 4/10	5/10	1/10	1/10	Yes Yes Yes
2001098	Rouge River Phoenix Lake	Carp Channel Catfish Northern Pike	0.023 0.176 0.044	1/1 3/8					Yes No Yes#
2001110	Torch Lake Antrim County	Lake Whitefish Yellow Perch	0.083 0.001	6/10	1/10				Yes Yes#
2001131	Ruddiman Creek Lagoon	Carp Largemouth Bass	0.922 0.145	7/10	5/10 3/10	1/10	4/10	4/10	No No
2001132	Lake Michigan Northern	Burbot	0.031	3/10	1/10				No
2001140	Cary Lake Branch County	Largemouth Bass White Sucker	0.001K 0.001K	1/10					Yes# No

Table 8. Continued

				Number of Fish in Each Consumption Advisory Category*				General Population Trigger Level	Current Advisory
				Women and Children Consumption Advisory Categories					
Site ID	Location	Species	Median Conc. ppm	1 meal/week 0.05-0.2 ppm	1 meal/month 0.2-1.0 ppm	6 meals/year 1.0-1.9 ppm	No Cons. > 1.9 ppm	2.0 ppm	
2001142	Long Lake St. Joseph County	Brown Bullhead Largemouth Bass	0.020 0.021	2/10 2/10					No Yes#
2001146	Menominee River	Lake Sturgeon	0.499		2/2				Yes#

\* 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.

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.

Site ID	Location	Species	Species Median Concentration (ppm)	Range (ppm)	Exceedance* Rate	Current Advisory
2001003	Big Shag Lake Marquette County	Northern Pike	0.495	0.39 - 1.35	5/10	Yes (a)
2001005	Burt Lake Cheboygan County	Walleye	0.35	0.14 - 0.67	1/10	Yes (a)
		White Sucker	0.05	0.03 - 0.13	0/10	No
2001008	Deer Lake Marquette County	Northern Pike	0.605	0.41 - 1.5	4/6	Yes
		Walleye	0.84	0.24 - 1.09	10/12	Yes
		Yellow Perch	0.18	0.14 - 0.58	3/11	Yes
2001010	Detroit River Grassy Island	Walleye	0.24	0.19 - 0.5	1/6	Yes
2001011	Goose Lake Marquette County	Northern Pike	0.230	0.170 - 0.680	1/5	No
		Walleye	0.190	0.110 - 0.230	0/11	No
		Yellow Perch	0.095	0.070 - 0.150	0/11	No
2001071	Lake Orion Oakland County	Carp	0.040	0.02 - 0.07	0/9	No
		Largemouth Bass	0.665	0.39 - 0.99	5/8	Yes
2001077	Lake St. Clair	Carp	0.370	0.23 - 0.87	1/7	No
		Muskellunge	1.91	1.91	1/1	Yes
		Smallmouth Bass	0.41	0.17 - 0.83	4/11	Yes
		Walleye	0.305	0.14 - 1.05	2/12	Yes
2001082	Muskegon Lake Muskegon County	Largemouth Bass	0.285	0.15 - 0.61	2/10	Yes
		Smallmouth Bass	0.245	0.2 - 0.66	1/10	Yes (a)
2001132	Lake Michigan Northern	Burbot	0.410	0.31 - 0.52	3/10	No
2001134	Bob Lake Houghton County	Walleye	0.595	0.22 - 1.25	8/10	Yes (a)

Table 9. Continued

Site ID	Location	Species	Species Median Concentration (ppm)	Range (ppm)	Exceedance* Rate	Current Advisory
2001135	Vermilac Lake Baraga County	Walleye	0.425	0.22 - 1.25	3/10	Yes (a)
2001144	Sudden Lake Ontonagon County	Walleye	0.69	0.32 - 0.97	7/9	Yes (a)
2001145	Klinger Lake St. Joseph County	Largemouth Bass	0.31	0.23 - 0.59	1/8	Yes (a)
2001146	Menominee River River Mouth	Lake Sturgeon	0.365	0.04 - 0.69	1/2	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.

Site ID	Location	Species	Species Median Concentration (ppt)	Range (ppt)	Exceedance* Rate	Current Advisory
2001061	Lake Huron Thunder Bay	Carp	15.9	4.29 - 45.39	8/10	Yes
2001079	Lake Superior Keweenaw Bay	Ciscowet	4.76	1.45 - 16.57	4/9	Yes
2001100	Torch Lake Antrim County	Lake Whitefish	2.96	0.69 - 15.55	2/10	Yes#
2001132	Lake Michigan Northern	Burbot	0.139	0 - 1.10	0/10	No

\* 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.

Site ID	Location	Species	Species Median Concentration (ppt)	Range (ppt)	Exceedance* Rate	Current Advisory
2001071	Lake Orion Oakland County	Carp	0.073	0.025 - 1.131	2/9	No
2001131	Ruddiman Creek Lagoon	Carp	0.125	0.065 - 0.458	1/10	No

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

Table 12. Net uptake of contaminants (ppm) and 95 percent confidence interval in caged-fish tissue samples collected in 2001.  
 Concentrations of organic contaminants are lipid normalized while mercury concentrations are wet weight.

Site Number	Location	Sample Size	Mercury	Total PCB	Total Chlordane	Total DDT	Dieldrin	HCB	Heptachlor Epoxide
<b><u>Clinton River</u></b>									
2001114	Clinton River, Control	4	0.02 NA	0.003 +/-0.0005	0.0018 +/-0.0003	0.022 +/-0.008	0.003 +/-0.0002	0.00006 +/-0.00018	ND
2001015	Clinton River, Mt. Clemens, City Park	1	0.01 NA	0.037 NA	0.0053 NA	0.019 NA	NQU	0.0009 NA	0.0003 NA
2001016	Clinton River, Mt. Clemens, VFW Hall	2	NQU	NQU	NQU	0.022 +/-0.013	NQU	0.00095 +/-0.0014	NQU
2001017	Clinton River, Mt. Clemens, Firehouse	4	NQU	0.024 +/-0.0174	0.0066 +/-0.0042	NQU	NQU	0.0006 +/-0.0003	NQU
<b><u>Grand River</u></b>									
2001126	Grand River, Control	4	0.043 +/-0.008	0.0014 +/-0.0007	0.0011 +/-0.0004	0.012 +/-0.0022	0.0016 +/-0.00019	ND	ND
2001013	Grand River, U/S of Jackson, Reed Rd.	4	NQU	NQU	NQU	NQU	NQU	ND	ND
2001014	Grand River, D/S of Jackson, Thompkins Rd.	4	NQU	0.016 +/-0.0051	0.0046 +/-0.0016	0.013 +/-0.011	NQU	ND	ND
2001015	Red Cedar River, Mouth	4	NQU	0.0053 +/-0.0036	0.0021 +/-0.0014	0.017 +/-0.0063	NQU	ND	ND
2001016	Grand River, D/S of Lansing, Clintonia Rd.	4	NQU	0.0079 +/-0.0056	0.0008 +/-0.0006	0.012 +/-0.0055	NQU	ND	ND

Table 12. Continued

Site Number	Location	Sample Size	Mercury	Total PCB	Total Chlordane	Total DDT	Dieldrin	HCB	Heptachlor Epoxide
2001017	Flat River, Mouth, Lowell	4	NQU	0.0077 +/-0.0017	NQU	0.011 +/-0.0016	NQU	ND	ND
2001018	Grand River, M21	2	NQU	0.014 +/-0.0099	NQU	NQU	NQU	NQU	ND
2001019	Thornapple River, Mouth	4	NQU	0.0016 +/-0.0007	NQU	NQU	NQU	ND	ND
2001020	Grand River, Grand Haven, river mouth	3	NQU	0.015 +/-0.0019	0.003 +/-0.0027	NQU	NQU	NQU	ND
	<b><u>Kawkawlin River</u></b>								
2001126	Kawkawlin River, Control	4	0.043 +/-0.008	0.0014 +/-0.0007	0.0011 +/-0.0004	0.012 +/-0.0022	0.0016 +/-0.00019	ND	ND
2001127	Kawkawlin River M-13 (S. Huron Rd.)	4	NQU	0.0054 +/-0.0036	NQU	0.012 +/-0.0064	NQU	ND	ND
2001128	Kawkawlin River Wheeler Road	4	NQU	0.012 +/-0.0075	NQU	0.010 +/-0.0053	NQU	ND	ND
	<b><u>St. Joseph River</u></b>								
2001126	St. Joseph River, Control	4	0.043 +/-0.008	0.0014 +/-0.0007	0.0011 +/-0.0004	0.012 +/-0.0022	0.0016 +/-0.00019	ND	ND
2001086	St. Joseph River Above Niles	4	NQU	0.029 +/-0.014	0.006 +/-0.0017	0.015 +/-0.0079	0.0022 +/-0.0005	NQU	NQU

Table 12. Continued

Site Number	Location	Sample Size	Mercury	Total PCB	Total Chlordane	Total DDT	Dieldrin	HCB	Heptachlor Epoxide
2001087	St. Joseph River Below Buchanan	4	NA	0.019 +/-0.015	0.0028 +/-0.0017	0.013 +/-0.0065	NQU	ND	NQU
2001089	St. Joseph River Berrien Springs, Below Dam	4	NQU	0.052 +/-0.010	0.0028 +/-0.0023	NQU	NQU	0.0004 +/-0.0003	NQU
2001090	St. Joseph River U/S of Paw Paw River	3	NQU	0.032 +/-0.029	0.0024 +/-0.0006	0.011 +/-0.0065	NQU	NQU	NQU
2001091	St. Joseph River Benton Harbor, river mouth	4	NQU	NQU	0.0039 +/-0.0032	NQU	NQU	0.0006 +/-0.0004	NQU
2001092	Ox Creek Mouth	4	NQU	0.0097 +/-0.0037	0.031 +/-0.016	0.023 +/-0.019	0.0022 +/-0.0004	NQU	0.0009 +/-0.0003
2001093	Paw Paw River Above Ox Creek	4	ND	0.0091 +/-0.0059	NQU	NQU	NQU	ND	NQU
2001094	Paw Paw River Below Ox Creek	4	NQU	0.0057 +/-0.0030	0.0041 +/-0.0022	0.012 +/-0.010	NQU	ND	NQU

NA = Not available

ND = Less than quantification

NQU = No Quantifiable Uptake

Table 13. 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	+/-3.7		+/-4.5		-5.3	<0.05	-7.8	<0.01		
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	9.7	<0.001	+/-7.3		+/-6.7		+/-4.8			
	Walleye	+/-6.0		+/-6.9		-6.6	<0.05	-9.9	<0.01		
<b>Lake St. Clair</b>											
L'Anse Creuse Bay	Carp	+/-1.1		-13.6	<0.001	-10.7	<0.01	-12.8	<0.001		
	Walleye	+/-5.8		+/-7.0		-8.4	<0.05	-9.0	<0.001		
<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**	3.6		-7.2		-6.2		-9.1		-5.4	
	Median**	6.7		-5.5		-6.8		-9.0		-5.4	

\*+/- 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 13. 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	-7.6	<0.01	-28.1	<0.001	-18.6	<0.001	-22.6	<0.001		
River Raisin	Carp	+/-2.8		+/-7.4		+/-5.2		+/-3.9			
St. Joseph River	Carp	+/-2.7		+/-5.8		+/-6.1		+/-6.7			
<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	-9.6	<0.001	-12.2	<0.001	+/-4.2		#NA			
South Manistique Lake	Walleye	-4.7	<0.001	+/-3.6		+/-3.1		NA			
Higgins Lake	Lake Trout	-3.6	<0.01	-10.1	<0.001	-10.2	<0.001	-11.5	<0.001		
Houghton Lake	Largemouth Bass	+/-2.6		-11.0	<0.001	-7.8	<0.001	+/-5.6			
Gull Lake	Largemouth Bass	+/-1.6		+/-3.3		-5.6	<0.01	-8.9	<0.001		
Gun Lake	Largemouth Bass	-3.3	<0.01	+/-5.5		-5.4	<0.05	+/-5.2			
Pontiac Lake	Largemouth Bass	-8.1	<0.001	+/-5.1		+/-8.8		+/-21.9			
	Average**	-3.1		-11.4		-7.1		-12.5			
	Median**	-3.6		-11.6		-7.8		-11.0			

\*+/- 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.

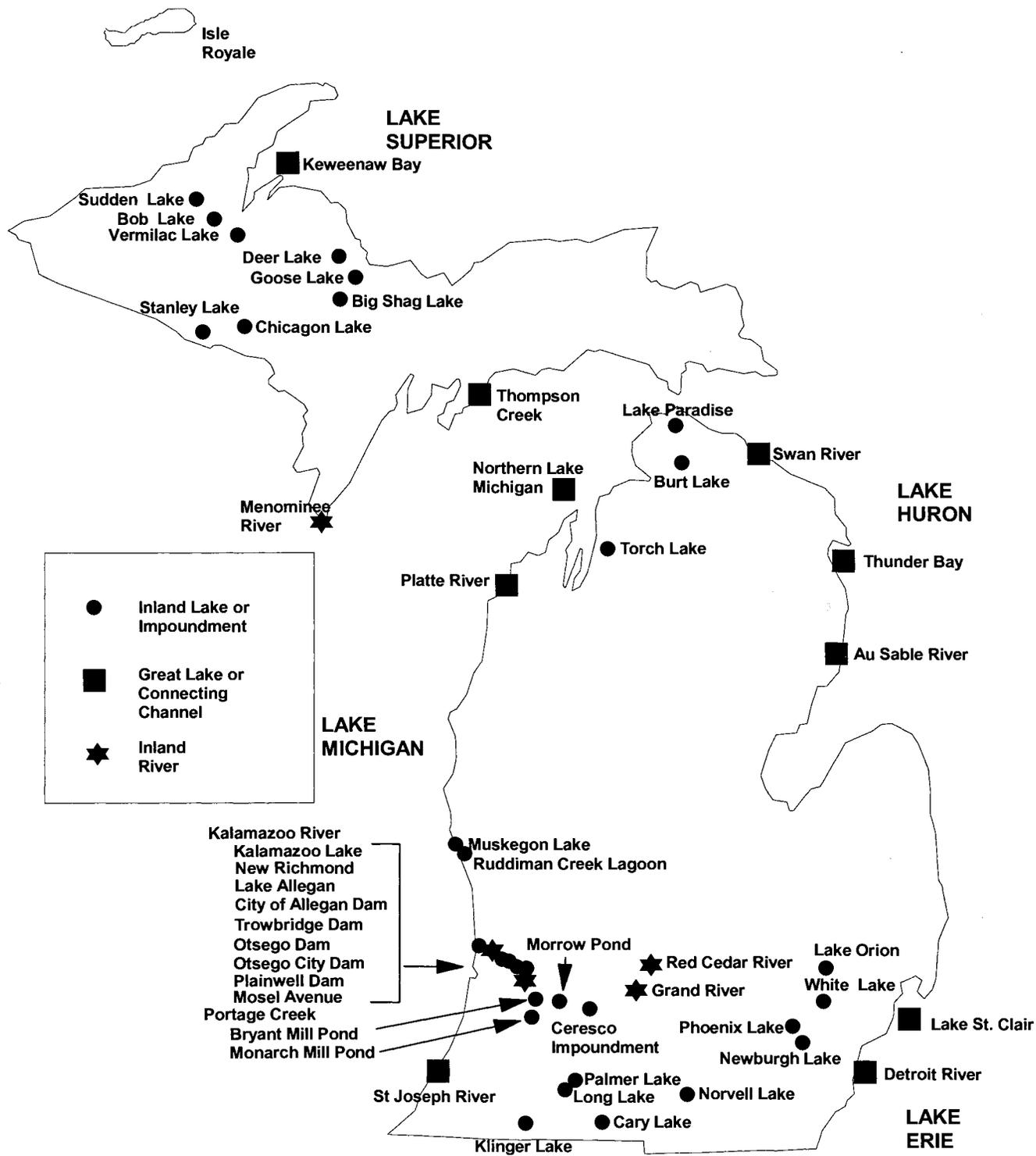
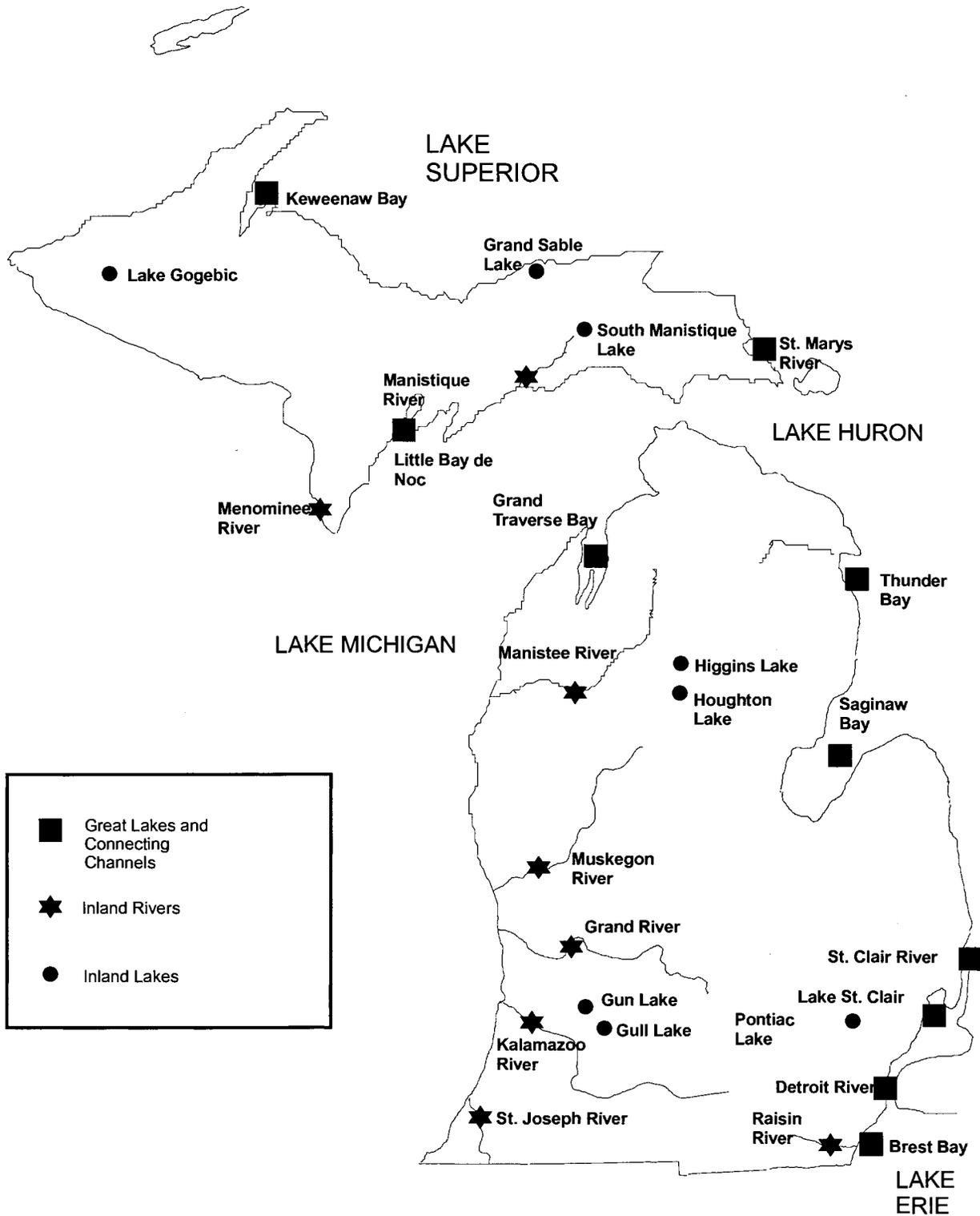


Figure 1. 2001 edible-portion fish sample locations.



**Figure 2. Whole-fish trend monitoring sites.**

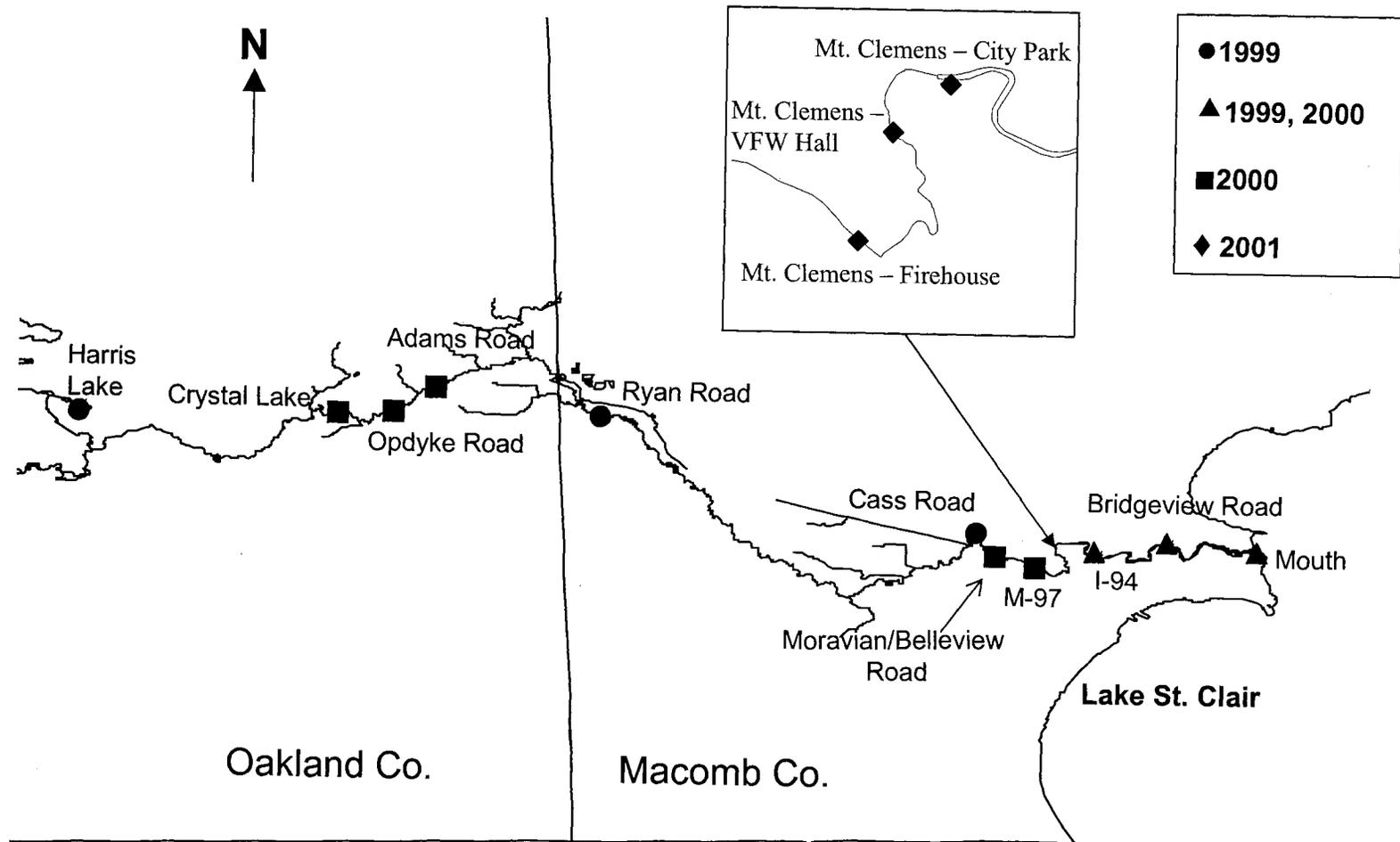


Figure 3. Clinton River caged-fish monitoring locations in 1999, 2000, and 2001.

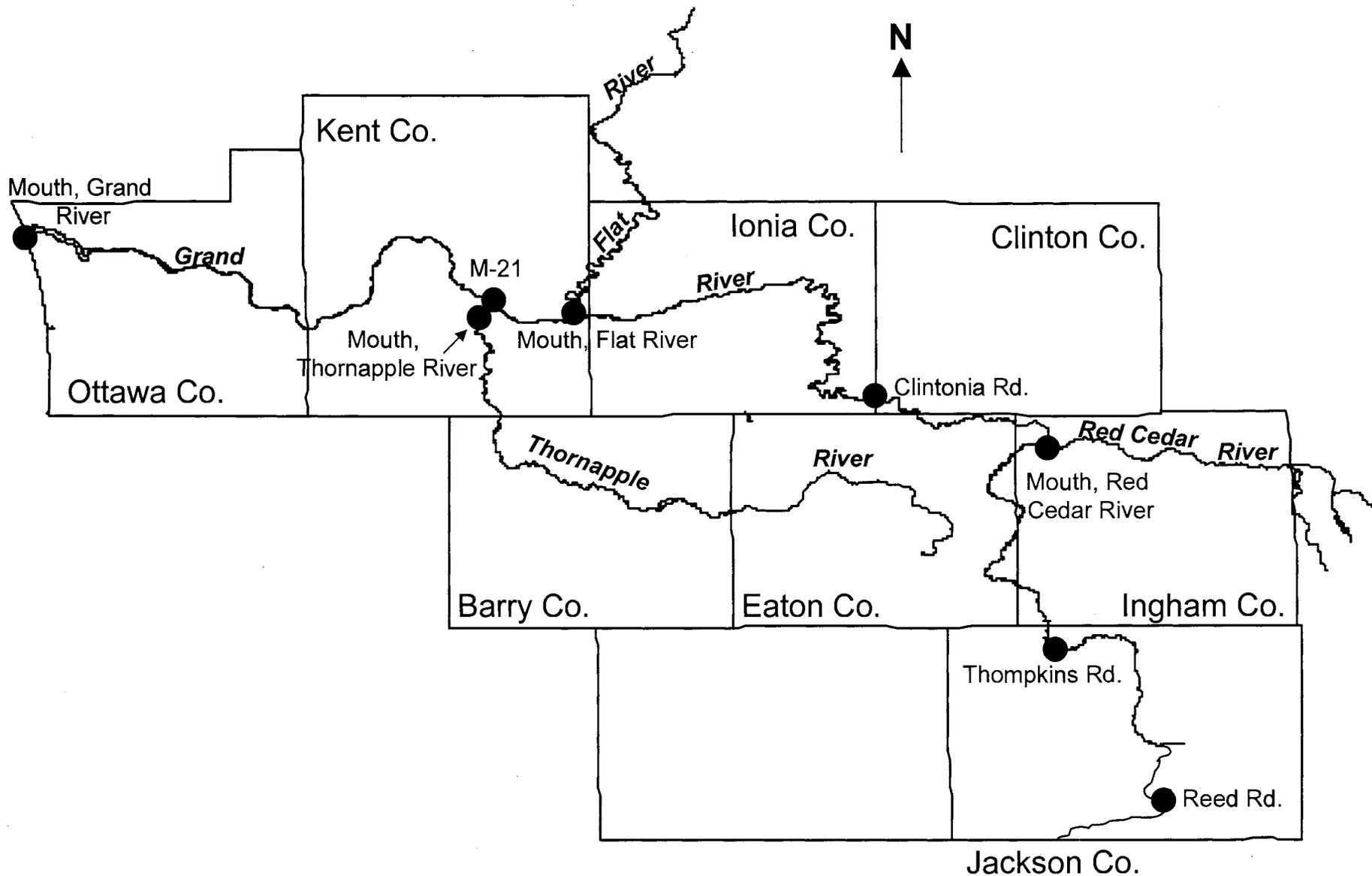


Figure 4. Grand River caged-fish monitoring locations.

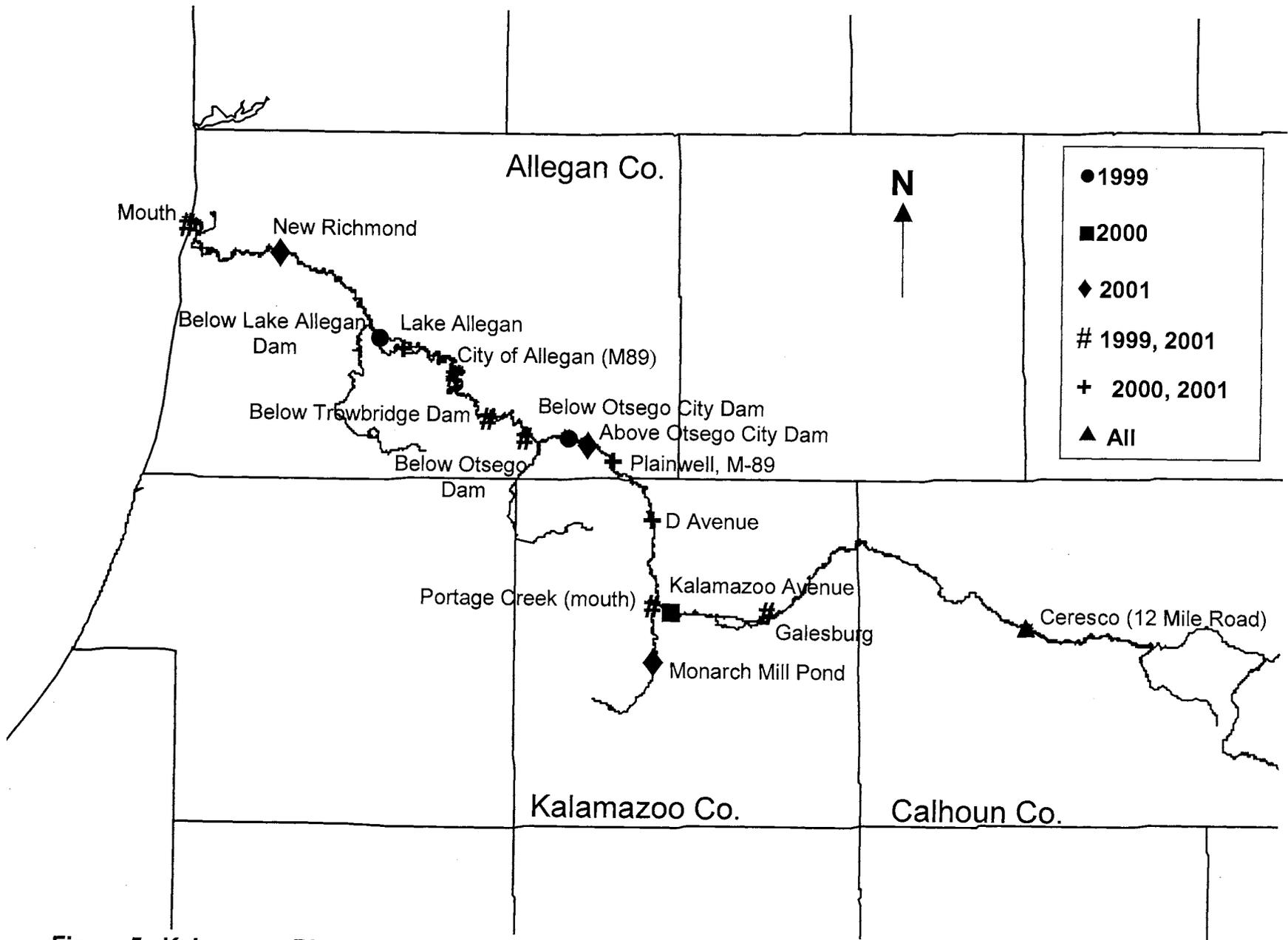


Figure 5. Kalamazoo River caged-fish monitoring locations in 1999, 2000, and 2001.

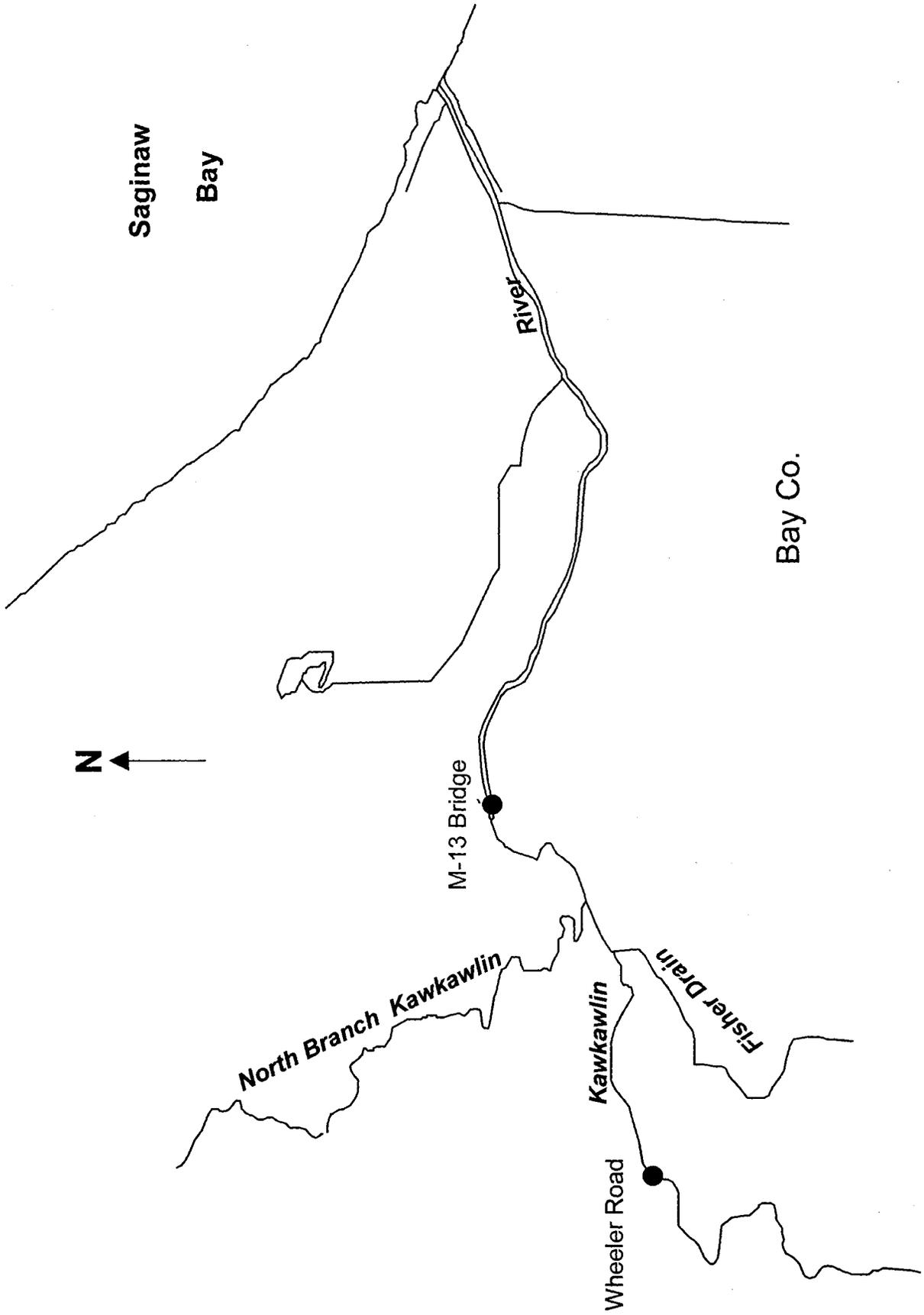


Figure 6. Kawkawlin River caged-fish monitoring locations.

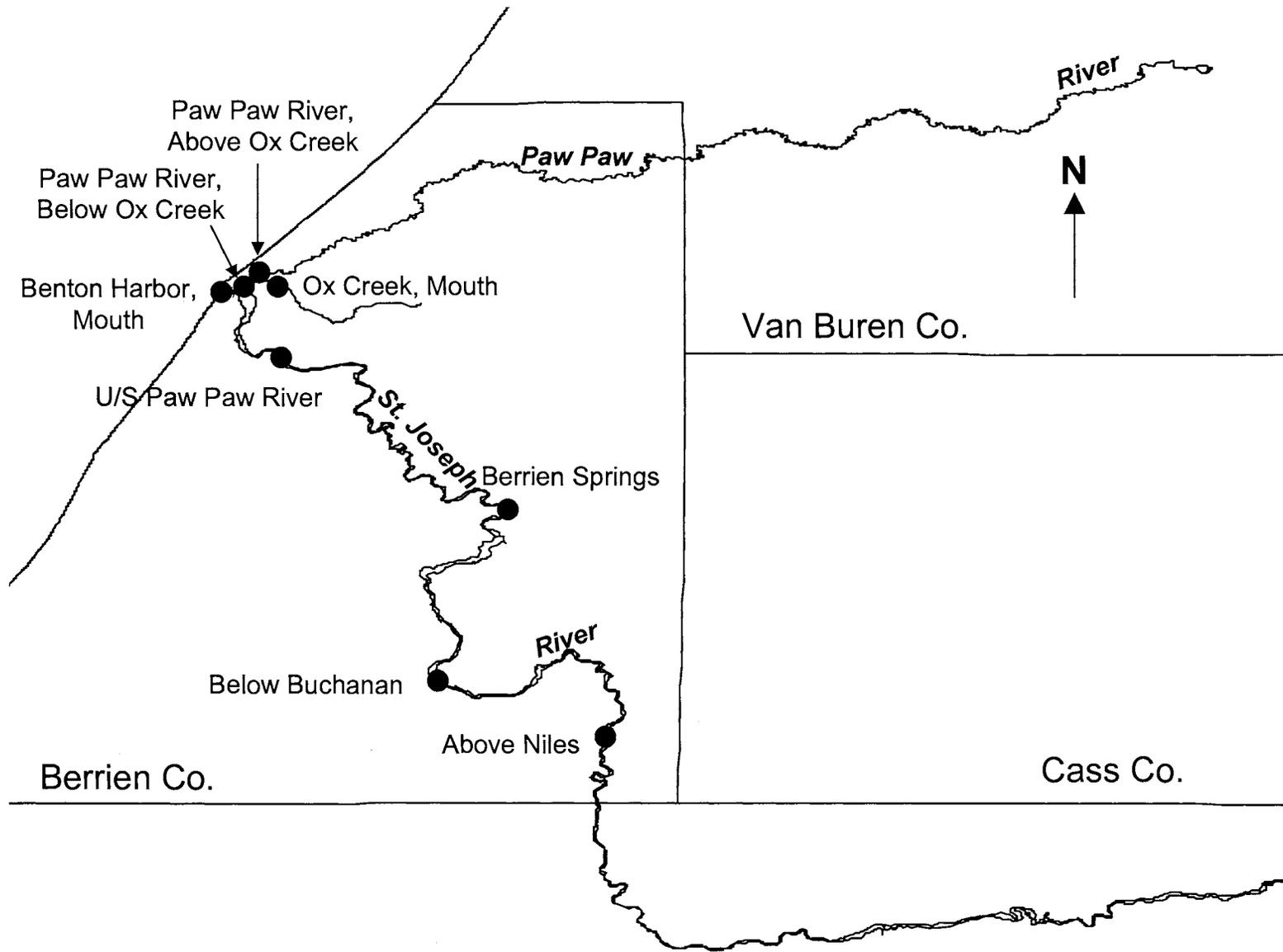


Figure 7. St. Joseph River caged-fish monitoring locations.

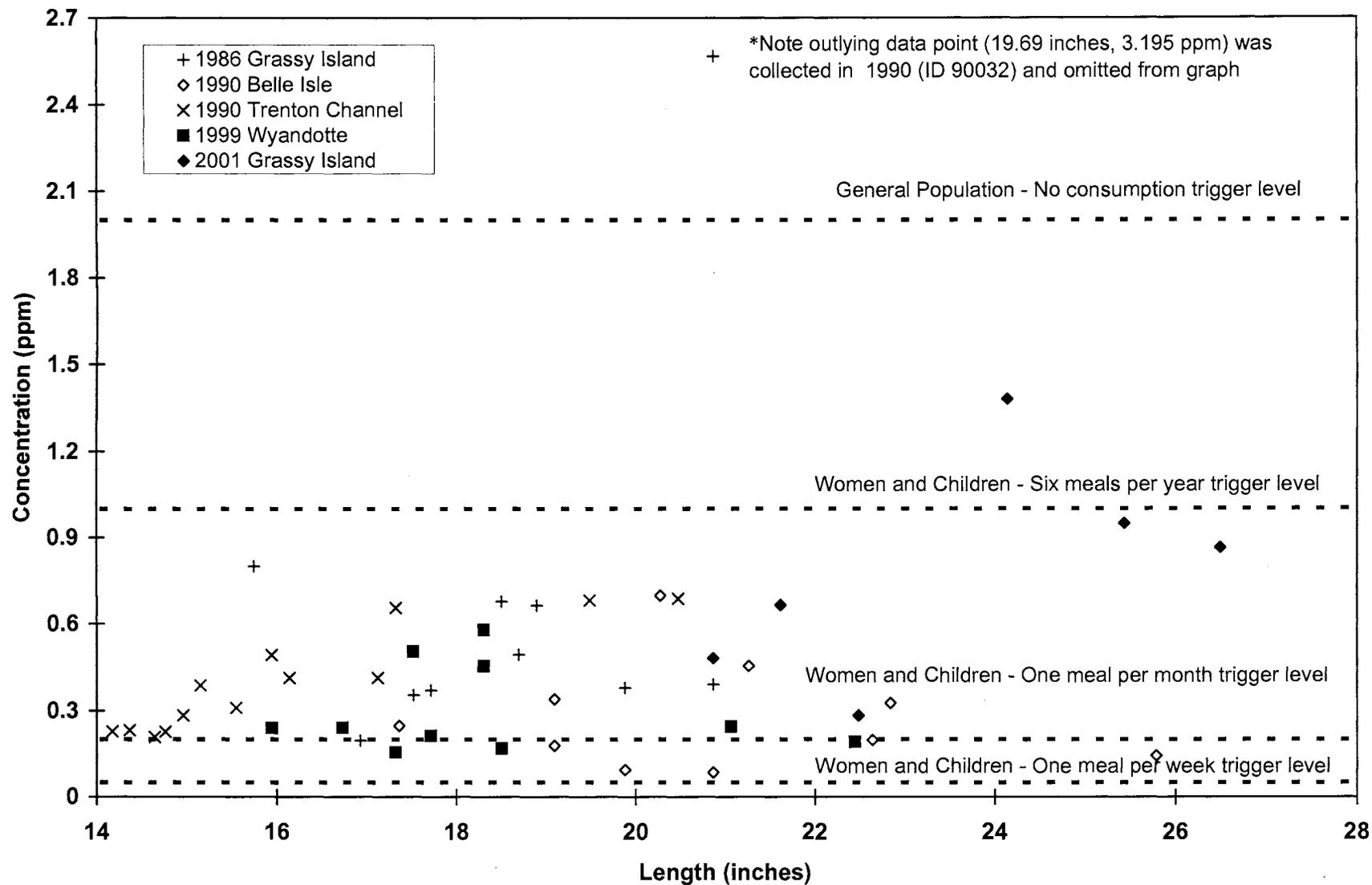


Figure 8. Total length versus total PCB concentration in walleye collected from the Detroit River in 1986 (ID 86064), 1990 (ID 90031 and 90032), 1999 (ID 1999007), and 2001 (ID 2001010).

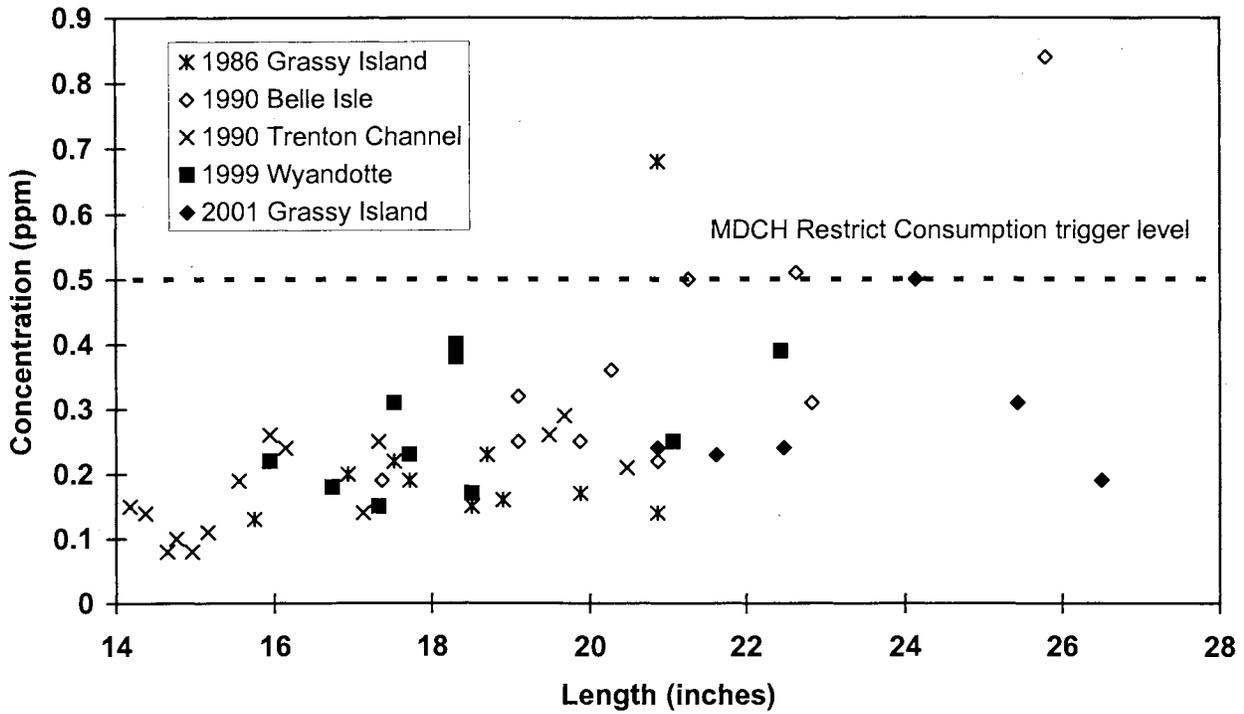


Figure 9. Total length versus mercury concentration in walleye collected from the Detroit River in 1986 (ID 86064), 1990 (ID 90031 and 90032), 1999 (ID 1999007), and 2001 (ID 2001010).

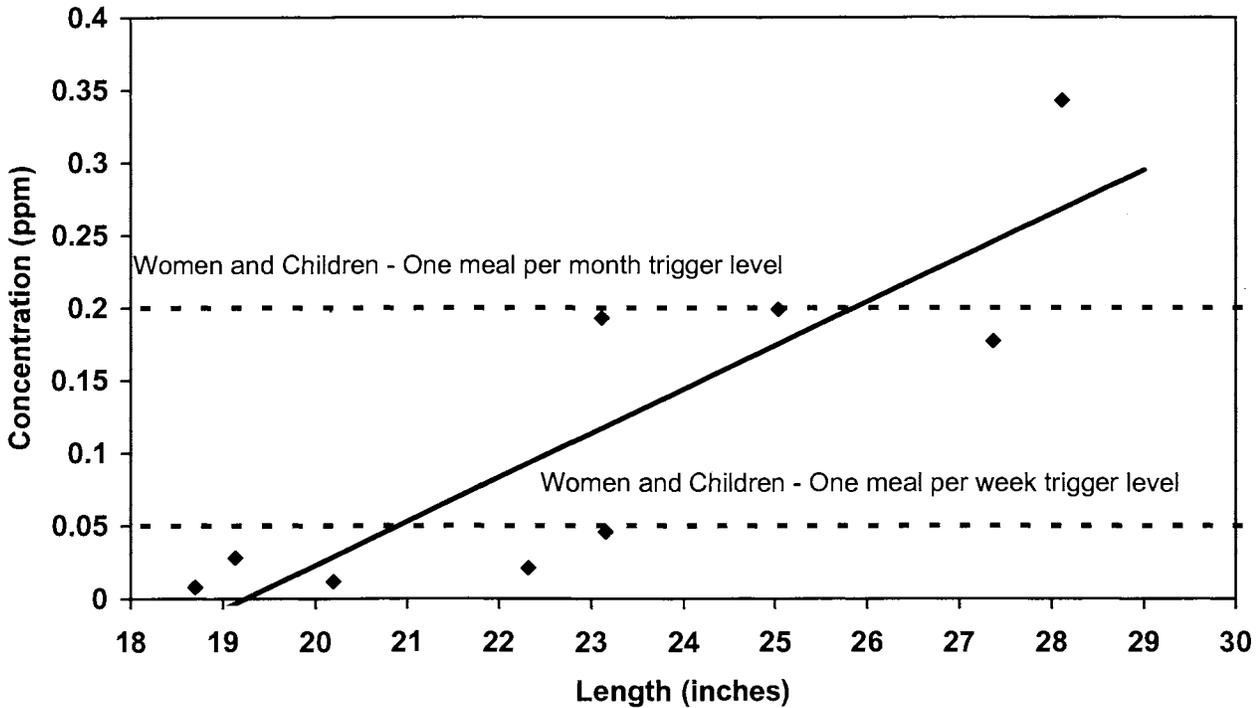


Figure 10. Total length versus total PCB concentration in carp collected from Lake Orion, Oakland County in 2001 (ID 2001071).

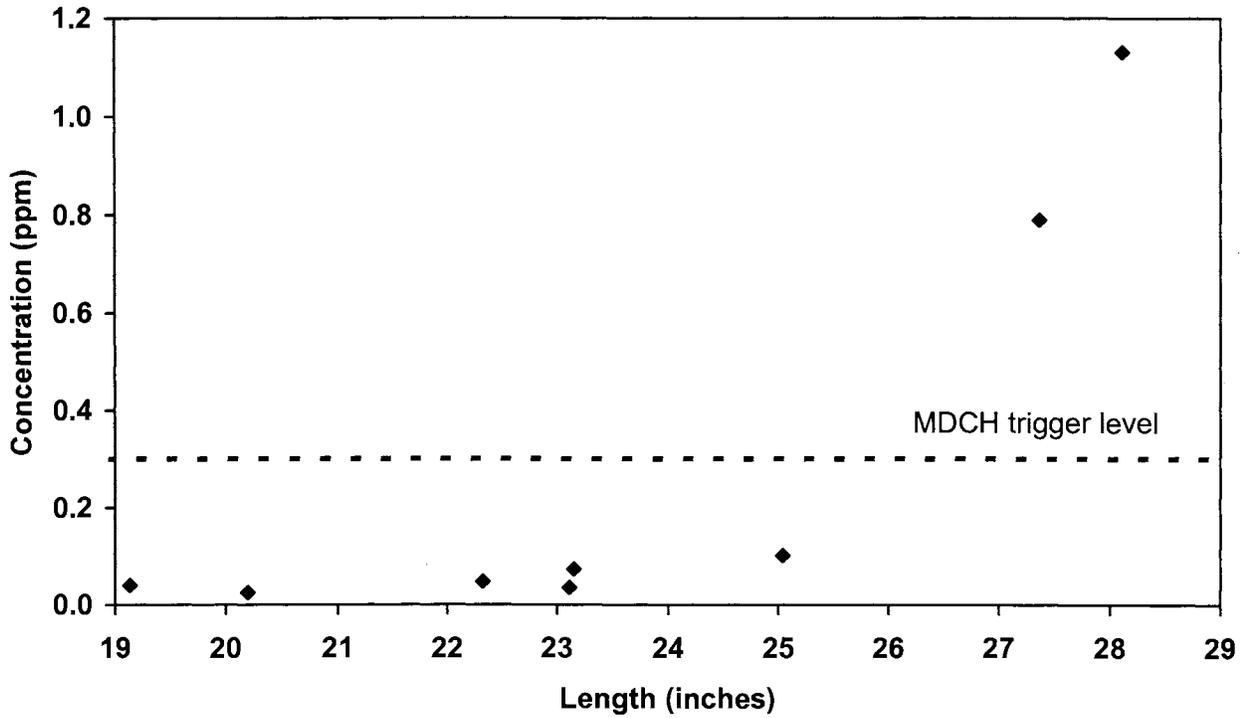


Figure 11. Total length versus total chlordane concentration in carp collected from Lake Orion, Oakland County in 2001 (ID 2001071).



Figure 12. Total length versus total PCB concentration in largemouth bass collected from Lake Orion, Oakland County in 1989 (ID 89005) and 2001 (ID 2001071).

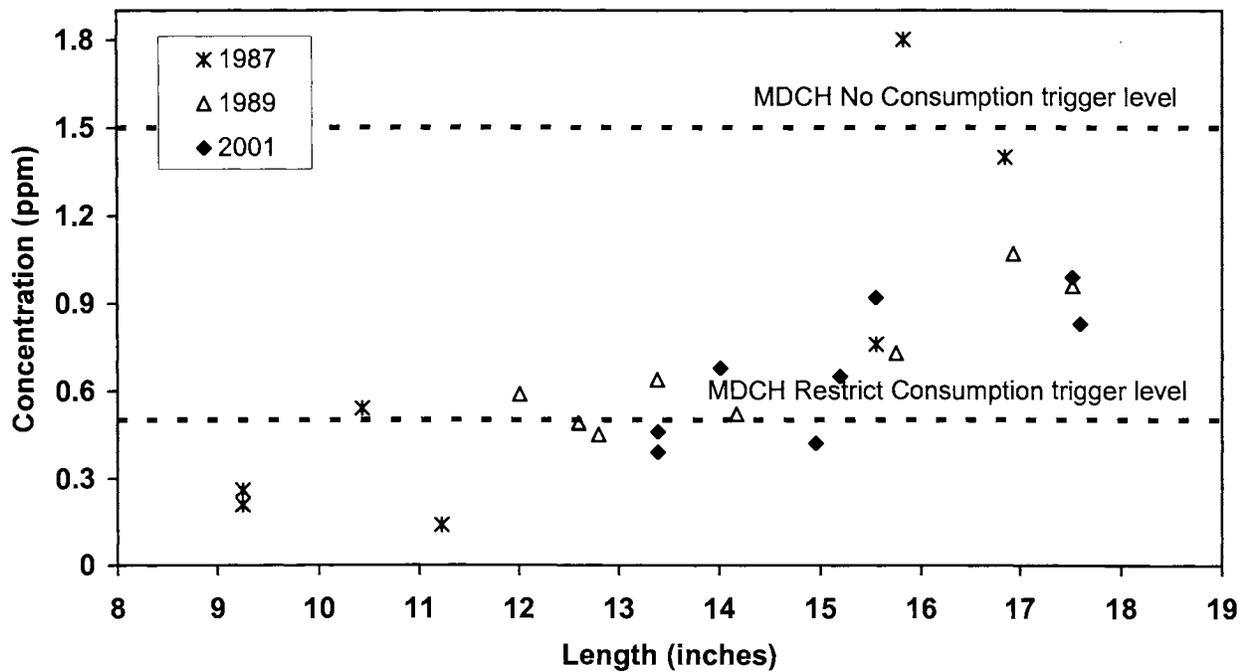


Figure 13. Total length versus mercury concentration in largemouth bass collected from Lake Orion, Oakland County in 1987 (ID 87021), 1989 (ID 89005), and 2001 (ID 2001071).



Figure 14. Total length versus total PCB concentration in carp collected from Norvell Lake, Jackson County in 2001 (ID 2001084).

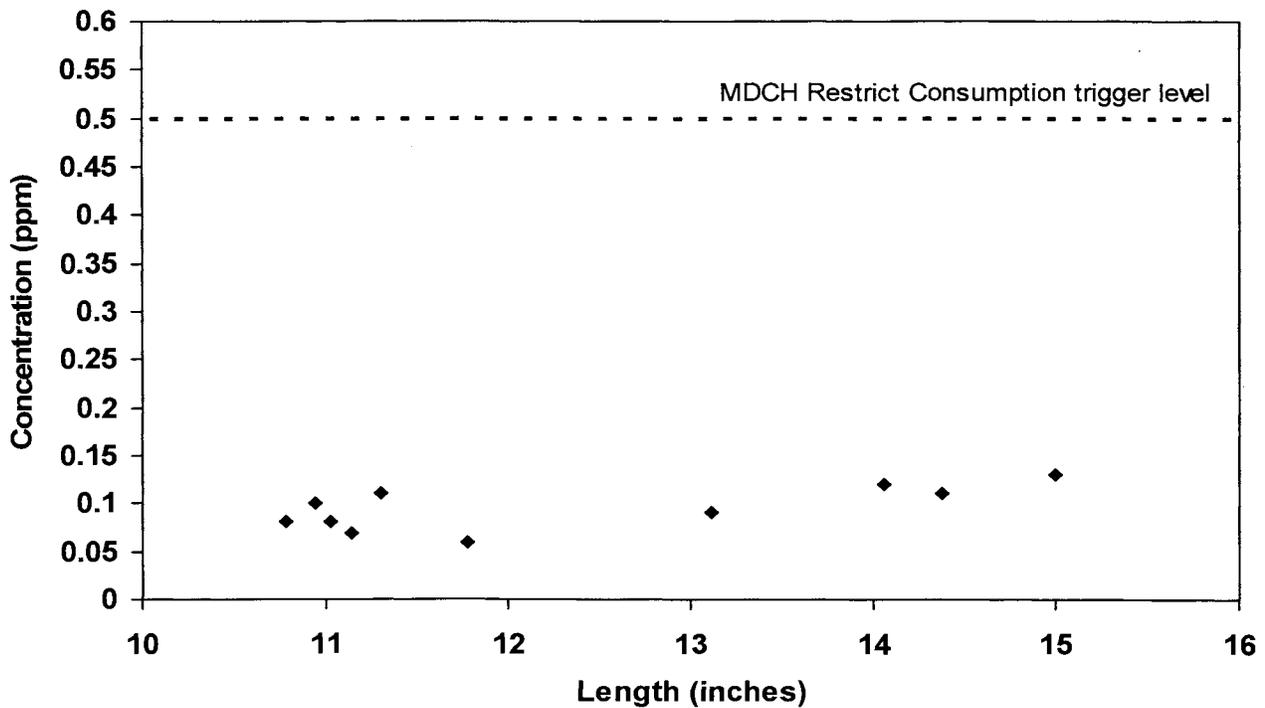


Figure 15. Total length versus mercury concentration in largemouth bass collected from Norvell Lake, Jackson County in 2001 (ID 2001084).

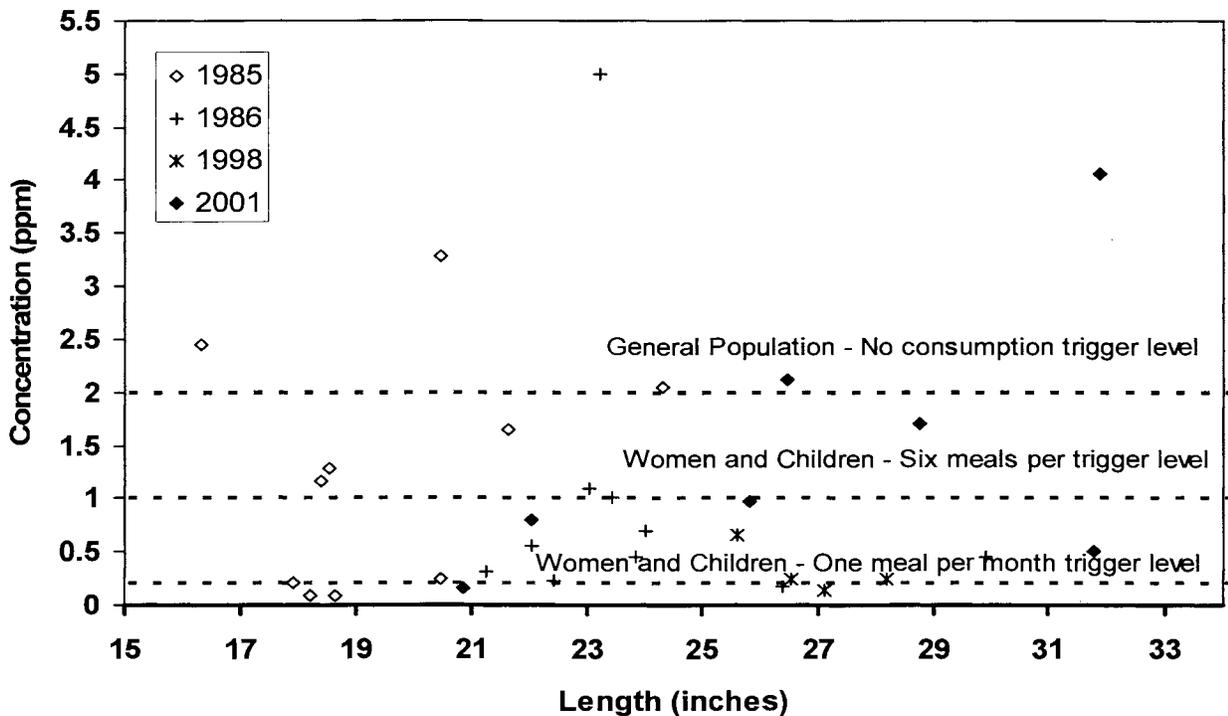


Figure 16. Total length versus total PCB concentration in carp collected from Lake St. Clair in 1985 (ID 85013), 1986 (ID 86017), 1998 (ID 1998064) and 2001 (ID 2001077).

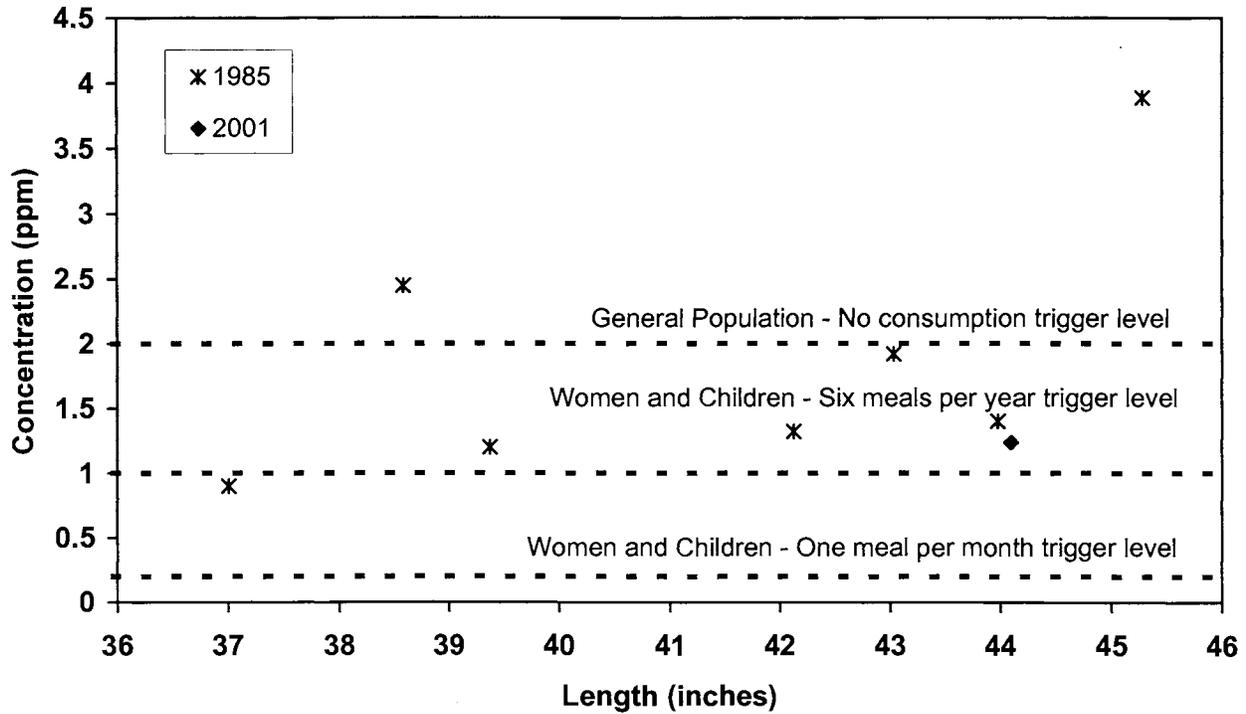


Figure 17. Total length versus total PCB concentration in muskellunge collected from Lake St. Clair in 1985 (ID 85014) and 2001 (ID 2001077).

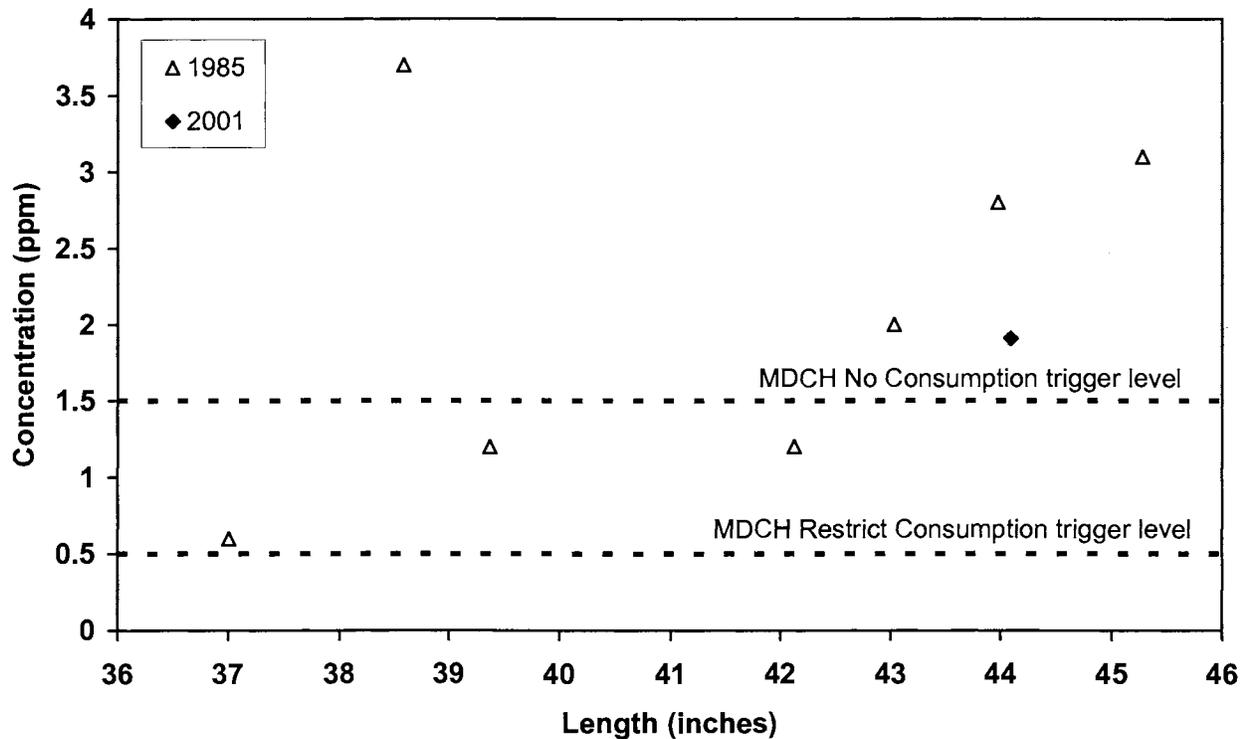


Figure 18. Total length versus mercury concentration in muskellunge collected from Lake St. Clair in 1985 (ID 85014) and 2001 (ID 2001077).

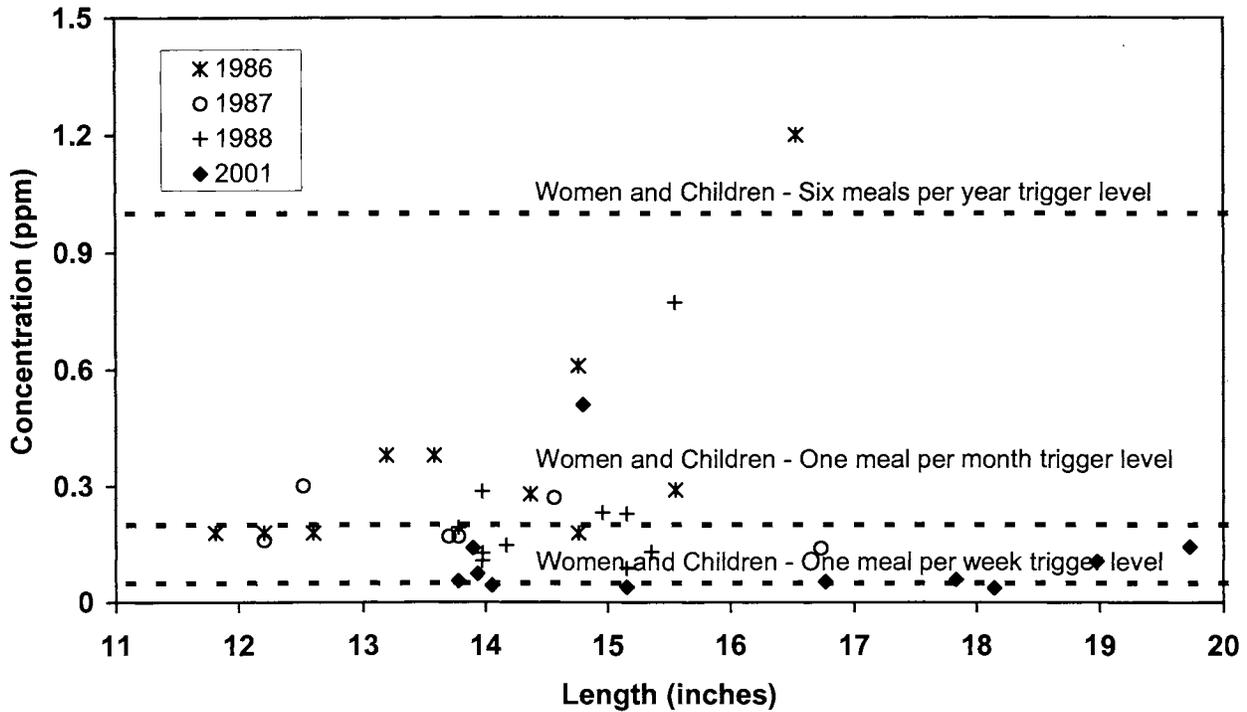


Figure 19. Total length versus total PCB concentration in smallmouth bass collected from Lake St. Clair in 1986 (ID 86017), 1987 (ID 87035), 1988 (ID 88026), and 2001 (ID 2001077).

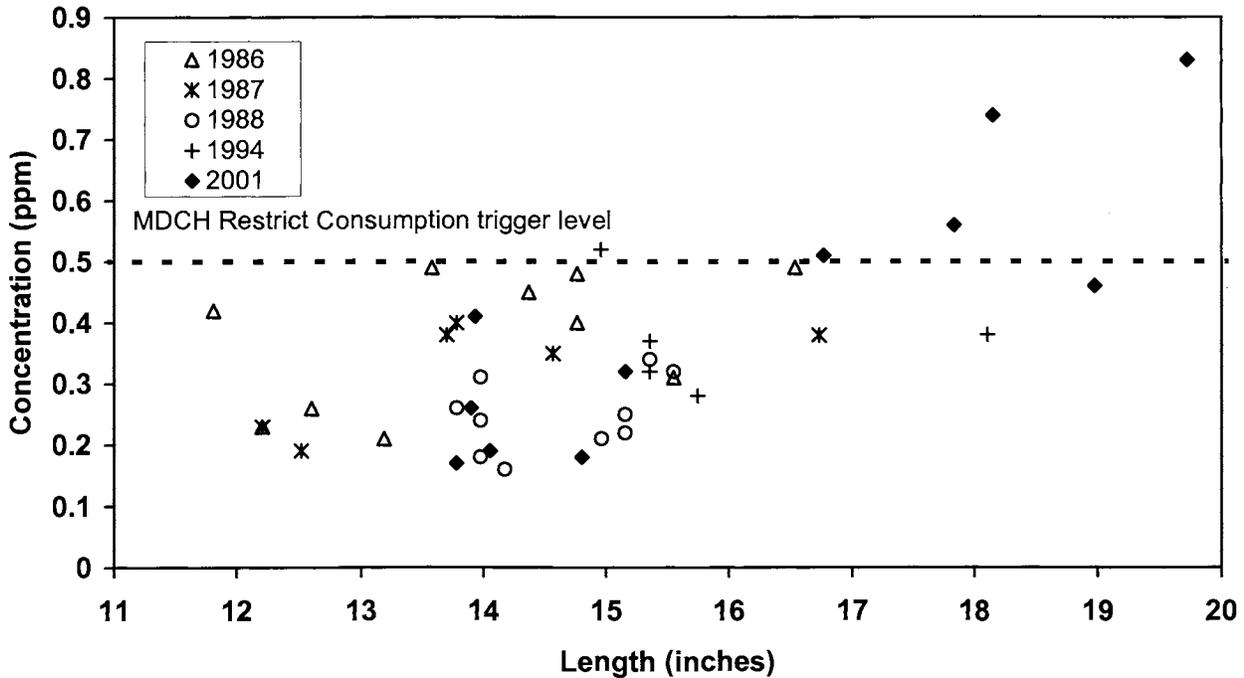


Figure 20. Total length versus mercury concentration in smallmouth bass collected from Lake St. Clair in 1986 (ID 86017), 1987 (ID 87035), 1988 (ID 88026), 1994 (ID 94049), and 2001 (ID 2001077).

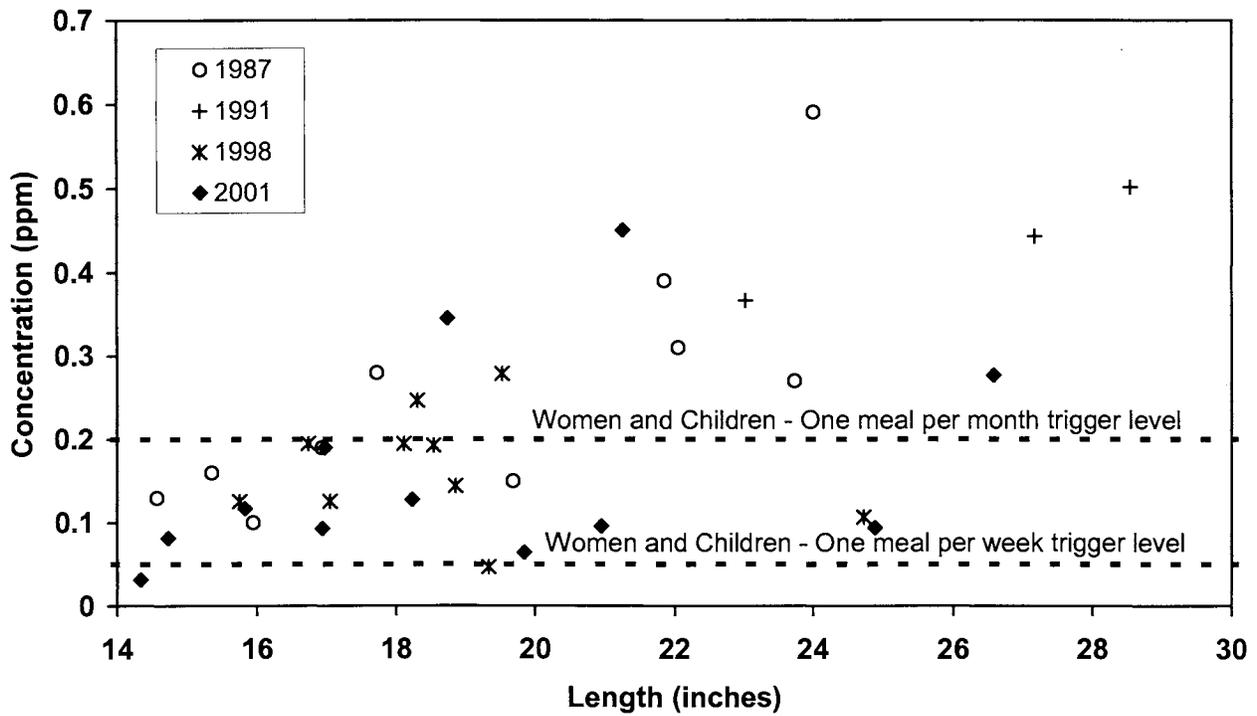


Figure 21. Total length versus total PCB concentration in walleye collected from Lake St. Clair in 1987 (ID 87035), 1991 (ID 91056), 1998 (ID 1998064), and 2001 (ID 2001077).

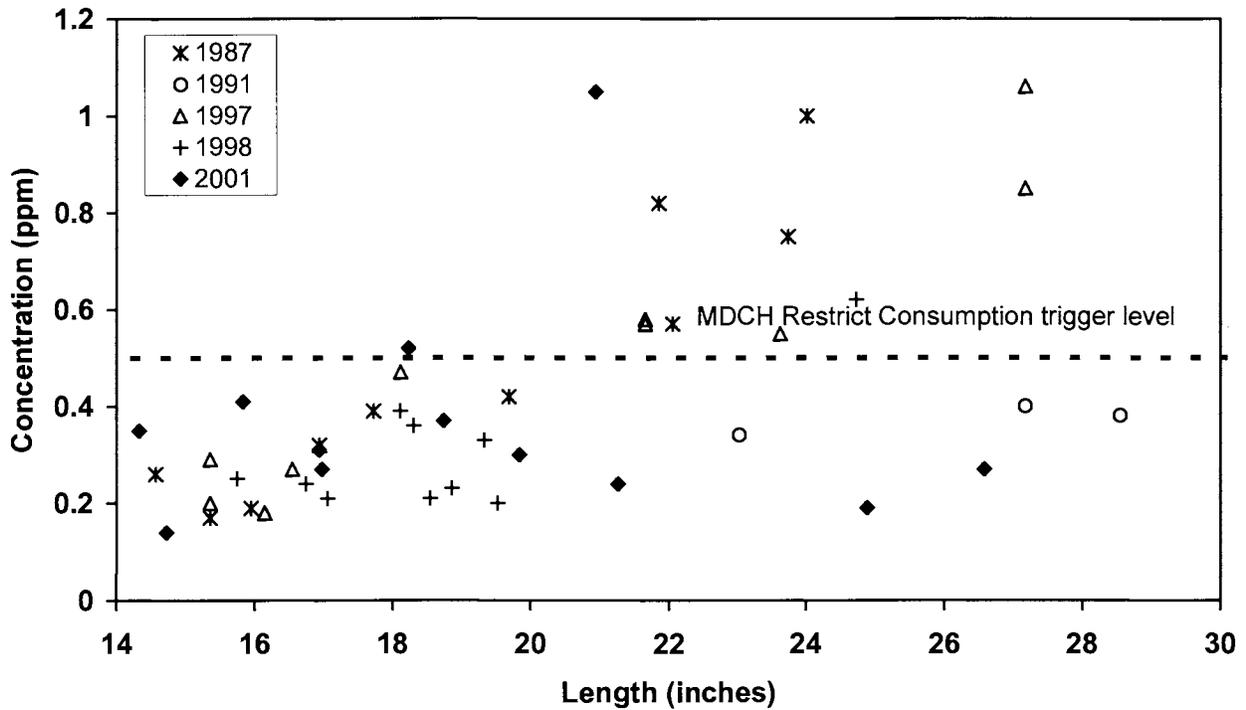


Figure 22. Total length versus mercury concentration in walleye collected from Lake St. Clair in 1987 (ID 87035), 1991 (ID 91056), 1997 (ID 97034), 1998 (ID 1998064), and 2001 (ID 2001077).

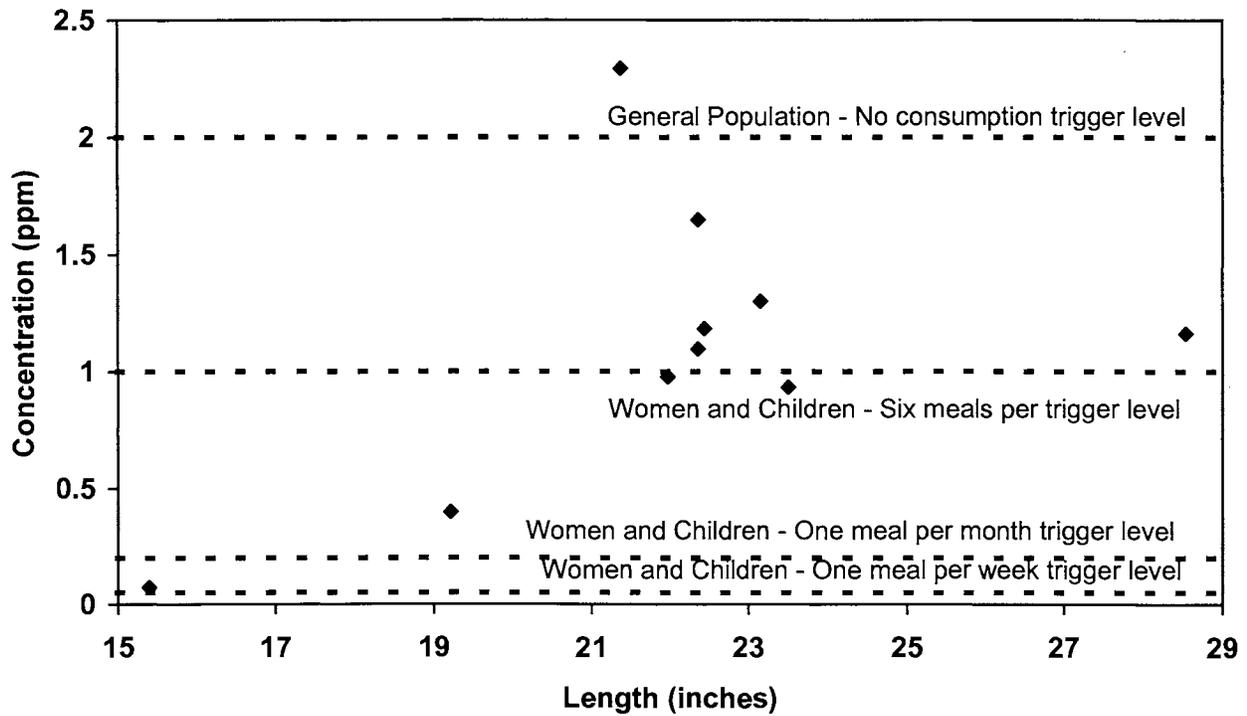


Figure 23. Total length versus total PCB concentration in carp collected from the Rouge River, Newburgh Lake in 2001 (ID 2001097).



Figure 24. Total length versus total PCB concentration in channel catfish collected from the Rouge River, Newburgh Lake in 2001 (ID 2001097).

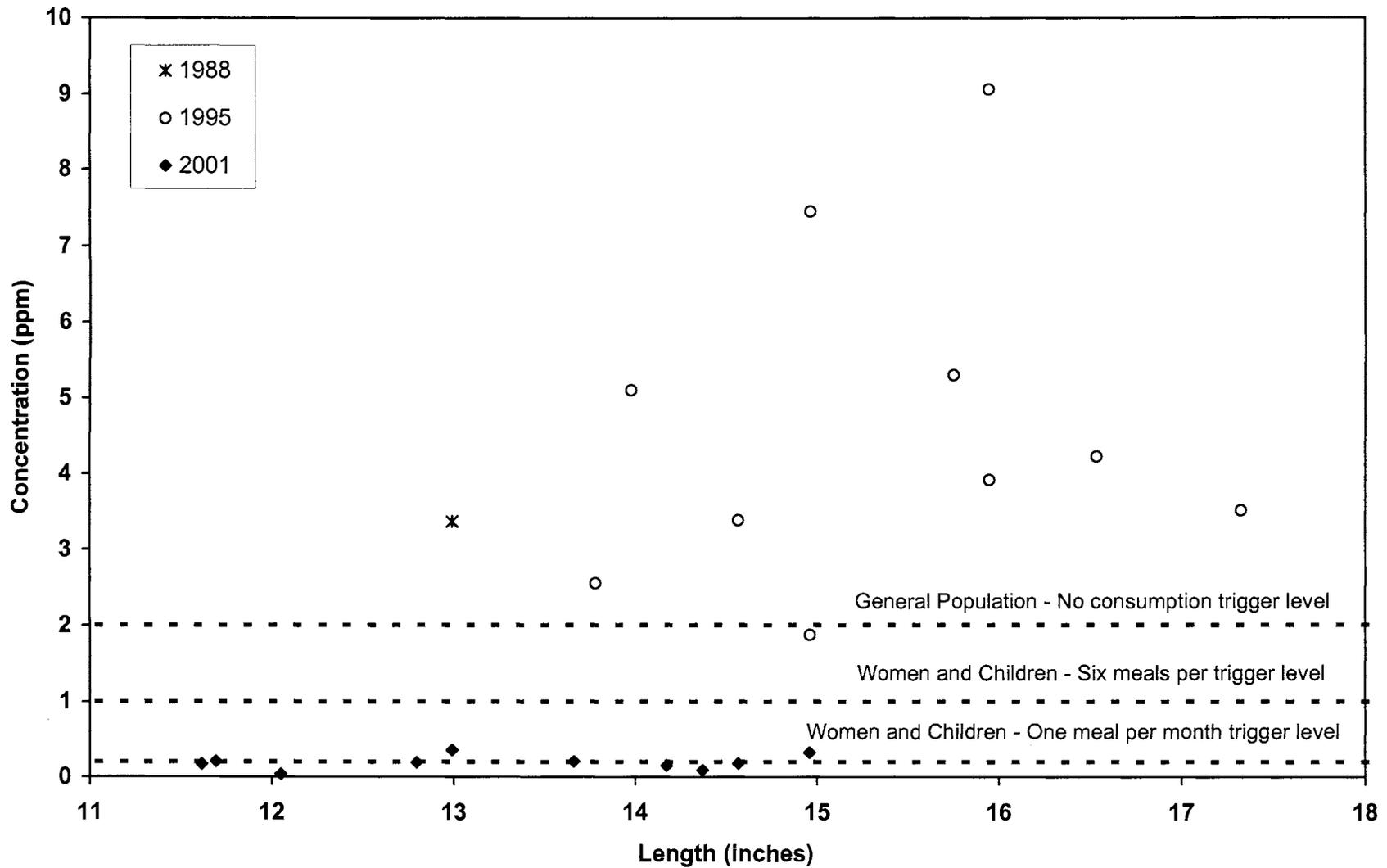


Figure 25. Total length versus total PCB concentration in largemouth bass collected from the Rouge River, Newburgh Lake in 1988 (ID 88011), 1995 (ID 95024), and 2001 (ID 2001097).

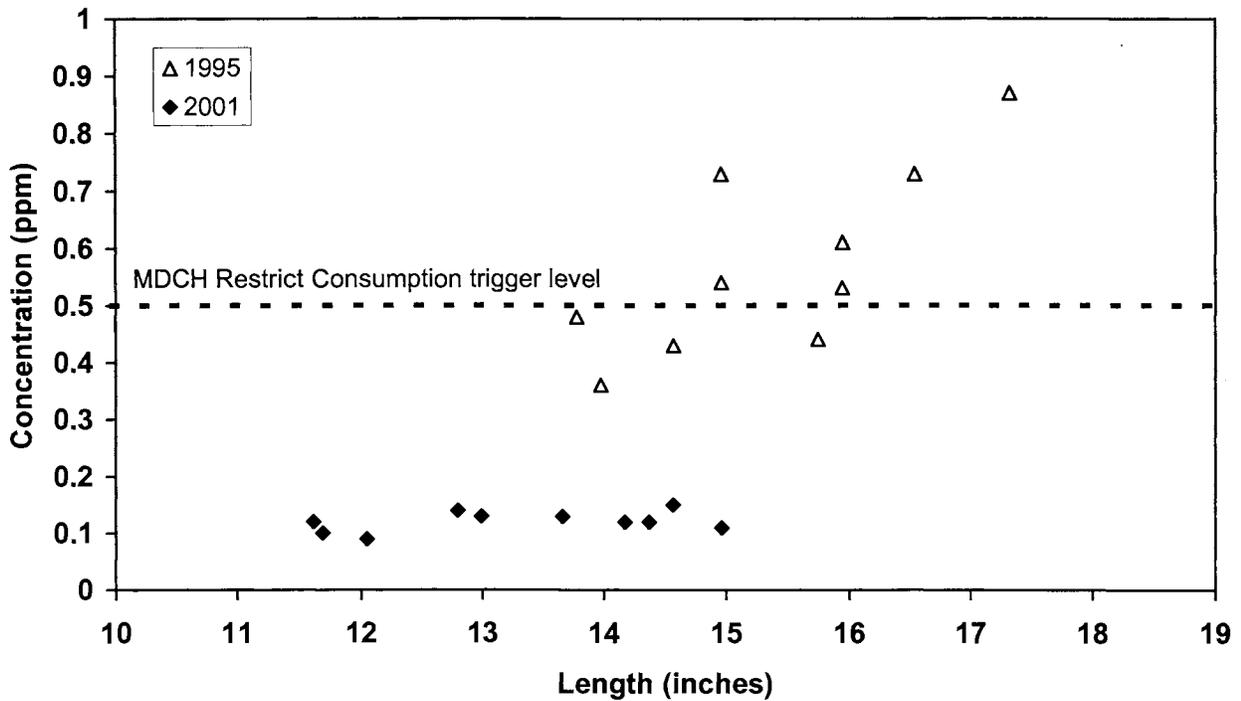


Figure 26. Total length versus mercury concentration in largemouth bass collected from the Rouge River, Newburgh Lake in 1995 (ID 95024) and 2001 (ID 2001097).

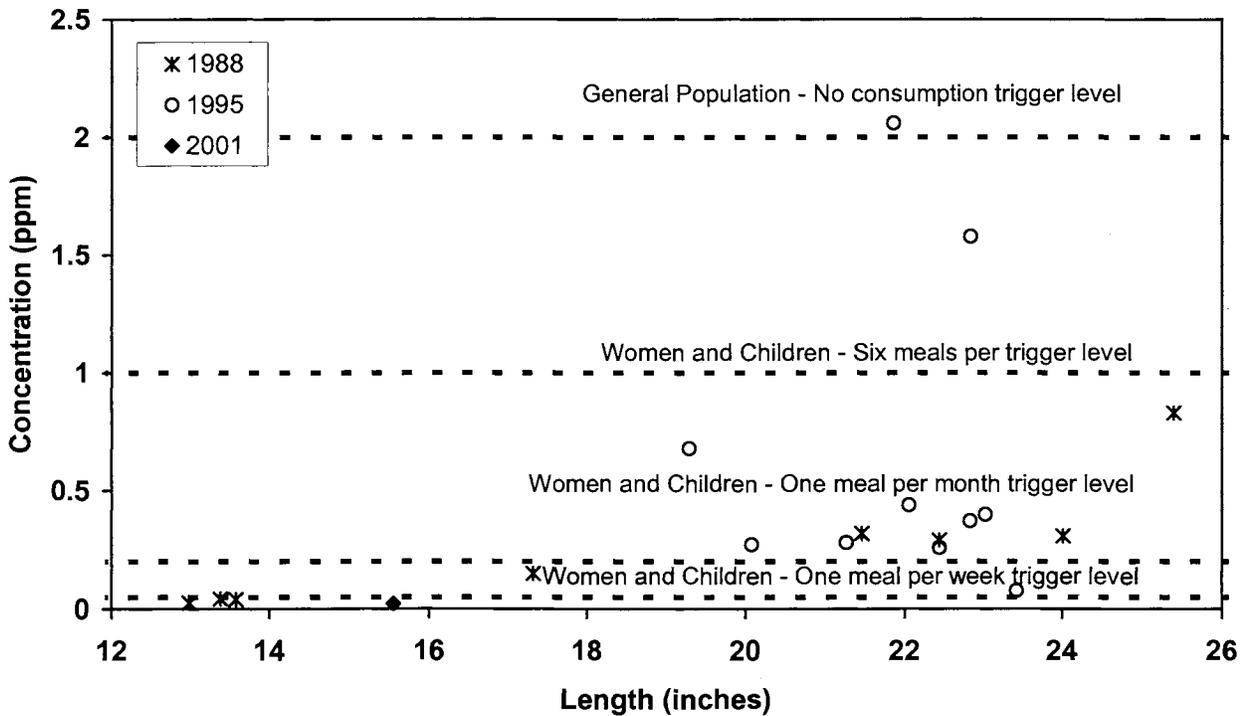


Figure 27. Total length versus total PCB concentration in carp collected from the Rouge River, Phoenix Lake in 1988 (ID 88012), 1995 (ID 95023), and 2001 (ID 2001098).



Figure 28. Total length versus total PCB concentration in northern pike collected from the Rouge River, Phoenix Lake in 1988 (ID 88012) and 2001 (ID 2001098).

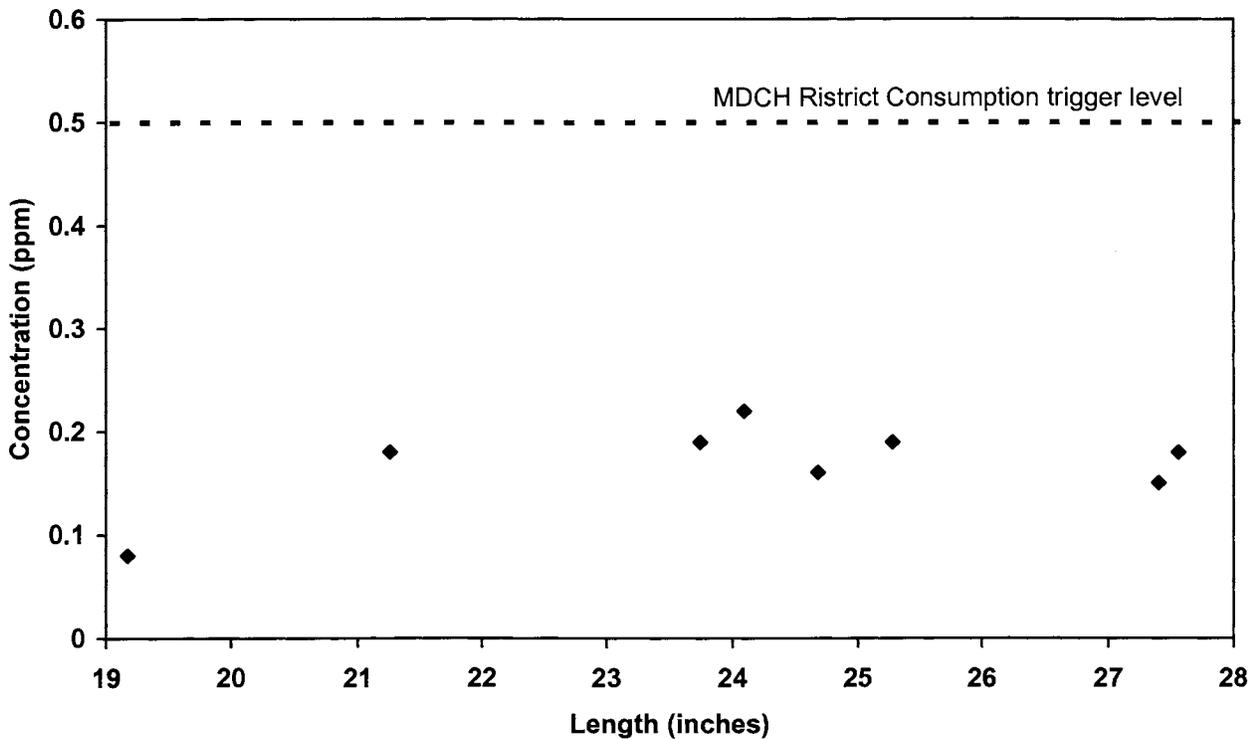


Figure 29. Total length versus mercury concentration in northern pike collected from the Rouge River, Phoenix Lake in 2001 (ID 2001098).

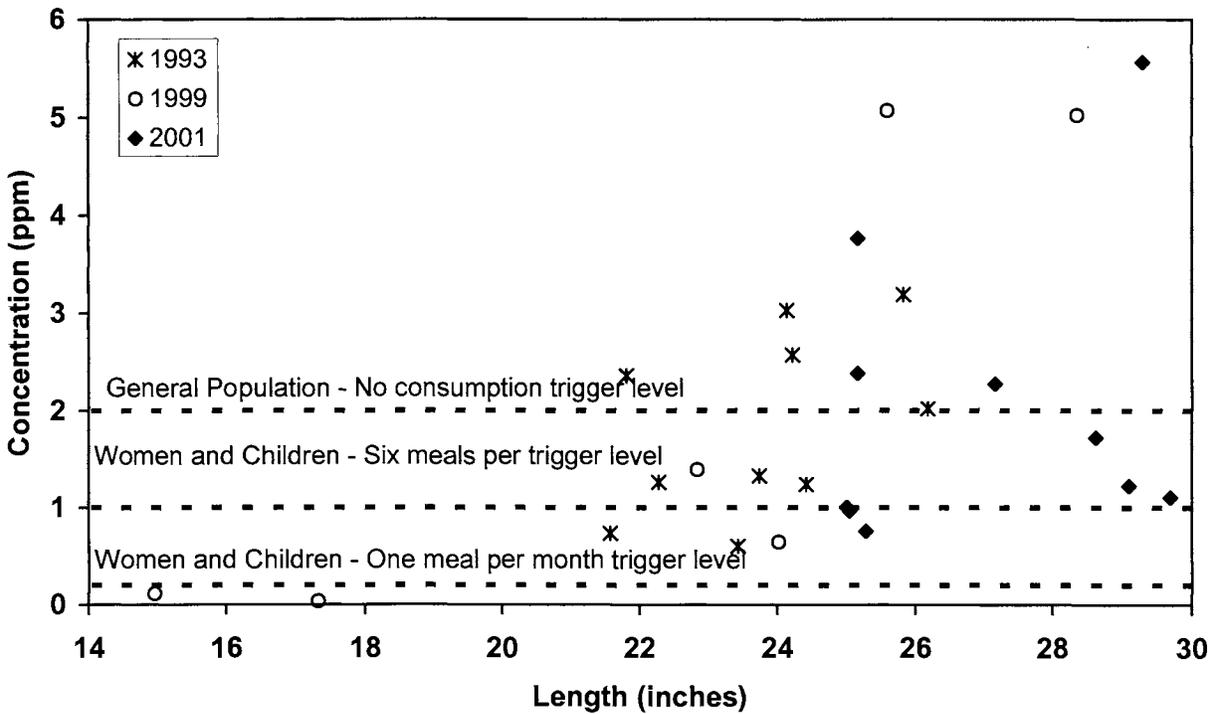


Figure 30. Total length versus total PCB concentration in carp collected from Lake Huron, Thunder Bay in 1993 (ID 93070), 1999 (ID 1999029), and 2001 (ID 2001061).

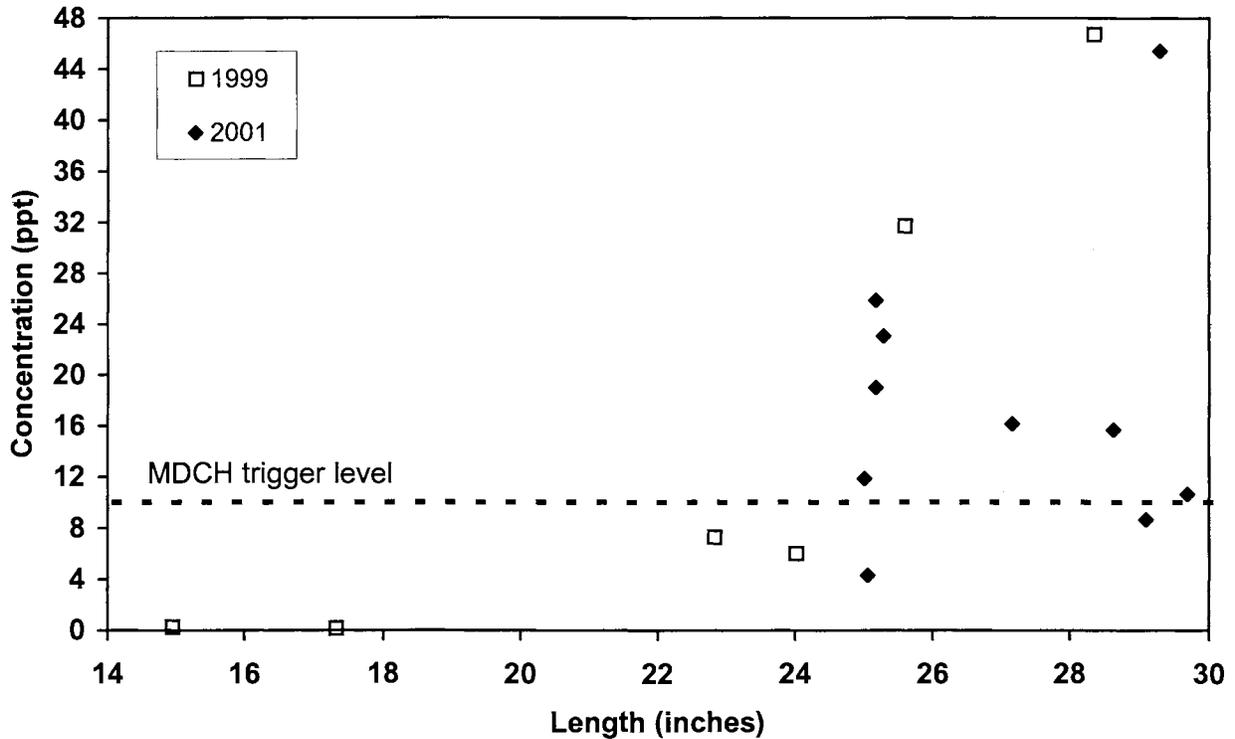


Figure 31. Total length versus dioxin TEQ concentration in carp collected from Lake Huron, Thunder Bay in 1999 (ID 1999029) and 2001 (ID 2001061).

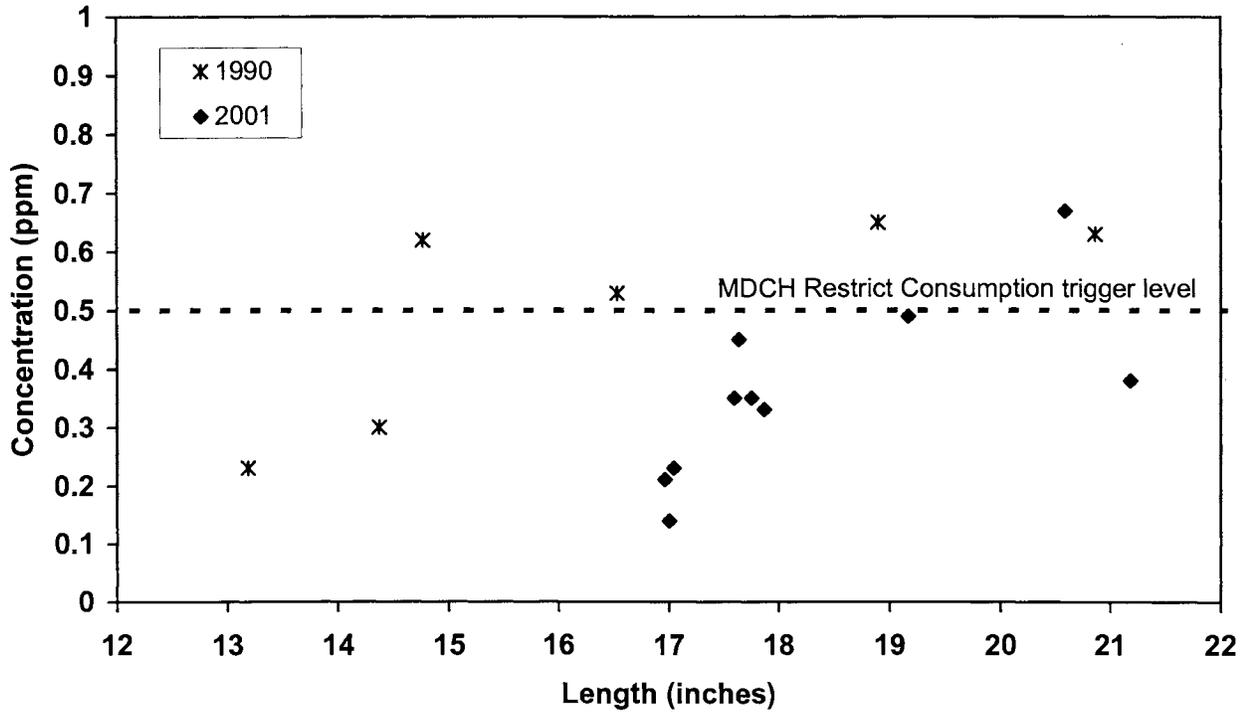


Figure 32. Total length versus mercury concentration in walleye collected from Burt Lake, Cheboygan County in 1990 (ID 90061) and 2001 (ID 2001005).

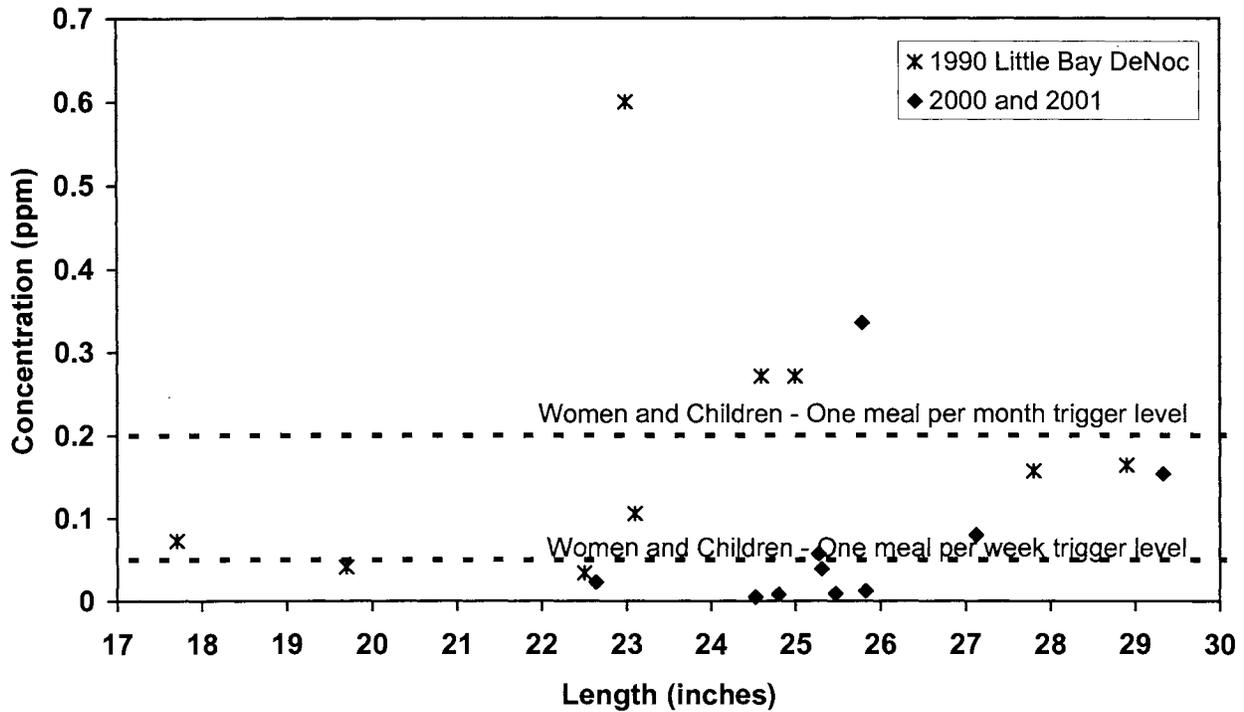


Figure 33. Total length versus total PCB concentration in burbot collected from Lake Michigan in 1990 (ID 90001), 2000 and 2001 (ID 2001132).

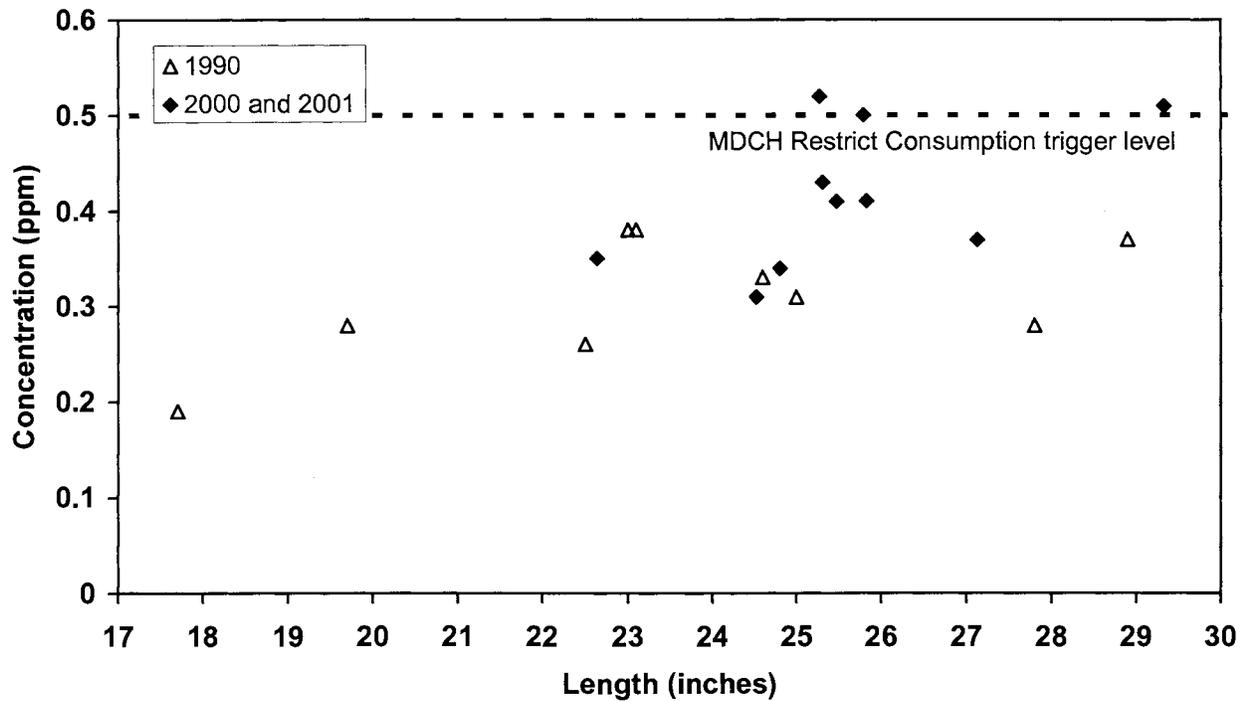


Figure 34. Total length versus mercury concentration in burbot collected from Lake Michigan in 1990 (ID 90001), 2000 and 2001 (ID 2001132).

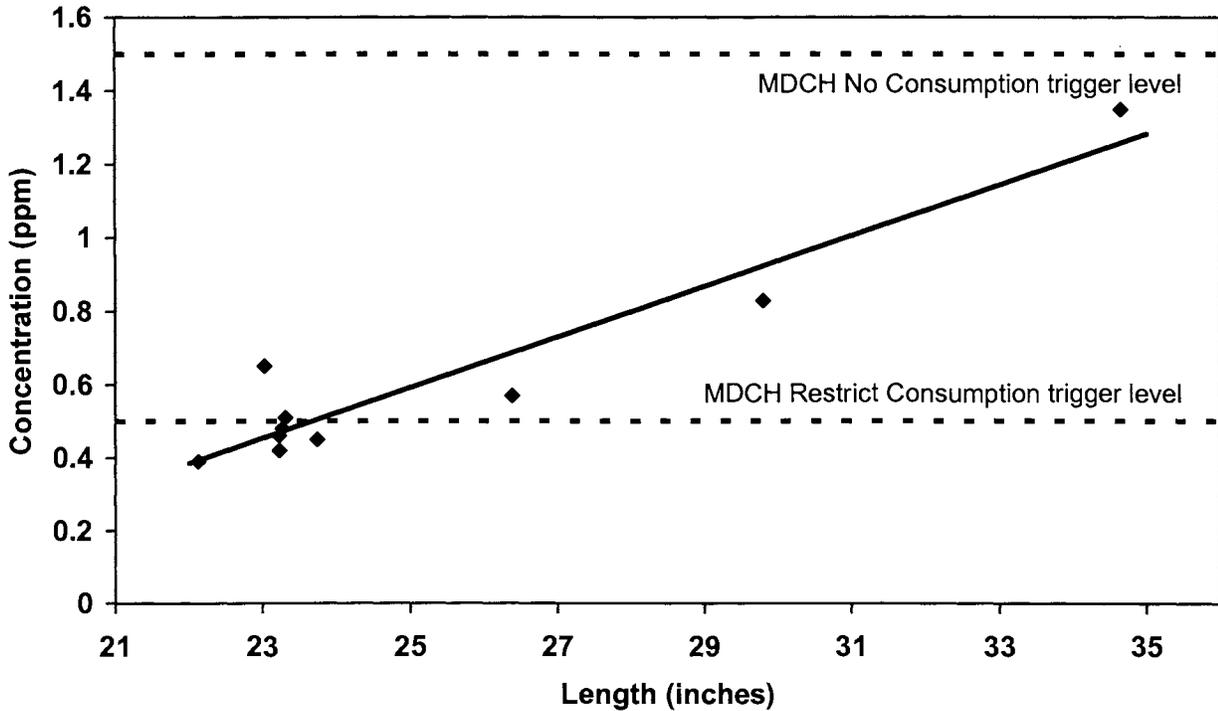


Figure 35. Total length versus mercury concentration in northern pike collected from Big Shag Lake, Cheboygan County in 2001 (ID 2001003).

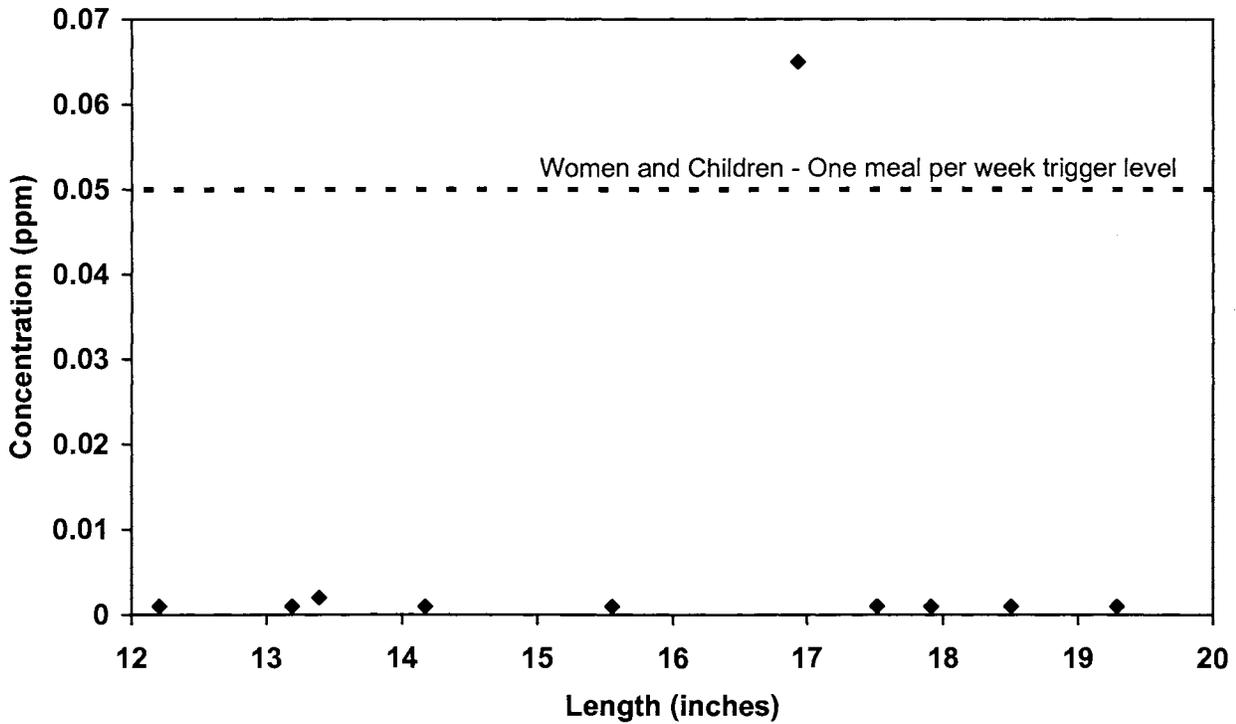


Figure 36. Total length versus total PCB concentration in white sucker collected from Cary Lake, Branch County in 2001 (ID 2001140).

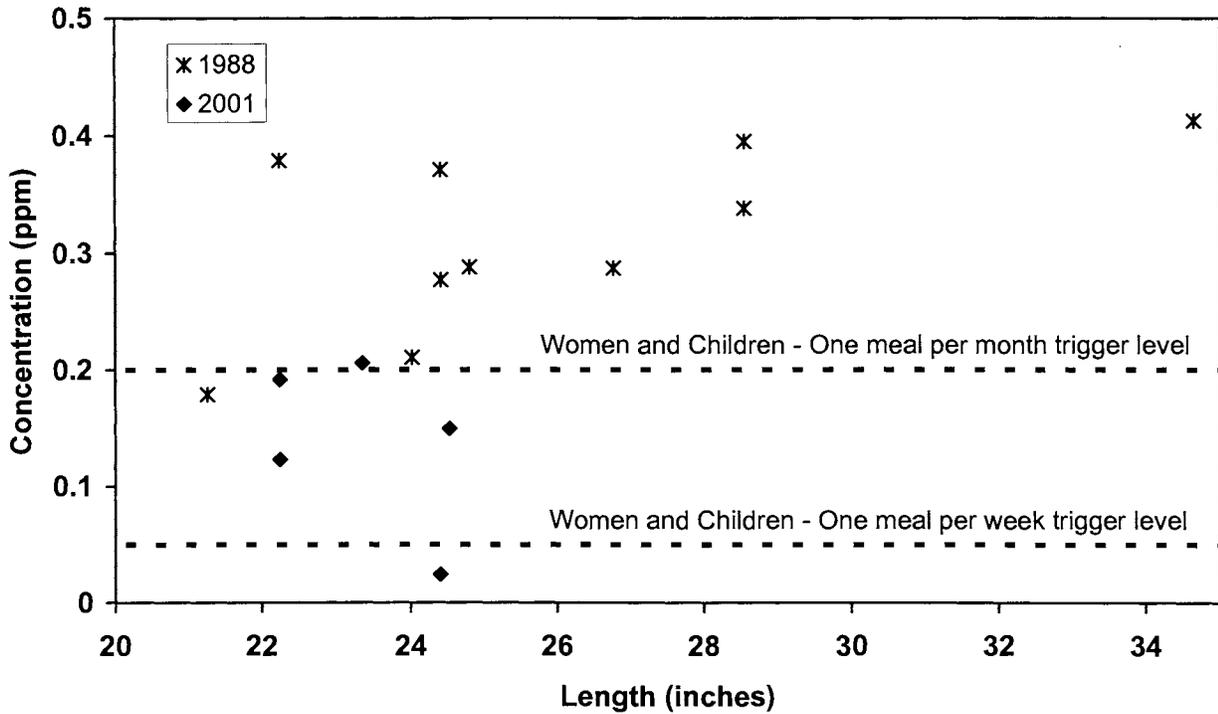


Figure 37. Total length versus total PCB concentration in northern pike collected from Goose Lake, Marquette County in 1988 (ID 88045) and 2001 (ID 2001011).

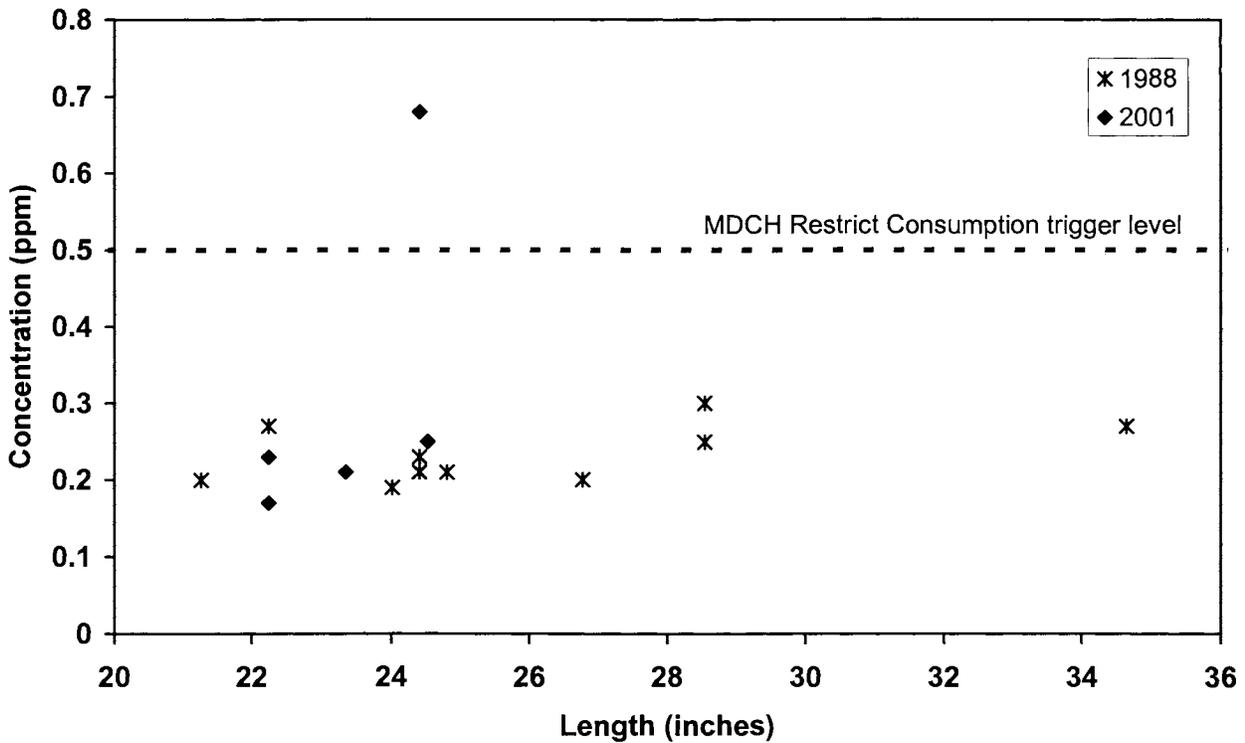


Figure 38. Total length versus mercury concentration in northern pike collected from Goose Lake, Marquette County in 1988 (ID 88045) and 2001 (ID 2001011).

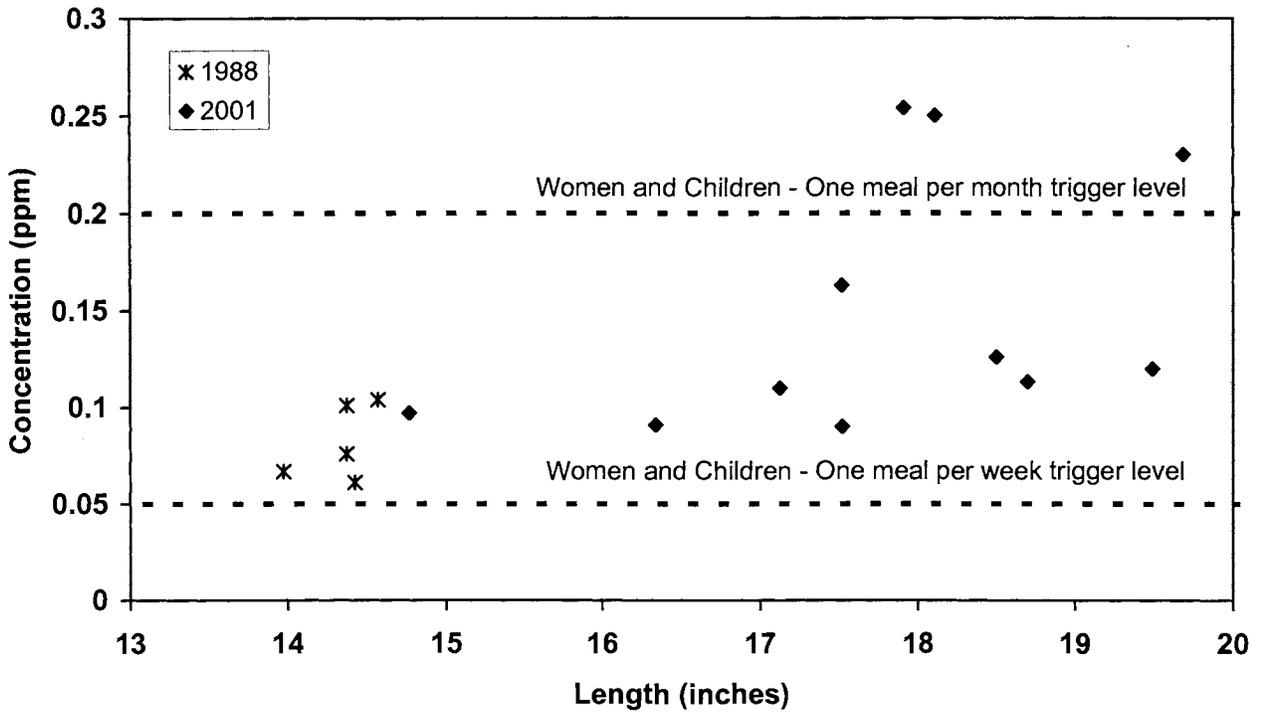


Figure 39. Total length versus total PCB concentration in walleye collected from Goose Lake, Marquette County in 1988 (ID 88045) and 2001 (ID 2001011).

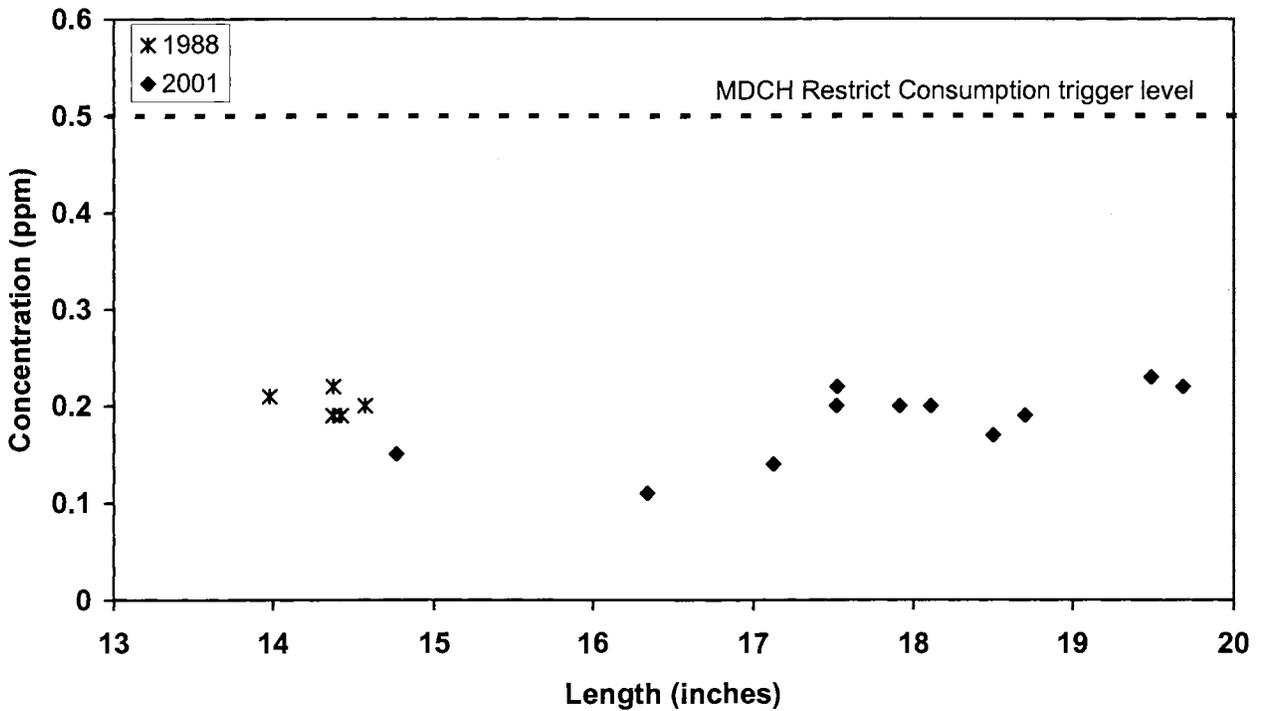


Figure 40. Total length versus mercury concentration in walleye collected from Goose Lake, Marquette County in 1988 (ID 88045) and 2001 (ID 2001011).



Figure 41. Total length versus total PCB concentration in yellow perch collected from Goose Lake, Marquette County in 1988 (ID 88045) and 2001 (ID 2001011).

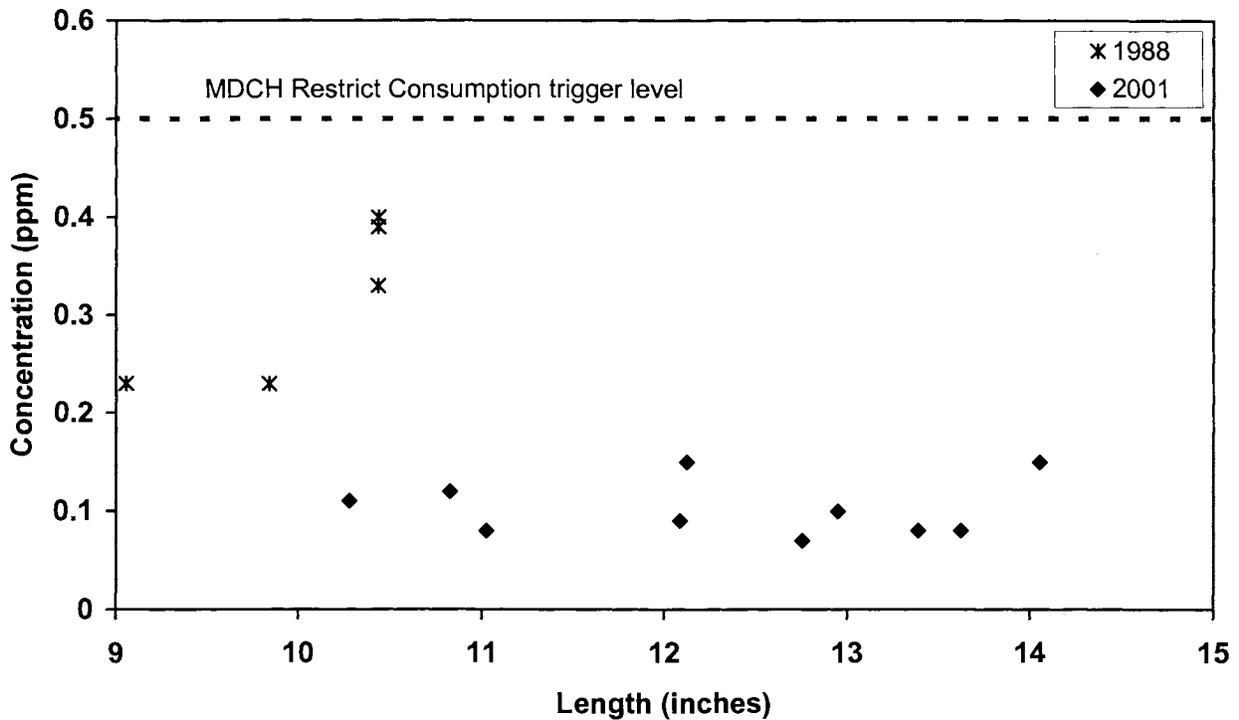


Figure 42. Total length versus mercury concentration in yellow perch collected from Goose Lake, Marquette County in 1988 (ID 88045) and 2001 (ID 2001011).

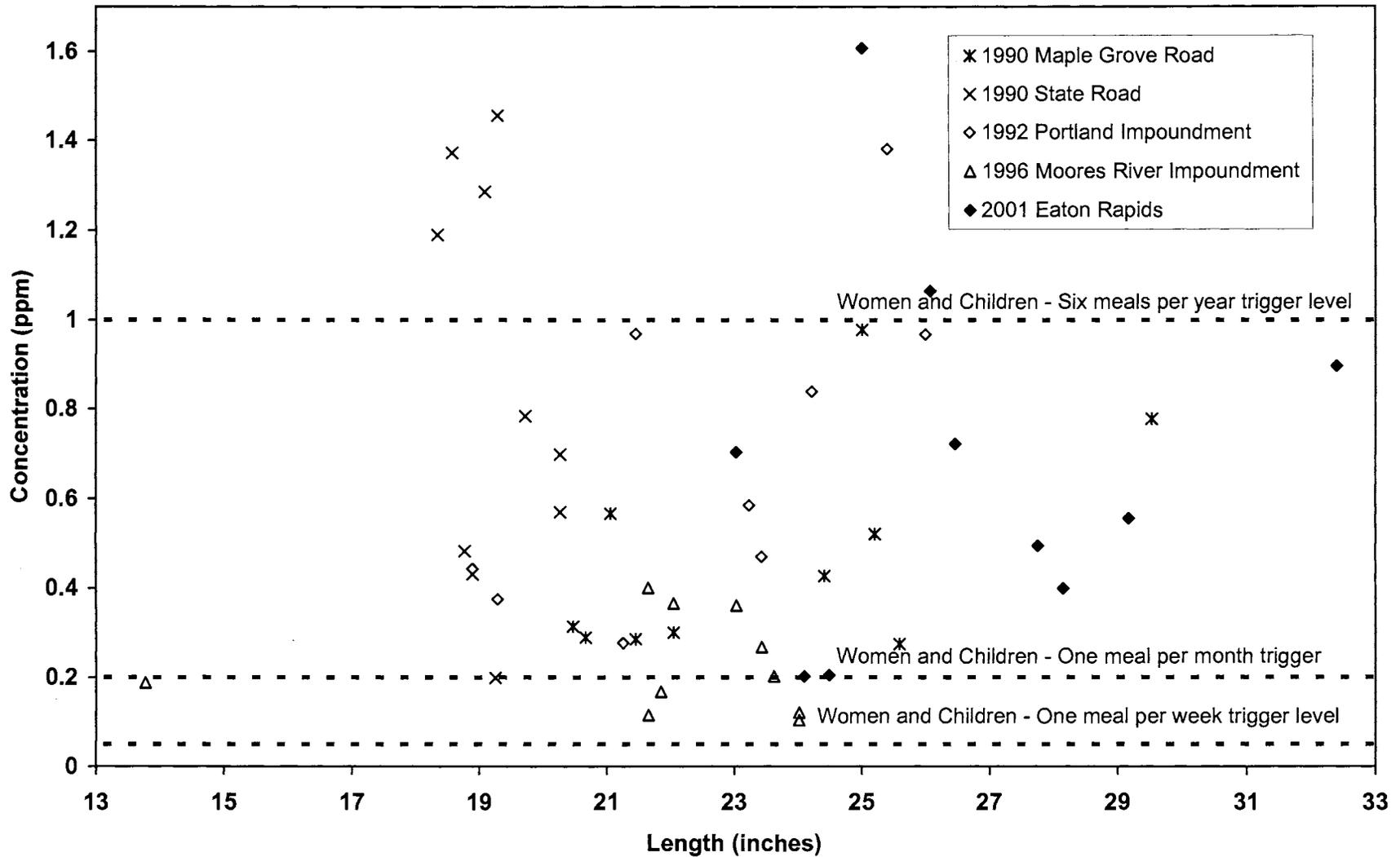


Figure 43. Total length versus total PCB concentration in carp collected from the Grand River in 1990 (ID 90021 and 90022), 1992 (ID 92051), 1996 (ID 96013), and 2001 (ID 2001021).



Figure 44. Total length versus total PCB concentration in largemouth bass collected from the Grand River in 1989 (ID 89054), 1990 (ID 90022), 1996 (ID 96013), and 2001 (ID 2001021).

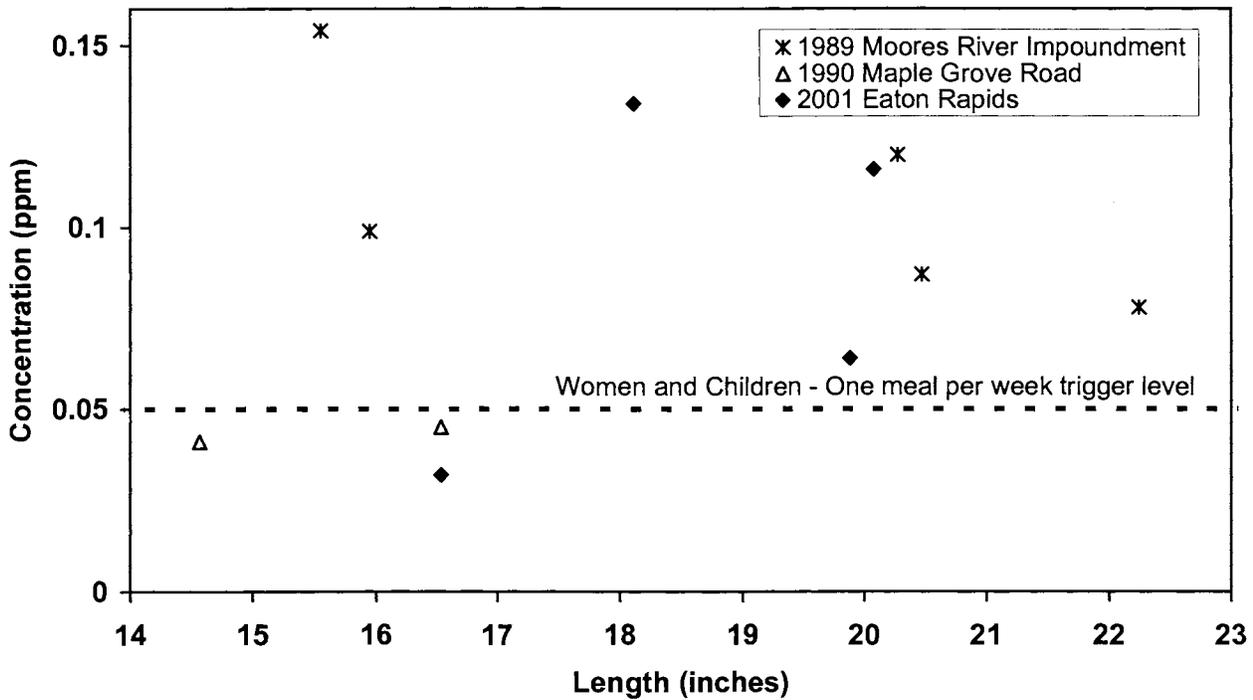


Figure 45. Total length versus total PCB concentration in walleye collected from the Grand River in 1989 (ID 89054), 1990 (ID 90021), and 2001 (ID 2001021).

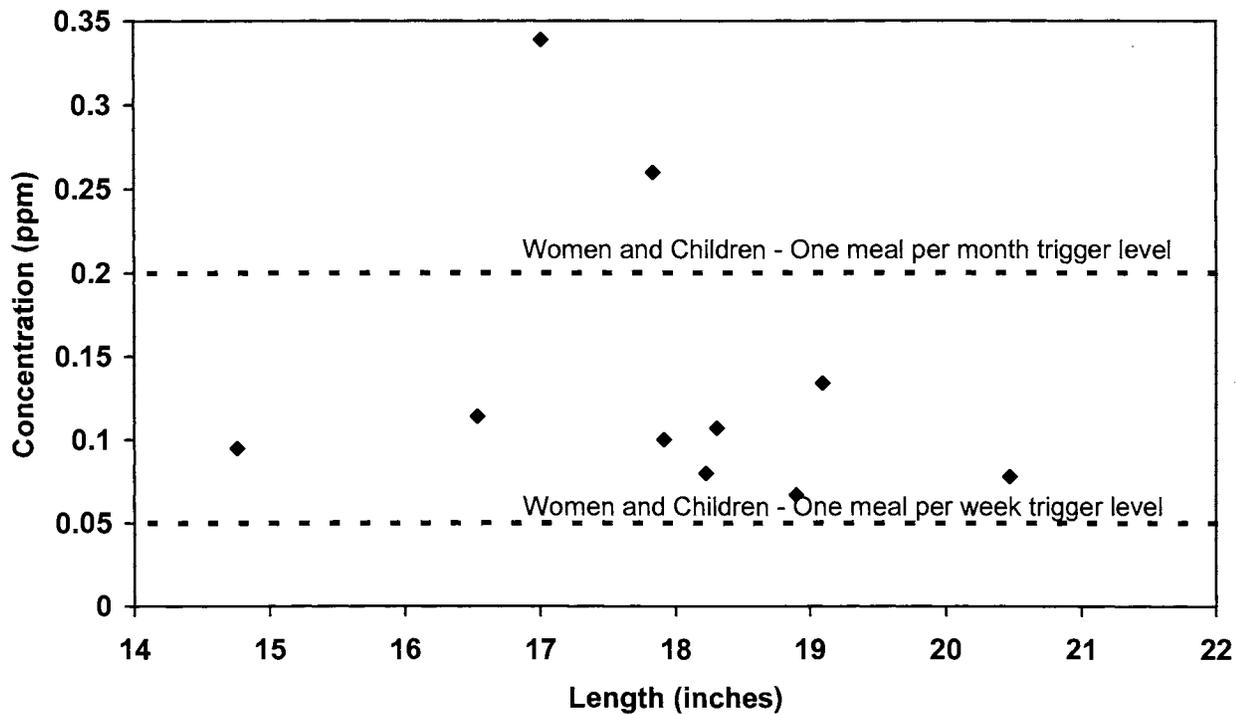


Figure 46. Total length versus total PCB concentration in white sucker collected from the Grand River in 2001 (ID 2001021).

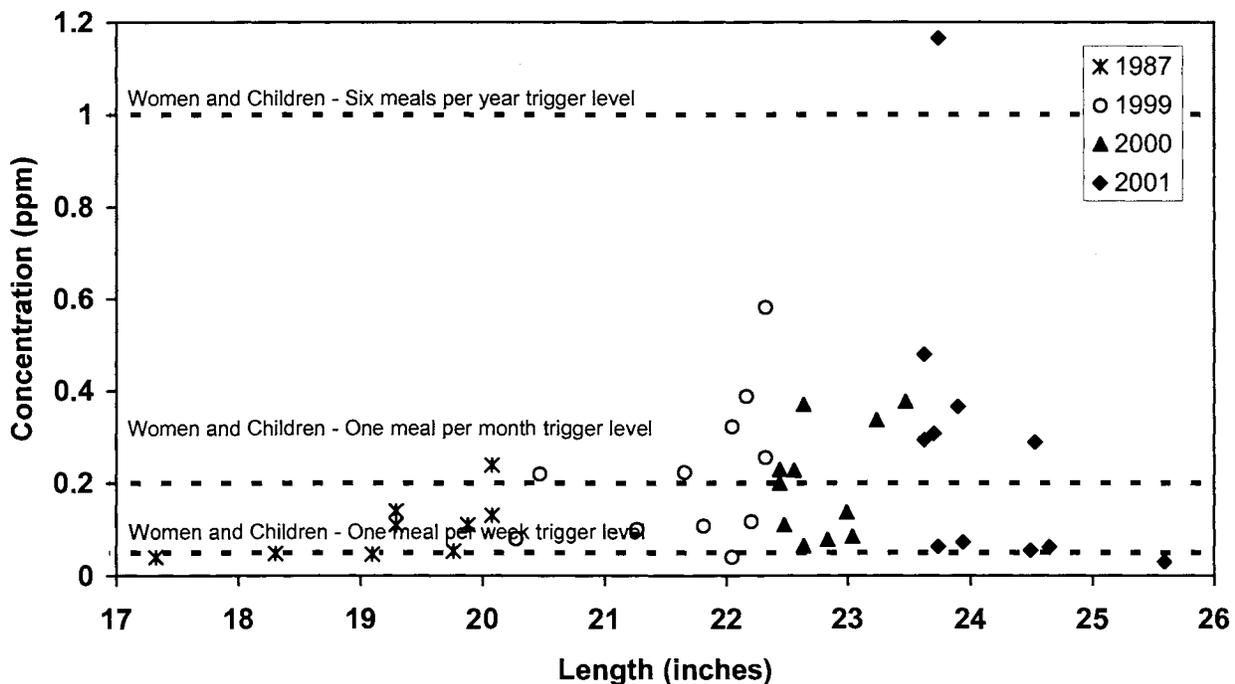


Figure 47. Total length versus total PCB concentration in carp collected from the Kalamazoo River at Ceresco Impoundment in 1987 (ID 87048), 1999 (ID 1999082), 2000 (ID 2000120), and 2001 (ID 2001042).

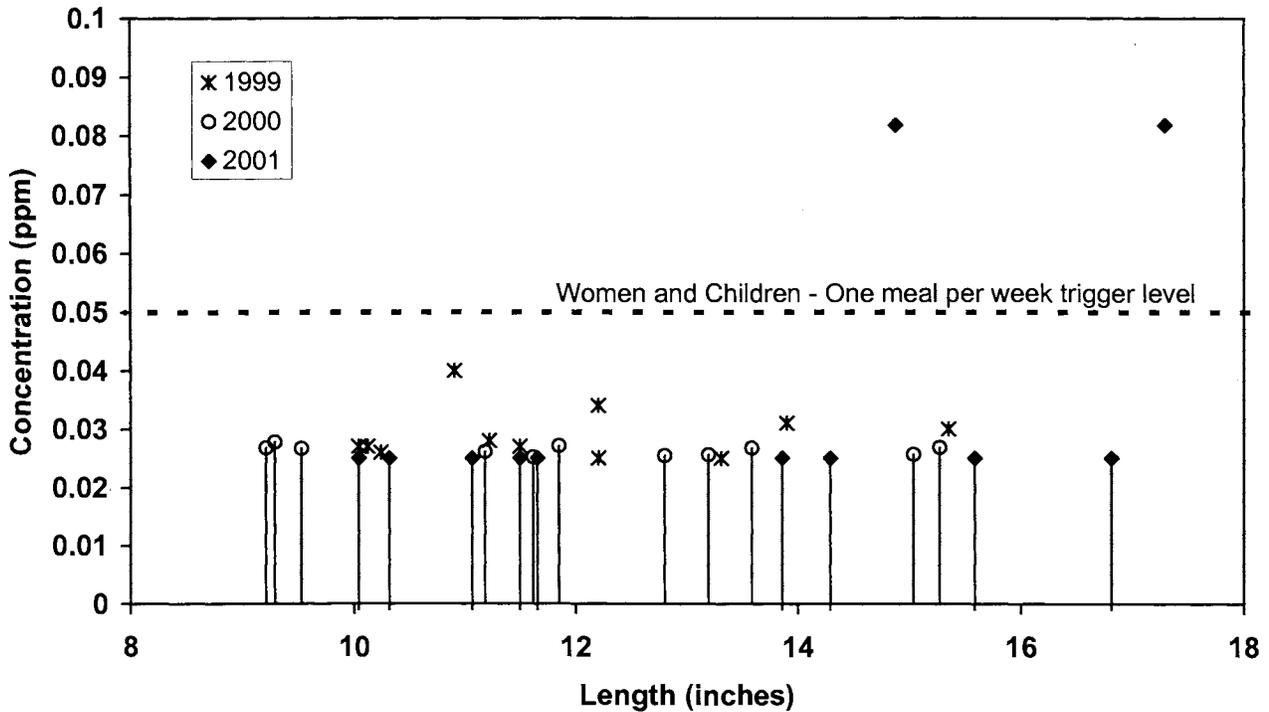


Figure 48. Total length versus total PCB concentration in smallmouth bass collected from the Kalamazoo River at Ceresco Impoundment in 1999 (ID 1999082), 2000 (ID 2000120), and 2001 (site 2001042).

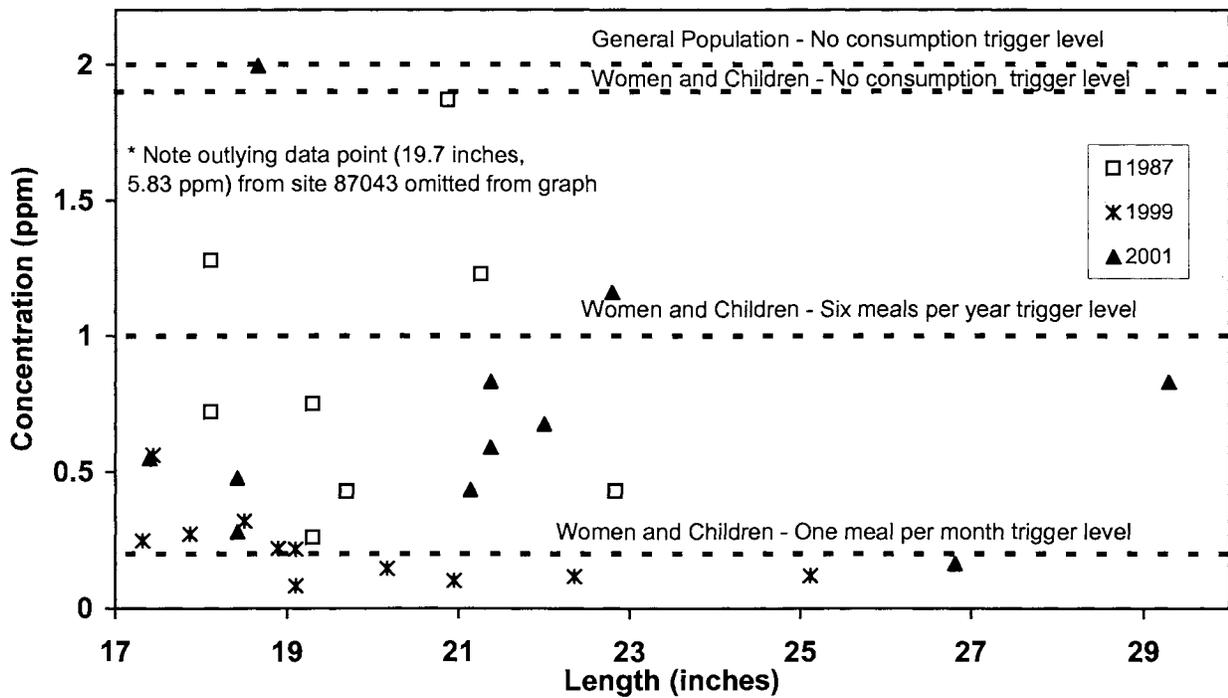


Figure 49. Total length versus total PCB concentration in carp collected from the Kalamazoo River at Morrow Pond in 1987 (ID 87043), 1999 (ID 1999082), and 2001 (ID 2001043).



Figure 50. Total length versus total PCB concentration in smallmouth bass collected from the Kalamazoo River at Morrow Pond in 1987 (ID 87043), 1999 (ID 1999082) and 2001 (ID 2001043).

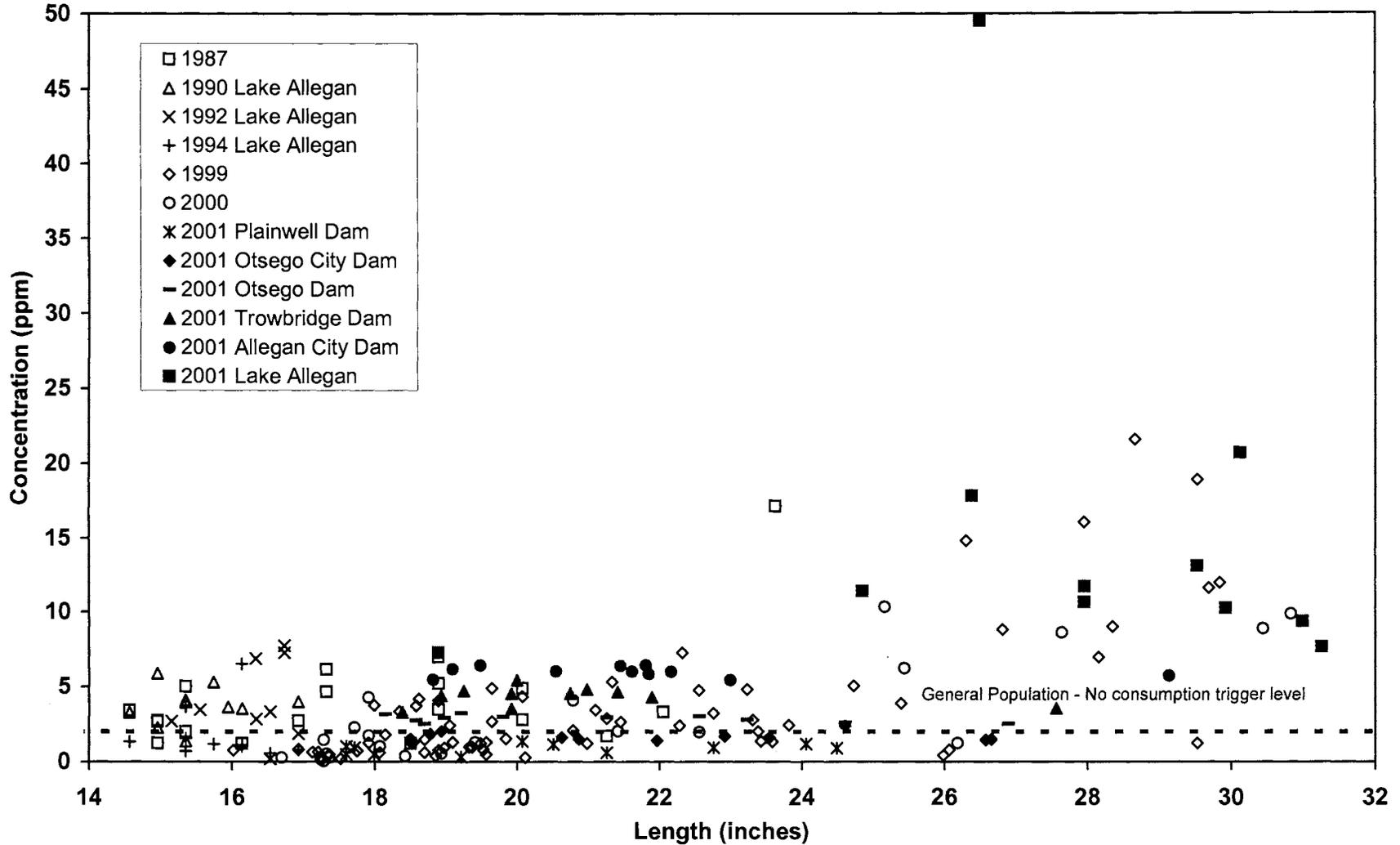


Figure 51. Total length versus total PCB concentration in carp collected from the Kalamazoo River between Morrow Dam and Allegan Dam in 1987 (ID 87044 and 87045), 1990 (ID 90050), 1992 (ID 92019), 1994 (ID 94025), 1999 (ID 1999084, 1999085, 1999086, 1999087, 1999092, and 1999093), 2000 (ID 200122, 2000123, and 200124), and 2001 (ID 2001048, 2001049, 2001050, 2001051, 2001052, and 2001053).

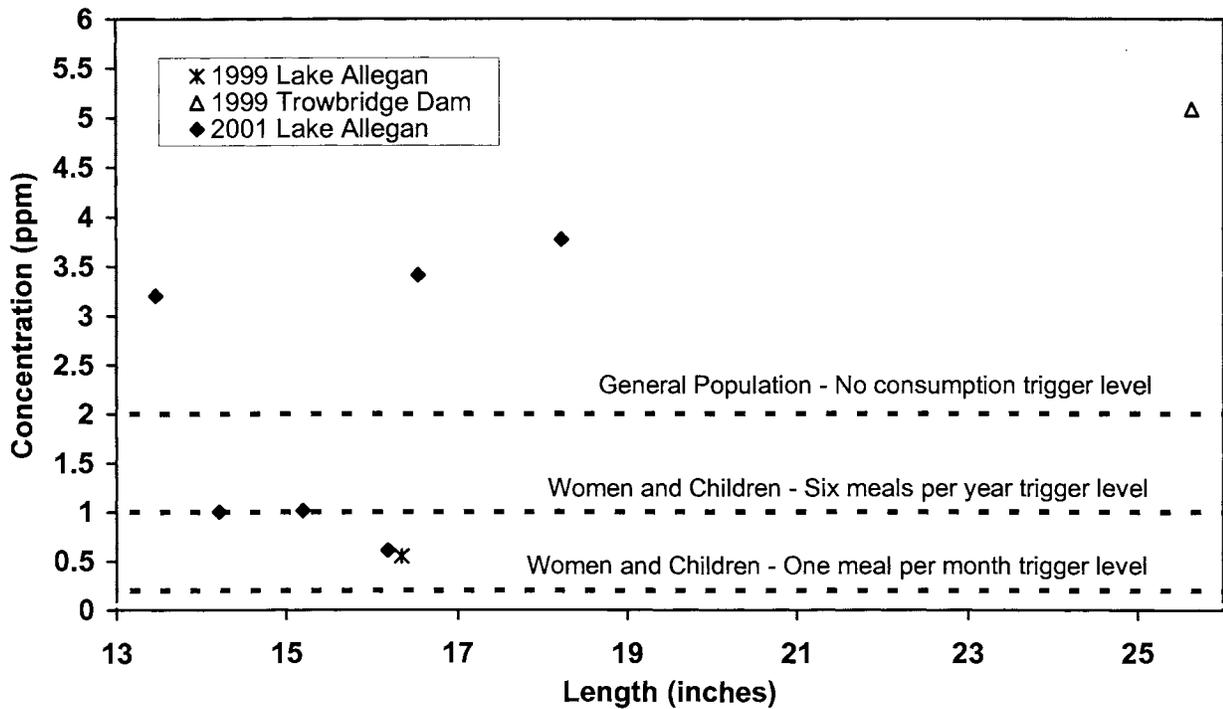


Figure 52. Total length versus total PCB concentration in channel catfish collected from the Kalamazoo River between Morrow Dam and Allegan Dam in 1999 (ID 1999087 and 1999093) and 2001 (ID 2001053).

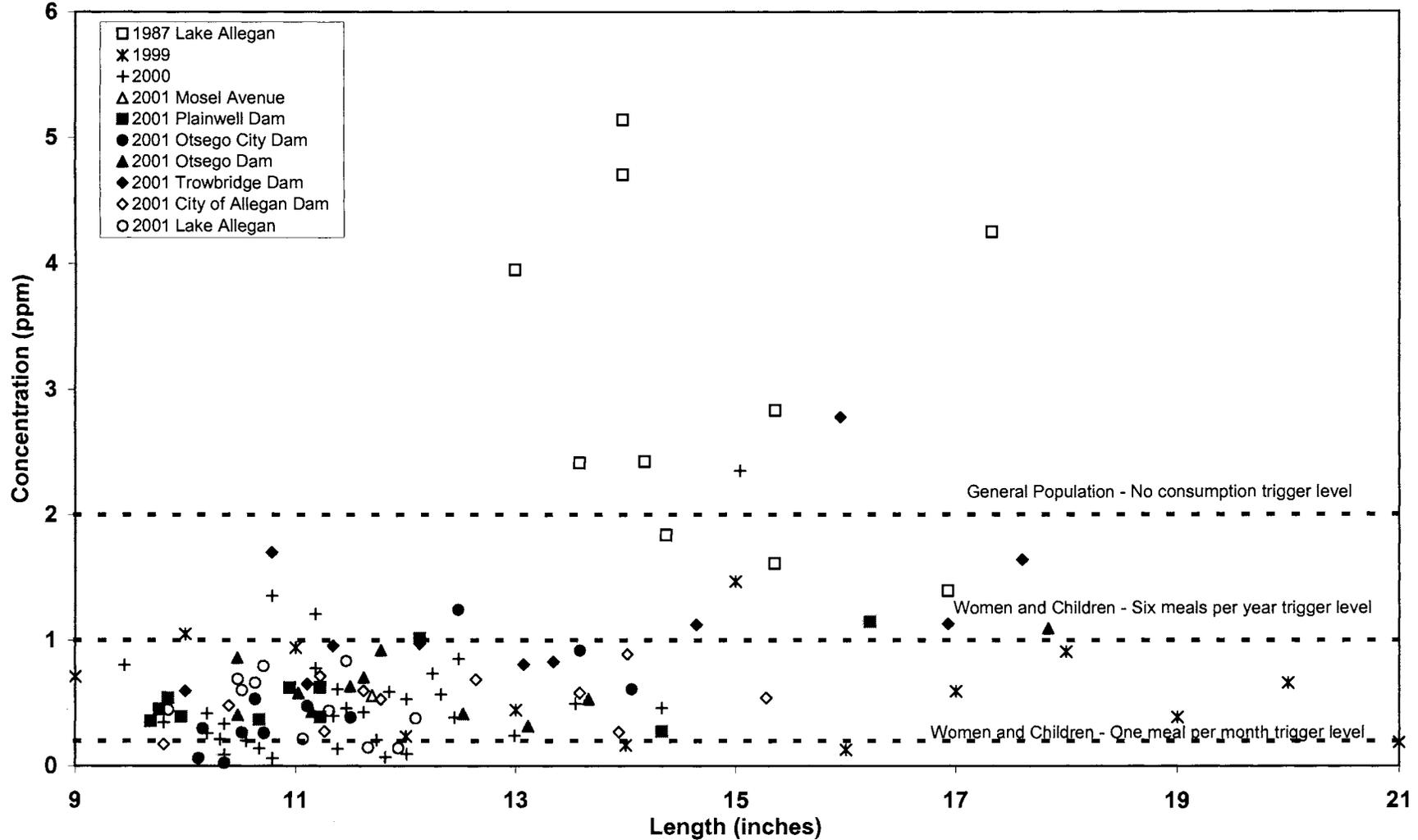


Figure 53. Total length versus total PCB concentration in smallmouth bass collected from the Kalamazoo River between Morrow Dam and Allegan Dam in 1987 (ID 87045), 1999 (ID 1999084, 1999085, 1999086, 1999087, 1999092, and 1999093), 2000 (ID 2000122, 2000123, and 2000124), and 2001 (ID 2001046, 2001048, 2001049, 2001050, 2001051, 2001052, and 2001053).

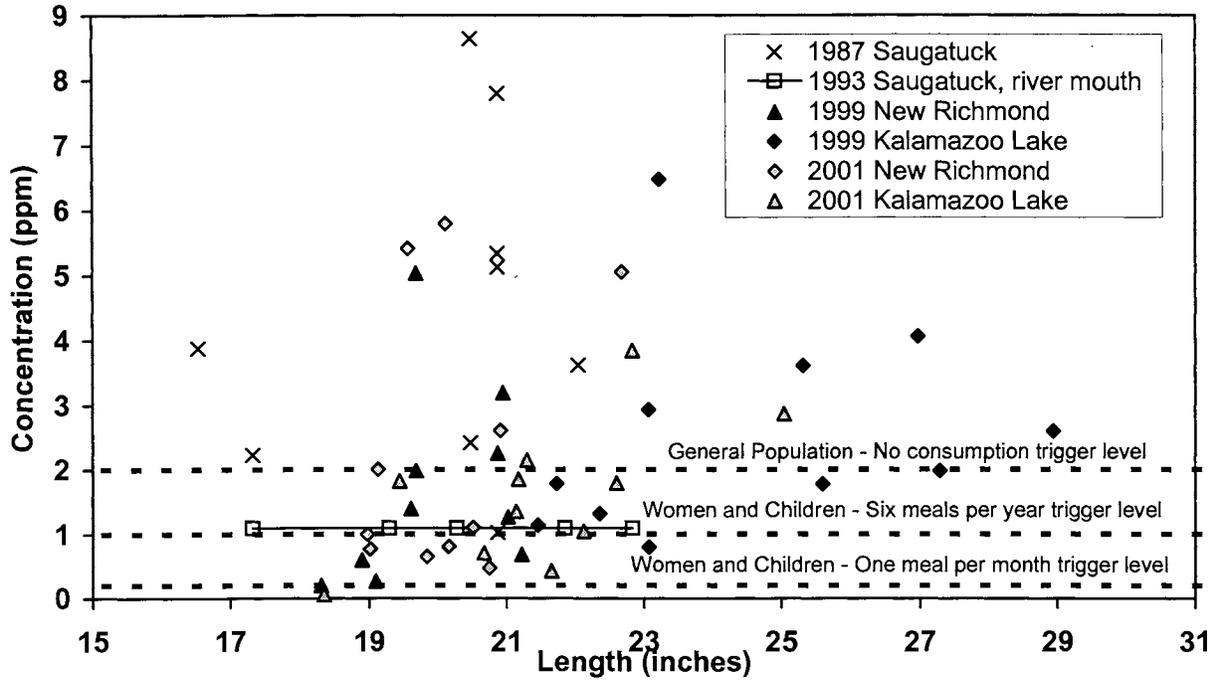


Figure 54. Total length versus total PCB concentration in carp collected from the Kalamazoo River downstream of Allegan Dam in 1987 (ID 87046), 1993 (ID 93035), 1999 (ID 1999094 and 1999095), and 2001 (ID 2001054 and 2001055).

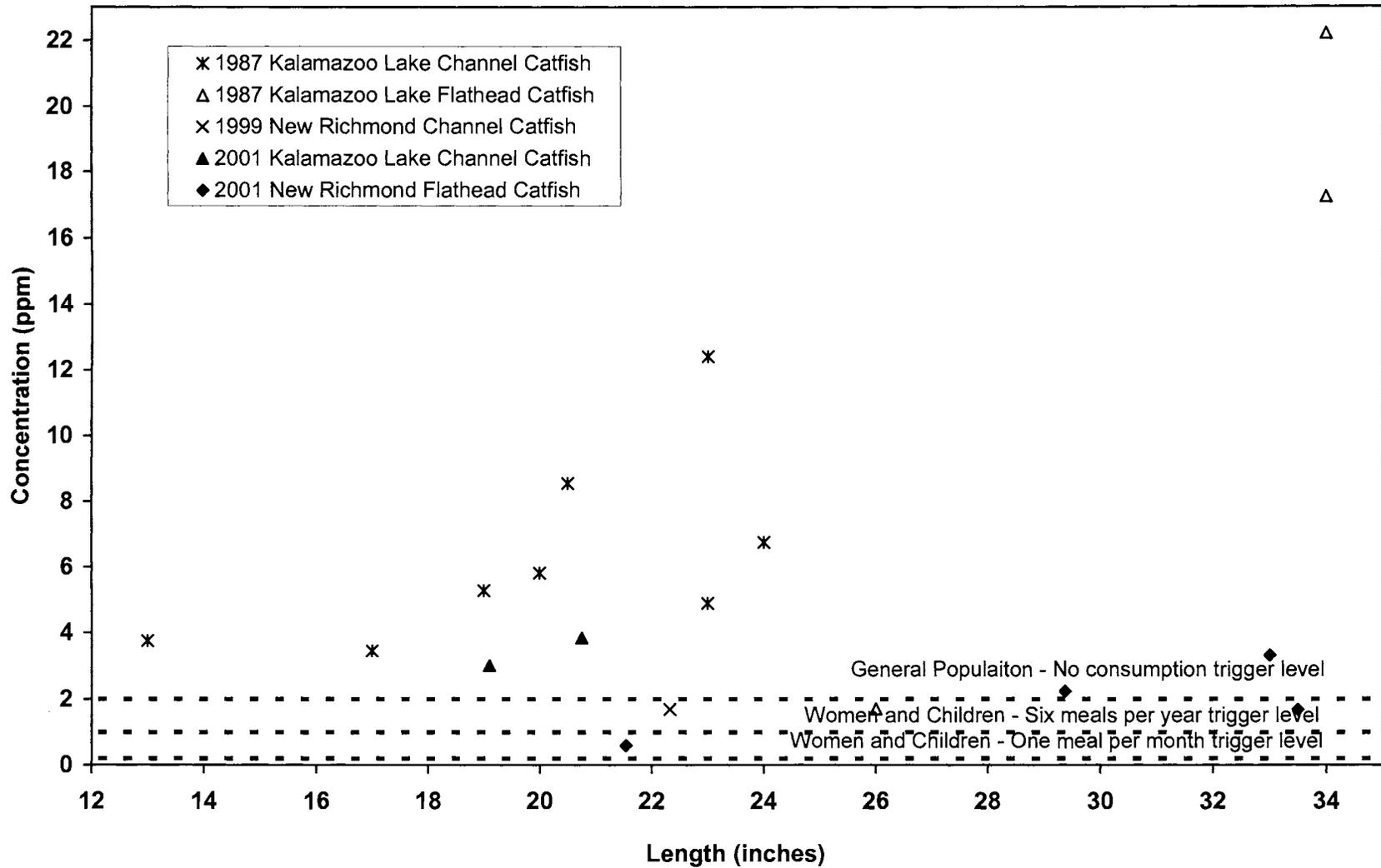


Figure 55. Total length versus total PCB concentration in channel catfish and flathead catfish collected from the Kalamazoo River downstream of Allegan Dam in 1987 (ID 87010), 1999 (ID 1999094), and 2001 (ID 2001054 and 2001055).

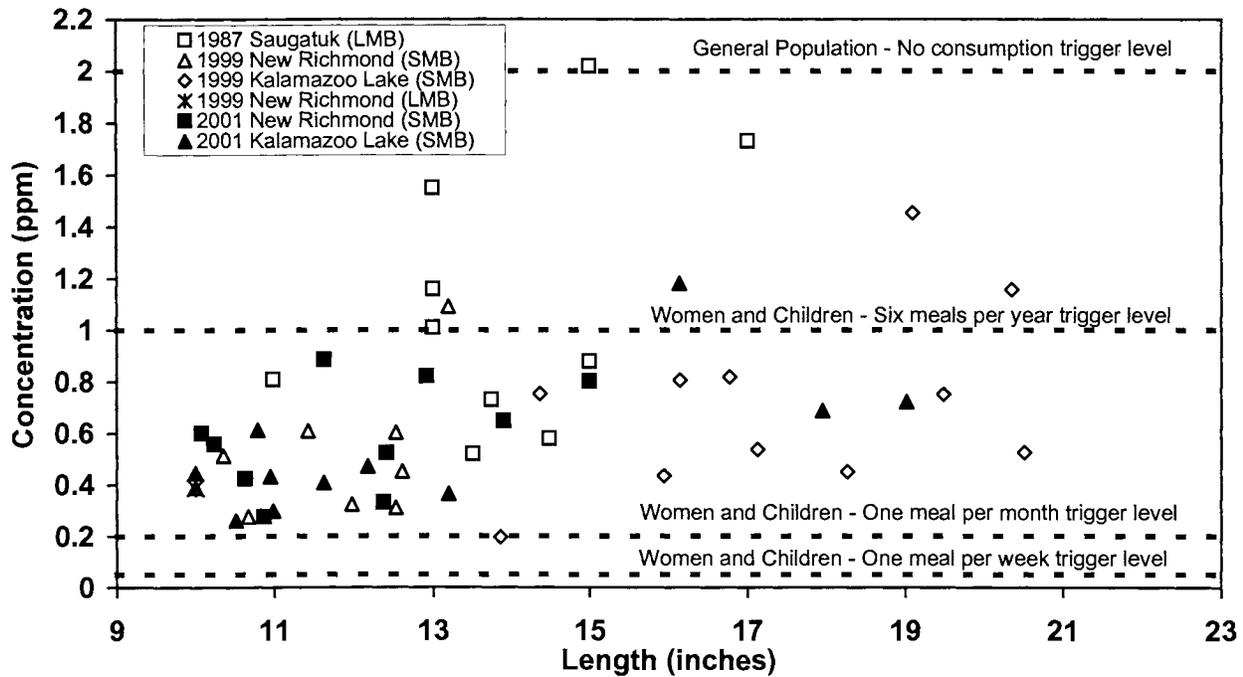


Figure 56. Total length versus total PCB concentration in smallmouth and largemouth bass collected from the Kalamazoo River downstream of Allegan Dam in 1987 (ID 87010), 1999 (ID 1999094 and 1999095), and 2001 (ID 2001054 and 2001055).

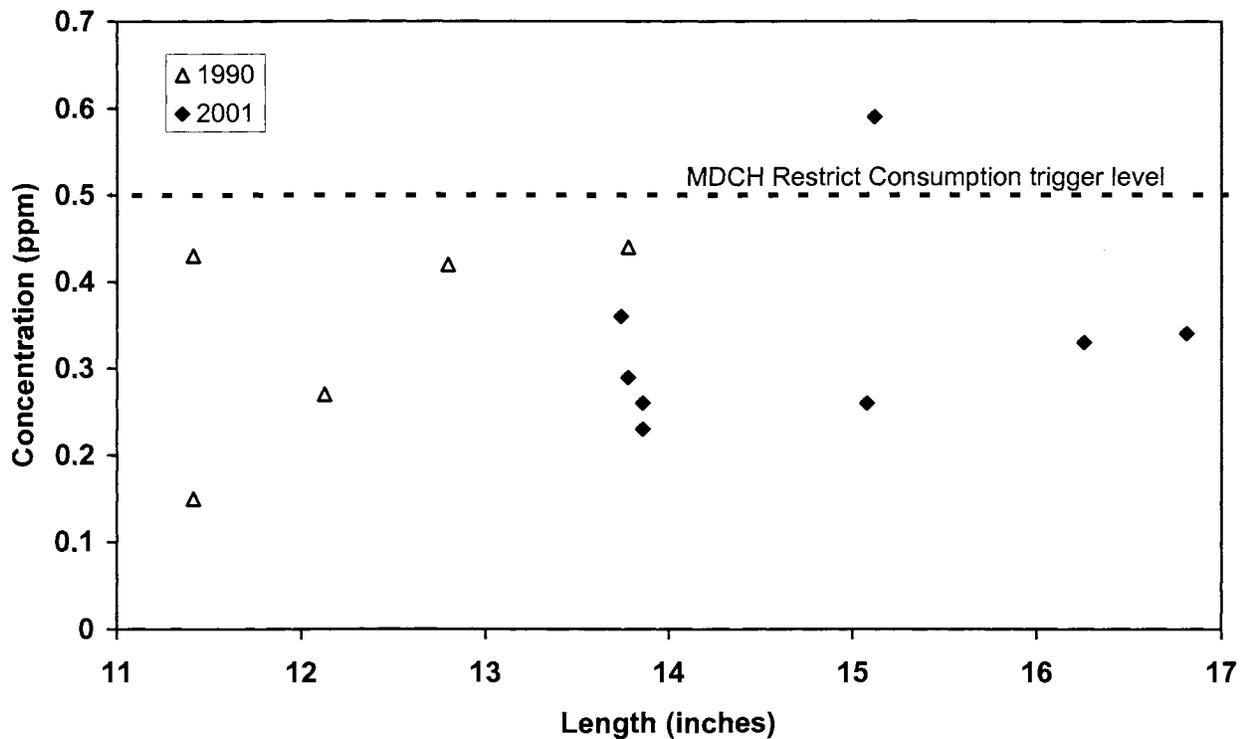


Figure 57. Total length versus mercury concentration in largemouth bass collected from Klinger Lake, St. Joseph County in 1990 (ID 90034) and 2001 (ID 2001145).

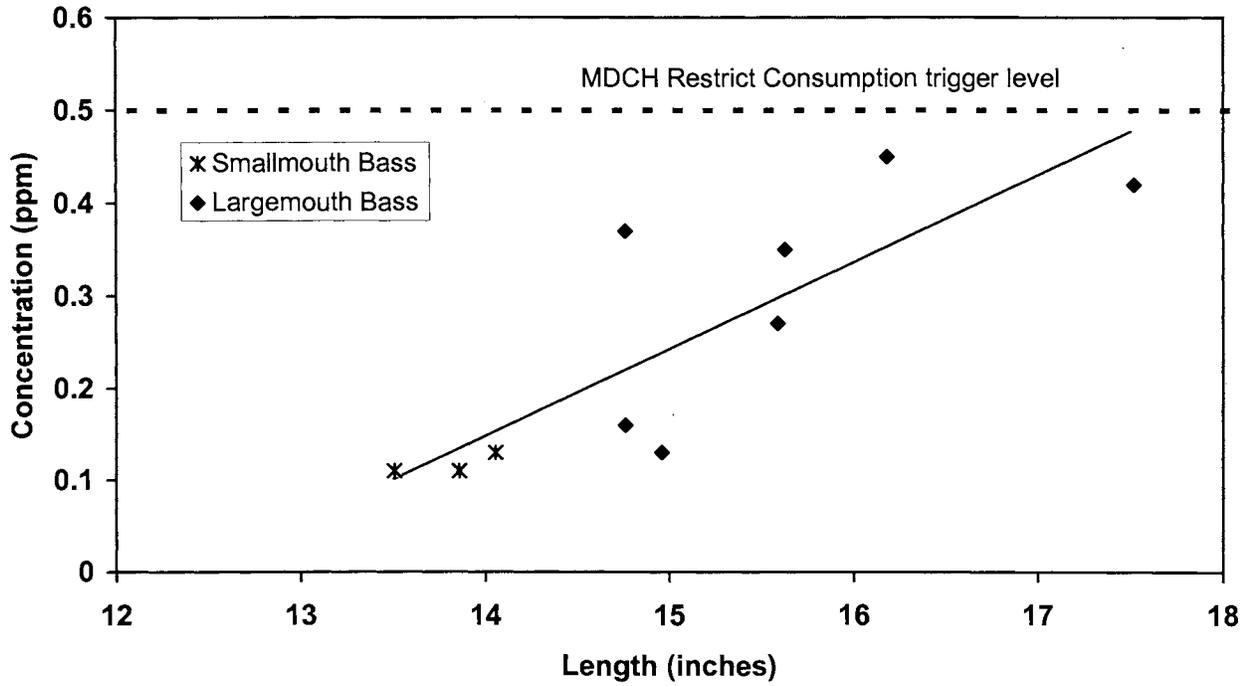


Figure 58. Total length versus mercury concentration in smallmouth and largemouth bass collected from Lake Paradise, Emmet County in 2001 (ID 2001073).

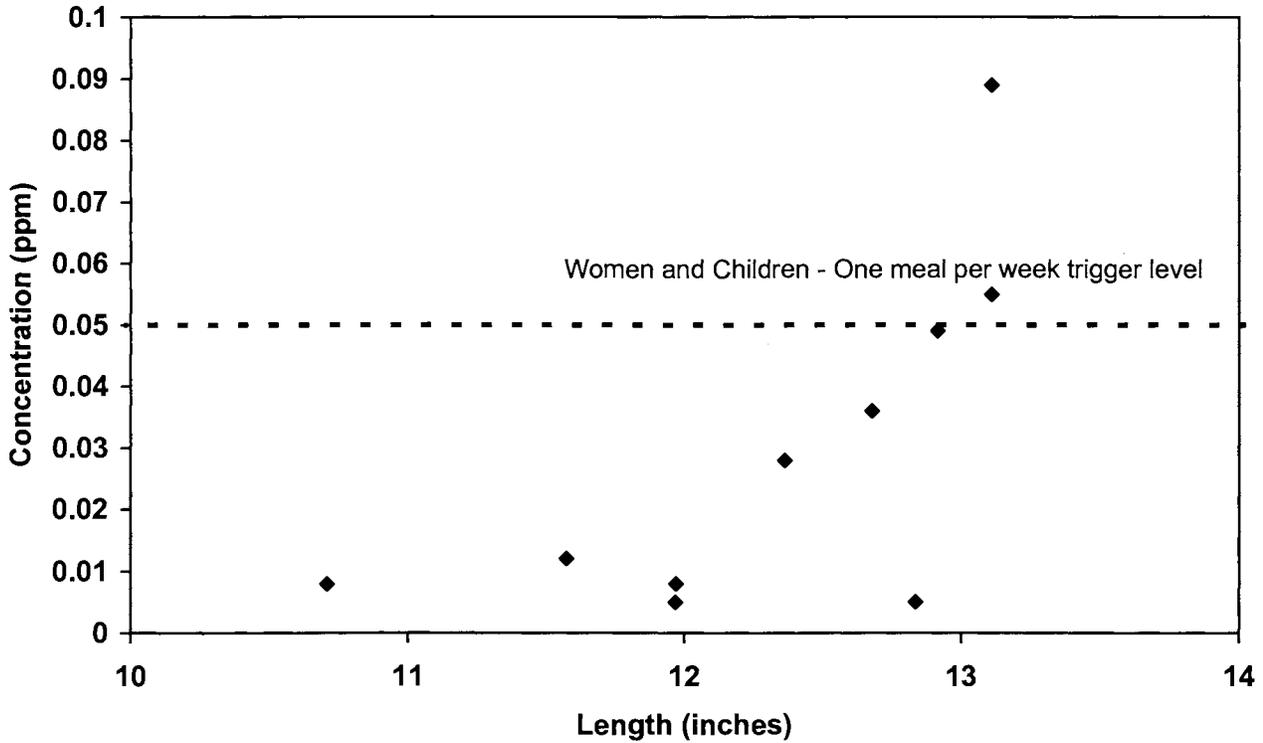


Figure 59. Total length versus total PCB concentration in brown bullhead collected from Long Lake, St. Joseph County in 2001 (ID 2001142).



Figure 60. Total length versus total PCB concentration in largemouth bass collected from Long Lake, St. Joseph County in 2001 (ID 2001142).

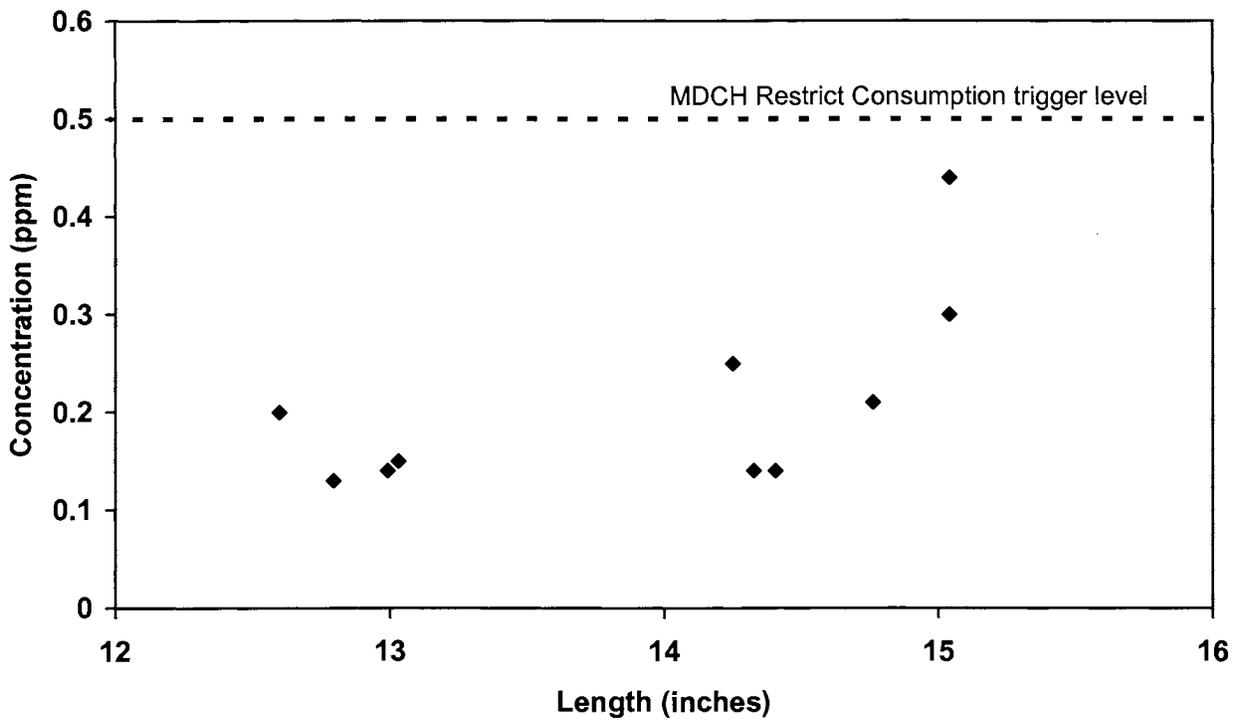


Figure 61. Total length versus mercury concentration in largemouth bass collected from Long Lake, St. Joseph County in 2001 (ID 2001142).

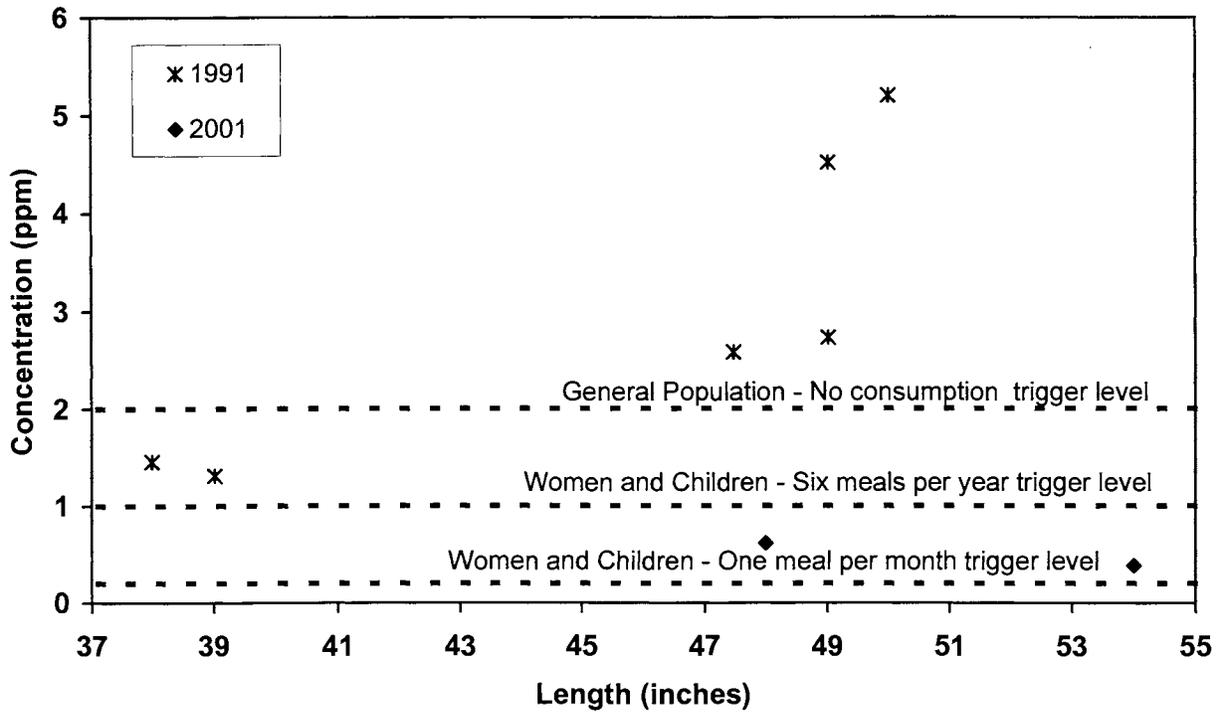


Figure 62. Total length versus total PCB concentration in lake sturgeon collected from the Menominee River mouth in 1991 (91040) and 2001(ID 2001146).

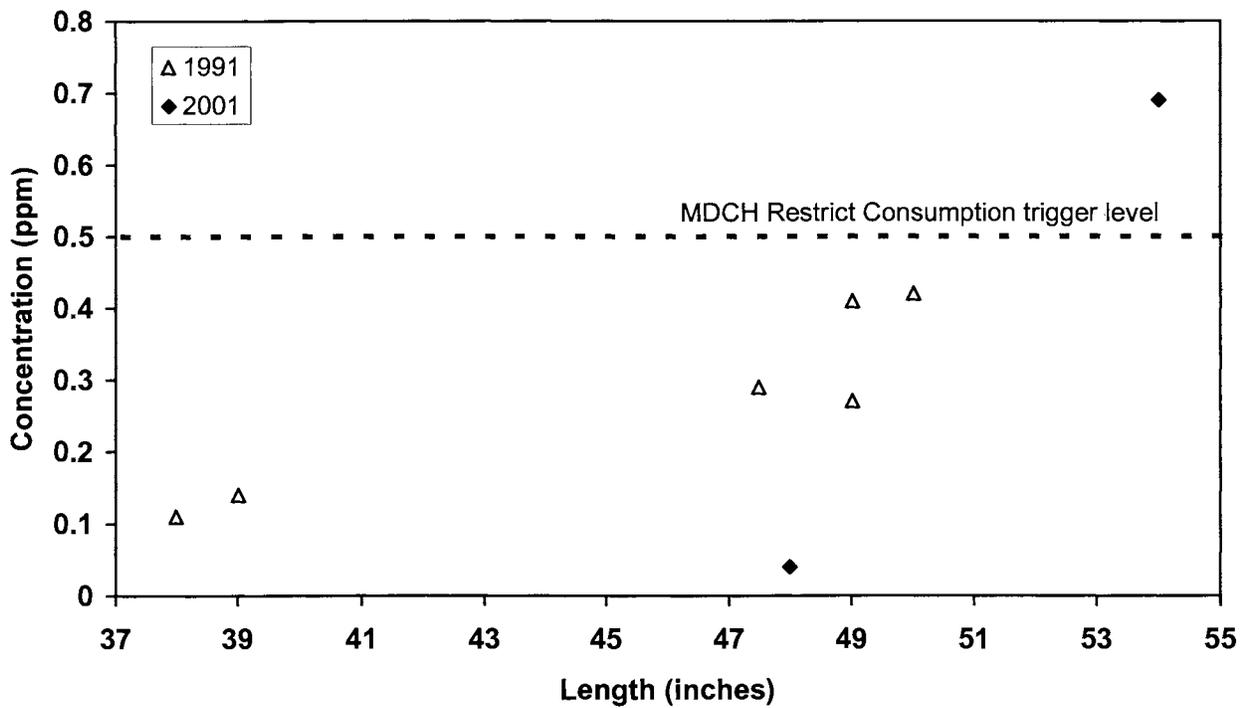


Figure 63. Total length versus mercury concentration in lake sturgeon collected from the Menominee River mouth in 1991 (91040) and 2001 (ID 2001146).

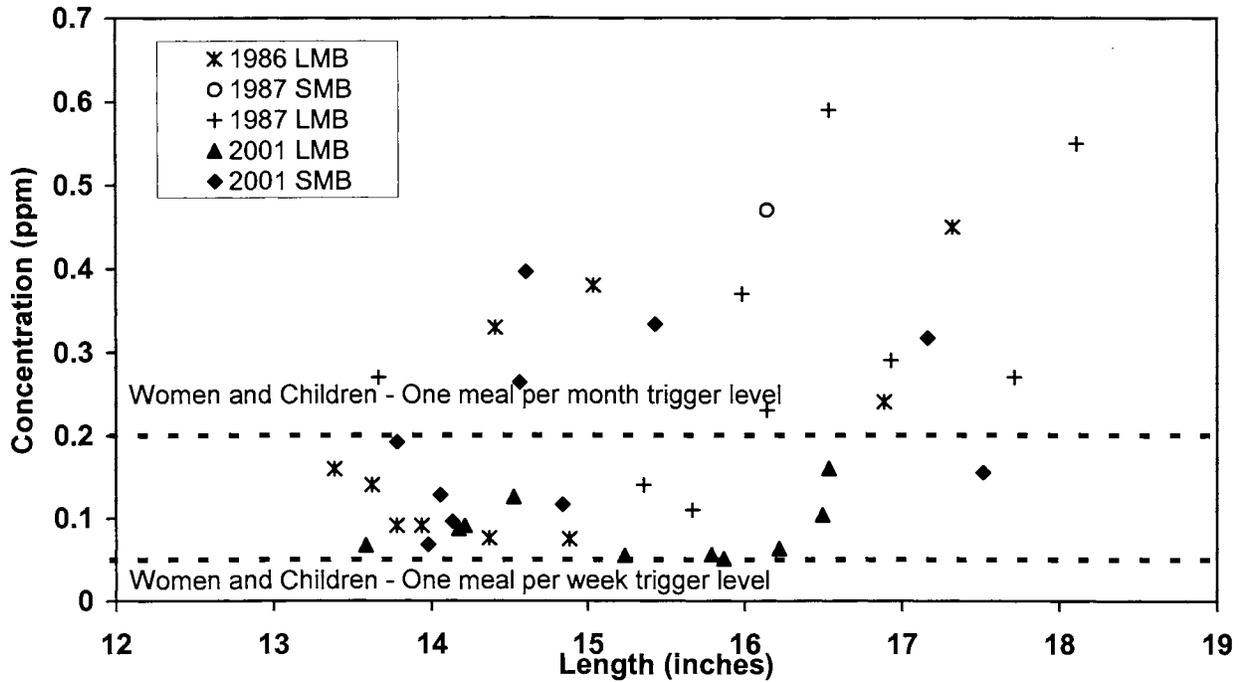


Figure 64. Total length versus total PCB concentration in largemouth and smallmouth bass collected from Muskegon Lake, Muskegon County in 1986 (ID 86061), 1987 (ID 87054), and 2001 (ID 2001082).

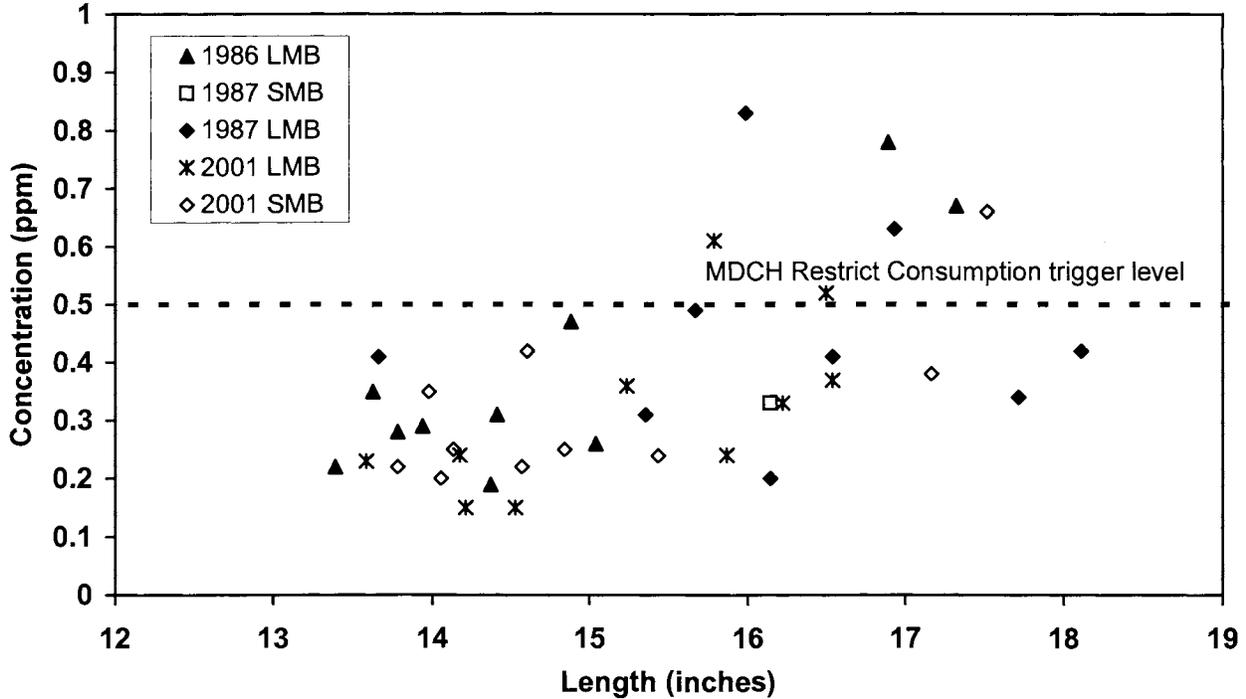


Figure 65. Total length versus mercury concentration in largemouth and smallmouth bass collected from Muskegon Lake, Muskegon County in 1986 (ID 86061), 1987 (ID 87054), and 2001 (ID 2001082).

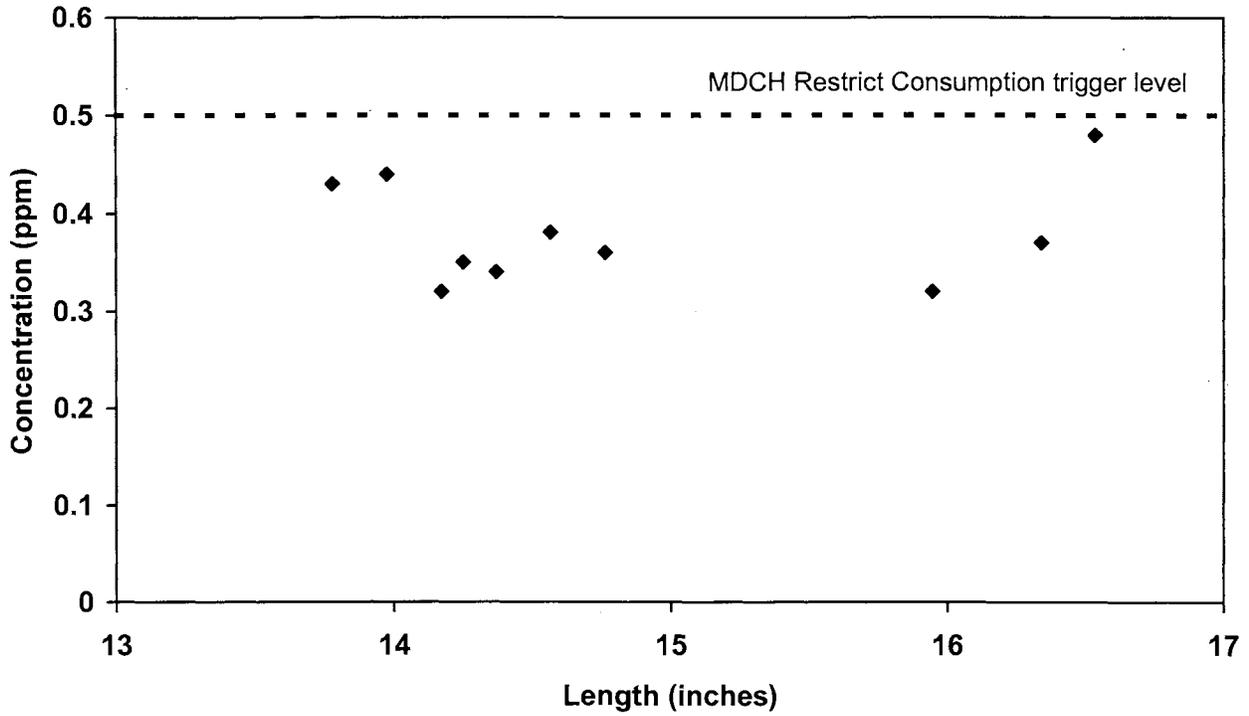


Figure 66. Total length versus mercury concentration in largemouth bass collected from Palmer Lake, St. Joseph County in 2001 (ID 2001141).

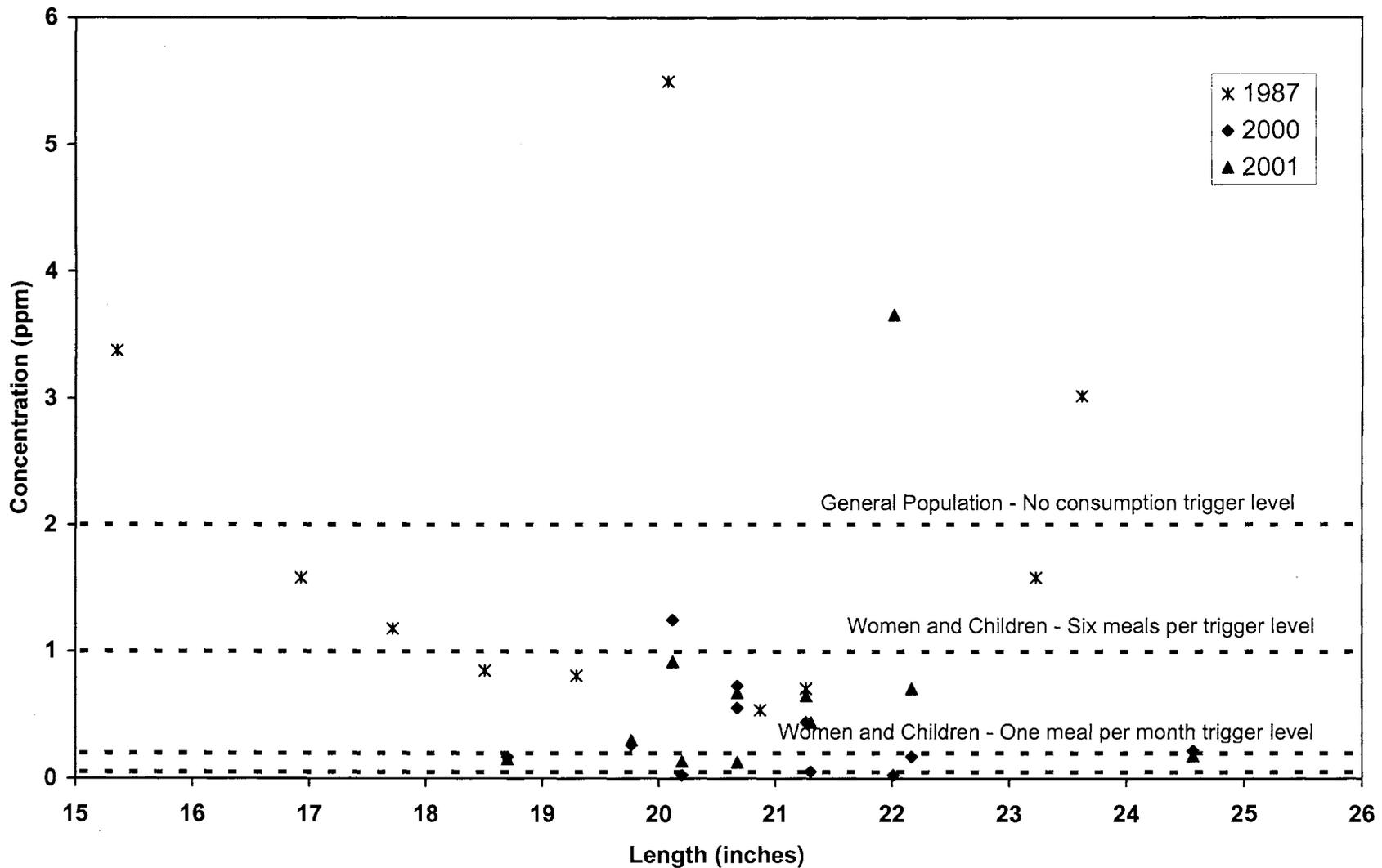


Figure 67. Total length versus total PCB concentration in carp collected from Portage Creek at Bryant Mill Pond in 1987 (ID 87047), 2000 (ID 2000121), and 2001 (ID 2001044).

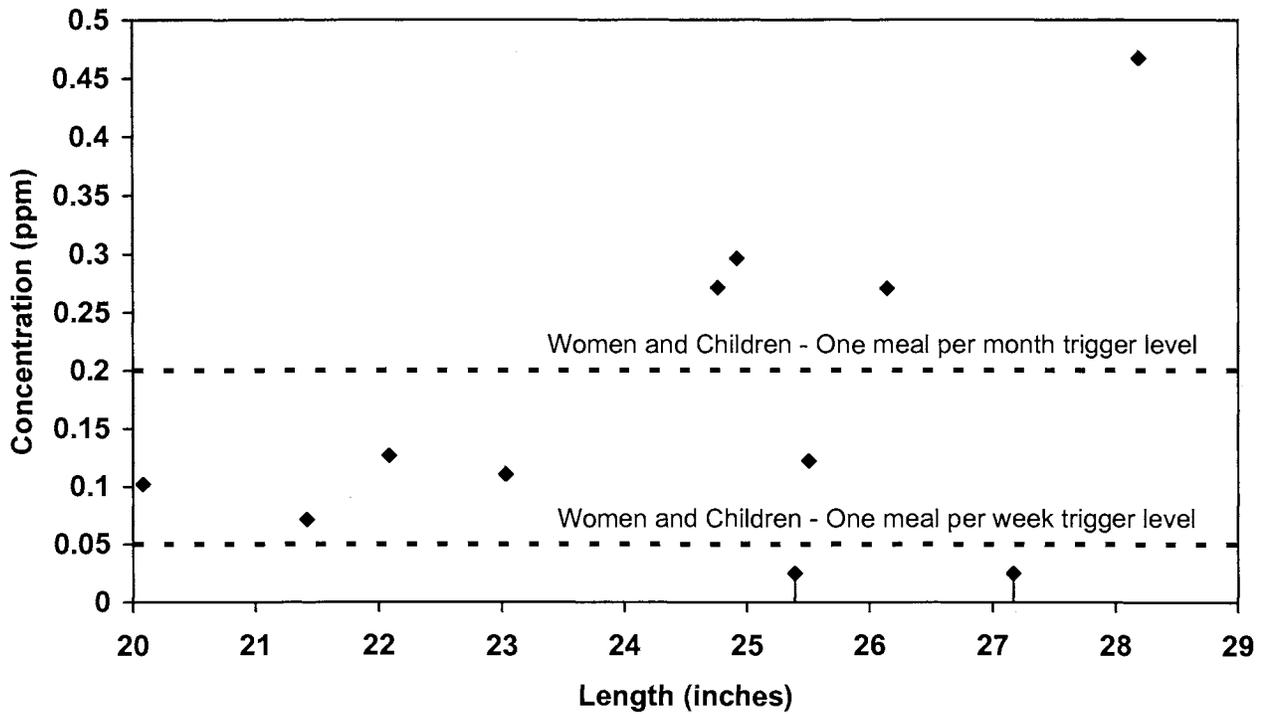


Figure 68. Total length versus total PCB concentration in carp collected from Portage Creek at Monarch Mill Pond in 2001 (ID 2001045)

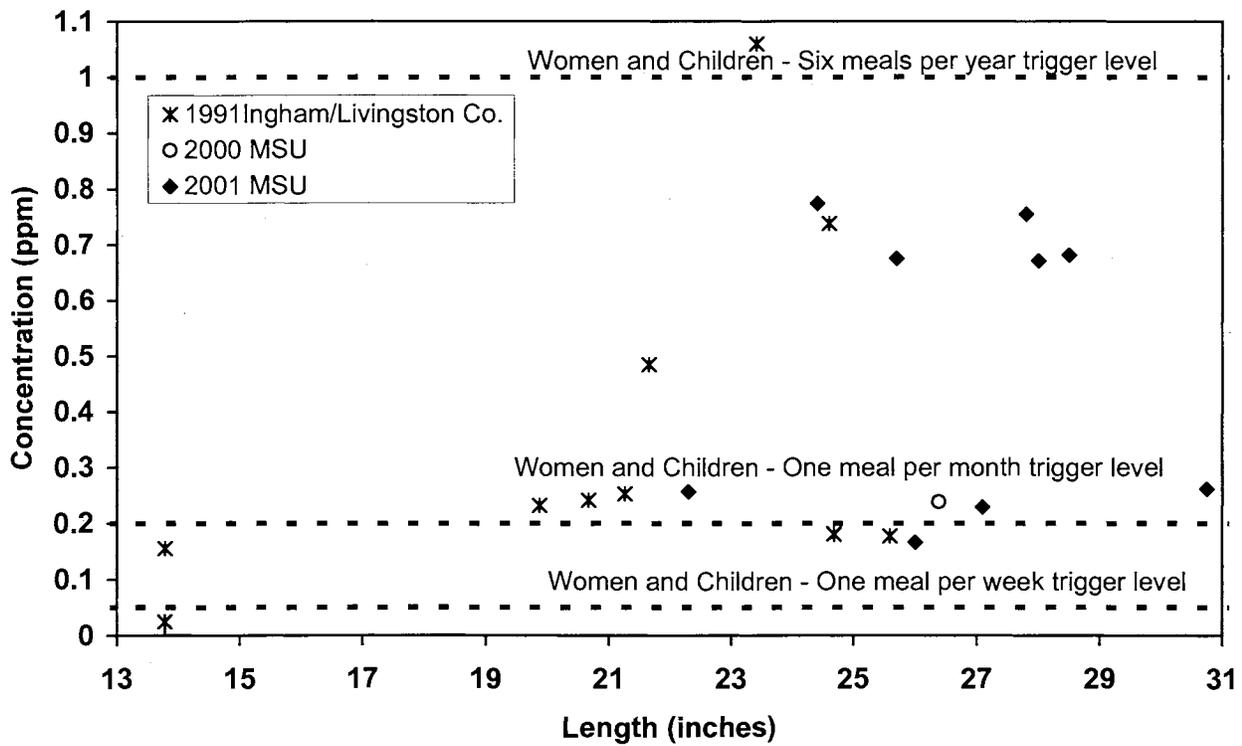


Figure 69. Total length versus total PCB concentration in carp collected from the Red Cedar River in 1991 (ID 91019), 2000 (ID 2000075) and 2001 (ID 2001096).

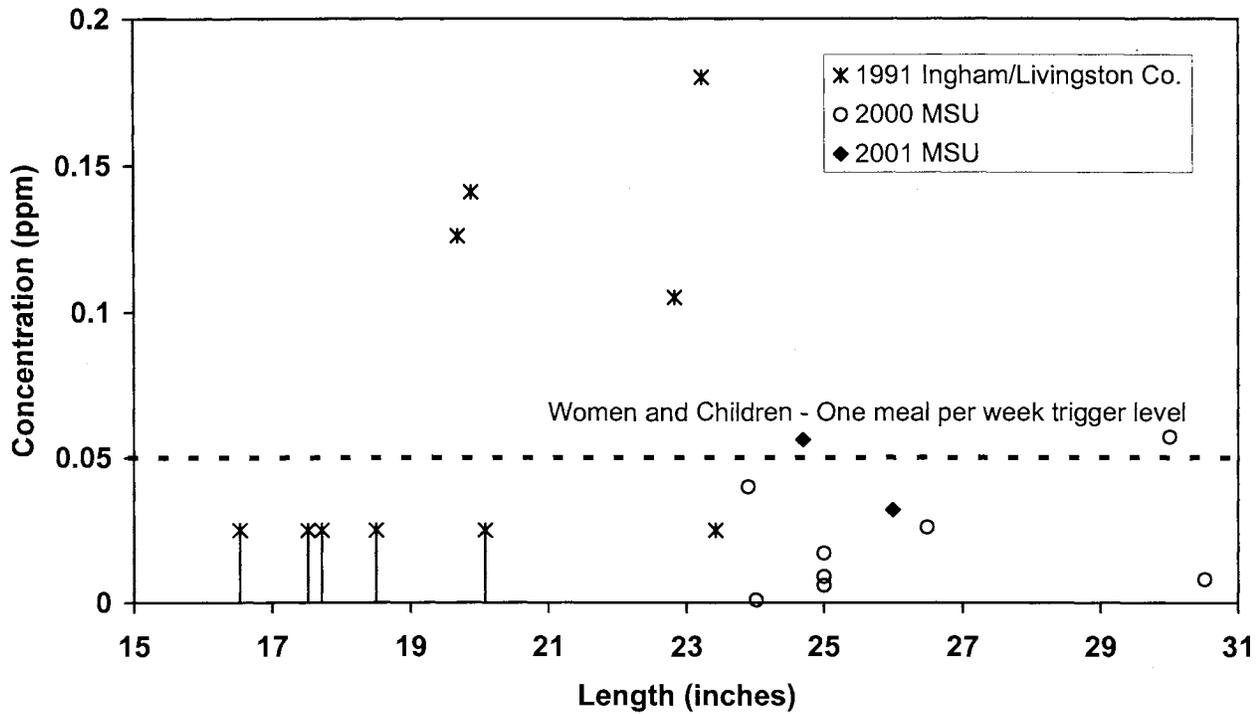


Figure 70. Total length versus total PCB concentration in northern pike collected from the Red Cedar River in 1991 (ID 91019), 2000 (ID 2000075) and 2001 (ID 2001096).

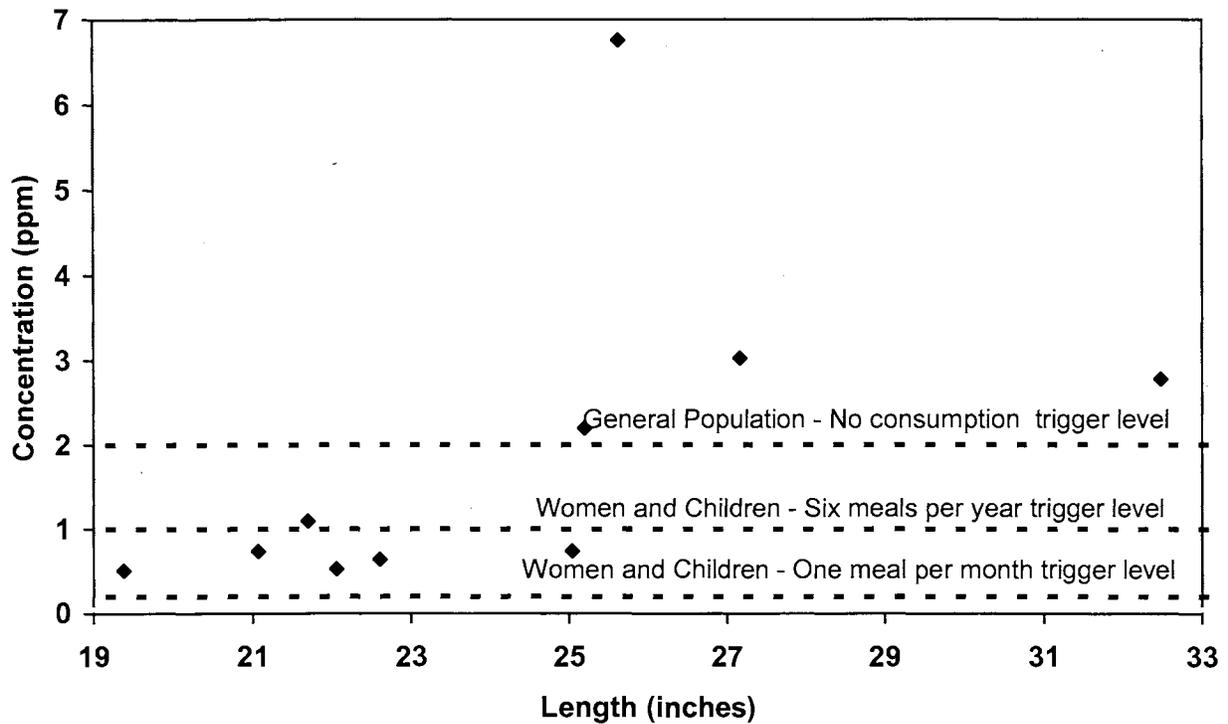


Figure 71. Total length versus total PCB concentration in carp collected from Ruddiman Creek lagoon in 2001 (ID 2001131).

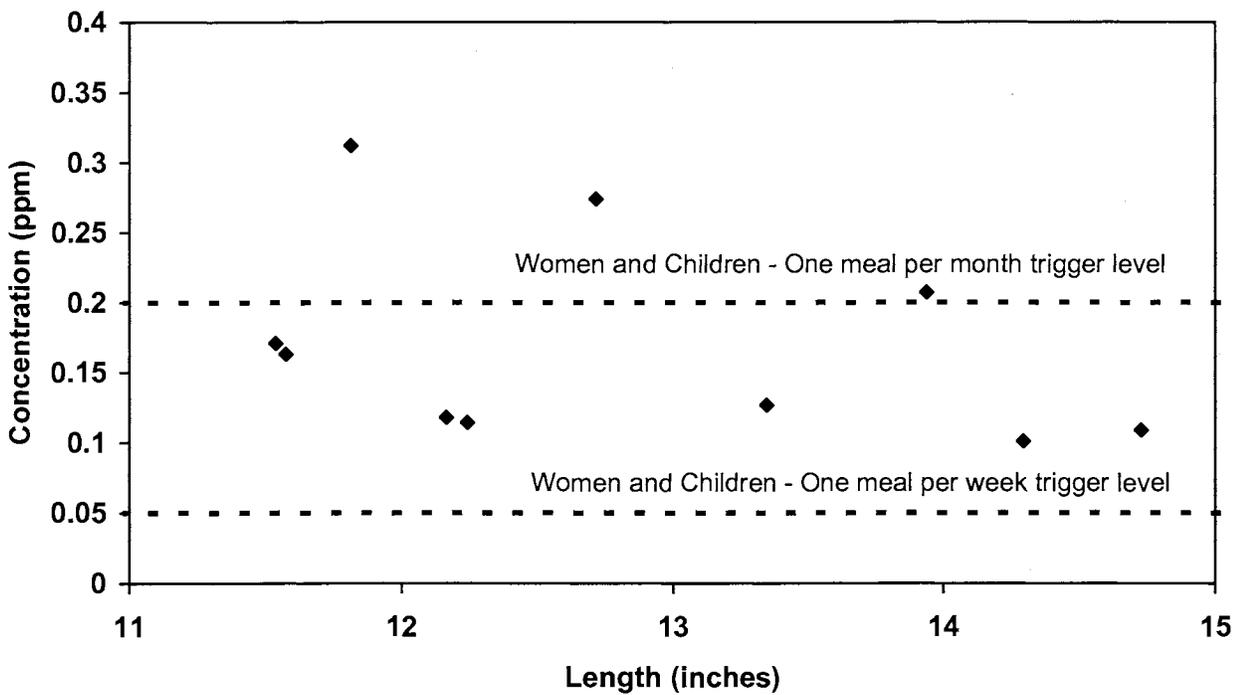


Figure 72. Total length versus total PCB concentration in largemouth bass collected from Ruddiman Creek lagoon in 2001 (ID 2001131).

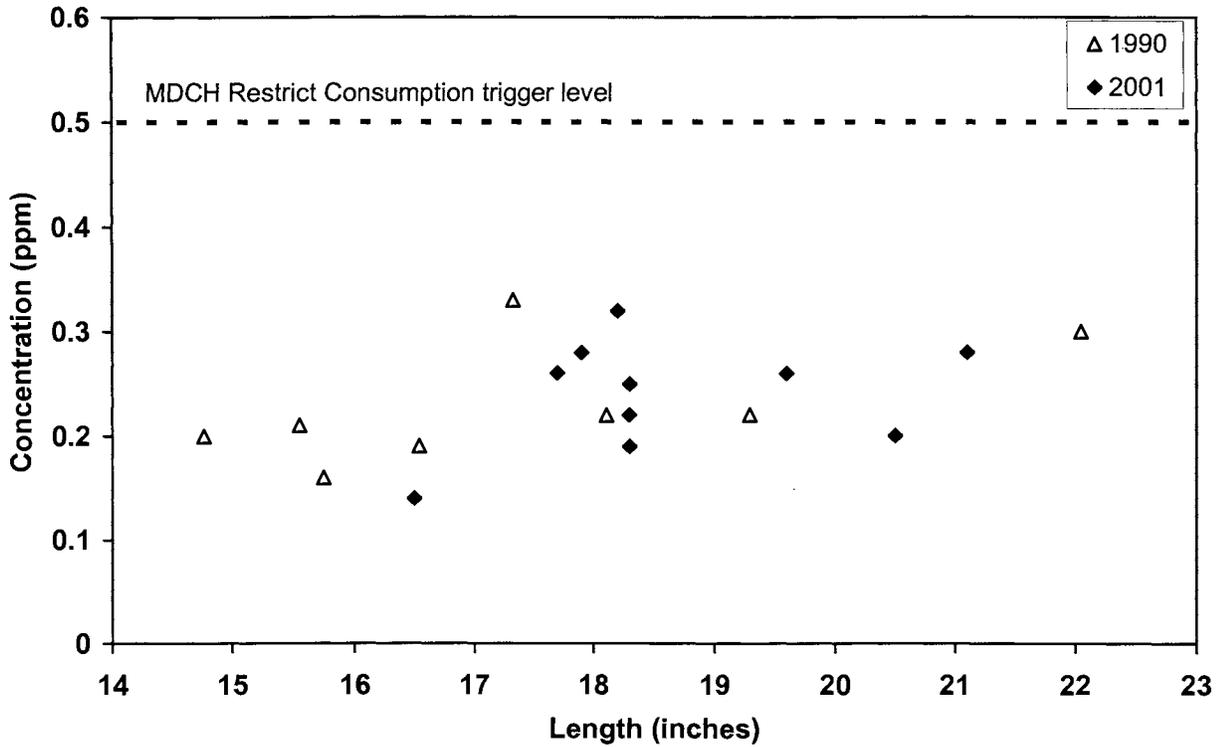


Figure 73. Total length versus mercury concentration in walleye collected from Stanley Lake, Iron County in 1990 (ID 90013) and 2001 (ID 2001143).

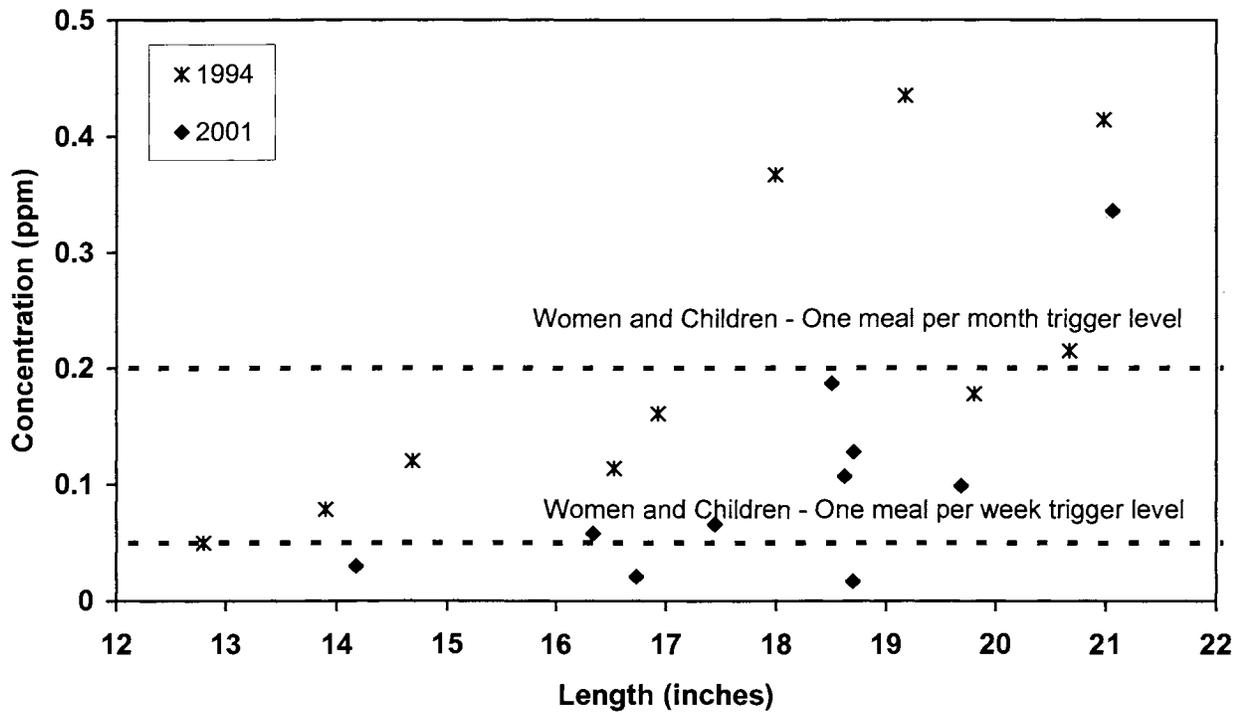


Figure 74. Total length versus total PCB concentration in lake whitefish collected from Torch Lake, Antrim County in 2001 (ID 2001110).

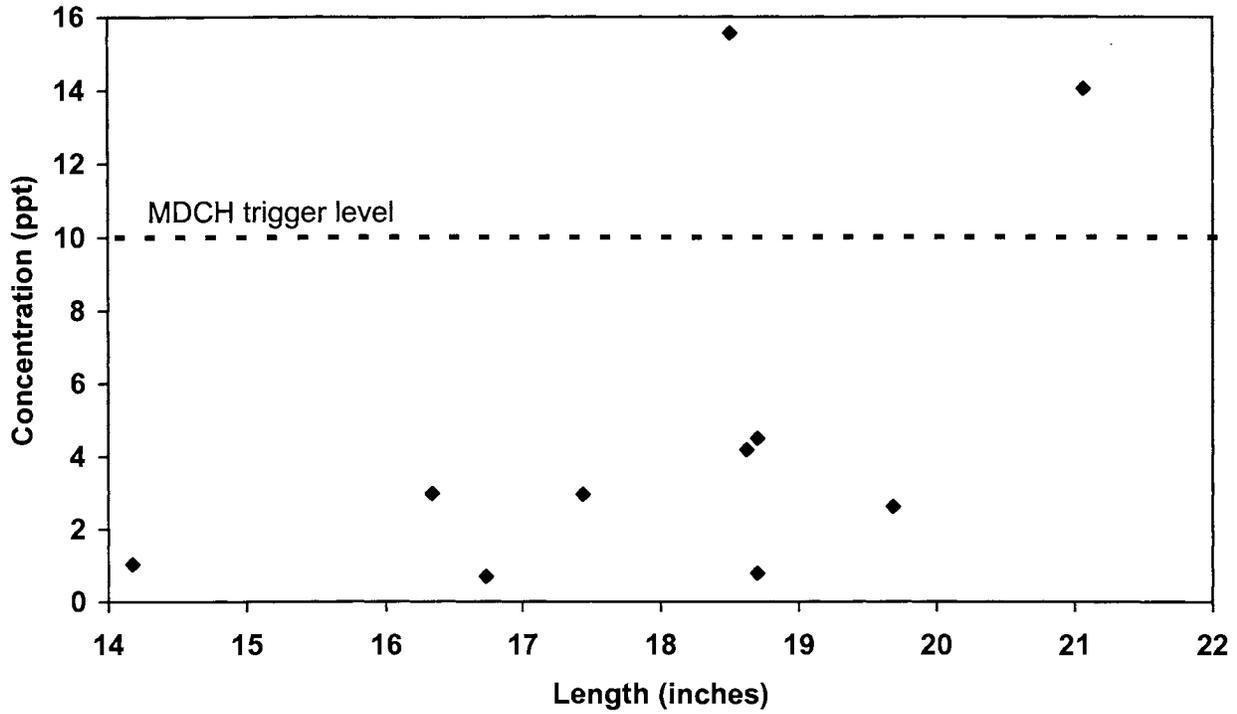


Figure 75. Total length versus dioxin TEQ concentration in lake whitefish collected from Torch Lake, Antrim County in 2001 (ID 2001061).

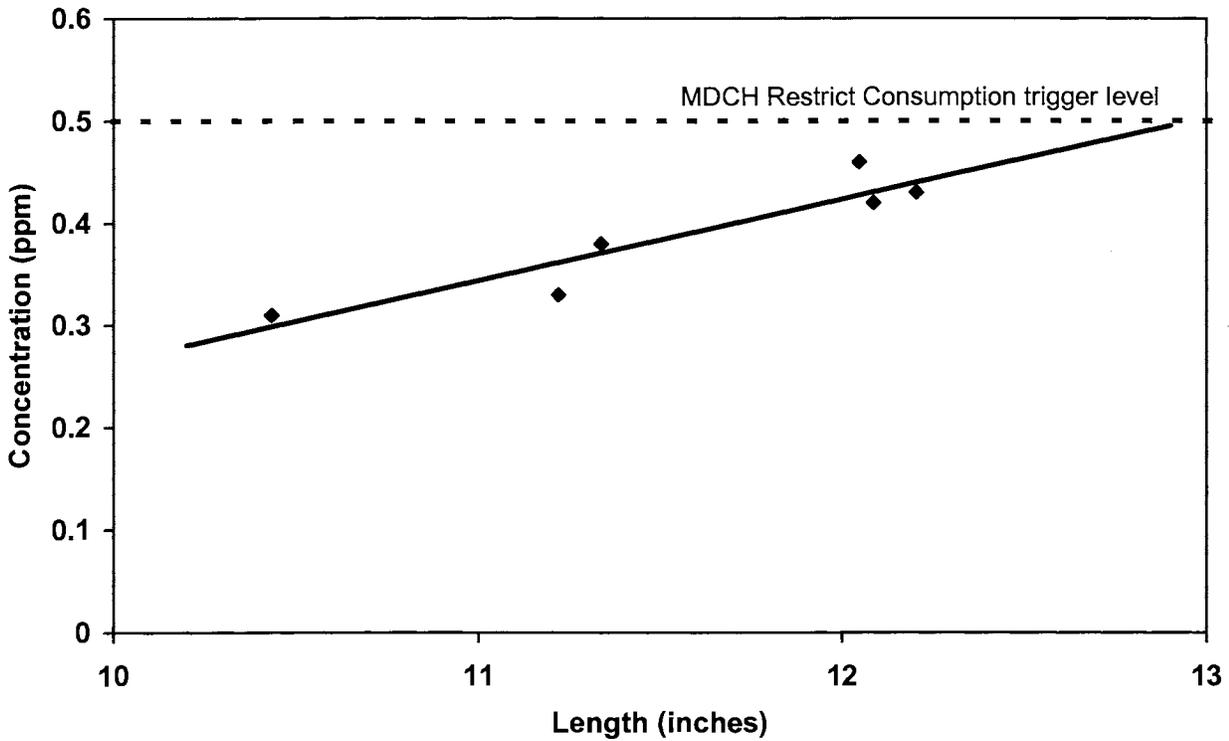


Figure 76. Total length versus mercury concentration in yellow perch collected from Torch Lake, Antrim County in 2001 (ID 2001110).

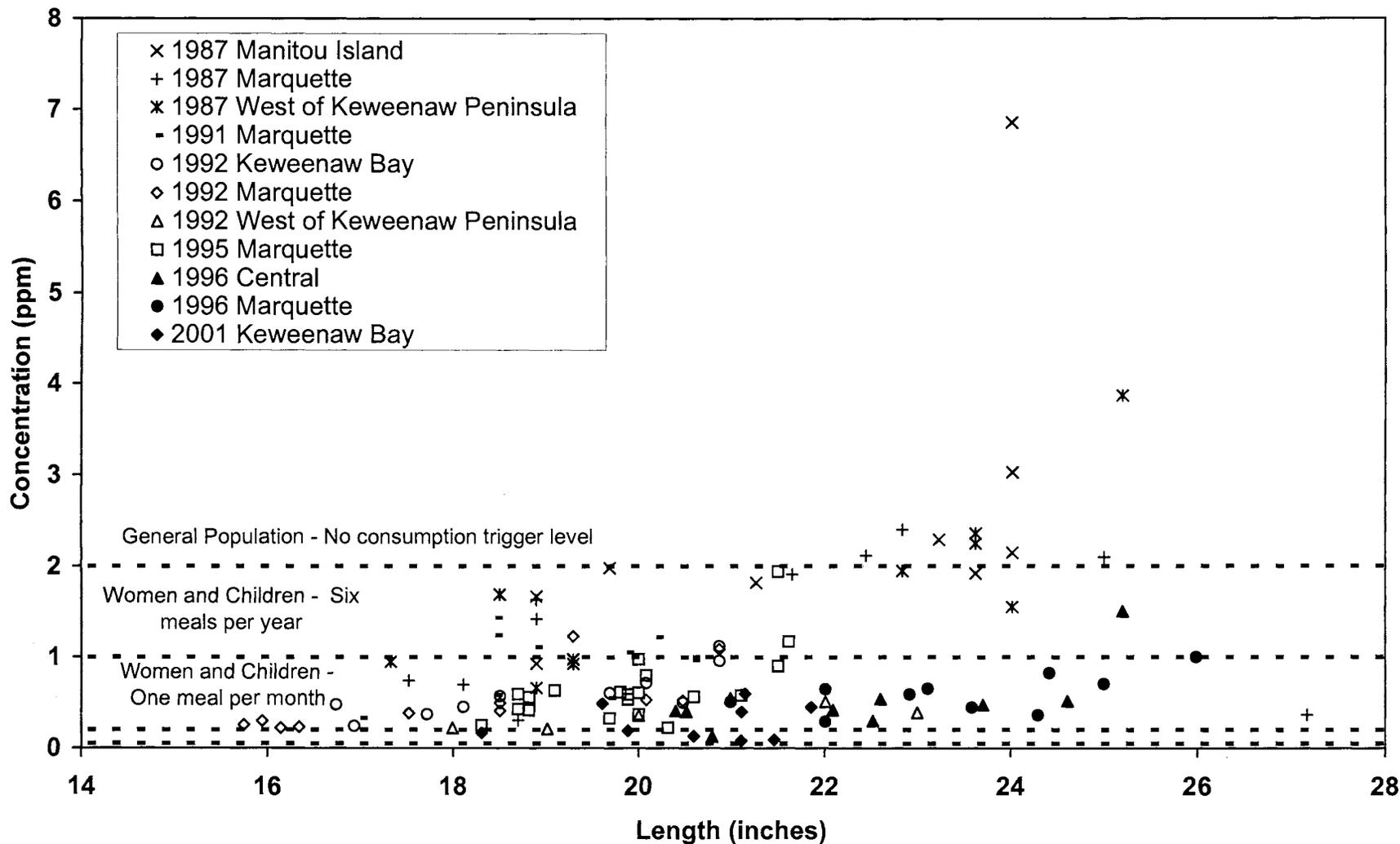


Figure 77. Total length versus total PCB concentration in ciscowet collected from Lake Superior in 1987 (ID 87069, 87071 and 87072), 1991 (ID 92042), 1992 (ID 92073, 92074 and 92077), 1995 (ID 95065), 1996 (ID 96038 and 96034), and 2001 (ID 2001079).

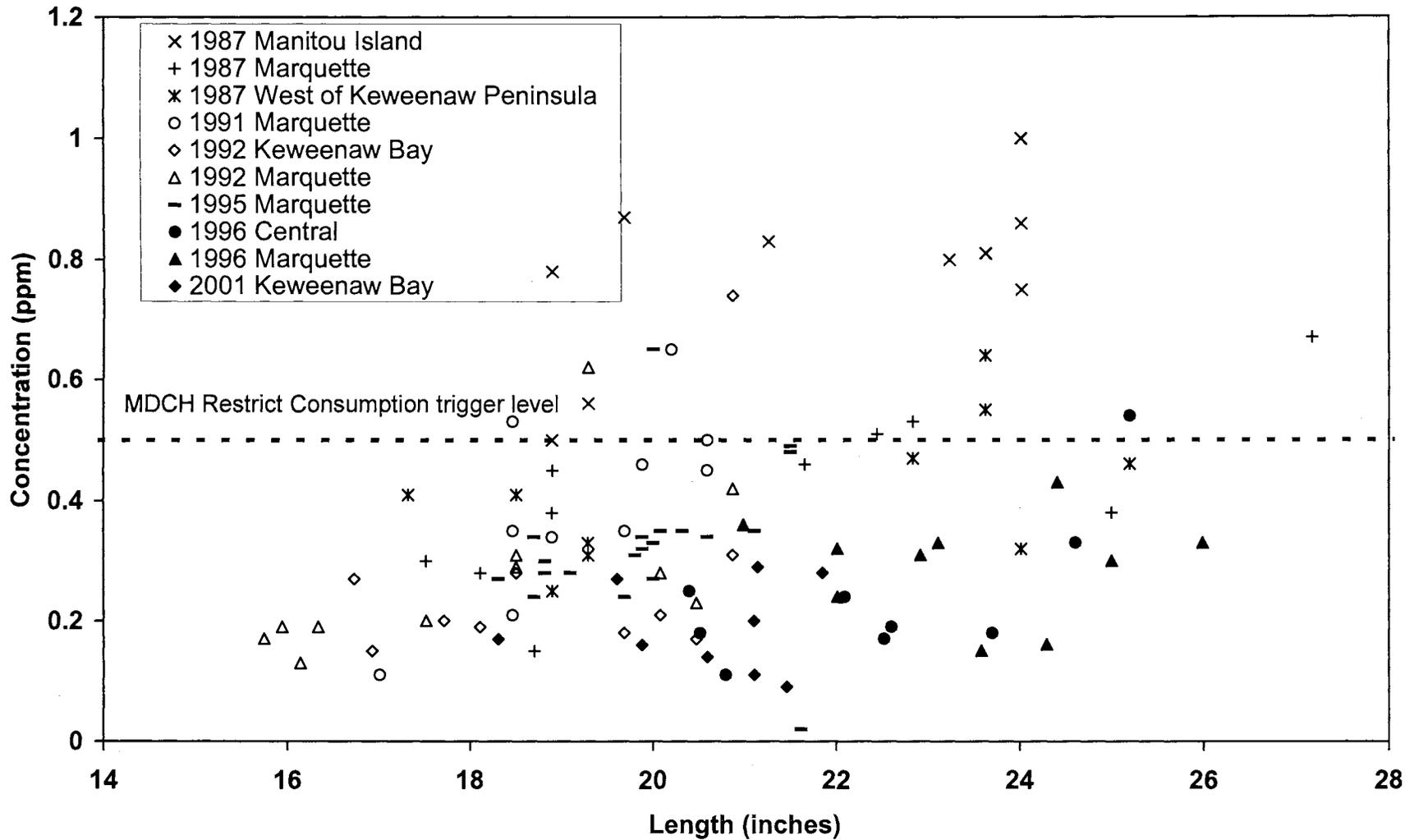


Figure 78. Total length versus mercury concentration in cisco collected from Lake Superior in 1987 (ID 87069, 87071 and 87072), 1991 (ID 92042), 1992 (ID 92073 and 92074), 1995 (ID 95065), 1996 (ID 96038 and 96034), and 2001 (ID 2001079).

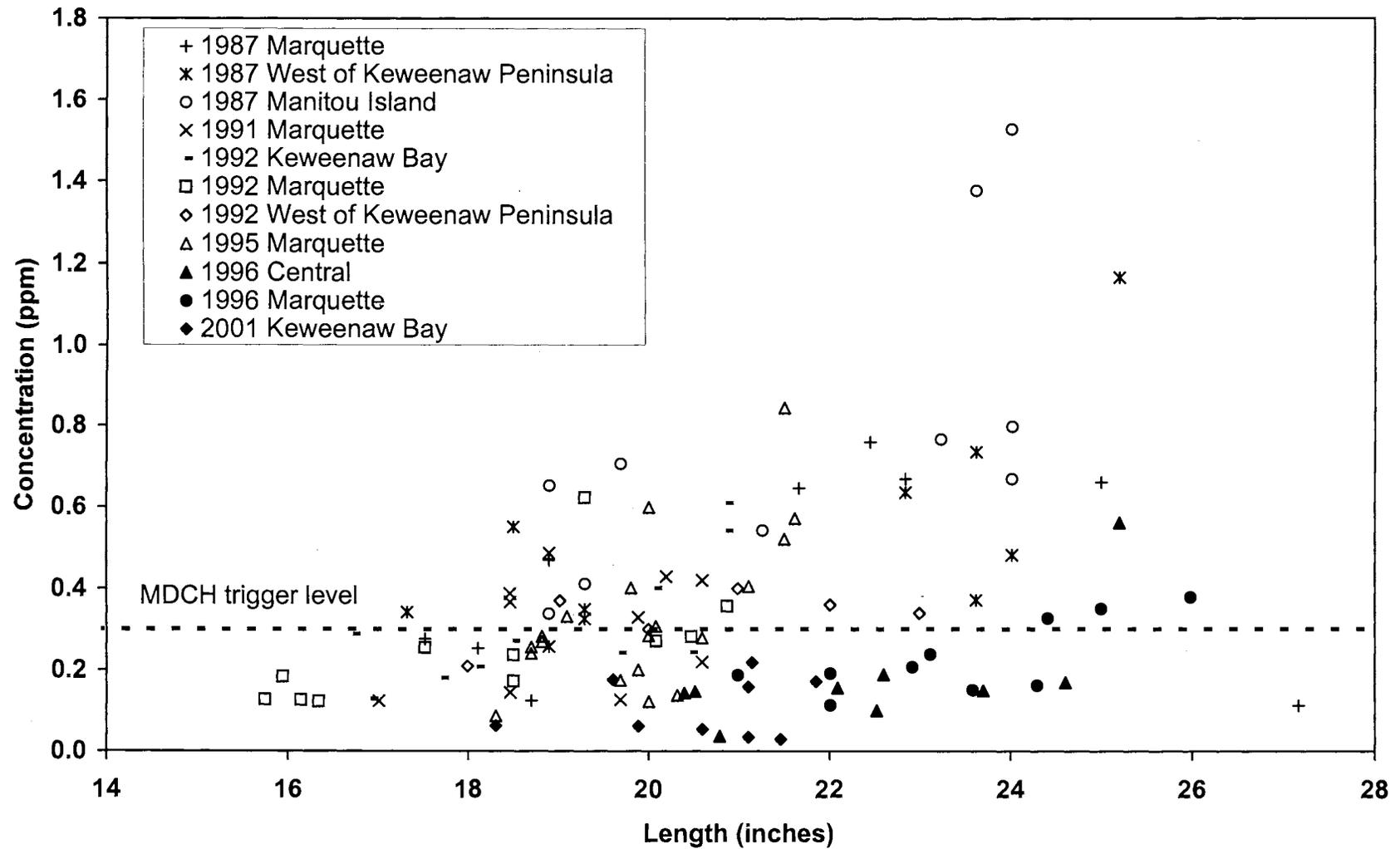


Figure 79. Total length versus total chlordane concentration in cisco collected from Lake Superior in 1987 (ID 87069, 87071 and 87072), 1991 (ID 92042), 1992 (ID 92073, 92074 and 92077), 1995 (ID 95065), 1996 (ID 96034 and 96038), and 2001 (ID 2001079).

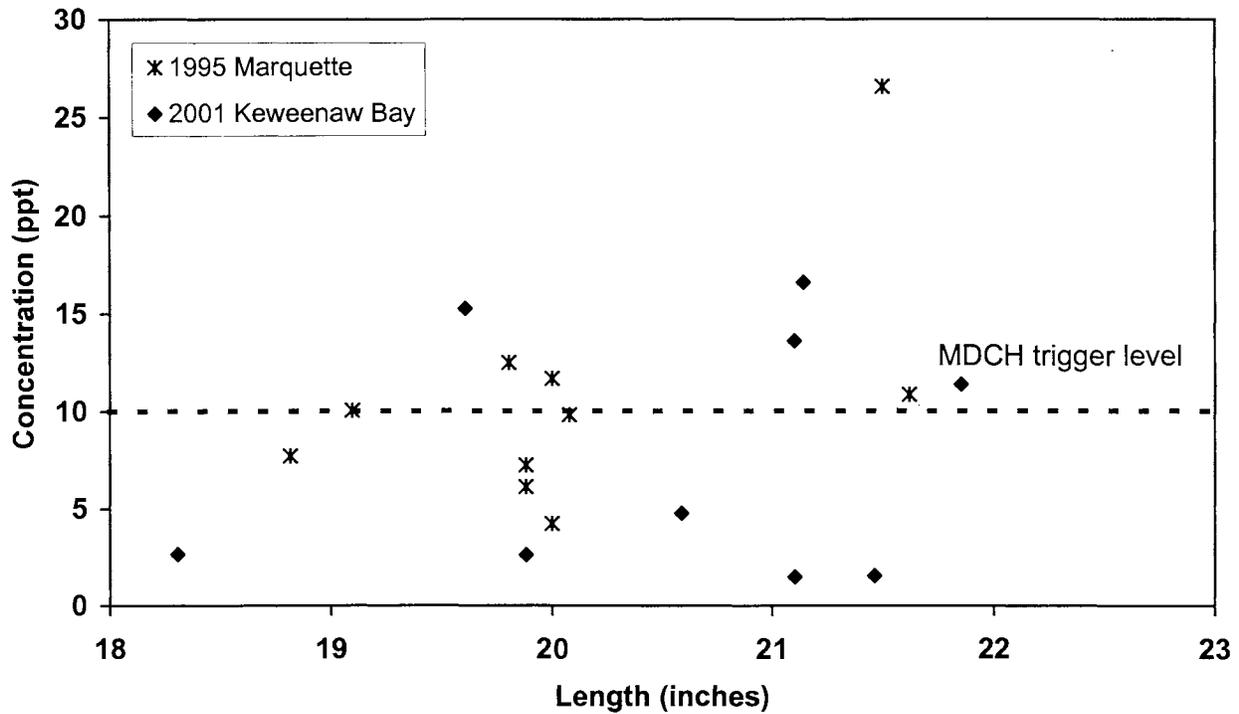


Figure 80. Total length versus dioxin TEQ concentration in ciscowet collected from Lake Superior in 1995 (ID 95065) and 2001 (ID 2001110).

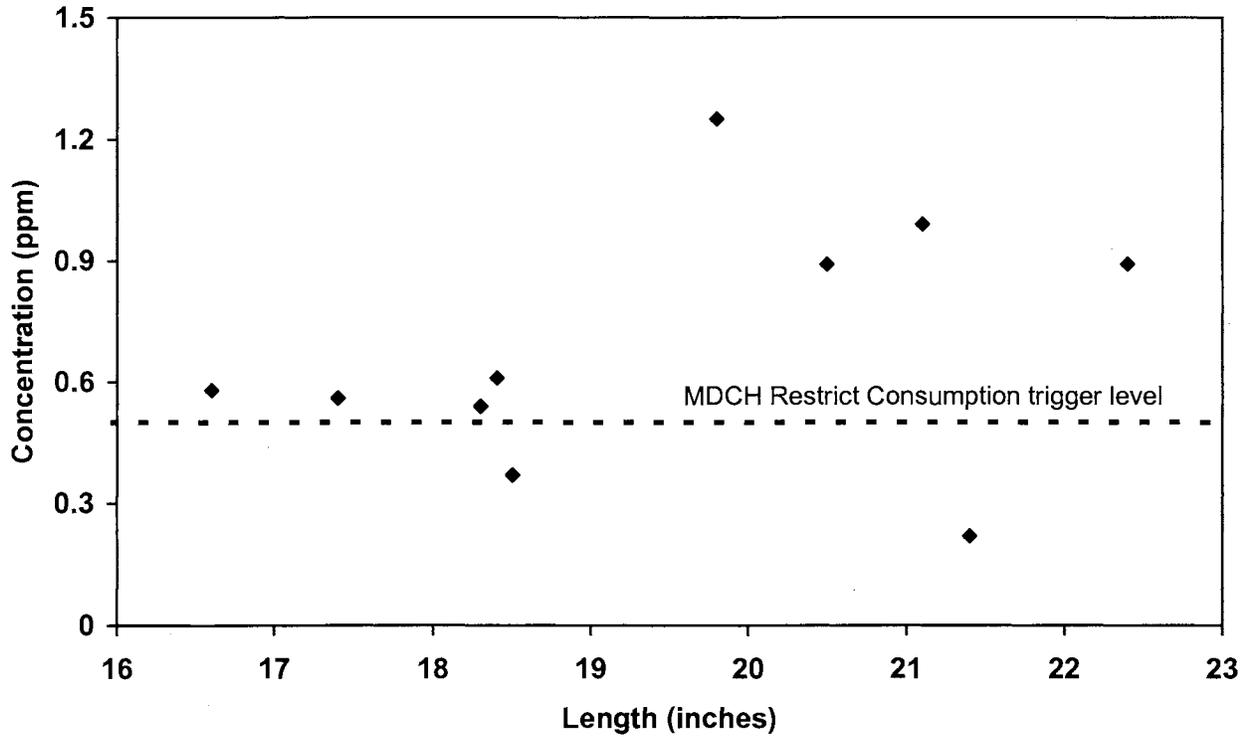


Figure 81. Total length versus mercury concentration in walleye collected from Bob Lake, Houghton County in 2001 (ID 2001134).

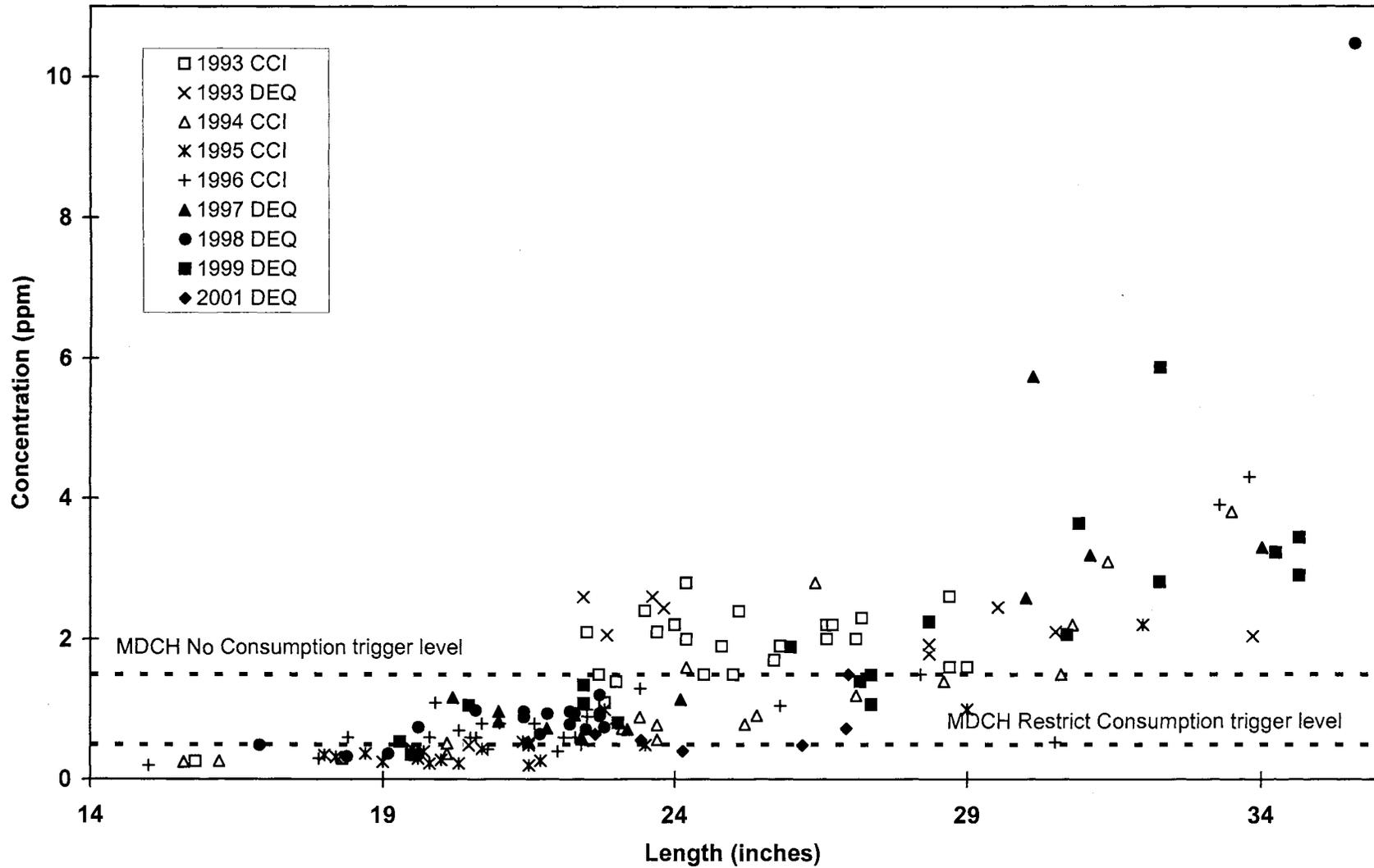


Figure 82. Total length versus mercury concentration in northern pike collected from Deer Lake, Marquette County in 1993 (ID 93083), 1993-1996 (collection and analyses coordinated by Cleveland Cliffs Iron Company), 1997 (ID 97070), 1998 (ID 1998024), 1999 (ID 1999006), and 2001 (ID 2001008).

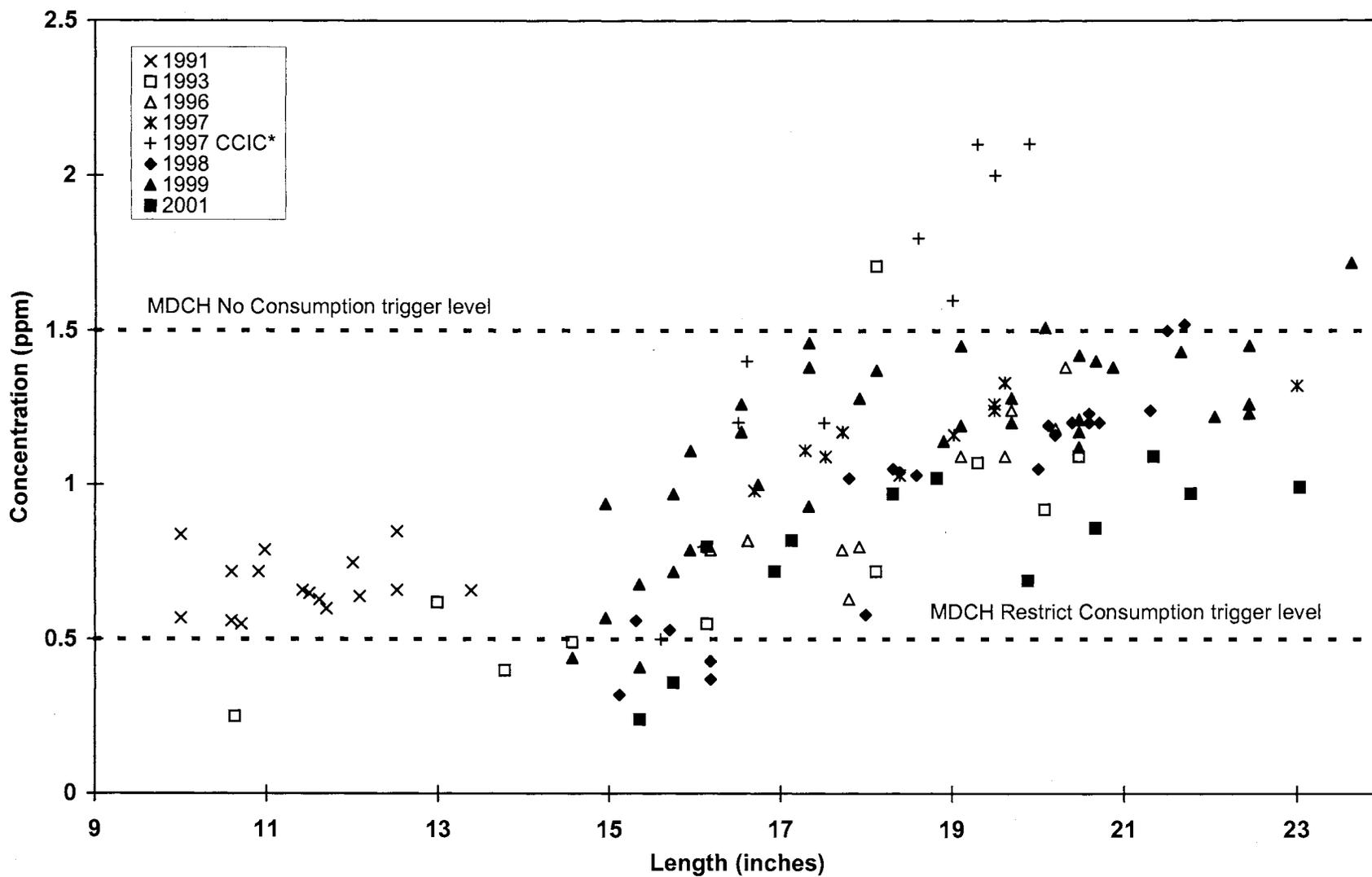


Figure 83. Total length versus mercury concentration in walleye collected from Deer Lake, Marquette County in 1991 (ID 91032), 1993 (ID 93082), 1996 (ID 96008), 1997 (ID 97070 and CCIC\*), 1998 (ID 1998024), 1999 (ID 1999006), and 2001 (ID 2001008). \*Collection and analyses coordinated by Cleveland Cliffs Iron Company.

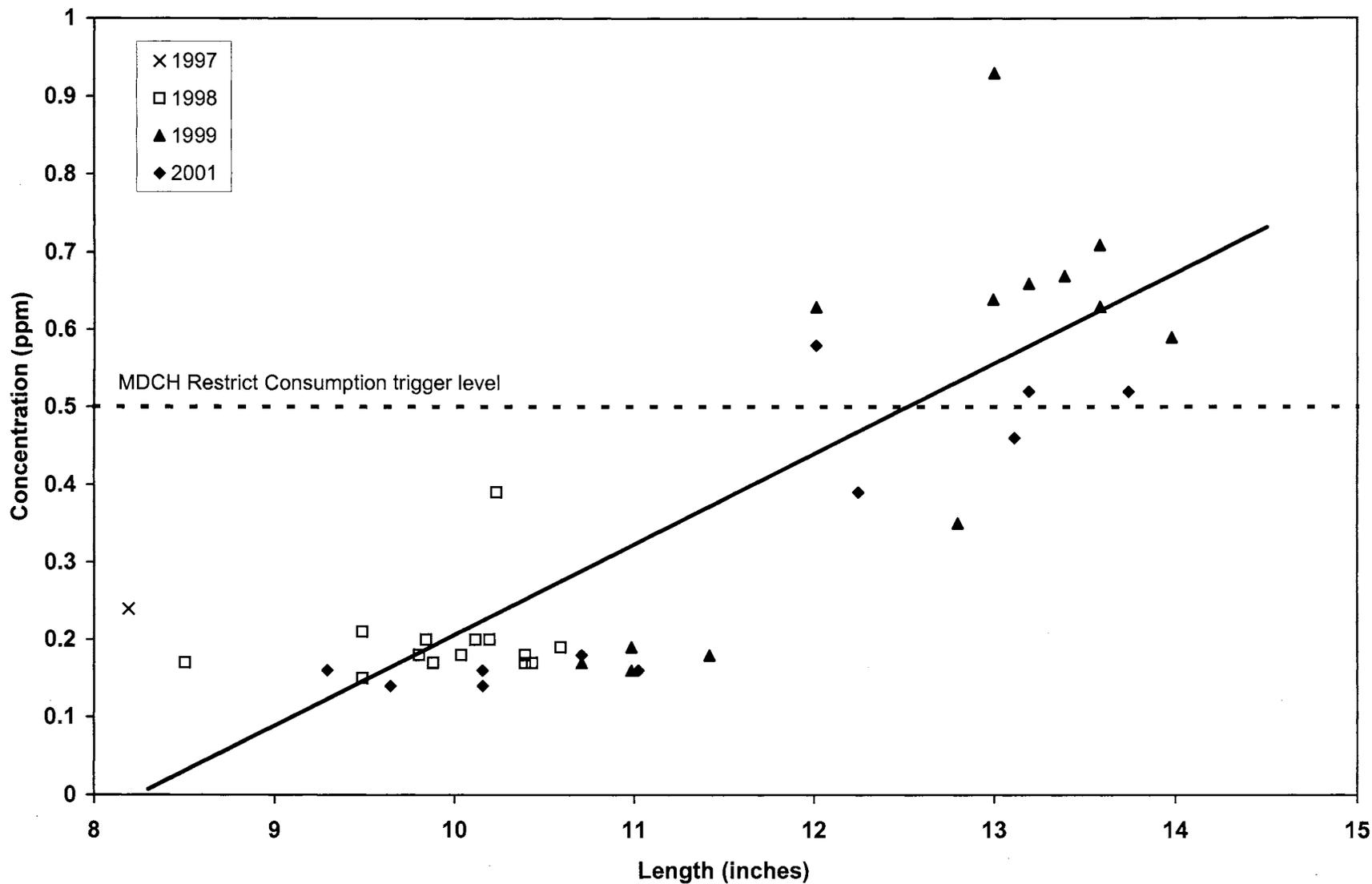


Figure 84. Total length versus mercury concentration in yellow perch collected from Deer Lake, Marquette County in 1997 (ID 97070), 1998 (ID 1998024), 1999 (ID 1999006), and 2001 (ID 2001008).

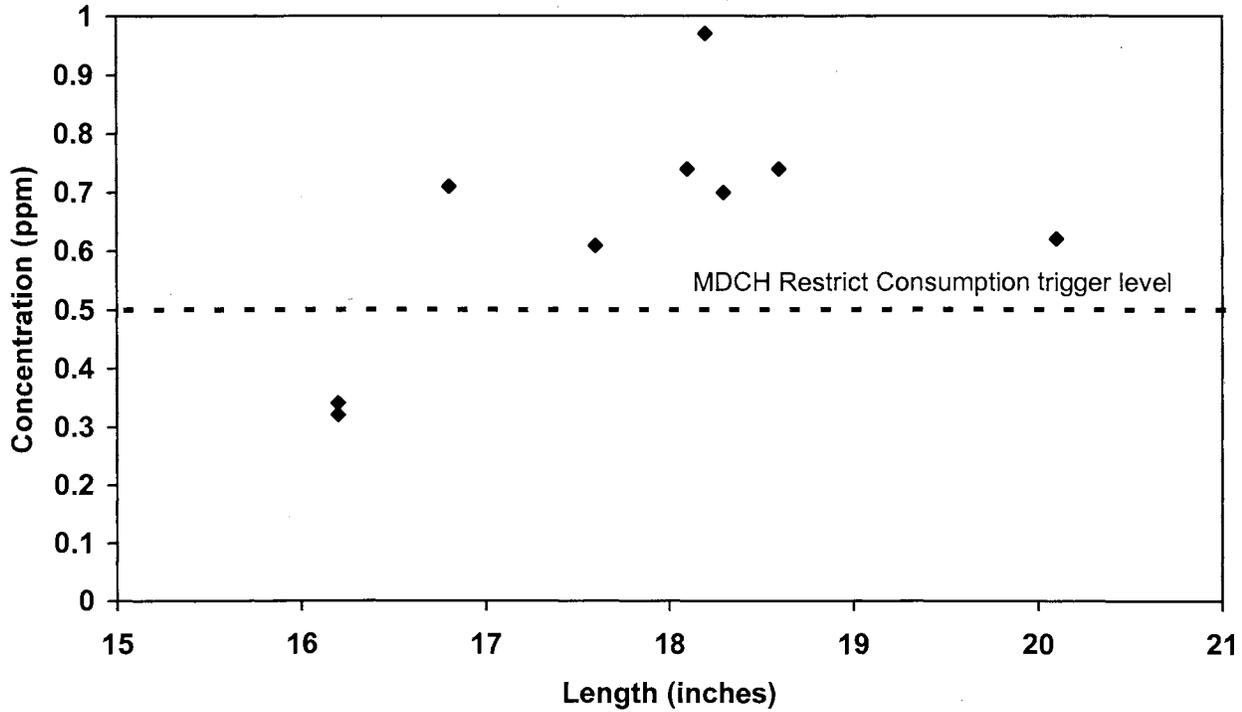


Figure 85. Total length versus mercury concentration in walleye collected from Sudden Lake, Ontonagon County in 2001 (ID 2001144).

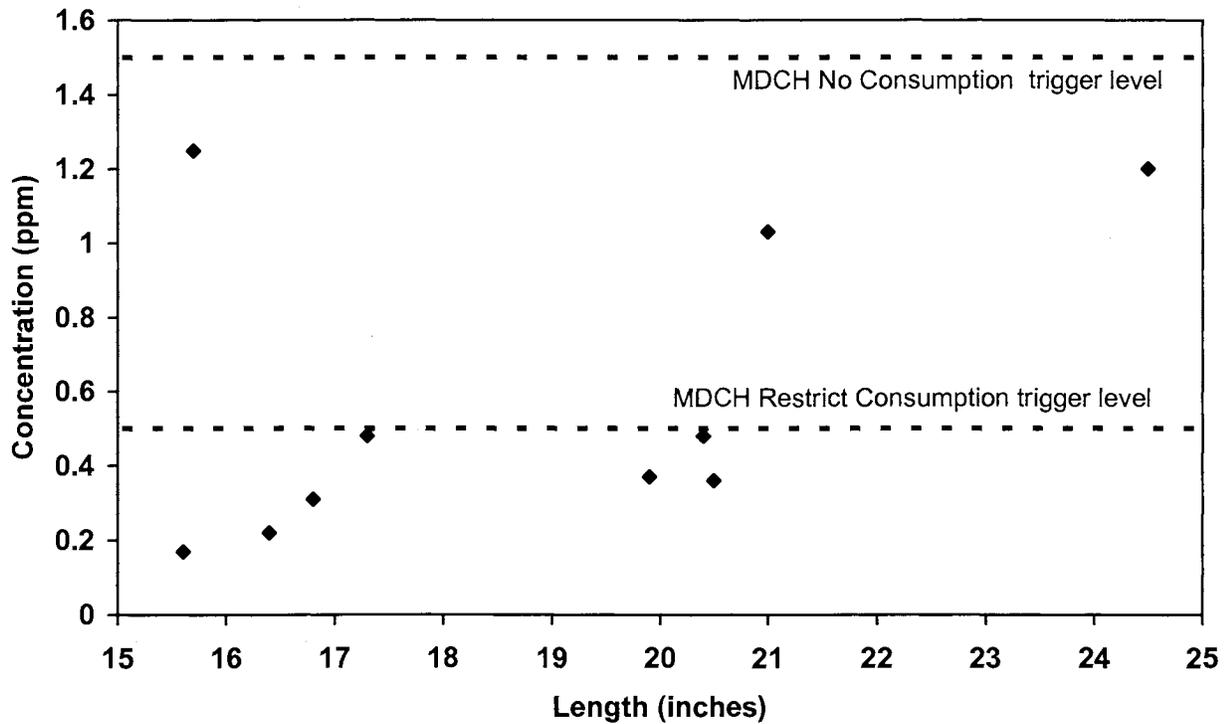


Figure 86. Total length versus mercury concentration in walleye collected from Vermilac Lake, Baraga County in 2001 (ID 2001135).

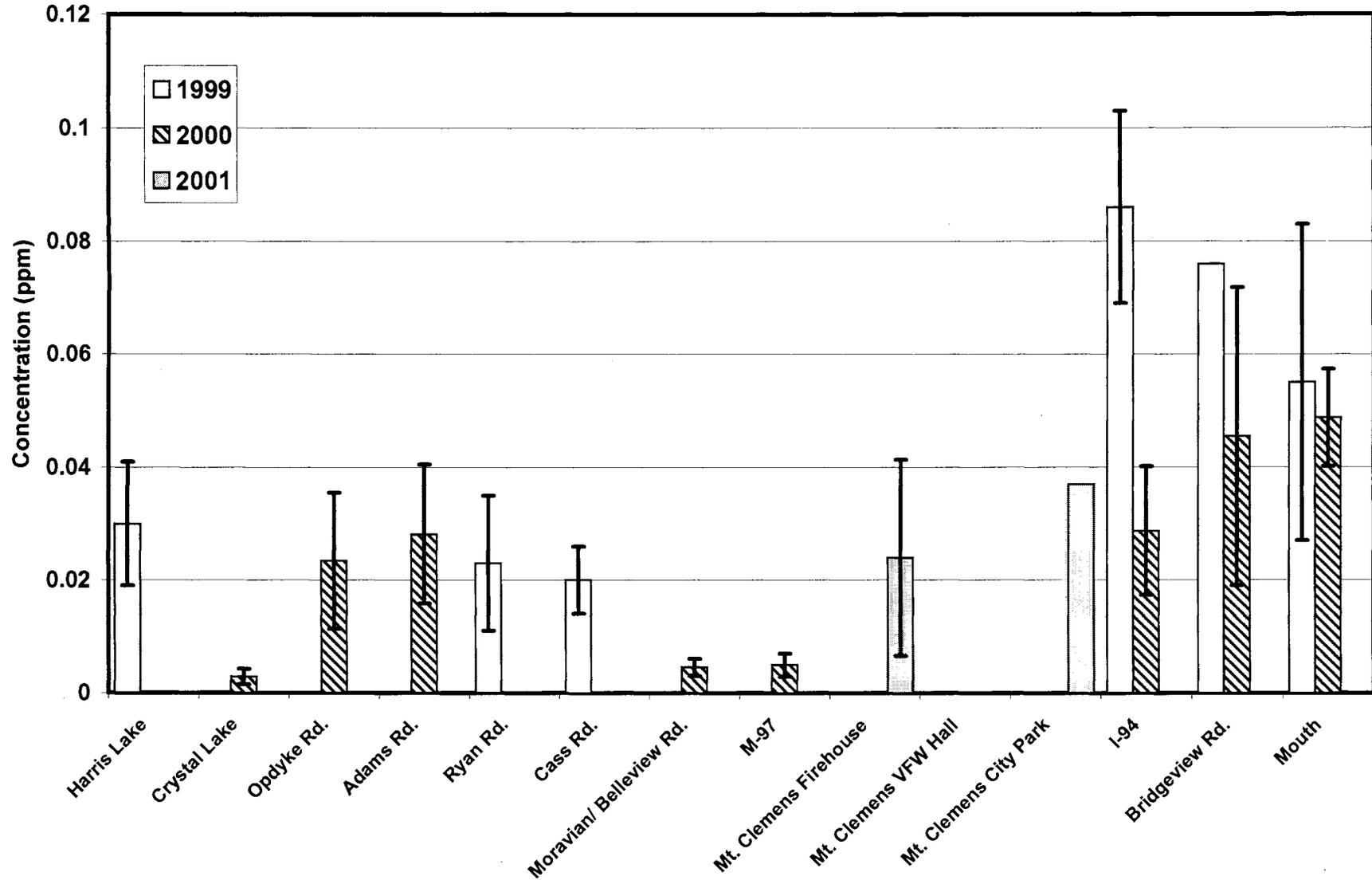
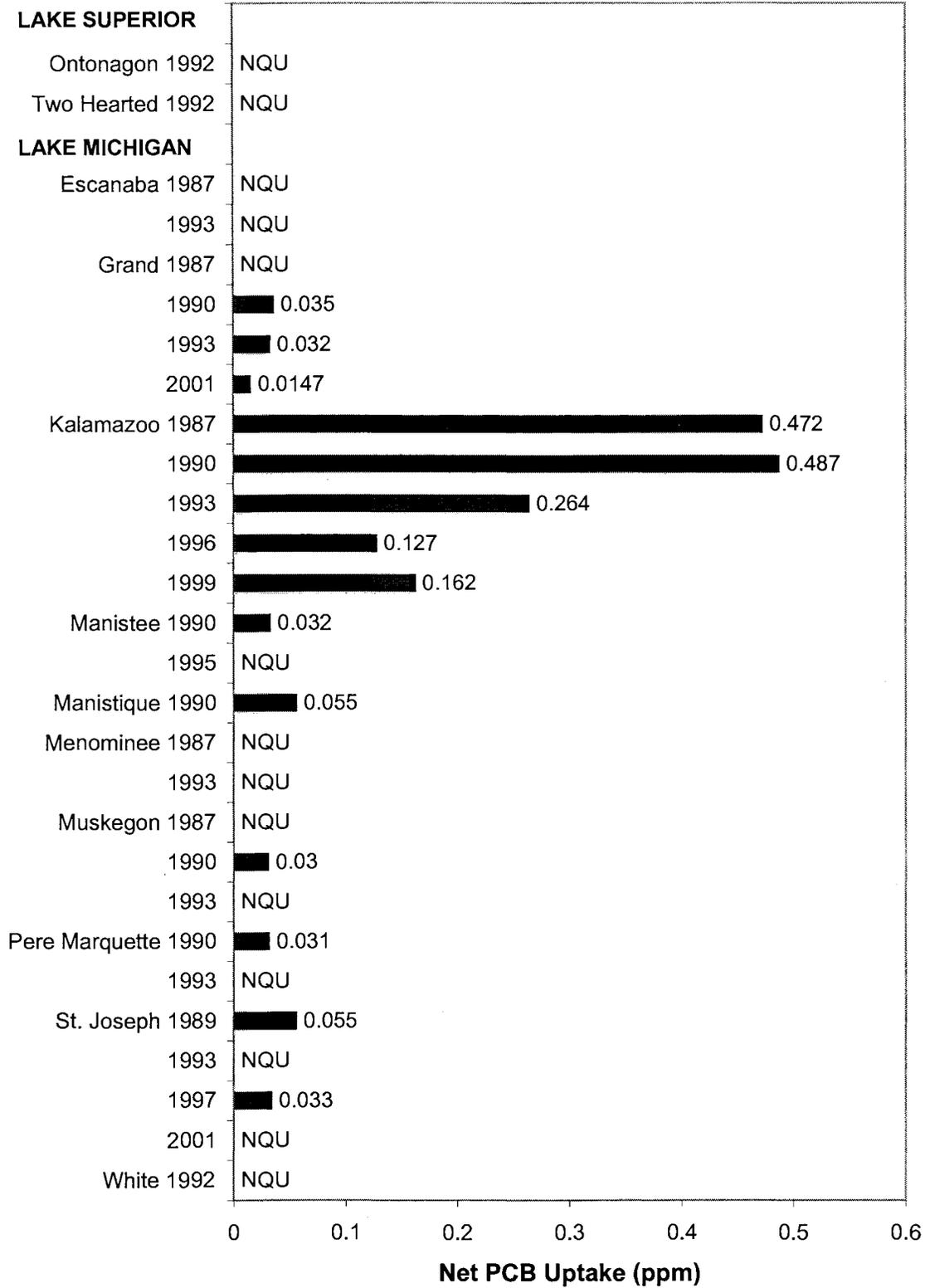
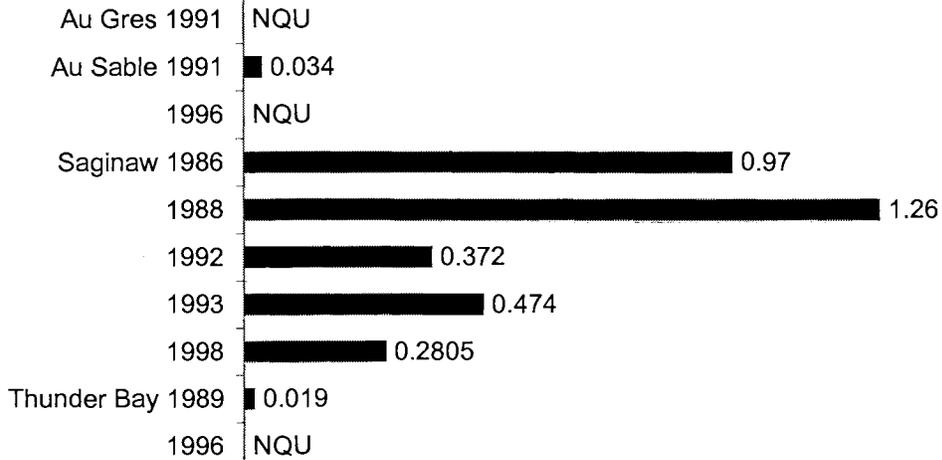


Figure 87. Net uptake of lipid normalized concentrations of total PCBs in Clinton River caged fish monitored in 1999, 2000, and 2001. Error bars indicate 95 % confidence intervals.

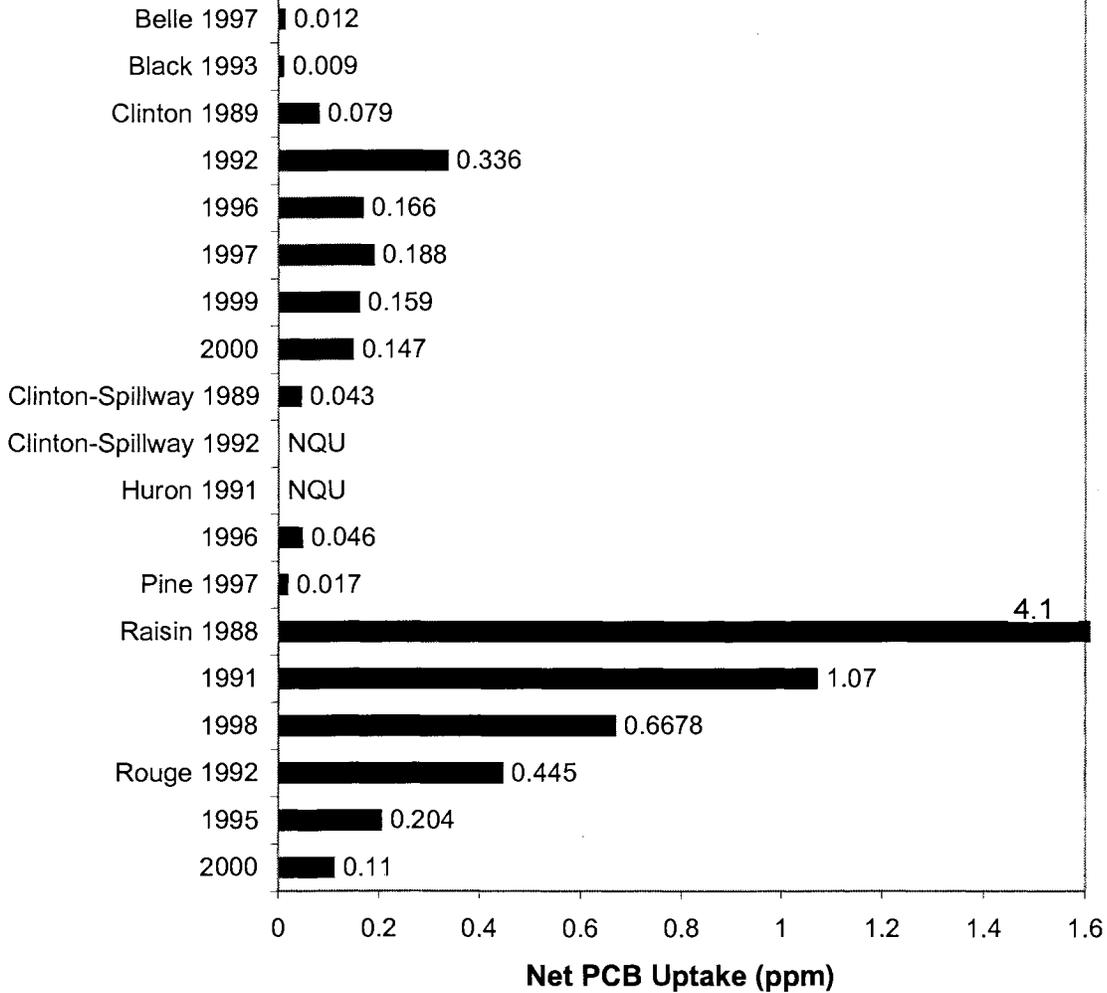


**Figure 88. Net uptake of total PCB in caged fish from the mouths of selected Michigan rivers (NQU = no quantifiable uptake).**

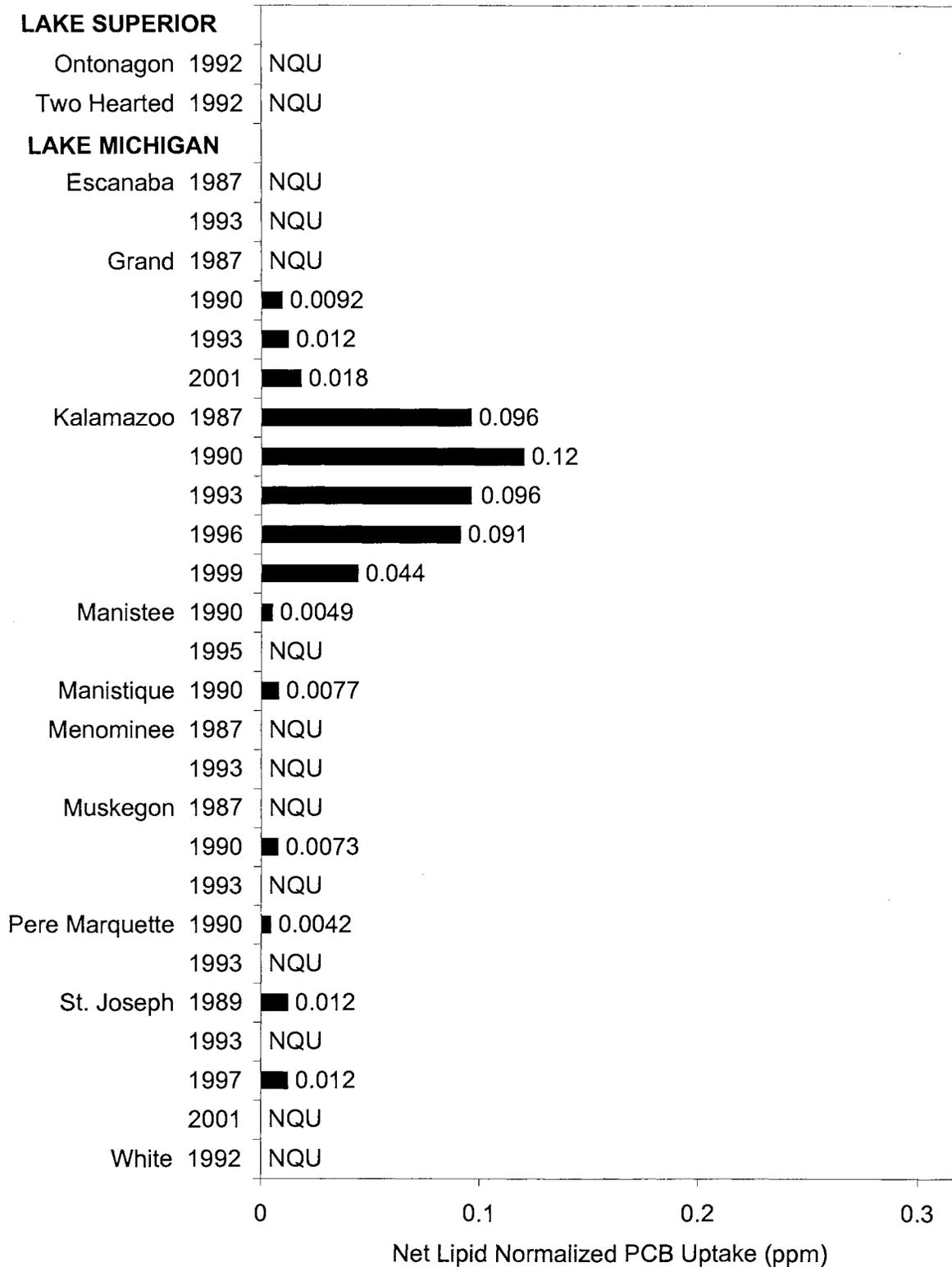
**LAKE HURON**



**LAKE ERIE**



**Figure 88. Continued.**



**Figure 89. Net uptake of lipid normalized total PCB in caged fish from the mouths of selected Michigan rivers (NQU = no quantifiable uptake).**

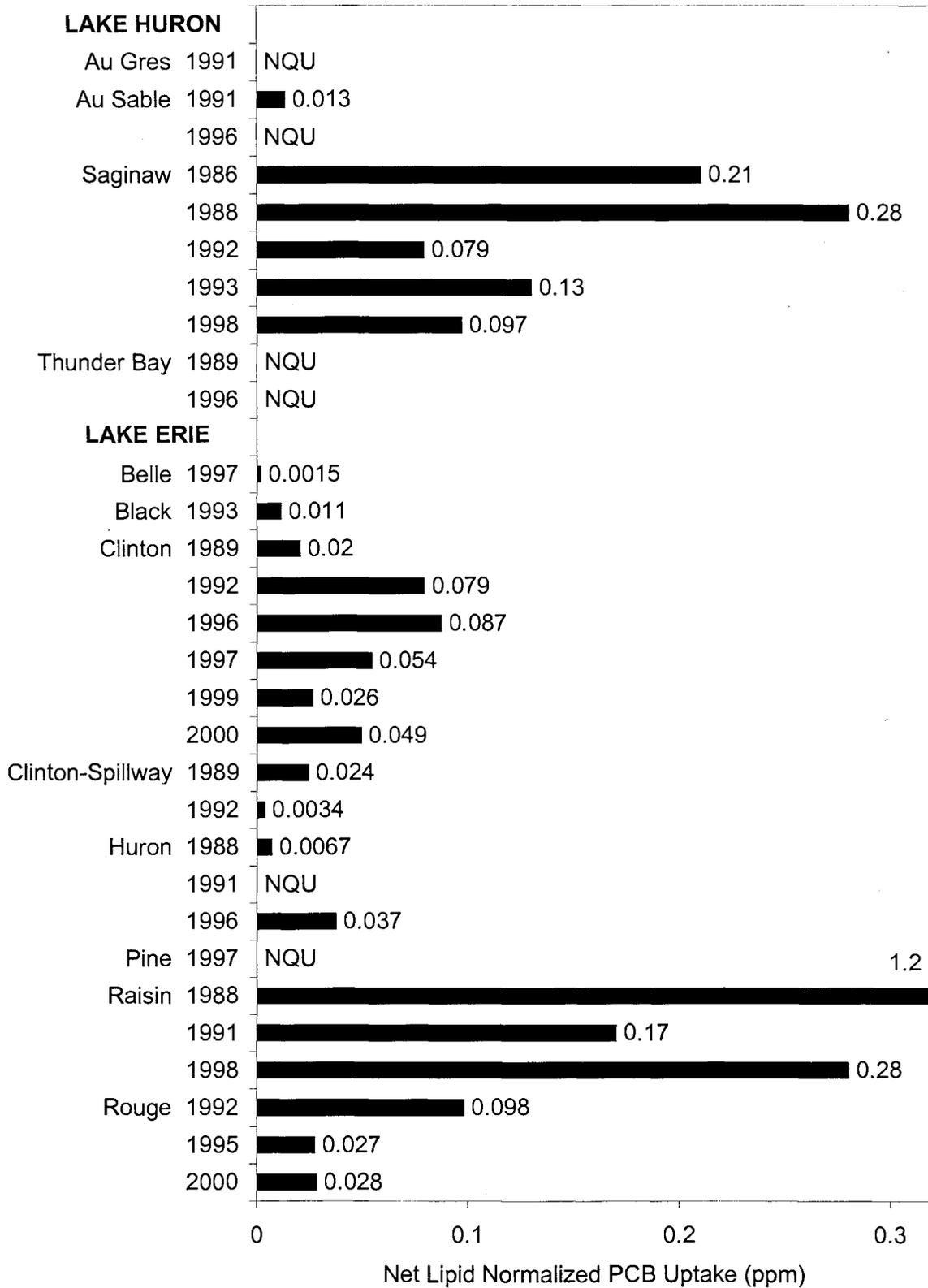


Figure 89. Continued

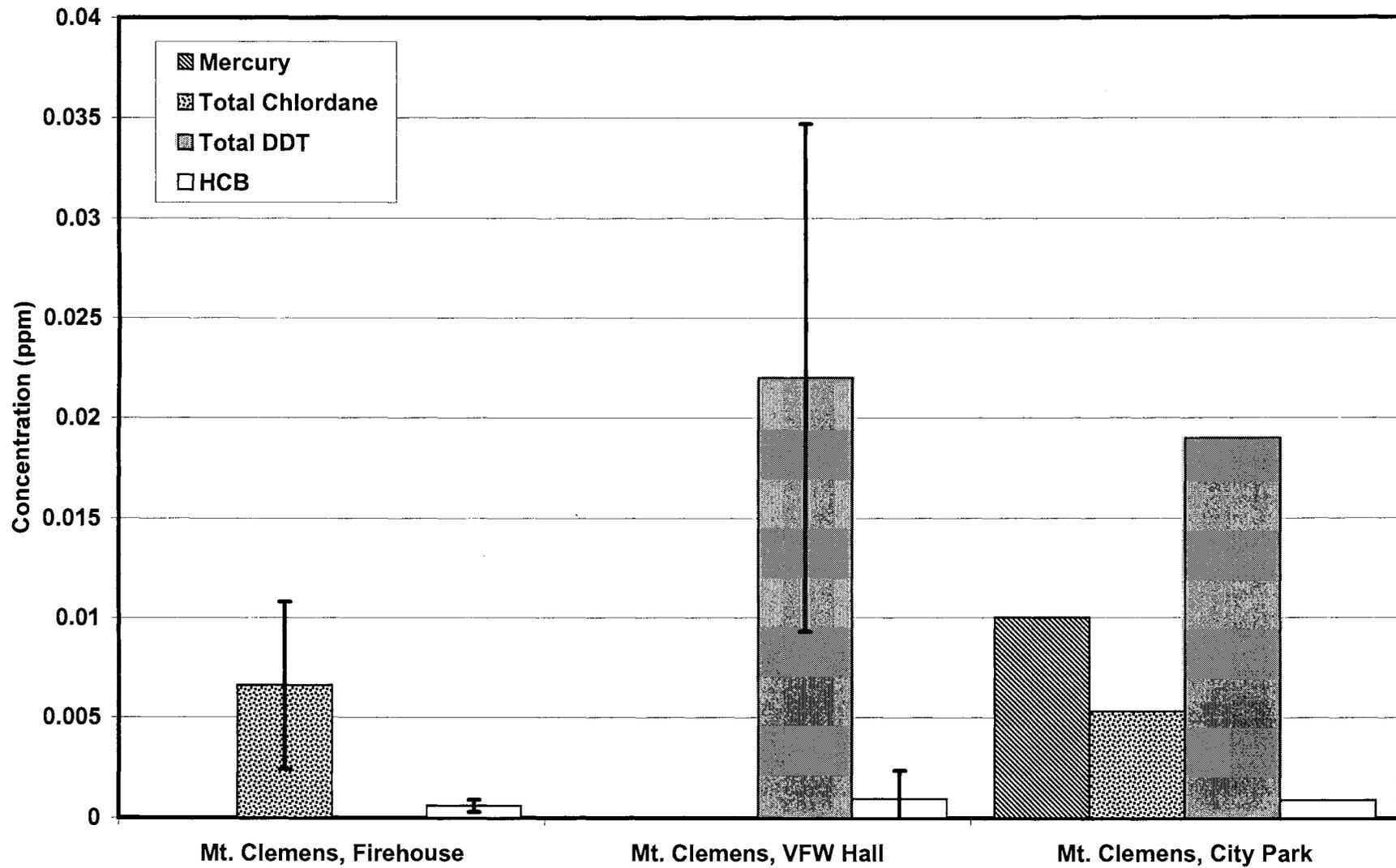


Figure 90. Net uptake of contaminants in Clinton River caged fish monitored in 2001. Mercury concentrations are wet weight and all other concentrations are lipid normalized. Error bars indicate 95% confidence intervals.

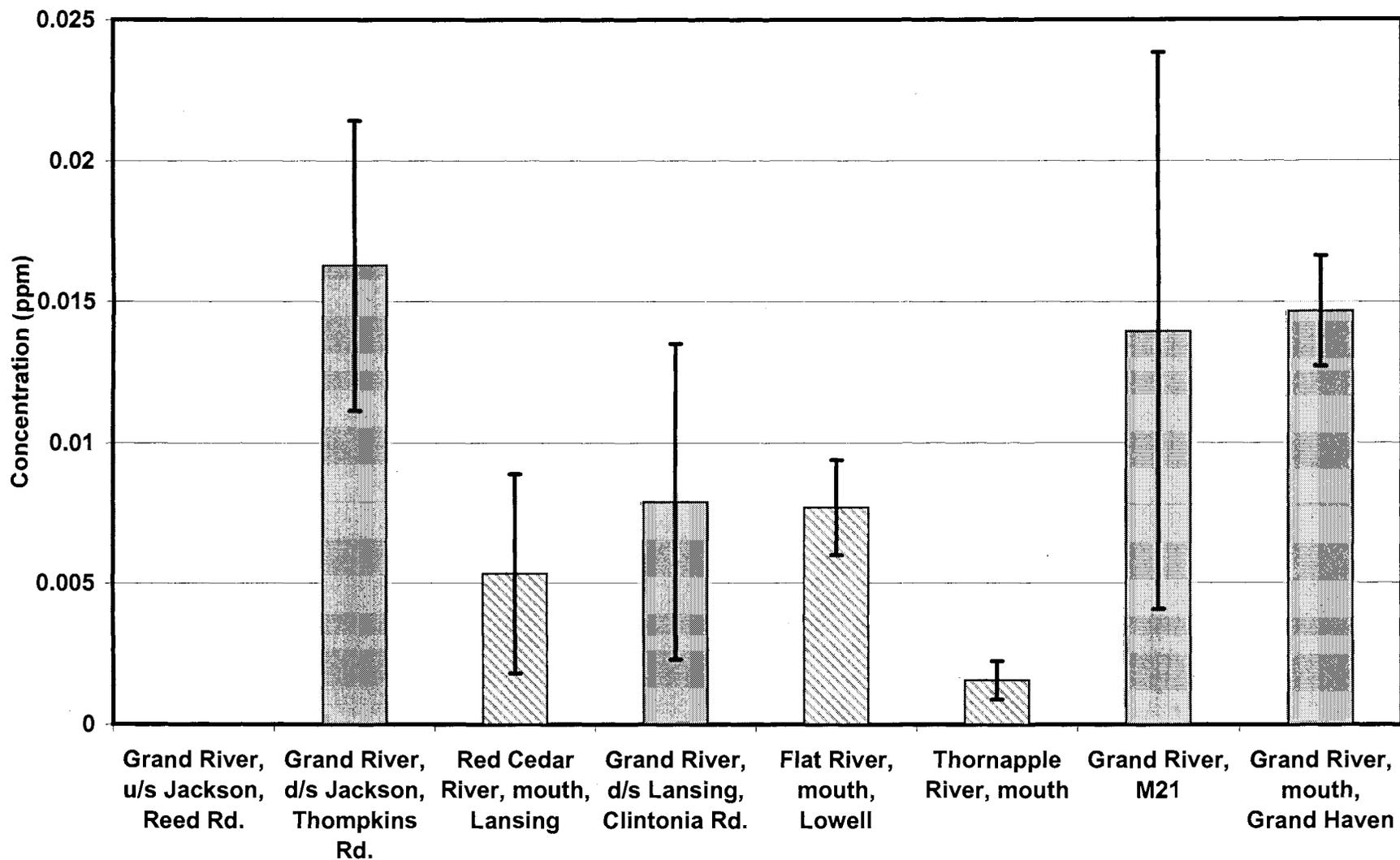


Figure 91. Net uptake of lipid normalized concentrations of total PCBs in Grand River caged fish monitored in 2001. Error bars indicate 95% confidence intervals.

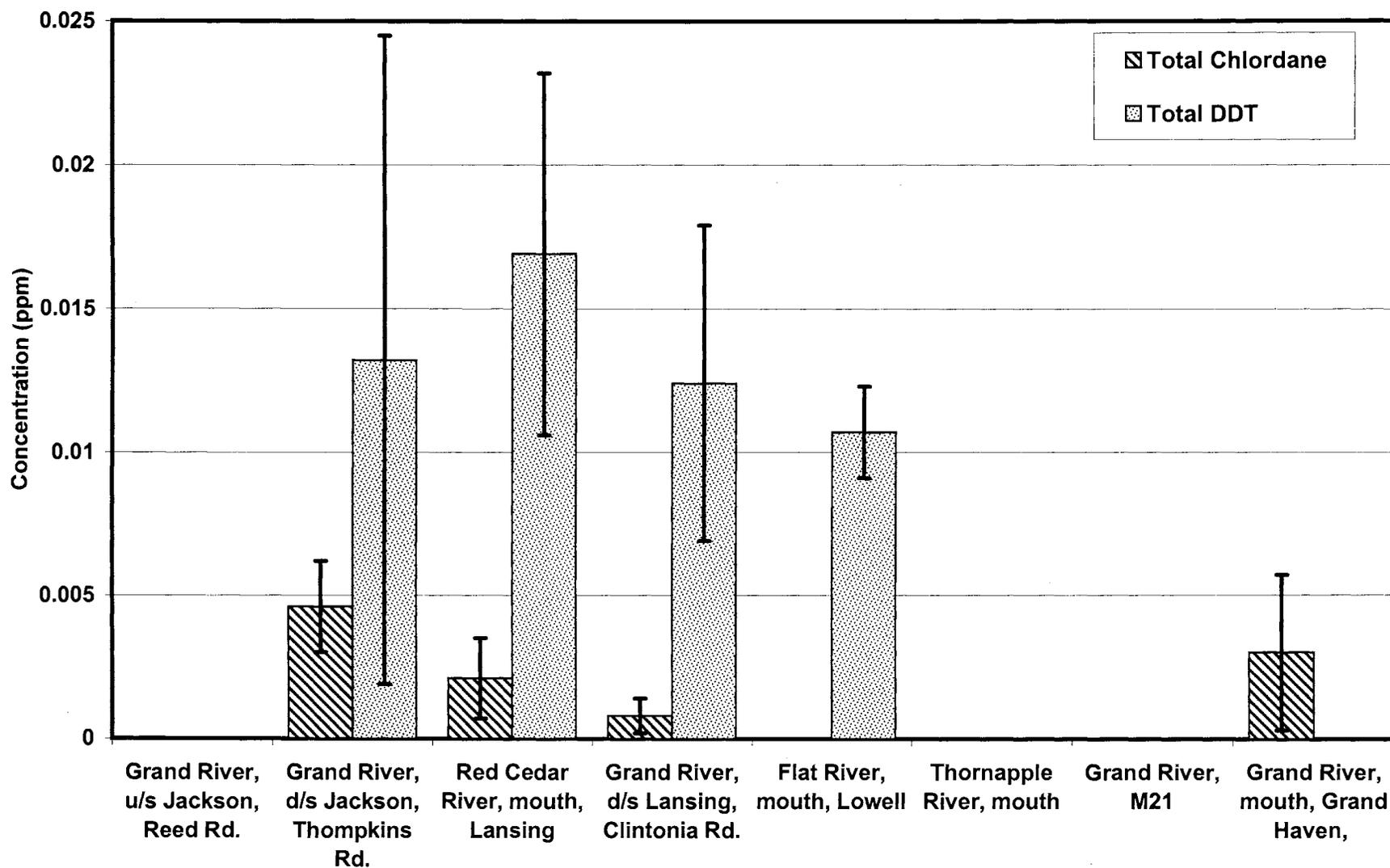


Figure 92. Net uptake of lipid normalized contaminants in Grand River caged fish monitored in 2001. Error bars indicate 95% confidence intervals.

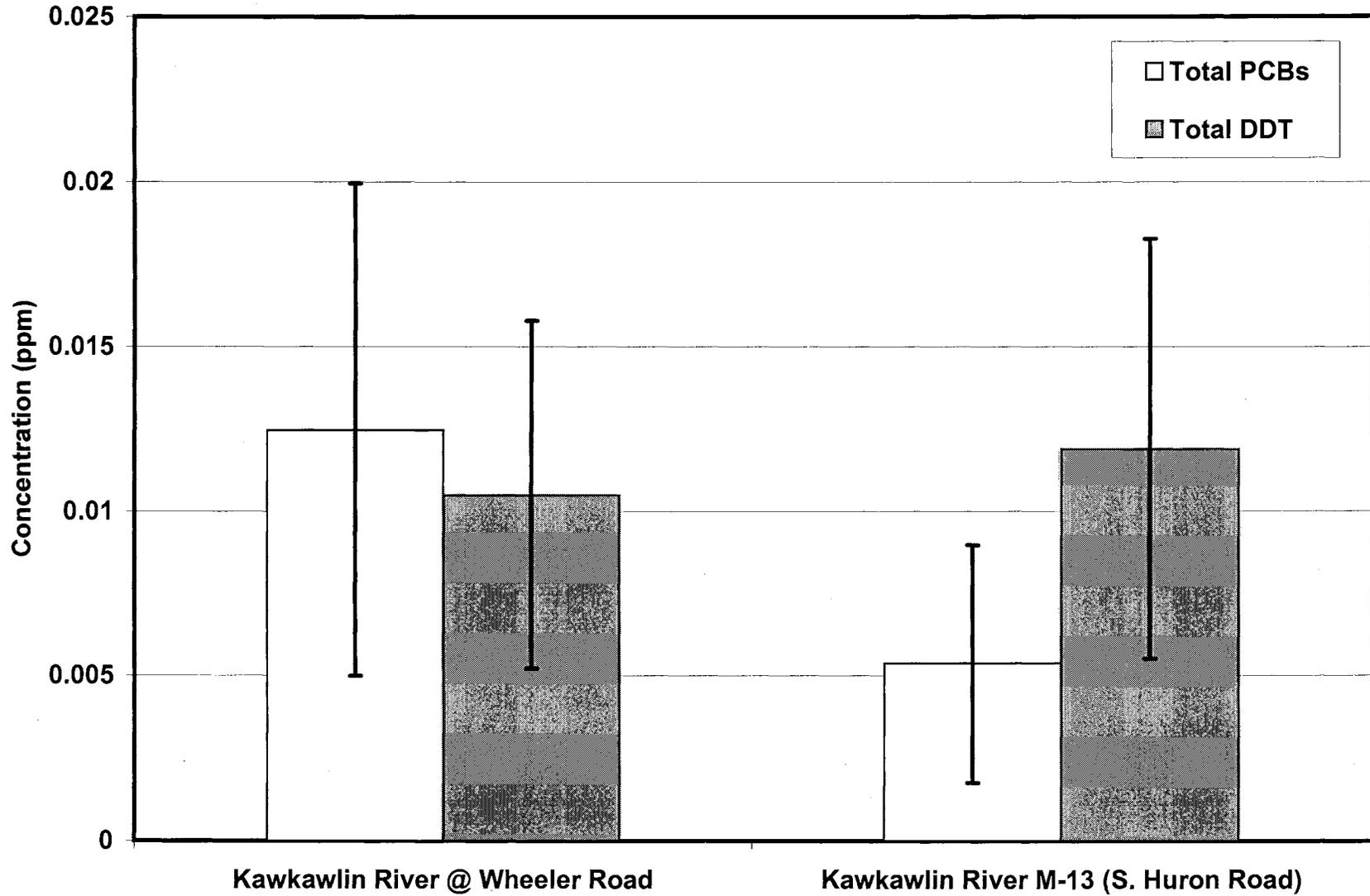


Figure 93. Net uptake of lipid normalized contaminants in Kawkawlin River caged fish monitored in 2001. Error bars indicate 95% confidence intervals.

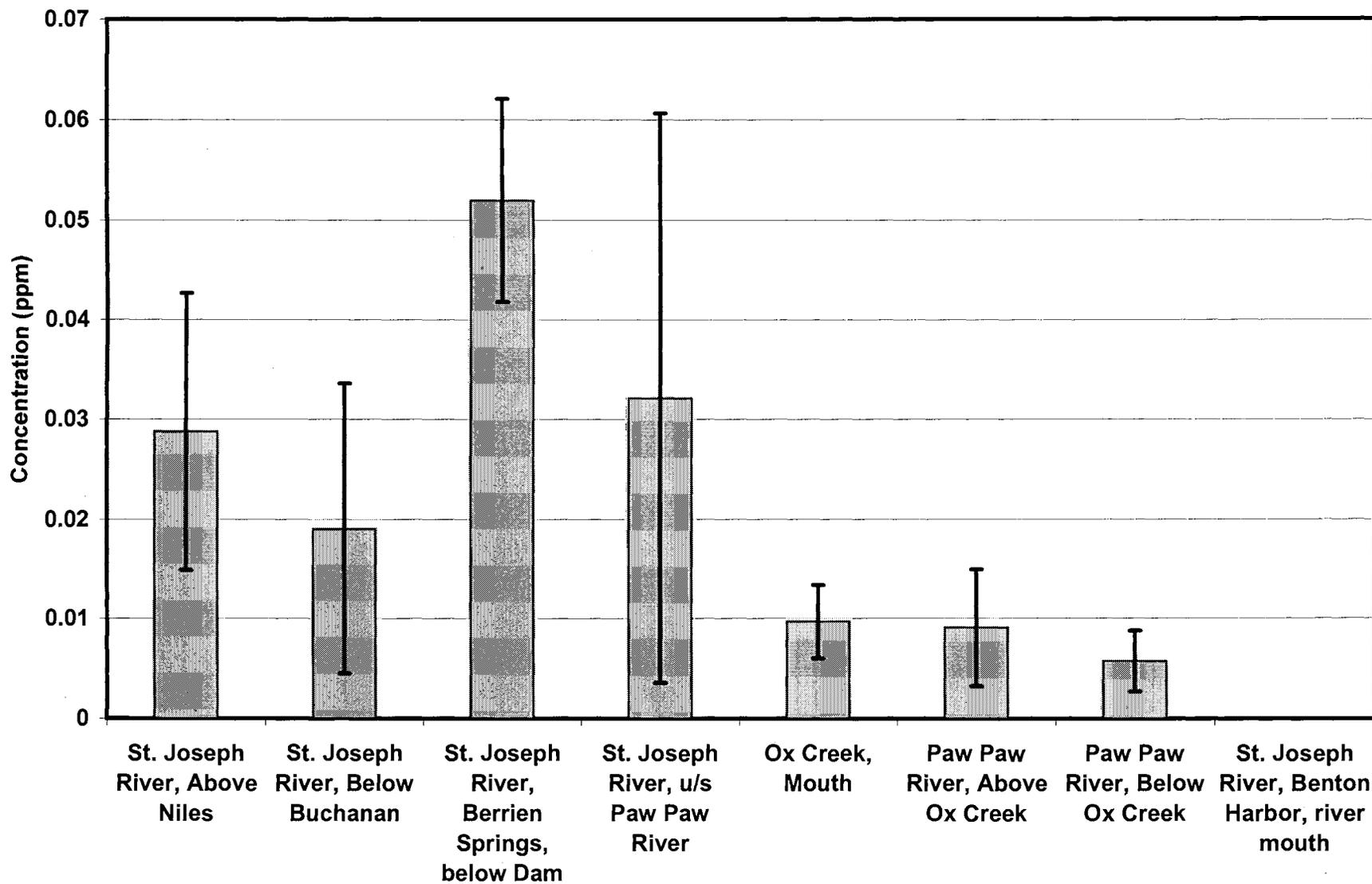


Figure 94. Net uptake of lipid normalized concentrations of total PCBs in St. Joseph River caged fish monitored in 2001. Error bars indicate 95% confidence intervals.

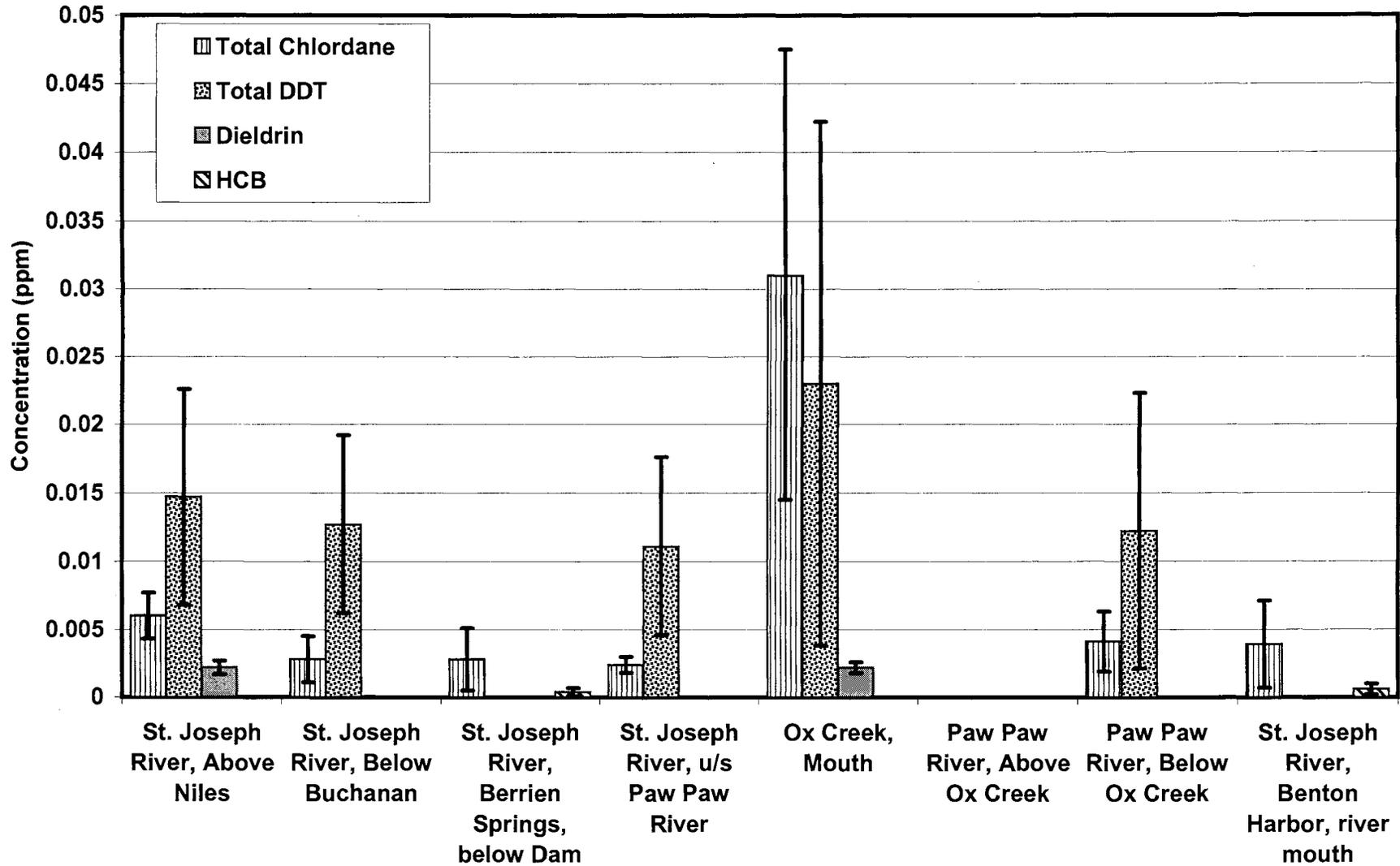


Figure 95. Net uptake of lipid normalized contaminants in St. Joseph River caged fish monitored in 2001. Error bars indicate 95% confidence intervals.

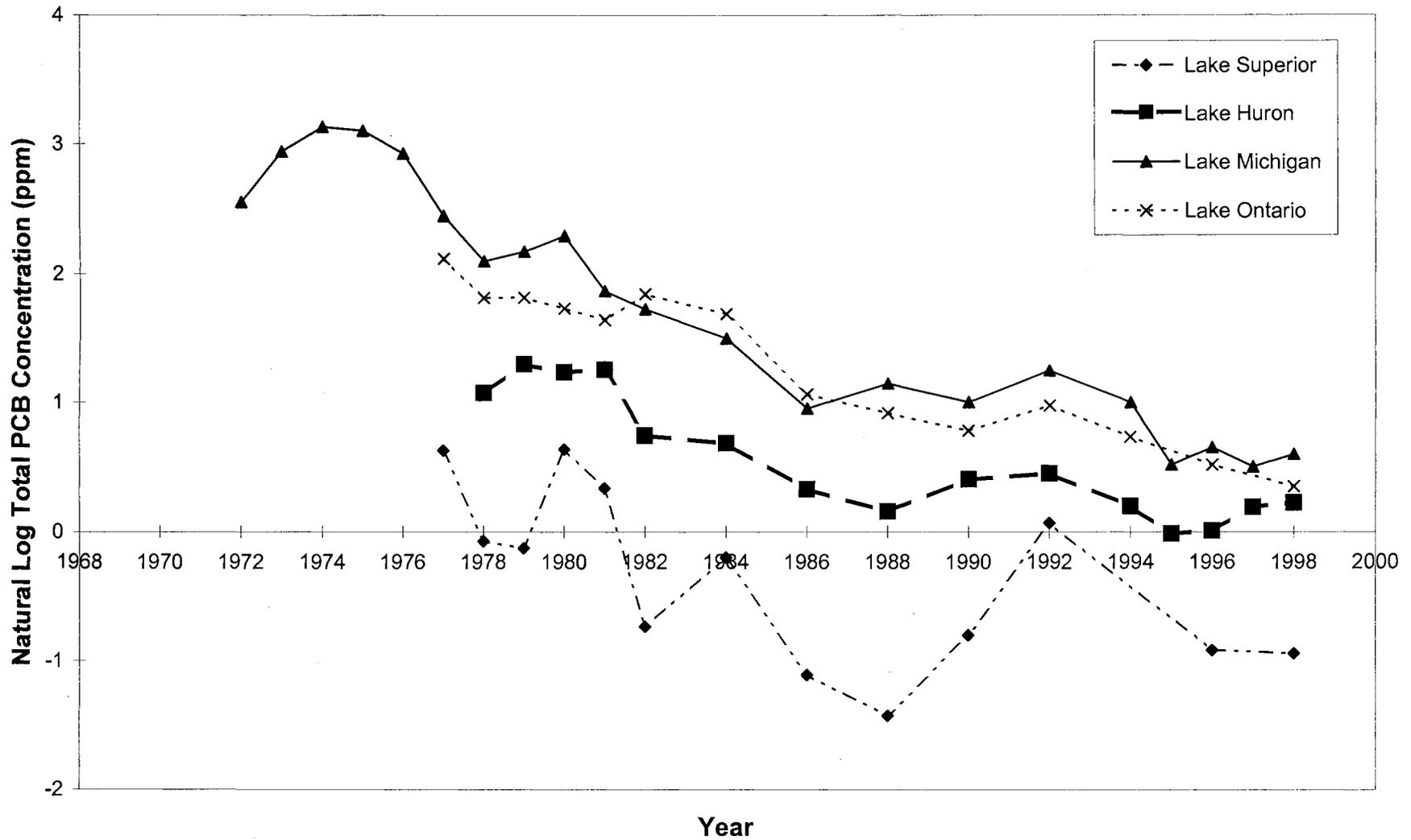


Figure 96. Natural log of average total PCB concentrations in whole lake trout from the Great Lakes, 1970-1998 (DeVault et al. 1996, USEPA unpublished data).

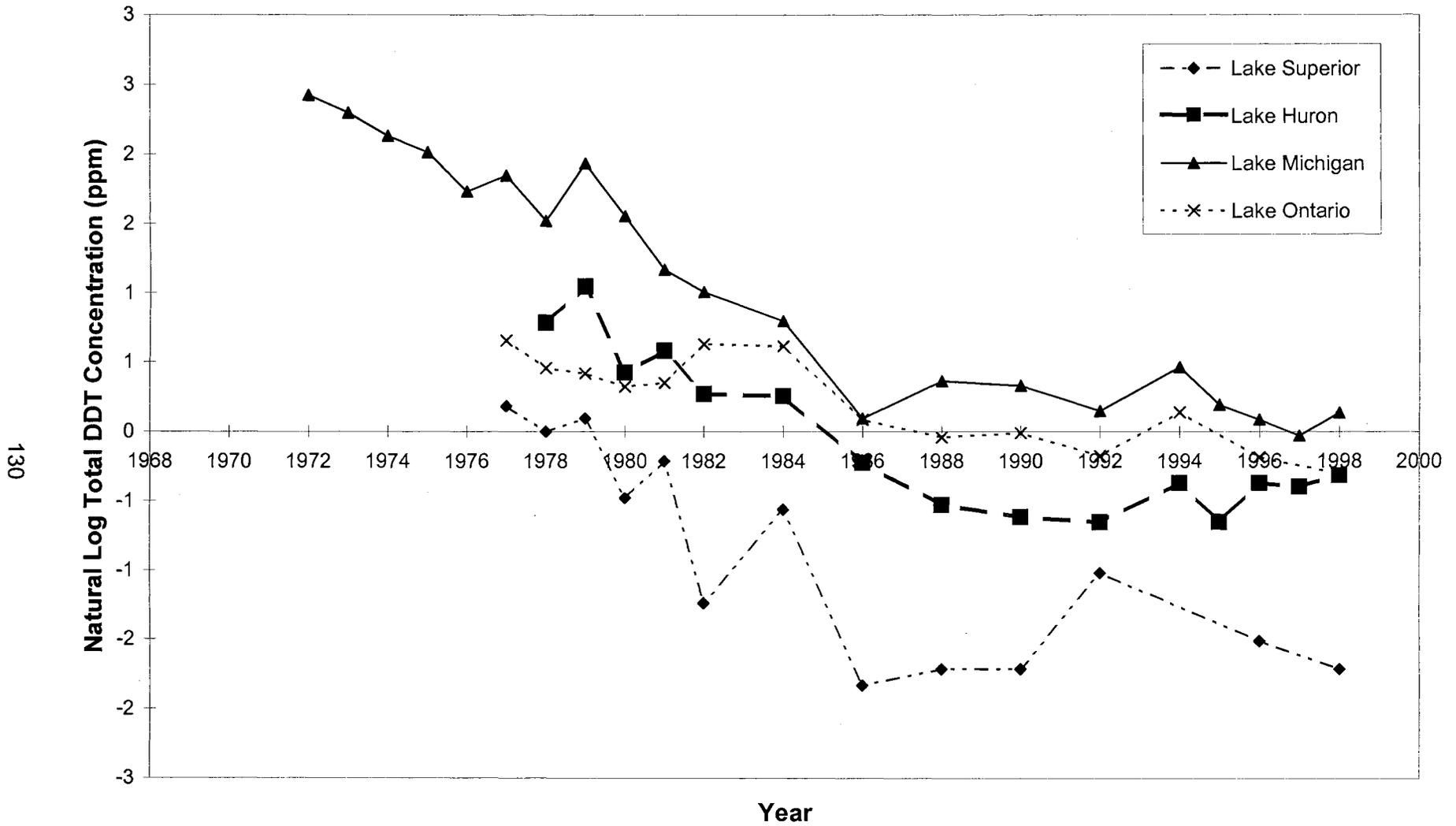


Figure 97. Natural log of average total DDT concentrations in whole lake trout from the Great Lakes, 1970-1998 (DeVault et al. 1996, USEPA unpublished data).

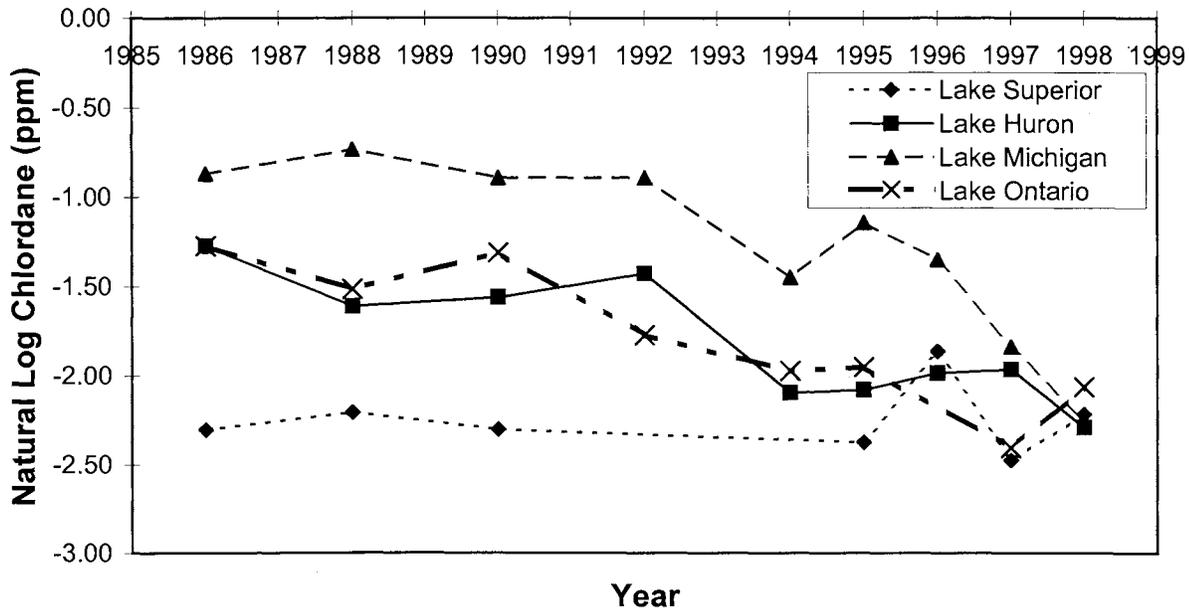


Figure 98. Natural log of average total chlordane concentrations in whole lake trout from the Great Lakes, 1986-1998 (DeVault et al. 1996, USEPA unpublished data).

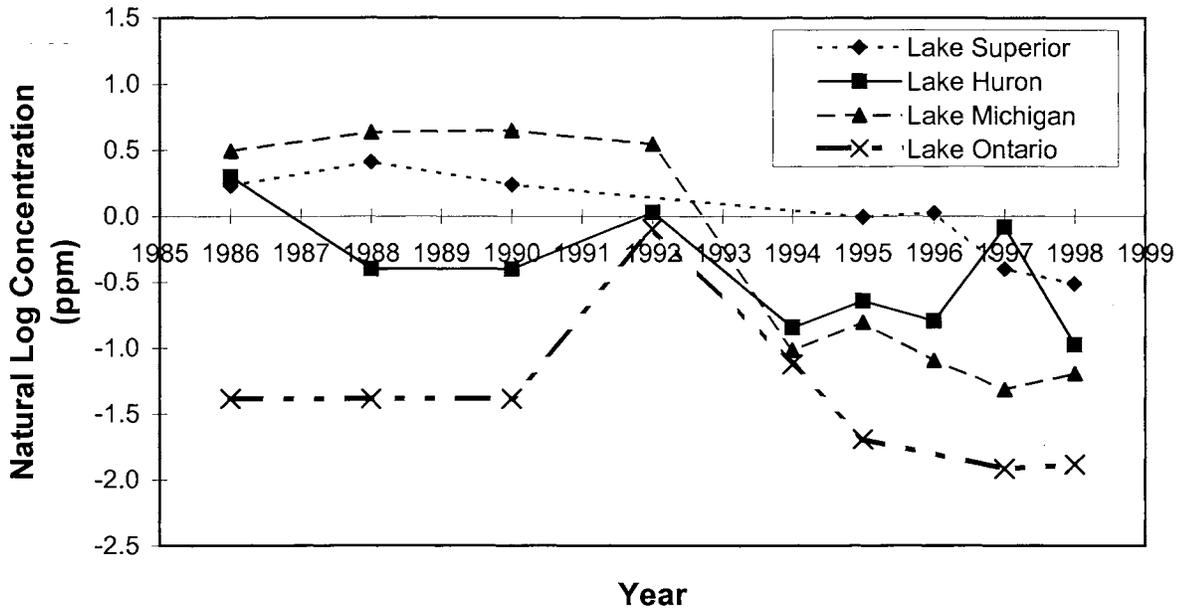


Figure 99. Natural log of average apparent toxaphene concentrations in whole lake trout from the Great Lakes, 1986-1998 (DeVault et al. 1996, USEPA unpublished data). Concentrations were below the quantification level in Lake Ontario fish collected between 1986 and 1990.

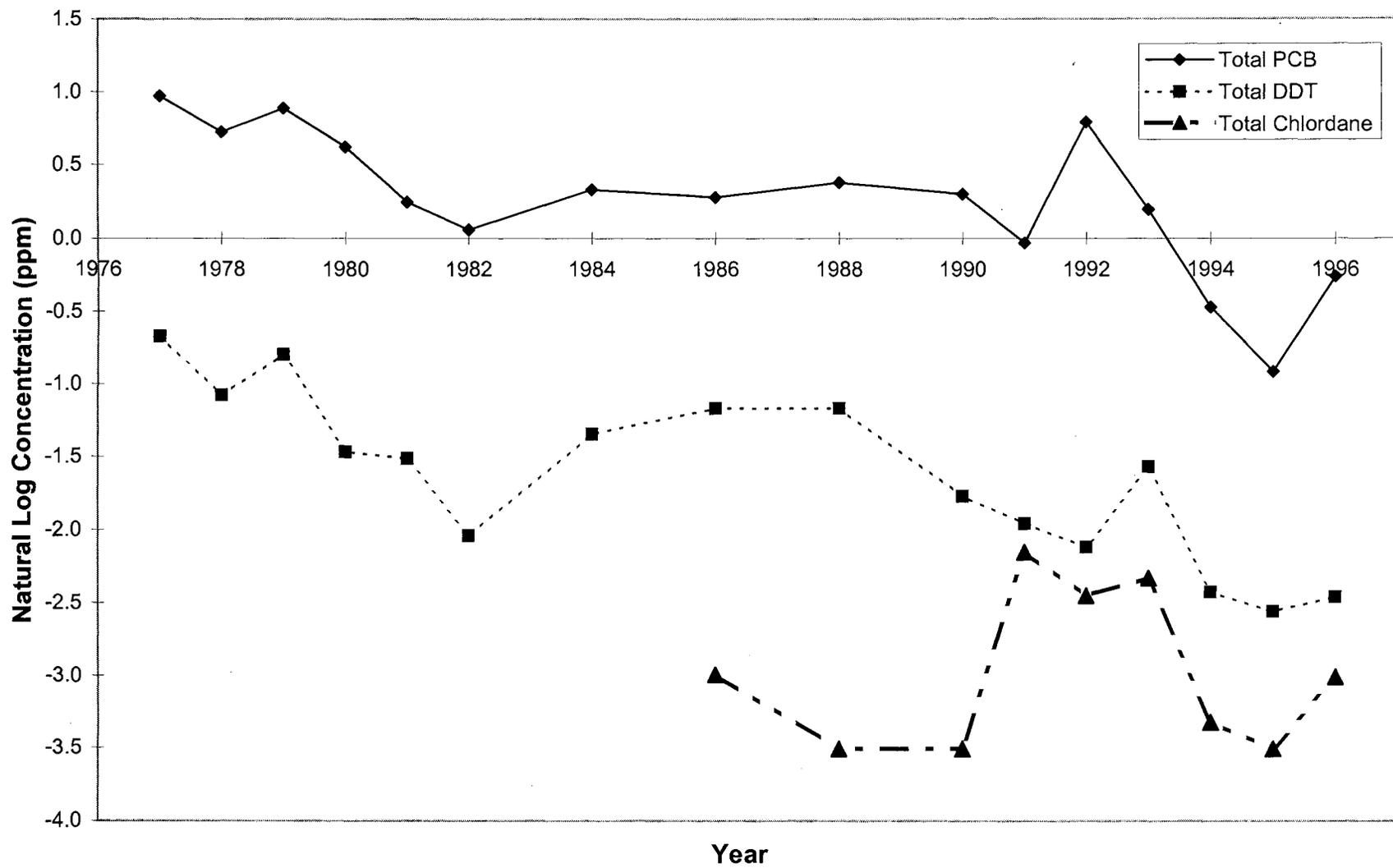


Figure 100. Natural log of average total PCB, total DDT and total chlordane concentrations in whole walleye from Lake Erie, 1986-1996 (DeVault et al. 1996, USEPA unpublished data).

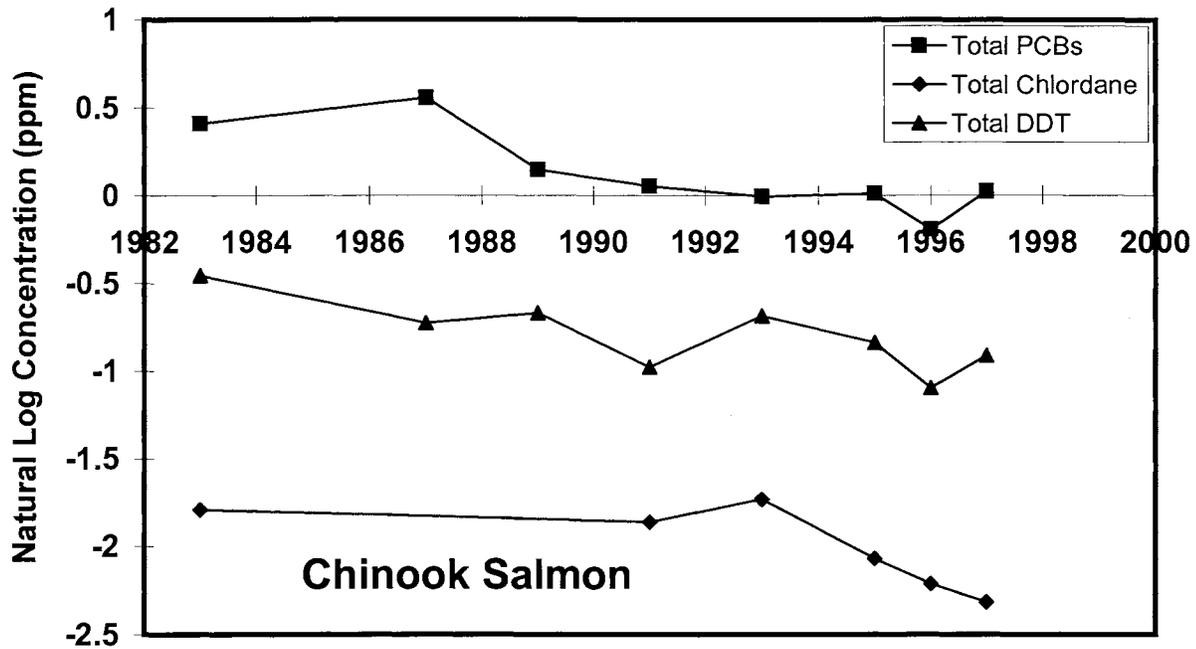
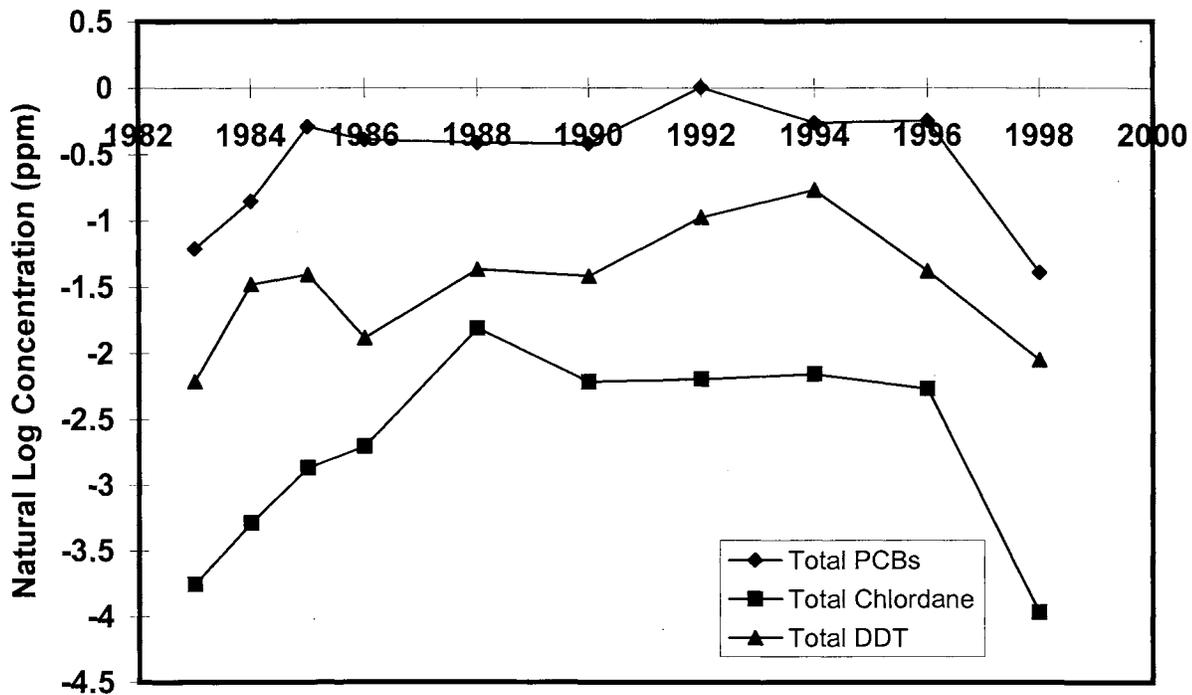


Figure 101. Natural log of average total PCB, total DDT and total chlordane concentrations in coho and chinook salmon fillet samples from Lake Michigan.

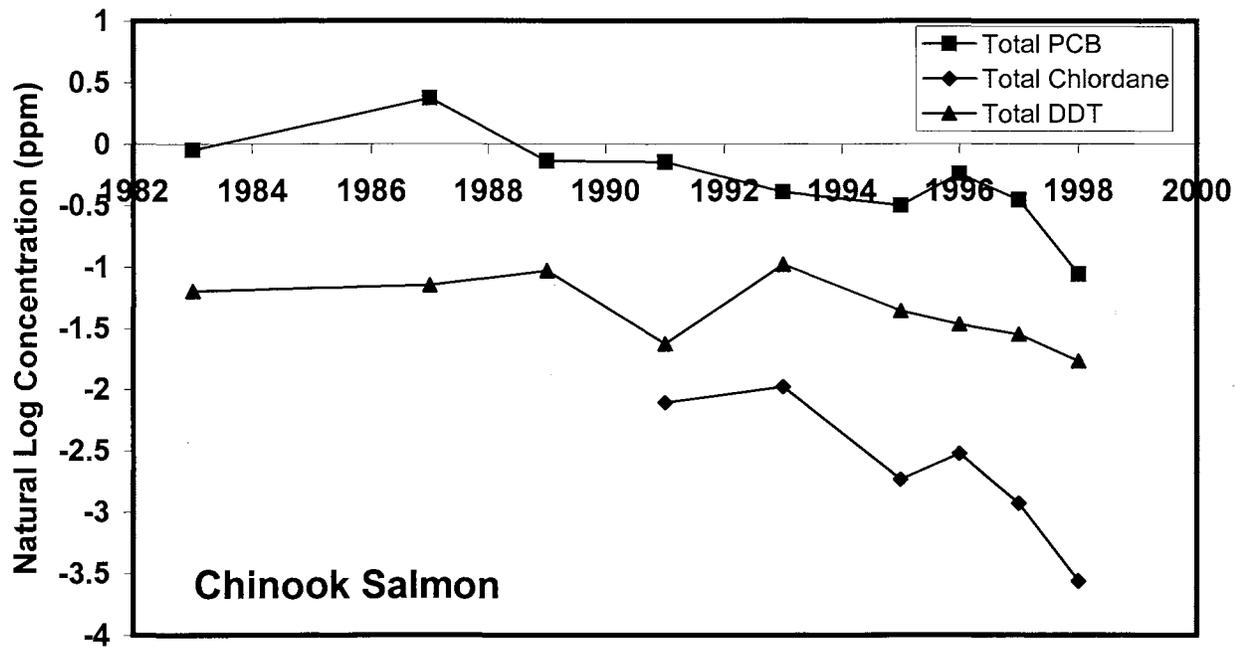
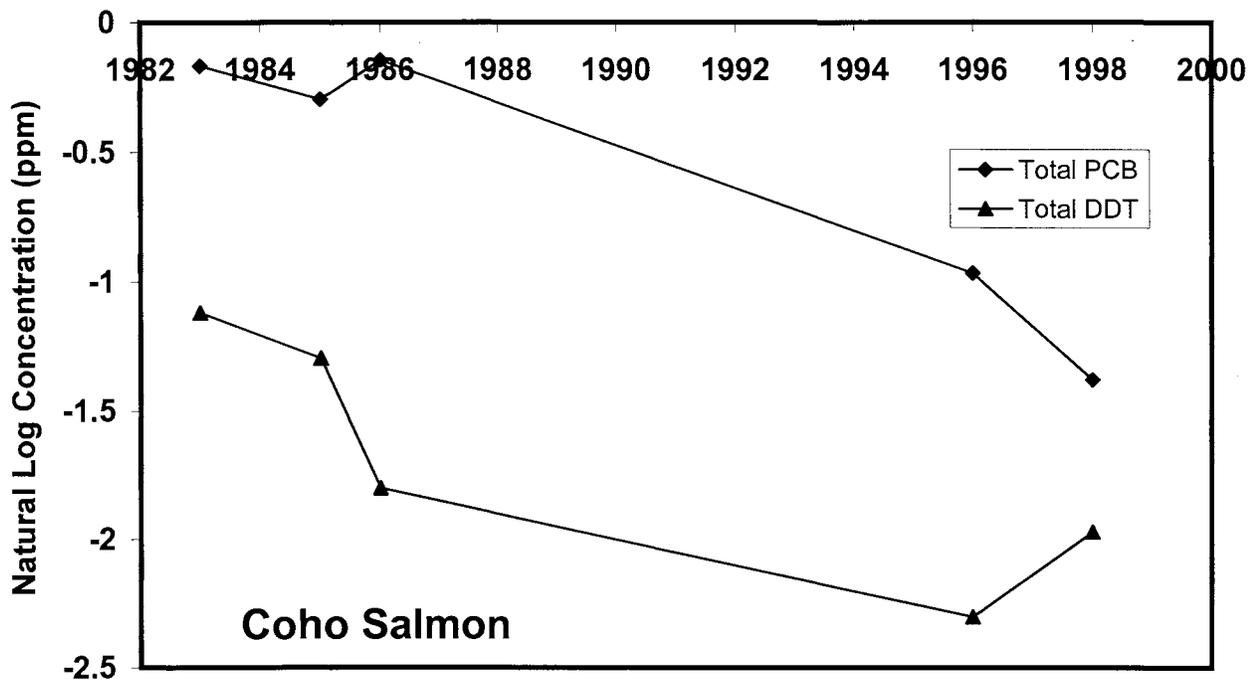
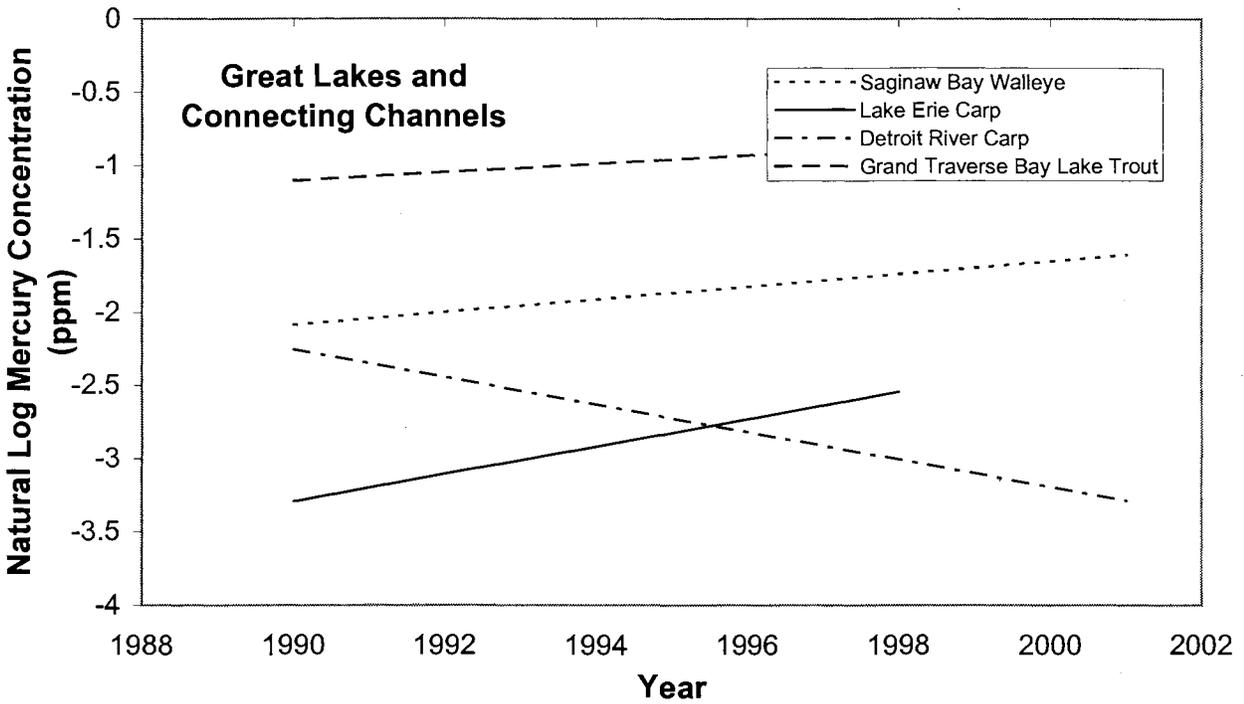
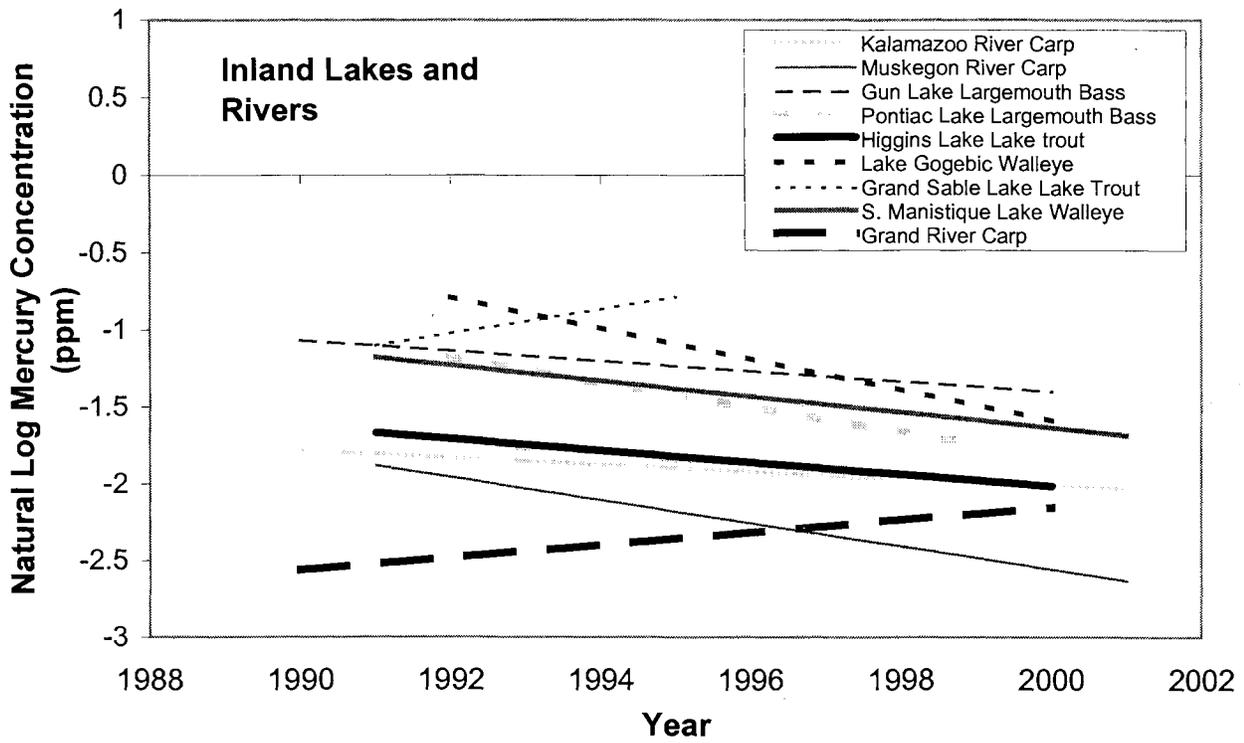
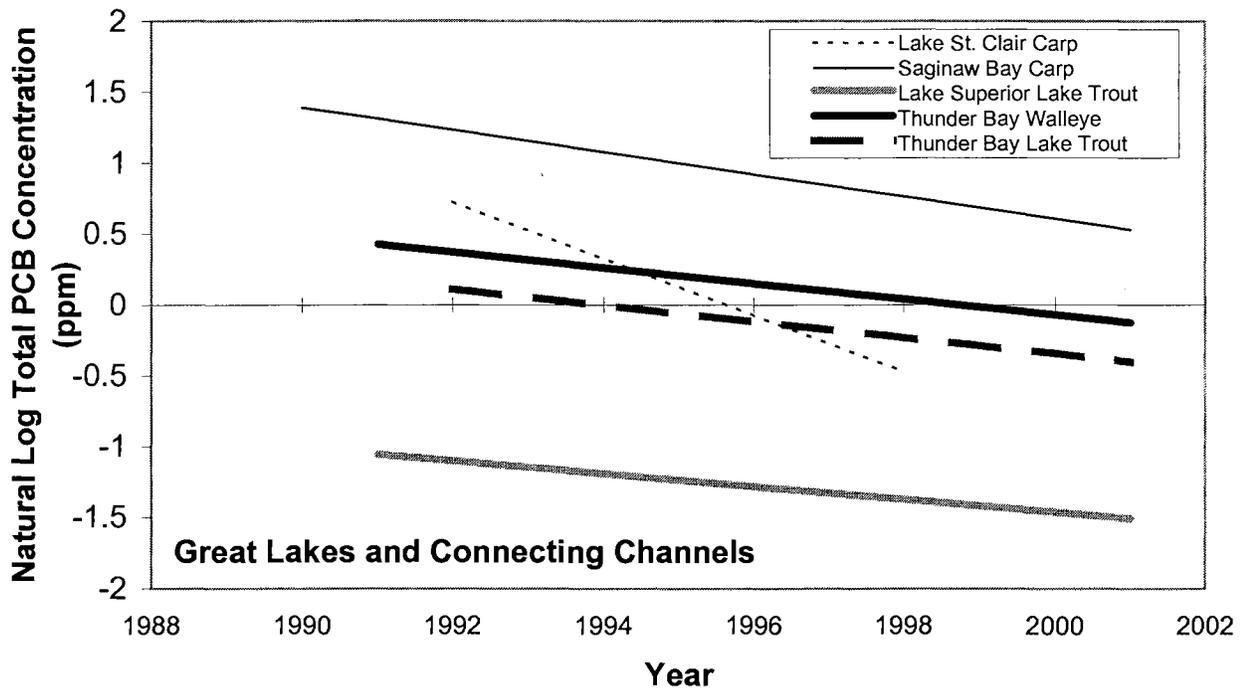
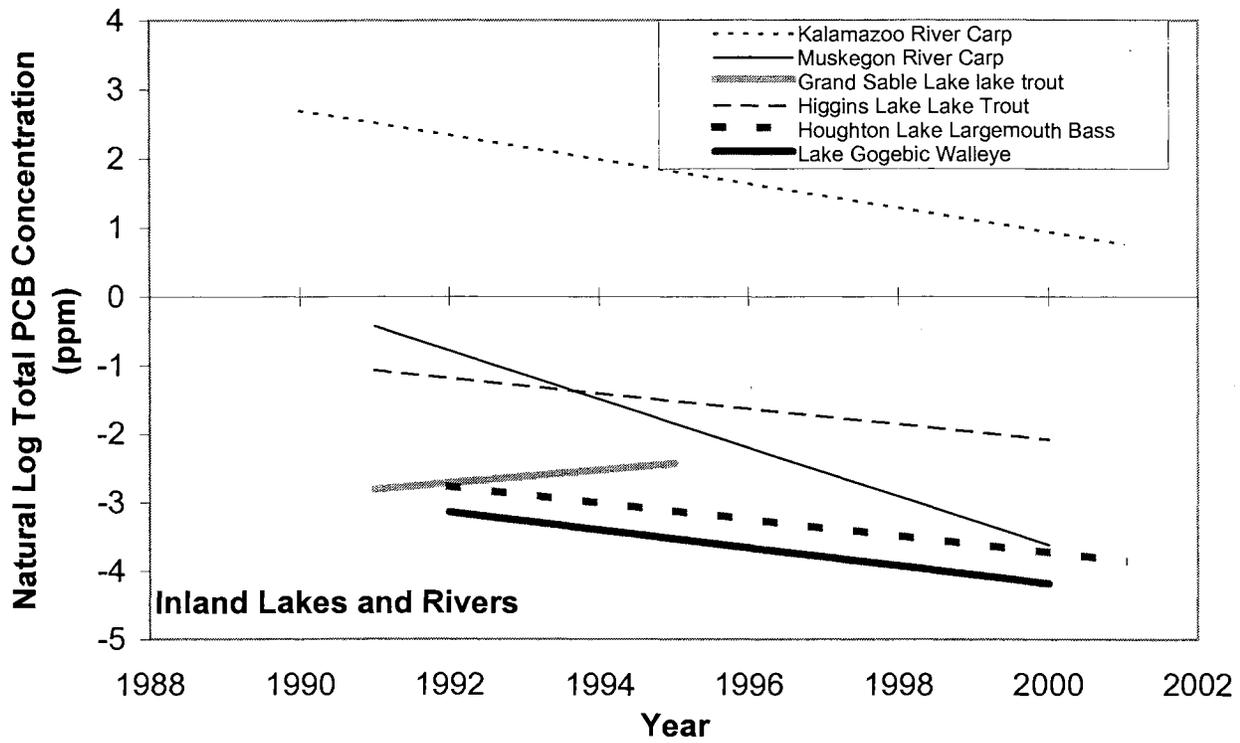


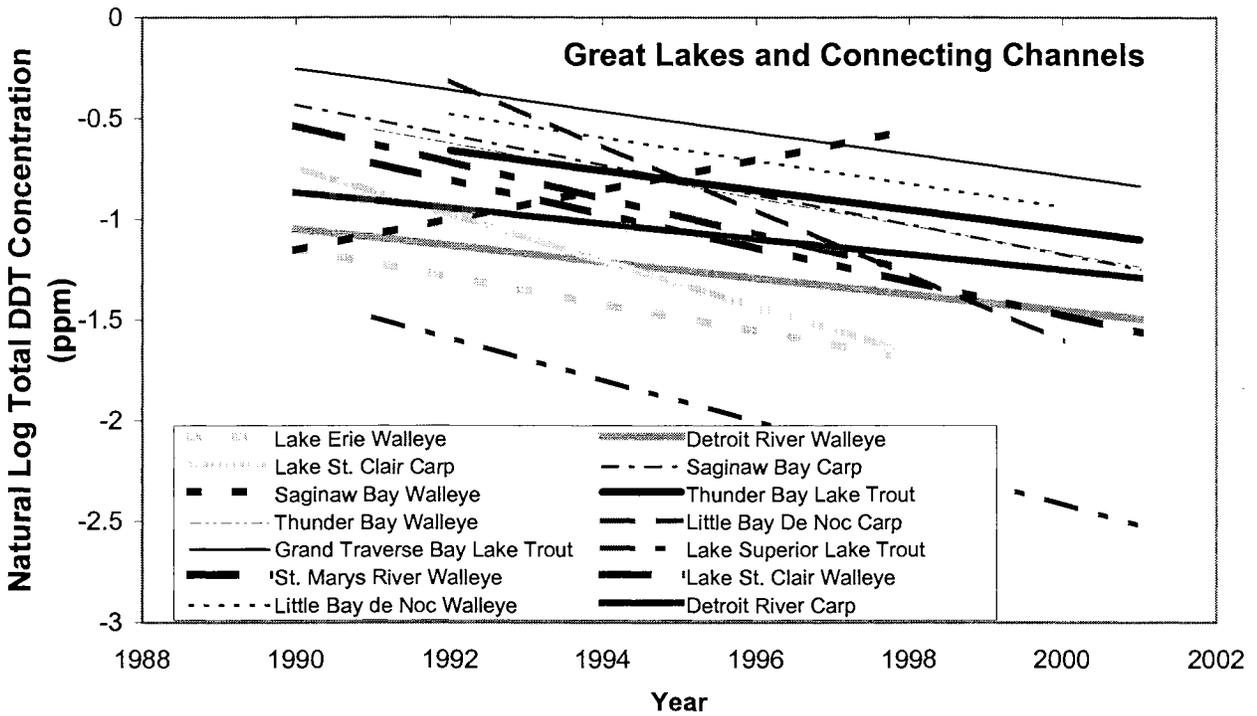
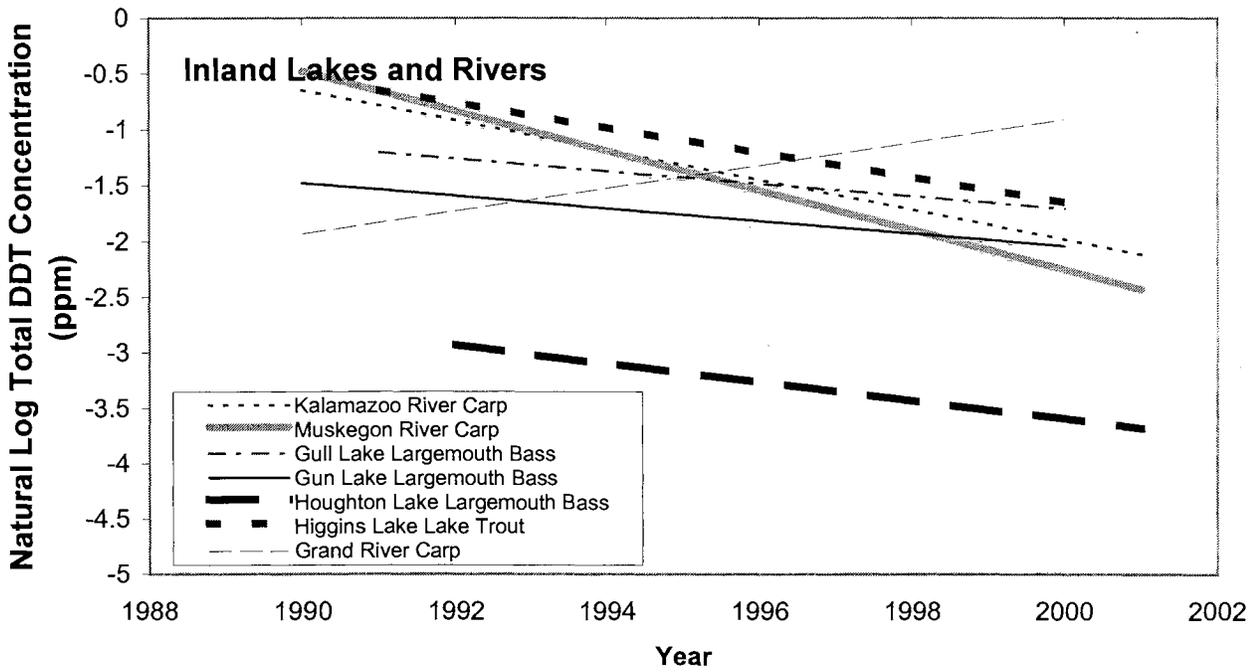
Figure 102. Natural log of average total PCB, total DDT and total chlordane concentrations in coho and chinook salmon fillet samples from Lake Huron.



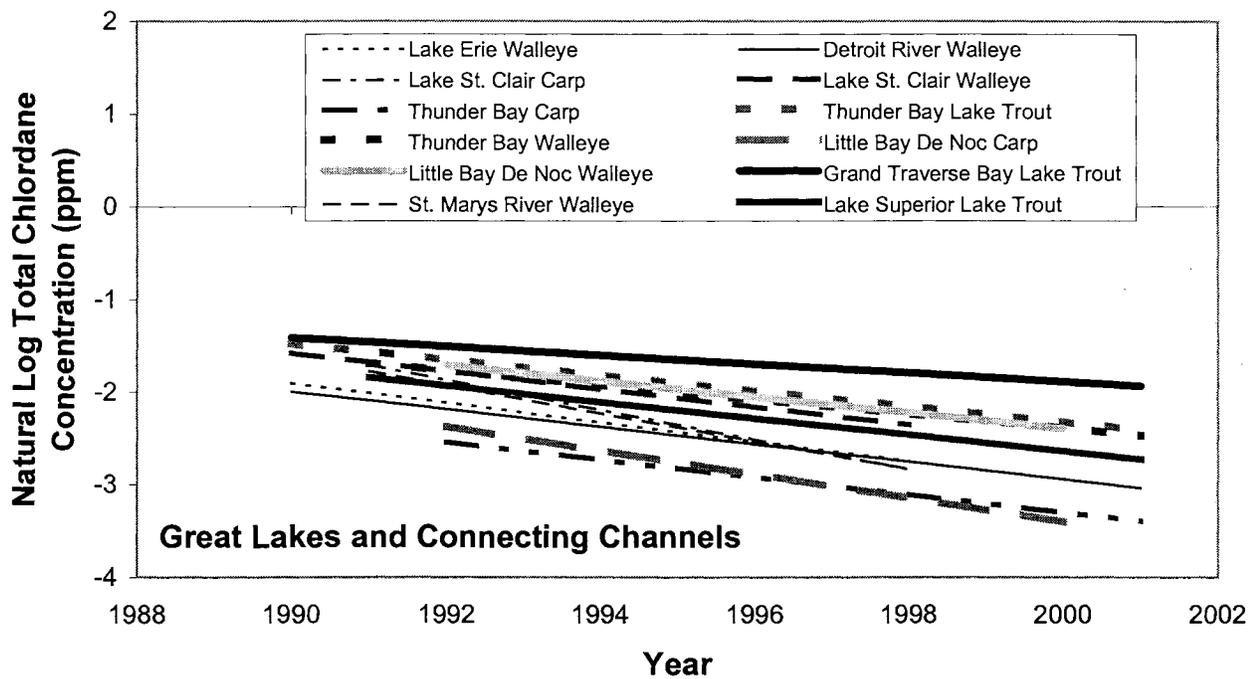
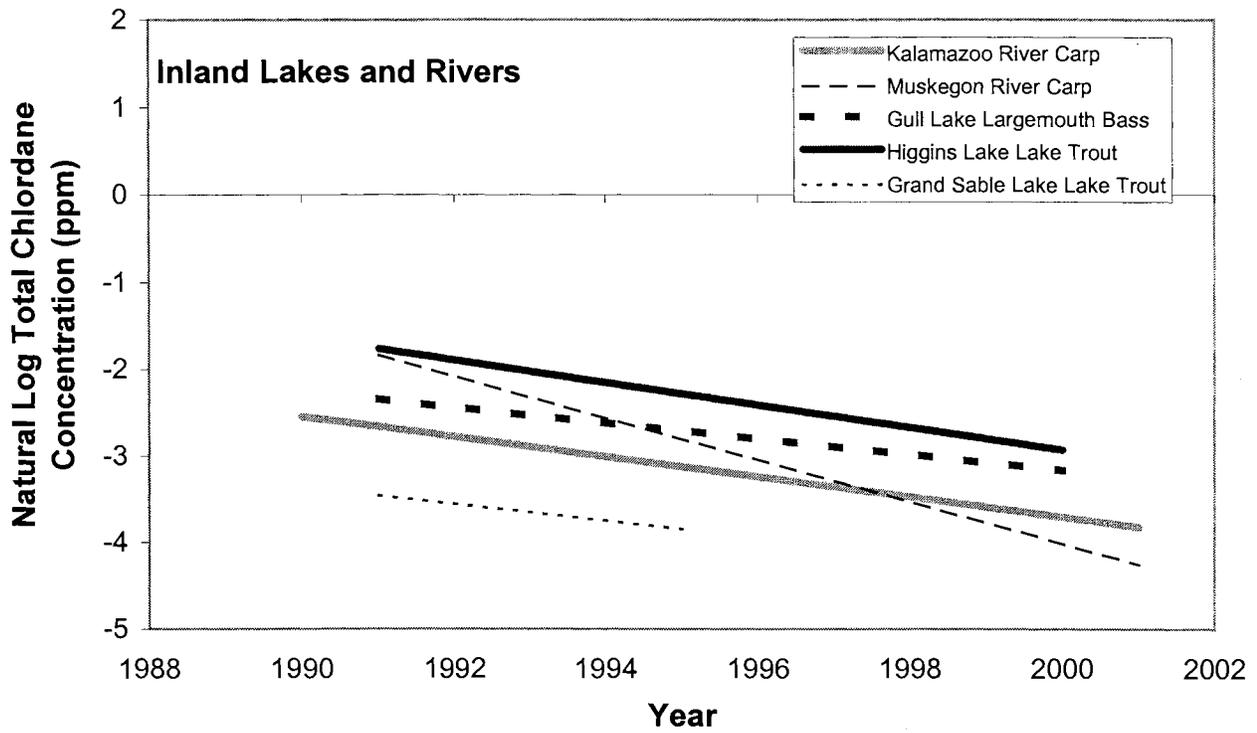
**Figure 103. Changes in mercury concentrations over time at selected whole-fish trend monitoring sites.**



**Figure 104. Changes in total PCB concentrations over time at selected whole-fish trend monitoring sites.**



**Figure 105. Changes in total DDT concentrations over time at selected whole-fish trend monitoring sites.**



**Figure 106. Changes in total chlordane concentrations over time at selected whole-fish trend monitoring sites.**

APPENDIX A

INVENTORY OF FISH CONTAMINANT MONITORING SITES AND SPECIES, 1980-2001



<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Port Huron, river mouth	93003	Aug/31/1993	Channel Catfish
Black River	Sanilac County, Croswell Impoundment	89017	Apr/20/1989	Carp

Waterbody	Location	Visit ID#	Date	Species
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
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
Brevooort Lake	Mackinac County	89033	May/01/1989	Rock Bass, Walleye
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	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
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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
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

Waterbody	Location	Visit ID#	Date	Species
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
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

Waterbody	Location	Visit ID#	Date	Species
Flint River	Mott Reservoir	96011	Apr/16/1996	Carp, Walleye
Flint River	Saginaw County, river mouth	88022	Aug/02/1988	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	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
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

Waterbody	Location	Visit ID#	Date	Species
Grand River	Moores River Impoundment	89054	Jul/27/1989	Channel Catfish, Largemouth Bass, Northern Pike, Smallmouth Bass, Walleye
Grand River	Moores 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
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
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
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
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	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	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
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

Waterbody	Location	Visit ID#	Date	Species
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, Flth. 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
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

Waterbody	Location	Visit ID#	Date	Species
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, 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
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	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

Waterbody	Location	Visit ID#	Date	Species
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 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/Ontoganon County	85062	Jul/30/1985	Walleye, White Sucker
Lake Gogebic	Gogebic/Ontoganon County	92043	May/05/1992	Walleye
Lake Gogebic	Gogebic/Ontoganon County	94028	Apr/29/1994	Walleye
Lake Gogebic	Gogebic/Ontoganon County	97020	May/04/1997	Walleye, Yellow Perch
Lake Gogebic	Gogebic/Ontoganon County	2000031	Apr/18/2000	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
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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

Waterbody	Location	Visit ID#	Date	Species
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
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	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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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

Waterbody	Location	Visit ID#	Date	Species
Lake Michigan	Green Bay	1999032	Aug/02/1999	Lake Whitefish
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 Manistee River Weir	85021	Sep/09/1985	Brown Trout
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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

Waterbody	Location	Visit ID#	Date	Species
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	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
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	Keewenaw Bay	91024	May/01/1991	Lake Trout
Lake Superior	Keewenaw Bay	93055	May/03/1993	Lake Trout
Lake Superior	Keewenaw Bay	96035	May/23/1996	Lake Trout
Lake Superior	Keewenaw Bay	1999039	May/13/1999	Lake Trout
Lake Superior	Keewenaw Bay	2001078	Apr/30/2001	Lake Trout
Lake Superior	Keewenaw Bay, Keystone Point	92073	Jul/31/1992	Ciscowet, Lake Whitefish
Lake Superior	Keewenaw Bay, L'Anse Bay	89029	Apr/24/1989	Lake Trout
Lake Superior	Keewenaw Bay, Traverse Island	91060	May/01/1991	Lake Trout
Lake Superior	Keewenaw 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

Waterbody	Location	Visit ID#	Date	Species
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	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
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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, 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
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
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

Waterbody	Location	Visit ID#	Date	Species
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
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 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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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
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
Pickereel Lake	Dickinson County	87082	Sep/24/1987	Largemouth Bass, Northern Pike
Pickereel 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

Waterbody	Location	Visit ID#	Date	Species
Pine River	Below Alma Dam	97060	Jul/29/1997	Carp, Largemouth Bass
Pine River	Gordonville Road	2000070	Jul/20/2000	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
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	M-46	1999050	Jun/24/1999	Channel Catfish
Pine River	M-46	2000067	Jul/20/2000	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	WWTP Bridge	1999052	Jun/24/1999	Channel Catfish
Pine River	WWTP Bridge	2000069	Jul/20/2000	Channel Catfish
Platte River	Burnt Mill Road, Benzie County	1998087	Aug/05/1998	Brown Trout, White Sucker
Pium 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
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	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

Waterbody	Location	Visit ID#	Date	Species
Portage Lake	Houghton County	88016	Aug/04/1988	Brown Trout, Northern Pike, Walleye
Portage Lake	Houghton County	1998151	Sep/15/1998	Walleye, White Sucker
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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, Elisa Howell Park	87031	Jun/17/1987	White Sucker
Rouge River	Wayne County, Elisa Howell Park	94015	Sep/13/1994	White Sucker
Rouge River, Lower Branch	Wayne County, Gullely Road	87025	Jun/16/1987	Carp
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	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	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	Zilwaukee Bridge	1998098	Sep/04/1998	Channel Catfish
Sand Lake	Newaygo County	92058	May/22/1992	Black Crappie, Largemouth Bass

Waterbody	Location	Visit ID#	Date	Species
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	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	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
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
Six Mile Lake	Houghton County	95012	May/16/1995	Bluegill, Walleye

Waterbody	Location	Visit ID#	Date	Species
Smokey Lake	Iron County	86056	Oct/07/1986	Lake Trout, Rock Bass, Smallmouth Bass, White Sucker
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	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
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	Constantine Impoundment	1998110	Jun/24/1998	Channel Catfish, Redhorse Sucker
St. Joseph River	St. Joseph County, Constantine	92031	Apr/02/1992	Carp, Walleye

Waterbody	Location	Visit ID#	Date	Species
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	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

Waterbody	Location	Visit ID#	Date	Species
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	Mouth	1998119	Sep/04/1998	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	88023	Aug/02/1988	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
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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



<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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
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
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 Gogebic	Gogebic/Ontoganon County	92043	May/05/1992	Walleye
Lake Gogebic	Gogebic/Ontoganon County	94028	Apr/29/1994	Walleye
Lake Gogebic	Gogebic/Ontoganon County	97020	May/04/1997	Walleye, Yellow Perch
Lake Gogebic	Gogebic/Ontoganon County	2000031	Apr/18/2000	Walleye
Lake Huron	Saginaw Bay	90063	Apr/24/1990	Carp, Walleye

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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 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 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
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
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Pontiac Lake	Oakland County	1999056	Apr/06/1999	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. 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. 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



<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Port Huron, river mouth	93003	Aug/31/1993	Channel Catfish
Cass River	Saginaw County, M-13	88025	Aug/02/1988	Channel Catfish
Chippewa River	9 Mile Road	2000004	Jul/20/2000	Channel Catfish
Chippewa River	Nature Center	2000005	Jul/25/2000	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
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
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

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Grand River	Upstream Jackson, Reed Road	2001013	Jul/23/2001	Channel Catfish
Huron River	Rockwood, river mouth	91012	Sep/06/1991	Channel Catfish
Huron River	Rockwood, river mouth	96015	Aug/20/1996	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	Soo Line RR Bridge	90028.2	Sep/24/1990	Channel Catfish
Menominee River	Menominee, river mouth	93039	Jun/30/1993	Channel Catfish
Muskegon River	Muskegon, river mouth	90020	Aug/07/1990	Channel Catfish
Muskegon River	Muskegon, river mouth	93042	Jul/01/1993	Channel Catfish
Ontonagon River	Ontonagon, river mouth	92008	Aug/04/1992	Channel Catfish
Ox Creek	Mouth	2001092	Jul/30/2001	Channel Catfish
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	Harrison Road	1999049	Jun/24/1999	Channel Catfish
Pine River	Harrison Road	2000066	Jul/20/2000	Channel Catfish
Pine River	M-46	1999050	Jun/24/1999	Channel Catfish
Pine River	M-46	2000067	Jul/20/2000	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	WWTP Bridge	1999052	Jun/24/1999	Channel Catfish
Pine River	WWTP Bridge	2000069	Jul/20/2000	Channel Catfish

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Saginaw County, Saginaw	88021	Aug/01/1988	Channel Catfish
Saginaw River	upstream of Middle Ground Isle	1998097	Sep/04/1998	Channel Catfish
Saginaw River	Zilwaukee Bridge	1998098	Sep/04/1998	Channel Catfish
Shiawassee River	Mouth	1998099	Sep/04/1998	Channel Catfish
Shiawassee River	Saginaw County, Miller Road	88024	Aug/18/1988	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	Midland County, Smiths Road	2000095	Jul/20/2000	Channel Catfish
Tittabawassee River	Mouth	1998119	Sep/04/1998	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	88023	Aug/02/1988	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  
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Waterbody	Location	Visit ID#	Date	Species
Big Shag Lake	Marquette County	2001003	May/01/2001	Northern Pike
Bob Lake	Houghton County	2001134	Oct/03/2001	Walleye
Burt Lake	Cheboygan County	2001005	Oct/10/2001	Walleye, White Sucker
Cary Lake	Branch County	2001140	Oct/02/2001	Largemouth Bass, White Sucker
Chicagon Lake	Iron County	2001007	Nov/22/2000	Lake Whitefish
Clinton River	Mt. Clemens, VFW Hall	2001116	Aug/29/2001	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
Deer Lake	Marquette County	2001008	May/01/2001	Northern Pike, Walleye, Yellow Perch
Detroit River	Grassy Island	2001009	Oct/18/2001	Carp, Walleye
Detroit River	Grassy Island	2001010	Oct/30/2001	Walleye
Flat River	Lowell	2001017	Jul/23/2001	Channel Catfish
Goose Lake	Marquette County	2001011	May/01/2001	Northern Pike, Walleye, Yellow Perch
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	Eaton Rapids, Gale Road/Waverly Road	2001021	Oct/03/2001	Carp, Largemouth Bass, Walleye, White Sucker
Grand River	Grand Haven, river mouth	2001020	Jul/23/2001	Channel Catfish
Grand River	M-21	2001018	Jul/23/2001	Channel Catfish
Grand River	Upstream Jackson, Reed Road	2001013	Jul/23/2001	Channel Catfish
Houghton Lake	Roscommon County	2001026	Oct/11/2001	Largemouth Bass
Kalamazoo River	Above Otsego City Dam	2001049	Sep/20/2001	Carp, Smallmouth Bass
Kalamazoo River	Ceresco Impoundment, 12 Mile Road	2001042	Oct/11/2001	Carp, Smallmouth Bass
Kalamazoo River	City of Allegan Dam	2001052	Sep/17/2001	Carp, Smallmouth Bass
Kalamazoo River	Kalamazoo Lake	2001055	Oct/03/2001	Carp, Channel Catfish, Smallmouth Bass
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	2001043	Aug/17/2001	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Mosel Avenue	2001046	Sep/25/2001	Smallmouth Bass
Kalamazoo River	New Richmond	2001054	Oct/16/2001	Carp, Flathead 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
Kawkawlin River	Route 13 (S. Huron Road)	2001127	Jul/23/2001	Channel Catfish
Kawkawlin River	Wheeler Road	2001128	Jul/23/2001	Channel Catfish
Klinger Lake	St. Joseph County	2001145	Aug/22/2001	Largemouth Bass
Lake Huron	Saginaw Bay	2001059	Aug/22/2001	Carp
Lake Huron	Thunder Bay	2001061	Jul/02/2001	Carp
Lake Huron	Thunder Bay	2001062	Jun/13/2001	Carp, Lake Trout, Walleye
Lake Michigan	Grand Traverse Bay	2001065	Aug/15/2001	Lake Trout
Lake Michigan	Northern Lake Michigan	2001132	Oct/31/2001	Burbot
Lake Orion	Oakland County	2001071	May/01/2001	Carp, Largemouth Bass

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Lake Paradise	Emmet County	2001073	Oct/09/2001	Largemouth Bass, Smallmouth Bass, White Sucker
Lake St. Clair	Michigan waters	2001077	Jun/26/2001	Carp, Muskellunge, Smallmouth Bass, Walleye
Lake Superior	Keweenaw Bay	2001078	Apr/30/2001	Lake Trout
Lake Superior	Keweenaw Bay, Traverse Island	2001079	Jun/08/2001	Ciscowet
Long Lake	St. Joseph County	2001142	Nov/19/2001	Brown Bullhead, Largemouth Bass
Menominee River	Menominee, river mouth	2001146	Oct/10/2000	Lake Sturgeon
Muskegon Lake	Muskegon County	2001082	Sep/13/2001	Largemouth Bass, Smallmouth Bass
Norvell Lake	Jackson County	2001084	Oct/17/2001	Carp, Largemouth Bass
Ox Creek	Mouth	2001092	Jul/30/2001	Channel Catfish
Palmer Lake	St. Joseph County	2001141	Aug/30/2001	Largemouth Bass
Paw Paw River	Above Ox Creek	2001093	Jul/30/2001	Channel Catfish
Paw Paw River	Below Ox Creek	2001094	Jul/30/2001	Channel Catfish
Portage Creek	Bryant Mill Pond	2001044	Aug/29/2001	Carp, White Sucker
Portage Creek	Monarch Pond	2001045	Oct/17/2001	Carp
Red Cedar River	Mouth	2001015	Jul/23/2001	Channel Catfish
Red Cedar River	MSU	2001096	Apr/27/2001	Carp, Northern Pike, Rock Bass
Rouge River, Middle Branch	Newburgh Lake	2001097	Oct/30/2001	Carp, Channel Catfish, Largemouth Bass, White Sucker
Rouge River, Middle Branch	Phoenix Lake	2001098	Oct/30/2001	Carp, Channel Catfish, Northern Pike
Ruddiman Creek	Lagoon	2001131	Sep/13/2001	Carp, Largemouth Bass
South Manistique Lake	Mackinac County	2001099	Nov/11/2001	Walleye
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	2001087	Jul/30/2001	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	2001091	Jul/30/2001	Channel Catfish
St. Joseph River	Berrien Springs, below Dam	2001089	Jul/30/2001	Channel Catfish
St. Marys River	Munuscong Bay	2001102	Apr/23/2001	Walleye
Stanley Lake	Iron County	2001143	Sep/10/2001	Walleye
Stoney Creek Hatchery	Caged Fish Control Station	2001027	Jul/25/2001	Channel Catfish
Stoney Creek Hatchery	Caged Fish Control Station	2001114	Aug/29/2001	Channel Catfish
Stoney Creek Hatchery	Caged Fish Control Station	2001126	Jun/25/2001	Channel Catfish
Sudden Lake	Ontonagon County	2001144	Oct/03/2001	Walleye
Thornapple River	Mouth	2001019	Jul/23/2001	Channel Catfish
Torch Lake	Antrim County	2001110	Oct/08/2001	Lake Whitefish, Yellow Perch
Vermilac Lake	Baraga County	2001135	Oct/04/2001	Walleye
White Lake	Oakland Co.	2001111	Oct/18/2001	Brown Bullhead, Rock Bass