

MICHIGAN FISH CONTAMINANT MONITORING PROGRAM
2008 ANNUAL REPORT

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LIST OF ACRONYMS

%	Percent
BCCs	Bioaccumulative Chemicals of Concern
CWA	Clean Water Act
DDD	1,1-bis(4-chlorophenyl)-2,2-dichloroethane
DDE	Dichlorodiphenyl dichloroethane
DDT	Dichlorodiphenyl trichloroethane
DL	Detection Level
FAWCAC	Fish and Wildlife Contaminant Advisory Committee
FCMP	Fish Contaminant Monitoring Program
GLEAS	Great Lakes and Environmental Assessment Section
MDA	Michigan Department of Agriculture
MDCH-AC	Michigan Department of Community Health-Analytical Chemistry
MDEQ-WB	Michigan Department of Environmental Quality-Water Bureau
MDNR	Michigan Department of Natural Resources
PBDE	Polybrominated diphenyl ether
PCB	Polychlorinated biphenyl
PPB	Parts per billion
PPM	Parts per million
QL	Quantification Level
RPC	Research Productivity Council
Se	Selenium
TCDD	Total 2,3,7,8-tetrachlorodibenzo-p-dioxin
TEQ	Toxic equivalent
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant

SECTION 1.0

INTRODUCTION

The Michigan Department of Environmental Quality-Water Bureau (MDEQ-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. The presence of even extremely low concentrations of some bioaccumulative pollutants in surface water can result in fish tissue concentrations that pose a human or wildlife health risk.

Several state and federal agencies and tribal organizations assist with the MDEQ-WB's fish contaminant monitoring efforts by collecting or analyzing samples and data. These include the Michigan Department of Natural Resources (MDNR), MDCH, MDA, United States Environmental Protection Agency (USEPA), United States Fish and Wildlife Service, Grand Traverse Bay Band of Chippewa and Ottawa, Chippewa Ottawa Resource Authority, Keweenaw Bay Indian Community, and the Great Lakes Indian Fish and Wildlife Commission. Camp, Dresser & McKee collected samples from several sites in the Kalamazoo River watershed at the request of the MDEQ, Remediation and Redevelopment Division. 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 (FCMP) 2008 Annual Report are as follows:

- 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 2007 that are supporting and not supporting the fish consumption designated use described in the WQS, and identify contaminant trends where possible.
- Summarize the results of whole fish tissue analyses and identify any spatial or temporal contaminant trends.
- Identify spatial or temporal trends that can be attributed to specific pollution control activities.

Prior to 1986, Michigan conducted fish contaminant studies on an as needed 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 have been compiled into a large database and are available online at www.deq.state.mi.us/fcmp. The FCMP database, along with several other Michigan water quality databases, is also available online through the Michigan Surface Water Information Management System at <http://mcgiga.mcgi.state.mi.us/miswims/>. Contaminant data are also available in staff reports (MDNR, 1986a, 1986b, and 1989; Duling, 1988; Duling and Benzie, 1989 and 1990; Saalfeld et al., 1991; Waggoner, 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 et al., 2004; Day and Bohr, 2005; and Bohr and Zbytowski, 2006, 2007, and 2008). In addition, inventories of fish contaminant monitoring locations sampled between 1980 and 2007 are provided in Appendices A, B, and C.

SECTION 2.0

METHODS

The FCMP 2008 Annual Report includes the analytical results available by December 31, 2008, which were not presented in earlier annual reports. A list of water bodies and species included in this annual report is provided in Appendix D. Raw data from these sites are included in Appendix E (available upon request).

A total of 843 fish were collected from inland lakes, rivers, and the Great Lakes and connecting channels during 2007 and analyzed for this report. Results of the analyses of 163 fish collected prior to 2007 and 360 fish collected for a special project in 2008 are also included. Many of these fish were combined into composite samples, and a total of 811 samples were analyzed. The samples included 33 species collected from 61 locations. Approximately 64 percent (%) of the samples were processed as edible portions to support the development and review of fish consumption advisories, and to determine WQS attainment status. The remaining samples were collected to support the other goals of the FCMP.

2.1 EDIBLE PORTION AND WHOLE FISH COLLECTION AND PROCESSING

The MDNR-Fisheries Division and the MDEQ-WB collected the majority of the fish using standard fish sampling techniques determined to be 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. Composite samples comprised of whole fish were prepared for certain special projects.

2.1.1 Edible Portion Monitoring

This report summarizes the analyses of edible portion samples of 361 fish collected from 30 locations in 2007, 150 fish collected from 12 locations in 2006, and 4 fish collected from 1 location in 2003. In all, 15 species of fish were analyzed as edible portion samples for this report. The 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 2 to 5 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 180 fish tissue samples collected from 15 trend sites in 2007 (Appendix E) were analyzed for this report. In addition, 9 samples collected from 1 site in 2006 are included. Carp were collected from the Detroit River, Lake Michigan at Little Bay de Noc, Lake St. Clair, the St. Clair River, Grand River, St. Joseph River, Kalamazoo River, and Muskegon River; lake

trout were collected from Lake Michigan at Grand Traverse Bay, Lake Huron at Thunder Bay, and Lake Superior at Keweenaw Bay; largemouth bass were collected from Gull Lake and Gun Lake; and walleye were collected from Lake Huron at Saginaw Bay and Thunder Bay, Lake Michigan at Little Bay de Noc, Lake St. Clair, the St. Marys River, and South Manistique Lake. All 15 trend sites have been sampled at least 6 times since 1990. Trend monitoring sites, collection dates, and species are listed in Appendix B.

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

Whole carp or redhorse sucker were collected from 8 river trend monitoring sites since 1990 (Table 2). The Kalamazoo River was monitored 9 times; the Muskegon River was monitored 8 times; the St. Joseph and Grand Rivers were monitored 7 times; the River Raisin was monitored 6 times; the Manistee, Manistique, and Menominee Rivers were each monitored 2 times.

Ten trend monitoring sites were established in the Great Lakes or connecting channels (Table 2). Carp have been monitored at 9 locations, and were sampled at Little Bay De Noc (Lake Michigan) 6 times, Grand Traverse Bay (Lake Michigan) 4 times, Saginaw Bay (Lake Huron) 7 times, Thunder Bay (Lake Huron) 7 times, Lake St. Clair 7 times, Lake Erie 7 times, the St. Marys River 4 times, the St. Clair River 4 times, and the Detroit River 8 times. Walleye have been monitored at 8 locations, and were sampled at Little Bay De Noc 7 times, Saginaw Bay 8 times, Thunder Bay 6 times, Lake St. Clair 7 times, Lake Erie 6 times, the St. Marys River 7 times, the St. Clair River 1 time, and the Detroit River 7 times. Lake trout have been monitored at 3 locations, and were sampled at Grand Traverse Bay 7 times, Thunder Bay 8 times, and Keweenaw Bay (Lake Superior) 7 times.

2.1.3 Special Projects

At the request of the MDNR-Fisheries Division, contaminant concentrations were measured in samples of hatchery-reared brown trout, chinook salmon, and coho salmon from 2 state hatcheries. A total of 80 fish were analyzed as 5 composites of whole fish, and the results are discussed in this report.

Because of concerns about selenium (Se) in Marquette County mining facility effluents, waste rock seeps, and nearby surface waters, fish and benthic macroinvertebrate tissue samples from several locations were analyzed (wet weight) for Se. The results are summarized in this report and discussed fully in a separate staff report (Selenium Monitoring Workgroup, 2009).

Polybrominated diphenyl ether (PBDE) was analyzed in 57 edible portion and 110 whole fish trend samples collected in 2007. Michigan began monitoring PBDE in selected fish tissue samples collected in 2006 to evaluate the spatial distribution and potential human and ecological impacts of the contaminant. Analytical results for PBDE will be presented and discussed in a separate staff report.

2.2 CAGED FISH BIOCONCENTRATION STUDIES

The MDEQ-WB uses caged fish to identify sources of bioaccumulative contaminants and 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 4 composite samples of whole fish. The remaining channel catfish were held in stainless steel cages at the test sites for 28 days. At the end of the test period the fish were removed from the cages and divided into composite samples of whole fish. Each sample had a minimum total weight of 40 grams, and the number of composites and number of fish per composite was determined by the size of the fish and the number surviving to the end of the 28-day test. Each composite sample was wrapped individually in aluminum foil, placed in a separate plastic bag, labeled, and frozen until analyzed.

Caged fish studies were conducted in the Black River (Sanilac/St. Clair Counties), Chippewa River (Midland County), Looking Glass River (Ionia County), Maple River (Ionia County), and Pine River (Gratiot/Midland Counties) watersheds in 2007. Funds from the Clean Michigan Initiative were used to support analyses of caged fish tissue samples at a private laboratory.

Three sites were monitored in the Black River (Figure 3). One site each was monitored in the Chippewa, Looking Glass, and Maple Rivers (Figures 4, 5, and 6), and 3 sites were monitored in the Pine River (Figure 4).

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

2.3 CHEMICAL ANALYSES

Analytical results for this report were produced by several laboratories, including the MDCH-Analytical Chemistry (AC) Laboratory, Pace Laboratories (formerly Eno River Laboratories), and the Research Productivity Council (RPC). Each of these analytical laboratories has quality assurance programs and uses peer-reviewed methods of digestion, extraction, and quantification.

A total of 796 samples collected for this report were submitted to the MDCH-AC for analysis. Of those, 236 edible portion samples were analyzed for mercury only, and a total of 72 samples were analyzed for Se only. The remaining fish tissue samples submitted to the MDCH-AC 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.

In 2007, the MDCH-AC began analyzing samples for PBDE congeners in selected fish tissue samples. The analyses were conducted, in part, as a test of methodology; the results were not quantified since the lab did not have suitable quality control material. The MDCH-AC has since developed in-house PBDE quality control materials and delivered quantified results for selected fish tissue samples for this report. A total of 68 edible portion samples and 109 whole fish trend samples were analyzed for PBDE. The samples were analyzed for 8 PBDE congeners (BZ# 28, 47, 66, 77, 99, 100, 153, and 154). For purposes of between species and between site comparisons, total PBDE for these samples was estimated by summing the 8 congeners.

Analyses of chlorinated dioxin and dibenzofuran (Table 5) were performed on a subset of edible portion and whole fish trend samples. Pace Laboratories analyzed dioxin and dibenzofuran congeners in 39 samples and the results are summarized in Sections 3.1 and 3.3.

The RPC analyzed mercury and organic contaminants in 20 caged fish tissue samples collected in 2007, including 4 day-0 control samples. The results of the 2007 caged fish analyses conducted by the RPC are summarized in Section 3.2. The 2007 samples were analyzed for the contaminants listed in Table 6a. In addition, the RPC analyzed a total of 13 caged fish samples for PBDE congeners (Table 6b).

A total of 90 chinook salmon were collected from 6 Lake Huron and Lake Michigan tributaries in 2007 as part of a Great Lakes trend monitoring program implemented by state and federal agencies. The chinook salmon were combined into 18 edible portion composite samples. These samples were sent to Clarkson University 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.

Se samples were analyzed by the MDCH-AC using techniques based on the USEPA Method 200.11 and reported as wet weight concentrations.

Toxaphene is referred to as "apparent toxaphene" throughout the report. The MDCH-AC 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-AC does not report concentrations below the quantification level (QL), but above the detection level (DL) for mercury and the organic parameters listed in Table 3. As a result, concentrations of these parameters that are below the QL are coded with a "K" in Appendix E. In these cases, the "K" coded concentrations represent the MDCH-AC's QLs. However, "K" codes assigned to dioxin, furan, and PCB congeners indicate that concentrations were below the DL while "J" or "NQ" codes indicate that concentrations were above the DL, but did not meet all of the quantification requirements. The "J" code was used when analytical laboratory scientists decided the divergence from quantification requirements was not significant; in these cases, the "J" coded concentrations are treated the same as uncoded results. The "NQ" coded concentrations are treated as null results.

2.4 SUMMARY STATISTICS

Total PCB concentration was estimated by summing the concentrations of PCB congeners. Individual congeners below the DL 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 other 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 DL, then the total PCB concentration was reported as less than the highest DL of the individual congeners (1 part per billion [ppb]).

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

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

Total 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxic equivalents (TEQs) were calculated using the 2005 World Health Organization toxic equivalency factors for 7 dioxins, 10 dibenzofurans, and 12 dioxin-like PCB congeners (Van den Berg et al., 2006). The concentrations of individual dioxin, dibenzofuran, and dioxin-like PCB congeners in a fish sample were multiplied by toxic equivalency factors; the resulting products were summed to calculate a 2,3,7,8-TCDD TEQ concentration. Beginning with the 2008 Fish Consumption Advisory, the MDCH included the 12 dioxin-like PCB congeners in the calculation of TEQs. Any individual congener concentrations less than the DL were assigned a value of 0 for the purpose of calculating the dioxin TEQ. To be consistent with past calculations, the dioxin-like PCBs are not included in the calculation of TEQ for the whole fish trend samples.

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 QL (DL for dioxin TEQ and total PCBs). In these cases, calculating the true average contaminant concentration was not possible. Therefore, average contaminant concentrations were calculated using half of the QL (DL for dioxin TEQ and total PCBs) in place of the sample concentrations that were below the QL (or DL). 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 QL (DL for dioxin TEQ and total PCBs) the mean was reported as half of the QL (DL for dioxin TEQ and total PCBs) and the median was reported as less than the QL (DL for dioxin TEQ and total PCBs).

Summary statistics were not generated for individual dioxin, furan, or PCB congeners.

Calculated values presented in Appendix E were not rounded to significant figures. All calculated values are identified in Appendix E.

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 7). 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 these 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 10 samples before establishing or modifying fish consumption advisories. However, best professional judgment is applied when evaluating smaller data sets.

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

2.5.1 Fish Consumption Advisory Trigger Levels for Chlorinated Organic Contaminants Other Than PCBs

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 7. The general population is advised to eat no more than 1 meal per week when concentrations in more than 10% of the samples from a particular species of fish of a given length range exceed the trigger level. A “no consumption” advisory is issued if concentrations in 50% or more of the fish sampled exceed the trigger level. In addition, the MDCH advises women and children against eating any fish when concentrations in more than 10% of a particular species of fish of a given length range 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 percentages of samples exceeding trigger levels were 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 when concentrations in more than 10% of the samples from a particular species of fish of a given length range exceed the trigger level. In addition, the MDCH advises the general population against eating any fish when concentrations in 50% or more of the samples exceed the trigger level.

Again, either linear regression analyses or percentages were used to make recommendations to the MDCH regarding specific changes to the *Michigan Fish Advisory*. When linear regression analysis was not appropriate, the percentages of samples exceeding trigger levels were 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 5 consumption advisory categories based on concentrations of total PCBs. Fish are placed into the consumption advisory categories according to species and size, 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 2 trigger levels to assess the need for fish consumption advisories based on mercury (Table 7). 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 1 meal per week of fish covered by a “restrict consumption” advisory. Women of child bearing age and children under age 15 are advised against eating more than 1 meal per month of fish covered by a “restrict consumption” trigger level.

In 1988, the MDCH issued a statewide advisory covering certain predator species from all inland lakes and reservoirs, based on a preponderance of data indicating mercury concentrations were elevated in those species in most lakes and impoundments. According to the MDCH, no one should eat more than 1 meal per week of fish of the following species and sizes: rock bass, yellow perch, or crappies over 9 inches in length; and largemouth bass, smallmouth bass, walleye, northern pike, or muskellunge of any size. Also, the MDCH advises mothers who are breast feeding, pregnant women, women who intend to have children, and children under age 15 against eating more than 1 meal per month of these fish.

Lastly, the MDCH is planning to revise the protocol for determining fish consumption advisories based on mercury concentrations. The revision will most likely result in changes in advice for all water bodies, and most of the changes will result in more restrictive advice for women of child bearing age and children under age 15. Since this revision will probably affect the 2010 advisory, the MDCH decided not to institute any relaxations of the current advice based on elevated mercury concentrations. The decision was made in order to avoid possible confusion resulting from relaxing advisories in 2009 only to provide more restrictive advice in 2010. For this reason, recommendations for advisory changes made in this report do not include suggestions for the relaxation of mercury-based advisories where such changes would be indicated under the existing protocol. However, recommendations for advisory changes were made when mercury concentrations indicated more restrictive advice was appropriate.

SECTION 3.0

RESULTS AND DISCUSSION

3.1 EDIBLE PORTION MONITORING

The FCMP 2008 Annual Report includes the analytical results available by December 31, 2007, for edible portion fish samples collected primarily in 2006 and 2007. A total of 515 edible portion fish tissue samples are summarized in this report. This includes samples of 15 species from 40 locations (Figure 1).

3.1.1 General Highlights

- Several chemicals analyzed were not quantified in any of the fish samples, including aldrin, heptachlorostyrene, lindane, pentachlorostyrene, terphenyl, and toxaphene. However, dieldrin, a breakdown product of aldrin, was quantified in fish tissue samples from 16 of 20 locations where chlorinated organic compounds were analyzed (Table 8).
- Mercury was quantified in every sample analyzed (Table 8). The highest concentrations were found in top predator species from inland lakes and impoundments.
- Dioxin TEQ concentrations were quantified in every sample from the 1 location where samples were analyzed for dioxin and dibenzofuran congeners (Table 8). However, the QLs for dioxin and dibenzofuran congeners are 3 to 4 orders of magnitude lower than the QLs 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 most chlorinated organic contaminants were found in fish from the Great Lakes or locations with access to the Great Lakes (Table 8). White Lake (Muskegon County) carp and Lake Superior siscowet had the highest concentrations of several organic contaminants.
- Sampling results indicate that total PCB concentrations may be declining in fish from several water bodies, and additional sampling may lead to the relaxation of consumption advisories for those locations.

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 contaminant concentrations exceeded trigger levels, or where 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:

- Total DDT, dieldrin, heptachlor/heptachlor epoxide, and mirex trigger levels were not exceeded in any samples analyzed for this report.
- Total PCB concentrations were greater than or equal to the women and children trigger level in 112 of 275 (41%) samples. Concentrations were greater than or equal to the women and children trigger levels in fish from 15 of 17 (88%) locations (Table 9). The 2008 MDCH *Fish Consumption Advisory* includes women and children advisories due to elevated PCBs for 13 of the 15 locations.
- Total PCB concentration was greater than or equal to the general population trigger level in 1 of 275 (.4%) samples at 1 of 17 (6%) locations (Table 9). The 2008 MDCH *Fish Consumption Advisory* includes a general population advisory at that location.
- Mercury concentrations were greater than or equal to the “restrict consumption” trigger level in 129 of 515 (25%) samples from 24 of 40 (60%) locations (Table 10). The 2008 MDCH *Fish Consumption Advisory* includes either statewide or specific advisories due to elevated mercury concentrations for 20 of the 24 locations.
- One sample analyzed for this report had a mercury concentration exceeding the “no consumption” trigger level (Table 10).
- Dioxin TEQ concentrations were assayed in siscowet taken from Keweenaw Bay in Lake Superior in 2007. The TEQ concentrations exceeded the “no consumption” trigger level in 1 sample from the site (Table 11). The 2008 MDCH *Fish Consumption Advisory* includes an advisory due to elevated dioxin TEQ concentrations in Lake Superior siscowet.
- Based on the following site-specific trigger level comparisons, the MDCH should consider relaxing fish consumption advisories at 5 sites and adding or expanding advisories at 8 sites. Also, additional monitoring is recommended for 6 water bodies.

3.1.2.2 Lake Erie Watershed

Middle Straits Lake, Oakland County (ID 2007240) *Northern Pike*

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

Comparison to Trigger Levels: Ten northern pike ranging in length from 24 to 34 inches were collected from Middle Straits Lake in 2007 and analyzed for mercury only. Mercury

concentrations exceeded the MDCH “restrict consumption” trigger level in 8 fish, and the median mercury concentration was 0.67 ppm (Table 10; Figure 7).

Recommendations: No change to the advisory is recommended and additional monitoring is not necessary at this time.

White Lake, Oakland County (ID 2007259)

Walleye

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

Comparison to Trigger Levels: Ten walleye ranging in length from 16 to 26 inches were collected from White Lake in 2007. Total PCB concentrations exceeded women and children trigger levels in 1 fish (Table 9; Figure 8) with a concentration in the women and children “1 meal per month” range. The median total PCB concentration was 0.006 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 4 walleye collected in 2007 (Table 10; Figure 9). The median mercury concentration of walleye greater than 20 inches was 0.52 ppm and walleye less than 20 inches was 0.30 ppm.

Recommendations: No change to the advisory is recommended and additional monitoring is not necessary at this time.

Lake Huron Watershed

Lake Huron, Thunder Bay (ID 2007269)

Lake Whitefish

Existing MDCH Advisory: The general population should not eat more than 1 meal per week of lake whitefish between 18 and 22 inches and no lake whitefish greater than 22 inches from Thunder Bay due to elevated concentrations of PCBs and dioxins. Also, women and children should not eat more than 1 meal per week of lake whitefish less than 18 inches and should not eat any lake whitefish greater than 18 inches due to elevated concentrations of PCBs and dioxins.

Comparison to Trigger Levels: Ten lake whitefish ranging in length from 19 to 25 inches were collected from Thunder Bay in 2007. Total PCB concentrations exceeded the women and children trigger levels in 9 fish (Table 9; Figure 10), and all 9 had concentrations in the women and children “1 meal per week” range. The median total PCB concentration was 0.07 ppm. A total of 45 lake whitefish were collected from Thunder Bay since 1992 and the median total PCB concentration was 0.20 ppm.

The mercury concentrations in all 10 lake whitefish were below the MDCH “restrict consumption” trigger level, and the median concentration was 0.10 ppm (Figure 11). The median mercury concentration in the 45 lake whitefish collected since 1992 was 0.07 ppm.

Recommendations: The samples should be analyzed for dioxins and dioxin-like PCBs. No change to the advisory is recommended pending results of that analysis.

Lake Huron, Saginaw Bay (ID 2007270)
Freshwater Drum

Existing MDCH Advisory: Saginaw Bay freshwater drum are not covered by an advisory.

Comparison to Trigger Levels: Ten freshwater drum ranging in length from 14 to 19 inches were collected from Saginaw Bay in 2007. Total PCB concentrations exceeded women and children trigger levels in 3 fish (Table 9; Figure 12), and the concentrations in all 3 fish were in the women and children “1 meal per week” range. The median total PCB concentration in the 10 freshwater drum was 0.04 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 4 of the 10 freshwater drum (Table 10; Figure 13) collected in 2007. The median mercury concentration was 0.44 ppm.

Recommendations: The MDCH should consider advising women and children not to eat more than 1 meal per week of Saginaw Bay freshwater drum due to elevated levels of PCBs and mercury. Additional monitoring is not needed at this time.

Black River, Croswell Impoundment, Sanilac County (ID 2007263)
Carp

Existing MDCH Advisory: Women and children should eat no more than 1 meal per week of Black River carp of any size due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten carp ranging in length from 17 to 25 inches were collected from the Black River, Croswell Impoundment in 2007. Total PCB concentrations were below women and children trigger levels in all carp collected in 2007 (Figure 14). The median total PCB concentration was 0.001 ppm. A total of 20 carp were collected from the Croswell Impoundment since 1989, and the overall median total PCB concentration was 0.02 ppm.

Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 10 carp collected in 2007, and the median mercury concentration was 0.24 ppm. The median mercury concentration in the 20 carp collected since 1989 was 0.21 ppm.

Recommendations: The MDCH should consider removing the advisory on Black River carp less than 26 inches. Additional carp greater than 26 inches should be collected to evaluate the possibility of removing the advisory based on PCBs.

Budd Lake, Clare County (ID 2007268)
Largemouth Bass

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

Comparison to Trigger Levels: Seven largemouth bass ranging in length from 14 to 17 inches were collected from Budd Lake in 2007 and analyzed for mercury only. The mercury concentrations in all 7 fish were below the MDCH “restrict consumption” trigger level, and the median mercury concentration was 0.11 ppm (Figure 15).

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Caribou Lake, Chippewa County (ID 2006006)
Rock Bass and Smallmouth Bass

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

Comparison to Trigger Levels: Ten rock bass ranging in length from 7 to 9 inches were collected from Caribou Lake in 2006 and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 10 fish (Table 10; Figure 16), and the median mercury concentration was 0.34 ppm. A total of 15 rock bass were collected from Caribou Lake since 1986 and the median mercury concentration was 0.35 ppm.

Ten smallmouth bass ranging in length from 13 to 18 inches were collected from Caribou Lake in 2006 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 3 fish (Table 10; Figure 17). The median mercury concentration in the 7 smallmouth bass greater than the 14-inch legal size limit was 0.5 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Cranberry Lake, Clare County (ID 2007212)
Largemouth Bass

Existing MDCH Advisory: Cranberry 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 Cranberry Lake in 2007 and analyzed for mercury only. Mercury concentrations in 7 fish exceeded the MDCH “restrict consumption” trigger level (Table 10; Figure 18). The median mercury concentration in the 9 largemouth bass greater than the 14-inch legal size limit was 0.56 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Hubbard Lake, Alcona County (ID 2006017)
Walleye

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

Comparison to Trigger Levels: Ten walleye ranging in length from 17 to 20 inches were collected from Hubbard Lake in 2006 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 5 fish (Table 10; Figure 19) and the median mercury concentration was 0.5 ppm. A total of 20 walleye were collected from Hubbard Lake since 1989 and the median mercury concentration was 0.5 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Long Lake, Montmorency County (ID 2006046)

Smallmouth Bass

Existing MDCH Advisory: Long Lake smallmouth bass are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten smallmouth bass ranging in length from 12 to 19 inches were collected from Long Lake in 2006 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 5 fish (Table 10; Figure 20). The median mercury concentration in the 8 smallmouth bass greater than the 14-inch legal size limit was 0.6 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Lost Lake, Presque Isle County (ID 2007237)

Largemouth Bass

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

Comparison to Trigger Levels: Ten largemouth bass ranging in length from 13 to 18 inches were collected from Lost Lake in 2007 and analyzed for mercury only. The total mercury concentration in 9 fish exceeded the MDCH “restrict consumption” trigger level (Table 10; Figure 21). The median concentration in the 9 legal size largemouth bass collected in 2007 was 0.72 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Murphy Lake, Tuscola County (ID 2007243)

Northern Pike

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

Comparison to Trigger Levels: Ten northern pike ranging in length from 20 to 34 inches were collected from Murphy Lake in 2007 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 3 northern pike (Table 10; Figure 22). The median mercury concentration in the 7 fish greater than the 24-inch legal size limit was 0.37 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Otsego Lake, Otsego County (ID 2007244)
Walleye

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

Comparison to Trigger Levels: Ten walleye ranging in length from 14 to 25 inches were collected from Otsego Lake in 2007 and analyzed for mercury only. Total mercury concentration in 2 fish exceeded the MDCH “restrict consumption” trigger level (Table 10; Figure 23). The median mercury concentration in the 7 legal size walleye collected in 2007 was 0.39 ppm. The median mercury concentration in legal size walleye less than 22 inches was 0.2 ppm and the median concentration in walleye greater than 22 inches was 0.5 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Tobico Marsh, Bay County (ID 2007256)
Carp, Largemouth Bass, and Northern Pike

Existing MDCH Advisory: Women and children should eat no more than 1 meal per week of Tobico Marsh carp of any size due to elevated levels of PCBs. Largemouth bass are covered by the statewide mercury advisory. Women and children should not eat more than 1 meal per week of northern pike greater than 26 inches due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten carp ranging in length from 19 to 21 inches were collected from Tobico Marsh in 2007. Total PCB concentrations exceeded women and children trigger levels in 5 fish (Table 9; Figure 24). Concentrations in 4 carp were in the women and children “1 meal per week” range, and 1 fish was in the “1 meal per month” range. The median total PCB concentration was 0.05 ppm. A total of 20 carp were collected from Tobico Marsh since 1996 and the median total PCB concentration was 0.09 ppm.

Ten largemouth bass ranging in length from 12 to 18 inches were collected from Tobico Marsh in 2007. Total PCB concentrations were below the women and children trigger levels in all 10 fish. The median total PCB concentration for the 7 legal sized largemouth bass was 0.005 ppm.

Mercury concentrations were below the “restrict consumption” trigger level in all 10 largemouth bass collected from Tobico Marsh in 2007 (Table 10; Figure 25). Linear regression analysis indicates that Tobico Marsh largemouth bass greater than 20 inches are likely to have mercury concentrations of at least 0.5 ppm.

Seven northern pike ranging in length from 19 to 25 inches were collected from Tobico Marsh in 2007. Total PCB concentrations were below the women and children trigger levels in all 7 fish (Table 9; Figure 26), and the median total PCB concentration was 0.001 ppm. A total of 17 northern pike were collected from Tobico Marsh since 1996. The median total PCB concentration in the 10 fish greater than the 24-inch legal size limit was 0.02 ppm.

Mercury concentrations were below the “restrict consumption” trigger level in all 10 northern pike collected from Tobico Marsh in 2007 (Table 10; Figure 27). The median mercury concentration in the 10 fish collected since 1996 that were greater than the 24-inch legal size limit was 0.17 ppm.

Recommendations: No changes to the advisory are recommended at this time.

Additional northern pike larger than 26 inches and carp should be collected to evaluate the possibility of relaxing the advisory based on PCBs.

3.1.2.3 Lake Michigan Watershed

Bass Lake (East), Marquette County (ID 2007202)

Northern Pike

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

Comparison to Trigger Levels: Ten northern pike ranging in length from 20 to 27 inches were collected from Bass Lake in 2007 and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 10 fish (Table 10; Figure 28), and the median mercury concentration in the 6 legal size northern pike collected was 0.35 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Crockery Lake, Ottawa County (ID 2006009)

Largemouth Bass

Existing MDCH Advisory: Crockery 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 Crockery Lake in 2006 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 8 fish (Table 10; Figure 29). The median mercury concentration in the 9 largemouth bass greater than the 14-inch legal size limit was 0.61 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Dodge Lake, Schoolcraft County (ID 2006121)

Northern Pike

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

Comparison to Trigger Levels: Ten northern pike ranging in length from 24 to 30 inches were collected from Dodge Lake in 2006 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 5 fish (Table 10; Figure 30). All of the northern pike were of legal size and the median mercury concentration was 0.52 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Galien River, Berrien County (ID 2007215)

Carp

Existing MDCH Advisory: No one should eat Galien River carp greater than 22 inches due to elevated concentrations of PCBs and chlordane. Also, women and children should eat no more than 1 meal per week of carp between 12 and 14 inches and no more than 1 meal per month of carp between 14 and 22 inches due to elevated concentrations of PCBs and chlordane.

Comparison to Trigger Levels: Ten carp ranging in length from 22 to 26 inches were collected from the Galien River in 2007. Total PCB concentrations exceeded women and children trigger levels in 4 fish. Concentrations in 2 fish 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 9; Figure 31). The overall median total PCB concentration was 0.04 ppm. A total of 16 carp were collected from the Galien River since 1992 and the median total PCB concentration was 0.26 ppm.

Total chlordane concentrations were below the MDCH trigger level in all 10 carp collected in 2007 (Figure 32), and the median chlordane concentration was 0.002 ppm. Three of 16 (19%) carp collected since 1992 had total chlordane concentrations exceeding the MDCH trigger level.

Recommendations: The MDCH should consider removing chlordane from the list of contaminants causing the advisory on Galien River carp. The MDCH should also consider removing the general population advisory on Galien River carp. Additional Galien River carp should be collected to evaluate the possibility of relaxing the advisory for women and children.

Glen Lake, Leelanau County (ID 2007216)

Rainbow Trout

Existing MDCH Advisory: Glen Lake rainbow trout are not covered by an advisory.

Comparison to Trigger Levels: Eleven rainbow trout ranging in length from 13 to 26 inches were collected from Glen Lake in 2007. The total PCB concentration in 1 fish exceeded women and children trigger levels with a concentration in the women and children “1 meal per week” range (Table 9; Figure 33). The median total PCB concentration in the 7 rainbow trout greater than the 15-inch legal size limit was 0.008 ppm, and the concentration in the 1 fish greater than 22 inches was 0.054 ppm.

Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 11 rainbow trout (Table 10; Figure 34), and the median mercury concentration was 0.13 ppm.

Recommendations: The MDCH should consider advising women and children not to eat more than 1 meal per week of Glen Lake rainbow trout greater than 22 inches due to elevated levels of PCBs. Additional monitoring is not necessary at this time.

Grand River, Grand Rapids, Below 6th Street Dam (ID 2007300) and at Ionia (ID 2006103)

Channel Catfish, Northern Pike, and Redhorse Sucker

Existing MDCH Advisory: Women and children should eat no more than 1 meal per week of channel catfish between 12 and 18 inches and no more than 1 meal per month of channel catfish greater than 18 inches due to elevated concentrations of PCBs. In addition, women and children should eat no more than 1 meal per week of Grand River northern pike greater than

22 inches due to elevated concentrations of PCBs. Lastly, women and children should eat no more than 1 meal per month of sucker from the Grand River due to elevated levels of PCBs.

Comparison to Trigger Levels: Ten channel catfish ranging in length from 12 to 21 inches were collected from the Grand River at Ionia in 2006. Total PCB concentrations exceeded women and children trigger levels in 5 fish. Concentrations in 5 fish were in the women and children “1 meal per week” range (Table 9; Figure 35). The median total PCB concentration in channel catfish less than 18 inches was 0.03 ppm, and the median concentration in fish greater than 17 inches was 0.07 ppm. A total of 20 channel catfish were collected from the Grand River since 1989 (10 were collected from the Moores Park Impoundment in 1989). The median total PCB concentration in channel catfish less than 18 inches was 0.08 ppm and the median concentration in fish greater than 18 inches was 0.12 ppm.

Ten northern pike ranging in length from 23 to 28 inches were collected from the Grand River at Grand Rapids, below the 6th Street Dam in 2007. Total PCB concentrations exceeded women and children trigger levels in 4 fish. Concentrations in the 4 northern pike were in the women and children “1 meal per week” range (Table 9; Figure 36). The overall median total PCB concentration in the 9 legal size northern pike collected in 2007 was 0.04 ppm. A total of 12 northern pike were collected from the Grand River since 1998 and the median total PCB concentration of the 9 legal size fish was 0.04 ppm.

Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 10 northern pike and the median mercury concentration for the 9 legal size fish was 0.18 ppm (Table 10; Figure 37). The median mercury concentration for the 9 legal size northern pike collected since 1998 was 0.18 ppm.

Ten redhorse sucker ranging in length from 12 to 17 inches were collected from the Grand River at Ionia in 2006. Total PCB concentrations exceeded women and children trigger levels in 6 fish, and all concentrations were in the women and children “1 meal per week” range (Table 9; Figure 38). The overall median PCB concentration was 0.05 ppm. A total of 30 white sucker and redhorse sucker were collected from the Grand River since 1998, and the overall median total PCB concentration was 0.1 ppm.

Recommendations: No change to the advisory is recommended. Additional channel catfish, redhorse sucker, white sucker, and legal size northern pike should be collected from the Grand River to evaluate the possibility of relaxing the advisory.

Klinger Lake, St. Joseph County (ID 2006126) *Northern Pike*

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

Comparison to Trigger Levels: Ten northern pike ranging in size from 22 to 28 inches were collected from Klinger Lake in 2006 and analyzed for mercury only. Mercury concentration in 3 fish exceeded the MDCH “restrict consumption” trigger level (Table 10; Figure 39). The median mercury concentration in the 5 fish larger than the 24-inch legal size limit was 0.72 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Lake Margrethe, Crawford County (ID 2007227)

Walleye

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

Comparison to Trigger Levels: Ten walleye ranging in length from 14 to 20 inches were collected from Lake Margrethe and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 4 walleye (Table 10; Figure 40). The median mercury concentration in the 8 walleye greater than the 15-inch legal size limit was 0.47 ppm. A total of 20 walleye were collected from Lake Margrethe since 1995. The median mercury concentration in the 18 legal size walleye was 0.44 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Lake Michigamme, Marquette County (ID 2006035)

Rock Bass and Walleye

Existing MDCH Advisory: Lake Michigamme rock bass are covered by the statewide mercury 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 Lake Michigamme walleye due to elevated levels of mercury.

Comparison to Trigger Levels: Ten rock bass ranging in length from 7 to 11 inches were collected from Lake Michigamme and analyzed for mercury only. Median mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 9 fish (Table 10; Figure 41). The median mercury concentration was 0.69 ppm. A total of 14 rock bass were collected from Lake Michigamme since 1984; the median mercury concentration was 0.69 ppm.

Ten walleye ranging in length from 14 to 26 inches were collected from Lake Michigamme and analyzed for mercury only. Median mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 9 fish and exceeded the MDCH “no consumption” trigger level in 1 fish (Table 10; Figure 42). The median mercury concentration in the 7 walleye larger than the 15-inch legal size limit was 1.16 ppm. A total of 16 walleye were collected from Lake Michigamme since 1984, and the median mercury concentration in the 11 legal size walleye was 1.10 ppm. The median mercury concentration in walleye less than 18 inches was 0.87 ppm; the median concentration in walleye greater than 18 inches was 1.92 ppm.

Recommendations: The MDCH should consider advising that no one should eat Lake Michigamme walleye greater than 18 inches due to elevated levels of mercury. Additional monitoring is not necessary at this time.

Long Lake, Iron County (ID 2007235)

Walleye

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

Comparison to Trigger Levels: Ten walleye ranging in length from 20 to 30 inches were collected from Long Lake in 2007 and analyzed for mercury only. Mercury concentrations in 9

fish exceeded the MDCH “restrict consumption” trigger level (Table 10; Figure 43). The median mercury concentration was 0.64 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Long Lake, Kent County (ID 2006044)
Largemouth Bass

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

Comparison to Trigger Levels: Ten largemouth bass ranging in length from 12 to 15 inches were collected from Long Lake in 2006 and analyzed for mercury only. The mercury concentration in 3 fish exceeded the MDCH “restrict consumption” trigger level (Table 10; Figure 44). The median mercury concentration of the 6 legal size largemouth bass was 0.48 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Manistique River, downstream Manistique Papers Dam, Schoolcraft County (ID 2007238)
Walleye

Existing MDCH Advisory: The general population should eat no more than 1 meal per week of Manistique River 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 less than 22 inches and no more than 1 meal per month of walleye greater than 22 inches due to elevated concentrations of mercury and PCBs.

Comparison to Trigger Levels: Ten walleye ranging in length from 17 to 29 inches were collected from the Manistique River downstream of the Manistique Papers Dam. Total PCB concentrations exceeded women and children trigger levels in 9 fish (Table 9; Figure 45). Concentrations in 8 fish were in the women and children “1 meal per week” and 1 fish was in the women and children “1 meal per month” range. The median total PCB concentration in legal size walleye less than 22 inches was 0.06 ppm and the concentration in fish greater than 22 inches was 0.19 ppm. A total of 30 walleye were collected from the Manistique River since 2003. The median total PCB concentration in the legal size walleye less than 22 inches was 0.06 ppm and the concentration in the walleye greater than 22 inches was 0.21 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 2 walleye collected in 2007 and the median mercury concentration was 0.20 ppm (Table 10; Figure 46). A total of 30 walleye were collected from the Manistique River since 2003 and analyzed for mercury. The median mercury concentration in the 22 legal size walleye collected was 0.33 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Maple River, Clinton/Gratiot/Ionia Counties (ID 2006150)
Carp

Existing MDCH Advisory: Maple River carp are not covered by an advisory.

Comparison to Trigger Levels: Ten carp ranging in length from 18 to 23 inches were collected from the Maple River in 2006. Total PCB concentrations exceeded women and children trigger levels in 1 fish, and the concentration was in the women and children “1 meal per week” range (Table 9; Figure 47). The median total PCB concentration was 0.001 ppm.

Mercury concentration exceeded the MDCH “restrict consumption” trigger level in 1 carp collected from the Maple River and the median mercury concentration was 0.28 ppm (Table 10; Figure 48).

Recommendations: The MDCH should consider advising women and children to eat no more than 1 meal per week of Maple River carp larger than 22 inches due to elevated levels of PCBs. Additional monitoring is not necessary at this time.

Milakokia Lake, Mackinac County (ID 2007241)
Walleye

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

Comparison to Trigger Levels: Ten walleye ranging in length from 14 to 23 inches were collected from Milakokia Lake in 2007 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 4 fish, and the median mercury concentration in the 9 legal size walleye was 0.47 ppm (Table 9; Figure 49). A total of 22 walleye were collected from Milakokia Lake since 1985, and the median mercury concentration was 0.81 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Millecoquins Lake, Mackinac County (ID 2006049)
Rock Bass

Existing MDCH Advisory: Millecoquins Lake rock bass are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten rock bass ranging in length from 8 to 10 inches were collected from Millecoquins Lake in 2006 and analyzed for mercury only. Mercury concentration exceeded the MDCH “restrict consumption” trigger level in 1 fish, and the median mercury concentration was 0.32 ppm (Table 9; Figure 50).

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Muskegon Lake, Muskegon County (ID 2006050)
Northern Pike

Existing MDCH Advisory: Women and children should eat no more than 1 meal per week of northern pike less than 26 inches and no more than 1 meal per month of northern pike greater than 26 inches due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten northern pike ranging in length from 22 to 26 inches were collected from Muskegon Lake in 2006. Total PCB concentrations exceeded women and children trigger levels in 2 fish, and the concentrations in both fish were in the women and children “1 meal per week” range (Table 9; Figure 51). The median total PCB concentration of the 5 legal size northern pike was 0.01 ppm. A total of 17 northern pike were collected from Muskegon Lake since 1986. The median total PCB concentration of the 9 legal size northern pike was 0.06 ppm.

Mercury concentration exceeded the MDCH “restrict consumption” trigger level in 2 northern pike (Table 10; Figure 52). The median mercury concentration of the 5 legal size fish was 0.33 ppm. The median mercury concentration of the 9 legal size northern pike collected since 1986 was 0.23 ppm.

Recommendations: No changes to the advisory are recommended. Additional northern pike larger than 26 inches should be collected to evaluate the possibility of relaxing the advisory.

Osterhout Lake, Allegan County (ID 2007265)
Largemouth Bass

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

Comparison to Trigger Levels: Ten largemouth bass ranging in length from 12 to 17 inches were collected from Osterhout Lake and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 10 fish (Table 10; Figure 53). The median mercury concentration for the 6 largemouth bass greater than the 14-inch legal size limit was 0.34 ppm. Regression analysis indicates that Osterhout Lake largemouth bass larger than 17 inches are likely to have mercury concentrations exceeding 0.5 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

Randall Lake Chain, Morrison Lake, Branch County (ID 2007242)
Northern Pike

Existing MDCH Advisory: Women and children should eat no more than 1 meal per month and the general population should eat no more than 1 meal per week of Randall Lake Chain northern pike due to elevated concentrations of mercury and PCBs.

Comparison to Trigger Levels: Ten northern pike ranging in length from 20 to 34 inches were collected from the Randall Lake Chain, Morrison Lake in 2007. Total PCB concentrations were below women and children trigger levels in all 10 fish (Table 9; Figure 54). The median total PCB concentration of the 7 northern pike greater than the 24-inch legal size limit was 0.004 ppm. A total of 18 northern pike were collected from the Randall Lake Chain since 1990.

The median total PCB concentration in the 12 legal size northern pike collected since 1990 was 0.02 ppm.

Mercury concentration exceeded the MDCH “restrict consumption” trigger level in 7 northern pike collected in 2007 (Table 10; Figure 55). The median mercury concentration of the 7 fish greater than the 24-inch legal size limit was 0.72 ppm. The median mercury concentration in the 12 legal size northern pike collected since 1990 was 0.55 ppm.

Recommendations: The MDCH should consider removing PCBs from the list of contaminants causing the advisory for Randall Lake Chain northern pike. No additional monitoring is necessary at this time.

Silver Lake, Grand Traverse County (ID 2007251)
Walleye

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

Comparison to Trigger Levels: Ten walleye ranging in length from 13 to 19 inches were collected from Silver Lake in 2007 and analyzed for mercury only. Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 3 fish (Table 10; Figure 56). The median mercury concentration of the 7 legal size walleye was 0.5 ppm. Regression analysis indicates that Silver Lake walleye greater than 18 inches are likely to have mercury concentrations exceeding 0.5 ppm.

Recommendations: No changes to the advisory are recommended and additional monitoring is not necessary at this time.

White Lake, Muskegon County (ID 2007258)
Carp and Northern Pike

Existing MDCH Advisory: No one should eat carp of any size from White Lake due to elevated levels of PCBs. White Lake northern pike are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten carp ranging in length from 22 to 30 inches were collected from White Lake in 2007. Total PCB concentrations exceeded the general population trigger level in 1 (10%) fish (Table 9; Figure 57). Concentrations exceeded women and children trigger levels in 9 carp. Total PCB concentrations in 6 fish were in the women and children “1 meal per week” range, 1 fish was in the women and children “1 meal per month” range, 1 fish was in the women and children “6 meals per year” range, and 1 fish exceeded the women and children “no consumption trigger level. The median total PCB concentration was 0.14 ppm. A total of 25 carp were collected from White Lake since 1991 and analyzed for PCBs. The median total PCB concentration was 0.71 ppm.

Ten northern pike ranging in length from 24 to 35 inches were collected from White Lake in 2007. Total PCB concentrations in 5 fish exceeded the women and children trigger levels (Table 9; Figure 58); all 5 northern pike had concentrations in the “1 meal per week” range. The median total PCB concentration was 0.06 ppm.

Mercury concentrations in 4 northern pike exceeded the MDCH “restrict consumption” trigger level and the median concentration was 0.46 ppm (Table 10; Figure 59). A total of 20 northern

pike were collected from White Lake since 1984. The median mercury concentration was 0.41 ppm.

Recommendations: The MDCH should consider relaxing the general population advisory to no more than 1 meal per week of White Lake carp of any size. Also, the MDCH should consider adding PCBs to the list of contaminants causing the advisory on White Lake northern pike.

No additional monitoring is necessary at this time.

3.1.2.5 Lake Superior Watershed

Lake Superior, Marquette and Keweenaw Bay (IDs 2007267, 2007230 and 2007231) *Lake Herring, Siscowet, Lake Whitefish*

Existing MDCH Advisory: Women and children should eat no more than 1 meal per week of Lake Superior lake herring less than 26 inches and no more than 1 meal per month of lake herring greater than 26 inches due to elevated concentrations of PCBs while the general population should eat no more than 1 meal per week of lake herring greater than 30 inches. Women and children should eat no more than 1 meal per month of siscowet less than 18 inches and no one should eat any siscowet greater than 18 inches due to elevated concentrations of chlordane, dioxins, and PCBs. In addition, women and children should eat no more than 1 meal per week of lake whitefish greater than 22 inches due to elevated concentrations of PCBs.

Comparison to Trigger Levels: Ten lake herring ranging in size from 13 to 18 inches were collected from Lake Superior in 2007. Total PCB concentrations were below women and children trigger levels in all 10 fish (Table 9; Figure 60) and the median total PCB concentration was 0.008 ppm. A total of 31 lake herring were collected from Lake Superior since 1994 and the median total PCB concentration was 0.035 ppm.

Ten siscowet ranging in size from 17 to 26 inches were collected from Lake Superior in 2007. Total PCB concentrations were below the general population trigger level in all 10 fish. Concentrations exceeded women and children trigger levels in all 10 fish (Table 9; Figure 61). Concentrations in 4 fish were in the women and children “1 meal per week” range, 5 fish were in the “1 meal per month” range, and 1 fish was in the women and children “no consumption” range. A total of 148 siscowet have been collected from Lake Superior since 1987. Total PCB concentrations have declined and have not exceeded the general population trigger level since 1987. A total of 49 siscowet were collected since 1996. The median total PCB concentration in fish less than 18 inches was 0.17 ppm, 0.24 ppm in fish between 18 and 22 inches, 0.53 ppm in fish between 22 and 26 inches, and 1.14 ppm in siscowet greater than 26 inches collected from Lake Superior since 1996.

Mercury concentrations exceeded the MDCH “restrict consumption” in 2 of 10 siscowet collected in 2007 and the median mercury concentration was 0.22 ppm (Table 10; Figure 62). A total of 130 siscowet collected from Lake Superior since 1986 were analyzed for mercury and concentrations have declined since that time. A total of 49 siscowet were collected since 1996. The median mercury concentration in fish less than 18 inches was 0.17 ppm, 0.18 ppm in fish between 18 and 22 inches, 0.30 ppm in fish between 22 and 26 inches, and 0.52 ppm in siscowet greater than 26 inches collected from Lake Superior since 1996.

Total chlordane concentrations exceeded the MDCH “restrict consumption” trigger level in 1 (10%) siscowet collected in 2007 (Figure 63). A total of 148 siscowet were collected from

Lake Superior since 1987 and total chlordane concentrations have declined since that time. A total of 49 siscowet were collected since 1996. Total chlordane concentrations were below the trigger level in all 25 fish less than 22 inches. Concentrations exceeded the trigger level in 5 of 20 (25%) siscowet between 22 and 26 inches and in 2 of 4 (50%) fish 26 inches and greater collected since 1996.

Dioxin and furan congeners were analyzed in the 10 siscowet collected in 2007. Dioxin TEQ concentrations exceeded the MDCH trigger level in 1 (10%) fish (Table 11; Figure 64). Dioxin TEQ concentrations exceeded the trigger level in 15 of 40 (38%) siscowet collected since 1995. Concentrations exceeded the trigger level in 10 of 31 (32%) fish less than 22 inches and 5 of 9 (56%) fish greater than 22 inches.

Seventeen lake whitefish ranging in size from 18 to 22 inches were collected from Lake Superior in 2007. Total PCB concentrations exceeded women and children levels in 12 fish, and all 12 had concentrations in the women and children "1 meal per week" range. The median total PCB concentration was 0.06 ppm (Table 9; Figure 65). A total of 63 lake whitefish were collected from Lake Superior since 1996. The median total PCB concentration in fish less than 22 inches was 0.06 ppm and the median concentration in fish greater than 22 inches was 0.05 ppm.

Recommendations: The MDCH should consider relaxing the women and children advisory to no more than 1 meal per week of Lake Superior lake herring of any size.

The MDCH should also consider advising women and children to eat no more than 1 meal per week of Lake Superior lake whitefish of any size due to elevated concentrations of PCBs.

Additional siscowet should be collected from Lake Superior and analyzed for dioxins, furans, and dioxin-like PCBs to evaluate the possibility of relaxing the advisory based on dioxin TEQ.

Lake Superior, Portage Lake/Sturgeon River, Houghton County (ID 2007254) ***Burbot***

Existing MDCH Advisory: Lake Superior burbot are not covered by an advisory.

Comparison to Trigger Levels: Ten burbot ranging in length from 14 to 25 inches were collected from Portage Lake/Sturgeon River in 2007. Total PCB concentrations were below the women and children trigger levels in all 10 fish (Table 9; Figure 66). The median total PCB concentration was 0.02 ppm.

Burbot liver is consumed by many of the anglers that target the species. Burbot liver samples from 7 fish were analyzed as 2 composites and liver samples from the 2 largest fish were analyzed individually. The total PCB concentrations in all 4 samples exceeded women and children trigger levels (Table 9; Figure 67). Concentrations in 3 samples were in the "1 meal per month" range and 1 sample was in the "6 meals per year" range. The median total PCB concentration was 0.64 ppm.

Mercury concentration exceeded the MDCH "restrict consumption" trigger level in 1 fish (Table 10; Figure 68). The median mercury concentration in burbot less than 22 inches was 0.22 ppm.

Mercury concentrations in all 4 burbot liver samples were below the MDCH trigger level.

Recommendations: The MDCH should consider advising the general population to eat no more than 1 meal per week and women and children to eat no more than 1 meal per month of Lake Superior burbot greater than 22 inches due to elevated levels of mercury.

Based on analysis of PCB concentrations found in Lake Superior burbot livers, the MDCH has advised women and children not to eat internal organs of any fish from Michigan water bodies due to elevated levels of PCBs.

Additional monitoring is not necessary at this time.

Blind Sucker Flooding, Luce County (ID 2007207)
Yellow Perch

Existing MDCH Advisory: Blind Sucker Flooding yellow perch are covered by the statewide mercury advisory.

Comparison to Trigger Levels: Ten yellow perch ranging in length from 6 to 8 inches were collected from Blind Sucker Flooding and analyzed for mercury only. Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 10 fish (Table 10; Figure 69). The median mercury concentration was 0.17 ppm.

Recommendations: No change to the advisory is recommended and additional monitoring is not necessary at this time.

Marion Lake, Gogebic County (ID 2003500)
Northern Pike, Smallmouth Bass, Walleye, and Yellow Perch

Existing MDCH Advisory: Marion Lake northern pike, smallmouth bass, walleye, and yellow perch are covered by the statewide mercury advisory.

Comparison to Trigger Levels: At the request of the United States Forest Service, 1 northern pike, 1 smallmouth bass, 1 walleye, and 1 yellow perch collected from Marion Lake in 2003 were analyzed for mercury only. Mercury concentration exceeded MDCH trigger level in the 1 northern pike and the mercury concentration was 0.90 ppm (Table 10; Figure 70).

A total of 8 walleye were collected from Marion Lake since 1987. The median mercury concentration of the 6 walleye greater than the 15-inch legal size limit was 0.8 ppm (Figure 71).

Recommendations: No change to the advisory is recommended and additional monitoring is not necessary at this time.

Portage Lake, Houghton County (ID 2007247)
Walleye

Existing MDCH Advisory: The general population should eat no more than 1 meal per week of Portage Lake walleye greater than 22 inches and women and children should eat no more than 1 meal per month of walleye greater than 22 inches due to elevated concentrations of mercury and PCBs.

Comparison to Trigger Levels: Ten walleye ranging in length from 16 to 28 inches were collected from Portage Lake in 2007. Total PCB concentrations exceeded women and children trigger levels in 2 fish, and concentrations in both fish were in the women and children “1 meal per week” range. The median total PCB concentration was 0.03 ppm (Table 9; Figure 72). A total of 25 walleye were collected from Portage Lake since 1988. The median total PCB concentration in legal size walleye less than 22 inches was 0.025 ppm, and in fish greater than 22 inches the median concentration was 0.08 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 2 walleye collected in 2007 (Table 10; Figure 73). The median mercury concentration in walleye less than 22 inches was 0.24 ppm and the median concentration in fish greater than 22 inches was 0.87 ppm. A total of 25 walleye were collected since 1988. The median mercury concentration in legal size walleye less than 22 inches was 0.23 ppm, and in fish greater than 22 inches the median concentration was 0.87 ppm.

Recommendations: No change to the advisory is recommended and additional monitoring is not necessary at this time.

Torch Lake, Houghton County (ID 2007257) *Northern Pike, Walleye, and White Sucker*

Existing MDCH Advisory: Women and children should eat no more than 1 meal per week of northern pike from Torch Lake less than 30 inches and no more than 1 meal per month of northern pike greater than 30 inches, and the general population should eat no more than 1 meal per week of northern pike greater than 30 inches due to elevated concentrations of mercury and 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 less than 22 inches, and no more than 1 meal per month of walleye greater than 22 inches due to elevated concentrations of mercury and PCBs. White sucker are not covered by an advisory.

Comparison to Trigger Levels: Ten northern pike ranging in size from 19 to 37 inches were collected from Torch Lake in 2007. Total PCB concentrations exceeded women and children trigger levels in 1 fish with a concentration in the women and children “1 meal per week” range. The median total PCB concentration was 0.03 ppm (Table 9; Figure 74). A total of 30 northern pike were collected from Torch Lake since 1988; the median total PCB concentration in the 16 legal size northern pike less than 30 inches was 0.044 ppm, and the median concentration in the 6 northern pike greater than 30 inches was also 0.044 ppm.

The mercury concentration in 2 northern pike exceeded the MDCH “restrict consumption” trigger level and the median mercury concentration was 0.42 ppm for the 7 legal size fish collected in 2007 (Table 10; Figure 75). The median mercury concentration in the 16 legal size northern pike less than 30 inches collected since 1988 was 0.31 ppm, and the median mercury concentration in the 6 northern pike greater than 30 inches was 0.59 ppm.

Twenty walleye ranging in length from 15 to 25 inches were collected from Torch Lake in 2007. Total PCB concentrations exceeded women and children trigger levels in 14 fish. Concentrations in 7 walleye were in the women and children “1 meal per week” range and 7 were in the women and children “1 meal per month” range. The median total PCB concentration in walleye less than 22 inches was 0.04 ppm, and the median concentration in fish greater than 22 inches was 0.21 ppm (Table 9; Figure 76). A total of 36 walleye were

collected from Torch Lake since 1988. The median total PCB concentration in the 25 legal size walleye less than 22 inches was 0.04 ppm and the median concentration in the 9 walleye greater than 22 inches was 0.21 ppm.

Mercury concentrations exceeded the MDCH “restrict consumption” trigger level in 10 walleye and exceeded the MDCH “no consumption” trigger level in 3 walleye collected in 2007 (Table 10; Figure 77). The median mercury concentration in walleye less than 22 inches was 0.40 ppm and the median concentration in walleye greater than 22 inches was 1.4 ppm. The median mercury concentration in the 25 legal size walleye less than 22 inches collected since 1988 was 0.33 ppm. The median mercury concentration in the 9 walleye greater than 22 inches was 1.4 ppm. Regression analysis indicates that Torch Lake walleye greater than 25 inches are likely to have mercury concentrations exceeding the MDCH “no consumption” trigger level.

Ten white sucker ranging in length from 13 to 19 inches were collected from Torch Lake in 2007. Total PCB concentrations exceeded women and children trigger levels in 1 fish with a concentration in the women and children “1 meal per week” range (Table 9; Figure 78). The median total PCB concentration was 0.007 ppm.

Mercury concentrations were below the MDCH “restrict consumption” trigger level in all 10 white sucker and the median mercury concentration was 0.08 ppm (Table 10; Figure 79).

Recommendations: The MDCH should consider advising that no one eat Torch Lake walleye over 22 inches due to elevated levels of mercury and PCBs.

No additional monitoring is necessary at this time.

3.1.3 Summary of Recommendations

The MDCH should consider relaxing fish consumption advisories at 5 sites and adding or expanding advisories at 7 sites. Additional monitoring is recommended for 5 water bodies.

3.1.3.1 Summary of Recommendations for Relaxed Advisories

- The MDCH should consider removing the advisory on Black River (Sanilac County) carp less than 26 inches.
- The MDCH should consider removing chlordane from the list of contaminants causing the advisory on Galien River (Berrien County) carp. The MDCH should also consider removing the general population advisory on Galien River carp.
- The MDCH should consider removing PCBs from the list of contaminants causing the advisory for Randall Lake Chain (Branch County) northern pike.
- The MDCH should consider relaxing the general population advisory to no more than 1 meal per week of White Lake (Muskegon County) carp of any size.
- The MDCH should consider relaxing the women and children advisory to no more than 1 meal per week of Lake Superior lake herring of any size.
- In addition, if the MDCH retains the current advisory protocol for mercury, relaxation of fish consumption advisories should be considered for the following sites and species:

White Lake (Oakland County) walleye, Budd Lake (Clare County) largemouth bass, Otsego Lake (Otsego County) walleye, Tobico Marsh (Bay County) largemouth bass, East Bass Lake (Marquette County) northern pike, and Silver Lake (Grand Traverse County) walleye.

3.1.3.2 Summary of Recommendations for Expanded Advisories

- The MDCH should consider advising women and children not to eat more than 1 meal per week of Saginaw Bay freshwater drum due to elevated levels of PCBs and mercury.
- The MDCH should consider advising women and children not to eat more than 1 meal per week of Glen Lake (Leelanau County) rainbow trout greater than 22 inches due to elevated levels of PCBs.
- The MDCH should consider advising that no one should eat Lake Michigamme (Marquette County) walleye greater than 18 inches due to elevated levels of mercury.
- The MDCH should consider advising women and children to eat no more than 1 meal per week of Maple River (Clinton/Gratiot/Ionia Counties) carp larger than 22 inches due to elevated levels of PCBs.
- The MDCH should consider adding PCBs to the list of contaminants causing the advisory on White Lake (Muskegon County) northern pike.
- The MDCH should consider advising women and children to eat no more than 1 meal per week of Lake Superior lake whitefish of any size due to elevated concentrations of PCBs.
- The MDCH should consider advising the general population to eat no more than 1 meal per week and women and children to eat no more than 1 meal per month of Lake Superior burbot greater than 22 inches due to elevated levels of mercury.
- Based on analysis of PCB concentrations found in Lake Superior burbot livers, the MDCH has advised women and children not to eat the internal organs of any fish from Michigan water bodies due to elevated levels of PCBs.
- The MDCH should consider advising that no one eat Torch Lake (Houghton County) walleye over 22 inches due to elevated levels of mercury and PCBs.

3.1.3.3 Summary of Recommendations for Additional Monitoring

- Additional carp greater than 26 inches should be collected from the Black River, Sanilac County, to evaluate the possibility of removing the advisory based on PCBs.
- Additional northern pike larger than 26 inches and carp should be collected from Tobico Marsh (Bay County) to evaluate the possibility of relaxing the advisory based on PCBs.
- Additional Galien River (Berrien County) carp should be collected to evaluate the possibility of relaxing the advisory based on PCBs.

- Additional channel catfish, redhorse sucker, white sucker, and legal size northern pike should be collected from the Grand River to evaluate the possibility of relaxing the advisory based on PCBs.
- Additional northern pike larger than 26 inches should be collected from Muskegon Lake (Muskegon County) to evaluate the possibility of relaxing the advisory based on PCBs.
- Additional siscowet should be collected from Lake Superior and analyzed for dioxins, furans, and dioxin-like PCBs to evaluate the possibility of relaxing the advisory based on dioxin TEQ.

3.1.3.4 Summary of WQS Attainment Status

The MDEQ-WB is required by the federal Clean Water Act (CWA) to describe the water quality of all navigable waters of the state and to provide an analysis of the extent to which these waters support designated uses. Designated uses are 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 (Michigan Compiled Laws). States are required by the CWA to develop a list of water bodies that do not support designated uses or do not attain WQS, and therefore require the development of a Total Maximum Daily Load (TMDL). The MDEQ-WB compiles a biennial integrated report, which includes that list, in order to satisfy CWA requirements.

Water bodies are evaluated and placed into at least 1 reporting category for each of 10 designated uses. 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 attain WQS and is in need of TMDL development, it is listed in Category 5.

The fish consumption designated use protects a water body's ability to provide a fishery for human consumption. Attainment status of the fish consumption designated use is determined for water bodies with site-specific data, water column concentrations of Bioaccumulative Chemicals of Concern (BCCs), fish tissue concentrations of BCCs, and/or Fish Consumption Advisories issued by the MDCH. Details of the methods used to make attainment status determinations as well as changes in attainment status are subject to biennial review, and are presented in the 2008 Sections 303(d), 305(b), and 314 Integrated Report (LeSage and Smith, 2008).

The sites assessed for the FCMP 2008 Annual Report represented 40 water bodies. Seventeen of the water bodies had not been assessed previously for the fish consumption designated use (Table 12). We will propose that 13 of the previously unassessed water bodies be designated Category 5, 3 designated Category 2, and 1 water body designated Category 3 for fish consumption designated use. In addition, we propose that 1 water body be changed from Category 3 to Category 5 for the fish consumption designated use. Water body record modifications will be reviewed by MDEQ staff and the public before being presented in the 2010 Integrated Report (IR). The USEPA will then review the IR to determine if they can approve the changes in attainment status.

3.2 CAGED FISH BIOCONCENTRATION STUDIES

Caged fish bioconcentration monitoring was conducted at 9 locations in 5 watersheds in 2007. The raw data are presented in Appendix E. General highlights of the caged fish studies conducted in the Black River, Chippewa River, Looking Glass River, Maple River, and Pine River watersheds include:

- Net uptake of mercury was not measured at any caged fish locations in 2007.
- Net uptake of total lipid-normalized PCBs was measured at 3 of 9 locations. The highest net uptake was measured in fish from a cage set in the Pine River downstream of the St. Louis impoundment.
- Net uptake of total lipid-normalized DDT was measured at 3 of 9 locations. The highest net uptake was measured in fish from a cage set in the Pine River downstream of the St. Louis impoundment.
- Net uptake of total lipid-normalized chlordane was measured at 4 of 9 locations. Net uptake was 1 ppb at all 4 sites.
- Net uptake of total PBDE was measured in samples from all 5 caged fish locations where the contaminant was assayed.

3.2.1 Black River Caged Fish Study

Cages were placed at 3 locations in the Black River (Sanilac and St. Clair Counties) in 2007 (Figure 3). The Black River is covered by a sport fish consumption advisory due to elevated concentrations of PCBs in carp. The 2007 caged fish study was conducted to identify sources of PCBs and other BCCs. A previous caged fish study was conducted in the Black River near the river mouth in 1993.

Total PCBs and lipid-normalized total PCBs were quantified in samples from the Black River mouth 1993 (Figures 80 and 81), but no quantifiable uptake was measured in samples from any of the 3 sites monitored in 2007 (Table 13).

Net uptake of lipid-normalized total chlordane was quantified at all 3 Black River sites in 2007 (Table 13). The concentrations at the 3 sites were equivalent, indicating that sources are probably diffuse and the contaminant is ubiquitous in the environment. The average net uptake was 1 ppb, which ranks approximately in the 60th percentile of concentrations measured in caged fish samples from Great Lakes tributaries in Michigan (Table 14).

The samples from the Black River mouth site were analyzed for PBDE congeners. Net uptake of lipid-normalized total PBDE was 0.2 ppb, which is the lowest concentration measured in caged fish samples to date.

No quantifiable uptake of any other contaminant, including mercury and total DDT, was measured at any of the 3 Black River locations (Table 13).

3.2.2 Chippewa River Caged Fish Study

One cage was placed in the Chippewa River near, but upstream, of the confluence with the Pine River in 2007 (Figure 4). A previous caged fish study was conducted in the Chippewa River in 2000 with 1 site downstream of the Pine River confluence and 1 site roughly 8 river miles upstream of that confluence. Another caged fish study was conducted in 2002 with a cage set at the site downstream of the Pine River confluence. The 2007 study was conducted in conjunction with a study of the Pine River, and the Chippewa River cage was placed in order to provide independent results for each river.

The Chippewa River is covered by a sport fish consumption advisory due to elevated levels of PCBs in suckers. The 2007 caged fish study was conducted to identify sources of PCBs and other BCCs.

No net uptake of lipid-normalized total PCBs was measured at the Chippewa River caged fish site in 2007 (Table 13). This is consistent with the results of previous caged fish studies on the river and indicates that there is no significant source of PCBs in the Chippewa River watershed.

Net uptake of lipid-normalized total chlordane was quantified at the Chippewa River site in 2007 (Table 13) at a low level consistent with results found in previous studies.

The samples from the Chippewa River site were analyzed for PBDE congeners. Net uptake of lipid-normalized total PBDE was 0.4 ppb, which ranks approximately in the 30th percentile of concentrations measured in caged fish samples to date.

No quantifiable uptake of any other contaminant, including mercury and total DDT, was measured at the Chippewa River site (Table 13).

3.2.3 Looking Glass River Caged Fish Study

One cage was placed in the Looking Glass River near the mouth in 2007 (Figure 5). The Looking Glass River has not been monitored previously using caged fish; this study was conducted to determine if there are sources of PCBs and other BCCs in the watershed.

The samples from the Looking Glass River site were analyzed for PBDE congeners. Net uptake of lipid-normalized total PBDE was 0.8 ppb, which ranks approximately in the 70th percentile of concentrations measured in caged fish samples to date.

No quantifiable uptake of any other contaminant, including mercury, total PCBs, total chlordane, and total DDT, was measured at the Looking Glass River site (Table 13).

3.2.4 Maple River Caged Fish Study

One cage was placed in the Maple River near its confluence with the Grand River in 2007 (Figure 6). The Maple River has not been monitored previously using caged fish; this study was conducted to determine if there are sources of PCBs and other BCCs in the watershed.

The samples from the Maple River site were analyzed for PBDE congeners. Net uptake of lipid-normalized total PBDE was 0.3 ppb, which ranks approximately in the 20th percentile of concentrations measured in caged fish samples to date.

No quantifiable uptake of any other contaminant, including mercury, total PCBs, total chlordane, and total DDT, was measured at the Maple River site (Table 13).

3.2.5 Pine River Caged Fish Study

Three cages were placed in the Pine River between the city of Alma (Gratiot County) and the confluence with the Chippewa River in Midland County (Figure 4). The St. Louis Impoundment of the Pine River is the site of the Velsicol Chemical Corporation (formerly Michigan Chemical Corporation) USEPA Superfund project; DDT is the primary contaminant of concern there. Remediation projects addressing the problem of contaminated river sediments near that site were completed in 2006.

The highest net uptake of lipid-normalized total DDT measured in the 2007 Pine River caged fish study was observed at the Wastewater Treatment Plant (WWTP) site immediately downstream of the St. Louis Impoundment (Table 13; Figure 82). Based on the uptake measured at the WWTP site, DDT concentrations in the Pine River downstream of the St. Louis Impoundment have not changed significantly since 1999. However, water column contaminant concentrations can be affected by river discharge; elevated concentrations are observed during both low and high flow periods, and the lowest concentrations are generally measured during periods of moderate flow (Turk and Troutman, 1981). The results of the 2002 study appear to be inconsistent with the other years, but this may be due to differences in river discharge between the years. The mean Pine River flow during the sampling periods in 1999, 2000, and 2002 was equivalent, while the flow during the 2007 sampling period was significantly lower. The low flow in 2007 may have led to uptake that overestimates concentrations in comparison with samples collected during years with higher flows. Caged fish studies should be continued at selected sites on the Pine River to evaluate changes in DDT concentrations.

Net uptake of lipid-normalized total PCBs was measured at all 3 sites in the Pine River in 2007 (Table 13; Figure 83). The highest concentration was observed at the St. Louis WWTP site. This is consistent with the results of previous caged fish studies (Figure 83) and suggests that there is a source of PCBs between US-127 and the WWTP site. As noted in the discussion of DDT results, low river flows in 2007 may have led to an overestimate of uptake relative to the other sampling years.

The samples from the Gordonville Road site were analyzed for PBDE congeners. Net uptake of lipid-normalized total PBDE was 0.7 ppb, which ranks approximately in the 60th percentile of concentrations measured in caged fish samples to date.

No quantifiable uptake of any other contaminant, including mercury and total chlordane, was measured in the Pine River samples in 2007 (Table 13).

3.3 TREND MONITORING

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

Highlights of the 3 trend monitoring programs are presented below.

3.3.1 USEPA - Great Lakes Whole Fish Trend Monitoring

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

General conclusions are presented below:

- The USEPA 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 84 and 85). Also, Lake Michigan lake trout had higher levels of total PCBs 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 86). 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 87). 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 88).

3.3.2 Federal-State Chinook and Coho Salmon Fillet Trend Monitoring

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

The average total PCB, total DDT, and total chlordane concentrations in coho and chinook salmon fillet samples collected in Michigan's portion of Lake Michigan between 1983 and 2000 are presented in Figure 89. 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. Concentrations of all three contaminants increased in both chinook and coho salmon from Lake Michigan between 1998 and 2000. The fact that total DDT, total PCBs, and total chlordane all increased suggests that the changes in concentrations are probably due to food-web changes after introductions of exotic species (e.g., zebra mussel, goby) rather than increases in contaminant loading to the lake.

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 2000 are presented in Figure 90. 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. The Lake Huron coho salmon population has declined significantly in recent years, and only chinook salmon samples were analyzed in 1999 and 2000. Total DDT, total PCB, and total chlordane concentrations all increased in chinook salmon between 1998 and 2000. As in Lake Michigan, the increased concentrations are probably due to changes in the food-web following the introduction of exotic species.

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 all 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, weight, and

collection date as explanatory variables for mercury concentrations. The model for organic contaminant concentrations used length, weight, 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 $\pm 1.4\%$ 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 1.4% per year. Therefore, the absolute value of the real trend (if any) was 1.4% per year or less.

Statistically significant changes in mercury concentrations were detected in 12 of 32 data sets (Table 15; Figure 91). Concentrations are increasing in at least 1 species of fish at 7 of the 8 Great Lakes or connecting channel trend sites where a trend can be detected. The average and median rates of change in these 8 data sets were $+3.0\%$ per year and $+4.1\%$ per year, respectively. Mercury concentrations declined in fish from 2 of 3 inland lakes or rivers where trends could be detected, and increased in fish from the third site. The average and median rates of change in fish from the 3 inland lakes or rivers was -0.8% per year and -2.5% per year, respectively. Minimum detectable mercury concentration trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from $\pm 1.1\%$ per year to $\pm 2.9\%$ per year with a median minimum detectable trend of $\pm 1.9\%$ per year.

Statistically significant changes in total PCB concentrations were detected in 30 of 32 data sets (Table 15; Figure 92). Total PCB concentrations decreased in 29 of the 30 data sets where changes were statistically significant. The one exception was lake trout from Grand Sable Lake where a 9.1% increase in total PCB concentrations was observed between 1991 and 1995. No samples have been collected from that lake since 1995. Where trends in total PCB concentrations could be detected, concentrations tended to decrease faster in fish from rivers and inland lakes compared to fish from the Great Lakes and connecting channels. A significant trend in total PCB concentrations was detected in fish from all river and inland lake trend sites, and concentrations declined at 12 of the 13 sites. The average and median rates of change in fish from all 13 inland sites were -7.1% per year and -6.4% per year, respectively. Total PCB concentrations declined in at least 1 species from all 10 sites in the Great Lakes or connecting channels. The average and median rates of change in these data sets were -6.4% per year and -5.7% per year, respectively. Only 1 data set (Little Bay de Noc carp) has not yet shown a significant trend in total chlordanes concentrations, with a minimum detectable trend of $\pm 3.8\%$.

Changes in total DDT concentrations were detected in 29 of 32 data sets (Table 15; Figure 93). Total DDT concentrations decreased in all 29 data sets where changes were statistically significant. Concentrations declined in fish from all 11 rivers and inland lakes where a trend was detected, and the average and median rates of change in fish from those 11 sites were -8.2% per year and -8.6% per year, respectively. Concentrations decreased in all of the Great Lakes and connecting channel data sets where a trend could be detected. The average and median rates of change in fish from these sites were -8.8% per year and -8.7% per year, respectively.

Minimum detectable trends from all inland lake, river, Great Lakes, and connecting channel data sets ranged from +/-3.7% per year to +/-4.3% per year with a median minimum detectable trend of +/-3.8% per year.

Changes in total chlordane concentrations were observed in 29 of 30 data sets (Table 15; Figure 94). Concentrations were consistently near or below the QL in walleye from Lake Gogebic and South Manistique Lake, and trend analysis was not appropriate or necessary for those data sets. Total chlordane concentrations decreased in all 29 data sets where changes were statistically significant, and the rates of decline at the Great Lakes, connecting channels, and inland sites were equivalent. Total chlordane concentrations declined in fish from all 11 rivers and inland lakes where analysis was appropriate. The average and median rates of change in fish from these 11 sites were equal at -9.2% per year. Concentrations of total chlordane declined in 18 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 -9.9% per year and -9.0% per year, respectively. Only 1 data set (Detroit River carp) has not yet shown a significant trend in total chlordane concentrations, and has a minimum detectable trend of +/-2.7%.

Changes in dioxin TEQ concentrations were measured in fish from all 4 sites where samples were analyzed for the contaminant (Table 15; Figure 95). Concentrations declined in lake trout from Grand Traverse Bay, Thunder Bay, and Keweenaw Bay, and in carp from Saginaw Bay. The average and median rates of decline in dioxin TEQ were -7.9% per year and -7.8% per year, respectively.

The minimum detectable trends in all data sets ranged from +/-1.1% per year to +/-4.3% per year. 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 all of the trends analyses conducted.

In addition, the following general conclusions can be made:

- Lindane, terphenyl, polybrominated biphenyls, 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 PCBs, 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 QL. 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 extensive areas of PCB-contaminated sediments, a problem that is being addressed under state and federal programs.
- Carp and walleye from the St. Marys River had lower concentrations of organic contaminants than carp from Lake St. Clair and 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

3.4.1 Contaminant Concentrations in MDNR Fish Hatchery Stock

At the request of the MDNR-Fisheries Division, contaminant concentrations in samples of fingerling and yearling fish of several species from 2 state hatcheries were measured. Composite samples of whole fish were analyzed for the standard suite of contaminants (Table 3).

One composite sample each of brown trout and chinook salmon from the Thompson State Fish Hatchery were analyzed (ID 2007500). Concentrations of quantifiable contaminants were higher in the chinook salmon sample as compared to the brown trout sample. The mercury concentration was 0.02 ppm in the brown trout sample and 0.04 ppm in the chinook salmon sample. The total PCB concentration was below the QL (0.001 ppm) in the brown trout sample and 0.04 ppm in the chinook salmon sample. Total chlordane was not quantifiable in the brown trout sample and was 0.003 ppm in the chinook salmon sample. Total DDT concentrations were 0.001 ppm in the brown trout sample and 0.021 in the chinook salmon sample. All other contaminant concentrations in the Thompson Hatchery samples were below QLs.

Two composite samples of chinook salmon and 1 composite sample of coho salmon from the Platte River State Fish Hatchery were analyzed (ID 2007501). Mercury concentrations ranged from an average of 0.03 ppm in chinook salmon to 0.06 ppm in coho salmon. The total PCB concentration in the coho salmon sample was 0.01 ppm and averaged 0.09 ppm in the chinook salmon samples. Total chlordane was not quantifiable in the coho salmon sample and averaged 0.004 ppm in the chinook salmon samples. The total DDT concentration in the coho salmon sample was 0.01 ppm and averaged 0.02 ppm in the chinook salmon samples. All other contaminant concentrations in the Platte River Hatchery samples were at or below QLs.

Total PCB concentrations in the chinook salmon samples from both hatcheries sampled in 2007 were near or above the level at which the MDCH would recommend restricted consumption by children and women of childbearing age. However, the samples were whole fish, which generally have higher concentrations of chlorinated organic contaminants than fillet samples from the same fish.

Complete results are presented in Appendix E.

3.4.2 Se Concentrations in Marquette County Aquatic Biota

Cleveland Cliffs Michigan Operations operates the Empire and Tilden mining facilities in the Marquette Iron Range near the town of Palmer (Marquette County). Because of concerns about Se in facility effluents, waste rock seeps, and nearby surface waters, the MDEQ formed an internal work group in 2008. The work group developed a monitoring plan, which included the analysis of fish and macroinvertebrate samples from streams that may be impacted by Se contamination from the mining operations (Goose Lake Outlet and Warner Creek) as well as from a control site (Bear Creek).

Biotic samples were collected from 3 sample sites in May 2008. Fish tissue samples from all 3 locations were analyzed (wet weight) for Se. At Goose Lake Outlet (ID 2008500), mean Se levels ranged from 8 to 17.5 ppm in the tissues of brook trout, white suckers, fathead minnows, and creek chubs. In Warner Creek (ID 2008502), mean tissue Se levels for the same species ranged from 5.6 to 10.1 ppm. Se concentrations in fish from the Bear Creek control site (ID 2008501) were low, never exceeding a mean of 1 ppm.

Benthic macroinvertebrates from Goose Lake Outlet also were analyzed; a Se concentration of 22.3 ppm was found in a composite of caddisfly tissue (a level greater than in fish tissue). Se was also present at lower levels in leeches, snails, mayflies, and odonates. Benthic invertebrates were not collected from Warner Creek or Bear Creek for tissue analysis.

The Se monitoring methods and results are discussed fully in a separate staff report (Selenium Monitoring Workgroup, 2009). Complete results are presented in Appendix E.

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SECTION 4.0

REFERENCES

- Bohr, J., and J. Zbytowski. 2008. Michigan Fish Contaminant Monitoring Program: 2007 Annual Report. MDEQ-WB Report #MI/DEQ/WB-08/029.
- Bohr, J., and J. Zbytowski. 2007. Michigan Fish Contaminant Monitoring Program: 2006 Annual Report. MDEQ-WB Report #MI/DEQ/WB-07/053.
- Bohr, J., and J. Zbytowski. 2006. Michigan Fish Contaminant Monitoring Program: 2005 Annual Report. MDEQ-WB Report #MI/DEQ/WB-06/091.
- Day, R. 1997. Michigan Fish Contaminant Monitoring Program: 1997 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-97/125.
- Day, R. 1998. Michigan Fish Contaminant Monitoring Program: 1998 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-98/091.
- Day, R. 1999. Michigan Fish Contaminant Monitoring Program: 1999 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQD-99/164.
- Day, R. 2002. Michigan Fish Contaminant Monitoring Program: 2002 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQD-03/084.
- Day, R., and J. Bohr. 2005. Michigan Fish Contaminant Monitoring Program: 2004 Annual Report. MDEQ-WB Report #MI/DEQ/WB-05/024.
- Day, R., J. Bohr, and R. Ramirez. 2004. Michigan Fish Contaminant Monitoring Program: 2003 Annual Report. MDEQ-WB Report #MI/DEQ/WB-04/080.
- Day, R. and S. Holden. 1996. Michigan Fish Contaminant Monitoring Program: 1996 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-96/112.
- Day, R. and S. Walsh. 2000. Michigan Fish Contaminant Monitoring Program: 2000 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-00/122.
- Day, R. and S. Walsh. 2001. Michigan Fish Contaminant Monitoring: 2001 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-02/035.
- DeVault, D.S., R. Hesselberg, P.W. Rodgers, T.J. Feist. 1996. Contaminant Trends in Lake Trout and Walleye from the Laurentian Great Lakes. J. Grt. Lks. Res. 22(4):884-895.
- Duling, L. 1988. Fish Contaminant Monitoring Program - 1988 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-88/090.
- Duling, L. and S. Benzie. 1989. Fish Contaminant Monitoring Program - 1989 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-89/168.

- Duling, L. and S. Benzie. 1990. Fish Contaminant Monitoring Program - 1990 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-90/077.
- Eisenreich, S.J. 1996. Toxaphene in the Great Lakes: Concentrations, Trends and Pathways. Proceedings of a March 27-29, 1996 Workshop. 23 pp.
- Exponent. 2003. Fish Contaminant Monitoring Program: Review and Recommendations. Prepared for MDEQ-WD.
- LeSage, S. W., and J. Smith. 2008. Water quality and pollution control in Michigan 2008 sections 303(d), 305(b), and 314 Integrated Report. MDEQ-WB Report #MI/DEQ/WB-08/007.
- Michigan Department of Natural Resources (MDNR). 1986a. Fish Contaminant Monitoring Program - 1986 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-91/294.
- Michigan Department of Natural Resources (MDNR). 1986b. Fish Contaminant Monitoring in Michigan - 1985. MDNR-SWQD Report #MI/DNR/SWQ-87/055.
- Michigan Department of Natural Resources (MDNR). 1989. Fish Contaminant Monitoring in Michigan - 1984. MDNR-SWQD Report #MI/DNR/SWQ-89/071.
- Saalfeld, G., C. Waggoner, S. Benzie, B. Walker, and J. Gahsman. 1991. Michigan Fish Contaminant Monitoring Program 1991 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-91/273.
- Selenium Monitoring Workgroup. 2009. An Assessment Of Environmental Selenium Levels Around Empire And Tilden Mines Marquette County, Michigan. MDEQ-WB Report #MI/DEQ/WB-0/038.
- Turk, J.T. and D.W. Troutman. 1981. Polychlorinated Biphenyl Transport in the Hudson River, New York. USGS Water-Resources Investigations 81-9. Reston, Virginia: U.S. Geological Survey. 11 p.
- Van den Berg, M., L.S. Birnbaum, M. Denison, M. DeVito, W. Farland, M. Feeley, H. Fiedler, H. Hakansson, A. Hanberg, L. Haws, M. Rose, S. Safe, D. Schrenk, C. Tohyama, A. Tritscher, J. Tuomisto, M. Tysklind, N. Walker, and R.E. Peterson. 2006. The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. Toxicological Sciences 93(2):223-241.
- Waggoner, C.A. 1992. Michigan Fish Contaminant Monitoring Program: 1992 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-92/292.
- Wood, C.A. 1993. Michigan Fish Contaminant Monitoring Program: 1993 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-93/059.
- Wood, C.A. 1994. Michigan Fish Contaminant Monitoring Program: 1994 Annual Report. MDNR-SWQD Report #MI/DNR/SWQ-94/074.
- Wood, C.A., R. Day, and S. Holden. 1995. Michigan Fish Contaminant Monitoring Program: 1995 Annual Report. MDEQ-SWQD Report #MI/DEQ/SWQ-95/087.

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

Standard Edible Portion	Common Name	Scientific Name
Skin-on Fillet	Yellow Perch	<i>Perca flavescens</i>
	Walleye	<i>Sander vitreus</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.

WATER BODY	SPECIES COLLECTED*	YEARS MONITORED
GREAT LAKES AND CONNECTING CHANNELS		
Lake Michigan		
Little Bay de Noc	Carp	1992, 94, 00, 03, 05, 07
	Walleye	1992, 94, 97, 00, 02, 05, 07
Grand Traverse Bay	Carp	1993, 95, 00, 03
	Lake Trout (D)	1990, 92, 95, 98, 01, 04, 06
Lake Huron		
Saginaw Bay	Carp (D)	1990, 92, 94, 98, 01, 03, 05
	Walleye	1990, 91, 92, 94, 98, 03, 05, 07
Thunder Bay	Carp	1992, 94, 95, 99, 01, 04, 06
	Lake Trout (D)	1992, 94, 95, 98, 01, 04, 05, 07
	Walleye	1991, 95, 98, 01, 05, 07
Lake Superior		
Keweenaw Bay	Lake Trout (D)	1991, 93, 96, 99, 01, 04, 07
Lake St. Clair		
L'Anse Creuse Bay	Carp	1990, 92, 94, 98, 02, 05, 07
	Walleye	1990, 92, 94, 98, 02, 05, 07
Lake Erie		
Brest Bay	Carp	1990, 92, 94, 97, 98, 02, 06
	Walleye	1990, 92, 94, 98, 04, 06
St. Marys River		
Munuscong Bay	Carp	1993, 95, 98, 04
	Walleye	1991, 93, 95, 98, 01, 05, 07
St. Clair River		
Algonac	Carp	1992, 94, 02, 05, 07
	Walleye	1992
Detroit River		
Grassy Island	Carp	1990, 92, 94, 96, 98, 01, 04, 07
	Walleye	1990, 94, 96, 98, 01, 04, 05
RIVERS		
Grand River	Carp	1990, 92, 95, 00, 03, 05, 07
Kalamazoo River	Carp	1990, 92, 94, 97, 99, 01, 03, 05, 07
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, 05, 07
River Raisin	Carp	1991, 94, 97, 00, 04, 06
St. Joseph River	Carp	1991, 93, 97, 00, 02, 05, 07
INLAND LAKES		
Grand Sable Lake	Lake Trout	1991, 93, 95
Lake Gogebic	Walleye	1992, 94, 97, 00, 02, 05
South Manistique Lake	Walleye	1991, 93, 95, 98, 01, 03, 05, 07
Higgins Lake	Lake Trout	1991, 95, 97, 00, 02
Houghton Lake	Largemouth Bass	1992, 94, 98, 01, 04, 06
Gull Lake	Largemouth Bass	1991, 93, 95, 97, 00, 02, 05, 07
Gun Lake	Largemouth Bass	1990, 92, 94, 97, 00, 02, 05, 07
Pontiac Lake	Largemouth Bass	1992, 94, 97, 99, 03, 06

*D = dioxin and furan congeners.

Table 3. Halogenated organic chemicals and mercury quantified in edible portion and whole fish tissue samples.

<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
Oxychlorane	0.001 ppm
<i>gamma</i> -Chlordane	0.001 ppm
<i>trans</i> -Nonachlor	0.001 ppm
<i>alpha</i> -Chlordane	0.001 ppm
<i>cis</i> -Nonachlor	0.001 ppm
Octachlorostyrene	0.001 ppm
Hexachlorostyrene	0.001 ppm
Heptachlorostyrene	0.001 ppm
Pentachlorostyrene	0.001 ppm
Heptachlor	0.001 ppm
Terphenyl	0.250 ppm
Toxaphene	0.050 ppm
Mirex	0.001 ppm
PBB (FF-1, BP-6)	0.001 ppm

Table 4. 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.

<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

Table 6a. Halogenated organic chemicals and mercury analyzed in caged fish tissue samples.

<u>Analyses for all caged fish sites:</u>	<u>Level of Quantification</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
Total PBDE (sum of 8 congeners)	0.001 ppm

Table 6b. Polybrominated diphenyl ether congeners analyzed in selected caged fish tissue samples.

<u>BZ#</u>	<u>Structure</u>	<u>Level of Quantification (ppt)</u>
028	Tribromodiphenyl ethers 2,4,4'	50
047	Tetrabromodiphenyl ethers 2,2',4,4'	50
099	Pentabromodiphenyl ethers 2,2',4,4',5	50
100	2,2',4,4',6	50
153	Hexabromodiphenyl ethers 2,2',4,4',5,5'	50
154	2,2',4,4',5,6	50
183	Heptabromodiphenyl ethers 2,2',3,4,4',5',6'	50
209	Decabromodiphenyl ether	500

BZ# = identification numbers adopted by the International Union of Pure and Applied Chemists.
ppt = part per trillion (ng/Kg) billion ($\mu\text{g/Kg}$)

Table 7. 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 8. 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
Total Chlordane	20	18	0.001-0.444	Lake Superior, Keweenaw Bay- Siscowet
Total DDT	20	20	0.001-1.061	White Lake, Muskegon County- Carp
Dieldrin	20	16	0.001-0.047	Lake Superior, Keweenaw Bay- Lake Whitefish
Heptachlor Epoxide	20	4	0.001-0.017	Lake Superior, Marquette- Lake Whitefish
Hexachlorobenzene	20	4	0.001-0.006	Lake Superior, Keweenaw Bay- Siscowet
Mirex	20	4	0.001-0.056	White Lake, Muskegon County- Carp
Mercury	43	43	0.02-2.34	Torch Lake, Houghton County- Walleye
Octachlorostyrene	20	4	0.001-0.036	White Lake, Muskegon County- Carp
PBB	20	3	0.001-0.004	Lake Superior, Portage Lake/Sturgeon River- Burbot
Total PCB	20	20	0.001-3.139	White Lake, Muskegon County- Carp
Total TPBDE	7	7	1.00-374.9	Lake Superior, Keweenaw Bay- Siscowet
Dioxin TEQ	1	1	1.1-11.2 ppt	Lake Superior, Keweenaw Bay- Siscowet

K = Unquantified at the level shown.

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

Table 9. Edible portion fish tissue samples with total PCB concentrations exceeding the MDCH's sport fish consumption advisory trigger levels.

				Number of Fish in Each Consumption Advisory Category*					
				Women and Children Consumption Advisory Categories				General Population Trigger Level	
Site ID	Location	Species	Median Conc. ppm	1 meal/week 0.05-0.2 ppm	1 meal/month 0.2-1.0 ppm	6 meals/year 1.0-1.9 ppm	No Cons. > 1.9 ppm	2.0 ppm	Current Advisory
Lake Erie Watershed									
2007259	White Lake Oakland County	Walleye	0.006		1/10				No (#)
Lake Huron Watershed									
2007270	Lake Huron Saginaw Bay	Freshwater Drum	0.04	2/10	1/10				No
2007269	Lake Huron Thunder Bay	Lake Whitefish	0.07	9/10					Yes (#)
2007256	Tobico Wetland Bay County	Carp	0.05	4/10	1/10				Yes
Lake Michigan Watershed									
2007215	Galien River	Carp	0.04	2/10	2/10				Yes (#)
2007216	Glen Lake Leelanau County	Rainbow Trout	0.006	1/10					No
2007300	Grand River Below 6 th St Dam	Northern Pike	0.03	4/10					Yes
2006103	Grand River Ionia	Carp Channel Catfish Redhorse Sucker Walleye	0.21 0.04 0.05 0.04	5/10 5/10 6/10 4/10	5/10				Yes Yes Yes Yes
2007238	Manistique River d/s Papers Dam	Walleye	0.07	8/10	1/10				Yes(#)
2006150	Maple River u/s Matherton	Carp	0.001	1/10					No

Table 9. 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		
2006050	Muskegon Lake Muskegon County	Northern Pike	0.02	2/10					Yes	
2007258	White Lake Muskegon County	Carp	0.15	5/9	1/9	1/9		1/9	Yes	
Lake Superior Watershed										
2007230	Lake Superior	Lake Whitefish	0.06	12/17					Yes	
2007267	Keweenaw Bay	Siscowet	0.24	4/10	5/10	1/10			Yes (#)	
2007247	Portage Lake Houghton County	Walleye	0.03	2/10					Yes (#)	
2007257	Torch Lake Houghton County	Northern Pike	0.03		1/10				Yes (#)	
		Walleye	0.14	7/20	7/20				Yes (#)	
		White Sucker	0.007	1/10					No	

Table 10. Edible portion fish tissue samples with mercury concentrations exceeding the MDCH's sport fish consumption advisory trigger level.

Site ID	Location	Species	Species Median Concentration (ppm)	Range (ppm)	Exceedance* Rate	Current Advisory
Lake Erie Watershed						
2007240	Middle Straits Lake Oakland County	Northern Pike	0.67	0.13-1.12	8/10	Yes (a)
2007259	White Lake Oakland County	Walleye	0.4	0.29-0.86	4/10	Yes (a)
Lake Huron Watershed						
2007270	Lake Huron Saginaw Bay	Freshwater Drum	0.44	0.11-0.78	4/10	No
2006006	Caribou Lake Chippewa County	Smallmouth Bass	0.42	0.23-0.86	3/10	Yes (a)
2007212	Cranberry Lake Clare County	Largemouth Bass	0.55	0.25-1.0	7/10	Yes (a)
2006017	Hubbard Lake Alcona County	Walleye	0.5	0.29-0.65	5/10	Yes (a)
2006046	Long Lake Montmorency County	Smallmouth Bass	0.5	0.2-0.75	5/10	Yes (a)
2007237	Lost Lake Presque Isle County	Largemouth Bass	0.73	0.45-0.89	9/10	Yes (a)
2007243	Murphy Lake Tuscola County	Northern Pike	0.34	0.22-0.73	3/10	Yes (a)
2007244	Otsego Lake Otsego County	Walleye	0.16	0.05-0.65	2/10	Yes (a)
Lake Michigan Watershed						
2006009	Crockery Lake Ottawa County	Largemouth Bass	0.61	0.29-0.90	8/10	Yes (a)

* Number of samples exceeding trigger levels/number of samples analyzed.

a The species and water body are covered by the statewide mercury advisory.

Covered by an advisory based on contaminants other than mercury

Table 10. Continued

Site ID	Location	Species	Species Median Concentration (ppm)	Range (ppm)	Exceedance* Rate	Current Advisory
2006121	Dodge Lake Schoolcraft County	Northern Pike	0.52	0.29-0.77	5/10	Yes (a)
2007300	Grand River At Ionia	Walleye	0.23	0.21-0.51	1/10	No (#)
2006126	Klinger Lake St. Joseph County	Northern Pike	0.32	0.21-1.11	3/10	Yes (a)
2007227	Lake Margrethe Crawford County	Walleye	0.47	0.35-0.80	4/10	Yes (a)
2006035	Lake Michigamme Marquette County	Rock Bass Walleye	0.69 1.01	0.42-0.93 0.80-1.92	9/10 10/10	Yes (a) Yes (#)
2007235	Long Lake Iron County	Walleye	0.64	0.39-1.06	9/10	Yes (a)
2006044	Long Lake Kent County	Largemouth Bass	0.45	0.37-0.62	3/10	Yes (a)
2007238	Manistique River Manistique	Walleye	0.2	0.07-0.95	2/10	Yes (#)
2006150	Maple River Clinton County	Carp	0.28	0.20-0.59	1/10	No
2007241	Milakokia Lake Mackinac County	Walleye	0.47	0.13-1.10	4/10	Yes (a)
2006049	Millecoquins Lake Mackinac County	Rock Bass Walleye	0.32 0.81	0.19-0.51 0.53-0.97	1/10 10/10	Yes (a) Yes (a)
2006050	Muskegon Lake Muskegon County	Northern Pike	0.31	0.18-0.64	2/10	No (#)
2007242	Randall Lake Chain Morrison Lake	Northern Pike	0.63	0.39-0.97	7/10	Yes (#)

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

Table 10. Continued

Site ID	Location	Species	Species Median Concentration (ppm)	Range (ppm)	Exceedance* Rate	Current Advisory
2007251	Silver Lake Grand Traverse County	Walleye	0.28	0.17-0.56	3/10	Yes (a)
2007258	White Lake Muskegon County	Northern Pike	0.46	0.30-0.59	4/10	No
Lake Superior Watershed						
2007230	Lake Superior Keweenaw Bay	Siscowet	0.22	0.12-0.71	2/10	Yes (#)
2007254	Lake Superior Portage Lake/Sturgeon River	Burbot	0.22	0.11-0.67	1/10	No
2003500	Marion Lake Gogebic County	Northern Pike	0.90	0.90	1/1	Yes (a)
2007247	Portage Lake Houghton County	Walleye	0.31	0.15-1.3	2/10	Yes (#)
2007257	Torch Lake Houghton County	Northern Pike Walleye	0.34 0.79	0.18-1.04 0.17-2.34	2/10 14/20	Yes (#) Yes (#)

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

Table 11. Dioxin TEQ concentrations in edible portion samples.

Site ID	Location	Species	Species Median Concentration (ppt)	Range (ppt)	Exceedance* Rate	Current Advisory
2007230	Lake Superior	Siscowet	2.2	1.1-11.2	1/10	Yes

* Number of samples exceeding trigger levels/number of samples analyzed.

Table 12. Fish consumption water quality attainment categories for water bodies assessed for the 2008 report.

Location	Present Category	Proposed Category	Impairment	Species Sampled
Lake Erie Watershed				
Middle Straits Lake, Oakland County	None	5	Fish Tissue-Hg	Northern Pike
White Lake, Oakland County	None	5	Fish Tissue-Hg	Walleye
Lake Huron Watershed				
Lake Huron, Thunder Bay	5	5	FCA PCB, Dioxins	Lake Whitefish
Lake Huron, Saginaw Bay	5	5	FCA PCB, Dioxins, Fish Tissue-Hg	Freshwater Drum
Black River, Croswell Impoundment, Sanilac County	5	5	FCA PCB	Carp
Budd Lake, Clare County	None	2		Largemouth Bass
Caribou Lake, Chippewa County	5	5	Fish Tissue-Hg	Rock Bass Smallmouth Bass
Cranberry Lake, Clare County	None	5	Fish Tissue-Hg	Largemouth Bass
Hubbard Lake, Alcona County	5	5	Fish Tissue-Hg	Walleye
Long Lake, Montmorency County	None	5	Fish Tissue-Hg	Smallmouth Bass
Lost Lake, Presque Isle County	None	5	Fish Tissue-Hg	Largemouth Bass
Murphy Lake, Tuscola County	None	5	Fish Tissue-Hg	Northern Pike
Otsego Lake, Otsego County	None	2		Walleye
Tobico Marsh, Bay County	5	5	FCA PCB	Carp Largemouth Bass Northern Pike
Lake Michigan Watershed				
Bass Lake, Marquette County	None	5	Fish Tissue-Hg	Northern Pike
Crockery Lake, Ottawa County	None	5	Fish Tissue-Hg	Largemouth Bass
Dodge Lake, Schoolcraft County	none	5	Fish Tissue-Hg	Northern Pike
Galien River, Berrien County	5	5	FCA PCB *	Carp
Glen Lake, Leelanau County	5	5	FCA PCB	Rainbow Trout
Grand River, Grand Rapids, Below 6 th Street Dam	5	5	FCA PCB	Northern Pike
Grand River, Ionia County	5	5	FCA PCB	Carp Channel Catfish Redhorse Sucker
Klinger Lake, St. Joseph County	3	5	Fish Tissue-Hg	Northern Pike
Lake Margrethe, Crawford County	5	5	Fish Tissue-Hg	Walleye

Table 12. Continued.

Location	Present Category	Proposed Category	Impairment	Species Sampled
Lake Michigamme, Marquette County	5	5	Fish Tissue-Hg	Rock Bass Walleye
Long Lake, Iron County	None	5	Fish Tissue-Hg	Walleye
Long Lake, Kent County	None	5	Fish Tissue-Hg	Largemouth Bass
Manistique River, d/s Manistique Dam Schoolcraft County	5	5	FCA PCB	Walleye
Maple River, Clinton County	5	5	FCA PCB	Carp
Milakokia Lake, Mackinac County	5	5	Fish Tissue-Hg	Walleye
Millecoquins Lake, Mackinac County	5	5	Fish Tissue-Hg	Rock Bass
Muskegon Lake, Muskegon County	None	5	FCA PCB	Northern Pike
Osterhout Lake, Allegan County	None	2		Largemouth Bass
Randall Lake Chain, Morrison Lake	5	5	Fish Tissue-Hg [†]	Northern Pike
Silver Lake, Grand Traverse County	None	5	Fish Tissue-Hg	Walleye
White Lake, Muskegon County	5	5	FCA PCB, Fish Tissue-Hg	Carp Northern Pike
Lake Superior Watershed				
Lake Superior, Marquette and Keweenaw Bay	5	5	FCA PCB, Chlordane, Dioxins, Fish Tissue-Hg	Lake Herring Siscowet Lake Whitefish
Blind Sucker Flooding, Luce County	None	3		Yellow Perch
Marion Lake, Gogebic County	5	5	Fish Tissue-Hg	Northern Pike Smallmouth Bass Walleye Yellow Perch
Portage Lake, Houghton County	5	5	FCA PCB, Fish Tissue-Hg	Walleye
Torch Lake, Houghton County	5	5	FCA PCB, Fish Tissue-Hg	Northern Pike Walleye White Sucker

* - Chlordane removed from list of contaminants causing an advisory

† - PCBs removed from list of contaminants causing an advisory

Table 13. Average net uptake of contaminants in caged fish tissue samples collected in 2007. Concentrations of organic contaminants are lipid-normalized; mercury concentrations are wet weight.

Site Number		Sample Size	Mercury (ppb)	Total PCB (ppb)	Total Chlordane (ppb)	Total DDT (ppb)	Total PBDE (ppb)
<u>Black River</u>							
2007004	u/s Croswell	2	NQU	NQU	1	NQU	NT
2007001	d/s Croswell	1	NQU	NQU	1	NQU	NT
2007003	Near mouth	1	NQU	NQU	1	NQU	0.2
<u>Chippewa River</u>							
2007005	u/s Pine River confluence	2	NQU	NQU	1	NQU	0.4
<u>Looking Glass River</u>							
2007006	Near mouth	2	NQU	NQU	NQU	NQU	0.8
<u>Maple River</u>							
2007007	Near mouth	2	NQU	NQU	NQU	NQU	0.3
<u>Pine River</u>							
2007012	u/s St. Louis Impoundment (US-127)	1	NQU	12	NQU	13	NT
2007013	d/s St. Louis Impoundment (WWTP)	3	NQU	53	NQU	679	NT
2007008	u/s Chippewa River confluence (Gordonville Rd)	2	NQU	29	NQU	52	0.7

NQU = no quantifiable uptake

BQ = below quantification

NT = not tested

Table 14. A comparison of the concentrations of major contaminants measured in caged fish samples from Great Lakes tributaries. Concentrations of chlorinated contaminants are lipid-normalized; mercury concentrations are wet weight.

Tributary / Sample Year	PCB (ppb)	DDT (ppb)	Chlordane (ppb)	Mercury (ppb)	PBDE (ppb)
Lake Erie Watershed					
Belle River / 1997	NQU	NQU	NQU	NQU	
Black River (St. Clair Co) / 2007	NQU	NQU	1	NQU	0.2
Clinton River / 2001	37	22	7	10	
Huron River / 2002	2.4	24	NQU	NQU	
Ottawa River / 2005	146	24	7	NQU	
Raisin River / 2004	65	20	1	NQU	
Rouge River / 2000	28	21	4	8	
Lake Huron Watershed					
Au Gres River / 1991	NQU	5	BQ	NQU	
Au Sable River / 1996	NQU	6	1	NQU	
Kawkawlin River / 2001	12	12	NQU	NQU	
Saginaw River / 2005	83	23	3	3	
Tawas River / 2006	NQU	NQU	BQ	8	1.2
Thunder Bay River / 1996	NQU	4	2	NQU	
Lake Michigan Watershed					
Black Creek (Muskegon Co) / 2005	5	20	BQ	NQU	
Black River (VanBuren Co) / 2002	1	6	BQ	5	
Boardman River / 2003	9	3	BQ	6	
Escanaba River / 2005	13	11	2	5	
Galien River / 2002	NQU	3.3	0.4	2	
Grand River / 2001	16	17	5	NQU	
Kalamazoo River / 1999	183	NT	NT	NT	
Macatawa River / 2005	46	16	7	NQU	
Manistique River / 2002	NQU	2	BQ	NQU	
Menominee River / 1993	NQU	6	1	NQU	
Muskegon River / 2002	NQU	10	NQU	5	
Pere Marquette / 2003	5	1	BQ	6	
Rabbit River / 2003	4	3	0.5	NQU	
St. Joseph River / 2006	NQU	NQU	NQU	NQU	1.4
White River / 1992	NQU	8	0.5	NQU	
Lake Superior Watershed					
Ontonagon River / 1992	NQU	3	BQ	NQU	
Two Hearted River / 1992	NQU	2	0.6	NQU	

NQU = no quantifiable uptake
 BQ = 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.

WATER BODY	SPECIES	RATE OF CHANGE (%) AND PROBABILITY (p)									
		Mercury		Total PCB		Total DDT		Total Chlordane		Dioxin TEQ	
		%	p	%	p	%	p	%	p	%	p
GREAT LAKES AND CONNECTING CHANNELS											
Lake Michigan											
Little Bay de Noc	Carp	±2.3		±3.7		±3.8		-4.0	<0.05		
	Walleye	3.7	<0.001	-8.6	<0.001	-12.3	<0.001	-13.7	<0.001		
Grand Traverse Bay	Carp	±2.6		-10.3	<0.01	-10.5	<0.01	-8.6	<0.01		
	Lake Trout	5.3	<0.001	-4.6	<0.001	-7.9	<0.001	-9.0	<0.001	-10.8	<0.001
Lake Huron											
Saginaw Bay	Carp	±2.6		-6.3	<0.001	-2.7	<0.10	-7.6	<0.001	-5.1	<0.05
	Walleye	3.9	<0.001	-4.3	<0.001	-7.0	<0.001	-8.7	<0.001		
Thunder Bay	Carp	4.1	<0.05	±3.6		±3.5		-8.7	<0.001		
	Lake Trout	2.2	<0.001	-5.6	<0.001	-8.6	<0.001	-12.4	<0.001	-6.2	<0.001
	Walleye	±2.1		-6.0	<0.001	-11.5	<0.001	-15.1	<0.001		
Lake Superior											
Keweenaw Bay	Lake Trout	±1.6		-10.4	<0.001	-10.0	<0.001	-9.6	<0.001	-9.4	<0.001
Lake Erie											
Brest Bay	Carp	5.4	<0.001	-4.2	<0.05	-7.3	<0.001	-7.2	<0.001		
	Walleye	±1.9		-5.5	<0.001	-10.5	<0.001	-13.4	<0.001		
Lake St. Clair											
L'Anse Creuse Bay	Carp	±2.8		-6.2	<0.01	-7.5	<0.001	-8.7	<0.001		
	Walleye	4.9	<0.001	-5.7	<0.001	-13.7	<0.001	-13.9	<0.001		
St. Clair River											
Algonac	Carp	4.3	<0.005	-8.3	<0.01	-6.7	<0.01	-6.3	<0.005		
Detroit River											
Grassy Island	Carp	-6.9	<0.001	-3.4	<0.05	-2.0	<0.05	±2.7			
	Walleye	±1.9		-4.6	<0.001	-7.2	<0.001	-10.7	<0.001		
St. Marys River											
Munuscong Bay	Carp	±1.8		-8.9	<0.01	-14.0	<0.001	-11.8	<0.001		
	Walleye	±1.8		-5.4	<0.001	-10.2	<0.001	-8.9	<0.001		
	Average**	3.0		-6.4		-8.8		-9.9		-7.9	
	Median**	4.1		-5.7		-8.7		-9.0		-7.8	

*± 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

WATER BODY	SPECIES	RATE OF CHANGE (%) AND PROBABILITY (p)									
		Mercury		Total PCB		Total DDT		Total Chlordane		Dioxin TEQ	
		%	p	%	p	%	p	%	p	%	p
INLAND RIVERS											
Grand River	Carp	±2.9		-3.1	<0.005	±3.7		-4.5	<0.001		
Kalamazoo River	Carp	±1.5		-7.2	<0.001	-7.0	<0.001	-3.9	<0.005		
Muskegon River	Carp	±2.9		-13.4	<0.001	-11.2	<0.001	-13.9	<0.001		
River Raisin	Carp	-2.5	<0.01	-14.1	<0.001	-12.8	<0.001	-12.5	<0.001		
St. Joseph River	Carp	±1.4		-2.9	<0.05	-7.5	<0.001	-5.5	<0.001		
INLAND LAKES											
Grand Sable Lake	Lake Trout	7.6	<0.01	9.1	<0.001	±4.3		-8.6	<0.05		
Lake Gogebic	Walleye	-7.4	<0.001	-15.9	<0.001	-9.7	<0.001	#NA			
South Manistique Lake	Walleye	±1.5		-4.3	<0.001	-2.9	<0.005	NA			
Higgins Lake	Lake Trout	±2.4		-10.3	<0.001	-8.6	<0.001	-12.0	<0.001		
Houghton Lake	Largemouth Bass	±1.4		-12.1	<0.001	-9.0	<0.001	-9.3	<0.001		
Gull Lake	Largemouth Bass	±1.1		-6.4	<0.001	-9.4	<0.001	-12.6	<0.001		
Gun Lake	Largemouth Bass	±1.2		-6.3	<0.001	-5.2	<0.005	-4.8	<0.001		
Pontiac Lake	Largemouth Bass	±2.8		-6.0	<0.005	-6.8	<0.001	-15.0	<0.001		
	Average**	-0.8		-7.1		-8.2		-9.3			
	Median**	-2.5		-6.4		-8.6		-9.3			

*± 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.

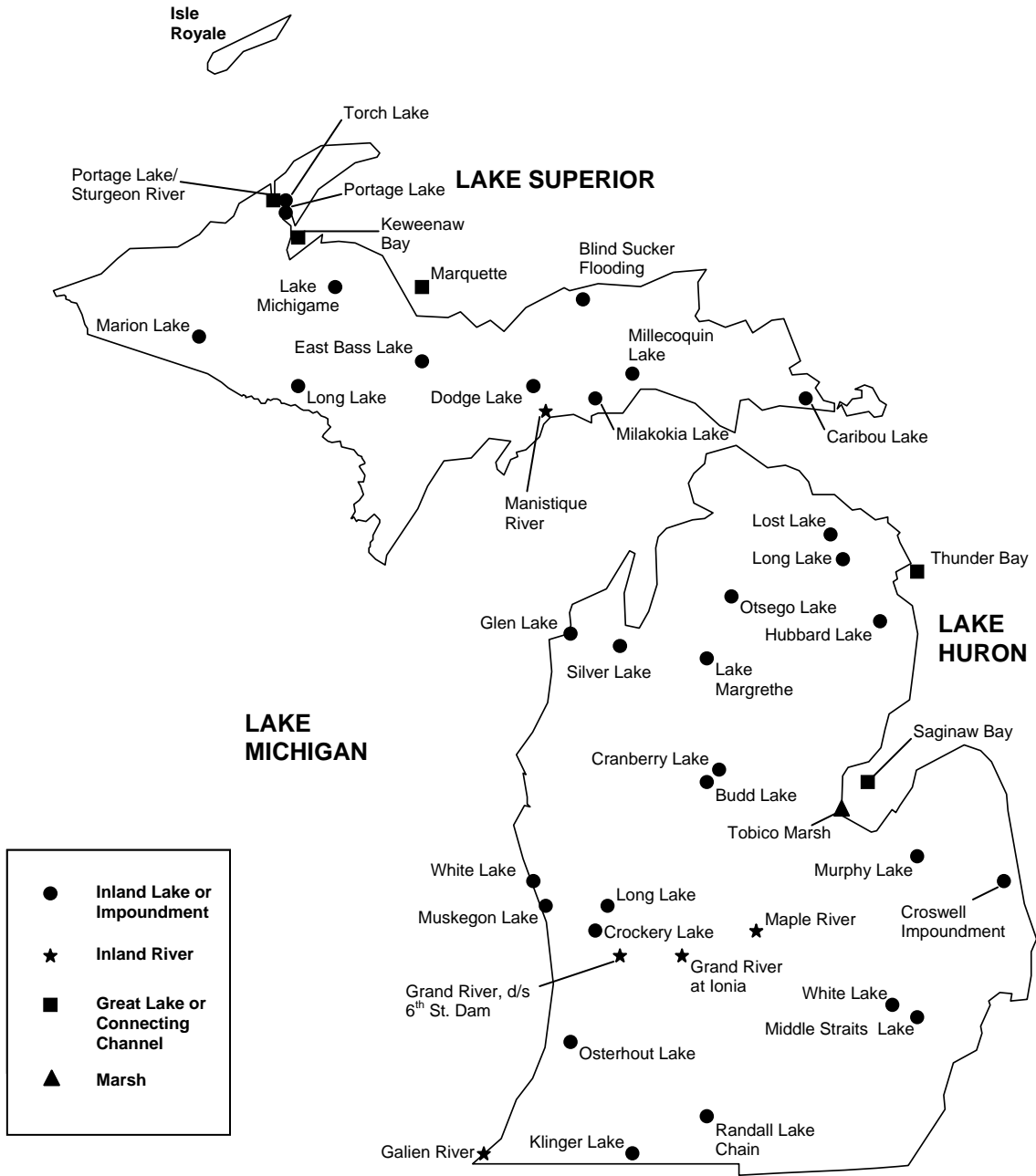


Figure 1. Edible portion fish sample locations

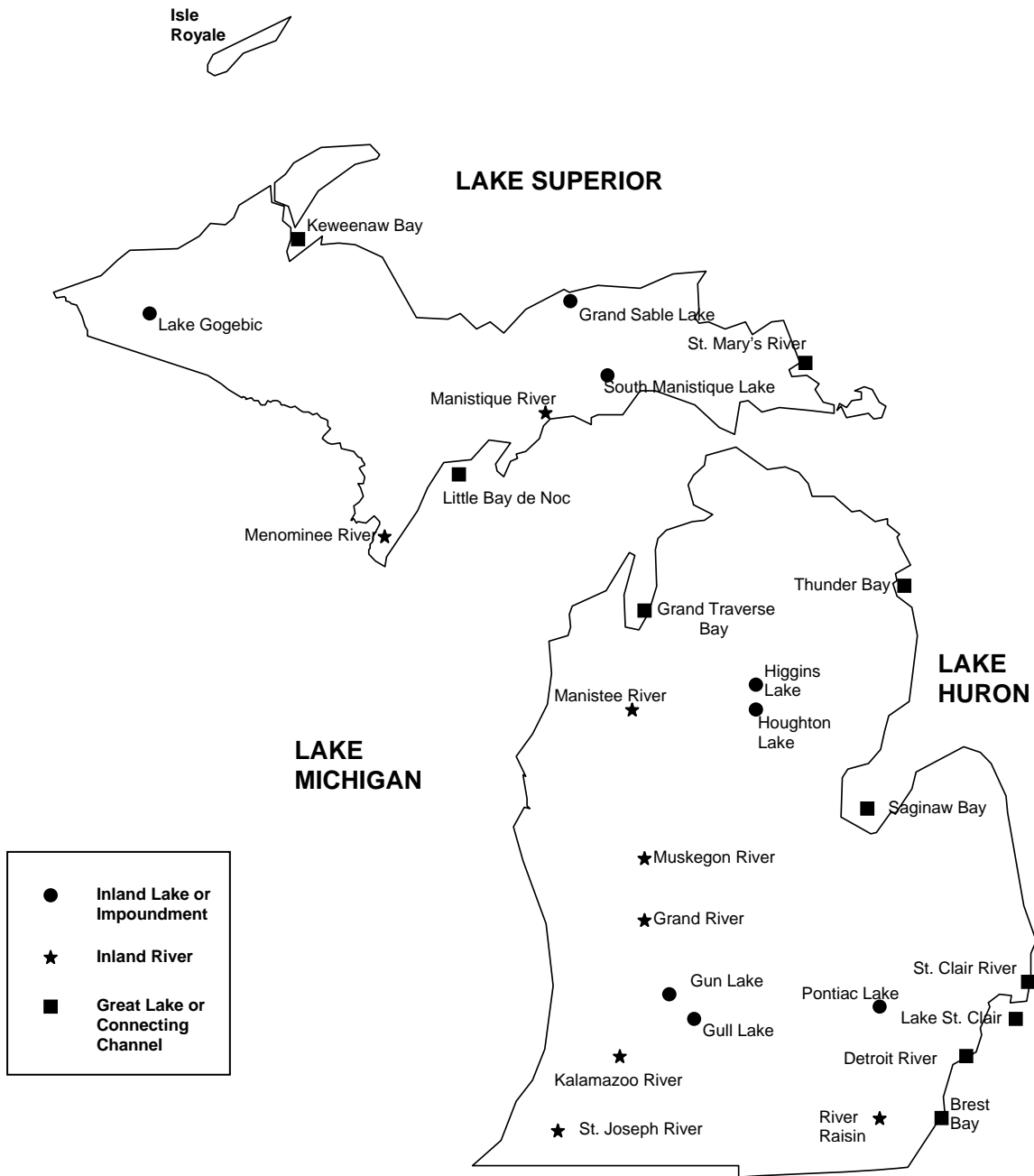


Figure 2. Whole fish trend monitoring sites.

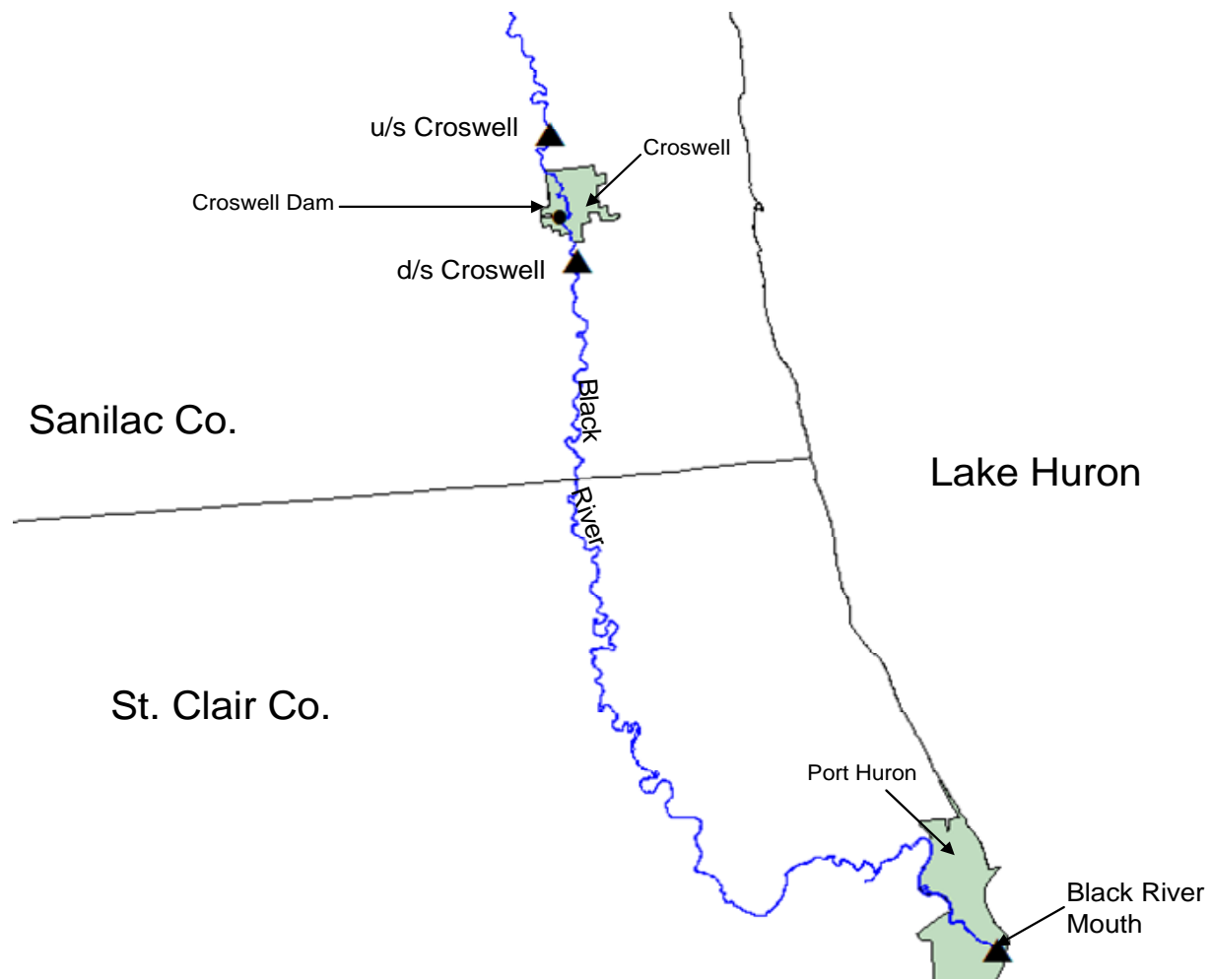


Figure 3. Black River 2007 caged fish monitoring locations.

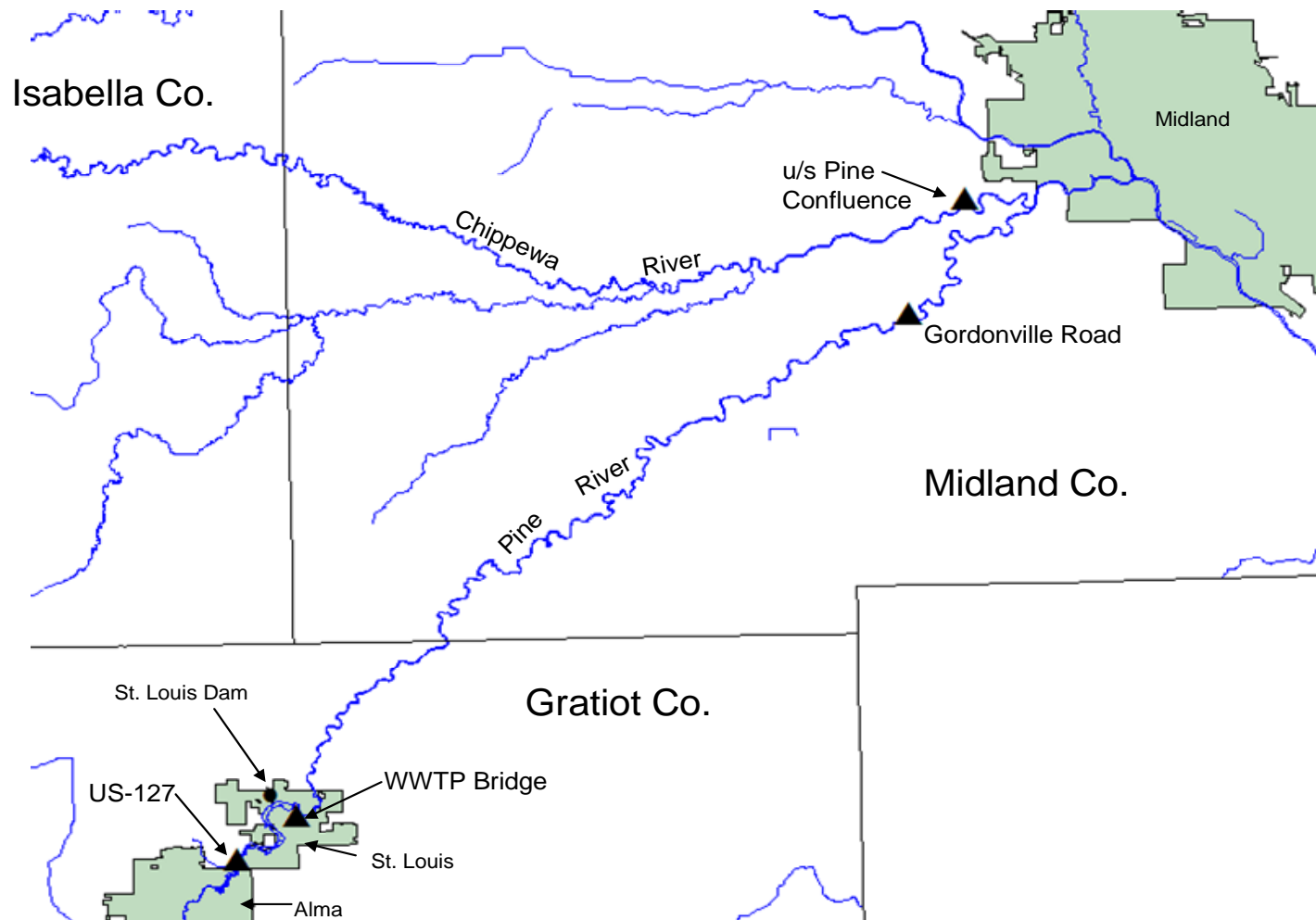


Figure 4. Chippewa and Pine River 2007 caged fish monitoring locations.

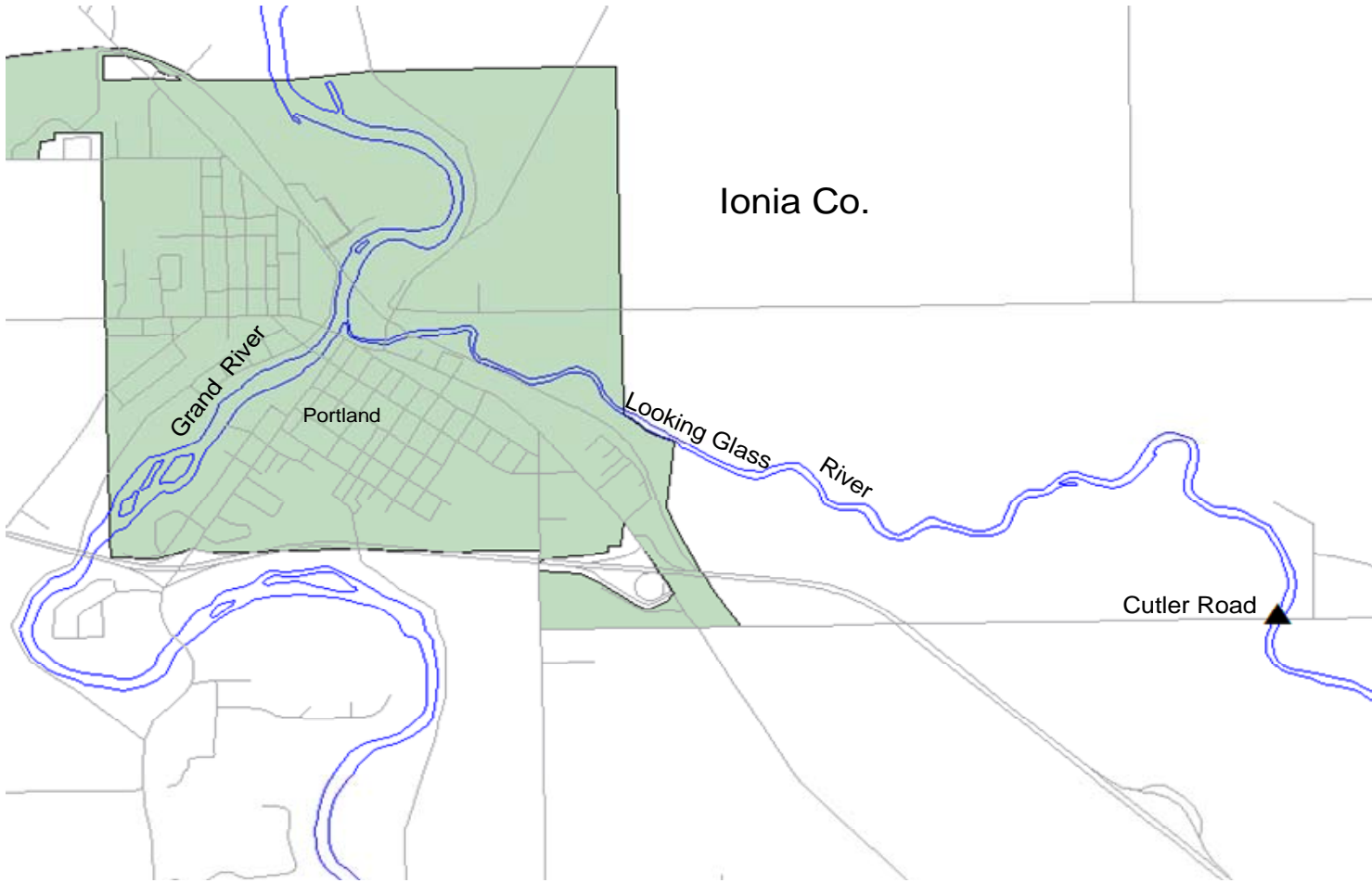


Figure 5. Looking Glass River 2007 caged fish monitoring location.

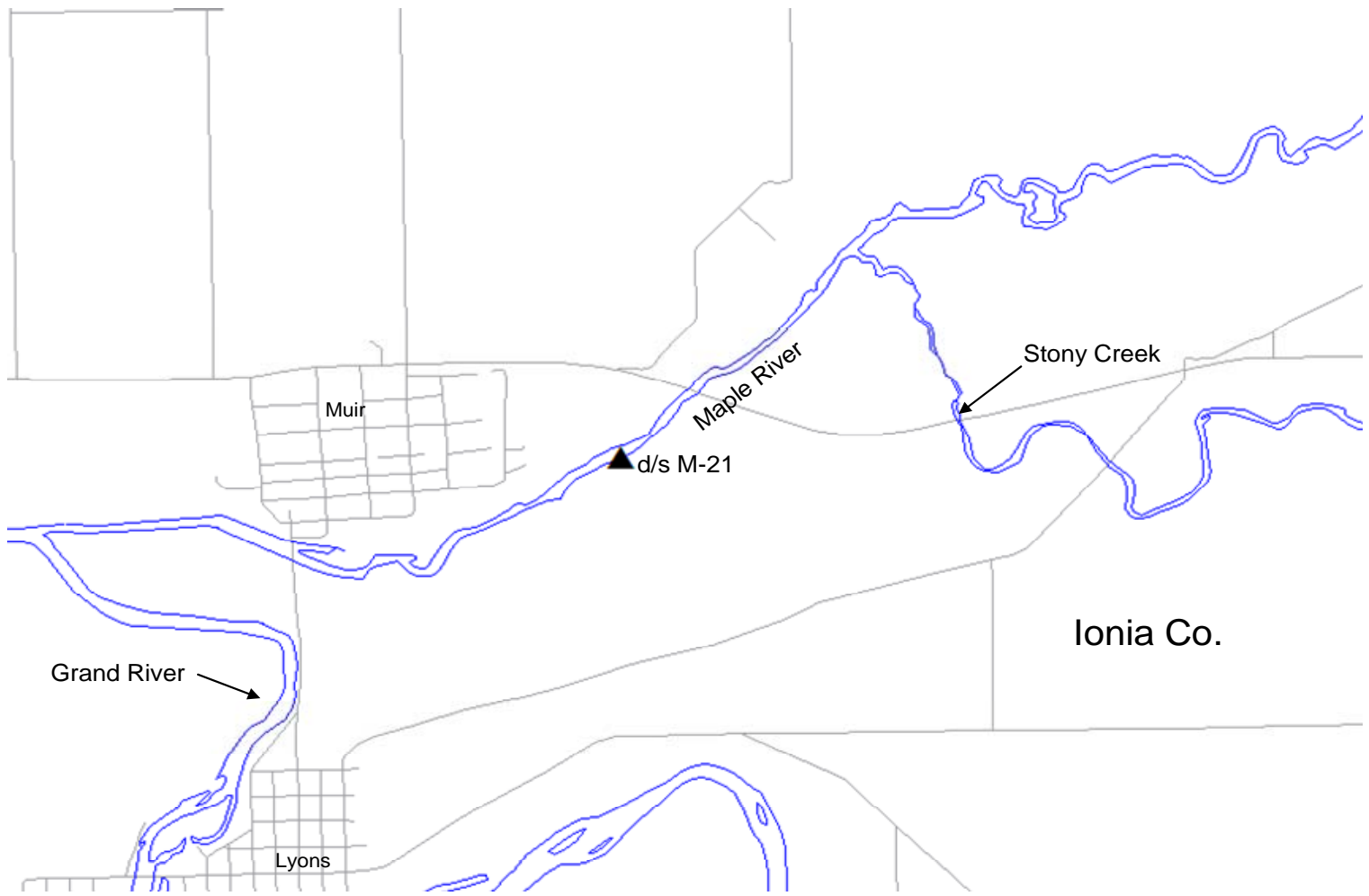


Figure 6. Maple River 2007 caged fish monitoring location.

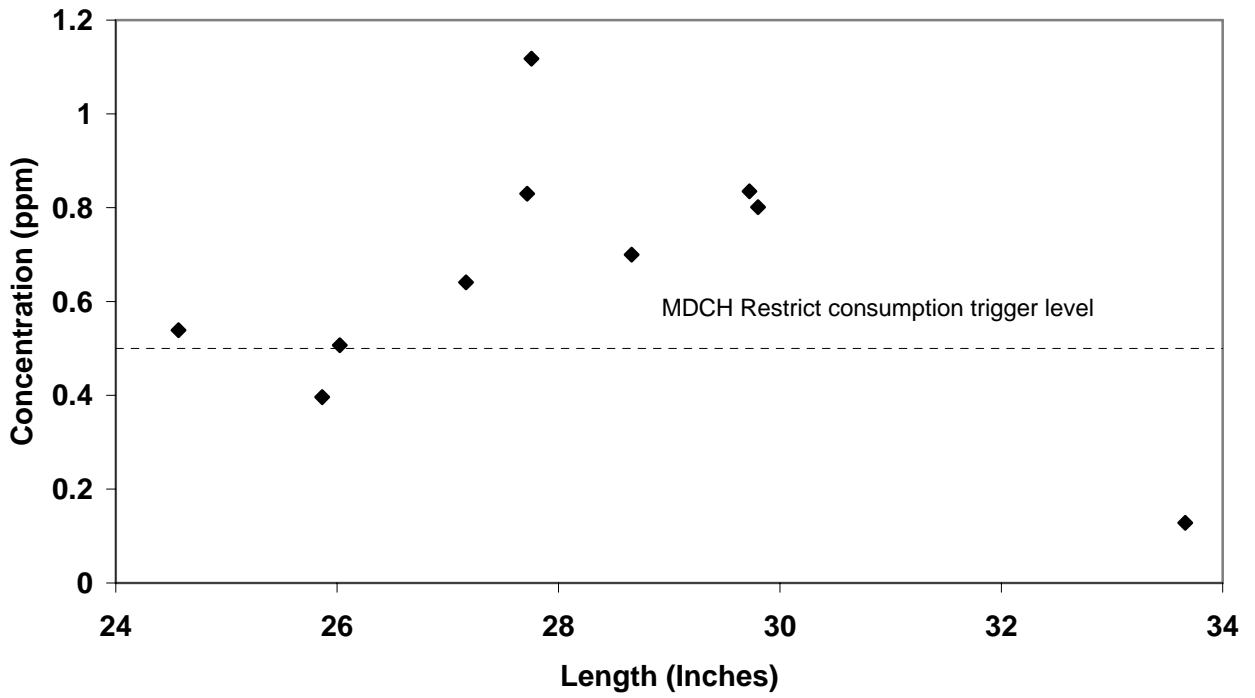


Figure 7. Total length versus total mercury concentration in northern pike collected from Middle Straits Lake, Oakland County, in 2007 (ID 2007240).

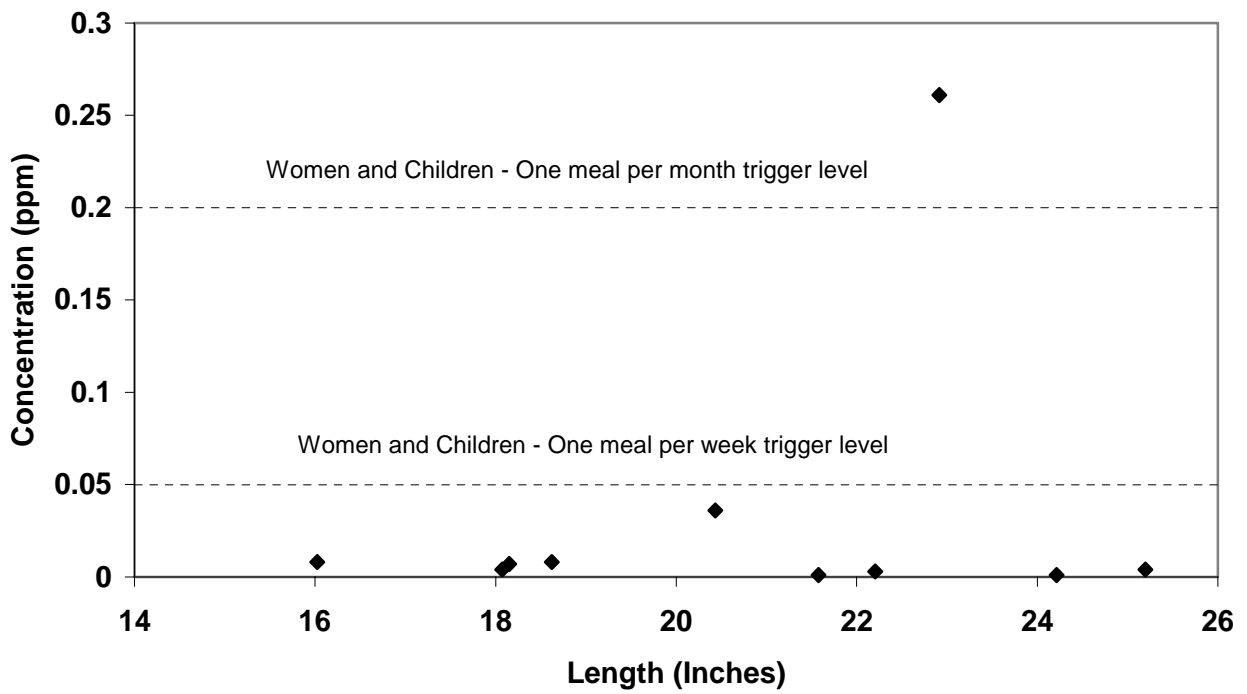


Figure 8. Total length versus total PCB concentration in walleye collected from White Lake, Oakland County, in 2007 (ID 2007259).

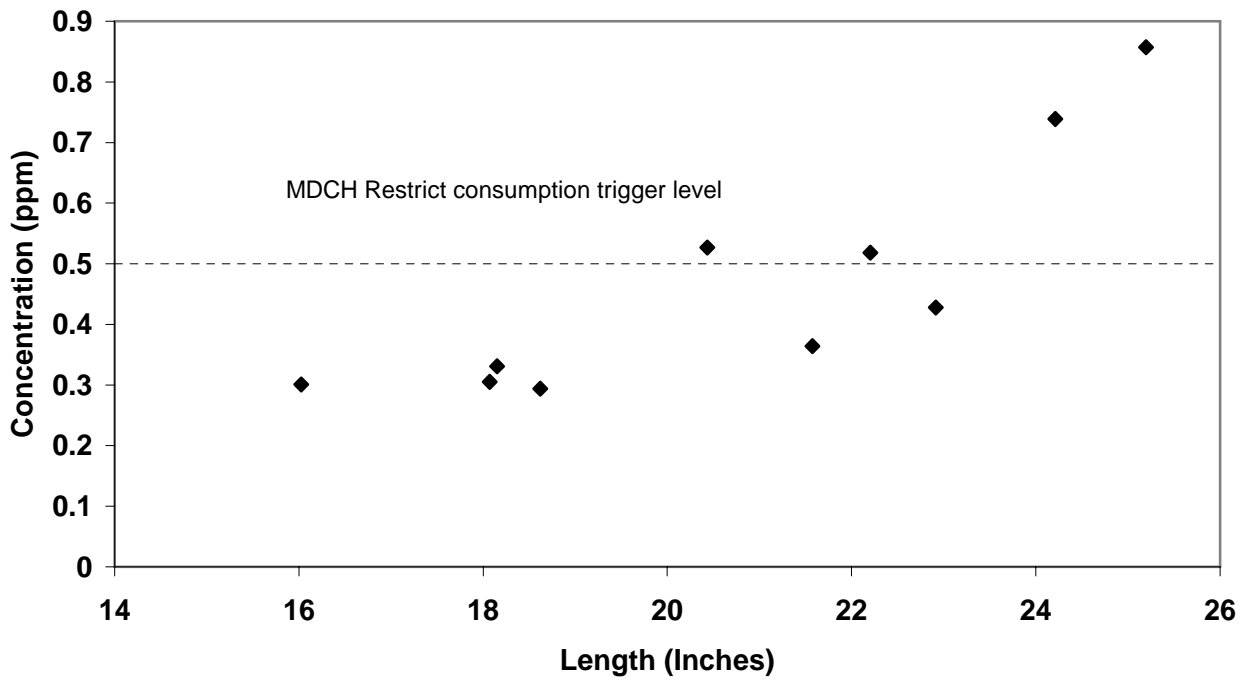


Figure 9. Total length versus total mercury concentration in walleye collected from White Lake, Oakland County, in 2007 (ID 2007259).

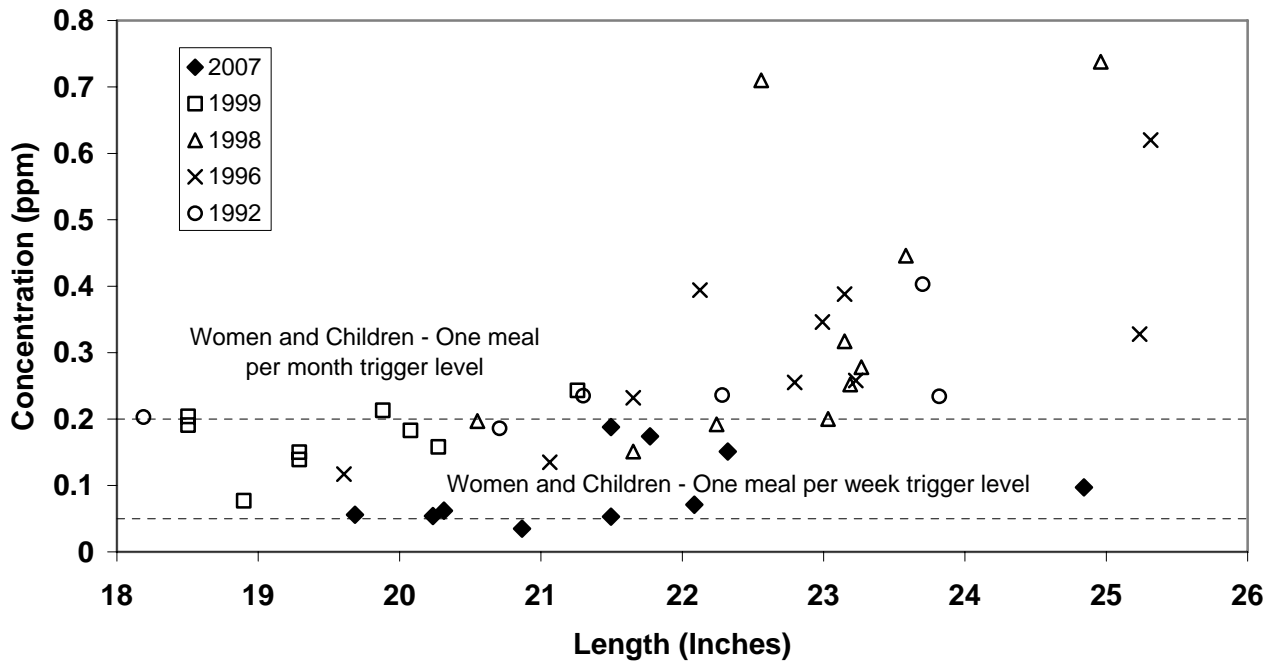


Figure 10. Total length versus total PCB concentration in lake whitefish collected from Lake Huron, Thunder Bay, in 1992 (ID 92057), 1996 (ID 96022), 1998 (ID 1998055), 1999 (ID 1999029), and 2007 (ID 2007269).

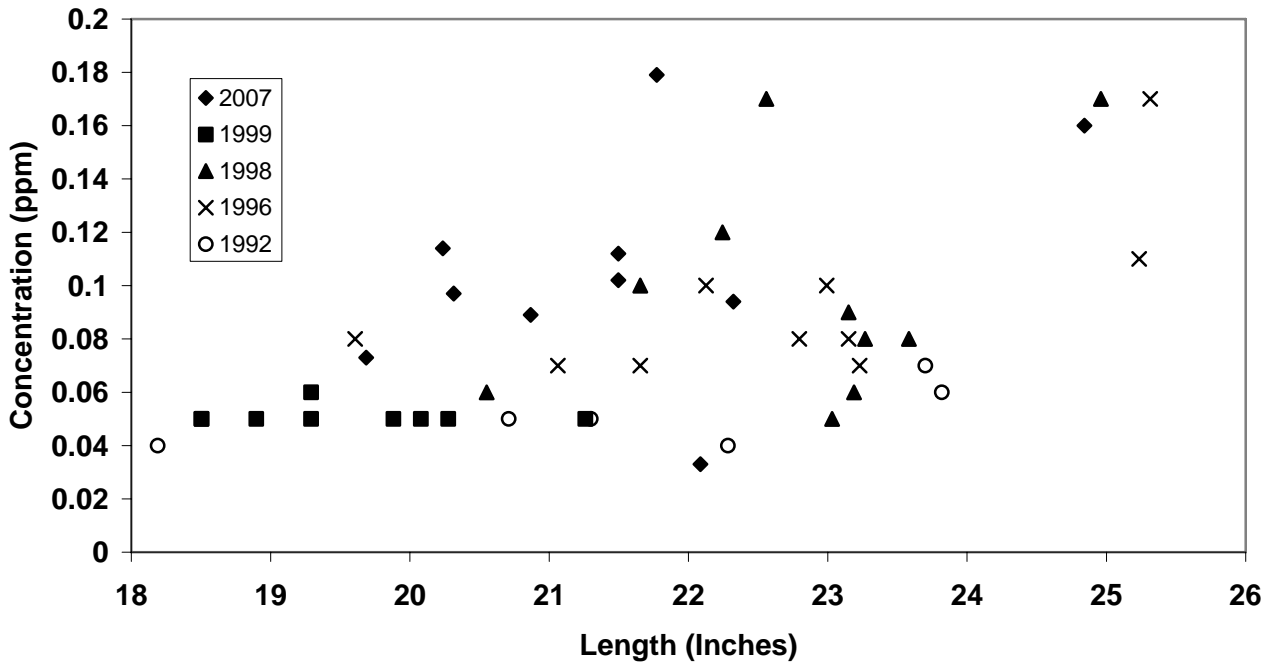


Figure 11. Total length versus total mercury concentration in lake whitefish collected from Lake Huron, Thunder Bay, in 1992 (ID 92057), 1996 (ID 96022), 1998 (ID 1998055), 1999 (ID 1999029), and 2007 (ID 2007269).

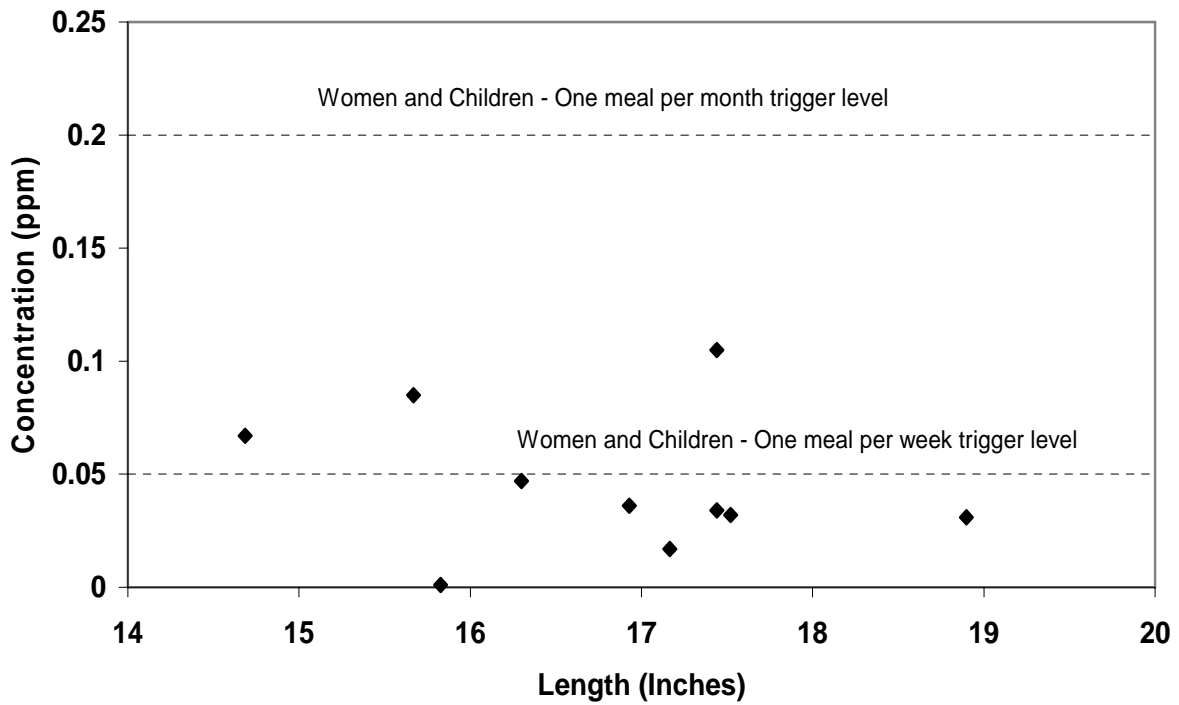


Figure 12. Total length versus total PCB concentration in freshwater drum collected from Saginaw Bay, Charity Island, in 2007 (ID 2007270).

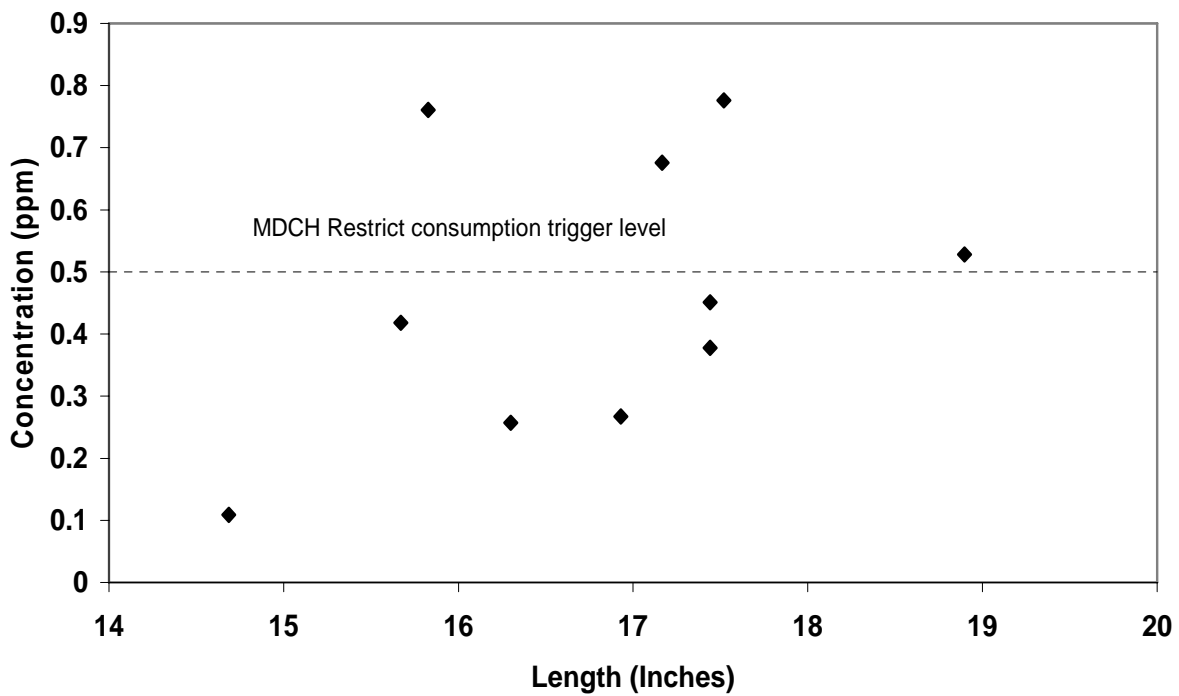


Figure 13. Total length versus total mercury concentration in freshwater drum collected from Saginaw Bay, Charity Island, in 2007 (ID 2007270).

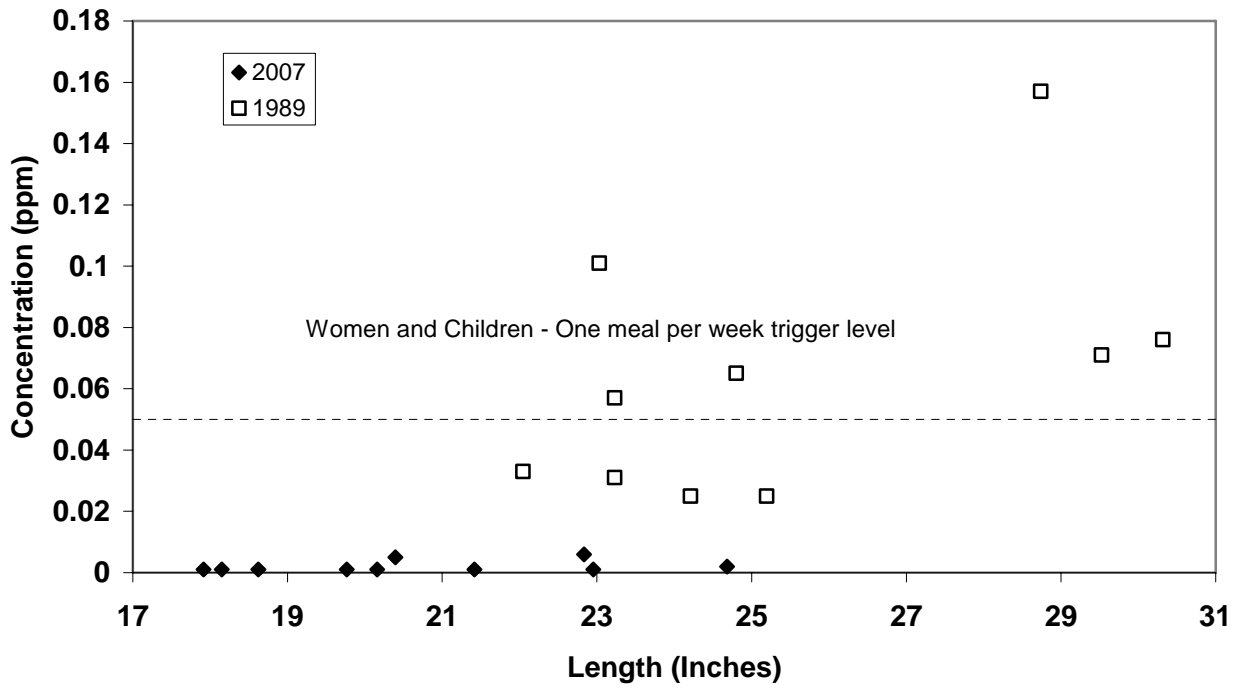


Figure 14. Total length versus total PCB concentration in carp collected from the Black River, Sanilac County, in 1989 (ID 89017) and 2007 (ID 2007263).

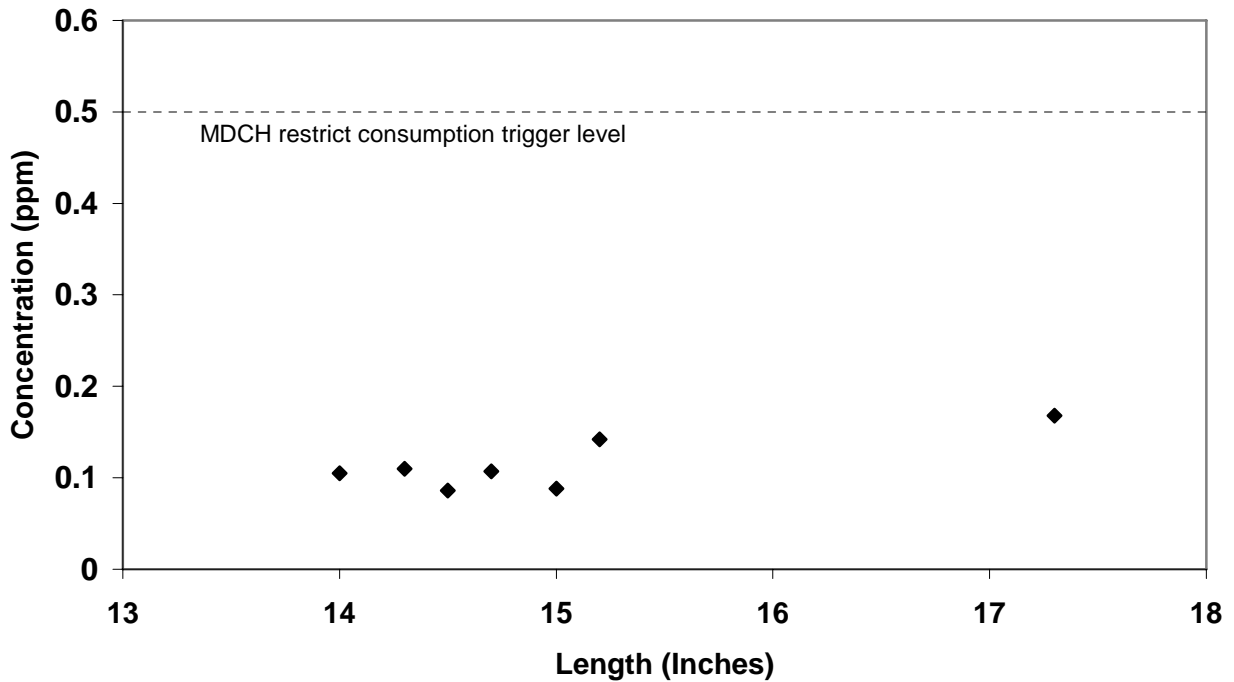


Figure 15. Total length versus total mercury concentration in largemouth bass collected from Budd Lake, Clare Co., in 2007 (ID 2007268).

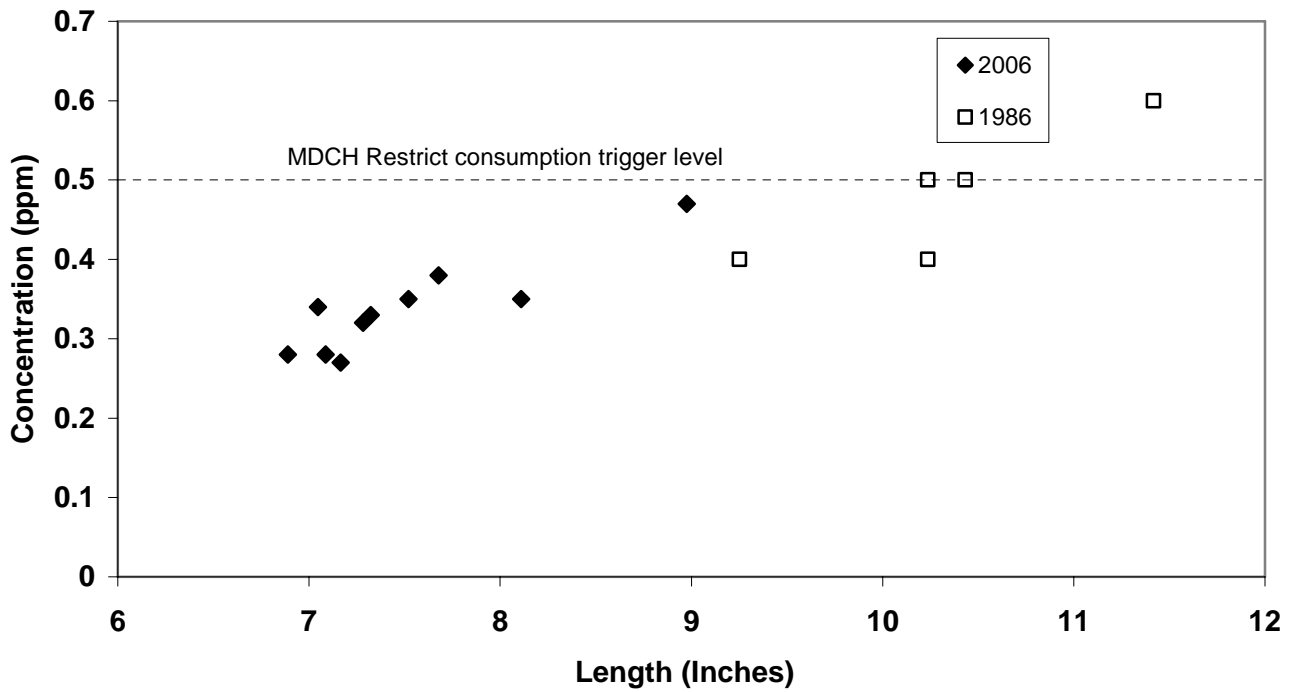


Figure 16. Total length versus total mercury concentration in rock bass collected from Caribou Lake, Chippewa County in 1986 (ID 86004) and 2006 (ID 2006006).

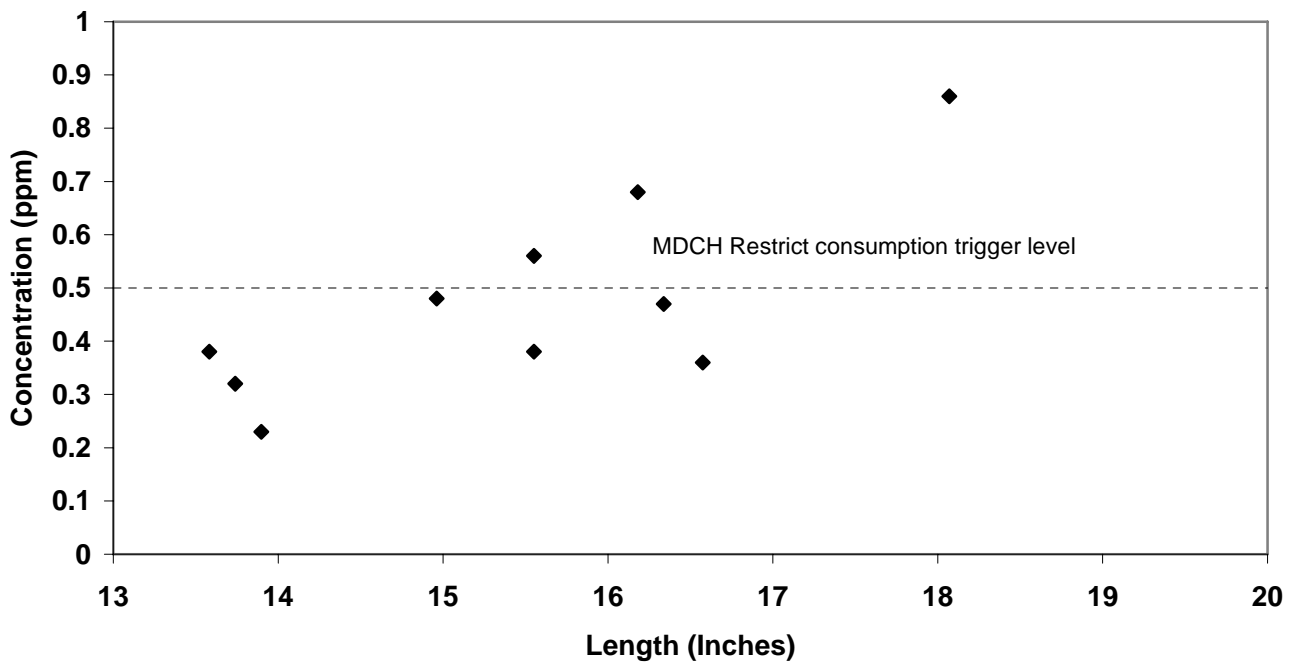


Figure 17. Total length versus total mercury concentration in smallmouth bass collected from Caribou Lake, Chippewa County, in 2006 (ID 2006006).

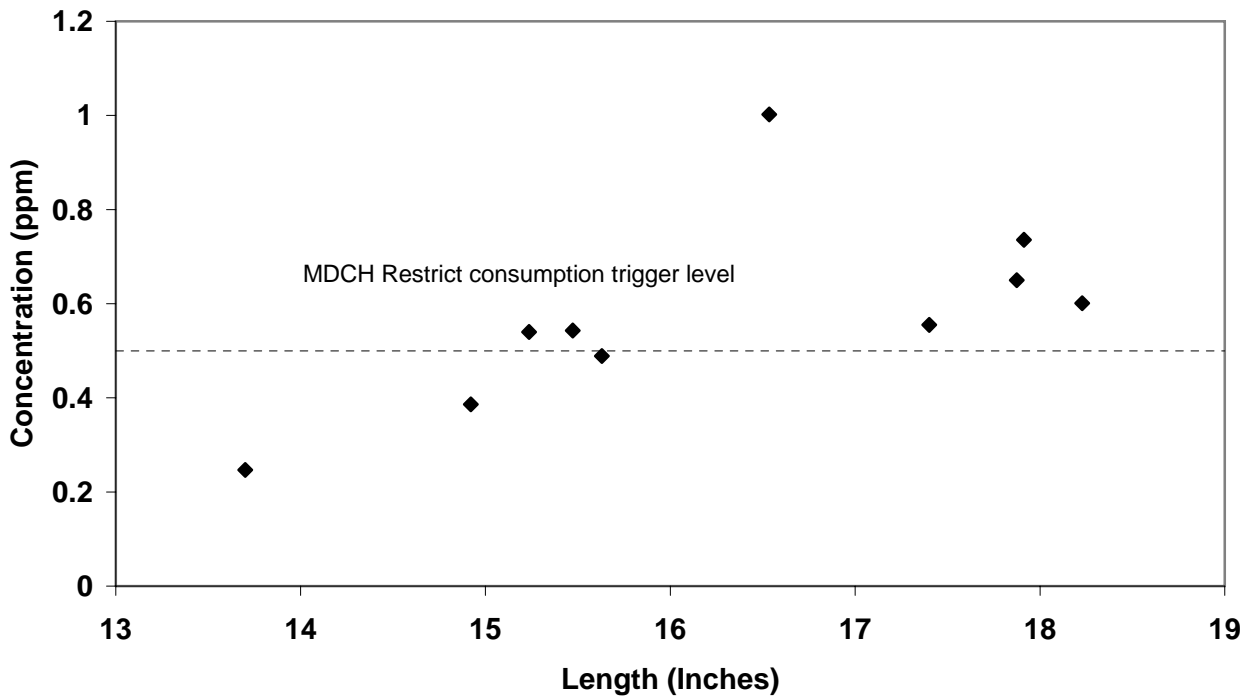


Figure 18. Total length versus total mercury concentration in largemouth bass collected from Cranberry Lake, Clare County, in 2007 (ID 2007212).

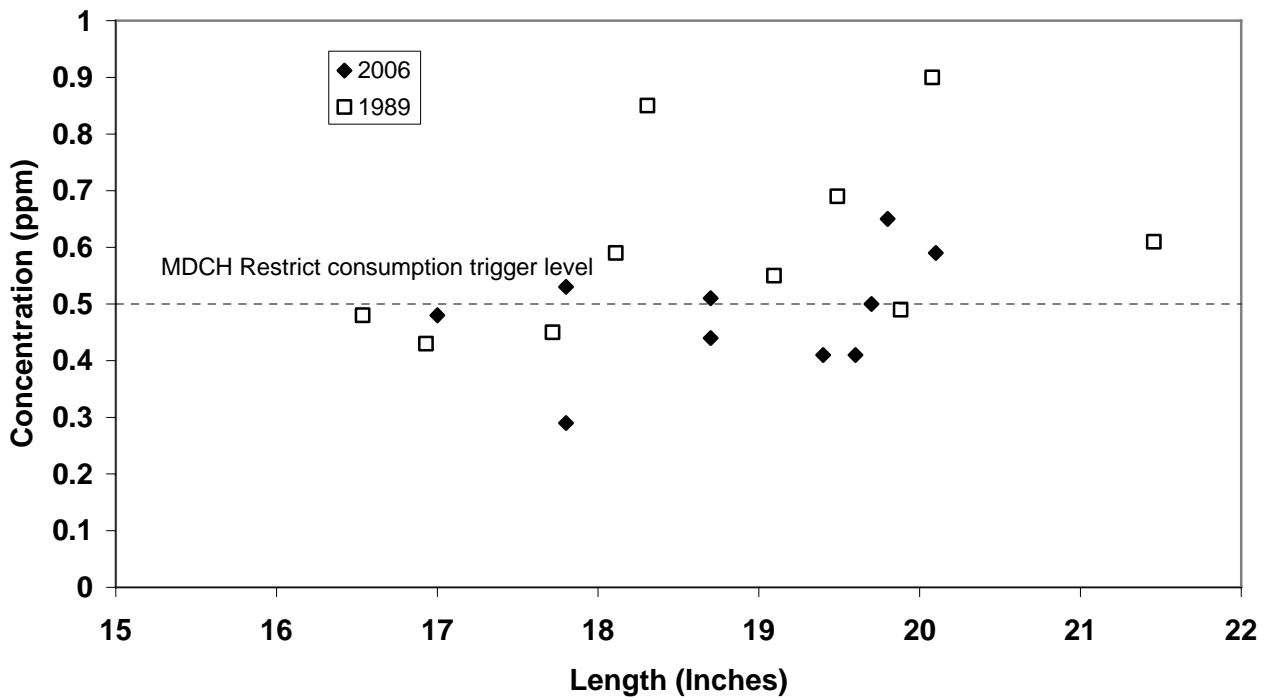


Figure 19. Total length versus total mercury concentration in walleye collected from Hubbard Lake, Alcona County, in 1989 (ID 89076) and 2006 (ID 2006017).

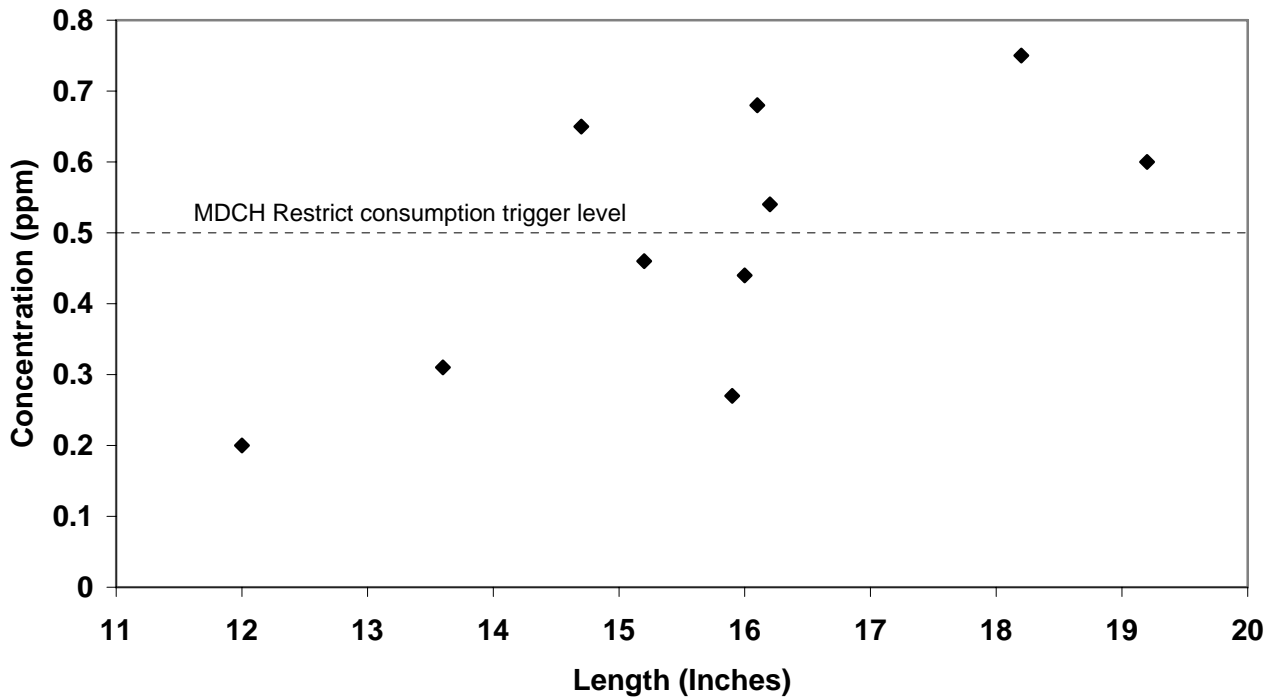


Figure 20. Total length versus total mercury concentration in smallmouth bass collected from Long Lake, Montmorency County, in 2006 (ID 2006046).

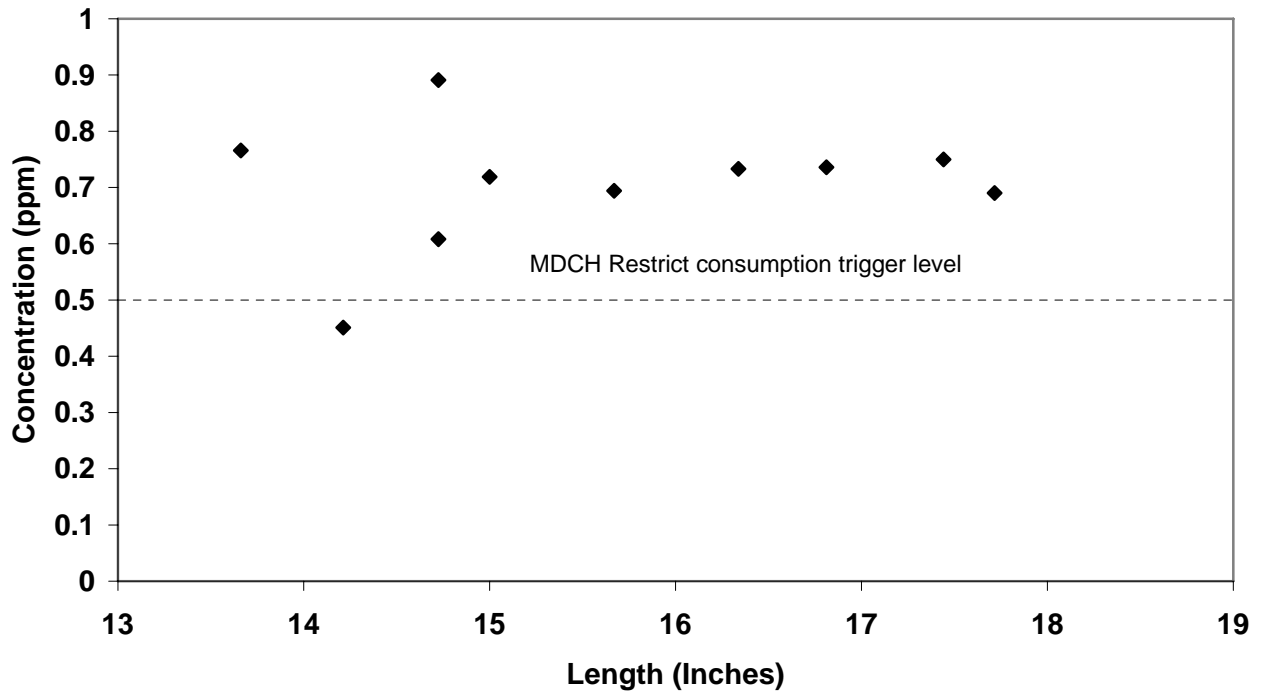


Figure 21. Total length versus total mercury concentration in largemouth bass collected from Lost Lake, Presque Isle County, in 2007 (ID 2007237).

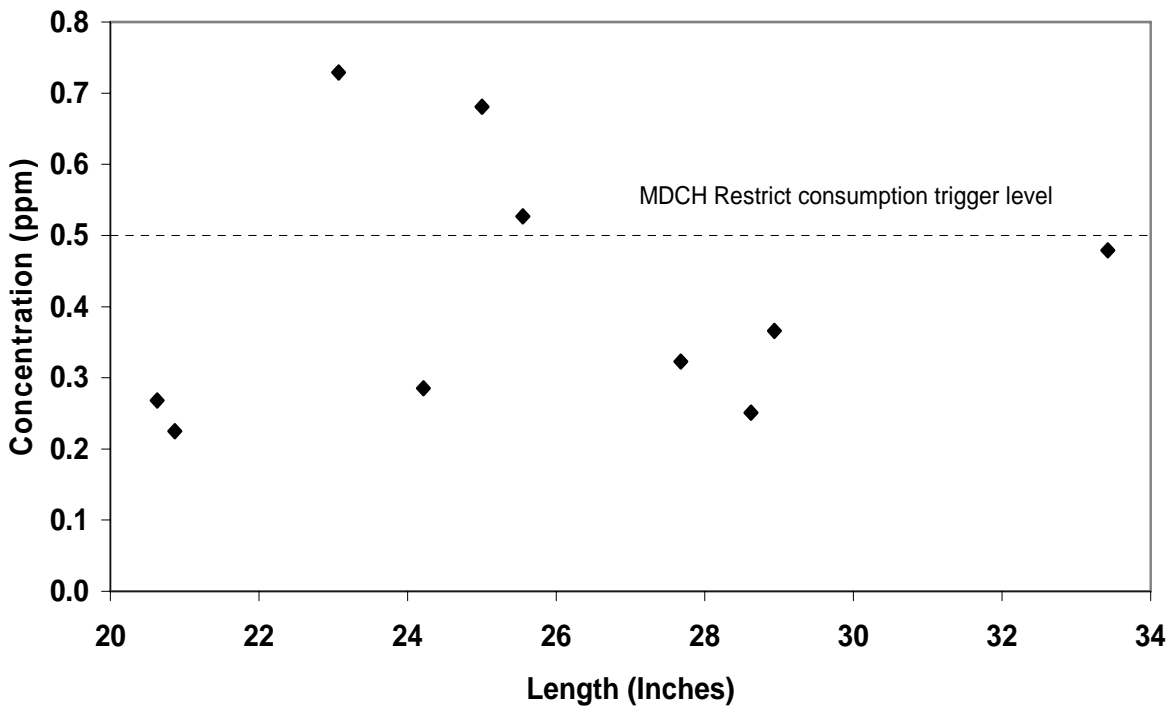


Figure 22. Total length versus total mercury concentration in northern pike collected from Murphy Lake, Tuscola County, in 2007 (ID 2007243).

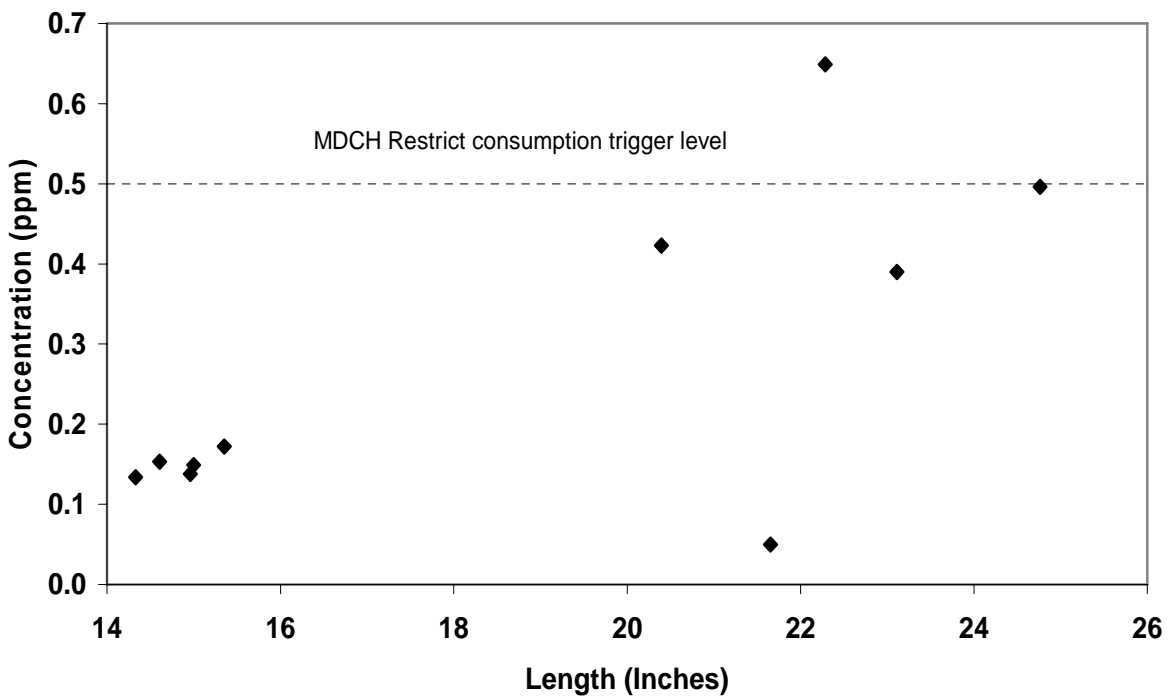


Figure 23. Total length versus total mercury concentration in walleye collected from Otsego Lake, Otsego County, in 2007 (ID 2007244).

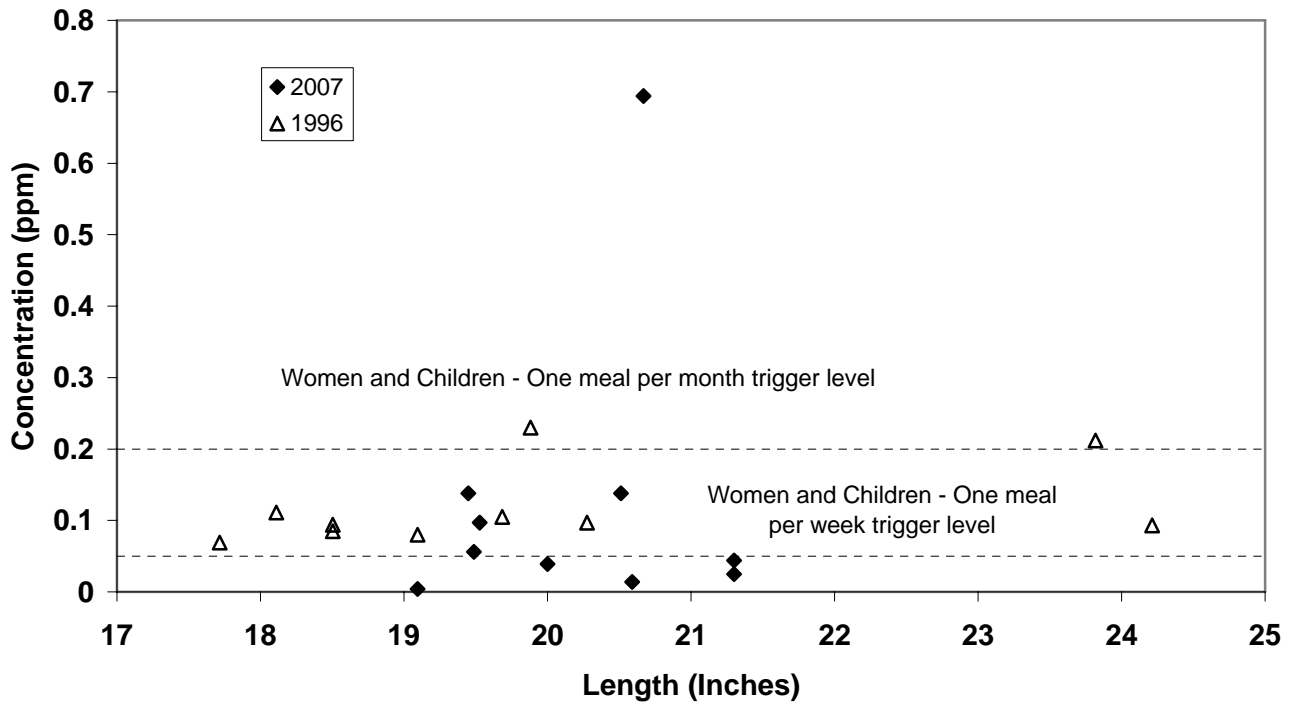


Figure 24. Total length versus total PCB concentration in carp collected from the Tobico Marsh, Bay County, in 1996 (ID 96054) and 2007 (ID 2007256).

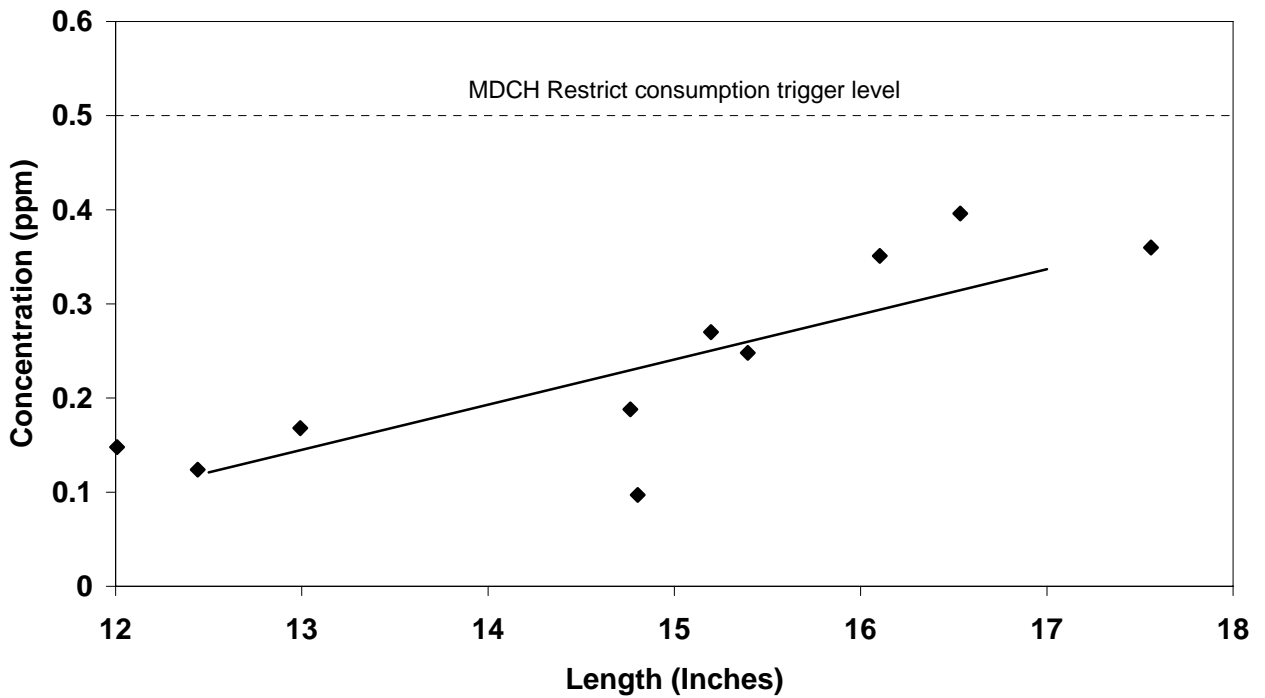


Figure 25. Total length versus total mercury concentration in largemouth bass collected from the Tobico Marsh, Bay County, in 2007 (ID 2007256).

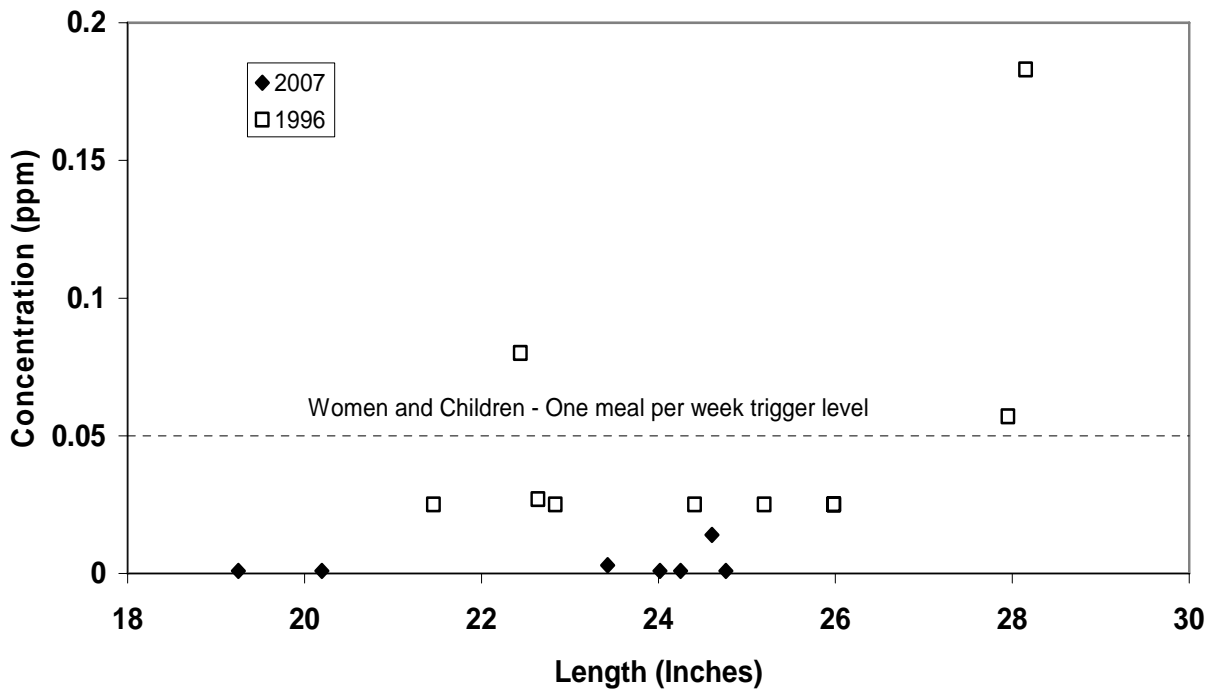


Figure 26. Total length versus total PCB concentration in northern pike collected from the Tobico Marsh, Bay County, in 1996 (ID 96054) and 2007 (ID 2007256).

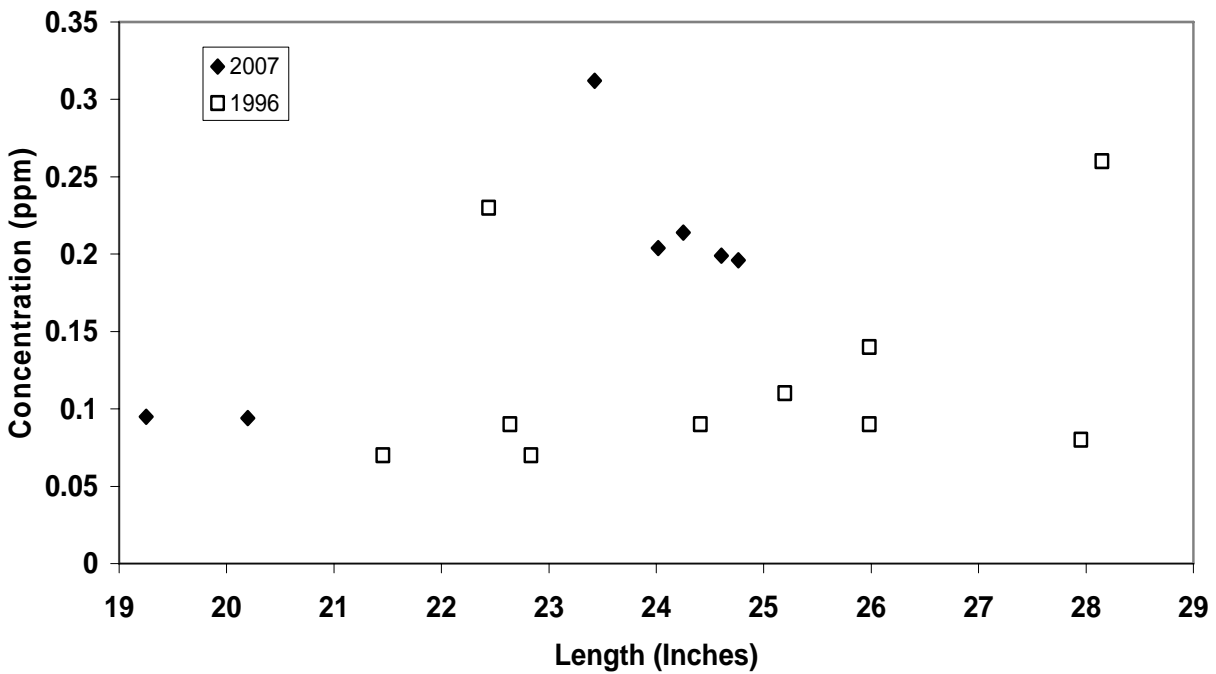


Figure 27. Total length versus total mercury concentration in northern pike collected from the Tobico Marsh, Bay County, in 1996 (ID 96054) and 2007 (ID 2007256).

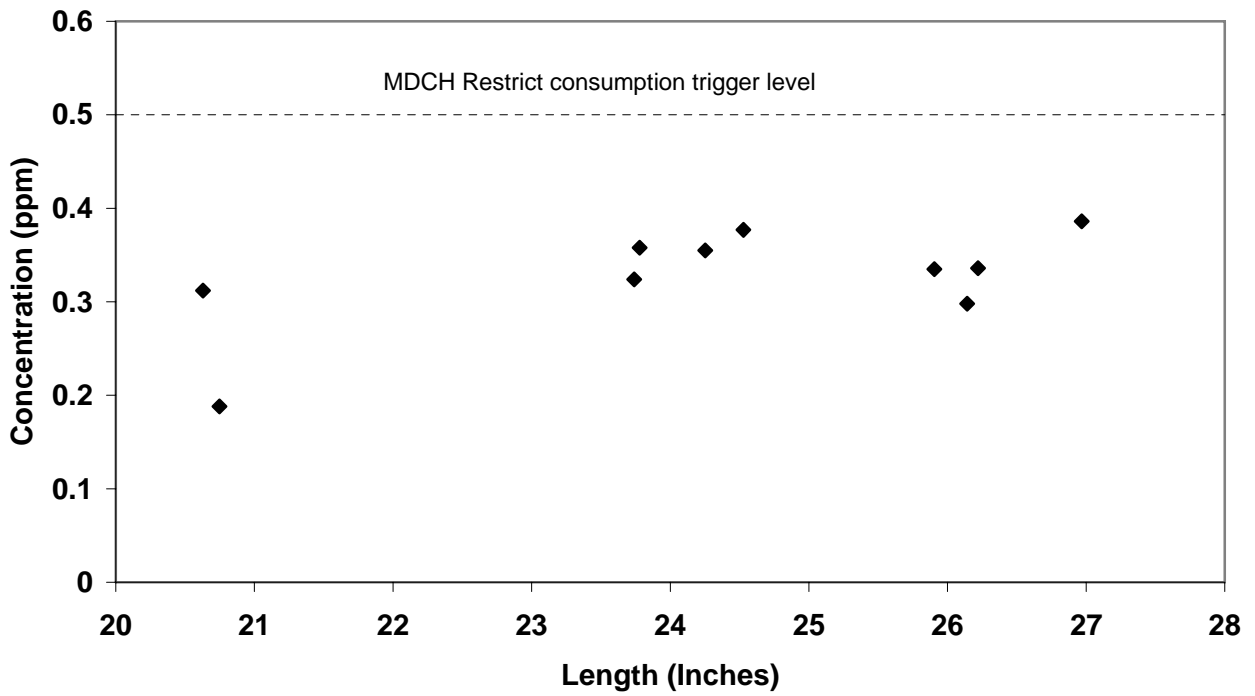


Figure 28. Total length versus total mercury concentration in northern pike collected from Bass Lake (East), Marquette County, in 2007 (ID 2007202).

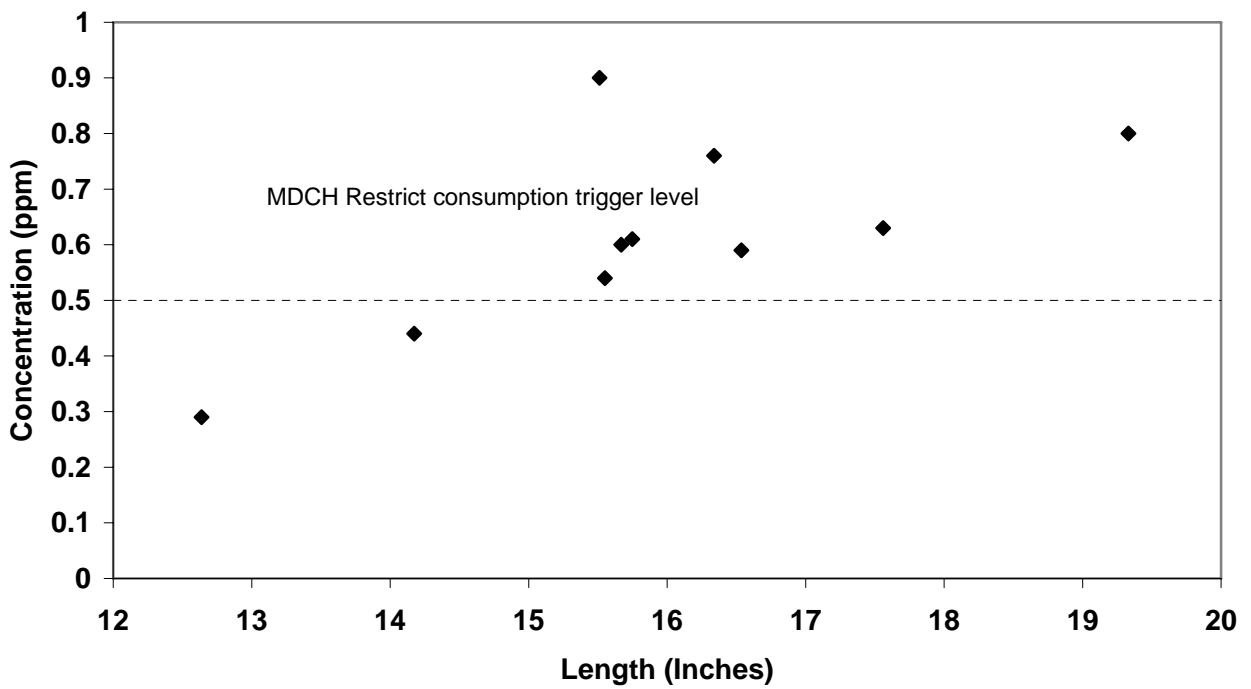


Figure 29. Total length versus total mercury concentration in largemouth bass collected from Crockery Lake, Ottawa County, in 2006 (ID 2006009).

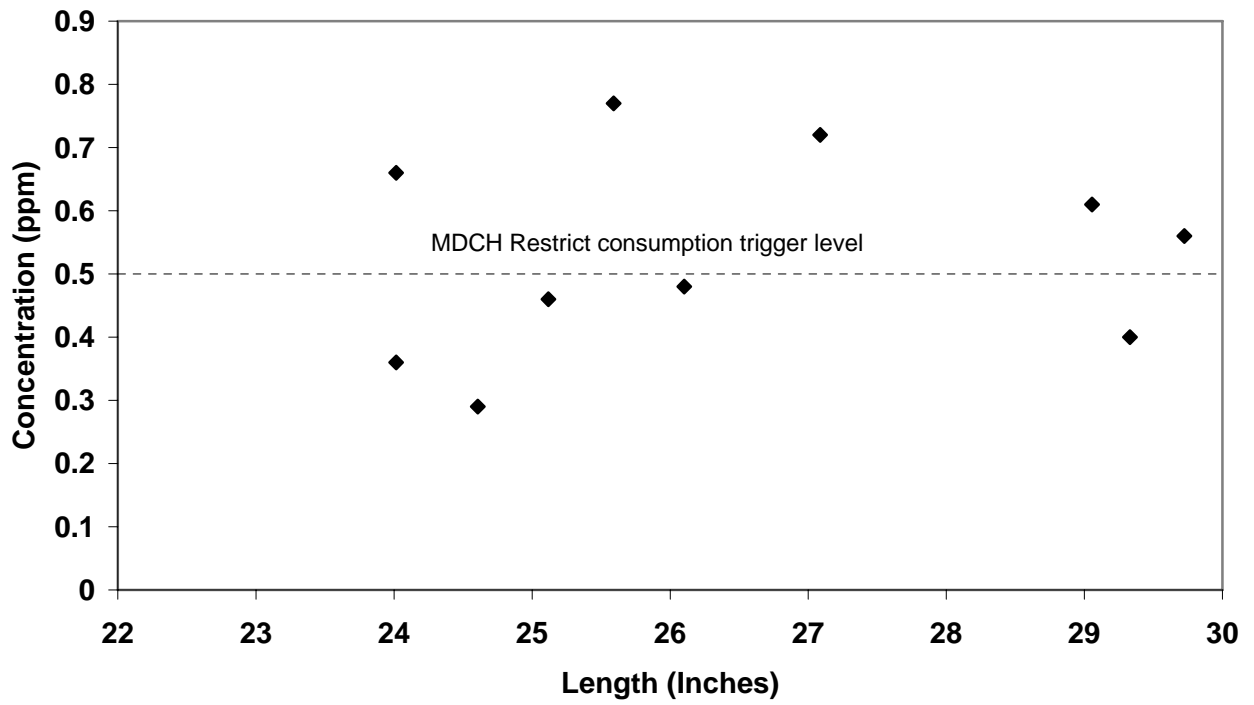


Figure 30. Total length versus total mercury concentration in northern pike collected from Dodge Lake, Schoolcraft County, in 2006 (ID 2006121).

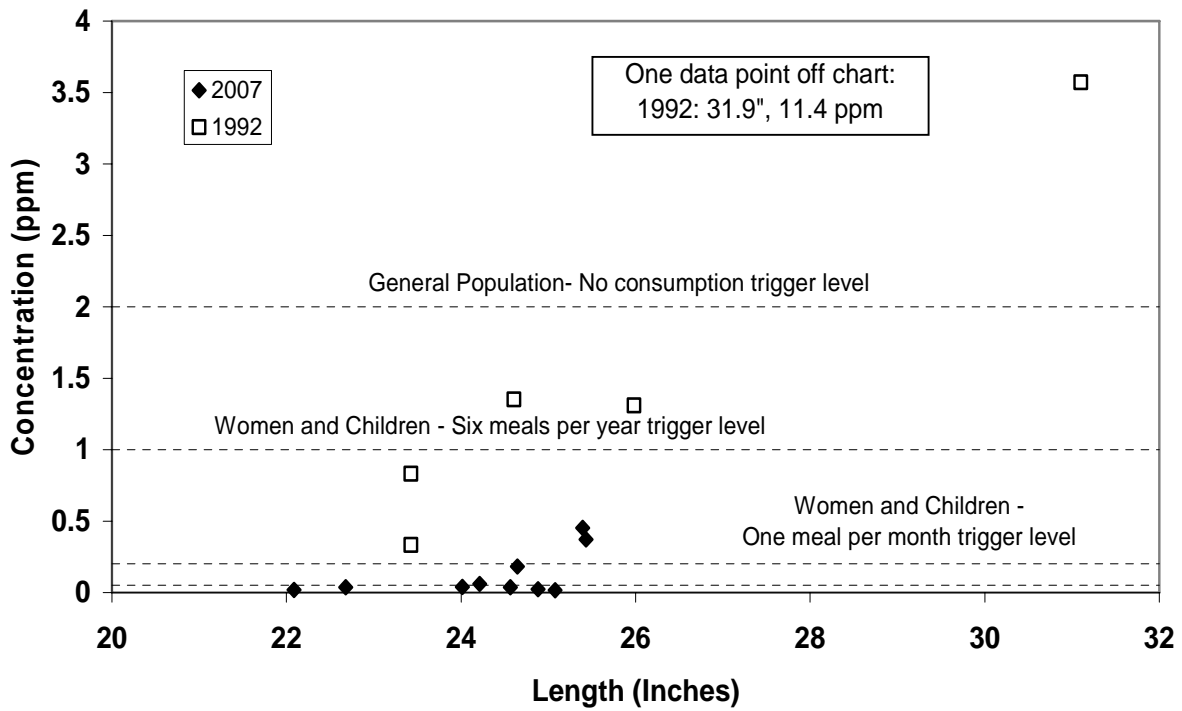


Figure 31. Total length versus total PCB concentration in carp collected from Galien River, Berrien County, in 1992 (ID 92017) and 2007 (ID 2007215).

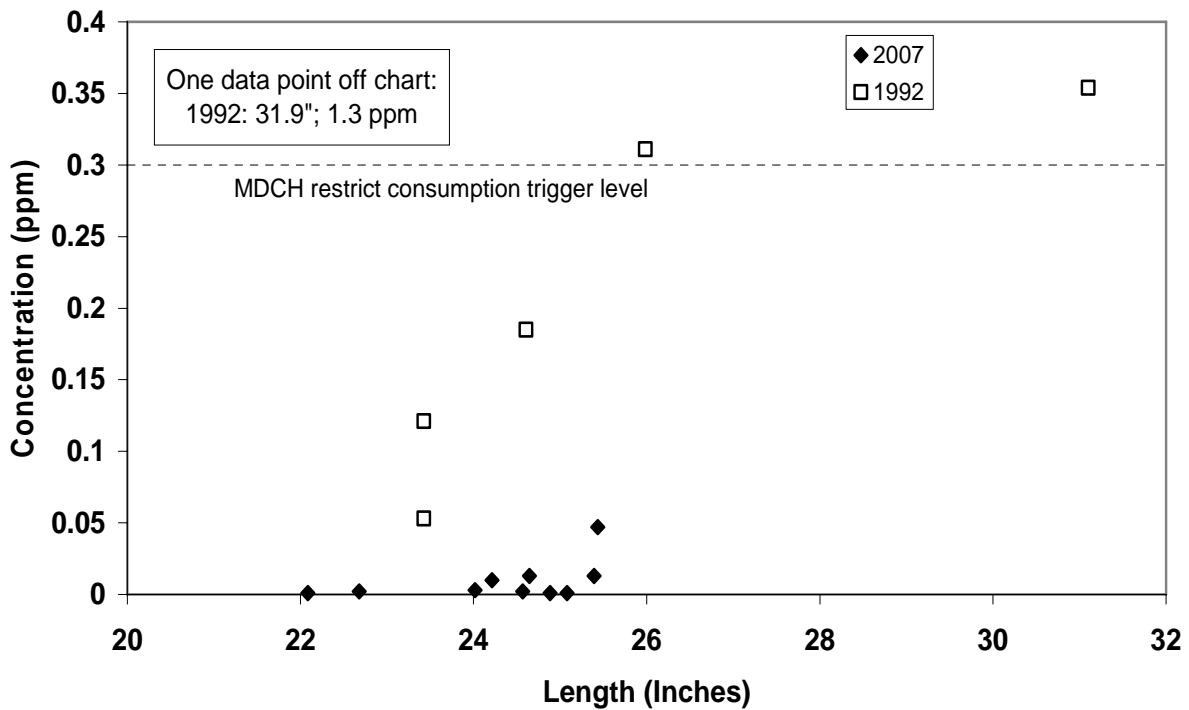


Figure 32. Total length versus total chlordane concentration in carp collected from Galien River, Berrien County, in 1992 (ID 92017) and 2007 (ID 2007215).

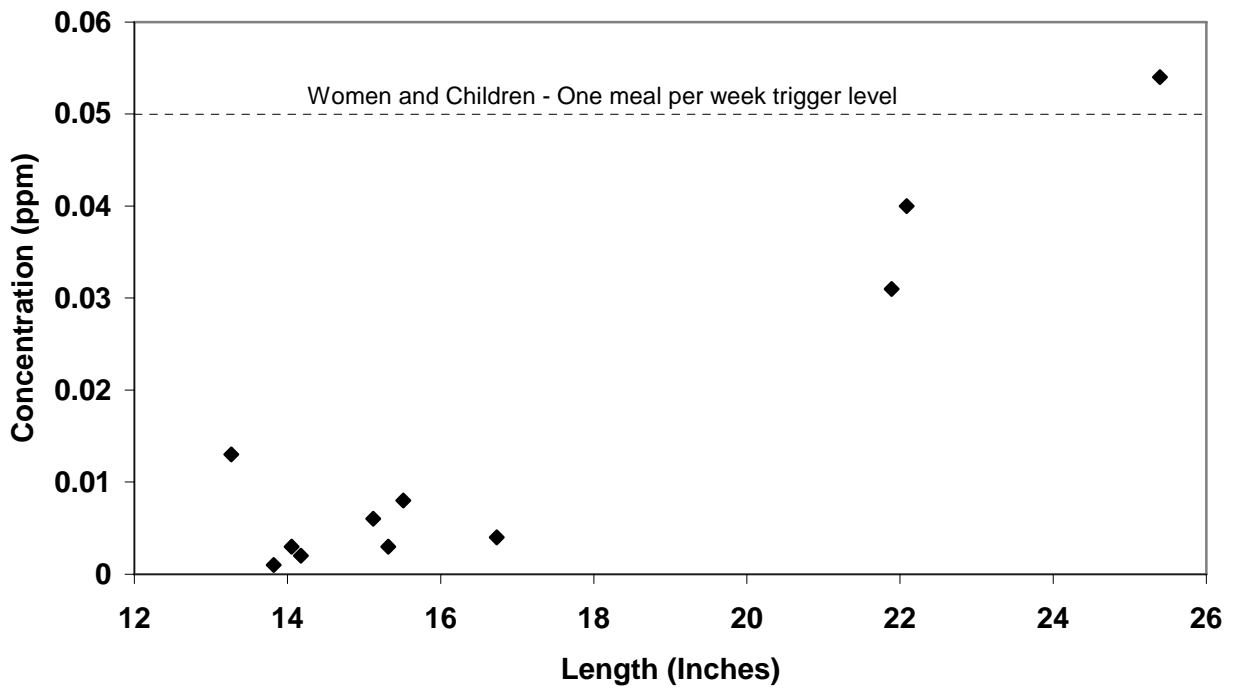


Figure 33. Total length versus total PCB concentration in rainbow trout collected from Glen Lake, Leelanau County, in 2007 (ID 2007216).

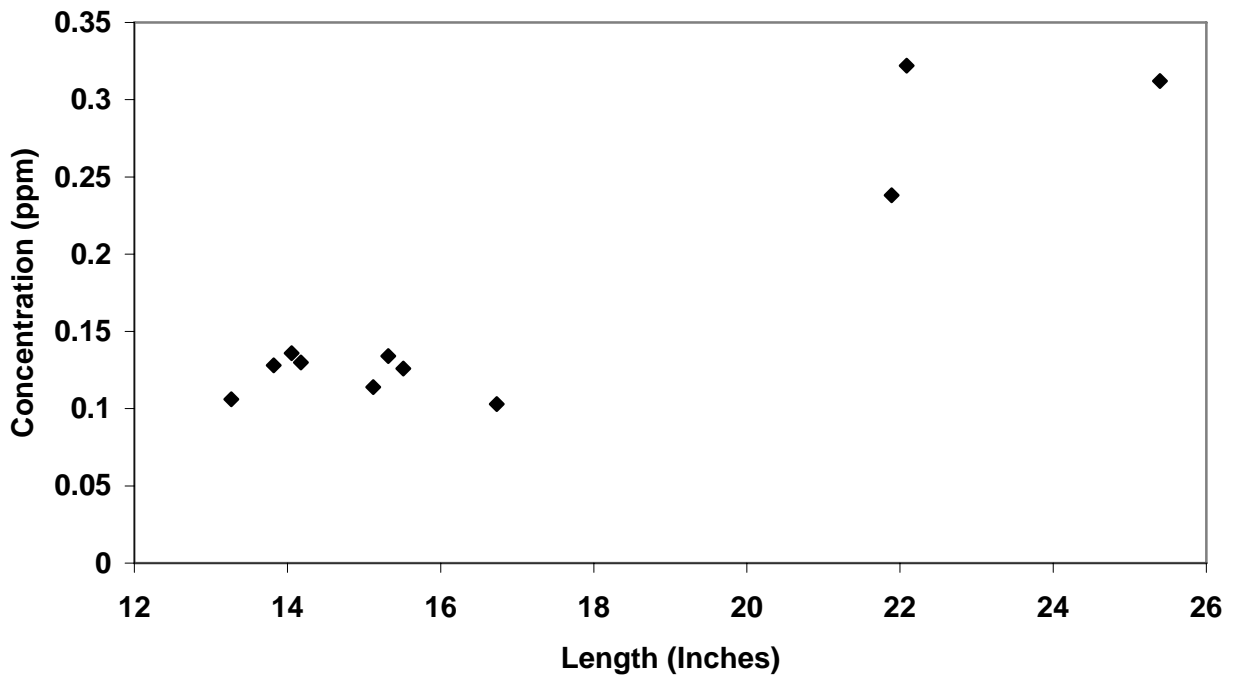


Figure 34. Total length versus total mercury concentration in rainbow trout collected from Glen Lake, Leelanau County, in 2007 (ID 2007216).

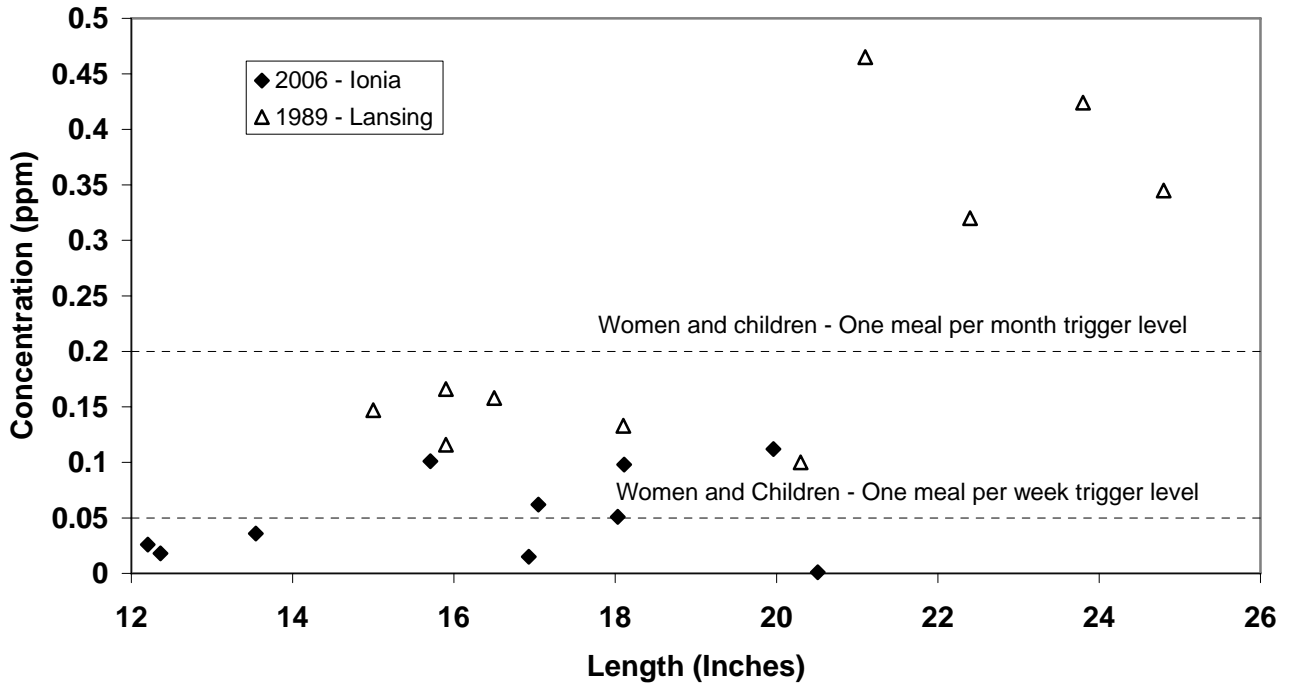


Figure 35. Total length versus total PCB concentration in channel catfish collected from the Grand River at Lansing in 1989 (ID 89054) and Ionia in 2006 (ID 2006103).

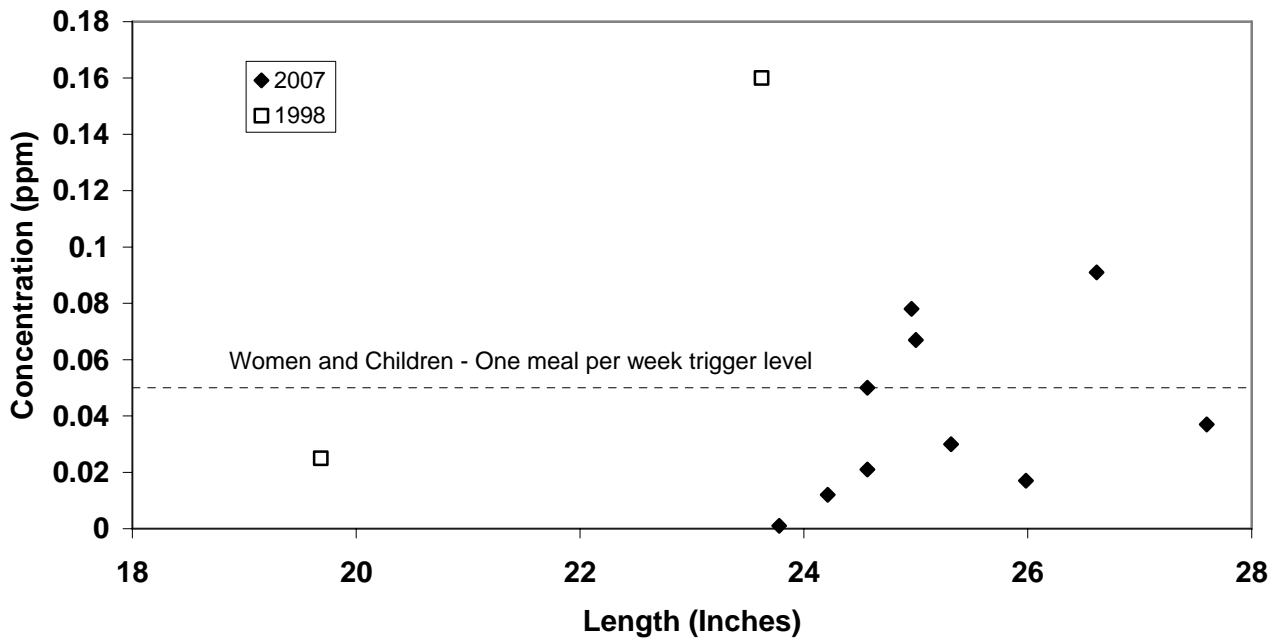


Figure 36. Total length versus total PCB concentration in northern pike collected from the Grand River, below the 6th street dam, in 1998 (ID 1998148) and 2007 (ID 2007300).

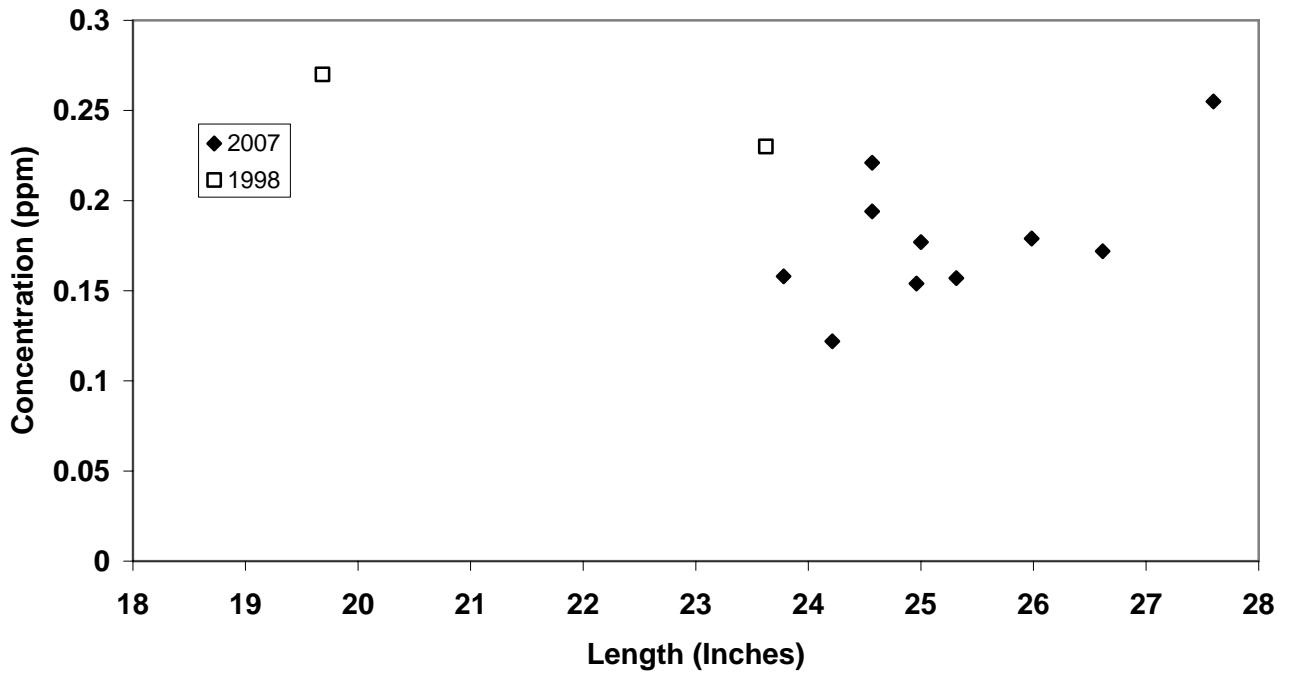


Figure 37. Total length versus total mercury concentration in northern pike collected from the Grand River, below the 6th street dam, in 1998 (ID 1998148) and 2007 (ID 2007300).



Figure 38. Total length versus total PCB concentration in white sucker and redhorse sucker collected from the Grand River at Ionia in 2006 (ID 2006103).

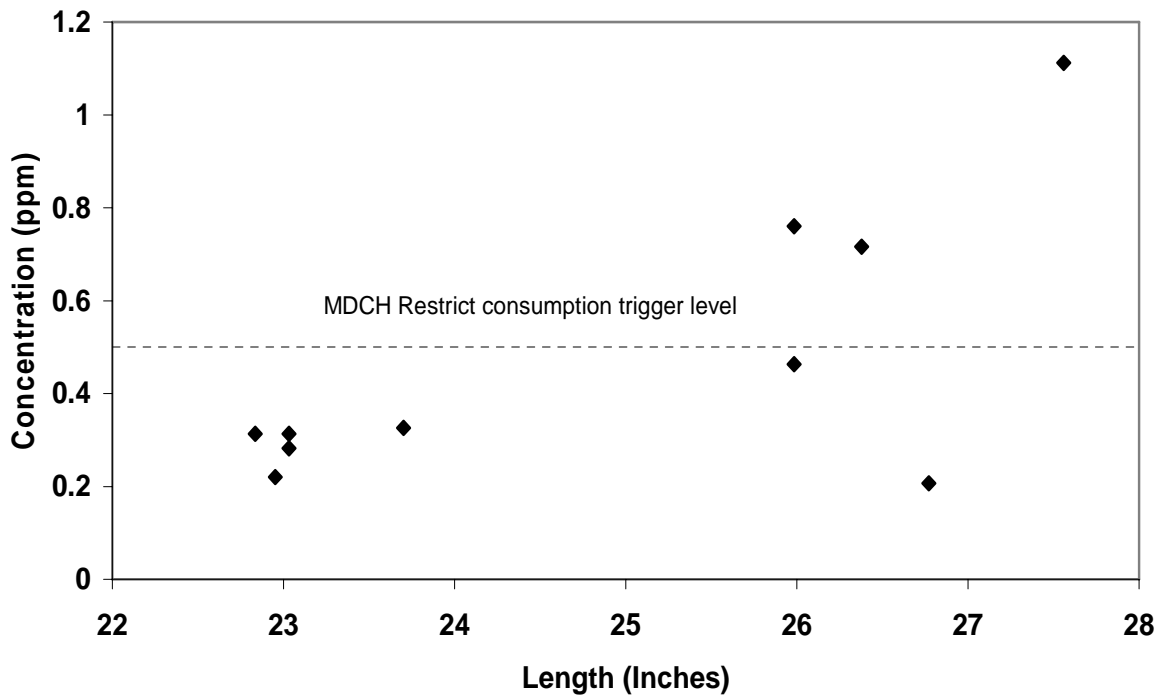


Figure 39. Total length versus total mercury concentration in northern pike collected from Klinger Lake, St. Joseph County, in 2006 (ID 2006126).

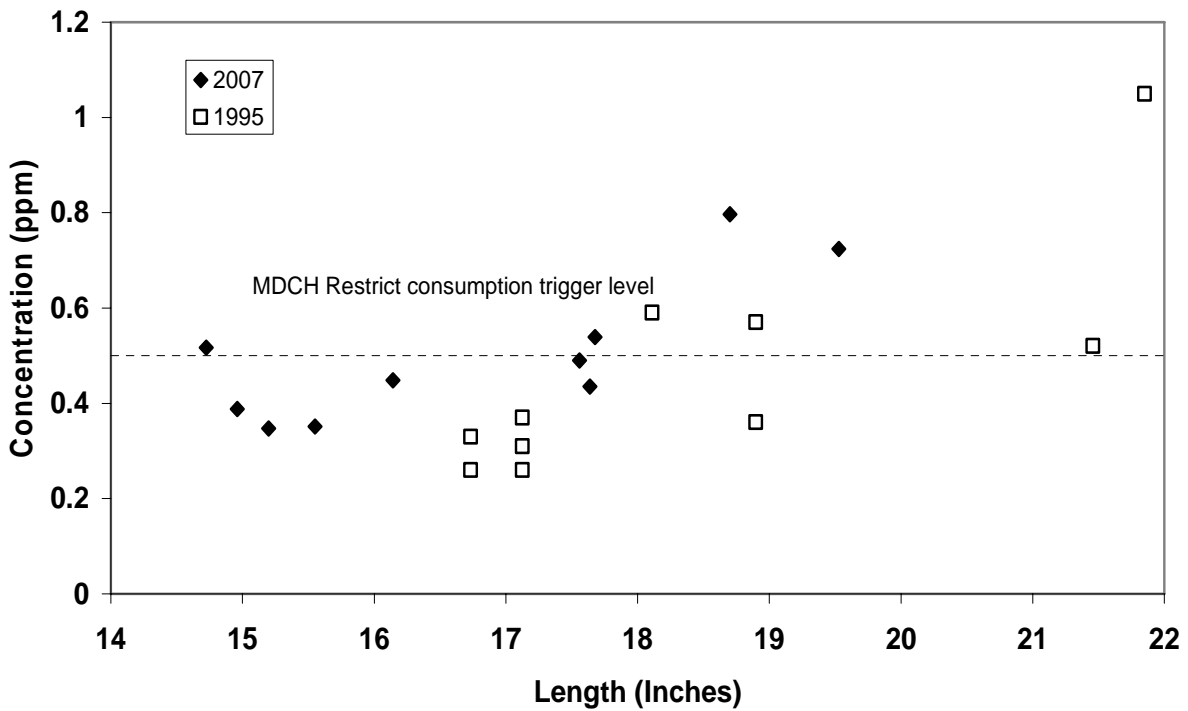


Figure 40. Total length versus total mercury concentration in walleye collected from Lake Margrethe, Crawford County, in 1995 (ID 95002) and 2007 (ID 2007227).

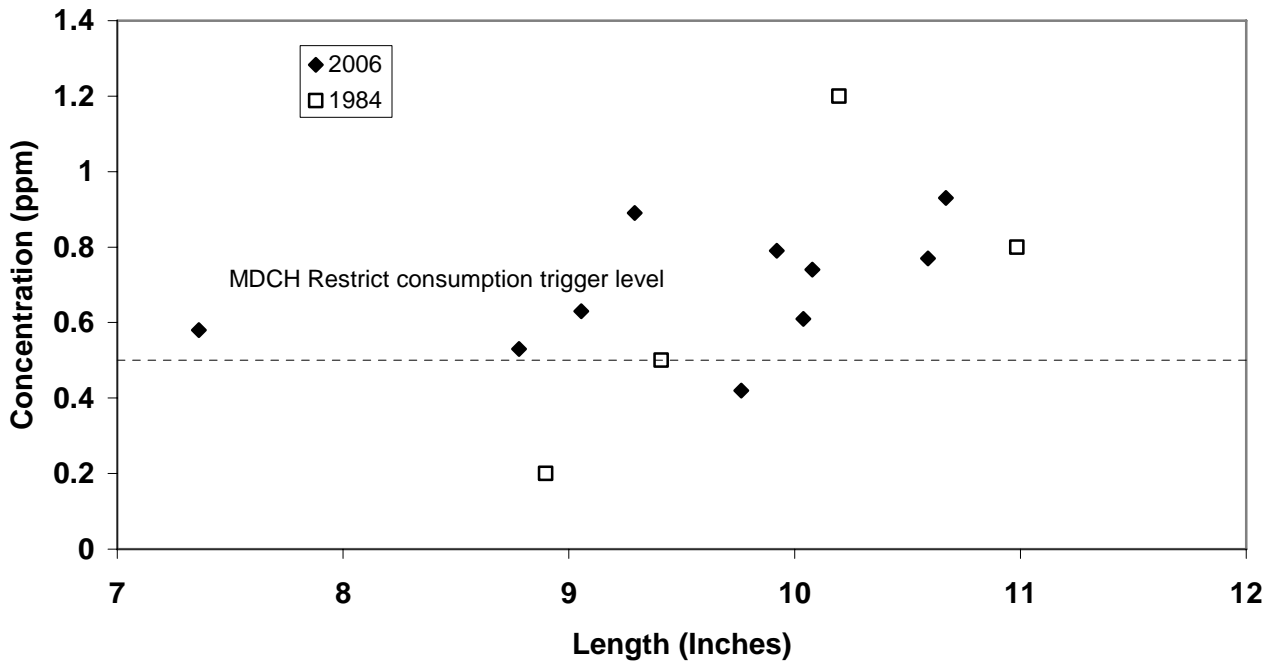


Figure 41. Total length versus total mercury concentration in rock bass collected from Lake Michigamme, Marquette County, in 1984 (ID 84019) and 2006 (ID 2006035).

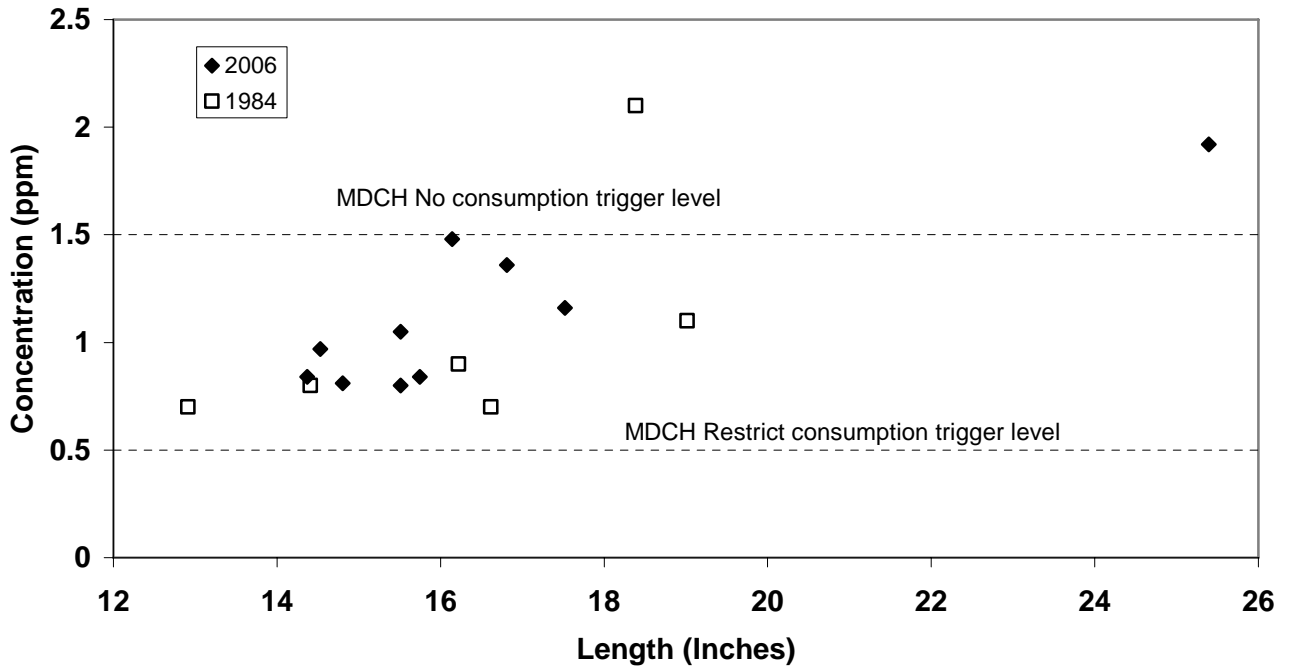


Figure 42. Total length versus total mercury concentration in walleye collected from Lake Michigamme, Marquette County, in 1984 (ID 84019) and 2006 (ID 2006035).

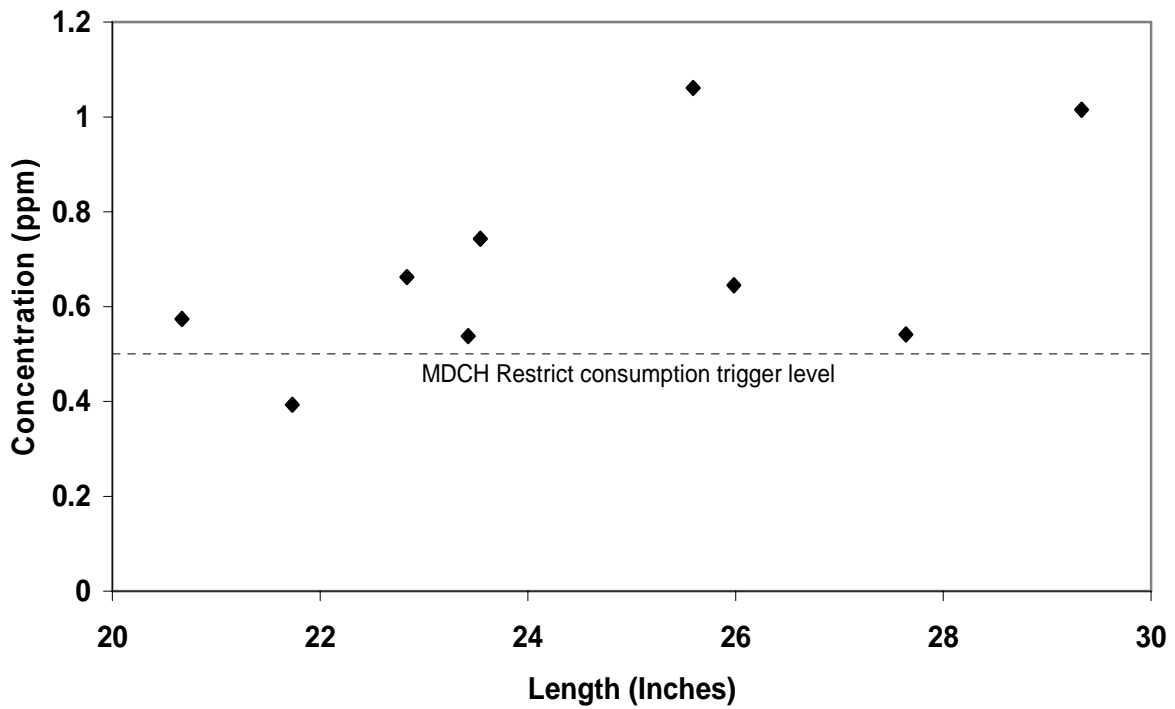


Figure 43. Total length versus total mercury concentration in walleye collected from Long Lake, Iron County, in 2007 (ID 2007235).

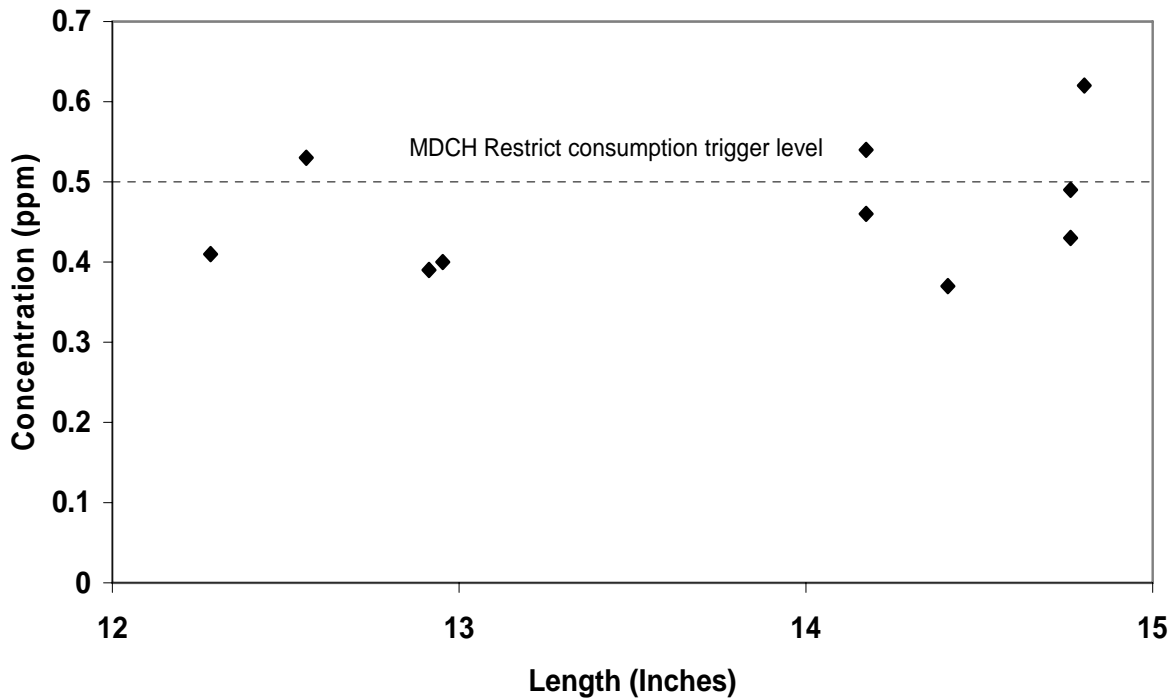


Figure 44. Total length versus total mercury concentration in largemouth bass collected from Long Lake, Kent County, in 2006 (ID 2006044).

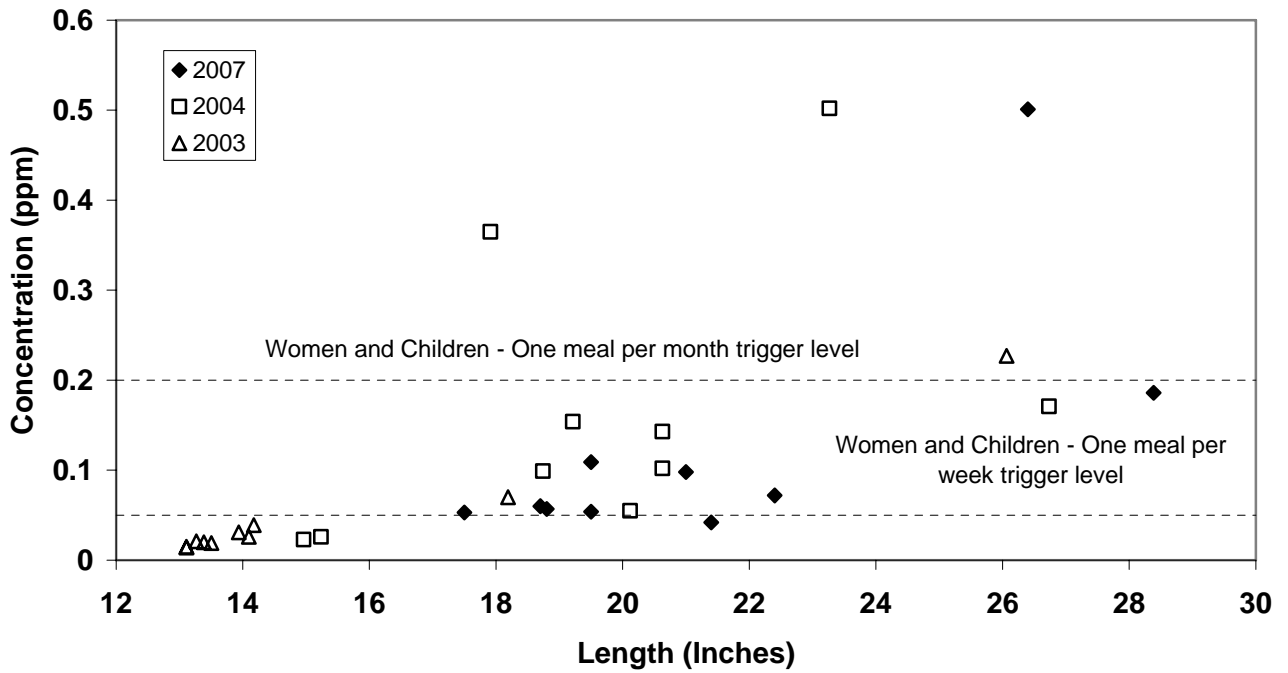


Figure 45. Total length versus total PCB concentration in walleye collected from the Manistique River, downstream of Manistique Papers Dam, in 2003 (ID 2003077), 2004 (ID 2004072), and 2007 (ID 2007238).

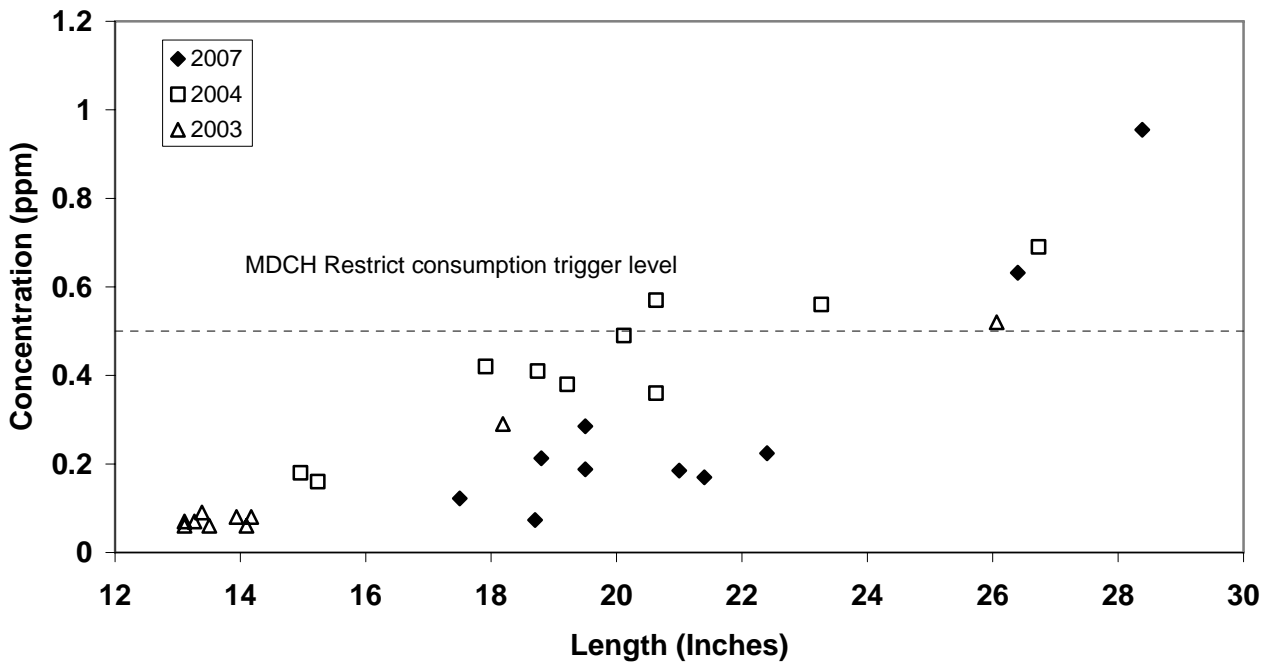


Figure 46. Total length versus total mercury concentration in walleye collected from the Manistique River, downstream of Manistique Papers Dam, in 2003 (ID 2003077), 2004 (ID 2004072), and 2007 (ID 2007238).

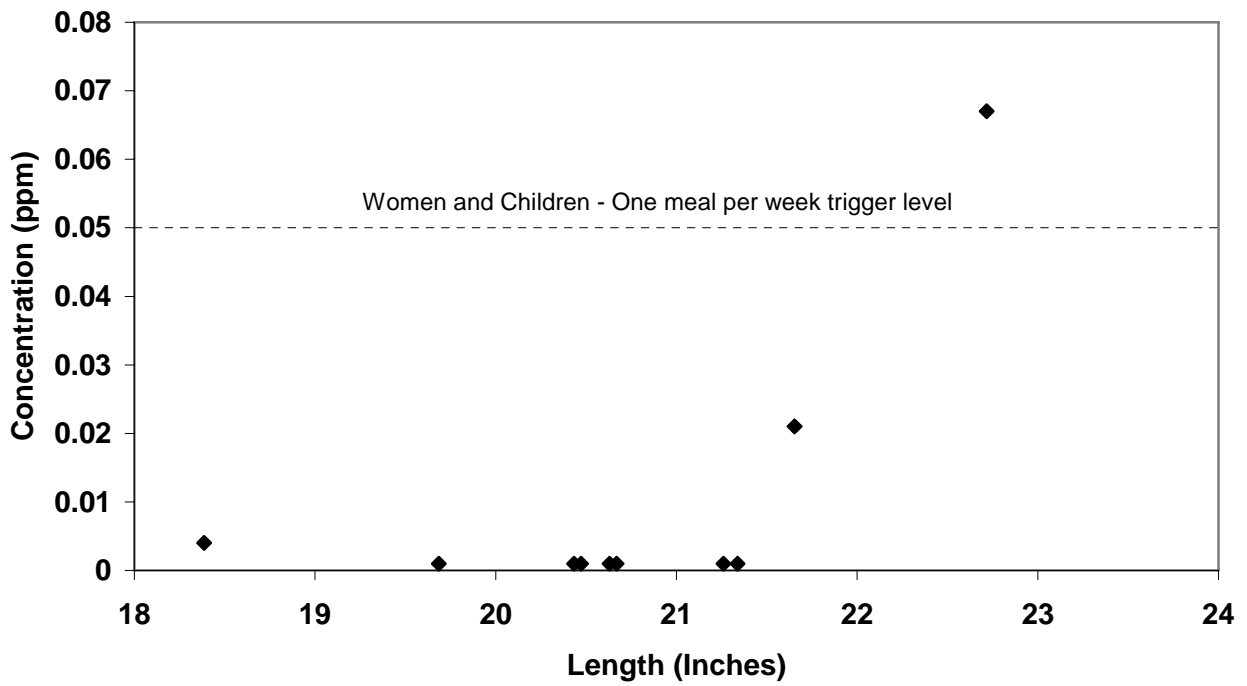


Figure 47. Total length versus total PCB concentration in carp collected from the Maple River, upstream of Matherton in 2006 (ID 2006150).

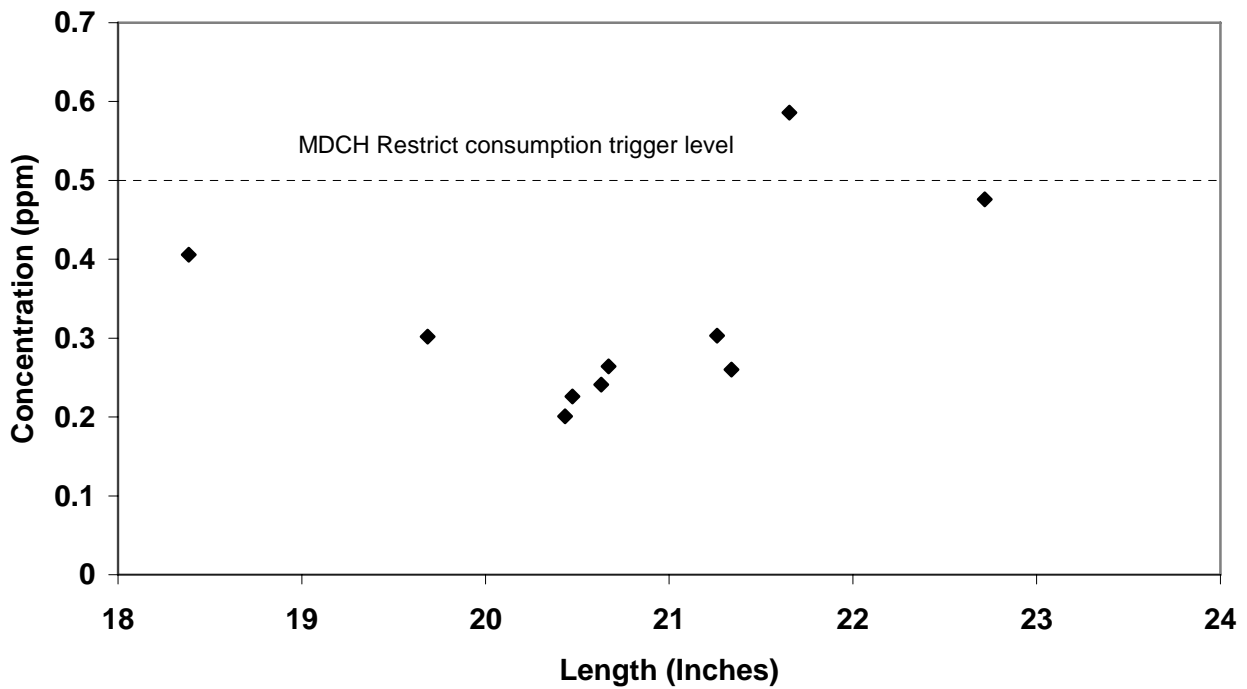


Figure 48. Total length versus total mercury concentration in carp collected from the Maple River, upstream of Matherton in 2006 (ID 2006150).

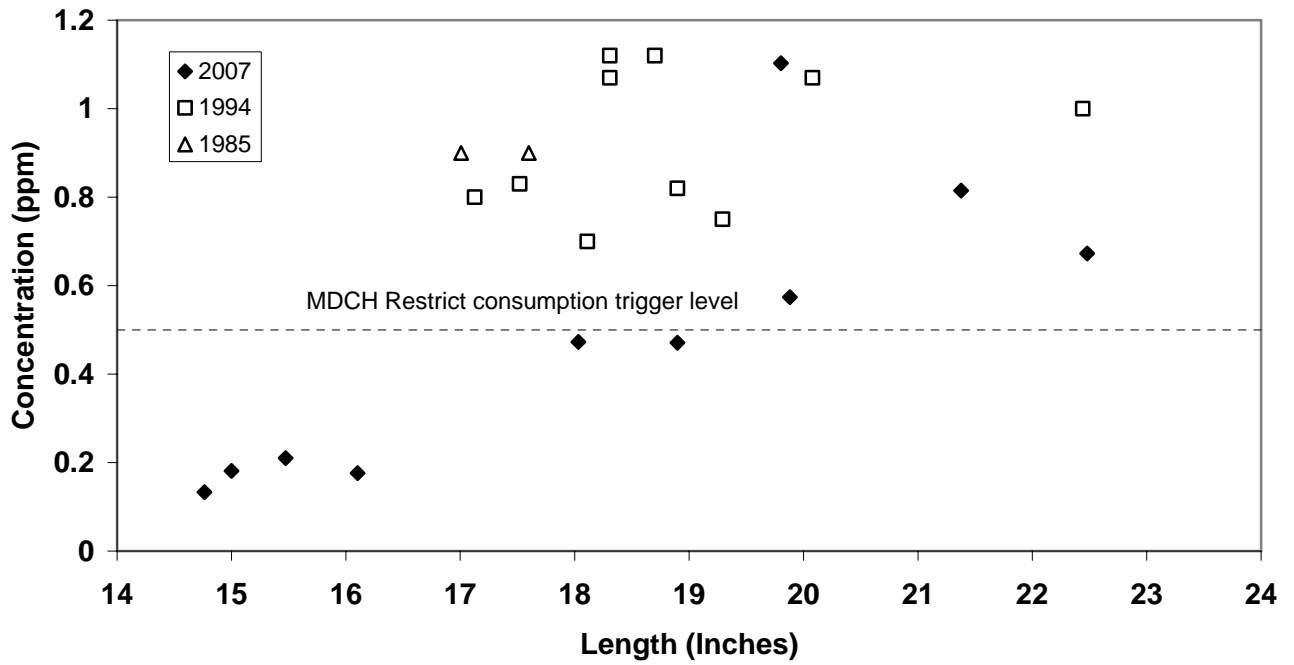


Figure 49. Total length versus total mercury concentration in walleye collected from Milakokia Lake, Mackinac County, in 1985 (ID 85061), 1994 (ID 94031), and 2007 (ID 2007241).

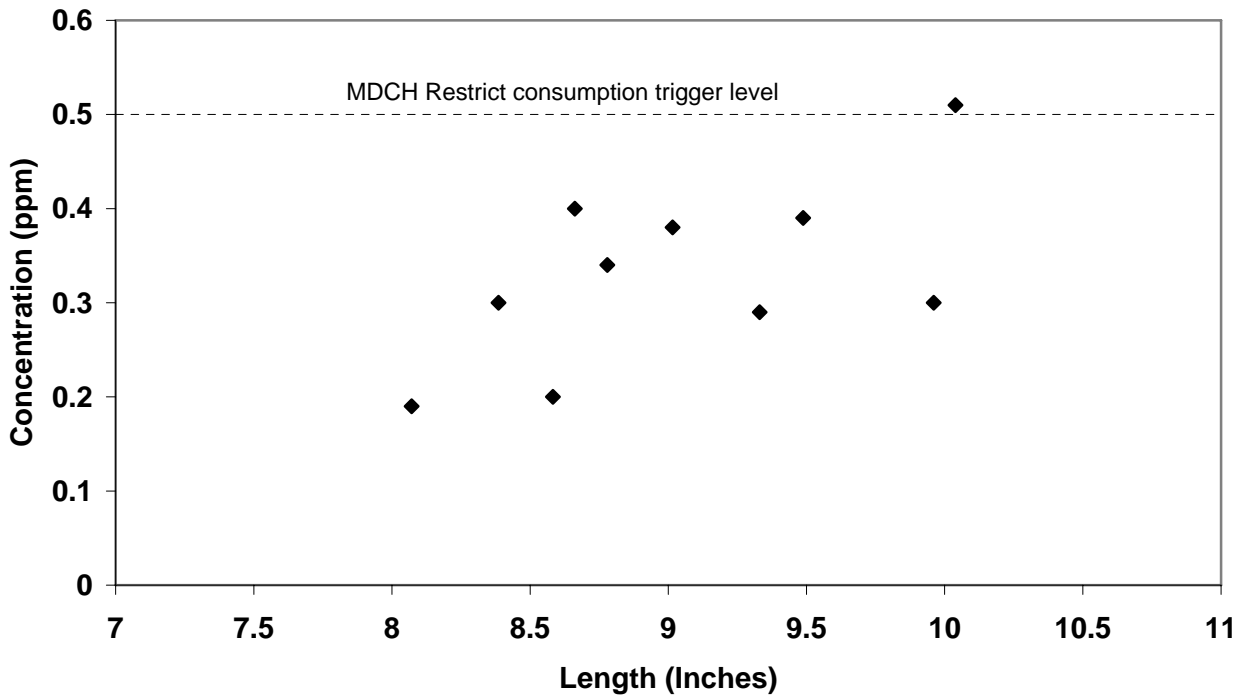


Figure 50. Total length versus total mercury concentration in rock bass collected from Millecoquins Lake, Mackinac County, in 2006 (ID 2006049).

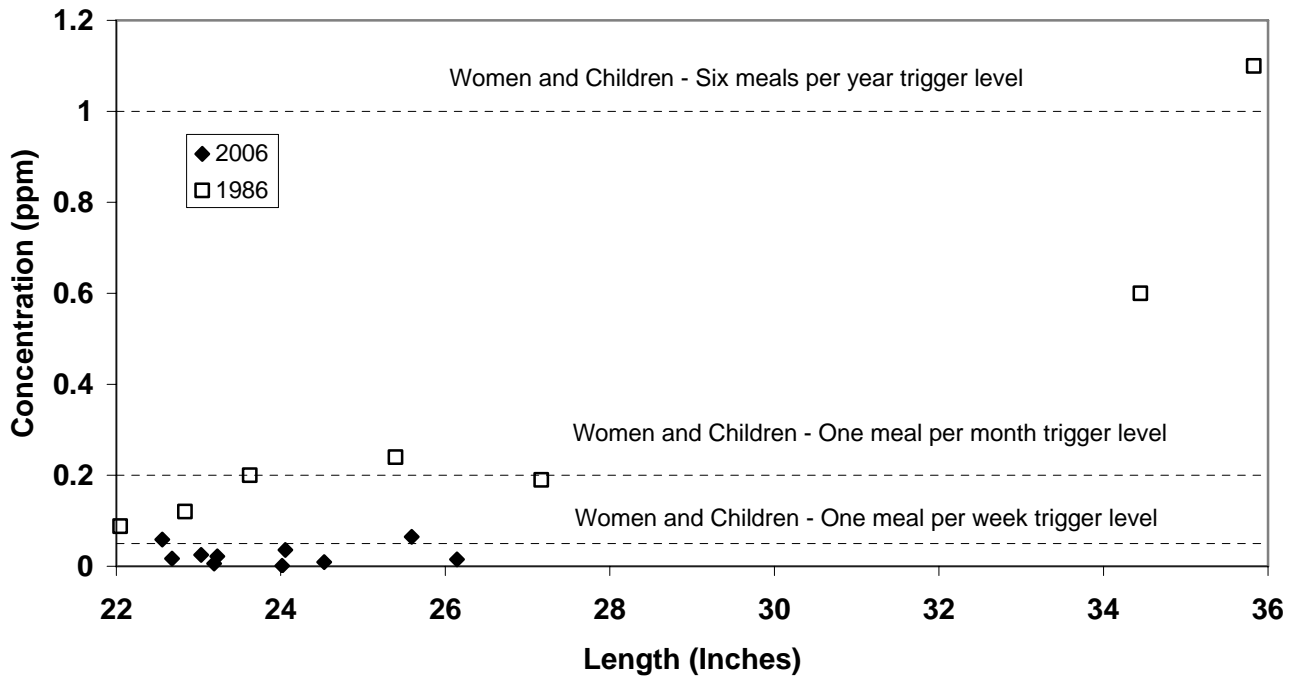


Figure 51. Total length versus total PCB concentration in northern pike collected from Muskegon Lake, Muskegon County, in 1986 (ID 86061) and 2006 (ID 2006050).

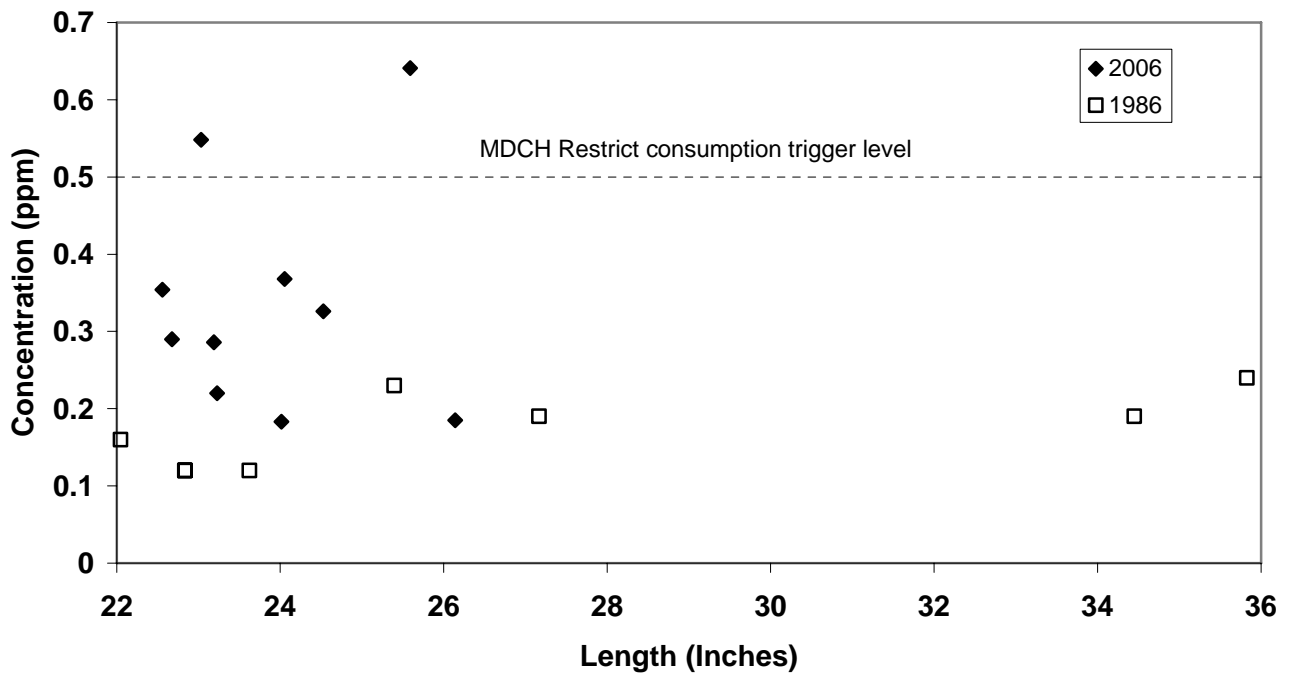


Figure 52. Total length versus total mercury concentration in northern pike collected from Muskegon Lake, Muskegon County, in 1986 (ID 86061) and 2006 (ID 2006050).

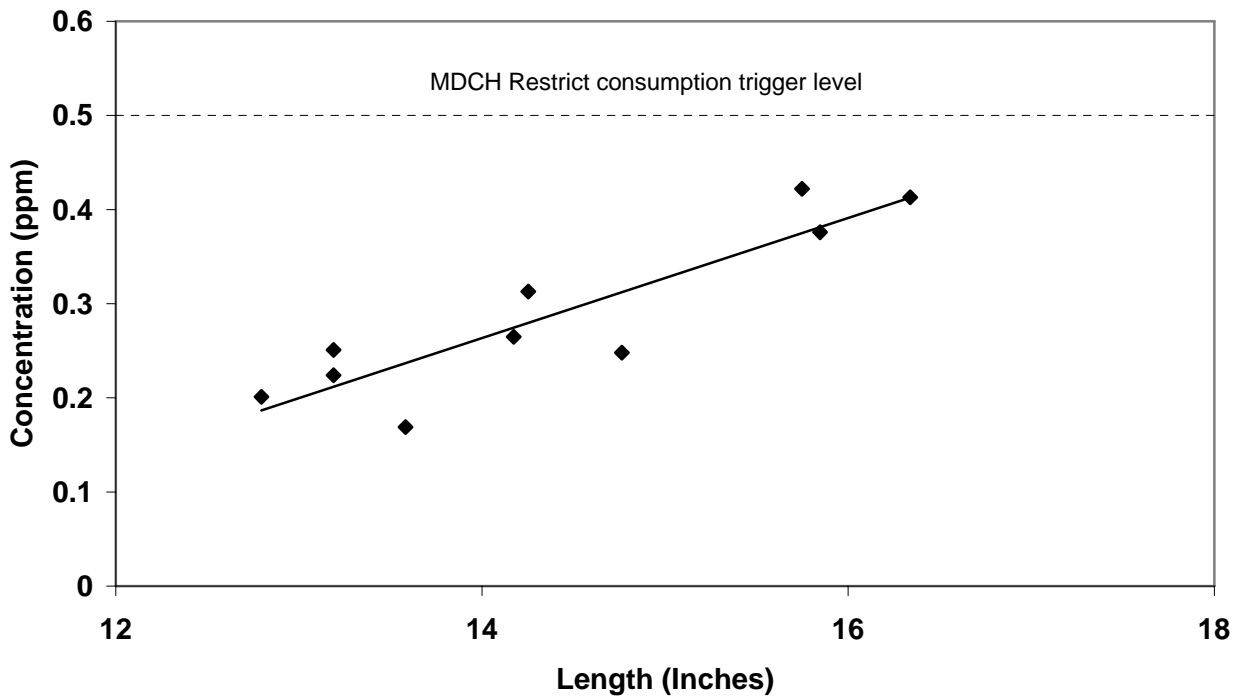


Figure 53. Total length versus total mercury concentration in largemouth bass collected from Osterhout Lake, Allegan County, in 2007 (ID 2007265).

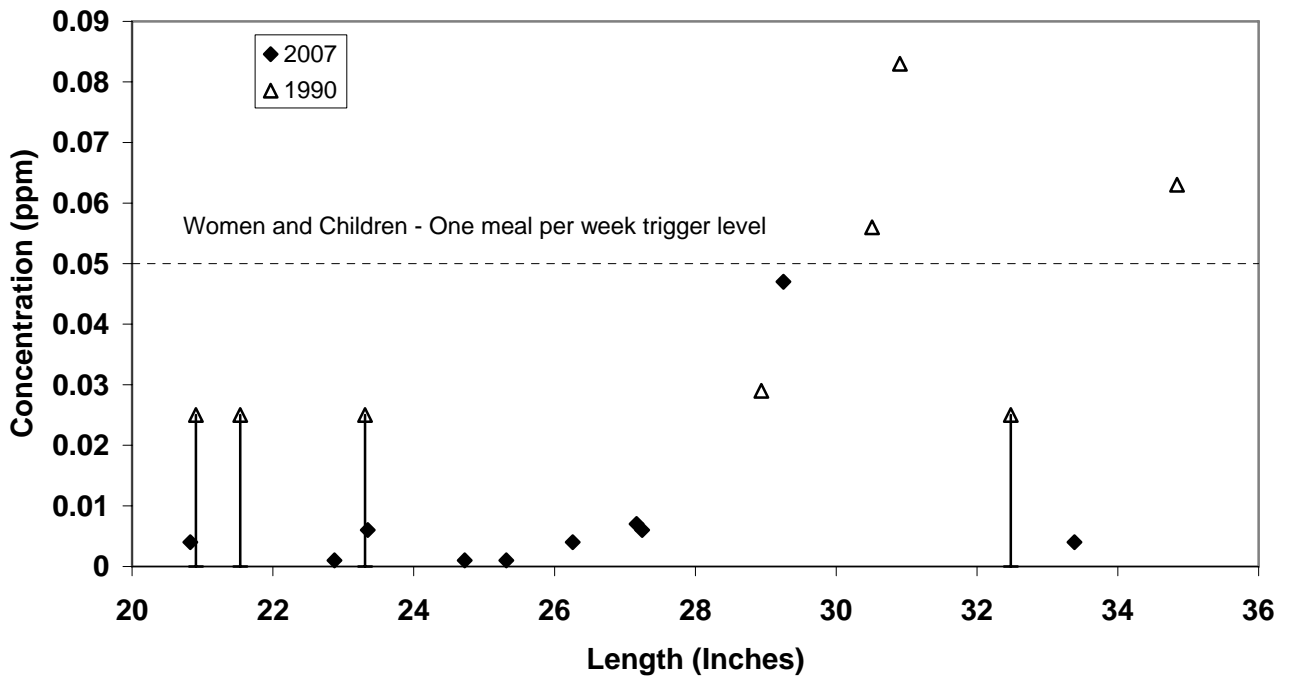


Figure 54. Total length versus total PCB concentration in northern pike collected from the Randall Lake Chain; Craig and Randall Lakes in 1990 (IDs 90014.1 & 90014.2) and Morrison Lake in 2007 (ID 2007242).

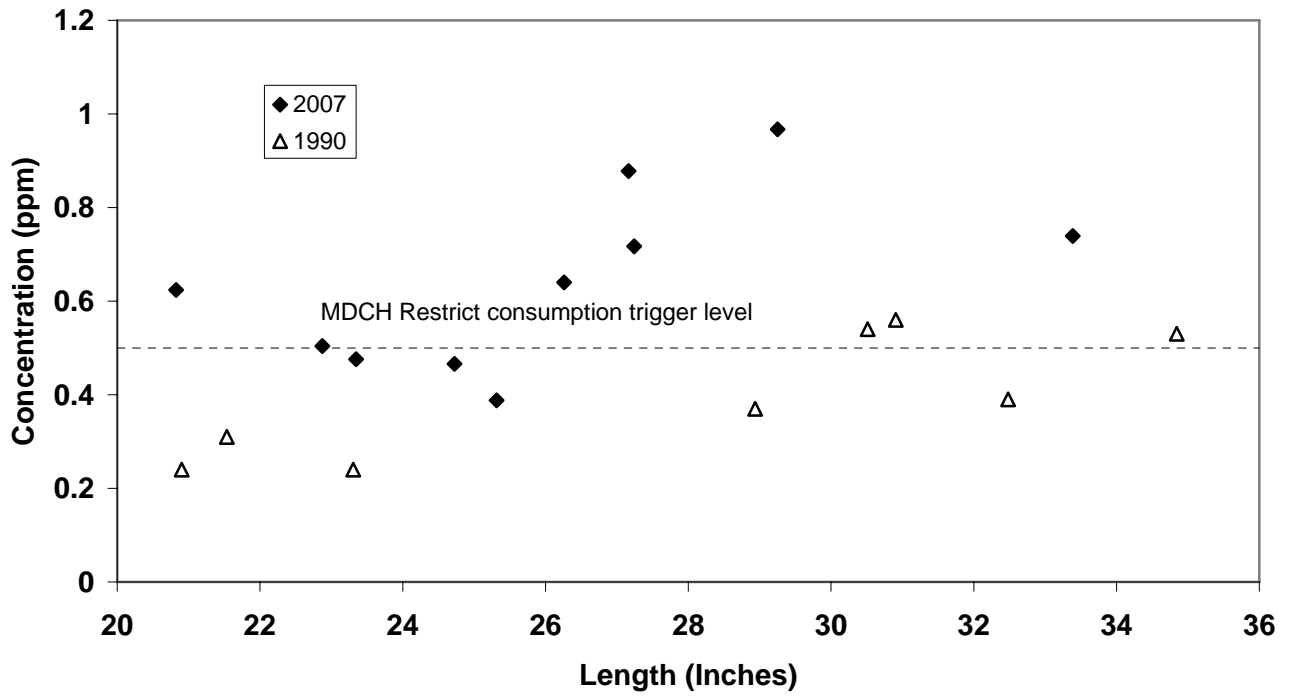


Figure 55. Total length versus total mercury concentration in northern pike collected from the Randall Lake Chain; Craig and Randall Lakes in 1990 (IDs 90014.1 & 90014.2) and Morrison Lake in 2007 (ID 2007242).

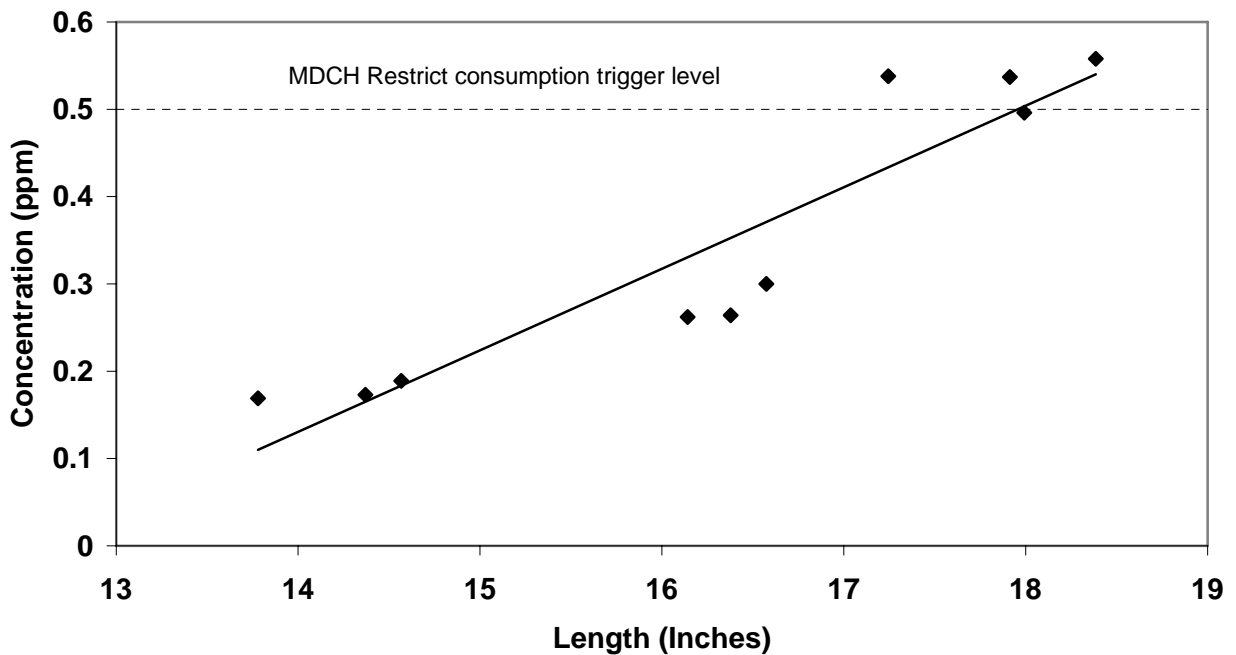


Figure 56. Total length versus total mercury concentration in walleye collected from Silver Lake, Grand Traverse County, in 2007 (ID 2007251).

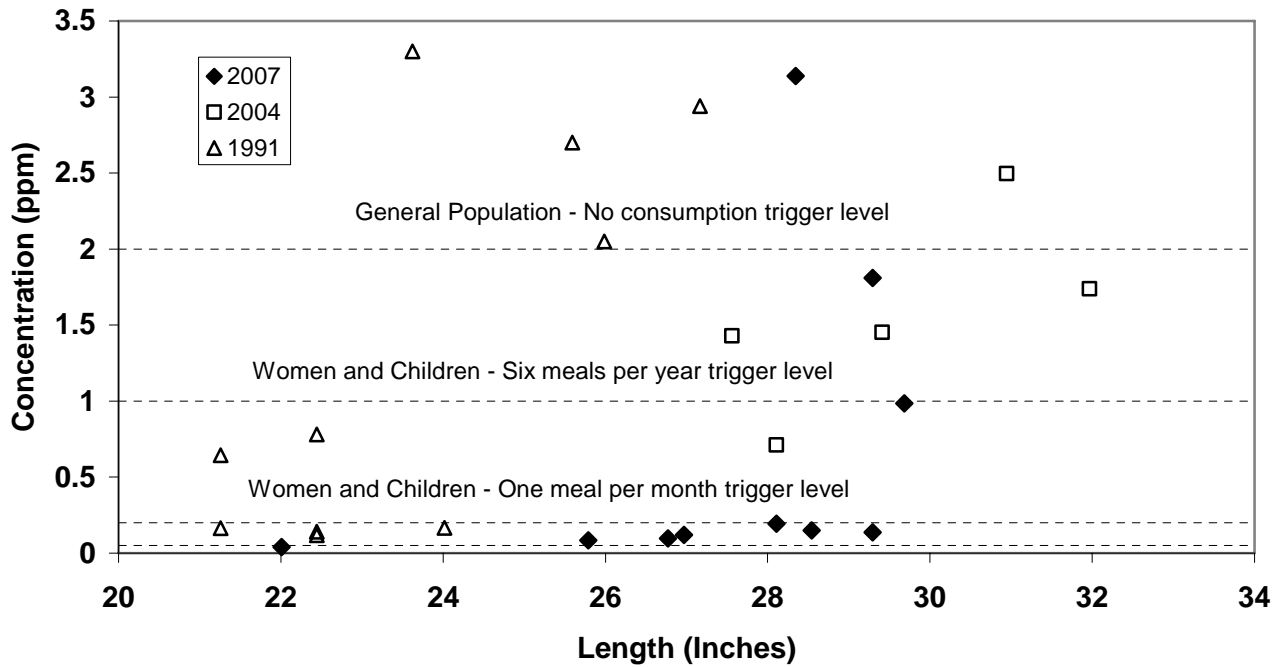


Figure 57. Total length versus total PCB concentration in carp collected from White Lake, Muskegon County, in 1991 (ID 91046), 2004 (ID 2004126), and 2007 (ID 2007258).

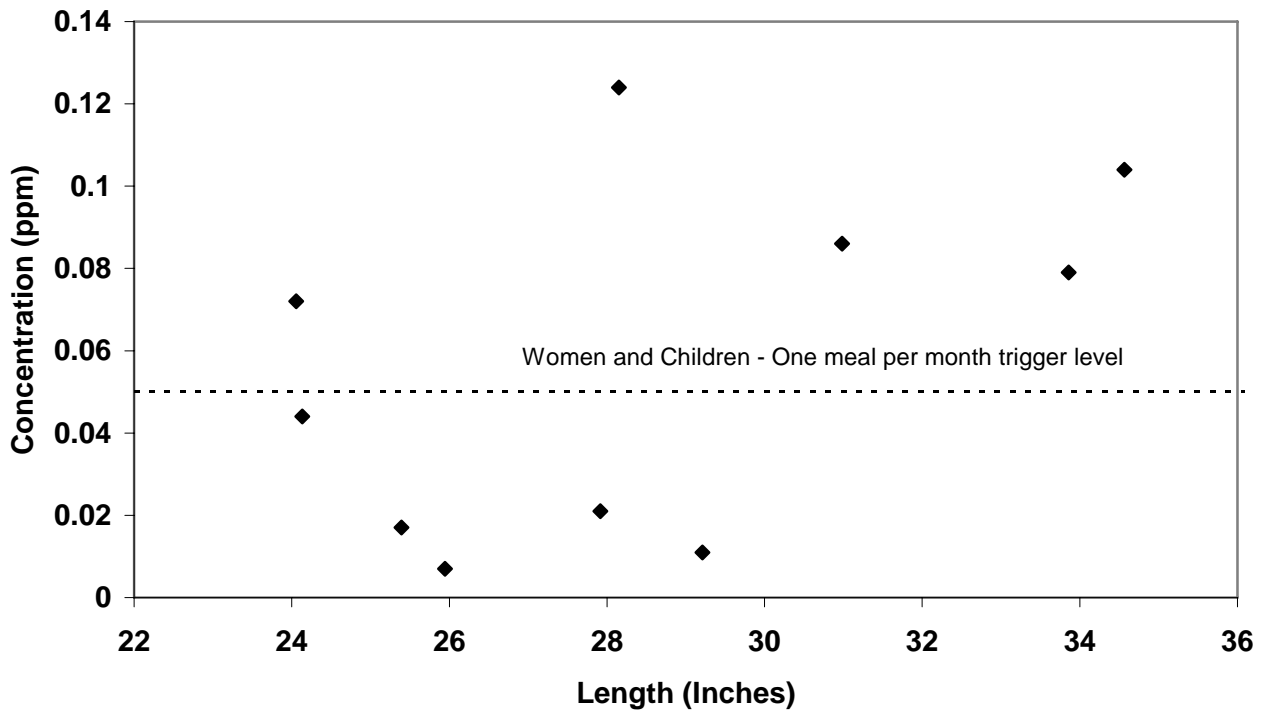


Figure 58. Total length versus total PCB concentration in northern pike collected from White Lake, Muskegon County in 2007 (ID 2007258).

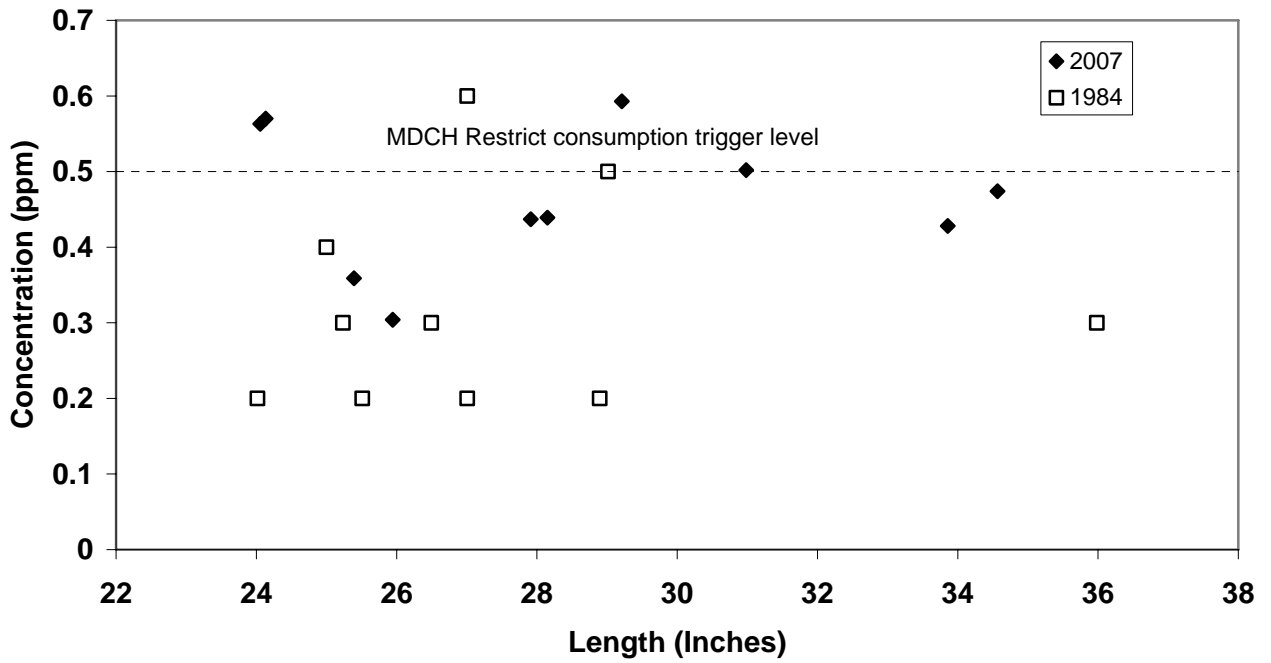


Figure 59. Total length versus total mercury concentration in northern pike collected from White Lake, Muskegon County, in 1984 (ID 84001) and 2007 (ID 2007258).



Figure 60. Total length versus total PCB concentration in lake herring collected from Lake Superior in 1994 (ID 94056), 1995 (ID 954066), 2000 (ID 2000046), and 2007 (ID 2007230).

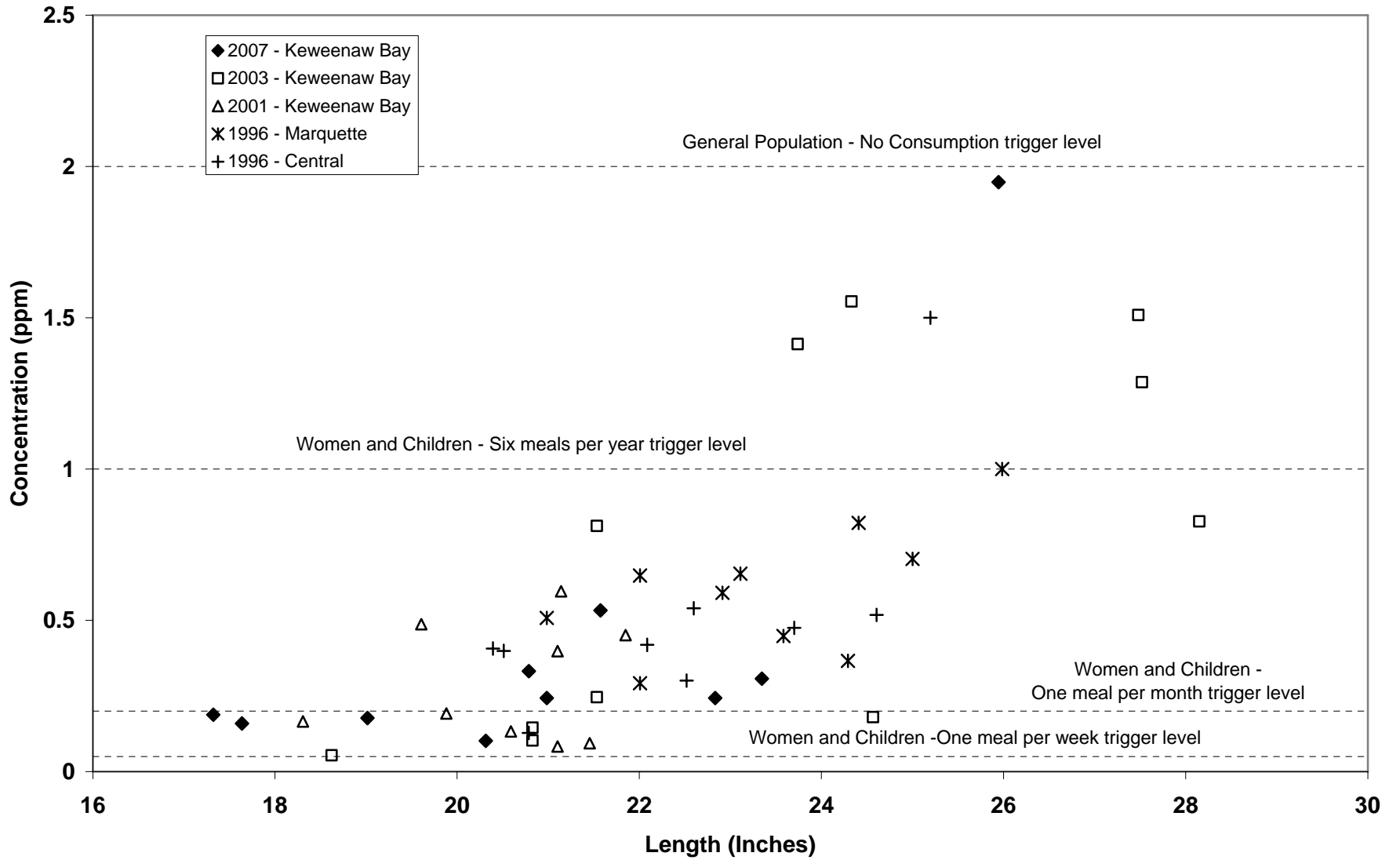


Figure 61. Total length versus total PCB concentration in siscowet collected from Lake Superior in 1996 (IDs 96034 & 96038), 2001 (ID 2001079), 2003 (ID 2003070), and 2007 (ID 2007230).

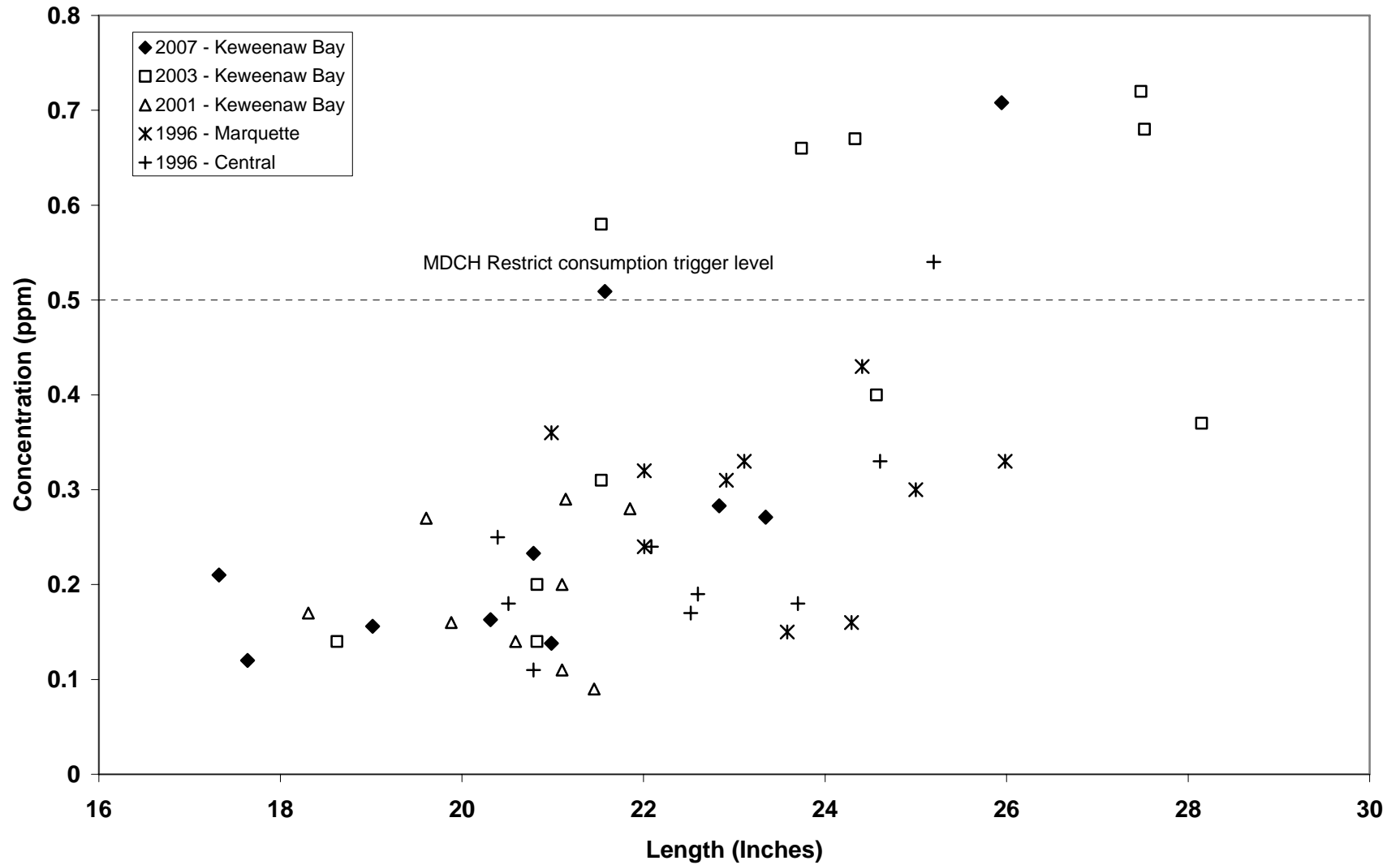


Figure 62. Total length versus mercury concentration in siscowet collected from Lake Superior in 1996 (IDs 96034 & 96038), 2001 (ID 2001079), 2003 (ID 2003070), and 2007 (ID 2007230).

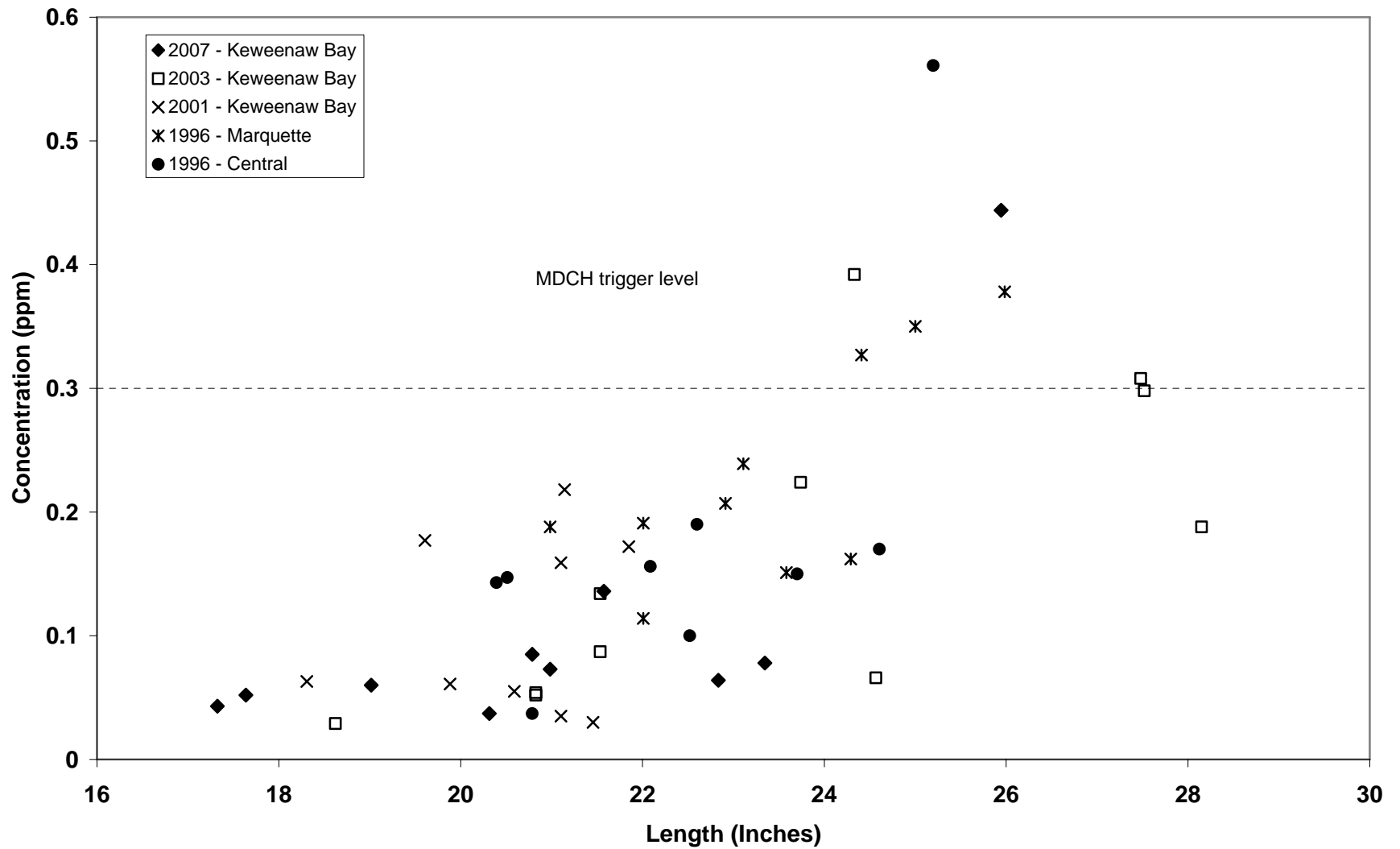


Figure 63. Total length versus total chlordane concentration in siscowet collected from Lake Superior in 1996 (IDs 96034 & 96038), 2001 (ID 2001079), 2003 (ID 2003070), and 2007 (ID 2007230).

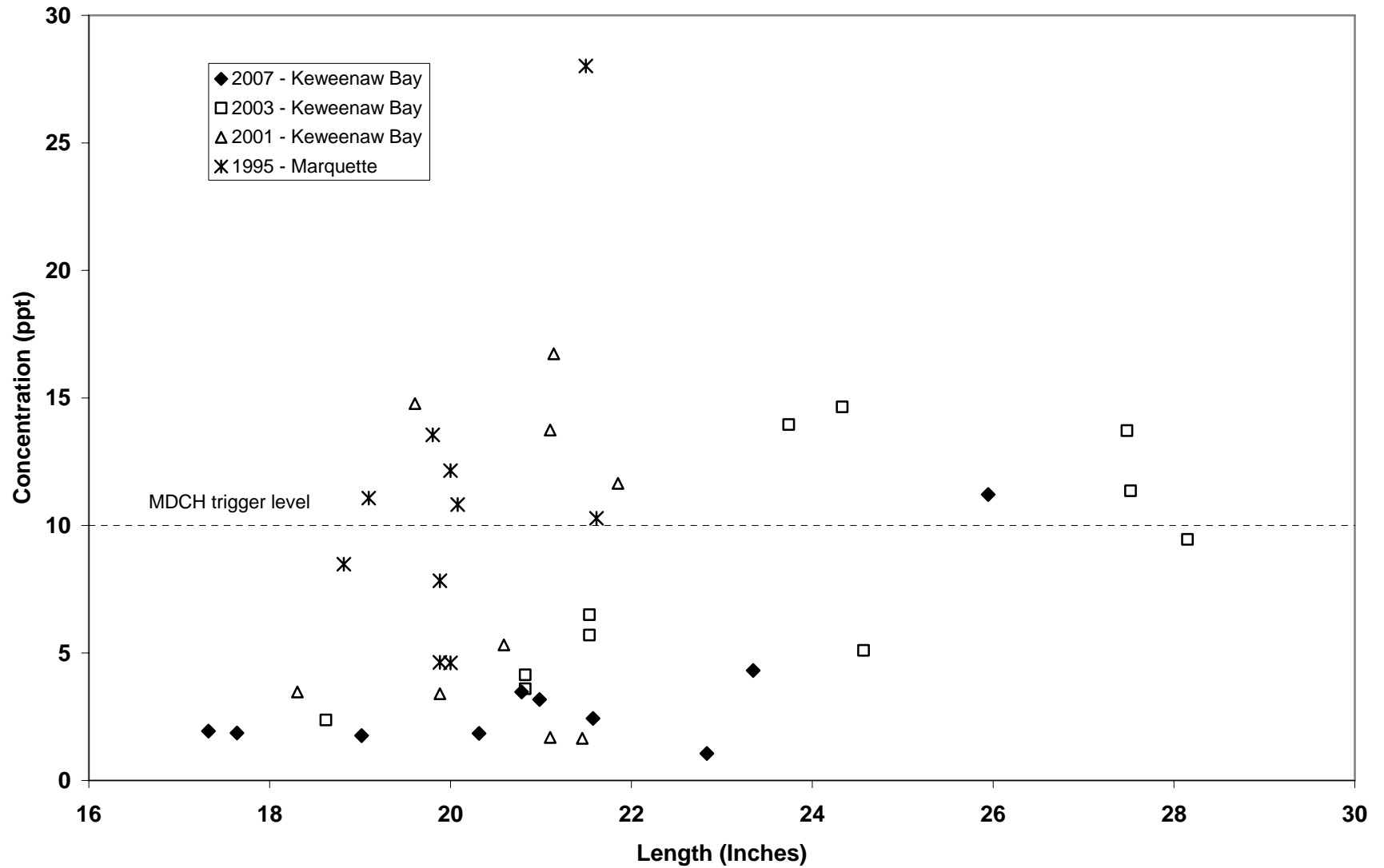


Figure 64. Total length versus dioxin TEQ concentration in siscowet collected from Lake Superior in 1995 (ID 95065), 2001 (ID 2001079), 2003 (ID 2003070), and 2007 (ID 2007230).

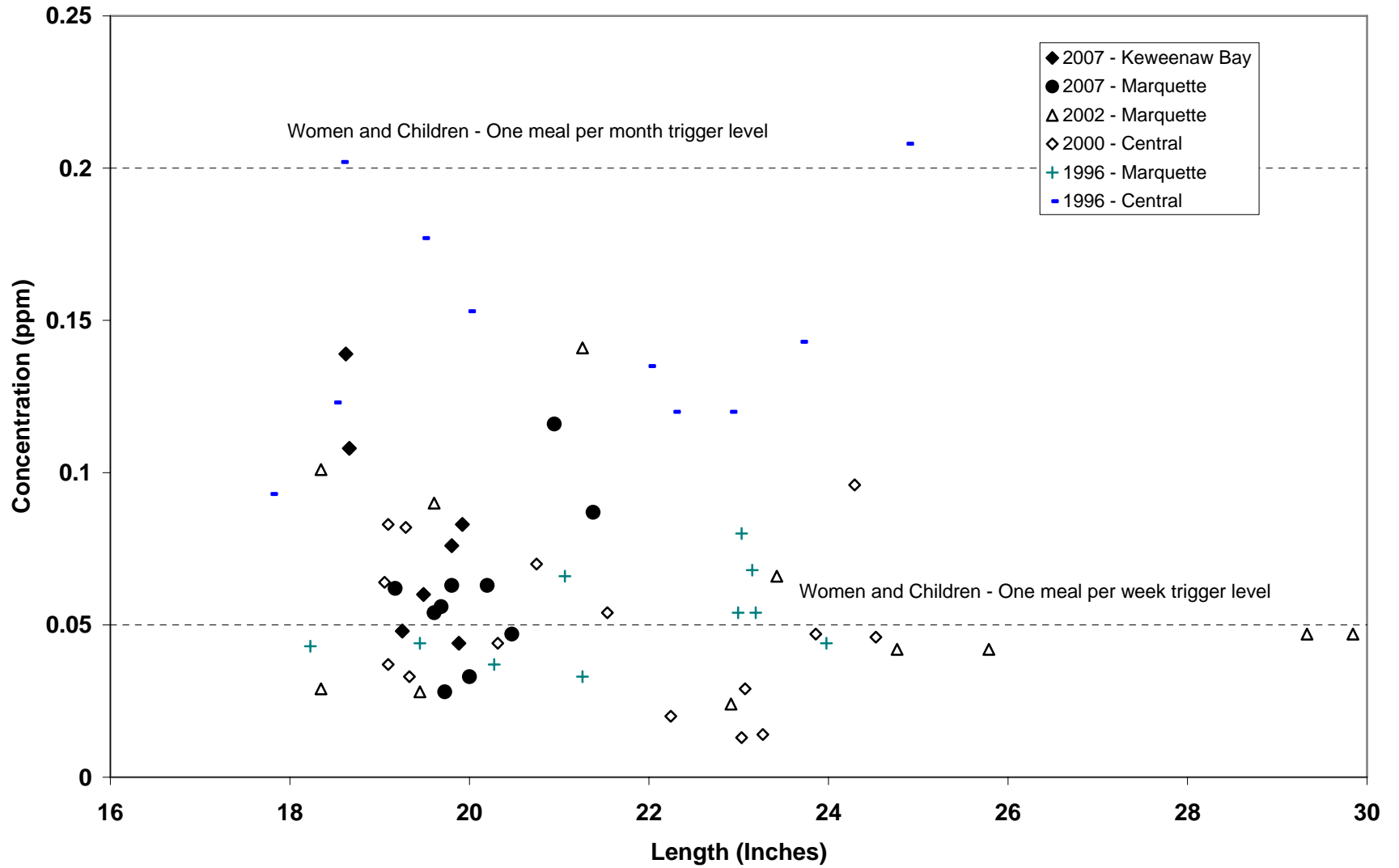


Figure 65. Total length versus total PCB concentration in whitefish collected from Lake Superior in 1996 (IDs 96034 & 96038), 2000 (ID 2000046), 2002 (ID 2002060), and 2007 (IDs 2007231 & 2007267).

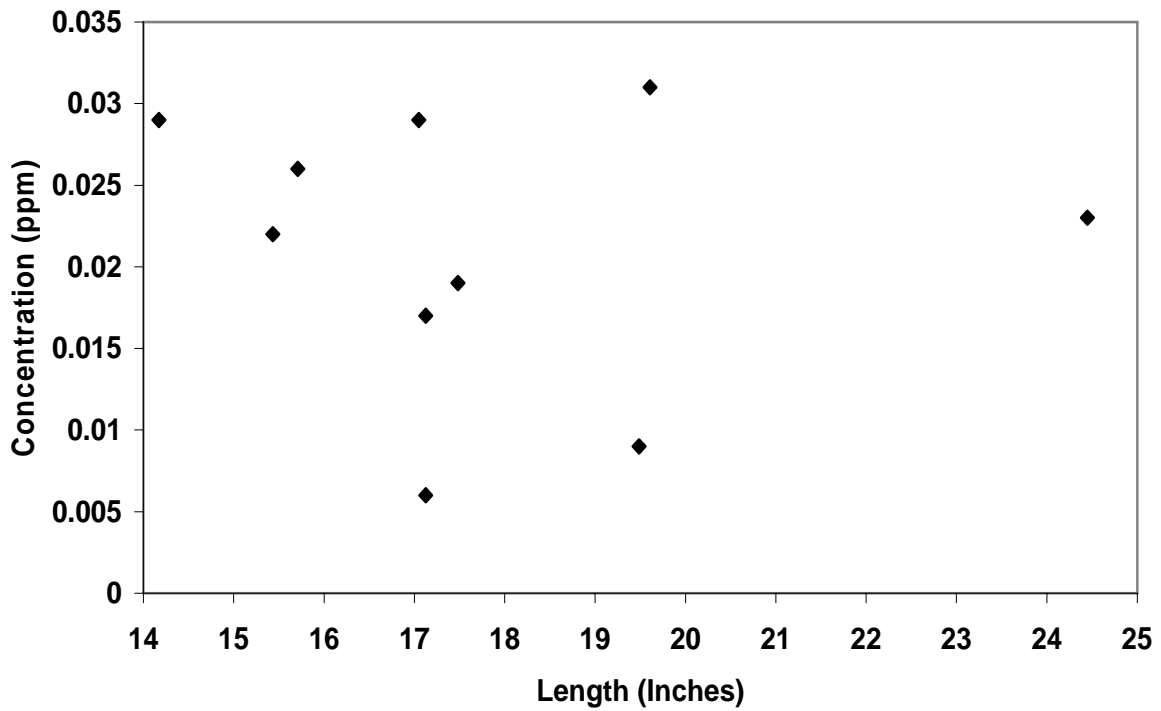


Figure 66. Total length versus total PCB concentration in burbot collected from Lake Superior, in 2007 (ID 2007254).

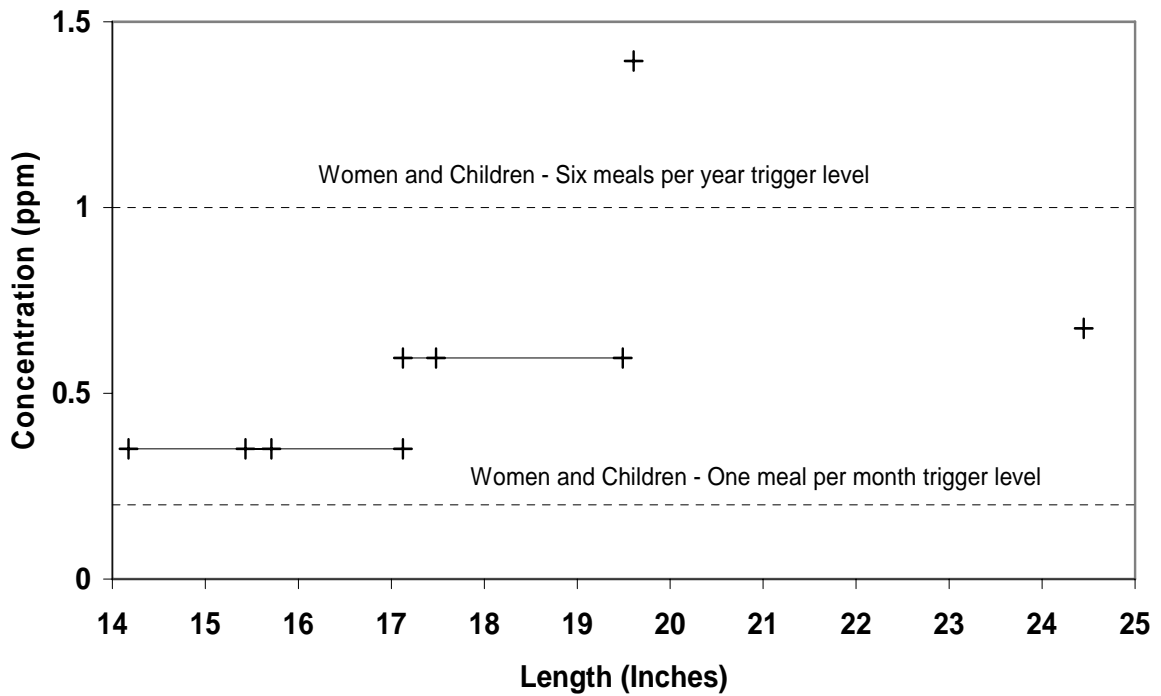


Figure 67. Total length versus total PCB concentration in livers of burbot collected from Lake Superior, in 2007 (ID 2007254).

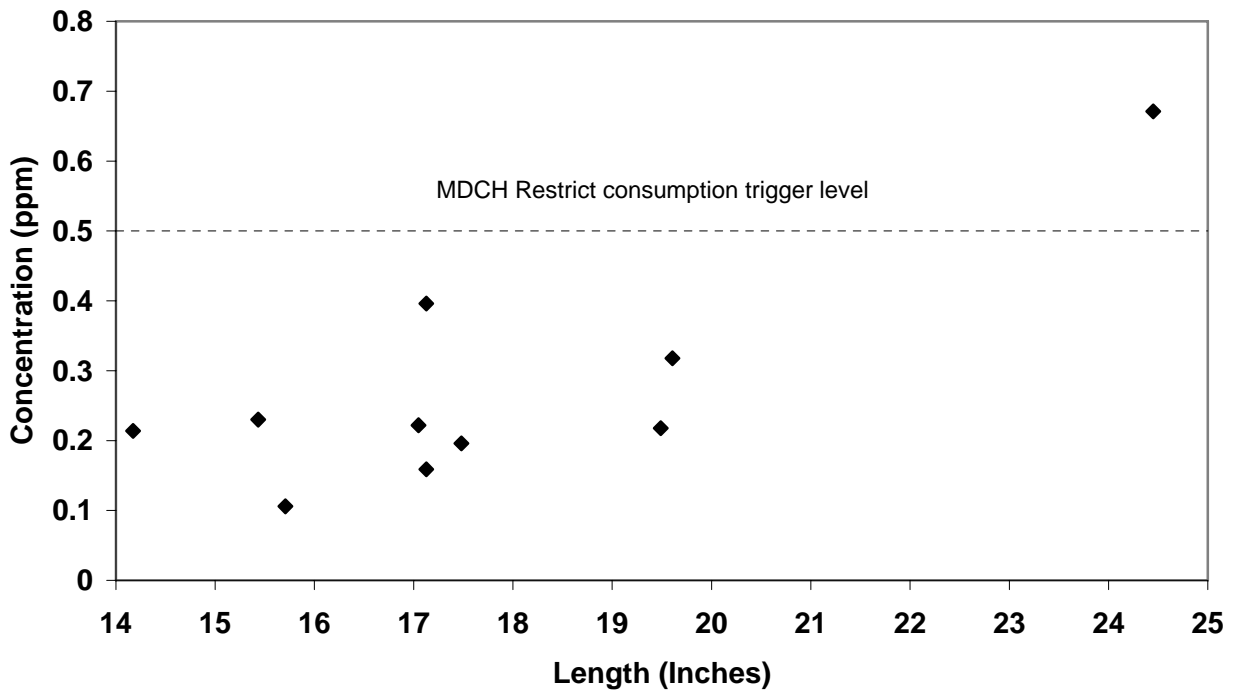


Figure 68. Total length versus mercury concentration in burbot collected from Lake Superior, in 2007 (ID 2007254).

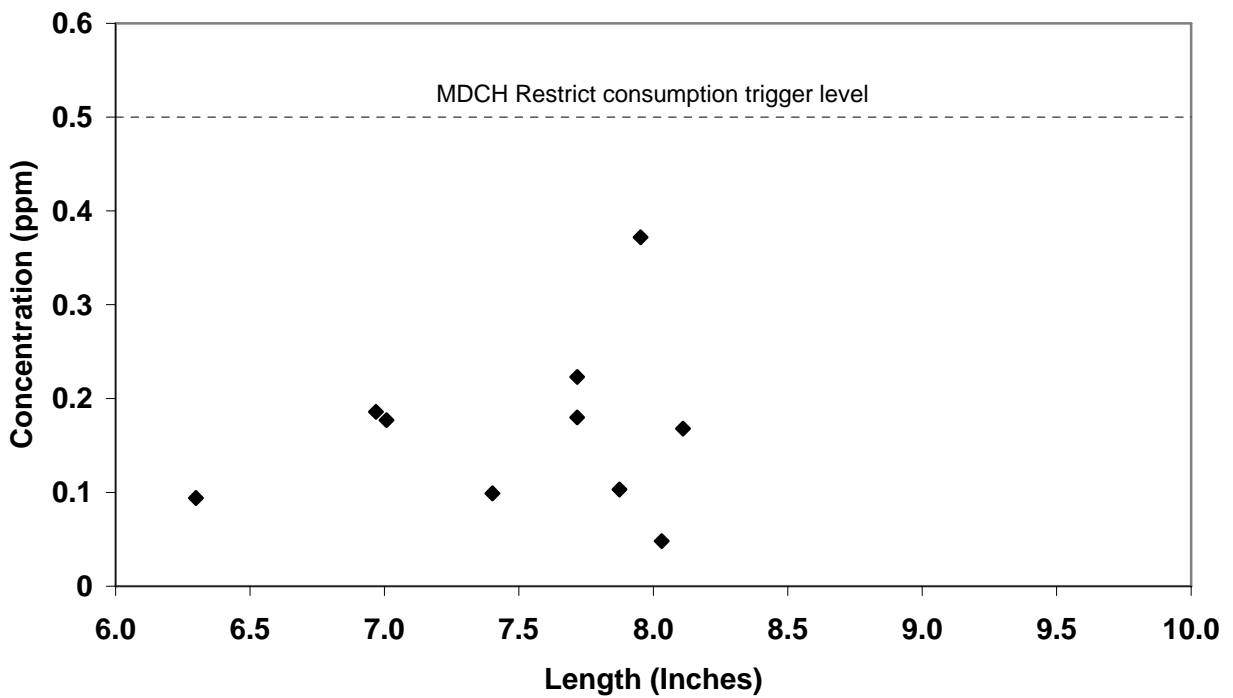


Figure 69. Total length versus total mercury concentration in yellow perch collected from Blind Sucker Flooding, Luce County, in 2007 (ID 2007207).

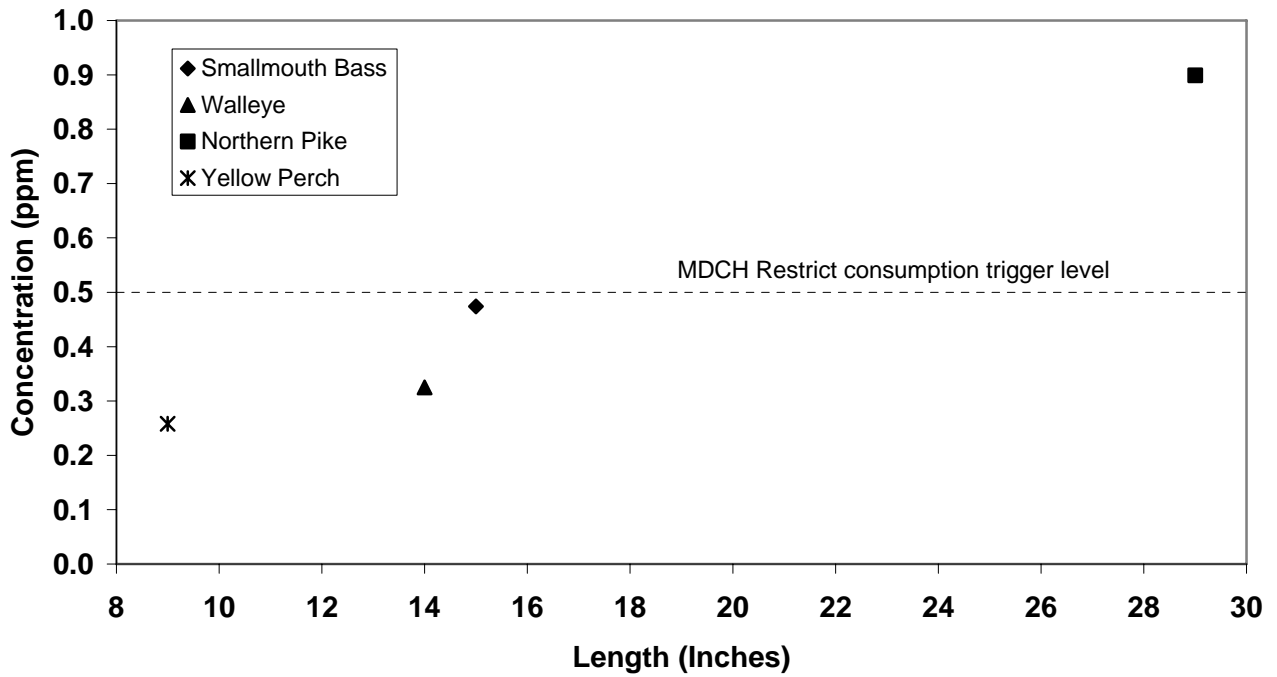


Figure 70. Total length versus total mercury concentration in northern pike, smallmouth bass, walleye, and yellow perch collected from Marion Lake, Gogebic County, in 2003 (ID 2003500).

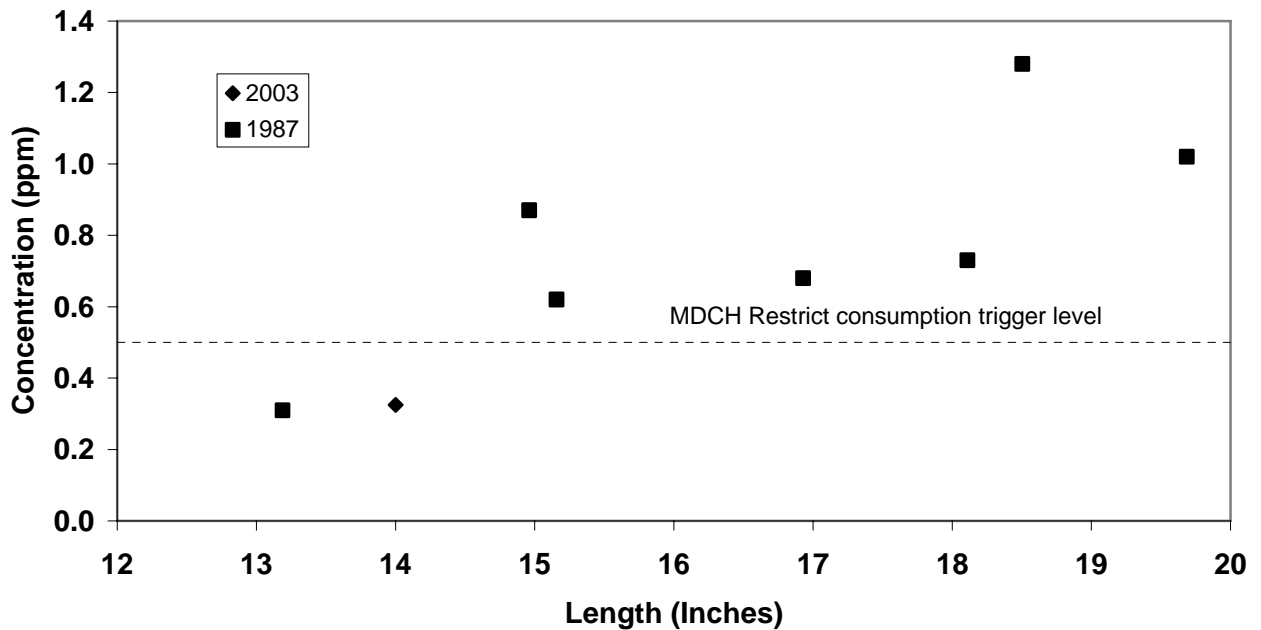


Figure 71. Total length versus total mercury concentration in walleye collected from Marion Lake, Gogebic County, in 1987 (ID 87070) and 2003 (ID 2003500).

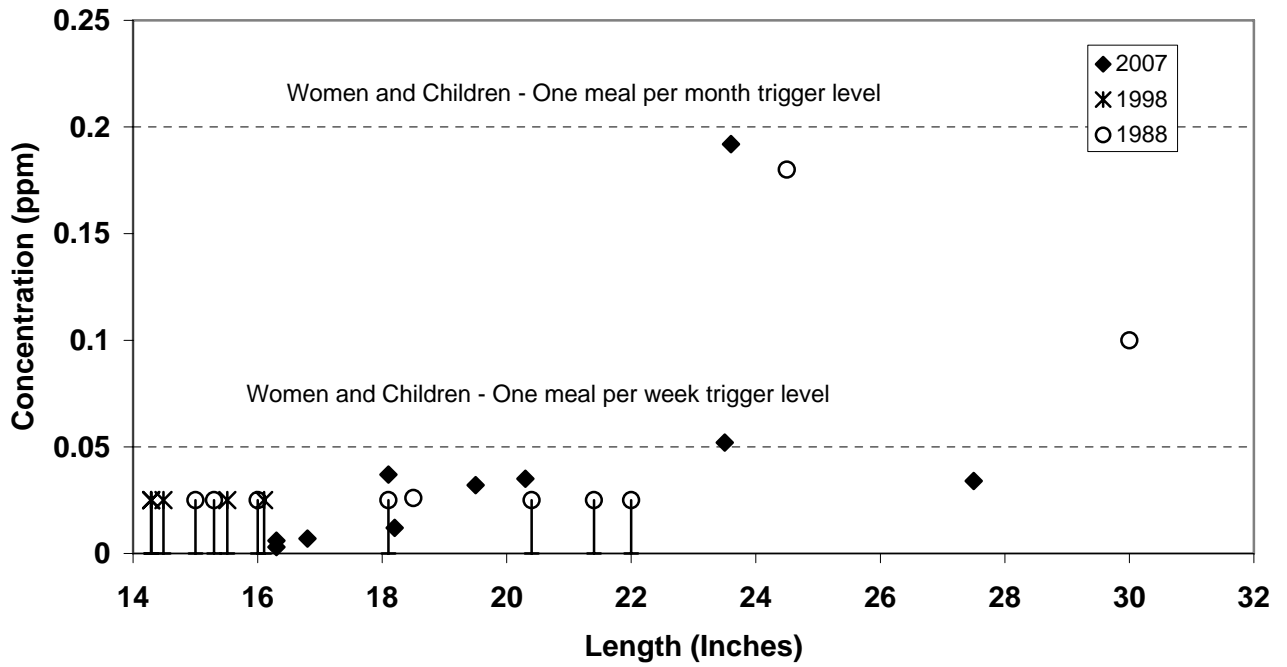


Figure 72. Total length versus total PCB concentration in walleye collected from Portage Lake, Houghton County, in 1988 (ID 88016), 1998 (ID 1998151), and 2007 (ID 2007247).

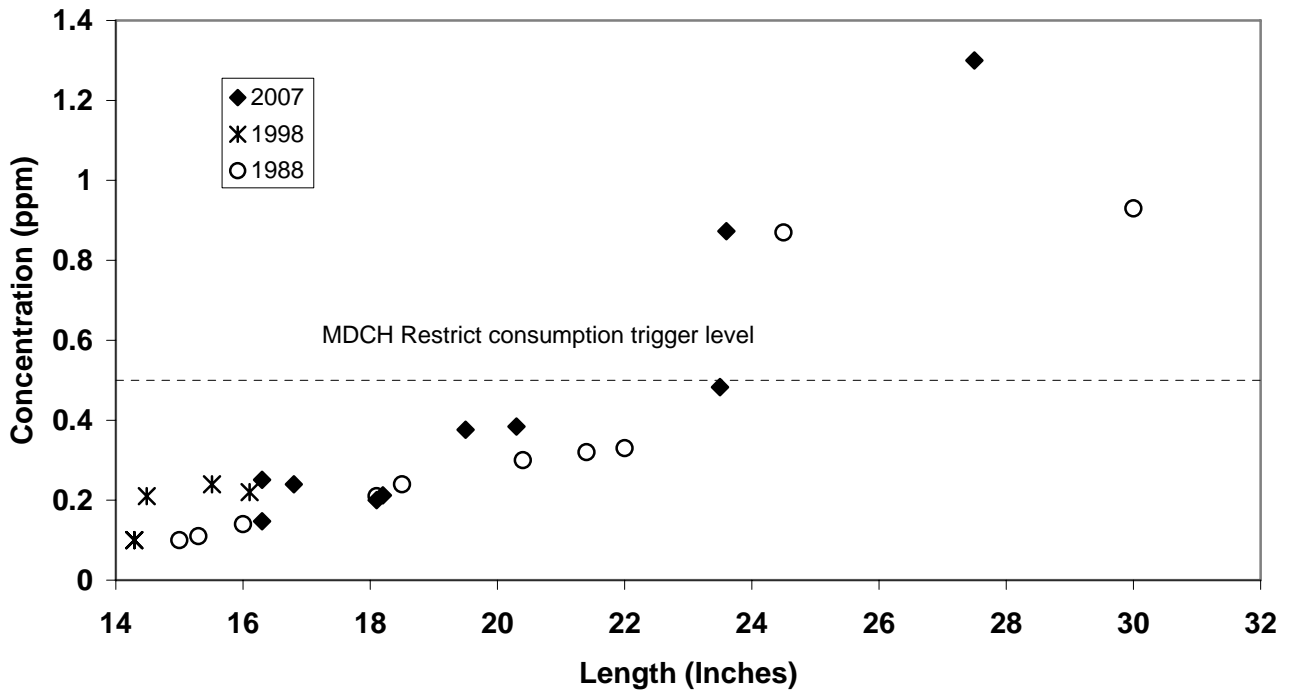


Figure 73. Total length versus mercury concentration in walleye collected from Portage Lake, Houghton County, in 1988 (ID 88016), 1998 (ID 1998151), and 2007 (ID 2007247).



Figure 74. Total length versus total PCB concentration in northern pike collected from Torch Lake, Houghton County, in 1988 (ID 88015), 2000 (ID 2000096), and 2007 (ID 2007257).

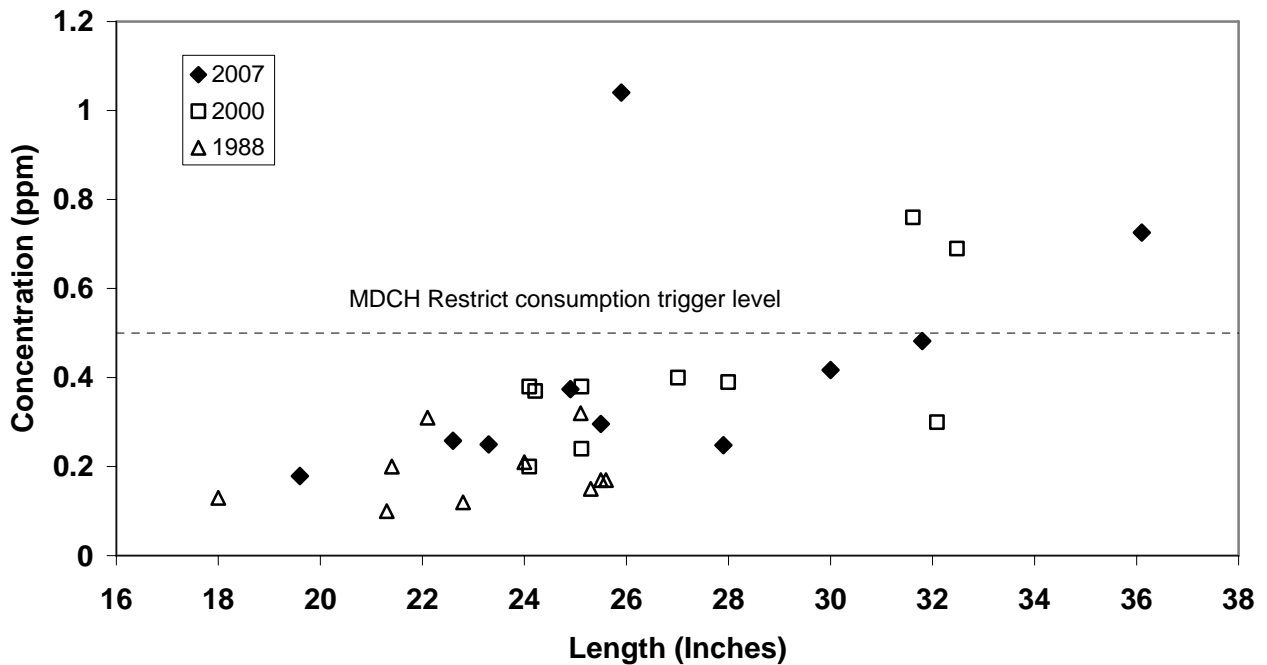


Figure 75. Total length versus total mercury concentration in northern pike collected from Torch Lake, Houghton County, in 1988 (ID 88015), 2000 (ID 2000096), and 2007 (ID 2007257).

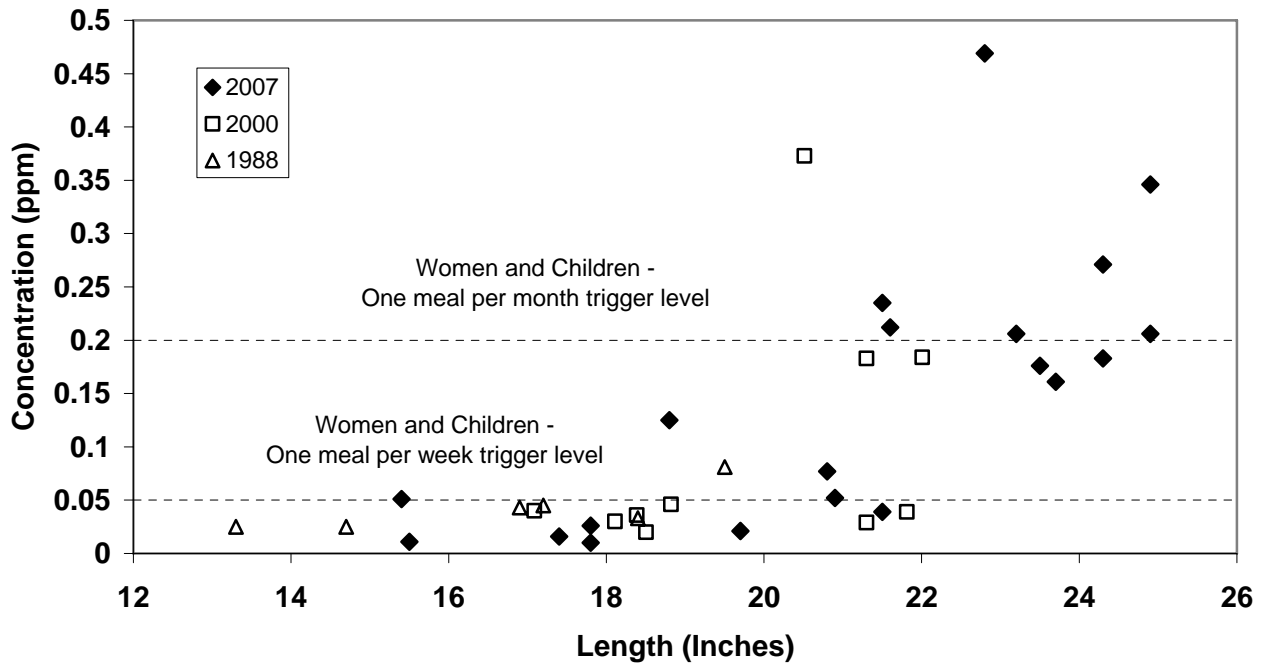


Figure 76. Total length versus total PCB concentration in walleye collected from Torch Lake, Houghton County, in 1988 (ID 88015), 2000 (ID 2000096), and 2007 (ID 2007257).

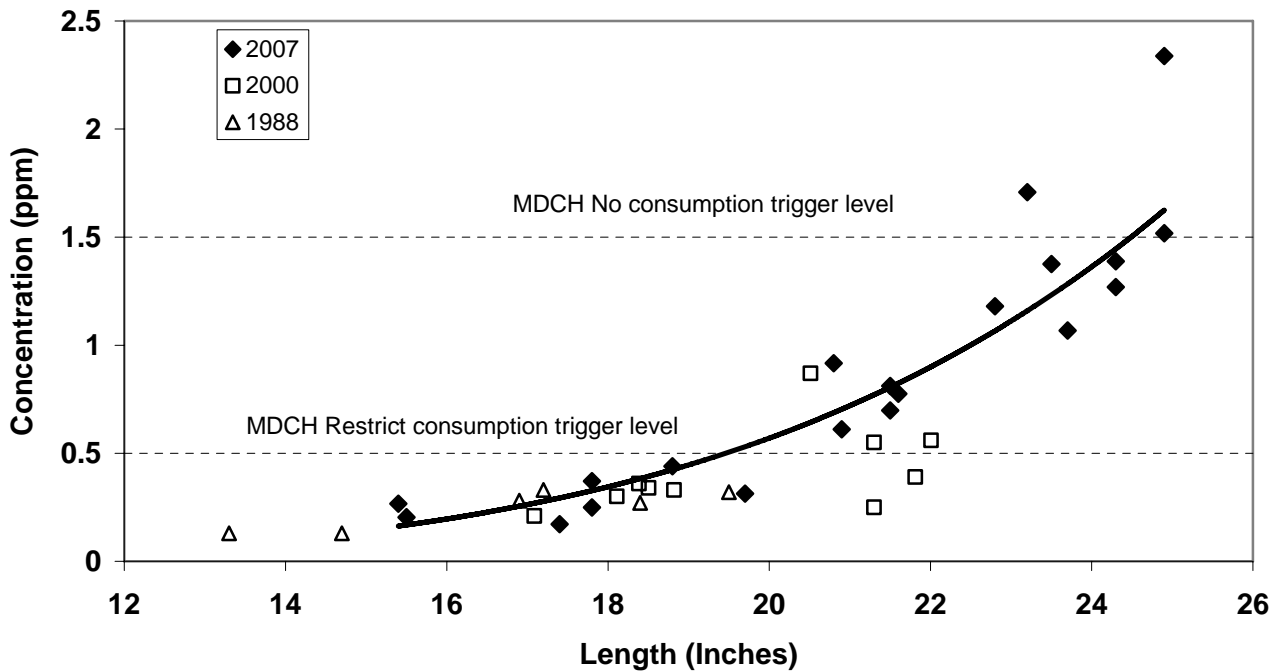


Figure 77. Total length versus total mercury concentration in walleye collected from Torch Lake, Houghton County, in 1988 (ID 88015), 2000 (ID 2000096), and 2007 (ID 2007257).

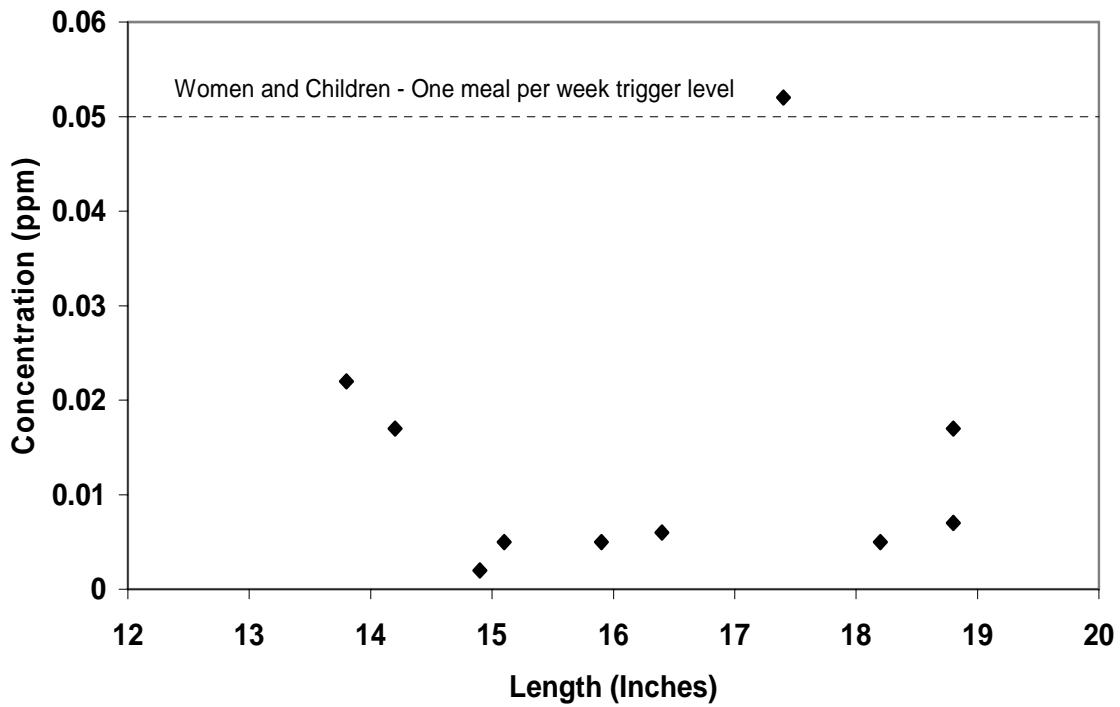


Figure 78. Total length versus total PCB concentration in white sucker collected from Torch Lake, Houghton County, in 2007 (ID 2007257).

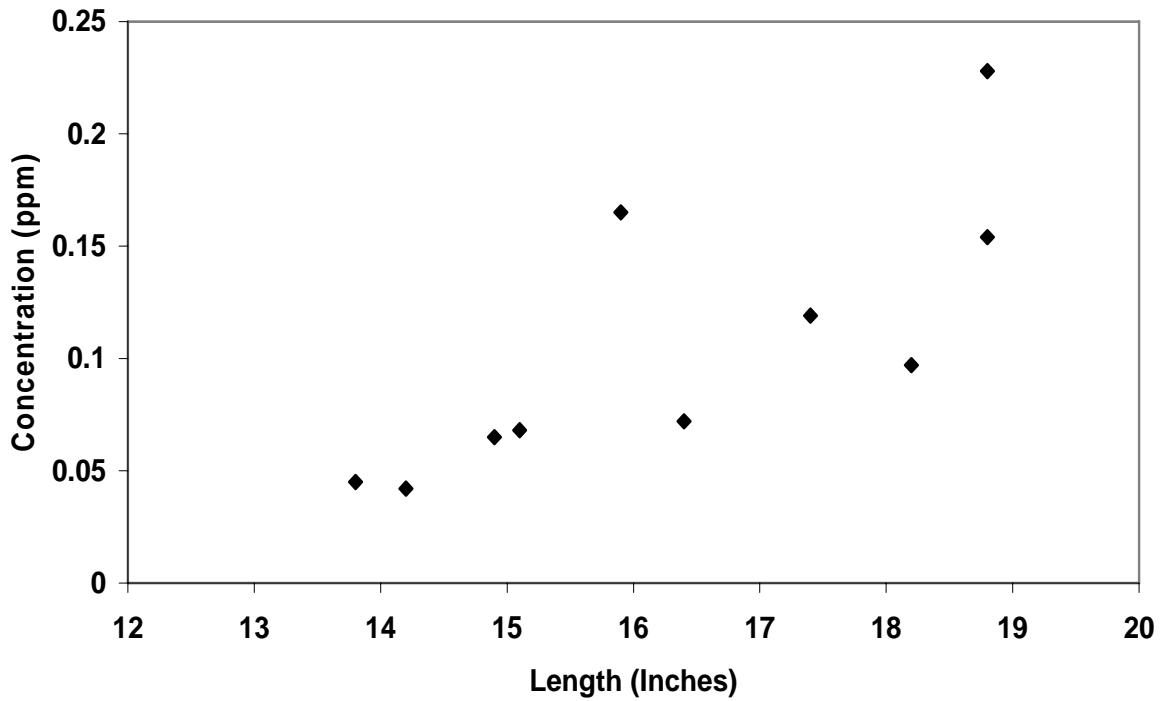


Figure 79. Total length versus total mercury concentration in white sucker collected from Torch Lake, Houghton County, in 2007 (ID 2007257).

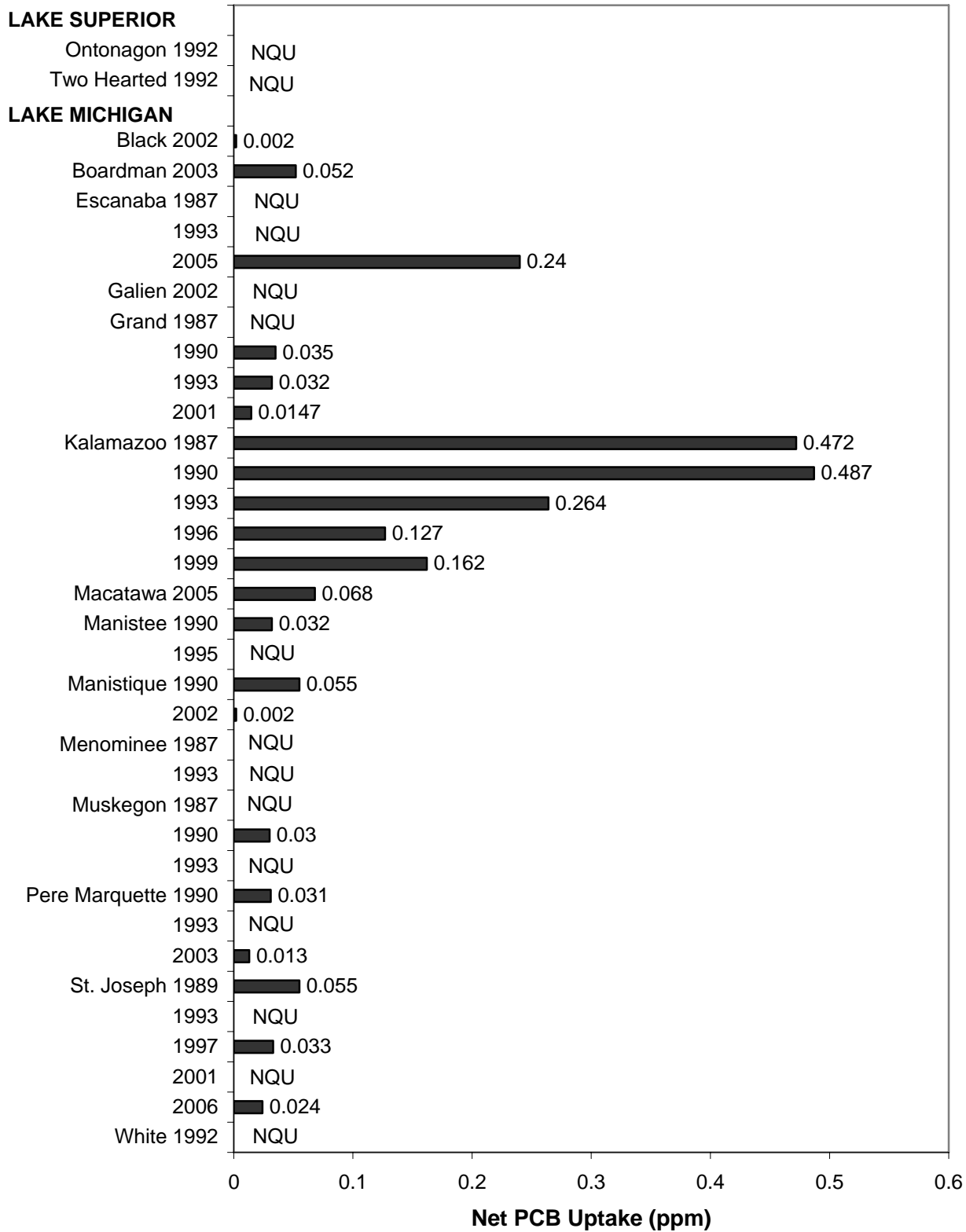


Figure 80. Net uptake of total PCB in caged fish from the mouths of selected Michigan rivers (NQU = no quantifiable uptake).

LAKE HURON

Au Gres 1991 NQU
 Au Sable 1991
 1996 NQU
 Saginaw 1986
 1988
 1992
 1993
 1998
 2002
 2005
 Tawas 2006 NQU
 Thunder Bay 1989
 1996 NQU

LAKE ERIE

Belle 1997
 Black 1993
 2007 NQU
 Clinton 1989
 1992
 1996
 1997
 1999
 2000
 Clinton-Spillway 1989
 Clinton-Spillway 1992 NQU
 Huron 1991 NQU
 1996
 2002 NQU
 Ottawa 2005
 Pine 1997
 Raisin 1988
 1991
 1998
 2004
 Rouge 1992
 1995
 2000

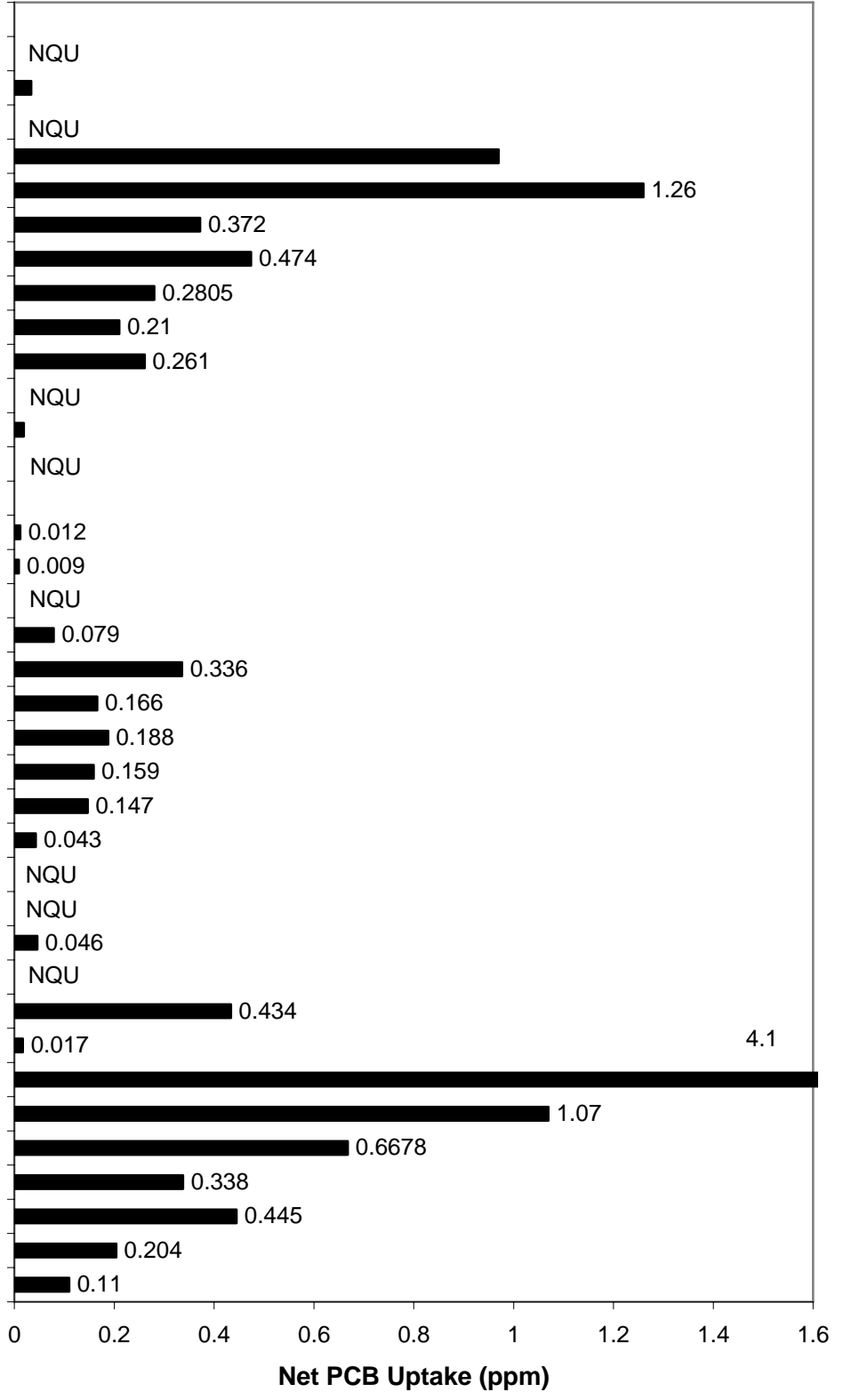


Figure 80. Continued.

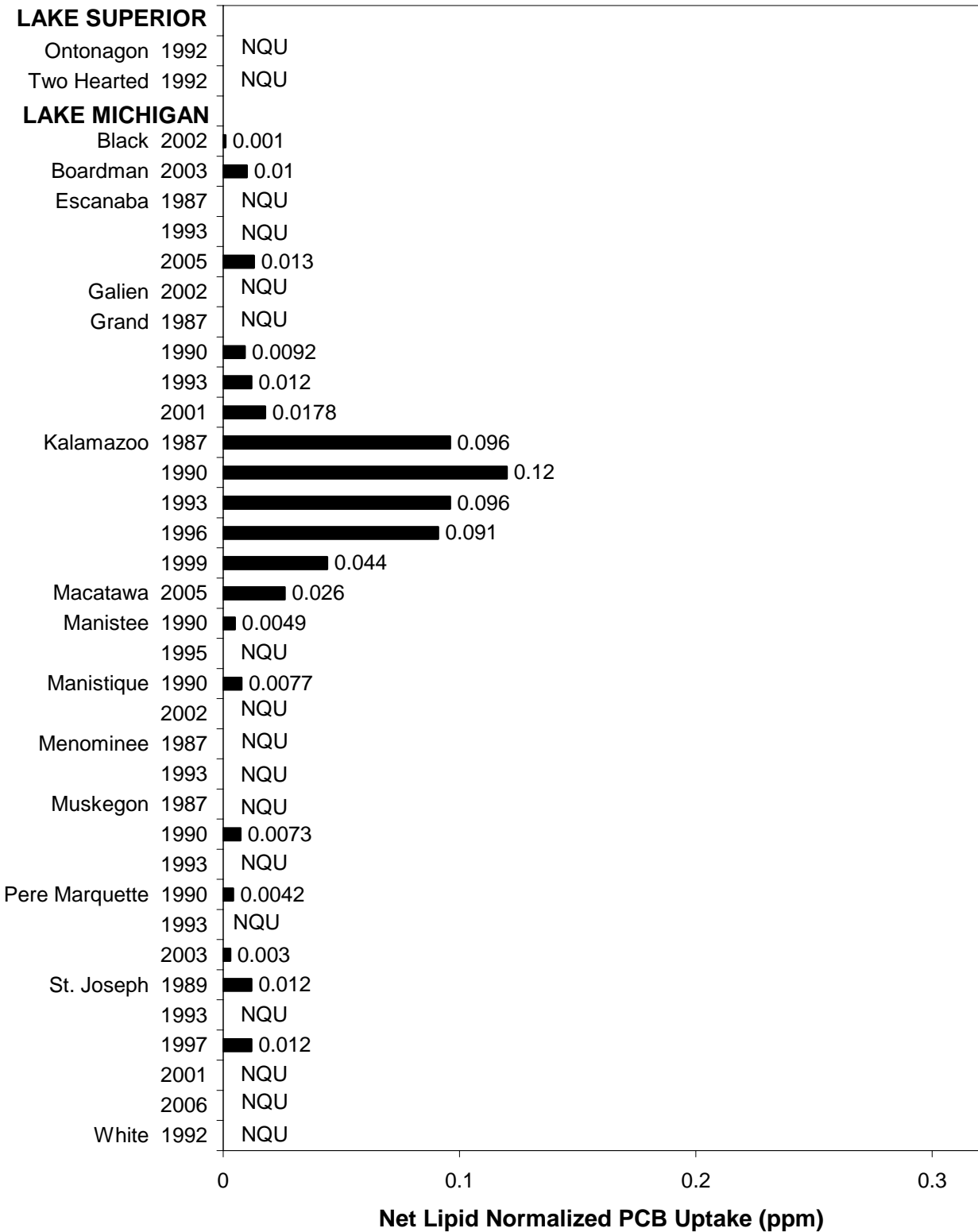


Figure 81. Net uptake of lipid normalized total PCB in caged fish from the mouths of selected Michigan rivers (NQU = no quantifiable uptake).

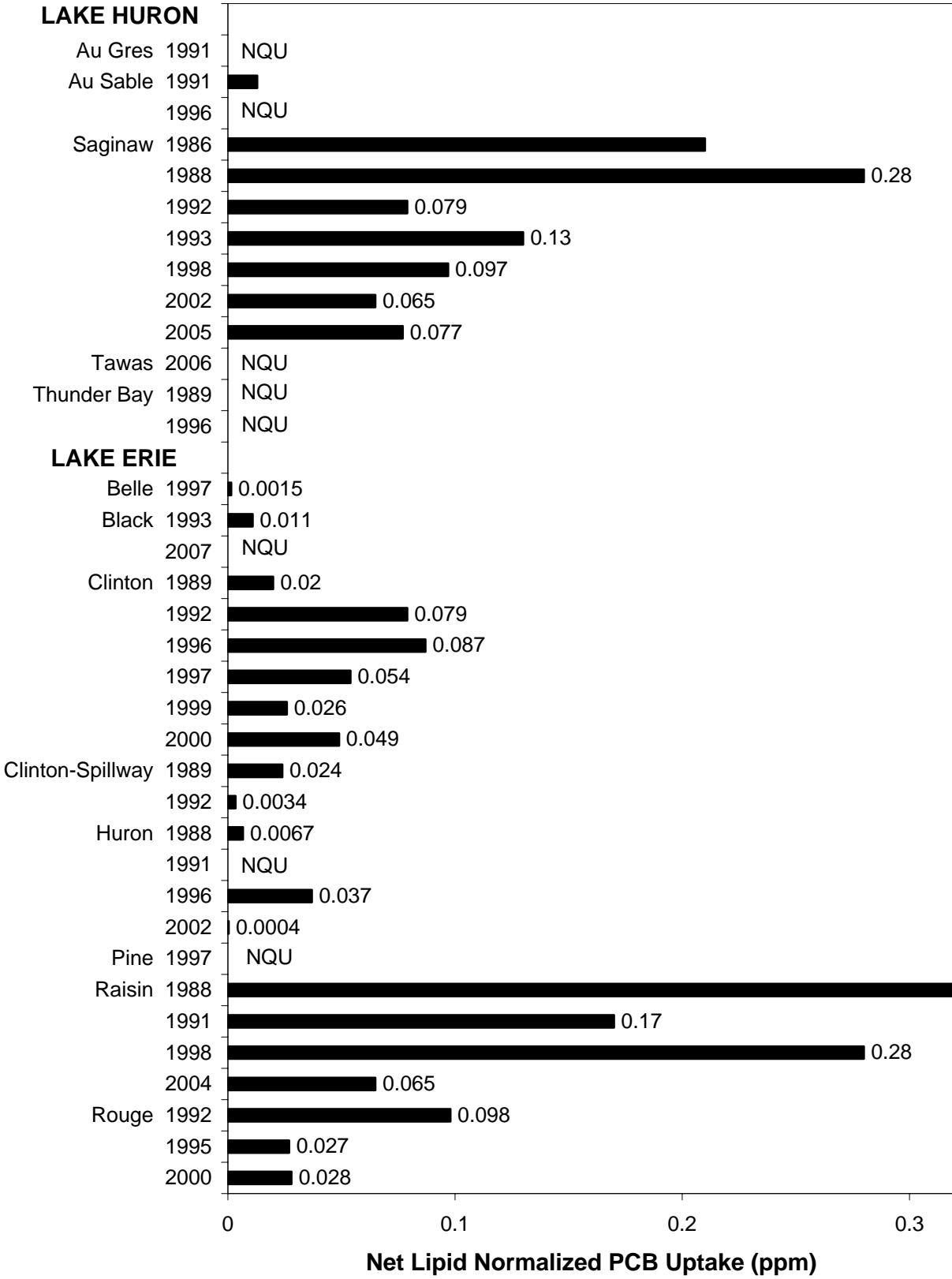


Figure 81. Continued

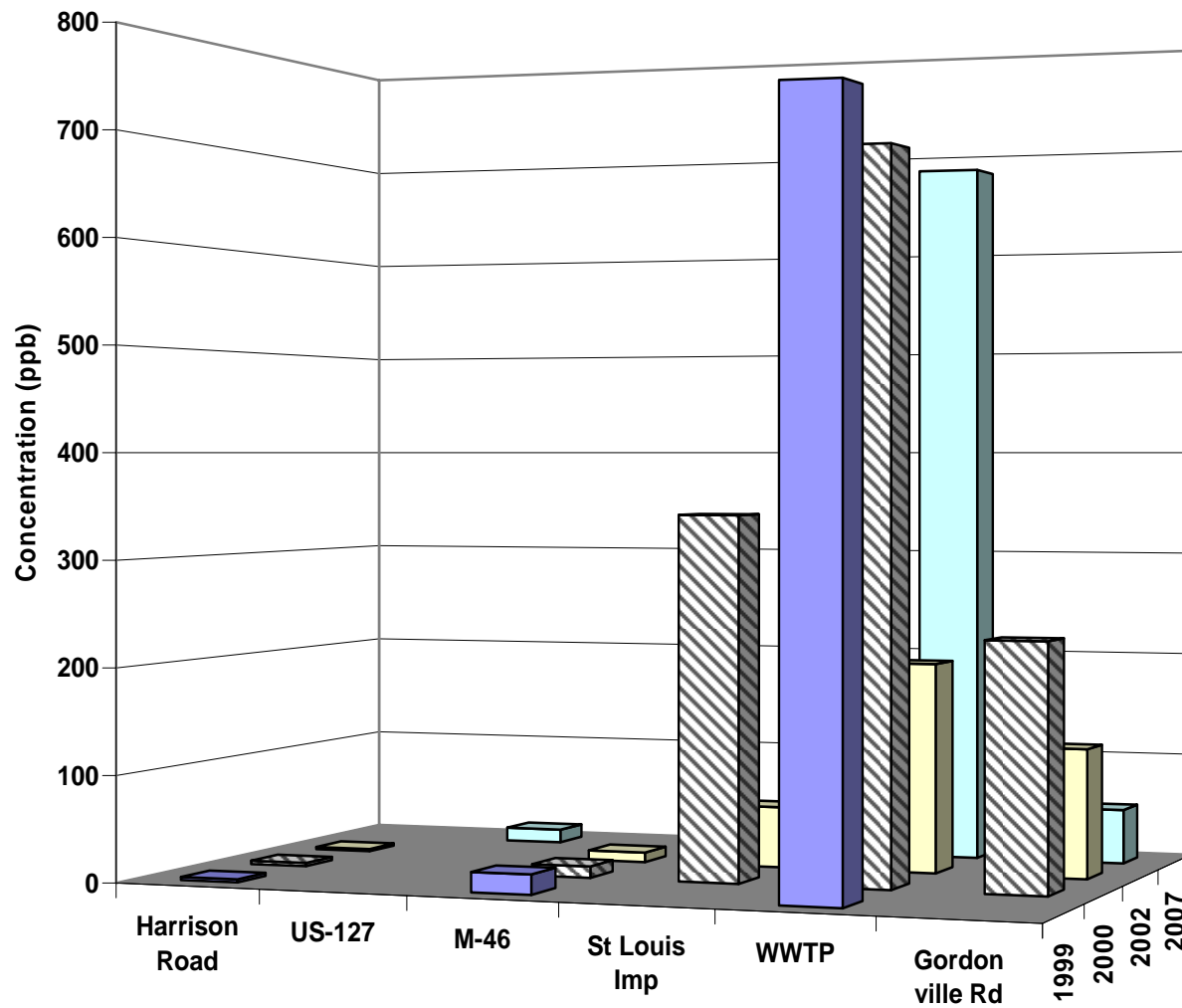


Figure 82. Comparison of mean net uptake of lipid-normalized total DDT across years at six sites on the Pine River.

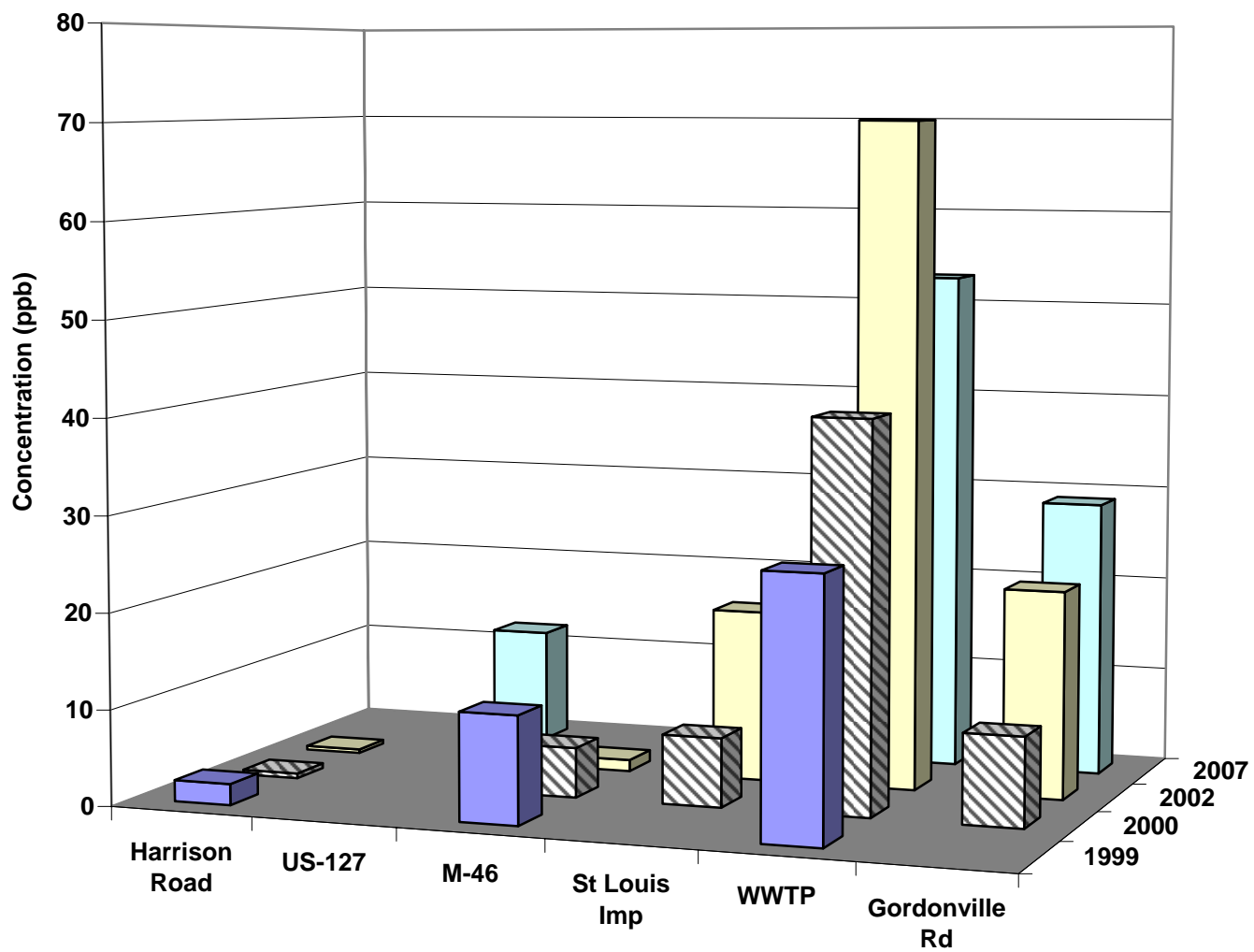


Figure 83. Comparison of mean net uptake of lipid-normalized total PCB across years at six sites on the Pine River.

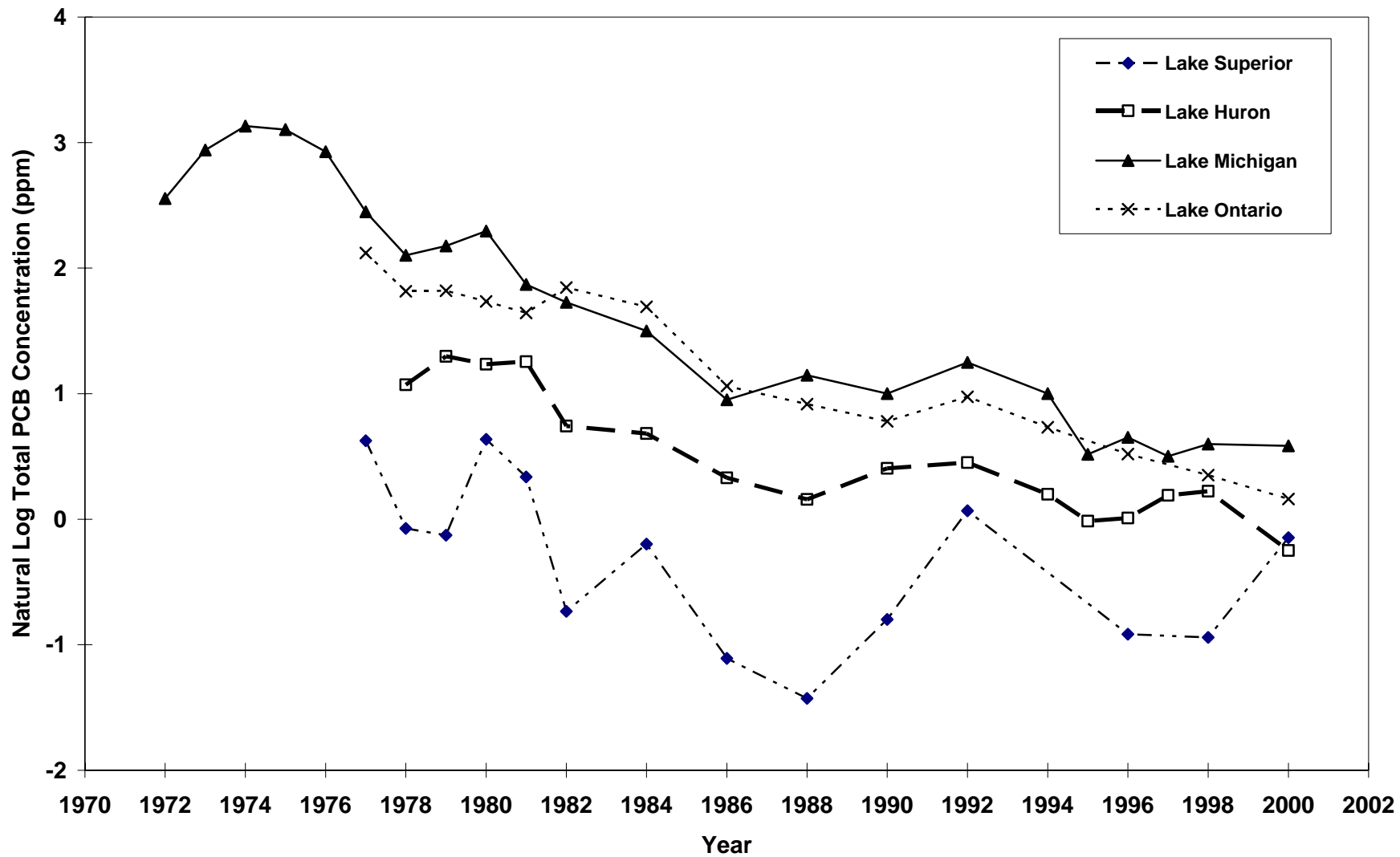


Figure 84. Natural log of average total PCB concentrations in whole lake trout from the Great Lakes, 1970-2000 (DeVault et al. 1996; USEPA unpublished data).

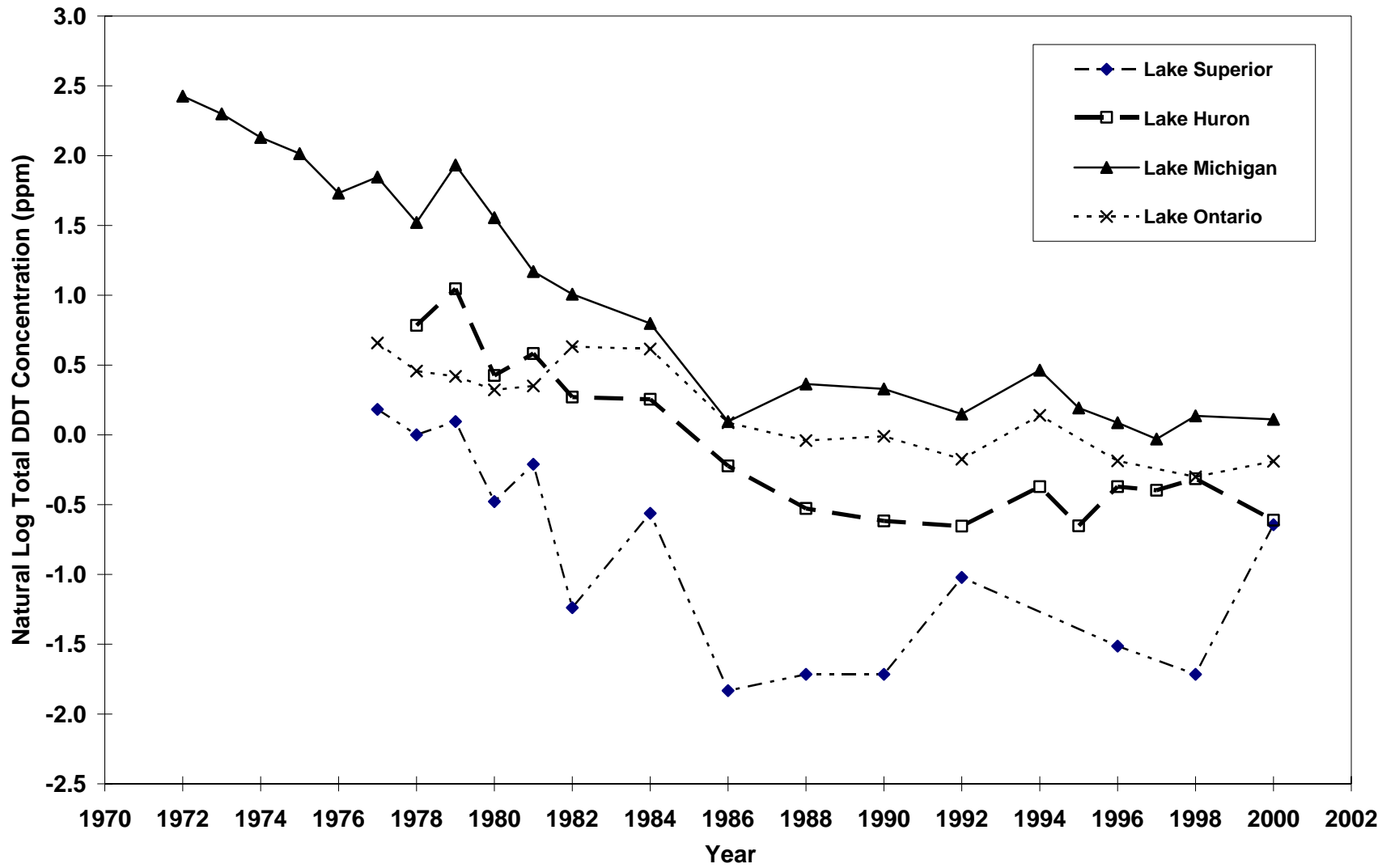


Figure 85. Natural log of average total DDT concentrations in whole lake trout from the Great Lakes, 1970-2000 (DeVault et al. 1996; USEPA unpublished data).

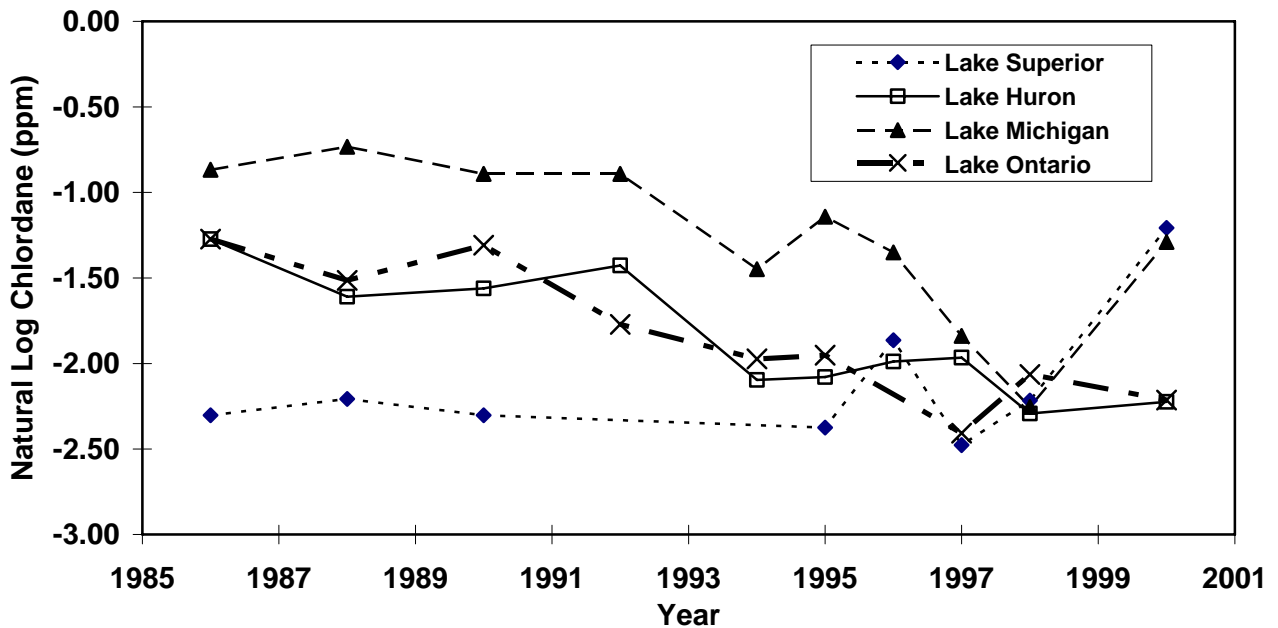


Figure 86. Natural log of average total chlordane concentrations in whole lake trout from the Great Lakes, 1986-2000 (DeVault et al. 1996, USEPA unpublished data).

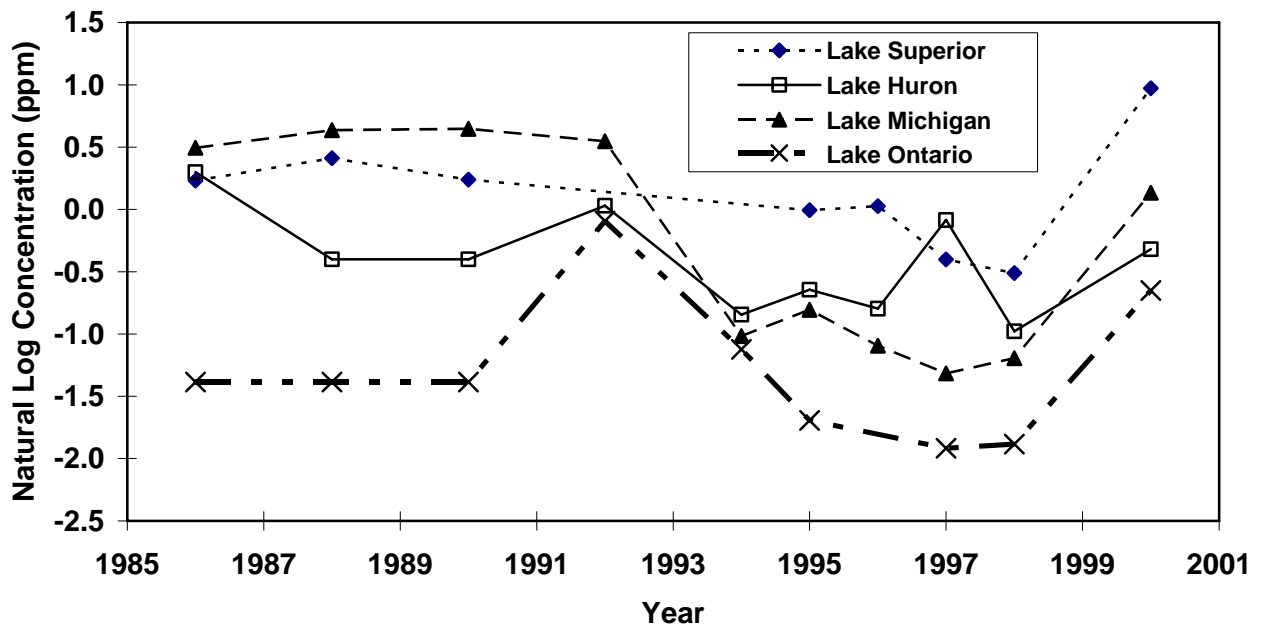


Figure 87. Natural log of average apparent toxaphene concentrations in whole lake trout from the Great Lakes, 1986-2000 (DeVault et al. 1996; USEPA unpublished data). Concentrations were below the quantification level in Lake Ontario fish collected between 1986 and 2000.

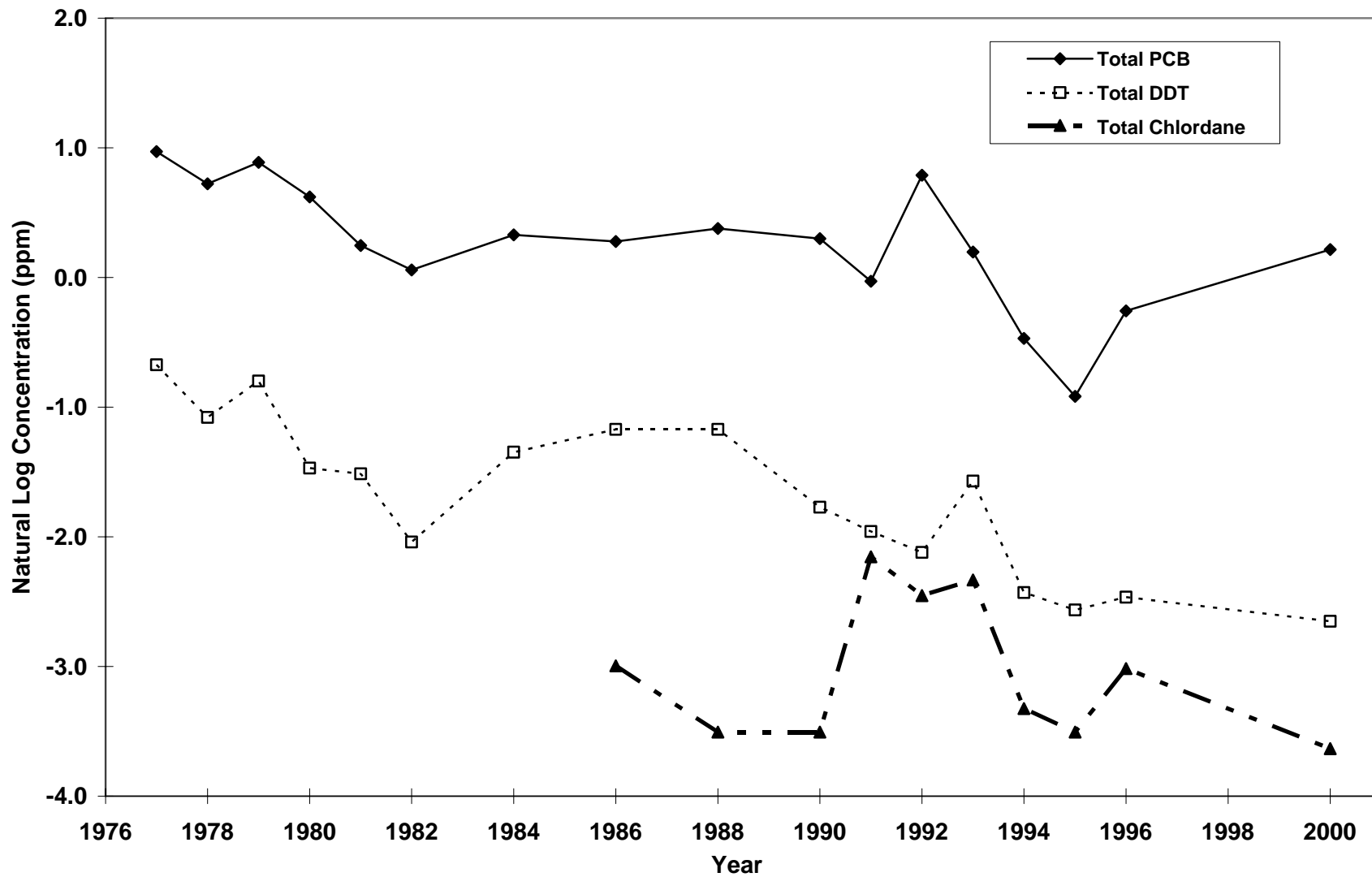


Figure 88. Natural log of average total PCB, total DDT, and total chlordane concentrations in whole walleye from Lake Erie 1986-2000 (DeVault et al. 1996; USEPA unpublished data).

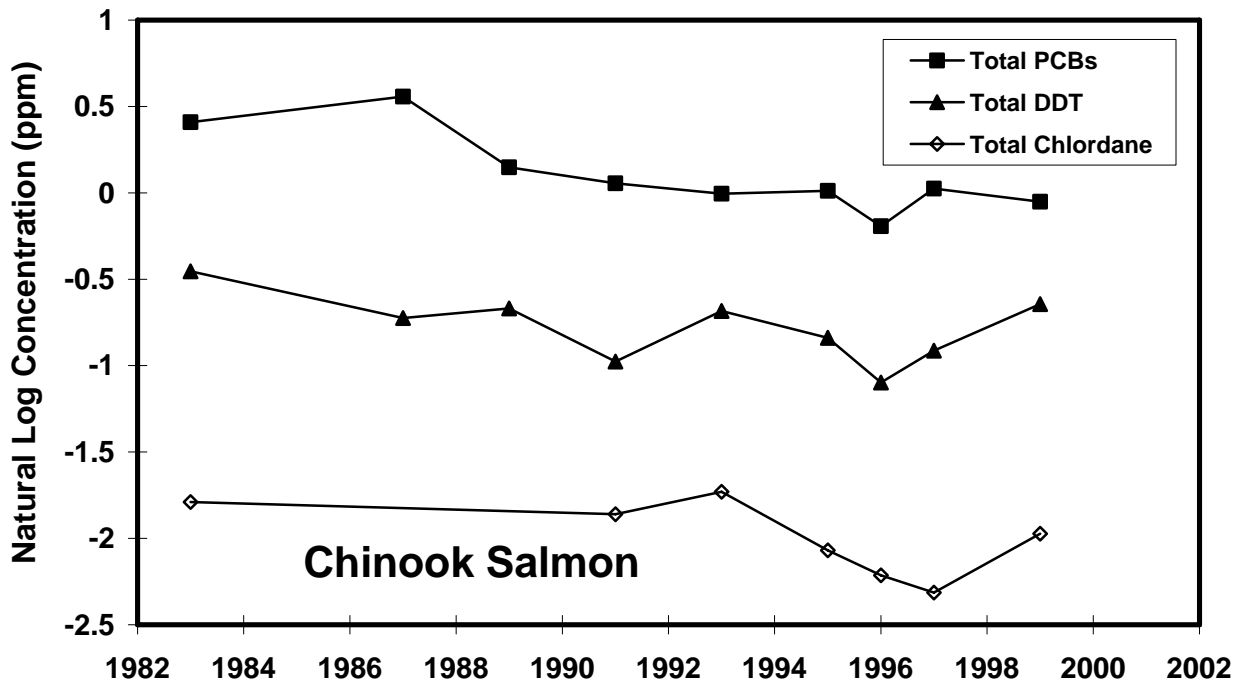


Figure 89. Natural log of average total PCB, total DDT, and total chlordane concentrations in coho and chinook salmon fillet samples from Lake Michigan.

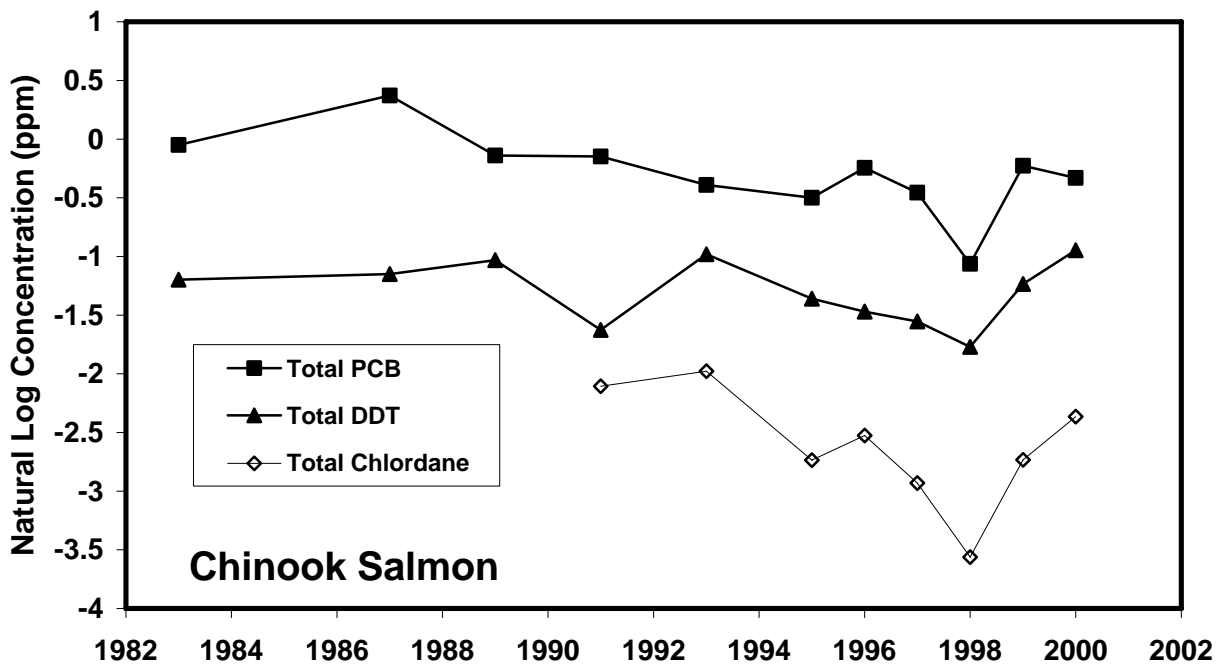


Figure 90. Natural log of average total PCB, total DDT, and total chlordane concentrations in coho and chinook salmon fillet samples from Lake Huron.

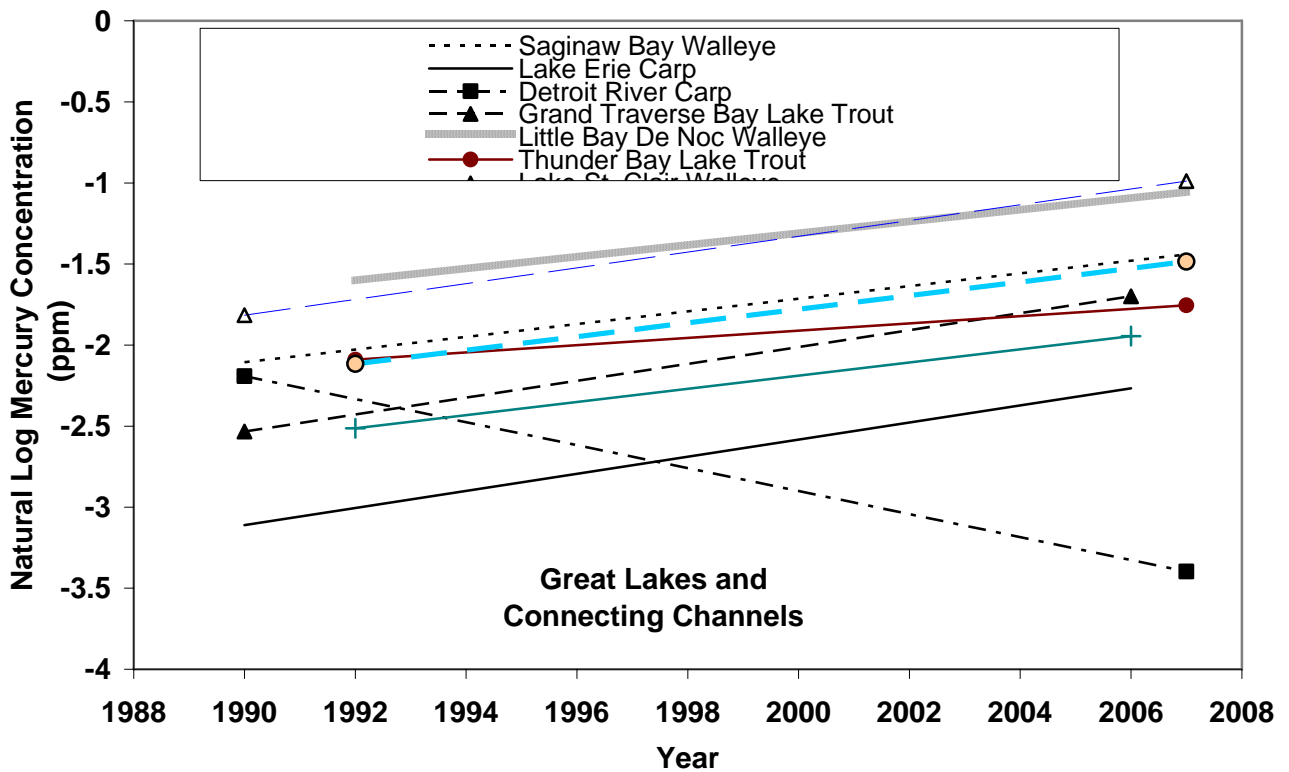
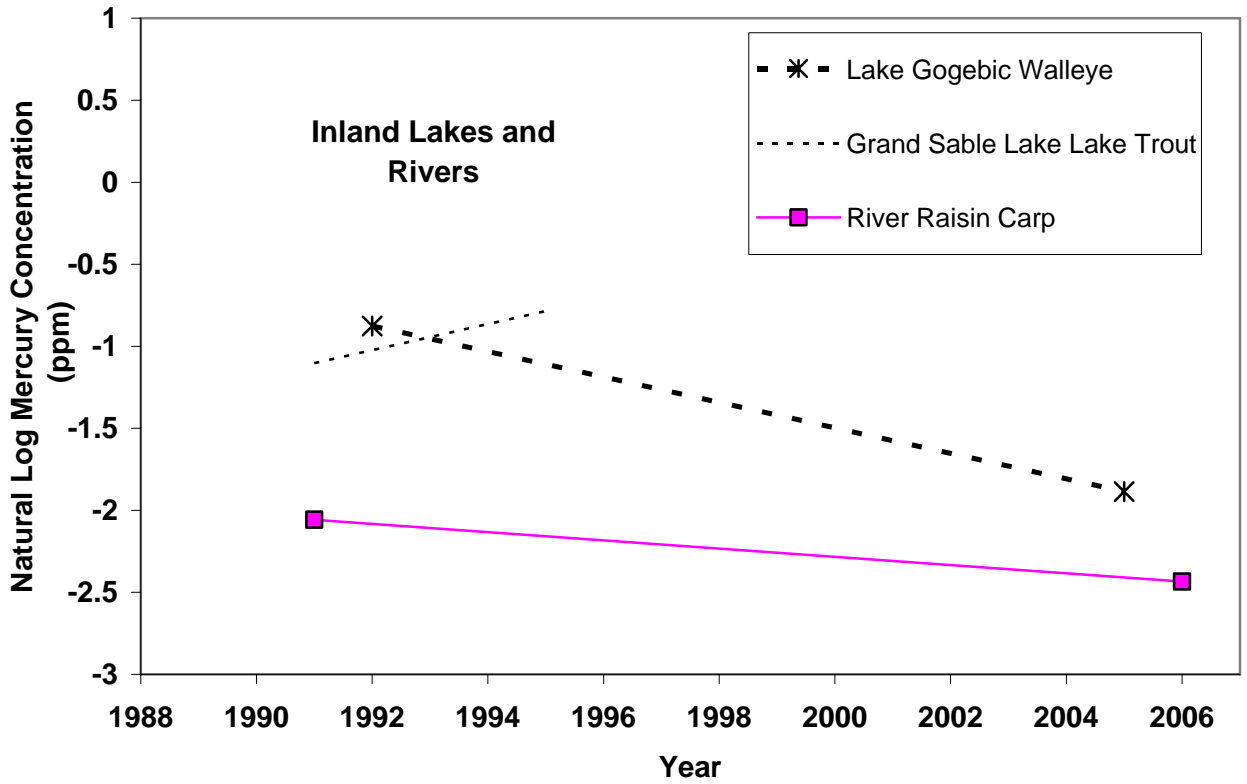


Figure 91. Temporal changes in mercury concentrations at selected whole fish trend monitoring sites.

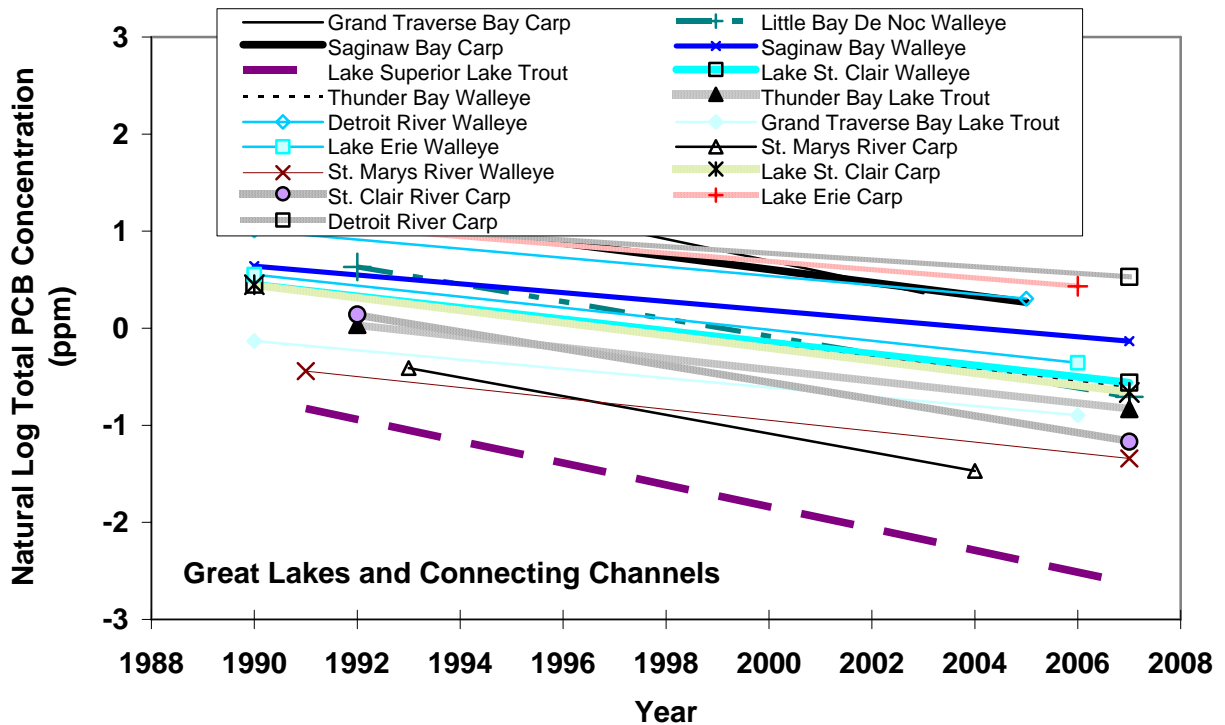
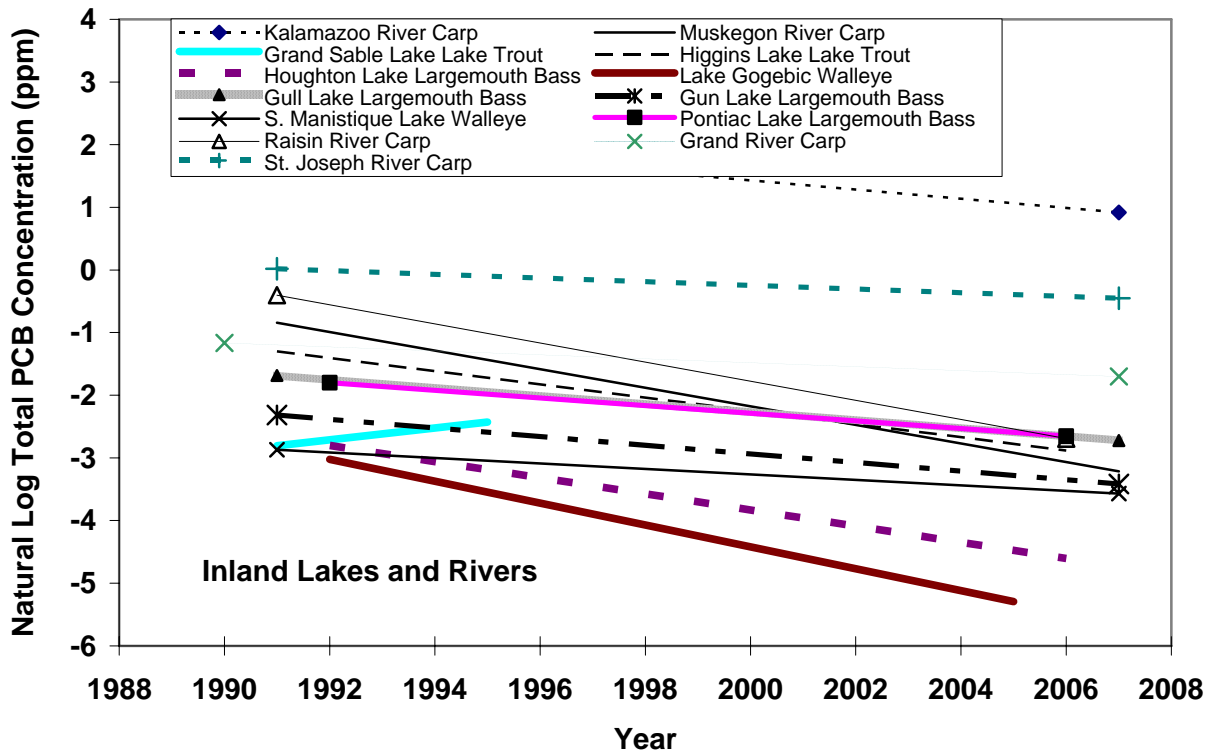


Figure 92. Temporal changes in total PCB concentrations at selected whole fish trend monitoring sites.

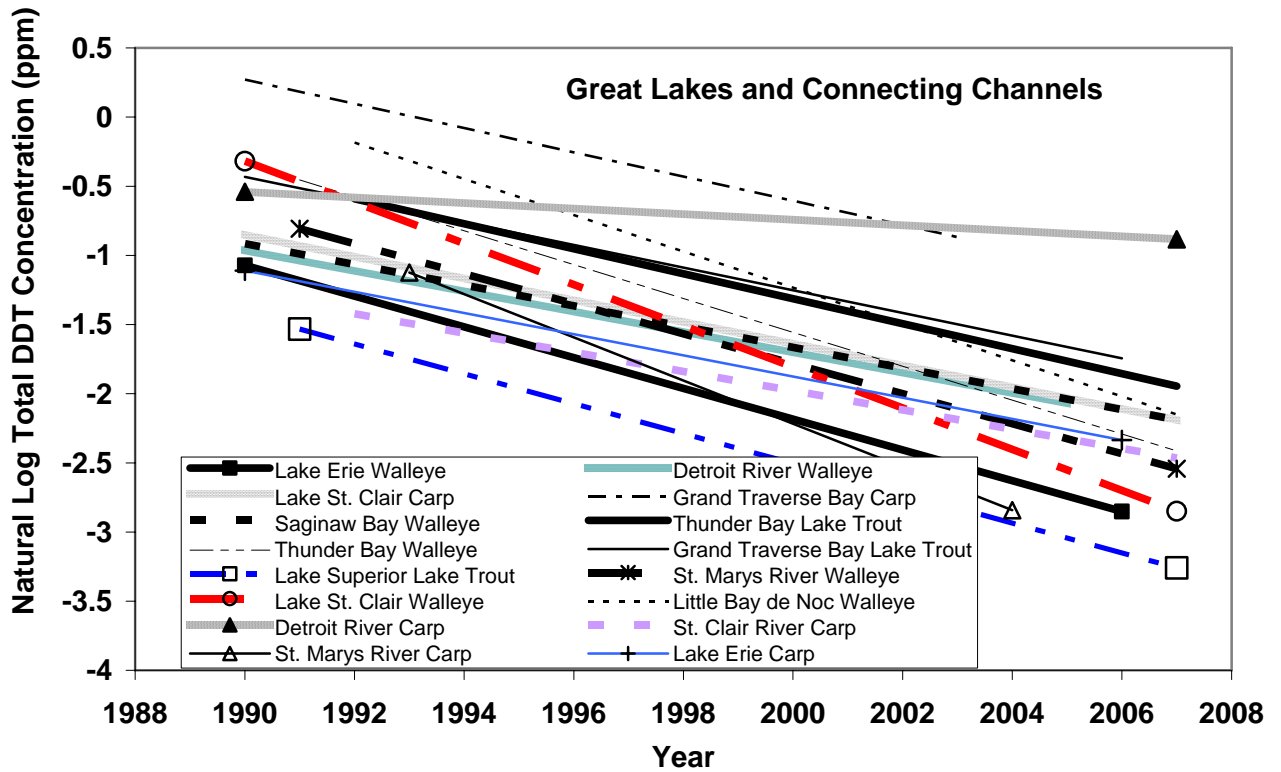
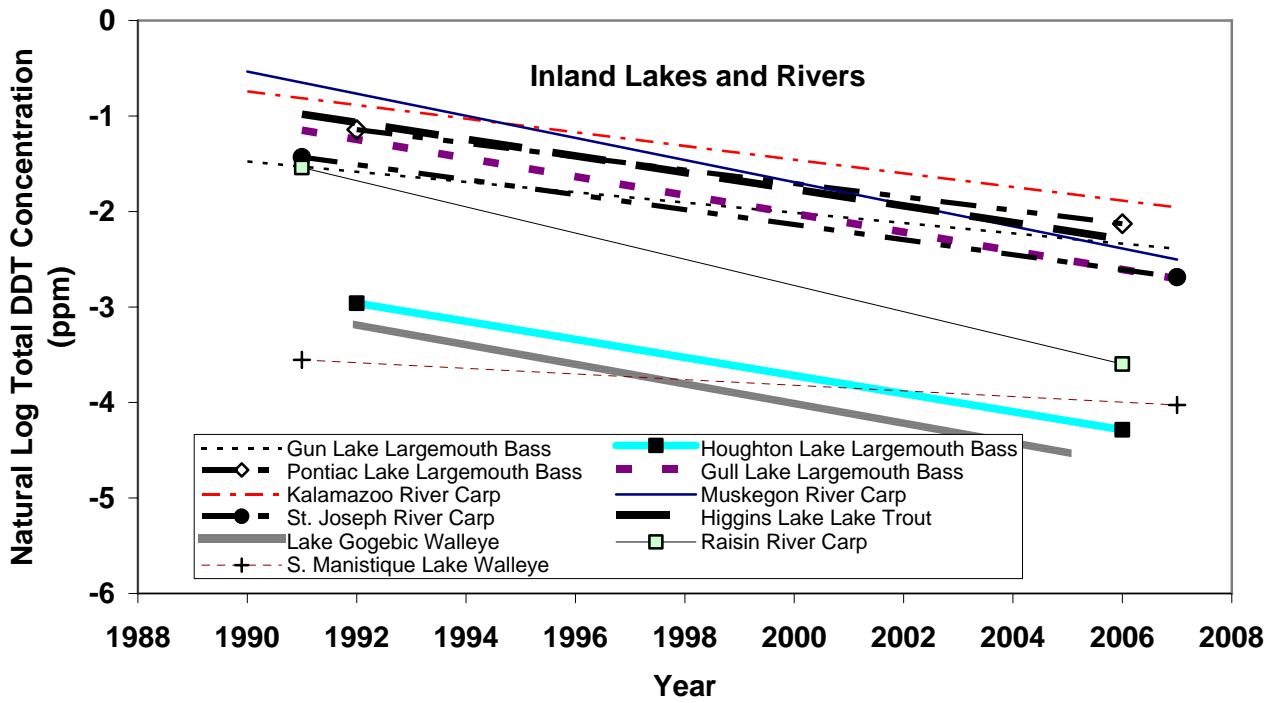


Figure 93. Temporal changes in total DDT concentrations at selected whole fish trend monitoring sites.

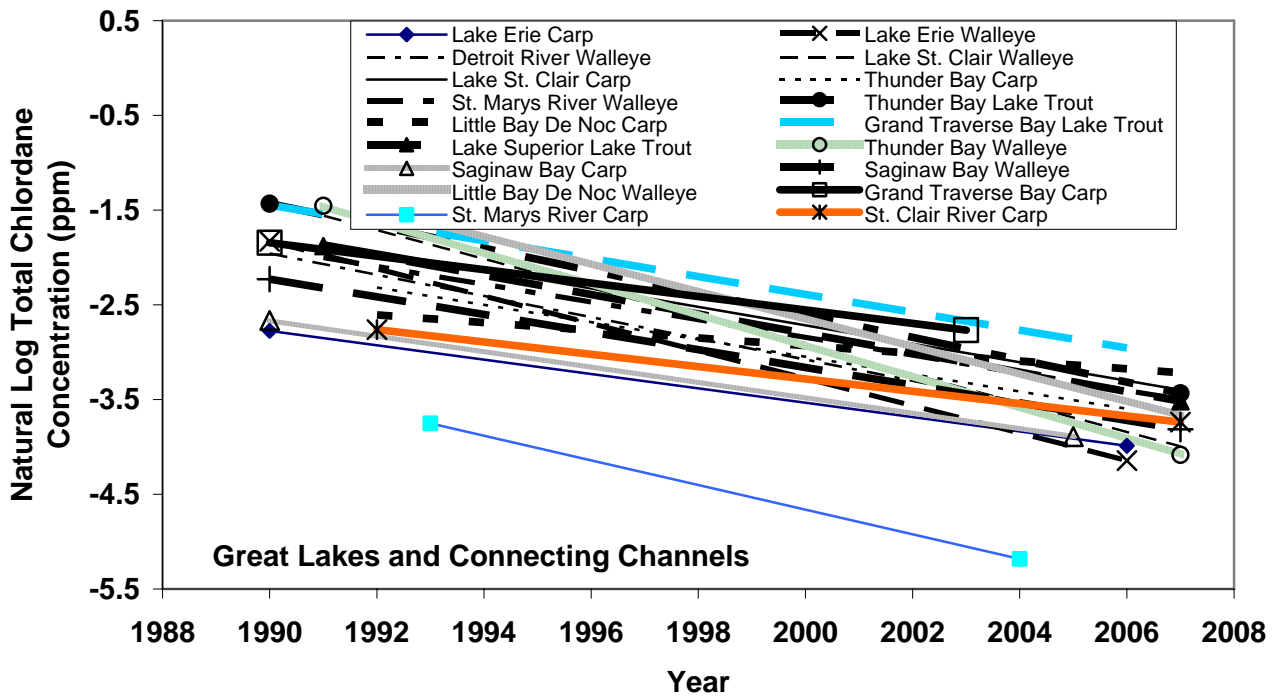
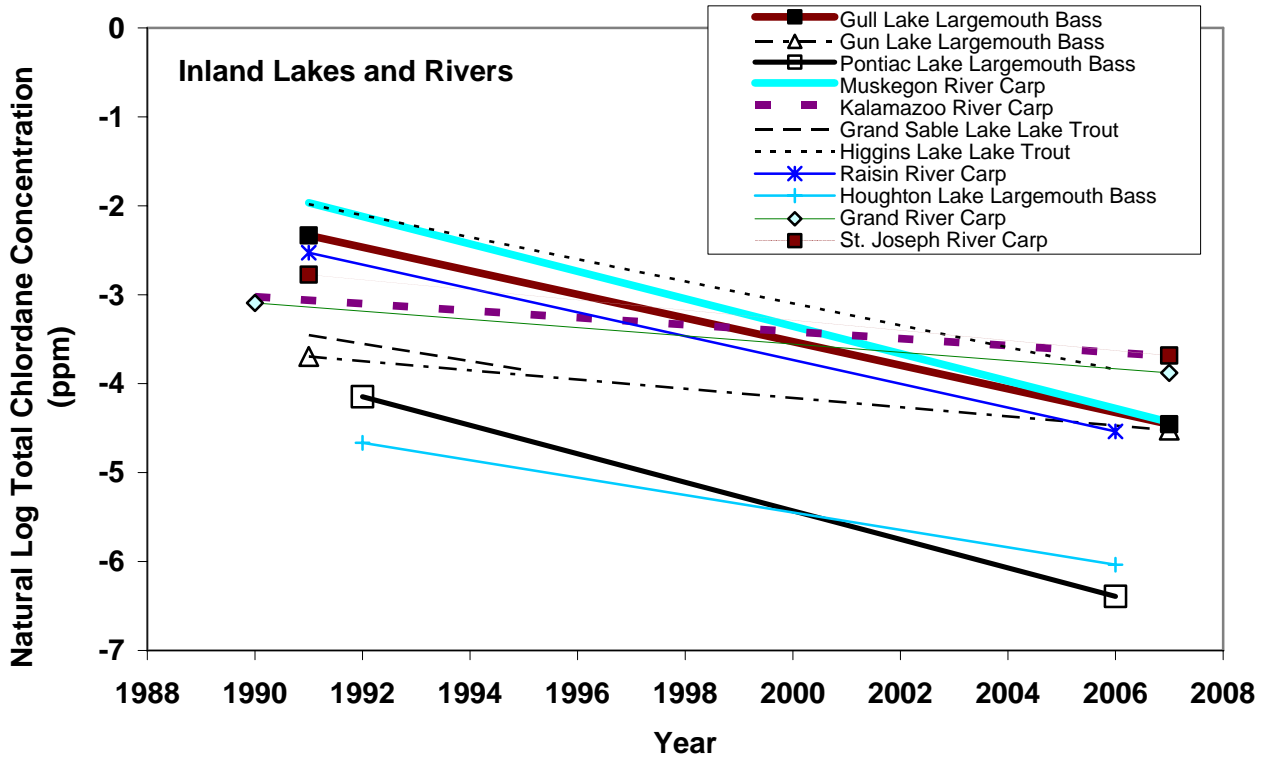


Figure 94. Temporal changes in total chlordane concentrations at selected whole fish trend monitoring sites.

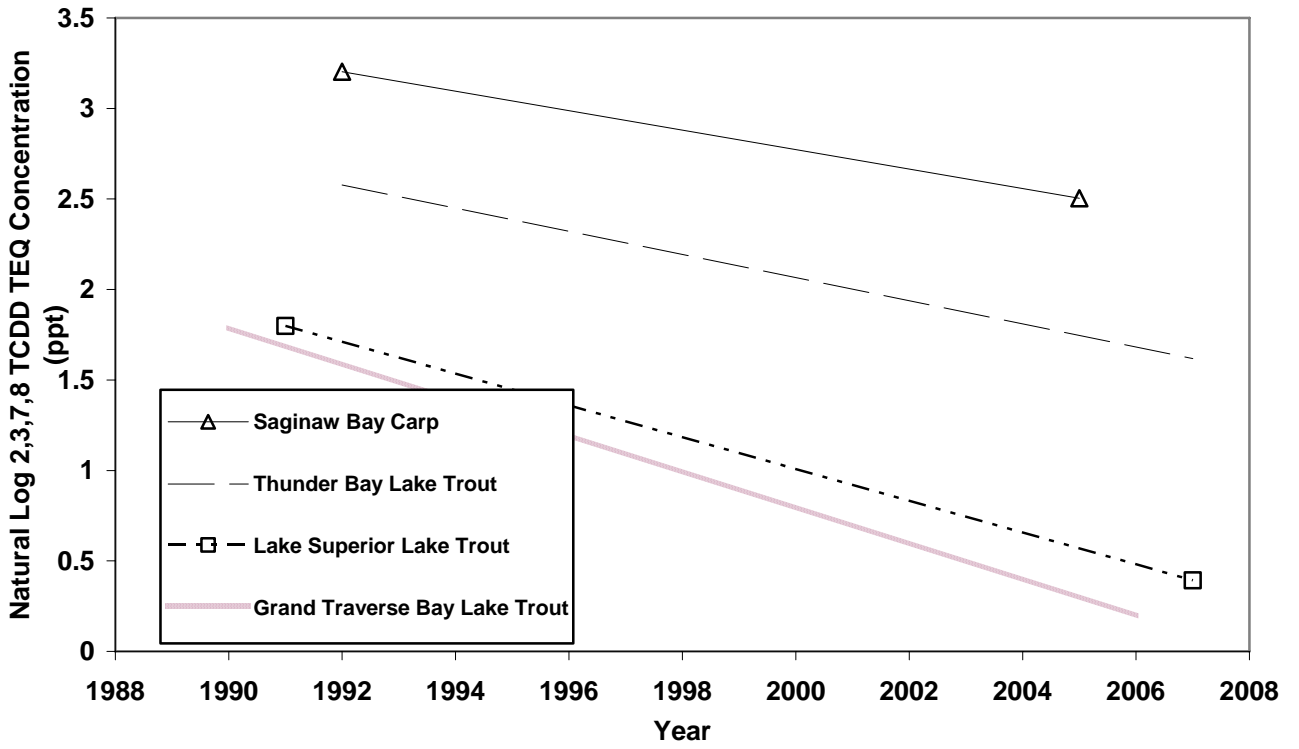


Figure 95. Temporal changes in 2,3,7,8 TCDD TEQ concentrations at selected whole fish trend monitoring sites.

Appendix A. Inventory of Fish Contaminant Monitoring Sites and Species; 1980-2006.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Adrian Lake	Lenawee County	90007	Jun/13/1990	Carp, Northern Pike
Antoine Lake	Dickinson County	88004	May/24/1988	Largemouth Bass, Smallmouth Bass, Walleye
Antoine Lake	Dickinson County	2005001	Nov/10/2005	Northern Pike, 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	2005002	Oct/03/2005	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
Au Train Lake	Alger County	2005003	Sep/12/2005	Walleye, Yellow Perch
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
Baldwin River	Near M-37	2003005	Jul/16/2003	Channel Catfish
Baldwin River	near M-37	2005004	Aug/18/2005	Brown Trout
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 Seven Lake (Seven Lakes)	Oakland County	2004133	May/18/2004	Largemouth Bass
Big Shag Lake	Marquette County	2001003	May/01/2001	Northern Pike

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Big South Branch Pere Marquette River	Walhalla Road	2003007	Jul/16/2003	Channel Catfish
Bills Lake	Newaygo County	88055	Oct/05/1988	Largemouth Bass, Walleye
Bird Lake	Hillsdale County	87019	May/27/1987	Bluegill, Northern Pike, Yellow Perch
Bishop Lake	Livingston County	87014	May/12/1987	Largemouth Bass, Northern Pike
Bishop Lake	Livingston County	89010	Jun/28/1989	Largemouth Bass, Northern Pike
Black Creek	Lenawee County	91005	Jun/13/1991	Carp
Black Creek	Maple Island Rd	2005006	Jun/29/2005	Channel Catfish
Black Creek	Mill Iron Rd	2005007	Jun/29/2005	Channel Catfish
Black Creek	Mouth	2005008	Jun/29/2005	Channel Catfish
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	d/s Crowell @ Sheridan Line Rd	2007001	Jul/25/2007	Channel Catfish
Black River	Mouth	2002007	Aug/02/2002	Channel Catfish
Black River	Port Huron, river mouth	93003	Aug/31/1993	Channel Catfish
Black River	Port Huron, river mouth	2007003	Jul/25/2007	Channel Catfish
Black River	Sanilac County, Croswell Impoundment	89017	Apr/20/1989	Carp
Black River	Sanilac County, Croswell Impoundment	2007263	Nov/08/2007	Carp
Black River	South Haven	92016	Aug/25/1992	Carp, Northern Pike
Black River	u/s Crowell off Old 51	2007004	Jul/25/2007	Channel Catfish
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
Blind Sucker Flooding	Luce County	2007207	Jun/19/2007	Yellow Perch
Boardman Lake	Grand Traverse County	91006	Sep/26/1991	Northern Pike, Walleye, White Sucker
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
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
Budd Lake	Clare Co	2007268	May/09/2007	Largemouth Bass
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
Caribou Lake	Chippewa County	2006006	Jun/13/2006	Rock Bass, Smallmouth Bass
Carney Lake	Dickinson County	89031	May/08/1989	Northern Pike, Walleye
Carp Creek	u/s Deer Lake	2005013	Aug/25/2005	Brook Trout, White Sucker
Carp Lake	Chippewa County	87089	Oct/23/1987	Northern Pike, Walleye

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Above Caro	2005014	Aug/09/2005	Redhorse Sucker, Rock Bass
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	Caro Impoundment	2006104	Jul/13/2006	Carp, Largemouth Bass
Cass River	d/s Caro	2006093	Jan/13/2006	Channel Catfish
Cass River	d/s Cass City WWTP	2006094	Jul/13/2006	Channel Catfish
Cass River	d/s Frankenmuth	2006092	Jul/13/2006	Channel Catfish
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	Saginaw County, M-13	2006091	Jul/13/2006	Channel Catfish
Cass River	Tuscola County, above Frankenmuth	88009	Jun/07/1988	Redhorse Sucker, Rock Bass, Smallmouth Bass
Cass River	u/s Cass City WWTP	2006122	Jul/13/2006	Channel Catfish
Cedar Lake	Alcona County	90067	Oct/09/1990	Largemouth Bass, Northern Pike
Cedar River	Antrim County	1998020	Aug/17/1998	Brown Trout, White Sucker
Chaney Lake	Gogebic County	87037	Jun/08/1987	Black Crappie, Northern Pike
Chaney Lake	Gogebic County	93049	Jun/03/1993	Northern Pike, Yellow Perch
Chaney Lake	Gogebic County	1998147	Oct/01/1998	Northern Pike, Walleye
Chaney Lake	Gogebic County	2000003	Apr/26/2000	Northern Pike, Walleye, Yellow Perch
Cheboyganing Creek	Saginaw County	89058	Aug/02/1989	Carp, Northern Pike
Cheboyganing Creek	Saginaw County	94035	Aug/01/1994	Carp
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	u/s Pine confluence	2007005	Jul/25/2007	Channel Catfish

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Chippewa River	Upstream of Lake Isabella, Roland/Drew	97005.2	Aug/13/1997	Rock Bass
Chippewa River	Upstream of Lake Isabella, Wyman Road	97005.1	Aug/13/1997	Carp, White Sucker
Cisco Lake	Gogebic County, Cisco Lake Chain	88030	Jul/11/1988	Northern Pike, Walleye
Cisco Lake	Gogebic County, Cisco Lake Chain	95031	Aug/14/1995	Bluegill, Walleye
Cisco Lake	Gogebic County, Cisco Lake Chain	1999005	Apr/19/1999	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
Clinton River	Macomb County, Mt. Clemens	86015	Jun/16/1986	Carp, Largemouth Bass, Smallmouth Bass, Walleye
Clinton River	Moravian/Belleview Road	2000013	Aug/28/2000	Channel Catfish
Clinton River	Mt. Clemens, City Park	2001115	Aug/29/2001	Channel Catfish
Clinton River	Mt. Clemens, Firehouse	2001117	Aug/29/2001	Channel Catfish
Clinton River	Mt. Clemens, Market Street	97006	Sep/17/1997	Channel Catfish
Clinton River	Mt. Clemens, river mouth	89023.1	Aug/29/1989	Channel Catfish
Clinton River	Mt. Clemens, river mouth	92003.1	Aug/17/1992	Channel Catfish
Clinton River	Mt. Clemens, river mouth	96005	Aug/20/1996	Channel Catfish
Clinton River	Mt. Clemens, river mouth	97008	Sep/17/1997	Channel Catfish
Clinton River	Mt. Clemens, river mouth	1999069	Aug/06/1999	Channel Catfish
Clinton River	Mt. Clemens, river mouth	2000016	Aug/28/2000	Channel Catfish
Clinton River	Opdyke Road	2000008	Aug/28/2000	Channel Catfish
Clinton River	Ryan Road, Utica	84014	Sep/23/1984	Carp, White Sucker
Clinton River	Ryan Road, Utica	94003	May/25/1994	Carp, Rock Bass, White Sucker
Clinton River	Ryan Road, Utica	1999073	Aug/06/1999	Channel Catfish
Clinton River	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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
Coldwater River	Union City	2003019	Jul/16/2003	Channel Catfish
Craig Lake	Baraga County	89074	Aug/23/1989	Walleye
Craig Lake	Baraga County	91028	Jun/04/1991	Northern Pike, Walleye
Craig Lake	Baraga County	2005015	Nov/08/2005	Black Crappie, Northern Pike, Walleye, White Sucker
Cranberry Lake	Clare Co	2007212	May/23/2007	Largemouth Bass
Crego Park Pond	Lansing	86033	Jul/29/1986	Black Bullhead, Bluegill, Goldfish
Crockery Lake	Ottawa County	2006009	Jun/06/2006	Largemouth Bass
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
Dead River	Forestville Basin	2005017	Jun/01/2005	Northern Pike, 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
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, Grand River u/s 6th St	2003601	Sep/20/2003	Control
DEQ Control	DEQ Control, Kalamazoo River at Trowbridge	2004603	Aug/26/2003	Control
DEQ Control	DEQ Control, Kalamazoo River at Trowbridge	2006603	Aug/26/2003	control
DEQ Control	DEQ Control, Kalamazoo River at Trowbridge	2007603	Jan/01/2008	Control
DEQ Control	DEQ Control, Lake Huron at Tawas Bay	2006602	Aug/19/2003	control
DEQ Control	DEQ Control, Lake Huron at Tawas Bay	2007601	Jan/01/2007	Control

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
DEQ Control	DEQ Control, Lake Huron at Tawas Bay	2007602	Jan/01/2007	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	Grassy Island	2005018	Jun/22/2005	Walleye
Detroit River	Grassy Island	2007100	Jun/30/2007	Carp
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	Michigan waters	2005200	Jan/01/2005	Lake Sturgeon
Detroit River	Trenton Channel	90032	Aug/30/1990	Carp, Freshwater Drum, Walleye
Detroit River	Trenton Channel	93020	Sep/01/1993	Freshwater Drum, Northern Pike, Redhorse Sucker, Yellow Perch
Detroit River	Wyandotte	1999007	Oct/29/1999	Walleye
Dinner Lake	Gogebic County	2004024	Jun/11/2004	Black Crappie, Largemouth Bass, Northern Pike, Smallmouth Bass, Walleye
Dodge Lake	Schoolcraft County	2006121	Jun/14/2006	Largemouth Bass, Northern Pike
Dowagiac Creek	Dutch Settlement Road, u/s LaGrange Lake	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
East Bass Lake	Marquette County	2007202	Jun/05/2007	Northern Pike
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
Elk Lake	Grand Traverse/Antrim County	2006012	Apr/11/2006	Brown Trout, Lake Trout, Northern Pike, Walleye
Ellsworth Lake	Antrim County	85065	Nov/27/1985	Bluegill, Largemouth Bass, Northern Pike, Rock Bass, Yellow Perch

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Ellsworth Lake	Antrim County	86009	May/28/1986	Largemouth Bass, Northern Pike, White Sucker
Ellsworth Lake	Antrim County	94063	Jun/09/1994	Brown Bullhead, Largemouth Bass, White Sucker
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	CR 420	2005122	Jun/29/2005	Channel Catfish
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	Escanaba, river mouth	2005121	Jun/29/2005	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
Fawn River	St. Joseph County, Stubey Road	2005019	Sep/14/2005	Carp, Smallmouth 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	Belding downstream WWTP	2003028	Aug/20/2003	Channel Catfish
Flat River	Belding upstream WWTP	2003027	Aug/20/2003	Channel Catfish
Flat River	Fallasberg Park, downstream of Fallasberg Dam	1998035	Oct/27/1998	Carp
Flat River	Greenville downstream WWTP	2003026	Aug/20/2003	Channel Catfish
Flat River	Greenville upstream WWTP	2003025	Aug/20/2003	Channel Catfish
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	Lowell downstream WWTP	2003030	Aug/20/2003	Channel Catfish
Flat River	Lowell upstream WWTP	2003029	Aug/20/2003	Channel Catfish

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Flat River	Miller Rd, upstream of Greenville	2003032	Jul/29/2003	Rock Bass, White Sucker
Fletcher Pond	Alpena County	2005020	May/16/2005	Northern Pike
Flint River	Above Flint @ Bray	2003036	Aug/21/2003	Channel Catfish
Flint River	Below Flint	2003033	Aug/21/2003	Channel Catfish
Flint River	Birch Run Road	93005	Aug/30/1993	Carp
Flint River	Downstream Ragnone WWTP	2003038	Aug/21/2003	Channel Catfish
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	Klam Road	2003034	Aug/21/2003	Channel Catfish
Flint River	M-15	2003035	Aug/21/2003	Channel Catfish
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
Flint River	Saginaw County, river mouth	2003039	Aug/21/2003	Channel Catfish
Flint River	Upstream Ragnone WWTP	2003037	Aug/21/2003	Channel Catfish
Fortune Lake	Iron County	90012	May/29/1990	Largemouth Bass, Smallmouth Bass
Four Mile Lake	Washtenaw County	2000022	May/12/2000	Northern Pike
Fremont Lake	Newaygo County	90062	Oct/26/1990	Carp
Fremont Lake	Newaygo County	2005021	Jun/22/2005	Carp, Largemouth Bass
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
Galien River	New Buffalo	2007215	Sep/18/2007	Carp
Gaylanta Lake	Montmorency County	2003040	May/08/2003	Northern Pike
Glen Lake	Leelanau County	90053	Oct/18/1990	Lake Trout, Smallmouth Bass
Glen Lake	Leelanau County	2007216	Apr/17/2007	Lake Trout, Rainbow Trout
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
Gourdneck Lake	Kalamazoo County	2005126	May/26/2005	Northern Pike
Grand Lake	Presque Isle County	95015	May/22/1995	Rock Bass, Smallmouth Bass, Walleye
Grand River	at Ionia	2006103	Jul/11/2006	Carp, Channel Catfish, Redhorse Sucker, 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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Channel Catfish, Northern Pike, Smallmouth Bass, Walleye
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	Grand Rapids, below 6th Street dam	2007300	Jun/18/2007	Northern Pike
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, above 6th St. Dam	2005023	Jul/14/2005	Carp
Grand River	Kent County, above 6th St. Dam	2007101	Sep/11/2007	Carp
Grand River	Kent County, below Grand Rapids	90029	Aug/23/1990	Carp
Grand River	Kent County, below Grand Rapids	91036	Mar/20/1991	Walleye
Grand River	M-21	2001018	Jul/23/2001	Channel Catfish
Grand River	Maple Grove Road	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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Gratiot Lake	Keweenaw County	87038	Jan/01/1987	Rock Bass, Smallmouth Bass
Gratiot Lake	Keweenaw County	2005025	May/25/2005	Northern Pike, Smallmouth Bass, Walleye
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
Gull Lake	Kalamazoo County	2005026	Aug/09/2005	Largemouth Bass
Gull Lake	Kalamazoo County	2007102	May/29/2007	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
Gun Lake	Barry County	2005027	Jul/07/2005	Largemouth Bass
Gun Lake	Barry County	2006014	Jun/01/2006	Largemouth Bass
Gun Lake	Barry County	2007103	Jun/01/2007	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
Hanbury Lake	Dickinson County	2005028	May/02/2005	Largemouth Bass
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
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
Higgins Lake	Roscommon County	2005030	Oct/12/2005	Lake Trout
Hopkins Lake	Shiawassee County	91033	Sep/04/1991	Largemouth Bass
Houghton Lake	Roscommon County	87063	Aug/05/1987	Carp, Northern Pike, Walleye

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
Houghton Lake	Roscommon County	2006016	May/24/2006	Largemouth Bass
Hubbard Lake	Alcona County	89076	Oct/16/1989	Northern Pike, Walleye
Hubbard Lake	Alcona County	2006017	May/10/2006	Walleye, White Sucker
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	Ford Lake	2006018	May/16/2006	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	Above Otsego City Dam	2006164	Sep/05/2006	Carp
Kalamazoo River	Below Lake Allegan Dam	1999020	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Otsego Dam	1999023	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Trowbridge Dam, 26th St. Bridge	1999022	Sep/08/1999	Channel Catfish
Kalamazoo River	Ceresco (12 Mile Road)	1999099	Sep/08/1999	Channel Catfish
Kalamazoo River	Ceresco (12 Mile Road)	2000114	Oct/04/2000	Channel Catfish
Kalamazoo River	Ceresco Impoundment, 12 Mile Road	1999082	Oct/07/1999	Carp, Smallmouth Bass
Kalamazoo River	Ceresco Impoundment, 12 Mile Road	2000120	Sep/21/2000	Carp, Smallmouth Bass
Kalamazoo River	Ceresco Impoundment, 12 Mile Road	2001042	Oct/11/2001	Carp, Smallmouth Bass
Kalamazoo River	Ceresco Impoundment, 12 Mile Road	2006160	Aug/08/2006	Carp, Smallmouth Bass

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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 Dam	2006167	Sep/07/2006	Carp, Channel catfish, 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	Kalamazoo Lake	2006170	Sep/29/2006	Carp
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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Kalamazoo River	Lake Allegan	2001053	Aug/23/2001	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Lake Allegan	2001056	Aug/23/2001	Carp
Kalamazoo River	Lake Allegan	2003147	Jun/07/2003	Carp
Kalamazoo River	Lake Allegan	2005036	Jun/16/2005	Carp
Kalamazoo River	Lake Allegan	2006168	Sep/27/2006	Carp, Channel Catfish, Smallmouth Bass
Kalamazoo River	Lake Allegan	2007105	Jun/01/2007	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	Morrow Pond	2006161	Aug/29/2006	Carp, 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	Mosel Avenue	2006162	Sep/20/2006	Carp, 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	New Richmond	2006169	Oct/03/2006	Carp, Channel Catfish, 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	Otsego Dam Impoundment	2006165	Sep/19/2006	Carp
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 Dam Reservoir	2006163	Sep/22/2006	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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Kalamazoo River	Trowbridge Dam Impoundment	2003142	Aug/18/2003	Carp, Smallmouth Bass
Kalamazoo River	Trowbridge Dam Impoundment	2004143	Aug/25/2004	Carp
Kalamazoo River	Trowbridge Dam Impoundment	2006166	Sep/06/2006	Carp, Channel Catfish, 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
King Lake	Baraga County	2005037	Apr/30/2005	Largemouth Bass
Kingston Lake	Alger County	2003047	May/29/2003	Largemouth Bass, Muskellunge, Smallmouth Bass, Walleye
Klinger Lake	St. Joseph County	90034	Oct/02/1990	Largemouth Bass
Klinger Lake	St. Joseph County	2001145	Aug/22/2001	Largemouth Bass
Klinger Lake	St. Joseph County	2006126	Dec/05/2006	Northern Pike
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 Charlevoix	Charlevoix County	2006023	Apr/19/2006	Walleye, White Sucker
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	Brest Bay	2006027	Apr/24/2006	Carp, 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	N. Maumee Bay	2006025	Sep/26/2006	Carp, Largemouth Bass, Yellow Perch
Lake Erie	N. Maumee Bay	2006225	Sep/26/2006	Gizzard Shad
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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Lake Erie	Off Monroe	2006099	Apr/24/2006	Carp, Freshwater Drum, Smallmouth Bass, White Bass, Yellow Perch
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 Gogebic	Gogebic/Ontonagon County	2005040	Jun/10/2005	Walleye
Lake Hudson	Lenawee County	89003	Apr/03/1989	Carp, Muskellunge, Northern Pike
Lake Hudson	Lenawee County	2000032	Jul/21/2000	Carp, Largemouth 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
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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	2005042	Oct/14/2005	Carp, Walleye
Lake Huron	Saginaw Bay	2007107	Sep/04/2007	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, Charity Island	2007270	Sep/04/2007	Freshwater Drum
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
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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Lake Huron	Saginaw Bay, Wildfowl Bay	85063	Sep/25/1985	Carp
Lake Huron	Saginaw Bay, Wildfowl Bay	85064	Apr/26/1985	Carp, Channel Catfish
Lake Huron	Saginaw Bay, Wildfowl Bay	86070	Apr/21/1986	Carp
Lake Huron	Saginaw Bay, Wildfowl Bay	86071	May/12/1986	Channel Catfish
Lake Huron	Saginaw Bay, Wildfowl Bay	86072	Jul/21/1986	Carp
Lake Huron	Saginaw Bay, Wildfowl Bay	88010	Jun/14/1988	Carp, Channel Catfish, Walleye, Yellow Perch
Lake Huron	South Point	92055	Jun/02/1992	Lake Trout, Lake Whitefish
Lake Huron	Swan River	84054	Sep/30/1984	Coho
Lake Huron	Swan River	86055	Oct/07/1986	Chinook
Lake Huron	Swan River	86067	Oct/10/1986	Coho
Lake Huron	Swan River	87080	Sep/18/1987	Chinook
Lake Huron	Swan River	88090	Sep/01/1988	Chinook
Lake Huron	Swan River	89064	Oct/20/1989	Chinook
Lake Huron	Swan River	91047	Sep/30/1991	Chinook
Lake Huron	Swan River	93052	Oct/13/1993	Chinook
Lake Huron	Swan River	95048	Oct/10/1995	Chinook
Lake Huron	Swan River	96021	Oct/18/1996	Chinook
Lake Huron	Swan River	97021	Oct/13/1997	Chinook
Lake Huron	Swan River	1998053	Oct/01/1998	Chinook
Lake Huron	Tawas Bay	90068	Oct/10/1990	Burbot
Lake Huron	Tawas River	83009	Oct/11/1983	Chinook, Coho
Lake Huron	Tawas River	84056	Oct/01/1984	Coho
Lake Huron	Tawas River	85056	Oct/08/1985	Coho
Lake Huron	Tawas River	86051	Sep/26/1986	Chinook, Coho
Lake Huron	Thunder Bay	86046	Jul/23/1986	Brown Trout
Lake Huron	Thunder Bay	90069	Oct/15/1990	Brown Trout
Lake Huron	Thunder Bay	91053	Jun/19/1991	Brown Trout
Lake Huron	Thunder Bay	91054	Jun/25/1991	Walleye
Lake Huron	Thunder Bay	92056	Jun/04/1992	Carp, Lake Trout
Lake Huron	Thunder Bay	92057	Jun/01/1992	Brown Trout, Lake Whitefish
Lake Huron	Thunder Bay	93070	Jun/14/1993	Alewife, Brown Trout, Carp, Channel Catfish, Chub, Lake Trout, Walleye
Lake Huron	Thunder Bay	94029	Jun/27/1994	Carp, Lake Trout
Lake Huron	Thunder Bay	95036	Jun/16/1995	Carp, Lake Trout, Spottail Shiner, Walleye
Lake Huron	Thunder Bay	96022	Jun/26/1996	Lake Trout, Lake Whitefish
Lake Huron	Thunder Bay	1998054	Aug/22/1998	Lake Trout, Walleye
Lake Huron	Thunder Bay	1998055	Aug/20/1998	Lake Whitefish
Lake Huron	Thunder Bay	1999028	Sep/28/1999	Carp, Yellow Perch
Lake Huron	Thunder Bay	1999029	Aug/03/1999	Carp, Lake Whitefish, Walleye
Lake Huron	Thunder Bay	2001061	Jul/02/2001	Carp
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	2005044	Jun/08/2005	Lake Trout, Walleye
Lake Huron	Thunder Bay	2005161	May/03/2005	9-spine stickleback, Smelt
Lake Huron	Thunder Bay	2006032	Jun/14/2006	Carp
Lake Huron	Thunder Bay	2007109	Jun/11/2007	Lake Trout, Walleye
Lake Huron	Thunder Bay	2007130	Aug/01/2007	Alewife, Round goby

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Lake Huron	Thunder Bay	2007269	Oct/23/2007	Lake Whitefish
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 Independence	Marquette County	2005045	Apr/29/2005	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 Macatawa	Ottawa County	2005047	May/16/2005	Carp, Walleye
Lake Margrethe	Crawford County	95002	Mar/31/1995	Walleye
Lake Margrethe	Crawford County	2007227	May/08/2007	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 Michigamme	Marquette County	2006035	Apr/22/2006	Rock Bass, Walleye
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
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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	2006037	Jun/02/2006	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	2004054	Apr/08/2004	Smallmouth Bass, White Sucker
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	Green Bay, Cedar River	2005050	Apr/15/2005	Longnose Sucker, Smallmouth Bass, Walleye, White Sucker
Lake Michigan	Kalamazoo River mouth	2003155	May/17/2002	Lake Sturgeon
Lake Michigan	Lake Muskegon	2004200	Apr/01/2004	Lake Sturgeon
Lake Michigan	Leland	84049	Aug/06/1984	Chub
Lake Michigan	Little Bay De Noc	83017	Oct/20/1983	Lake Trout, Lake Whitefish

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Lake Michigan	Little Bay De Noc	87004	Apr/14/1987	Northern Pike, Walleye
Lake Michigan	Little Bay De Noc	89032	Apr/10/1989	Carp
Lake Michigan	Little Bay De Noc	90001	Feb/28/1990	Burbot
Lake Michigan	Little Bay De Noc	91022	Apr/16/1991	Longnose Sucker, Walleye
Lake Michigan	Little Bay De Noc	92046	Jun/04/1992	Carp, Walleye
Lake Michigan	Little Bay De Noc	92049	Jun/04/1992	Walleye
Lake Michigan	Little Bay De Noc	93079	Apr/27/1993	Carp, Yellow Perch
Lake Michigan	Little Bay De Noc	94041	Apr/20/1994	Carp, Walleye
Lake Michigan	Little Bay De Noc	94042	Apr/20/1994	White Sucker
Lake Michigan	Little Bay De Noc	95016	Feb/12/1995	Lake Sturgeon
Lake Michigan	Little Bay De Noc	97026	Apr/28/1997	Walleye, Yellow Perch
Lake Michigan	Little Bay De Noc	2000039	Oct/05/2000	Carp, Walleye
Lake Michigan	Little Bay De Noc	2002055	Apr/19/2002	Walleye
Lake Michigan	Little 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 Bay De Noc	2005051	Apr/14/2005	Carp, Walleye
Lake Michigan	Little Bay De Noc	2007112	Apr/18/2007	Carp, Walleye
Lake Michigan	Little Manistee River Weir	85021	Sep/09/1985	Brown Trout
Lake Michigan	Little Manistee River Weir	86053	Oct/06/1986	Brown Trout, Chinook, Rainbow Trout
Lake Michigan	Little Manistee River Weir	94044	Nov/07/1994	Rainbow Trout
Lake Michigan	Little Traverse Bay	83021	Sep/27/1983	Lake Trout
Lake Michigan	Little Traverse Bay	84036	May/02/1984	Lake Trout
Lake Michigan	Ludington	90058	Oct/21/1990	Yellow Perch
Lake Michigan	Ludington	2000118	Jul/19/1999	Lake Sturgeon
Lake Michigan	Manistee	83029	May/12/1983	Chub
Lake Michigan	Manistee 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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Lake Michigan	Pentwater	91025	Apr/12/1991	Brown Trout, Lake Trout
Lake Michigan	Platte River	83011	Oct/07/1983	Chinook, Coho
Lake Michigan	Platte River	83040	Sep/20/1983	Coho
Lake Michigan	Platte River	84048	Sep/30/1984	Coho
Lake Michigan	Platte River	84053	Oct/09/1984	Coho
Lake Michigan	Platte River	85022	Sep/25/1985	Brown Trout
Lake Michigan	Platte River	85055	Sep/25/1985	Coho
Lake Michigan	Platte River	85068	Sep/25/1985	Coho
Lake Michigan	Platte River	86054	Oct/06/1986	Coho
Lake Michigan	Platte River	87091	Oct/06/1987	Chinook
Lake Michigan	Platte River	88066	Sep/26/1988	Coho
Lake Michigan	Platte River	88091	Sep/10/1988	Coho, Coho Eggs
Lake Michigan	Platte River	89067	Oct/30/1989	Chinook
Lake Michigan	Platte River	90048	Oct/01/1990	Coho
Lake Michigan	Platte River	91055	Oct/09/1991	Chinook
Lake Michigan	Platte River	92068	Sep/23/1992	Coho
Lake Michigan	Platte River	92069	Oct/21/1992	Brown Trout
Lake Michigan	Platte River	93053	Sep/29/1993	Chinook
Lake Michigan	Platte River	94045	Oct/01/1994	Coho
Lake Michigan	Platte River	94046	Oct/15/1994	Rainbow Trout
Lake Michigan	Platte River	95049	Oct/09/1995	Chinook
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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Lake Michigan	St. Joseph River, Berrien Springs	87085	Sep/30/1987	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	88032	Sep/15/1988	Coho
Lake Michigan	St. Joseph River, Berrien Springs	89065	Oct/27/1989	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	89066	Oct/27/1989	Brown Trout
Lake Michigan	St. Joseph River, Berrien Springs	90042	Sep/19/1990	Brown Trout
Lake Michigan	St. Joseph River, Berrien Springs	90043	Sep/20/1990	Coho
Lake Michigan	St. Joseph River, Berrien Springs	91043	Sep/30/1991	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	92067	Sep/22/1992	Coho
Lake Michigan	St. Joseph River, Berrien Springs	93061	Sep/09/1993	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	94047	Sep/29/1994	Coho
Lake Michigan	St. Joseph River, Berrien Springs	94048	Sep/12/1994	Rainbow Trout
Lake Michigan	St. Joseph River, Berrien Springs	95055	Oct/13/1995	Chinook
Lake Michigan	St. Joseph River, Berrien Springs	96030	Oct/22/1996	Chinook
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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Lake Paradise	Emmet County	2001073	Oct/09/2001	Largemouth Bass, Smallmouth Bass, White Sucker
Lake Ponemah	Genesee County	2000044	Jul/07/2000	Carp, Largemouth Bass
Lake St. Clair	Bouvier Bay	86017	Jun/17/1986	Carp, Smallmouth Bass
Lake St. Clair	L'Anse Creuse Bay	90002	Apr/02/1990	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	92029	Jun/04/1992	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	94049	Aug/24/1994	Bluegill, Brown Bullhead, Channel Catfish, Freshwater Drum, Largemouth Bass, Northern Pike, Rock Bass, Smallmouth Bass, Yellow Perch
Lake St. Clair	L'Anse Creuse Bay	94058	Jul/13/1994	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	97034	Jun/01/1997	Black Crappie, Bluegill, Northern Pike, Pumpkinseed, Walleye, White Bass
Lake St. Clair	L'Anse Creuse Bay	1998063	Jun/15/1998	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	1998064	Jun/15/1998	Bluegill, Carp, Channel Catfish, Freshwater Drum, Walleye
Lake St. Clair	L'Anse Creuse Bay	2002059	May/23/2002	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	2005055	Jun/01/2005	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	2007113	May/28/2007	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	Michigan waters	2005201	Jun/14/2005	Lake Sturgeon
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	Lake Trout, Lake Whitefish, Siscowet
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	Huron Bay	2006111	Apr/20/2006	Rainbow Trout, Walleye
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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Siscowet
Lake Superior	Keweenaw Bay	2004063	May/04/2004	Lake Trout
Lake Superior	Keweenaw Bay	2006043	Apr/17/2006	Rainbow Trout
Lake Superior	Keweenaw Bay	2007114	Aug/01/2007	Lake Trout
Lake Superior	Keweenaw Bay	2007230	May/15/2007	Lake Herring, Siscowet
Lake Superior	Keweenaw Bay	2007231	May/15/2007	Lake Whitefish
Lake Superior	Keweenaw Bay, Keystone Point	92073	Jul/31/1992	Lake Whitefish, Siscowet
Lake Superior	Keweenaw Bay, L'Anse Bay	89029	Apr/24/1989	Lake Trout
Lake Superior	Keweenaw Bay, Traverse Island	91060	May/01/1991	Lake Trout
Lake Superior	Keweenaw Bay, Traverse Island	2001079	Jun/08/2001	Siscowet
Lake Superior	Laughing Whitefish River	88036	Sep/27/1988	Chinook
Lake Superior	Manitou Island	87072	Jun/26/1987	Siscowet
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	Siscowet
Lake Superior	Marquette	92074	Aug/18/1992	Lake Whitefish, Siscowet
Lake Superior	Marquette	93089	Jul/01/1993	Lake Whitefish
Lake Superior	Marquette	95065	Dec/13/1995	Siscowet
Lake Superior	Marquette	96038	Jun/10/1996	Lake Trout, Lake Whitefish, Siscowet
Lake Superior	Marquette	2002060	May/13/2002	Lake Trout, Lake Whitefish
Lake Superior	Marquette	2007267	May/01/2007	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	Siscowet
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/ Sturgeon River	2007254	Dec/20/2006	Burbot, Burbot Liver
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	Siscowet
Lake Superior	West of Keweenaw Peninsula	92077	Jul/13/1992	Siscowet
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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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 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
Little Lake	Marquette County	2002043	May/24/2002	Walleye
Little Oxbow Lake	Gogebic County	2005056	Nov/01/2005	Largemouth Bass, Walleye
Little Round Lake	Alger Co.	2006199	Nov/19/2006	Bluegill
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	Iron County	2007235	Apr/17/2007	Walleye
Long Lake	Kalamazoo County	2002064	Oct/16/2002	Black Crappie
Long Lake	Kalamazoo County	2003153	Mar/28/2003	Brown Bullhead
Long Lake	Kent Co.	2006044	Jun/15/2006	Largemouth Bass
Long Lake	Montmorency County	2006046	May/11/2006	Smallmouth Bass
Long Lake	Presque Isle County	2004066	Apr/14/2004	Smallmouth Bass, White Sucker
Long Lake	Presque Isle County	2006045	May/25/2006	Brown Bullhead, Smallmouth Bass
Long Lake	St. Joseph County/Colon Twp	2001142	Nov/19/2001	Brown Bullhead, Largemouth Bass
Looking Glass River	Cutler Rd	2007006	Jul/25/2007	Channel Catfish
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
Lost Lake	Presque Isle County	2007237	Jun/05/2007	Largemouth 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
Macatawa River	d/s River St. Bridge	2005060	Jun/24/2005	Channel Catfish
Macatawa River	N. Buoy 11	2005059	Jun/29/2005	Channel Catfish
Macatawa River	u/s 112th Ave	2005061	Jun/29/2002	Channel Catfish
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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Manistique River	d/s Manistique Papers Dam	2004072	Aug/02/2004	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye
Manistique River	d/s Manistique Papers Dam	2007238	Apr/17/2007	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
Maple River	d/s M-21	2007007	Jul/25/2007	Channel Catfish
Maple River	u/s Matherton	2006150	Jul/11/2006	Carp
Marion Lake	Gogebic County	87070	Jul/29/1987	Rock Bass, Walleye
Marquette State Fish Hatchery	Marquette	2006200	Oct/17/2006	Brook Trout, Lake Trout, Splake
Marten Lake	Iron County	85019	Oct/25/1985	Brown Bullhead, Northern Pike
McCormick Lake	Montmorency County	2004074	Jun/02/2004	Brown Trout
MDCH Control	MDCH Lab	2006610	Jan/01/2006	control
MDCH Control	MDCH Lab	2007800	Jan/01/2007	Control
MDCH Control	MDCH Lab	2007801	Jan/01/2007	Control
MDCH Control	MDCH Lab	2007802	Jan/01/2007	Control
MDCH Control	MDCH Lab	2007803	Jan/01/2008	Control
MDCH Control	MDCH Lab	2007804	Jan/01/2007	Control
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	Dickinson County, below Piers Gorge	89078	Sep/12/1989	Redhorse Sucker, Walleye
Menominee River	Dickinson County, Little Quinnesec Flowage	89079	Apr/21/1989	Carp, Walleye, White Sucker
Menominee River	Dickinson County, Vulcan	86058	Oct/09/1986	Northern Pike, Redhorse Sucker, Smallmouth Bass, Walleye
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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Menominee, river mouth	2006097	Apr/10/2006	Carp, Walleye
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
Middle Straits Lake	Oakland County	2007240	May/09/2007	Northern Pike
Milakokia Lake	Mackinac County	85061	Jun/18/1985	Walleye, White Sucker
Milakokia Lake	Mackinac County	94031	Jun/21/1994	Walleye, White Sucker, Yellow Perch
Milakokia Lake	Mackinac County	2007241	May/22/2007	Walleye
Mill Creek	Washtenaw County	89021	Jul/24/1989	White Sucker
Millecoquins Lake	Mackinac County	89038	May/11/1989	Northern Pike, Walleye
Millecoquins Lake	Mackinac County	92071	Aug/05/1992	Lake Sturgeon
Millecoquins Lake	Mackinac County	2006049	May/01/2006	Rock Bass, Walleye
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
Murphy Lake	Tuscola Co	2007243	Apr/12/2007	Northern Pike
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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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 Lake	Muskegon County	2006050	Jun/06/2006	Northern Pike
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	Newaygo County, Croton Dam Pond	2005070	Jul/06/2005	Carp
Muskegon River	Newaygo County, Croton Dam Pond	2007115	Sep/11/2007	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
Nettie Lake	Presque Isle County	2005114	Sep/21/2005	Smallmouth Bass
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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Orchard Lake	Oakland County	87087	Sep/25/1987	Largemouth Bass, Northern Pike
Orchard Lake	Oakland County	89006	Jun/07/1989	Largemouth Bass, Northern Pike, Smallmouth Bass
Orchard Lake	Oakland County	94036	May/10/1994	Northern Pike
Ormes Lake	Gogebic County	2005071	Nov/01/2005	Largemouth Bass
Osmun Lake	Oakland County	1999048	Jul/07/1999	Carp, Largemouth Bass
Osterhout Lake	Allegan County	2007265	May/24/2007	Largemouth Bass
Otsego Lake	Otsego Co	2007244	May/22/2007	Walleye
Ottawa Lake	Iron County	86005	May/22/1986	Northern Pike, Rock Bass, Walleye
Ottawa River	Mouth	93047	Sep/29/1993	Carp, Largemouth Bass
Ottawa River	Mouth	2005074	Jun/28/2005	Channel Catfish
Ottawa River	Mouth	2006109	Sep/26/2006	Carp, Largemouth Bass
Ottawa River	Mouth	2006226	Sep/26/2006	Gizzard Shad
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	M 139	2006053	Jul/13/2006	Channel Catfish
Ox Creek	Mouth	2001092	Jul/30/2001	Channel Catfish
Ox Creek	Mouth	2006054	Jul/13/2006	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	Above Ox Creek	2006056	Jul/13/2006	Channel Catfish
Paw Paw River	Below Ox Creek	2001094	Jul/30/2001	Channel Catfish
Paw Paw River	d/s Hartford @ 6750th	2006060	Jul/13/2006	Channel Catfish
Paw Paw River	Maple Lake	2006048	Sep/27/2006	Carp, Largemouth Bass
Paw Paw River S. Br.	C. Rd. 358	2006062	Jul/13/2006	Channel Catfish
Paw Paw River, S. Br.	d/s Maple Lake @3750th	2006061	Jul/13/2006	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	Downstream Ludington WWTP	2003090	Jul/16/2003	Channel Catfish
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	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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Pere Marquette River, Little South Branch	Taylor Bridge	94032	Aug/17/1993	Brown Trout
Pickereel Lake	Dickinson County	87082	Sep/24/1987	Largemouth Bass, Northern Pike
Pickereel Lake	Emmet County	89069	May/23/1989	Largemouth Bass, Smallmouth Bass, Walleye
Pigeon River	Ottawa Co, at 136th Ave	2005129	Jun/28/2005	White Sucker
Pigeon River	Vistula Rd.	2005076	Sep/14/2005	Redhorse Sucker, Rock Bass, Smallmouth Bass
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	Gordonville Road	2007008	Jul/25/2007	Channel Catfish
Pine River	Gratiot County, Alma	83047	May/31/1983	Carp
Pine River	Gratiot County, below St Louis Dam	83001	Oct/31/1983	Brown Bullhead, Carp, Common Shiner, Rock Bass, Smallmouth Bass, White Sucker
Pine River	Gratiot County, below St Louis Dam	85007	Aug/06/1985	Carp
Pine River	Gratiot County, below St Louis Dam	94021	Aug/23/1994	Carp
Pine River	Gratiot County, below St Louis Dam	97072	Oct/16/1997	Carp
Pine River	Harrison Road	1999049	Jun/24/1999	Channel Catfish
Pine River	Harrison Road	2000066	Jul/20/2000	Channel Catfish
Pine River	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, Northern hogsucker, 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	St. Louis WWTP Bridge	1999052	Jun/24/1999	Channel Catfish
Pine River	St. Louis WWTP Bridge	2000069	Jul/20/2000	Channel Catfish
Pine River	St. Louis WWTP Bridge	2002013	Jul/16/2002	Channel Catfish
Pine River	St. Louis WWTP Bridge	2007013	Jul/25/2007	Channel Catfish

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Pine River	US-127	2007012	Jul/25/2007	Channel Catfish
Platte Lake	Benzie County	2004151	Jul/11/2004	Channel Catfish, Northern Pike, Smallmouth Bass, Walleye
Platte Lake	Benzie County	2005160	Sep/02/2005	Rock Bass
Platte River	Burnt Mill Road, Benzie County	1998087	Aug/05/1998	Brown Trout, White Sucker
Platte River State Fish Hatchery	Honor	2007501	May/11/2007	Chinook, Coho
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
Pontiac Lake	Oakland County	2006065	May/23/2006	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	Bryant Mill Pond	2006172	Sep/18/2006	Carp, White Sucker
Portage Creek	Kalamazoo, Crosstown Pkwy.	89059	Aug/30/1989	Channel Catfish
Portage Creek	Monarch Pond	2001045	Oct/17/2001	Carp
Portage Creek	Monarch Pond	2006171	Sep/19/2006	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	Houghton County	2007247	Apr/19/2007	Walleye
Portage Lake	Jackson County	89042	May/23/1989	Black Crappie, Largemouth Bass, Northern Pike
Portage Lake	Manistee County	90008	Jun/12/1990	Largemouth Bass, Northern Pike, Smallmouth Bass
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
Proud Lake	Oakland County	2006066	May/25/2006	Carp, Largemouth Bass
Rabbit River	d/s Hamilton Dam	2003098	Sep/17/2003	Carp, Largemouth Bass, Northern Pike, Redhorse Sucker, Rock Bass
Rabbit River	d/s Hamilton, d/s 133TH	2003099	Aug/20/2003	Channel Catfish
Rabbit River	u/s Hamilton Dam	2003096	Sep/17/2003	Carp, Largemouth Bass, Northern Pike, Redhorse Sucker
Rabbit River	u/s Hamilton, d/s 38th St	2003097	Aug/20/2003	Channel Catfish
Rainbow Lake	Montcalm County	90045	Sep/21/1990	Largemouth Bass, Northern Pike
Raisin River	Above Monroe Dam	91050	Sep/25/1991	Carp

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Above Monroe Dam	2006067	Sep/06/2006	Carp
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 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	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
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	Morrison Lake	2007242	Apr/06/2007	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
Rogue River	Kent County, above Rockford Dam	93072	Nov/01/1993	White Sucker
Roland Lake	Houghton County	87040	Jun/30/1988	Rock Bass, Smallmouth Bass
Rouge River	Bell Branch	92040	Aug/25/1992	Channel Catfish
Rouge River	Below M-153	95059	Apr/24/1995	Carp, Northern Pike, White Sucker
Rouge River	Below M-153	2005077	Nov/04/2005	Carp, Redhorse Sucker
Rouge River	Below Newburgh Lake	2000116	Oct/04/2000	Channel Catfish

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Rouge River	Below Phoenix Lake	2000077	Aug/28/2000	Channel Catfish
Rouge River	Dearborn, river mouth	86016	Jun/24/1986	Carp
Rouge River	Dearborn, river mouth	92010	Aug/25/1992	Channel Catfish
Rouge River	Dearborn, river mouth	95044	Oct/09/1995	Channel Catfish
Rouge River	Dearborn, river mouth	2000079	Aug/28/2000	Channel Catfish
Rouge River	Dearborn, river mouth	2000117	Oct/04/2000	Channel Catfish
Rouge River	Evergreen Road	95042	Oct/09/1995	Channel catfish
Rouge River	Greenfield Road	95043	Oct/09/1995	Channel Catfish
Rouge River	Oakland County, Lahser Road	87029	Jun/17/1987	Carp, Rock Bass, White Sucker
Rouge River	Wayne County, above turning basin	85012	Jun/19/1985	Carp
Rouge River	Wayne County, below Jefferson Ave	85011	Jun/19/1985	Carp
Rouge River	Wayne County, Eliza Howell Park	87031	Jun/17/1987	White Sucker
Rouge River	Wayne County, Eliza Howell Park	94015	Sep/13/1994	White Sucker
Rouge River, Lower Branch	Wayne County, Gulley Road	87025	Jun/16/1987	Carp
Rouge River, Middle Branch	d/s Nankin Dam	2005078	Nov/03/2005	Carp, Rock Bass, White Sucker
Rouge River, Middle Branch	Inkster Road below Newburgh Lake	2002084	Sep/06/2002	White Sucker
Rouge River, Middle Branch	Newburgh Lake	88011	Jul/19/1988	Largemouth Bass, Northern Pike, White Sucker
Rouge River, Middle Branch	Newburgh Lake	93014	Nov/17/1993	Northern Pike, White Sucker
Rouge River, Middle Branch	Newburgh Lake	95024	May/30/1995	Bluegill, Largemouth Bass
Rouge River, Middle Branch	Newburgh Lake	2001097	Oct/30/2001	Carp, Channel Catfish, Largemouth Bass, White Sucker
Rouge River, Middle Branch	Newburgh Lake	2002085	Sep/24/2002	Carp, Channel Catfish, Northern Pike, White Sucker
Rouge River, Middle Branch	Newburgh Lake	2005079	Jun/02/2005	Carp, Channel Catfish, Northern Pike, White Sucker
Rouge River, Middle Branch	Oakland County, 9 Mile Road	87028	Jun/16/1987	Brown Bullhead, Carp, Channel Catfish, Rock Bass, White Sucker
Rouge River, Middle Branch	Phoenix Lake	88012	Jul/19/1988	Carp, Northern Pike, White Sucker
Rouge River, Middle Branch	Phoenix Lake	95023	Jun/13/1995	Bluegill, Carp
Rouge River, Middle Branch	Phoenix Lake	2001098	Oct/30/2001	Carp, Channel Catfish, Northern Pike
Rouge River, Middle Branch	Phoenix Lake	2002086	Oct/22/2002	Carp, Northern Pike, White Sucker
Rouge River, Middle Branch	u/s Nankin Dam	2005080	Nov/03/2005	Carp, Northern Pike, Rock Bass, White Sucker
Rouge River, Middle Branch	Wayne County, Haggerty/Hines Drain	87027	Jun/16/1987	Rock Bass, Smallmouth Bass, White Sucker
Rouge River, Middle Branch	Wayne County, Inkster Road	87026	Jun/16/1987	Goldfish
Rouge River, Middle Branch	Wayne County, Merriman Road	2000083	Jul/24/2000	White Sucker
Rouge River, Upper Branch	Oakland County, Powers Road	87032	Jun/17/1987	White Sucker
Rouge River, Upper Branch	Wayne County, 7 Mile Road	87030	Jun/17/1987	White Sucker
Round Lake	Delta County	87083	Sep/23/1987	Northern Pike, Walleye
Round Lake	Marquette County, Champion Twp	2005081	Jun/07/2005	Largemouth Bass
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

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<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Ruppert Lake	Kalamazoo County	2004099	May/28/2004	Largemouth Bass
Rush Lake	Van Buren County	2004100	Mar/23/2004	Northern Pike
Saginaw Bay	Gull Island	2005083	Jun/27/2005	Channel Catfish
Saginaw River	Bay County	86014	Jun/10/1986	Carp, Walleye
Saginaw River	Bay County	2003200	Oct/14/2003	Lake Sturgeon
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	Bay County, river mouth	2005084	Jun/27/2005	Channel Catfish
Saginaw River	d/s Middle Ground Island (7th St. Bridge)	2005088	Jun/27/2005	Channel Catfish
Saginaw River	Detroit & Mack RR	2005086	Jun/27/2005	Channel Catfish
Saginaw River	Downstream Wilder Rd	2005085	Jun/27/2005	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	Truman Parkway Bridge	2005087	Jun/27/2005	Channel Catfish
Saginaw River	u/s Middle Ground Island	1998097	Sep/04/1998	Channel Catfish
Saginaw River	u/s Middle Ground Island	2002027	Jul/16/2002	Channel Catfish
Saginaw River	u/s Middle Ground Island	2005289	Jun/27/2005	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, Northern hogsucker, 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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Shiawassee River	Shiawassee County, New Lothrop Road	81008	Jun/03/1981	Black Crappie, Carp, Minnow, Northern hogsucker, 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	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	Livingston County, Bowen Road	81002	Jun/03/1981	Black Bullhead, Minnow, Northern Pike, Sunfish, White Sucker
Shiawassee River, South Branch	Livingston County, Bowen Road	84008	Jun/02/1984	Black Crappie, Grass Pickerel, Northern Pike, Rock Bass, White Sucker
Shiawassee River, South Branch	Livingston County, Chase Lake Road	81004	Jun/03/1981	Carp, Minnow, Northern Pike, Rock Bass, Sunfish, White Sucker, Yellow Bullhead
Shiawassee River, South Branch	Livingston County, Chase Lake Road	86036	Jul/30/1986	Carp, Northern Pike, Rock Bass, White Sucker
Shiawassee River, South Branch	Livingston County, Grand River Road	81001	Jun/03/1981	Minnow, Sunfish, White Sucker
Shiawassee River, South Branch	Livingston County, Marr Road	81003	Jun/03/1981	Carp, Minnow, Northern Pike, Sunfish, White Sucker, Yellow Bullhead
Shiawassee River, South Branch	Livingston County, Marr Road	87065	Jul/29/1987	Rock Bass, White Sucker
Shiawassee River, South Branch	Livingston County, Oak Grove Road	81005	Jun/03/1981	Black Crappie, Carp, Rock Bass, White Sucker
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
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 Lake	Grand Traverse Co	2007251	Jun/05/2007	Walleye
Silver Lead Creek	Marquette County, K.I. Sawyer AFB	96056	Nov/04/1996	Brook Trout
Silver Lead Creek	Marquette County, K.I. Sawyer AFB	2006072	May/15/2006	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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
South Manistique Lake	Mackinac County	2005095	Apr/28/2005	Walleye
South Manistique Lake	Mackinac County	2007116	Apr/16/2007	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
St. Clair River	Algonac	94009	Aug/25/1994	Carp
St. Clair River	Algonac	2002093	May/24/2002	Carp
St. Clair River	Algonac	2005097	Jun/22/2005	Carp
St. Clair River	Algonac	2007118	Jun/28/2007	Carp
St. Clair River	Marine City	91031	May/14/1991	Walleye
St. Clair River	Marine City	2006076	May/20/2006	Carp, 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 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	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	Benton Harbor, river mouth	2006077	Jul/13/2006	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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
St. Joseph River	Berrien Springs, below Dam	2001089	Jul/30/2001	Channel Catfish
St. Joseph River	Chapin Lake	83033	May/01/1983	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	Chapin Lake	2005098	Oct/27/2005	Carp, Largemouth Bass, Smallmouth Bass
St. Joseph River	Chapin Lake	2005099	Oct/27/2005	Carp
St. Joseph River	Chapin Lake	2007119	Sep/18/2007	Carp
St. Joseph River	Constantine Impoundment	1998110	Jun/24/1998	Channel Catfish, Redhorse Sucker
St. Joseph River	Mottville downstream of Ritz	2003118	Jul/16/2003	Channel Catfish
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	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	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	Munuscong Bay	2005101	Apr/18/2005	Walleye
St. Marys River	Munuscong Bay	2007117	Apr/19/2007	Walleye
St. Marys River	N. Drummond Island	89035	May/11/1989	Yellow Perch
St. Marys River	Sugar Island	87049	Sep/11/1987	Northern Pike, Walleye, White Sucker
Stanley Lake	Iron County	90013	May/31/1990	Largemouth Bass, Smallmouth Bass, Walleye
Stanley Lake	Iron County	2001143	Sep/10/2001	Walleye
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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Sunset Lake	Iron County	88049	Oct/11/1988	Northern Pike, Walleye
Swan Creek	Monroe County	86059	Oct/09/1986	White Sucker
Swartz Creek	Swartz Creek Golf Course	2003127	Aug/21/2003	Channel Catfish
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
Tahquamenon River	Luce County, Slater's Landing	2005105	Jul/14/2005	Walleye, Yellow Perch
Tannery Creek	Emmet County	87058	Jul/21/1987	Brook Trout
Tawas River	Iosco County	88058	Oct/14/1988	Northern Pike, White Sucker
Tawas River	Mouth	2006098	Jul/13/2006	Channel Catfish
Teal Lake	Marquette County	2004122	May/11/2004	Smallmouth Bass, Walleye
Teal Lake	Marquette County	2005106	Jun/01/2005	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	Livingston County	2005107	May/18/2005	Black Crappie, Carp, Northern Pike
Thompson Lake	St. Joseph County	2002036	Jun/25/2002	Brown Bullhead, Largemouth Bass
Thompson State Fish Hatchery	Manistique	2006201	Apr/04/2006	Atlantic Salmon, Brown Trout, Rainbow Trout
Thompson State Fish Hatchery	Manistique	2007500	Mar/27/2007	Brown Trout, Chinook, Rainbow Trout
Thornapple River	Ada Impoundment	2005130	Jul/19/2005	Carp, Smallmouth Bass
Thornapple River	Cascade Impoundment	2005131	Jul/19/2005	Smallmouth Bass
Thornapple River	d/s Nashville	2006100	Jun/14/2006	White Sucker
Thornapple River	Gresham Highway	1998117	Jul/02/1998	White Sucker
Thornapple River	LaBarge Impoundment	2006102	Jun/20/2006	Carp
Thornapple River	Middleville Impoundment	2006101	Jun/14/2006	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
Thornapple River	Thornapple Lake, Barry County	2006081	Apr/12/2006	Largemouth Bass
Thousand Island Lake	Gogebic County, Cisco Lake Chain	1999065	Apr/23/1999	Walleye
Thread Creek	Above Impoundment @ Perry	2003129	Aug/21/2003	Channel Catfish
Thread Creek	Genesee County	93017	Aug/30/1993	Carp, Northern Pike
Thread Creek	M-54 (Dort)	2003130	Aug/21/2003	Channel Catfish
Thread Creek	Near mouth @ Clifford	2003131	Aug/21/2003	Channel Catfish
Thread Creek	Thread Lake	2000092	Sep/28/2000	Carp, Largemouth Bass
Thunder Bay River	4-Mile Pond	2006082	May/25/2006	Smallmouth 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 County, Lake Besser	2006083	May/24/2006	Brown Bullhead, Smallmouth Bass
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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Tittabawassee River	Freeland	2002019	Jul/16/2002	Channel Catfish
Tittabawassee River	Midland County, below Dow Dam	84010	Apr/03/1984	Carp, Walleye, White Sucker
Tittabawassee River	Midland County, below Dow Dam	87002	Apr/07/1987	Walleye
Tittabawassee River	Midland County, below Dow Dam	89001	Apr/06/1989	Walleye Eggs
Tittabawassee River	Midland County, below Dow Dam	92064	Oct/30/1992	Carp, Walleye
Tittabawassee River	Midland County, below Dow Dam	95013	Apr/06/1995	White Bass, White Sucker
Tittabawassee River	Midland County, below Dow Dam	1999066	May/26/1999	Carp, Smallmouth Bass
Tittabawassee River	Midland County, below Dow Dam	2000093	Jul/05/2000	Smallmouth Bass, Walleye
Tittabawassee River	Midland County, Smiths 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 Marsh	Bay County	96054	May/21/1996	Carp, Northern Pike
Tobico Marsh	Bay County	2007256	May/30/2007	Carp, Largemouth Bass, 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

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Torch Lake	Houghton County	2007257	Apr/25/2007	Northern Pike, Walleye, White Sucker
Tucker Lake	Leelanau County	2005127	Jun/03/2005	Brown Bullhead
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	Baraga County	2005108	Jun/06/2005	Largemouth Bass, Northern Pike, Yellow Perch
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
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
Walloon Lake	Charlevoix County	2006086	Apr/18/2006	Brown Bullhead, Northern Pike, Rainbow Trout, Smallmouth Bass, Walleye, White Sucker
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
Weldon Creek	Benson Road	2003137	Jul/16/2003	Channel Catfish
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	Muskegon County	2007258	Jun/12/2007	Carp, Northern Pike
White Lake	Oakland Co.	2001111	Oct/18/2001	Brown Bullhead, Rock Bass
White Lake	Oakland Co.	2007259	Jun/05/2007	Walleye
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
Wolf Lake State Fish Hatchery	Mattawan	2006202	Mar/21/2006	Chinook, Lake Sturgeon, Muskellunge, Rainbow Trout

Appendix A. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Woodland Lake	Livingston County	2000104	May/02/2000	Carp, Largemouth Bass

Appendix B. Inventory of Whole Fish Trend Monitoring Sites and Species.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Detroit River	Grassy Island	90033	Aug/28/1990	Carp, Walleye
Detroit River	Grassy Island	92033	Aug/17/1992	Carp, Walleye
Detroit River	Grassy Island	94050	Aug/25/1994	Carp, Walleye
Detroit River	Grassy Island	96009	Jul/12/1996	Carp, Walleye
Detroit River	Grassy Island	1998025	Sep/22/1998	Carp, Walleye
Detroit River	Grassy Island	2001009	Oct/18/2001	Carp, Walleye
Detroit River	Grassy Island	2004020	Jul/20/2004	Carp, Walleye
Detroit River	Grassy Island	2005018	Jun/22/2005	Walleye
Detroit River	Grassy Island	2007100	Jun/30/2007	Carp
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 River	Kent County, above 6th St. Dam	2005023	Jul/14/2005	Carp
Grand River	Kent County, above 6th St. Dam	2007101	Sep/11/2007	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
Gull Lake	Kalamazoo County	2005026	Aug/09/2005	Largemouth Bass
Gull Lake	Kalamazoo County	2007102	May/29/2007	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
Gun Lake	Barry County	2005027	Jul/07/2005	Largemouth Bass
Gun Lake	Barry County	2007103	Jun/01/2007	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
Higgins Lake	Roscommon County	2005030	Oct/12/2005	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

Appendix B. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Houghton Lake	Roscommon County	2004037	May/27/2004	Largemouth Bass
Houghton Lake	Roscommon County	2006016	May/24/2006	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
Kalamazoo River	Lake Allegan	2005036	Jun/16/2005	Carp
Kalamazoo River	Lake Allegan	2007105	Jun/01/2007	Carp
Lake Erie	Brest Bay	90003	Apr/09/1990	Carp, Walleye
Lake Erie	Brest Bay	92026	Apr/10/1992	Carp, Walleye
Lake Erie	Brest Bay	94026	Apr/19/1994	Carp, Walleye
Lake Erie	Brest Bay	97017	Apr/21/1997	Carp
Lake Erie	Brest Bay	1998051	Apr/15/1998	Carp, Walleye
Lake Erie	Brest Bay	2002044	Apr/26/2002	Carp
Lake Erie	Brest Bay	2003051	Oct/24/2003	Walleye
Lake Erie	Brest Bay	2004042	Oct/08/2004	Walleye
Lake Erie	Brest Bay	2006027	Apr/24/2006	Carp, 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 Gogebic	Gogebic/Ontonagon County	2005040	Jun/10/2005	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	Saginaw Bay	2005042	Oct/14/2005	Carp, Walleye
Lake Huron	Saginaw Bay	2007107	Sep/04/2007	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 Huron	Thunder Bay	2005044	Jun/08/2005	Lake Trout, Walleye
Lake Huron	Thunder Bay	2006032	Jun/14/2006	Carp
Lake Huron	Thunder Bay	2007109	Jun/11/2007	Lake Trout, Walleye
Lake Huron	Thunder Bay	2007130	Aug/01/2007	Alewife, Round goby
Lake Michigan	Grand Traverse Bay	90074	Jun/20/1990	Lake Trout
Lake Michigan	Grand Traverse Bay	92059	Jul/15/1992	Lake Trout

Appendix B. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Grand Traverse Bay	2006037	Jun/02/2006	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 Michigan	Little Bay De Noc	2005051	Apr/14/2005	Carp, Walleye
Lake Michigan	Little Bay De Noc	2007112	Apr/18/2007	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	90002	Apr/02/1990	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	92029	Jun/04/1992	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	94058	Jul/13/1994	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	1998063	Jun/15/1998	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	2002059	May/23/2002	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	2005055	Jun/01/2005	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	2007113	May/28/2007	Carp, Walleye
Lake Superior	Keweenaw Bay	91024	May/01/1991	Lake Trout
Lake Superior	Keweenaw Bay	93055	May/03/1993	Lake Trout
Lake Superior	Keweenaw Bay	96035	May/23/1996	Lake Trout
Lake Superior	Keweenaw Bay	1999039	May/13/1999	Lake Trout
Lake Superior	Keweenaw Bay	2001078	Apr/30/2001	Lake Trout
Lake Superior	Keweenaw Bay	2004063	May/04/2004	Lake Trout
Lake Superior	Keweenaw Bay	2007114	Aug/01/2007	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
Muskegon River	Newaygo County, Croton Dam Pond	2005070	Jul/06/2005	Carp

Appendix B. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Muskegon River	Newaygo County, Croton Dam Pond	2007115	Sep/11/2007	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
Pontiac Lake	Oakland County	2006065	May/23/2006	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
Raisin River	Above Monroe Dam	2006067	Sep/06/2006	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
South Manistique Lake	Mackinac County	2005095	Apr/28/2005	Walleye
South Manistique Lake	Mackinac County	2007116	Apr/16/2007	Walleye
St. Clair River	Algonac	92061	Jun/21/1992	Carp, Walleye
St. Clair River	Algonac	94009	Aug/25/1994	Carp
St. Clair River	Algonac	2002093	May/24/2002	Carp
St. Clair River	Algonac	2005097	Jun/22/2005	Carp
St. Clair River	Algonac	2007118	Jun/28/2007	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. Joseph River	Chapin Lake	2005099	Oct/27/2005	Carp
St. Joseph River	Chapin Lake	2007119	Sep/18/2007	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
St. Marys River	Munuscong Bay	2005101	Apr/18/2005	Walleye
St. Marys River	Munuscong Bay	2007117	Apr/19/2007	Walleye

Appendix C. Inventory of Caged Fish Bioconcentration Studies.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Au Gres River	Au Gres, river mouth	91002	Sep/03/1991	Channel Catfish
Au Sable River	Oscoda, river mouth	91003	Sep/03/1991	Channel Catfish
Au Sable River	Oscoda, river mouth	96002	Aug/19/1996	Channel Catfish
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 Creek	Maple Island Rd	2005006	Jun/29/2005	Channel Catfish
Black Creek	Mill Iron Rd	2005007	Jun/29/2005	Channel Catfish
Black Creek	Mouth	2005008	Jun/29/2005	Channel Catfish
Black River	d/s Crowell @ Sheridan Line Rd	2007001	Jul/25/2007	Channel Catfish
Black River	Mouth	2002007	Aug/02/2002	Channel Catfish
Black River	Port Huron, river mouth	93003	Aug/31/1993	Channel Catfish
Black River	Port Huron, river mouth	2007003	Jul/25/2007	Channel Catfish
Black River	u/s Crowell off Old 51	2007004	Jul/25/2007	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	d/s Caro	2006093	Jan/13/2006	Channel Catfish
Cass River	d/s Cass City WWTP	2006094	Jul/13/2006	Channel Catfish
Cass River	d/s Frankenmuth	2006092	Jul/13/2006	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
Cass River	Saginaw County, M-13	2006091	Jul/13/2006	Channel Catfish
Cass River	u/s Cass City WWTP	2006122	Jul/13/2006	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
Chippewa River	u/s Pine confluence	2007005	Jul/25/2007	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

Appendix C. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
Escanaba River	CR 420	2005122	Jun/29/2005	Channel Catfish
Escanaba River	Escanaba, river mouth	93040	Jun/30/1993	Channel Catfish
Escanaba River	Escanaba, river mouth	2005121	Jun/29/2005	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
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

Appendix C. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
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
Looking Glass River	Cutler Rd	2007006	Jul/25/2007	Channel Catfish
Macatawa River	d/s River St. Bridge	2005060	Jun/24/2005	Channel Catfish
Macatawa River	N. Buoy 11	2005059	Jun/29/2005	Channel Catfish
Macatawa River	u/s 112th Ave	2005061	Jun/29/2002	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
Maple River	d/s M-21	2007007	Jul/25/2007	Channel Catfish
Menominee River	Menominee, river mouth	93039	Jun/30/1993	Channel Catfish

Appendix C. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
Ottawa River	Mouth	2005074	Jun/28/2005	Channel Catfish
Ox Creek	M 139	2006053	Jul/13/2006	Channel Catfish
Ox Creek	Mouth	2001092	Jul/30/2001	Channel Catfish
Ox Creek	Mouth	2006054	Jul/13/2006	Channel Catfish
Paw Paw River	Above Ox Creek	2001093	Jul/30/2001	Channel Catfish
Paw Paw River	Above Ox Creek	2006056	Jul/13/2006	Channel Catfish
Paw Paw River	Below Ox Creek	2001094	Jul/30/2001	Channel Catfish
Paw Paw River	d/s Hartford @ 6750th	2006060	Jul/13/2006	Channel Catfish
Paw Paw River S. Br.	C. Rd. 358	2006062	Jul/13/2006	Channel Catfish
Paw Paw River, S. Br.	d/s Maple Lake @3750th	2006061	Jul/13/2006	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	Gordonville Road	2007008	Jul/25/2007	Channel Catfish
Pine River	Harrison Road	1999049	Jun/24/1999	Channel Catfish
Pine River	Harrison Road	2000066	Jul/20/2000	Channel Catfish
Pine River	Harrison Road	2002011	Jul/16/2002	Channel Catfish
Pine River	M-46	1999050	Jun/24/1999	Channel Catfish
Pine River	M-46	2000067	Jul/20/2000	Channel Catfish
Pine River	M-46	2002012	Jul/16/2002	Channel Catfish
Pine River	Mill Street	2000068	Jul/20/2000	Channel Catfish
Pine River	Nine Mile Road	1999053	Jun/24/1999	Channel Catfish
Pine River	St. Clair	97051	Sep/17/1997	Channel Catfish
Pine River	St. Louis Impoundment	2002103	Jul/16/2002	Channel Catfish
Pine River	St. Louis WWTP Bridge	1999052	Jun/24/1999	Channel Catfish
Pine River	St. Louis WWTP Bridge	2000069	Jul/20/2000	Channel Catfish
Pine River	St. Louis WWTP Bridge	2002013	Jul/16/2002	Channel Catfish
Pine River	St. Louis WWTP Bridge	2007013	Jul/25/2007	Channel Catfish
Pine River	US-127	2007012	Jul/25/2007	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

Appendix C. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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 Bay	Gull Island	2005083	Jun/27/2005	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	Bay County, river mouth	2005084	Jun/27/2005	Channel Catfish
Saginaw River	d/s Middle Ground Island (7th St. Bridge)	2005088	Jun/27/2005	Channel Catfish
Saginaw River	Detroit & Mack RR	2005086	Jun/27/2005	Channel Catfish
Saginaw River	Downstream Wilder Rd	2005085	Jun/27/2005	Channel Catfish
Saginaw River	Saginaw County, Saginaw	88021	Aug/01/1988	Channel Catfish
Saginaw River	Truman Parkway Bridge	2005087	Jun/27/2005	Channel Catfish
Saginaw River	u/s Middle Ground Island	1998097	Sep/04/1998	Channel Catfish
Saginaw River	u/s Middle Ground Island	2002027	Jul/16/2002	Channel Catfish
Saginaw River	u/s Middle Ground Island	2005289	Jun/27/2005	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
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

Appendix C. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Benton Harbor, river mouth	2006077	Jul/13/2006	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
Tawas River	Mouth	2006098	Jul/13/2006	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
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 2007 Annual Report.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Black River	d/s Crowell @ Sheridan Line Rd	2007001	Jul/25/2007	Channel Catfish
Black River	Port Huron, river mouth	2007003	Jul/25/2007	Channel Catfish
Black River	Sanilac County, Crowell Impoundment	2007263	Nov/08/2007	Carp
Black River	u/s Crowell off Old 51	2007004	Jul/25/2007	Channel Catfish
Blind Sucker Flooding	Luce County	2007207	Jun/19/2007	Yellow Perch
Budd Lake	Clare Co	2007268	May/09/2007	Largemouth Bass
Caribou Lake	Chippewa County	2006006	Jun/13/2006	Rock Bass, Smallmouth Bass
Chippewa River	u/s Pine confluence	2007005	Jul/25/2007	Channel Catfish
Cranberry Lake	Clare Co	2007212	May/23/2007	Largemouth Bass
Crockery Lake	Ottawa County	2006009	Jun/06/2006	Largemouth Bass
Detroit River	Grassy Island	2007100	Jun/30/2007	Carp
Dodge Lake	Schoolcraft County	2006121	Jun/14/2006	Largemouth Bass, Northern Pike
East Bass Lake	Marquette County	2007202	Jun/05/2007	Northern Pike
Galien River	New Buffalo	2007215	Sep/18/2007	Carp
Glen Lake	Leelanau County	2007216	Apr/17/2007	Lake Trout, Rainbow Trout
Grand River	at Ionia	2006103	Jul/11/2006	Carp, Channel Catfish, Redhorse Sucker, Walleye
Grand River	Grand Rapids, below 6th Street dam	2007300	Jun/18/2007	Northern Pike
Grand River	Kent County, above 6th St. Dam	2007101	Sep/11/2007	Carp
Gull Lake	Kalamazoo County	2007102	May/29/2007	Largemouth Bass
Gun Lake	Barry County	2007103	Jun/01/2007	Largemouth Bass
Hubbard Lake	Alcona County	2006017	May/10/2006	Walleye, White Sucker
Kalamazoo River	Lake Allegan	2007105	Jun/01/2007	Carp
Klinger Lake	St. Joseph County	2006126	Dec/05/2006	Northern Pike
Lake Huron	Saginaw Bay	2007107	Sep/04/2007	Walleye
Lake Huron	Saginaw Bay, Charity Island	2007270	Sep/04/2007	Freshwater Drum
Lake Huron	Thunder Bay	2007109	Jun/11/2007	Lake Trout, Walleye
Lake Huron	Thunder Bay	2007130	Aug/01/2007	Alewife, Round goby
Lake Huron	Thunder Bay	2007269	Oct/23/2007	Lake Whitefish
Lake Margrethe	Crawford County	2007227	May/08/2007	Walleye
Lake Michigamme	Marquette County	2006035	Apr/22/2006	Rock Bass, Walleye
Lake Michigan	Little Bay De Noc	2007112	Apr/18/2007	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	2007113	May/28/2007	Carp, Walleye
Lake Superior	Keweenaw Bay	2007114	Aug/01/2007	Lake Trout
Lake Superior	Keweenaw Bay	2007230	May/15/2007	Lake Herring, Siscowet
Lake Superior	Keweenaw Bay	2007231	May/15/2007	Lake Whitefish
Lake Superior	Marquette	2007267	May/01/2007	Lake Whitefish
Lake Superior	Portage Lake/ Sturgeon River	2007254	Dec/20/2006	Burbot, Burbot Liver
Long Lake	Iron County	2007235	Apr/17/2007	Walleye
Long Lake	Kent Co.	2006044	Jun/15/2006	Largemouth Bass
Long Lake	Montmorency County	2006046	May/11/2006	Smallmouth Bass
Looking Glass River	Cutler Rd	2007006	Jul/25/2007	Channel Catfish
Lost Lake	Presque Isle County	2007237	Jun/05/2007	Largemouth Bass
Manistique River	d/s Manistique Papers Dam	2007238	Apr/17/2007	Walleye
Maple River	d/s M-21	2007007	Jul/25/2007	Channel Catfish
Maple River	u/s Matherton	2006150	Jul/11/2006	Carp
Middle Straits Lake	Oakland County	2007240	May/09/2007	Northern Pike

Appendix D. Cont.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Milakokia Lake	Mackinac County	2007241	May/22/2007	Walleye
Millecoquins Lake	Mackinac County	2006049	May/01/2006	Rock Bass, Walleye
Murphy Lake	Tuscola Co	2007243	Apr/12/2007	Northern Pike
Muskegon Lake	Muskegon County	2006050	Jun/06/2006	Northern Pike
Muskegon River	Newaygo County, Croton Dam Pond	2007115	Sep/11/2007	Carp
Osterhout Lake	Allegan County	2007265	May/24/2007	Largemouth Bass
Otsego Lake	Otsego Co	2007244	May/22/2007	Walleye
Pine River	Gordonville Road	2007008	Jul/25/2007	Channel Catfish
Pine River	St. Louis WWTP Bridge	2007013	Jul/25/2007	Channel Catfish
Pine River	US-127	2007012	Jul/25/2007	Channel Catfish
Portage Lake	Houghton County	2007247	Apr/19/2007	Walleye
Randall Lake Chain	Morrison Lake	2007242	Apr/06/2007	Northern Pike
Silver Lake	Grand Traverse Co	2007251	Jun/05/2007	Walleye
South Manistique Lake	Mackinac County	2007116	Apr/16/2007	Walleye
St. Clair River	Algonac	2007118	Jun/28/2007	Carp
St. Joseph River	Chapin Lake	2007119	Sep/18/2007	Carp
St. Marys River	Munuscong Bay	2007117	Apr/19/2007	Walleye
Stoney Creek Hatchery	Caged Fish Control Station	2007020	Jul/25/2007	Channel Catfish
Tobico Marsh	Bay County	2007256	May/30/2007	Carp, Largemouth Bass, Northern Pike
Torch Lake	Houghton County	2007257	Apr/25/2007	Northern Pike, Walleye, White Sucker
White Lake	Muskegon County	2007258	Jun/12/2007	Carp, Northern Pike
White Lake	Oakland Co.	2007259	Jun/05/2007	Walleye