

MI/DEQ/WB-06/091

MICHIGAN FISH CONTAMINANT MONITORING PROGRAM  
2005 ANNUAL REPORT

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## SECTION 1.0

### INTRODUCTION

The Michigan Department of Environmental Quality (MDEQ), Water Bureau (WB), has analyzed over 17,000 fish tissue samples collected since 1980. The MDEQ, WB, conducts fish contaminant monitoring to address four goals. The first goal is to support the development of the Michigan Department of Community Health's (MDCH's) *Michigan Fish Advisory*. Edible portion sample results are used by the MDCH to issue general and specific advisories against eating certain sport fish from Michigan's surface waters. The second goal is to support the regulation of commercial fisheries in the waters of the state. The Michigan Department of Agriculture (MDA) uses edible portion monitoring results to regulate sales of the commercial catch. The third goal of the fish contaminant monitoring is to identify spatial differences and temporal trends in the quality of Michigan's surface waters. Temporal trends and spatial differences are examined by collecting whole fish and caged fish samples in addition to the edible portion samples. Finally, the fourth goal is to evaluate whether existing pollution prevention, regulatory, and remedial programs are effectively reducing chemical contamination in the aquatic environment. To achieve this goal, fish tissue samples are used to identify waters that are attaining or not attaining the designated uses described in Michigan's Water Quality Standards (WQS), 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. Even the presence of extremely low concentrations of some bioaccumulative pollutants in surface water can result in fish tissue concentrations that pose a human or wildlife health risk.

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

Fish contaminant data are presented annually in staff reports. The objectives of the Michigan Fish Contaminant Monitoring Program 2005 Annual Report (2005 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 water bodies monitored in 2004, that are not meeting the designated fish consumption use described in the WQS, and identify contaminant trends where possible.
2. Summarize the results of whole fish tissue analyses and identify any spatial or temporal contaminant trends.
3. Identify spatial or temporal trends that can be attributed to specific pollution control activities.

Prior to 1986, Michigan conducted fish contaminant studies on a demand basis primarily to address specific problems. In 1986, a comprehensive program was initiated to assess the degree of chemical contamination in fish from the surface waters of the state. Michigan's fish contaminant data are available

online at [www.deq.state.mi.us/fcmp/](http://www.deq.state.mi.us/fcmp/). Also, contaminant data are available in staff reports (MDNR, 1986a, 1986b, and 1989; Duling, 1988; Duling and Benzie, 1989 and 1990; Waggoner, 1991 and 1992; Wood, 1993 and 1994; Wood et. al., 1995; Day and Holden, 1996; Day, 1997, 1998, 1999, and 2002; Day and Walsh, 2000 and 2001; Day, Bohr, and Ramirez, 2004; and Day and Bohr, 2005). In addition, inventories of fish contaminant monitoring locations sampled between 1980 and 2004, are provided in Appendices A, B, and C.

## **SECTION 2.0**

### **METHODS**

The 2005 Annual Report includes the analytical results available by January 15, 2006, for samples collected prior to January 1, 2005, which were not presented in earlier annual reports. A list of water bodies and species included in the 2005 Annual Report is provided in Appendix D. Raw data from these sites are included in Appendix E (available upon request).

A total of 1,595 fish were collected from inland lakes, rivers, and the Great Lakes and connecting channels during calendar year 2004. Many of these fish were combined into composite samples and a total of 1,080 samples were analyzed and included in the 2005 Annual Report. The samples included 22 species collected from 90 locations. Approximately 87 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.

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

The MDNR, Fisheries Division, and the MDEQ, WB, collected the majority of the fish using standard fish sampling techniques determined appropriate for individual water bodies. These techniques included electrofishing, trap nets, gill nets, and trawling. In addition, private consultants and tribal organizations collected samples for the program.

The MDEQ, WB, processed fish in accordance with the Great Lakes and Environmental Assessment Section (GLEAS) 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 2004, 1,006 fish were collected from 64 locations and processed as edible portion samples. These samples included 20 species of fish. The 2004 edible portion sample locations are illustrated in Figure 1. Edible portion sampling was often targeted toward sites of known or suspected contamination, sites popular with sport anglers, and sites with public access.

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

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

A total of 110 fish tissue samples were collected from 9 trend sites in 2004 (Appendix E). Largemouth bass were collected from Houghton Lake; carp were collected from the Detroit, Raisin, and St. Marys Rivers, as well as Lake Huron at Thunder Bay; lake trout were collected from Lake Michigan at Grand Traverse Bay and Good Harbor Reef, Lake Huron at Thunder Bay, and Lake Superior at Keweenaw Bay; and walleye were collected from South Manistique Lake and Lake Huron at Saginaw Bay. All 26 trend sites have been sampled at least 3 times since 1990, except the Manistee, Manistique, and Menominee Rivers. Trend monitoring sites, collection dates, and species are listed in Appendix B.

Since 1990, lake trout, walleye, or largemouth bass were collected from eight inland lake trend monitoring sites (Table 2). Gun, Gull, and South Manistique Lakes were sampled six times; Pontiac Lake, Lake Gogebic, and Higgins Lake were sampled five times; Houghton Lake was sampled five times; and Grand Sable Lake was sampled three times.

Whole carp or redhorse sucker were collected from eight river trend monitoring sites since 1990 (Table 2). The Kalamazoo River was monitored seven times; the Muskegon River was monitored six times; the St. Joseph and Grand Rivers were monitored five times; the Raisin River was monitored five times; the Manistee, Manistique, and Menominee Rivers were each monitored two times.

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

## **2.2 CAGED FISH BIOCONCENTRATION STUDIES**

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

The MDEQ, WB, performed all caged fish studies in accordance with the 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 four composite samples of whole fish. The remaining channel catfish were held in stainless steel cages at the test sites for 28 days. The fish were removed from the cages and divided into four 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 Boardman, Flat, Flint, Pere Marquette, Rabbit, and St. Joseph Rivers watersheds in 2003. The results were not available for inclusion in the 2004 Annual Report and are included in this report. The results of the 2004 caged fish studies conducted in Little Black Creek, Raisin River, and the South Branch of the Shiawassee River are also included here. Clean Michigan Initiative funds were used to support analyses of caged fish tissue samples at a contract laboratory, Research Productivity Council.

Three sites were monitored in the Boardman River (Figure 3). Six sites were monitored in the Flat River (Figure 4). Eleven sites were monitored in the Flint River watershed, including three sites in Thread Creek and one site in Swartz Creek (Figure 5). Three sites were monitored in Little Black Creek, Muskegon County, in the City of Muskegon (Figure 6). Eight sites were monitored in the Pere Marquette watershed, including one site in the Little South Branch Pere Marquette River, one in Baldwin River, one in the Big South Branch Pere Marquette River, and one in Weldon Creek (Figure 7). Two sites were monitored in the Rabbit River in Allegan County (Figure 8). Three sites were monitored in Raisin River in Monroe (Figure 9). Five sites were monitored in the South Branch Shiawassee River upstream and

downstream of Howell (Figure 10). Eight sites were monitored in the St. Joseph River, from upstream of Union City in Branch County, to the Michigan/Indiana state line in Berrien County (Figure 11).

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

### **2.3 CHEMICAL ANALYSES**

Fish tissue samples collected in 2004 were analyzed by several laboratories, including the MDCH, Health Risk Assessment Laboratory, Eno River Laboratories (formerly Triangle Laboratories), the University of Minnesota, and the Research Productivity Council. Each of these analytical laboratories has quality assurance programs and use peer-reviewed methods of digestion, extraction, and quantification.

The MDCH, Health Risk Assessment Laboratory, analyzed the majority of the fish tissue samples collected in 2004. A total of 941 samples were submitted for analyses, of which 200 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). The results are summarized in Section 3.1.

Analyses of chlorinated dioxin and dibenzofuran congeners (Table 5) were performed on a subset of edible portion and whole fish tissue samples. Eno River Laboratories analyzed dioxin and dibenzofuran congeners in 101 samples and the results are summarized in Sections 3.1 and 3.3. In addition, the Eno River Laboratories determined coplanar PCB congener (Table 6) concentrations in 58 edible portion fish samples from the Saginaw Bay watershed, and the results are available upon request.

The Research Productivity Council analyzed mercury and organic contaminants in 158 caged fish tissue samples collected in 2003, and 58 samples collected in 2004. The samples were analyzed for the contaminants listed in Table 7, and results are summarized in Section 3.2.

A total of 60 coho salmon and 30 chinook salmon were collected from 6 Lake Huron and Lake Michigan tributaries as part of a Great Lakes trend monitoring program implemented by state and federal agencies. The salmon were combined into 18 edible portion composite samples. These samples were sent to the University of Minnesota for analyses. The results were not available for inclusion in this report.

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

Toxaphene is referred to as "apparent toxaphene" throughout the report. The MDCH, Health Risk Assessment Laboratory, 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, Health Risk Assessment Laboratory, does not report concentrations below the quantification level but above the detection level for mercury and the organic chemicals listed in Table 3. As a result, concentrations of these chemicals that are below the quantification level are coded with a "K" in Appendix E. In these cases, the "K" coded concentrations represent the MDCH, Health Risk Assessment Laboratory'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 Health Risk Assessment Laboratory’s detection level.

## 2.4 SUMMARY STATISTICS

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

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

Total chlordane concentration was estimated by summing the concentrations of five 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 five isomers were below the quantification level, then the total chlordane concentration was reported as less than the quantification level of the individual isomers.

Total dichlorodiphenyltrichloroethane (DDT) concentrations were calculated by summing concentrations of the para, para’ and ortho, para’ forms of the following chemicals: Dichlorodiphenyldichloroethylene (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 six 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 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 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 8). These trigger levels have a variety of origins. The United States Food and Drug Administration developed most of the trigger levels for chlorinated organic chemicals. Dioxin TEQ and mercury trigger levels were developed by the 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. Where possible, 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 either do not often conform to the underlying assumptions of this statistical method or the method does not produce a statistically significant line. In those cases, the appropriate advisory is determined using either median concentrations or the percentage of samples exceeding the trigger level, depending on the contaminant being considered.

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

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

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

The MDCH issues fish consumption advisories based on either linear regression analyses or the percentage of samples that exceed the trigger levels presented in Table 8. The general population is advised to eat no more than 1 meal per week of a fish species when concentrations in more than 10% of the samples from that 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*. When linear regression analysis was not appropriate, the percentage of samples exceeding trigger levels was calculated. The results are presented in Section 3.1.

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

The MDCH uses the United States Food and Drug Administration’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 of a fish species when concentrations in more than 10% of the samples from that 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*. When linear regression analysis was not appropriate, the percentage of samples exceeding trigger levels was calculated. The results are 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 five consumption advisory categories based on concentrations of total PCBs. Fish species and size classes are placed into the consumption advisory categories based on linear regression analyses or median total PCB concentrations. The results are presented in Section 3.1.

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

The MDCH uses two trigger levels to assess the need for fish consumption advisories based on mercury (Table 8). 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. When linear regression analysis was not appropriate, median concentrations were used to place species and size classes into appropriate advisory categories. The results are presented in Section 3.1.

The MDCH advises the general population to eat no more than one 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 one meal per month of fish covered by a “restrict consumption” trigger level.

Finally, the MDCH issued a statewide advisory covering certain predator species from all inland lakes and reservoirs. According to the MDCH, no one should eat more than one meal per week of fish of the following species and sizes: rock bass, yellow perch, or crappies over nine 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 2005 Annual Report includes the analytical results available by January 15, 2005 for edible portion fish samples collected in 2004. A total of 855 edible portion fish tissue samples are summarized in this report. This includes samples from 20 species and 59 locations (Figure 1).

##### 3.1.1 General Highlights

- Several chemicals analyzed were not quantified in any of the fish samples, including aldrin, heptachlorostyrene, hexachlorostyrene, polybrominated biphenyls (PBBs), pentachlorostyrene, and terphenyl. However, the breakdown product of aldrin (i.e., dieldrin) was quantified in fish tissue samples from 20 of 36 locations in which they were analyzed (Table 9).
- Mercury was quantified in every sample analyzed (Table 9). The highest concentrations were found in top predator species from inland lakes or impoundments.
- Dioxin TEQ concentrations were quantified in every sample of the six locations from which samples were analyzed for dioxin and dibenzofuran congeners (Table 9). However, the quantification levels for dioxin and dibenzofuran congeners are three to four orders of magnitude lower than the quantification levels for other organic contaminants (Tables 3 and 5). Therefore, dioxin and dibenzofuran congeners were quantified more frequently than many of the other organic contaminants.
- The maximum concentrations of Dioxin TEQ were found in Lake Huron carp.
- The maximum concentrations of most chlorinated organic contaminants were found in fish from the Great Lakes or locations with access to the Great Lakes (Table 9). White Lake carp had the highest concentrations of several organic contaminants.

##### 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, total chlordane, total DDT, heptachlor+heptachlor epoxide, dieldrin, and mirex trigger levels were not exceeded in any sample analyzed.
- Total PCB concentrations were greater than or equal to the women and children trigger level in 390 of 648 (60%) samples. Concentrations were greater than or equal to the women and children trigger levels in fish from 27 of 37 (73%) locations (Table 10). The 2004 MDCH *Fish Consumption Advisory* includes women and children advisories due to elevated PCBs for all of the 27 locations.
- Total PCB concentrations were greater than or equal to the general population trigger level in 50 of 648 (8%) samples. Concentrations were greater than or equal to the general population trigger level in fish from 13 of 37 (35%) locations (Table 10). The 2004 MDCH *Fish Consumption Advisory* includes general population advisories due to elevated PCB concentrations for all of the 13 locations.
- Mercury concentrations were greater than or equal to the “restrict consumption” trigger level in 97 of 843 (11%) samples from 30 of 58 (52%) locations (Table 11). The 2004 MDCH *Fish Consumption Advisory* includes either statewide or specific advisories due to elevated mercury concentrations for 29 of the 30 locations.
- Mercury concentrations were greater than or equal to the “no consumption” trigger level in 4 of 843 (0.5%) samples from 2 of 58 (3.0%) locations (Table 11). The 2 locations are covered by the statewide mercury advisory.
- Twenty-one of 29 (72%) inland lakes or reservoirs sampled in 2002 and 2003, had 1 or more fish with mercury concentrations greater than or equal to the “restrict consumption” trigger level and 1 of 29 (3.4%) had mercury concentrations greater than or equal to the “no consumption” trigger level. This compares to 71% and 6.8% of the 266 inland lakes and reservoirs, respectively (monitored at least once since 1985).
- Dioxin TEQ concentrations exceeded the trigger level in 14 of 96 (15%) samples from 4 of 7 (57%) locations (Table 12). The 2004 MDCH *Fish Consumption Advisory* includes an advisory based on dioxin at 6 of the 7 locations.

### 3.1.2.2 Lake Erie Watershed

#### Lake Erie, Western Basin, Monroe County (ID 2004043)

#### *Walleye, White Bass, and White Perch*

Existing MDCH Advisory: Women and children should eat no more than 1 meal per week of walleye less than 22 inches and no more than 1 meal per month greater than 22 inches due to elevated concentrations of PCBs. Women and children should eat no more than 1 meal per month of white bass due to elevated concentrations of PCBs. Additionally, women and children should eat no more than 1 meal per month of white perch due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Eleven walleye ranging in length from 17 to 22 inches were collected from the Western Basin of Lake Erie in 2004. Total PCB concentrations exceeded the women and

children trigger levels in all 11 fish (Table 10; Figure 12). Four fish were in the “1 meal per week” range, 6 fish were in the “1 meal per month” range and 1 fish was in the “6 meals per year” range. A total of 26 walleye were collected since 1992. The median total PCB concentration in the 10 walleye less than 18 inches was 0.242 ppm, and the median concentration in the 16 fish greater than 18 inches was 0.317 ppm.

Ten white bass ranging in length from 11 to 13 inches were collected from the Western Basin of Lake Erie in 2004. Total PCB concentrations were above women and children trigger levels in all 10 white bass; 8 fish were in the women and children “1 meal per month” range, and 2 were in the “6 meals per year” range (Table 10; Figure 13). A total of 24 white bass were collected since 1993, and the overall total PCB median concentration was 0.68 ppm.

Ten white perch ranging in length from 9 to 10 inches were collected in 2004. Total PCB concentrations were above women and children trigger levels in all 10 white perch; 1 fish was in the “1 meal per week” range, 8 were in the “1 meal per month” range, and 1 was in the “6 meals per year” range (Table 10; Figure 14). A total of 20 white perch were collected since 1995, and the overall median total PCB concentration was 0.63 ppm.

Recommendations: The MDCH should consider advising women and children to eat no more than one meal per month of walleye of any size from the western basin of Lake Erie due to elevated levels of PCBs.

No additional monitoring is recommended.

#### **Clinton River, downstream of Yates Dam, Ryan Road, Utica, Macomb County (ID 2004015) *Carp, Rock Bass, and White Sucker***

Existing MDCH Advisory: Women and children should not eat more than 6 meals per year of carp greater than 18 inches and no more than 1 meal per month of carp less than 18 inches due to elevated concentrations of PCBs. Women and children should not eat more than 1 meal per week of rock bass due to elevated concentrations of PCBs. Women and children should eat no more than 1 meal per week of white sucker due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten carp ranging in length from 20 to 24 inches were collected in 2004. Total PCB concentrations were below women and children trigger levels in 2 carp, 3 were in the “1 meal per week” range, 4 were in the “1 meal per month” range, and 1 exceeded the “no consumption” trigger level (Table 10; Figure 15). A total of 27 carp were collected since 1986, and the overall median total PCB concentration was 0.59 ppm.

Ten rock bass ranging in length from 8 to 9 inches were collected in 2004. Total PCB concentrations were below women and children trigger levels in 9 fish and 1 was in the “1 meal per week” range (Table 10; Figure 16). A total of 18 rock bass were collected since 1994. The overall median total PCB concentration was 0.042 ppm. Regression analysis indicates that rock bass greater than 9 inches in length are likely to have PCB concentrations exceeding the 0.05 ppm women and children “1 meal per week” trigger level.

Ten white sucker ranging in length from 11 to 14 inches were collected in 2004. Total PCB concentrations in all 10 fish were below women and children trigger levels (Figure 17). A total of 21 white suckers were collected since 1994, and the median total PCB concentration was 0.069 ppm.

Recommendations: The MDCH should consider removing the advisory on rock bass less than 8 inches from the Clinton River downstream of Yates Dam. The MDCH should also consider removing the advisory on white sucker from the Clinton River below Yates Dam.

No additional monitoring is recommended.

**Detroit River, Michigan Waters, Wayne County (ID 2004021)**  
***Carp, Freshwater Drum, Redhorse Sucker, and Yellow Perch***

Existing MDCH Advisory: No one should eat any carp from the Detroit River due to elevated concentrations of PCBs and dioxins. No one should eat more than 1 meal per week of freshwater drum over 14 inches and women and children should not eat more than 1 meal per month of any freshwater drum due to elevated concentrations of mercury and PCBs. Women and children should eat no more than 1 meal per month of redhorse sucker less than 14 inches and no more than 6 meals per year of redhorse sucker greater than 14 inches due to elevated concentrations of PCBs. Women and children should not eat more than 1 meal per week of yellow perch due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Eight carp ranging in length from 18 to 27 inches were collected in 2004. Total PCB concentrations exceeded the general population “no consumption” trigger level in 6 (75%) of the fish. Total PCB concentrations exceeded women and children trigger levels in all 8 fish (Table 10; Figure 18). Two carp were in the women and children “6 meals per year” range, and 6 carp exceeded the “no consumption” trigger level. A total of 18 carp were collected since 1994. The median total PCB concentration in carp less than 22 inches was 2.17 ppm, and the median concentration in carp greater than 22 inches was 3.93 ppm.

Dioxin TEQ concentrations exceeded the MDCH trigger level in 1 (12%) of the carp collected in 2004 (Table 12; Figure 19). Five of 18 (28%) of the carp collected since 1994 had dioxin TEQ concentrations exceeding the MDCH trigger level.

Ten freshwater drum ranging in length from 15 to 20 inches were collected in 2004. Total PCB concentrations exceeded women and children trigger levels in all 10 fish (Table 10; Figure 20). Two drum were in the “1 meal per week” range and 8 were in the “1 meal per month” range. The median total PCB concentration in fish collected in 2004 was 0.42 ppm. A total of 32 freshwater drum were collected since 1990. The median total PCB concentration of fish less than 18 inches was 0.53 ppm, and the median concentration in fish greater than 18 inches was 0.34 ppm. The overall median total PCB concentration was 0.48 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 2 freshwater drum collected in 2004, and the median concentration was 0.40 ppm (Table 11; Figure 21) The median mercury concentration in all freshwater drum less than 18 inches collected since 1990 was 0.35 ppm, and the median concentration in fish greater than 18 inches was 0.57 ppm (Table 11; Figure 21).

Ten redhorse sucker ranging in length from 14 to 21 inches were collected in 2004. Total PCB concentrations exceeded women and children trigger levels in all 10 fish (Table 10; Figure 22). Five redhorse sucker were in the “1 meal per week” range, and 5 were in the “1 meal per month” range. The median total PCB concentration in fish less than 18 inches was 0.13 ppm and the median concentration in redhorse sucker greater than 18 inches was 0.63 ppm. A total of 20 redhorse sucker were collected since 1993. The overall median total PCB concentration in fish less than 18 inches was 0.56 ppm, and in fish greater than 18 inches the median concentration was 0.63 ppm.

A total of 10 yellow perch ranging in length from 7 to 9.5 inches were collected from the Detroit River in 2004. Total PCB concentrations were below women and children trigger levels in 9 yellow perch and the concentration in 1 fish was in the “1 meal per week” range (Table 10; Figure 23). A total of 20 yellow perch were collected since 1993. The median total PCB concentration in yellow perch less than 10 inches in length was 0.040 ppm, and in fish greater than 10 inches the median total PCB concentration was 0.58 ppm.

#### Recommendations:

The MDCH should consider relaxing the general population advisory on Detroit River freshwater drum to no more than 1 meal per week of freshwater drum greater than 18 inches.

In addition, the MDCH should consider relaxing the women and children advisory on Detroit River redhorse sucker to no more than 1 meal per week of redhorse sucker less than 18 inches and no more than 1 meal per month of redhorse sucker greater than 18 inches.

Lastly, the MDCH should consider removing the women and children advisory on Detroit River yellow perch less than 10 inches.

No additional monitoring is recommended.

#### **Kent Lake, Oakland County (ID 2004040) *Black Crappie and Walleye***

Existing MDCH Advisory: No one should eat more than 1 meal per week of Kent Lake black crappie greater than 8 inches, and women and children should eat no more than 1 meal per week of black crappie under 8 inches and no more than 1 meal per month of black crappie greater than 8 inches due to elevated concentrations of mercury and PCBs. The general population should eat no more than 1 meal per week and women and children should eat no more than 1 meal per month of walleye from Kent Lake greater than 14 inches due to elevated concentrations of mercury and PCBs.

Comparison to Trigger Levels: Ten black crappie ranging in length from 8 to 9.5 inches were collected from Kent Lake in 2004. Total PCB concentrations were below women and children trigger levels in 8 black crappie and concentrations were in the “1 meal per week” range in 2 fish (Table 10; Figure 24). The median total PCB concentration in the black crappie collected in 2004 was 0.04 ppm. A total of 15 black crappie were collected since 1990. The overall median total PCB concentration was 0.05 ppm.

Mercury concentrations were below the MDCH restrict consumption trigger level in all 15 black crappie collected since 1990 (Table 11; Figure 25), and the median concentration was 0.12 ppm.

Ten walleye ranging in length from 15 to 24 inches were collected from Kent Lake in 2004. Total PCB concentrations exceeded women and children trigger levels in 8 walleye. Three walleye had concentrations in the “1 meal per week” range and 5 fish had concentrations in the “1 meal per month” range (Table 10; Figure 26). A total of 20 walleye were collected since 1990. The median total PCB concentration for walleye less than 18 inches was 0.06 ppm, and the median concentration for fish greater than 18 inches was 0.26 ppm.

Mercury concentrations were below the MDCH restrict consumption trigger level in all walleye collected since 1990 (Table 11; Figure 27), and the median concentration was 0.12 ppm. The mercury concentrations in all the walleye collected in 2004 were lower than the concentrations measured in fish collected in 1990.

Recommendations: The MDCH should consider removing the consumption advisories on Kent Lake black crappie less than 10 inches.

In addition, the MDCH should consider removing the general population consumption advisory for walleye.

No additional monitoring is recommended.

**River Raisin, Upstream of Monroe Dam, Monroe County (ID 2004085)**  
***Carp***

Existing MDCH Advisory: Women and children should eat no more than 1 meal per month of carp from the River Raisin due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten carp ranging in length from 22 to 30 inches were collected from the River Raisin upstream of the Monroe Dam in 2004. The total PCB concentration in 1 carp was below women and children trigger levels, 6 carp had concentrations in the women and children “1 meal per week” range, and 3 carp had concentrations in the women and children “1 meal per month” range (Table 10; Figure 28). A total of 20 carp were collected since 1987, and the overall median total PCB concentration was 0.21 ppm.

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

**3.1.2.3 Lake Huron Watershed**

**Lake Huron, Grindstone City, Huron County (ID 2004130)**  
**and Thunder Bay, Alpena County (ID 2004145)**  
***Lake Trout***

Existing MDCH Advisory: Women and children should not eat any Lake Huron lake trout due to elevated concentrations of PCBs, chlordane, and dioxins. Also, the general population should not eat any Lake Huron lake trout greater than 22 inches and no more than 1 meal per week of lake trout less than 22 inches.

Comparison to Trigger Levels: Ten lake trout ranging in length from 21 to 26 inches were collected from Lake Huron near Grindstone City, and 10 lake trout ranging in length from 22 to 30 inches were collected from Lake Huron near Thunder Bay in 2004. Total PCB concentrations in 18 fish were in the women and children “1 meal per month” range, and 2 fish were in the “6 meals per year” range (Table 10; Figure 29). The median total PCB concentration in the lake trout collected in 2004 was 0.44 ppm. A total of 68 lake trout were collected since 1991. The median total PCB concentration in fish less than 26 inches was 0.68 ppm, and in lake trout greater than 26 inches the median concentration was 1.57 ppm.

Dioxin TEQ concentrations were measured in 10 lake trout collected from Lake Huron near Grindstone City in 2004. Concentrations were below the MDCH trigger level in all 10 lake trout (Table 12; Figure 30). Dioxin TEQ has been measured in 40 lake trout since 1991. Concentrations in 11 of 33 (33%) of the lake trout less than 26 inches, and all 7 (100%) of the fish greater than 26 inches exceeded the MDCH trigger level.

Total chlordane concentrations were below the MDCH trigger level in all 20 lake trout collected in 2004 (Figure 31). One of 56 (2%) of lake trout less than 26 inches, and 4 of 12 (33%) fish greater than 26 inches collected since 1991 had total chlordane concentrations exceeding the MDCH trigger level.

Recommendations: The MDCH should consider relaxing the general population advisory on Lake Huron lake trout to no more than 1 meal per week of fish less than 26 inches. Also, the MDCH should consider removing chlordane from the list of contaminants causing the advisory for Lake Huron lake trout.

Additional lake trout should be collected from Lake Huron to evaluate the possibility of relaxing the advisory for women and children based on PCBs and dioxin TEQ.

**Lake Huron, Saginaw Bay, Bay Port, Huron County (ID 2004046)**  
***Carp, Channel Catfish, Walleye, White Bass, White Sucker, and Yellow Perch***

Existing MDCH Advisory: No one should eat any Saginaw Bay carp due to elevated concentrations of PCBs and dioxins. Women and children should not eat channel catfish from Saginaw Bay due to elevated concentrations of PCBs and dioxins. The general population should not eat any channel catfish greater than 18 inches and no more than 1 meal per week of channel catfish less than 18 inches. The general population should eat no more than 1 meal per week of walleye greater than 22 inches due to elevated concentrations of mercury and PCBs. Also, women and children should eat no more than 1 meal per month of walleye greater than 22 inches and no more than 1 meal per week of walleye less than 22 inches. The general population should eat no more than 1 meal per week and women and children should eat no more than 6 meals per year of white bass due to elevated concentrations of PCBs. Women and children should eat no more than 1 meal per week of white sucker less than 14 inches and no more than 1 meal per month of white sucker greater than 14 inches due to elevated levels of PCBs. Lastly, women and children should eat no more than 1 meal per week of yellow perch due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Nine carp ranging from 21 to 27 inches were collected from Saginaw Bay in 2004. Total PCB concentrations exceeded the general population trigger level in 2 (22%) of the fish. 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, 3 were in the “6 meals per year” range, and 2 had concentrations exceeding the “no consumption” trigger level (Table 10; Figure 32). A total of 41 carp were collected since 1991. Total PCB concentrations exceeded the general population trigger level in 19 (46%) of the fish. The overall median concentration was 1.65 ppm.

Dioxin TEQ concentrations exceeded the MDCH trigger level in 4 (44%) of the carp collected in 2004 (Table 12; Figure 33). A total of 24 carp have been analyzed for dioxin TEQ concentrations since 1991, and 16 (67%) had concentrations exceeding the MDCH trigger level.

Ten channel catfish ranging in length from 14 to 25 inches were collected in 2004. Total PCB concentrations in 4 channel catfish were in the women and children “1 meal per week” range, and 6 fish were in the “1 meal per month” range (Table 10; Figure 34). A total of 46 channel catfish were collected since 1991. The median total PCB concentration in fish less than 18 inches was 0.42 ppm, and in fish greater than 18 inches the median concentration was 1.07 ppm.

Dioxin TEQ concentrations exceeded the MDCH trigger level in 2 (20%) of the channel catfish collected in 2004 (Table 12; Figure 35). A total of 20 channel catfish have been analyzed for dioxin TEQ since 1999. Four of 16 (25%) of the fish less than 22 inches, and 2 of 4 (50%) of the channel catfish greater than 22 inches had concentrations exceeding the MDCH trigger level.

Ten walleye ranging in length from 16 to 22 inches were collected in 2004. Total PCB concentrations in 5 walleye were below women and children trigger levels, 4 fish had concentrations in the “1 meal per week” range, and 1 fish was in the “1 meal per month” range (Table 10; Figure 36). A total of 38 walleye

were collected since 1992. The median total PCB concentration in walleye less than 18 inches was 0.05 ppm, and in fish greater than 18 inches the median concentration was 0.29 ppm.

Mercury concentrations in the 10 walleye collected in 2004 were less than the MDCH “restrict consumption” trigger level. A total of 37 walleye were analyzed for mercury since 1992. The overall median mercury concentration in walleye less than 22 inches was 0.17 ppm, and in fish greater than 22 inches the median concentration was 0.33 ppm (Figure 37).

A total of 10 white bass ranging in length from 8 to 14 inches were collected in 2004. Total PCB concentrations exceeded women and children trigger levels in all 10 fish. Six white bass were in the “1 meal per week” range, 3 fish were in the “1 meal per month” range, and 1 white bass was in the “6 meals per year” range (Table 10; Figure 38). A total of 20 white bass were collected since 1993. Two of 11 (18%) white bass greater than 12 inches exceeded the MDCH “no consumption” trigger level.” The median total PCB concentration in white bass less than 12 inches was 0.18 ppm, and in fish greater than 12 inches the median concentration was 1.51 ppm.

Dioxin TEQ concentrations were less than the MDCH trigger level in all 9 white bass less than 12 inches. The 1 fish greater than 12 inches had a dioxin TEQ concentration exceeding the trigger level (Figure 39).

A total of 10 white sucker ranging in length from 13 to 19 inches were collected in 2004. Total PCB concentrations were below women and children trigger levels in 5 fish, and 5 white sucker had concentrations in the “1 meal per week” range (Table 10; Figure 40). A total of 30 white sucker were collected since 1991. The median total PCB concentration in white sucker less than 14 inches was 0.06 ppm, and the median concentration in fish greater than 14 inches was 0.16 ppm.

A total of 10 yellow perch ranging in length from 8 to 11 inches were collected in 2004. Total PCB concentrations were below women and children trigger levels in all 10 fish (Figure 41). A total of 39 yellow perch were collected since 1991. The overall median total PCB concentration was 0.07 ppm.

Recommendations: The MDCH should consider removing the general population advisory on Saginaw Bay white bass less than 12 inches and relaxing the women and children advisory on white bass to no more than 1 meal per month of fish less than 12 inches. In addition, the MDCH should consider advising women and children against eating any white bass from Saginaw Bay greater than 12 inches, due to elevated levels of dioxin TEQ.

Additional yellow perch should be collected from Saginaw Bay to evaluate the possibility of removing the advisory for women and children based on PCBs.

### **Bad River, Saginaw County (ID 2004003) *Carp, Channel Catfish, and Northern Pike***

Existing MDCH Advisory: Carp are not covered by an advisory. No one should eat more than 1 meal per week of channel catfish greater than 12 inches from the Bad River due to elevated concentrations of PCBs. Also, women and children should not eat any channel catfish greater than 22 inches, no more than 6 meals per year of channel catfish between 18 and 22 inches, and no more than 1 meal per month of channel catfish less than 18 inches. Women and children should eat no more than 1 meal per week of northern pike greater than 22 inches due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten carp ranging in length from 17 to 28 inches were collected in 2004. The total PCB concentration exceeded the MDCH “no consumption” trigger level in 1 (10%) of the fish (Table 10; Figure 42). The total PCB concentration in 1 carp was below women and children trigger levels, 4 fish had concentrations in the “1 meal per week” range, and 4 carp had concentrations in the “1

meal per month” range. The overall median total PCB concentration was 0.15 ppm. One of 4 (25%) carp greater than 22 inches exceeded the general population “no consumption” trigger level. The median total PCB concentration in carp less than 18 Inches was 0.06 ppm, and the median concentration in fish greater than 18 inches was 0.30 ppm.

Ten channel catfish ranging in length from 12 to 22 inches were collected in 2004. The total PCB concentration was below the women and children trigger levels in 1 fish, concentrations were in the women and children “1 meal per week” range in 5 channel catfish, and 4 fish were in the “1 meal per month” range (Table 10; Figure 43). The median total PCB concentration in channel catfish collected in 2004 less than 18 inches was 0.10 ppm, and in fish greater than 18 inches the median concentration was 0.29 ppm. A total of 20 channel catfish were collected since 1994. The overall median total PCB concentration in fish less than 18 inches was 0.17 ppm, and the median concentration in fish between 18 and 22 inches was 0.56 ppm.

Seven northern pike ranging in length from 19 to 28 inches were collected in 2004. Three of the fish were longer than the 24-inch legal size limit. Total PCB concentrations in 6 of the northern pike were below women and children trigger levels, and 1 fish had a concentration in the “1 meal per week” range (Table 10; Figure 44). A total of 11 northern pike were collected since 1994. The median total PCB concentration in fish greater than 22 inches was 0.06 ppm.

Recommendations: The MDCH should consider advising the general population against eating more than 1 meal per week of Bad River carp greater than 22 inches due to elevated levels of PCBs. Also, the MDCH should consider advising women and children to eat no more than 1 meal per week of carp less than 18 inches, and no more than 1 meal per month of carp greater than 18 inches.

In addition, the MDCH should consider removing the general population advisory on channel catfish from the Bad River, and relaxing the women and children advisory to no more than 1 meal per week of channel catfish less than 18 inches and no more than 1 meal per month of channel catfish between 18 and 22 inches.

### **Big Seven Lake (Seven Lakes), Oakland County (ID 2004133)** ***Largemouth Bass***

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

Comparison to Trigger Levels: Five largemouth bass ranging in length from 13.3 to 18.0 inches were collected from Big Seven Lake in 2004 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 3 fish (Table 11; Figure 45). The median mercury concentration was 0.71 in the 4 fish longer than the 14-inch legal size limit.

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

### **Cass River, Bridgeport, Saginaw County (ID 2004011)** ***Carp and Channel Catfish***

Existing MDCH Advisory: Women and children should not eat carp from the Cass River and the general population should not eat more than 1 meal per month of carp due to elevated concentrations of PCBs. The general population should not eat any channel catfish due to elevated concentrations of PCBs, mercury, and dioxins.

Comparison to Trigger Levels: Nine carp ranging in length from 13 to 27 inches were collected in 2004. Total PCB concentrations were below women and children trigger levels in 2 carp, 4 carp had concentrations in the “1 meal per week” range, and 3 carp had concentrations in the “1 meal per month” range (Table 10; Figure 46). A total of 19 carp were collected since 1992. The total PCB concentration exceeded the general population “no consumption” trigger level in 1 (5%) of the fish. The overall median total PCB concentration was 0.22 ppm.

Dioxin TEQ concentrations were below the MDCH trigger level in all 9 carp collected in 2004 (Table 12; Figure 47). Dioxin TEQ was measured in 14 Cass River carp since 1992. Concentrations exceeded the MDCH trigger level in 2 (14%) of the fish.

Nine channel catfish ranging in length from 11 to 16 inches were collected in 2004. Total PCB concentrations were below women and children trigger levels in 6 channel catfish, 2 fish were in the “1 meal per week” range, and 1 fish was in the “1 meal per month” range (Table 10; Figure 48). A total of 17 legal-sized channel catfish were collected since 1992. Total PCB concentrations in 4 of 12 (33%) of the fish greater than 14 inches exceeded the general population “no consumption” trigger level. The median total PCB concentration in legal-sized channel catfish less than 14 inches was 0.02 ppm, and the median concentration in fish greater than 14 inches was 1.13 ppm.

Dioxin TEQ concentrations in the 9 channel catfish collected in 2004 were all below the MDCH trigger level (Table 12; Figure 49). Dioxin TEQ concentrations were measured in a total of 14 channel catfish from the Cass River since 1992. Concentrations exceeded the MDCH trigger level in 4 (28%) of the fish. Four of 8 (50%) of the channel catfish greater than 14 inches and none of the fish less than 14 inches had concentrations exceeding the dioxin TEQ trigger level.

Mercury concentrations in the 9 channel catfish collected in 2004 were all below the MDCH “restrict consumption” trigger level (Figure 50). The median mercury concentration in the 13 legal-sized channel catfish less than 18 inches collected since 1992, was 0.18 ppm. The 4 channel catfish greater than 18 inches had a median mercury concentration of 0.59 ppm.

Recommendations: The MDCH should consider removing the general population advisory for Cass River carp. Also, the MDCH should consider removing the general population advisory for channel catfish less than 14 inches, and relaxing the women and children advisory for channel catfish less than 14 inches to no more than 1 meal per week.

Additional carp should be collected from the Cass River below Bridgeport to evaluate the possibility of removing dioxin from the list of contaminants causing the advisory.

### **Cheboyganing Creek, Saginaw County (ID 2004013) Carp**

Existing MDCH Advisory: No one should eat any Cheboyganing Creek carp greater than 22 inches due to elevated concentrations of PCBs. The general population should eat no more than 1 meal per week of carp between 18 and 22 inches. Also, women and children should eat no more than 1 meal per month of carp between 12 and 18 inches and no more than 6 meals per year of carp between 18 and 22 inches.

Comparison to Trigger Levels: Ten carp ranging in length from 13 to 33 inches were collected from Cheboyganing Creek in 2004. The total PCB concentration exceeded the MDCH “no consumption” trigger level in 1 (10%) of the fish (Table 10; Figure 51). Total PCB concentrations were below women and children trigger levels in 1 fish, and 8 fish were in the “1 meal per week” range. A total of 29 carp were collected since 1989. The total PCB concentration in 11 of 15 (73%) of the fish greater than

22 inches, and none of the carp less than 22 inches exceeded the general population “no consumption” trigger level. The median total PCB concentration in carp less than 22 inches was 0.25 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 1 (10%) carp collected in 2004 (Table 11; Figure 52), and in 2 of 29 (7%) carp collected since 1989. The overall median mercury concentration was 0.16 ppm.

Recommendations: The MDCH should consider relaxing the women and children advisory to no more than 1 meal per month, and the general population advisory to no more than 1 meal per week of Cheboyganing Creek carp less than 22 inches.

Additional carp should be collected from Cheboyganing Creek to evaluate levels of dioxin TEQ in the fish.

### **Five Lakes, Clare County (ID 2004131) *Largemouth Bass***

Existing MDCH Advisory: Five Lakes largemouth bass are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Nine largemouth bass ranging in length from 13.9 to 17.1 inches were collected from Five Lakes in 2004 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 1 fish (Table 11; Figure 53). A total of 14 largemouth bass have been collected from Five Lakes since 1991 and the median mercury concentration was 0.35 ppm for fish longer than the 14-inch legal size limit.

Recommendations: The MDCH should consider removing the advisory on Five Lakes largemouth bass less than 18 inches. No additional monitoring is recommended.

### **Frenchman Lake, Chippewa County (ID 2004029) *Northern Pike***

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

Comparison to Trigger Levels: Ten northern pike ranging in length from 19.3 to 27 inches were collected from Frenchman Lake in 2004 and analyzed for mercury only. There is no legal size limit on northern pike from Frenchman Lake. Mercury concentrations in all 10 northern pike were below the “restrict consumption” trigger level (Figure 54). The median mercury concentration was 0.22 ppm.

Recommendations: The MDCH should consider removing the advisory on Frenchman Lake northern pike less than 26 inches. No additional monitoring is recommended.

### **Hardwood Lake, Ogemaw County (ID 2004034) *Northern Pike***

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

Comparison to Trigger Levels: Ten northern pike ranging in length from 17.3 to 27.8 inches were collected from Hardwood Lake in 2004 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 1 fish (Table 11; Figure 55). Four fish were longer than the 24-inch legal size limit and had a median mercury concentration of 0.37 ppm.

Recommendations: No change to the advisory or additional monitoring is recommended.

**Kawkawlin River, M-247, Bay County (ID 2004039)**

***Carp***

Existing MDCH Advisory: No one should eat any carp from the Kawkawlin River due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten carp ranging in length from 13 to 25 inches were collected from the Kawkawlin River in 2004. Total PCB concentrations exceeded the MDCH “no consumption” trigger level in 1 (10%) of the fish (Table 10; Figure 56). Total PCB concentrations were below women and children trigger levels in 1 fish, 3 fish were in the “1 meal per week” range, 3 were in the “1 meal per month” range, and 2 were in the “6 meals per year” range. A total of 20 carp were collected since 1988. The total PCB concentration in 7 of 13 (54%) of fish greater than 22 inches, and none of the carp less than 22 inches exceeded the general population “no consumption” trigger level. The median concentration of carp less than 22 inches was 0.86 ppm.

Recommendations: No change to the advisory or additional monitoring is recommended.

**Long Lake, Presque Isle County (ID 2004066)**

***Smallmouth Bass and White Sucker***

Existing MDCH Advisory: Long Lake smallmouth bass are covered by the statewide mercury advisory. White sucker are not covered by an advisory.

Comparison to Trigger Levels: Ten smallmouth bass ranging in length from 15.7 to 20.0 inches were collected from Long Lake in 2004. The mercury concentration in 1 smallmouth bass exceeded the MDCH “restrict consumption” trigger level (Table 11; Figure 57) and the median mercury concentration was 0.22 ppm. The median mercury concentration of smallmouth bass less than 18 inches was 0.2 ppm.

Ten white sucker ranging in length from 11.6 inches to 20.5 inches were collected from Long Lake in 2004. Contaminant concentrations in all 10 fish were below MDCH trigger levels.

Recommendations: The MDCH should consider removing the advisory on smallmouth bass less than 18 inches. No additional monitoring is recommended.

**McCormick Lake, Montmorency County (ID 2004074)**

***Brown Trout***

Existing MDCH Advisory: McCormick Lake brown trout are not covered by an advisory.

Comparison to Trigger Levels: Seven brown trout ranging in length from 13 to 21 inches were collected from McCormick Lake in 2004. Contaminant concentrations in all 7 fish were below MDCH trigger levels.

Recommendations: No change to the advisory or additional monitoring is recommended.

**Peach Lake, Ogemaw County (ID 2004080)**

***Northern Pike***

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

Comparison to Trigger Levels: Nine northern pike ranging in length from 21 to 29 inches were collected from Peach Lake in 2004 and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 9 fish (Figure 58). The median mercury concentration in the 7 northern pike longer than the 24-inch legal size limit was 0.36 ppm.

Recommendations: The MDCH should consider removing the advisory on Peach Lake northern pike less than 26 inches. No additional monitoring is recommended.

**Saginaw River, LaFayette, Bay County (ID 2004113)**  
**Carp**

Existing MDCH Advisory: No one should eat any carp from the Saginaw River due to elevated concentrations of PCBs and dioxins.

Comparison to Trigger Levels: Ten carp ranging in length from 14 to 24 inches were collected from the Saginaw River in 2004. Total PCB concentrations exceeded the general population trigger level in 2 (20%) fish (Table 10; Figure 59). Concentrations in 3 carp were below women and children trigger levels, 3 were in the “1 meal per week” range, 1 was in the “1 meal per month” range, 1 was in the “6 meals per year” range, and 2 exceeded the “no consumption” trigger level. The median total PCB concentration in carp less than 22 inches was 0.18 ppm, and the median concentration for fish greater than 22 inches was 0.07 ppm. A total of 29 carp were collected from the Saginaw River since 1984. The overall median total PCB concentration was 1.55 ppm.

Dioxin TEQ concentrations exceeded the MDCH trigger level in 3 (30%) of the carp collected in 2004 (Table 12; Figure 60). Nine of 16 (56%) carp analyzed for dioxin TEQ since 1992 had concentrations exceeding the MDCH trigger level.

Recommendations: No change to the advisory or additional monitoring is recommended.

**Sebewaing River, Huron County (ID 2004114)**  
**Carp and Northern Pike**

Existing MDCH Advisory: Women and children should eat no more than 1 meal per week of Sebewaing River carp less than 14 inches and no more than 1 meal per month of carp greater than 14 inches due to elevated concentrations of PCBs. Women and children should eat no more than 1 meal per week of northern pike greater than 22 inches due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten carp ranging in length from 16 to 27 inches were collected from the Sebewaing River in 2004. Total PCB concentrations exceeded the general population trigger level in 1 (10%) fish (Table 10; Figure 61). The total PCB concentration in 1 carp was below women and children trigger levels, 2 were in the “1 meal per week” range, 3 were in the “1 meal per month” range, 3 were in the “6 meals per year” range, and 1 exceeded the “no consumption” trigger level. A total of 20 carp were collected since 1988. The median total PCB concentration in the 5 fish less than 18 inches was 0.16 ppm, and in the 15 carp greater than 18 inches the median concentration was 0.60 ppm.

Seven northern pike ranging in length from 19 to 26 inches were collected from the Sebewaing River in 2004. The total PCB concentration in the 1 fish above the legal size limit was in the women and children “1 meal per week” range (Table 10; Figure 62). A total of 17 northern pike were collected since 1988. The overall median total PCB concentration in the 4 legal-sized fish was 0.16 ppm.

Recommendations: No change to the advisory is recommended.

Additional carp and northern pike should be collected from the Sebewaing River to evaluate the possibility of relaxing the advisory for women and children based on PCBs.

**Shiawassee River, South Branch, between M-59 and Byron (ID 2004101)**  
***Carp, Rock Bass, and White Sucker***

Existing MDCH Advisory: No one should eat any carp, rock bass, or white sucker from the South Branch of the Shiawassee River due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Seven carp ranging in length from 22 to 28 inches were collected from the South Branch of the Shiawassee River in 2004. Total PCB concentrations exceeded the general population trigger level in 4 (57%) fish (Table 10; Figure 63). Three fish were in the women and children “6 meals per year” range. A total of 21 carp were collected from the South Branch of the Shiawassee River since 1986. Total PCB concentrations exceeded the general population trigger level in 13 (62%) fish and the overall median concentration was 3.2 ppm.

Eleven rock bass ranging in length from 6 to 7 inches were collected from the South Branch of the Shiawassee River in 2004. The total PCB concentration in 1 fish (9%) exceeded the general population trigger level (Table 10; Figure 64). Total PCB concentrations exceeded women and children trigger levels in all 11 fish. Three fish were in the women and children “1 meal per month” range, 5 fish were in the “6 meals per year” range, and 3 fish exceeded the women and children “no consumption” trigger level. The median total PCB concentration was 1.43 ppm. A total of 30 rock bass have been collected from the South Branch of the Shiawassee River since 1986. Total PCB concentrations exceeded the general population trigger level in 21 (70%) fish and the median concentration was 2.55 ppm.

Eleven white sucker ranging in length from 9 to 13 inches were collected from the South Branch of the Shiawassee River in 2004. Total PCB concentrations exceeded the general population trigger level in 11 (100%) fish (Table 10; Figure 65), and the median concentration was 5.34 ppm. A total of 26 white sucker were collected since 1986. All 26 fish exceeded the general population trigger level and the median total PCB concentration was 6.48 ppm.

Recommendations: No change to the advisory or additional monitoring is recommended.

**St. Marys River, Chippewa County (ID 2004149 and 2004120)**  
***Northern Pike and Walleye***

Existing MDCH Advisory: Women and children should eat no more than 1 meal per week of St. Marys River northern pike greater than 26 inches due to elevated concentrations of PCBs. The general population should eat no more than 1 meal per week of walleye greater than 22 inches due to elevated concentrations of mercury and PCBs. Also, women and children should eat no more than 1 meal per week of walleye between 14 and 22 inches and no more than 1 meal per month of walleye greater than 22 inches.

Comparison to Trigger Levels: Seven northern pike ranging in length from 22 to 30 inches were collected from the St. Marys River in 2004. Total PCB concentrations were below the women and children trigger level in all 7 northern pike (Figure 66), and the median concentration of the 4 fish longer than the 24-inch legal size limit was 0.002 ppm. A total of 16 northern pike were collected from the St. Marys River since 1995. The median total PCB concentration in the 9 legal-sized fish was 0.025 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 3 northern pike collected in 2004 (Table 11; Figure 67) and the median concentration for all 7 fish was 0.4 ppm. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 4 of the 16 northern pike collected since 1995. The median mercury concentration in the 9 legal-sized fish was 0.31 ppm.

Ten walleye ranging in length from 14 to 19 inches were collected from the St. Marys River in 2004. Total PCB concentrations were below the women and children trigger levels in 5 fish, and 5 fish were in the “1 meal per week” range (Table 10; Figure 68). The median concentration in the 9 walleye longer than the 15-inch legal size limit was 0.06 ppm. A total of 25 walleye have been collected since 1991 and the total PCB median concentration for fish between 14 and 22 inches is 0.07 ppm and 0.38 ppm for fish greater than 22 inches.

Mercury concentrations were below the “restrict consumption” trigger level in all 10 walleye (Table 11; Figure 69). The median concentration of the legal-sized walleye collected in 2004 was 0.27 ppm. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 8 of the 25 fish collected since 1991. The median concentration in walleye greater than 22 inches was 0.65 ppm.

Recommendations: The MDCH should consider advising the general population not to eat more than 1 meal per week, and women and children not to eat more than 1 meal per month of St. Marys River northern pike due to elevated levels of mercury. In addition, the MDCH should consider removing PCBs from the list of contaminants causing the advisory on St. Marys River northern pike.

No additional monitoring is recommended.

#### **3.1.2.4 Lake Michigan Watershed**

##### **Lake Michigan, South of Frankfort (ID 2004055 and 2004060) *Rainbow Trout (Steelhead)***

Existing MDCH Advisory: Women and children should eat no more than 1 meal per month of southern Lake Michigan rainbow trout (steelhead) greater than 18 inches and no more than 1 meal per week of fish less than 18 inches due to elevated levels of PCBs.

Comparison to Trigger Levels: Nineteen rainbow trout ranging in length from 20 to 33 inches were collected from Lake Michigan (Manistee and St. Joseph Rivers) in 2004. Total PCB concentrations in 6 fish were in the women and children “1 meal per week” range, 12 fish were in the “1 meal per month” range, and 1 fish was in the “6 meals per year” range (Table 10; Figure 70). Linear regression analysis indicates that rainbow trout less than 23 inches are likely to have total PCB concentrations in the women and children “1 meal per week” range, and fish greater than 23 inches are likely to have concentrations in the “1 meal per month” range. A total of 58 rainbow trout were collected from southern Lake Michigan since 1994. The median total PCB concentration in fish less than 22 inches was 0.26 ppm, and the median concentration in fish greater than 22 inches was 0.85 ppm.

Recommendations: The MDCH should consider relaxing the women and children advisory to no more than 1 meal per week of southern Lake Michigan rainbow trout less than 22 inches, and no more than 1 meal per month of rainbow trout greater than 22 inches.

No additional monitoring is recommended.

**Lake Michigan, Little Bay De Noc, Delta County (ID 2004150)**  
***Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, and Walleye***

Existing MDCH Advisory: No one should eat Little Bay de Noc carp greater than 26 inches and the general population should not eat more than 1 meal per week of carp less than 26 inches due to elevated concentrations of PCBs. Also, women and children should not eat more than 6 meals per year of carp less than 26 inches. The general population should not eat more than 1 meal per week of smallmouth bass greater than 18 inches and women and children should not eat more than 1 meal per month of smallmouth bass greater than 14 inches due to elevated concentrations of mercury and PCBs. 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. Also, women and children should not eat more than 6 meals per year of walleye greater than 26 inches, no more than 1 meal per month of fish between 18 and 26 inches, and no more than 1 meal per week of fish less than 18 inches. Redhorse sucker and rock bass are not covered by an advisory.

Comparison to Trigger Levels: Ten carp ranging in length from 24 to 31 inches were collected from Little Bay De Noc in 2004. Total PCB concentrations exceeded the general population trigger level in 4 (40%) fish. Concentrations in 2 carp were in the women and children “1 meal per month” range, 4 were in the “6 meals per year” range, and 4 had concentrations exceeding the women and children “no consumption” trigger level (Table 10; Figure 71). A total of 28 carp were collected since 1989. The median total PCB concentration in fish less than 26 inches was 0.70 ppm, and for carp greater than 26 inches the median concentration was 1.99 ppm. Total PCB concentrations exceeded the general population trigger level in 3 of 15 (20%) fish less than 26 inches, and 7 of 13 (54%) carp greater than 26 inches.

Ten redhorse sucker ranging in length from 20 to 25 inches were collected from Little Bay De Noc in 2004. Total PCB concentrations exceeded women and children trigger levels in 8 fish. Concentrations were in the “1 meal per week” range in 3 fish, and 5 fish were in the “1 meal per month” range (Table 10; Figure 72). The median total PCB concentration was 0.20 ppm.

Four rock bass ranging in length from 6 to 8 inches were collected from Little Bay De Noc in 2004. Contaminant concentrations in all 4 fish were below MDCH trigger levels.

Ten smallmouth bass ranging in length from 13 to 18 inches were collected from Little Bay De Noc in 2004. Total PCB concentrations in 8 fish were below women and children trigger levels, and 2 fish had concentrations in the women and children “1 meal per week” range (Table 10; Figure 73). The median total PCB concentration in the legal-sized smallmouth bass was 0.02 ppm. A total of 19 smallmouth bass have been collected since 1992, including 9 fish from near the Cedar River, approximately 40 miles southwest of the 2004 sampling site. The overall median total PCB concentration for fish less than 18 inches was 0.05 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 1 (10%) smallmouth bass collected in 2004 (Table 11; Figure 74). The median mercury concentration in fish greater than the 14 inch legal size was 0.3 ppm. Two of 17 (12%) fish collected since 1992 had mercury concentrations exceeding the MDCH “restrict consumption” trigger level. Linear regression analysis indicates that smallmouth bass larger than 18 inches are likely to have mercury concentrations exceeding the “restrict consumption” trigger level.

Nine walleye ranging in length from 16 to 23 inches were collected from Little Bay De Noc in 2004. Total PCB concentrations exceeded women and children trigger levels in 6 walleye (Table 10; Figure 75). Concentrations were in the “1 meal per week” range in 4 fish, 1 was in the “1 meal per month” range, and 1 walleye was in the “6 meals per year” range. The median total PCB concentration in walleye less than

22 inches collected in 2004 was 0.07 ppm. A total of 43 walleye were collected from Little Bay De Noc and Green Bay near the Cedar River since 1987. The median total PCB concentration in walleye less than 22 inches was 0.18 ppm, and in fish greater than 22 inches the median concentration was 0.76 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 5 (55%) walleye collected in 2004 (Table 11; Figure 76). The median mercury concentration was 0.52 ppm. Thirteen of 43 (30%) of the walleye collected since 1987 had mercury concentrations exceeding the “restrict consumption” trigger level. Linear regression analysis indicates that walleye larger than 23 inches are likely to have mercury concentrations exceeding the MDCH “restrict consumption” trigger level.

Recommendations: The MDCH should consider advising women and children to eat no more than 1 meal per month of redhorse sucker from Little Bay De Noc. Also, the MDCH should consider relaxing the women and children advisory to “no more than 1 meal per week” of smallmouth bass less than 18 inches.

**Lake Michigan, South Haven, Van Buren County (ID 2004051)**  
***Round Goby***

Existing MDCH Advisory: Round goby are not covered by an advisory.

Comparison to Trigger Levels: A total of 84 round goby ranging in length from 3 to 6 inches were collected from southern Lake Michigan in 2004. The fish were processed as headless/gutless specimens, graded by size, and analyzed as 10 composite samples. Contaminant concentrations did not exceed MDCH trigger levels.

Recommendations: No change to the advisory or additional monitoring is recommended.

**Battle Creek River, Division St., Calhoun County (ID 2004004)**  
***Carp and Smallmouth Bass***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per month of Battle Creek River carp greater than 22 inches and not more than 1 meal per week of carp less than 22 inches due to elevated concentrations of PCBs. Women and children should not eat more than 1 meal per week of smallmouth bass due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten carp ranging from 16 to 31 inches were collected from the Battle Creek River in 2004. Total PCB concentrations exceeded women and children trigger levels in 5 fish (Table 10; Figure 77). Two fish were in the women and children “1 meal per week” range, 2 were in the “1 meal per month” range, and 1 fish was in the “6 meals per year” range. The median total PCB concentration was 0.085 ppm. A total of 15 carp were collected since 1991. The overall median total PCB concentration in carp less than 22 inches was 0.03 ppm, and the median concentration in fish greater than 22 inches was 0.24 ppm.

Ten smallmouth bass ranging in length from 13 to 16 inches were collected from the Battle Creek River in 2004. Nine of the fish exceeded women and children trigger levels (Table 10; Figure 78). Eight fish were in the women and children “1 meal per week” range, and 1 fish was in the “1 meal per month” range. The 5 fish greater than 14 inches in length had a median total PCB concentration of 0.13 ppm. A total of 14 smallmouth bass were collected since 1991. None of the smallmouth bass collected in 1991 were of legal size.

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

**Boot Lake, Schoolcraft County (ID 2004007)**  
***Walleye***

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

Comparison to Trigger Levels: Nine walleye ranging in length from 18 to 24 inches were collected from Boot Lake in 2004 and analyzed for mercury only. Mercury concentrations were above the MDCH “restrict consumption” trigger level in 2 fish and the median concentration was 0.36 ppm (Table 11; Figure 79). Linear regression analysis indicates that fish greater than 22.5 inches are likely to have mercury concentrations exceeding the “restrict consumption” trigger level.

Recommendations: The MDCH should consider removing the advisory on Boot Lake walleye less than 22 inches. No additional monitoring is recommended.

**Clifford Lake, Montcalm County (ID 2004014)**  
***Largemouth Bass***

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

Comparison to Trigger Levels: Seven largemouth bass ranging in length from 13 to 17 inches were collected from Clifford Lake in 2004 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 4 fish (Table 11; Figure 80). The median mercury concentration in the 3 fish longer than the 14-inch legal size limit was 0.53 ppm.

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

**Emerald Lake, Newaygo County (ID 2004026)**  
***Largemouth Bass and Northern Pike***

Existing MDCH Advisory: Emerald Lake largemouth bass and northern pike are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Three largemouth bass ranging in length from 14 to 15 inches were collected from Emerald Lake in 2004 and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 3 fish (Table 11; Figure 81). The median mercury concentration was 0.38 ppm.

Six northern pike ranging in length from 23 to 33 inches were collected from Emerald Lake in 2004 and analyzed for mercury only. Mercury concentrations were at or exceeded the MDCH “restrict consumption” trigger level in 3 fish (Table 11; Figure 82). The median mercury concentration in the 4 legal-size northern pike was 0.54 ppm.

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

**Escanaba River, Cataract Basin, Marquette County (ID 2004028)**  
***Walleye***

Existing MDCH Advisory: Walleye from the Cataract Basin are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten walleye ranging in length from 15 to 22 inches were collected from the Escanaba River at the Cataract Basin in 2004 and analyzed for mercury only. Mercury concentrations were at or exceeded the MDCH “restrict consumption” trigger level in 4 fish (Table 11; Figure 83). The median concentration in walleye between 14 and 18 inches was 0.38 ppm, and the median concentration in fish greater than 18 inches was 0.48 ppm.

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

**Grand River, Upstream of the Moores Park Dam (ID 2004146, 2004147, and 2004148)**  
***Northern Pike***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per week of northern pike from the Grand River upstream of the Webber Dam due to elevated levels of PCBs.

Comparison to Trigger Levels: Five northern pike ranging in length from 24 to 25 inches were collected from the Grand River upstream of the Moores Park dam in 2004. Total PCB concentrations in 2 fish were below MDCH trigger levels, and 3 fish were in the women and children “1 meal per week” range (Table 10; Figure 84). The median total PCB concentration was 0.07 ppm. A total of 7 northern pike were collected from the Grand River upstream of the Moores Park dam since 1989. The overall median total PCB concentration was 0.08 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 2 northern pike collected in 2004, and the median concentration was 0.32 ppm (Table 11; Figure 85). Concentrations exceeded the MDCH “restrict consumption” trigger level in 2 of 7 northern pike collected since 1989. The overall median mercury concentration was 0.19 ppm.

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

**Green Lake, Grand Traverse County (ID 2003139)**  
***Lake Trout***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per month and the general population should not eat more than 1 meal per week of Green Lake lake trout due to elevated concentrations of PCBs and mercury.

Comparison to Trigger Levels: Ten lake trout ranging in length from 28 to 32 inches were collected from Green Lake in 2003. Results of analysis for mercury, PCBs, and the standard chlorinated organics were presented in the 2004 Annual Report (Day and Bohr, 2005). Dioxin and furan analysis was not complete in time for the 2004 report.

Dioxin TEQ concentrations were below the trigger level in all 10 lake trout collected in 2003.

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

**Kalamazoo River, Trowbridge Dam Impoundment, Allegan County (ID 2004143)**  
***Carp***

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

Comparison to Trigger Levels: Carp were collected from the Trowbridge Impoundment of the Kalamazoo River in 2004. These fish were collected by Camp, Dresser & McKee at the request of the MDEQ, Remediation and Redevelopment Division (RRD). The samples were analyzed for PCB Aroclors and lipids by Northeast Analytical Inc, and for dioxin and lipids by Severn Trent Laboratories, Inc. These samples were collected as part of the MDEQ, RRD's long-term monitoring plan for the Kalamazoo superfund site.

A total of 11 carp ranging in length from 18 to 31 inches were collected from the Trowbridge Impoundment in 2004. Total PCB concentrations exceeded the general population trigger level in 9 (82%) fish (Table 10; Figure 86). Concentrations in 2 carp were in the women and children "6 meals per year" range, and 9 fish had concentrations exceeding the "no consumption" trigger level. A total of 33 carp were collected since 2001. The median total PCB concentration was 3.1 ppm.

Dioxin TEQ concentrations exceeded the MDCH trigger level in 3 (27%) of the carp collected in 2004 (Table 12; Figure 87). Eight of 32 (25%) carp analyzed for dioxin TEQ since 1992 had concentrations exceeding the MDCH trigger level.

Recommendations: No change to the advisory or additional monitoring is recommended.

**Lake Cadillac, Wexford County (ID 2004041)**  
***Northern Pike and Smallmouth Bass***

Existing MDCH Advisory: Lake Cadillac northern pike and smallmouth bass are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Five northern pike ranging in length from 22 to 27 inches were collected from Lake Cadillac in 2004. Contaminant concentrations were below MDCH trigger levels in all 5 fish, but only 2 of the northern pike were above the 24-inch legal size limit.

Five smallmouth bass ranging in length from 13 to 18 inches were collected from Lake Cadillac in 2004. Total PCB concentrations were below women and children trigger levels in 4 fish, and the concentration in 1 fish was in the "1 meal per week" range (Table 10; Figure 88). The median total PCB concentration in the 4 legal-sized smallmouth bass was 0.02 ppm.

The mercury concentration in 1 of 5 smallmouth bass exceeded the MDCH "restrict consumption" trigger level (Table 11; Figure 89). The median concentration in the 4 legal-sized fish was 0.2 ppm.

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

**Lake Montcalm, Montcalm County (ID 2004062)**  
***Largemouth Bass***

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

Comparison to Trigger Levels: Ten largemouth bass ranging in length from 13 to 19 inches were collected from Lake Montcalm in 2004 and analyzed for mercury only. Mercury concentrations were at or exceeded the MDCH "restrict consumption" trigger level in 7 fish (Table 11; Figure 90). A total of 20 largemouth bass have been collected from Lake Montcalm since 2003 and linear regression analysis indicates that fish longer than 14.9 inches are likely to have mercury concentrations exceeding the MDCH "restrict consumption" trigger level.

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

**Manistique River, Below Manistique Papers Dam (ID 2004072)**  
***Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, and Walleye***

Existing MDCH Advisory: No one should eat Manistique River carp due to elevated concentrations of PCBs. Women and children should not eat more than 1 meal per month of redhorse sucker or smallmouth bass due to elevated levels of PCBs. The general public should not eat more than 1 meal per week, and women and children should not eat more than 1 meal per month of walleye greater than 22 inches. Also, women and children should not eat more than 1 meal per week of walleye less than 22 inches due to elevated levels of PCBs and mercury. Rock bass are not covered by an advisory.

Comparison to Trigger Levels: Ten carp ranging in length from 24 to 30 inches were collected from the Manistique River in 2004. Total PCB concentrations exceeded the general population trigger level in 6 (60%) fish (Table 10; Figure 91), and 4 carp were in the women and children “6 meals per year” range. A total of 25 carp were collected since 1985, including 5 fish collected in 1993 that were analyzed as one composite. Total PCB concentrations exceeded the general population trigger level in 18 (72%) fish, and the median concentration was 2.84 ppm.

Ten redhorse sucker ranging in length from 14 to 20 inches were collected from the Manistique River in 2004. Total PCB concentrations exceeded women and children trigger levels in all 10 fish (Table 10; Figure 92). Five fish were in the “1 meal per week” range, and 5 were in the “1 meal per month” range. The median total PCB concentration was 0.18 ppm. A total of 20 redhorse sucker were collected since 2003, and the median total PCB concentration was 0.23 ppm.

Ten rock bass ranging in length from 6 to 9 inches were collected from the Manistique River in 2004. Total PCB concentrations in 9 fish were below women and children trigger levels, and 1 fish was in the women and children “1 meal per week” range (Table 10; Figure 93). The median total PCB concentration in rock bass less than 8 inches was 0.01 ppm, and the concentration in the 1 fish greater than 8 inches was 0.08 ppm.

Mercury concentrations exceeded the “restrict consumption” trigger level in 2 rock bass collected in 2004 (Table 11; Figure 94). The median mercury concentration in rock bass less than 8 inches was 0.33 ppm, and the concentration in the 1 fish greater than 8 inches was 0.54 ppm.

Five smallmouth bass ranging in length from 12 to 16 inches were collected from the Manistique River in 2004. All 5 fish had total PCB concentrations in the women and children “1 meal per week” range (Table 10; Figure 95). A total of 9 smallmouth bass were collected since 2003. The median total PCB concentration in the 5 fish greater than the 14-inch legal minimum size was 0.20 ppm.

Mercury concentrations exceeded the “restrict consumption” trigger level in 1 smallmouth bass collected in 2004 (Table 11; Figure 96). The median mercury concentration in the 2 smallmouth bass greater than the 14-inch legal minimum size was 0.44 ppm, and the median concentration in the 5 legal-sized fish collected since 2003 was 0.35 ppm.

Ten walleye ranging in length from 15 to 27 inches were collected from the Manistique River in 2004. Total PCB concentrations in 2 fish were below women and children trigger levels, 6 walleye were in the women and children “1 meal per week” range, and 2 were in the women and children “1 meal per month” range (Table 10; Figure 97). The median total PCB concentration in walleye between 15 and 22 inches was 0.10 ppm, and the median concentration in fish greater than 22 inches was 0.34 ppm. A total of 38

walleye were collected since 1984. The median total PCB concentration in walleye between 15 and 22 inches was 0.14 ppm, and in fish greater than 22 inches the median concentration was 0.36 ppm.

Mercury concentrations exceeded the “restrict consumption” trigger level in 3 (30%) of the walleye collected from the Manistique River in 2004 (Table 11; Figure 98). The median mercury concentration in fish between 15 and 22 inches was 0.39 ppm, and in walleye greater than 22 inches the median concentration was 0.63 ppm. A total of 20 walleye were collected since 2003. The median mercury concentration in walleye between 15 and 22 inches was 0.38 ppm and in fish greater than 22 inches the median concentration was 0.56 ppm.

Recommendations: The MDCH should consider advising women and children to eat no more than 1 meal per week of rock bass greater than 8 inches due to elevated levels of PCBs and mercury.

No additional monitoring is recommended.

**Nevins Lake, Montcalm County (ID 2004076)**  
***Largemouth Bass***

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

Comparison to Trigger Levels: Ten largemouth bass ranging in length from 13 to 19 inches were collected from Nevins Lake in 2004 and analyzed for mercury only. Mercury concentrations were at or exceeded the MDCH “restrict consumption” trigger level in 3 fish (Table 11; Figure 99). The median mercury concentration in fish between 14 and 18 inches was 0.43 ppm, and the median concentration in fish greater than 18 inches was 0.75 ppm.

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

**Pere Marquette and Little South Branch Pere Marquette Rivers, Lake County (IDs 2004081 and 2004082)**  
***Brown Trout and White Sucker***

Existing MDCH Advisory: Women and children should not eat more than 1 meal per month of Pere Marquette River brown trout greater than 14 inches and not more than 1 meal per week of fish less than 14 inches due to elevated concentrations of mercury and PCBs. The general population should not eat more than 1 meal per week of brown trout greater than 14 inches. White sucker are not covered by an advisory.

Comparison to Trigger Levels: A total of 20 brown trout ranging in length from 9 to 13 inches were collected from 2 sites in the Pere Marquette River, Lake County, in 2004. Total PCB concentrations exceeded women and children trigger levels in 19 fish (Table 10; Figure 100). Concentrations were in the women and children “1 meal per week” range in 7 brown trout, and 12 fish had concentrations in the “1 meal per month” range. The median total PCB concentration in fish less than 12 inches was 0.19 ppm, and in fish greater than 12 inches the median concentration was 0.34 ppm. A total of 25 brown trout were collected from the Pere Marquette River in Lake County since 1994. The median total PCB concentration in fish less than 12 inches was 0.16 ppm, and the median concentration in fish greater than 12 inches was 0.34 ppm.

Mercury concentrations were below MDCH trigger levels in all 20 brown trout collected in 2004 (Figure 101), and the median mercury concentration was 0.13 ppm. The median mercury concentration

in brown trout collected since 1994 that were less than 14 inches was 0.13 ppm, and the 1 fish greater than 14 inches had a concentration of 0.7 ppm.

Seven white sucker ranging in length from 9 to 15 inches were collected from the Little South Branch of the Pere Marquette River in 2004. Contaminant concentrations were below MDCH trigger levels in all 7 fish.

Recommendations: The MDCH should consider advising women and children to eat no more than 1 meal per month of Pere Marquette brown trout greater than 12 inches due to elevated levels of PCBs.

No additional monitoring is recommended.

**Portage Lake, Manistee County (ID 2004144)**  
***Carp, Largemouth Bass, and Northern Pike***

Existing MDCH Advisory: Carp are not covered by an advisory. The general population should eat no more than 1 meal per week and women and children should eat no more than 1 meal per month of Portage Lake largemouth bass or northern pike due to elevated concentrations of mercury and PCBs.

Comparison to Trigger Levels: Ten carp ranging in length from 17 to 33 inches were collected from Portage Lake in 2004. Total PCB concentrations exceeded the women and children trigger levels in 7 fish (Table 10; Figure 102). Four fish had total PCB concentrations in the women and children “1 meal per week” range, and 3 were in the “1 meal per month” range. Carp under 26 inches had a median total PCB concentration of 0.042 ppm, and carp over 26 inches had a median concentration of 0.2 ppm.

Ten largemouth bass ranging in length from 14 to 20 inches were collected from Portage Lake in 2004. Total PCB concentrations were above the women and children “1 meal per week” trigger level in 2 fish (Table 10; Figure 103). Eight fish were larger than the 14-inch size limit and had a median total PCB concentration of 0.029 ppm. A total of 17 largemouth bass were collected since 1990, and the median total PCB concentration in the 13 legal-sized fish was 0.09 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 1 largemouth bass (Table 11; Figure 104). The median mercury concentration in the 8 legal-sized fish collected in 2004 was 0.3 ppm. Linear regression analysis of the data collected since 1990 indicates that fish over 18 inches would exceed the “restrict consumption” trigger level.

Ten northern pike ranging in length from 24 to 30 inches were collected from Portage Lake in 2004. Total PCB concentrations were below the MDCH women and children trigger levels in 9 fish, and 1 fish was in the “1 meal per week” range (Table 10; Figure 105). The median total PCB concentration in the 7 northern pike longer than the 24-inch legal size limit was 0.03 ppm. A total of 20 northern pike were collected since 1990. The median total PCB concentration in fish between 24 and 30 inches was 0.04 ppm, and in fish longer than 30 inches the median concentration was 0.34 ppm.

None of the northern pike collected since 1990 had mercury concentrations exceeding the “restrict consumption” trigger level (Table 11; Figure 106). The median mercury concentration in fish between 24 and 30 inches was 0.2 ppm, and in fish longer than 30 inches the median concentration was 0.4 ppm.

Recommendations: The MDCH should consider advising women and children to eat no more than 1 meal per month of Portage Lake carp greater than 26 inches.

The MDCH should consider relaxing the general population advisory to no more than 1 meal per week and the women and children advisory to no more than 1 meal per month of Portage Lake largemouth bass greater than 18 inches.

In addition, the MDCH should consider removing the general population advisory on Portage Lake northern pike, and relaxing the women and children advisory to no more than 1 meal per month of Portage Lake northern pike greater than 30 inches. Also, the MDCH should consider removing mercury from the list of contaminants causing the Portage Lake northern pike advisory.

No further monitoring is recommended.

**Robinson Lake, Newaygo County (ID 2004095)**  
***Northern Pike***

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

Comparison to Trigger Levels: Nine northern pike ranging in length from 23 to 26 inches were collected from Robinson Lake in 2004 and analyzed for mercury only. Mercury concentrations were at or exceeded the MDCH “restrict consumption” trigger level in 4 fish (Table 11; Figure 107). The median mercury concentration in the 5 fish longer than the 24-inch legal size limit was 0.47 ppm.

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

**Ruppert Lake, Kalamazoo County (ID 2004099)**  
***Largemouth Bass***

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

Comparison to Trigger Levels: Ten largemouth bass ranging in length from 12 to 16 inches were collected from Ruppert Lake in 2004 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 1 fish (Table 11; Figure 108). The median mercury concentration was 0.48 ppm for largemouth bass greater than the 14-inch legal size limit.

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

**Rush Lake, Van Buren County (ID 2004100)**  
***Northern Pike***

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

Comparison to Trigger Levels: Ten northern pike ranging in length from 23 to 29 inches were collected from Rush Lake in 2004 and analyzed for mercury only. Mercury concentrations exceeded the “restrict consumption” trigger level in 4 fish (Table 11; Figure 109). The median concentration of the 6 fish greater than the 24-inch size limit was 0.55 ppm.

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

**Sporley Lake, Marquette County (ID 2004117)**  
***Splake***

Existing MDCH Advisory: Sporley Lake splake are not covered by an advisory.

Comparison to Trigger Levels: Ten splake ranging in length from 12 to 14 inches were collected from Sporley Lake in 2004. Contaminant concentrations were below MDCH trigger levels in all 10 fish.

Recommendations: No changes to the advisory or further monitoring is recommended.

**St. Joseph River, Sturgis Impoundment (ID 2004119)**  
***Carp and Largemouth Bass***

Existing MDCH Advisory: Women and children should not eat any carp and the general population should not eat more than 1 meal per week of carp from the St. Joseph River upstream of the Berrien Springs Dam due to elevated concentrations of PCBs. Largemouth bass from St. Joseph River impoundments are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten carp ranging from 19 to 25 inches were collected from the St. Joseph River above the Sturgis Dam in 2004. Total PCB concentrations were below women and children trigger levels in all 10 fish (Figure 110). A total of 16 carp were collected from the St. Joseph River upstream of the Constantine Dam since 1992 (the Constantine Dam is approximately 12 miles downstream of the Sturgis Dam; a dam at Three Rivers is approximately midway between the Constantine and Sturgis Dams). The median total PCB concentration in the carp collected since 1992 was 0.01 ppm.

Six largemouth bass ranging in length from 11 to 17 inches were collected from the St. Joseph River above the Sturgis Dam in 2004. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 6 fish. The median mercury concentration in the 3 fish larger than the 14-inch legal size limit was 0.2 ppm (Table 11; Figure 111).

Recommendations: The MDCH should consider removing the advisory on carp less than 26 inches from the St. Joseph River upstream of the Sturgis Dam. Also, the MDCH should consider removing the advisory on largemouth bass less than 18 inches from the St. Joseph River upstream of the Sturgis Dam.

No additional monitoring is recommended.

**Sylvan Lake, Newaygo County (ID 2004141)**  
***Largemouth Bass and Northern Pike***

Existing MDCH Advisory: Sylvan Lake largemouth bass and northern pike are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Six largemouth bass ranging in length from 14 to 17 inches were collected from Sylvan Lake in 2004 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 2 largemouth bass (Table 11; Figure 112). The median mercury concentration for all 6 fish was 0.5 ppm.

Five northern pike ranging in length from 23 to 36 inches were collected from Sylvan Lake in 2004 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 2 fish. The median mercury concentration in northern pike was 0.6 ppm for fish greater than the 24-inch legal size limit (Figure 113).

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

**Van Auken Lake, Van Buren County (ID 2004125)**

***Northern Pike***

Existing MDCH Advisory: Van Auken Lake northern pike are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten northern pike ranging in length from 24 to 27 inches were collected from Van Auken Lake in 2004 and analyzed for mercury only. Mercury concentrations exceeded the “restrict consumption” trigger level in 2 fish (Table 11; Figure 114). The median concentration in the nine northern pike longer than the 24-inch legal size limit was 0.37 ppm.

Recommendations: The MDCH should consider removing the advisory on northern pike less than 26 inches. No additional monitoring is recommended.

**White Lake, Muskegon County (ID 2004126)**

***Carp, Smallmouth Bass, and Walleye***

Existing MDCH Advisory: No one should eat White Lake carp due to elevated concentrations of PCBs and chlordane. The general population should eat no more than 1 meal per week and women and children no more than 1 meal per month of smallmouth bass due to elevated levels of mercury and PCBs. Also, the general population should not eat more than 1 meal per week of walleye greater than 26 inches, and women and children should not eat more than 1 meal per month of walleye greater than 18 inches and not more than 1 meal per week of walleye less than 18 inches, due to elevated concentrations of mercury and PCBs.

Comparison to Trigger Levels: Five carp ranging in length from 27 to 32 inches were collected from White Lake in 2004. Total PCB concentrations exceeded the general population trigger level in 1 (20%) fish. The concentration in 1 carp was in the women and children “1 meal per month” range, 3 fish had concentrations in the “6 meals per year” range, and 1 carp had a concentration exceeding the women and children “no consumption” trigger level (Table 10; Figure 115). A total of 23 carp were collected from White Lake since 1984. The median total PCB concentration in fish less than 26 inches was 0.95 ppm, and in carp greater than 26 inches the median concentration was 2.27 ppm. Total PCB concentrations exceeded the general population trigger level in 5 of 13 (38%) carp less than 26 inches, and in 6 of 10 (60%) fish greater than 26 inches.

Total chlordane concentrations were below the MDCH “restrict consumption” trigger level in all 5 carp collected from White Lake in 2004 (Figure 116). Concentrations exceeded the trigger level in 1 of 15 (7%) carp collected since 1991.

Seven smallmouth bass ranging in length from 12 to 18 inches were collected from White Lake in 2004. Total PCB concentrations were below women and children trigger levels in all 7 fish. A total of 16 smallmouth bass were collected since 1987. The median total PCB concentration was 0.33 ppm (Figure 117).

Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 7 smallmouth bass collected in 2004. Mercury concentrations exceeded the “restrict consumption” trigger level in 1 of the 16 smallmouth bass collected since 1987, and the median mercury concentration in the legal-sized fish was 0.3 ppm (Figure 118).

Ten walleye ranging in length from 19 to 26 inches were collected from White Lake in 2004. Total PCB concentrations exceeded women and children trigger levels in all 10 fish. The concentrations in 7 walleye were in the “1 meal per week” range, and 3 fish had concentrations in the “1 meal per month” range (Table 10; Figure 119). A total of 23 walleye were collected from White Lake since 1987. The median total PCB concentration in legal-sized walleye less than 26 inches was 0.12 ppm, and the median concentration in fish larger than 26 inches was 0.45 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 3 walleye collected in 2004 (Table 11; Figure 120), and the median concentration was 0.14 ppm. Concentrations exceeded the “restrict consumption” trigger level in 5 of 23 fish collected since 1987. The overall median mercury concentration was 0.41 ppm.

Recommendations: The MDCH should consider removing chlordane from the list of contaminants causing the consumption advisory on carp from White Lake.

In addition, the MDCH should consider removing the general population advisory on White Lake smallmouth bass less than 18 inches.

Lastly, the MDCH should consider relaxing the women and children advisory to no more than 1 meal per week of White Lake walleye less than 26 inches.

Additional carp and smallmouth bass should be collected from White Lake to evaluate the possibility of relaxing the advisories based on PCBs.

### **3.1.2.5 Lake Superior Watershed**

#### **Carp River Downstream of Deer Lake, Marquette County (ID 2004009 and 2004010) *Brook Trout and White Sucker***

Existing MDCH Advisory: No one should eat Carp River white sucker due to elevated levels of mercury. Carp River brook trout are not covered by an advisory.

Comparison to Trigger Levels: Thirteen brook trout ranging in length from 7 to 14 inches were collected from the Carp River downstream of Deer Lake in 2004, and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 13 fish (Figure 121).

Ten white sucker ranging in length from 8 to 14 inches were collected from the Carp River downstream of Deer Lake in 2004 and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 10 fish (Figure 122).

Recommendations: The MDCH should consider removing the advisory for Carp River white sucker. No additional monitoring is recommended.

#### **Deer Lake, Alger County (ID 2004019) *Northern Pike***

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

Comparison to Trigger Levels: Ten northern pike ranging in length from 23 to 28 inches were collected from Deer Lake in 2004. Mercury concentrations exceeded the “restrict consumption” trigger level in all 10 fish with 3 of the fish exceeding the “no consumption” trigger level (Table 11; Figure 123). The

median mercury concentration in fish between 24 and 26 inches was 1.16 ppm, and the median mercury concentration of fish longer than 26 inches was 1.62 ppm.

Recommendations: The MDCH should consider advising the general population not to eat Deer Lake northern pike greater than 26 inches. No additional monitoring is recommended.

#### **Dinner Lake, Gogebic County (ID 2004024)**

##### ***Black Crappie, Largemouth Bass, Northern Pike, Smallmouth Bass, and Walleye***

Existing MDCH Advisory: Dinner Lake black crappie, largemouth bass, northern pike, smallmouth bass, and walleye are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Two black crappie, 11.7 inches and 12.0 inches in length, were collected from Dinner Lake in 2004 and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in both fish with a median of 0.40 ppm (Figure 124).

Two largemouth bass, 13.1 inches and 17.1 inches in length, were collected in 2004. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in both fish (Table 11; Figure 124). The largemouth bass that was greater than the 14-inch legal size limit had a mercury concentration of 0.75 ppm.

Three northern pike ranging from 29.2 to 31.7 inches were collected in 2004. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in all 3 northern pike with a median concentration of 1.05 ppm (Table 11; Figure 125).

Two smallmouth bass, 14.0 and 14.6 inches in length, were collected in 2004. Mercury concentrations in both fish exceeded the MDCH “restrict consumption” trigger level with a median concentration of 0.56 ppm (Table 11; Figure 124).

One 9.0 inch walleye was collected in 2004. The fish had a mercury concentration of 1.09 ppm, which exceeds the MDCH “restrict consumption” trigger level (Table 11; Figure 124).

Recommendations: No changes to the advisory are recommended. Additional walleye and northern pike should be collected from Dinner Lake to evaluate the need for increased advisories.

#### **Lake Medora, Keweenaw County (ID 2004050)**

##### ***Smallmouth Bass and Walleye***

Existing MDCH Advisory: Lake Medora smallmouth bass and walleye are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Five smallmouth bass ranging in length from 14 to 17 inches were collected from Lake Medora in 2004 and analyzed for mercury only. Mercury concentrations were at or above the MDCH “restrict consumption” trigger level in 3 fish (Table 11; Figure 126). The median mercury concentration in the 5 fish was 0.5 ppm.

Five walleye ranging in length from 16 to 19 inches were collected from Lake Medora in 2004 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 3 fish (Table 11; Figure 127). The median mercury concentration in the 5 fish was 0.5 ppm.

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

**Pretty Lake, Luce County (ID 2004083)**  
**Walleye**

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

Comparison to Trigger Levels: Five walleye ranging in length from 16 to 24 inches were collected from Pretty Lake in 2004 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 3 fish (Table 11; Figure 128). The median mercury concentration in walleye between 14 and 18 inches was 0.51 ppm, and fish between 18 and 22 inches had a median concentration of 0.59 ppm.

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

**Teal Lake, Marquette County (ID 2004122)**  
**Smallmouth Bass and Walleye**

Existing MDCH Advisory: Teal Lake smallmouth bass and walleye are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Four smallmouth bass ranging in length from 14 to 16 inches in length were collected from Teal Lake in 2004 and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 4 fish with a median mercury concentration of 0.27 ppm (Figure 129).

Eight walleye ranging in length from 13 to 24 inches were collected in 2004 and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 8 fish (Figure 130). The median mercury concentration in fish longer than the 15-inch legal size limit was 0.32 ppm.

Recommendations: The MDCH should consider removing the advisory on Teal Lake smallmouth bass less than 18 inches and walleye less than 22 inches. No additional monitoring is recommended.

**3.1.3 Summary of Recommendations**

The MDCH should consider relaxing fish consumption advisories at 22 sites and adding or expanding advisories at 10 sites. Also, additional monitoring is recommended at 6 water bodies.

**3.1.3.1 Summary of Recommendations for Relaxed Advisories**

- The MDCH should consider removing the advisory on rock bass less than 8 inches from the Clinton River below Yates Dam. The MDCH should also consider removing the advisory on white sucker from the Clinton River below Yates Dam.
- The MDCH should consider relaxing the general population advisory on Detroit River freshwater drum to no more than 1 meal per week of freshwater drum greater than 18 inches. In addition, the MDCH should consider relaxing the women and children advisory on Detroit River redhorse sucker to no more than 1 meal per week of redhorse sucker less than 18 inches and no more than 1 meal per month of fish greater than 18 inches. Lastly, the MDCH should consider removing the women and children advisory on Detroit River yellow perch less than 10 inches.

- The MDCH should consider removing the consumption advisories on Kent Lake black crappie less than 10 inches. Also, the MDCH should consider removing the general population consumption advisory for walleye.
- The MDCH should consider relaxing the general population advisory on Lake Huron lake trout to no more than 1 meal per week of fish less than 26 inches. Also, the MDCH should consider removing chlordane from the list of contaminants causing the advisory for Lake Huron lake trout.
- The MDCH should consider removing the general population advisory on Saginaw Bay white bass less than 12 inches and relaxing the women and children advisory on white bass to no more than 1 meal per month of fish less than 12 inches.
- The MDCH should consider removing the general population advisory on channel catfish from the Bad River, and relaxing the women and children advisory to no more than 1 meal per week of channel catfish less than 18 inches and no more than 1 meal per month of channel catfish between 18 and 22 inches.
- The MDCH should consider removing the general population advisory for Cass River carp. Also, the MDCH should consider removing the general population advisory for channel catfish less than 14 inches, and relaxing the women and children advisory for channel catfish less than 14 inches to no more than 1 meal per week.
- The MDCH should consider relaxing the women and children advisory to no more than 1 meal per month, and the general population advisory to no more than 1 meal per week of Cheboyganing Creek carp less than 22 inches.
- The MDCH should consider removing the advisory on Five Lakes largemouth bass less than 18 inches.
- The MDCH should consider removing the advisory on Frenchman Lake northern pike less than 26 inches.
- The MDCH should consider removing the advisory on Long Lake smallmouth bass less than 18 inches.
- The MDCH should consider removing the advisory on Peach Lake northern pike less than 26 inches.
- The MDCH should consider removing PCBs from the list of contaminants causing the advisory on St. Marys River northern pike.
- The MDCH should consider relaxing the women and children advisory to no more than 1 meal per week of southern Lake Michigan rainbow trout less than 22 inches.
- The MDCH should consider relaxing the women and children advisory to no more than 1 meal per week of Little Bay De Noc smallmouth bass less than 18 inches.
- The MDCH should consider removing the advisory on Boot Lake walleye less than 22 inches.

- The MDCH should consider relaxing the general population advisory to no more than 1 meal per week and the women and children advisory to no more than 1 meal per month of Portage Lake largemouth bass greater than 18 inches. In addition, the MDCH should consider removing the general population advisory on Portage Lake northern pike, and relaxing the women and children advisory to no more than 1 meal per month of Portage Lake northern pike greater than 30 inches. Also, the MDCH should consider removing mercury from the list of contaminants causing the Portage Lake northern pike advisory.
- The MDCH should consider removing the advisory on carp less than 26 inches from the St. Joseph River upstream of the Sturgis Dam. Also, the MDCH should consider removing the advisory on largemouth bass less than 18 inches from the St. Joseph River upstream of the Sturgis Dam.
- The MDCH should consider removing the advisory on Van Auken Lake northern pike less than 26 inches.
- The MDCH should consider removing the general population advisory on White Lake smallmouth bass 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 White Lake walleye less than 26 inches. The MDCH should also consider removing chlordane from the list of contaminants causing the consumption advisory on carp from White Lake.
- The MDCH should consider removing the advisory for Carp River white sucker.
- The MDCH should consider removing the advisory on Teal Lake smallmouth bass less than 18 inches and walleye less than 22 inches.

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

- The MDCH should consider advising women and children to eat no more than 1 meal per month of walleye of any size from the western basin of Lake Erie due to elevated levels of PCBs.
- The MDCH should consider advising women and children against eating any white bass from Saginaw Bay greater than 12 inches due to elevated levels of dioxin TEQ.
- The MDCH should consider advising the general population against eating more than 1 meal per week of Bad River carp greater than 22 inches due to elevated levels of PCBs. Also, the MDCH should consider advising women and children to eat no more than 1 meal per week of carp less than 18 inches, and no more than 1 meal per month of fish greater than 18 inches.
- The MDCH should consider advising the general population not to eat more than 1 meal per week, and women and children to not eat more than 1 meal per month of St. Marys River northern pike due to elevated levels of mercury.
- The MDCH should consider advising women and children to eat no more than 1 meal per month of redhorse sucker from Little Bay De Noc.
- The MDCH should consider advising women and children to eat no more than 1 meal per week of rock bass greater than 8 inches from the Manistique River below Manistique Papers Dam due to elevated levels of PCBs and mercury.

- The MDCH should consider advising women and children to eat no more than 1 meal per month of Pere Marquette brown trout greater than 12 inches due to elevated levels of PCBs.
- The MDCH should consider advising women and children to eat no more than 1 meal per month of Portage Lake carp greater than 26 inches.
- The MDCH should consider advising the general population to not eat Deer Lake (Alger County) northern pike greater than 26 inches.

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

Additional monitoring should be considered at the following sites:

- Additional lake trout should be collected from Lake Huron to evaluate the possibility of relaxing the advisory for women and children based on PCBs and dioxin TEQ.
- Additional yellow perch should be collected from Saginaw Bay to evaluate the possibility of removing the advisory for women and children based on PCBs.
- Additional carp should be collected from the Cass River below Bridgeport to evaluate the possibility of removing dioxin from the list of contaminants causing the advisory.
- Additional carp should be collected from Cheboyganing Creek to evaluate levels of dioxins in the fish.
- Additional carp and northern pike should be collected from the Sebewaing River to evaluate the possibility of relaxing the advisory for women and children based on PCBs.
- Additional carp and smallmouth bass should be collected from White Lake to evaluate the possibility of relaxing the advisories based on PCBs.
- Additional walleye and northern pike should be collected from Dinner Lake to evaluate the need for increased advisories.

### **3.1.4 Summary of Water Quality Standard Attainment Status**

The MDEQ, WB is required by the federal Clean Water Act (CWA) to compile a list of water bodies with water quality impairments. Impaired water bodies are defined as those that do not attain one or more of the designated uses set forth in Rule 100 (R 323.1100) of the Part 4 rules, WQS, promulgated under Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Under Section 303(d) of the CWA, states are required to develop a Total Maximum Daily Load (TMDL) for water bodies that will not attain WQS with technology-based controls. In order to satisfy the CWA requirements, the MDEQ compiles an integrated report, biennially, listing Michigan water bodies that are not attaining one or more designated use and require the establishment of a TMDL to meet and maintain WQS.

Water bodies are evaluated and placed into at least one of five reporting categories. A water body is placed in Category 1 if all designated uses are supported and no use is threatened, and in Category 2 if some designated uses are supported. Category 3 indicates that there is not sufficient data to determine

if the designated use is being supported. Category 4 includes water bodies that have a threatened or impaired designated use, but do not need a TMDL developed because either: a) a TMDL has been approved or established by the USEPA; (b) an impairment caused by a pollutant is being addressed through other pollution control requirements; or (c) an impairment is not caused by a pollutant. Lastly, if a water body does not meet WQS and is in need of TMDL development, it is listed in Category 5.

Attainment status based on fish contaminants is determined for water bodies with site-specific, edible portion data. For contaminants other than mercury, a water body was considered not attaining if the MDCH issued a site-specific Fish Contaminant Advisory. Attainment status based on mercury in fish was determined by comparison of site-specific data to a fish tissue criterion developed using a method identical to that used by the USEPA. All inland lakes, impoundments, wetlands, and rivers with fish tissue mercury concentrations greater than 0.35 ppm (based on at least 5 fish of a given species) are considered to be not attaining WQS. The 0.35 ppm value is a concentration that is not expected to pose a health concern to people consuming up to 15 grams of fish per day. The listing methodology for evaluating attainment status is subject to biennial review.

The sites assessed in 2004 represented 51 water bodies. Most of those water bodies have fish tissue-based records in the MDEQ, WB database used to track attainment status of sampled sites (Table 13). The database will need to be modified by the addition of 9 new records with a proposed attainment category based on fish contaminants, and by updating the remaining 42 existing records. Proposed water body record modifications will be reviewed by MDEQ staff, the USEPA, and the public before being presented in the 2008 Integrated Report.

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

Caged fish bioconcentration monitoring was conducted at 38 locations in 6 watersheds in 2003, and at 12 locations in 3 watersheds in 2004. The raw data are presented in Appendix E. General highlights of the caged fish studies conducted in the Boardman, Flat, Flint, Little Black Creek, Pere Marquette, Rabbit, River Raisin, Shiawassee, and St. Joseph Watersheds include:

- Net uptake of mercury was measured at 15 of 50 locations. The highest net uptake was measured in fish from cages set in the Shiawassee River.
- Net uptake of total lipid-normalized PCB was measured at 43 of 50 locations. The highest net uptake was measured in fish from cages set at Chase Lake Road in the South Branch Shiawassee River.
- Net uptake of total lipid-normalized DDT was measured at 22 of 50 locations. The highest net uptake was measured in fish from cages set in the River Raisin.
- Net uptake of total lipid-normalized chlordane was measured at 32 of 50 locations. The highest net uptake was measured in fish from cages set in the South Branch Shiawassee River and Little Black Creek.
- Net uptake of lipid-normalized dioxin TEQ was measured at 9 of 13 locations. The highest net uptake was measured in fish from cages set in the Flint River downstream of Flint.
- Net uptake of lipid-normalized total heptachlor epoxide (HPE) was measured at 5 of 50 locations, including all 3 sites in the River Raisin, and 3 of 6 sites in the South Branch Shiawassee River. The highest net uptake was measured in the South Branch Shiawassee River.

### **3.2.1 Boardman River Watershed Caged Fish Study**

Cages were placed at 3 locations in the Boardman River in 2003 (Figure 3) as part of basin year monitoring. No fish contaminant sampling has been conducted on the Boardman River to date, and there are no consumption advisories specific to the river. Samples from the Eighth Street and Beitner Road sites were analyzed for dioxin TEQ, as well as the standard list of contaminants.

Lipid-normalized total PCB uptake was measured at all three sites (Table 14; Figure 131) and was significantly higher at the downstream site compared to both sites upstream of the dam. Net uptake of total PCB and lipid-normalized PCB was roughly equivalent to other Great Lake tributary mouths with low levels (Figures 132 and 133).

No quantifiable uptake of mercury was observed at the upstream (Beitner Road) site, but statistically significant uptake of mercury was detected at the Eighth Street Bridge [downstream of the Wastewater Treatment Plant (WWTP)] and at the Union Street site, downstream of the Boardman Dam (Table 14; Figure 131).

Net uptake of lipid-normalized total DDT was detected only at the Union Street site, and no net uptake of total chlordane was measured at any of the Boardman River sites (Table 14; Figure 131).

### **3.2.2 Flat River Watershed Study**

Cages were placed at 6 sites in the Flat River in 2003 (Figure 4). Flat River carp and rock bass are covered by sport fish consumption advisories due to elevated levels of PCBs.

Net uptake of total lipid-normalized PCB was detected at all 6 sites, but no spatial pattern was observed (Table 14; Figure 134).

Net uptake of lipid-normalized total chlordane was measured at all 6 sites, but no spatial pattern was observed (Table 14; Figure 134).

Net uptake of lipid-normalized total DDT was measured at Greenville downstream of the WWTP, and both upstream and downstream of the WWTP in Lowell (Table 14; Figure 134).

Net uptake of total lipid-normalized dioxin TEQ was detected at all sites, but no spatial pattern was observed (Table 14; Figure 135).

No quantifiable uptake of mercury was observed at any of the Flat River sites in 2003.

### **3.2.3 Flint River Watershed Study**

Cages were placed at 11 sites in the Flint River watershed in 2003 (Figure 5). Thread Creek and Thread Creek Impoundment is covered by a sport fish consumption advisory for carp due to elevated levels of PCBs. Carp and smallmouth bass downstream of Flint are also under advisory for PCBs.

Net uptake of lipid-normalized total PCB and lipid-normalized total chlordane was measured at all sites (Table 14; Figure 136). The average net uptake of lipid-normalized total PCB at sites downstream of Flint was significantly higher than the average observed upstream of Flint. The concentration increased dramatically between the Bray Road site and the site downstream of Flint, indicating a source or sources of PCBs in that reach of the river.

Quantifiable uptake of mercury was measured only at the Swartz Creek site (Table 14; Figure 136).

Net uptake of lipid-normalized total DDT was measured at 6 of 11 sites in the Flint River watershed (Table 14; Figure 136). Spatial patterns suggest that the Thread Creek Impoundment may be a source of DDT to the river, but other patterns are not apparent.

Net uptake of lipid-normalized total chlordane was measured at all 11 sites in the Flint River watershed (Table 14; Figure 136). Concentrations were low and no spatial pattern was apparent, indicating that chlordane is ubiquitous in the watershed.

Net uptake of lipid-normalized dioxin TEQ was measured in the Flint River at all 3 sites where it was analyzed (Table 14; Figure 137). The average concentration increased slightly from upstream to downstream, but the difference was not significant ( $\alpha < 0.05$ ).

#### **3.2.4 Little Black Creek Watershed Study**

Cages were placed at 4 sites in the Little Black Creek in 2004 (Figure 6). The Peerless Plating Superfund site, located on Little Black Creek, was a source of heavy metal contamination to the creek. An insufficient number of fish for analysis were retrieved from the cage set downstream of the Peerless site.

Little Black Creek is a tributary to Mona Lake, which is covered by fish consumption advisories due to elevated levels of PCBs. The caged fish study was conducted to identify sources of bioaccumulative contaminants to the watershed.

Statistically significant uptake of total lipid-normalized PCB was measured at the Department of Public Works (DPW) Wetland and at the mouth of Little Black Creek. The average net uptake of lipid-normalized PCB increased from upstream to downstream (Table 14; Figure 138).

Net uptake of mercury was measured at US-31 and at the mouth of Little Black Creek, but not in the samples from the DPW site (Table 14; Figure 138). The average net uptake of mercury was highest at US-31.

Total lipid-normalized chlordane was measured at all 3 sites with average net uptake increasing slightly from upstream to downstream (Table 14; Figure 138).

#### **3.2.5 Pere Marquette River Watershed Study**

Cages were placed at 8 sites in the Pere Marquette River watershed in 2003 (Figure 7). Pere Marquette River brown trout are under a sport fish consumption advisory due to elevated levels of PCBs and mercury, while redhorse suckers are under a sport fish consumption advisory for PCBs.

Net uptake of total lipid-normalized PCB was measured at 5 sites in the Pere Marquette watershed, and the average net uptake was highest at the Little South Branch site (Table 14; Figure 139).

Net uptake of mercury was measured at the Little South Branch of the Pere Marquette River site and downstream of the Ludington WWTP (Table 14; Figure 139).

Net uptake of total lipid-normalized DDT in the Pere Marquette watershed was measured only at the Little South Branch Pere Marquette site (Table 14; Figure 139).

Total chlordane concentrations were below detection limits in all of the 2003 Pere Marquette caged fish samples, and net uptake of lipid-normalized dioxin TEQ was not measured at any of the sites (Table 14).

### **3.2.6 Rabbit River Watershed Study**

Cages were placed at 2 locations in the Rabbit River in 2003 (Figure 8). The Rabbit River is covered by sport fish advisories due to elevated levels of PCBs and mercury.

Net uptake of total lipid-normalized PCB, total lipid-normalized DDT, and total lipid-normalized chlordane was measured at both locations. Average net uptake of both DDT and chlordane was highest upstream of Hamilton, but the differences were not statistically significant ( $\alpha < 0.05$ ). No quantifiable uptake of mercury was detected at either location (Table 14; Figure 140).

### **3.2.7 River Raisin Watershed Study**

Cages were placed at 3 sites in the River Raisin in 2004 (Figure 9). The River Raisin is designated as a Great Lakes Area of Concern (AOC). The primary impaired use in the AOC is fish consumption, due to high levels of PCBs found in fish samples. A sediment removal remediation project was completed in 1997, but other areas with high concentrations of PCBs remain, primarily in the area downstream of the turning basin.

Net uptake of total lipid-normalized PCBs was measured at all 3 sites (Table 14; Figure 141). Concentrations at the upstream site (railroad bridge) were significantly less than those measured in samples from the turning basin or at the river mouth ( $\alpha < 0.05$ ), consistent with the pattern observed in a previous caged fish study conducted in 1998. Net uptake of PCB and lipid-normalized PCB measured at the River Raisin mouth have declined since 1988, but uptake was higher than recently observed at the mouths of the Kalamazoo or Saginaw Rivers (Figures 132 and 133).

Low net uptake of total lipid-normalized chlordane, total lipid-normalized DDT, and lipid-normalized HPE was measured at some sites (Table 14; Figure 141), suggesting low-level point and/or nonpoint sources of the banned and discontinued pesticides. These sources may represent legacy remnants within sediments throughout the river.

### **3.2.8 Shiawassee River Watershed Study**

Cages were placed at 6 sites in the South Branch of the Shiawassee River in 2004 (Figure 10). The river near Howell is a USEPA Superfund site due to PCB contaminated sediments, and the river between M-59 and Byron is under a sport fish consumption advisory due to elevated levels of PCBs. The caged fish sampling was conducted prior to sediment remediation work.

Net uptake of total lipid-normalized PCBs was measured at all sites in the South Branch Shiawassee River (Table 14; Figure 142). Concentrations were relatively low at the 2 sampling sites upstream of the Superfund area and at the site furthest downstream (near Byron). The concentrations in samples from the 3 sites between Howell and the Byron site were significantly higher than the others ( $\alpha < 0.05$ ), indicating that the prime sources of PCBs to that reach of the river are in the Superfund area.

Net uptake of mercury, lipid-normalized total DDT, lipid-normalized total chlordane was measured at nearly all stations (Table 14; Figure 143), but no spatial patterns were apparent.

Low net uptake of HPE was measured in the South Branch Shiawassee River, increasing in concentration from Howell downstream to Marr Road (Table 14; Figure 143). This may indicate legacy remnants within river sediments in that reach of the stream.

### **3.2.9 St. Joseph River Watershed Study**

Cages were placed at 8 locations in the St. Joseph River upstream of the Michigan/Indiana state line in 2003 (Figure 11). Fish consumption advisories are in effect for several species of fish in the St. Joseph River due to elevated levels of PCBs.

Net uptake of total lipid-normalized PCBs was measured at all sites sampled except the Union City and Three Rivers sites (Table 14; Figure 144). Net uptake was low and relatively constant from the most upstream site through Three Rivers, but uptake increased markedly beginning at the site downstream of Constantine, indicating a potential source between the two points and probable nonpoint sources downstream of Constantine.

Results for other detected contaminants indicate low-level, widespread sources.

Net uptake of mercury was measured at Union City, and downstream of both Union City and the Sturgis Dam (Table 14; Figure 144).

Low-level net uptake of lipid-normalized DDT was measured downstream of both Union Lake and Constantine (Table 14; Figure 144).

Net uptake of total lipid-normalized chlordane was measured only at the State Line. Chlordane levels were below the detection limit in samples from the other sites (Table 14; Figure 144).

## **3.3 TREND MONITORING**

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

Highlights of the 3 trend monitoring programs are presented below:

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

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

General conclusions are presented below:

- The USEPA's lake trout data for Lakes Superior, Michigan, Huron, and Ontario indicate that total PCB and total DDT concentrations in all four lakes declined between the 1970s and 2000 (Figures 145 and 146). Also, Lake Michigan lake trout had higher levels of total PCB and total DDT than lake trout from the other Great Lakes.
- Total PCB and total DDT concentrations in Lake Superior lake trout showed no consistent trend between the late 1980s and 2000. Total PCB and total DDT concentrations in lake trout from Lakes Huron, Michigan, and Ontario continued to decline between 1986 and 2000, but at a slower rate than the declines observed between 1974 and 1986.
- Total chlordane concentrations declined at a fairly steady rate in lake trout from Lakes Huron and Ontario between 1986 and 2000 (Figure 147). Total chlordane levels in Lake Superior lake trout remained fairly constant from 1986 to 1995 but increased between 1997 and 2000. Lake trout from Lake Michigan exhibited a slow decline in total chlordane concentrations from 1986 to 2000.
- Apparent toxaphene concentrations declined between 1986 and 1998 in lake trout from each of the 4 Great Lakes monitored (Figure 148). The increases seen in the 2000 samples are due, at least in part, to a change in lab reporting methods (D. Swackhamer, personal communication).
- Contaminant concentrations in Lake Superior lake trout were lower than concentrations in lake trout from the other Great Lakes with the exception of apparent toxaphene. The relatively high apparent toxaphene concentrations in Lake Superior lake trout compared to Lake Ontario lake trout may be a result of local sources or variability in lake overflow rates, productivity, climate, and the relative efficiencies of internal removal processes (Eisenreich, 1996).
- Average total DDT and total PCB concentrations in Lake Erie walleye declined since 1977 while no trend in total chlordane concentrations is apparent between 1986 and 2000 (Figure 149).

### **3.3.2 Federal and 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 federal and state agencies. Samples were collected by state agencies and analyzed by federal contract laboratories. Although samples continue to be collected, recent results were not available for inclusion in this report.

The average total PCB, total DDT, and total chlordane concentrations in coho and chinook salmon fillet samples collected in Michigan's portion of Lake Michigan between 1983 and 1998 are presented in Figure 150. Average total chlordane, total PCB, and total DDT concentrations increased in Lake Michigan coho salmon until the mid-1990s 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 151. 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, contaminant concentrations in chinook and coho salmon collected during spawning runs vary with fish length, and conclusions regarding changes in average contaminant concentrations may be influenced by changes in the size of the fish over time. The salmon collected in the late 1990s were smaller than salmon collected during the 1980s and early 1990s (Day and Walsh, 2000).

### 3.3.3 Michigan's Whole Fish Trend Monitoring

Trends analyses were conducted on a total of 32 data sets collected as part of Michigan's whole fish trend monitoring program. These data sets included species and sites for which data were available from a minimum of three sampling events (Table 2). These include carp from 5 inland rivers; lake trout, walleye, or largemouth bass from 8 inland lakes; and 19 carp, walleye, or lake trout data sets from 10 Great Lake or connecting channel stations. A significant increase or decrease in at least one selected contaminant was detected in 31 of 32 data sets.

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

Minimum detectable trends were calculated in cases where the regression model failed to detect a significant trend in contaminant concentrations. The statistical significance of slope (or trend) in a linear regression model is calculated using a t-test. The minimum detectable trend can be calculated by rearranging the t-test, establishing a desired significance level ( $p = 0.05$ ), and obtaining the standard error of the slope from the regression analyses (Exponent, 2003). The minimum detectable trend is the smallest possible trend that could have been detected with the available data for each contaminant, species, and site. For example, a minimum detectable trend of  $\pm 1.8\%$  per year in Houghton Lake largemouth bass mercury concentrations (Table 15) indicates that no mercury trend was detected and the data were sufficient to detect a trend with an absolute value greater than  $1.8\%$  per year. Therefore, the absolute value of the real trend (if any) was  $1.8\%$  per year or less.

Statistically significant changes in mercury concentrations were detected in 13 of 32 data sets (Table 15; Figure 152). 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 5 of 7 inland lakes or inland rivers where trends could be detected. The average and median rates of change in fish from the 7 inland lakes or inland rivers was  $-1.5\%$  per year and  $-2.1\%$  per year, respectively. Significant trends were found in 1 species at each of 6 sites monitored in the Great Lakes and connecting channels. Mercury concentrations increased in 5 of the 6 datasets in which significant trends were detected. The average and median rates of change in these 6 data sets were  $+2.9\%$  per year and  $+3.3\%$  per year, respectively. Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from  $\pm 0.8\%$  per year to  $\pm 8.6\%$  per year with a median minimum detectable trend of  $\pm 2.2\%$  per year.

Statistically significant changes in total PCB concentrations were detected in 24 of 32 data sets (Table 15; Figure 153). Total PCB concentrations decreased in 23 of the 24 data sets where changes were

statistically significant. Where trends could be detected, concentrations tended to decrease faster in fish from inland lakes and rivers compared to fish from the Great Lakes and connecting channels. Total PCB concentrations declined in fish from 11 of 12 inland lakes or inland rivers. The average and median rates of change in fish from all 12 sites were -8.5% per year and -7.9% per year, respectively. Concentrations declined in at least 1 species from 9 sites in the Great Lakes or connecting channels. The average and median rates of change in these data sets were -6.1% per year and -5.7% per year, respectively. Minimum detectable PCB trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-3.5% per year to +/-21.0% per year with a median minimum detectable trend of +/-4.8% per year.

Changes in total DDT concentrations were detected in 27 of 32 data sets (Table 15; Figure 154). Total DDT concentrations decreased in 26 of the 27 data sets where changes were statistically significant. Concentrations declined in fish from 10 of 11 inland lakes or inland rivers. The average and median rates of change in fish from all 11 sites were -6.4% per year and -7.9% per year, respectively. Concentrations decreased in 16 data sets collected from 10 locations in the Great Lakes and connecting channels. The average and median rates of change in fish from these sites were -8.0% per year and -7.1% per year, respectively. Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-1.9% per year to +/-4.4% per year with a median minimum detectable trend of +/-4.3% per year.

Changes in total chlordane concentrations were observed in 26 of 30 data sets (Table 15; Figure 155). Total chlordane concentrations decreased in all 26 data sets where changes were statistically significant. Total chlordane concentrations declined in fish from 9 inland lakes or inland rivers. The average and median rates of change in fish from these 9 sites were -10.2% per year and -9.0% per year, respectively. Concentrations of total chlordane changed in 17 data sets collected from 9 locations in the Great Lakes and connecting channels. The average and median rates of change in fish from these sites were -8.9% per year and -8.6% per year, respectively. Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-3.4% per year to +/-17.1% per year with a median detectable trend of +/-4.2% per year.

Changes in dioxin TEQ concentrations were measured in fish from 2 of 4 sites (Table 15). Concentrations declined in lake trout from both Thunder Bay and Keweenaw Bay. The minimum detectable trend ranged from +/-5.6% per year to +/-13.0% per year in the remaining 2 data sets with a median detectable trend of +/-9.3% per year.

The minimum detectable trends in all data sets ranged from +/-0.8% per year to +/-21.0% per year. Eight percent of the minimum detectable trends were greater than +/-10% per year; 13% were between +/-5% per year and +/-10% per year; and, 79% were less than +/-5% per year (Table 15). 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 94% 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 98% of the trends analyses conducted.

In addition, the following general conclusions can be made:

- Lindane, terphenyl, PBB, heptachlor, and aldrin were not quantified in any of the fish sampled. However, heptachlor epoxide and dieldrin (breakdown products of heptachlor and aldrin) were quantified in most of the samples analyzed.

- In addition to heptachlor epoxide and dieldrin, several chemicals were quantified in fish consistently, indicating that they are ubiquitous in the aquatic environment. These include mercury, hexachlorobenzene, total PCB, total chlordane, and total DDT.
- Apparent toxaphene was found primarily in walleye and lake trout from the Great Lakes and connecting channels. However, lake trout collected from Higgins Lake in 1991 (Site 91001) had quantifiable levels of apparent toxaphene while samples collected in 1995, 1998, and 2001 had concentrations below the quantification level. The highest concentrations of apparent toxaphene were quantified in lake trout from Lake Superior. The relatively high concentration in Lake Superior lake trout is consistent with the results reported by DeVault (1996) and discussed in Section 3.3.1.
- Largemouth bass and walleye from inland lakes tended to have the highest concentration of mercury. Fish from inland lakes tended to have higher concentrations of mercury than the same species from the Great Lakes or connecting channels.
- All species from the Great Lakes and connecting channels tended to have higher concentrations of chlorinated organic contaminants than the same species from inland lakes.
- Average total PCB concentrations were highest in carp from the Kalamazoo River site. The Kalamazoo River has a known total PCB contamination problem that is being addressed under state and federal remediation programs.
- Carp and walleye from the St. Marys River had lower concentrations of organic contaminants than carp from Lake St. Clair and the Detroit River. 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.

### **3.4 SPECIAL STUDIES**

Results from 2 special contaminant monitoring studies conducted in 2005 were available for inclusion in this report. These studies are briefly summarized below:

#### **3.4.1 Contaminant Concentrations in USFWS Sullivan Creek Fish Hatchery Lake Trout Brood Stock**

Staff from the USFWS Sullivan Creek Fish Hatchery, in Chippewa County requested that samples of lake trout from the facility be analyzed to assist them in determining the appropriate method of disposal of excess brood stock. Ten fish were collected in May 2005, and analysis was expedited to provide data in time for hatchery operation decisions.

Two lake trout each of ages 3, 7, 10, 12, and 17 years were analyzed individually as skin-on fillets. None of the contaminant concentrations exceeded MDCH consumption advisory trigger levels (ID 2005124, Appendix E).

Total PCB, mercury, and total DDT concentrations in the hatchery lake trout were markedly lower than concentrations observed in similar sized lake trout from Lakes Superior, Michigan and Huron.

Total PCB concentrations ranged from 0.001 to 0.047 ppm, and averaged 0.021 ppm. Mercury concentrations ranged from 0.04 to 0.09 ppm, and averaged 0.07 ppm. Total DDT concentrations ranged from 0.004 to 0.022 ppm, and averaged 0.012 ppm.

Concentrations of all other contaminants analyzed were near or below detection limits.

### **3.4.2 PCB Concentrations in Torch Lake, Houghton County, Using Semi-Permeable Membrane Devices (SPMDs)**

Torch Lake, Houghton County, is currently listed as a Great Lakes AOC by the USEPA, in part, because of elevated levels of PCBs in fish. A fish consumption advisory due to elevated levels of PCBs was first issued for Torch Lake fish by the MDCH in 1998, and the most recent advisory recommends restricting consumption of northern pike, smallmouth bass, and walleye from the lake.

The goal of this study was to compare water column PCB concentrations in Torch Lake to concentrations in surrounding water bodies as a first step in determining if significant sources of PCBs exist within the Torch Lake watershed. SPMDs were determined to be the most cost-effective method for measuring water column PCB concentrations for this project. The SPMDs were deployed for a period of 28 days, beginning October 20, 2005.

The SPMD contents were analyzed for PCB congeners only. The highest concentrations of total PCBs were observed within Torch Lake, suggesting a source of PCBs exists in the Torch Lake watershed. Additional PCB source identification work is planned. A complete description of the study methods and results is available as a MDEQ staff report (Bohr, 2006).

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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>Sander vitreum</i>
	Sauger	<i>Sander 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>
White Sucker	<i>Catostomus commersonii</i>	
Redhorse Sucker	<i>Moxostoma</i> spp.	
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</i> sp
	Carp	<i>Cyprinus carpio</i>
Freshwater Drum (Sheepshead)	<i>Aplodinotus grunniens</i>	
Buffalo	<i>Ictiobus cyprinellus</i>	
Burbot	<i>Lota lota</i>	
Quillback	<i>Carpoides cyprinus</i>	
Skin-off Steak	Sturgeon	<i>Acipenser fulvescens</i>
Headless, Gutted	Rainbow Smelt	<i>Osmerus mordax</i>

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

WATERBODY	SPECIES COLLECTED*	YEARS MONITORED
<b>GREAT LAKES AND CONNECTING CHANNELS</b>		
Lake Michigan		
Little Bay de Noc	Carp	1992, 94, 00, 03
	Walleye	1992, 94, 97, 00, 02
Grand Traverse Bay	Carp	1993, 95, 00, 03
	Lake Trout (D)	1990, 92, 95, 98, 01, 04
Lake Huron		
Saginaw Bay	Carp (D)	1990, 92, 94, 98, 01, 03
	Walleye	1990, 91, 92, 94, 98, 03
Thunder Bay	Carp	1992, 94, 95, 99, 01, 04
	Lake Trout (D)	1992, 94, 95, 98, 01, 04
	Walleye	1991, 95, 98, 01
Lake Superior		
Keweenaw Bay	Lake Trout (D)	1991, 93, 96, 99, 01, 04
Lake St. Clair		
L'Anse Creuse Bay	Carp	1990, 92, 94, 98, 02
	Walleye	1990, 92, 94, 98, 02
Lake Erie		
Brest Bay	Carp	1990, 92, 94, 97, 98, 02
	Walleye	1990, 92, 94, 98, 04
St. Marys River		
Munuscong Bay	Carp	1993, 95, 98, 04
	Walleye	1991, 93, 95, 98, 01
St. Clair River		
Algonac	Carp	1992, 94, 02
	Walleye	1992
Detroit River		
Grassy Island	Carp	1990, 92, 94, 96, 98, 01, 04
	Walleye	1990, 94, 96, 98, 01, 04
<b>INLAND RIVERS</b>		
Grand River	Carp	1990, 92, 95, 00, 03
Kalamazoo River	Carp	1990, 92, 94, 97, 99, 01, 03
Manistee River	Carp	1992, 94
Manistique River	Redhorse Sucker	1993, 03
Menominee River	Carp (D)	1991
	Redhorse Sucker	1994
Muskegon River	Carp	1991, 93, 95, 97, 00, 02
River Raisin	Carp	1991, 94, 97, 00, 04
St. Joseph River	Carp	1991, 93, 97, 00, 02
<b>INLAND LAKES</b>		
Grand Sable Lake	Lake Trout	1991, 93, 95
Lake Gogebic	Walleye	1992, 94, 97, 00, 02
South Manistique Lake	Walleye	1991, 93, 95, 98, 01, 03
Higgins Lake	Lake Trout	1991, 95, 97, 00, 02
Houghton Lake	Largemouth Bass	1992, 94, 98, 01, 04
Gull Lake	Largemouth Bass	1991, 93, 95, 97, 00, 02
Gun Lake	Largemouth Bass	1990, 92, 94, 97, 00, 02
Pontiac Lake	Largemouth Bass	1992, 94, 97, 99, 03

\*D = dioxin and furan congeners.

Table 3. Halogenated organic chemicals and mercury quantified in edible portion and whole 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
1,2,3,4,6,7,8,9-Octachlorodibenzo-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. Coplanar polychlorinated biphenyl congeners analyzed for Michigan's Fish Contaminant Monitoring Program.

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<u>BZ#</u>	<u>Structure</u>	<u>Quantification Limit (ppt)</u>
	TETRACHLOROBIPHENYLS	
077	3,3',4,4'	50.0
081	3,4,4',5	50.0
	PENTACHLOROBIPHENYLS	
105	2,3,3',4,4'	50.0
114	2,3,4,4',5	50.0
118	2,3',4,4',5	50.0
123	2',3,4,4',5	50.0
126	3,3',4,4',5	50.0
	HEXACHLOROBIPHENYLS	
156	2,3,3',4,4',5	50.0
157	2,3,3',4,4',5'	50.0
167	2,3',4,4',5,5'	50.0
169	3,3',4,4',5,5'	50.0
	HEPTACHLOROBIPHENYLS	
189	2,3,3',4,4',5,5'	50.0

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BZ# = identification numbers adopted by the International Union of Pure and Applied Chemists (IUPAC).  
 ppt = part per trillion (ng/Kg)

Table 7. Halogenated organic chemicals and mercury analyzed in caged fish tissue samples.

<u>Analyses for all caged fish sites:</u>	<u>Level of Detection</u>
Mercury	0.01 ppm
Hexachlorobenzene	0.002 ppm
Dieldrin	0.002 ppm
4,4'-DDE	0.005 ppm
4,4'-DDD	0.002 ppm
4,4'-DDT	0.004 ppm
Heptachlor	0.002 ppm
Heptachlor Epoxide	0.002 ppm
Oxychlordane	0.002 ppm
<i>gamma</i> -Chlordane	0.002 ppm
<i>trans</i> -Nonachlor	0.002 ppm
<i>alpha</i> -Chlordane	0.002 ppm
<i>cis</i> -Nonachlor	0.003 ppm
Total PCB (sum of 83 congeners)	0.001 ppm
 <u>Additional analyses for the Saginaw River watershed:</u>	
2,4'-DDD	0.002 ppm
2,4'-DDT	0.004 ppm
PBB (Firemaster BP-6)	0.04 ppm
Pentachlorostyrene	0.034 ppm
Hexachlorostyrene	0.018 ppm
Heptachlorostyrene	0.006 ppm
Octachlorostyrene	0.001 ppm

Table 8. 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 9. 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	36	25	K 0.001– 0.054	White Lake – Carp
g-Chlordane	36	20	K 0.001– 0.029	White Lake – Carp
cis-Nonachlor	36	28	K 0.001– 0.051	Lake Michigan - Carp
Trans-Nonachlor	36	29	K 0.001– 0.07	Lake Huron - Lake Trout
Oxychlordane	36	20	K 0.001– 0.01	Lake Huron - Lake Trout
Total Chlordane	36	29	K 0.001–0.185	White Lake – Carp
4,4'-DDD	36	33	K 0.001– 0.225	Detroit River - Carp
4,4'-DDE	36	36	K 0.001– 1.709	Lake Michigan, Little Bay De Noc - Carp
4,4'-DDT	36	26	K 0.001– 0.037	Lake Michigan, Little Bay De Noc - Carp
2,4'-DDT	36	17	K 0.001–0.028	White Lake – Carp
2,4'-DDD	36	20	K 0.001–0.044	Detroit River - Carp
Total DDT	36	36	K 0.001–1.861	Lake Michigan, Little Bay De Noc- Carp
Dieldrin	36	20	K 0.001– 0.028	Lake Michigan – Rainbow Trout
Heptachlor	36	3	K 0.001– 0.002	Detroit River - Redhorse
Heptachlor Epoxide	36	17	K 0.001– 0.007	Detroit River – Carp
Hexachlorobenzene	36	23	K 0.001 – 0.017	Clinton River – Rock Bass
Lindane	36	3	K 0.001 – 0.003	Saginaw River – Carp
Mirex	36	15	K 0.001– 0.074	White Lake – Carp
Mercury	59	59	0.01 – 1.84	Deer Lake, Alger County– Northern Pike
Octachlorostyrene	36	16	K 0.001 – 0.029	White Lake – Carp
Total PCB	36	36	K 0.001 – 15.615	Shiawassee River – Carp
Apparent Toxaphene	36	1	K 0.050 – J 0.2	Lake Huron - Lake Trout
Dioxin TEQ	6	6	0.3 – 42.6 ppt	Lake Huron, Saginaw Bay - Carp

K = Unquantified at the level shown.

J = Estimated value, value may not be precise.

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

Table 10. Edible-portion fish tissue samples with total PCB concentrations exceeding the Michigan Department of Community Health's (MDCH) sport fish consumption advisory trigger levels.

				Number of Fish in Each Consumption Advisory Category*					General Population Trigger Level	Current Advisory
				Women and Children Consumption Advisory Categories						
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		
<b>Lake Erie Watershed</b>										
2004043	Lake Erie	Walleye	0.213	4/11	6/11	1/11			Yes	
	Western Basin	White Bass	0.716		8/10	2/10			Yes	
		White Perch	0.540	1/10	8/10	1/10			Yes	
2004015	Clinton River Ryan Road, Utica	Carp	0.210	3/10	4/10		1/10	1/10	Yes	
		Rock Bass	0.020	1/10					Yes	
2004021	Detroit River Michigan Waters	Carp	2.34			2/8	6/8	6/8	Yes	
		Freshwater Drum	0.425	2/10	8/10				Yes	
		Redhorse Sucker	0.185	5/10	5/10				Yes	
		Yellow Perch	0.024	1/10					Yes	
2004040	Kent Lake Oakland County	Black Crappie	0.036	2/10					Yes	
		Walleye	0.205	3/10	5/10				Yes	
2004085	Raisin River Above Monroe Dam	Carp	0.150	6/10	3/10				Yes	
<b>Lake Huron Watershed</b>										
2004130	Lake Huron Grindstone City	Lake Trout	0.333		10/10				Yes	
2004046	Lake Huron Saginaw Bay Bay Port	Carp	1.102	1/9	3/9	3/9	2/9	2/9	Yes	
		Channel Catfish	0.297	4/10	6/10				Yes	
		Walleye	0.053	4/10	1/10				Yes	
		White Bass	0.185	6/10	3/10	1/10			Yes	
		White Sucker	0.053	5/10					Yes	
2004145	Lake Huron Thunder Bay	Lake Trout	0.557		8/10	2/10			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 10. 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		
2004003	Bad River Saginaw County	Carp	0.145	4/10	4/10		1/10	1/10	Yes	
		Channel Catfish	0.172	5/10	4/10				Yes	
		Northern Pike	0.027	1/7					Yes	
2004011	Cass River Below Bridgeport	Carp	0.113	4/9	3/9				Yes	
		Channel Catfish	0.031	2/9	1/9				Yes	
2004013	Cheboyganing Creek Saginaw County	Carp	0.118	8/10			1/10	1/10	Yes	
2004039	Kawkawlin River Saginaw County	Carp	0.855	3/10	3/10	2/10	1/10	1/10	Yes	
2004113	Saginaw River LaFayette	Carp	0.16	3/10	1/10	1/10	2/10	2/10	Yes	
2004114	Sebewaing River Huron County	Carp	0.629	2/10	3/10	3/10	1/10	1/10	Yes	
		Northern Pike	0.036	1/7					Yes	
2004101	Shiawassee River, South Branch Between M59 and Byron	Carp	4.651			3/7	4/7	4/7 1/11 11/11	Yes	
		Rock Bass	1.426		3/11	5/11	3/11		Yes	
		White Sucker	5.345				11/11		Yes	
2004120 2004149	St. Marys River Michigan Waters	Walleye	0.057	5/10					Yes	
<b>Lake Michigan Watershed</b>										
2004055 2004060	Lake Michigan South of Frankfort	Steelhead	0.438	6/19	12/19	1/19			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 10. 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		
2004150	Lake Michigan Little Bay De Noc	Carp	1.598		2/10	4/10	4/10	4/10	Yes	
		Redhorse Sucker	0.198	3/10	5/10				No	
		Smallmouth Bass	0.021	2/10					Yes	
		Walleye	0.021	4/9	1/9	1/9			Yes	
2004004	Battle Creek River, Division St., Calhoun County	Carp	0.085	2/10	2/10	1/10			Yes	
		Smallmouth Bass	0.124	8/10	1/10				Yes	
2004146 2004147 2004148	Grand River Above Moores River Impoundment	Northern Pike	0.07	3/5					Yes	
2004041	Lake Cadillac Wexford County	Smallmouth Bass	0.013	1/5					Yes	
2004072	Manistique river Below Manistique Papers Dam	Carp	2.213			4/10	6/10	6/10	Yes	
		Redhorse Sucker	0.179	5/10	5/10				No	
		Rock Bass	0.010	1/10					No	
		Smallmouth Bass	0.180	5/5					No	
		Walleye	0.123	6/10	2/10				No	
2004081	Pere Marquette River Lake County	Brown Trout	0.278	3/10	6/10				Yes	
2004082	Pere Marquette River, Little South Branch Lake County	Brown Trout	0.229	4/10	6/10				Yes	
2004144	Portage Lake Manistee Lake	Carp	0.119	3/10	4/10				No	
		Largemouth Bass	0.022	2/10					Yes	
		Northern Pike	0.029	1/10					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 10. Continued

				Number of Fish in Each Consumption Advisory Category*				General Population Trigger Level	
				Women and Children Consumption Advisory Categories					
2004126	White Lake Muskegon County	Carp Walleye	1.452 0.138	7/10	1/5 3/10	3/5	1/5	1/5	Yes 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 11. 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
<b>Lake Erie Watershed</b>						
2004021	Detroit River Michigan Waters Macomb County	Freshwater Drum	0.39	0.25-1.01	2/10	Yes
2004040	Kent Lake Oakland County	Black Crappie Walleye	0.07 0.16	0.05-0.08 0.08-0.31	0/10 0/10	Yes Yes
<b>Lake Huron Watershed</b>						
2004133	Big Seven Lake Oakland County	Largemouth Bass	0.70	0.38-1.0	3/5	Yes (a)
2004013	Cheboyganing Creek Saginaw County	Carp	0.18	0.06-0.57	1/10	Yes (a)
2004131	Five Lakes Clare County	Largemouth Bass	0.35	0.29-0.63	1/9	Yes (a)
2004034	Hardwood Lake Ogemaw County	Northern Pike	0.34	0.21-0.53	1/10	Yes (a)
2004066	Long Lake Presque Isle County	Smallmouth Bass	0.215	0.12-0.52	1/10	Yes (a)
2004120 2004149	St. Mary's River Chippewa County	Northern Pike Walleye	0.40 0.27	0.20-0.68 0.18-0.46	3/7 0/10	Yes (#) Yes

Table 11. Continued

Site ID	Location	Species	Species Median Concentration (ppm)	Range (ppm)	Exceedance* Rate	Current Advisory
<b>Lake Michigan Watershed</b>						
2004150	Lake Michigan Little Bay De Noc	Redhorse Sucker	0.31	0.18-0.47	0/10	No
		Smallmouth Bass	0.26	0.16-0.54	1/10	Yes
		Walleye	0.52	0.24-1.04	5/10	Yes
2004007	Boot Lake Schoolcraft County	Walleye	0.36	0.20-0.67	2/9	Yes (a)
2004014	Clifford Lake Montcalm County	Largemouth Bass	0.52	0.38-0.67	4/7	Yes (a)
2004026	Emerald Lake Newaygo County	Largemouth Bass	0.38	0.38-0.40	0/3	Yes (a)
		Northern Pike	0.48	0.32-0.77	3/6	Yes (a)
2004062	Montcalm Lake Montcalm County	Largemouth Bass	0.56	0.45-0.80	7/10	Yes (a)
2004076	Nevins Lake Montcalm County	Largemouth Bass	0.43	0.32-0.85	3/10	Yes (a)
2004144	Portage Lake Manistee County	Largemouth Bass	0.32	0.20-0.58	1/10	Yes (a)
		Northern Pike	0.22	0.17-0.32	0/10	Yes (a)
2004095	Robinson Lake Newaygo County	Northern Pike	0.47	0.27-0.56	4/9	Yes (a)
2004099	Ruppert Lake Kalamazoo County	Largemouth Bass	0.26	0.21-0.58	1/10	Yes (a)
2004100	Rush Lake Van Buren County	Northern Pike	0.41	0.25-0.82	4/10	Yes (a)
2004119	St. Joseph River Sturgis Impoundment	Largemouth Bass	0.14	0.10-0.31	0/6	Yes (a)
2004141	Sylvan Lake Newaygo County	Largemouth Bass	0.49	0.14-0.74	2/6	Yes (a)
		Northern Pike	0.57	0.34-1.32	2/5	Yes (a)
2004125	Van Auken Lake Van Buren County	Northern Pike	0.39	0.14-0.56	2/10	Yes (a)
2004126	White Lake Muskegon County	Smallmouth Bass	0.31	0.15-0.42	0/7	Yes (a)
		Walleye	0.44	0.22-0.64	3/10	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 11. Continued

Site ID	Location	Species	Species Median Concentration (ppm)	Range (ppm)	Exceedance* Rate	Current Advisory
<b>Lake Superior Watershed</b>						
2004009	Carp River	Brook Trout	0.17	0.07-0.27	0/13	Yes
2004010	Marquette County	White Sucker	0.21	0.07-0.39	0/10	Yes
2004019	Deer Lake Alger County	Northern Pike	1.16	0.73-1.84	10/10	Yes (a)
2004024	Dinner Lake Gogebic County	Black Crappie	0.40	0.35-0.44	0/2	Yes (a)
		Smallmouth Bass	0.56	0.52-0.59	2/2	Yes (a)
		Largemouth Bass	0.65	0.55-0.75	2/2	Yes (a)
		Walleye	1.09	1.09	1/1	Yes (a)
		Northern Pike	1.05	0.91-1.08	3/3	Yes (a)
2004050	Lake Medora Keweenaw County	Smallmouth Bass	0.50	0.45-0.67	3/5	Yes (a)
		Walleye	0.51	0.29-0.90	3/5	Yes (a)
2004083	Pretty Lake Luce County	Walleye	0.72	0.26-0.85	3/5	Yes (a)

\* 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 12. Dioxin TEQ concentrations in edible portion samples.

Site ID	Location	Species	Species Median Concentration (ppt)	Range (ppt)	Exceedance* Rate	Current Advisory
2003139	Green Lake Grand Traverse County	Lake Trout	1.40	1.02-4.15	0/10	No
2004021	Detroit River Michigan Waters Macomb County	Carp	5.11	2.93-12.36	1/8	Yes
2004046	Lake Huron Saginaw Bay	Carp	7.62	2.36-42.61	4/9	Yes
		Channel Catfish	5.95	3.06-10.35	2/10	Yes
		White Bass	5.32	1.90-16.34	1/10	No
2004011	Cass River Bridgeport, Saginaw County	Carp	0.54	0.32-8.66	0/9	Yes
		Channel Catfish	0.83	0.60-8.41	0/9	Yes
2004113	Saginaw River LaFayette, Bay County	Carp	4.68	1.90-36.92	3/10	Yes
2004130	Lake Huron Grindstone City	Lake Trout	3.86	3.37-7.74	0/10	Yes

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

Table 13. Fish consumption water quality attainment categories for waterbodies assessed for the 2005 FCMP Final Report.

Location	Present Category	Proposed Category	Impairment	Species Sampled	New Record
<b>Lake Erie Watershed</b>					
Lake Erie, Western Basin Monroe County	5	5	FCA PCB	Walleye White Bass White Perch	No
Clinton River downstream of Yates Dam Macomb County	5	5	FCA PCB	Carp Rock Bass	No
Detroit River, Michigan Waters Wayne County	5	5	FCA PCB, Fish Tissue Hg, Dioxin	Carp Freshwater Drum Redhorse Sucker Yellow Perch	No
Kent Lake Oakland County	5	5	FCA PCB	Black Crappie Walleye	No
River Raisin upstream of Monroe Dam Monroe County	5	5	FCA PCB	Carp	No
<b>Lake Huron Watershed</b>					
Lake Huron, Grindstone City (ID 2004130) Huron County and Thunder Bay Alpena County	5	5	FCA PCB, Dioxins	Lake Trout	No
Lake Huron, Saginaw Bay, Bay Port Huron County	5	5	FCA PCB, Dioxins	Carp Channel Catfish Walleye White Bass White Sucker Yellow Perch	No
Bad River Saginaw County	5	5	FCA PCB	Carp Channel Catfish Northern Pike	No
Big Seven Lake (Seven Lakes) Oakland County	5	5	Fish Tissue Hg	Largemouth Bass	No
Cass River, Bridgeport Saginaw County	5	5	FCA PCB, Dioxins	Carp Channel Catfish	No
Cheboyganing Creek Saginaw County	5	5	FCA PCB	Carp	No
Five Lakes Clare County	5	5	Fish Tissue Hg	Largemouth Bass	No
Frenchman Lake Chippewa County	none	2	none	Northern Pike (no size limit)	Yes
Hardwood Lake Ogemaw County	5	5	Fish Tissue Hg	Northern Pike	No
Kawkawlin River, M-247 Bay County	5	5	FCA PCB	Carp	No
Long Lake Presque Isle County	none	2	none	Smallmouth bass	Yes
McCormick Lake Montmorency County	none	2	none	Brown trout	Yes
Peach Lake Ogemaw County	none	2	none	Northern Pike	Yes

Table 13. Continued.

Location	Present Category	Proposed Category	Impairment	Species Sampled	New Record
Saginaw River, LaFayette Bay County	5	5	FCA PCB, Dioxins	Carp	No
Sebewaing River Huron County	5	5	FCA PCB	Carp Northern Pike	No
Shiawassee River, South Branch, between M-59 and Byron Shiawassee County	5	5	FCA PCB	Carp Rock Bass White Sucker	No
St. Marys River Chippewa County	5	5	Fish Tissue Hg FCA PCB	Northern Pike Walleye	No
<b>Lake Michigan Watershed</b>					
Lake Michigan, South of Frankfort	5	5	FCA PCB	Rainbow Trout (Steelhead)	No
Lake Michigan, Little Bay De Noc Delta County	5	5	FCA PCB, Fish Tissue Hg	Carp Redhorse Sucker Smallmouth Bass Walleye	No
Battle Creek River, Division St. Calhoun County	5	5	FCA PCB	Carp Smallmouth Bass	No
Boot Lake Schoolcraft County	5	5	Fish Tissue Hg	Walleye	No
Clifford Lake Montcalm County	5	5	Fish Tissue Hg	Largemouth Bass	No
Emerald Lake Newaygo County	5	5	Fish Tissue Hg	Largemouth Bass Northern Pike	No
Escanaba River, Cataract Basin Marquette County	5	5	Fish Tissue Hg	Walleye	No
Grand River upstream of the Moores River Dam Ingham County	5	5	FCA PCB, Fish Tissue Hg	Northern Pike	No
Green Lake Grand Traverse County	5	5	FCA PCB, Fish Tissue Hg	Lake Trout	No
Kalamazoo River, Trowbridge Dam Impoundment Allegan County	5	5	FCA PCB, Dioxins	Carp	No
Lake Cadillac Wexford County	none	3	Fish Tissue Hg	Northern Pike Smallmouth Bass	Yes
Lake Montcalm Montcalm County	5	5	Fish Tissue Hg	Largemouth Bass	No
Manistique River below Manistique Papers Dam Schoolcraft County	5	5	FCA PCB, Fish Tissue Hg	Carp Redhorse Sucker Rock Bass Smallmouth Bass Walleye	No

Table 13. Continued.

Location	Present Category	Proposed Category	Impairment	Species Sampled	New Record
Nevins Lake Montcalm County	5	5	Fish Tissue Hg	Largemouth Bass	No
Pere Marquette and Little South Branch Pere Marquette Rivers	5	5	FCA PCB	Brown Trout	No
Portage Lake Manistee County	5	5	FCA PCB	Carp Largemouth Bass Northern Pike	No
Robinson Lake Newaygo County	5	5	Fish Tissue Hg	Northern Pike	No
Ruppert Lake Kalamazoo County	none	3	Fish Tissue Hg	Largemouth Bass	Yes
Rush Lake Van Buren County	5	5	Fish Tissue Hg	Northern Pike	No
Sporley Lake Marquette County	none	3	Fish Tissue Hg	Splake	Yes
St. Joseph River, Sturgis Impoundment St. Joseph County	none	3	Fish Tissue Hg	Largemouth Bass	Yes
Sylvan Lake Newaygo County	5	5	Fish Tissue Hg	Largemouth Bass Northern Pike	No
Van Auken Lake Van Buren County	5	5	Fish Tissue Hg	Northern Pike	No
White Lake Muskegon County	5	5	FCA PCB, Fish Tissue Hg	Carp Walleye	No
<b>Lake Superior Watershed</b>					
Carp River d/s Deer Lake Marquette County	5	5	Fish Tissue Hg	White sucker	No
Deer Lake Alger County	5	5	Fish Tissue Hg	Northern Pike	No
Dinner Lake Gogebic County	3	3	Fish Tissue Hg	Black Crappie Largemouth Bass Northern Pike Smallmouth Bass Walleye	No
Lake Medora Keweenaw County	5	5	Fish Tissue Hg	Smallmouth Bass Walleye	No
Pretty Lake Luce County	5	5	Fish Tissue Hg	Walleye	No
Teal Lake Marquette County	none	2	none	Smallmouth Bass Walleye	Yes

Table 14. Net uptake of contaminants and 95% confidence interval in caged fish tissue samples collected in 2003 and 2004. Concentrations of organic contaminants are lipid normalized; mercury concentrations are wet weight.

Site Number	Sample Site	Sample Size	Mercury (ppb)	Total PCB (ppb)	Total Chlordane (ppb)	Total DDT (ppb)	Total Dioxin TEQ (ppt)	Total HPE (ppb)
<b>Boardman River</b>								
2003011	Boardman River Beitner Rd.	4	NQU	1 ± 0.9	NQU	NQU	NQU	ND
2003012	Boardman River Eighth St. Bridge	4	4 ± 4	3 ± 3	NQU	NQU	NQU	ND
2003013	Boardman River D/S WWTP	4	6 ± 3	10 ± 9	NQU	3 ± 1	NT	ND
<b>Flat River</b>								
2003025	Flat River U/S Greenville	4	NQU	7 ± 6	0.4 ± 0.2	NQU	0.08 ± 0.07	ND
2003026	Flat River D/S Greenville	4	NQU	8 ± 4	0.3 ± 0.3	1 ± 2	0.08 ± 0.02	ND
2003027	Flat River U/S Belding	4	NQU	7 ± 3	0.3 ± 0.4	NQU	0.07 ± 0.06	ND
2003028	Flat River D/S Belding	4	NQU	9 ± 7	0.6 ± 0.4	NQU	0.08 ± 0.02	ND
2003029	Flat River U/S Lowell	4	NQU	8 ± 5	1 ± 0.3	2 ± 2	0.12 ± 0.06	ND
2003030	Flat River D/S Lowell	4	NQU	9 ± 6	1 ± 0.2	2 ± 2	0.11 ± 0.06	ND
<b>Flint River</b>								
2003127	Swartz Creek Golf Course	4	4 ± 3	5 ± 2	0.8 ± 0.6	NQU	NT	ND
2003129	Thread Creek U/S Impoundment	4	NQU	4 ± 4	0.3 ± 0.3	2 ± 3	NT	ND
2003130	Thread Creek M-54	4	NQU	7 ± 6	0.6 ± 0.2	NQU	NT	ND
2003131	Thread Creek Near Mouth	4	NQU	2 ± 4	2 ± 1	7 ± 5	NT	ND
2003034	Flint River Klam Rd.	4	NQU	5 ± 3	0.5 ± 0.4	6 ± 6	NT	ND
2003033	Flint River D/S Flint	4	NQU	16 ± 12	2 ± 1	NQU	0.18 ± 0.08	ND
2003037	Flint River U/S Ragnone WWTP	4	NQU	11 ± 9	0.9 ± 0.9	NQU	0.12 ± 0.13	ND
2003038	Flint River D/S Ragnone WWTP	4	NQU	19 ± 3	1 ± 0.3	6 ± 1	0.13 ± 0.05	ND

NQU = no quantifiable uptake

ND = not detected

NT = not tested

Table 14. Continued

Site Number	Sample Site	Sample Size	Mercury (ppb)	Total PCB (ppb)	Total Chlordane (ppb)	Total DDT (ppb)	Total Dioxin TEQ (ppt)	Total HPE (ppb)
2003039	Flint River Mouth	4	NQU	10 ± 12	1 ± 0.8	NQU	NT	ND
2003035	Flint River M-15	4	NQU	1 ± 0.9	0.3 ± 0.2	2 ± 2	NT	ND
2003036	Flint River Bray Rd.	4	NQU	4 ± 5	0.7 ± 0.6	6 ± 5	NT	ND
<b>Little Black Creek</b>								
2004134	Little Black Creek US-31	4	6 ± 5	NQU	0.2 ± 0.2	NQU	NT	NQU
2004136	Little Black Creek DPW Wetland	4	NQU	6 ± 4	2 ± 2	NQU	NT	NQU
2004137	Little Black Creek Mouth	4	3 ±	12 ± 9	2 ± 0.7	NQU	NT	NQU
<b>Pere Marquette River</b>								
2003071	Little S. Br. PM River 17 Mile Rd.	4	6 ± 5	5 ± 4	ND	1 ± 1	NT	ND
2003005	Baldwin River Near M-37	4	NQU	NQU	ND	NQU	NT	ND
2003087	Pere Marquette River South Branch Rd.	4	NQU	3 ± 3	ND	NQU	NT	ND
2003007	Big S. Br. PM River Walhalla Rd.	4	NQU	1 ± 1	ND	NQU	NT	ND
2003137	Weldon Creek Benson Rd.	4	NQU	NQU	ND	NQU	NT	ND
2003088	Pere Marquette River Scottville Rd.	4	NQU	NQU	ND	NQU	NT	ND
2003089	Pere Marquette River U/S Ludington WWTP	4	NQU	4 ± 2	ND	NQU	NQU	ND
2003090	Pere Marquette River D/S Ludington WWTP	4	5 ± 3	3 ± 3	ND	NQU	NQU	ND
<b>Rabbit River</b>								
2003097	Rabbit River U/S Hamilton	4	NQU	4 ± 2	0.5 ± 0.3	3 ± 4	NT	ND
2003099	Rabbit River D/S Hamilton	4	NQU	4 ± 3	0.3 ± 0.1	1 ± 0.1	NT	ND
<b>Raisin River</b>								
2004088	Raisin River Railroad Bridge	4	NQU	3 ± 4	1 ± 0.8	20 ± 15	NT	0.2 ± 0.2

NQU = no quantifiable uptake

ND = not detected

NT = not tested

Table 14. Continued

Site Number	Sample Site	Sample Size	Mercury (ppb)	Total PCB (ppb)	Total Chlordane (ppb)	Total DDT (ppb)	Total Dioxin TEQ (ppt)	Total HPE (ppb)
2004089	Raisin River D/S Turning Basin	4	NQU	52 ± 19	1 ± 1	NQU	NT	0.5 ± 0.3
2004091	Raisin River River Mouth	4	NQU	65 ± 25	0.8 ± 0.7	17 ± 18	NT	1 ± 0.6
<b>Shiawassee River (South Branch)</b>								
2004104	South Branch Shiawassee U/S M-59	4	4 ± 3	NQU	2 ± 0.4	7 ± 6	NT	ND
2004105	South Branch Shiawassee Howell	4	3 ± 2	26 ± 6	2 ± 1	8 ± 9	NT	0.5 ± 0.3
2004106	South Branch Shiawassee D/S Howell	4	4 ± 3	120 ± 62	2 ± 2	13 ± 11	NT	1.9 ± 1.5
2004107	South Branch Shiawassee Marr Rd.	4	NQU	194 ± 67	2 ± 0.2	NQU	NT	3.4 ± 1.1
2004108	South Branch Shiawassee Chase Lake Rd.	4	6 ± 2	224 ± 98	1 ± 0.2	12 ± 15	NT	ND
2004109	South Branch Shiawassee U/S Byron	4	7 ± 4	39 ± 14	1 ± 1	12 ± 14	NT	ND
<b>St. Joseph River</b>								
2003019	Coldwater River Union City	4	3 ± 3	NQU	ND	NQU	NT	ND
2003113	St. Joseph River D/S Union City	4	3 ± 3	2 ± 2	ND	NQU	NT	ND
2003114	St. Joseph River D/S Union Lake	4	NQU	2 ± 2	ND	1 ± 1	NT	ND
2003115	St. Joseph River D/S Sturgis Dam	4	4 ± 4	2 ± 1	ND	NQU	NT	ND
2003116	St. Joseph River D/S Three Rivers	4	NQU	NQU	ND	NQU	NT	ND
2003117	St. Joseph River D/S Constantine	4	NQU	5 ± 3	ND	1 ± 1	NT	ND
2003118	St. Joseph River Mottville	4	NQU	10 ± 10	ND	NQU	NT	ND
2003119	St. Joseph River State Line	4	NQU	12 ± 7	1 ± 1	NQU	NT	ND

NQU = no quantifiable uptake

ND = not detected

NT = not tested

Table 15. 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	*+/-2.5		+/-5.4		-6.2	<0.05	-8.5	<0.01		
	Walleye	3.3	<0.05	-4.9	<0.05	-7.0	<0.01	-10.1	<0.001		
Grand Traverse Bay	Carp	+/-2.6		-10.3	<0.01	-10.5	<0.01	-8.6	<0.01		
	Lake Trout	6.3	<0.001	-2.6	<0.05	-7.2	<0.001	-7.4	<0.001	+/-13.0	
<b>Lake Huron</b>											
Saginaw Bay	Carp	+/-2.8		-6.1	<0.001	+/-3.5		-6.1	<0.001	+/-5.6	
	Walleye	3.0	<0.05	-2.6	<0.05	-4.8	<0.01	-6.0	<0.01		
Thunder Bay	Carp	+/-4.8		+/-4.5		+/-4.4		-10.0	<0.001		
	Lake Trout	3.3	<0.01	-3.3	<0.05	-4.1	<0.001	-6.7	<0.001	-6.0	<0.001
	Walleye	+/-3.3		-5.3	<0.05	-6.6	<0.01	-7.5	<0.001		
<b>Lake Superior</b>											
Keweenaw Bay	Lake Trout	+/-2.0		-10.8	<0.001	-9.8	<0.001	-9.7	<0.001	-5.6	<0.01
<b>Lake Erie</b>											
Brest Bay	Carp	7.4	<0.01	+/-5.1		+/-4.3		-6.0	<0.001		
	Walleye	+/-2.1		-6.2	<0.001	-11.0	<0.001	-13.4	<0.001		
<b>Lake St. Clair</b>											
L'Anse Creuse Bay	Carp	+/-3.7		+/-5.6		-5.7	<0.05	-7.2	<0.001		
	Walleye	+/-0.8		-8.4	<0.001	-12.0	<0.001	-12.5	<0.001		
<b>St. Clair River</b>											
Algonac	Carp	+/-8.6		+/-21.0		-12.1	<0.10	+/-17.1			
<b>Detroit River</b>											
Grassy Island	Carp	-6.2	<0.001	+/-3.5		-3.0	<0.05	+/-3.6			
	Walleye	+/-2.1		-3.7	<0.01	-6.8	<0.001	-10.0	<0.001		
<b>St. Marys River</b>											
Munuscong Bay	Carp	+/-1.8		-8.9	<0.01	-14.0	<0.001	-11.8	<0.001		
	Walleye	+/-3.1		+/-4.1		-8.1	<0.05	-10.0	<0.001		
	Average**	2.9		-6.1		-8.0		-8.9		-5.8	
	Median**	3.3		-5.7		-7.1		-8.6		-5.8	

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

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

Table 15. 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	3.7	<0.05	+/-4.5		5.7	<0.01	+/-3.4			
Kalamazoo River	Carp	+/-2.0		-9.4	<0.001	-10.5	<0.001	-7.5	<0.001		
Muskegon River	Carp	-5.8	<0.005	-23.6	<0.001	-16.3	<0.001	-18.5	<0.001		
River Raisin	Carp	+/-2.2		-10.9	<0.001	-9.9	<0.001	-9.8	<0.001		
St. Joseph River	Carp	-1.8	<0.10	-5.7	<0.01	-7.9	<0.005	+/-4.7			
<b>INLAND LAKES</b>											
Grand Sable Lake	Lake Trout	7.6	<0.01	9.1	<0.001	+/-4.3		-8.6	<0.05		
Lake Gogebic	Walleye	-8.7	<0.001	-19.0	<0.001	-6.2	<0.001	#NA			
South Manistique Lake	Walleye	-3.2	<0.001	-4.7	<0.001	+/-1.9		NA			
Higgins Lake	Lake Trout	-2.1	<0.10	-10.7	<0.001	-14.7	<0.001	-7.4	<0.005		
Houghton Lake	Largemouth Bass	+/-1.8		-12.0	<0.001	-8.1	<0.001	-9.0	<0.001		
Gull Lake	Largemouth Bass	+/-1.2		-6.4	<0.001	-9.1	<0.001	-12.8	<0.001		
Gun Lake	Largemouth Bass	+/-1.7		-4.6	<0.05	-4.6	<0.05	-5.3	<0.05		
Pontiac Lake	Largemouth Bass	+/-3.3		-4.6	<0.05	-5.2	<0.05	-12.5	<0.001		
	Average**	-1.5		-8.5		-7.9		-10.2			
	Median**	-2.1		-7.9		-8.1		-9.0			

\*+/- 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.

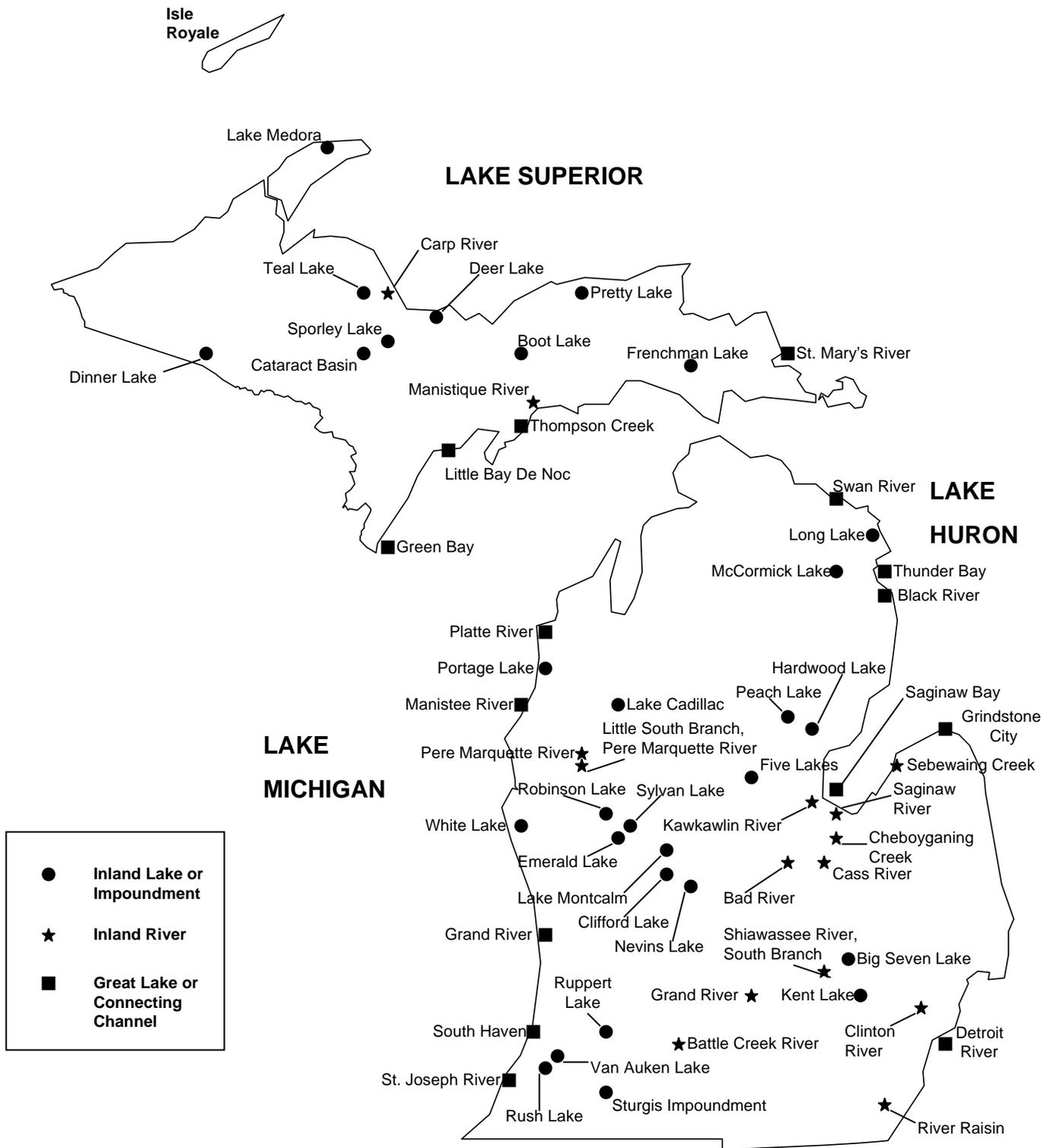


Figure 1. Edible portion fish sample locations.

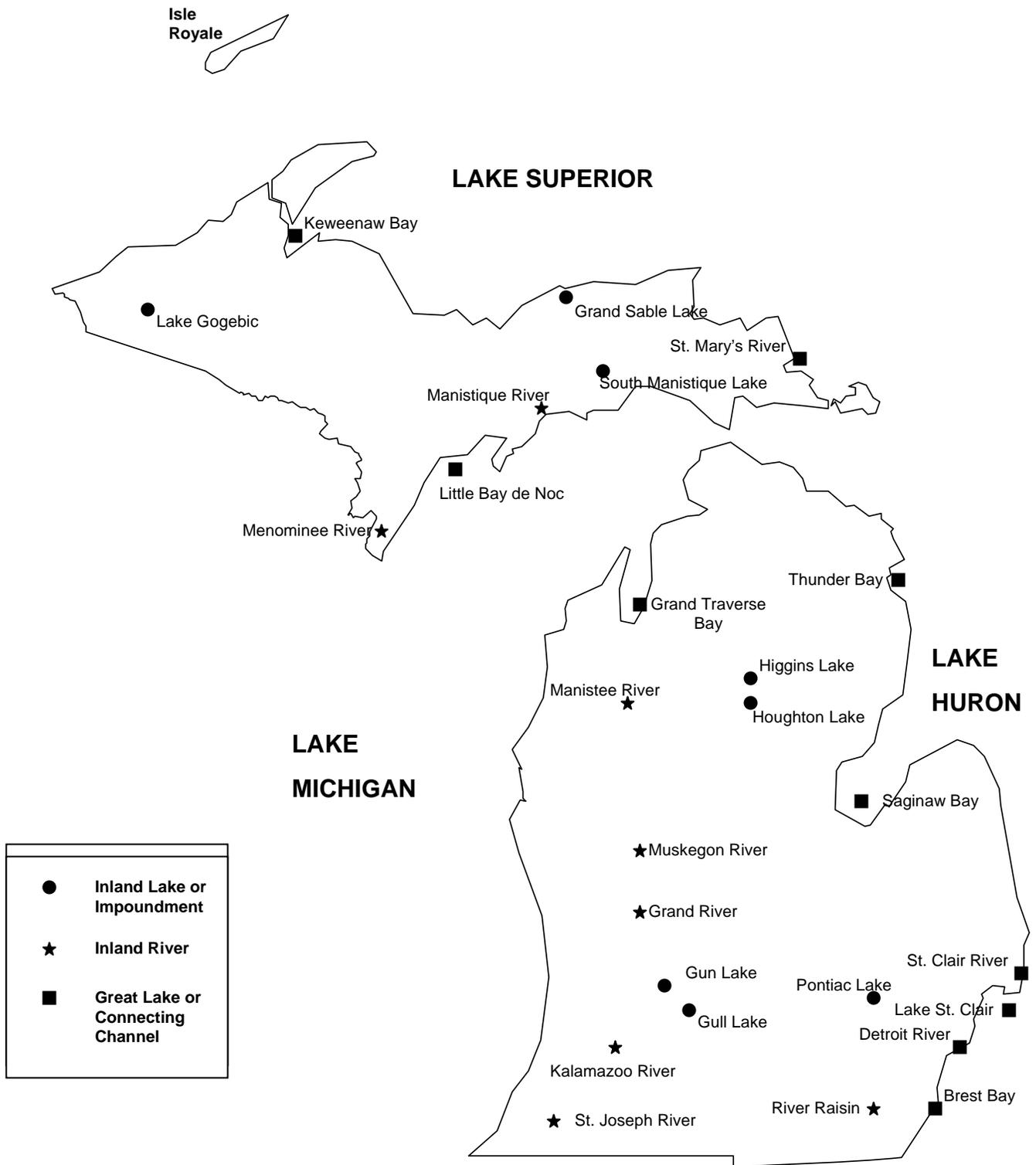


Figure 2. Whole-fish trend monitoring sites.

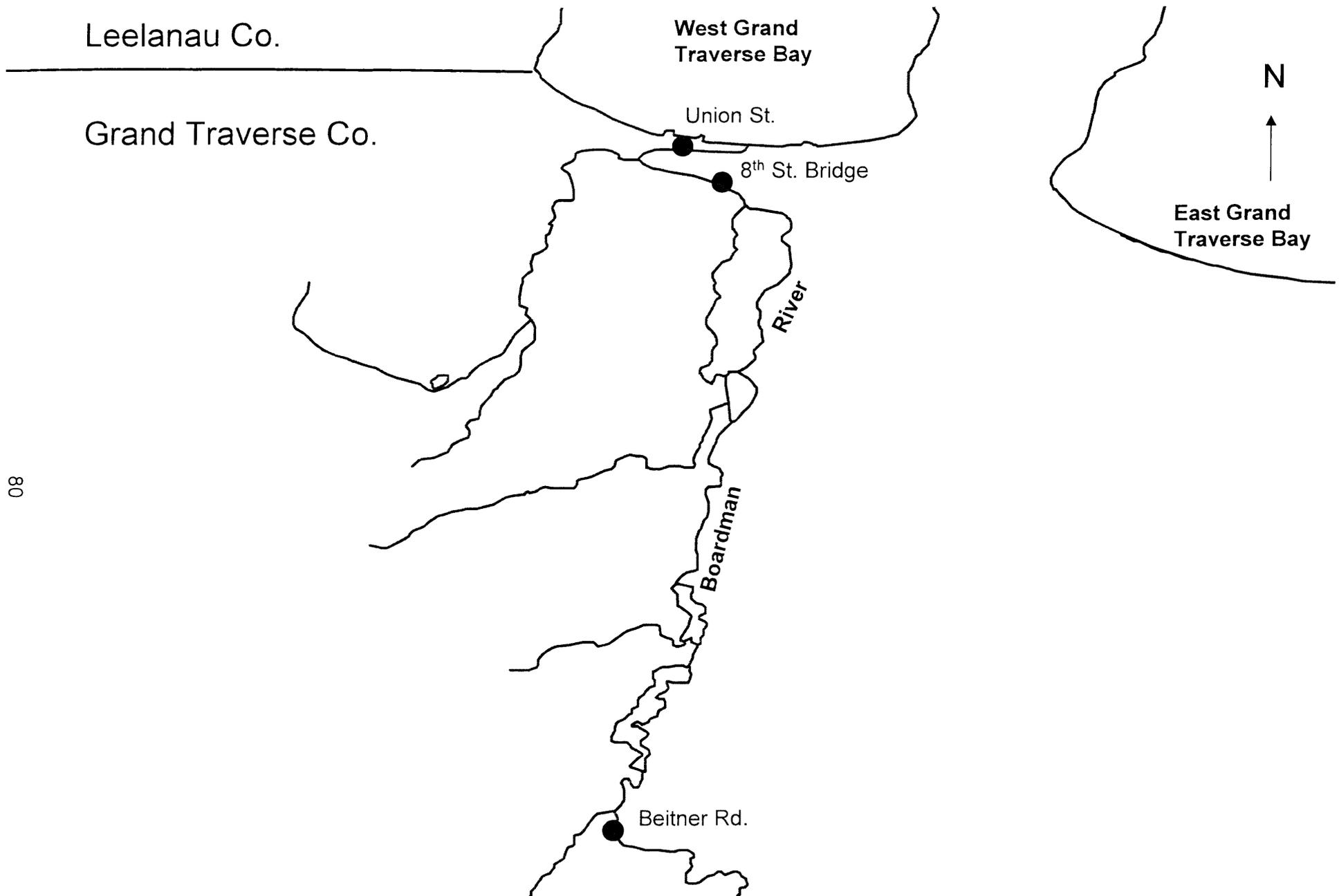


Figure 3. Boardman River 2003 caged-fish monitoring locations.

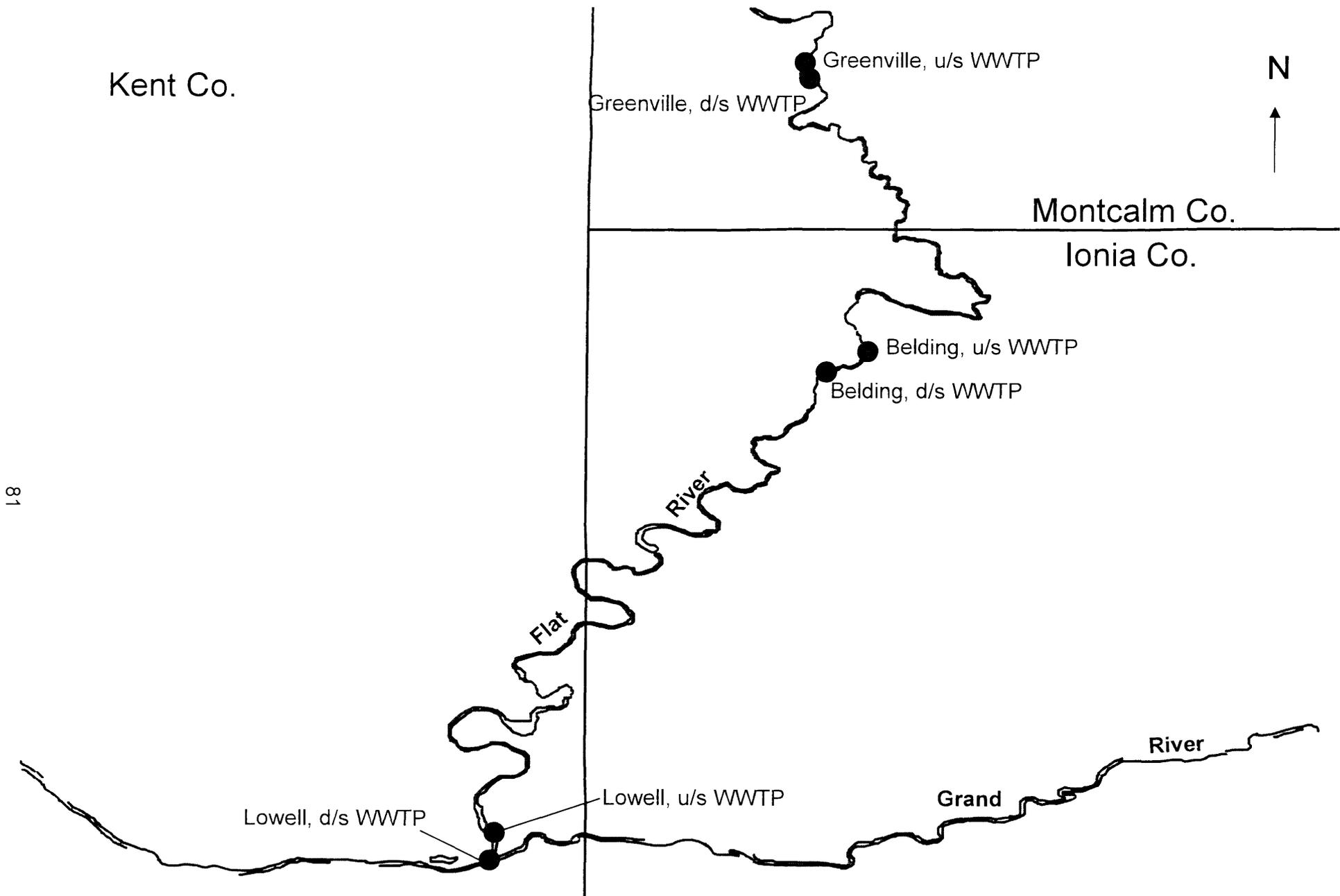


Figure 4. Flat River 2003 caged-fish monitoring locations.

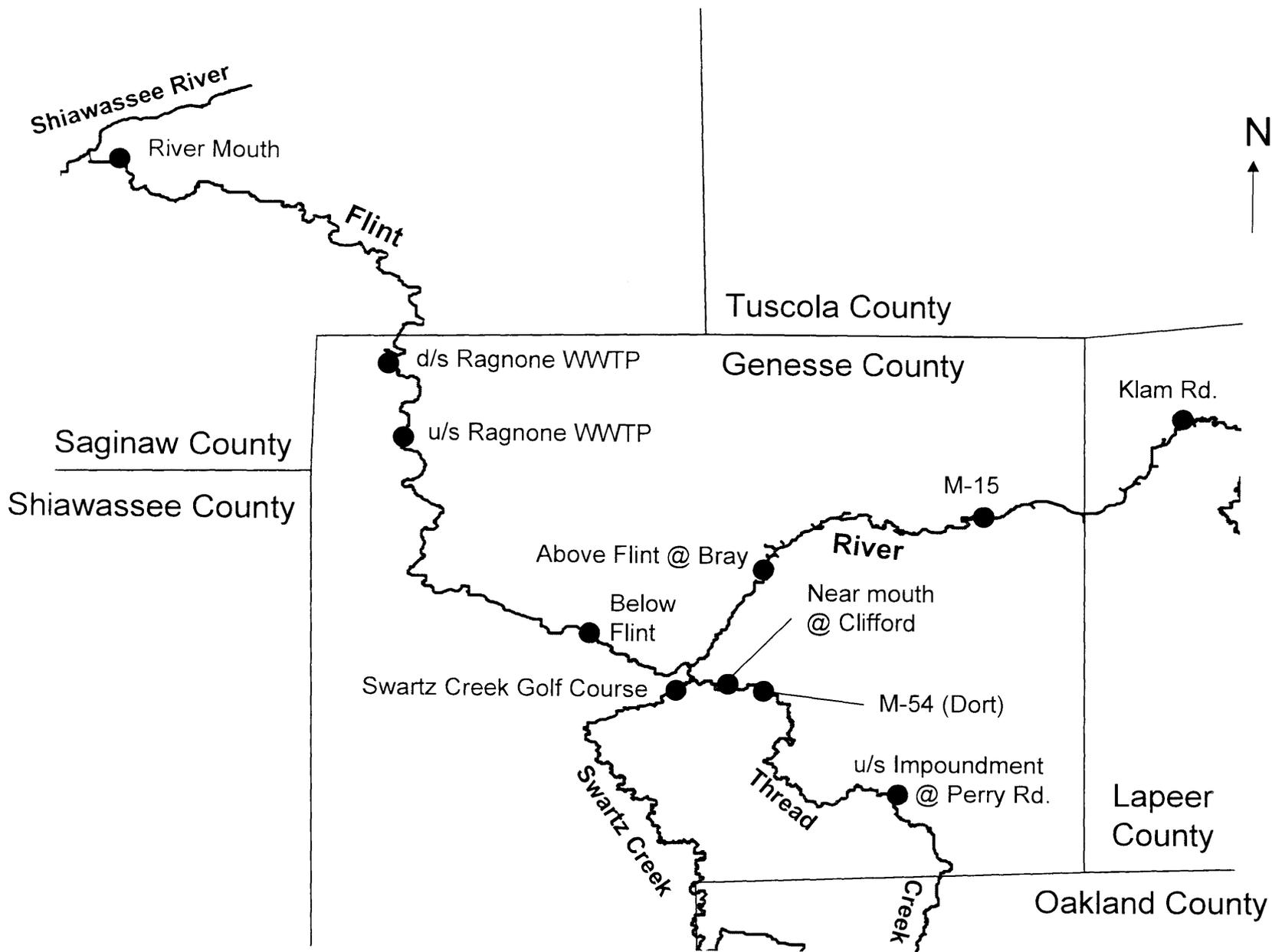


Figure 5. Flint River 2003 caged-fish monitoring locations

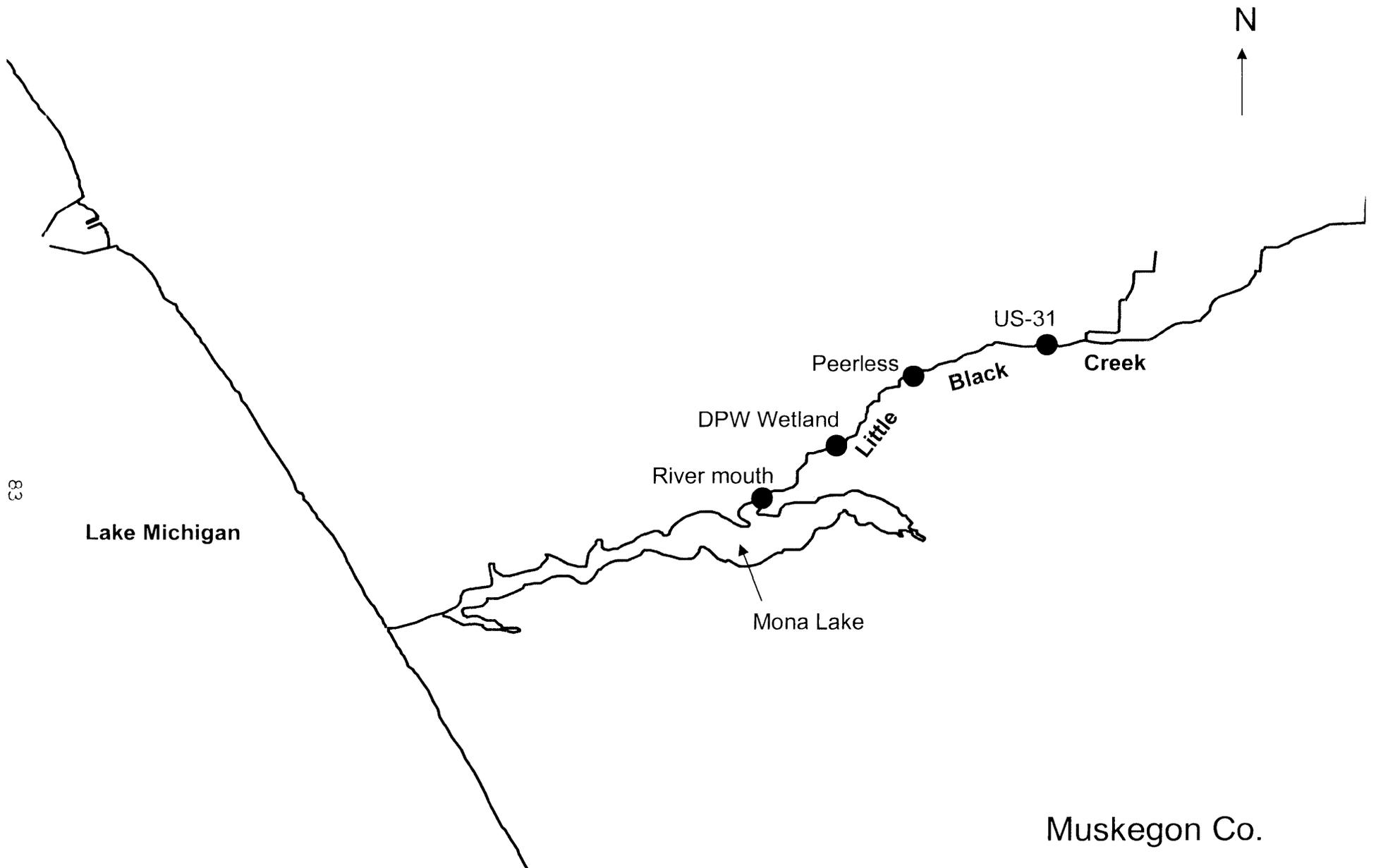


Figure 6. Little Black Creek caged fish monitoring locations, 2004.

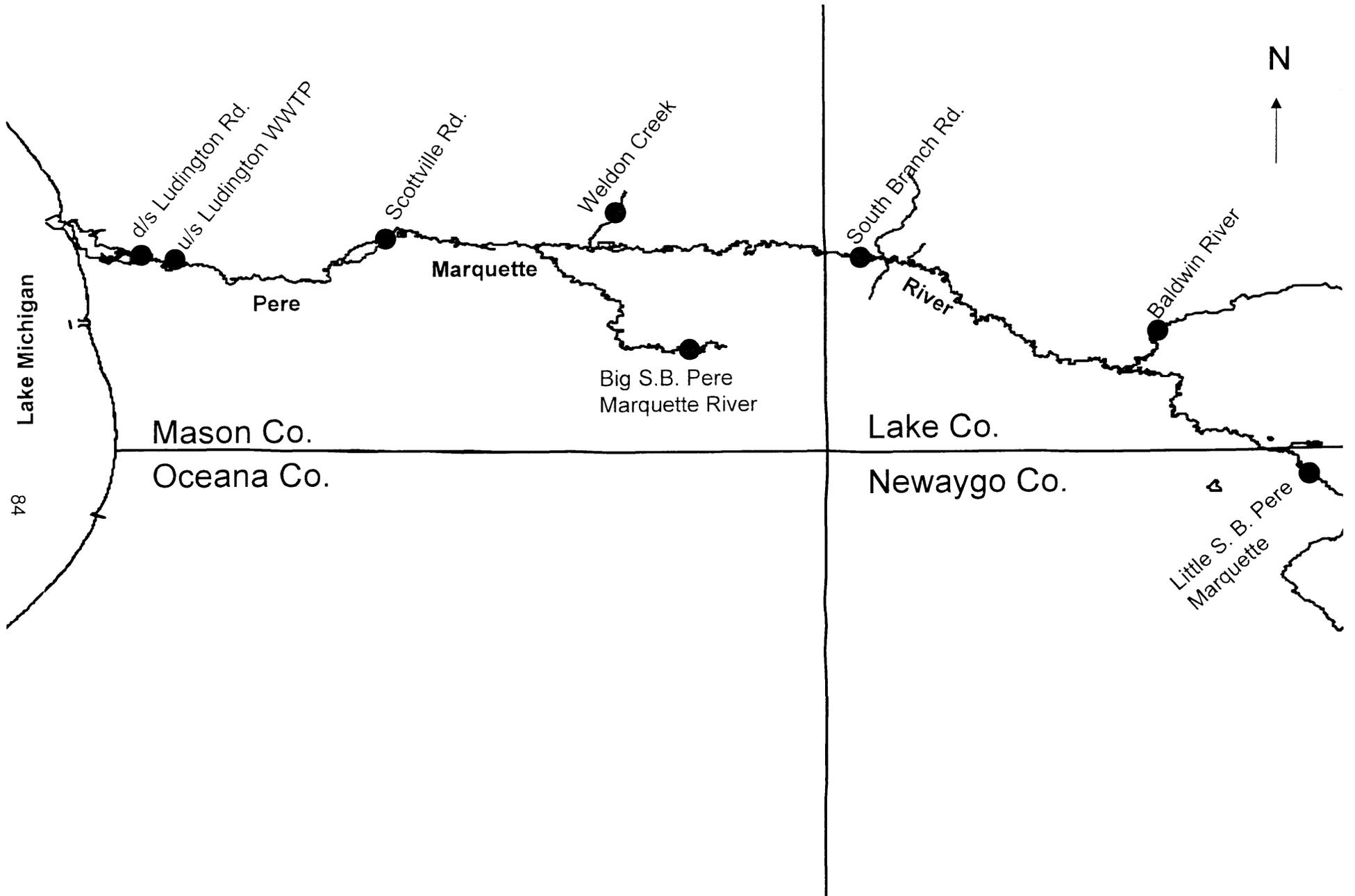


Figure 7. Pere Marquette River 2003 caged-fish monitoring locations.

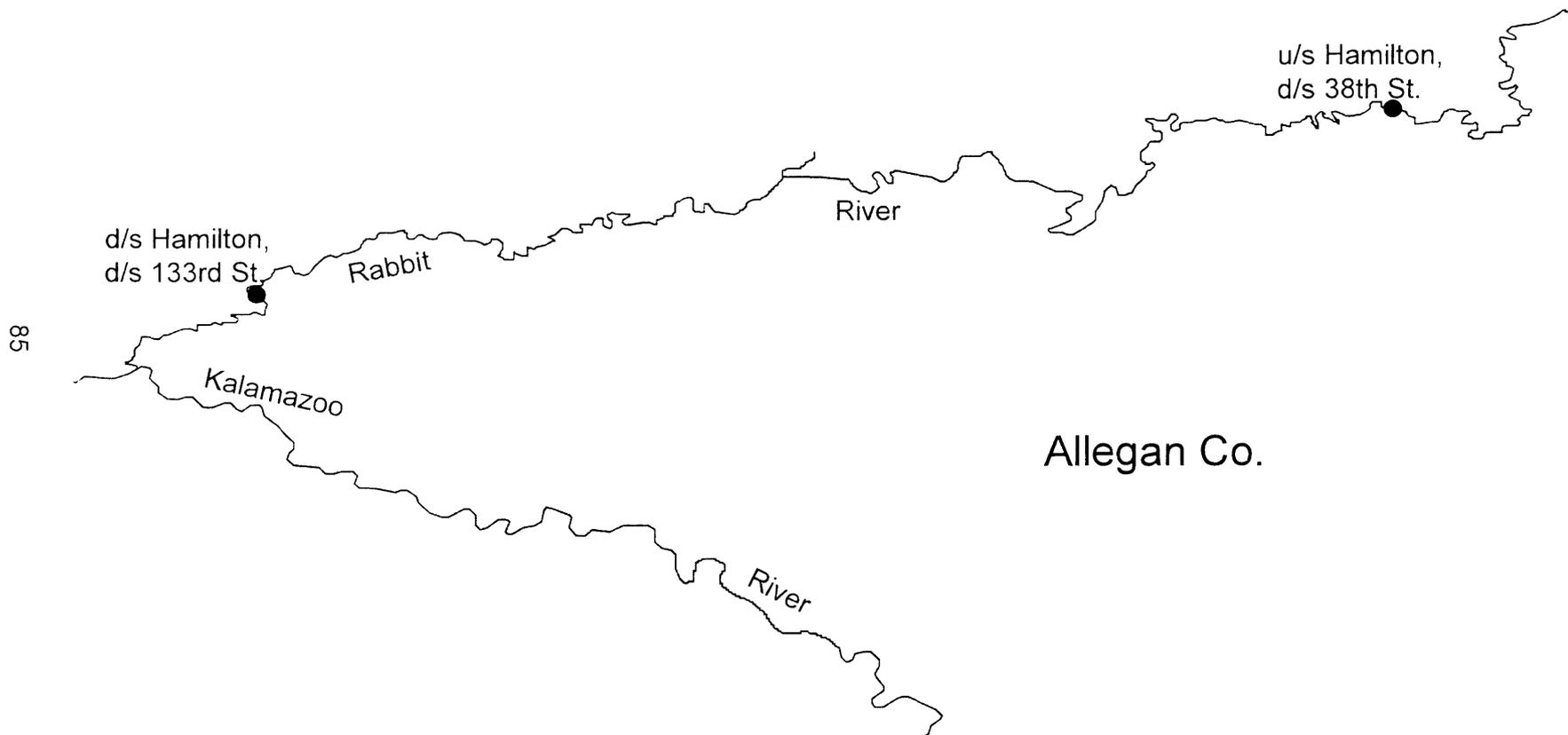
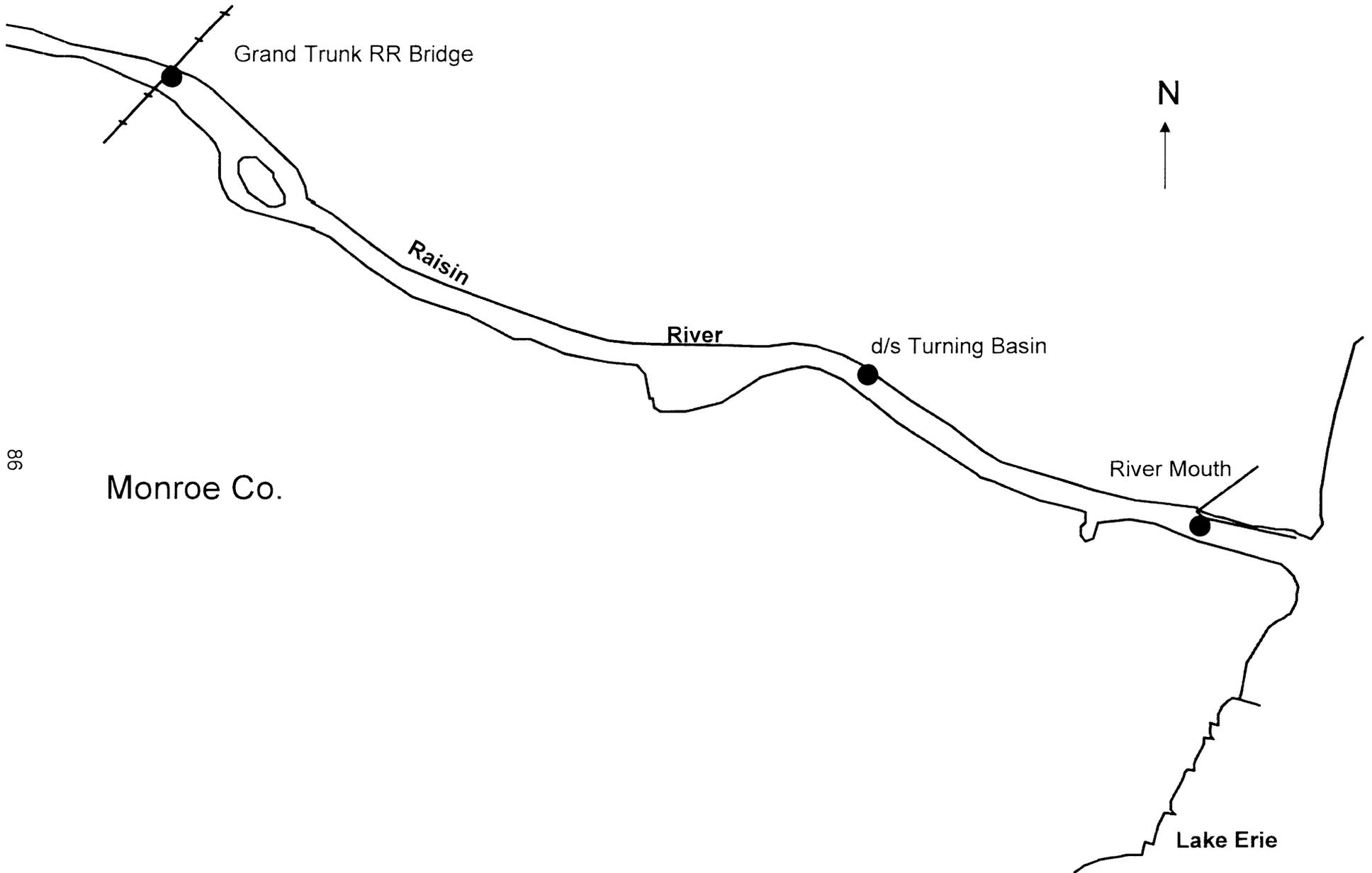


Figure 8. Rabbit River 2003 caged-fish monitoring locations.



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Figure 9. 2004 Raisin River caged-fish locations.

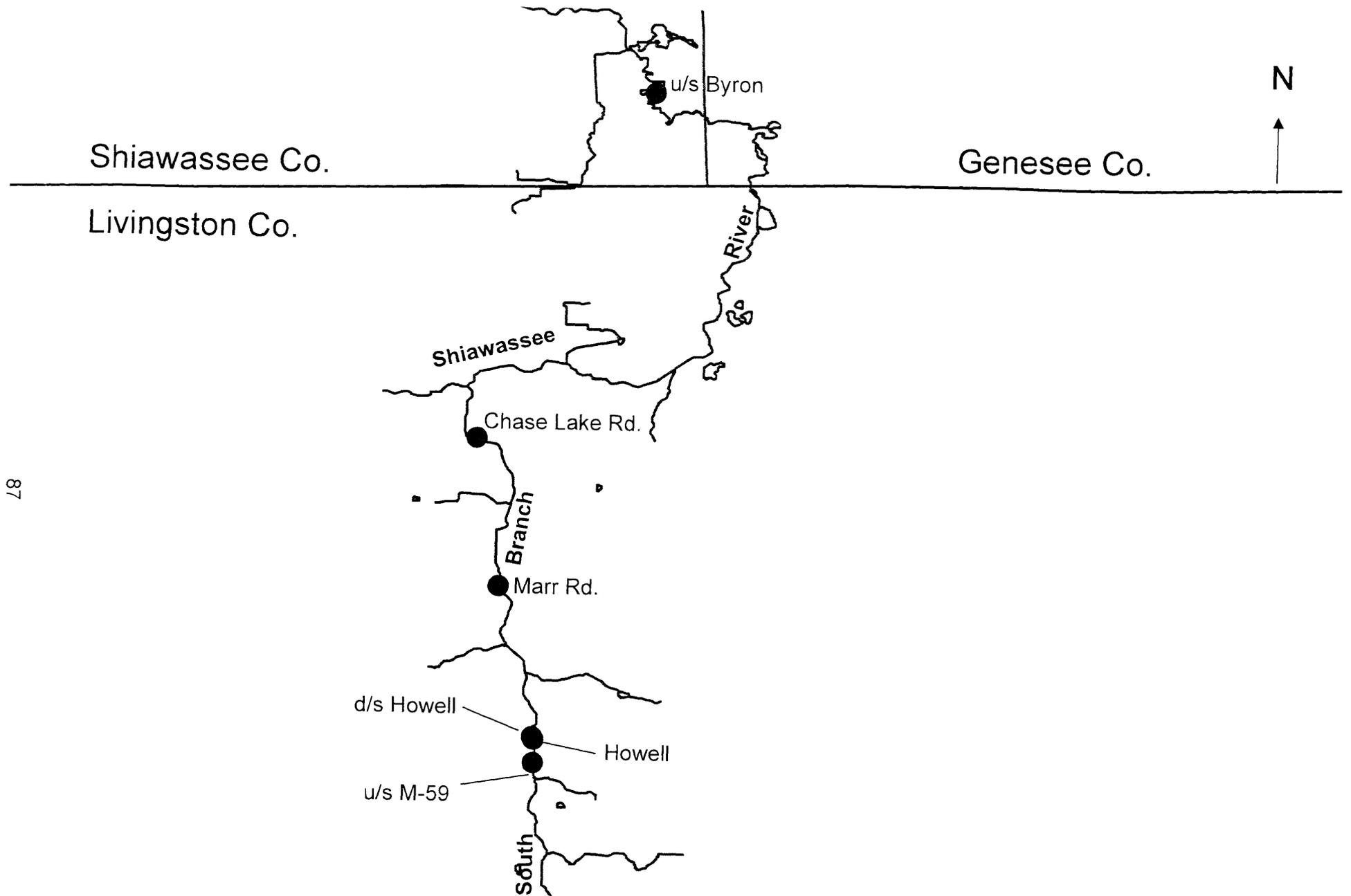


Figure 10. South Branch Shiawassee River 2004 caged-fish monitoring locations.

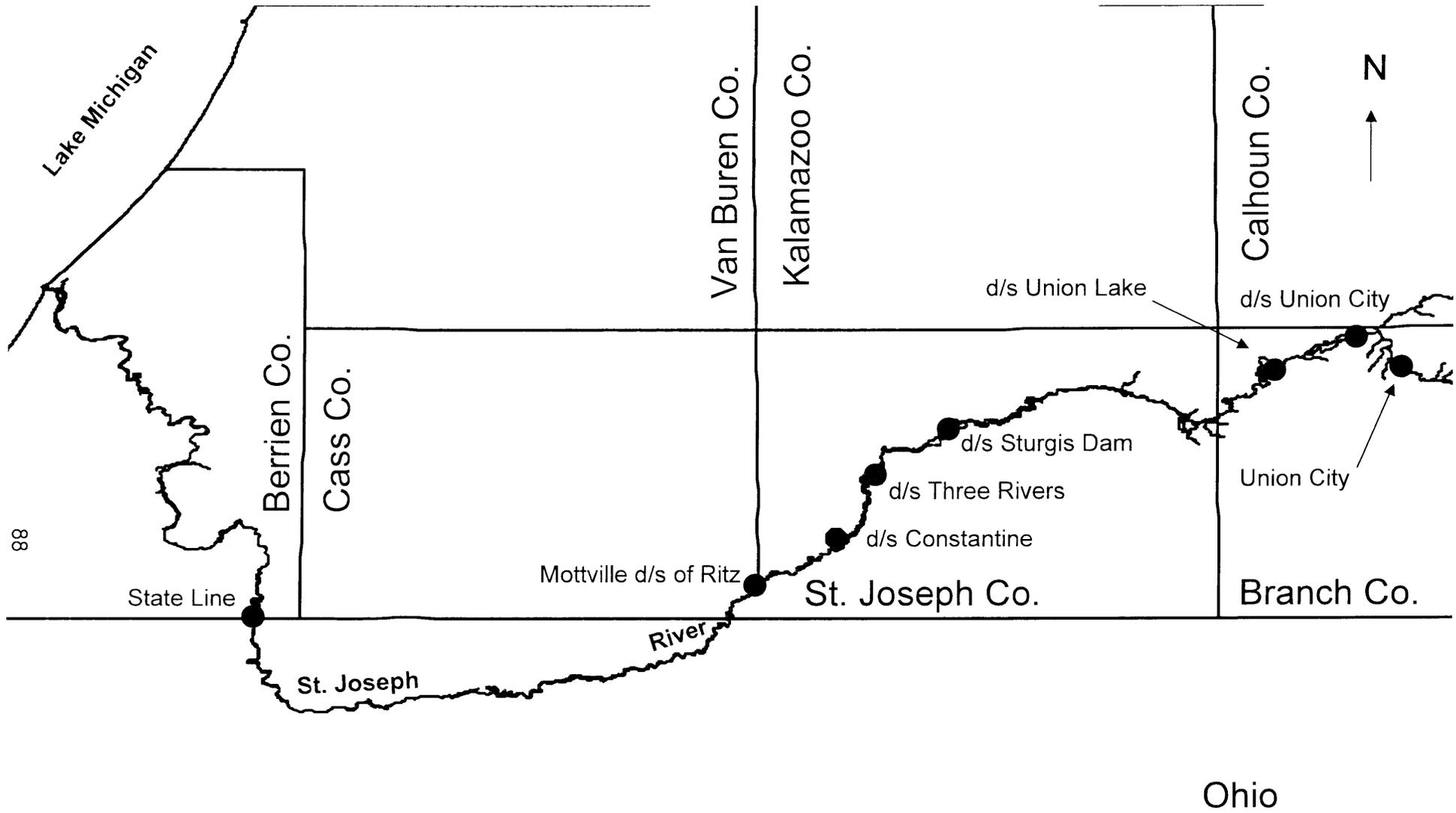


Figure 11. St. Joseph River 2003 caged-fish monitoring locations.

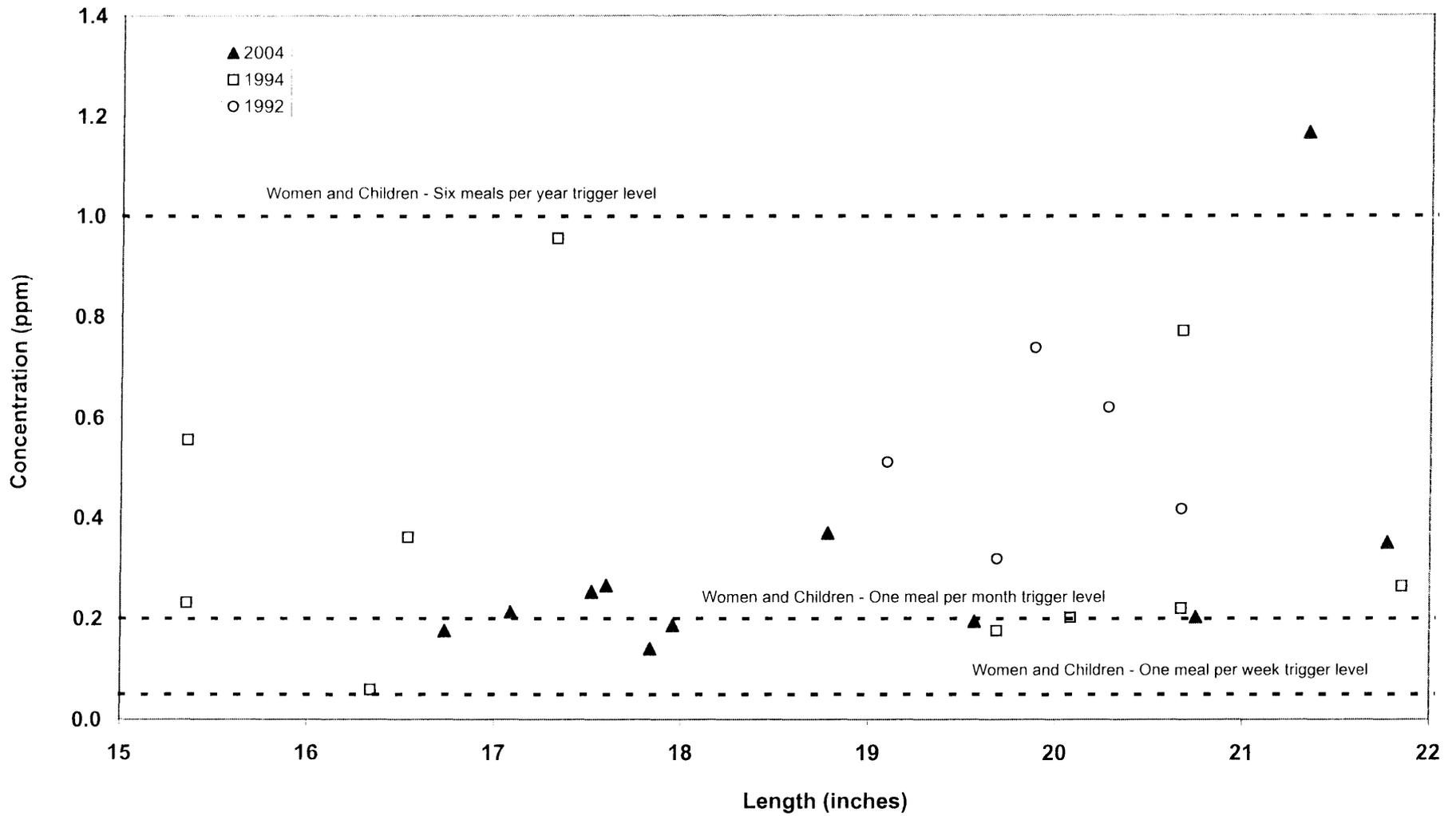


Figure 12. Total length versus total PCB concentration in walleye collected from Lake Erie, Western Basin in 1992 (ID 92062), 1994 (ID 94027), and 2004 (2004043).

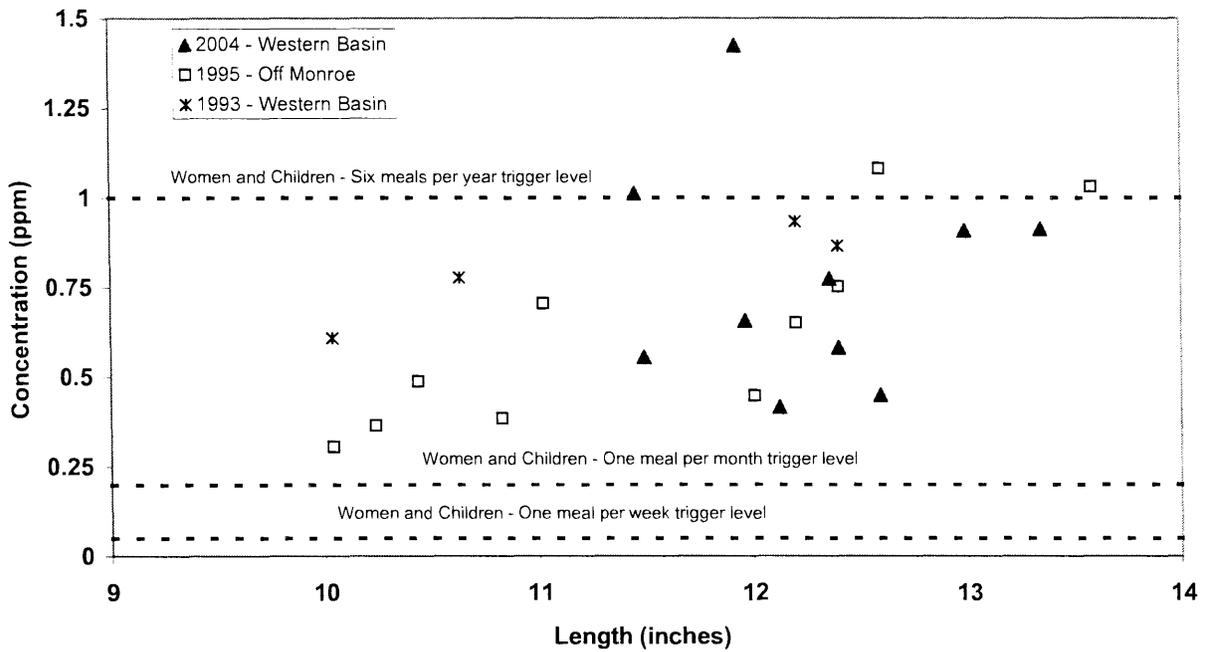


Figure 13. Total length versus total PCB concentration in white bass collected from Lake Erie in 1993 (ID 93082), 1995 (ID 95040), and 2004 (ID 2004043).

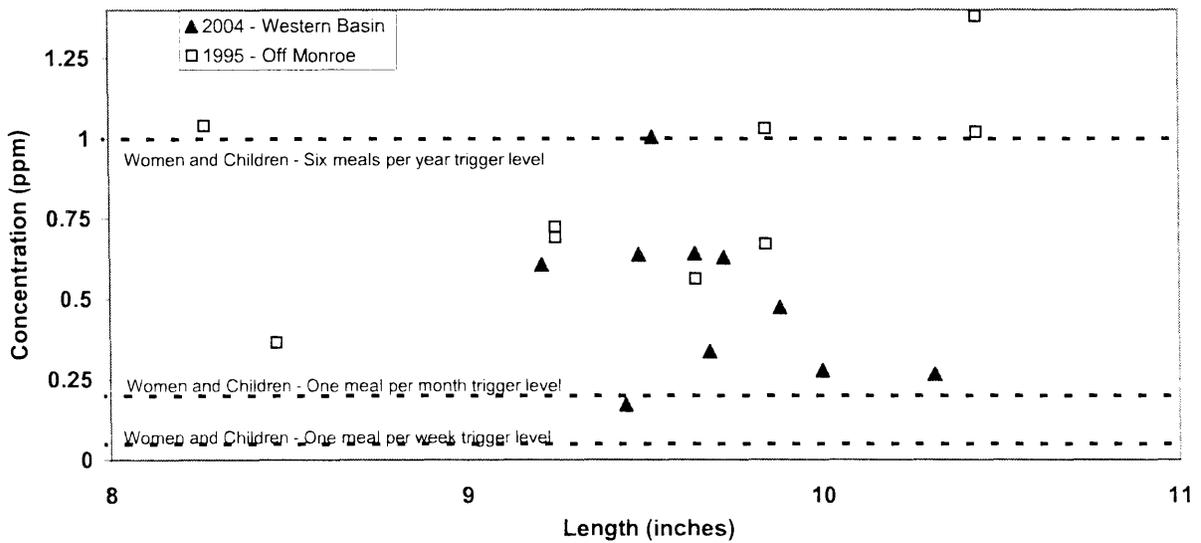


Figure 14. Total length versus total PCB concentration in white perch collected from Lake Erie in 1995 (ID 95040) and 2004 (ID 2004043).

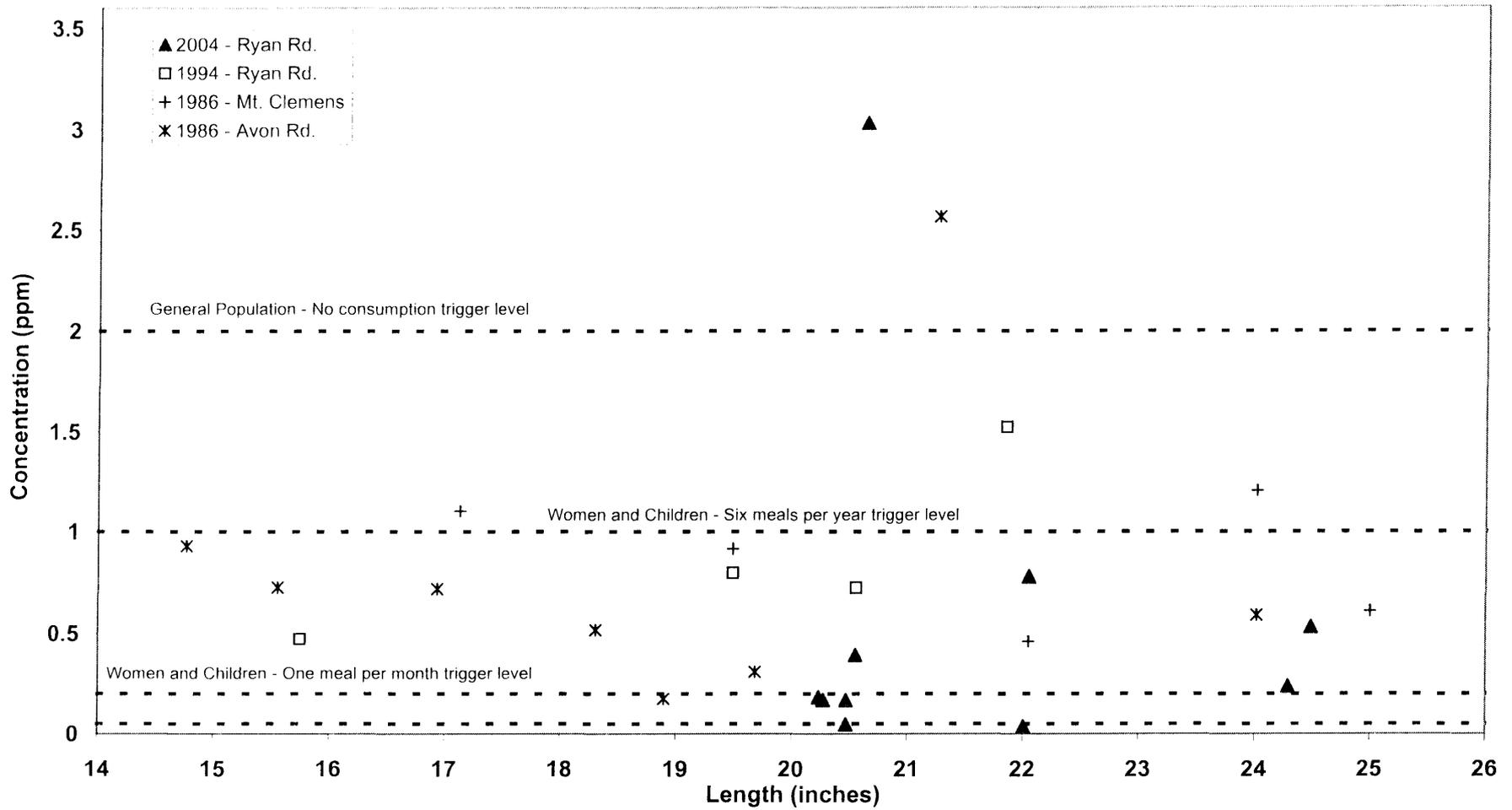


Figure 15. Total length versus total PCB concentration in carp collected from Clinton River, below Yates Dam in 1986. (ID 86015 & 86044), 1994 (ID 94003), and 2004 (ID 2004015).

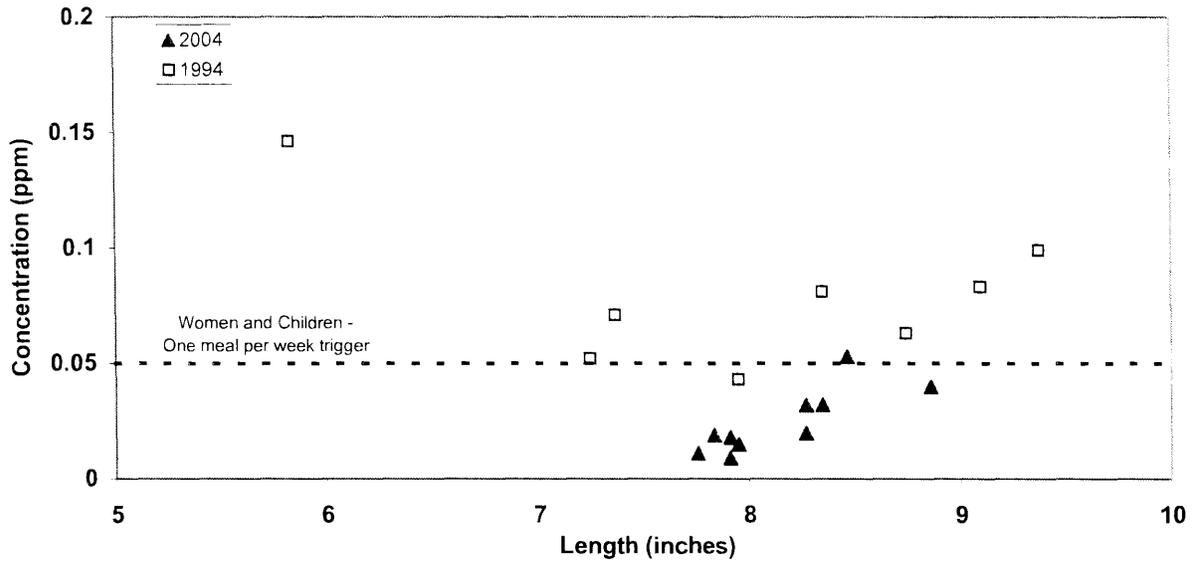


Figure 16. Total length versus total PCB concentration in rock bass collected from Clinton River at Ryan Rd., Utica in 1994 (ID 94003) and 2004 (ID 2004015).

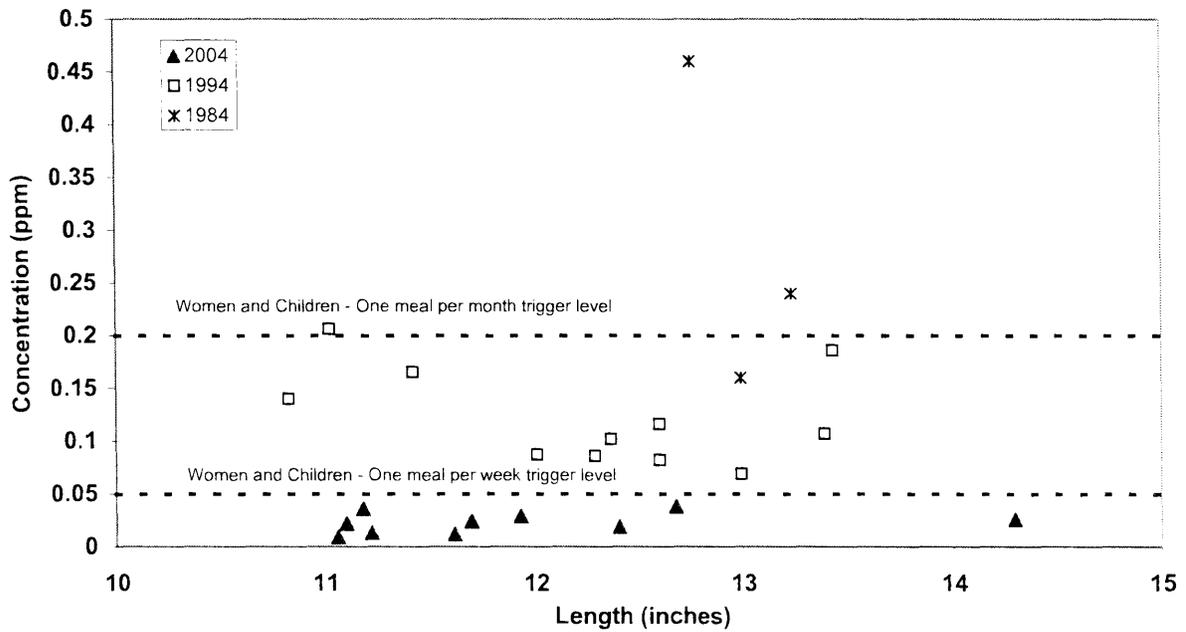


Figure 17. Total length versus total PCB concentration in white sucker collected from Clinton River at Ryan Rd., Utica in 1984 (ID 84014), 1994 (ID 94003), and 2004 (ID 2004015).

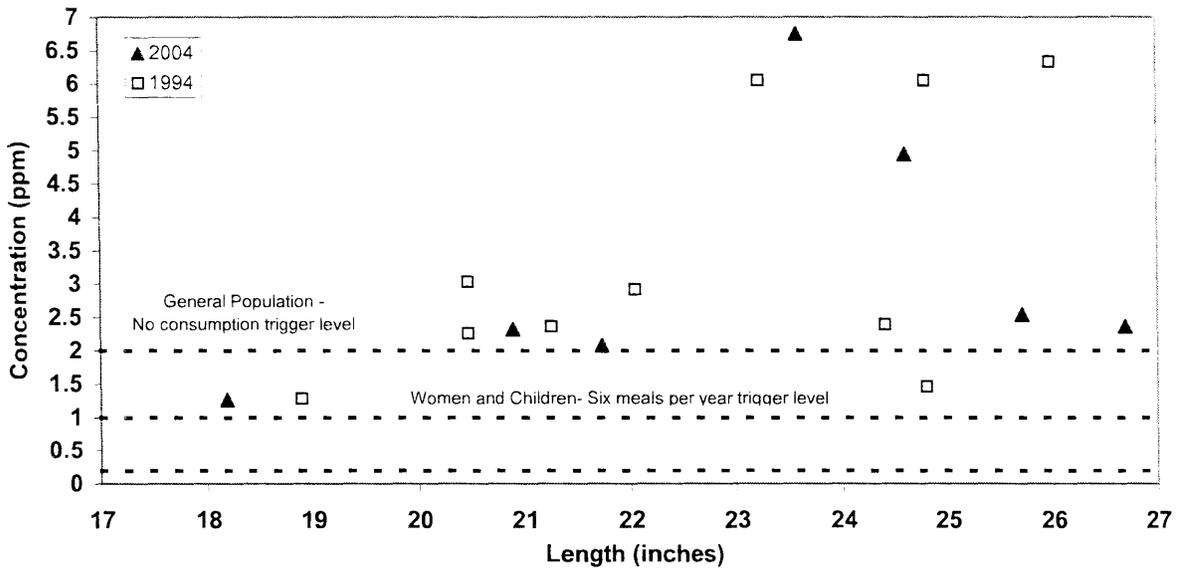


Figure 18. Total length versus total PCB concentration in carp collected from the Detroit River, Michigan waters in 1994 (ID 94018), and 2004 (ID 2004021).

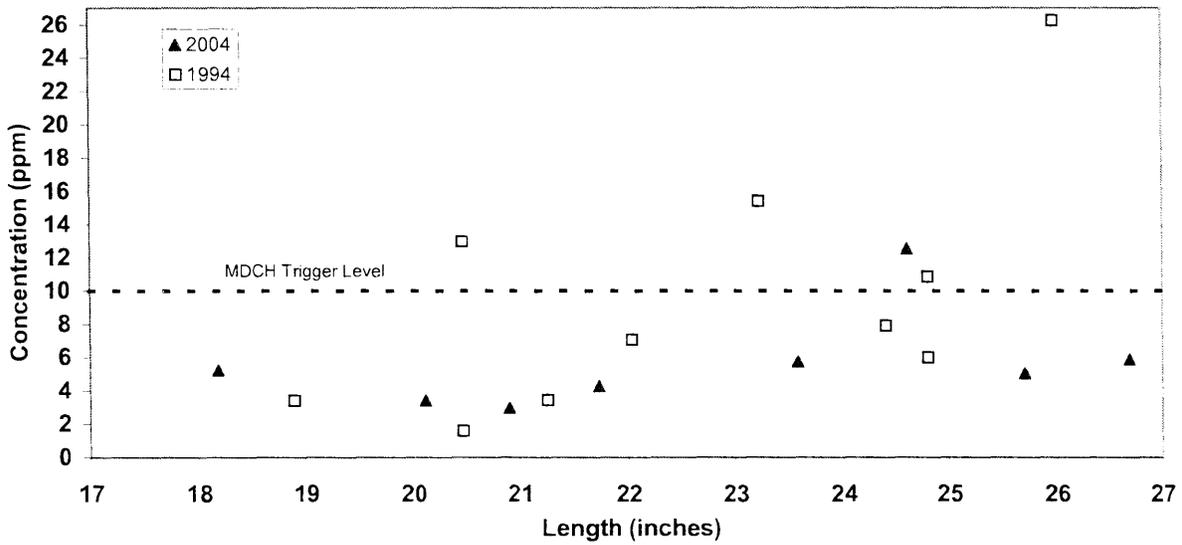


Figure 19. Total length versus dioxin TEQ concentration in carp collected from the Detroit River, Michigan waters in 1994 (ID 94018) and 2004 (ID 2004021).

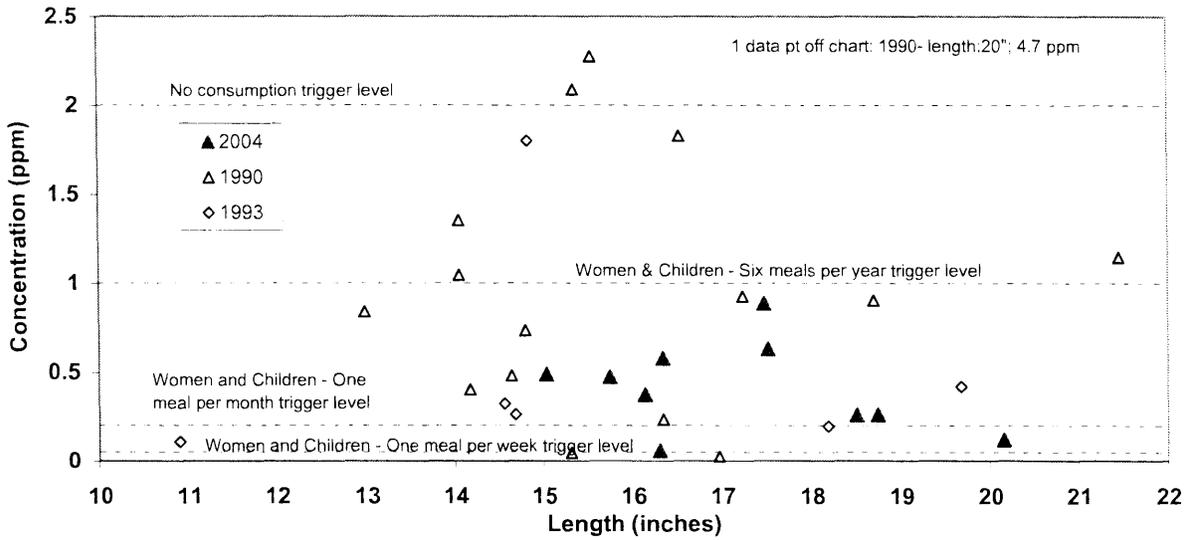


Figure 20. Total length versus total PCB concentration in freshwater drum collected from the Detroit River, Michigan waters in 1990 (ID 90031 & 90032), 1993 (ID 93020), and 2004 (ID 2004021).

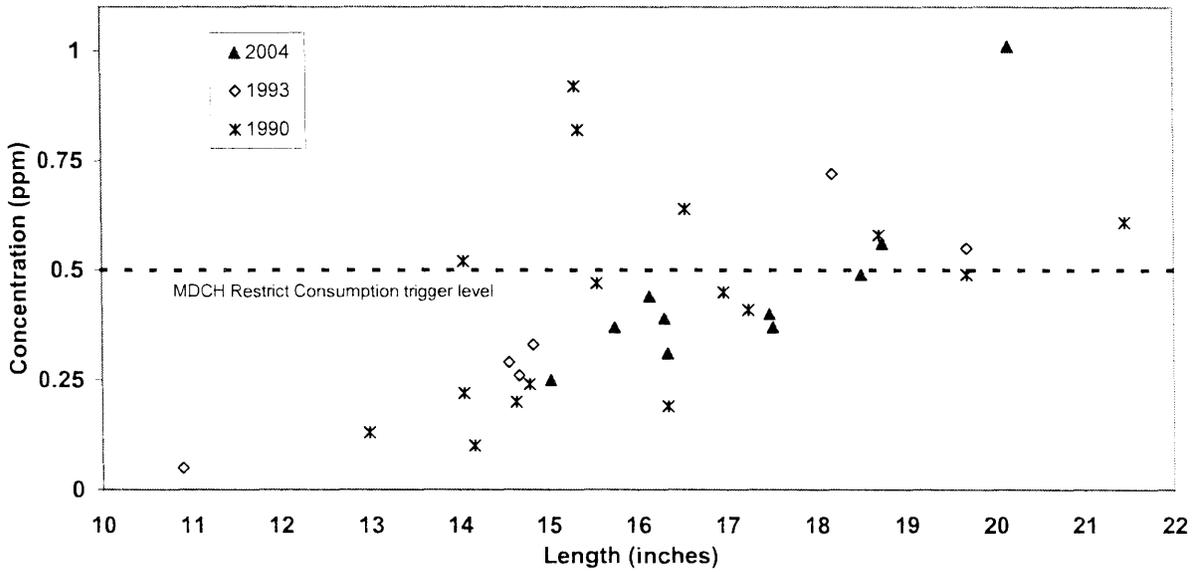


Figure 21. Total length versus mercury concentration in freshwater drum collected from the Detroit River, Michigan waters in 1990 (ID 90031 & 90032), 1993 (ID 93020), and 2004 (ID 2004021).

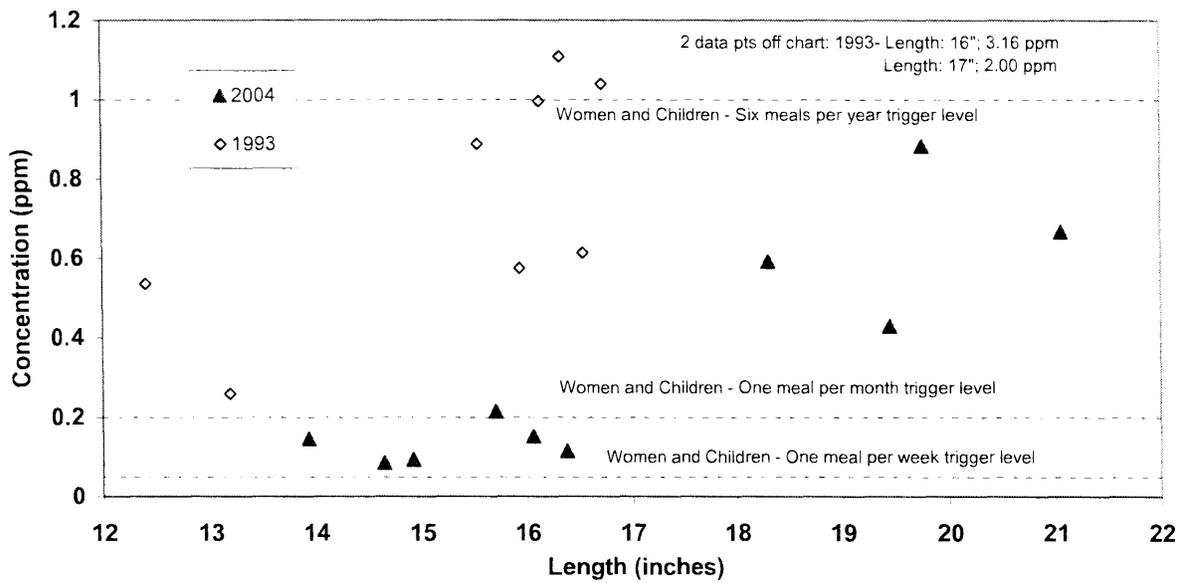


Figure 22. Total length versus total PCB concentration in redhorse sucker collected from the Detroit River, Michigan waters in 1993 (ID 93020) and 2004 (ID 2004021).

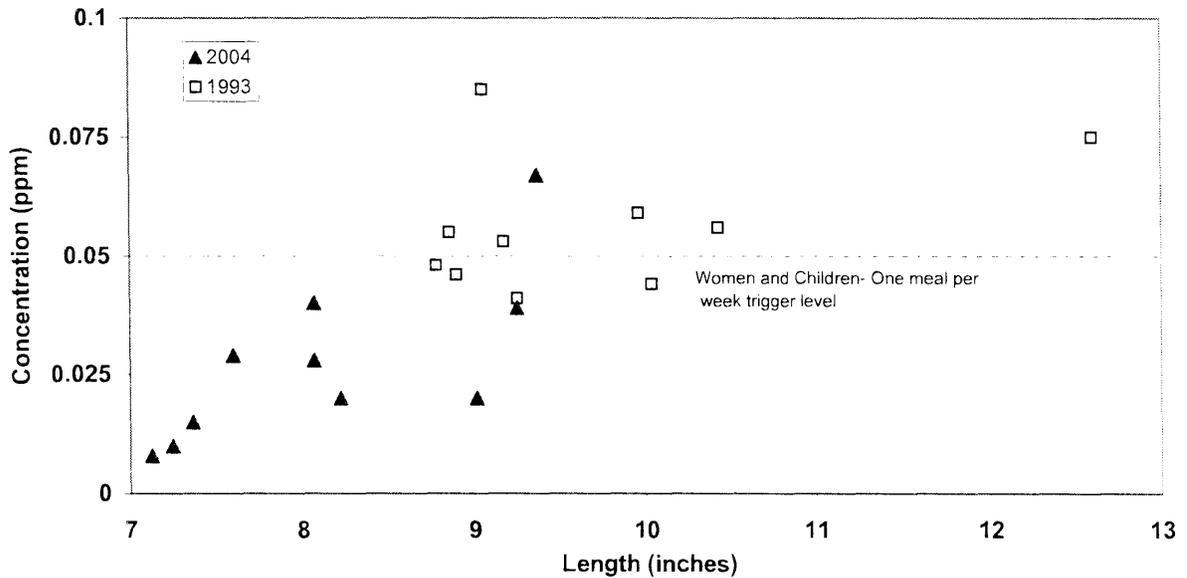


Figure 23. Total length versus total PCB concentration in yellow perch collected from the Detroit River, Michigan waters in 1993 (ID 93020) and 2004 (ID 2004021).

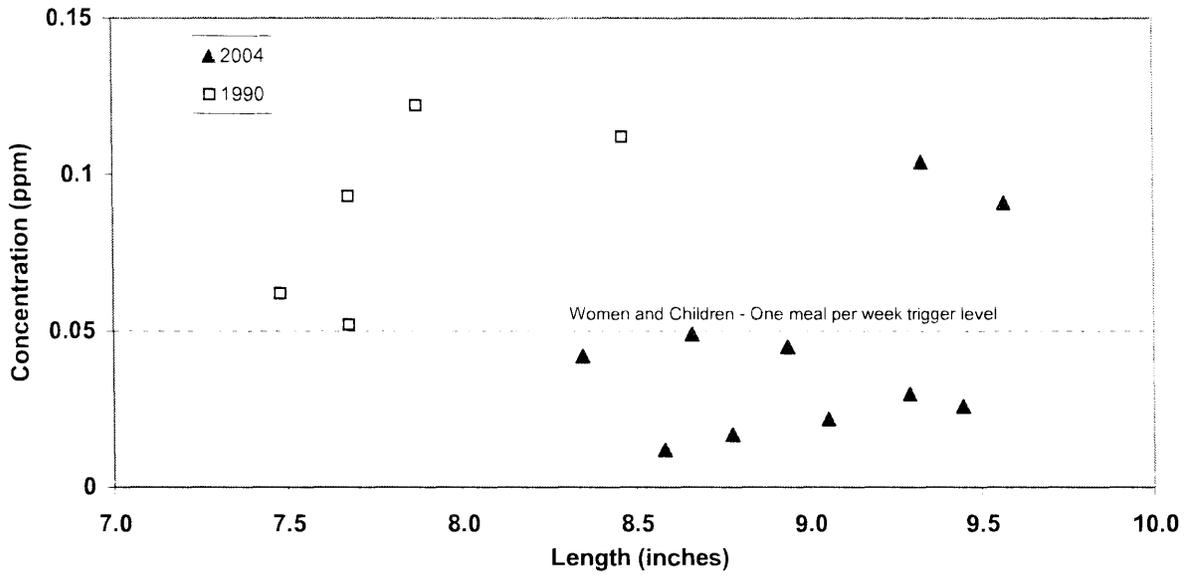


Figure 24. Total length versus total PCB concentration in black crappie collected from Kent Lake, Oakland County in 1990 (ID 90017) and 2004 (ID 2004040).

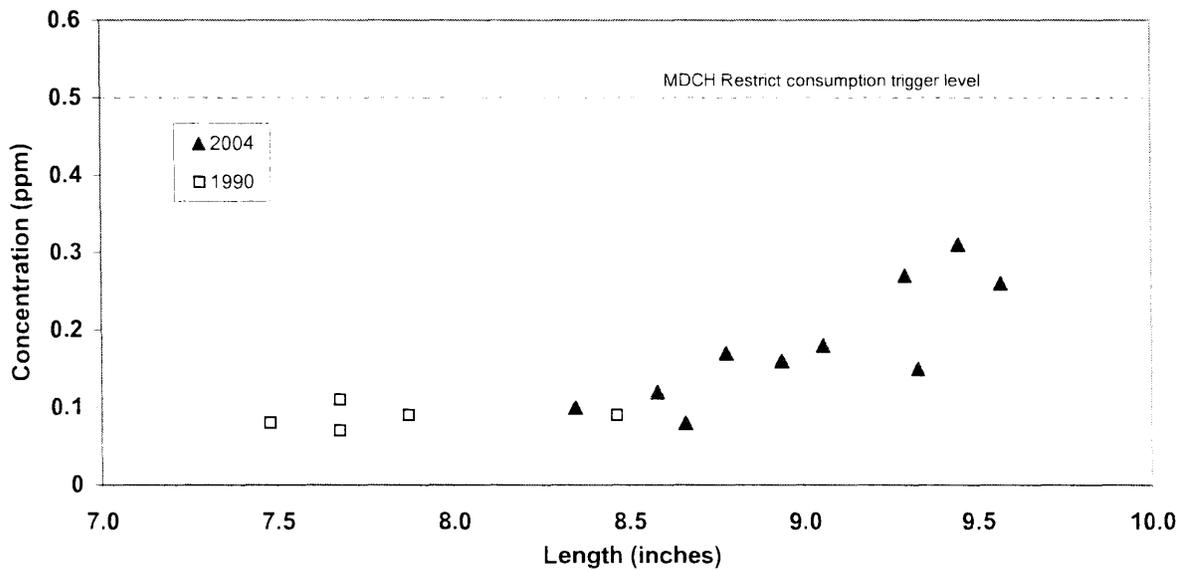


Figure 25. Total length versus mercury concentration in black crappie collected from Kent Lake, Oakland County in 1990 (ID 90017) and 2004 (ID 2004040).

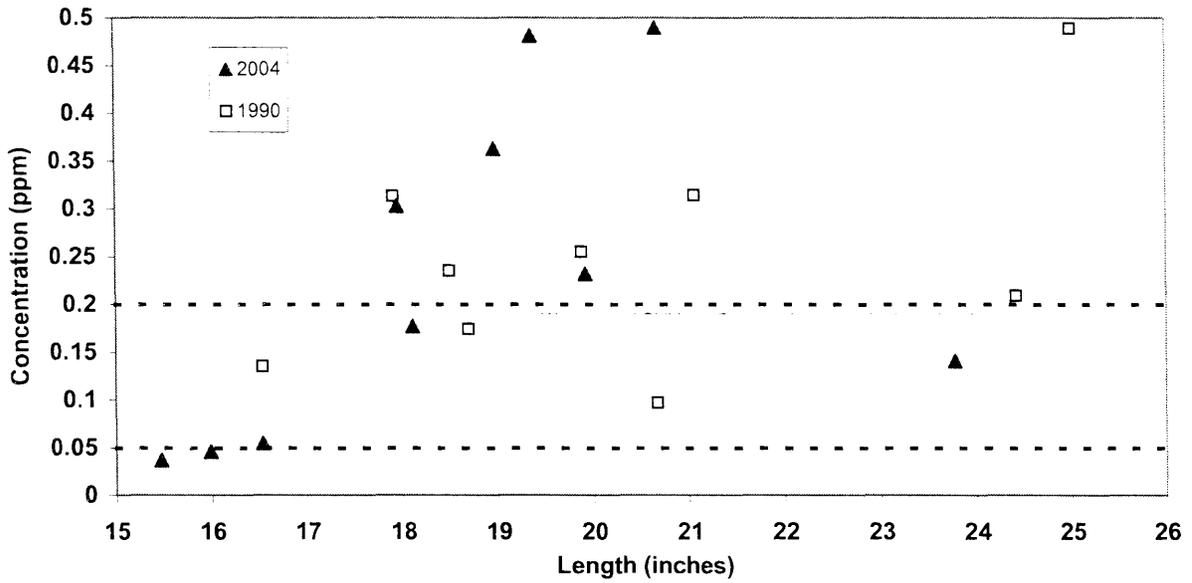


Figure 26. Total length versus total PCB concentration in walleye collected from Kent Lake, Oakland County in 1990 (ID 90017) and 2004 (ID 2004040).

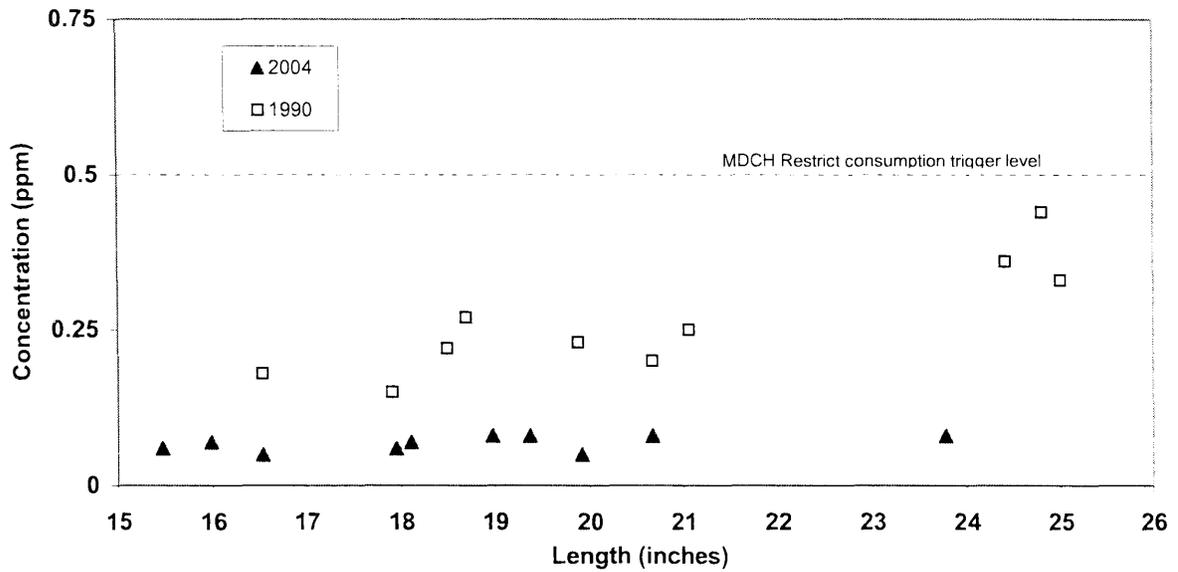


Figure 27. Total length versus mercury concentration in walleye collected from Kent Lake, Oakland County in 1990 (ID 90017) and 2004 (ID 2004040).

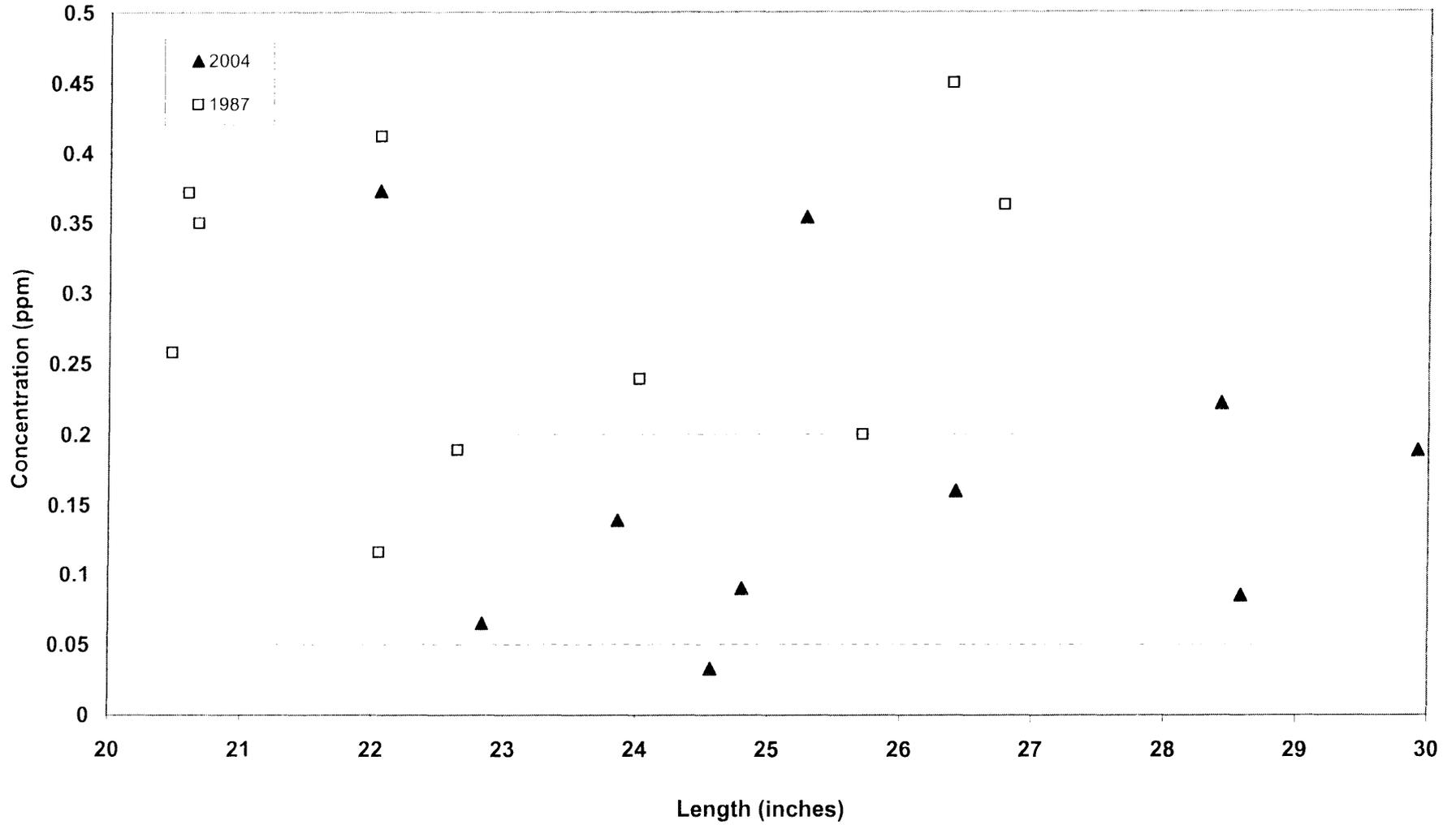


Figure 28. Total length versus total PCB concentration in carp collected from the Raisin River upstream of the Monroe Dam in 1987. (ID 87024) and 2004 (ID 2004085).

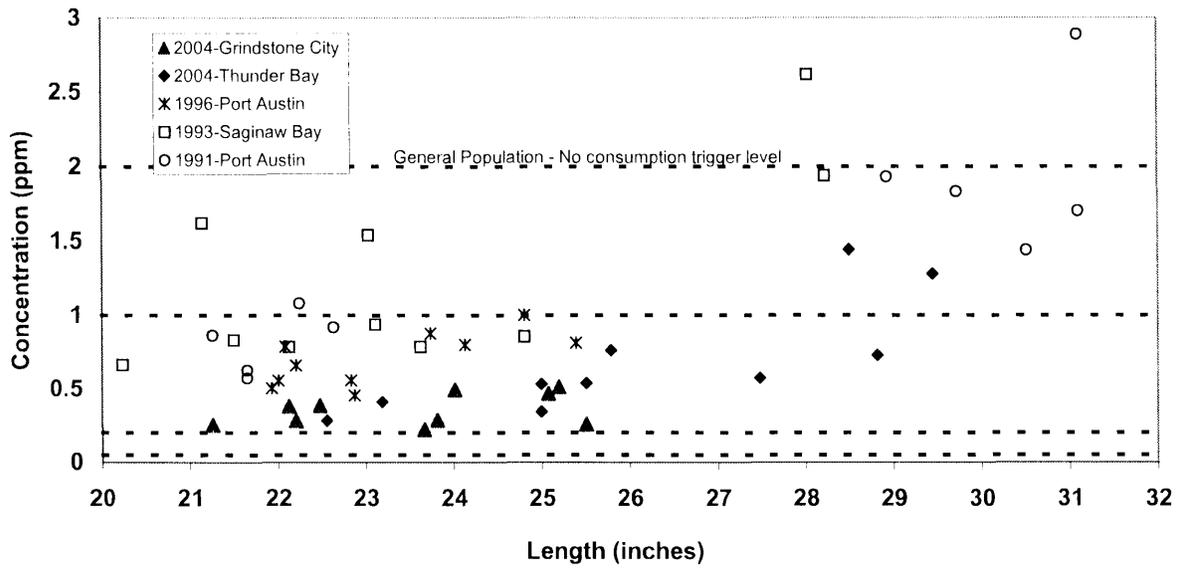


Figure 29. Total length versus total PCB concentration in lake trout collected from Lake Huron in 1991 (ID 91052), 1993 (ID 93069), 1996 (ID 96019), and 2004 (ID 2004130 & 2004145).

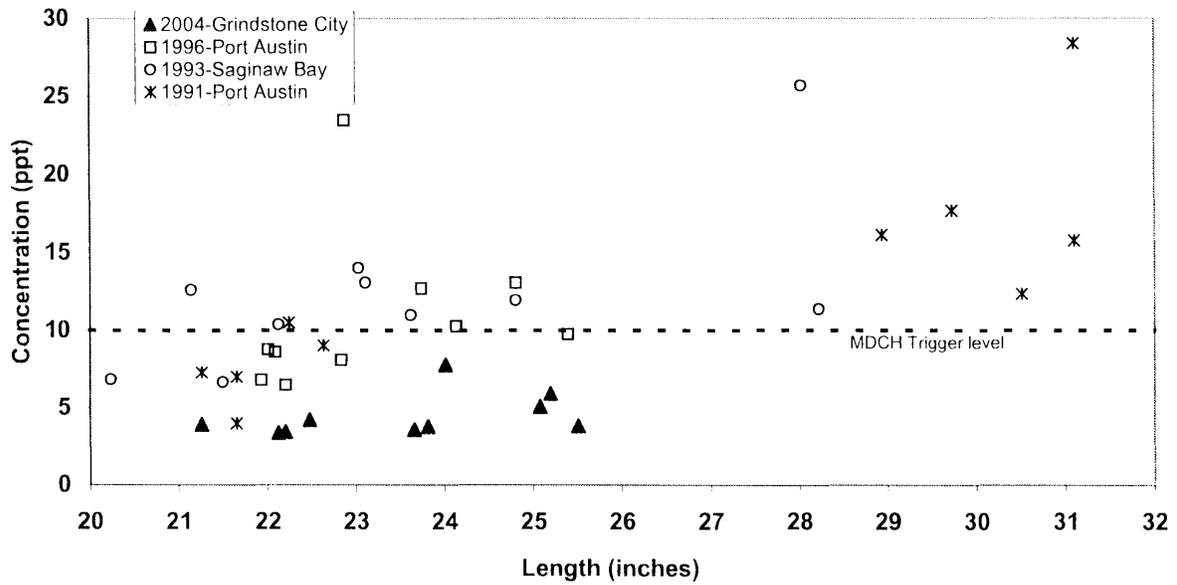


Figure 30. Total length versus dioxin TEQ concentration in lake trout collected from Lake Huron in 1991 (ID 91052), 1993 (ID 93069), 1996 (ID 96019), and 2004 (ID 2004130).

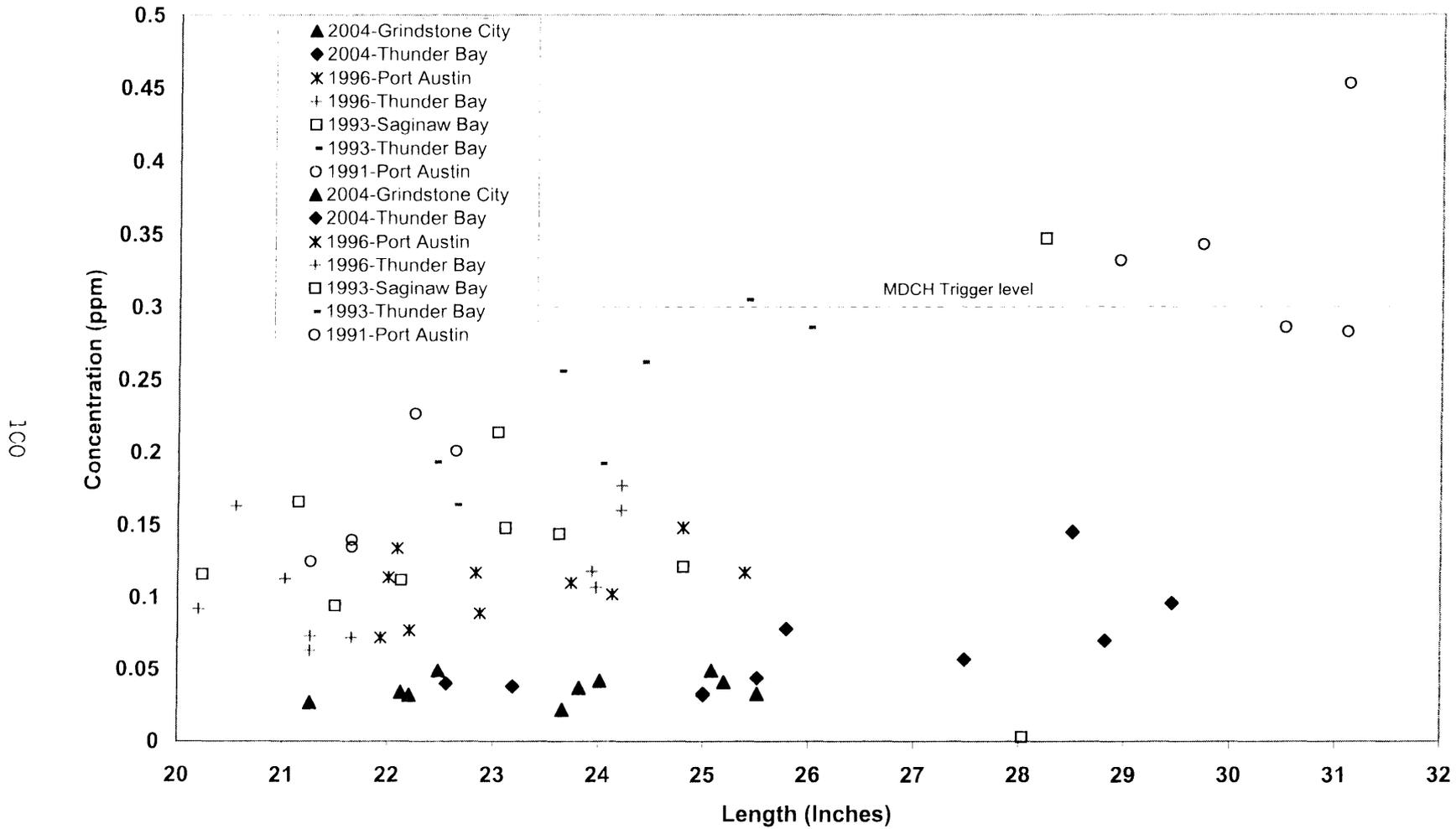


Figure 31. Total length versus total chlordane concentration in lake trout collected from Lake Huron in 1991 (ID 91052), 1993 (ID 93069 & 93070), 1996 (ID 96019 & 96022), and 2004 (ID 2004130 & 2004145).

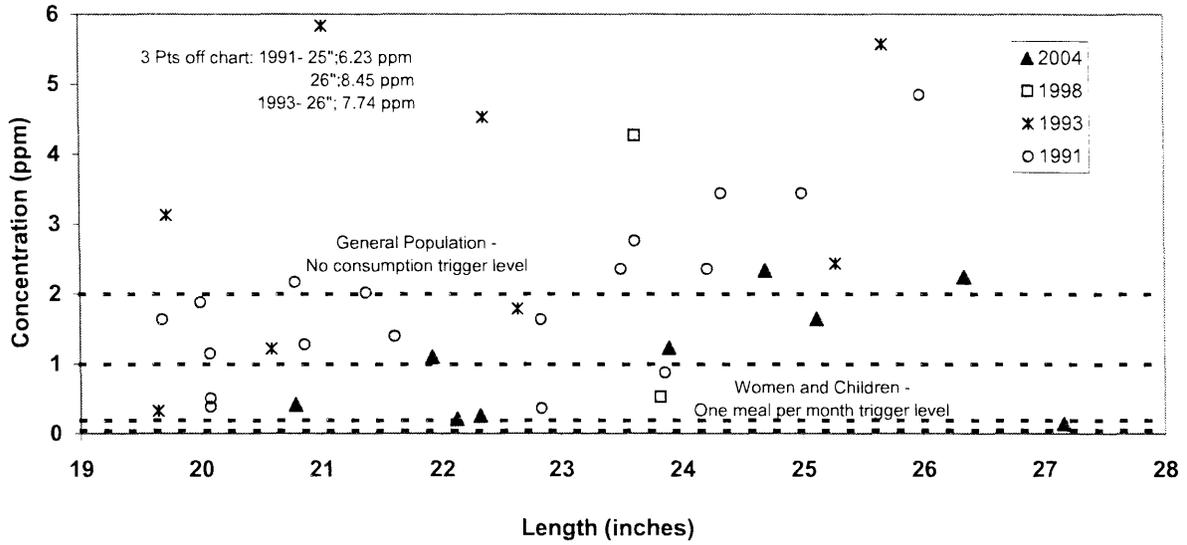


Figure 32. Total length versus total PCB concentration in carp collected from Lake Huron, Saginaw Bay in 1991 (ID 91037), 1993 (ID 93069), 1998 (ID 1998140), and 2004 (ID 2004046).

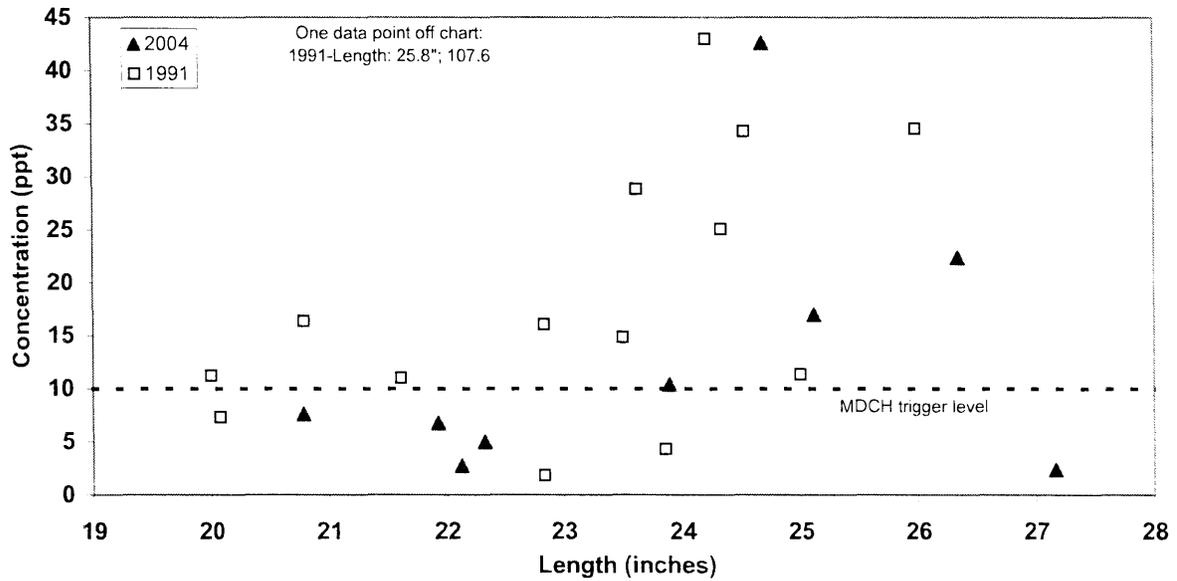


Figure 33. Total length versus dioxin TEQ concentration in carp collected from Lake Huron, Saginaw Bay in 1991 (ID 91037), and 2004 (ID 2004046).

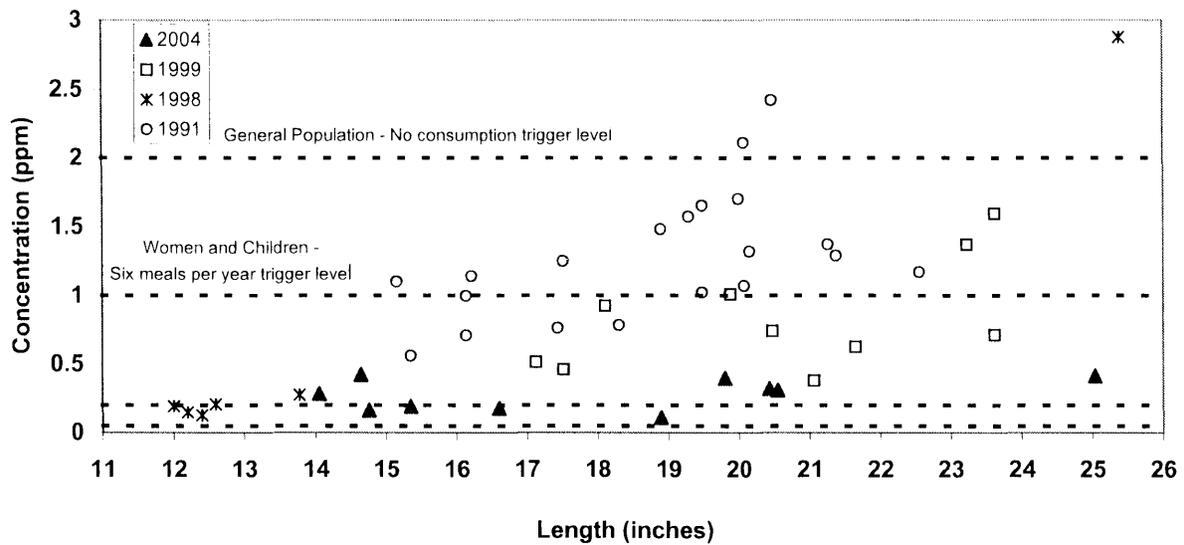


Figure 34. Total length versus total PCB concentration in channel catfish collected from Lake Huron, Saginaw Bay in 1991 (ID 91037 & 91038), 1998 (ID 1998140), 1999 (ID 1999089), and 2004 (ID 2004046).

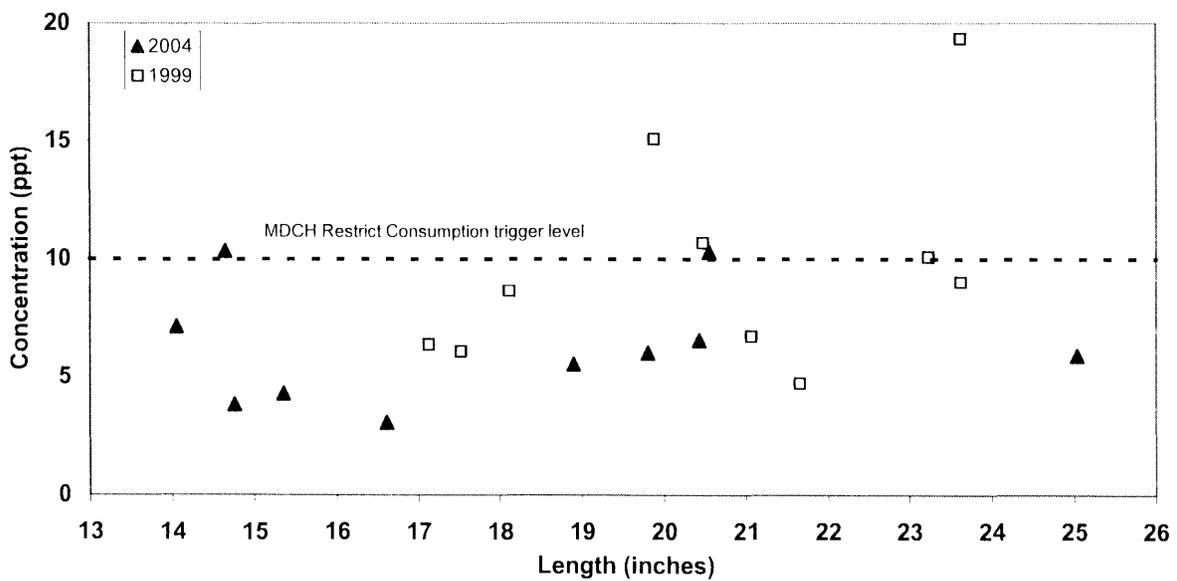


Figure 35. Total length versus dioxin TEQ concentration in channel catfish collected from Lake Huron, Saginaw Bay in 1999 (ID 1999089), and 2004 (ID 2004046).

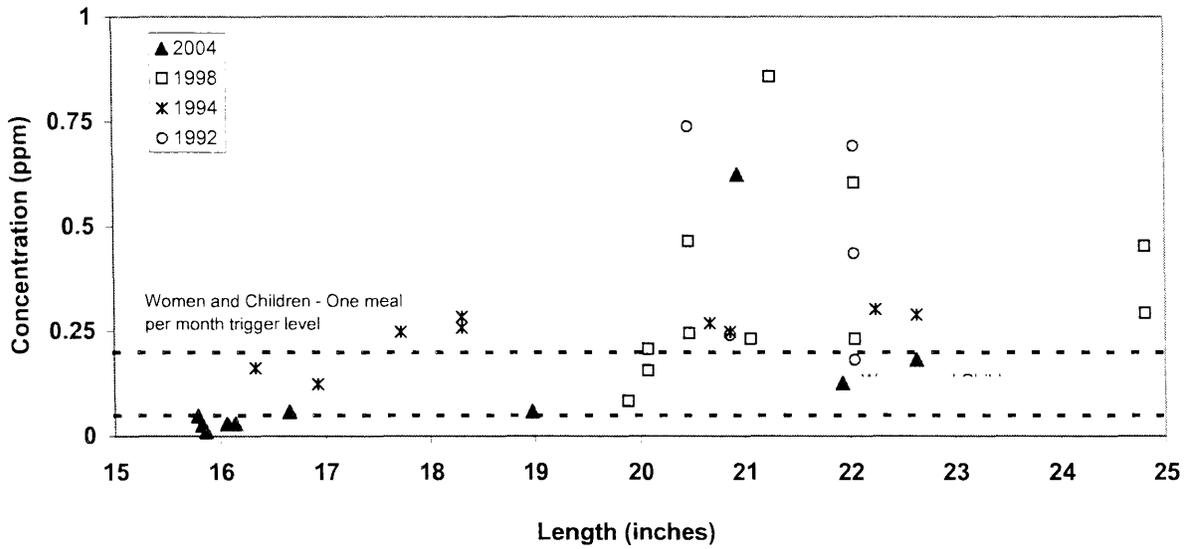


Figure 36. Total length versus total PCB concentration in walleye collected from Lake Huron, Saginaw Bay in 1992 (ID 92054), 1994 (ID 94038), 1998 (ID 1998140), and 2004 (ID 2004046).

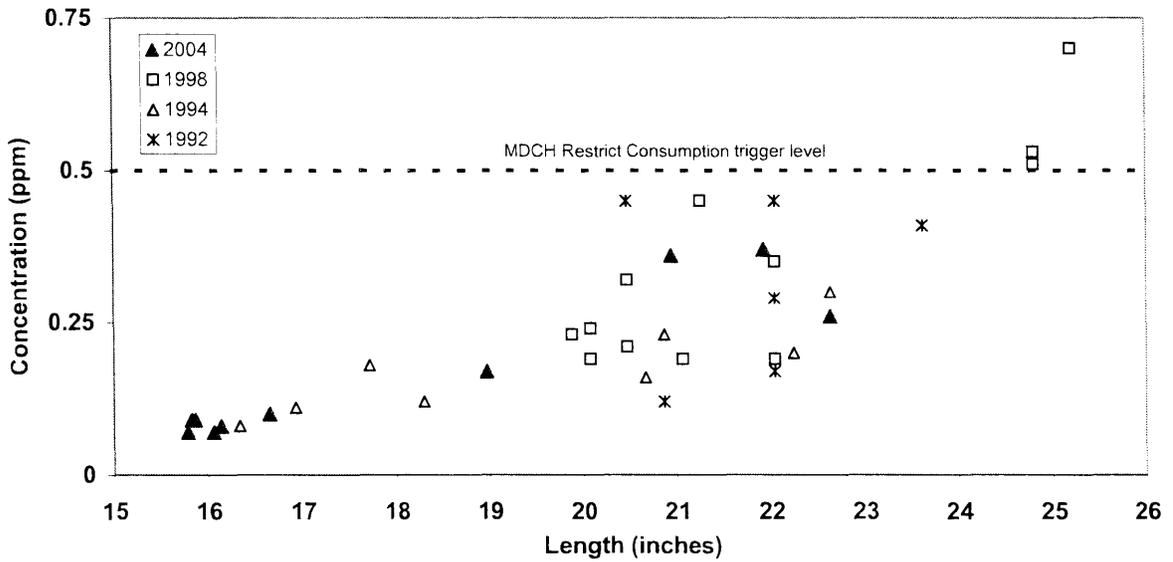


Figure 37. Total length versus mercury concentration in walleye collected from Lake Huron, Saginaw Bay in 1992 (ID 92054), 1994 (ID 94038), 1998 (ID 1998140), and 2004 (ID 2004046).

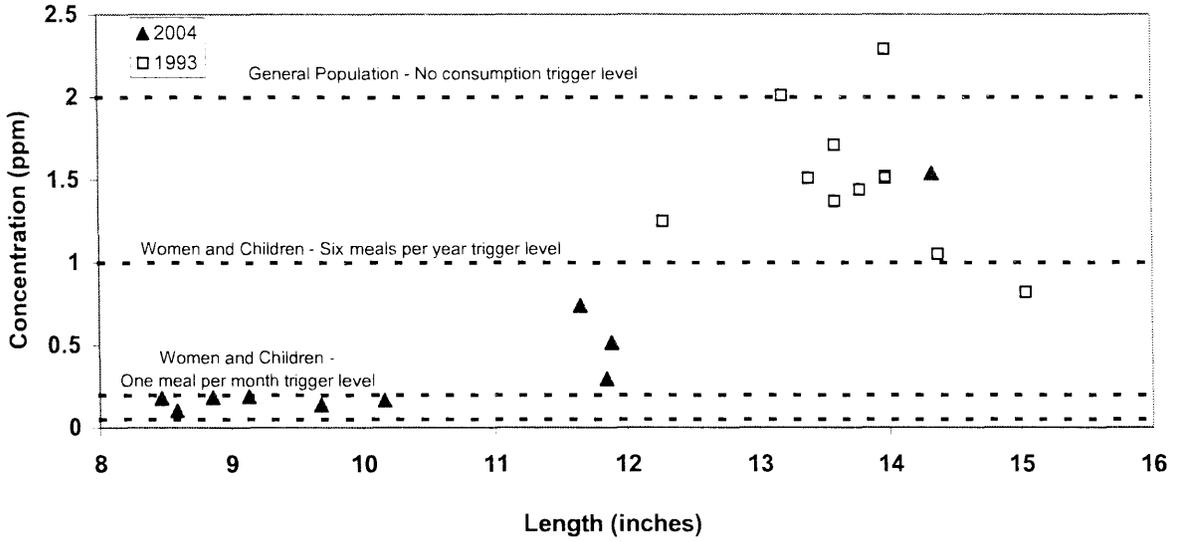


Figure 38. Total length versus total PCB concentration in white bass collected from Lake Huron, Saginaw Bay in 1993 (ID 93069) and 2004 (ID 2004046).

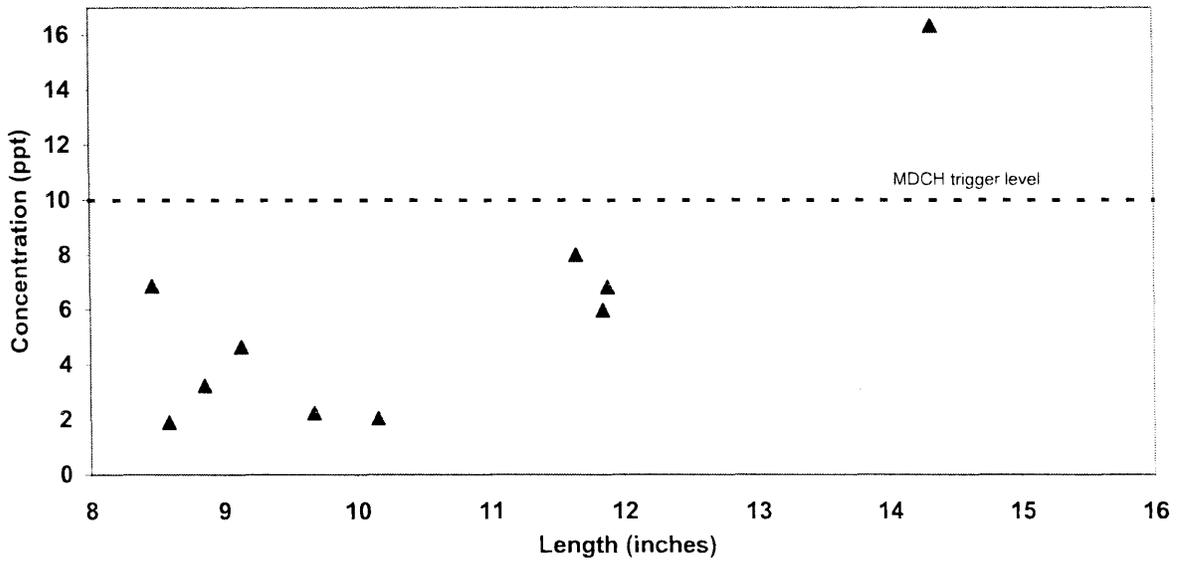


Figure 39. Total length versus dioxin TEQ concentration in white bass collected from Lake Huron, Saginaw Bay in 2004 (ID 2004046).

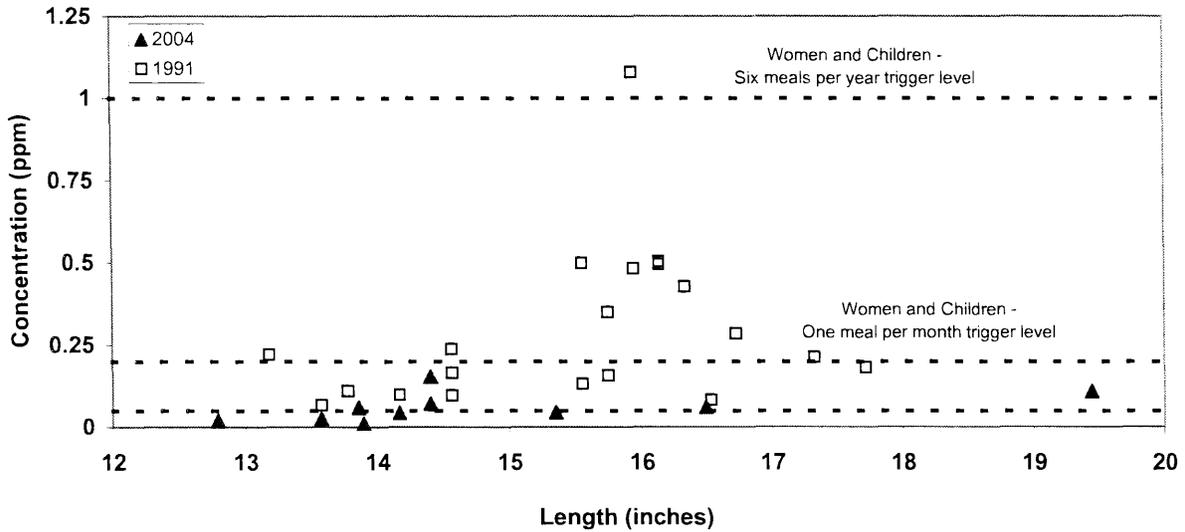


Figure 40. Total length versus total PCB concentration in white sucker collected from Lake Huron, Saginaw Bay in 1991 (ID 91037 & 91038) and 2004 (ID 2004046).

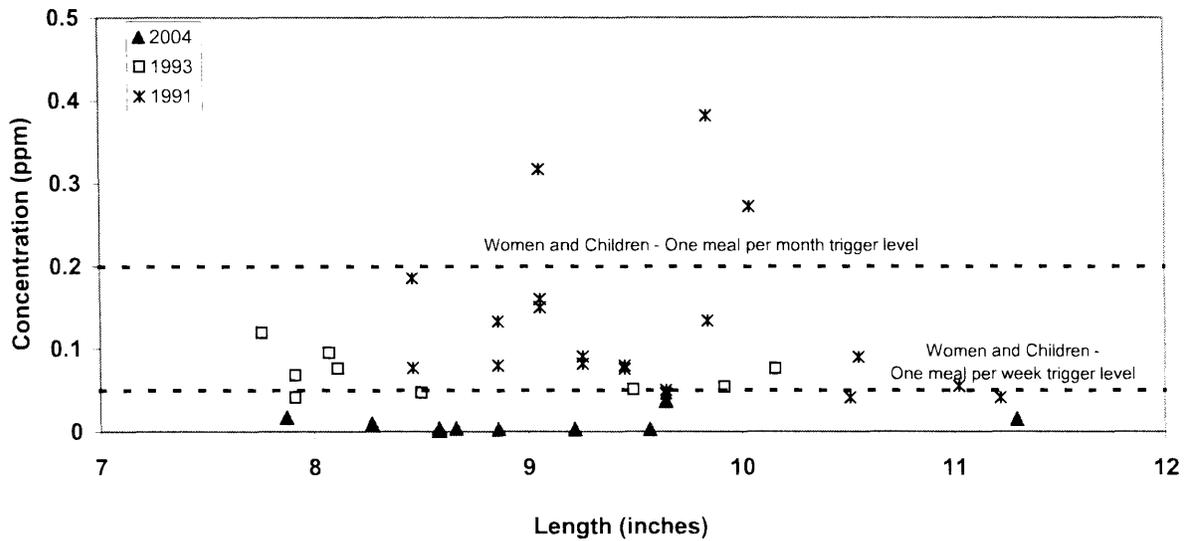


Figure 41. Total length versus total PCB concentration in yellow perch collected from Lake Huron, Saginaw Bay in 1991 (ID 91037 & 91038), 1993 (ID 93069), and 2004 (ID 2004046).

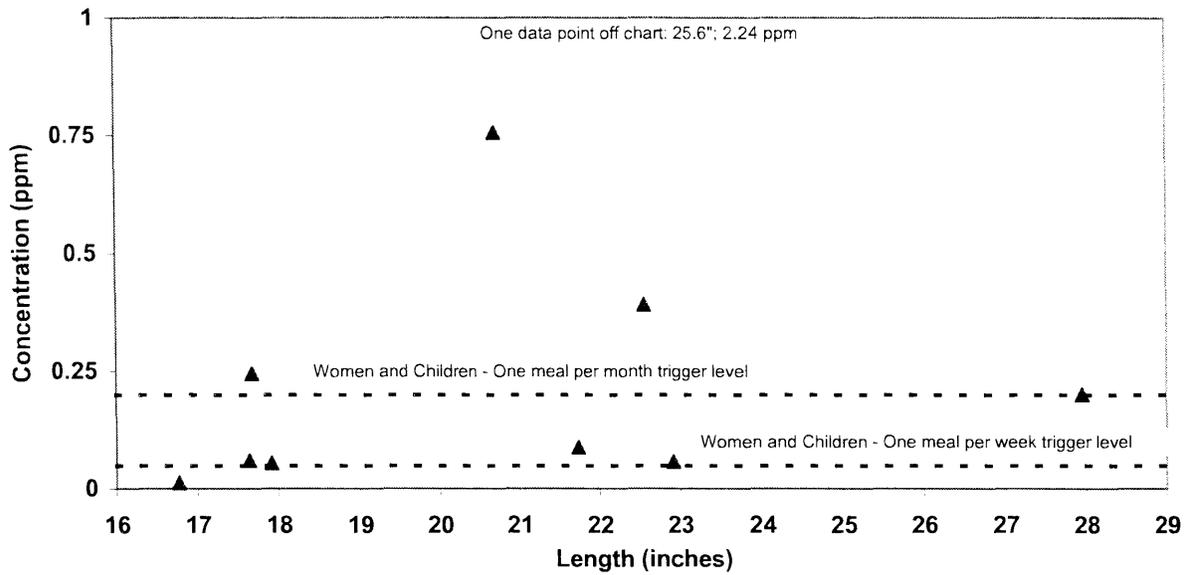


Figure 42. Total length versus total PCB concentration in carp collected from the Bad River, Saginaw County in 2004 (ID 2004003).

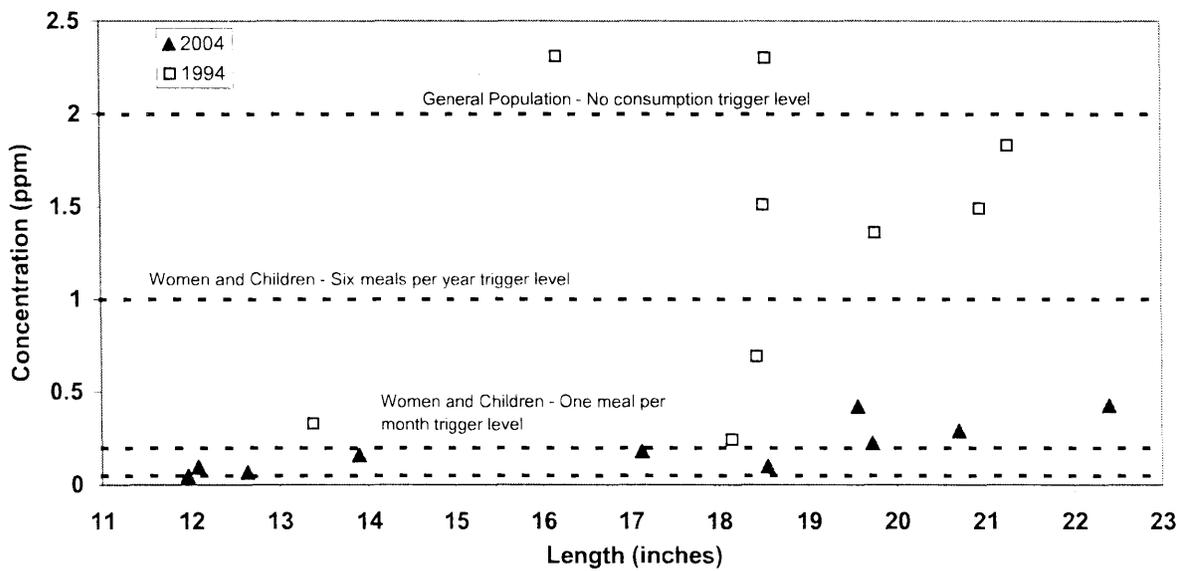


Figure 43. Total length versus total PCB concentration in channel catfish collected from the Bad River, Saginaw County in 1994 (ID 94034) and 2004 (ID 2004003).



Figure 44. Total length versus total PCB concentration in northern pike collected from the Bad River, Saginaw County in 1994 (ID 94034) and 2004 (ID 2004003).

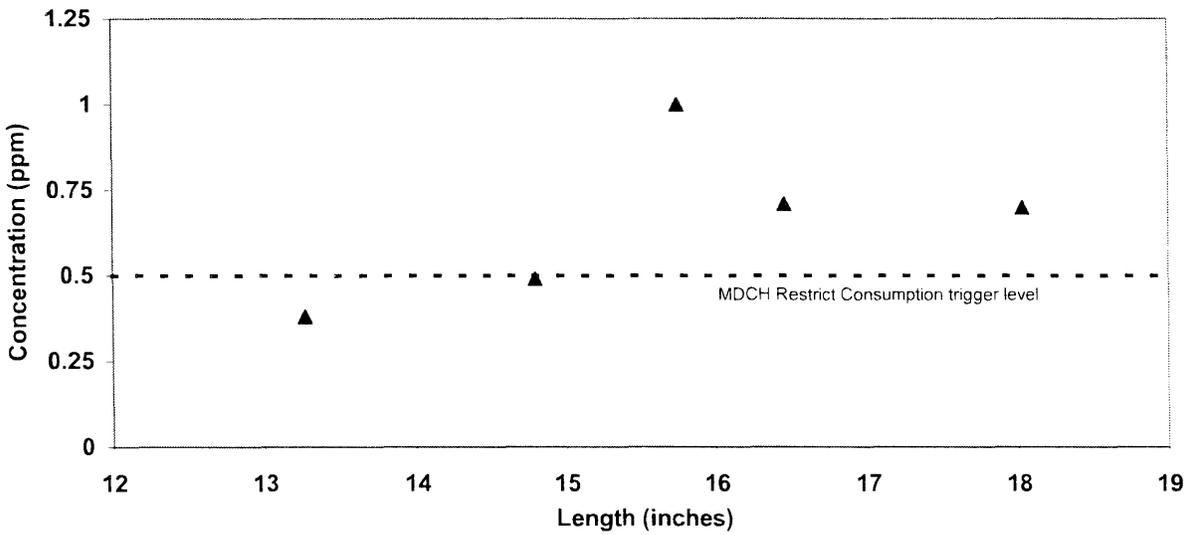


Figure 45. Total length versus mercury concentration in largemouth bass collected from Big Seven Lakes, Oakland County in 2004 (ID 2004133).

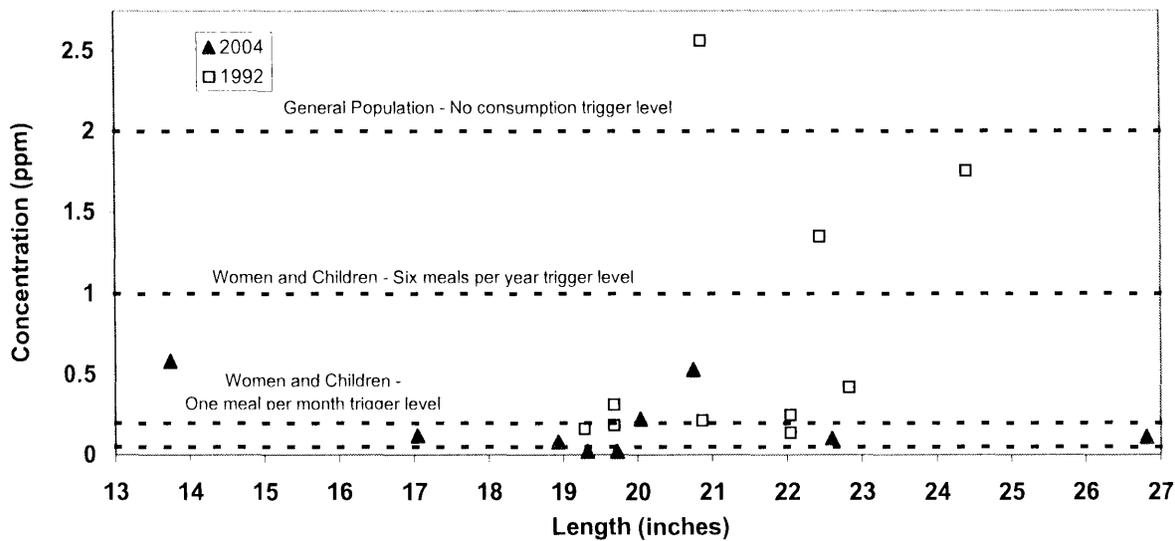


Figure 46. Total length versus total PCB concentration in carp collected from the Cass River at Bridgeport in 1992 (ID 92035) and 2004 (ID 2004011).

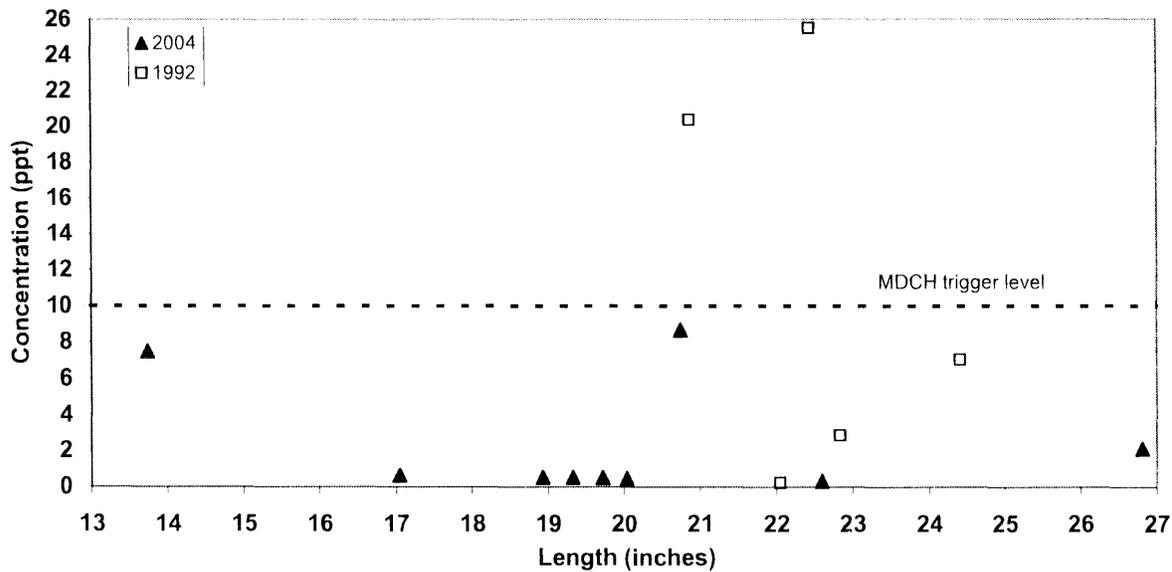


Figure 47. Total length versus dioxin TEQ concentration in carp collected from the Cass River at Bridgeport in 1992 (ID 92035) and 2004 (ID 2004011).

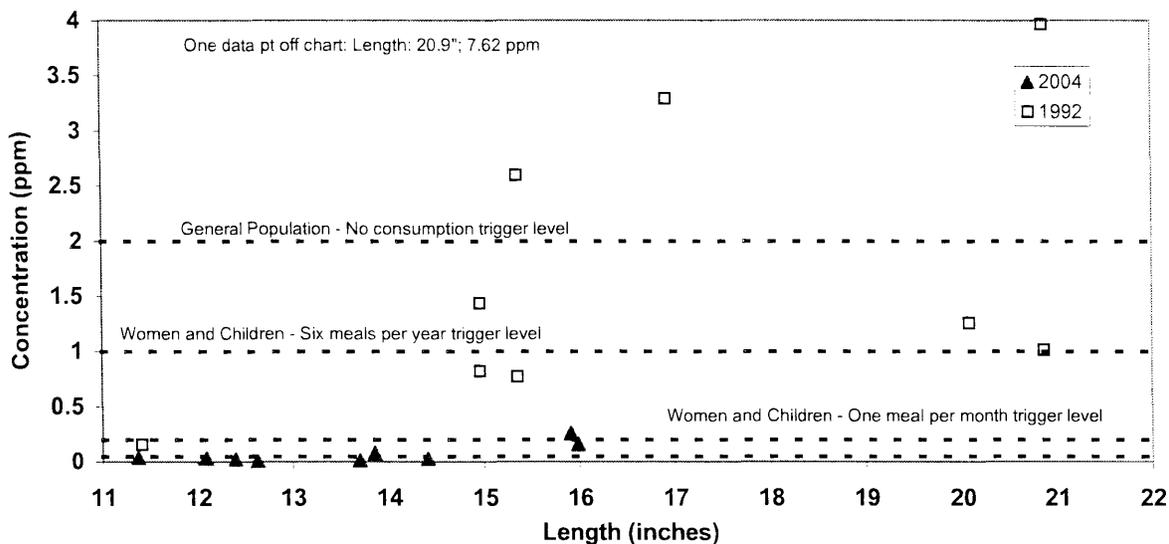


Figure 48. Total length versus total PCB concentration in channel catfish collected from the Cass River at Bridgeport in 1992 (ID 92035) and 2004 (ID 2004011).

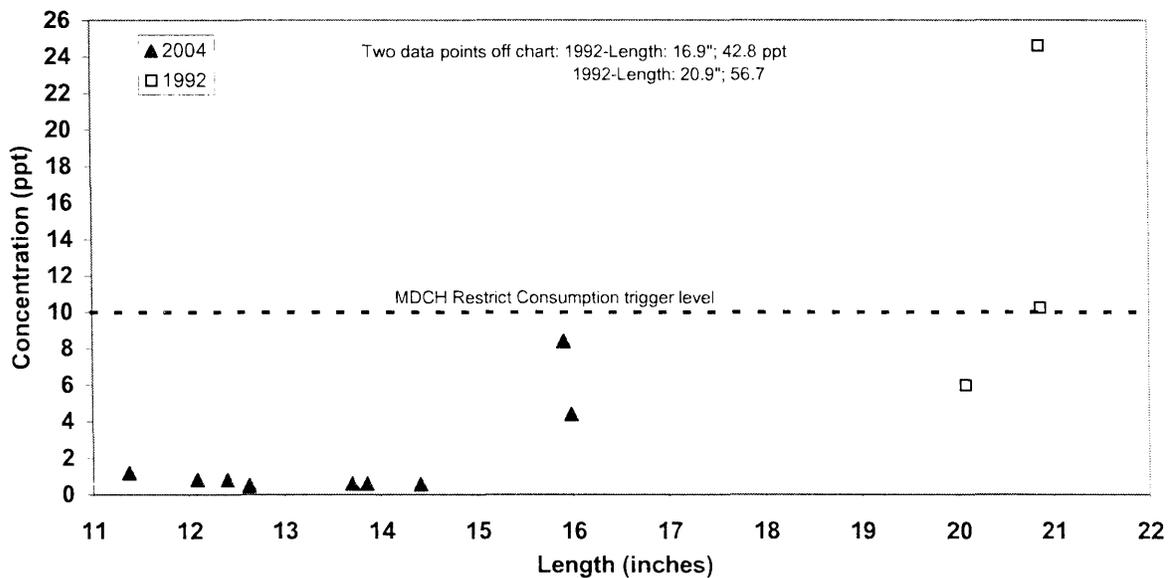


Figure 49. Total length versus dioxin TEQ concentration in channel catfish collected from the Cass River at Bridgeport in 1992 (ID 92035) and 2004 (ID 2004001).

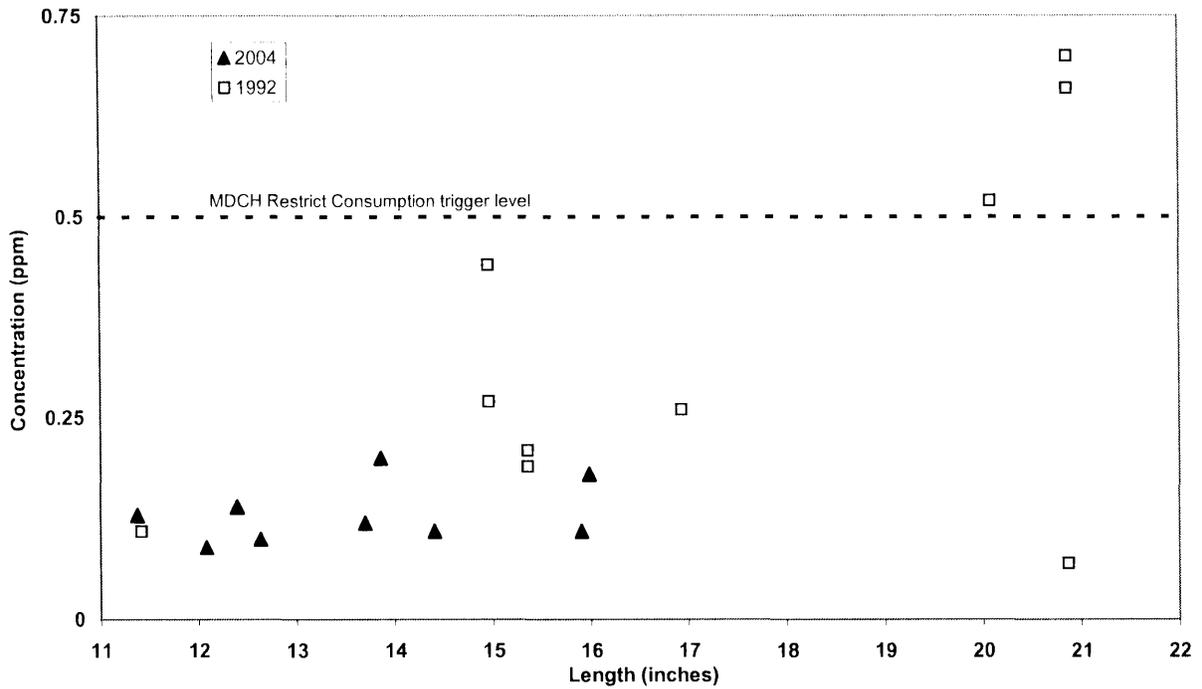


Figure 50. Total length versus mercury concentration in channel catfish collected from the Cass River at Bridgeport in 1992 (ID 92035) and 2004 (ID 2004011).

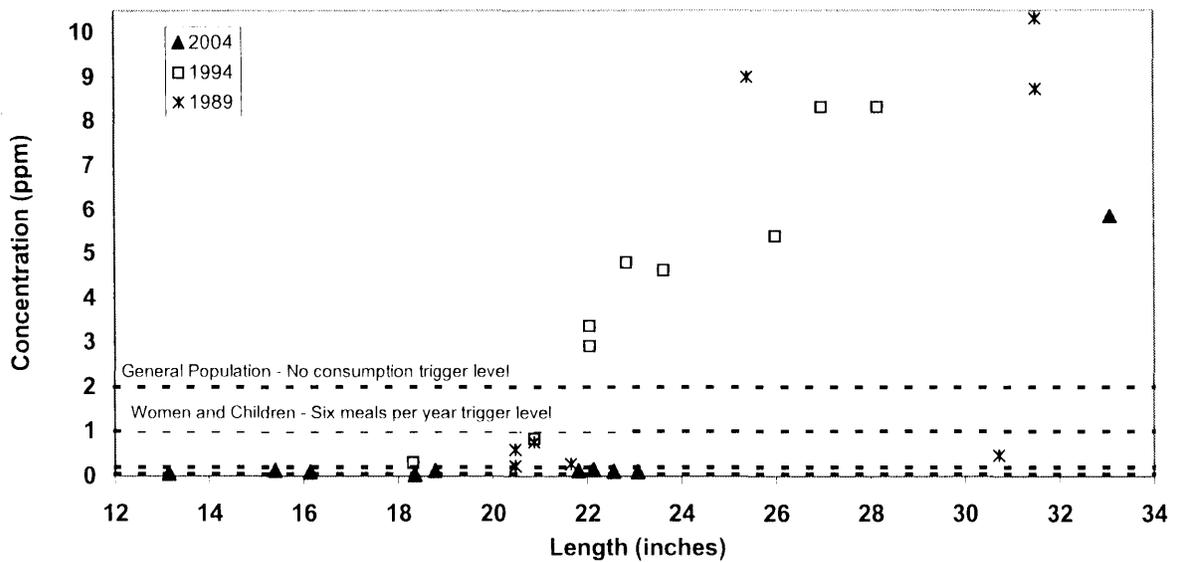


Figure 51. Total length versus total PCB concentration in carp collected from Cheboyganing Creek, Saginaw County in 1989 (ID 89058), 1994 (ID 94035), and 2004 (ID 2004013).

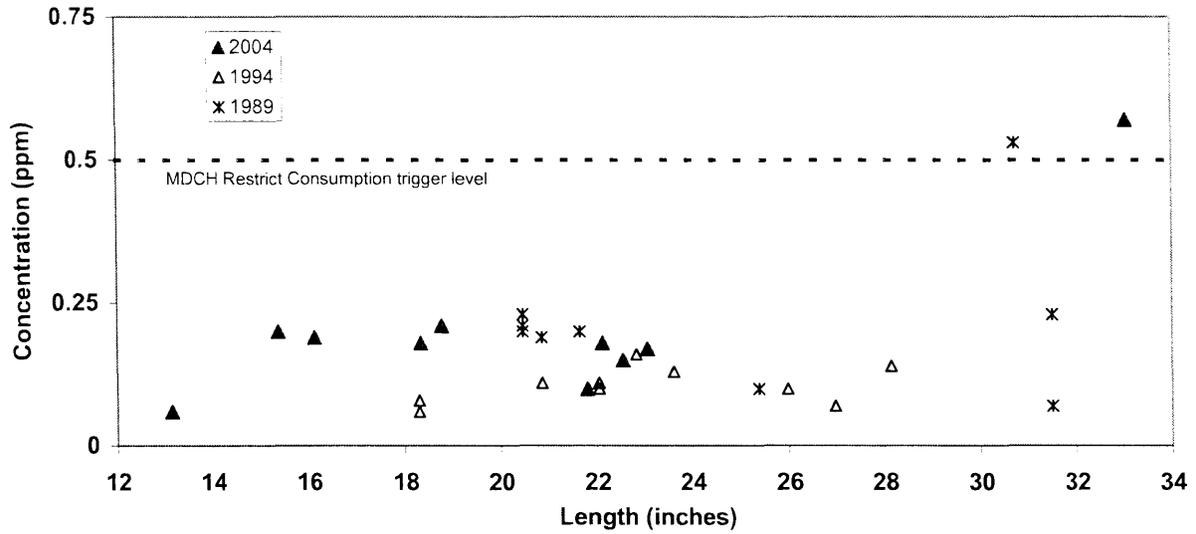


Figure 52. Total length versus mercury concentration in carp collected from Cheboyganing Creek, Saginaw County in 1989 (ID 89058), 1994 (ID 94035), and 2004 (ID 2004013).

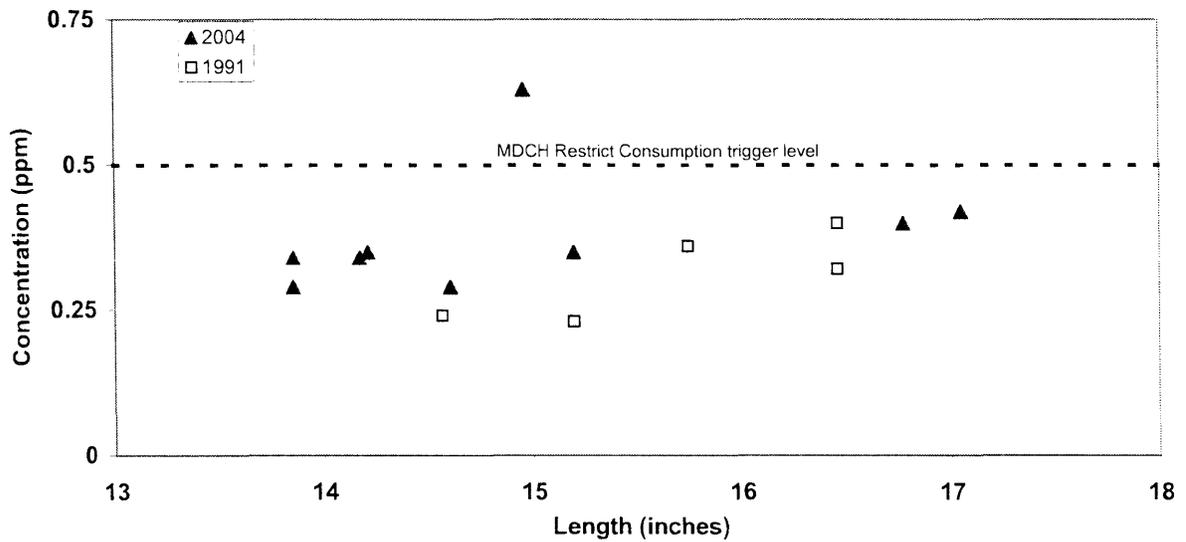


Figure 53. Total length versus mercury concentration in largemouth bass collected from Five Lakes, Clare County in 1991 (ID 91009) and 2004 (ID 2004131).

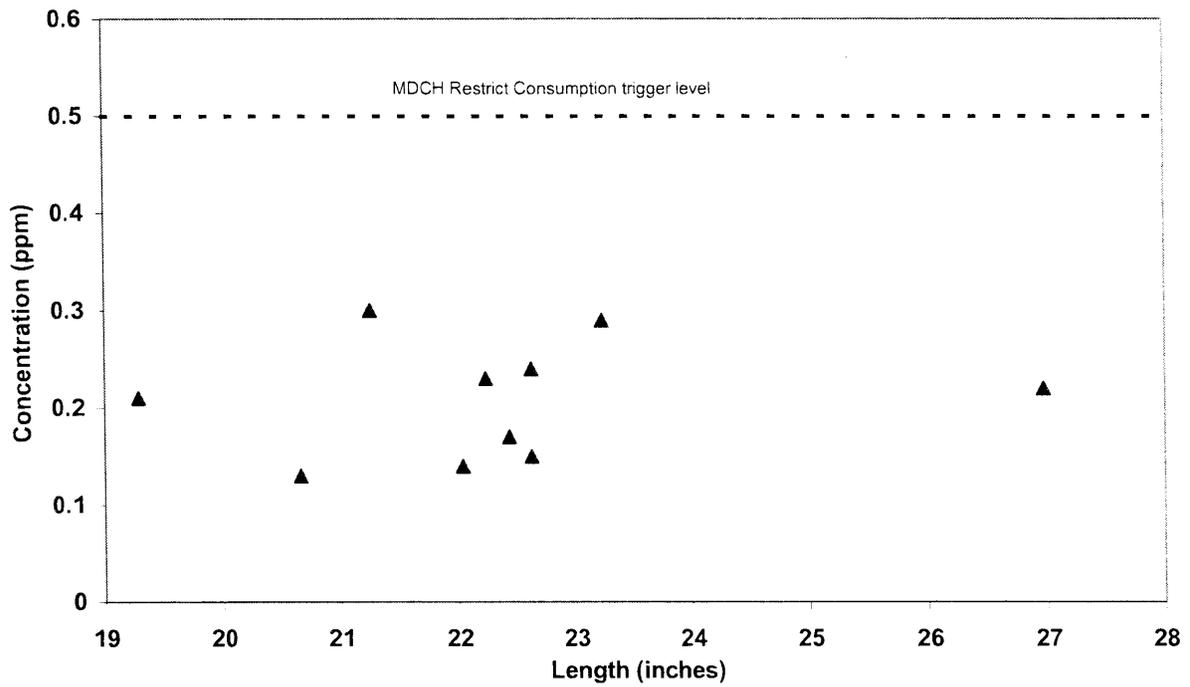


Figure 54. Total length versus mercury concentrations in northern pike collected from Frenchman Lake, Chippewa County in 2004 (ID 2004029).

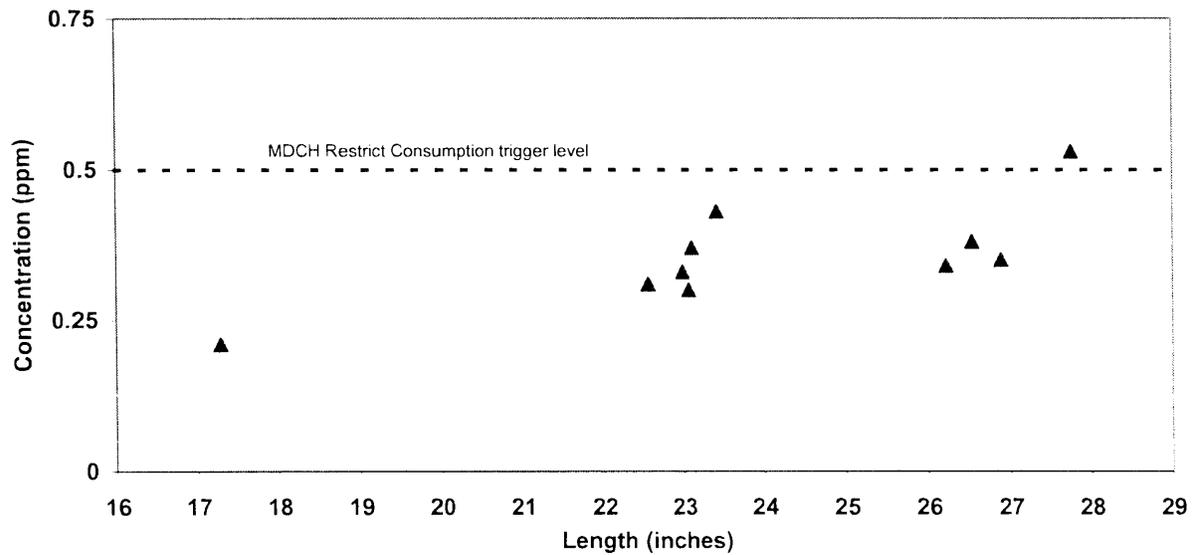


Figure 55. Total length versus mercury concentration in northern pike collected from Hardwood Lake, Ogemaw County in 2004 (ID 2004034).

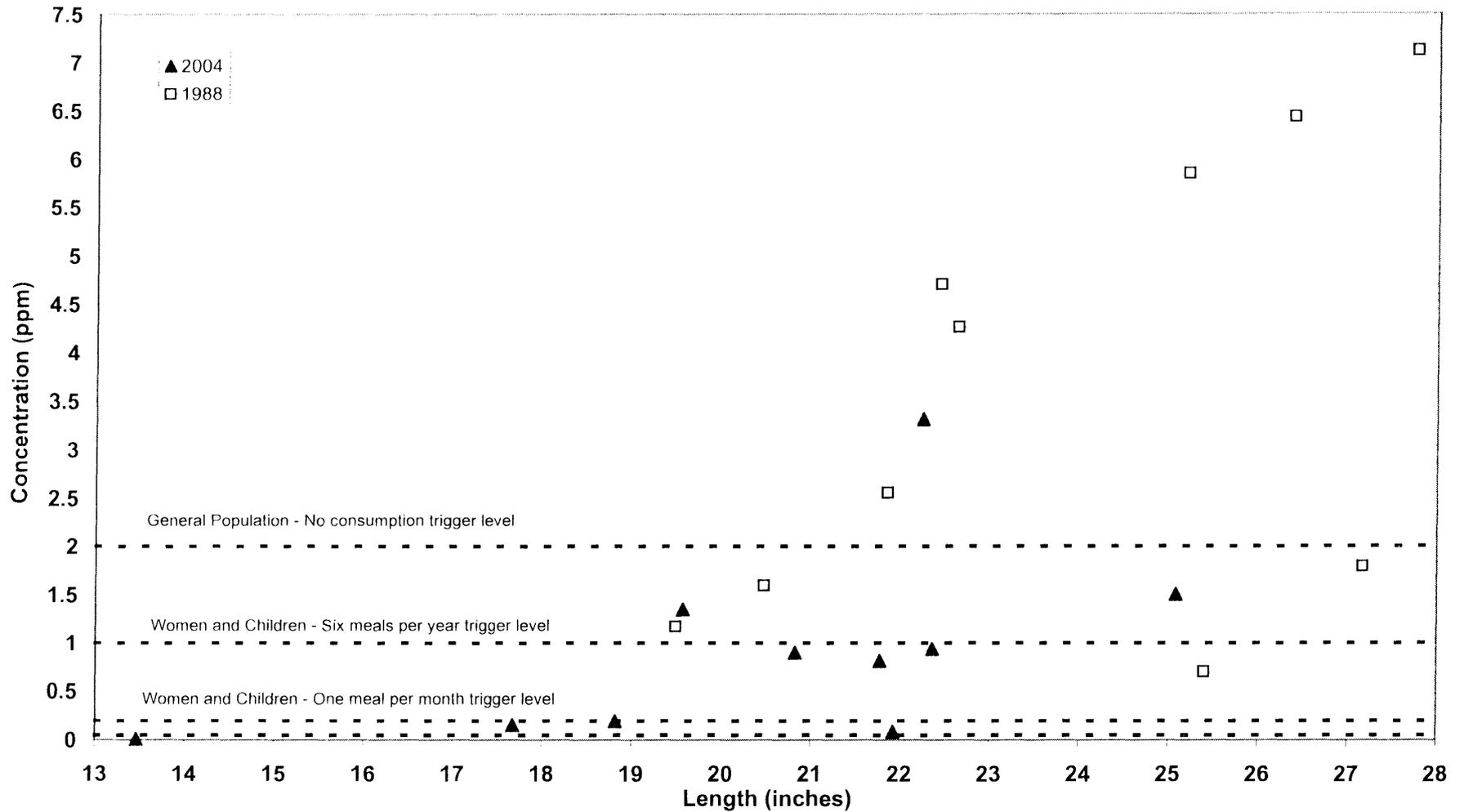


Figure 56. Total length versus total PCB concentration in carp collected from the Kawkawlin River, Bay County in 1988 (ID 88027) and 2004 (ID 2004039).

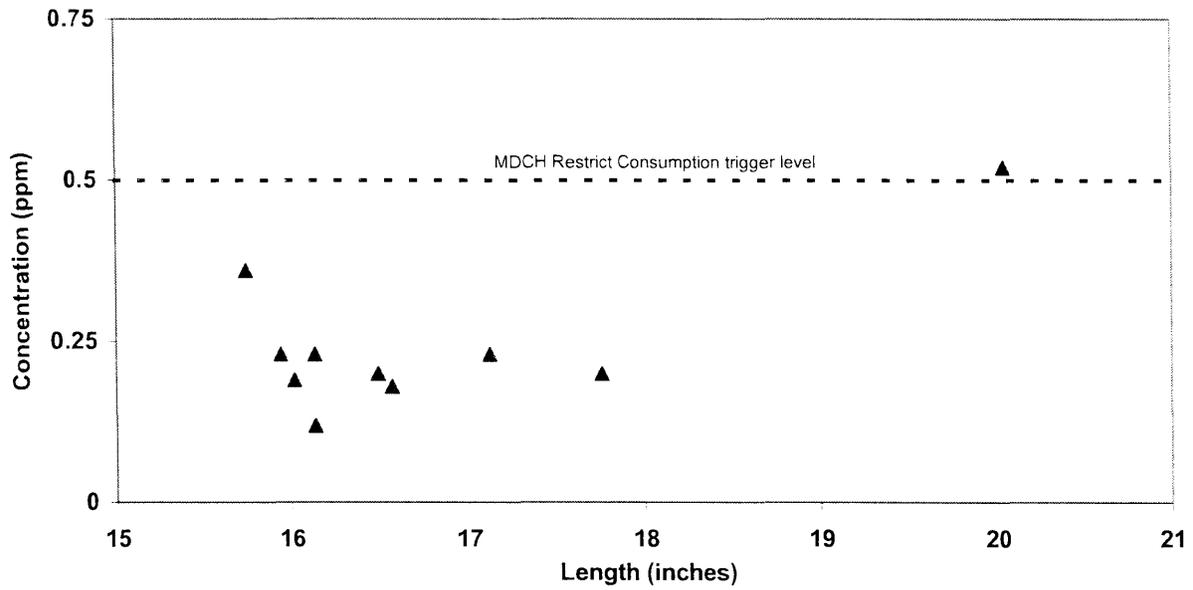


Figure 57. Total length versus mercury concentration in smallmouth bass collected from Long Lake, Presque Isle County in 2004 (ID 2004066).

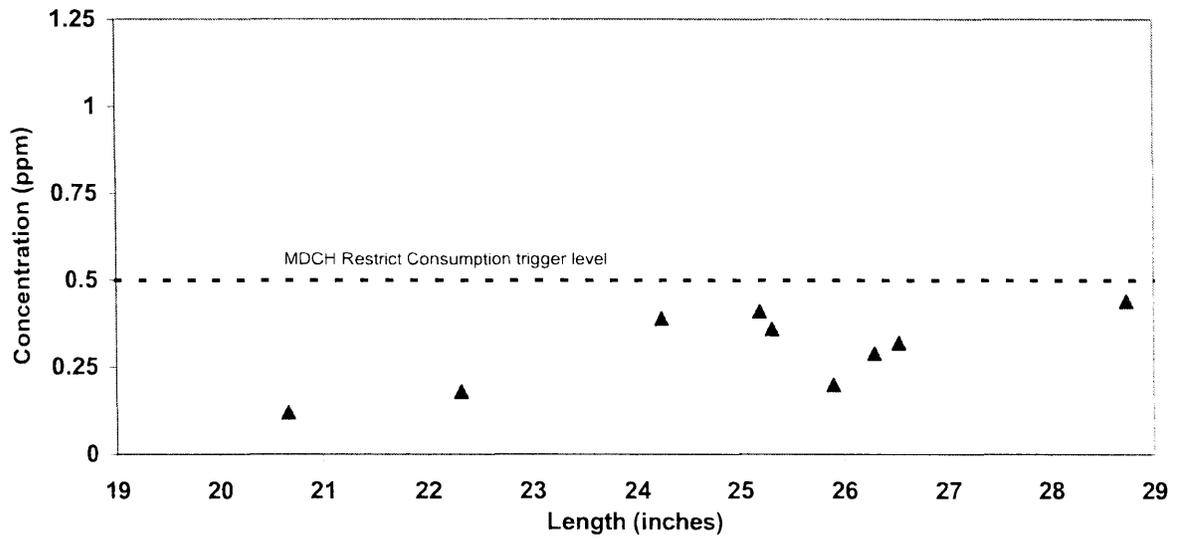


Figure 58. Total length versus mercury concentration in northern pike collected from Peach Lake, Ogemaw County in 2004 (ID 2004080).

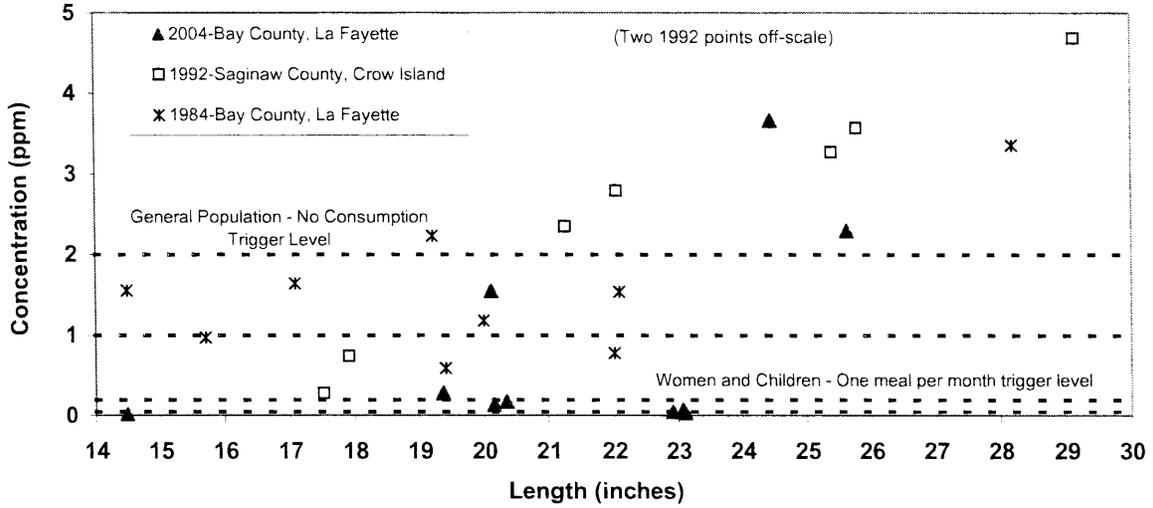


Figure 59. Total length versus total PCB concentration in carp collected from the Saginaw River in 1984 (ID 84013), 1993 (ID 93036), and 2004 (ID 2004113).

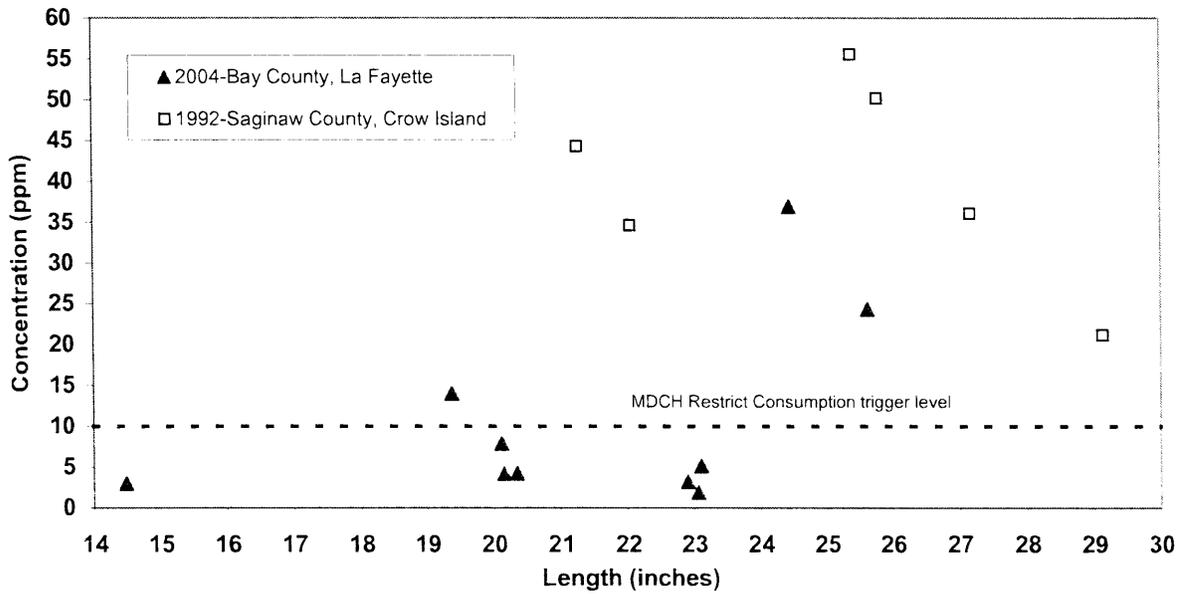


Figure 60. Total length versus dioxin TEQ concentration in carp collected from the Saginaw River in 1992 (ID 92036) and 2004 (ID 2004113).

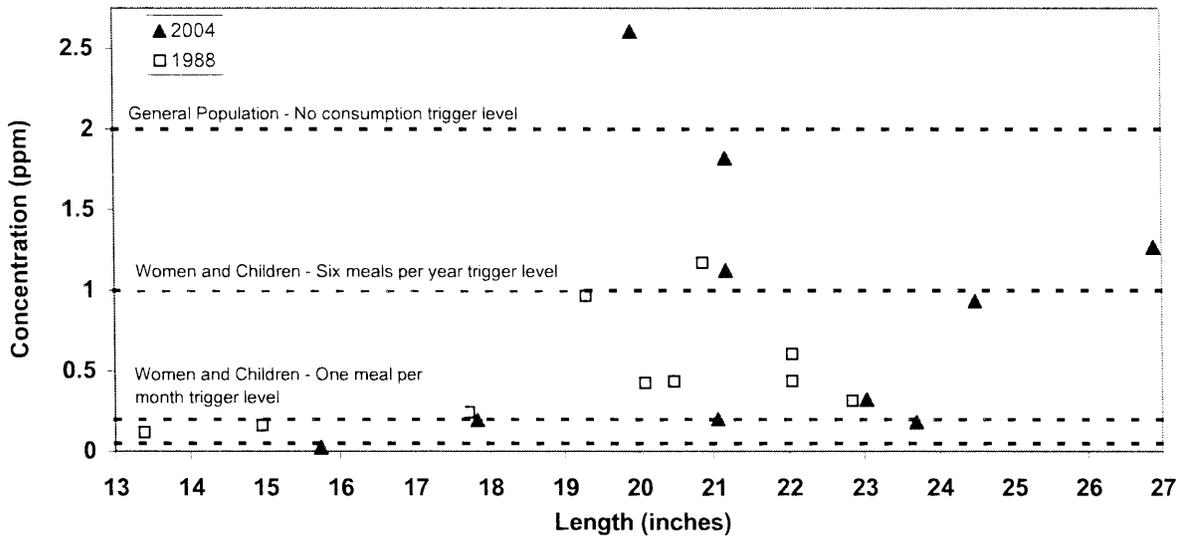


Figure 61. Total length versus total PCB concentration in carp collected from the Sebawaing River, Huron County in 1988 (ID 88037) and 2004 (ID 2004144).

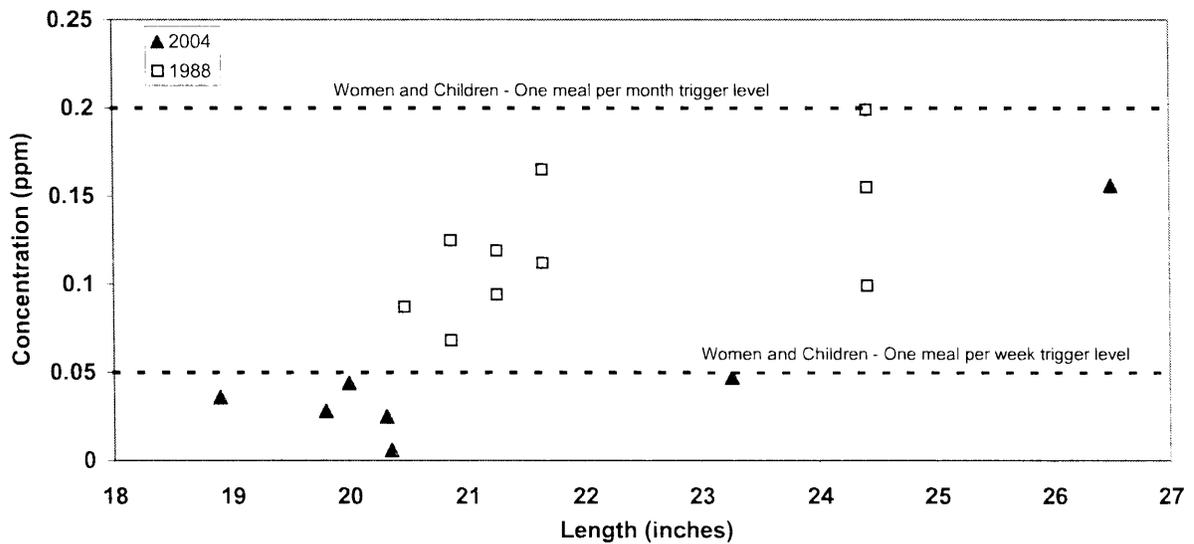


Figure 62. Total length versus total PCB concentration in northern pike collected from the Sebawaing River, Huron County in 1988 (ID 88037) and 2004 (ID 2004144).

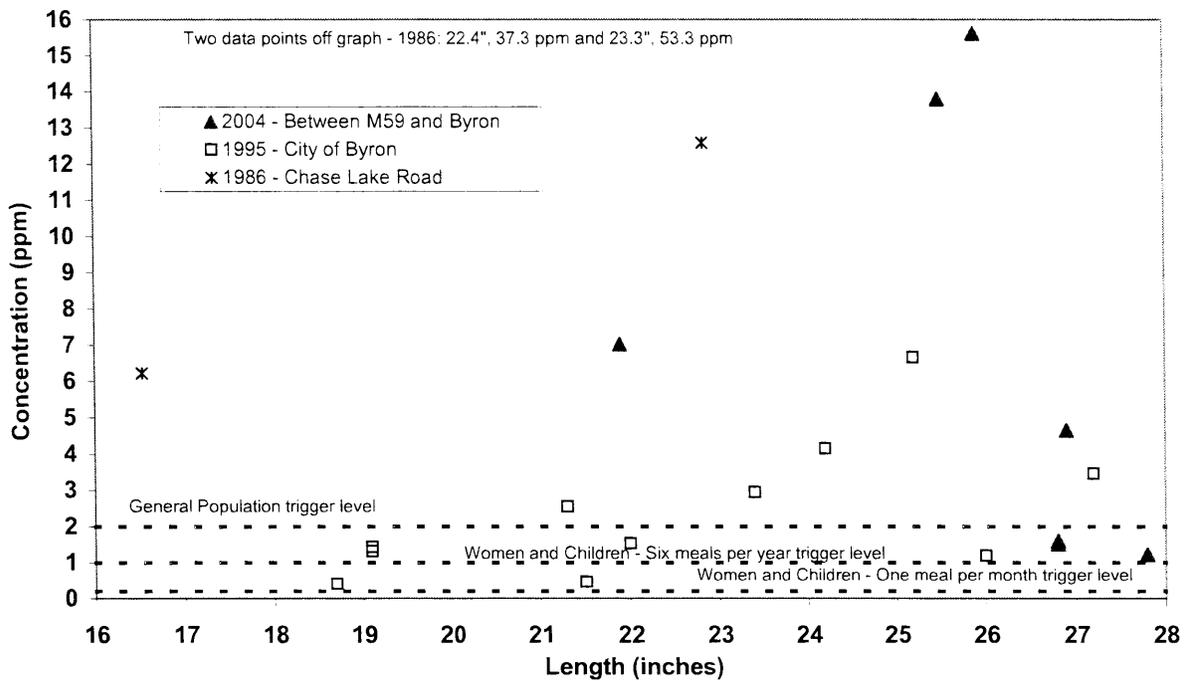


Figure 63. Total length versus total PCB concentration in carp collected from the Shiawassee River, South Branch in 1986 (ID 86036), 1995 (ID 95039), and 2004 (ID 2004101).

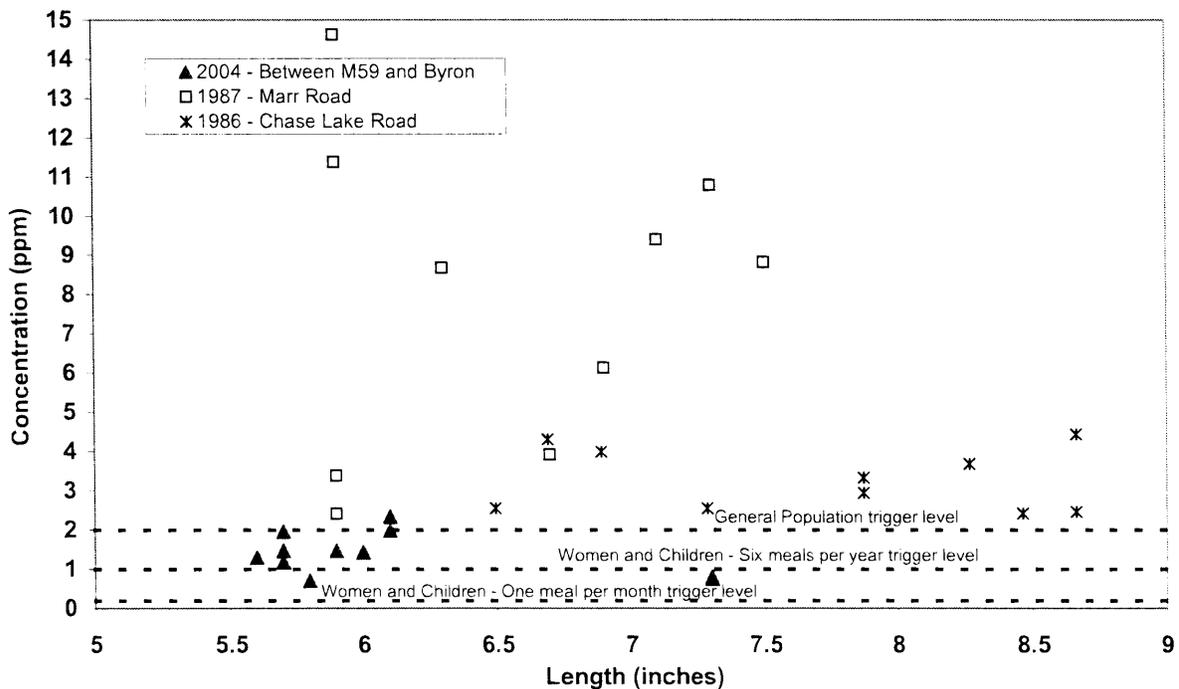


Figure 64. Total length versus total PCB concentration in rock bass collected from the Shiawassee River, South Branch in 1986 (ID 86036), 1987 (ID 87065), and 2004 (ID 2004101).

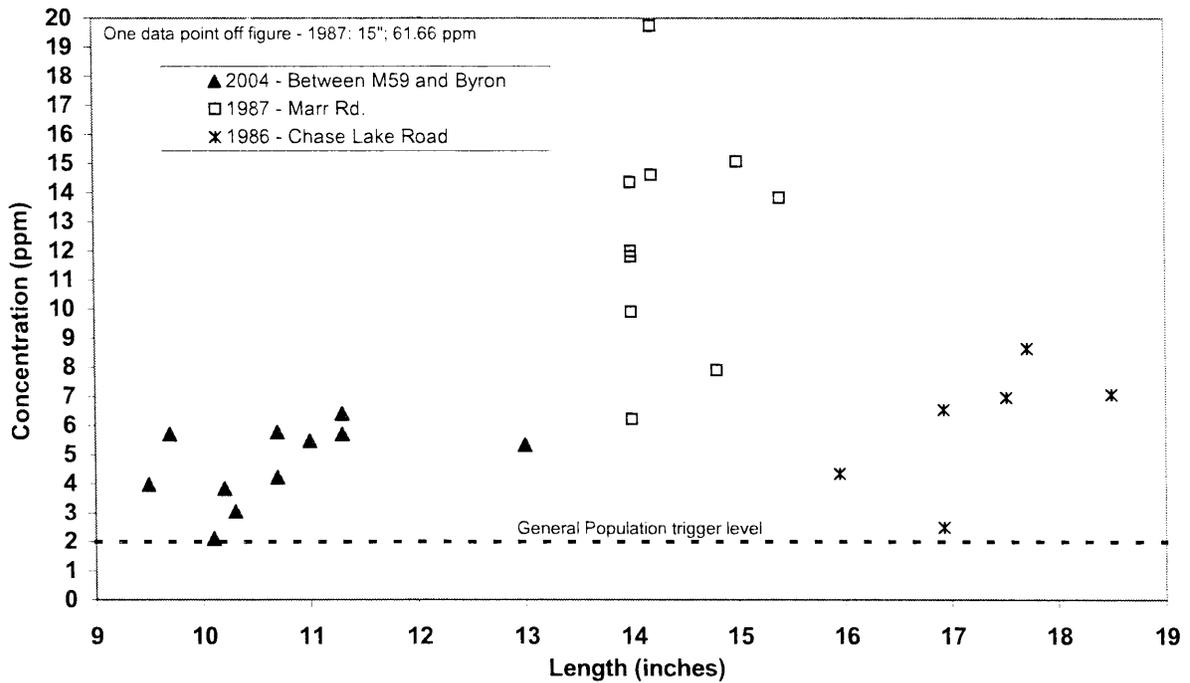


Figure 65. Total length versus total PCB concentration in white sucker collected from the Shiawassee River, South Branch in 1986 (ID 86036), 1987 (ID 87065), and 2004 (ID 2004101).

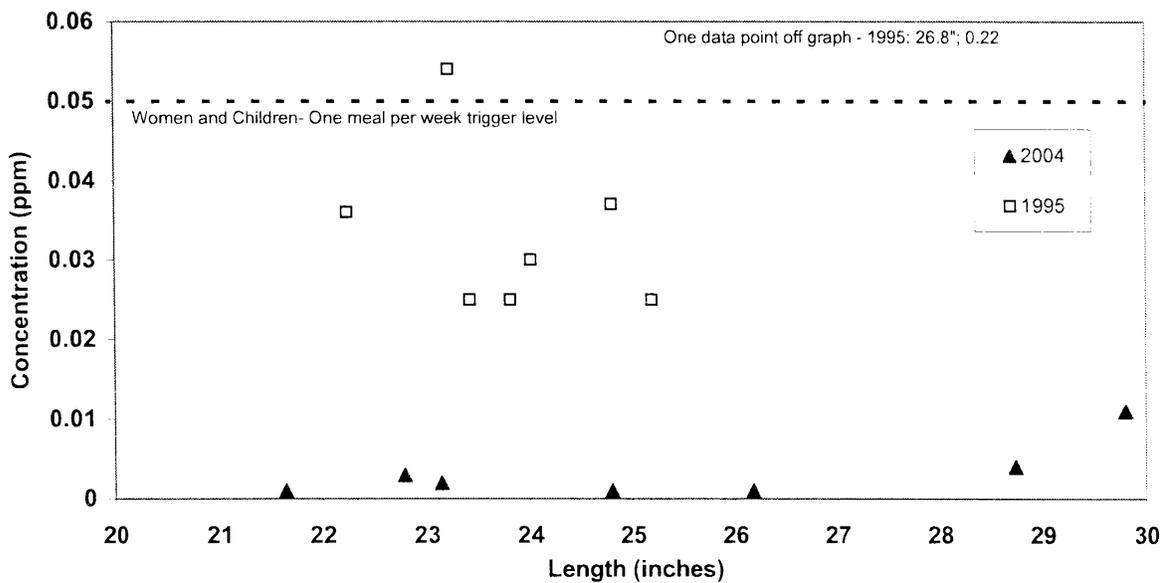


Figure 66. Total length versus total PCB concentration in northern pike collected from the St. Mary's River, Chippewa County in 1995 (ID 95046), and 2004 (ID 2004120 & 2004149).

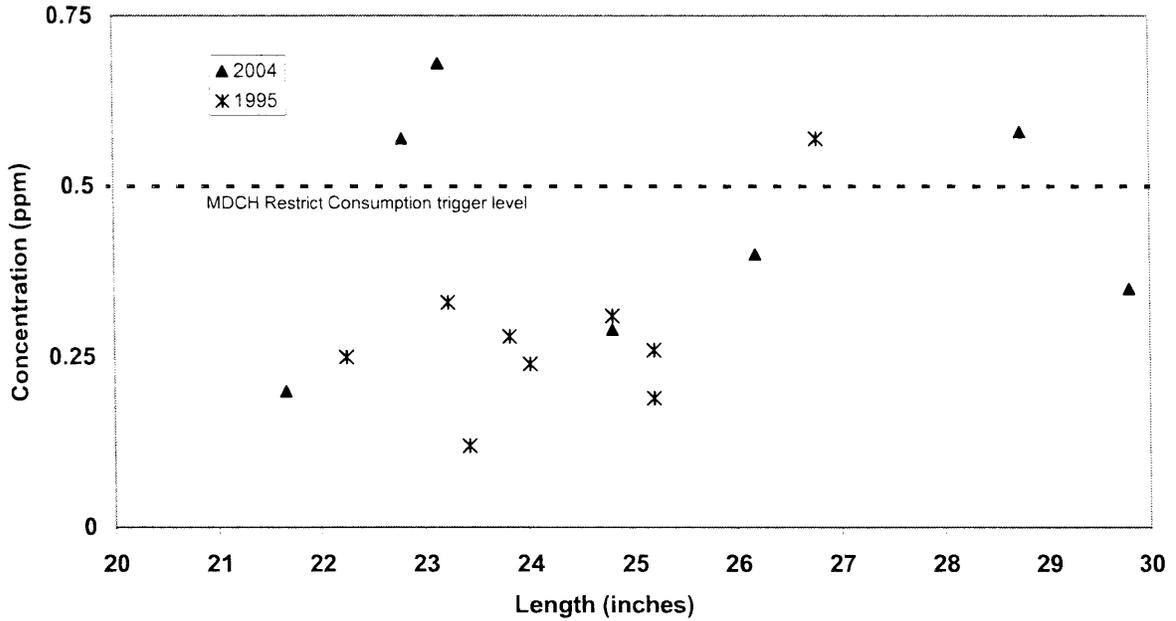


Figure 67. Total length versus mercury concentration in northern pike collected from the St. Mary's River, Chippewa County in 1995 (ID 95046), and 2004 (ID 2004120 & 2004149).

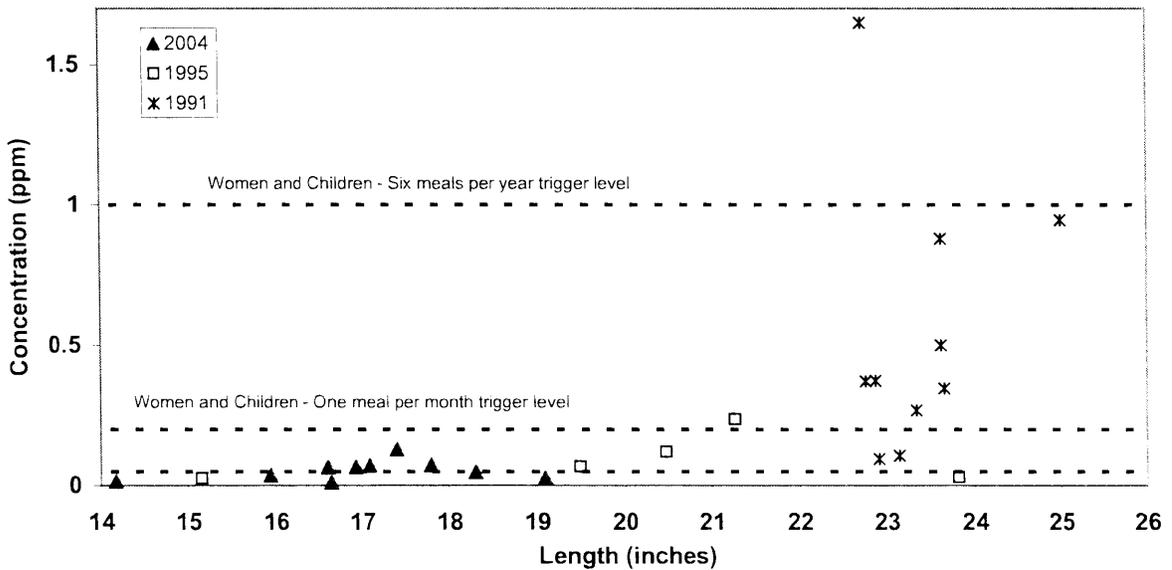


Figure 68. Total length versus total PCB concentration in walleye collected from the St. Mary's River, Chippewa County in 1991 (ID 91021), 1995 (ID 95046), and 2004 (ID 2004120 & 2004149).

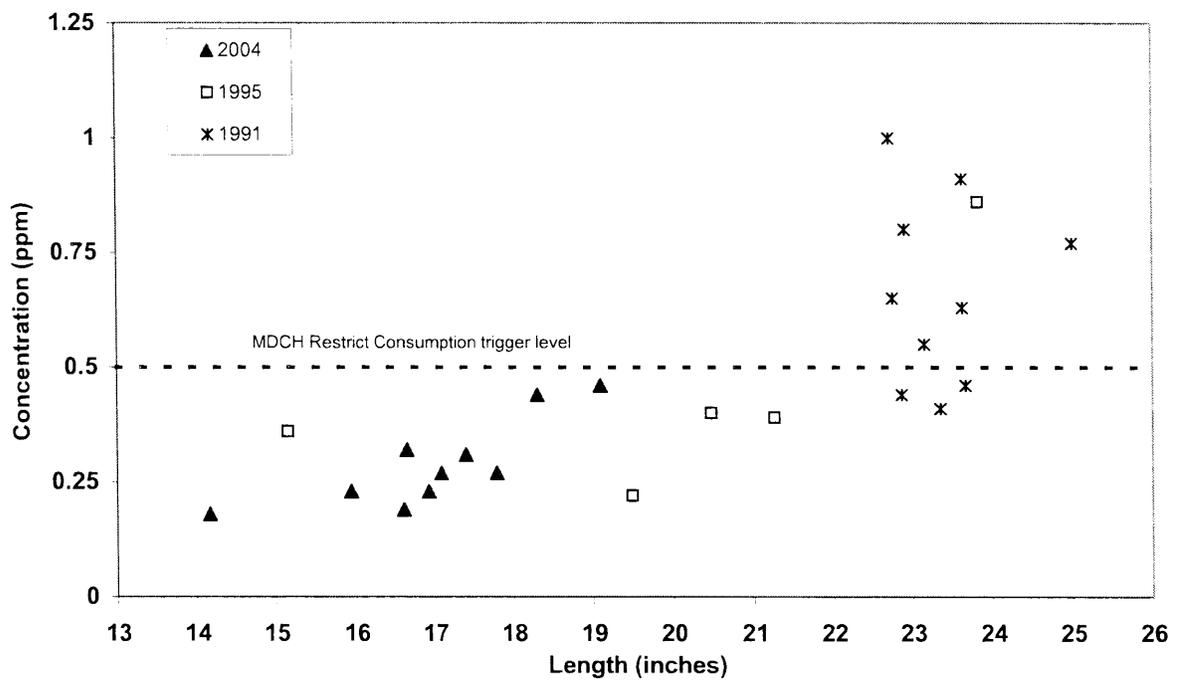


Figure 69. Total length versus mercury concentration in walleye collected from the St. Mary's River, Chippewa County in 1991 (ID 91021), 1995 (ID 95046), and 2004 (ID 2004120 & 2004149).

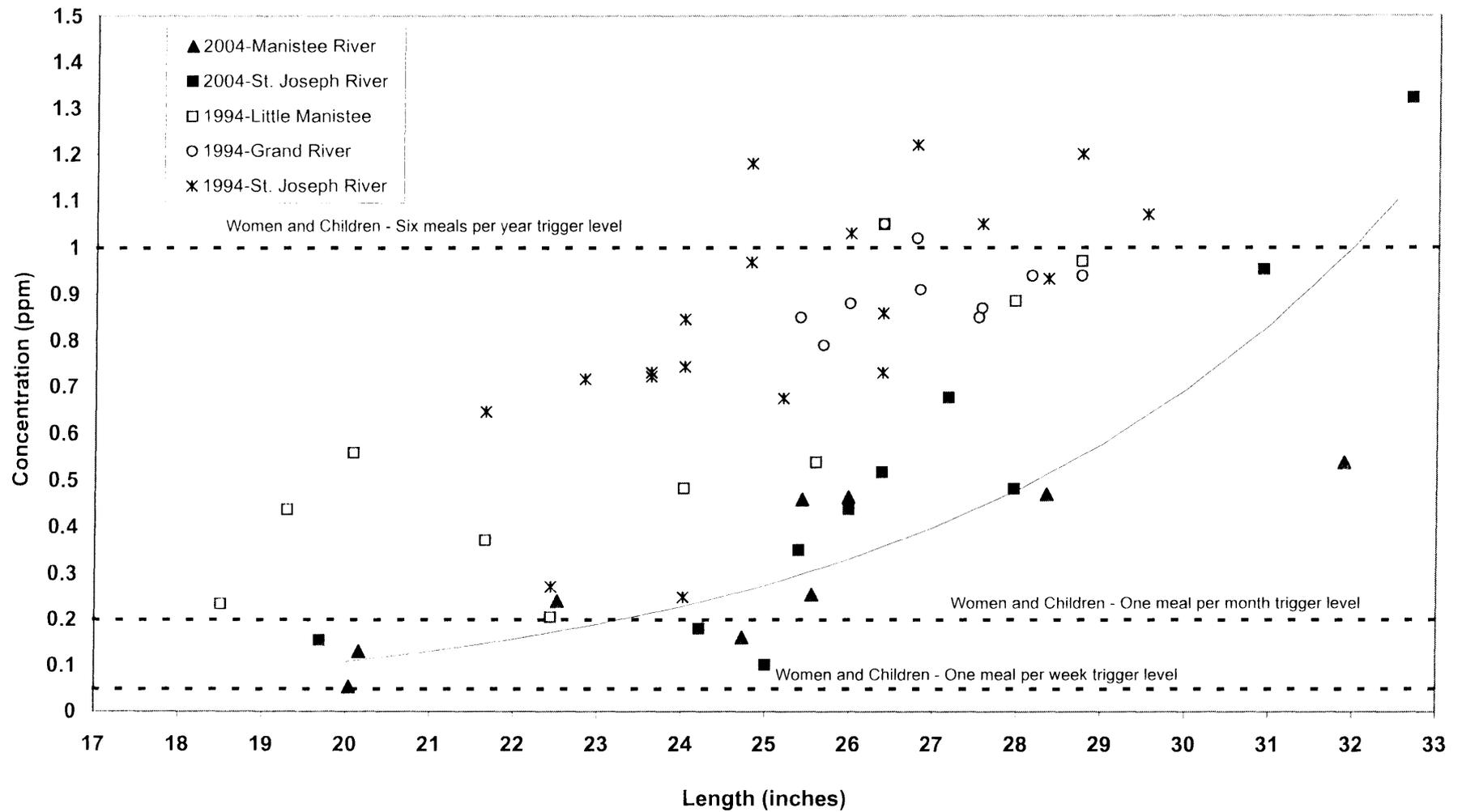


Figure 70. Total length versus total PCB concentration in rainbow trout collected from Lake Michigan south of Frankfort in 1994 (ID 94044, 94048, & 94059), and 2004 (ID 2004055 & 2004060).

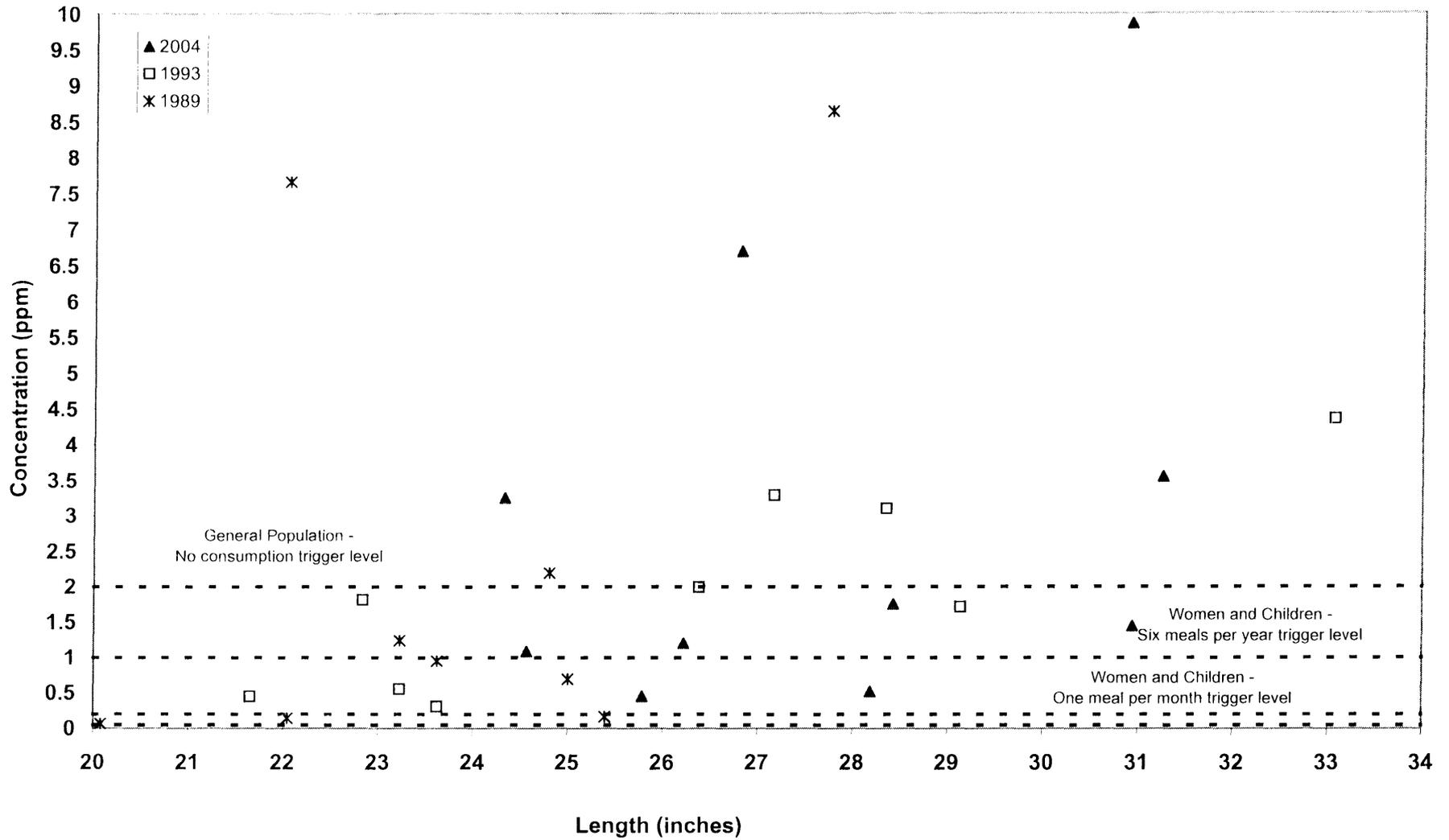


Figure 71. Total length versus total PCB concentration in carp collected from Lake Michigan, Little Bay De Noc in 1989 (ID 89032), 1993 (ID 93079), and 2004 (ID 2004150).

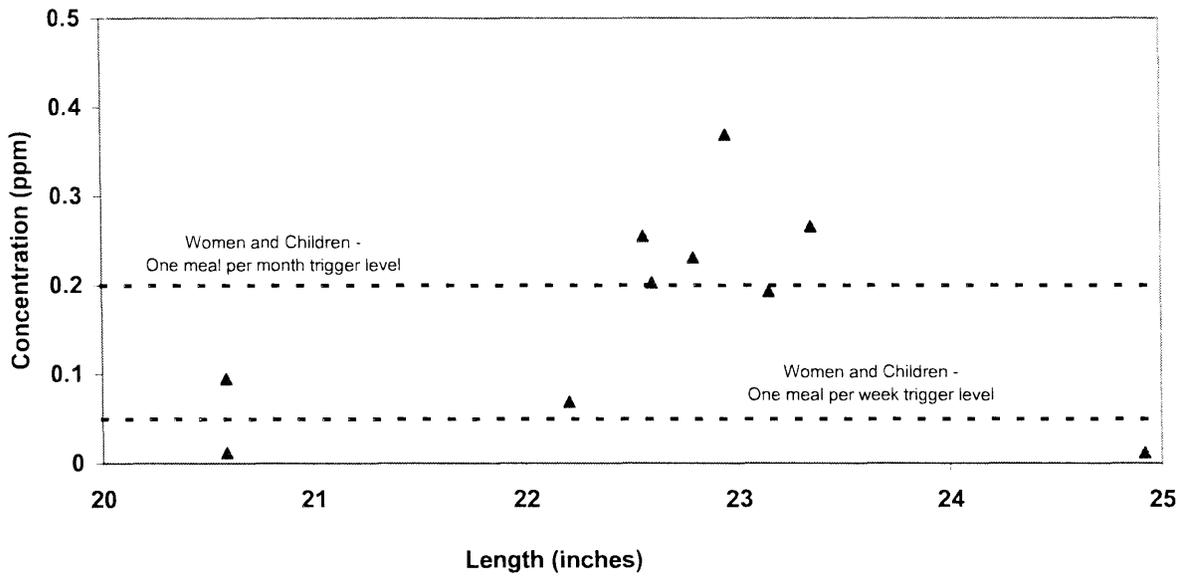


Figure 72. Total length versus total PCB concentration in redhorse sucker collected from Lake Michigan, Little Bay De Noc in 2004 (ID 2004150).

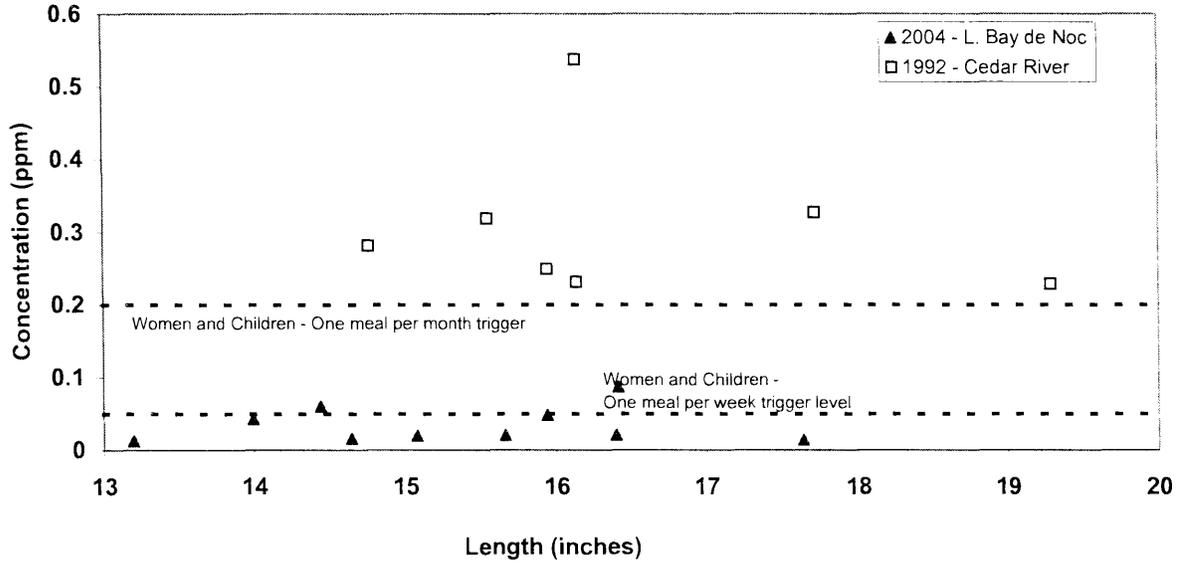


Figure 73. Total length versus total PCB concentration in smallmouth bass collected from Lake Michigan, Little Bay De Noc in 2004 (ID 2004150), and Green Bay at Cedar River in 1992 (ID 92022).

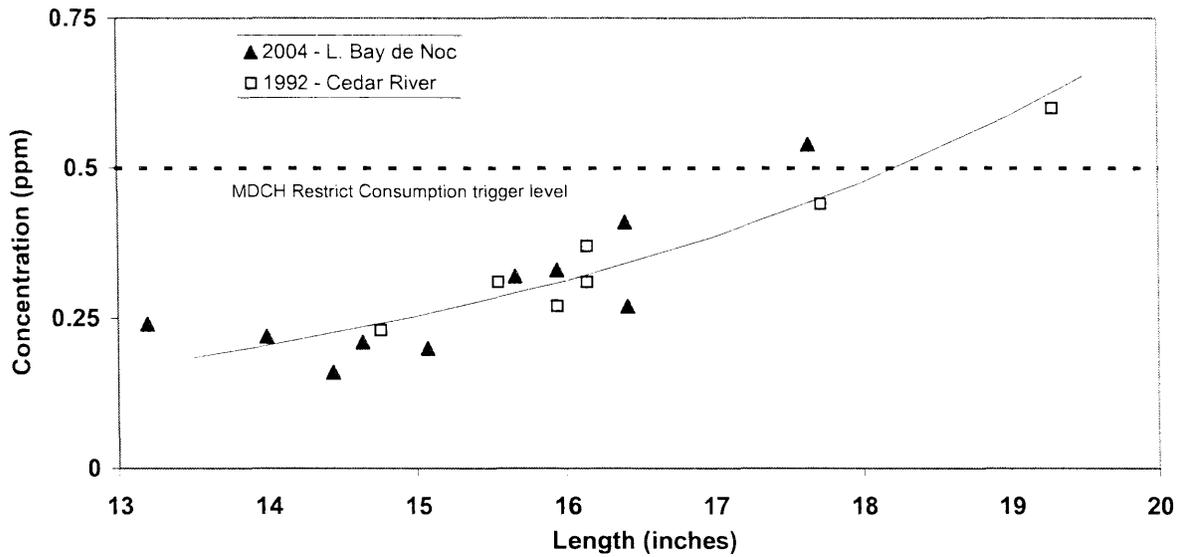
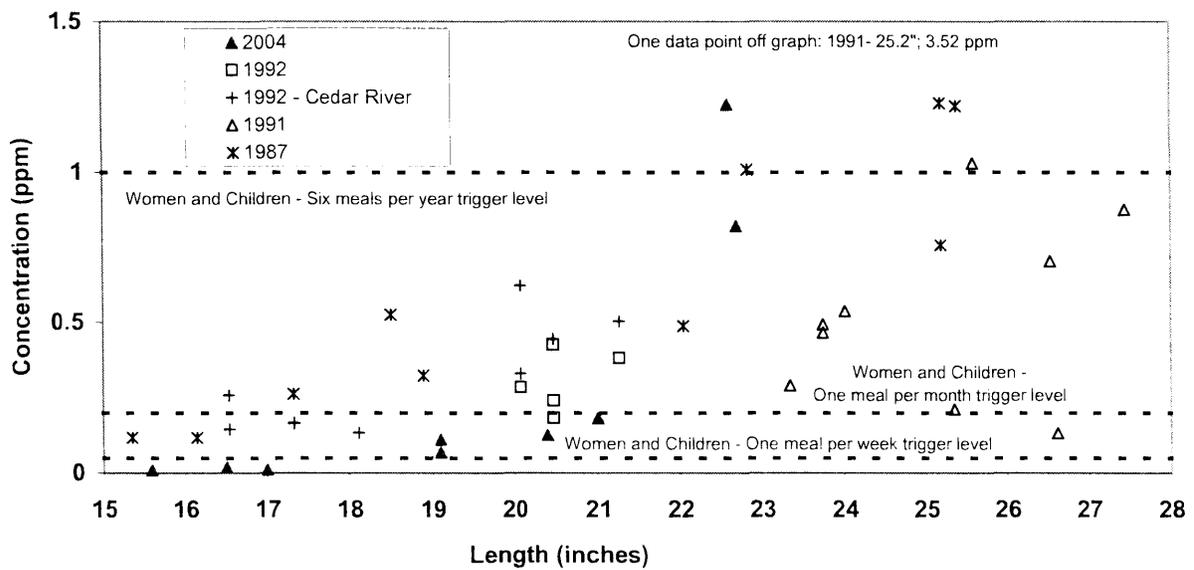


Figure 74. Total length versus mercury concentration in smallmouth bass collected from Lake Michigan, Little Bay De Noc in 2004 (ID 2004150) and Green Bay at Cedar River in 1992 (ID 92022).



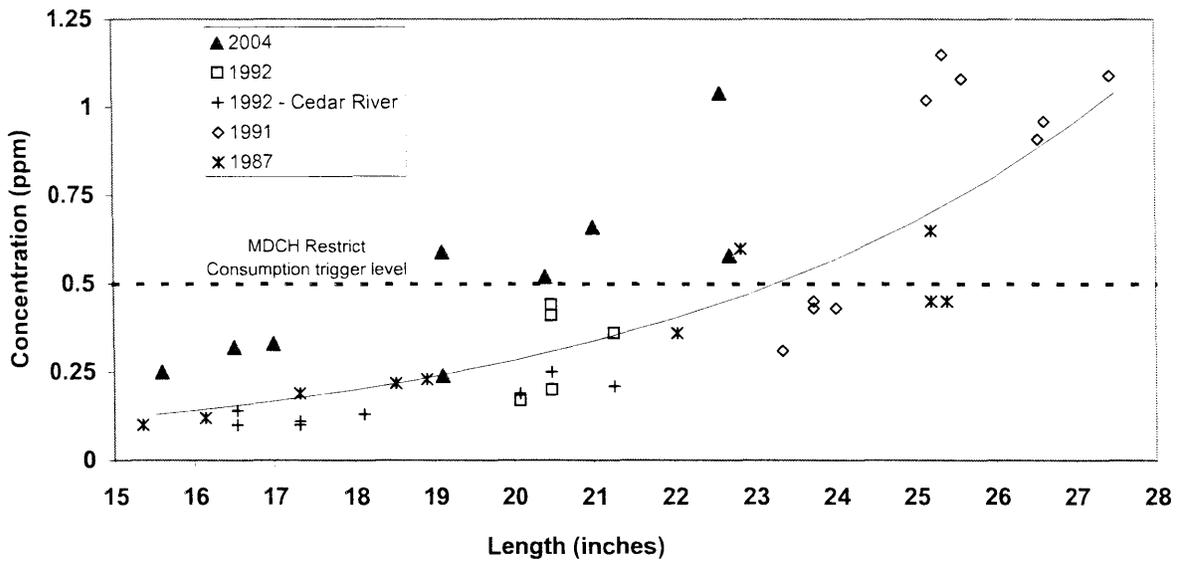


Figure 76. Total length versus mercury concentration in walleye collected from Lake Michigan, Little Bay De Noc in 1987 (ID 87004), 1991 (ID 91022), 1992 (ID 92049), 2004 (ID 2004150), and Green Bay at Cedar River in 1992 (ID 92022).

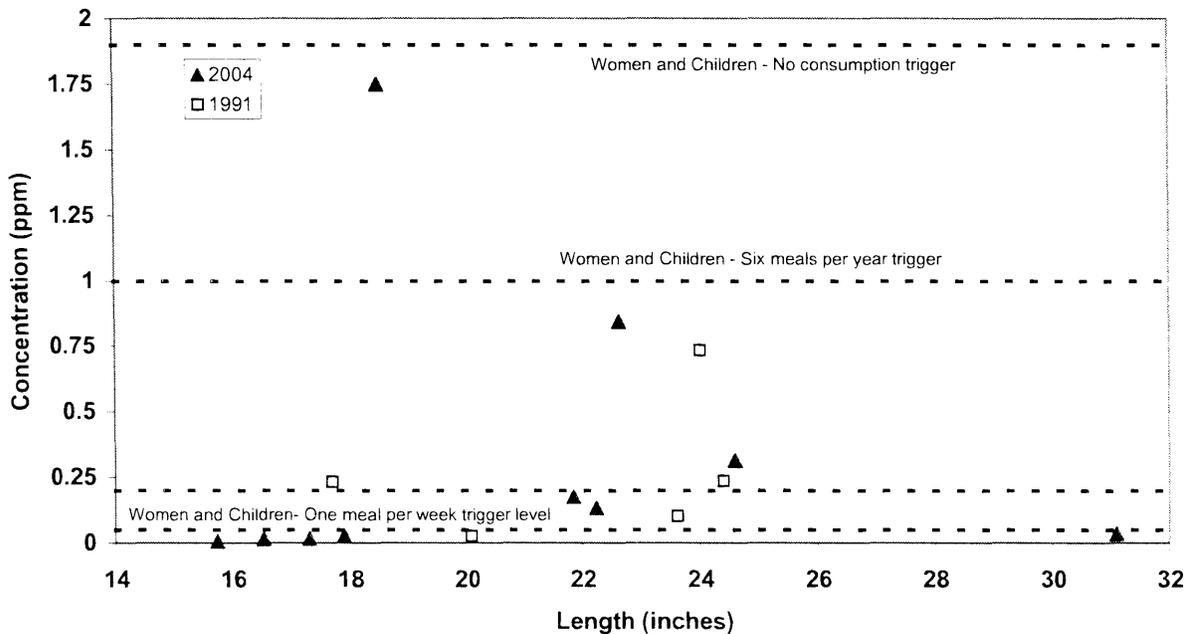


Figure 77. Total length versus total PCB concentration in carp collected from Battle Creek at Division St., Calhoun County in 1991 (ID 91004) and 2004 (ID 2004004).

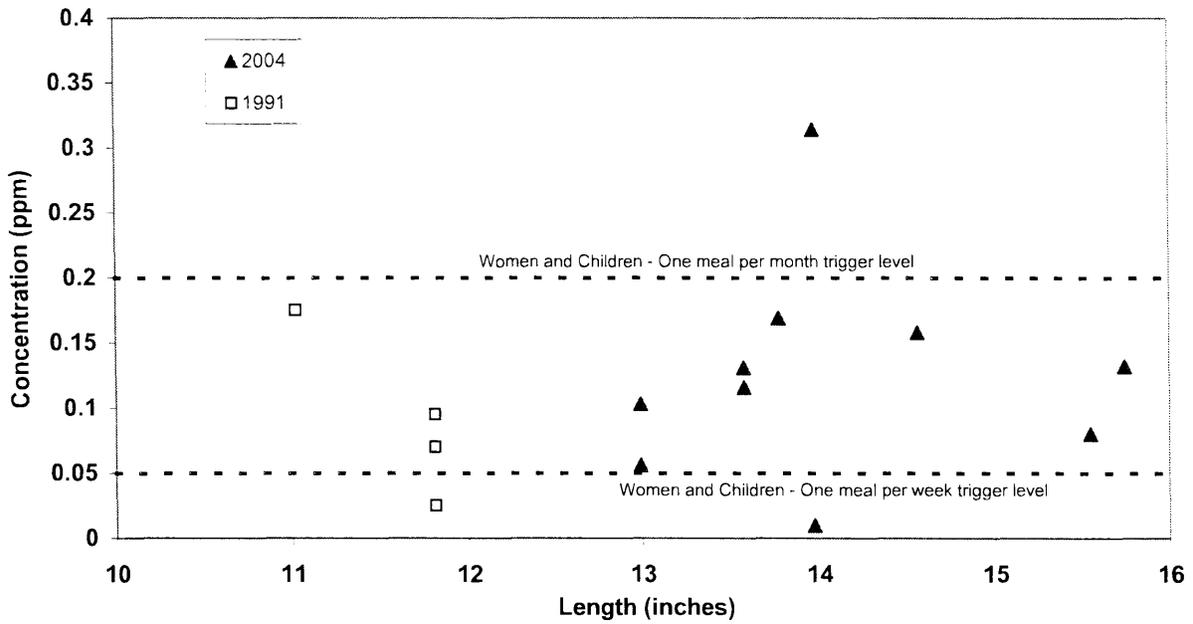


Figure 78. Total length versus total PCB concentration in smallmouth bass collected Battle Creek at Division St., Calhoun County in 1991 (ID 91004) and 2004 (ID 2004004).

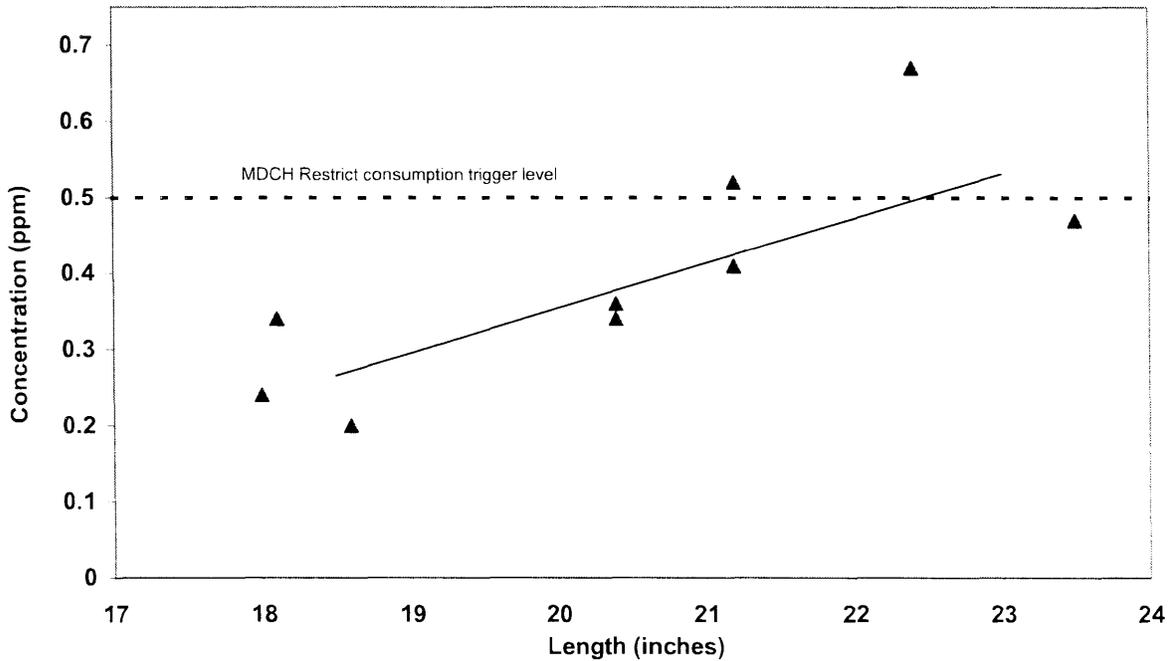


Figure 79. Total length versus mercury concentration in walleye collected from Boot Lake, Schoolcraft County in 2004 (ID 2004007).

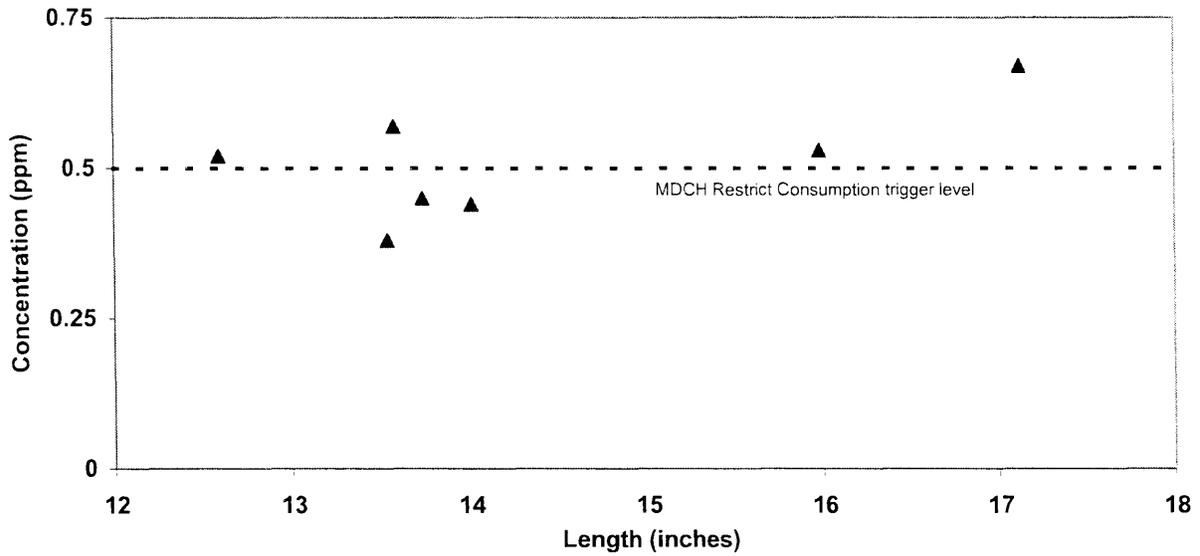


Figure 80. Total length versus mercury concentration in largemouth bass collected from Clifford Lake, Montcalm County in 2004 (ID 2004014).

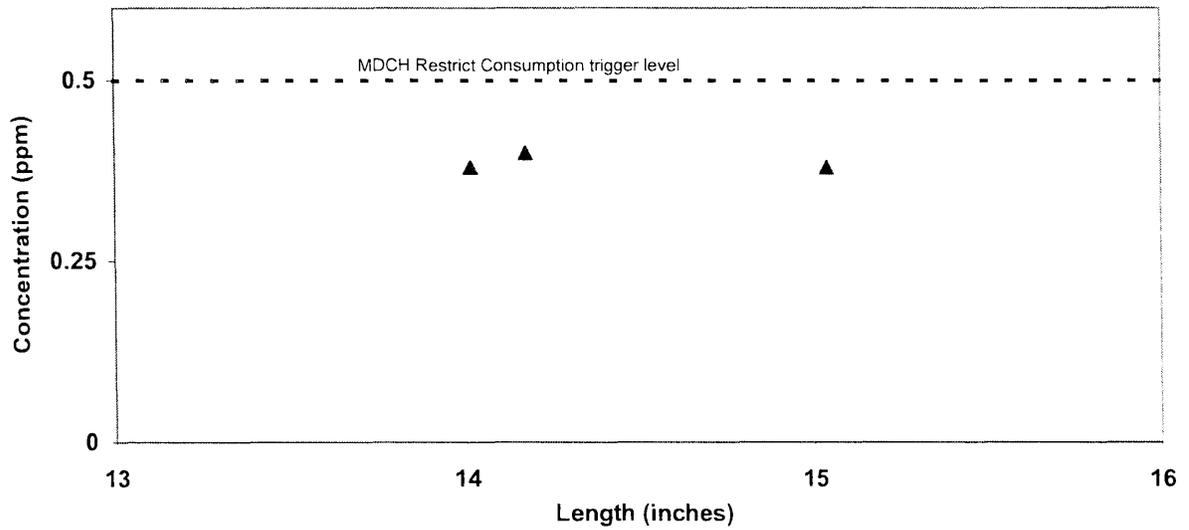


Figure 81. Total length versus mercury concentration in largemouth bass collected from Emerald Lake, Newaygo County in 2004 (ID 2004026).

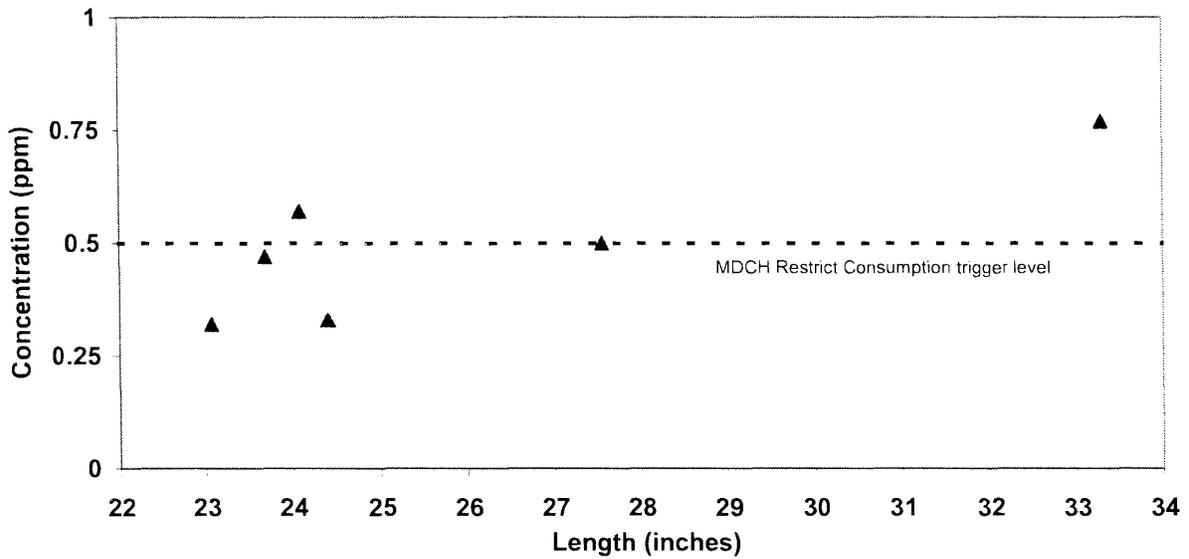


Figure 82. Total length versus mercury concentration in northern pike collected from Emerald Lake, Newaygo County in 2004 (ID 2004026).

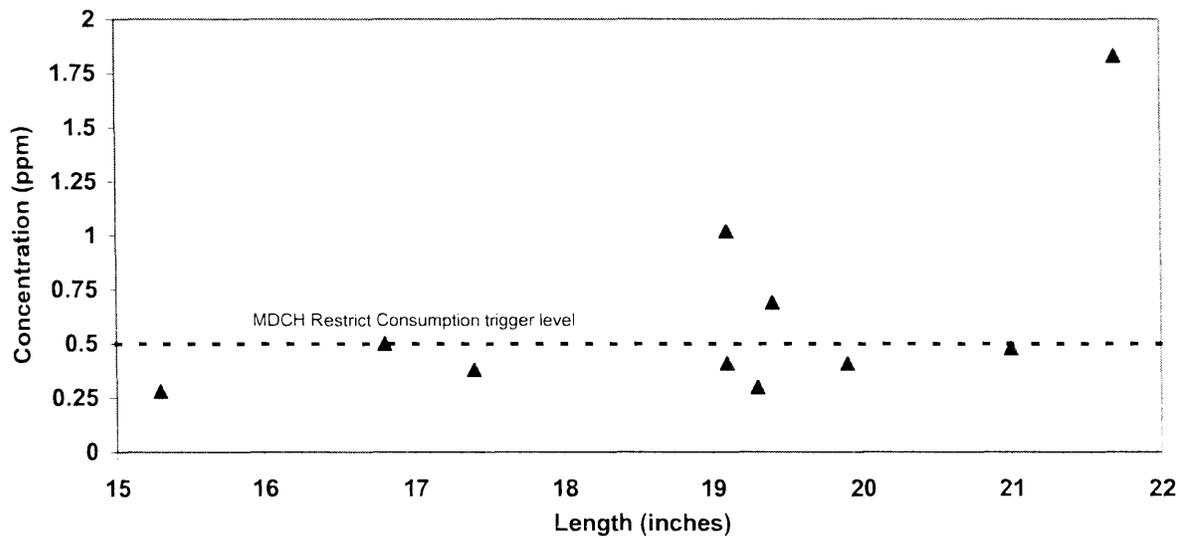


Figure 83. Total length versus mercury concentration in walleye collected from the Cataract Basin, Escanaba River in 2004 (ID 2004028).

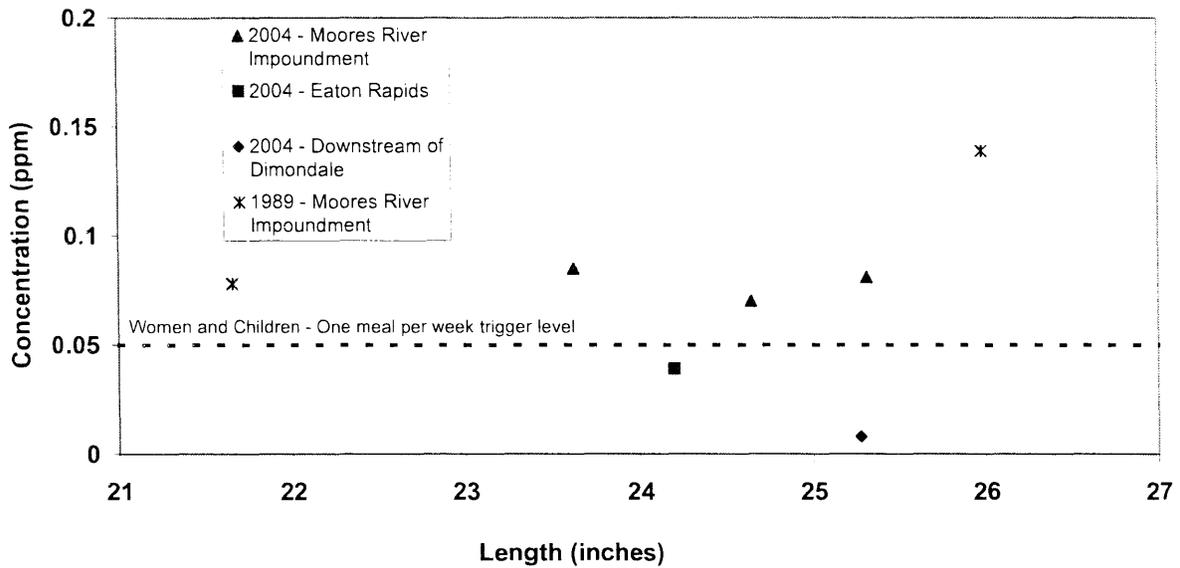


Figure 84. Total length versus total PCB concentration in northern pike collected from Grand River in 1989 (ID 89054) and 2004 (ID 2004146, 2004147, & 2004148).

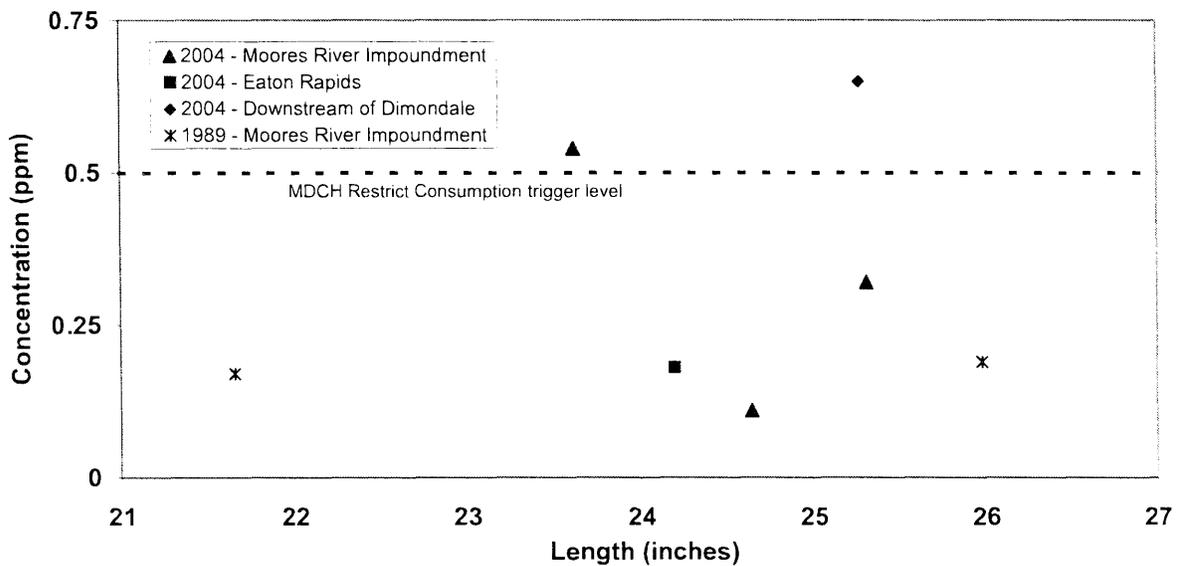


Figure 85. Total length versus mercury concentration in northern pike collected from Grand River in 1989 (ID 89054) and 2004 (ID 2004146, 2004147, & 2004148).

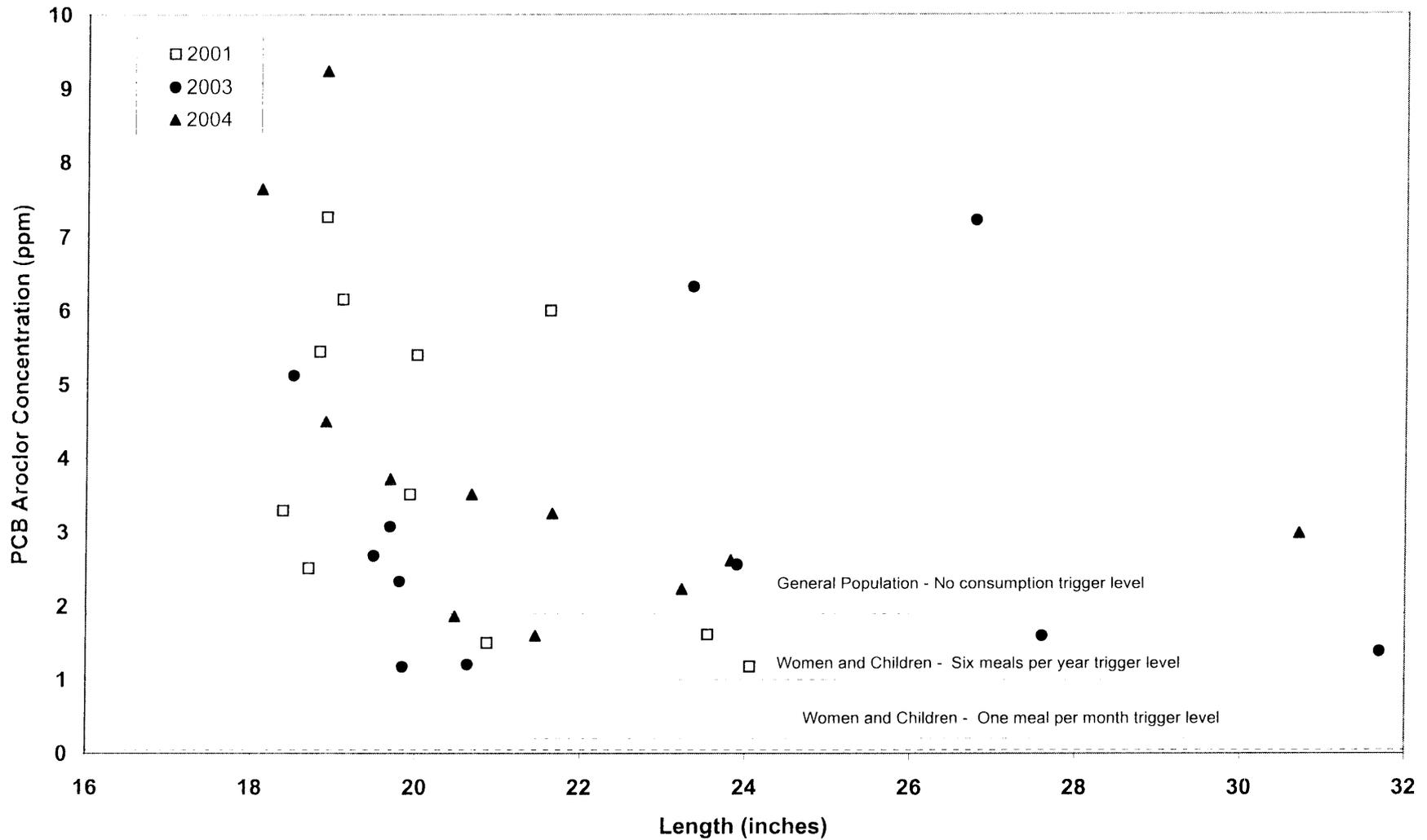


Figure 86. Total length versus total PCB concentration in carp collected from the Kalamazoo River in the Trowbridge Dam Impoundment in 2001 (ID 2001051), 2003 (ID 2003142), and 2004 (ID 2004143).

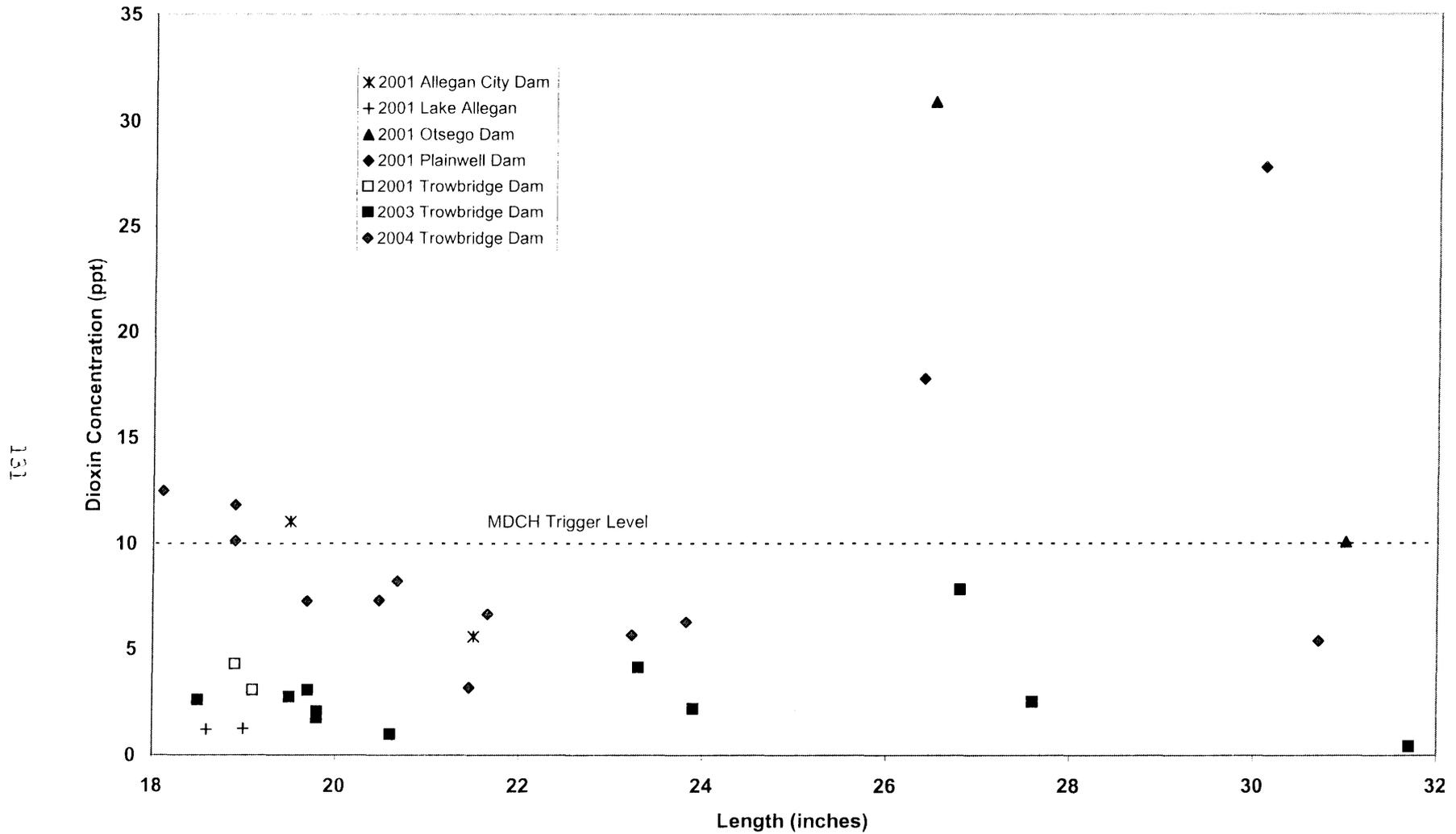


Figure 87. Total length versus dioxin TEQ concentration in carp collected from the Kalamazoo River between Morrow Dam and Lake Allegan in 2001, 2003, and 2004.

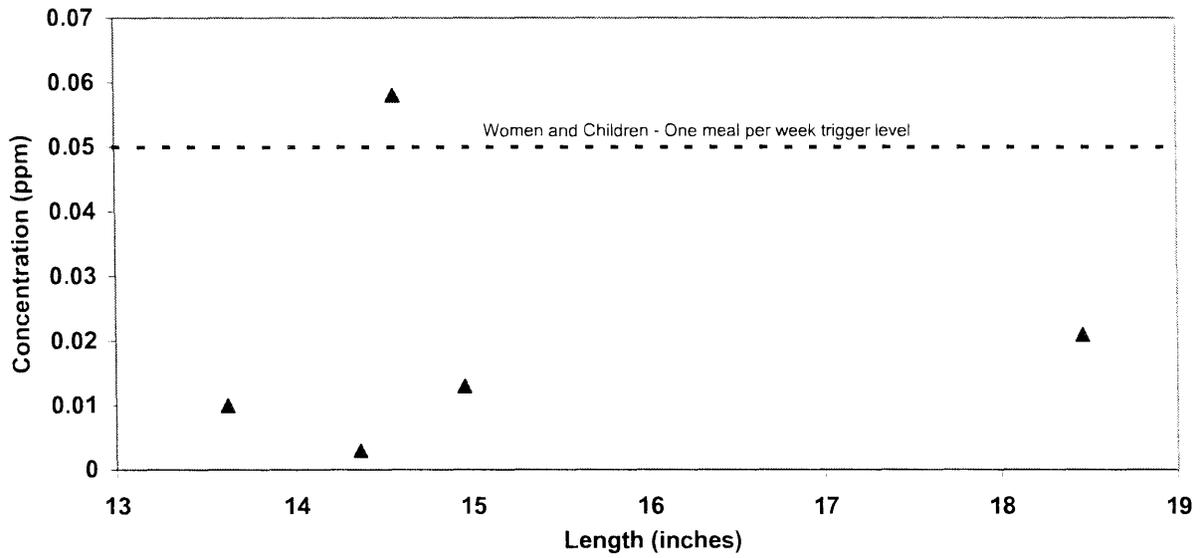


Figure 88. Total length versus total PCB concentration in smallmouth bass collected from Lake Cadillac, Wexford County in 2004 (ID 2004041).

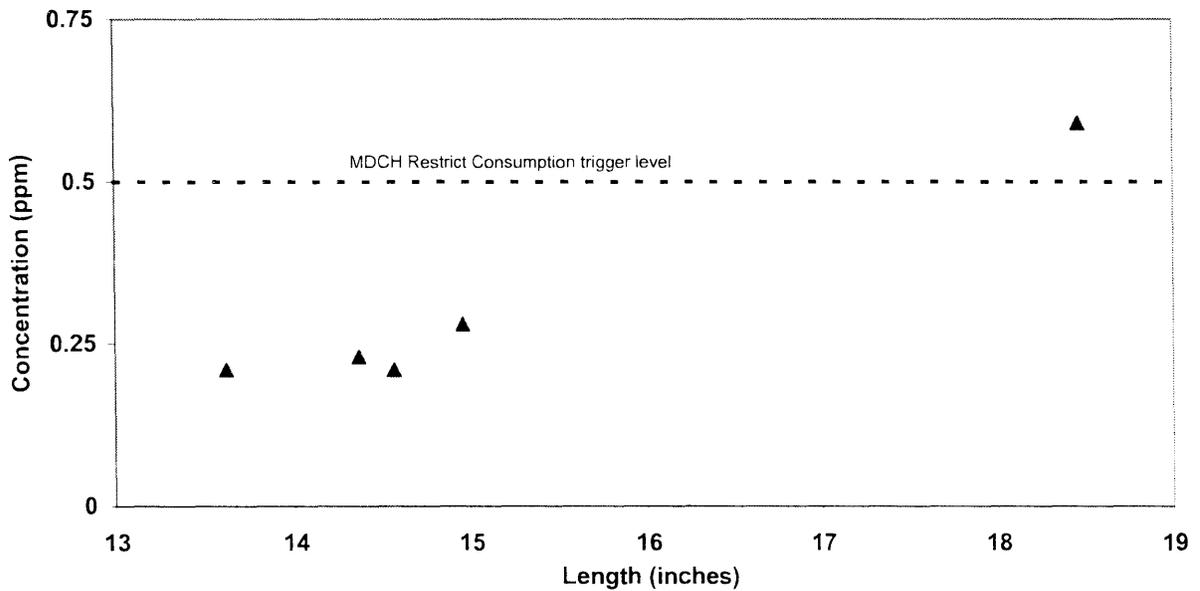


Figure 89. Total length versus mercury concentration in smallmouth bass collected from Lake Cadillac, Wexford County in 2004 (ID 2004041).

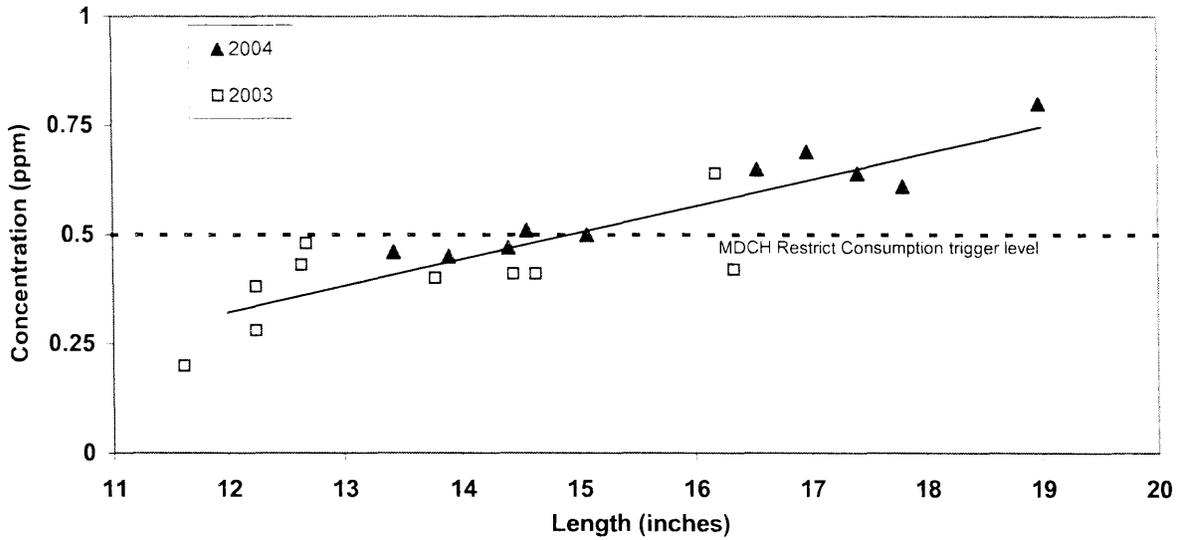


Figure 90. Total length versus mercury concentration in largemouth bass collected from Montcalm Lake, Montcalm County in 2003 and 2004 (ID 2003065 & 2004062).

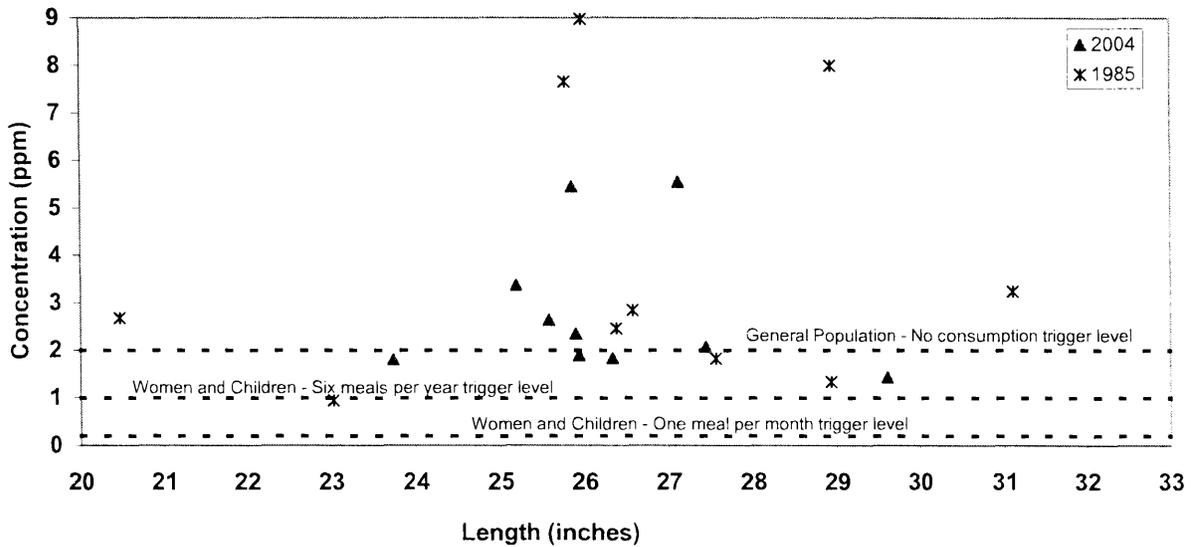


Figure 91. Total length versus total PCB concentration in carp collected from Manistique River, downstream of Manistique Papers dam in 1985 (ID 85008) and in 2004 (ID 2004072).

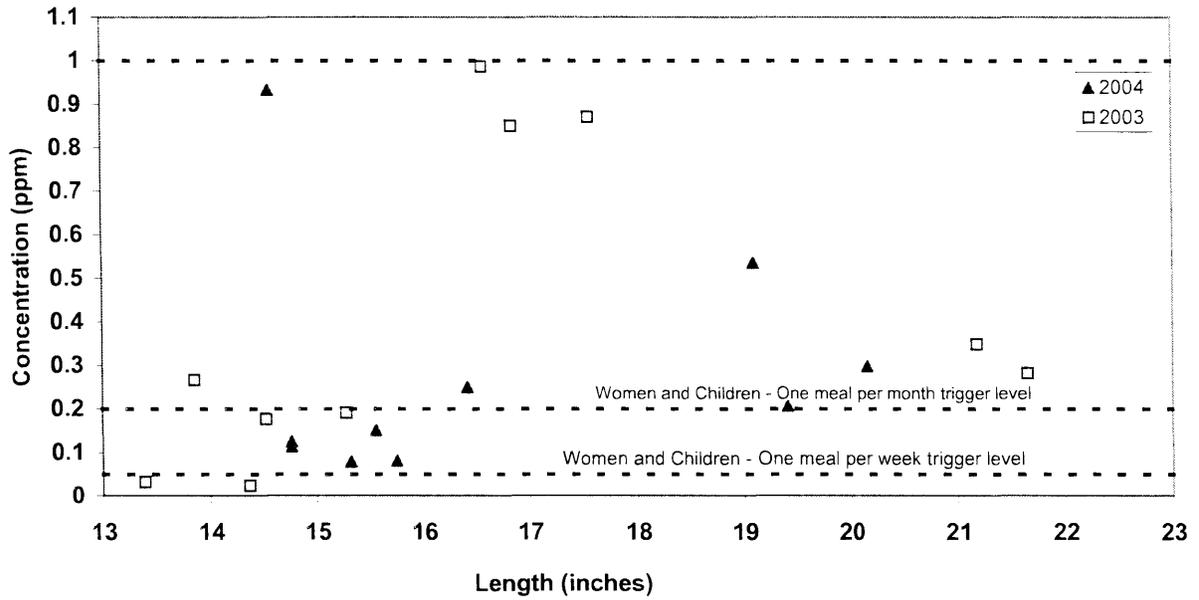


Figure 92. Total length versus total PCB concentration in redhorse sucker collected from Manistique River, downstream of Manistique Papers dam in 2003 (ID 2003077) and 2004 (ID 2004072).

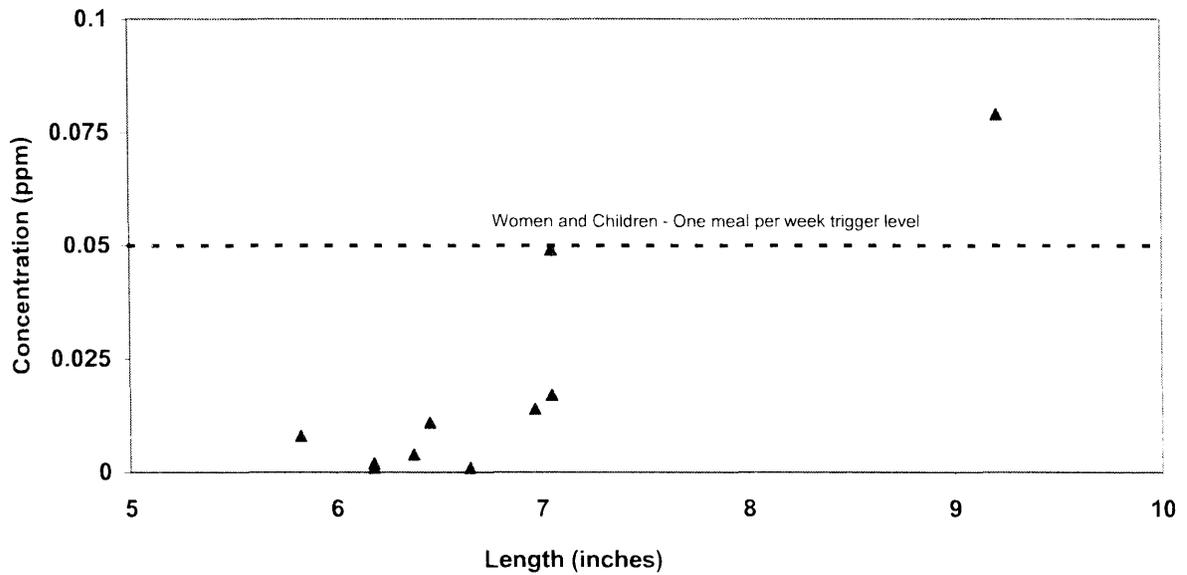


Figure 93. Total length versus total PCB concentration in rock bass collected from Manistique River, downstream of Manistique Papers dam in 2004 (ID 2004072).

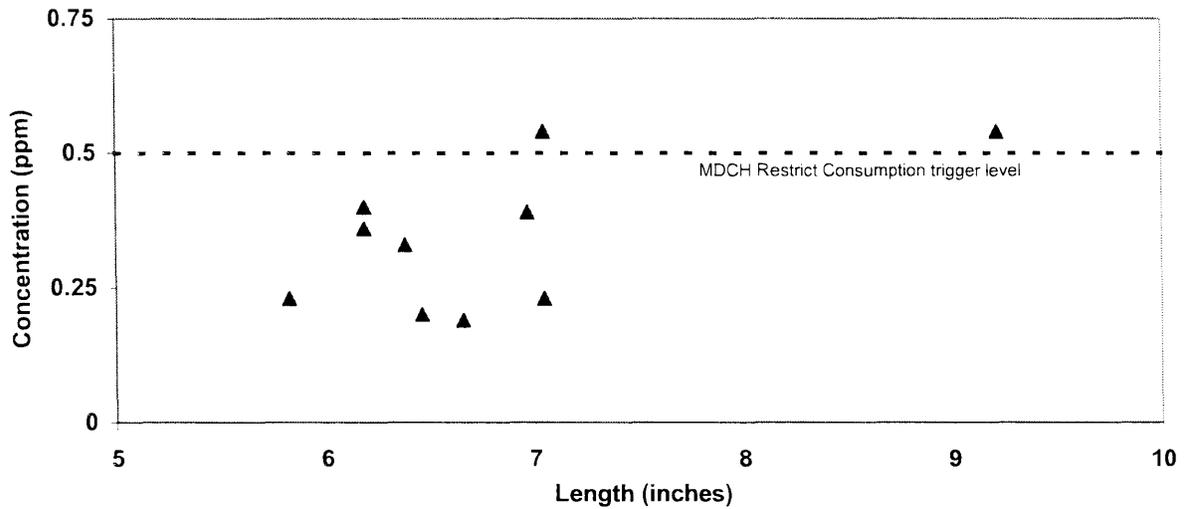


Figure 94. Total length versus mercury concentration in rock bass collected from Manistique River, downstream of Manistique Papers dam in 2004 (ID 2004072).

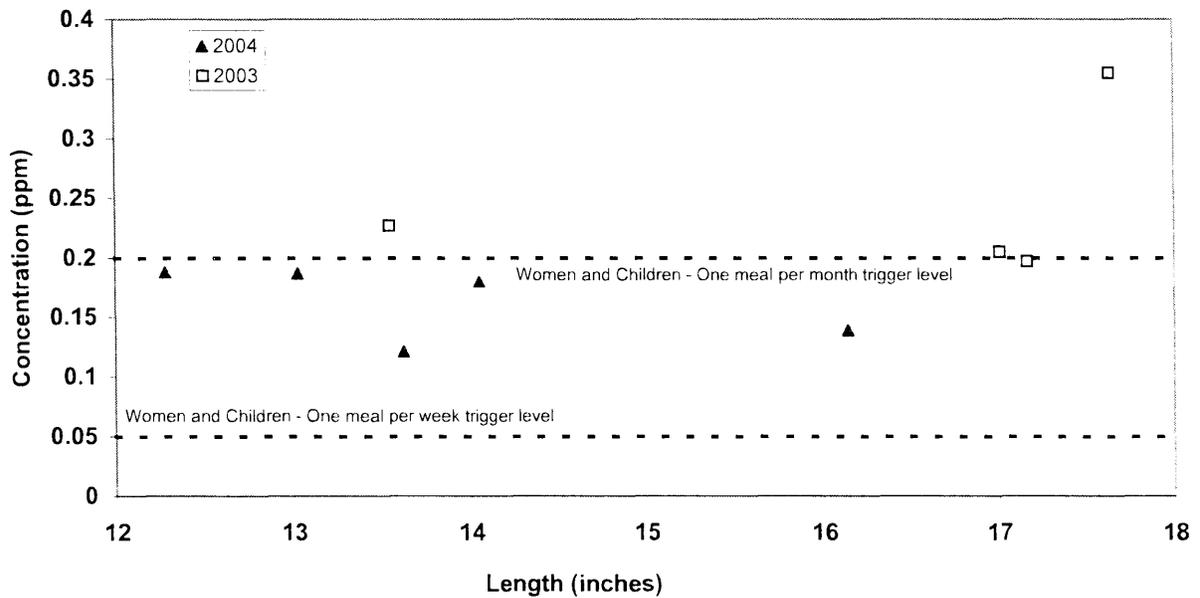


Figure 95. Total length versus total PCB concentration in smallmouth bass collected from Manistique River, downstream of Manistique Papers dam in 2003 (ID 2003077) and 2004 (ID 2004072).

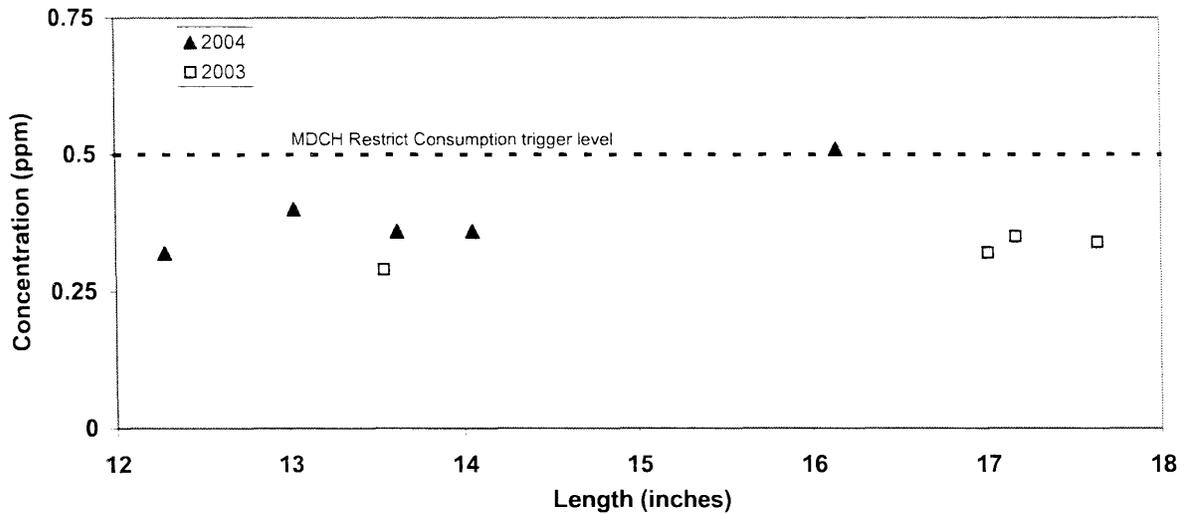


Figure 96. Total length versus mercury concentration in smallmouth bass collected from Manistique River, downstream of Manistique Papers dam in 2003 (ID 2003077) and 2004 (ID 2004072).

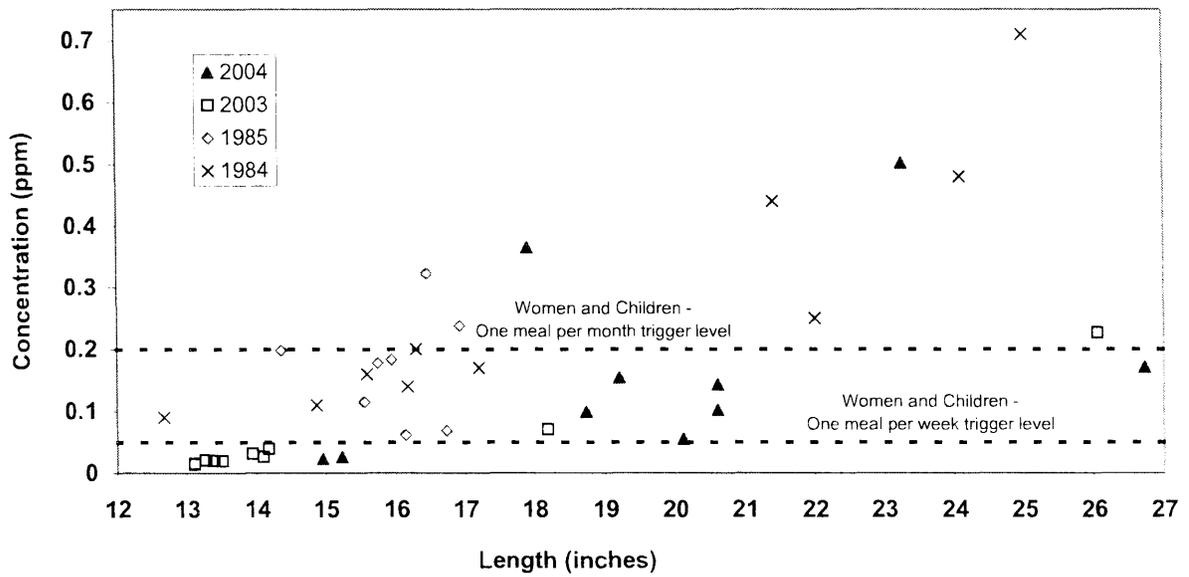


Figure 97. Total length versus total PCB concentration in walleye collected from Manistique River, downstream of Manistique Papers dam in 1984 (ID 84009), 1985 (ID 85008), 2003 (ID 2003077), and 2004 (ID 2004072).

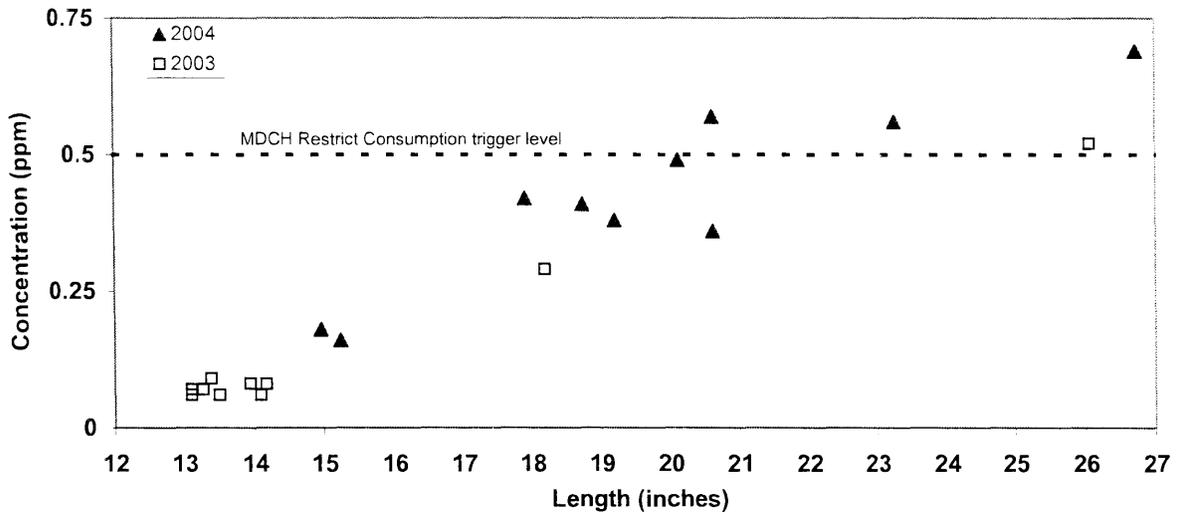


Figure 98. Total length versus mercury concentration in walleye collected from Manistique River, downstream of Manistique Papers dam in 2003 (ID 2003077) and 2004 (ID 2004072).

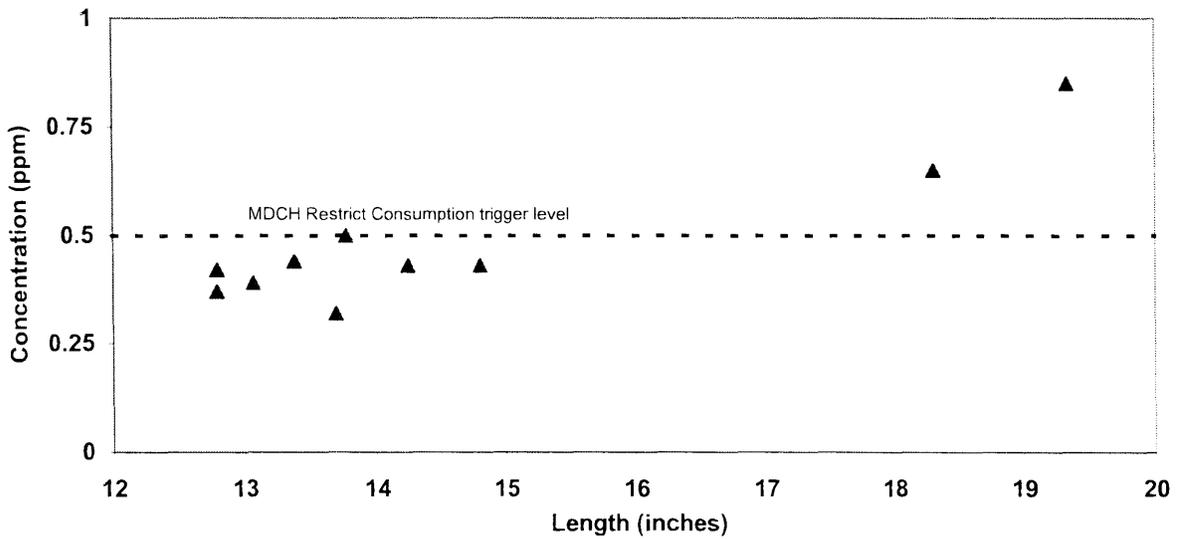


Figure 99. Total length versus mercury concentration in largemouth bass collected from Nevins Lake, Montcalm County in 2004 (ID 2004076).

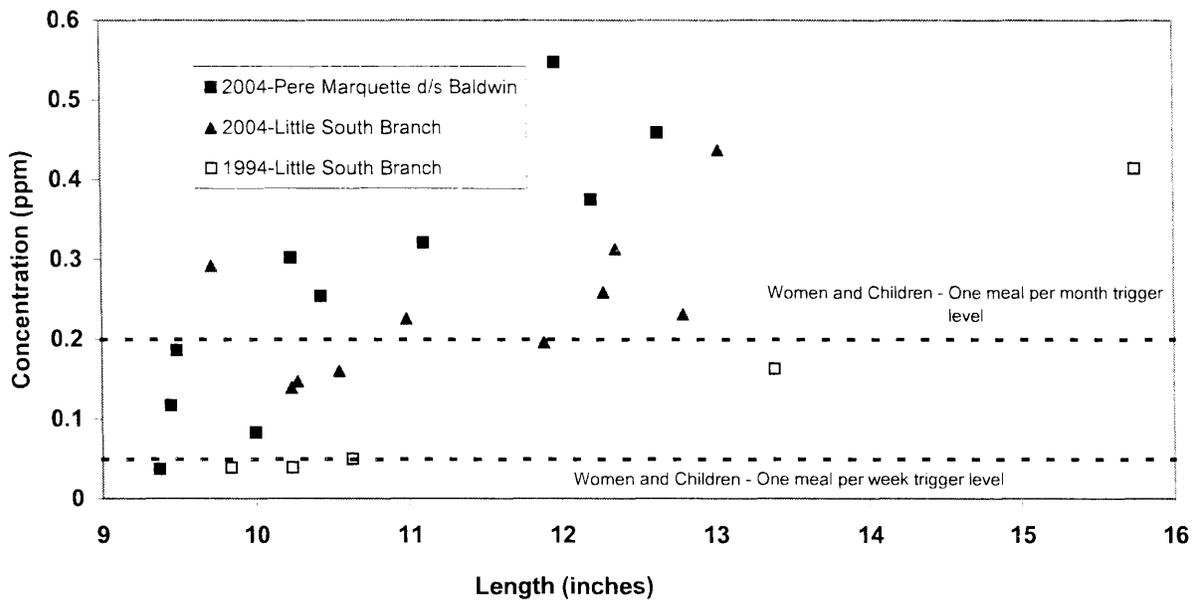


Figure 100. Total length versus total PCB concentration in brown trout collected from the Pere Marquette and Little S. Branch Pere Marquette Rivers, Lake County, in 1994(ID 94032) and 2004 (ID 2004081 & 20040822).

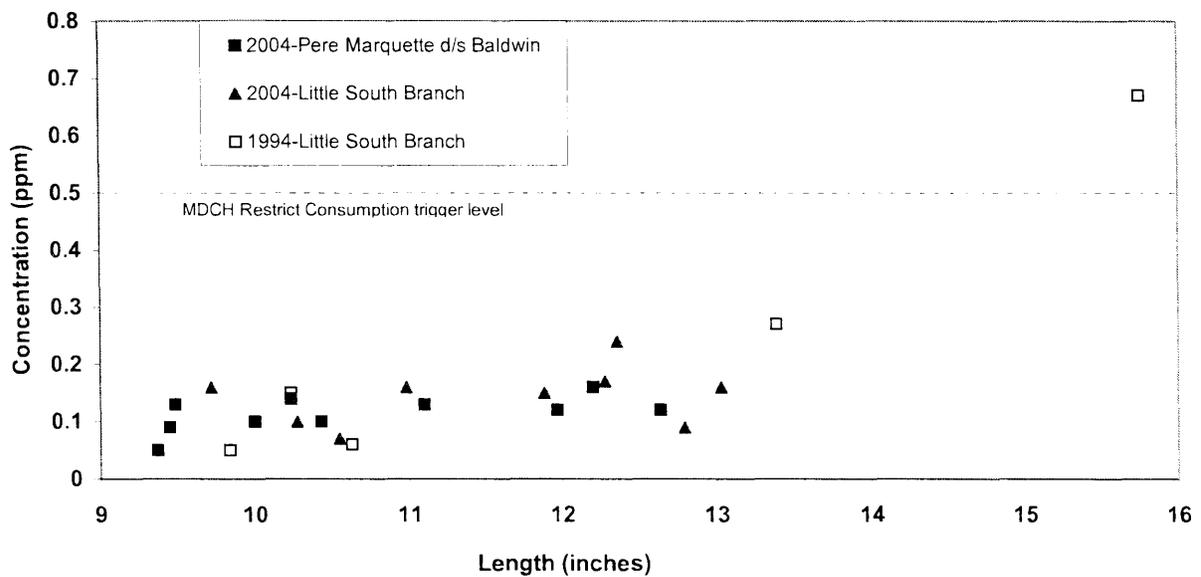


Figure 101. Total length versus mercury concentration in brown trout collected from the Pere Marquette and Little S. Branch Pere Marquette Rivers, Lake County, in 1994(ID 94032) and 2004 (ID 2004081 & 20040822).

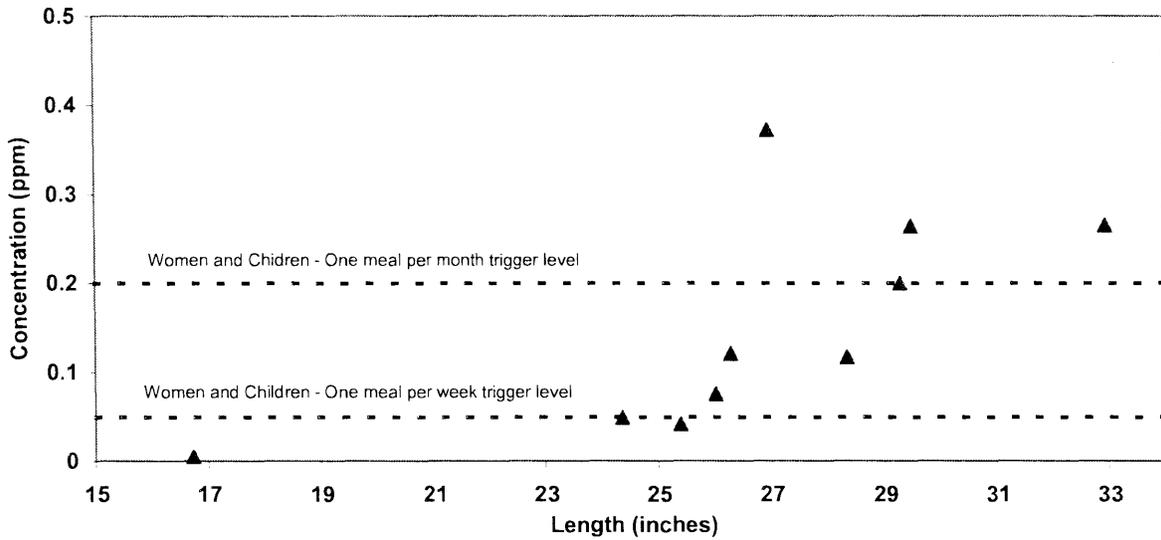


Figure 102. Total length versus total PCB concentration in carp collected from Portage Lake, Manistee County in 2004 (ID 2004144).

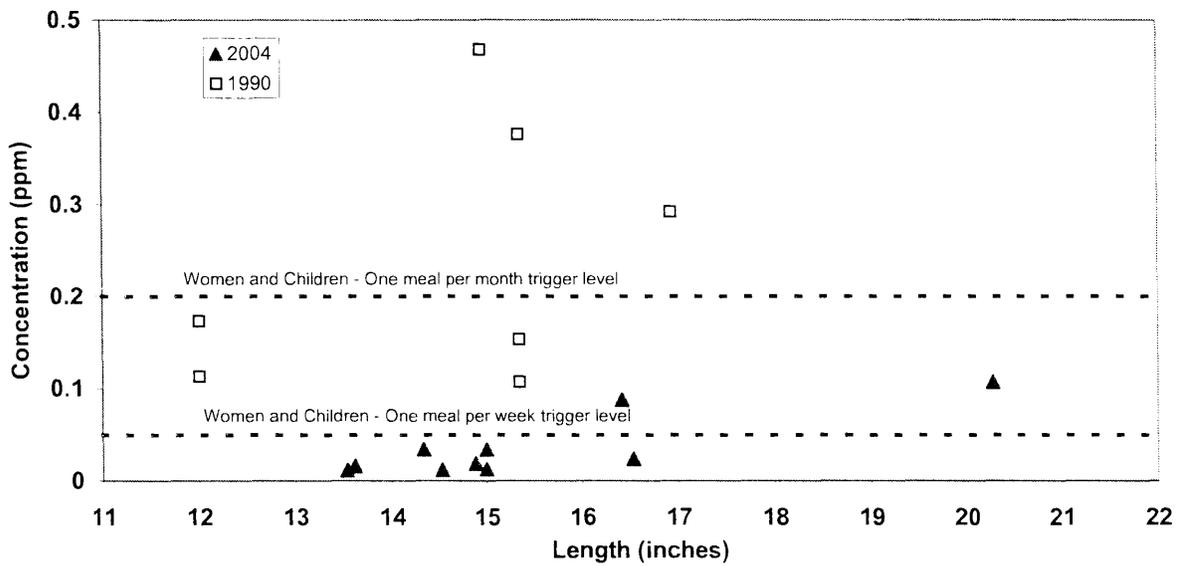


Figure 103. Total length versus total PCB concentration in largemouth bass collected from Portage Lake, Manistee County in 1990 (ID 90008) and 2004 (ID 2004144).

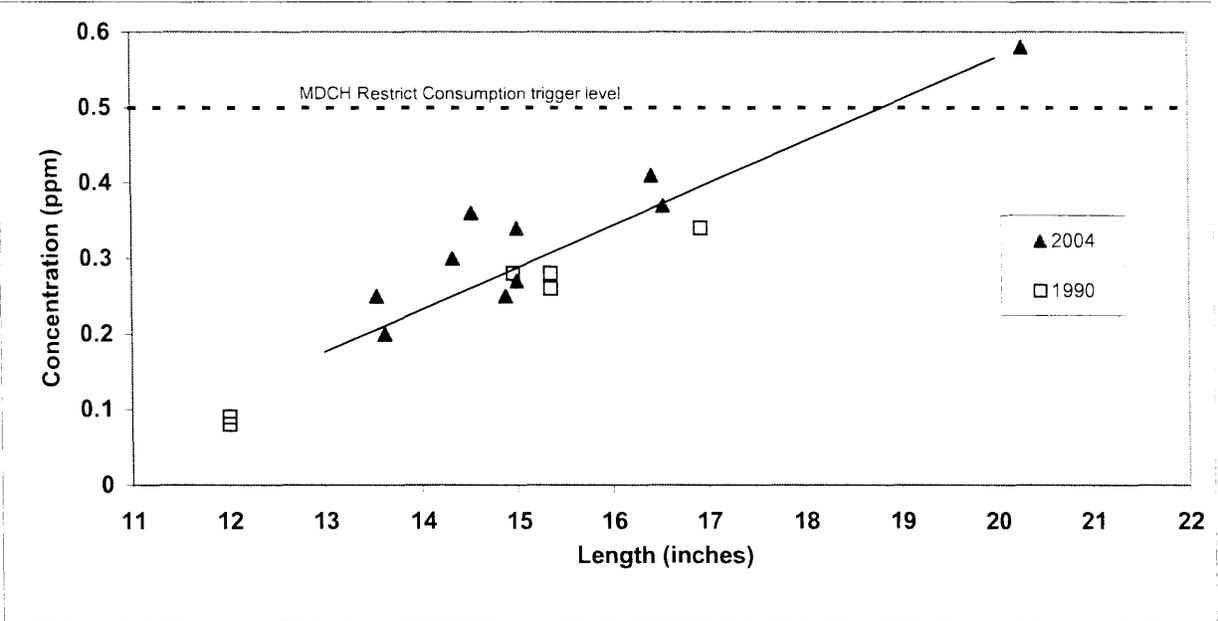


Figure 104. Total length versus mercury concentration in largemouth bass collected from Portage Lake, Manistee County in 1990 (ID 90008) and 2004 (ID 2004144).

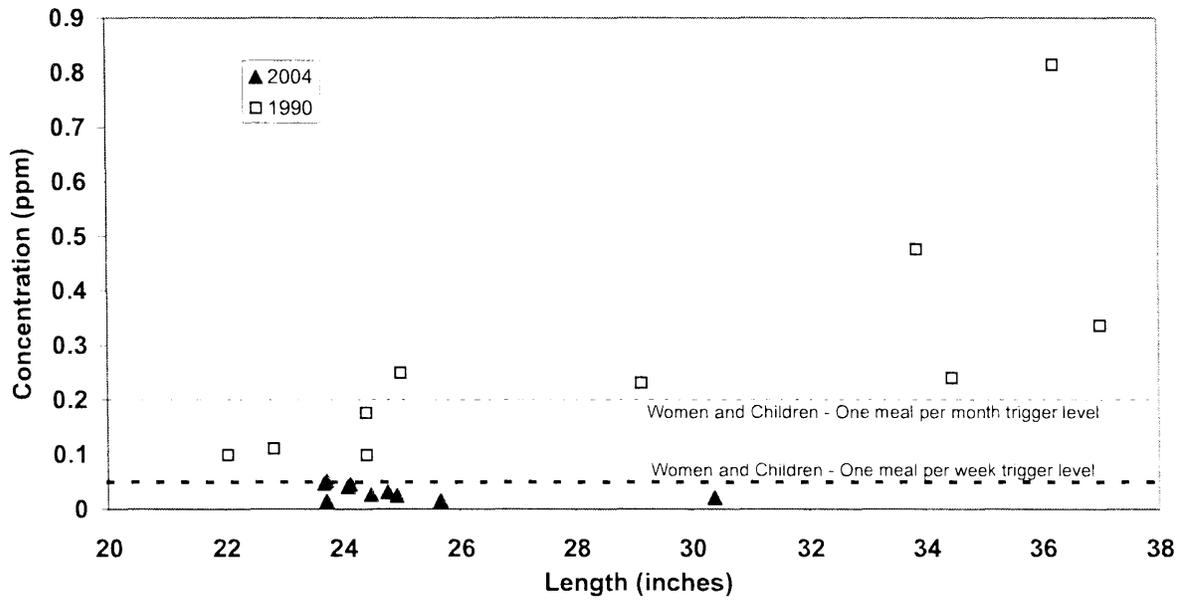


Figure 105. Total length versus total PCB concentration in northern pike collected from Portage Lake, Manistee County in 1990 (ID 90008) and 2004 (ID 2004144).

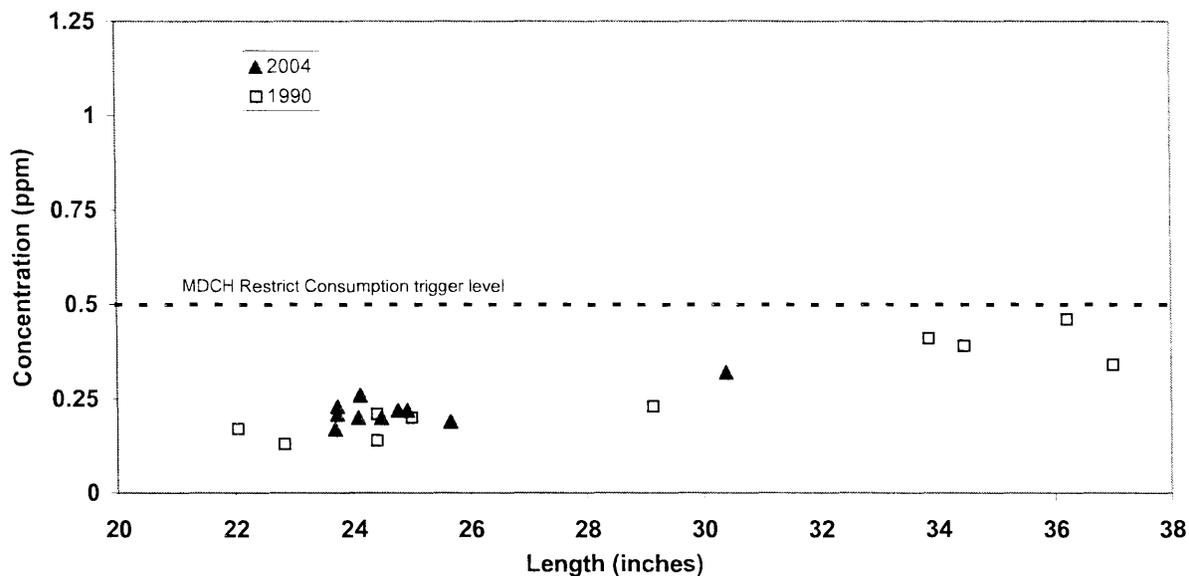


Figure 106. Total length versus mercury concentration in northern pike collected from Portage Lake, Manistee County in 1990 (ID 90008) and 2004 (ID 2004144).

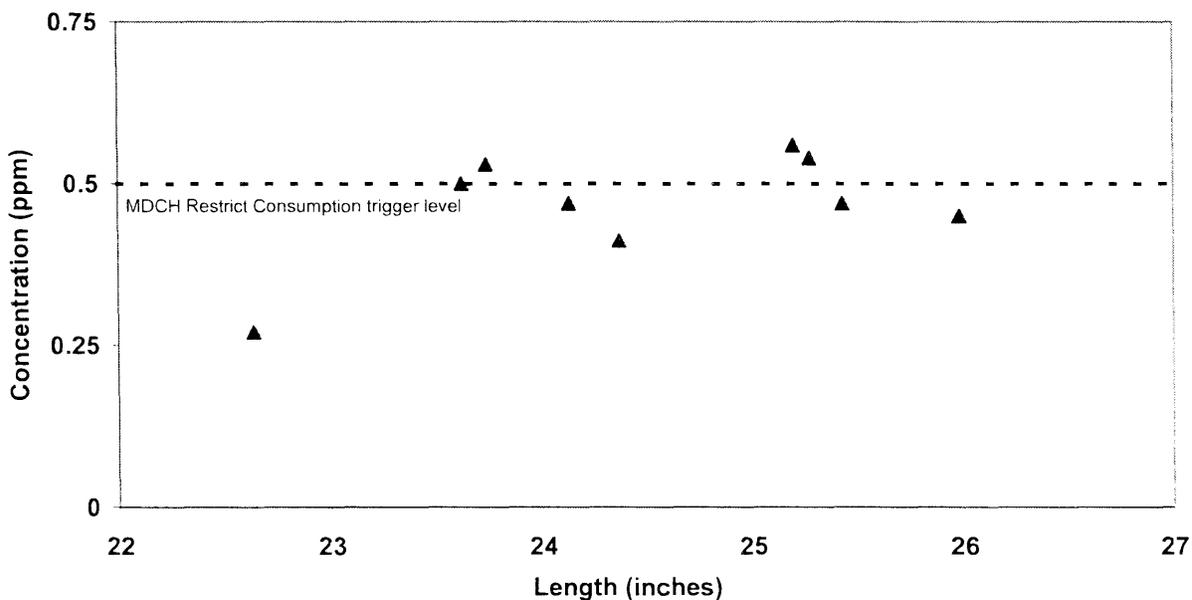


Figure 107. Total length versus mercury concentration in northern pike collected from Robinson Lake, Newaygo County in 2004 (ID 2004095).

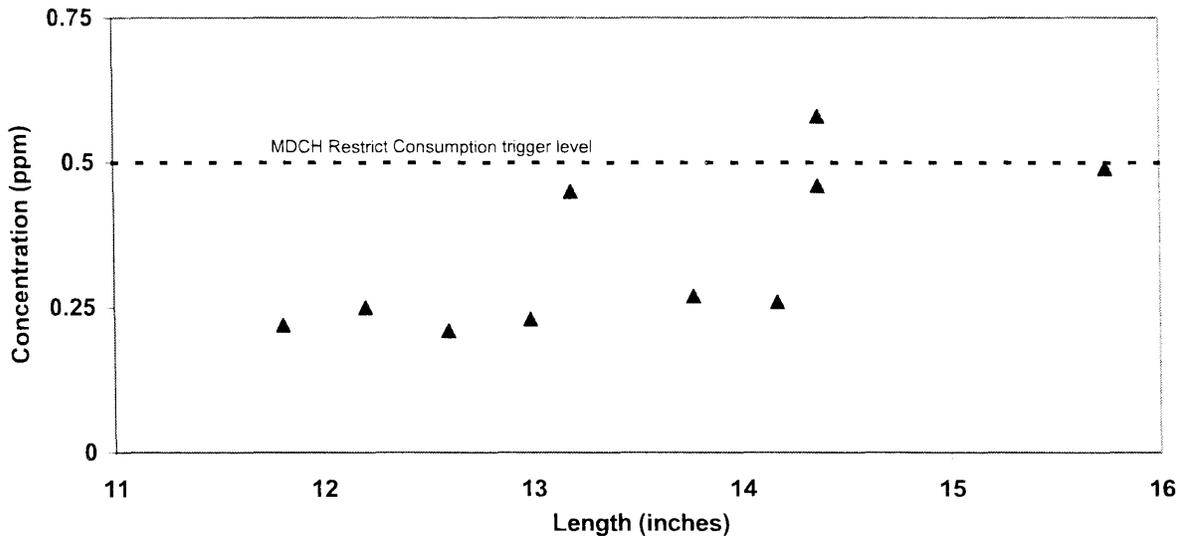


Figure 108. Total length versus mercury concentration in largemouth bass collected from Rupert Lake, Kalamazoo County in 2004 (ID 2004099).

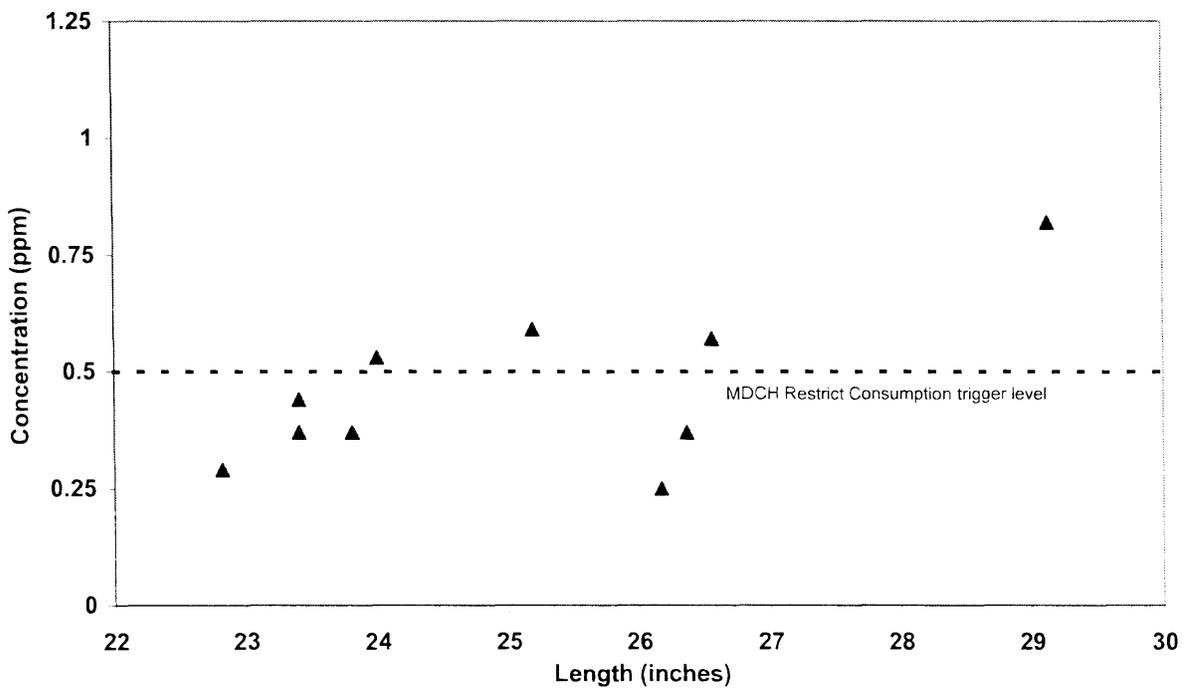


Figure 109. Total length versus mercury concentration in northern pike collected from Rush Lake, Van Buren County in 2004 (ID 2004100).

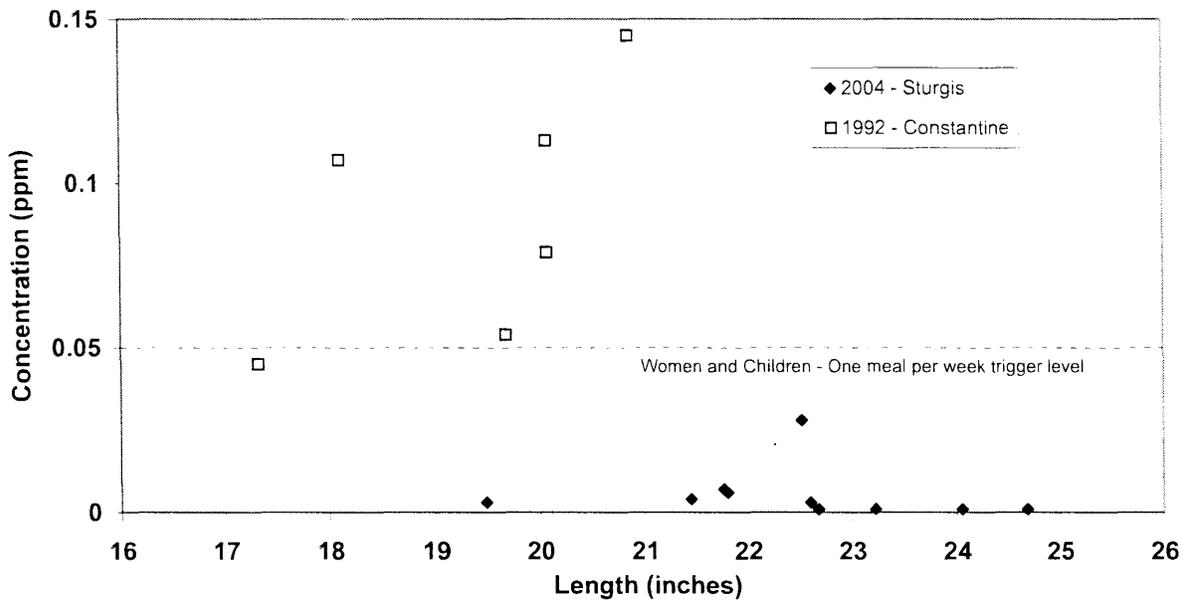


Figure 110. Total length versus total PCB concentration in carp collected from the St. Joseph River upstream of the Constantine Dam in 1992 (ID 92031) and upstream of the Sturgis Dam in 2004 (ID 2004119).

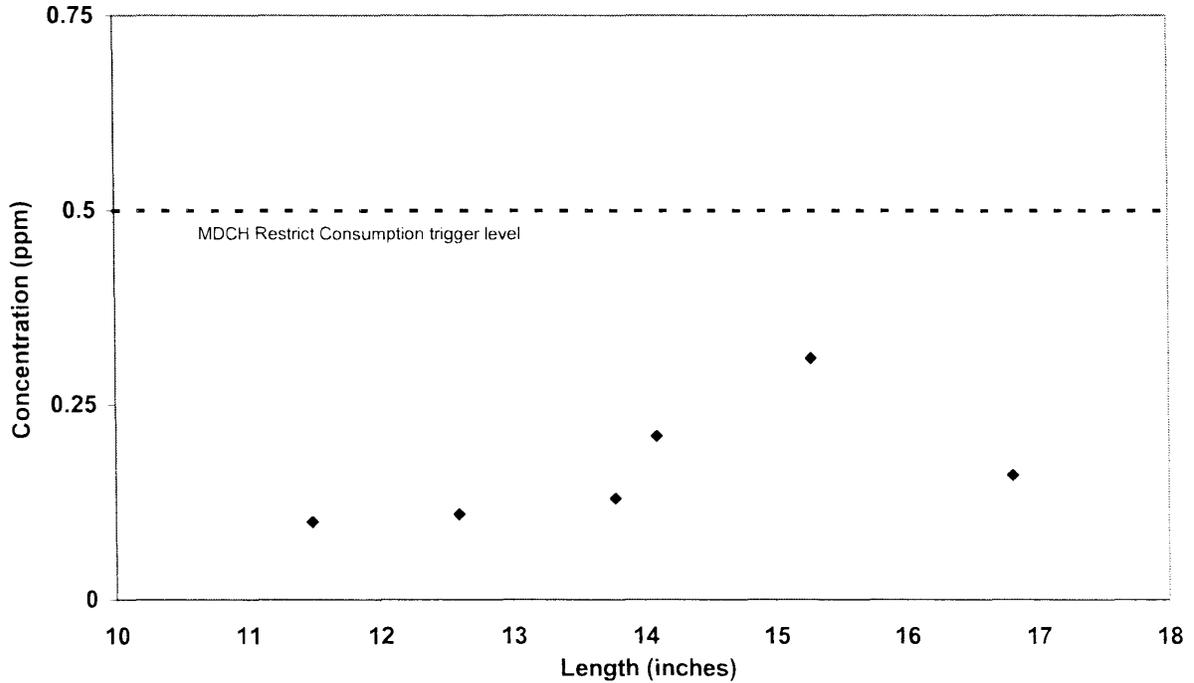


Figure 111. Total length versus mercury concentration in largemouth bass collected from the St. Joseph River above the Sturgis Dam in 2004 (ID 2004119).

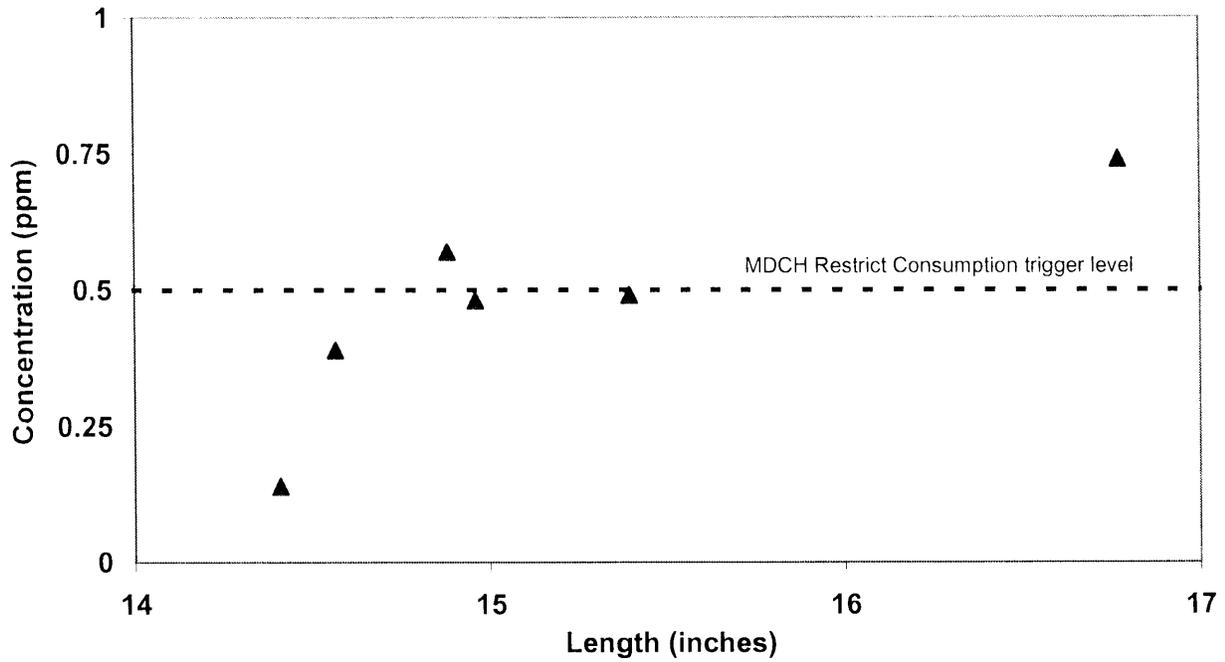


Figure 112. Total length versus mercury concentration in largemouth bass collected from Sylvan Lake, Newaygo County in 2004 (ID 2004141).

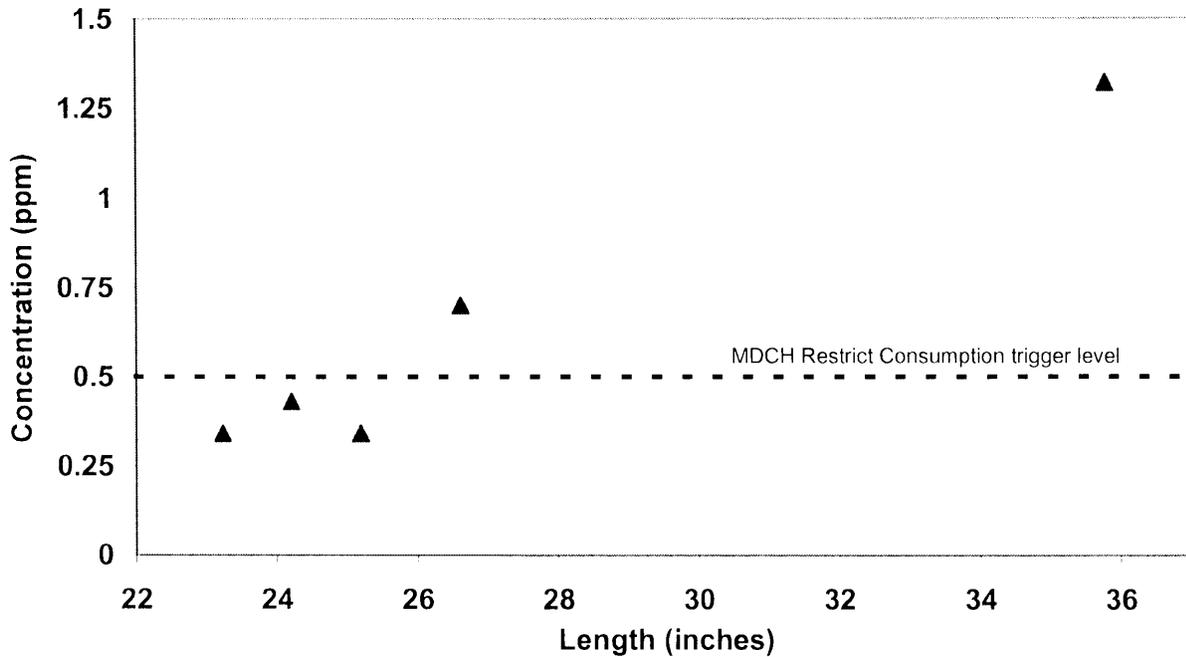


Figure 113. Total length versus mercury concentration in northern pike collected from Sylvan Lake, Newaygo County in 2004 (ID 2004141).

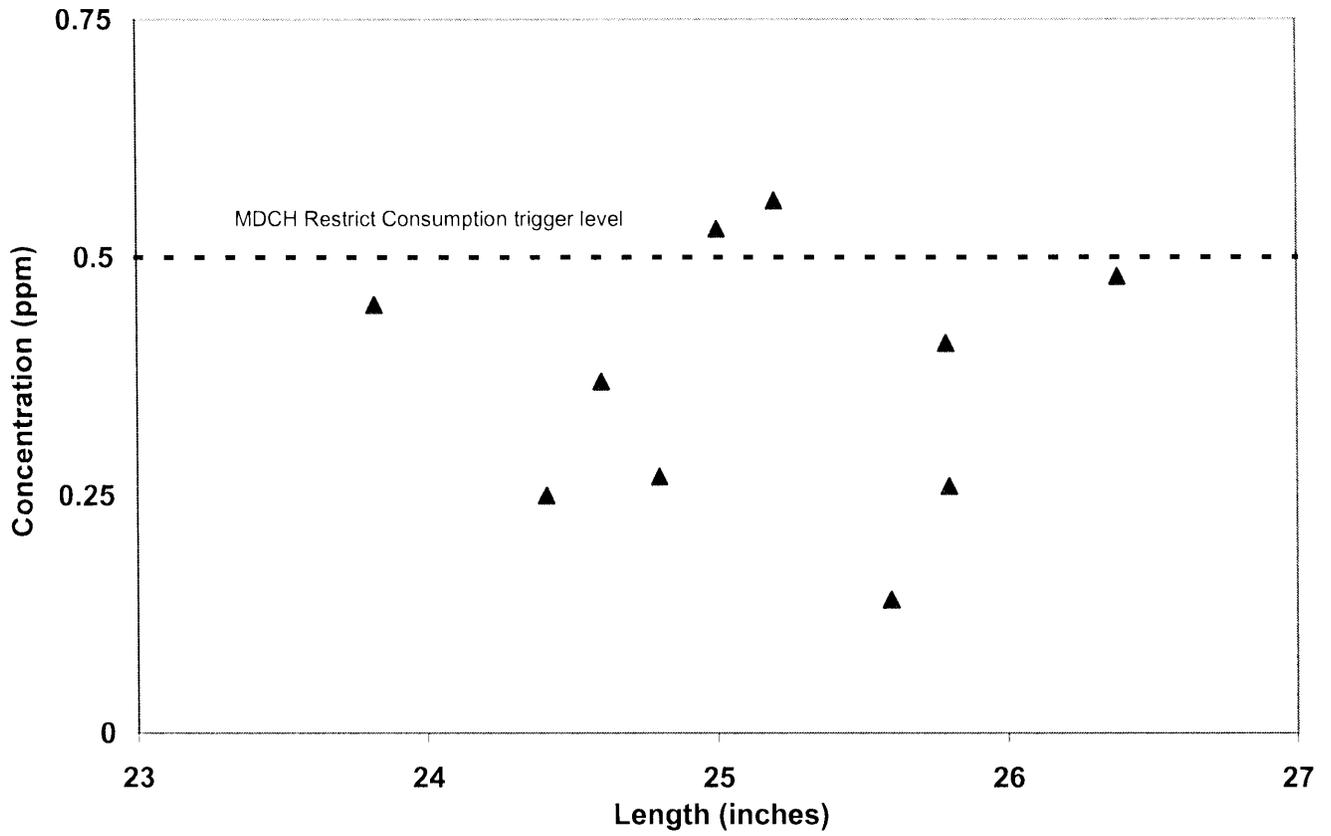


Figure 114. Total length versus mercury concentration in northern pike collected from Van Auken Lake, Van Buren County in 2004 (ID 2004125).

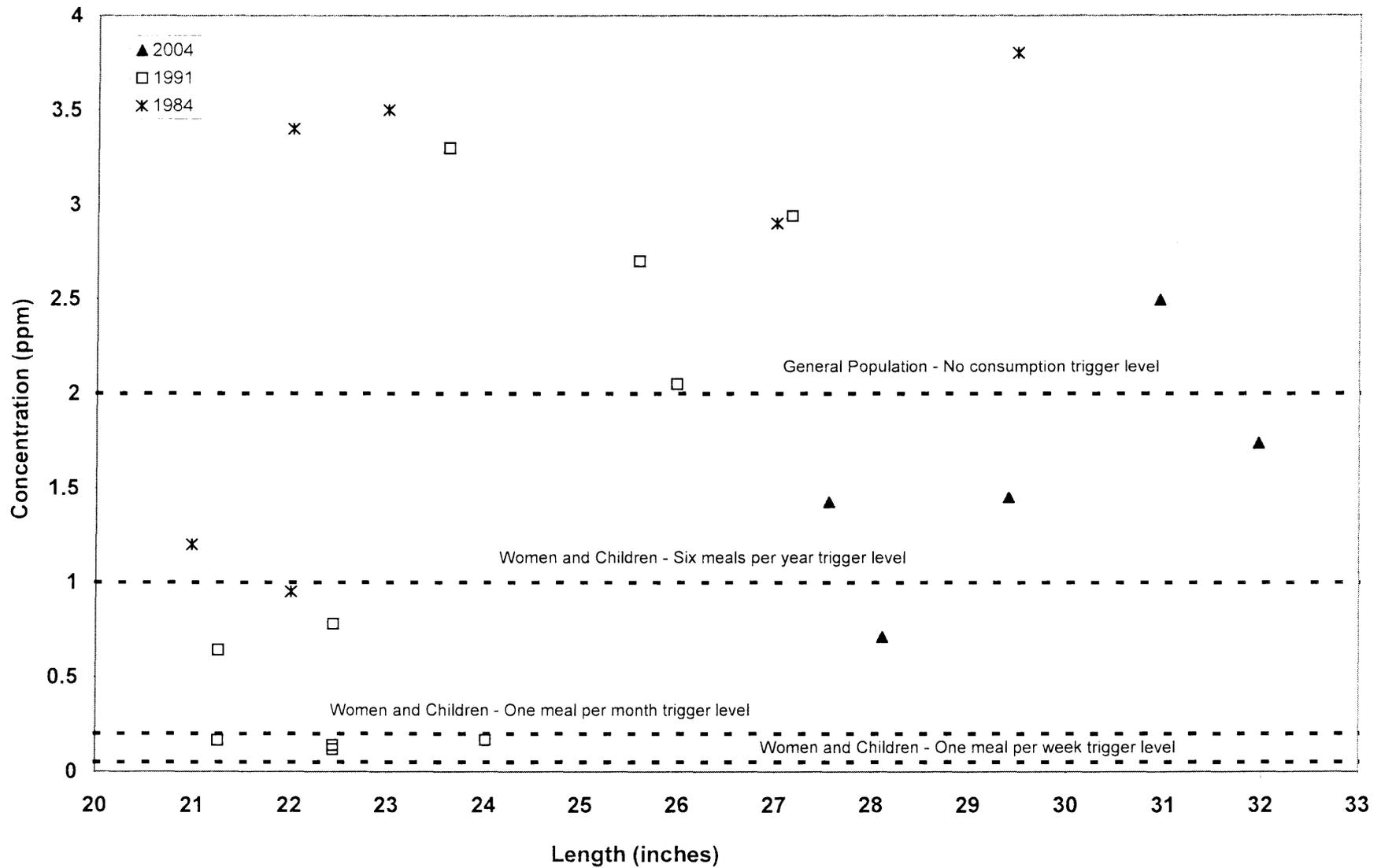


Figure 115. Total length versus total PCB concentration in carp collected from White Lake, Muskegon County in 1984 (ID 84001), 1991 (ID 91046), and 2004 (ID 2004126).

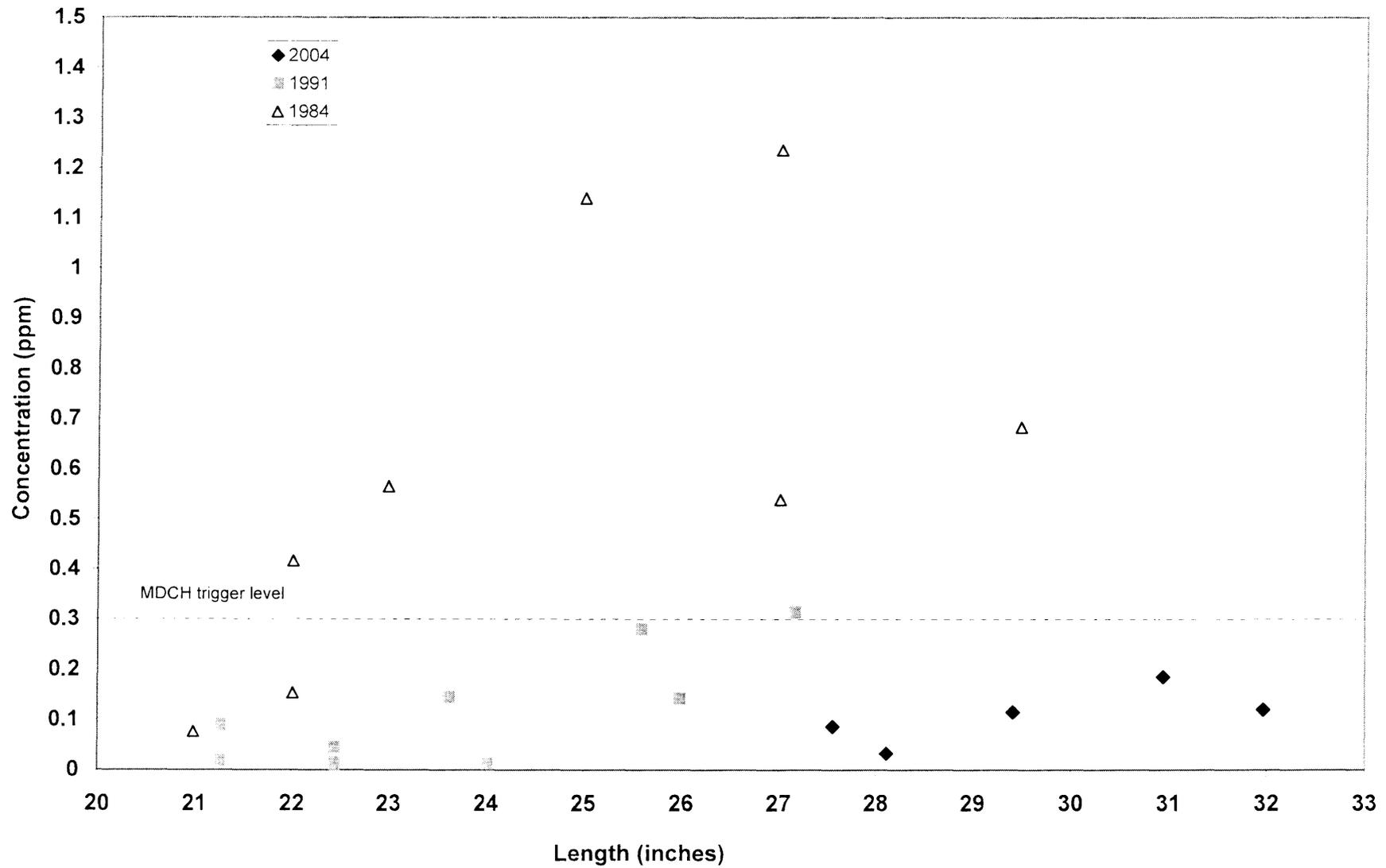


Figure 116. Total length versus total Chlordane concentration in carp collected from White Lake, Muskegon County in 1984 (ID 84001), 1991 (ID 91046), and 2004 (ID 2004126).

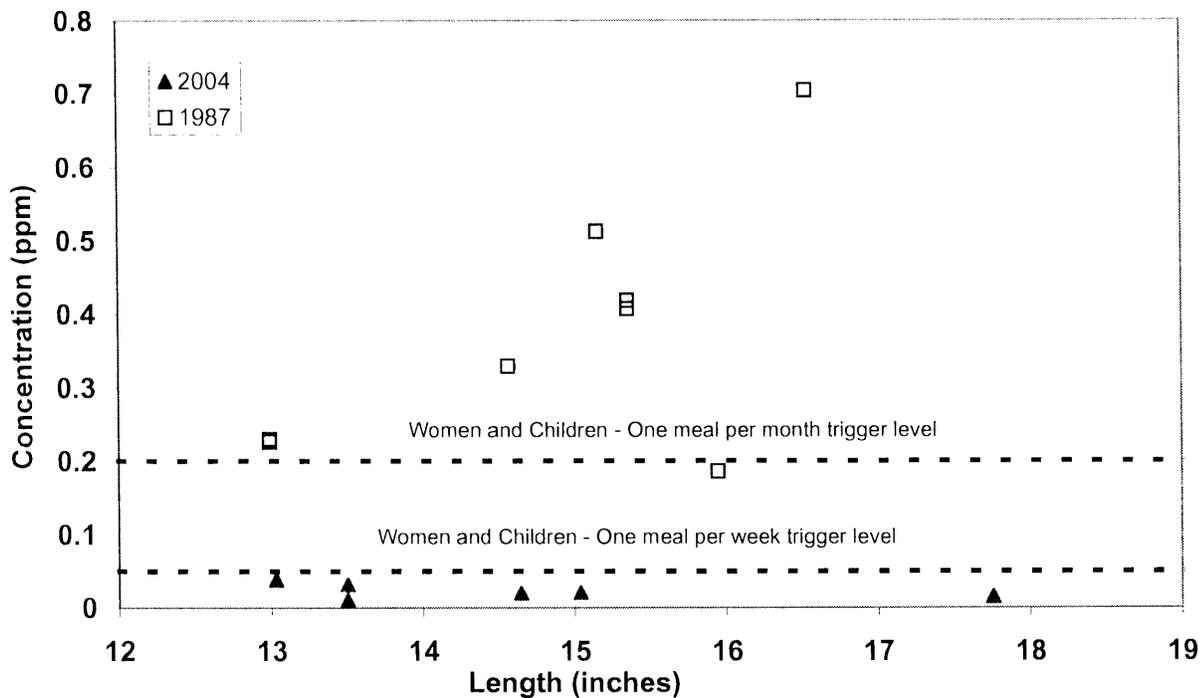


Figure 117. Total length versus total PCB concentration in smallmouth bass collected from White Lake, Muskegon County in 1987 (ID 87057) and 2004 (ID 2004126).

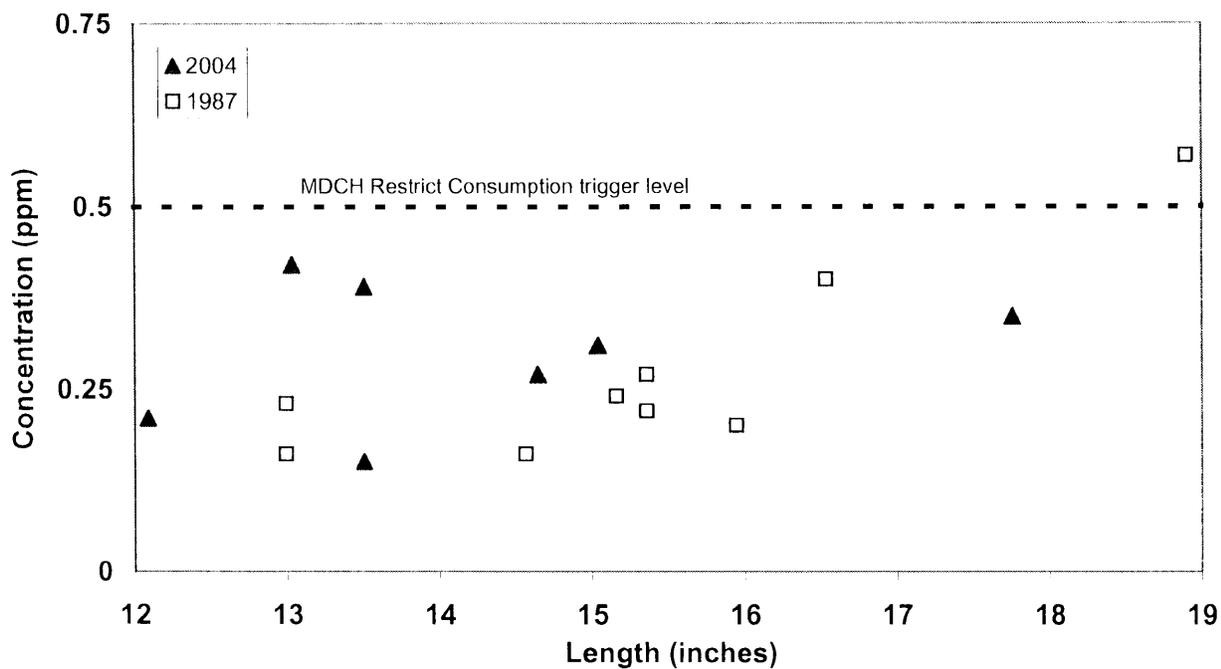


Figure 118. Total length versus mercury concentration in smallmouth bass collected from White Lake, Muskegon County in 1987 (ID 87057) and 2004 (ID 2004126).

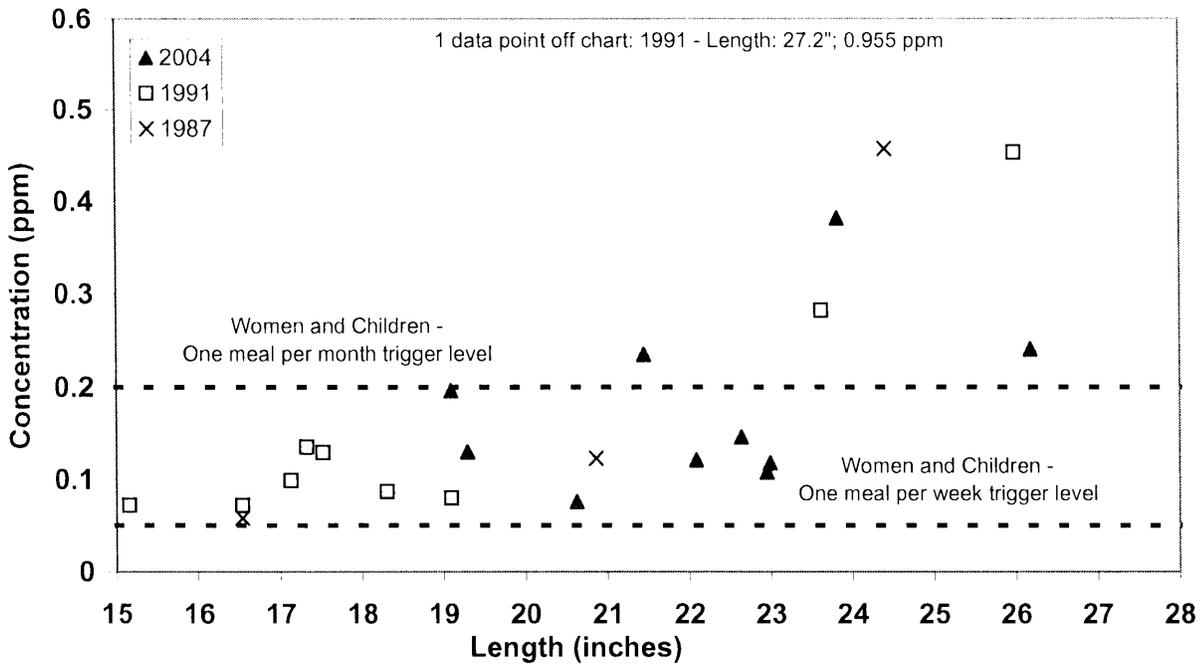


Figure 119. Total length versus total PCB concentration in walleye collected from White Lake, Muskegon County in 1987 (ID 87057), 1991 (ID 91046), and 2004 (ID 2004126).

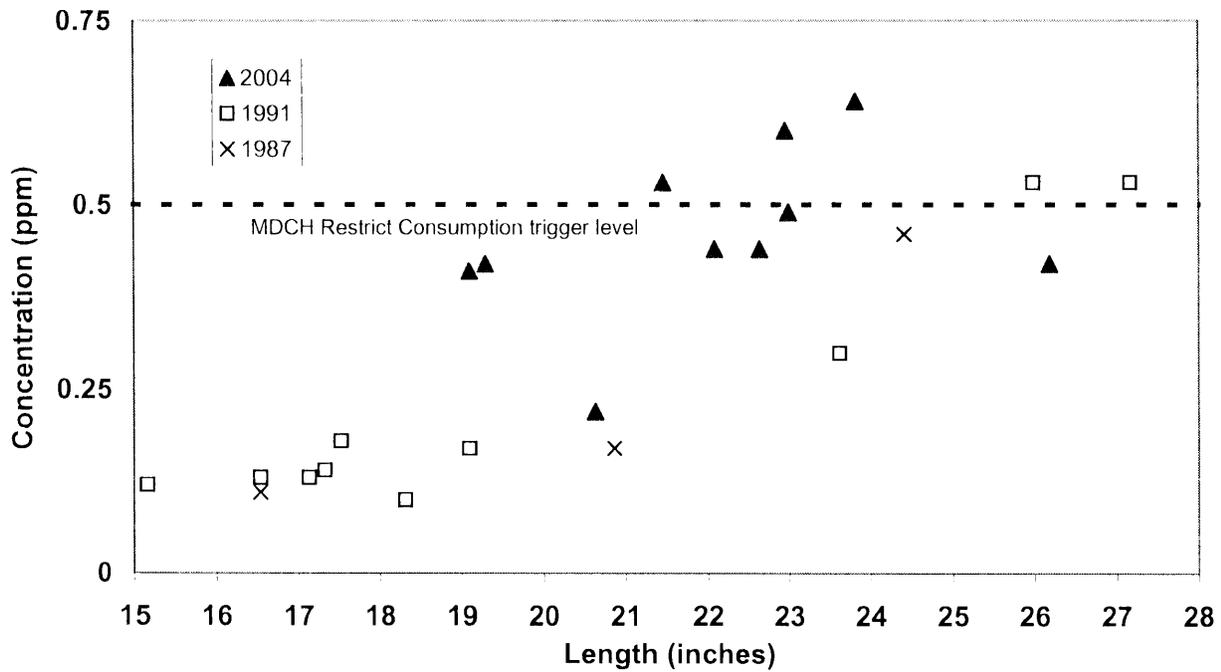


Figure 120. Total length versus mercury concentration in walleye collected from White Lake, Muskegon County in 1987 (ID 87057), 1991 (ID 91046), and 2004 (ID 2004126).

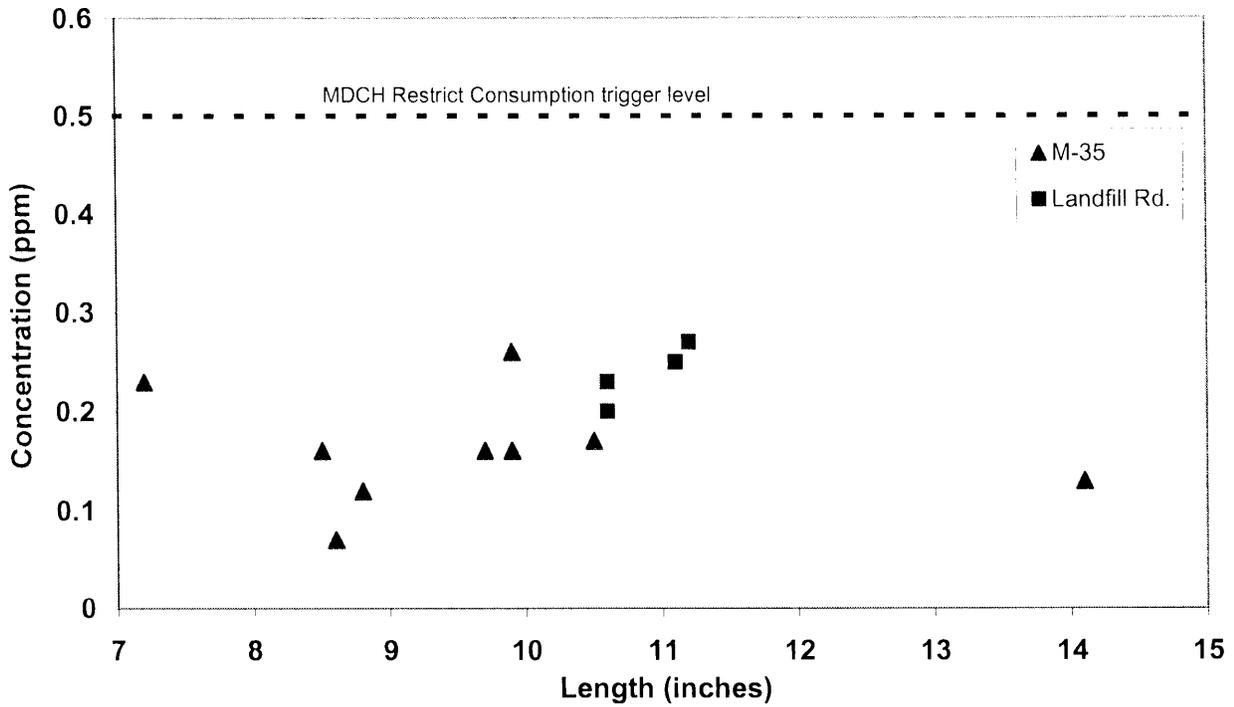


Figure 121. Total length versus mercury concentration in brook trout collected from Carp River, Marquette County in 2004 (ID 2004009 & 2004010).

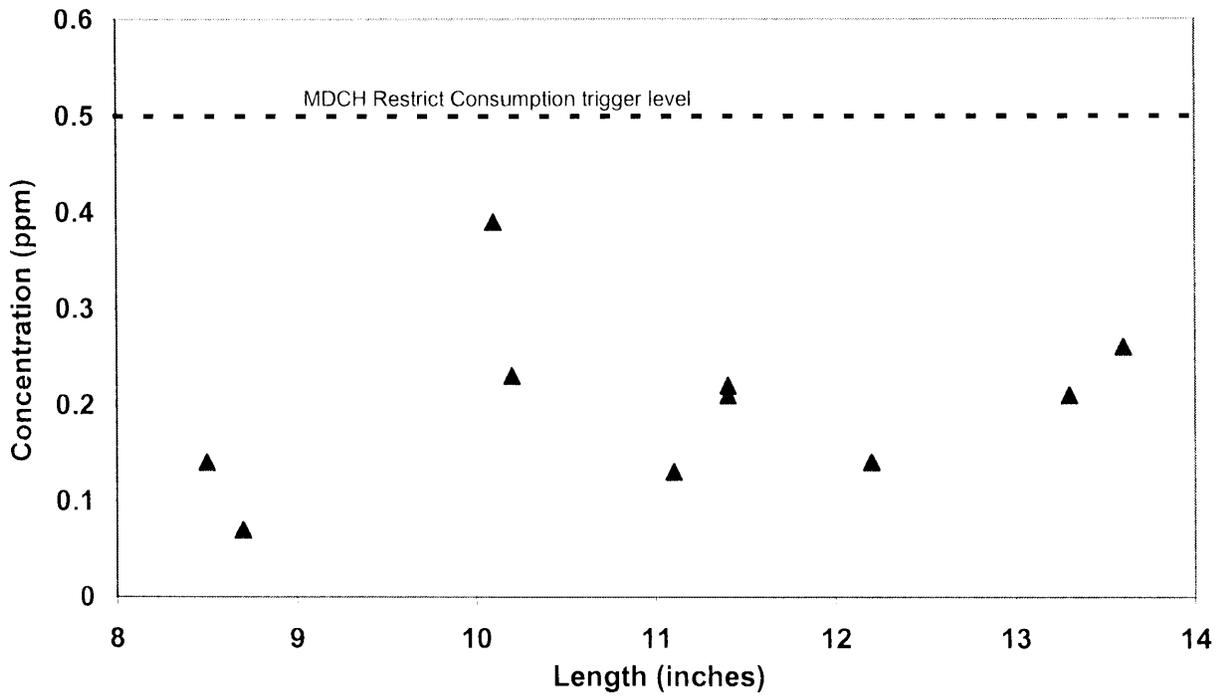


Figure 122. Total length versus mercury concentration in white suckers collected from Carp River, Marquette County in 2004 (ID 2004010).

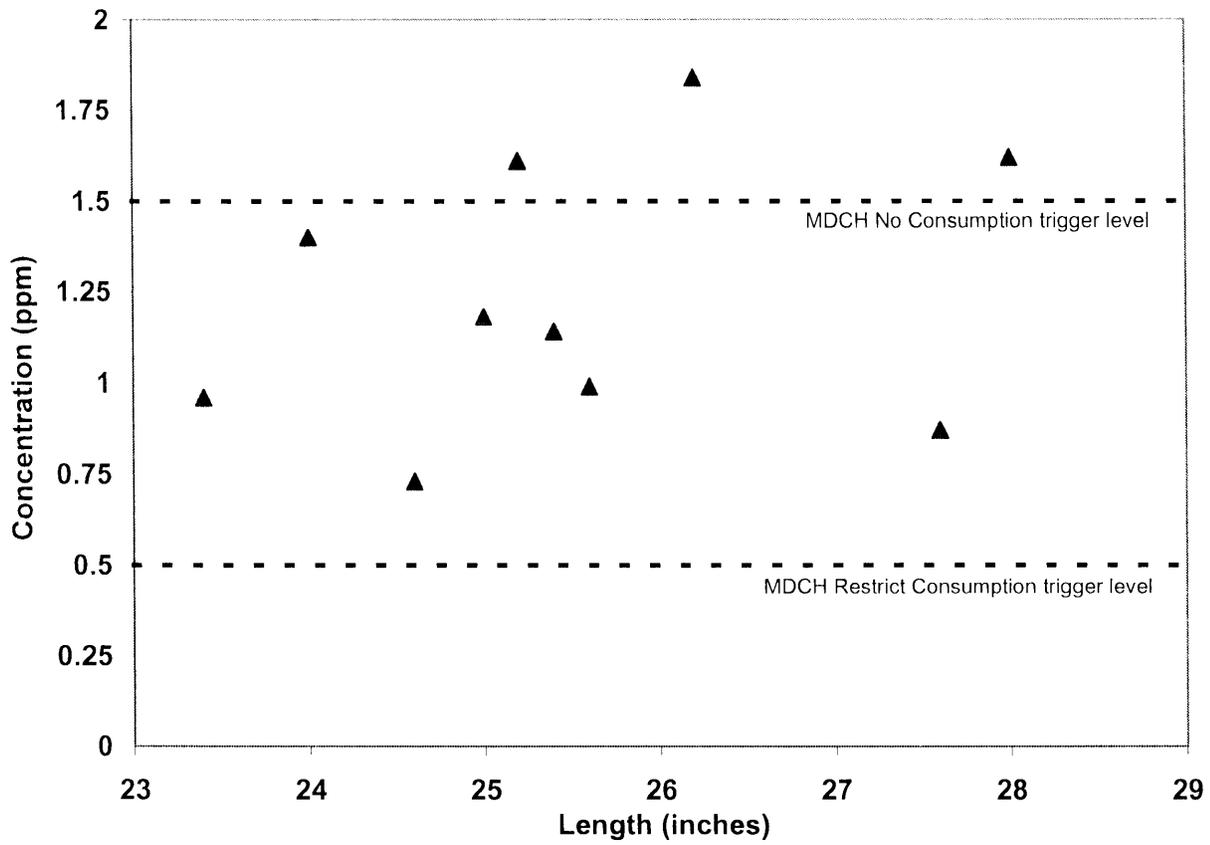


Figure 123. Total length versus mercury concentration in northern pike collected from Deer Lake, Alger County in 2004 (ID 2004019).

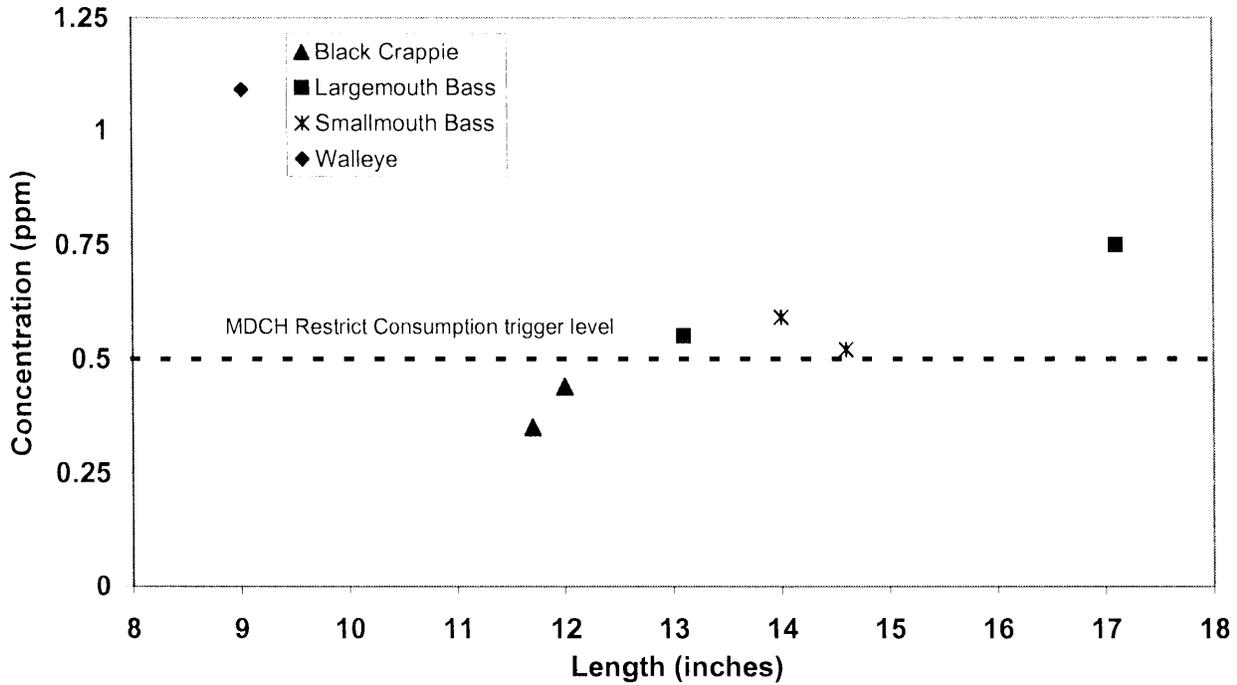


Figure 124. Total length versus mercury concentration in black crappie, largemouth bass, smallmouth bass, and walleye collected from Dinner Lake, Gogebic County in 2004 (ID 2004024).

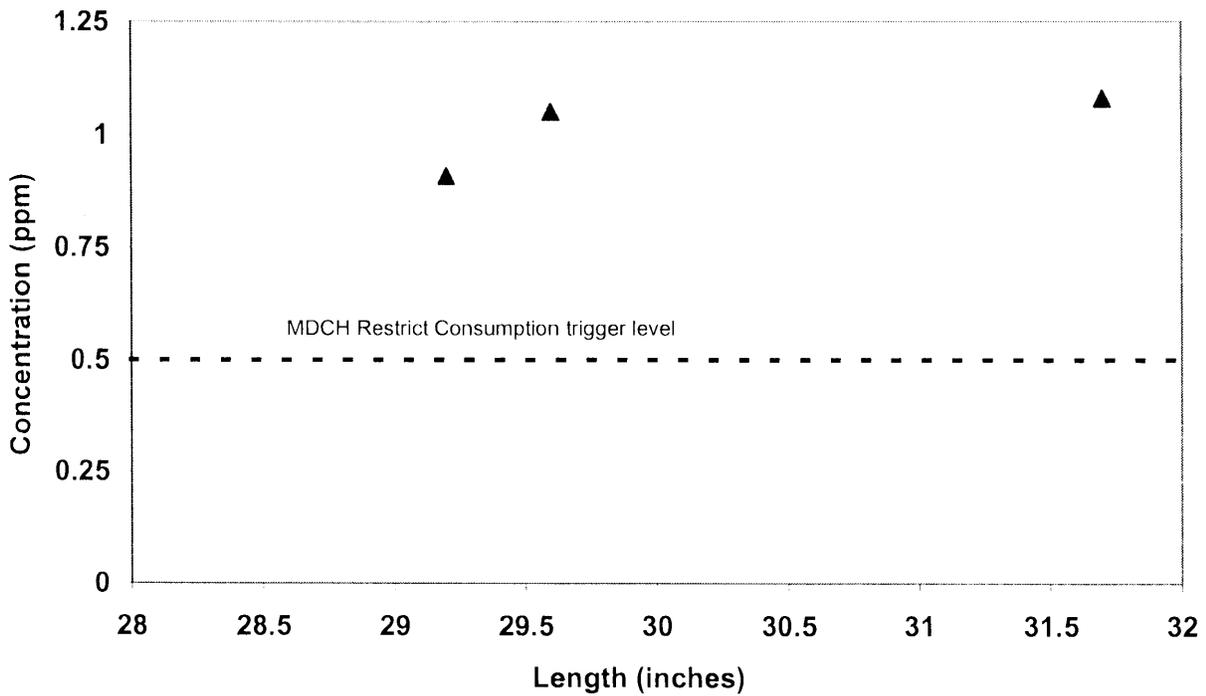


Figure 125. Total length versus mercury concentration in northern pike collected from Dinner Lake, Gogebic County in 2004 (ID 2004024).

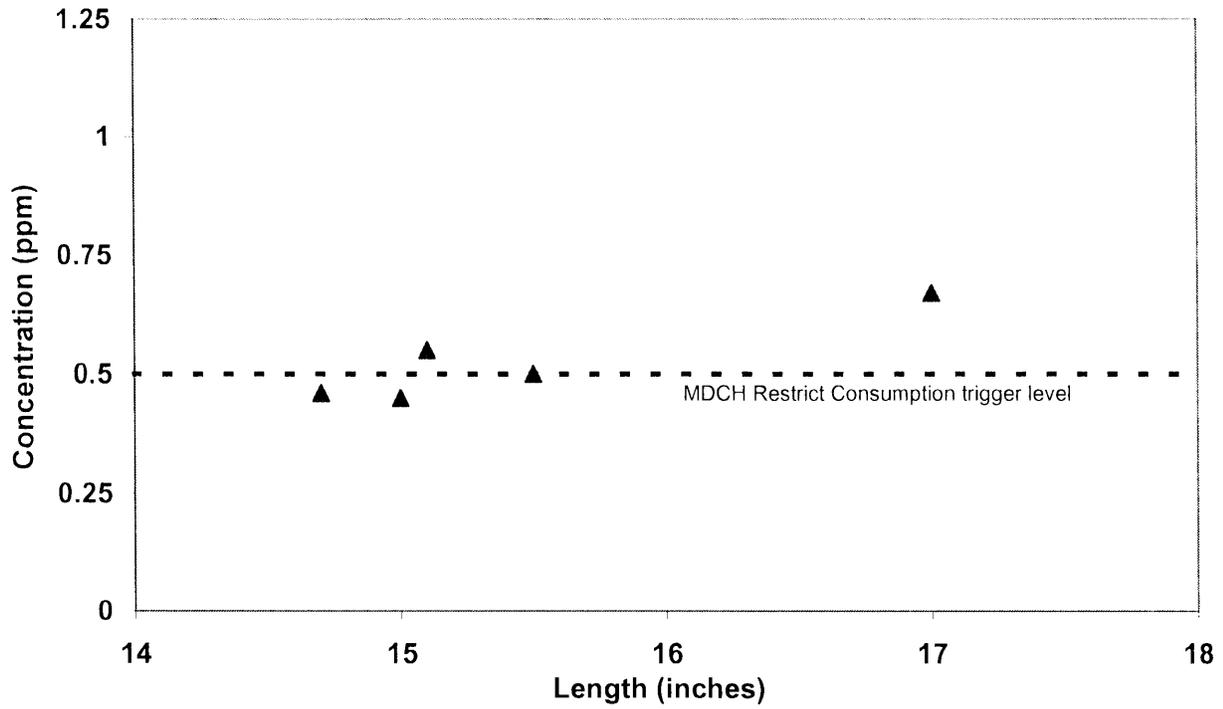


Figure 126. Total length versus mercury concentration in smallmouth bass collected from Lake Medora, Keweenaw County in 2004 (ID 2004050).

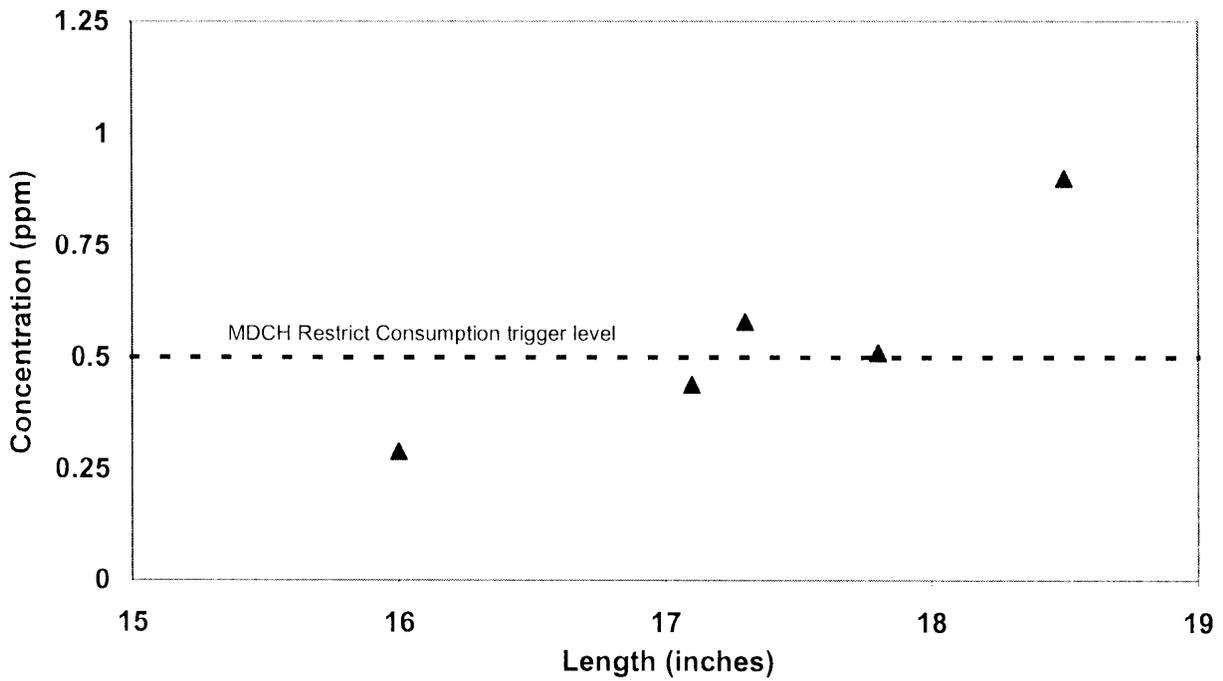


Figure 127. Total length versus mercury concentration in walleye collected from Lake Medora, Keweenaw County in 2004 (ID 2004050).

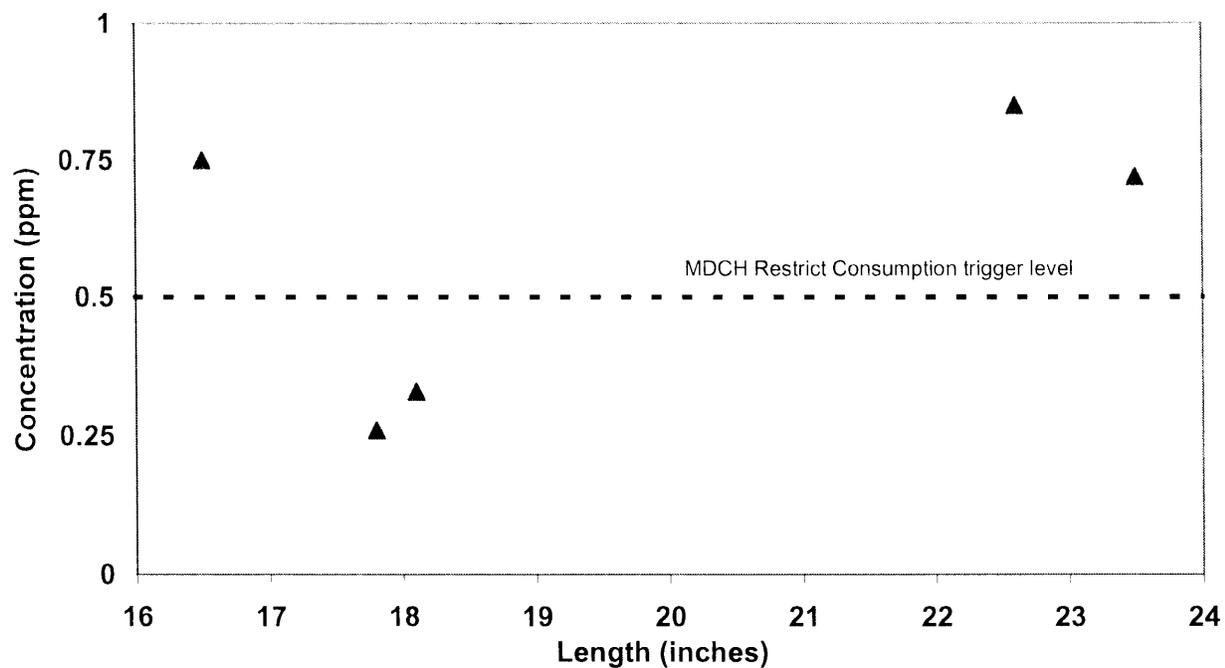


Figure 128. Total length versus mercury concentration in walleye collected from Pretty Lake, Luce County in 2004 (ID 2004083).

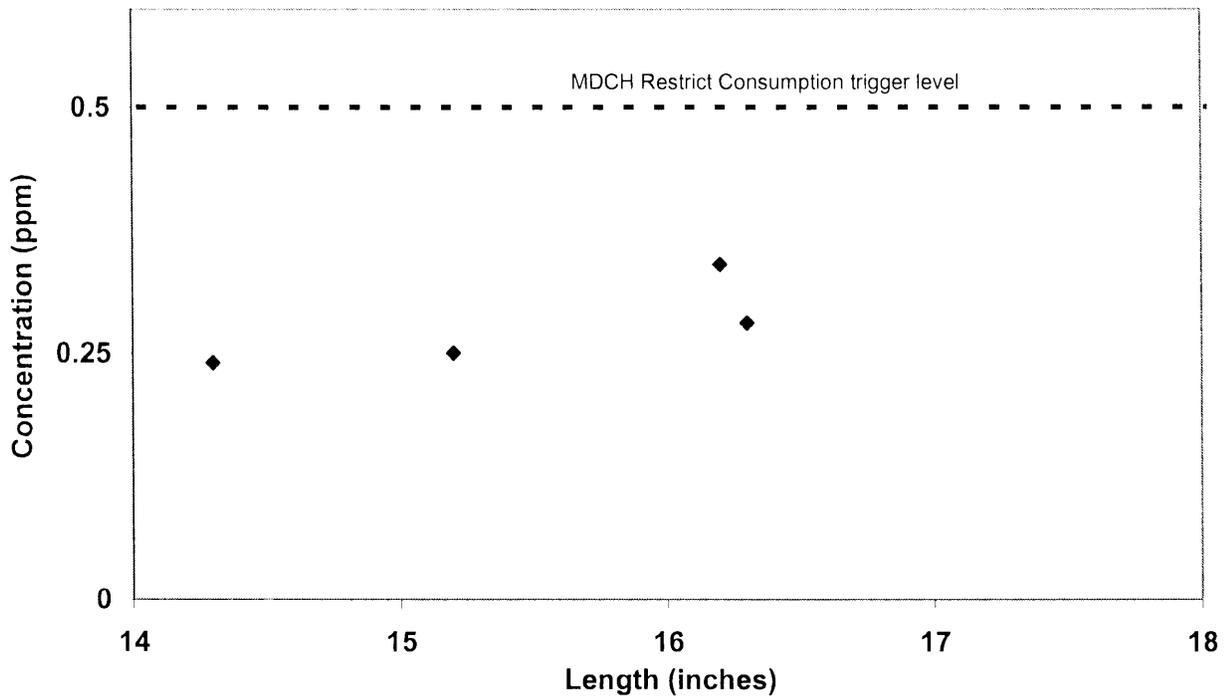


Figure 129. Total length versus mercury concentration in smallmouth bass collected from Teal Lake, Marquette County in 2004 (ID 2004122).

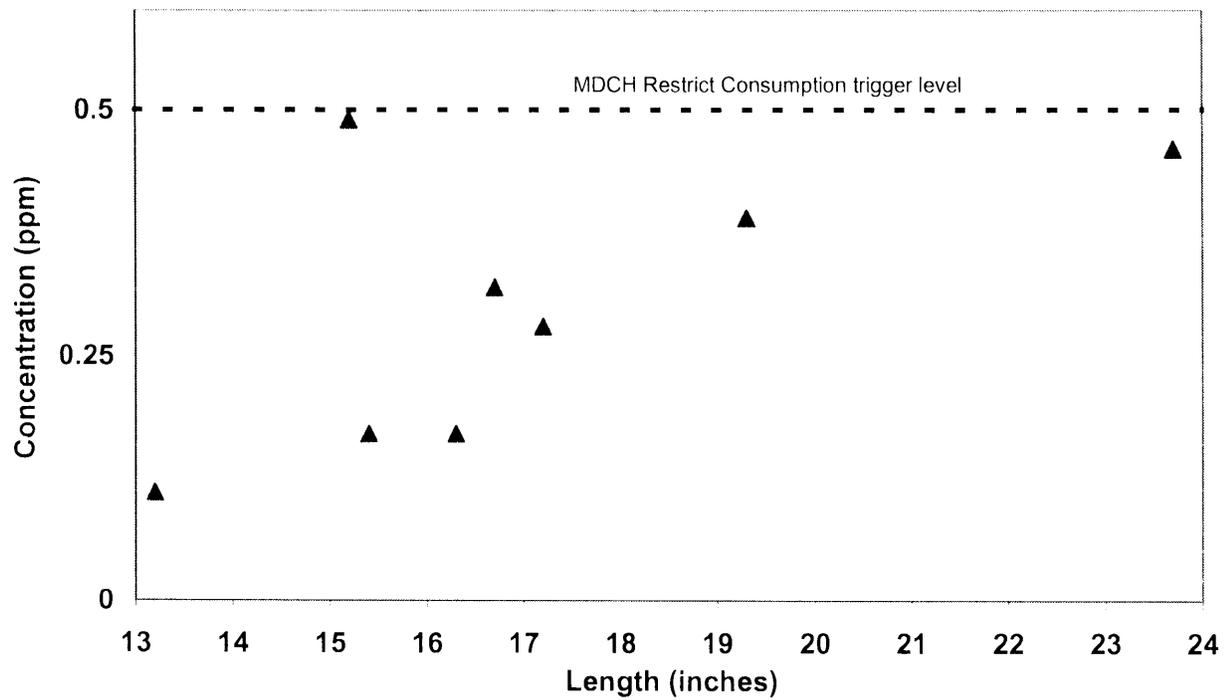


Figure 130. Total length versus mercury concentration in walleye collected from Teal Lake, Marquette County in 2004 (ID 2004122).

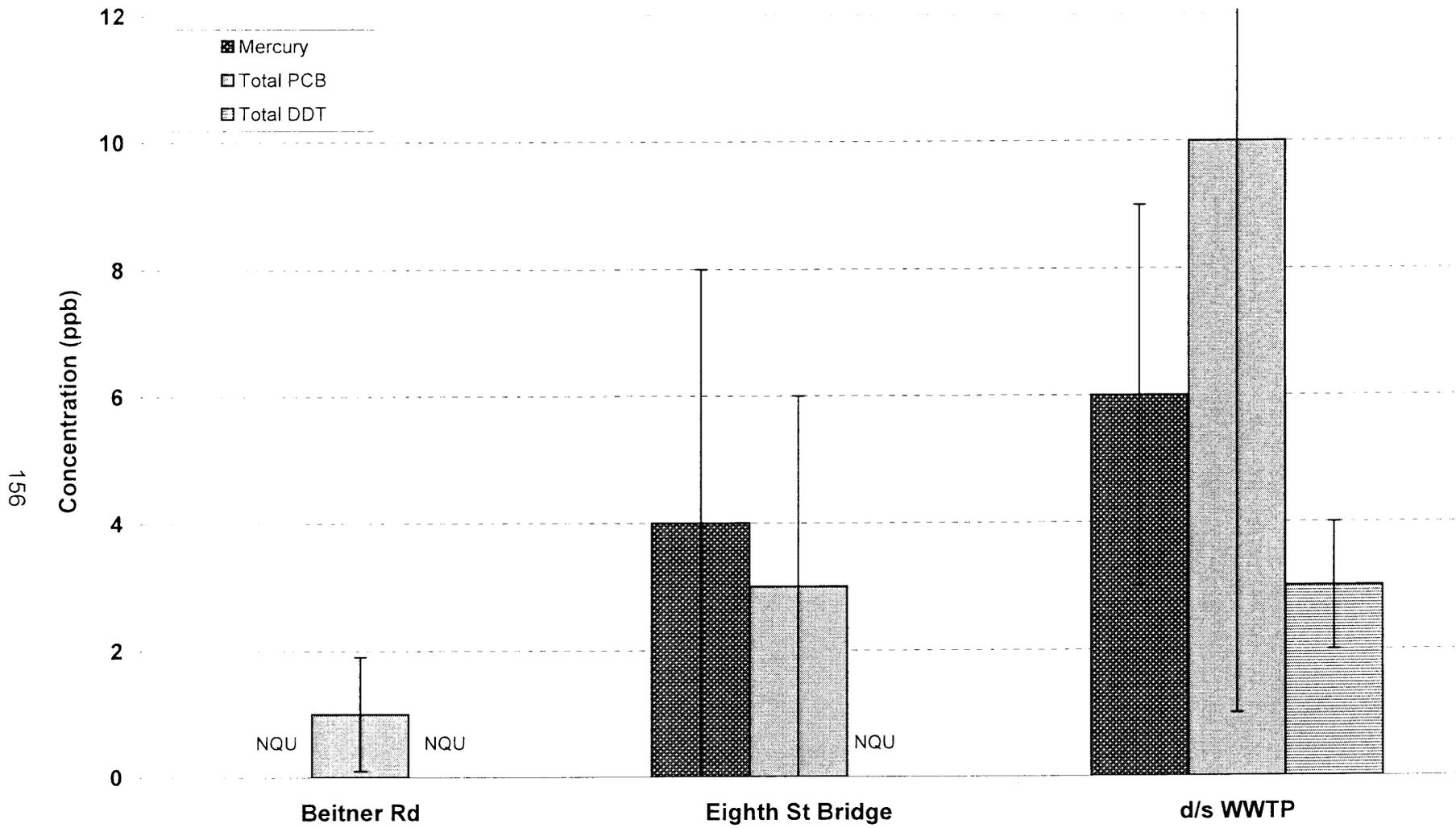


Figure 131. Net uptake of contaminants in Boardman River caged fish monitored in 2003. Mercury concentrations are wet weight and all other concentrations are lipid normalized. Error bars indicate 95% confidence intervals . (NQU = no quantifiable uptake)

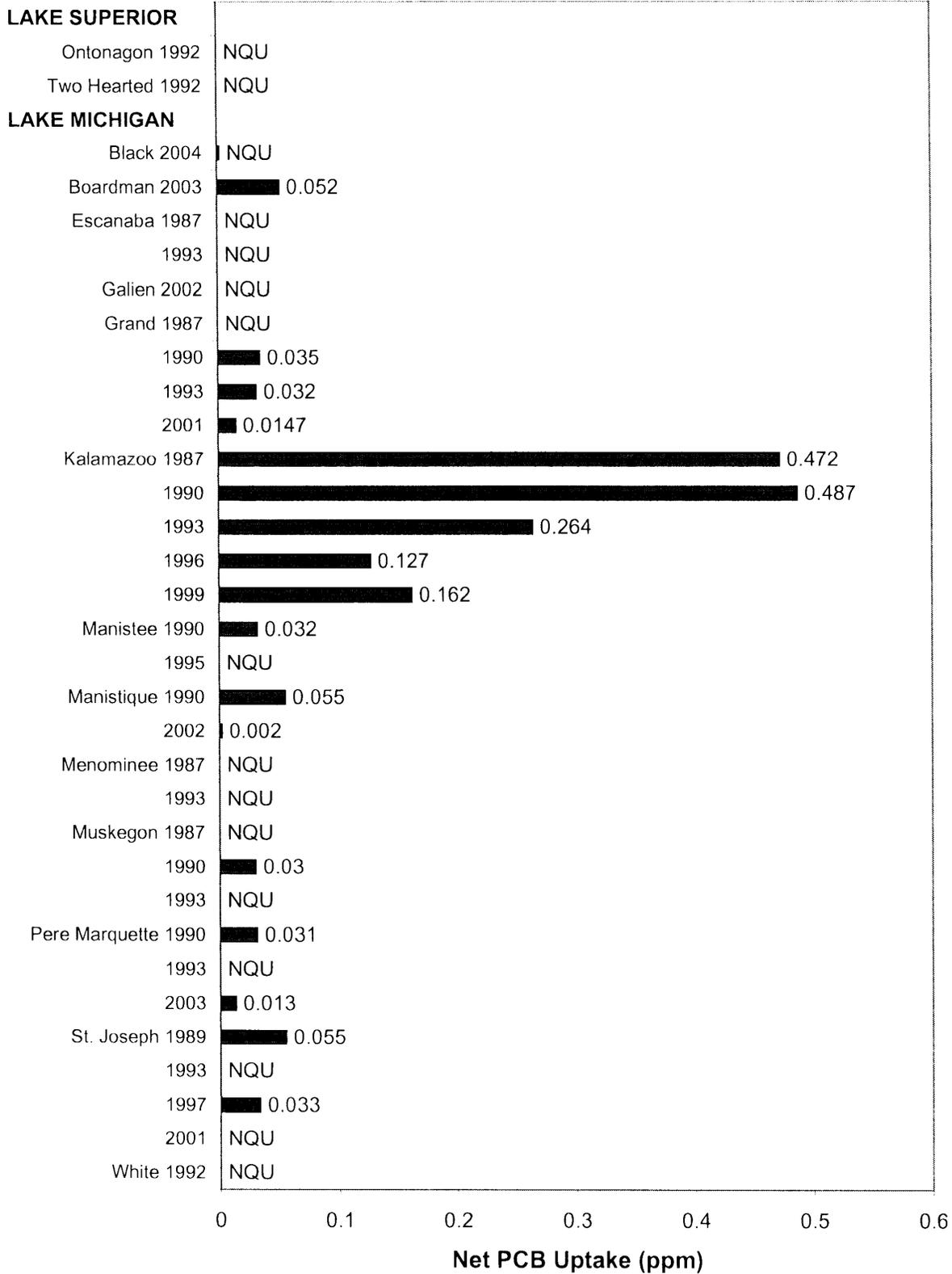
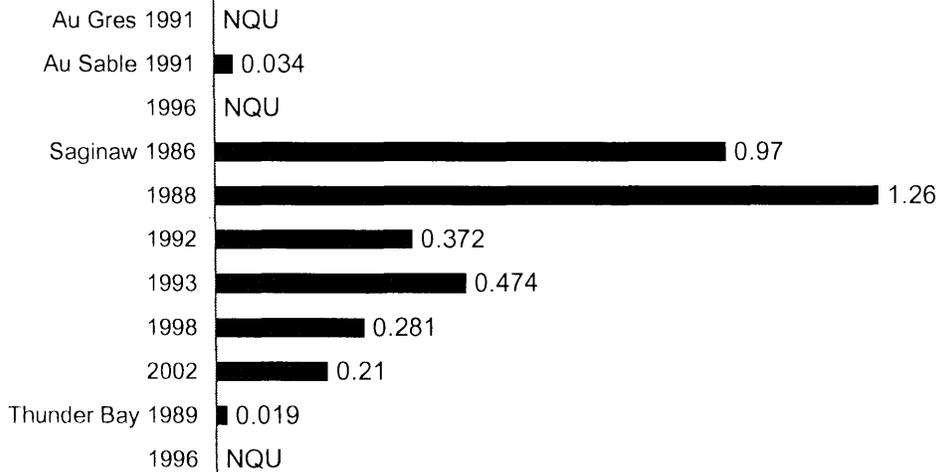


Figure 132. Net uptake of total PCB in caged fish from the mouths of selected Michigan rivers (NQU = no quantifiable uptake).

**LAKE HURON**



**LAKE ERIE**

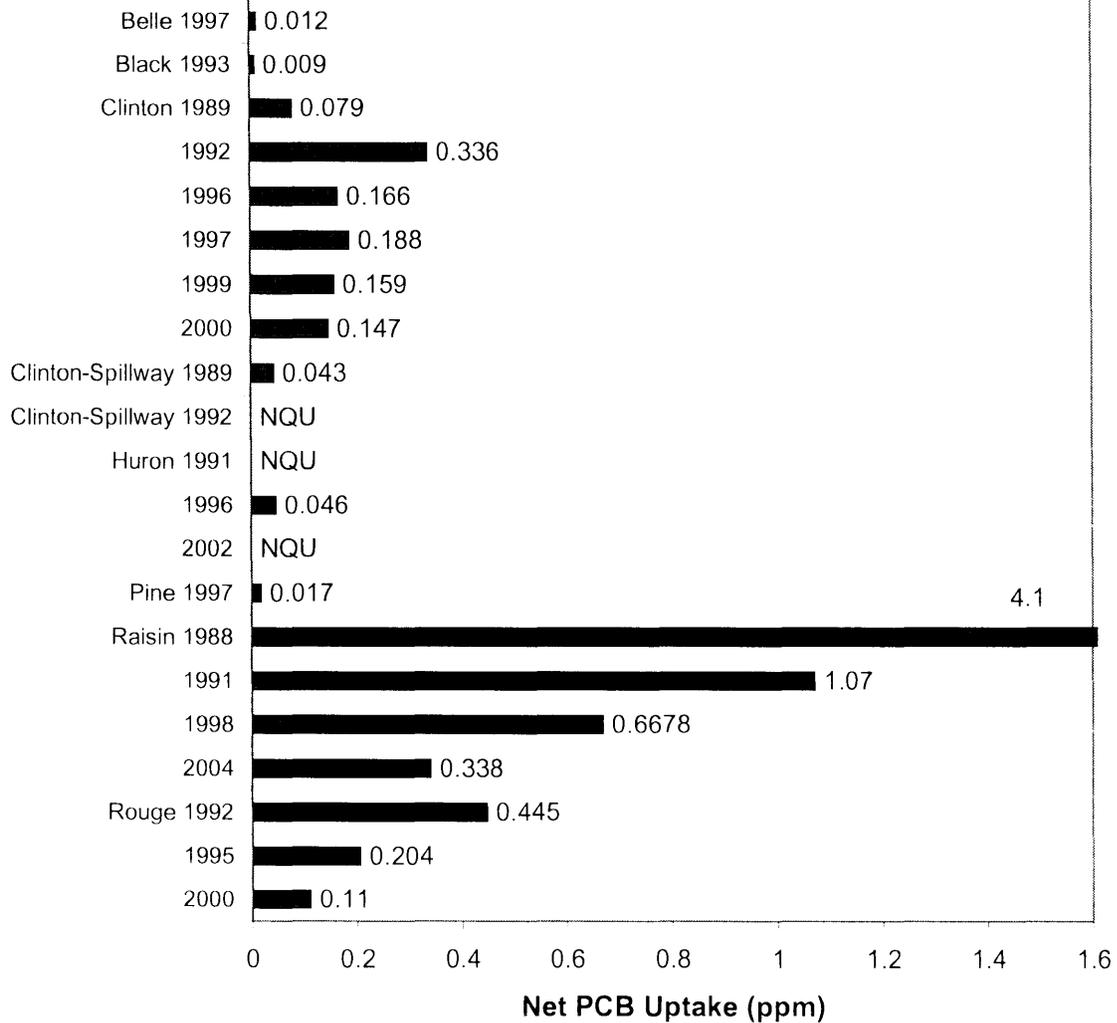


Figure 132. Continued.

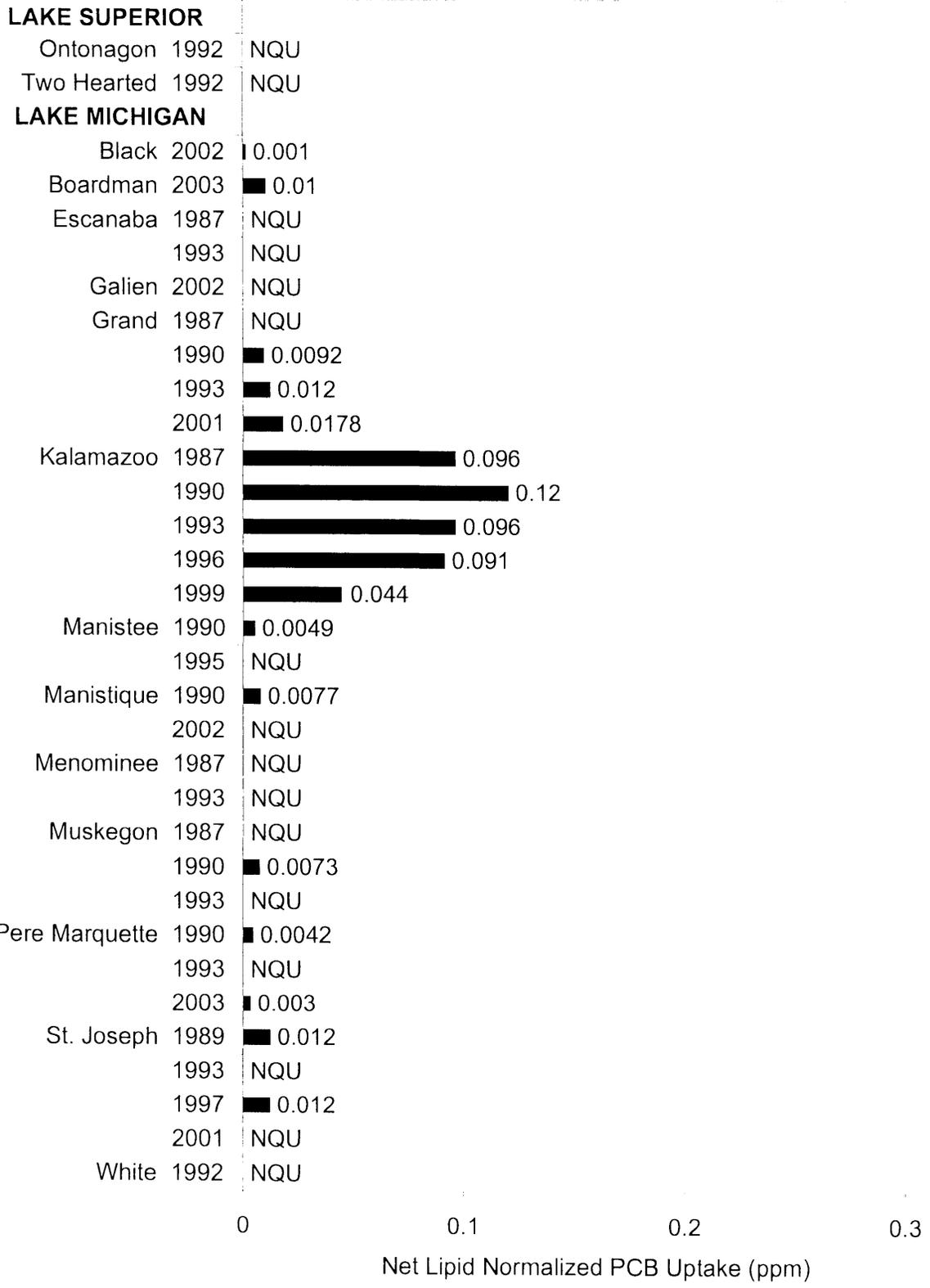


Figure 133. Net uptake of lipid normalized total PCB in caged fish from the mouths of selected Michigan rivers (NQU = no quantifiable uptake).

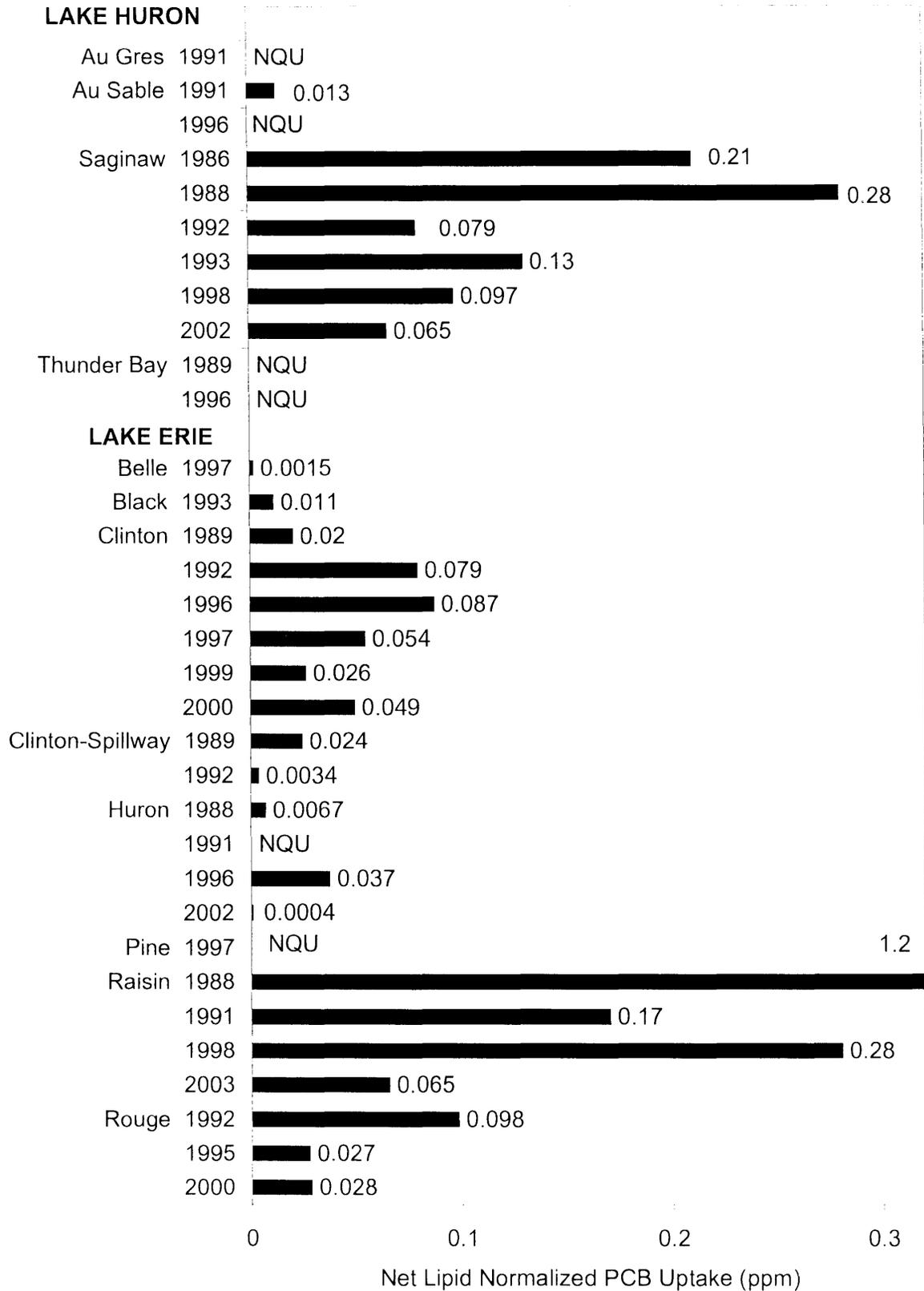


Figure 133. Continued

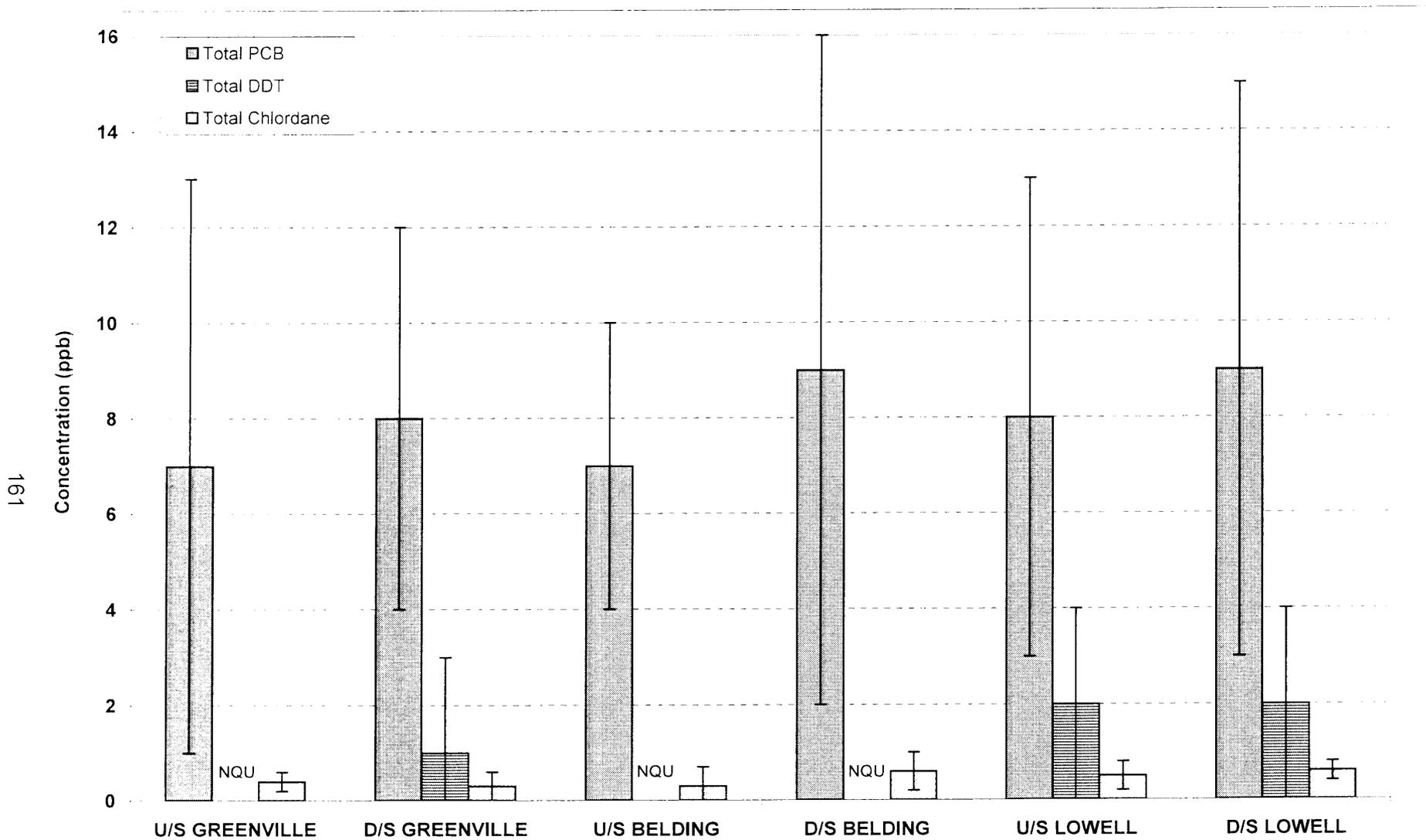


Figure 134. Net uptake of contaminants in Flat River caged fish monitored in 2003. Concentrations are lipid normalized. Error bars indicate 95% confidence intervals. (NQU = no quantifiable uptake).

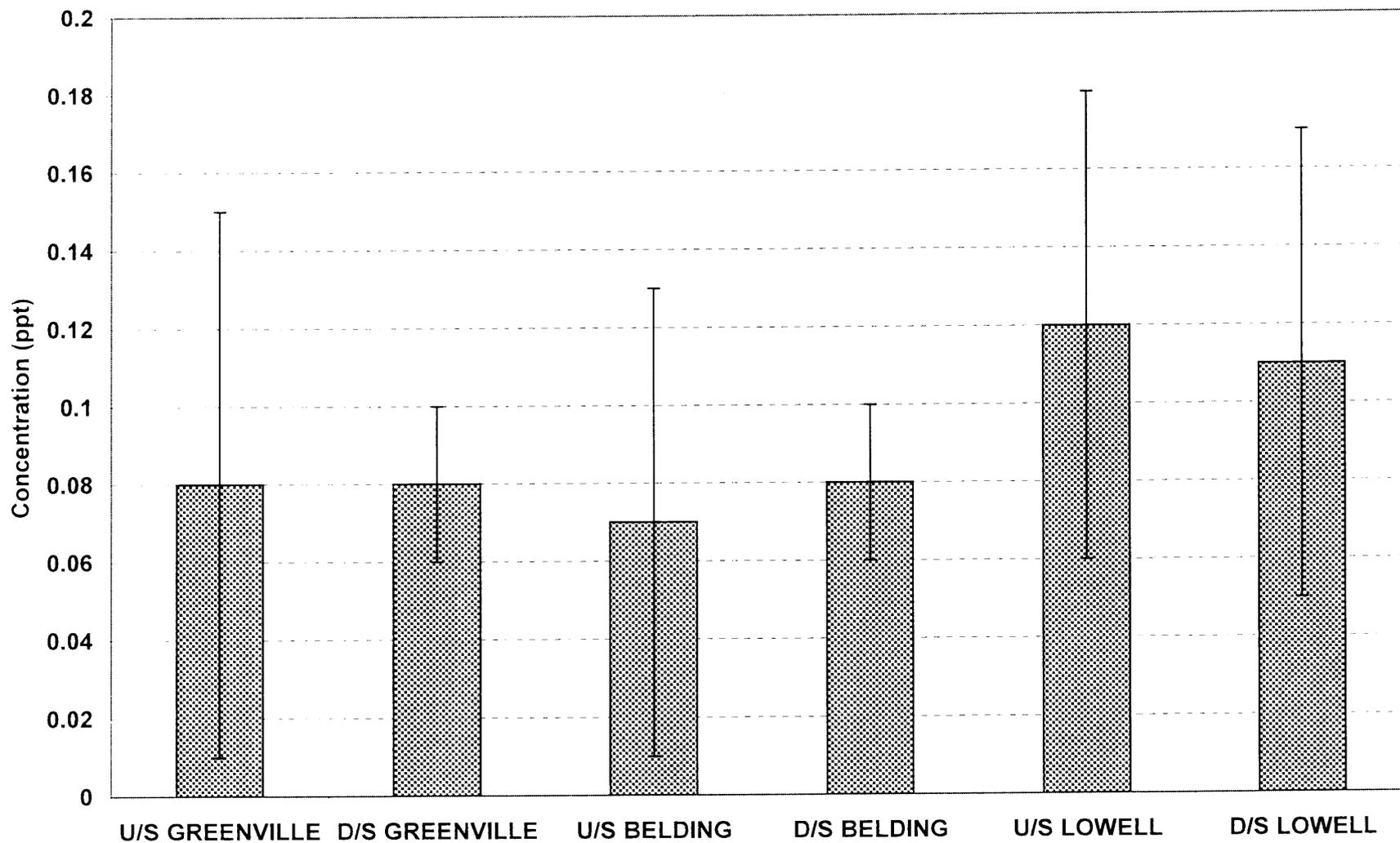


Figure 135. Net uptake of total Dioxin TEQ in Flat River caged fish monitored in 2003. Concentrations are lipid normalized. Error bars indicate 95% confidence intervals.

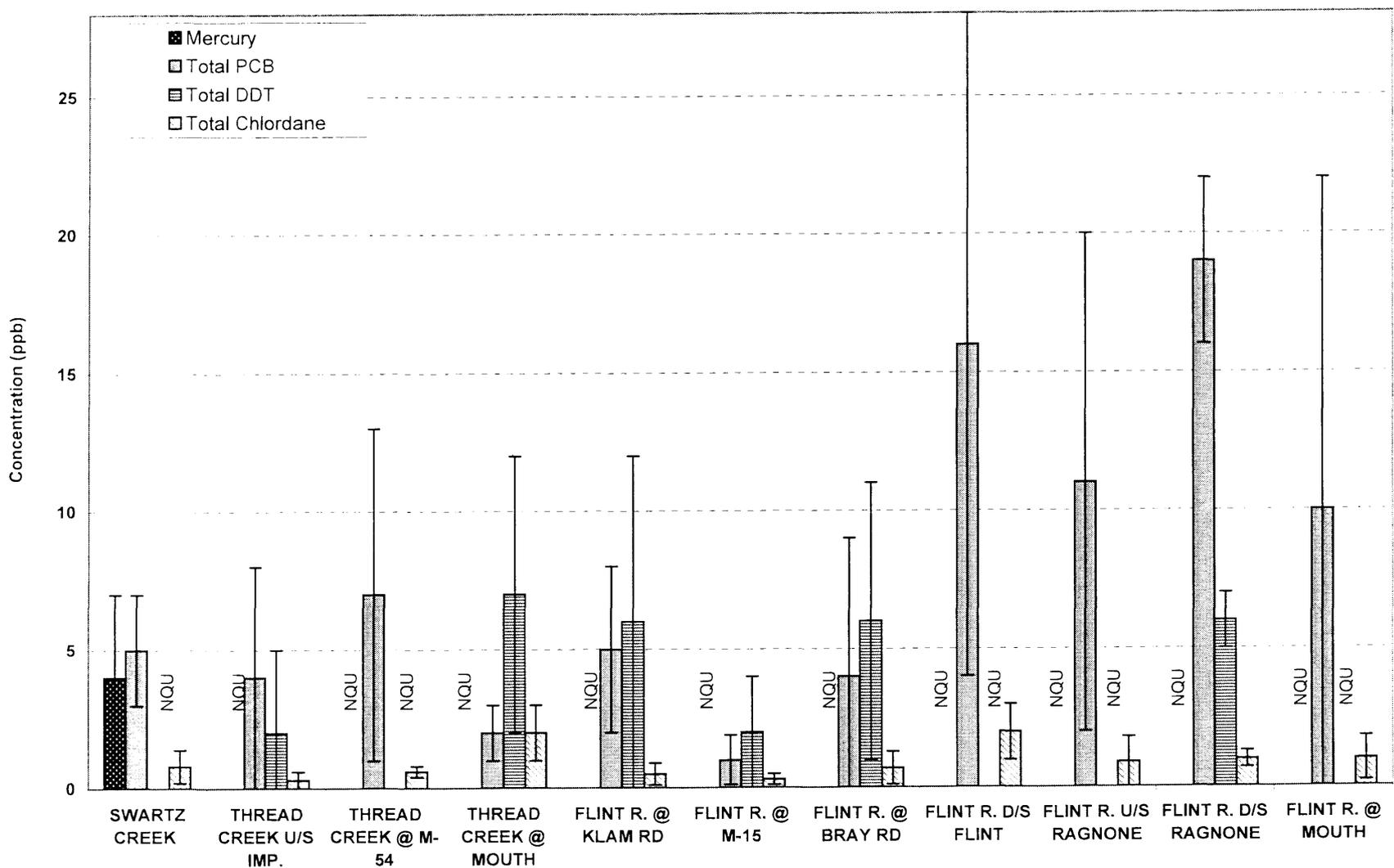


Figure 136. Net uptake of contaminants in Flint River caged fish monitored in 2003. Mercury concentrations are wet weight and all others are lipid normalized. Error bars indicate 95% confidence intervals. (NQU = no quantifiable uptake).

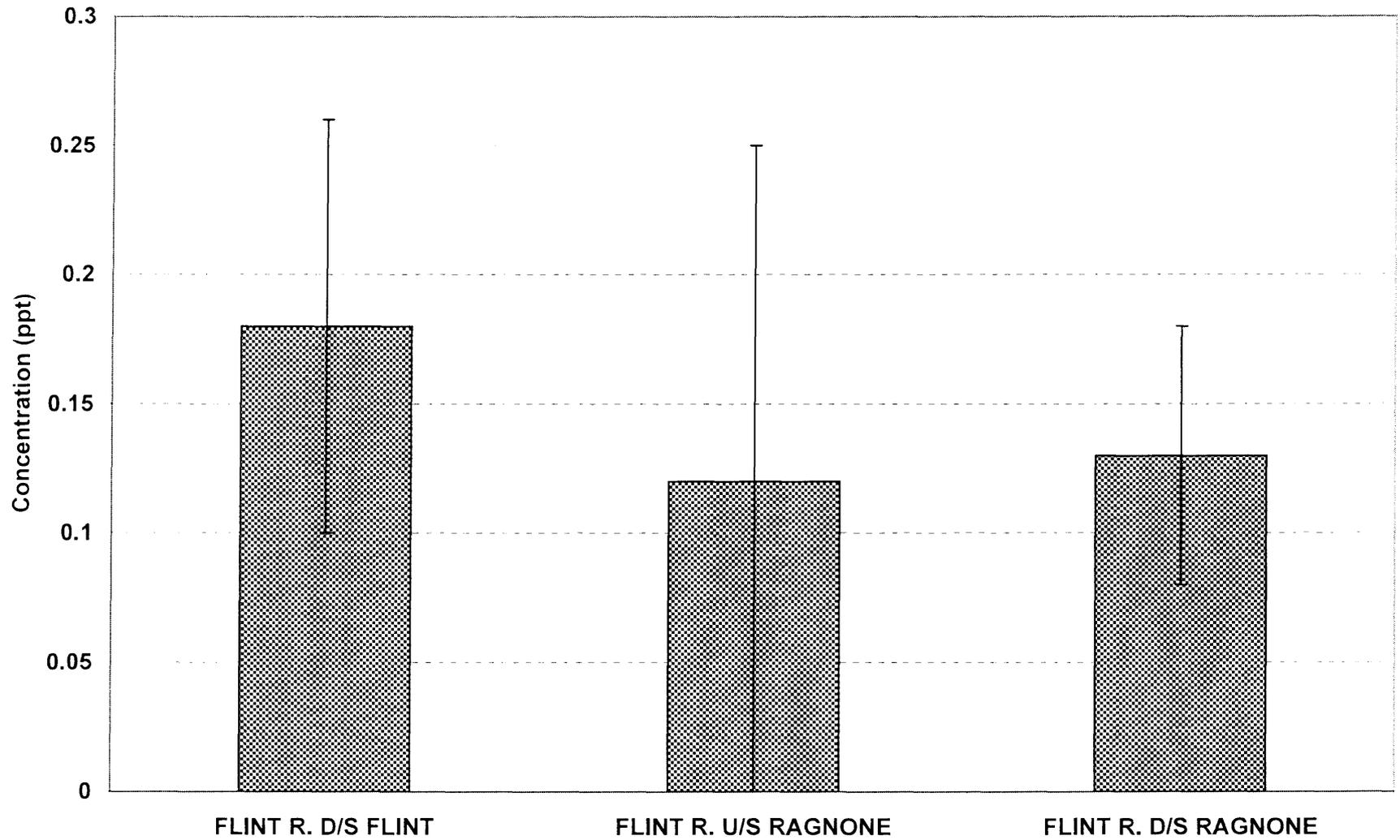


Figure 137. Net uptake of total Dioxin TEQ in Flint River caged fish monitored in 2003. Concentrations are lipid normalized. Error bars indicate 95% confidence intervals.

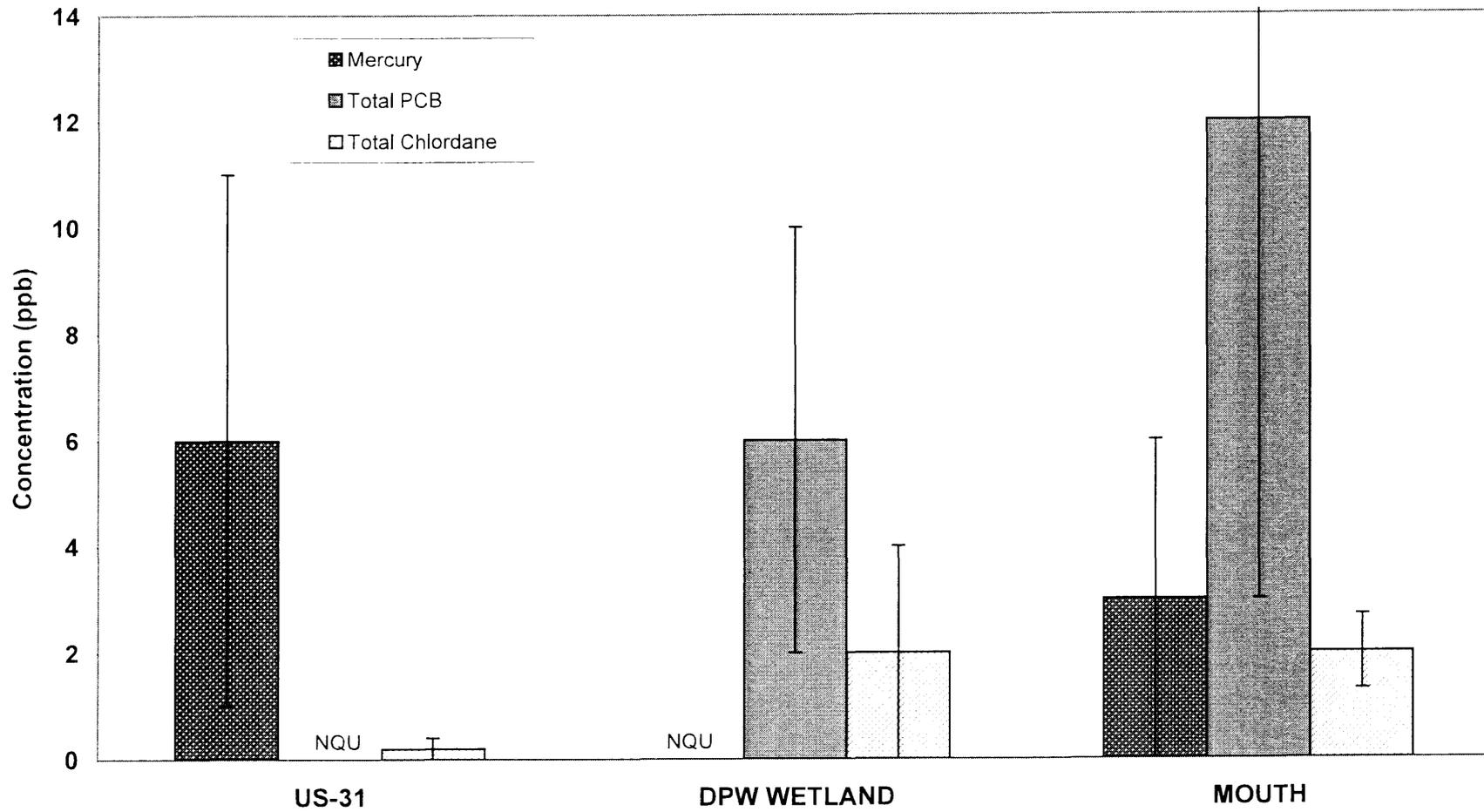


Figure 138. Net uptake of contaminants in Flint River caged fish monitored in 2004. Mercury concentrations are wet weight and all others are lipid normalized. Error bars indicate 95% confidence intervals. (NQU = no quantifiable uptake).

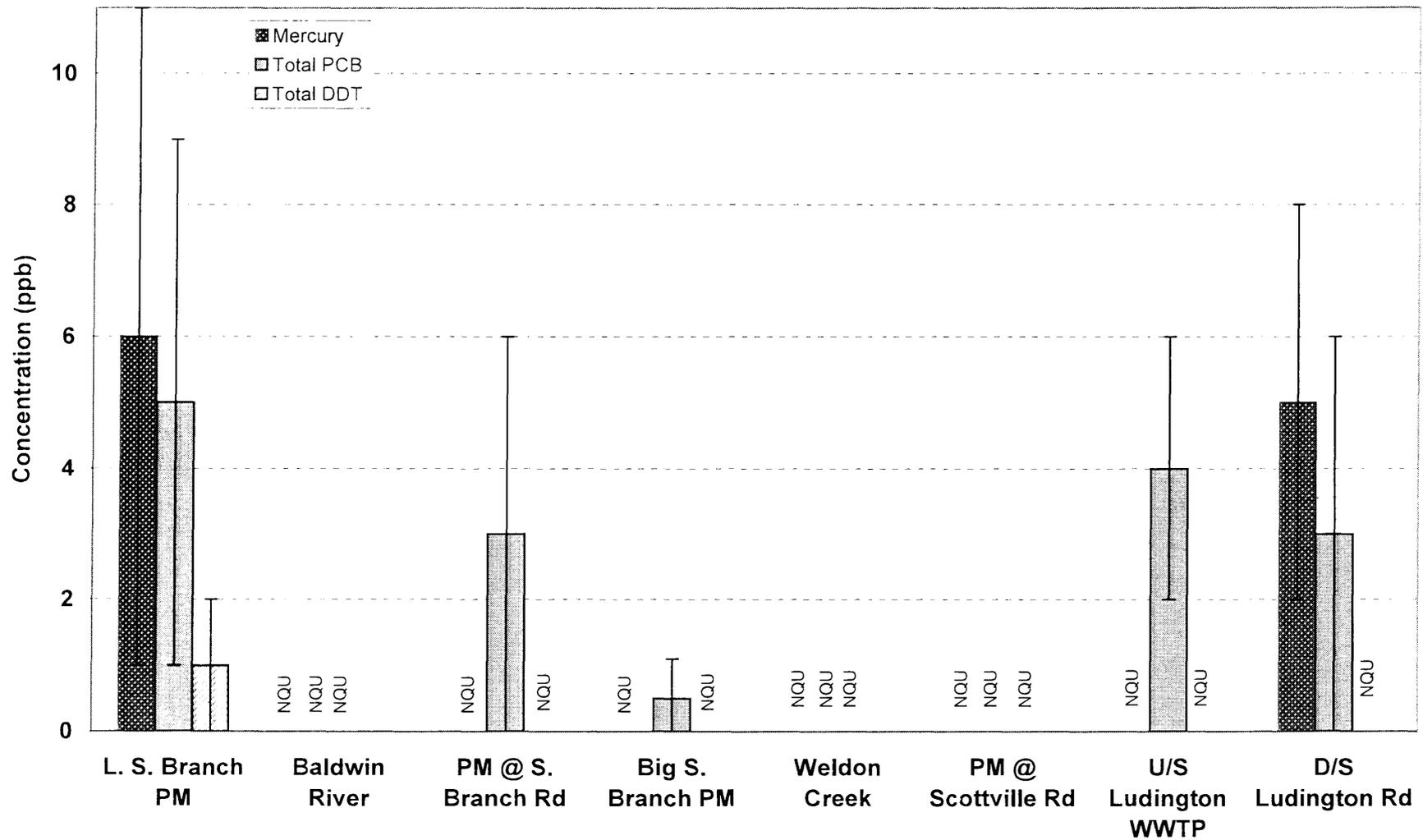


Figure 139. Net uptake of contaminants in Pere Marquette River caged fish monitored in 2003. Mercury concentrations are wet weight and all other concentrations are lipid normalized. Error bars indicate 95% confidence intervals. (NQU = no quantifiable uptake).

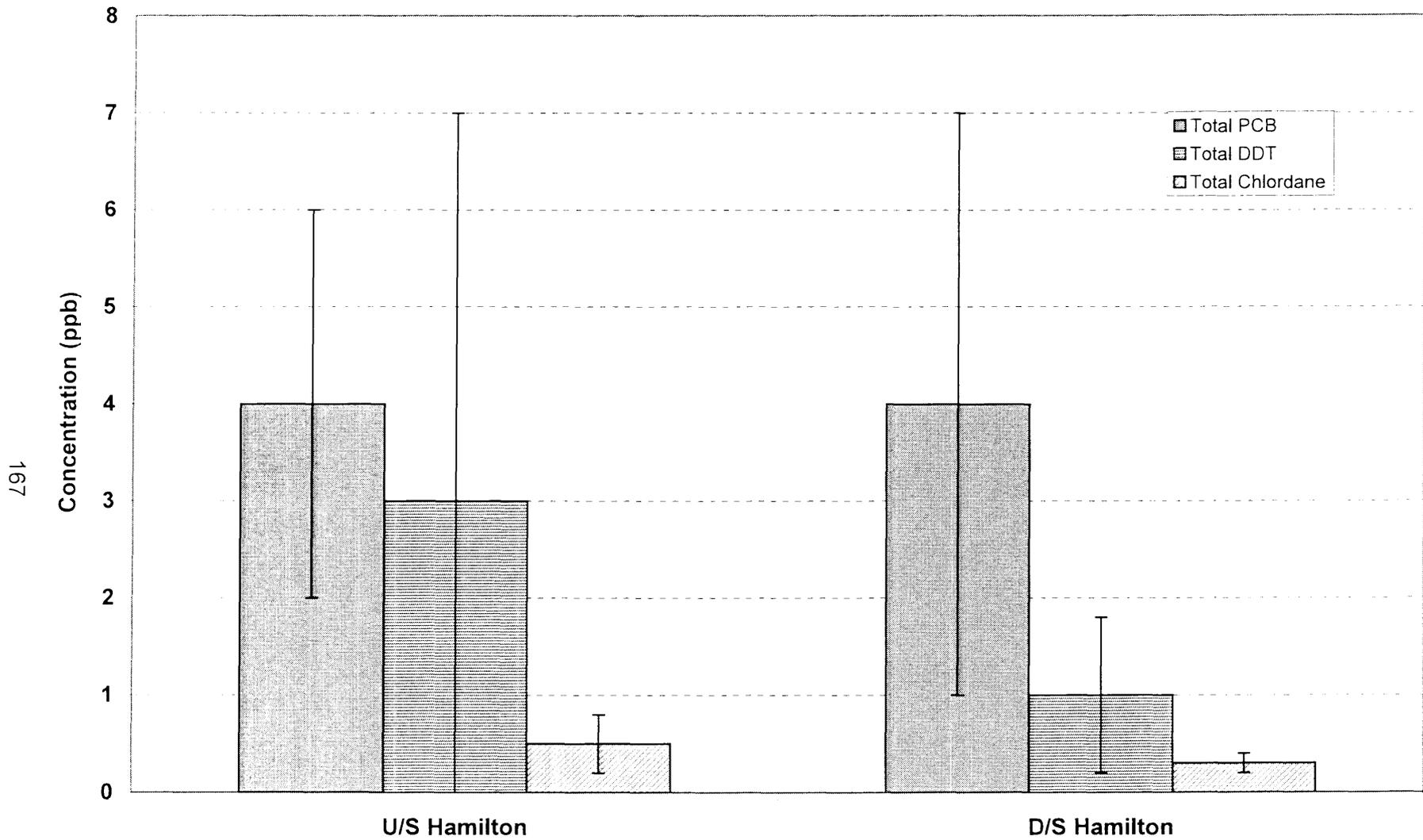


Figure 140. Net uptake of contaminants in Rabbit River caged fish monitored in 2003. Concentrations are lipid normalized. Error bars indicate 95% confidence intervals.

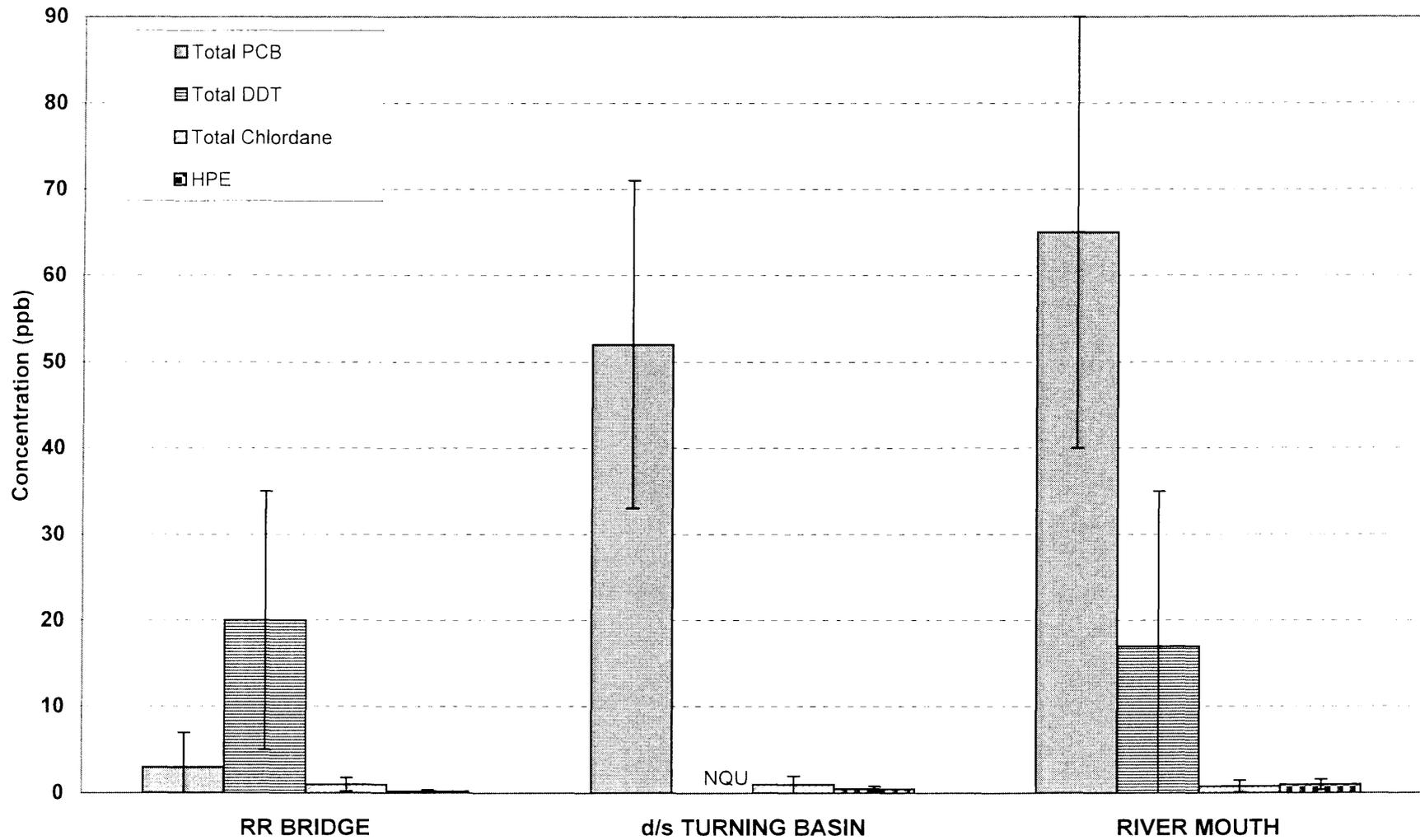


Figure 141. Net uptake of contaminants in River Raisin caged fish monitored in 2004. Concentrations are lipid normalized. Error bars indicate 95% confidence intervals. (NQU = no quantifiable uptake).

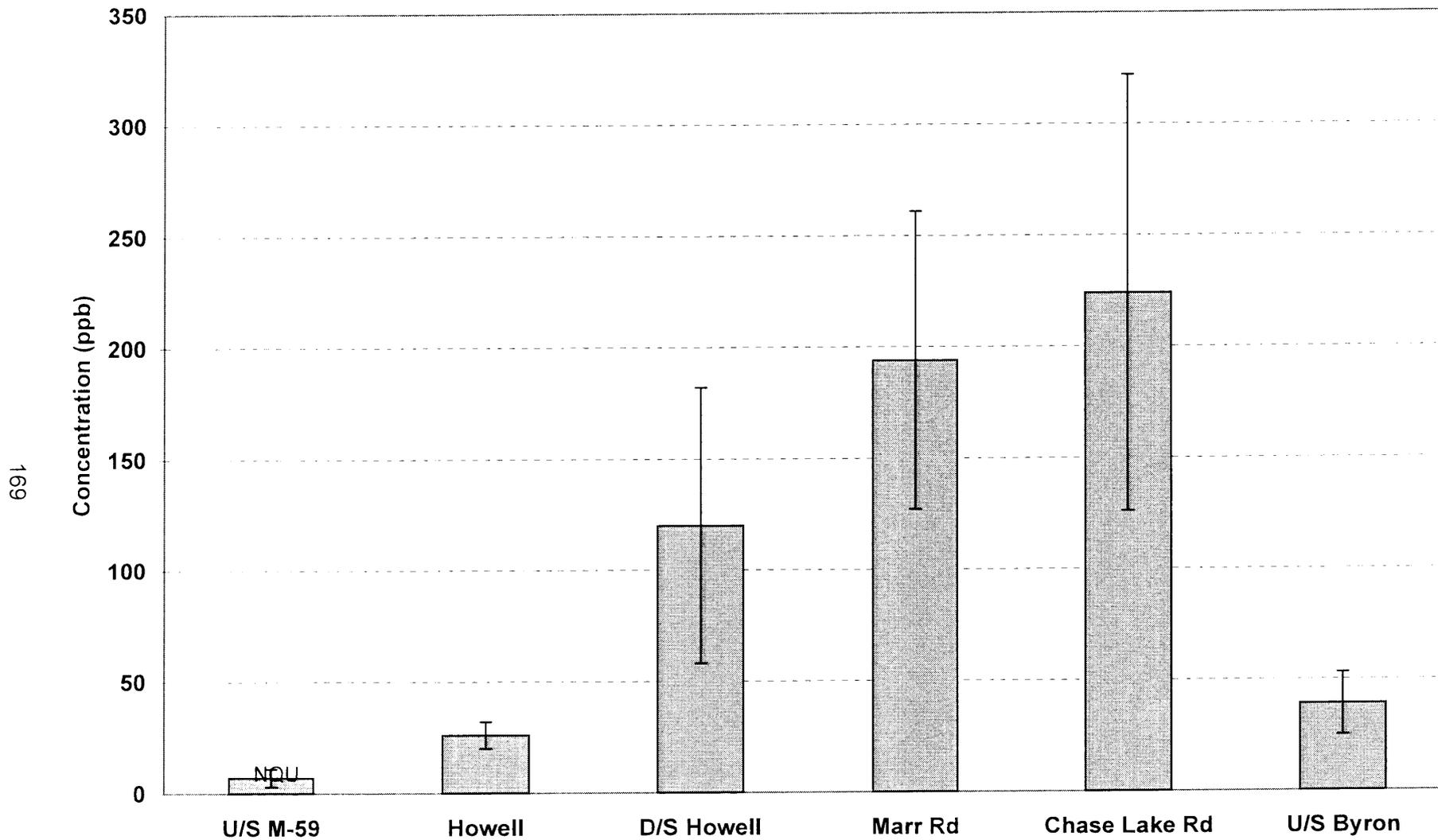


Figure 142. Net uptake of total PCBs in South Branch Shiawassee River caged fish monitored in 2004. Concentrations are lipid normalized. Error bars indicate 95% confidence intervals. (NQU = no quantifiable uptake).

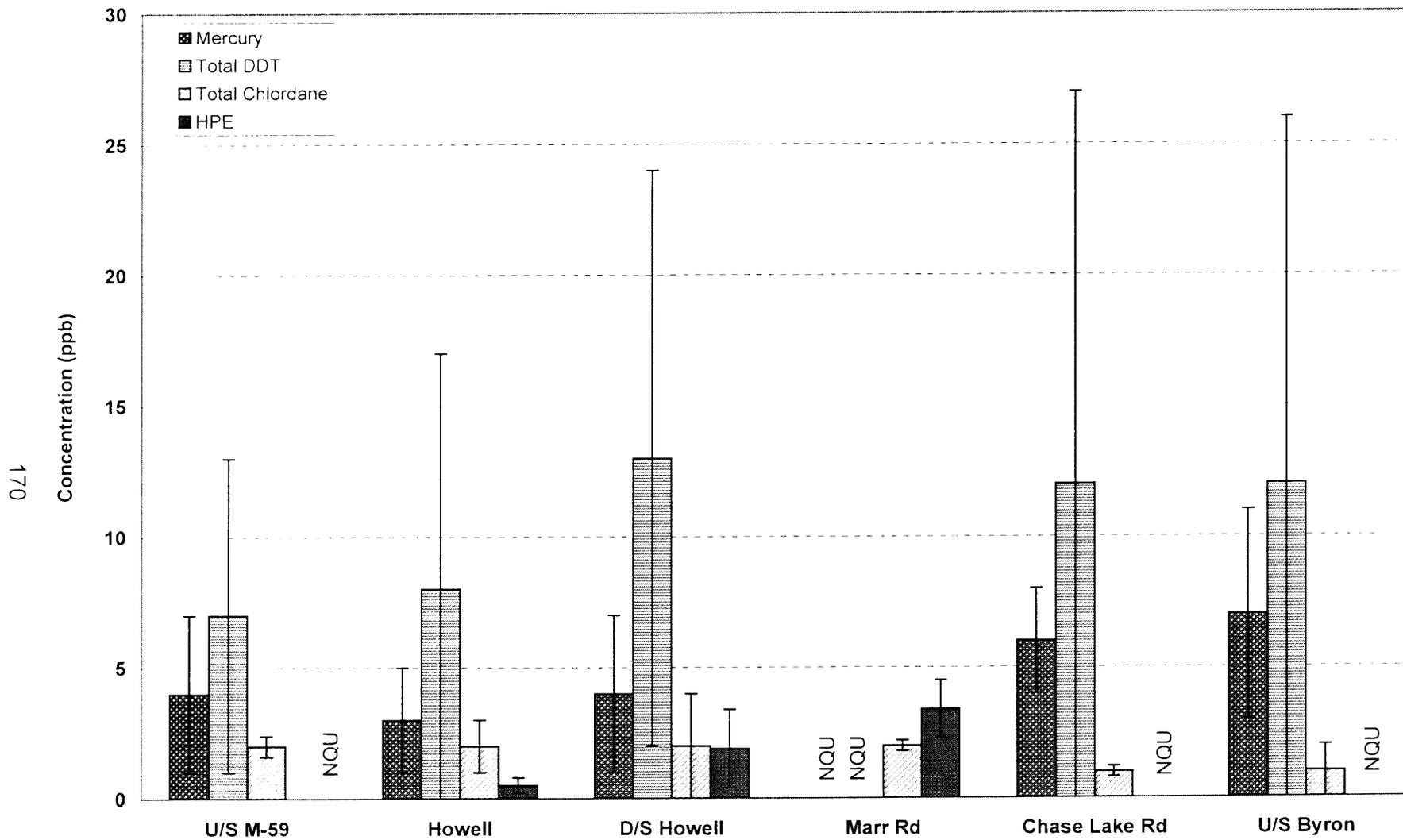


Figure 143. Net uptake of contaminants in South Branch Shiawassee River caged fish monitored in 2004. Mercury concentrations are wet weight and all other concentrations are lipid normalized. Error bars indicate 95% confidence intervals. (NQU = no quantifiable uptake).

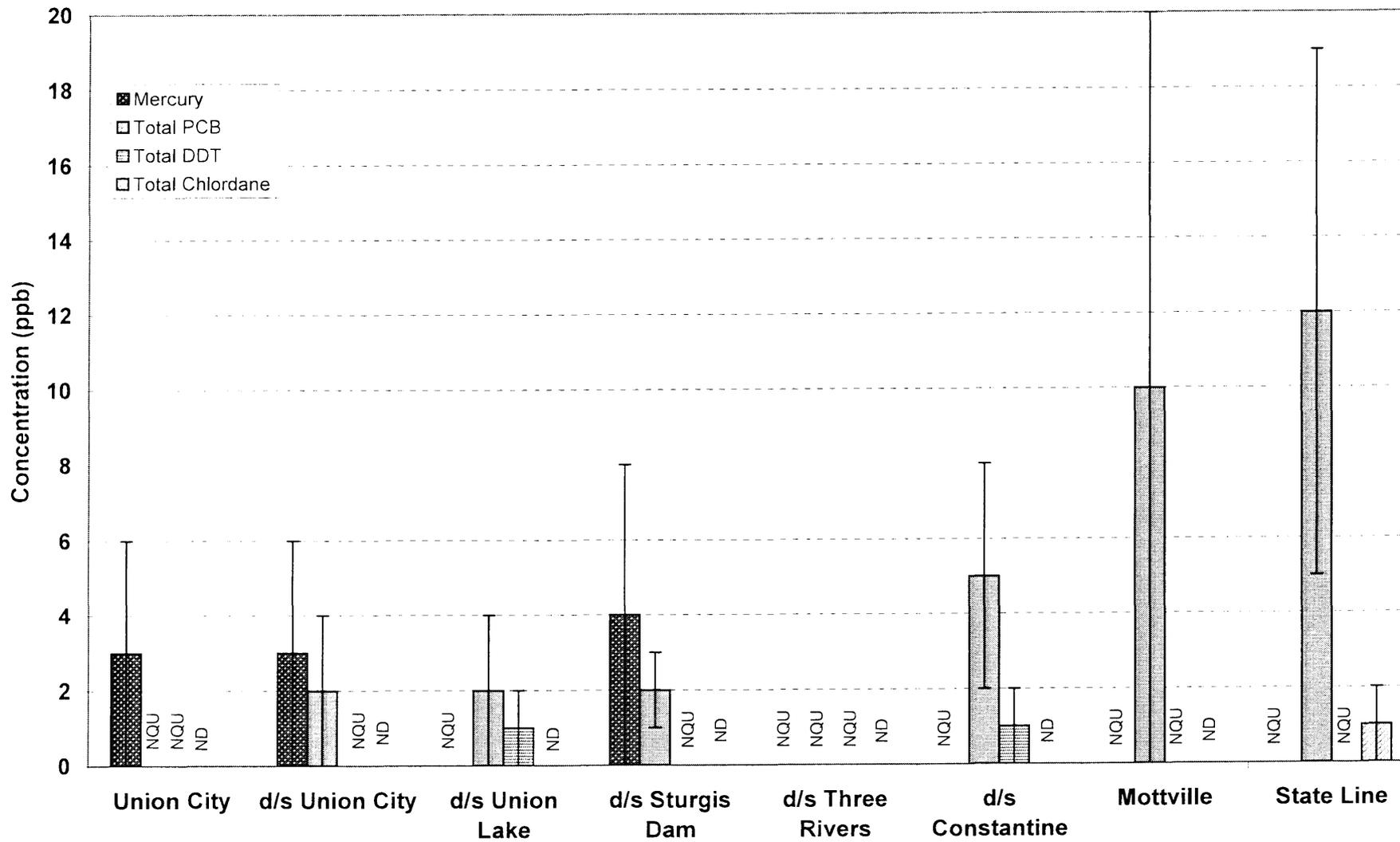


Figure 144. Net uptake of contaminants in St. Joseph River caged fish monitored in 2003. Mercury concentrations are wet weight and all other concentrations are lipid normalized. Error bars indicate 95% confidence intervals. (NQU = no quantifiable uptake, ND = nondetect ).

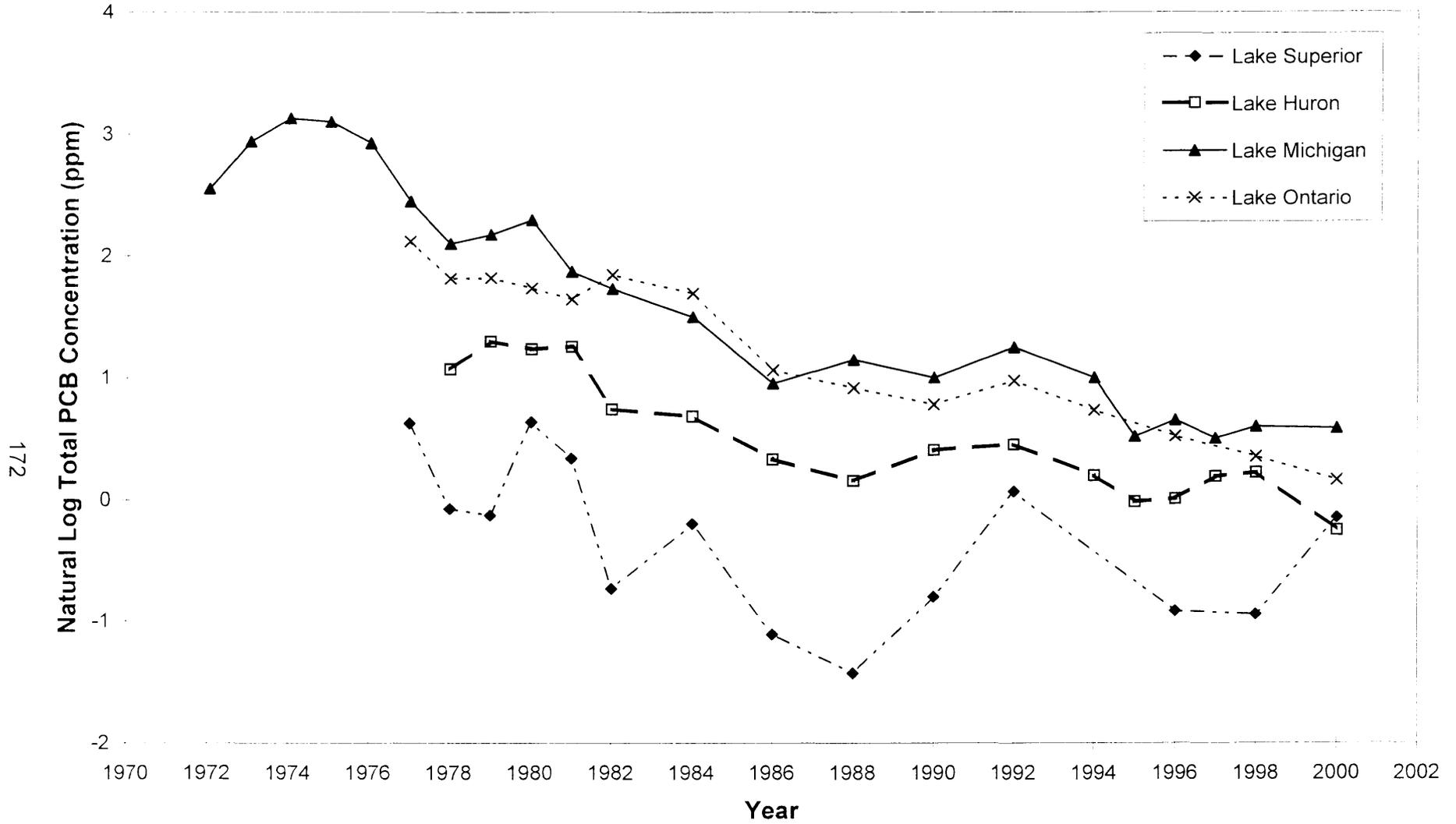


Figure 145. Natural log of average total PCB concentrations in whole lake trout from the Great Lakes, 1970-2000 (DeVault et al. 1996; USEPA unpublished data).

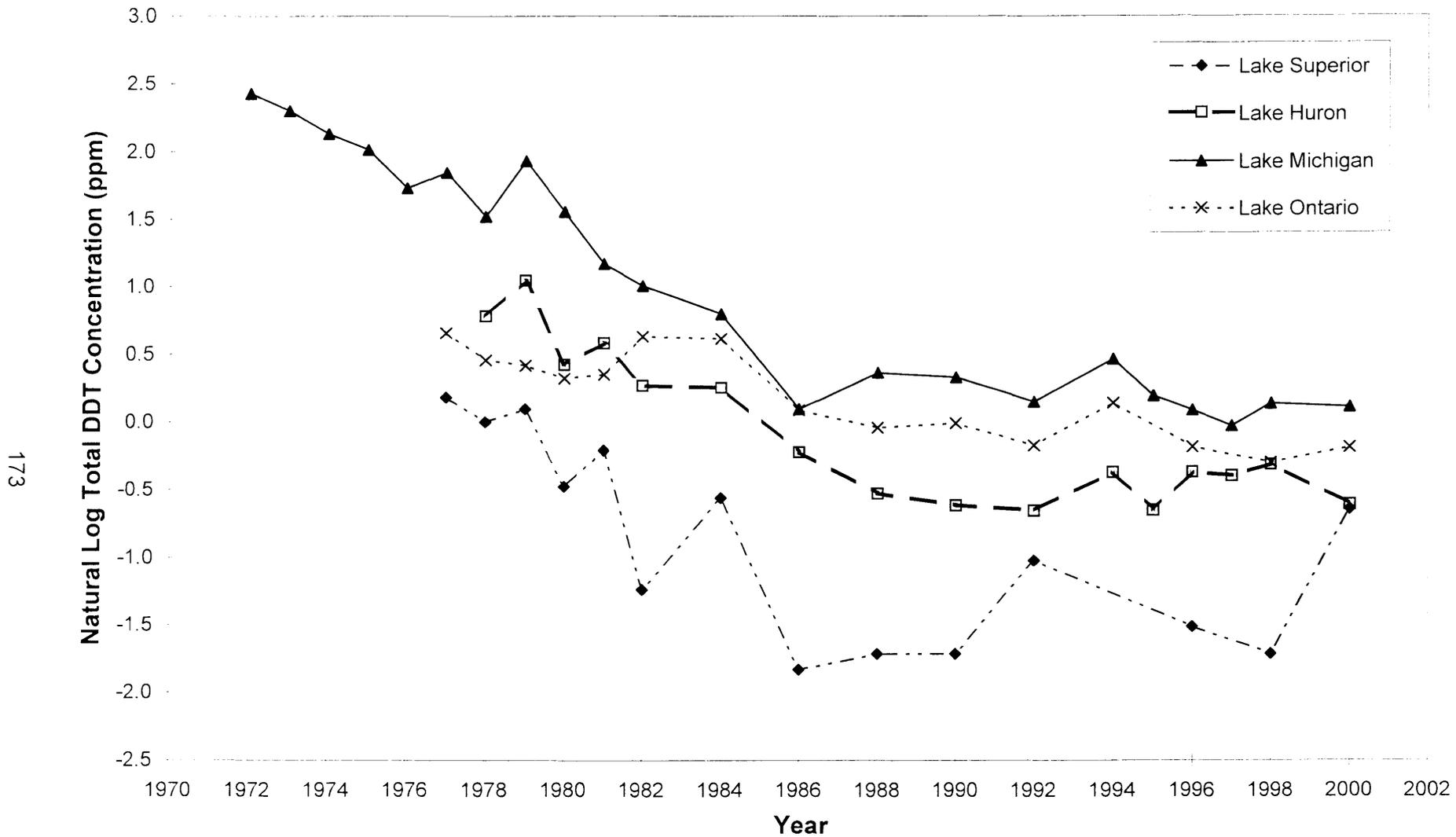


Figure 146. Natural log of average total DDT concentrations in whole lake trout from the Great Lakes, 1970-2000 (DeVault et al. 1996; USEPA unpublished data).

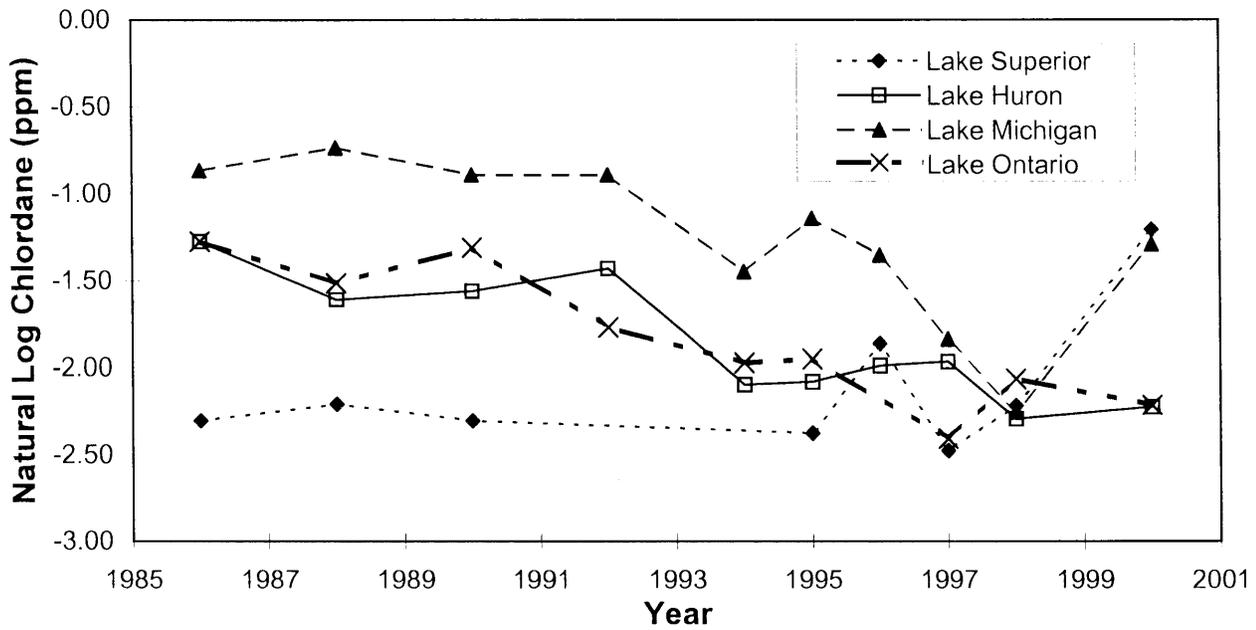


Figure 147. Natural log of average total chlordane concentrations in whole lake trout from the Great Lakes, 1986-2000 (DeVault et al. 1996, USEPA unpublished data).

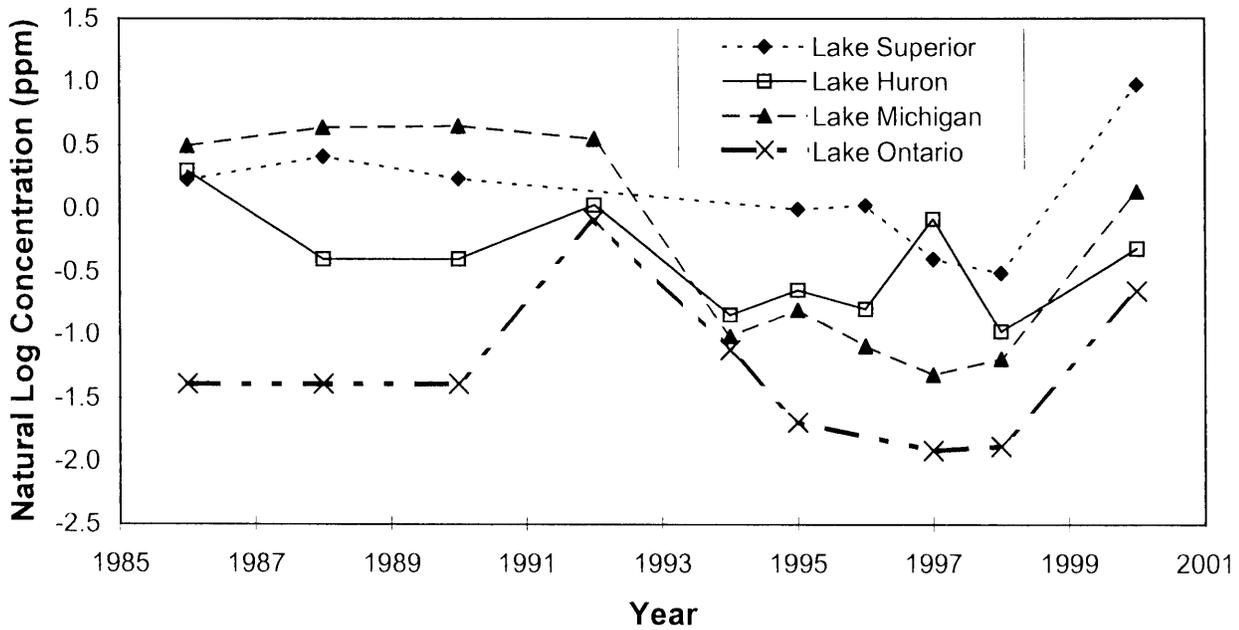


Figure 148. Natural log of average apparent toxaphene concentrations in whole lake trout from the Great Lakes, 1986-2000 (DeVault et al. 1996; USEPA unpublished data). Concentrations were below the quantification level in Lake Ontario fish collected between 1986 and 2000.

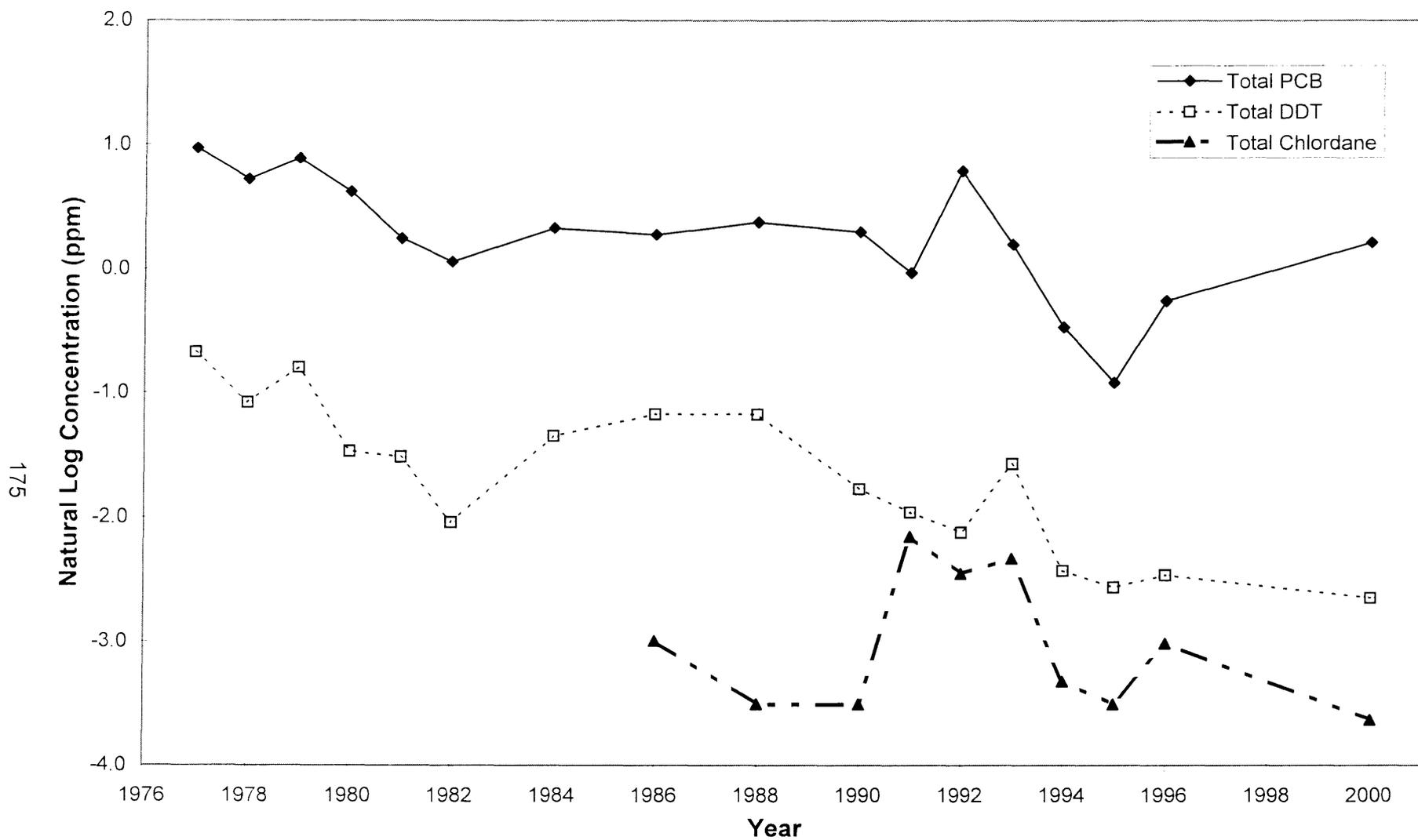


Figure 149. Natural log of average total PCB, total DDT and total chlordane concentrations in whole walleye from Lake Erie 1986-2000 (DeVault et al. 1996; USEPA unpublished data).

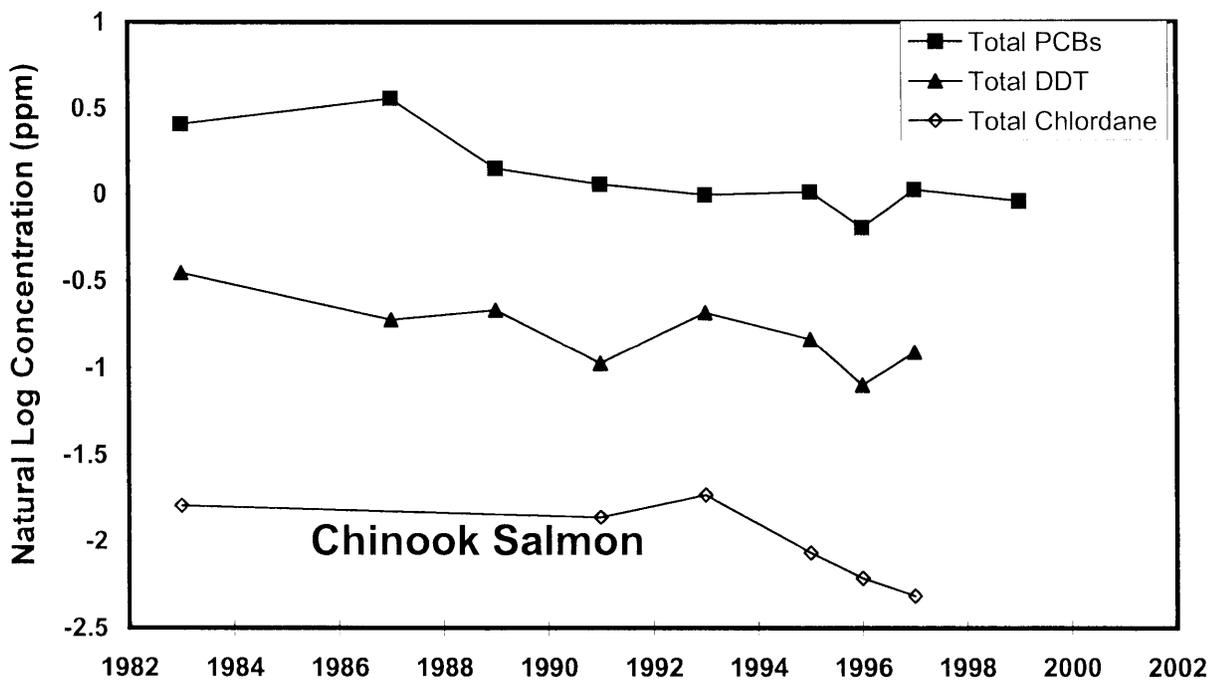
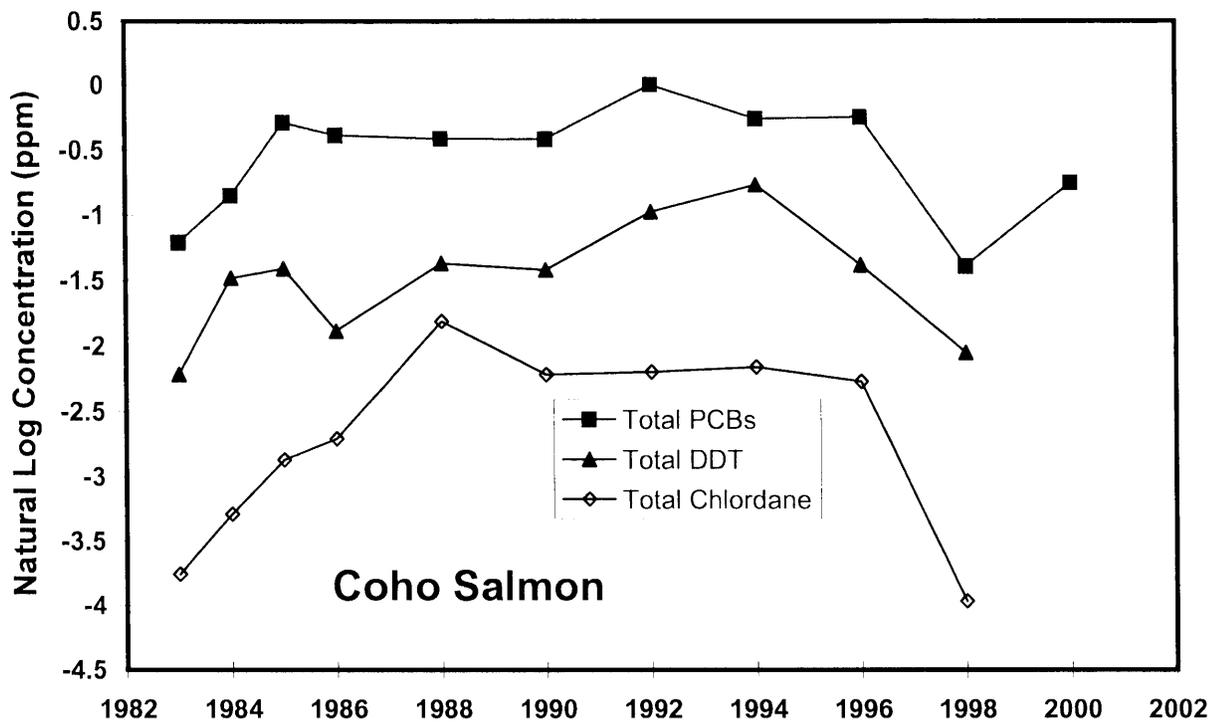


Figure 150. Natural log of average total PCB, total DDT and total chlordane concentrations in coho and chinook salmon fillet samples from Lake Michigan.

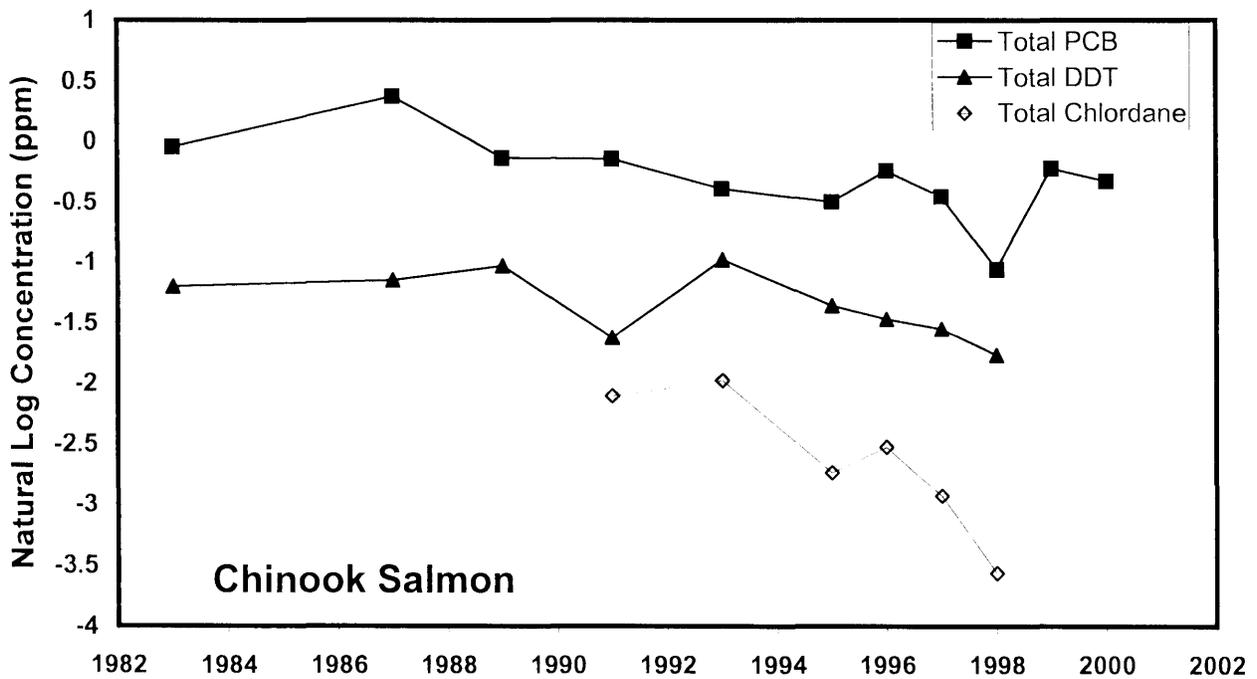
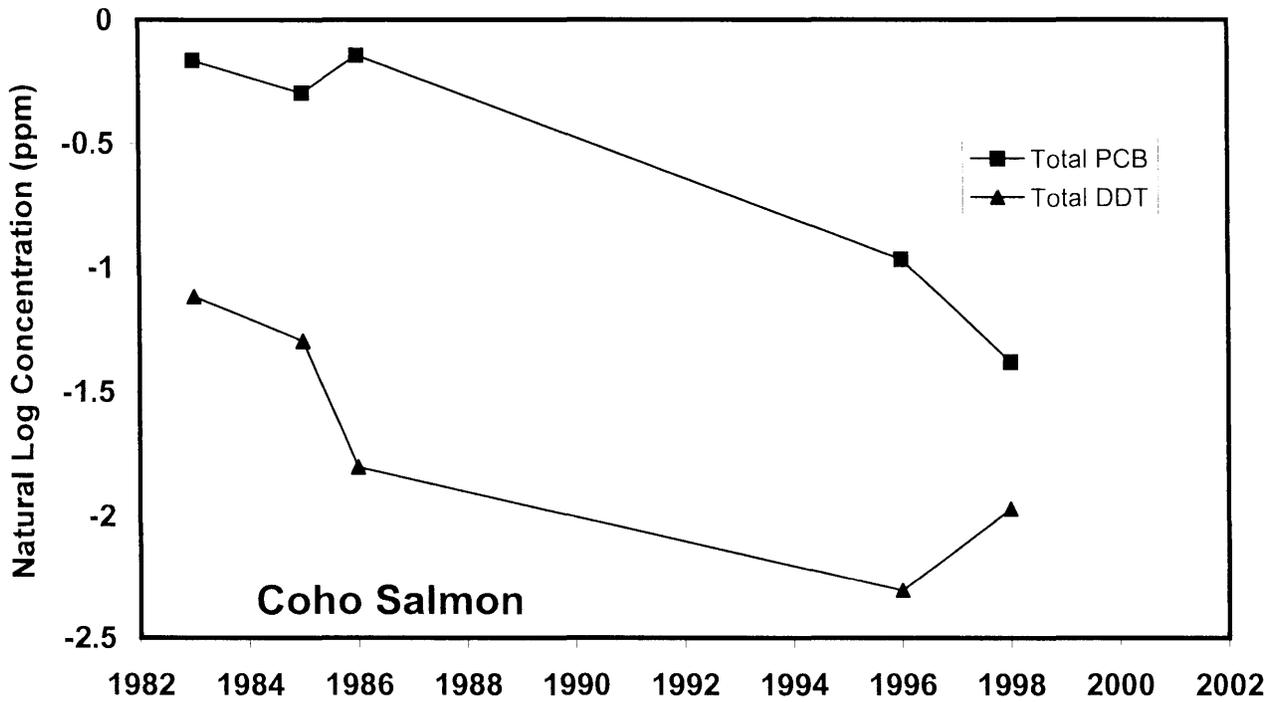


Figure 151. Natural log of average total PCB, total DDT and total chlordane concentrations in coho and chinook salmon fillet samples from Lake Huron.

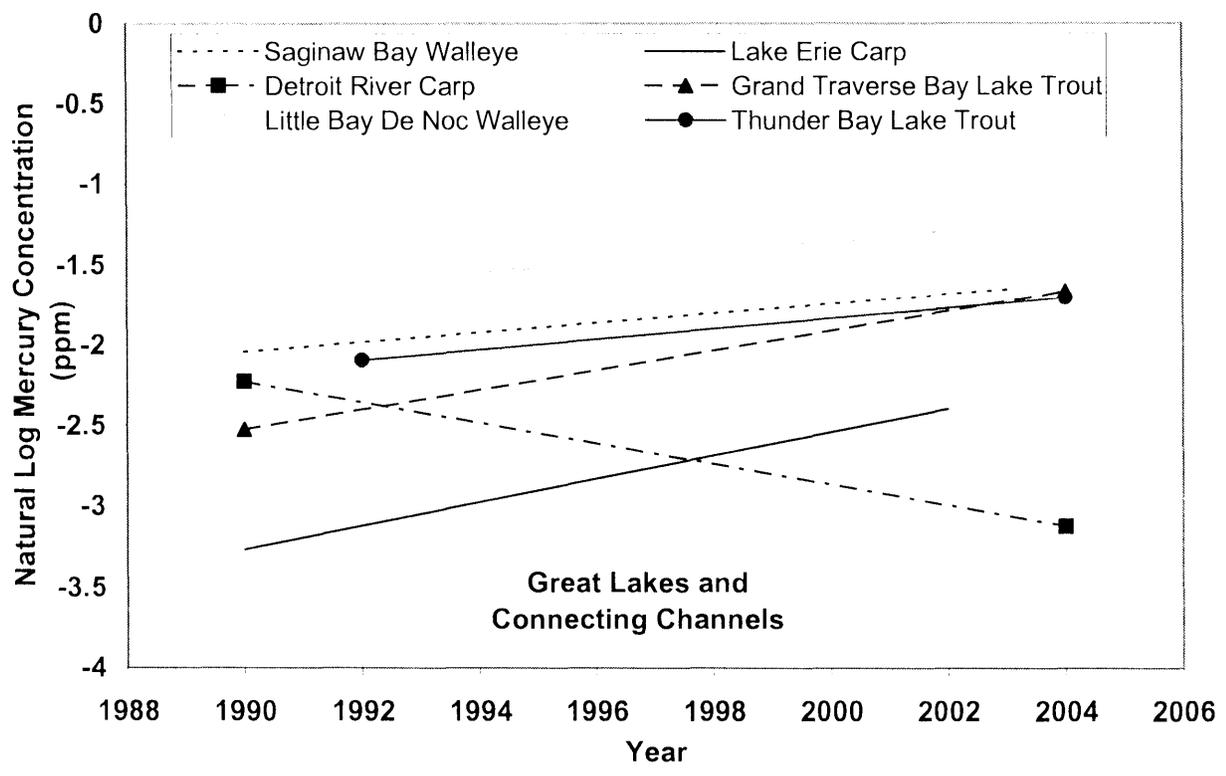
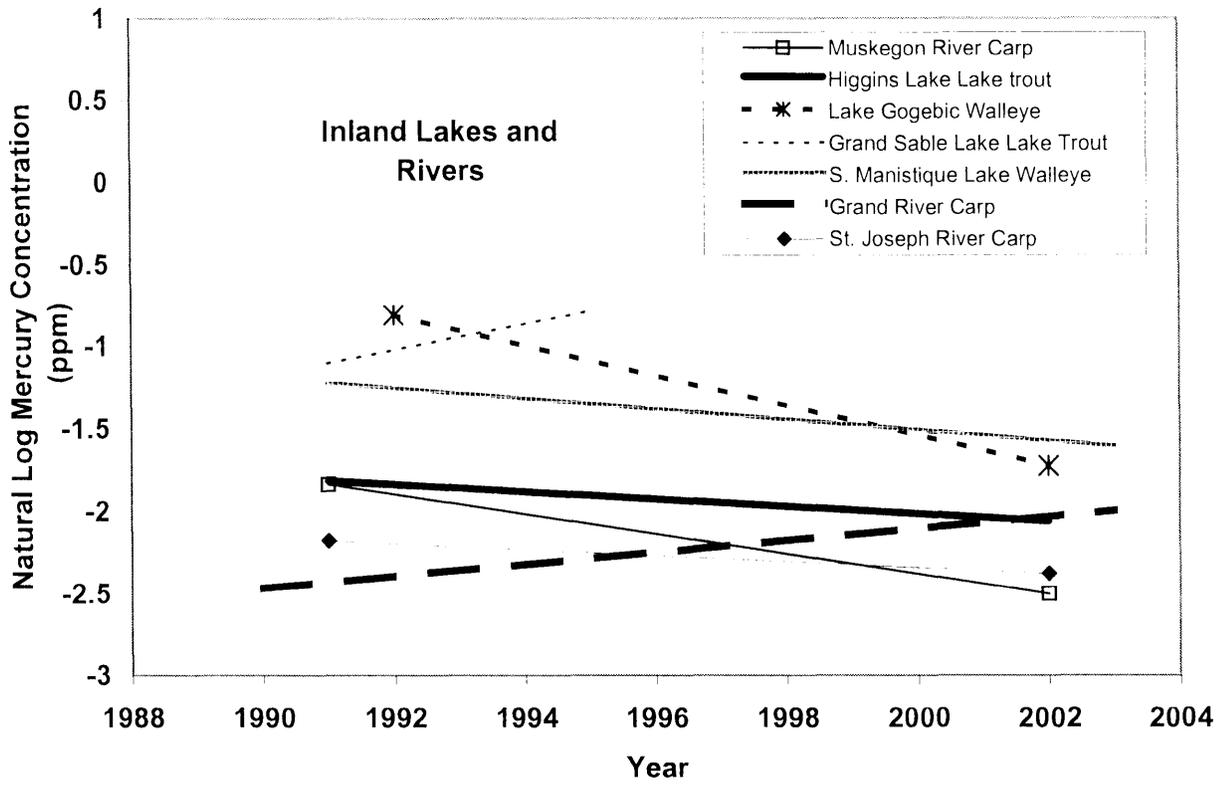


Figure 152. Temporal changes in mercury concentrations at selected whole-fish trend monitoring sites.

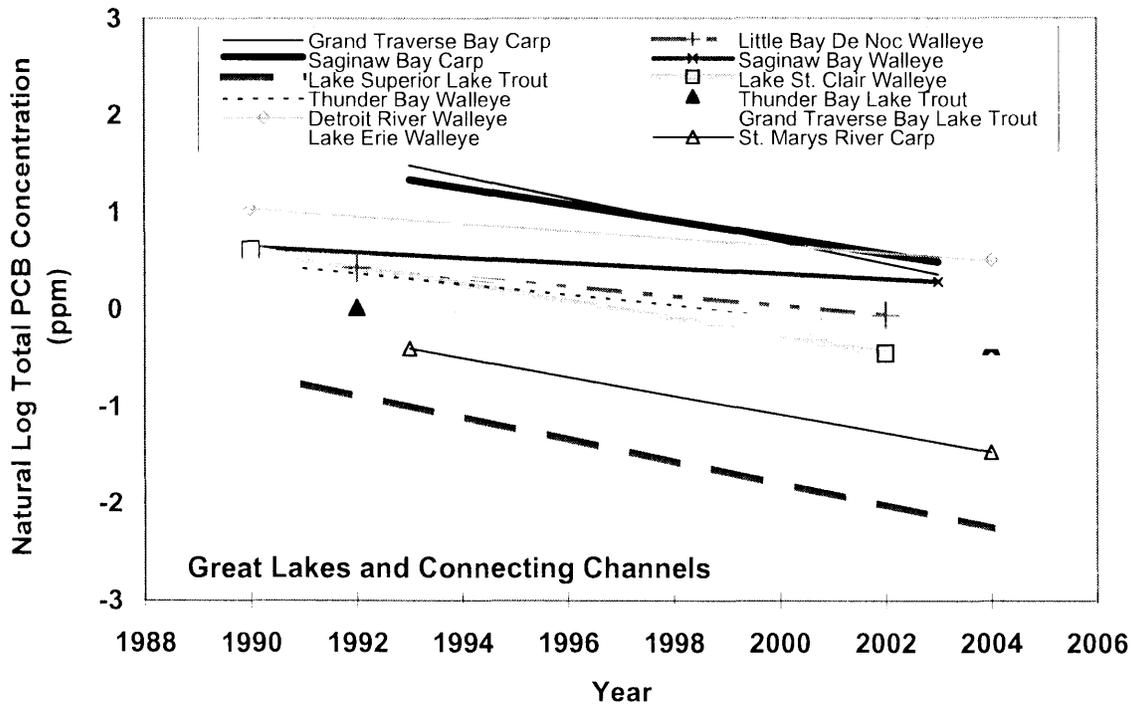
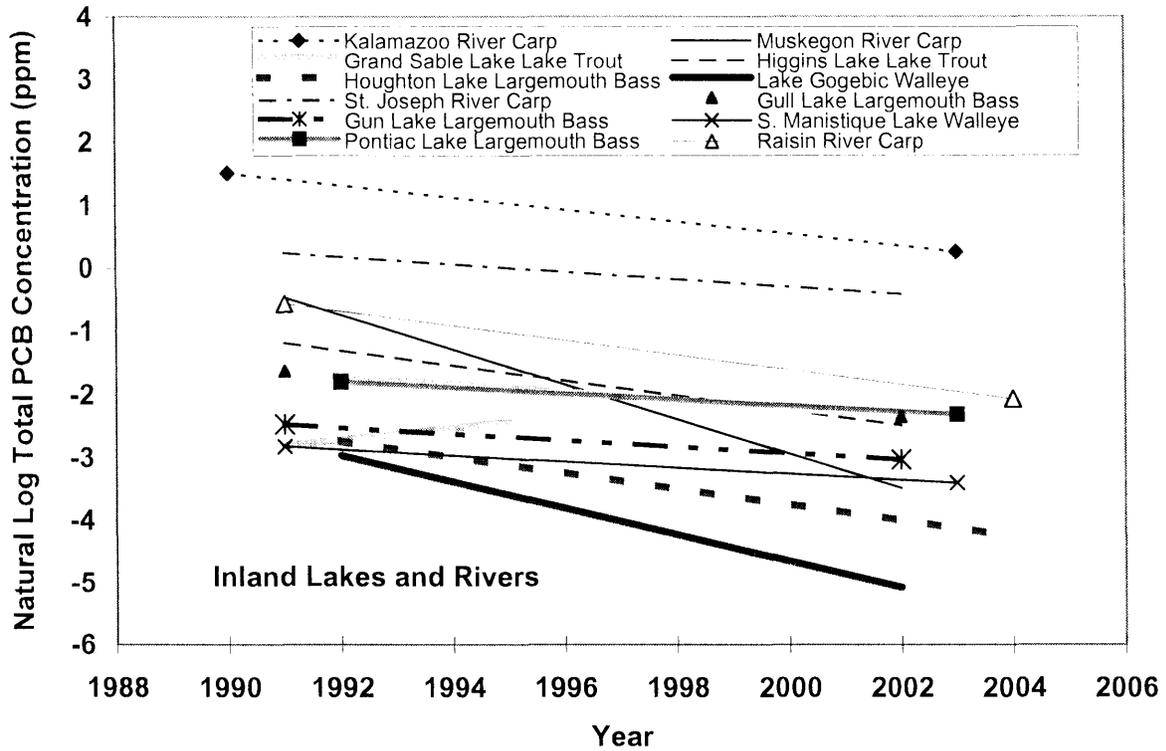


Figure 153. Temporal changes in total PCB concentrations at selected whole-fish trend monitoring sites.

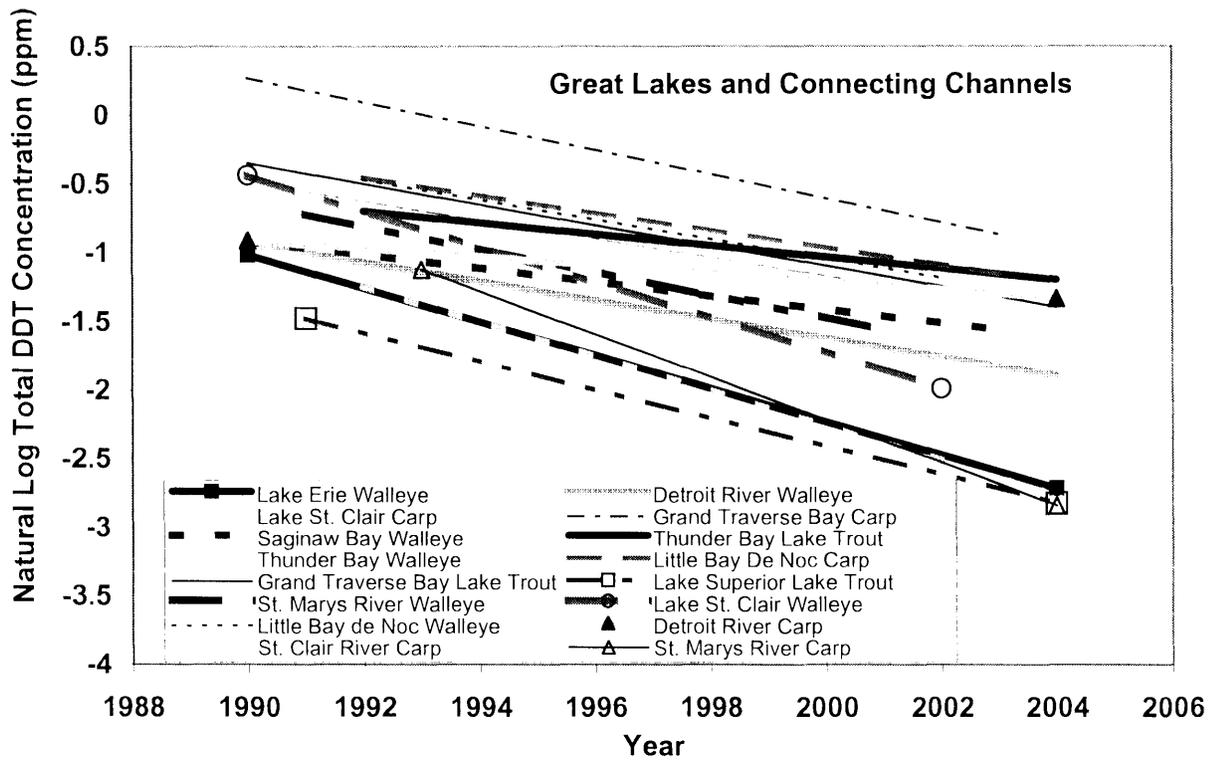
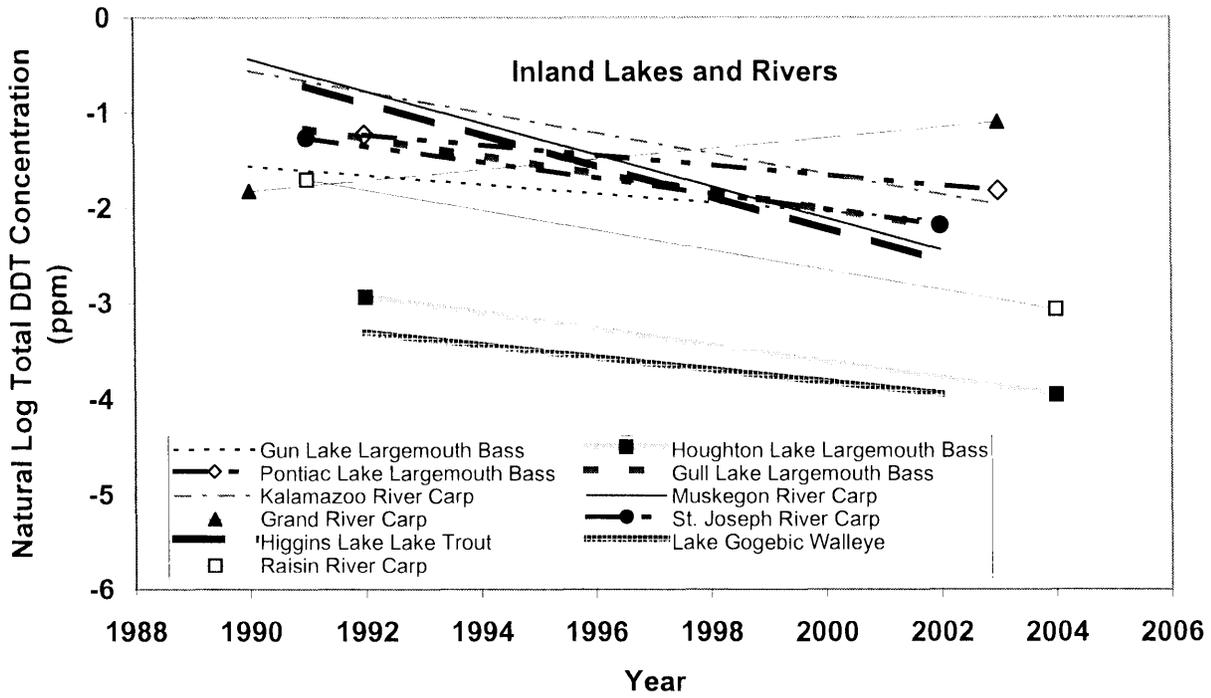


Figure 154. Temporal changes in total DDT concentrations at selected whole-fish trend monitoring sites.

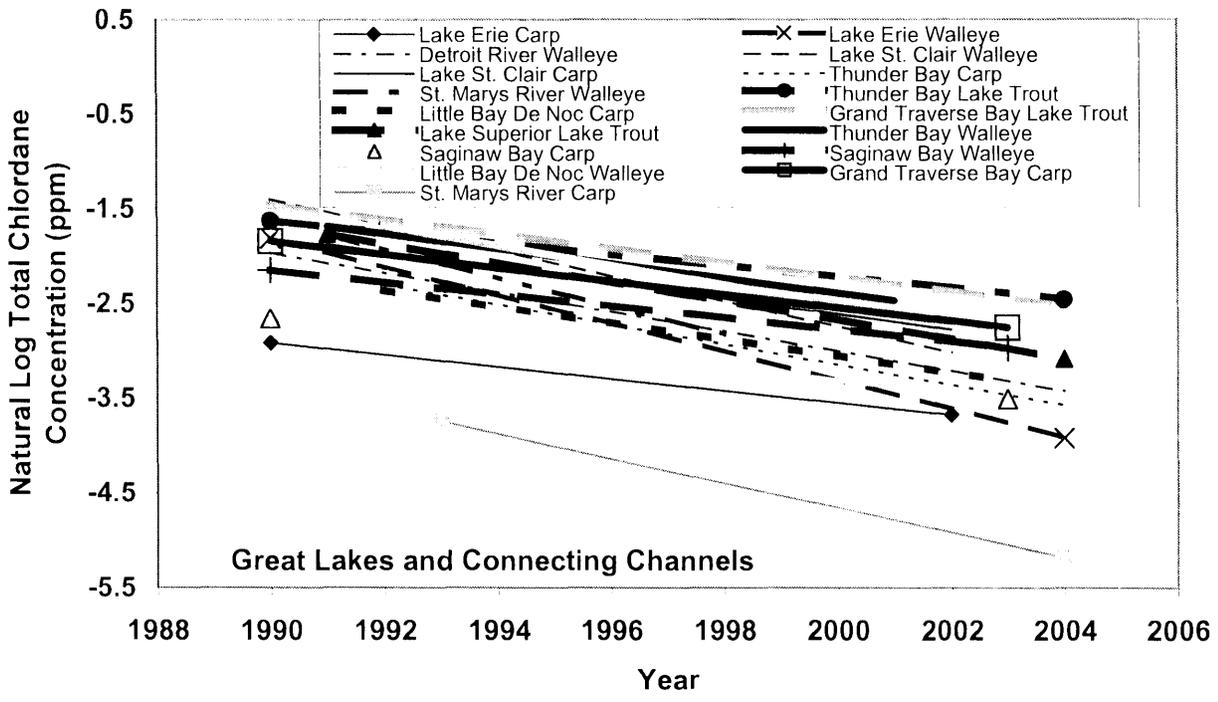
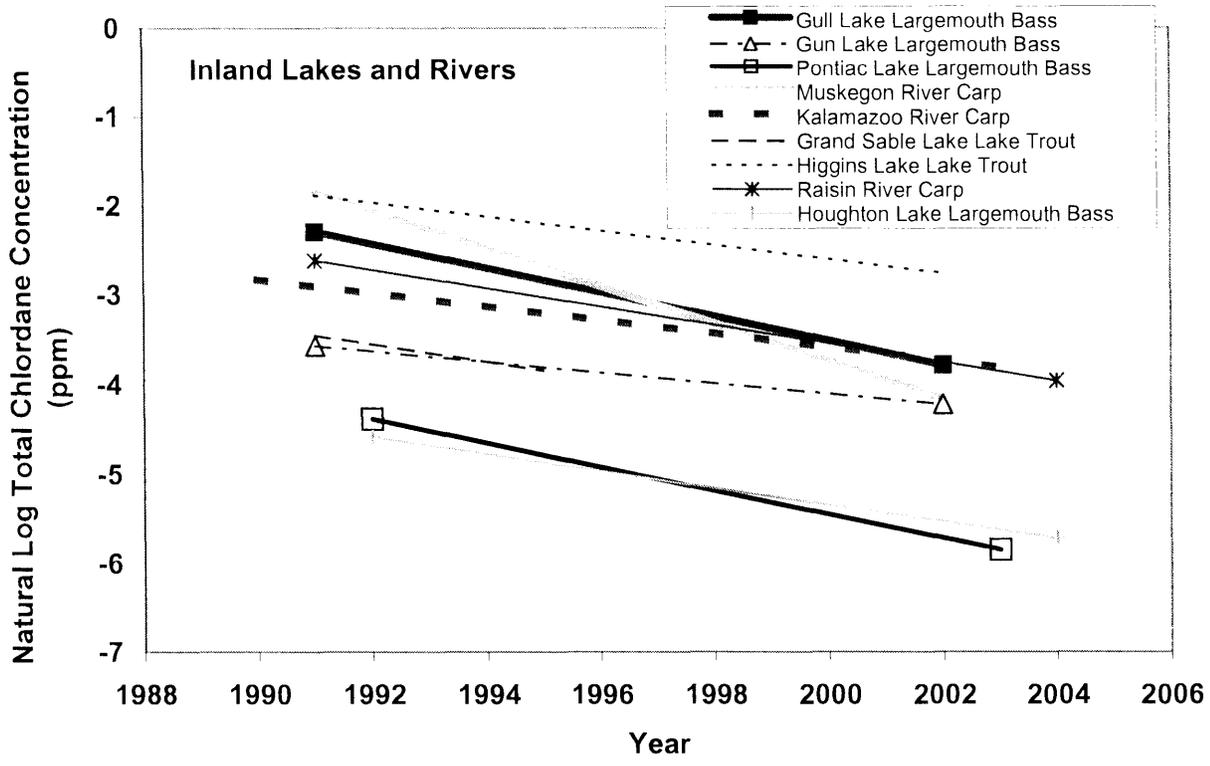


Figure 155. Temporal changes in total chlordane concentrations at selected whole-fish trend monitoring sites.

APPENDIX A

INVENTORY OF FISH CONTAMINANT MONITORING SITES AND SPECIES, 1980-2004

Waterbody	Location	Visit ID#	Date	Species
Adrian Lake	Lenawee County	90007	Jun/13/1990	Carp, Northern Pike
Antoine Lake	Dickinson County	88004	May/24/1988	Largemouth Bass, Smallmouth Bass, Walleye
Arbutus Lake	Grand Traverse County	93066	May/11/1993	Northern Pike
Au Gres River	Au Gres, river mouth	91002	Sep/03/1991	Channel Catfish
Au Sable River	Alcona Dam Pond	2003002	Jun/10/2003	Carp, Northern Pike, Walleye
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
Austin Lake	Kalamazoo County	2003154	Jul/21/2003	Carp, Largemouth Bass, Yellow Bullhead
Bad River	Saginaw County	94034	Aug/30/1994	Channel Catfish, Northern Pike
Bad River	Saginaw County	2004003	Jun/23/2004	Carp, 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, Division St.	91004	Oct/24/1991	Carp, Smallmouth Bass
Battle Creek River	Battle Creek, Division St.	2004004	Jun/10/2004	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	Alger County	2003150	Aug/28/2003	Walleye, Yellow Perch
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 Seven Lake (Seven Lakes)	Oakland County	2004133	May/18/2004	Largemouth Bass
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

Waterbody	Location	Visit ID#	Date	Species
Bishop Lake	Livingston County	87014	May/12/1987	Largemouth Bass, Northern Pike
Bishop Lake	Livingston County	89010	Jun/28/1989	Largemouth Bass, Northern Pike
Black Creek	Lenawee County	91005	Jun/13/1991	Carp
Black Creek	Muskegon County, US-31	87013	May/05/1987	Brown Trout, Carp, White Sucker
Black Lake	Cheboygan County	90052	Feb/01/1989	Lake Sturgeon
Black River	Mouth	2002007	Aug/02/2002	Channel Catfish
Black River	Port Huron, river mouth	93003	Aug/31/1993	Channel Catfish
Black River	Sanilac County, Croswell Impoundment	89017	Apr/20/1989	Carp
Black River	South Haven	92016	Aug/25/1992	Carp, Northern Pike
Black River, South Branch	Downstream of Bangor Dam	89020	Jul/07/1989	Carp, Largemouth Bass, Northern Pike, Rock Bass, White Sucker
Black River, South Branch	Downstream of Bangor Dam	2002008	Sep/23/2002	Carp, Northern Pike, White Sucker
Black River, South Branch	Upstream of Bangor Dam	2002106	Sep/23/2002	Carp, Northern Pike, White Sucker
Boardman Lake	Grand Traverse County	91006	Sep/26/1991	Northern Pike, Walleye, White Sucker
Bob Lake	Houghton County	2001134	Oct/03/2001	Walleye
Boot Lake	Schoolcraft County	2004007	Jun/23/2004	Walleye
Boston Pond	Houghton County	2000105	Jul/11/2000	White Sucker, Yellow Perch
Boyne River	Charlevoix County	1998011	Aug/05/1998	Brown Trout, White Sucker
Brevoort Lake	Mackinac County	89033	May/01/1989	Rock Bass, Walleye
Bristol Lake	Barry County	2002009	May/15/2002	Largemouth Bass, White Sucker
Burt Lake	Cheboygan County	90061	May/07/1990	Northern Pike, Walleye
Burt Lake	Cheboygan County	2001005	Oct/10/2001	Walleye, White Sucker
Cable Lake	Iron County	88005	May/26/1988	Largemouth Bass, Walleye
Camp Lake	Kent County	2003015	May/21/2003	Brown Bullhead, Largemouth Bass, Northern Pike
Caribou Lake	Chippewa County	86004	May/21/1986	Rock Bass, Walleye
Carmey 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	Landfill Rd.	2004009	Aug/18/2004	Brook Trout
Carp River	M-35	84012	Sep/27/1984	Brook Trout, White Sucker, Yellow Perch
Carp River	M-35	2004010	Aug/17/2004	Brook Trout, White Sucker
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	Bridgeport	2004011	Jun/24/2004	Carp, Channel Catfish
Cass River	Caro Impoundment	1998019	Oct/27/1998	Carp, Largemouth Bass
Cass River	Saginaw County, Dixie Highway	85039	Jan/31/1985	Carp, Freshwater Drum, Smallmouth Bass
Cass River	Saginaw County, M-13	88025	Aug/02/1988	Channel Catfish
Cass River	Saginaw County, M-13	2002024	Jul/16/2002	Channel Catfish
Cass River	Tuscola County, above Frankenmuth	88009	Jun/07/1988	Redhorse Sucker, Rock Bass, Smallmouth Bass
Cedar Lake	Alcona County	90067	Oct/09/1990	Largemouth Bass, Northern Pike

Waterbody	Location	Visit ID#	Date	Species
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
Cheboyganing Creek	Saginaw County	2004013	Aug/09/2004	Carp
Chenango Lake	Livingston County	2003017	Oct/16/2003	Largemouth Bass, Yellow Bullhead
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
Chippewa River	Nature Center	2002015	Jul/16/2002	Channel Catfish
Chippewa River	Upstream of Lake Isabella, Roland/Drew	97005.2	Aug/13/1997	Rock Bass
Chippewa River	Upstream of Lake Isabella, Wyman Road	97005.1	Aug/13/1997	Carp, White Sucker
Cisco Lake	Gogebic County	88030	Jul/11/1988	Northern Pike, Walleye
Cisco Lake	Gogebic County	1999005	Apr/19/1999	Walleye
Cisco Lake	Gogebic County, Cisco Lake Chain	95031	Aug/14/1995	Bluegill, Walleye
Clark Lake	Jackson	88043	Sep/29/1988	Black Crappie, Largemouth Bass, Rock Bass
Clear Spring Lake	Macomb County	1999088	Sep/20/1999	Largemouth Bass
Clifford Lake	Montcalm County	2004014	Jun/15/2004	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

Waterbody	Location	Visit ID#	Date	Species
Clinton River	Macomb County, Mt. Clemens	86015	Jun/16/1986	Carp, Largemouth Bass, Smallmouth Bass, Walleye
Clinton River	Moravian/Bellevue 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	Ryan Road, Utica	2004015	Oct/07/2004	Carp, Northern Pike, Rock Bass, White Sucker
Clinton River	Spillway Mouth	89023.2	Aug/29/1989	Channel Catfish
Clinton River	Spillway Mouth	92003.2	Aug/17/1992	Channel Catfish
Clinton River, North Branch	Macomb County	96006	Jun/17/1996	Rock Bass, Smallmouth Bass
Coldwater Lake	Branch County	88061	Oct/31/1988	Largemouth Bass, Northern Pike, Rock Bass
Coldwater Lake	Branch County	93067	Oct/04/1993	Largemouth Bass, Northern Pike
Coldwater Lake	Branch County	94019	Apr/12/1994	Bluegill, Largemouth Bass, Northern Pike
Coldwater Lake	Isabella County	89061	Aug/09/1989	Largemouth Bass, Walleye
Coldwater River	Brown Road	1998021	Jul/14/1998	White Sucker
Craig Lake	Baraga County	89074	Aug/23/1989	Walleye
Craig Lake	Baraga County	91028	Jun/04/1991	Northern Pike, Walleye
Crego Park Pond	Lansing	86033	Jul/29/1986	Black Bullhead, Bluegill, Goldfish
Crooked Lake	Barry County	2003020	Sep/19/2003	Brown Bullhead, Largemouth Bass
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	Alger County	2004019	Jun/02/2004	Northern Pike
Deer Lake	Charlevoix County	2003021	Oct/30/2003	Largemouth Bass, Northern Pike
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

Waterbody	Location	Visit ID#	Date	Species
Deer Lake	Marquette County	1998024	Oct/09/1998	Northern Pike, Walleye, Yellow Perch
Deer Lake	Marquette County	1999006	May/04/1999	Northern Pike, Walleye, Yellow Perch
Deer Lake	Marquette County	2001008	May/01/2001	Northern Pike, Walleye, Yellow Perch
Deer Lake	Marquette County	2003161	May/03/2003	Northern Pike, Walleye
DEQ Control	DEQ Control, Kalamazoo River at Trowbridge	2004603	Aug/26/2003	Control
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	Grassy Island	2004020	Jul/20/2004	Carp, Walleye
Detroit River	Michigan waters	93068	Apr/01/1993	Lake Sturgeon
Detroit River	Michigan waters	2004021	Jul/20/2004	Carp, Freshwater Drum, Redhorse Sucker, Yellow Perch
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
Dinner Lake	Gogebic County	2004024	Jun/11/2004	Black Crappie, Largemouth Bass, Northern Pike, Smallmouth Bass, Walleye
Dowagiac Creek	Dutch Settlement Road	1998027	Sep/02/1998	Brown Trout, White Sucker
Dowagiac River	Cass County, M-51	91008	Jul/18/1991	Carp
Dowagiac River	Cass County, Sink Road	2000020	Sep/18/2000	Carp
Duck Creek	Gogebic County	1998135	Jun/04/1998	Brook Trout, White Sucker
Duck Lake	Calhoun County	94011	May/23/1994	Bluegill, Largemouth Bass, Redear Sunfish, Walleye, Yellow Perch
Duck Lake	Gogebic County	86029	Jul/08/1986	Northern Pike, Rock Bass, Walleye
Duck Lake	Gogebic County	1999009	Apr/22/1999	Walleye
Echo Lake	Grand Isle, Alger County	95060	Jun/21/1995	Northern Pike, Yellow Perch
Elk Lake	Grand Traverse/Antrim County	90023	Sep/12/1990	Lake Trout
Elk Lake	Grand Traverse/Antrim County	96059	Dec/01/1996	Lake Trout
Elk Lake	Grand Traverse/Antrim County	97076	Dec/30/1997	Lake Trout
Ellsworth Lake	Antrim County	85065	Nov/27/1985	Bluegill, Largemouth Bass, Northern Pike, Rock Bass, Yellow Perch
Ellsworth Lake	Antrim County	86009	May/28/1986	Largemouth Bass, Northern Pike, White Sucker

Waterbody	Location	Visit ID#	Date	Species
Ellsworth Lake	Antrim County	94063	Jun/09/1994	Brown Bullhead, Largemouth Bass, White Sucker
Emerald Lake	Newaygo County	2004026	Jun/23/2004	Largemouth Bass, Northern Pike
Emily Lake	Houghton County	2002110	Jun/06/2002	Walleye
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	Cataract Basin	2004028	Jul/27/2004	Walleye
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
Ess Lake	Montmorency County	2003023	May/29/2003	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
Five Lakes	Clare County	2004131	May/11/2004	Largemouth Bass
Flat River	Fallasberg Park, downstream of Belding	1998035	Oct/27/1998	Carp
Flat River	Ingalls Road, downstream of Belding	1998037	Jul/30/1998	Rock Bass
Flat River	Ingalls Road, downstream of Belding	2003031	Jul/29/2003	Rock Bass, White Sucker
Flat River	Long Lake Road, upstream of Belding	1998036	Jul/30/1998	Rock Bass
Flat River	Lowell	2001017	Jul/23/2001	Channel Catfish
Flat River	Miller Rd, upstream of Greenville	2003032	Jul/29/2003	Rock Bass, White Sucker
Flint River	Birch Run Road	93005	Aug/30/1993	Carp
Flint River	Flushing	1998038	Oct/08/1998	Carp, Smallmouth Bass
Flint River	Genessee County, Elms Road	85030	Jun/17/1985	Black Crappie, Carp, Walleye
Flint River	Holloway Reservoir	89041	May/18/1989	Black Crappie, Channel Catfish, Largemouth Bass, Smallmouth Bass
Flint River	Mott Reservoir	96011	Apr/16/1996	Carp, Walleye
Flint River	Saginaw County, river mouth	88022	Aug/02/1988	Channel Catfish
Flint River	Saginaw County, river mouth	2002023	Jul/16/2002	Channel Catfish
Fortune Lake	Iron County	90012	May/29/1990	Largemouth Bass, Smallmouth Bass

Waterbody	Location	Visit ID#	Date	Species
Four Mile Lake	Washtenaw County	2000022	May/12/2000	Northern Pike
Fremont Lake	Newaygo County	90062	Oct/26/1990	Carp
Frenchman Lake	Chippewa County	2004029	May/26/2004	Northern Pike
Fumee Lake	Dickinson County	90011	May/25/1990	Smallmouth Bass
Galien River	Mouth	2002031	Aug/02/2002	Channel Catfish
Galien River	New Buffalo	92017	Aug/06/1992	Carp, Largemouth Bass, Rock Bass
Gaylanta Lake	Montmorency County	2003040	May/08/2003	Northern Pike
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	Downstream of Dimondale	2004147	Jun/16/2004	Northern Pike
Grand River	Eaton Rapids, Gale Road/Waverly Road	2001021	Oct/03/2001	Carp, Largemouth Bass, Walleye, White Sucker
Grand River	Eaton Rapids, Gale Road/Waverly Road	2004146	Jul/01/2004	Northern Pike
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, 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, above 6th St. Dam	2003042	Sep/20/2003	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

Waterbody	Location	Visit ID#	Date	Species
Grand River	M-21	2001018	Jul/23/2001	Channel Catfish
Grand River	Maple Grove Road	90021	Aug/14/1990	Carp, Walleye
Grand River	Maple Grove Road	2002113	Oct/03/2002	Northern Pike
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	Moores River Impoundment	2004148	Jun/09/2004	Northern Pike
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
Green Lake	Grand Traverse County	2003139	Jun/04/2003	Lake Trout
Gull Lake	Kalamazoo County	89073	Nov/01/1989	Largemouth Bass, Northern Pike
Gull Lake	Kalamazoo County	91058	Sep/12/1991	Largemouth Bass
Gull Lake	Kalamazoo County	93063	Jun/10/1993	Largemouth Bass
Gull Lake	Kalamazoo County	93064	Jun/10/1993	Largemouth Bass, Northern Pike
Gull Lake	Kalamazoo County	95035	Jun/01/1995	Largemouth Bass
Gull Lake	Kalamazoo County	97011	Jun/15/1997	Largemouth Bass
Gull Lake	Kalamazoo County	2000025	Jul/11/2000	Largemouth Bass
Gull Lake	Kalamazoo County	2002034	Jun/30/2002	Largemouth Bass
Gulliver Lake	Schoolcraft County	90015	May/15/1990	Northern Pike, Smallmouth Bass, Walleye
Gun Lake	Barry County	90006	Jul/01/1990	Largemouth Bass
Gun Lake	Barry County	92066	Jun/15/1992	Largemouth Bass
Gun Lake	Barry County	94023	Jul/17/1994	Largemouth Bass
Gun Lake	Barry County	97012	Jul/17/1997	Largemouth Bass
Gun Lake	Barry County	2000026	Jul/25/2000	Largemouth Bass
Gun Lake	Barry County	2002035	Jun/06/2002	Largemouth Bass
Hagerman Lake	Iron County	88050	Oct/12/1988	Smallmouth Bass, Walleye
Hamilton Lake	Dickinson County	94024	Apr/19/1994	Northern Pike, Walleye
Hamlin Lake	Mason County	90070	Feb/05/1991	Black Crappie, Northern Pike
Hardwood Lake	Ogemaw County	2004034	Jun/02/2004	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

Waterbody	Location	Visit ID#	Date	Species
Higgins Lake	Roscommon County	95057.2	Oct/31/1995	Lake Trout
Higgins Lake	Roscommon County	97013	Oct/22/1997	Lake Trout, Yellow Perch
Higgins Lake	Roscommon County	1998042	Nov/25/1998	Lake Trout
Higgins Lake	Roscommon County	2000028	Oct/11/2000	Lake Trout
Higgins Lake	Roscommon County	2002037	Oct/02/2002	Lake Trout
Hopkins Lake	Shiawassee County	91033	Sep/04/1991	Largemouth Bass
Houghton Lake	Roscommon County	87063	Aug/05/1987	Carp, Northern Pike, Walleye
Houghton Lake	Roscommon County	92037	Jun/13/1992	Largemouth Bass
Houghton Lake	Roscommon County	93050	Jun/01/1993	Walleye
Houghton Lake	Roscommon County	94006	Jun/07/1994	Largemouth Bass
Houghton Lake	Roscommon County	1998126	Jun/16/1998	Largemouth Bass
Houghton Lake	Roscommon County	1998127	Jun/16/1998	Carp
Houghton Lake	Roscommon County	2001026	Oct/11/2001	Largemouth Bass
Houghton Lake	Roscommon County	2004037	May/27/2004	Largemouth Bass
Hubbard Lake	Alcona County	89076	Oct/16/1989	Northern Pike, Walleye
Hudson Lake	Washtenaw County	89003	Apr/03/1989	Carp, Muskellunge, Northern Pike
Hudson Lake	Washtenaw County	2000032	Jul/21/2000	Carp, Largemouth Bass
Huron River	Barton Pond	92021	May/07/1992	Carp, Smallmouth Bass
Huron River	Belleville Lake	88003	May/10/1988	Carp, Walleye
Huron River	Belleville Lake	1999014	May/19/1999	Carp, Gizzard Shad, Walleye, White Sucker
Huron River	Downstream Belleville Lake	2002041	Aug/20/2002	Channel Catfish
Huron River	Downstream Ford Lake	2002040	Aug/20/2002	Channel Catfish
Huron River	Ford Lake	83002	Sep/12/1983	Black Crappie, Brown Bullhead, Carp, Largemouth Bass, Walleye, White Sucker
Huron River	Ford Lake	89026	May/02/1989	Black Crappie, Walleye
Huron River	Ford Lake	92020	May/05/1992	Carp, Walleye
Huron River	Ford Lake	1999015	May/19/1999	Black Crappie, Carp, Channel Catfish, Walleye
Huron River	Rockwood, river mouth	91012	Sep/06/1991	Channel Catfish
Huron River	Rockwood, river mouth	96015	Aug/20/1996	Channel Catfish
Huron River	Rockwood, river mouth	2002042	Aug/20/2002	Channel Catfish
Huron River	Upstream Dexter	2002039	Aug/20/2002	Channel Catfish
Huron River	Wayne County, Flat Rock	83043	Apr/21/1983	Carp
Intermediate Lake	Antrim County	90044	Sep/19/1990	Rock Bass, Smallmouth Bass, Walleye
Iron River	Above Wild River Road	1998045	Jun/04/1998	Brown Trout
Jordan Lake	Ionia/Barry County	89047	Jun/21/1989	Largemouth Bass
Kalamazoo River	Above Otsego City Dam	93073.3	Oct/11/1993	Walleye
Kalamazoo River	Above Otsego City Dam	1999085	Oct/13/1999	Carp, Smallmouth Bass
Kalamazoo River	Above Otsego City Dam	1999096	Sep/08/1999	Channel Catfish
Kalamazoo River	Above Otsego City Dam	2001049	Sep/20/2001	Carp, Smallmouth Bass
Kalamazoo River	Below Lake Allegan Dam	1999020	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Otsego Dam	1999023	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Trowbridge Dam, 26th St. Bridge	1999022	Sep/08/1999	Channel Catfish
Kalamazoo River	Ceresco (12 Mile Road)	1999099	Sep/08/1999	Channel Catfish
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

Waterbody	Location	Visit ID#	Date	Species
Kalamazoo River	Ceresco Impoundment, 12 Mile Road	2001042	Oct/11/2001	Carp, Smallmouth Bass
Kalamazoo River	Ceresco Impoundment, 15 Mile Road	87048	Jul/22/1987	Carp, Largemouth Bass, Smallmouth Bass
Kalamazoo River	City of Allegan Dam	1999092	Nov/09/1999	Carp, Smallmouth Bass
Kalamazoo River	City of Allegan Dam	2001052	Sep/17/2001	Carp, Smallmouth Bass
Kalamazoo River	City of Allegan, M-89	1999021	Sep/08/1999	Channel Catfish
Kalamazoo River	D-Avenue	2000112	Oct/04/2000	Channel Catfish
Kalamazoo River	D-Avenue	2000123	Aug/31/2000	Carp, Smallmouth Bass
Kalamazoo River	Galesburg, 35th St. Bridge	1999098	Sep/08/1999	Channel Catfish
Kalamazoo River	Kalamazoo Avenue	2000113	Oct/04/2000	Channel Catfish
Kalamazoo River	Kalamazoo Avenue	2000122	Aug/29/2000	Carp, Northern Pike, Rock Bass, Smallmouth Bass
Kalamazoo River	Kalamazoo Lake	83008	Jul/01/1984	Carp
Kalamazoo River	Kalamazoo Lake	85054	Jul/01/1985	Carp, Largemouth Bass, Smallmouth Bass
Kalamazoo River	Kalamazoo Lake	86027	Jul/09/1986	Carp, Largemouth Bass
Kalamazoo River	Kalamazoo Lake	87010	Mar/31/1987	Black Crappie, Bluegill, Brown Trout, Channel Catfish, Flathead 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

Waterbody	Location	Visit ID#	Date	Species
Kalamazoo River	Lake Allegan	2003147	Jun/07/2003	Carp
Kalamazoo River	Morrow Pond	85049	Jul/01/1985	Carp, Largemouth Bass, Smallmouth Bass
Kalamazoo River	Morrow Pond	86022	Jul/07/1986	Carp
Kalamazoo River	Morrow Pond	87043	Jul/14/1987	Carp, Smallmouth Bass
Kalamazoo River	Morrow Pond	93073.2	Oct/15/1993	Walleye
Kalamazoo River	Morrow Pond	1999083	Jul/28/1999	Carp, Smallmouth Bass
Kalamazoo River	Morrow Pond	2001043	Aug/17/2001	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Mosel Avenue	83006	Jul/01/1983	Carp
Kalamazoo River	Mosel Avenue	85051	Jul/01/1985	Carp, Smallmouth Bass
Kalamazoo River	Mosel Avenue	86024	Jul/07/1986	Carp
Kalamazoo River	Mosel Avenue	93073.5	Oct/15/1993	Walleye
Kalamazoo River	Mosel Avenue	2001046	Sep/25/2001	Smallmouth Bass
Kalamazoo River	New Richmond	93073.4	Sep/21/1993	Walleye
Kalamazoo River	New Richmond	1999094	Nov/18/1999	Carp, Channel Catfish, Largemouth Bass, Smallmouth Bass
Kalamazoo River	New Richmond	2001054	Oct/16/2001	Carp, Flathead Catfish, Smallmouth Bass
Kalamazoo River	Otsego Dam Impoundment	1999086	Oct/29/1999	Carp, Smallmouth Bass
Kalamazoo River	Otsego Dam Impoundment	2001050	Sep/18/2001	Carp, Smallmouth Bass
Kalamazoo River	Plainwell Dam Reservoir	83005	Jul/01/1983	Carp
Kalamazoo River	Plainwell Dam Reservoir	85052	Jul/01/1985	Carp, Smallmouth Bass
Kalamazoo River	Plainwell Dam Reservoir	86025	Jul/08/1986	Carp
Kalamazoo River	Plainwell Dam Reservoir	87044	Jul/14/1987	Carp
Kalamazoo River	Plainwell Dam Reservoir	1999084	Oct/12/1999	Carp, Smallmouth Bass
Kalamazoo River	Plainwell Dam Reservoir	2001048	Sep/05/2001	Carp, Smallmouth Bass
Kalamazoo River	Plainwell, M-89	2000111	Oct/04/2000	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	90019	Aug/07/1990	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	93044	Jul/01/1993	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	96016	Aug/21/1996	Channel Catfish
Kalamazoo River	River mouth, Old US-31 Bridge	1999019	Sep/08/1999	Channel Catfish
Kalamazoo River	Trowbridge Dam Impoundment	1999093	Nov/03/1999	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Trowbridge Dam Impoundment	2001051	Oct/09/2001	Carp, Smallmouth Bass
Kalamazoo River	Trowbridge Dam Impoundment	2003142	Aug/18/2003	Carp, Smallmouth Bass
Kalamazoo River, South Branch	Hillsdale County	1998103	Apr/22/1998	White Sucker
Kawkawlin River	Bay County, M-247	88027	Aug/04/1988	Carp, Northern Pike
Kawkawlin River	Bay County, M-247	2004039	Aug/10/2004	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
Kent Lake	Oakland County	2004040	May/11/2004	Black Crappie, Walleye
Kingston Lake	Alger County	2003047	May/29/2003	Largemouth Bass, Muskellunge, Smallmouth Bass, Walleye

Waterbody	Location	Visit ID#	Date	Species
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 Cadillac	Wexford County	2004041	Sep/28/2004	Northern Pike, Smallmouth Bass
Lake Charlevoix	Charlevoix County	90051	Nov/01/1990	Brown Trout, Lake Trout
Lake Emma	Presque Isle County	2003050	May/22/2003	Northern Pike
Lake Erie	Brest Bay	90003	Apr/09/1990	Carp, Walleye
Lake Erie	Brest Bay	92026	Apr/10/1992	Carp, Walleye
Lake Erie	Brest Bay	92062	Oct/15/1992	Walleye
Lake Erie	Brest Bay	94026	Apr/19/1994	Carp, Walleye
Lake Erie	Brest Bay	97017	Apr/21/1997	Carp
Lake Erie	Brest Bay	1998051	Apr/15/1998	Carp, Walleye
Lake Erie	Brest Bay	2002044	Apr/26/2002	Carp
Lake Erie	Brest Bay	2003051	Oct/24/2003	Walleye
Lake Erie	Brest Bay	2004042	Oct/08/2004	Walleye
Lake Erie	Huron River, Flat Rock	84050	Jan/01/1984	Coho
Lake Erie	Huron River, Flat Rock	97018	Oct/17/1997	Chinook, Rainbow Trout
Lake Erie	N. Maumee Bay	95008	Apr/26/1995	Carp
Lake Erie	Off Monroe	86002	Apr/22/1986	Carp, Channel Catfish, Walleye
Lake Erie	Off Monroe	87093	Oct/20/1987	Walleye
Lake Erie	Off Monroe	94027	Apr/19/1994	Walleye
Lake Erie	Off Monroe	95040	Apr/26/1995	Freshwater Drum, White Bass, White Perch
Lake Erie	Off Monroe	2000030	Apr/04/2000	Carp
Lake Erie	Western Basin	93082	Apr/01/1993	Carp, Channel Catfish, Gizzard Shad, White Bass, Yellow Perch
Lake Erie	Western Basin	95058	Oct/11/1995	Walleye
Lake Erie	Western Basin	97019	Apr/15/1997	Lake Whitefish, Smallmouth Bass, Yellow Perch
Lake Erie	Western Basin	2002045	Apr/05/2002	Channel Catfish
Lake Erie	Western Basin	2004043	Apr/20/2004	Walleye, White Bass, White Perch
Lake Esau	Presque Isle County	2003052	Jun/18/2003	Smallmouth Bass
Lake Fenton	Genesee County	87059	Jul/22/1987	Largemouth Bass
Lake Fenton	Genesee County	89037	May/09/1989	Largemouth Bass
Lake Fenton	Genesee County	90005	May/23/1990	Largemouth Bass, Northern Pike, Walleye
Lake Geneserath	Charlevoix County, Beaver Island	90072	Jun/01/1990	Largemouth Bass, Northern Pike
Lake Gogebic	Gogebic/Ontonagon County	85062	Jul/30/1985	Walleye, White Sucker
Lake Gogebic	Gogebic/Ontonagon County	92043	May/05/1992	Walleye
Lake Gogebic	Gogebic/Ontonagon County	94028	Apr/29/1994	Walleye
Lake Gogebic	Gogebic/Ontonagon County	97020	May/04/1997	Walleye, Yellow Perch
Lake Gogebic	Gogebic/Ontonagon County	2000031	Apr/18/2000	Walleye
Lake Gogebic	Gogebic/Ontonagon County	2002046	Apr/28/2002	Walleye
Lake Gogebic	Gogebic/Ontonagon County	2002047	Apr/28/2002	Walleye
Lake Gogebic	Gogebic/Ontonagon County	2003156	Oct/14/2003	Rock Bass
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

Waterbody	Location	Visit ID#	Date	Species
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	Grindstone City	2004130	May/10/2004	Lake Trout
Lake Huron	Hammond Bay	83018	Oct/25/1983	Lake Trout, Lake Whitefish
Lake Huron	Harbor Beach	89068	Nov/01/1989	Brown Trout
Lake Huron	Les Cheneaux Islands	95003	Apr/17/1995	Yellow perch
Lake Huron	Lexington	85027	Oct/22/1985	Brown Trout
Lake Huron	Marquette Island	83024	Nov/08/1983	Lake Trout
Lake Huron	Nunns Creek	93051	Apr/25/1993	Rainbow Smelt
Lake Huron	Oscoda	85025	Oct/10/1985	Brown Trout
Lake Huron	Port Austin	86007	May/27/1986	Lake Trout
Lake Huron	Port Austin	91052	May/20/1991	Lake Trout
Lake Huron	Port Austin	96019	May/16/1996	Lake Trout, Lake Whitefish
Lake Huron	Port Sanilac	85026	Oct/23/1985	Brown Trout
Lake Huron	Rock Falls Creek	91023	Apr/26/1991	Rainbow Trout
Lake Huron	Rock Falls Creek	92006	Apr/09/1992	Rainbow Trout
Lake Huron	Rockport	86021	Jun/19/1986	Lake Trout
Lake Huron	Rockport	89049	May/15/1989	Lake Trout
Lake Huron	Saginaw Bay	85031	May/23/1985	Channel Catfish
Lake Huron	Saginaw Bay	90063	Apr/24/1990	Carp, Walleye
Lake Huron	Saginaw Bay	91041	Oct/02/1991	Walleye
Lake Huron	Saginaw Bay	92028	May/19/1992	Carp, Walleye
Lake Huron	Saginaw Bay	94037	Sep/26/1994	Carp, Walleye
Lake Huron	Saginaw Bay	1998139	Sep/21/1998	Carp, Walleye
Lake Huron	Saginaw Bay	2001059	Aug/22/2001	Carp
Lake Huron	Saginaw Bay	2003055	Sep/17/2003	Alewife, Spottail Shiner
Lake Huron	Saginaw Bay	2003056	Aug/26/2003	Carp, Walleye
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, Bay Port	2004046	Sep/10/2004	Carp, Channel Catfish, Walleye, White Bass, White Sucker, 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	85034	May/28/1985	Carp, Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
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
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

Waterbody	Location	Visit ID#	Date	Species
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	2004048	May/20/2004	Carp, Lake Trout
Lake Huron	Thunder Bay	2004145	May/24/2004	Lake Trout
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 Le Vasseur	Marquette County	2002104	Jun/19/2002	Northern Pike
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 Medora	Keweenaw County	2004050	Jun/15/2004	Smallmouth Bass, Walleye
Lake Michigamme	Marquette County	84019	Aug/22/1984	Northern Pike, Rock Bass, Walleye, White Sucker, Yellow Perch
Lake Michigamme	Marquette County	97023	Jun/07/1997	Lake Herring, Northern Pike, White Sucker
Lake Michigan	Big Bay De Noc	90059	May/30/1990	Lake Whitefish
Lake Michigan	Bridgeman	2002112	Oct/03/2001	Lake Sturgeon
Lake Michigan	Bridgeman	2003159	Sep/05/2003	Lake Sturgeon
Lake Michigan	Charlevoix	86012	Jun/06/1986	Brown Trout, Chinook, Lake Trout
Lake Michigan	Charlevoix	96027	Aug/27/1996	Lake Trout
Lake Michigan	Charlevoix/Little Traverse Bay	89043	May/17/1989	Lake Trout
Lake Michigan	Epoufette	83019	Nov/08/1983	Lake Whitefish
Lake Michigan	Glen Haven	83022	Oct/20/1983	Lake Trout
Lake Michigan	Glen Haven	84040	Jun/04/1984	Chub
Lake Michigan	Grand Haven	86001	Apr/04/1986	Lake Trout, Yellow Perch
Lake Michigan	Grand Haven	87011	Apr/07/1987	Lake Trout
Lake Michigan	Grand Haven	96025	May/29/1996	Lake Trout
Lake Michigan	Grand Haven	97030	Apr/11/1997	Yellow Perch
Lake Michigan	Grand River, Grand Rapids	84055	Sep/28/1984	Coho
Lake Michigan	Grand River, Grand Rapids	94059	Oct/01/1994	Rainbow Trout
Lake Michigan	Grand River, Webber Dam	83015	Oct/06/1983	Chinook, Coho
Lake Michigan	Grand River, Webber Dam	85057	Sep/27/1985	Coho
Lake Michigan	Grand River, Webber Dam	86050	Oct/03/1986	Coho
Lake Michigan	Grand River, Webber Dam	87086	Sep/23/1987	Chinook
Lake Michigan	Grand River, Webber Dam	88041	Sep/19/1988	Coho
Lake Michigan	Grand River, Webber Dam	90046	Sep/25/1990	Coho
Lake Michigan	Grand River, Webber Dam	91045	Oct/10/1991	Chinook

Waterbody	Location	Visit ID#	Date	Species
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	2003060	Oct/31/2003	Carp
Lake Michigan	Grand Traverse Bay	2004053	May/18/2004	Lake Trout
Lake Michigan	Grand Traverse Bay, East Arm	84031	Mar/01/1984	Lake Trout
Lake Michigan	Grand Traverse Bay, East Arm	90065	Nov/11/1990	Lake Whitefish, Yellow Perch
Lake Michigan	Grand Traverse Bay, East Arm	96024	Dec/05/1996	Lake Whitefish
Lake Michigan	Grand Traverse Bay, East Arm	96060	Dec/05/1996	Lake Whitefish
Lake Michigan	Grand Traverse Bay, East Arm	96061	Mar/01/1996	Lake Whitefish
Lake Michigan	Grand Traverse Bay, West Arm	84032	Mar/20/1984	Lake Trout
Lake Michigan	Grand Traverse Bay, West Arm	84037	May/29/1984	Lake Trout
Lake Michigan	Grand Traverse Bay, West Arm	90066	Jun/20/1990	Lake Whitefish
Lake Michigan	Grand Traverse Bay, West Arm	93088	Jun/07/1993	Brown Trout, Lake Whitefish
Lake Michigan	Green Bay	93078	Apr/18/1993	Brown Trout, Splake
Lake Michigan	Green Bay	1999032	Aug/02/1999	Lake Whitefish
Lake Michigan	Green Bay	2001066	Apr/13/2001	Brown Trout
Lake Michigan	Green Bay	2002054	Apr/11/2002	Brown Trout
Lake Michigan	Green Bay	2003148	Apr/10/2003	Brown Trout
Lake Michigan	Green Bay, Cedar River	88057	Jul/19/1988	Longnose Sucker, White Sucker
Lake Michigan	Green Bay, Cedar River	92022	Apr/29/1992	Brown Trout, Chinook, Rainbow Trout, Smallmouth Bass, Splake, Walleye
Lake Michigan	Green Bay, Cedar River	2000037	Apr/10/2000	Carp
Lake Michigan	Kalamazoo River mouth	2003155	May/17/2002	Lake Sturgeon
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

Waterbody	Location	Visit ID#	Date	Species
Lake Michigan	Little Bay De Noc	89032	Apr/10/1989	Carp
Lake Michigan	Little Bay De Noc	90001	Feb/28/1990	Burbot
Lake Michigan	Little Bay De Noc	91022	Apr/16/1991	Longnose Sucker, Walleye
Lake Michigan	Little Bay De Noc	92046	Jun/04/1992	Carp, Walleye
Lake Michigan	Little Bay De Noc	92049	Jun/04/1992	Walleye
Lake Michigan	Little Bay De Noc	93079	Apr/27/1993	Carp, Yellow Perch
Lake Michigan	Little Bay De Noc	94041	Apr/20/1994	Carp, Walleye
Lake Michigan	Little Bay De Noc	94042	Apr/20/1994	White Sucker
Lake Michigan	Little Bay De Noc	95016	Feb/12/1995	Lake Sturgeon
Lake Michigan	Little Bay De Noc	97026	Apr/28/1997	Walleye, Yellow Perch
Lake Michigan	Little Bay De Noc	2000039	Oct/05/2000	Carp, Walleye
Lake Michigan	Little Bay De Noc	2002055	Apr/19/2002	Walleye
Lake Michigan	Little Bay De Noc	2003061	Apr/15/2003	Carp
Lake Michigan	Little Bay De Noc	2004150	Sep/10/2004	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, 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 Lake	2003158	Jul/10/2003	Lake Sturgeon
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	Manistee River	2004055	Apr/01/2004	Rainbow Trout
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	New Buffalo	2003160	Aug/19/2003	Lake Sturgeon
Lake Michigan	Northern Lake Michigan	97028	Mar/26/1997	Lake Whitefish
Lake Michigan	Northern Lake Michigan	2001132	Oct/31/2001	Burbot
Lake Michigan	Norwood	84033	Mar/20/1984	Lake Trout
Lake Michigan	Pentwater	83028	May/06/1983	Chub
Lake Michigan	Pentwater	84034	Apr/09/1984	Lake Trout
Lake Michigan	Pentwater	84041	Aug/02/1984	Chub
Lake Michigan	Pentwater	89039	May/02/1989	Lake Trout
Lake Michigan	Pentwater	91025	Apr/12/1991	Brown Trout, Lake Trout
Lake Michigan	Platte River	83011	Oct/07/1983	Chinook, Coho
Lake Michigan	Platte River	83040	Sep/20/1983	Coho

Waterbody	Location	Visit ID#	Date	Species
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	South Haven	2004051	Jun/15/2004	Round Goby
Lake Michigan	Southern	94057	Jul/01/1994	Lake Sturgeon
Lake Michigan	Southern	95064	Sep/24/1995	Lake Sturgeon
Lake Michigan	Southern	1998152	Sep/25/1998	Rainbow Smelt
Lake Michigan	St. Joseph River, Berrien Springs	83010	Oct/05/1983	Chinook, Coho
Lake Michigan	St. Joseph River, Berrien Springs	84051	Oct/03/1984	Coho
Lake Michigan	St. Joseph River, Berrien Springs	85023	Sep/20/1985	Brown Trout
Lake Michigan	St. Joseph River, Berrien Springs	85059	Sep/19/1985	Coho
Lake Michigan	St. Joseph River, Berrien Springs	86048	Sep/15/1986	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	86049	Sep/15/1986	Coho
Lake Michigan	St. Joseph River, Berrien Springs	87001	Apr/07/1987	Rainbow Trout
Lake Michigan	St. Joseph River, Berrien Springs	87084	Sep/30/1987	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	87085	Sep/30/1987	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	88032	Sep/15/1988	Coho

Waterbody	Location	Visit ID#	Date	Species
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	St. Joseph River, Berrien Springs	2004060	Mar/26/2004	Rainbow Trout
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 Mitchell	Wexford County	2003141	May/01/2003	Largemouth Bass
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 Ovid	Clinton County	2003152	Jun/25/2003	Largemouth Bass
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

Waterbody	Location	Visit ID#	Date	Species
Lake St. Clair	L'Anse Creuse Bay	92029	Jun/04/1992	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	94049	Aug/24/1994	Bluegill, Brown Bullhead, Channel Catfish, Freshwater Drum, Largemouth Bass, Northern Pike, Rock Bass, Smallmouth Bass, Yellow Perch
Lake St. Clair	L'Anse Creuse Bay	94058	Jul/13/1994	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	97034	Jun/01/1997	Black Crappie, Bluegill, Northern Pike, Pumpkinseed, Walleye, White Bass
Lake St. Clair	L'Anse Creuse Bay	1998063	Jun/15/1998	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	1998064	Jun/15/1998	Bluegill, Carp, Channel Catfish, Freshwater Drum, Walleye
Lake St. Clair	L'Anse Creuse Bay	2002059	May/23/2002	Carp, Walleye
Lake St. Clair	Michigan waters	85014	Sep/10/1985	Muskellunge
Lake St. Clair	Michigan waters	87035	Jun/18/1987	Bluegill, Channel Catfish, Freshwater Drum, Largemouth Bass, Rock Bass, Smallmouth Bass, Walleye
Lake St. Clair	Michigan waters	88026	Aug/19/1988	Bluegill, Freshwater Drum, Smallmouth Bass, White Bass, Yellow Perch
Lake St. Clair	Michigan waters	90054	Jul/15/1990	Lake Sturgeon
Lake St. Clair	Michigan waters	91056	Oct/28/1991	Lake Sturgeon, Walleye
Lake St. Clair	Michigan waters	2000108	Aug/28/2000	Lake Sturgeon
Lake St. Clair	Michigan waters	2001077	Jun/26/2001	Carp, Muskellunge, Smallmouth Bass, Walleye
Lake St. Clair	Michigan waters	2003069	Sep/15/2003	Smallmouth Bass
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 Harbor	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	Keweenaw Bay	91024	May/01/1991	Lake Trout
Lake Superior	Keweenaw Bay	93054	May/19/1993	Rainbow Smelt
Lake Superior	Keweenaw Bay	93055	May/03/1993	Lake Trout
Lake Superior	Keweenaw Bay	96035	May/23/1996	Lake Trout
Lake Superior	Keweenaw Bay	1999039	May/13/1999	Lake Trout
Lake Superior	Keweenaw Bay	2001078	Apr/30/2001	Lake Trout
Lake Superior	Keweenaw Bay	2003070	May/29/2003	Ciscowet
Lake Superior	Keweenaw Bay	2004063	May/04/2004	Lake Trout
Lake Superior	Keweenaw Bay, Keystone Point	92073	Jul/31/1992	Ciscowet, Lake Whitefish
Lake Superior	Keweenaw Bay, L'Anse Bay	89029	Apr/24/1989	Lake Trout
Lake Superior	Keweenaw Bay, Traverse Island	91060	May/01/1991	Lake Trout

Waterbody	Location	Visit ID#	Date	Species
Lake Superior	Keweenaw Bay, Traverse Island	2001079	Jun/08/2001	Ciscowet
Lake Superior	Laughing Whitefish River	88036	Sep/27/1988	Chinook
Lake Superior	Manitou Island	87072	Jun/26/1987	Ciscowet
Lake Superior	Marquette	86031	Jun/06/1986	Lake Trout, Lake Whitefish
Lake Superior	Marquette	87009	Apr/27/1987	Lake Trout
Lake Superior	Marquette	89028	Apr/27/1989	Lake Trout
Lake Superior	Marquette	92042	Jun/19/1991	Ciscowet
Lake Superior	Marquette	92074	Aug/18/1992	Ciscowet, Lake Whitefish
Lake Superior	Marquette	93089	Jul/01/1993	Lake Whitefish
Lake Superior	Marquette	95065	Dec/13/1995	Ciscowet
Lake Superior	Marquette	96038	Jun/10/1996	Ciscowet, Lake Trout, Lake Whitefish
Lake Superior	Marquette	2002060	May/13/2002	Lake Trout, Lake Whitefish
Lake Superior	Middle Branch Ontonagon River	1999040	Nov/15/1999	Brown Trout
Lake Superior	Mineral River	1998134	Jun/07/1998	Longnose Sucker
Lake Superior	Munising	87069	Aug/10/1987	Ciscowet
Lake Superior	Munising	94056	Dec/16/1994	Lake Herring
Lake Superior	Munising	95066	Jul/27/1995	Lake Herring
Lake Superior	Ontonagon	85028	Aug/01/1985	Lake Trout, Lake Whitefish, White Sucker
Lake Superior	Otter River Fish Ladder	2000119	May/27/2000	Lake Sturgeon
Lake Superior	Pendills Creek	96037	Sep/15/1996	Coho
Lake Superior	Portage Lake/Dollar Bay	2003157	Sep/12/2003	Lake Sturgeon
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 Lake	Marquette County	2002043	May/24/2002	Walleye
Littlefield Lake	Isabella County	95014	May/24/1995	Bluegill, Largemouth Bass
Lobdell Lake	Genesee County	2003072	May/20/2003	Carp, 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	Kalamazoo County	2002064	Oct/16/2002	Black Crappie
Long Lake	Kalamazoo County	2003153	Mar/28/2003	Brown Bullhead
Long Lake	Presque Isle County	2004066	Apr/14/2004	Smallmouth Bass, White Sucker
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

Waterbody	Location	Visit ID#	Date	Species
Maceday Lake	Oakland County	91049	Sep/16/1991	Northern Pike
Maceday Lake	Oakland County	96040	Apr/24/1996	Northern Pike
Manistee Lake	Manistee County	91015	Jun/19/1991	Smallmouth Bass, Walleye
Manistee Lake	Manistee County	92027	May/12/1992	Black Crappie, Largemouth Bass, Rock Bass
Manistee Lake	Manistee County	95019	Jun/07/1995	Bluegill
Manistee River	Above Hodenpyl Dam	92034	Jun/09/1992	Carp
Manistee River	Above Hodenpyl Dam	94030	Jun/15/1994	Carp
Manistee River	Cameron Bridge	1998069	Aug/26/1998	Brown Trout
Manistee River	M-72	1998123	Aug/27/1998	White Sucker
Manistee River	Manistee, river mouth	90026	Aug/21/1990	Channel Catfish
Manistee River	Manistee, river mouth	95028	Jul/24/1995	Channel Catfish
Manistique Lake	Mackinac County	2003075	Apr/25/2003	Walleye
Manistique River	d/s Manistique Papers Dam	84009	Oct/18/1984	Redhorse Sucker, Walleye, White Sucker
Manistique River	d/s Manistique Papers Dam	85008	Jun/01/1985	Carp, Largemouth Bass, Walleye
Manistique River	d/s Manistique Papers Dam	88017	Aug/03/1988	Channel Catfish
Manistique River	d/s Manistique Papers Dam	93033	Jun/02/1993	Carp
Manistique River	d/s Manistique Papers Dam	2003077	Oct/07/2003	Redhorse Sucker, Smallmouth Bass, Walleye
Manistique River	d/s Manistique Papers Dam	2004072	Aug/02/2004	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye
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, above Dam	2003076	Oct/08/2003	Redhorse Sucker
Manistique River	Manistique, river mouth	86035	Jul/31/1986	Carp, Walleye
Manistique River	Manistique, river mouth	90028.1	Sep/24/1990	Channel Catfish
Manistique River	Manistique, river mouth	2002067	Aug/21/2002	Channel Catfish
Manistique River	Soo Line RR Bridge	90028.2	Sep/24/1990	Channel Catfish
Manistique River	Soo Line RR Bridge	2002066	Aug/21/2002	Channel Catfish
Mann Creek	Moraine Lake	92041.2	Oct/21/1992	Northern Pike
Mann Creek	Sloan Lake	92041.1	Oct/21/1992	Northern Pike
Mann Creek	Sloan Lake	94001	May/25/1994	Bluegill, Northern Pike
Marion Lake	Gogebic County	87070	Jul/29/1987	Rock Bass, Walleye
Marten Lake	Iron County	85019	Oct/25/1985	Brown Bullhead, Northern Pike
McCormick Lake	Montmorency County	2004074	Jun/02/2004	Brown Trout
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

Waterbody	Location	Visit ID#	Date	Species
Menominee River	Dickinson County, Little Quinnesec Flowage	89079	Apr/21/1989	Carp, Walleye, White Sucker
Menominee River	Iron County	84017	Aug/01/1984	Rock Bass
Menominee River	Lower Scott Flowage, between Dams 1 and 2	90055	Oct/01/1990	Rock Bass, Walleye
Menominee River	Lower Scott Flowage, between Dams 1 and 2	91039	Jun/26/1991	Carp
Menominee River	Lower Scott Flowage, between Dams 1 and 2	94052	Jun/13/1994	Redhorse Sucker
Menominee River	Menominee, river mouth	88007	May/26/1988	Carp, Walleye
Menominee River	Menominee, river mouth	91040	Apr/20/1991	Lake Sturgeon
Menominee River	Menominee, river mouth	93031	Jun/01/1993	Carp
Menominee River	Menominee, river mouth	93039	Jun/30/1993	Channel Catfish
Menominee River	Menominee, river mouth	2001146	Oct/10/2000	Lake Sturgeon
Menominee River	Sturgeon Falls Impoundment	1999080	May/25/1999	Northern Pike
Menominee River	Upper Scott Flowage, Chappee Rapids	90057	Sep/20/1990	Rock Bass, Walleye
Menominee River	Upper Scott Flowage, Highway JJ	90056	Sep/27/1990	Rock Bass, Walleye
Menominee River	White Rapids Flowage	1999091	Oct/18/1999	Redhorse Sucker
Michigamme River	Iron County	84022	Aug/31/1984	Walleye
Michigamme River	Iron County, Michigamme Falls Impoundment	84025	Aug/24/1984	Black Crappie, Northern Pike, Pumpkinseed, Smallmouth Bass, Walleye, Yellow Perch
Michigamme River	Marquette County	84021	Aug/16/1984	Northern Pike, Walleye
Michigamme River	Michigamme Reservoir	84026	Jun/01/1984	Northern Pike, Walleye, White Sucker
Michigamme River	Michigamme Reservoir	92075	Sep/14/1992	Northern Pike, Walleye
Michigamme River	Michigamme Reservoir	95061	Oct/03/1995	Northern Pike, Walleye
Michigamme River	Michigamme Reservoir	1998072	Sep/29/1998	Northern Pike, Walleye
Michigamme River	Michigamme Reservoir	2000052	Sep/13/2000	Northern Pike, Walleye
Michigamme River	Peavy Pond	84023	Aug/10/1984	Northern Pike, Rock Bass, Walleye, White Sucker, Yellow Perch
Michigamme River	Peavy Pond	97043	Oct/30/1997	Burbot, Walleye
Michigamme River	Peavy Pond	1998145	Oct/13/1998	Lake Whitefish, Northern Pike, Rock Bass, Smallmouth Bass, Walleye, White Sucker, Yellow Perch
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
Mona Lake	Muskegon County	2002069	Jul/08/2002	Carp
Montcalm Lake	Montcalm County	2003065	Jul/07/2003	Largemouth Bass
Montcalm Lake	Montcalm County	2004062	May/20/2004	Largemouth Bass
Morrison Lake	Ionia County	88002	May/03/1988	Carp, Largemouth Bass, Walleye, White Sucker
Morrison Lake	Ionia County	1998076	Oct/27/1998	Largemouth Bass
Morrison Lake	Ionia County	2003081	Jun/15/2003	Carp
Mullett Lake	Cheboygan County	88035	Oct/18/1988	Northern Pike, Smallmouth Bass, Walleye

Waterbody	Location	Visit ID#	Date	Species
Muskallonge Lake	Luce County	2002070	May/15/2002	Brown Bullhead, Northern Pike
Muskegon Lake	Muskegon County	83052	May/27/1983	Carp, Northern Pike
Muskegon Lake	Muskegon County	86061	Oct/29/1986	Carp, Largemouth Bass, Northern Pike, Walleye
Muskegon Lake	Muskegon County	87054	Jul/07/1987	Largemouth Bass, Smallmouth Bass, Walleye
Muskegon Lake	Muskegon County	93071	Aug/19/1993	Carp, Walleye
Muskegon Lake	Muskegon County	2001082	Sep/13/2001	Largemouth Bass, Smallmouth Bass
Muskegon Lake	Muskegon County	2002071	Sep/04/2002	Carp, Walleye
Muskegon River	M-82 at High Rollaway	2002074	Aug/20/2002	Channel Catfish
Muskegon River	Maple Island Road	2002075	Aug/20/2002	Channel Catfish
Muskegon River	Muskegon, river mouth	90020	Aug/07/1990	Channel Catfish
Muskegon River	Muskegon, river mouth	93038	Jun/09/1993	Carp
Muskegon River	Muskegon, river mouth	93042	Jul/01/1993	Channel Catfish
Muskegon River	Newaygo County, below Croton Dam	89002	Apr/10/1989	Walleye Eggs
Muskegon River	Newaygo County, below Croton Dam	93011	Apr/04/1993	Walleye
Muskegon River	Newaygo County, below Croton Dam	96042	Mar/29/1996	Redhorse Sucker, Walleye
Muskegon River	Newaygo County, Croton Dam Pond	91029	Apr/04/1991	Carp
Muskegon River	Newaygo County, Croton Dam Pond	93080	Jun/28/1993	Carp
Muskegon River	Newaygo County, Croton Dam Pond	95041	Sep/27/1995	Carp
Muskegon River	Newaygo County, Croton Dam Pond	97047	Sep/30/1997	Walleye, White Sucker
Muskegon River	Newaygo County, Croton Dam Pond	97048	Sep/30/1997	Carp, Yellow Perch
Muskegon River	Newaygo County, Croton Dam Pond	2000058	Sep/06/2000	Carp, Yellow Perch
Muskegon River	Newaygo County, Croton Dam Pond	2002076	Jul/08/2002	Carp
Muskegon River	Vance Road	2002073	Aug/20/2002	Channel Catfish
Nawakwa Lake	Alger County	89055	Jun/20/1989	Northern Pike, Walleye
Nawakwa Lake	Alger County	1999076	May/06/1999	Northern Pike, Walleye
Net River	Iron County, The Wide Waters	89030	May/01/1989	Northern Pike, Walleye
Nettie Lake	Presque Isle County	95032	Jun/05/1995	Largemouth Bass, Northern Pike
Nevins Lake	Montcalm County	2004076	Sep/07/2004	Largemouth Bass
North Lake Leelanau	Leelanau County	2002078	Apr/26/2002	White Sucker
North Lake Leelanau	Leelanau County	2003082	Oct/21/2003	Lake Trout
North Manistique Lake	Luce County	89048	Jun/07/1989	Northern Pike, Walleye, Yellow Perch
North Manistique Lake	Luce County	2003083	Apr/24/2003	Walleye, Yellow Perch
Norvell Lake	Jackson County	2001084	Oct/17/2001	Carp, Largemouth Bass
Nottawa River	Calhoun County	1998080	Jul/29/1998	Brown Trout, Northern 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

Waterbody	Location	Visit ID#	Date	Species
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 Lake	Iron County	2003144	Jun/11/2003	Northern Pike
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
Peach Lake	Ogemaw County	2004080	May/18/2004	Northern Pike
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 Lake	Mason County	2003086	May/05/2003	Northern Pike, White Sucker
Pere Marquette River	Lake County	2004081	Sep/03/2004	Brown Trout
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
Pere Marquette River, Little South Branch	Lake County	2004082	Aug/24/2004	Brown Trout, White Sucker
Pere Marquette River, Little South Branch	Taylor Bridge	94032	Aug/17/1993	Brown Trout
Pickerel Lake	Dickinson County	87082	Sep/24/1987	Largemouth Bass, Northern Pike
Pickerel Lake	Emmet County	89069	May/23/1989	Largemouth Bass, Smallmouth Bass, Walleye
Pike Lake	Luce County	89056	Jun/28/1989	Walleye
Pine Lake	Barry County	95001	Mar/20/1995	Black Crappie, Northern Pike
Pine Lake	Manistee County	87042	Jun/02/1987	Brown Trout, Largemouth Bass, Rock Bass
Pine River	Above Alma	1998085	Oct/15/1998	Rock Bass, White Sucker
Pine River	Alma Impoundment	95018	Jun/07/1995	Carp, Largemouth Bass
Pine River	Below Alma Dam	97060	Jul/29/1997	Carp, Largemouth Bass
Pine River	Gordonville Road	2000070	Jul/20/2000	Channel Catfish
Pine River	Gordonville Road	2002014	Jul/16/2002	Channel Catfish
Pine River	Gratiot County, Alma	83047	May/31/1983	Carp
Pine River	Gratiot County, below St Louis Dam	83001	Oct/31/1983	Brown Bullhead, Carp, Common Shiner, Rock Bass, Smallmouth Bass, White Sucker
Pine River	Gratiot County, below St Louis Dam	85007	Aug/06/1985	Carp
Pine River	Gratiot County, below St Louis Dam	94021	Aug/23/1994	Carp
Pine River	Gratiot County, below St Louis Dam	97072	Oct/16/1997	Carp

Waterbody	Location	Visit ID#	Date	Species
Pine River	Harrison Road	1999049	Jun/24/1999	Channel Catfish
Pine River	Harrison Road	2000066	Jul/20/2000	Channel Catfish
Pine River	Harrison Road	2002011	Jul/16/2002	Channel Catfish
Pine River	M-46	1999050	Jun/24/1999	Channel Catfish
Pine River	M-46	2000067	Jul/20/2000	Channel Catfish
Pine River	M-46	2002012	Jul/16/2002	Channel Catfish
Pine River	Midland County, Homer Road	85060	Apr/11/1985	Carp, Smallmouth Bass, White Sucker
Pine River	Mill Street	2000068	Jul/20/2000	Channel Catfish
Pine River	Montcalm County, Edmore	86041	Jul/29/1986	Brown Trout, Hognose sucker, Redhorse Sucker, White Sucker
Pine River	Nine Mile Road	1999053	Jun/24/1999	Channel Catfish
Pine River	St. Clair	97051	Sep/17/1997	Channel Catfish
Pine River	St. Clair County, Griswold Road	92009	Jul/30/1992	Carp
Pine River	St. Louis	96500	Oct/15/1996	Muskrat, Raccoon
Pine River	St. Louis Impoundment	86042	Aug/07/1986	Carp, Crappie, Largemouth Bass, Northern Pike, Smallmouth Bass
Pine River	St. Louis Impoundment	89027	Apr/27/1989	Black Crappie, Carp, Largemouth Bass
Pine River	St. Louis Impoundment	95005	Apr/24/1995	Black Crappie, Carp
Pine River	St. Louis Impoundment	97071	Oct/17/1997	Carp, Smallmouth Bass
Pine River	St. Louis Impoundment	2002103	Jul/16/2002	Channel Catfish
Pine River	WWTP Bridge	1999052	Jun/24/1999	Channel Catfish
Pine River	WWTP Bridge	2000069	Jul/20/2000	Channel Catfish
Pine River	WWTP Bridge	2002013	Jul/16/2002	Channel Catfish
Platte River	Burnt Mill Road, Benzie County	1998087	Aug/05/1998	Brown Trout, White Sucker
Plum Creek	Monroe	1999090	Nov/01/1999	Black Buffalo, Carp, Channel Catfish, White Bass
Pomeroy Lake	Gogebic County	97052	Apr/30/1997	Walleye
Pomeroy Lake	Gogebic County	1999055	Apr/28/1999	Walleye
Pontiac Lake	Oakland County	92070	Jul/27/1992	Largemouth Bass
Pontiac Lake	Oakland County	94007	Oct/01/1994	Largemouth Bass
Pontiac Lake	Oakland County	97053	May/22/1997	Largemouth Bass
Pontiac Lake	Oakland County	1999056	Apr/06/1999	Largemouth Bass
Pontiac Lake	Oakland County	1999079	Apr/06/1999	Channel Catfish
Pontiac Lake	Oakland County	2003094	Jun/25/2003	Largemouth Bass
Portage Creek	Bryant Mill Pond	85050	Jul/01/1985	Carp
Portage Creek	Bryant Mill Pond	86023	Jul/08/1986	Carp
Portage Creek	Bryant Mill Pond	87047	Jul/14/1987	Carp
Portage Creek	Bryant Mill Pond	2000121	Aug/10/2000	Brown Trout, Carp
Portage Creek	Bryant Mill Pond	2001044	Aug/29/2001	Carp, White Sucker
Portage Creek	Bryant Mill Pond	2002108	Aug/19/2002	Carp
Portage Creek	Kalamazoo, Crosstown Pkwy.	89059	Aug/30/1989	Channel Catfish
Portage Creek	Monarch Pond	2001045	Oct/17/2001	Carp
Portage Creek	Mouth, Alcott St.	1999097	Sep/08/1999	Channel Catfish
Portage Lake	Houghton County	88016	Aug/04/1988	Brown Trout, Northern Pike, Walleye
Portage Lake	Houghton County	1998151	Sep/15/1998	Walleye, White Sucker
Portage Lake	Manistee County	90008	Jun/12/1990	Largemouth Bass, Northern Pike, Smallmouth Bass

Waterbody	Location	Visit ID#	Date	Species
Portage Lake	Manistee County	2004144	Oct/11/2004	Carp, Largemouth Bass, Northern Pike
Portage Lake	Washtenaw/Livingston County	89009	May/10/1989	Largemouth Bass, Walleye
Prairie River Lake	St. Joseph County	86043	Aug/12/1986	Largemouth Bass
Pratt Lake	Gladwin County	2003095	May/22/2003	Largemouth Bass
Pretty Lake	Luce County	2004083	Jun/22/2004	Walleye
Rabbit River	d/s Hamilton Dam	2003098	Sep/17/2003	Carp, Largemouth Bass, Northern Pike, Redhorse Sucker, Rock Bass
Rabbit River	u/s Hamilton Dam	2003096	Sep/17/2003	Carp, Largemouth Bass, Northern Pike, Redhorse Sucker
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	Above Monroe Dam	2004086	Oct/06/2004	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 County, above Monroe Dam	2004085	Oct/06/2004	Carp
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
Robinson Lake	Newaygo County	2004095	May/06/2004	Northern Pike
Rogue River	11 Mile/Granger	1998095	Aug/17/1998	Brown Trout, White Sucker

Waterbody	Location	Visit ID#	Date	Species
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
Rogue River	Bell Branch	92040	Aug/25/1992	Channel Catfish
Rogue River	Below M-153	95059	Apr/24/1995	Carp, Northern Pike, White Sucker
Rogue River	Below Newburgh Lake	2000116	Oct/04/2000	Channel Catfish
Rogue River	Below Phoenix Lake	2000077	Aug/28/2000	Channel Catfish
Rogue River	Dearborn, river mouth	86016	Jun/24/1986	Carp
Rogue River	Dearborn, river mouth	92010	Aug/25/1992	Channel Catfish
Rogue River	Dearborn, river mouth	95044	Oct/09/1995	Channel Catfish
Rogue River	Dearborn, river mouth	2000079	Aug/28/2000	Channel Catfish
Rogue River	Dearborn, river mouth	2000117	Oct/04/2000	Channel Catfish
Rogue River	Evergreen Road	95042	Oct/09/1995	Channel catfish
Rogue River	Greenfield Road	95043	Oct/09/1995	Channel Catfish
Rogue River	Oakland County, Lahser Road	87029	Jun/17/1987	Carp, Rock Bass, White Sucker
Rogue River	Wayne County, above turning basin	85012	Jun/19/1985	Carp
Rogue River	Wayne County, below Jefferson Ave	85011	Jun/19/1985	Carp
Rogue River	Wayne County, Eliza Howell Park	87031	Jun/17/1987	White Sucker
Rogue River	Wayne County, Eliza Howell Park	94015	Sep/13/1994	White Sucker
Rogue River, Lower Branch	Wayne County, Gulley Road	87025	Jun/16/1987	Carp
Rogue River, Middle Branch	Inkster Road below Newburg Lake	2002084	Sep/06/2002	White Sucker
Rogue River, Middle Branch	Newburgh Lake	88011	Jul/19/1988	Largemouth Bass, Northern Pike, White Sucker
Rogue River, Middle Branch	Newburgh Lake	93014	Nov/17/1993	Northern Pike, White Sucker
Rogue River, Middle Branch	Newburgh Lake	95024	May/30/1995	Bluegill, Largemouth Bass
Rogue River, Middle Branch	Newburgh Lake	2001097	Oct/30/2001	Carp, Channel Catfish, Largemouth Bass, White Sucker
Rogue River, Middle Branch	Newburgh Lake	2002085	Sep/24/2002	Carp, Channel Catfish, Northern Pike, White Sucker
Rogue River, Middle Branch	Oakland County, 9 Mile Road	87028	Jun/16/1987	Brown Bullhead, Carp, Channel Catfish, Rock Bass, White Sucker
Rogue River, Middle Branch	Phoenix Lake	88012	Jul/19/1988	Carp, Northern Pike, White Sucker
Rogue River, Middle Branch	Phoenix Lake	95023	Jun/13/1995	Bluegill, Carp
Rogue River, Middle Branch	Phoenix Lake	2001098	Oct/30/2001	Carp, Channel Catfish, Northern Pike
Rogue River, Middle Branch	Phoenix Lake	2002086	Oct/22/2002	Carp, Northern Pike, White Sucker
Rogue River, Middle Branch	Wayne County, Haggerty/Hines Drain	87027	Jun/16/1987	Rock Bass, Smallmouth Bass, White Sucker
Rogue River, Middle Branch	Wayne County, Inkster Road	87026	Jun/16/1987	Goldfish
Rogue River, Middle Branch	Wayne County, Merriman Road	2000083	Jul/24/2000	White Sucker
Rogue River, Upper Branch	Oakland County, Powers Road	87032	Jun/17/1987	White Sucker
Rogue 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
Runkle Lake	Iron County	2003104	Apr/21/2003	Northern Pike
Ruppert Lake	Kalamazoo County	2004099	May/28/2004	Largemouth Bass

Waterbody	Location	Visit ID#	Date	Species
Rush Lake	Van Buren County	2004100	Mar/23/2004	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, LaFayette	2004113	Aug/09/2004	Carp
Saginaw River	Bay County, river mouth	88020	Aug/01/1988	Channel Catfish
Saginaw River	Bay County, river mouth	92011	Aug/12/1992	Channel Catfish
Saginaw River	Bay County, river mouth	1998096	Sep/04/1998	Channel Catfish
Saginaw River	Bay County, river mouth	2002028	Jul/16/2002	Channel Catfish
Saginaw River	Saginaw County, Crow Island	92036	Jul/15/1992	Carp
Saginaw River	Saginaw County, Saginaw	88021	Aug/01/1988	Channel Catfish
Saginaw River	upstream of Middle Ground Isle	1998097	Sep/04/1998	Channel Catfish
Saginaw River	upstream of Middle Ground Isle	2002027	Jul/16/2002	Channel Catfish
Saginaw River	Zilwaukee Bridge	1998098	Sep/04/1998	Channel Catfish
Saginaw River	Zilwaukee Bridge	2002026	Jul/16/2002	Channel Catfish
Sand Lake	Lenawee County	2003107	May/29/2003	Walleye
Sand Lake	Newaygo County	92058	May/22/1992	Black Crappie, Largemouth Bass
Schweitzer Creek	Schweitzer Reservoir	92047	Aug/07/1992	Northern Pike, Smallmouth Bass, Walleye
Sebewaing River	Huron County	88037	Oct/20/1988	Carp, Northern Pike
Sebewaing River	Huron County	2004114	Aug/11/2004	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	Exchange Road	2003109	Jul/22/2003	Carp, Smallmouth Bass
Shiawassee River	Fergus Road	2002022	Jul/16/2002	Channel Catfish
Shiawassee River	Genesee County, Duffield Road	81007	Jun/03/1981	Carp, Hognose Sucker, Northern Pike, Rock Bass, Sunfish
Shiawassee River	Henderson	92012	Sep/22/1992	Carp, Smallmouth Bass
Shiawassee River	Mouth	1998099	Sep/04/1998	Channel Catfish
Shiawassee River	Mouth	2002025	Jul/16/2002	Channel Catfish
Shiawassee River	Oakland County, Fish Lake Road	87062	Jul/28/1987	Carp, Largemouth Bass, Rock Bass
Shiawassee River	Saginaw County below Chesaning	87064	Aug/05/1987	Carp, Rock Bass, Smallmouth Bass
Shiawassee River	Saginaw County, Miller Road	88024	Aug/18/1988	Channel Catfish
Shiawassee River	Shiawassee County, Byron Road	81006	Jun/03/1981	Black Crappie, Carp, Northern Pike, Redhorse Sucker, Rock Bass, Sunfish
Shiawassee River	Shiawassee County, Byron 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	Between M59 & Byron	2004101	Jul/13/2004	Carp, Rock Bass, White Sucker
Shiawassee River, South Branch	Livingston County, Bowen Road	81002	Jun/03/1981	Black Bullhead, Minnow, Northern Pike, Sunfish, White Sucker

Waterbody	Location	Visit ID#	Date	Species
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 Lake	Dickinson County	2002111	Jun/19/2002	Walleye
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
Siskiwit Lake	Isle Royale	2002105	Jun/29/2002	Lake Trout
Six Mile Lake	Charlevoix County	2003110	May/08/2003	Northern Pike
Six Mile Lake	Houghton County	95012	May/16/1995	Bluegill, Walleye
Smokey Lake	Iron County	86056	Oct/07/1986	Lake Trout, Rock Bass, Smallmouth Bass, White Sucker
South Branch Black River	Downstream of Bangor Dam	2002006	Aug/02/2002	Channel Catfish
South Branch Black River	Upstream of Bangor Dam	2002005	Aug/02/2002	Channel Catfish
South Groveland Pond	Dickinson County	2003146	Jun/04/2003	Walleye
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
South Manistique Lake	Mackinac County	2003112	Apr/25/2003	Walleye
Sporley Lake	Marquette County	93058	Jun/01/1993	White Sucker
Sporley Lake	Marquette County	2004117	May/10/2004	Splake
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

Waterbody	Location	Visit ID#	Date	Species
St. Clair River	Algonac	94009	Aug/25/1994	Carp
St. Clair River	Algonac	2002093	May/24/2002	Carp
St. Clair River	Marine City	91031	May/14/1991	Walleye
St. Clair River	Port Huron	86038	Jul/31/1986	Freshwater Drum, Walleye
St. Clair River	Rivermouth, North Channel	94008	Aug/25/1994	Carp, Freshwater Drum
St. Clair River	St. Clair	85006	Oct/10/1985	Walleye
St. Joseph River	Above Niles	2001086	Jul/30/2001	Channel Catfish
St. Joseph River	Above Niles Dam	95052	Jul/07/1995	Carp
St. Joseph River	Above Paw Paw River	2001090	Jul/30/2001	Channel Catfish
St. Joseph River	Below Buchanan	97065	Sep/16/1997	Channel Catfish
St. Joseph River	Below Buchanan	2001087	Jul/30/2001	Channel Catfish
St. Joseph River	Below Niles	97066	Sep/16/1997	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	89022	Aug/28/1989	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	93034	Jun/08/1993	Carp
St. Joseph River	Benton Harbor, river mouth	93045	Jul/01/1993	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	97063	Sep/16/1997	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	2001091	Jul/30/2001	Channel Catfish
St. Joseph River	Berrien Springs, below Dam	84004	Oct/03/1984	Carp, Smallmouth Bass
St. Joseph River	Berrien Springs, below Dam	87096	Nov/18/1987	Carp, Smallmouth Bass, Walleye
St. Joseph River	Berrien Springs, below Dam	97064	Sep/16/1997	Channel Catfish
St. Joseph River	Berrien Springs, below Dam	2001089	Jul/30/2001	Channel Catfish
St. Joseph River	Chapin Lake	83033	May/01/1983	Redhorse Sucker, Smallmouth Bass
St. Joseph River	Chapin Lake	83042	May/10/1983	Carp
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
St. Joseph River	Chapin Lake	95051.1	Jul/06/1995	Carp, Smallmouth Bass
St. Joseph River	Chapin Lake	2000088	Oct/17/2000	Carp
St. Joseph River	Chapin Lake	2002094	Oct/21/2002	Carp
St. Joseph River	Constantine Impoundment	1998110	Jun/24/1998	Channel Catfish, Redhorse Sucker
St. Joseph River	St. Joseph County, Constantine	92031	Apr/02/1992	Carp, Walleye
St. Joseph River	St. Joseph County, Three Rivers	92032	Apr/03/1992	Walleye
St. Joseph River	State Line, Berrien County	97067	Sep/16/1997	Channel Catfish
St. Joseph River	Sturgis Impoundment	2004119	Oct/14/2004	Carp, Largemouth Bass
St. Marys River	Michigan Waters	95046	Aug/01/1995	Northern Pike, Walleye, Yellow Perch
St. Marys River	Michigan Waters	2004120	Apr/19/2004	Northern Pike, Walleye
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	95004.1	Apr/17/1995	Carp
St. Marys River	Munuscong Bay	1998112	Apr/29/1998	Carp, Walleye
St. Marys River	Munuscong Bay	2001102	Apr/23/2001	Walleye
St. Marys River	Munuscong Bay	2004121	Sep/08/2004	Carp
St. Marys River	Munuscong Bay	2004149	Sep/07/2004	Northern Pike
St. Marys River	N. Drummond Island	89035	May/11/1989	Yellow Perch

Waterbody	Location	Visit ID#	Date	Species
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
Stevenson Lake	Isabella County	2002096	May/08/2002	Brown Bullhead, Largemouth Bass, Northern Pike, Yellow Bullhead
Stony Creek Impoundment	Macomb County	89025	Apr/16/1989	Crappie, Northern Pike, Walleye
Sudden Lake	Ontonagon County	2001144	Oct/03/2001	Walleye
Sullivan Creek	USFWS-Sullivan Creek Hatchery	2005124	May/03/2005	Lake Trout
Sunday Lake	Gogebic County	2003126	May/29/2003	Black Crappie, Northern Pike, Walleye, Yellow Perch
Sunset Lake	Iron County	88049	Oct/11/1988	Northern Pike, Walleye
Swan Creek	Monroe County	86059	Oct/09/1986	White Sucker
Sylvan Lake	Newaygo County	2004141	Jun/22/2004	Largemouth Bass, Northern Pike
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
Teal Lake	Marquette County	2004122	May/11/2004	Smallmouth Bass, Walleye
Tepee Lake	Iron County	2003145	Jun/19/2003	Northern Pike
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
Thompson Lake	St. Joseph County	2002036	Jun/25/2002	Brown Bullhead, Largemouth Bass
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
Thunder Bay River	Seven Mile Pond	2002097	Oct/15/2002	Brown Bullhead, Largemouth Bass
Tittabawassee River	Cook Road	2002016	Jul/16/2002	Channel Catfish
Tittabawassee River	Freeland	2002019	Jul/16/2002	Channel Catfish
Tittabawassee River	Midland County, below Dow Dam	84010	Apr/03/1984	Carp, Walleye, White Sucker
Tittabawassee River	Midland County, below Dow Dam	87002	Apr/07/1987	Walleye
Tittabawassee River	Midland County, below Dow Dam	89001	Apr/06/1989	Walleye Eggs
Tittabawassee River	Midland County, below Dow Dam	92064	Oct/30/1992	Carp, Walleye
Tittabawassee River	Midland County, below Dow Dam	95013	Apr/06/1995	White Bass, White Sucker
Tittabawassee River	Midland County, below Dow Dam	1999066	May/26/1999	Carp, Smallmouth Bass

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 Crossing Road	83054	Aug/23/1983	Carp, Channel Catfish, Smallmouth Bass, Walleye
Tittabawassee River	Midland County, Smiths Crossing Road	85015	Apr/17/1985	Walleye
Tittabawassee River	Midland County, Smiths Crossing Road	85016	May/23/1985	Black Crappie, Northern Pike, Smallmouth Bass, White Bass
Tittabawassee River	Midland County, Smiths Crossing Road	85017	Jul/16/1985	Walleye
Tittabawassee River	Midland County, Smiths Crossing Road	2000095	Jul/20/2000	Channel Catfish
Tittabawassee River	Midland County, Smiths Crossing Road	2002017	Jul/16/2002	Channel Catfish
Tittabawassee River	Midland County, Smiths Crossing Road	2003132	Apr/02/2003	Carp, Channel Catfish, Smallmouth Bass, Walleye, White Bass
Tittabawassee River	Mouth	1998119	Sep/04/1998	Channel Catfish
Tittabawassee River	Mouth	2002021	Jul/16/2002	Channel Catfish
Tittabawassee River	RR Bridge below Dow	2002018	Jul/16/2002	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	88023	Aug/02/1988	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	2002020	Jul/16/2002	Channel Catfish
Tittabawassee River	Sanford Lake	89004	Apr/07/1989	Black Crappie, Northern Pike, Walleye
Tittabawassee River	Sanford Lake	92065	Sep/15/1992	Carp
Tittabawassee River	Sanford Lake	1999081	May/20/1999	Black Crappie, Channel Catfish, Rock Bass
Tobico Wetland	Bay County	96054	May/21/1996	Carp, Northern Pike
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
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
Union Lake	Branch County	2003135	Jun/17/2003	Carp, Channel Catfish, Largemouth Bass, Walleye
Union Lake	Oakland County	2002100	May/29/2002	Largemouth Bass, Smallmouth Bass
Unnamed Lake	Washtenaw County	89007	May/02/1989	Bullhead, Largemouth Bass
Van Auken Lake	Van Buren County	2004125	Mar/23/2004	Northern Pike
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

Waterbody	Location	Visit ID#	Date	Species
Walkup Lake	Newaygo County	1999075	Jun/21/1999	Bluegill
Walled Lake	Oakland County	88031	Aug/24/1988	Carp, Northern Pike
Walloon Lake	Charlevoix County	87023	Jun/04/1987	Smallmouth Bass
Walloon Lake	Charlevoix County	2000099	Oct/10/2000	Rock Bass, White Sucker, Yellow Bullhead, Yellow Perch
Wamplers Lake	Jackson/Lenawee County	89040	May/19/1989	Black Crappie, Largemouth Bass, Northern Pike
Wamplers Lake	Jackson/Lenawee County	94055	Oct/17/1994	Largemouth Bass, Northern Pike
White Lake	Muskegon County	80001	Jul/02/1980	Carp, Largemouth Bass, Northern Pike, Redhorse Sucker, Smallmouth Bass, White Sucker, Yellow Perch
White Lake	Muskegon County	84001	Jul/24/1984	Carp, Northern Pike, Redhorse Sucker, Smallmouth Bass, Walleye
White Lake	Muskegon County	87057	Jul/14/1987	Smallmouth Bass, Walleye
White Lake	Muskegon County	91046	Aug/21/1991	Carp, Walleye
White Lake	Muskegon County	2004126	Sep/13/2004	Carp, Smallmouth Bass, Walleye
White Lake	Oakland Co.	2001111	Oct/18/2001	Brown Bullhead, Rock Bass
White River	White Lake outlet, river mouth	92014	Aug/18/1992	Channel Catfish
Whitmore Lake	Livingston County	92038	Jun/09/1992	Carp, Largemouth Bass, Northern Pike
Wixom Lake	Gladwin County	2002102	May/16/2002	Channel Catfish, Northern Pike
Wolf Creek	Montcalm County, Grove Road	2000103	Sep/18/2000	White Sucker
Wolf Creek	Montcalm County, Vickeryville Road	92015	Jun/01/1992	Brown Trout, Rock Bass
Woodland Lake	Livingston County	2000104	May/02/2000	Carp, Largemouth Bass

APPENDIX B

INVENTORY OF WHOLE-FISH TREND MONITORING SITES AND SPECIES

Waterbody	Location	Visit ID#	Date	Species
Detroit River	Grassy Island	90033	Aug/28/1990	Carp, Walleye
Detroit River	Grassy Island	92033	Aug/17/1992	Carp, Walleye
Detroit River	Grassy Island	94050	Aug/25/1994	Carp, Walleye
Detroit River	Grassy Island	96009	Jul/12/1996	Carp, Walleye
Detroit River	Grassy Island	1998025	Sep/22/1998	Carp, Walleye
Detroit River	Grassy Island	2001009	Oct/18/2001	Carp, Walleye
Detroit River	Grassy Island	2004020	Jul/20/2004	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 River	Kent County, above 6th St. Dam	2003042	Sep/20/2003	Carp
Grand Sable Lake	Alger County	91010	May/20/1991	Lake Trout
Grand Sable Lake	Alger County	93006	Jun/01/1993	Lake Trout
Grand Sable Lake	Alger County	95047	Sep/07/1995	Lake Trout
Gull Lake	Kalamazoo County	91058	Sep/12/1991	Largemouth Bass
Gull Lake	Kalamazoo County	93063	Jun/10/1993	Largemouth Bass
Gull Lake	Kalamazoo County	95035	Jun/01/1995	Largemouth Bass
Gull Lake	Kalamazoo County	97011	Jun/15/1997	Largemouth Bass
Gull Lake	Kalamazoo County	2000025	Jul/11/2000	Largemouth Bass
Gull Lake	Kalamazoo County	2002034	Jun/30/2002	Largemouth Bass
Gun Lake	Barry County	90006	Jul/01/1990	Largemouth Bass
Gun Lake	Barry County	92066	Jun/15/1992	Largemouth Bass
Gun Lake	Barry County	94023	Jul/17/1994	Largemouth Bass
Gun Lake	Barry County	97012	Jul/17/1997	Largemouth Bass
Gun Lake	Barry County	2000026	Jul/25/2000	Largemouth Bass
Gun Lake	Barry County	2002035	Jun/06/2002	Largemouth Bass
Higgins Lake	Roscommon County	91001	May/02/1991	Lake Trout
Higgins Lake	Roscommon County	95057.2	Oct/31/1995	Lake Trout
Higgins Lake	Roscommon County	97013	Oct/22/1997	Lake Trout, Yellow Perch
Higgins Lake	Roscommon County	2000028	Oct/11/2000	Lake Trout
Higgins Lake	Roscommon County	2002037	Oct/02/2002	Lake Trout
Houghton Lake	Roscommon County	92037	Jun/13/1992	Largemouth Bass
Houghton Lake	Roscommon County	94006	Jun/07/1994	Largemouth Bass
Houghton Lake	Roscommon County	1998126	Jun/16/1998	Largemouth Bass
Houghton Lake	Roscommon County	2001026	Oct/11/2001	Largemouth Bass
Houghton Lake	Roscommon County	2004037	May/27/2004	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
Kalamazoo River	Lake Allegan	2003147	Jun/07/2003	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

Waterbody	Location	Visit ID#	Date	Species
Lake Erie	Brest Bay	97017	Apr/21/1997	Carp
Lake Erie	Brest Bay	1998051	Apr/15/1998	Carp, Walleye
Lake Erie	Brest Bay	2002044	Apr/26/2002	Carp
Lake Erie	Brest Bay	2003051	Oct/24/2003	Walleye
Lake Erie	Brest Bay	2004042	Oct/08/2004	Walleye
Lake Gogebic	Gogebic/Ontonagon County	92043	May/05/1992	Walleye
Lake Gogebic	Gogebic/Ontonagon County	94028	Apr/29/1994	Walleye
Lake Gogebic	Gogebic/Ontonagon County	97020	May/04/1997	Walleye, Yellow Perch
Lake Gogebic	Gogebic/Ontonagon County	2000031	Apr/18/2000	Walleye
Lake Gogebic	Gogebic/Ontonagon County	2002047	Apr/28/2002	Walleye
Lake Huron	Saginaw Bay	90063	Apr/24/1990	Carp, Walleye
Lake Huron	Saginaw Bay	91041	Oct/02/1991	Walleye
Lake Huron	Saginaw Bay	92028	May/19/1992	Carp, Walleye
Lake Huron	Saginaw Bay	94037	Sep/26/1994	Carp, Walleye
Lake Huron	Saginaw Bay	1998139	Sep/21/1998	Carp, Walleye
Lake Huron	Saginaw Bay	2001059	Aug/22/2001	Carp
Lake Huron	Saginaw Bay	2003056	Aug/26/2003	Carp, Walleye
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 Huron	Thunder Bay	2004048	May/20/2004	Carp, Lake Trout
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	Grand Traverse Bay	2003060	Oct/31/2003	Carp
Lake Michigan	Grand Traverse Bay	2004053	May/18/2004	Lake Trout
Lake Michigan	Little Bay De Noc	92046	Jun/04/1992	Carp, Walleye
Lake Michigan	Little Bay De Noc	94041	Apr/20/1994	Carp, Walleye
Lake Michigan	Little Bay De Noc	97026	Apr/28/1997	Walleye, Yellow Perch
Lake Michigan	Little Bay De Noc	2000039	Oct/05/2000	Carp, Walleye
Lake Michigan	Little Bay De Noc	2002055	Apr/19/2002	Walleye
Lake Michigan	Little Bay De Noc	2003061	Apr/15/2003	Carp
Lake St. Clair	L'Anse Creuse Bay	90002	Apr/02/1990	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	92029	Jun/04/1992	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	94058	Jul/13/1994	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	1998063	Jun/15/1998	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	2002059	May/23/2002	Carp, Walleye
Lake Superior	Keweenaw Bay	91024	May/01/1991	Lake Trout
Lake Superior	Keweenaw Bay	93055	May/03/1993	Lake Trout
Lake Superior	Keweenaw Bay	96035	May/23/1996	Lake Trout
Lake Superior	Keweenaw Bay	1999039	May/13/1999	Lake Trout

Waterbody	Location	Visit ID#	Date	Species
Lake Superior	Keweenaw Bay	2001078	Apr/30/2001	Lake Trout
Lake Superior	Keweenaw Bay	2004063	May/04/2004	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
Manistique River	Manistique, above Dam	2003076	Oct/08/2003	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
Muskegon River	Newaygo County, Croton Dam Pond	2002076	Jul/08/2002	Carp
Pontiac Lake	Oakland County	92070	Jul/27/1992	Largemouth Bass
Pontiac Lake	Oakland County	94007	Oct/01/1994	Largemouth Bass
Pontiac Lake	Oakland County	97053	May/22/1997	Largemouth Bass
Pontiac Lake	Oakland County	1999056	Apr/06/1999	Largemouth Bass
Pontiac Lake	Oakland County	2003094	Jun/25/2003	Largemouth Bass
Raisin River	Above Monroe Dam	91050	Sep/25/1991	Carp
Raisin River	Above Monroe Dam	94010	Jun/10/1994	Carp
Raisin River	Above Monroe Dam	97054	Oct/02/1997	Carp
Raisin River	Above Monroe Dam	2000072	Oct/12/2000	Carp
Raisin River	Above Monroe Dam	2004086	Oct/06/2004	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
South Manistique Lake	Mackinac County	2003112	Apr/25/2003	Walleye
St. Clair River	Algonac	92061	Jun/21/1992	Carp, Walleye
St. Clair River	Algonac	94009	Aug/25/1994	Carp
St. Clair River	Algonac	2002093	May/24/2002	Carp
St. Joseph River	Chapin Lake	91044	Aug/20/1991	Carp
St. Joseph River	Chapin Lake	93081	Oct/06/1993	Carp
St. Joseph River	Chapin Lake	95051	Jul/06/1995	Carp
St. Joseph River	Chapin Lake	2000088	Oct/17/2000	Carp
St. Joseph River	Chapin Lake	2002094	Oct/21/2002	Carp
St. Marys River	Munuscong Bay	91059	Apr/23/1991	Walleye
St. Marys River	Munuscong Bay	93015	Apr/27/1993	Carp, Walleye
St. Marys River	Munuscong Bay	95004	Apr/17/1995	Carp, Walleye
St. Marys River	Munuscong Bay	1998112	Apr/29/1998	Carp, Walleye
St. Marys River	Munuscong Bay	2001102	Apr/23/2001	Walleye
St. Marys River	Munuscong Bay	2004121	Sep/08/2004	Carp

APPENDIX C

INVENTORY OF CAGED-FISH BIOCONCENTRATION STUDIES

Waterbody	Location	Visit ID#	Date	Species
Au Gres River	Au Gres, river mouth	91002	Sep/03/1991	Channel Catfish
Au Sable River	Oscoda, river mouth	91003	Sep/03/1991	Channel Catfish
Au Sable River	Oscoda, river mouth	96002	Aug/19/1996	Channel Catfish
Baldwin River	Near M-37	2003005	Jul/16/2003	Channel Catfish
Belle River	Marine City	97002	Sep/17/1997	Channel Catfish
Big South Branch Pere Marquette River	Walhalla Road	2003007	Jul/16/2003	Channel Catfish
Black River	Mouth	2002007	Aug/02/2002	Channel Catfish
Black River	Port Huron, river mouth	93003	Aug/31/1993	Channel Catfish
Boardman River	Beitner Rd	2003011	Jul/17/2003	Channel Catfish
Boardman River	Eighth St Bridge	2003012	Jul/17/2003	Channel Catfish
Boardman River	Union Street, downstream WWTP	2003013	Jul/17/2003	Channel Catfish
Cass River	Saginaw County, M-13	88025	Aug/02/1988	Channel Catfish
Cass River	Saginaw County, M-13	2002024	Jul/16/2002	Channel Catfish
Chippewa River	9 Mile Road	2000004	Jul/20/2000	Channel Catfish
Chippewa River	Nature Center	2000005	Jul/25/2000	Channel Catfish
Chippewa River	Nature Center	2002015	Jul/16/2002	Channel Catfish
Clinton River	Mt. Clemens, VFW Hall	2001116	Aug/29/2001	Channel Catfish
Clinton River	Adams Road	2000009	Aug/28/2000	Channel Catfish
Clinton River	Bridgeview Road	1999070	Aug/06/1999	Channel Catfish
Clinton River	Bridgeview Road	2000015	Aug/28/2000	Channel Catfish
Clinton River	Cass Road	1999072	Aug/06/1999	Channel Catfish
Clinton River	Crystal Lake	2000007	Aug/28/2000	Channel Catfish
Clinton River	Harris Lake	1999074	Aug/06/1999	Channel Catfish
Clinton River	M-97	2000012	Aug/28/2000	Channel Catfish
Clinton River	Macomb County above I-94 overpass	97007	Sep/17/1997	Channel Catfish
Clinton River	Macomb County above I-94 overpass	1999071	Aug/06/1999	Channel Catfish
Clinton River	Macomb County above I-94 overpass	2000014	Aug/28/2000	Channel Catfish
Clinton River	Moravian/Belleview Road	2000013	Aug/28/2000	Channel Catfish
Clinton River	Mt. Clemens, City Park	2001115	Aug/29/2001	Channel Catfish
Clinton River	Mt. Clemens, Firehouse	2001117	Aug/29/2001	Channel Catfish
Clinton River	Mt. Clemens, Market Street	97006	Sep/17/1997	Channel Catfish
Clinton River	Mt. Clemens, river mouth	89023.1	Aug/29/1989	Channel Catfish
Clinton River	Mt. Clemens, river mouth	92003.1	Aug/17/1992	Channel Catfish
Clinton River	Mt. Clemens, river mouth	96005	Aug/20/1996	Channel Catfish
Clinton River	Mt. Clemens, river mouth	97008	Sep/17/1997	Channel Catfish
Clinton River	Mt. Clemens, river mouth	1999069	Aug/06/1999	Channel Catfish
Clinton River	Mt. Clemens, river mouth	2000016	Aug/28/2000	Channel Catfish
Clinton River	Opdyke Road	2000008	Aug/28/2000	Channel Catfish
Clinton River	Ryan Road, Utica	1999073	Aug/06/1999	Channel Catfish
Clinton River	Spillway Mouth	89023.2	Aug/29/1989	Channel Catfish
Clinton River	Spillway Mouth	92003.2	Aug/17/1992	Channel Catfish
Coldwater River	Union City	2003019	Jul/16/2003	Channel Catfish
Escañaba River	Escañaba, river mouth	93040	Jun/30/1993	Channel Catfish
Flat River	Belding downstream WWTP	2003028	Aug/20/2003	Channel Catfish
Flat River	Belding upstream WWTP	2003027	Aug/20/2003	Channel Catfish
Flat River	Greenville downstream WWTP	2003026	Aug/20/2003	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Flat River	Greenville upstream WWTP	2003025	Aug/20/2003	Channel Catfish
Flat River	Lowell	2001017	Jul/23/2001	Channel Catfish
Flat River	Lowell downstream WWTP	2003030	Aug/20/2003	Channel Catfish
Flat River	Lowell upstream WWTP	2003029	Aug/20/2003	Channel Catfish
Flint River	Above Flint @ Bray	2003036	Aug/21/2003	Channel Catfish
Flint River	Below Flint	2003033	Aug/21/2003	Channel Catfish
Flint River	Downstream Ragnone WWTP	2003038	Aug/21/2003	Channel Catfish
Flint River	Klam Road	2003034	Aug/21/2003	Channel Catfish
Flint River	M-15	2003035	Aug/21/2003	Channel Catfish
Flint River	Saginaw County, river mouth	88022	Aug/02/1988	Channel Catfish
Flint River	Saginaw County, river mouth	2002023	Jul/16/2002	Channel Catfish
Flint River	Saginaw County, river mouth	2003039	Aug/21/2003	Channel Catfish
Flint River	Upstream Ragnone WWTP	2003037	Aug/21/2003	Channel Catfish
Galien River	Mouth	2002031	Aug/02/2002	Channel Catfish
Grand River	Below Jackson, Thompkins Road	2001014	Jul/23/2001	Channel Catfish
Grand River	Below Lansing, Clintonia Road	2001016	Jul/23/2001	Channel Catfish
Grand River	Grand Haven, river mouth	90018	Sep/04/1990	Channel Catfish
Grand River	Grand Haven, river mouth	93043	Jul/01/1993	Channel Catfish
Grand River	Grand Haven, river mouth	2001020	Jul/23/2001	Channel Catfish
Grand River	Jackson, above Jackson WWTP	90025	Sep/05/1990	Channel Catfish
Grand River	Jackson, below Jackson WWTP	90024	Aug/08/1990	Channel Catfish
Grand River	M-21	2001018	Jul/23/2001	Channel Catfish
Grand River	Upstream Jackson, Reed Road	2001013	Jul/23/2001	Channel Catfish
Huron River	Downstream Belleville Lake	2002041	Aug/20/2002	Channel Catfish
Huron River	Downstream Ford Lake	2002040	Aug/20/2002	Channel Catfish
Huron River	Rockwood, river mouth	91012	Sep/06/1991	Channel Catfish
Huron River	Rockwood, river mouth	96015	Aug/20/1996	Channel Catfish
Huron River	Rockwood, river mouth	2002042	Aug/20/2002	Channel Catfish
Huron River	Upstream Dexter	2002039	Aug/20/2002	Channel Catfish
Kalamazoo River	Above Otsego City Dam	1999096	Sep/08/1999	Channel Catfish
Kalamazoo River	Above Otsego City Dam	2001035	Aug/22/2001	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 Otsego Dam	2001036	Aug/22/2001	Channel Catfish
Kalamazoo River	Below Trowbridge Dam, 26th St. Bridge	1999022	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Trowbridge Dam, 26th St. Bridge	2001037	Aug/22/2001	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 (12 Mile Road)	2001028	Aug/22/2001	Channel Catfish
Kalamazoo River	City of Allegan, M-89	1999021	Sep/08/1999	Channel Catfish
Kalamazoo River	City of Allegan, M-89	2001038	Aug/22/2001	Channel Catfish
Kalamazoo River	D-Avenue	2000112	Oct/04/2000	Channel Catfish
Kalamazoo River	D-Avenue	2001033	Aug/22/2001	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Kalamazoo River	Galesburg, 35th St. Bridge	1999098	Sep/08/1999	Channel Catfish
Kalamazoo River	Galesburg, 35th St. Bridge	2001029	Aug/22/2001	Channel Catfish
Kalamazoo River	Kalamazoo Avenue	2000113	Oct/04/2000	Channel Catfish
Kalamazoo River	Lake Allegan	2000110	Jan/04/2000	Channel Catfish
Kalamazoo River	Lake Allegan	2001039	Aug/22/2001	Channel Catfish
Kalamazoo River	New Richmond, 58th Street	2001040	Aug/22/2001	Channel Catfish
Kalamazoo River	Plainwell, M-89	2000111	Oct/04/2000	Channel Catfish
Kalamazoo River	Plainwell, M-89	2001034	Aug/22/2001	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	River mouth, Old US-31 Bridge	2001041	Aug/22/2001	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
LeFarge Corp. Discharge Canal	Below quarry	94033	May/19/1994	Channel Catfish
Little Black Creek	DPW Wetland	2004136	Jul/01/2004	Channel Catfish
Little Black Creek	Mouth	2004137	Jul/01/2004	Channel Catfish
Little Black Creek	US-31	2004134	Jul/01/2004	Channel Catfish
Manistee River	Manistee, river mouth	90026	Aug/21/1990	Channel Catfish
Manistee River	Manistee, river mouth	95028	Jul/24/1995	Channel Catfish
Manistique River	Manistique, river mouth	90028.1	Sep/24/1990	Channel Catfish
Manistique River	Manistique, river mouth	2002067	Aug/21/2002	Channel Catfish
Manistique River	Soo Line RR Bridge	90028.2	Sep/24/1990	Channel Catfish
Manistique River	Soo Line RR Bridge	2002066	Aug/21/2002	Channel Catfish
Menominee River	Menominee, river mouth	93039	Jun/30/1993	Channel Catfish
Muskegon River	M-82 at High Rollaway	2002074	Aug/20/2002	Channel Catfish
Muskegon River	Maple Island Road	2002075	Aug/20/2002	Channel Catfish
Muskegon River	Muskegon, river mouth	90020	Aug/07/1990	Channel Catfish
Muskegon River	Muskegon, river mouth	93042	Jul/01/1993	Channel Catfish
Muskegon River	Vance Road	2002073	Aug/20/2002	Channel Catfish
Ontonagon River	Ontonagon, river mouth	92008	Aug/04/1992	Channel Catfish
Ox Creek	Mouth	2001092	Jul/30/2001	Channel Catfish
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	Downstream Ludington WWTP	2003090	Jul/16/2003	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
Pere Marquette River	Scottville Rd	2003088	Jul/16/2003	Channel Catfish
Pere Marquette River	South Branch Rd	2003087	Jul/16/2003	Channel Catfish
Pere Marquette River	Upstream Ludington WWTP	2003089	Jul/16/2003	Channel Catfish
Pere Marquette River, Little Branch	17 Mile Rd	2003071	Jul/16/2003	Channel Catfish
Pine River	Gordonville Road	2000070	Jul/20/2000	Channel Catfish
Pine River	Gordonville Road	2002014	Jul/16/2002	Channel Catfish
Pine River	Harrison Road	1999049	Jun/24/1999	Channel Catfish
Pine River	Harrison Road	2000066	Jul/20/2000	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Pine River	Harrison Road	2002011	Jul/16/2002	Channel Catfish
Pine River	M-46	1999050	Jun/24/1999	Channel Catfish
Pine River	M-46	2000067	Jul/20/2000	Channel Catfish
Pine River	M-46	2002012	Jul/16/2002	Channel Catfish
Pine River	Mill Street	2000068	Jul/20/2000	Channel Catfish
Pine River	Nine Mile Road	1999053	Jun/24/1999	Channel Catfish
Pine River	St. Clair	97051	Sep/17/1997	Channel Catfish
Pine River	St. Louis Impoundment	2002103	Jul/16/2002	Channel Catfish
Pine River	WWTP Bridge	1999052	Jun/24/1999	Channel Catfish
Pine River	WWTP Bridge	2000069	Jul/20/2000	Channel Catfish
Pine River	WWTP Bridge	2002013	Jul/16/2002	Channel Catfish
Portage Creek	Kalamazoo, Crosstown Pkwy.	89059	Aug/30/1989	Channel Catfish
Portage Creek	Monarch Mill Pond, Cork Street	2001031	Aug/22/2001	Channel Catfish
Portage Creek	Mouth, Alcott St.	1999097	Sep/08/1999	Channel Catfish
Portage Creek	Mouth, Alcott St.	2001030	Aug/22/2001	Channel Catfish
Rabbit River	d/s Hamilton, d/s 133TH	2003099	Aug/20/2003	Channel Catfish
Rabbit River	u/s Hamilton, d/s 38th St	2003097	Aug/20/2003	Channel Catfish
Raisin River	Below Turning Basin	1998091	Sep/10/1998	Channel Catfish
Raisin River	Below Turning Basin	2004089	Aug/11/2004	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	Monroe, river mouth	2004091	Aug/11/2004	Channel Catfish
Raisin River	Near Grand Trunk RR Bridge	1998092	Sep/10/1998	Channel Catfish
Raisin River	Near Grand Trunk RR Bridge	2004088	Aug/11/2004	Channel Catfish
Red Cedar River	Mouth	2001015	Jul/23/2001	Channel Catfish
Rouge River	Bell Branch	92040	Aug/25/1992	Channel Catfish
Rouge River	Below Newburgh Lake	2000116	Oct/04/2000	Channel Catfish
Rouge River	Below Phoenix Lake	2000077	Aug/28/2000	Channel Catfish
Rouge River	Dearborn, river mouth	92010	Aug/25/1992	Channel Catfish
Rouge River	Dearborn, river mouth	95044	Oct/09/1995	Channel Catfish
Rouge River	Dearborn, river mouth	2000079	Aug/28/2000	Channel Catfish
Rouge River	Dearborn, river mouth	2000117	Oct/04/2000	Channel Catfish
Rouge River	Evergreen Road	95042	Oct/09/1995	Channel catfish
Rouge River	Greenfield Road	95043	Oct/09/1995	Channel Catfish
Saginaw River	Bay County, river mouth	88020	Aug/01/1988	Channel Catfish
Saginaw River	Bay County, river mouth	92011	Aug/12/1992	Channel Catfish
Saginaw River	Bay County, river mouth	1998096	Sep/04/1998	Channel Catfish
Saginaw River	Bay County, river mouth	2002028	Jul/16/2002	Channel Catfish
Saginaw River	Saginaw County, Saginaw	88021	Aug/01/1988	Channel Catfish
Saginaw River	upstream of Middle Ground Isle	1998097	Sep/04/1998	Channel Catfish
Saginaw River	upstream of Middle Ground Isle	2002027	Jul/16/2002	Channel Catfish
Saginaw River	Zilwaukee Bridge	1998098	Sep/04/1998	Channel Catfish
Saginaw River	Zilwaukee Bridge	2002026	Jul/16/2002	Channel Catfish
Shiawassee River	Fergus Road	2002022	Jul/16/2002	Channel Catfish
Shiawassee River	Mouth	1998099	Sep/04/1998	Channel Catfish
Shiawassee River	Mouth	2002025	Jul/16/2002	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Shiawassee River	Saginaw County, Miller Road	88024	Aug/18/1988	Channel Catfish
Shiawassee River, South Branch	1/2 mile d/s of Howell	2004106	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	Chase Lake Road	2004108	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	Howell	2004105	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	Marr Road	2004107	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	u/s Byron	2004109	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	u/s M-59	2004104	Aug/11/2004	Channel Catfish
South Branch Black River	Downstream of Bangor Dam	2002006	Aug/02/2002	Channel Catfish
South Branch Black River	Upstream of Bangor Dam	2002005	Aug/02/2002	Channel Catfish
St. Joseph River	Above Niles	2001086	Jul/30/2001	Channel Catfish
St. Joseph River	Above Paw Paw River	2001090	Jul/30/2001	Channel Catfish
St. Joseph River	Below Buchanan	97065	Sep/16/1997	Channel Catfish
St. Joseph River	Below Buchanan	2001087	Jul/30/2001	Channel Catfish
St. Joseph River	Below Constantine	2003117	Jul/16/2003	Channel Catfish
St. Joseph River	Below Niles	97066	Sep/16/1997	Channel Catfish
St. Joseph River	Below Sturgis Dam	2003115	Jul/16/2003	Channel Catfish
St. Joseph River	Below Three Rivers	2003116	Jul/16/2003	Channel Catfish
St. Joseph River	Below Union City	2003113	Jul/16/2003	Channel Catfish
St. Joseph River	Below Union Lake	2003114	Jul/16/2003	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	Mottville downstream of Ritz	2003118	Jul/16/2003	Channel Catfish
St. Joseph River	State Line, Berrien County	97067	Sep/16/1997	Channel Catfish
St. Joseph River	State Line, Berrien County	2003119	Jul/16/2003	Channel Catfish
Swartz Creek	Swartz Creek Golf Course	2003127	Aug/21/2003	Channel Catfish
Thornapple River	Mouth	2001019	Jul/23/2001	Channel Catfish
Thread Creek	Above Impoundment @ Perry	2003129	Aug/21/2003	Channel Catfish
Thread Creek	M-54 (Dort)	2003130	Aug/21/2003	Channel Catfish
Thread Creek	Near mouth @ Clifford	2003131	Aug/21/2003	Channel Catfish
Thunder Bay River	Alpena, river mouth	89024	Sep/02/1989	Channel Catfish
Thunder Bay River	Alpena, river mouth	96053	Aug/19/1996	Channel Catfish
Tittabawassee River	Cook Road	2002016	Jul/16/2002	Channel Catfish
Tittabawassee River	Freeland	2002019	Jul/16/2002	Channel Catfish
Tittabawassee River	Midland County, Smiths Crossing Road	2000095	Jul/20/2000	Channel Catfish
Tittabawassee River	Midland County, Smiths Crossing Road	2002017	Jul/16/2002	Channel Catfish
Tittabawassee River	Mouth	1998119	Sep/04/1998	Channel Catfish
Tittabawassee River	Mouth	2002021	Jul/16/2002	Channel Catfish
Tittabawassee River	RR Bridge below Dow	2002018	Jul/16/2002	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	88023	Aug/02/1988	Channel Catfish
Tittabawassee River	Saginaw County, Center Road	2002020	Jul/16/2002	Channel Catfish
Tonquish Creek	Above Wayne Road, South of Joy Road	92039	Sep/14/1992	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Two Hearted River	Mouth	92013	Aug/04/1992	Channel Catfish
Weldon Creek	Benson Road	2003137	Jul/16/2003	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  
2005 ANNUAL REPORT

Waterbody	Location	Visit ID#	Date	Species
Bad River	Saginaw County	2004003	Jun/23/2004	Carp, Channel Catfish, Northern Pike
Baldwin River	Near M-37	2003005	Jul/16/2003	Channel Catfish
Battle Creek River	Battle Creek, Division St.	2004004	Jun/10/2004	Carp, Smallmouth Bass
Big Seven Lake (Seven Lakes)	Oakland County	2004133	May/18/2004	Largemouth Bass
Big South Branch Pere Marquette River	Walhalla Road	2003007	Jul/16/2003	Channel Catfish
Boardman River	Beitner Rd	2003011	Jul/17/2003	Channel Catfish
Boardman River	Eighth St Bridge	2003012	Jul/17/2003	Channel Catfish
Boardman River	Union Street, downstream WWTP	2003013	Jul/17/2003	Channel Catfish
Boot Lake	Schoolcraft County	2004007	Jun/23/2004	Walleye
Carp River	Landfill Rd.	2004009	Aug/18/2004	Brook Trout
Carp River	M-35	2004010	Aug/17/2004	Brook Trout, White Sucker
Cass River	Bridgeport	2004011	Jun/24/2004	Carp, Channel Catfish
Cheboyganing Creek	Saginaw County	2004013	Aug/09/2004	Carp
Clifford Lake	Montcalm County	2004014	Jun/15/2004	Largemouth Bass
Clinton River	Ryan Road, Utica	2004015	Oct/07/2004	Carp, Northern Pike, Rock Bass, White Sucker
Coldwater River	Union City	2003019	Jul/16/2003	Channel Catfish
Deer Lake	Alger County	2004019	Jun/02/2004	Northern Pike
DEQ Control	DEQ Control, Kalamazoo River at Trowbridge	2004603	Aug/26/2003	Control
Detroit River	Grassy Island	2004020	Jul/20/2004	Carp, Walleye
Detroit River	Michigan waters	2004021	Jul/20/2004	Carp, Freshwater Drum, Redhorse Sucker, Yellow Perch
Dinner Lake	Gogebic County	2004024	Jun/11/2004	Black Crappie, Largemouth Bass, Northern Pike, Smallmouth Bass, Walleye
Emerald Lake	Newaygo County	2004026	Jun/23/2004	Largemouth Bass, Northern Pike
Escanaba River	Cataract Basin	2004028	Jul/27/2004	Walleye
Five Lakes	Clare County	2004131	May/11/2004	Largemouth Bass
Flat River	Belding downstream WWTP	2003028	Aug/20/2003	Channel Catfish
Flat River	Belding upstream WWTP	2003027	Aug/20/2003	Channel Catfish
Flat River	Greenville downstream WWTP	2003026	Aug/20/2003	Channel Catfish
Flat River	Greenville upstream WWTP	2003025	Aug/20/2003	Channel Catfish
Flat River	Lowell downstream WWTP	2003030	Aug/20/2003	Channel Catfish
Flat River	Lowell upstream WWTP	2003029	Aug/20/2003	Channel Catfish
Flint River	Above Flint @ Bray	2003036	Aug/21/2003	Channel Catfish
Flint River	Below Flint	2003033	Aug/21/2003	Channel Catfish
Flint River	Downstream Ragnone WWTP	2003038	Aug/21/2003	Channel Catfish
Flint River	Klam Road	2003034	Aug/21/2003	Channel Catfish
Flint River	M-15	2003035	Aug/21/2003	Channel Catfish
Flint River	Saginaw County, river mouth	2003039	Aug/21/2003	Channel Catfish
Flint River	Upstream Ragnone WWTP	2003037	Aug/21/2003	Channel Catfish
Frenchman Lake	Chippewa County	2004029	May/26/2004	Northern Pike
Grand River	Downstream of Dimondale	2004147	Jun/16/2004	Northern Pike
Grand River	Eaton Rapids, Gale Road/Waverly Road	2004146	Jul/01/2004	Northern Pike
Grand River	Moore's River Impoundment	2004148	Jun/09/2004	Northern Pike
Hardwood Lake	Ogemaw County	2004034	Jun/02/2004	Northern Pike

Waterbody	Location	Visit ID#	Date	Species
Houghton Lake	Roscommon County	2004037	May/27/2004	Largemouth Bass
Kawkawlin River	Bay County, M-247	2004039	Aug/10/2004	Carp, Northern Pike
Kent Lake	Oakland County	2004040	May/11/2004	Black Crappie, Walleye
Lake Cadillac	Wexford County	2004041	Sep/28/2004	Northern Pike, Smallmouth Bass
Lake Erie	Brest Bay	2003051	Oct/24/2003	Walleye
Lake Erie	Brest Bay	2004042	Oct/08/2004	Walleye
Lake Erie	Western Basin	2004043	Apr/20/2004	Walleye, White Bass, White Perch
Lake Huron	Grindstone City	2004130	May/10/2004	Lake Trout
Lake Huron	Saginaw Bay, Bay Port	2004046	Sep/10/2004	Carp, Channel Catfish, Walleye, White Bass, White Sucker, Yellow Perch
Lake Huron	Thunder Bay	2004048	May/20/2004	Carp, Lake Trout
Lake Huron	Thunder Bay	2004145	May/24/2004	Lake Trout
Lake Medora	Keweenaw County	2004050	Jun/15/2004	Smallmouth Bass, Walleye
Lake Michigan	Grand Traverse Bay	2004053	May/18/2004	Lake Trout
Lake Michigan	Little Bay De Noc	2004150	Sep/10/2004	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye
Lake Michigan	Manistee River	2004055	Apr/01/2004	Rainbow Trout
Lake Michigan	South Haven	2004051	Jun/15/2004	Round Goby
Lake Michigan	St. Joseph River, Berrien Springs	2004060	Mar/26/2004	Rainbow Trout
Lake Superior	Keweenaw Bay	2004063	May/04/2004	Lake Trout
Little Black Creek	DPW Wetland	2004136	Jul/01/2004	Channel Catfish
Little Black Creek	Mouth	2004137	Jul/01/2004	Channel Catfish
Little Black Creek	US-31	2004134	Jul/01/2004	Channel Catfish
Long Lake	Presque Isle County	2004066	Apr/14/2004	Smallmouth Bass, White Sucker
Manistique River	d/s Manistique Papers Dam	2004072	Aug/02/2004	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye
McCormick Lake	Montmorency County	2004074	Jun/02/2004	Brown Trout
Montcalm Lake	Montcalm County	2004062	May/20/2004	Largemouth Bass
Nevins Lake	Montcalm County	2004076	Sep/07/2004	Largemouth Bass
Peach Lake	Ogemaw County	2004080	May/18/2004	Northern Pike
Pere Marquette River	Downstream Ludington WWTP	2003090	Jul/16/2003	Channel Catfish
Pere Marquette River	Lake County	2004081	Sep/03/2004	Brown Trout
Pere Marquette River	Scottville Rd	2003088	Jul/16/2003	Channel Catfish
Pere Marquette River	South Branch Rd	2003087	Jul/16/2003	Channel Catfish
Pere Marquette River	Upstream Ludington WWTP	2003089	Jul/16/2003	Channel Catfish
Pere Marquette River, Little Branch	17 Mile Rd	2003071	Jul/16/2003	Channel Catfish
Pere Marquette River, Little South Branch	Lake County	2004082	Aug/24/2004	Brown Trout, White Sucker
Portage Lake	Manistee County	2004144	Oct/11/2004	Carp, Largemouth Bass, Northern Pike
Pretty Lake	Luce County	2004083	Jun/22/2004	Walleye
Rabbit River	d/s Hamilton, d/s 133TH	2003099	Aug/20/2003	Channel Catfish
Rabbit River	u/s Hamilton, d/s 38th St	2003097	Aug/20/2003	Channel Catfish
Raisin River	Above Monroe Dam	2004086	Oct/06/2004	Carp
Raisin River	Below Turning Basin	2004089	Aug/11/2004	Channel Catfish
Raisin River	Monroe County, above Monroe Dam	2004085	Oct/06/2004	Carp
Raisin River	Monroe, river mouth	2004091	Aug/11/2004	Channel Catfish
Raisin River	Near Grand Trunk RR Bridge	2004088	Aug/11/2004	Channel Catfish

Waterbody	Location	Visit ID#	Date	Species
Robinson Lake	Newaygo County	2004095	May/06/2004	Northern Pike
Ruppert Lake	Kalamazoo County	2004099	May/28/2004	Largemouth Bass
Rush Lake	Van Buren County	2004100	Mar/23/2004	Northern Pike
Saginaw River	Bay County, LaFayette	2004113	Aug/09/2004	Carp
Sebewaing River	Huron County	2004114	Aug/11/2004	Carp, Northern Pike
Shiawassee River, South Branch	1/2 mile d/s of Howell	2004106	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	Between M59 & Byron	2004101	Jul/13/2004	Carp, Rock Bass, White Sucker
Shiawassee River, South Branch	Chase Lake Road	2004108	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	Howell	2004105	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	Marr Road	2004107	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	u/s Byron	2004109	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	u/s M-59	2004104	Aug/11/2004	Channel Catfish
Sporley Lake	Marquette County	2004117	May/10/2004	Splake
St. Joseph River	Below Constantine	2003117	Jul/16/2003	Channel Catfish
St. Joseph River	Below Sturgis Dam	2003115	Jul/16/2003	Channel Catfish
St. Joseph River	Below Three Rivers	2003116	Jul/16/2003	Channel Catfish
St. Joseph River	Below Union City	2003113	Jul/16/2003	Channel Catfish
St. Joseph River	Below Union Lake	2003114	Jul/16/2003	Channel Catfish
St. Joseph River	Mottville downstream of Ritz	2003118	Jul/16/2003	Channel Catfish
St. Joseph River	State Line, Berrien County	2003119	Jul/16/2003	Channel Catfish
St. Joseph River	Sturgis Impoundment	2004119	Oct/14/2004	Carp, Largemouth Bass
St. Marys River	Michigan Waters	2004120	Apr/19/2004	Northern Pike, Walleye
St. Marys River	Munuscong Bay	2004121	Sep/08/2004	Carp
St. Marys River	Munuscong Bay	2004149	Sep/07/2004	Northern Pike
Stoney Creek Hatchery	Caged Fish Control Station	2003024	Jul/23/2003	Channel Catfish
Stoney Creek Hatchery	Caged Fish Control Station	2003121	Jun/18/2003	Channel Catfish
Stoney Creek Hatchery	Caged Fish Control Station	2004087	Jul/14/2004	Channel Catfish
Stoney Creek Hatchery	Caged Fish Control Station	2004138	Jun/03/2004	Channel Catfish
Sullivan Creek	USFWS-Sullivan Creek Hatchery	2005124	May/03/2005	Lake Trout
Swartz Creek	Swartz Creek Golf Course	2003127	Aug/21/2003	Channel Catfish
Sylvan Lake	Newaygo County	2004141	Jun/22/2004	Largemouth Bass, Northern Pike
Teal Lake	Marquette County	2004122	May/11/2004	Smallmouth Bass, Walleye
Thread Creek	Above Impoundment @ Perry	2003129	Aug/21/2003	Channel Catfish
Thread Creek	M-54 (Dort)	2003130	Aug/21/2003	Channel Catfish
Thread Creek	Near mouth @ Clifford	2003131	Aug/21/2003	Channel Catfish
Van Auken Lake	Van Buren County	2004125	Mar/23/2004	Northern Pike
Weldon Creek	Benson Road	2003137	Jul/16/2003	Channel Catfish
White Lake	Muskegon County	2004126	Sep/13/2004	Carp, Smallmouth Bass, Walleye