

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

FISH CONTAMINANT MONITORING REPORT

**A SUMMARY OF EDIBLE PORTION SAMPLING EFFORT
AND ANALYTICAL RESULTS
WITH RECOMMENDATIONS FOR UPDATES TO THE
MICHIGAN DEPARTMENT OF COMMUNITY HEALTH
EAT SAFE FISH GUIDE**

DECEMBER 2014

SECTION 1.0

INTRODUCTION

The Michigan Department of Environmental Quality-Water Resources Division (MDEQ-WRD) has measured bioaccumulative contaminants in over 17,000 fish tissue samples collected since 1980. 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. The MDEQ-WRD conducts fish contaminant monitoring to address four goals:

1. The first goal is to support the development of the Michigan Department of Community Health (MDCH) *Michigan Eat Safe Fish Guide*. Edible portion sample results are used by the MDCH to issue general and specific consumption advisories for sport-caught fish from Michigan's surface waters.
2. The second goal is to support the regulation of commercial fisheries in the waters of the state. The Michigan Department of Agriculture and Rural Development (MDARD) uses edible portion monitoring results to regulate sales of the commercial catch.
3. 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.
4. 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.

Prior to 1986, Michigan conducted fish contaminant studies on an as needed basis primarily to address specific problems. In 1986, a comprehensive plan was initiated to assess the degree of chemical contamination in fish from the surface waters of the state. The MDEQ uses three sampling elements to meet the goals of the monitoring program:

1. Edible portion sampling is often targeted toward sites of known or suspected contamination, sites popular with sport anglers, and sites with public access. Results from the analysis of edible portion samples are used to develop recommendations for updates to the MDCH *Eat Safe Fish Guide* and to identify water bodies that are supporting and not supporting the fish consumption designated use described in the WQS.
2. Temporal trends in contaminant concentrations are assessed by analyzing whole fish samples collected every three to five years from 22 Great Lake, connecting channel, or inland water body locations.
3. Caged fish or passive water samplers are used to identify sources of bioaccumulative contaminants and to identify spatial trends in contaminant concentrations.

The most recent annual report was written in 2011 and summarized edible portion results for fish collected primarily in 2009 (Bohr and VanDusen, 2011b). Fish collections and contaminant analysis continued annually since the completion of that report, but reporting on those data was delayed while the MDCH developed and began implementing a new fish consumption guidance protocol (MDCH, 2014). In addition, the MDCH developed revised fish consumption screening values (FCSV) for several key contaminants; supporting documents for those revisions can be found online at www.michigan.gov/mdch/0,4612,7-132-54783_54784_54785-170340--,00.html.

Development of the protocol and revised FCSVs necessitated a review of the entire MDEQ edible portion fish contaminant dataset, and recalculation of contaminant statistics based on the new protocol. Annual reporting was postponed until completion of that effort.

This report includes a detailed summary of edible portion analytical results obtained since the last Fish Contaminant Monitoring Program (FCMP) annual report (Bohr and VanDusen, 2011b), a summary of all edible portion sampling events conducted from 1980 through 2012, and a summary of analytical results obtained over that time period (Appendix E). This report also includes a list of whole fish temporal trend and caged fish collection efforts (Appendices F and G). Results of temporal trend analysis, caged fish studies, and special projects are analyzed and discussed in separate staff reports.

Several state and federal agencies and tribal organizations assist with the MDEQ-WRD fish contaminant monitoring efforts by collecting or analyzing samples and data. These include the Michigan Department of Natural Resources-Fisheries Division (MDNR-FD), MDCH, MDARD, United States Environmental Protection Agency (USEPA), United States Fish and Wildlife Service, Grand Traverse Band of Ottawa and Chippewa Indians, Chippewa Ottawa Resource Authority, Keweenaw Bay Indian Community, Little Traverse Bay Bands of Odawa Indians, and the Great Lakes Indian Fish and Wildlife Commission. In addition, sample collection plans and analytical results are reviewed by Michigan's Fish and Wildlife Contaminant Advisory Committee (FAWCAC). The FAWCAC members include representatives from all Michigan agencies involved in fish and wildlife contaminant monitoring (MDEQ-WRD, MDCH, MDARD, 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.

Michigan's fish contaminant data have been compiled into a large database and are available online at *(The link provided was broken and has been removed)*. The FCMP database, along with several other Michigan water quality databases, is also available online through the Michigan Surface Water Information Management System at www.mcgi.state.mi.us/miswims/. Summaries of contaminant data are 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; Bohr and Zbytowski, 2006, 2007, 2008, and Bohr and VanDusen, 2009, 2011a, 2011b). In addition, an inventory of contaminant monitoring locations sampled between 1980 and 2012 with fish analyzed as edible portion samples is provided in Appendix A.

SECTION 2.0

METHODS

2.1 FISH COLLECTION AND EDIBLE PORTION PROCESSING

The MDNR-FD and the MDEQ-WRD 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 have collected samples for the program.

The MDEQ-WRD processed fish in accordance with the Surface Water Assessment Section Procedure WRD-SWAS-004 (available upon request). Each fish was measured (total length) and weighed. Fish were prepared as standard edible portions (Table 1). Each sample was individually wrapped in aluminum foil, labeled, and held frozen until analyzed.

Over 820,000 edible portion samples have been analyzed by the MDEQ-WRD since regular fish contaminant monitoring began in 1980. This report summarizes the analyses of all the edible portion samples in the MDEQ database, with detailed emphasis on the samples of 615 fish of 18 species collected from 31 locations in 2010, 612 fish of 15 species collected from 26 locations in 2011, and 481 fish of 14 species collected from 16 locations in 2012. The 2010 through 2012 edible portion sampling locations are illustrated in Figures 1, 2, and 3. Edible portion sampling was often targeted toward sites of known or suspected contamination, sites popular with sport anglers, and sites with public access. In addition, samples were collected and analyzed with the support of USEPA Great Lakes Restoration Initiative grants with a goal of evaluating the status of contaminants in fish from various Areas of Concern.

2.2 CHEMICAL ANALYSES

Most of the fish tissue samples analyzed for the FCMP were conducted by the MDCH-Analytical Chemistry Laboratory (MDCH-ACL)(previously Michigan Department of Public Health laboratory); historically, certain analyses were conducted by the MDNR, MDARD, USEPA, or one of several contract laboratories as needed. Current and past analytical laboratories all have quality assurance programs and use peer-reviewed methods of digestion, extraction, and quantification. Table 2 lists the standard contaminants measured in most fish tissue samples. All results are reported to the MDEQ as wet weight concentrations.

Prior to 2000, polychlorinated biphenyls (PCB) were reported as total Aroclors; subsequent samples were analyzed using a congener detection method with results for a total of 83 congeners (Table 3).

Analyses of chlorinated dibenzo-p-dioxin, dibenzofuran (Table 4a), and coplanar PCB congeners (Table 4b) were performed on a subset of edible portion samples. The analysis of coplanar PCB (dioxin-like) congeners in MDEQ fish samples began in 2003 and has been part of the dioxin analysis in edible portion samples since 2007. Pace Analytical Laboratories has analyzed the dioxin-like congeners under a subcontract with the MDCH-ACL since 2006.

Mercury was measured as total mercury by thermal decomposition, amalgamation, and atomic absorption spectrometry.

Selenium samples were analyzed in selected samples by the MDCH-ACL using techniques based on the USEPA Method 200.11.

Perfluorinated compounds (PFC) in fish tissue were measured by the MDCH-ACL by Reversed Phase High Performance Liquid Chromatography Multiple Reaction Monitoring Tandem Mass Spectrometry. A total of 16 PFCs can be quantified in edible portion samples with the method used by the MDCH-ACL (Table 5).

The standard MDCH-ACL analytical method for toxaphene can identify a residue with chromatographic characteristics similar to toxaphene, but does not specifically identify the residue as the pesticide toxaphene. Those results are referred to as “apparent toxaphene.” The MDCH-ACL Limit of Quantification (LOQ) for apparent toxaphene is 0.05 parts per million (Table 2), which is higher than several of the MDCH FCSV. This means that we cannot identify fish populations with apparent toxaphene concentrations that would lead to a consumption recommendation of more than four meals per month. Recently the MDCH-ACL has developed an analytical method (Parlar method) that provides precise measurements of the concentrations of several toxaphene congeners (Parlars 26, 40, 41, 44, 50, and 62) as well as the toxaphene degradation products commonly referred to as Hx-Sed and Hp-Sed. Due to the higher cost of this analytical method it is used selectively on sample sets with relatively high apparent toxaphene concentrations. Toxaphene Parlars 26, 50, and 62 are the most likely of those compounds to accumulate in fish and represent about 90% of toxaphene in humans (MDCH, 2009). Toxaphene results using the Parlar method are reported as the total of the three congeners and listed as Toxaphene $\Sigma 3PC_{26,50,62}$ (or Tox $\Sigma 3PC$).

Finally, the MDCH-ACL does not report contaminant concentrations below the quantification level (QL), but above the detection level (DL) for mercury, selenium, or the organic parameters listed in Table 2. As a result, concentrations of these parameters that are below the QL are coded with a “K” in the FCMP database. In these cases, the “K” coded concentrations represent the MDCH-ACL 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.

2.3 SUMMARY STATISTICS

Total PCB concentration was estimated by summing the concentrations of the PCB congeners listed in Table 3. Individual congeners below the DL were assigned a concentration equal to zero 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 zero for the purpose of calculating a total PCB concentration. If the results of an individual congener analysis did not meet all quantification requirements (flagged “J”), 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 microgram per kilogram [part per billion]).

Total chlordane concentration was estimated by summing the concentrations of five chlordane breakdown products: *alpha*-chlordane, *gamma*-chlordane, *cis*-nonachlor, *trans*-nonachlor, and oxychlordane. Individual compounds below the QL were assigned a concentration equal to zero for the purpose of calculating a total chlordane concentration. If all five compounds were below the QL, then the total chlordane concentration was reported as less than the QL of the individual compounds.

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 zero for the purpose of calculating a total DDT concentration. If all six 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 USEPA recommended toxic equivalency factors for 7 dioxin, 10 dibenzofuran, and 12 dioxin-like PCB (dl-PCB) congeners (USEPA, 2010). 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. Any individual congener concentrations less than the DL were assigned a value of zero for the purpose of calculating the dioxin TEQ. The MDCH began including the 12 dioxin-like PCB congeners in the calculation of TEQ for the 2008 Fish Consumption Advisory; prior to that the TEQs were calculated using only the 17 dioxin and dibenzofuran congeners.

2.4 FISH CONSUMPTION SCREENING VALUES AND “EAT SAFE FISH” GUIDANCE DEVELOPMENT

The MDCH is responsible for establishing, modifying, or removing sport fish consumption advisories in Michigan. The MDCH toxicologists develop FCSVs based on a review of the best available scientific literature about the adverse health effects associated with a chemical of concern. The MDCH has established FCSVs for mercury, total PCBs, dioxin TEQ, total DDT, perfluorooctane sulfonate (PFOS), selenium, and toxaphene for use in developing meal category guidance (Table 6).

The fish consumption advisories are developed based on an evaluation of the relationship between contaminant concentrations and screening values across all size ranges of a given species of fish taken from specific locations. Where possible, linear regression analyses of fish length versus contaminant concentrations are used to predict lengths at which the concentrations in fish species are likely to exceed screening values. When regression analysis indicates a positive slope with a correlation coefficient (R^2) greater than 0.6, the MDCH uses the regression line to estimate the contaminant concentration in fish between the minimum and maximum lengths represented in the dataset. The estimated concentration at a range of lengths is compared to the FCSV ranges.

However, contaminant concentrations and fish total length data often do not conform to the underlying assumptions of linear regression, or the line does not meet the minimum R^2 required by the MDCH. In these cases, the appropriate advisory is determined using the upper 95% confidence limit (95% UCL) on the mean concentration measured in a minimum of five fish of legal size. Fish will shrink a significant amount due to freezing; since FCMP fish are held frozen prior to being measured, those fish within ½-inch of the minimum legal size limit are considered to be legal size for the calculation of the 95% UCL.

The MDCH prefers a dataset with a minimum of ten samples before establishing or modifying fish consumption advisories. However, best professional judgment is applied when evaluating smaller datasets. Additional details can be found in the *Michigan Fish Consumption Advisory Program Guidance Document* (MDCH, 2014).

The MDCH Eat Safe Fish Guide divides the state into five regions listing guidance for water bodies by county within those regions. The five regions include the Upper Peninsula (UP) and four quadrants in the Lower Peninsula (Figure 4). Each of the regions has a separate

pamphlet style guide (available online at www.michigan.gov/eatsafefish [*Going Fishing?* Button]). Guidance for the Great Lakes and connecting channels that adjoin those five regions is included in the appropriate regional guides. The Web page noted above also has a *Reports & Science* button that provides links to the Fish Consumption Data and Recommendation sheets that were used to develop specific guidance.

SECTION 3.0

RESULTS AND DISCUSSION

This report summarizes the analytical results available by December 31, 2013, for edible portion fish samples collected primarily in 2010, 2011, and 2012. A total of 1,718 edible portion fish tissue samples collected during that time period are summarized in this report. This includes samples of 21 species from 66 locations.

The MDEQ has conducted 1,426 edible portion fish sampling events at 750 sites in inland and Great Lakes waters of Michigan between 1980 and 2012 (Tables 7 and 8); results of the analysis of those samples are also summarized.

3.1 General Highlights for Samples Collected in 2010, 2011, and 2012

- Mercury was quantified in every sample collected between 2010 and 2012 (Table 9). The highest concentrations were found in top predator species from inland lakes and impoundments.
- Several of the contaminants analyzed were below the limits of quantification in all of the fish samples collected between 2010 and 2012; these were aldrin, heptachlorostyrene, hexachlorostyrene, pentachlorostyrene, and selenium. However, dieldrin, a breakdown product of aldrin, was quantified in fish tissue samples from 27 of 49 locations where chlorinated organic compounds were analyzed (Table 9).
- Dioxin TEQ concentrations were quantified in every sample from the 13 locations where samples were analyzed for dioxin-like compounds between 2010 and 2012 (Table 9).
- The maximum concentrations of most chlorinated organic contaminants were found in fish from the Great Lakes or locations with access to the Great Lakes (Table 9). Lake St. Clair carp had the highest concentrations of several organic contaminants.

3.2 General Highlights of All Comparisons with MDCH Screening Values

The following statements are in reference to all edible portion samples analyzed between 1980 and 2012. The summarizations are based on a compilation of guidance for individual water bodies presented in Appendices B and C.

- Mercury is a primary cause of fish consumption advisories for approximately 57% of the fish populations evaluated to date where both mercury and PCBs were analyzed, and would cause advisories for nearly 96% of those fish populations if it was the only contaminant of concern.
- PCBs are a primary cause of fish consumption advisories for 52% of the fish populations evaluated to date where both mercury and PCBs were analyzed; PCBs would cause advisories for 71% of those fish populations if it were the only contaminant of concern.
- Total DDT is a primary contaminant in 2% of all fish populations sampled to date. All of those populations are in inland waters of the Lower Peninsula, and most are associated with the legacy contamination of the Pine River watershed in Gratiot County. In all cases, mercury, PCBs, or both cause advisories equivalent to the DDT advice.

- Toxaphene is a primary contaminant in 3 (0.5%) of the fish populations sampled to date, specifically in Glen Lake (Leelanau County) lake trout and Lake Superior siscowet and suckers. At least one other contaminant causes an equivalent advisory in the lake trout and siscowet. In addition, toxaphene would cause advisories for 4.8% of the fish populations sampled to date if it were the only contaminant of concern.
- Dioxin TEQ has been analyzed in 38 fish populations to date, and is a primary cause of fish consumption advisories in 30 (79%) of those populations. Dioxin TEQ would cause advisories for all 38 fish populations evaluated to date if it was the only contaminant of concern.
- PFCs were analyzed in 16 fish populations to date. PFOS is a primary cause of fish consumption advisories in 4 (25%) of those populations, and would cause advisories in 4 (25%) of those populations if it was the only contaminant of concern.
- Selenium was analyzed in 29 fish populations to date, primarily in water bodies near iron mining activity in Marquette County. Selenium is a primary cause of fish consumption advice in 1 (3.4%) of those populations, and would cause advisories in 3 (10%) of the populations if it was the only contaminant of concern.

3.3 Summary of Sampling and Screening Value Comparisons for Inland Waters by Region

This section discusses analytical results for mercury, total PCBs, total DDT, toxaphene (as either apparent toxaphene or Tox Σ 3PC), dioxin TEQ, PFOS, and selenium assays conducted on samples collected in 2010, 2011, and 2012 from inland lakes, impoundments, and rivers. These are the contaminants with screening values developed by the MDCH. The discussion is organized into the five regions of the state used by the MDCH in the *Eat Safe Fish Guide* (Figure 4).

Upper Peninsula

A total of 29 fish populations comprised of ten species from 11 UP water bodies were sampled in 2010, 2011, and 2012 (Table 10). Detailed summaries of the results for samples collected in 2012 from UP inland water bodies are presented in Appendix D1. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

Mercury was assayed in all of the samples of UP fish populations sampled in 2010, 2011, and 2012, and is a primary cause of consumption advice in 83% of the populations sampled; if it was the only contaminant of concern mercury would cause consumption advisories to varying degrees for all 29 UP fish populations.

Total PCBs were assayed in 17 of the UP fish populations sampled in 2010, 2011, and 2012 (Table 10), and is a primary cause of consumption advice in 47% of the populations sampled (mercury and PCBs cause equivalent advisories in 3 sample sets). The UP water bodies sampled recently that are affected by PCB advisories are the Manistique River downstream of the Manistique Dam and the Menominee River downstream of the Upper Scott Dam; both are Areas of Concern with legacy PCB issues.

Total DDT was assayed in 17 UP fish populations sampled in 2010, 2011, and 2012 (Table 10). The concentrations were not high enough to be a primary cause of consumption advice, but total DDT would cause advisories in 2 (12%) of those populations if it were the only contaminant of concern.

Apparent toxaphene was assayed in 17 UP fish populations sampled in 2010, 2011, and 2012 (Table 10). The concentrations were not high enough to be a primary cause of consumption advice, but toxaphene would cause advisories in 1 (6%) of those populations (Otter Lake walleye) if it were the only contaminant of concern.

PFCs were assayed in walleye collected from Otter Lake (Houghton County) in 2010 and from the Hoist Basin (Dead River) in 2012. PFOS concentrations were below the MDCH screening values in both populations and would not cause consumption advisories.

Selenium was assayed in white sucker collected from Carp Creek (Marquette County) and northern pike and walleye from Deer Lake (Marquette County) in 2010 and 2011. Selenium concentrations were below MDCH screening values in both populations and would not cause consumption advisories.

Dioxin TEQ was not assayed in UP fish populations in 2010, 2011, or 2012.

Northwest Lower Peninsula

A total of 6 fish populations comprised of five species from 3 northwest Lower Peninsula (NWLP) water bodies were sampled in 2010 and 2011 (Table 10). No samples from NWLP water bodies collected in 2012 were analyzed.

Mercury was assayed in all of the NWLP samples collected in 2010 and 2011 and is the primary cause of consumption advice for all 6 fish of the populations sampled.

Total PCBs, total DDT, and apparent toxaphene were assayed in rock bass, smallmouth bass, and walleye collected from one NWLP water body, Platte Lake (Benzie County), in 2010. The lake had been sampled in 2004 and 2005 at the request of lake property owners because of concerns over potential contamination due to operations at the state-run fish hatchery upstream of the lake, as well as potential contamination by salmon using the Platte River during spawning migrations. The previous collection efforts did not provide sample numbers sufficient for adequate evaluation. Results of the 2010 sample analysis indicated that total PCB concentrations in smallmouth bass would cause a consumption advisory if PCBs were the only contaminant of concern. Total DDT would not cause advisories, and apparent toxaphene concentrations did not exceed the LOQ in the three Platte Lake fish populations sampled in 2010.

Dioxin TEQ, PFCs, and selenium were not assayed in the samples collected from NWLP water bodies in 2010 and 2011.

Northeast Lower Peninsula

A total of 15 fish populations comprised of 7 species from 8 northeast Lower Peninsula (NELP) water bodies were sampled in 2010, 2011, and 2012 (Table 10). Detailed summaries of the results for samples collected in 2012 from NELP inland water bodies are presented in Appendix D2. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (Reports & Science button).

Mercury was assayed in 11 of the NELP fish populations sampled in 2010, 2011, and 2012, and is a primary cause of consumption advice in all of those populations.

Total PCBs, total DDT, and toxaphene were assayed in 6 of the NELP fish populations sampled in 2010, 2011, and 2012. Total PCBs are a primary cause and total DDT is a secondary cause of consumption advice in one (17%) of the populations sampled, that being lake trout from Higgins Lake. Point sources of those contaminants are not suspected; lake trout are a long-lived species and have relatively high muscle fat content, both factors that tend to lead to higher concentrations of chlorinated organic chemicals. The sources are believed to be primarily atmospheric. Apparent toxaphene concentrations did not exceed the LOQ in any of the NELP fish populations sampled.

PFCs were assayed in nine of the NELP fish populations sampled in 2010, 2011, and 2012. All but one of the populations sampled is associated with legacy PFC pollution at a retired Air Force base in Oscoda near the mouth of the Au Sable River. PFOS is a primary cause of consumption advice in four of the eight populations potentially affected by the legacy contamination, and would cause consumption advisories in the other four populations if it were the only contaminant of concern. PFOS was also assayed in walleye from Lake St. Helen (Roscommon County), but concentrations in that population did not exceed screening values. Lastly, steelhead (rainbow trout) and walleye collected from the Au Sable River were also analyzed for PFCs; these two species are considered transient in rivers connected to a Great Lake, and the results for these samples are discussed in the Lake Huron summary.

Dioxin TEQ and selenium were not assayed in NELP fish populations in 2010, 2011, or 2012.

Southwest Lower Peninsula

A total of 50 fish populations comprised of 11 species from 19 southwest Lower Peninsula (SWLP) water bodies were sampled between 2010 and 2012 (Table 10). Detailed summaries of the results for samples collected in 2012 from SWLP inland water bodies are presented in Appendix D3. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (Reports & Science button).

Mercury was assayed in 42 of the SWLP fish populations sampled between 2010 and 2012, and is the primary cause of consumption advice in over half of those populations. Mercury would cause consumption advisories in nearly 98% of the SWLP fish populations sampled if it were the only contaminant of concern.

Total PCBs were assayed in 41 of the SWLP fish populations sampled between 2010 and 2012, including 12 populations from the Kalamazoo River Area of Concern where PCBs are the main contaminant of concern. PCBs are a primary cause of consumption advice in 66% of the populations sampled and would cause a consumption advisory in 78% of the fish populations if it was the only contaminant of concern.

Total DDT was assayed in 32 of the SWLP fish populations sampled between 2010 and 2012 and was the primary cause of consumption advice in 1 (3%) population (carp from the Pine River downstream of St. Louis, Gratiot County). DDT would cause consumption advisories in 22% of the fish populations sampled if it was the only contaminant of concern; all but one of the affected populations is associated with the legacy contamination in the Pine River in Gratiot County.

Dioxin TEQ was assayed in carp from three areas of the Kalamazoo River in 2011. Dioxin TEQ is a primary cause of consumption advice in carp between the Morrow and Marshall Dams and downstream of the Allegan Dam, and is a secondary cause in carp from between the Morrow and Allegan Dams.

Apparent toxaphene was assayed in 32 of the SWLP fish populations sampled between 2010 and 2012. Concentrations did not exceed the LOQ in any of those populations.

PFCs and selenium were not assayed in samples collected from SWLP water bodies in 2010, 2011, or 2012.

Southeast Lower Peninsula

A total of 13 fish populations comprised of 6 species from 8 southeast Lower Peninsula (SELP) water bodies were sampled between 2010 and 2012 (Table 10). Detailed summaries of the results for samples collected in 2012 from SELP inland water bodies are presented in Appendix D4. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

Mercury was assayed in all 13 SELP fish populations sampled between 2010 and 2012, and is the primary cause of consumption advice in six (46%) of those populations. Mercury would cause consumption advisories in 12 (92%) of the SELP fish populations sampled if it were the only contaminant of concern.

Total PCBs were assayed in 11 of the SELP fish populations sampled between 2010 and 2012, including 3 populations from Belleville lake, an impoundment of the Huron River where PCBs were a legacy contaminant. PCBs are a primary cause of consumption advice in 8 (73%) of the fish populations sampled, but were not a secondary cause in any of the sample sets.

Total DDT was assayed in 11 of the SELP fish populations sampled between 2010 and 2012 and was not a primary cause of consumption advice in any of the sample sets. Total DDT would cause consumption advisories in 4 (36%) of the SELP fish populations sampled if it was the only contaminant of concern.

Apparent toxaphene was assayed in 11 SELP fish populations between 2010 and 2012; concentrations did not exceed the LOQ in any of those datasets.

Selenium was assayed in bluegill and largemouth bass collected in 2010 from Saline Pond, an impoundment of the Saline River. The sampling was conducted after elevated levels of the element were measured in a permitted discharge to the river. Selenium concentrations in the samples did not exceed screening levels.

PFCs and dioxin TEQ were not assayed in samples collected from SELP water bodies in 2010, 2011, or 2012.

3.4 Summary of Sampling and Screening Value Comparisons for the Great Lakes and Connecting Channels

This section discusses analytical results for mercury, total PCBs, total DDT, toxaphene (as either apparent toxaphene or Tox Σ 3PC), dioxin TEQ, PFOS, and selenium assays conducted on samples collected in 2010, 2011, and 2012 from the Great Lakes and connecting channels. These are the contaminants with screening values developed by the MDCH.

3.4.1 Lake Superior

No edible portion fish samples from Lake Superior were collected in 2010, 2011, or 2012. Summaries for data collected prior to 2010 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

3.4.2 St. Marys River

A total of seven St. Marys River fish populations were sampled in 2012 (Table 11). Detailed summaries of the results for samples collected in 2012 from the St. Marys River are presented in Appendix D5. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

Mercury was assayed in all 7 St. Marys River fish populations sampled in 2012 and is a primary cause of consumption advice in 6 (86%) of those populations.

Total PCBs were assayed in all 7 St. Marys River fish populations sampled in 2012 and is a primary cause of consumption advice in 2 (28%) of those populations (carp and walleye). Total PCB concentrations in the other species sampled did not exceed MDCH screening values.

Total DDT was assayed in all seven St. Marys River fish populations sampled in 2012. Concentrations were not high enough to be a primary cause of consumption advice, but total DDT would cause consumption advice in carp if it was the only contaminant of concern.

Apparent toxaphene was assayed in pumpkinseed, rock bass, suckers, and yellow perch collected from the St. Marys River in 2012, and the concentrations were below the LOQ in all four datasets. Tox Σ PC was assayed in carp, smallmouth bass, and walleye collected from the St. Marys River in 2012; concentrations were lower than MDCH screening values for the smallmouth bass and walleye, and would cause consumption advice in carp if it were the only contaminant of concern.

PFCs were assayed in walleye collected in 2012 from the St. Marys River. PFOS concentrations in that fish population did not exceed the MDCH screening values.

Neither dioxin TEQ nor selenium was assayed in any St. Marys River fish populations sampled in 2012.

3.4.3 Lake Michigan

A total of five fish populations from Little Bay De Noc (northern Lake Michigan) were sampled in 2010 and 2012 (Table 11). Detailed summaries of the results for samples collected in 2012 from Lake Michigan are presented in Appendix D6. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

Mercury was assayed in all 5 Lake Michigan fish populations sampled in 2010 and 2012 and is a primary cause of consumption advice in 3 (60%) of the fish populations sampled; if it was the only contaminant of concern mercury would cause consumption advisories in all 5 populations.

Total PCBs were assayed in all 5 Lake Michigan fish populations sampled in 2010 and 2012 and is a primary cause of consumption advice in 4 (80%) of those populations (mercury and PCBs cause equivalent advisories in 2 sample sets). Total PCBs cause consumption advice for carp, redhorse sucker, smallmouth bass, and walleye, but not for northern pike.

Total DDT was assayed in all five Lake Michigan fish populations sampled in 2010 and 2012. Concentrations were not high enough to be a primary cause of advice, but total DDT would cause advisories in carp and walleye if it was the only contaminant of concern.

Apparent toxaphene was assayed in carp, northern pike, redhorse sucker, and smallmouth bass collected from Lake Michigan in 2010 and 2012. Concentrations were below the LOQ in all four datasets. Tox Σ3PC was assayed in walleye collected from Lake Michigan in 2012 and would cause a consumption advisory if it were the only contaminant of concern.

PFCs were assayed in walleye collected in 2012 from Little Bay De Noc. PFOS concentrations were not high enough to be a primary cause of advice but would cause an advisory if it was the only contaminant of concern.

Dioxin TEQ was assayed in carp collected in 2012 from Little Bay De Noc and in lake trout collected from Grand Traverse Bay in 2009, and is a primary cause of consumption advisories for both fish populations.

Selenium has not been assayed by the MDEQ in any Lake Michigan fish populations sampled to date.

3.4.4 Lake Huron

A total of six fish populations from Lake Huron were sampled in 2012 (Table 11). In addition, analytical results for two Lake Huron fish populations sampled in 2013 were available for this report. Detailed summaries of the results for samples collected in 2012 and 2013 from Lake Huron are presented in Appendix D7. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

Mercury was assayed in all 8 Lake Huron fish populations sampled in 2012 and 2013 and is a primary cause of consumption advice in 4 (50%) of the fish populations sampled; if it was the only contaminant of concern mercury would cause consumption advisories in all 8 populations.

Total PCBs were assayed in all 8 Lake Huron fish populations sampled in 2012 and 2013 and is a primary cause of consumption advice in 2 (25%) of those populations. Total PCB causes consumption advice for Lake Huron carp and rainbow trout (steelhead), and would also cause consumption advice for Lake Huron walleye if it was the only contaminant of concern.

Total DDT was assayed in all eight Lake Huron fish populations sampled in 2012 and 2013. Concentrations were not high enough to be a primary cause of advice, but total DDT would cause advisories in carp if it was the only contaminant of concern.

Apparent toxaphene was assayed in all eight Lake Huron fish populations sampled in 2012 and 2013. Concentrations were not high enough to be a primary cause of advice, but apparent toxaphene would cause advisories in carp if it was the only contaminant of concern.

PFCs were assayed in rainbow trout (steelhead) and walleye collected in 2013 from the Au Sable River at Oscoda. These fish are migratory and were considered to represent Lake Huron populations. PFOS concentrations were not high enough in either species to be a primary cause of advice but would cause an advisory for both species if it was the only contaminant of concern.

Dioxin TEQ was assayed in carp collected from the Les Cheneaux Islands area of northern Lake Huron in 2012 and from Saginaw Bay in 2004, channel catfish from Saginaw Bay in 2004, lake whitefish from Thunder Bay in 2007, walleye from Saginaw Bay in 2004 and 2008, white bass collected from Saginaw Bay in 2004 and 2008, and yellow perch collected from Saginaw Bay in 2004. TEQ is a primary cause of consumption advice for all of the Lake Huron fish populations tested.

Selenium has not been assayed by the MDEQ in any Lake Huron fish populations sampled to date.

3.4.5 St. Clair River

A total of four St. Clair River fish populations were sampled in 2012 (Table 11). Detailed summaries of the results for samples collected in 2012 from the St. Clair River are presented in Appendix D8. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

Mercury was assayed in all 4 St. Clair River fish populations sampled in 2012 and is the primary cause of consumption advice in 3 (75%) of those populations; if it was the only contaminant of concern mercury would cause consumption advisories in all 4 populations.

Total PCBs were assayed in all 4 St. Clair River fish populations sampled in 2012 and is a primary cause of consumption advice in 1 (25%) of those populations (carp). In addition, total PCB would cause consumption advice in smallmouth bass if it were the only contaminant of concern.

Total DDT was assayed in all four St. Clair River fish populations sampled in 2012. Concentrations were not high enough to be a primary cause of consumption advice in any of the populations, but total DDT would cause consumption advice in carp if it was the only contaminant of concern.

Apparent toxaphene was assayed in all four St. Clair River fish populations sampled in 2012. Concentrations were below the LOQ in all four datasets.

Dioxin TEQ was assayed in St. Clair River carp collected in 2012 and is a primary cause of consumption advice for that species.

PFCs and selenium were not assayed in any St. Clair River fish populations sampled in 2012.

3.4.6 Lake St. Clair

Samples of 12 fish species were collected from open waters of Lake St. Clair in 2010, 2011, and 2012. In addition, 4 species were collected from the Lange/Revere (aka 10-Mile) canals at St. Clair Shores, and 6 species were collected from the nearshore area of Lake St. Clair within 2 miles of the Lange/Revere canals. The relatively intensive sampling in and around the canals was conducted to investigate the extent of contamination due to legacy discharges of PCBs into the 10-Mile drain that empties into the canals. Detailed summaries of the results for samples collected in 2012 from UP inland water bodies are presented in Appendix D9. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

Mercury was assayed in all but 1 of the Lake St. Clair fish populations sampled between 2010 and 2012 (Table 11) and is a primary cause of consumption advice in 5 (30%) of those populations. Mercury would cause consumption advice in 11 (65%) of the fish populations if it was the only contaminant of concern.

Total PCBs were assayed in all of the Lake St. Clair fish populations sampled between 2010 and 2012 and is a primary cause of consumption advice in 13 (72%) of those populations.

Total PCB would cause consumption advice in 16 (89%) of those populations if it was the only contaminant of concern.

Total DDT was assayed in all of the Lake St. Clair fish populations sampled between 2010 and 2012. Concentrations were not high enough to be a primary cause of consumption advice in any of the populations, but total DDT would cause consumption advice in four of the populations if it was the only contaminant of concern.

Apparent toxaphene was assayed in Lake St. Clair fish populations sampled between 2010 and 2012. Concentrations were below the LOQ in all of the datasets.

Dioxin TEQ was assayed in Lake St. Clair River channel catfish collected in 2010 and is the primary cause of consumption advice for that species.

PFCs and selenium were not assayed in any fish collected from Lake St. Clair between 2010 and 2012.

3.4.7 Detroit River

Samples of ten species of fish were collected from the Detroit River in 2010 and 2011 (Table 11). Summaries for data collected from the Detroit River prior to 2012 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

Mercury was assayed in all of the Detroit River fish populations sampled in 2010 and 2011 and is a primary cause of consumption advice in 2 (20%) of those populations. Mercury would cause consumption advice for all of the Detroit River species sampled in 2010 and 2011 if it were the only contaminant of concern.

Total PCBs were assayed in all of the Detroit River fish populations sampled in 2010 and 2011 and is a primary cause of consumption advice in 6 (60%) of those populations. Total PCB would cause consumption advice in all 10 fish populations if it were the only contaminant of concern.

Total DDT was assayed in all of the Detroit River fish populations sampled in 2010 and 2011. Concentrations were not high enough to be a primary cause of consumption advice in any of the populations, but total DDT would cause consumption advice in Detroit River carp if it was the only contaminant of concern.

Apparent toxaphene was assayed in Detroit River fish populations sampled between 2010 and 2011. Concentrations were below the LOQ in all of the datasets.

Dioxin TEQ was assayed in five species collected from the Detroit River in 2010 and 2011 and is a primary cause of consumption advisories for all five species.

PFCs and selenium were not assayed in fish collected from the Detroit River in 2010 and 2011.

3.4.8 Lake Erie

A total of six fish populations from Lake Erie were sampled in 2011 and 2012 (Table 11). Detailed summaries of the results for samples collected in 2012 from Lake Erie are presented in Appendix D10. Summaries for data collected prior to 2012 are available online at www.michigan.gov/eatsafefish (*Reports & Science* button).

Mercury was assayed in all six Lake Erie fish populations sampled in 2011 and 2012 and is not a primary cause of consumption advice in any of those populations; if it was the only contaminant of concern mercury would cause consumption advisories in all six populations.

Total PCBs were assayed in all six Lake Erie fish populations sampled in 2011 and 2012 and is a primary cause of consumption advice in all of those populations.

Total DDT was assayed in all six Lake Erie fish populations sampled in 2011 and 2012. Concentrations were not high enough to be a primary cause of advice, but total DDT would cause advisories in carp if it was the only contaminant of concern.

Apparent toxaphene was assayed in all six Lake Erie fish populations sampled in 2011 and 2012. Concentrations were not high enough to be a primary cause of advice, but apparent toxaphene would cause advisories in channel catfish if it was the only contaminant of concern.

PFCs were assayed in walleye collected in 2012 from Lake Erie. PFOS concentrations were not high enough to be a primary cause of advice but would cause an advisory if it was the only contaminant of concern.

Dioxin TEQ was assayed in carp collected from Lake Erie in 2006 and 2011, in channel catfish collected in 2008 and 2011, and white bass collected in 2011. TEQ is a primary cause of consumption advice for all three fish populations.

Selenium has not been assayed by the MDEQ in any Lake Erie fish populations sampled to date.

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SECTION 4.0

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

Standard Edible Portion	Common Name	Scientific Name
Skin-on Fillet	Yellow Perch	<i>Perca flavescens</i>
	Walleye	<i>Sander 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>Carpiodes cyprinus</i>	
Skin-off Steak	Sturgeon	<i>Acipenser fulvescens</i>
Headless, Gutted	Rainbow Smelt	<i>Osmerus mordax</i>

Table 2. Contaminants quantified in edible portion fish tissue samples.

<u>Contaminant</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
Selenium	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
Apparent Toxaphene	0.050 ppm
Toxaphene Σ 3PC _{26,50,62}	0.050 ppb
Mirex	0.001 ppm
PBB (FF-1, BP-6)	0.001 ppm
Total PCB (congener method)	0.001 ppm

Table 3. 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 4a. Chlorinated dibenzo-p-dioxin (CDD) and chlorinated dibenzofuran (CDF) congeners quantified in selected 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 4b. Coplanar PCB congeners analyzed quantified in selected fish tissue samples.

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

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

Table 5. Perfluorinated compounds quantified in selected fish tissue samples.

Compound	Level of Quantification (ppb)
Perfluorodecanoic acid	1
Perfluorododecanoic acid	1
Perfluorohexane sulfonate	1
Perfluoronanoic acid	1
Perfluorooctanoic acid	1
Perfluorooctane sulfonate	1
Perfluorooctanesulfonamide	1
Perfluorotridecanoic acid	1
Perfluoroundecanoic acid	1
Perfluorobutanoic acid	1
Perfluoropentanoic acid	1
Perfluorohexanoic acid	1
Perfluoroheptanoic acid	1
Perfluorotetradecanoic acid	1
Perfluorobutane sulfonate	1
Perfluorodecane sulfonate	1

Table 6. Michigan Department of Community Health Fish Consumption Screening Values for DDT plus metabolites, dioxin-like chemicals, mercury, PCBs, PFOS, selenium, and toxaphene.

Meal Category	DDT, DDE, DDD	Dioxins/Furans & co-planar PCBs	Mercury	PCBs
<i>meals per month</i>	<i>µg/g (ppm)</i>	<i>pg TEQ/g (ppt-TEQ)</i>	<i>µg/g (ppm)</i>	<i>µg/g (ppm)</i>
16	≤ 0.11	≤ 0.5	≤ 0.07	≤ 0.01
12	>0.11 to 0.15	>0.5 to 0.6	>0.07 to 0.09	>0.01 to 0.02
8	>0.15 to 0.23	>0.6 to 0.9	>0.09 to 0.13	>0.02 to 0.03
4	>0.23 to 0.45	>0.9 to 1.9	>0.13 to 0.27	>0.03 to 0.05
2	>0.45 to 0.91	>1.9 to 3.7	>0.27 to 0.53	>0.05 to 0.11
1	>0.91 to 1.8	>3.7 to 7.5	>0.53 to 1.1	>0.11 to 0.21
6 meals per year	>1.8 to 3.7	>7.5 to 15	>1.1 to 2.2	>0.21 to 0.43
Limited	>3.7 to 20	>15 to 90	NA	>0.43 to 2.7
Do Not Eat	>20	>90	>2.2	>2.7

Meal Category	PFOS (provisional)	Selenium	Total "Apparent" Toxaphene	Toxaphene Parlars 26, 50, 62 (Σ3PC26,50,62)
<i>meals per month</i>	<i>µg/g (ppm)</i>	<i>µg/g (ppm)</i>	<i>µg/g (ppm)</i>	<i>µg/g (ppm)</i>
16	≤ 0.009	≤ 2.3	≤ 0.02	≤ 0.001
12	>0.009 to 0.013	>2.3 to 3.1	>0.02 to 0.03	>0.001 to 0.002
8	>0.013 to 0.019	>3.1 to 4.6	>0.03 to 0.05	>0.002 to 0.003
4	>0.019 to 0.038	>4.6 to 9.2	>0.05 to 0.09	>0.003 to 0.006
2	>0.038 to 0.075	>9.2 to 17	>0.09 to 0.18	>0.006 to 0.011
1	>0.075 to 0.15	NA	>0.18 to 0.36	>0.011 to 0.023
6 meals per year	>0.15 to 0.3	NA	>0.36 to 0.73	>0.023 to 0.046
Limited	NA	NA	>0.73 to 4.5	>0.046 to 0.28
Do Not Eat	>0.3	>17	>4.5	>0.28

Table 7. Number of edible portion fish contaminant monitoring events by water body type, 1980 through 2012.

Year	Lakes	Impoundments	River	Drowned River Mouths	Wetland	Lake Superior	Lake Michigan	Lake Huron	Lake Erie	St. Marys River	St. Clair River	Lake St. Clair	Detroit River	Total
1980				2										2
1981		1	8											9
1982														0
1983	1	7	9				18	7			1			43
1984	2	5	14	2		2	17	6	1					49
1985	5	5	18			1	11	10			1	2		55
1986	13	5	15	1		1	10	13	1	1	2	1	3	66
1987	26	9	18	2		6	9	5	1	1		1		78
1988	25	7	12			1	9	2				1		57
1989	33	9	8	1		3	8	6		1				69
1990	28	3	7				11	2				1	2	54
1991	10	3	9	1		2	6	7		1	1	1		41
1992	4	11	11	1		5	7	4	1					44
1993	17	6	18			3	6	6	1				2	59
1994	12	2	5			2	10	1	1		1	1	1	36
1995	13	8	3	2		4	5	3	3	2				43
1996	5	6	7		1	3	8	4						34
1997	7	7	6			1	10	2	2			1		36
1998	7	5	33			1	7	4				1		58
1999	10	17	6	1		1	2	2					1	40
2000	15	7	10			3	2		1			1		39
2001	17	11	8			1	3	1				1	1	43
2002	16	5	3			1	2		1					28
2003	30	6	7	1		2	4	1				1		52
2004	27	4	17	1			6	3	1	2			1	62
2005	18	6	11	1			1	1				1	1	40
2006	27	15	12			3	1		3		1			62
2007	28	6	3	2	1	3		2						45
2008	23	8	13	1		3	2	1	1					52
2009	21	5	10				3	2					1	42
2010	11	9	5				2				1	2	1	31
2011	10	15	7				1		1			1	3	38
2012	2	5	4		1		1	1	2	1	1	1		19
Total	463	218	317	19	3	52	182	96	21	9	9	18	19	1426

Table 8. Total number of edible portion fish contaminant sampling sites by water body type, 1980 through 2012.

Water Body Type	# Sampling Sites
Inland Lakes	315
Impoundments	91
River	196
Drowned River Mouths	6
Wetland	1
Great Lakes & Connecting Channels	
Lake Superior	26
Lake Michigan	42
Lake Huron	35
Lake Erie	6
St. Marys River	4
St. Clair River	5
Lake St. Clair	15
Detroit River	8

Table 9. Summary of chemicals quantified in edible portion fish tissue samples collected in 2010, 2011, and 2012.

Chemical*	# of Sites Monitored	# of Sites Quantified	Concentration Range (ppm except as noted)	Location and Species with Maximum Concentration
Total Chlordane	49	42	K0.001 – 0.496	Lake St. Clair, Lange/Revere Canals, Carp
Total DDT	49	47	K0.001 - 12.99	Pine River, Gratiot Co., d-s St. Louis, Carp
Aldrin	49	0	K0.001	no quantified concentrations
Dieldrin	49	27	K0.001 – 0.013	Lake Erie, Monroe, Channel Catfish
<i>gamma</i> -BHC (Lindane)	49	3	K0.001 - 0.01	Lake St. Clair, Lange/Revere Canals, Carp
Heptachlor Epoxide	49	19	K0.001 – 0.003	Lake Michigan, Little Bay De Noc, Northern Pike
Hexachlorobenzene	49	38	K0.001 - 0.01	Lake Nepessing, Lapeer Co., Carp
Mirex	49	21	K0.001 – 0.004	Manistique River, d-s Manistique Dam, Carp
Mercury	63	63	0.013 - 5.5	Deer Lake, Marquette Co., Northern Pike
Heptachlor	49	5	K0.001 – 0.002	Lake Michigan, Little Bay De Noc, Carp
Heptachlorostyrene	49	0	K0.001	no quantified concentrations
Hexachlorostyrene	49	0	K0.001	no quantified concentrations
Octachlorostyrene	49	24	K0.001 – 0.018	Detroit River, Celeron Island, Channel Catfish
Pentachlorostyrene	49	0	K0.001	no quantified concentrations
PBB	49	11	K0.001 – 0.03	Pine River, d-s St. Louis, Smallmouth Bass
Selenium	2	0	K2.0	no quantified concentrations
Terphenyl	49	3	K0.25 – 0.25	Lake St. Clair, Anchor Bay, Carp
Total PCB	51	48	K0.001 - 215	Lake St. Clair, Lange/Revere Canals, Carp
Apparent Toxaphene	49	3	K0.05 – 0.05	Lake St. Clair, Anchor Bay, Carp
Toxaphene Σ PC _{26,50,62}	2	2	K5 – 2.2 ppb	Lake Michigan, Little Bay De Noc, Walleye
Dioxin TEQ*	13	13	0.69 - 186.9 ppt	Lake Huron, Les Cheneaux, Carp
PFOS	10	10	0.48 – 9580 ppb	Clark's Marsh, Iosco County, Pumpkinseed

K = Unquantified at the level shown.

* = TEQ calculated based on 2005 World Health Organization TEFs, including co-planar PCBs

Table 10. Summary of contaminants causing consumption guidance for fish taken from inland waters of Michigan using data collected in 2010, 2011, and 2012.

Site I.D.	Location	County	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	New Guideline?
Upper Peninsula											
2010260	Carp Creek u/s Deer Lake	Marquette	White Sucker	X	na	na	na	na		na	No
2010261 & 2011207	Carp River Basin	Marquette	Northern Pike	X	na	na	na	na	na	na	No
			Walleye	X	na	na	na	na	na	na	No
			White Sucker	X	na	na	na	na	na	na	No
			Yellow Perch	X	na	na	na	na	na	na	No
2010205 & 2011212	Deer Lake	Marquette	Northern Pike	X	na	na	na	na		na	No
			Walleye	X	na	na	na	na		na	No
			White Sucker	X	na	na	na	na	na	na	No
			Yellow Perch	X	na	na	na	na	na	na	No
2012208	Dead River	Hoist Basin	Marquette	Walleye	X	na	na	na		na	Yes
2012221, 2012300, & 2012360	Manistique River d/s Dam	Schoolcraft	Carp	+	X	+	na	na	na		No
			Redhorse Sucker	+	X		na	na	na		No
			Rock Bass	X	+		na	na	na		No
			Smallmouth Bass	+	X		na	na	na		No
			Walleye	+	X		na	na	na		No
2010237	Menominee River Chalk Hills Imp	Menominee	Walleye	X	+		na	na	na		No
			Redhorse Sucker	X	+		na	na	na		No

X = primary cause of advisory; + = secondary cause of advisory; blank = assessed but would not cause advisory; na = not assessed

Table 10 (continued). Summary of contaminants causing consumption guidance for fish taken from inland waters of Michigan using data collected in 2010, 2011, and 2012.

Site I.D.	Location	County	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	New Guideline?	
Upper Peninsula (continued)												
2012250	Menominee River, downstream of Lower Scott Dam (aka Menominee Dam)	Menominee	Black Crappie	X	+		na	na	na		Yes	
			Bluegill	X			na	na	na		Yes	
			Carp	+	X	+	na	na	na		No	
			Northern Pike	X	X		na	na	na		No	
			Smallmouth Bass	X	X		na	na	na		No	
			Yellow Perch	X	+		na	na	na		Yes	
2012355	Menominee River, Lower Scott Flowage	Menominee	Carp	X	X		na	na	na		Yes	
			Redhorse Sucker	X	+		na	na	na		Yes	
			Rock Bass	X			na	na	na		No	
			Smallmouth Bass				insufficient sample size					
2010240	Otter Lake	Houghton	Walleye	X	+		na		na	+	Yes	
2010252	Thayers Lake	Keweenaw	Yellow Perch	X	na	na	na	na	na	na	Yes	
2012230	Stager Lake	Iron	Walleye	X	na	na	na	na	na	na	Yes	
Northwest Lower Peninsula												
2010217	Hamlin Lake	Mason	Largemouth Bass	X	na	na	na	na	na	na	na	Yes
			Walleye	X	na	na	na	na	na	na	na	Yes
2011231	Manistee River Tippy Pond	Manistee	Northern Pike	X	na	na	na	na	na	na	Yes	
2010242	Platte Lake	Benzie	Rock Bass	X			na	na	na		No	
			Smallmouth Bass	X	+		na	na	na		No	
			Walleye	X			na	na	na		No	

X = primary cause of advisory; + = secondary cause of advisory; blank = assessed but would not cause advisory; na = not assessed

Table 10 (continued). Summary of contaminants causing consumption guidance for fish taken from inland waters of Michigan using data collected in 2010, 2011, and 2012.

Site I.D.	Location	County	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	New Guideline?
Northeast Lower Peninsula											
2010228	Lake St. Helen	Roscommon	Walleye	X	na	na	na		na	na	Yes
2010235	McCullum Lake	Oscoda	Largemouth Bass	X	na	na	na	na	na	na	Yes
2011103	Higgins Lake	Roscommon	Lake Trout	X	X	+	na	na	na		No
2011205	Big Lake	Otsego	Smallmouth Bass	X	na	na	na	na	na	na	Yes
2011226	Lake 15	Montmorency	Largemouth Bass	X	na	na	na	na	na	na	Yes
2011246	Au Sable River, d/s whirlpool	Iosco	Smallmouth Bass	X			na	X	na		Yes
			White Sucker	X			na	X	na		Yes
2011301 - 304	Clark's Marsh	Iosco	Pumpkinseed/Bluegill	na	na	na	na	X	na	na	Yes
2010253 & 2012351	Van Etten Lake	Iosco	Walleye	X			na	+	na		No
			White Sucker	X			na	+	na		Yes
			Pumpkinseed	na	na	na	na	+	na	na	Yes
			Rock Bass	na	na	na	na	+	na	na	Yes
2012353	Au Sable River, Oscoda	Iosco	Pumpkinseed/Bluegill				insufficient sample size				
			Rock Bass	X	na	na	na		na	na	Yes
			Smallmouth Bass	X			na	+	na		Yes
Southwest Lower Peninsula											
2011213	East Long Lake	Branch	Northern Pike	X	na	na	na	na	na	na	Yes
2010270	Fidelity Lake	Ingham	Black Crappie				insufficient sample size				
			Bluegill	X			na	na	na		Yes
			Largemouth Bass	X			na	na	na		Yes
2010219	Horsehead Lake	Mecosta	Largemouth Bass	X	na	na	na	na	na	na	Yes

X = primary cause of advisory; + = secondary cause of advisory; blank = assessed but would not cause advisory; na = not assessed

Table 10 (continued). Summary of contaminants causing consumption guidance for fish taken from inland waters of Michigan using data collected in 2010, 2011, and 2012.

Site I.D.	Location	County	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	New Guideline?
Southwest Lower Peninsula (continued)											
2010300 & 2011401	Kalamazoo River, Marshall Pond	Calhoun	Carp	X	X		na	na	na		Yes
			Largemouth Bass	X	+		na	na	na		Yes
			Rock Bass	X			na	na	na		Yes
			Smallmouth Bass	X	+		na	na	na		Yes
2010502, 2010503, 2011402, 2011403, & 2012400	Kalamazoo River, between Marshall and Morrow Dams	Calhoun and Kalamazoo	Bluegill		X		na	na	na		Yes
			Carp	+	X		X	na	na		No
			Channel Catfish	na	X		X	na	na		No
			Largemouth Bass	+	X		na	na	na		No
			Rock Bass	X			na	na	na		Yes
Smallmouth Bass	+	X		na	na	na		No			
2011430, 432, 433, 436, 437, 438, 462, 463, 482, 2013...	Kalamazoo River between Morrow Dam & Lake Allegan Dam	Kalamazoo & Allegan	Carp	+	X		+	na	na		No
			Channel Catfish	na	X	na	na	na	na		No
			Largemouth Bass	+	X		na	na	na		No
			Smallmouth Bass	+	X		na	na	na		No
			Bluegill/Sunfish	+	X		na	na	na		No
2011434 & 2011435	Kalamazoo River & Kalamazoo Lake	Allegan	Carp	na	X	na	na	na	na	na	No
			Channel Catfish	na	X	na	na	na	na	na	No
			Smallmouth Bass	+	X	na	na	na	na	na	No
2012500	Pine Creek Impoundment	Allegan	Bluegill	+	X	na	na	na	na	na	Yes
			Carp	+	X	na	na	na	na	na	Yes
			Largemouth Bass	X	+	na	na	na	na	na	Yes

X = primary cause of advisory; + = secondary cause of advisory; blank = assessed but would not cause advisory; na = not assessed

Table 10 (continued). Summary of contaminants causing consumption guidance for fish taken from inland waters of Michigan using data collected in 2010, 2011, and 2012.

Site I.D.	Location	County	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	New Guideline?
Southwest Lower Peninsula (continued)											
2010320	Pine River, u/s Alma	Gratiot	Redhorse Sucker	X			na	na	na		Yes
			Smallmouth Bass	X		na	na	na		Yes	
2010321	Pine River, Alma Pond	Gratiot	Carp	+	X	+	na	na	na		No
2010262	Pine River, St. Louis Impoundment	Gratiot	Black Crappie	X			na	na	na		No
			Bluegill	+	X		na	na	na		No
			Carp	+	X	+	na	na	na		No
			Channel Catfish	+	X	+	na	na	na		No
			Largemouth Bass	X	+	na	na	na		No	
			Northern Pike			insufficient sample size					
			Rock Bass	X		na	na	na		No	
			Smallmouth Bass	X	+	na	na	na		No	
2010322	Pine River, d/s St. Louis Dam	Gratiot	White Sucker	+	X		na	na	na		No
			Carp	+	X	X	na	na	na		No
			Redhorse Sucker	+	X	+	na	na	na		No
			Smallmouth Bass	X	X	+	na	na	na		No
2010243	Prairie River Lake	St. Joseph	Largemouth Bass	X	na	na	na	na	na	na	Yes
			Northern Pike	X	na	na	na	na	na	na	Yes
2011461	Portage Creek, Bryant Mill Pond	Kalamazoo	Carp	na	X	na	na	na	na	na	No
2011468	Portage Creek, Monarch Pond	Kalamazoo	Carp	na	X	na	na	na	na	na	No
2011243	Ruddiman Creek Lagoon	Muskegon	Carp	+	X	+	na	na	na		No
			Largemouth Bass	+	X		na	na	na		No
2011239	Six Lakes	Montcalm	Northern Pike	X	na	na	na	na	na	na	Yes
2011551	Sturgeon Lake	St. Joseph	Northern Pike	X	na	na	na	na	na	na	Yes
2011250	Thornapple Lake	Barry	Largemouth Bass	X			na	na	na		No

X = primary cause of advisory; + = secondary cause of advisory; blank = assessed but would not cause advisory; na = not assessed

Table 10 (continued). Summary of contaminants causing consumption guidance for fish taken from inland waters of Michigan using data collected in 2010, 2011, and 2012.

Site I.D.	Location	County	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	New Guideline?
Southeast Lower Peninsula											
2011210	Crotched Lake	Oakland	Carp	+	X		na	na	na		Yes
2010218	Hoisington Lake	Livingston	Carp	X	X		na	na	na		Yes
			Largemouth Bass	X	na	na	na	na	na	na	Yes
2012213	Huron River Belleville Lake	Wayne	Carp	+	X	+	na	na	na		No
			Channel Catfish	+	X	+	na	na	na		Yes
			Walleye	+	X		na	na	na		No
2011225	Lake Fenton	Genesee	Largemouth Bass	X			na	na	na	No	
2011227	Lake Nepessing	Lapeer	Carp	+	X	+	na	na	na	Yes	
2010233	Loon Lake	Oakland	Carp	+	X	+	na	na	na	No	
2010247	Saline River Saline Pond	Washtenaw	Bluegill	X	na	na	na	na		na	Yes
			Largemouth Bass	X			na	na			Yes
2012231	Tobico Marsh	Bay	Carp		X		na	na	na		No
			Northern Pike	X			na	na	na		No

X = primary cause of advisory; + = secondary cause of advisory; blank = assessed but would not cause advisory; na = not assessed

Table 11. Summary of contaminants causing consumption guidance for fish taken from Great Lakes and connecting channels in 2010, 2011, and 2012.

Visit I.D.	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	New Guideline?
Lake Michigan										
2010277 & 2012217	Little Bay De Noc	Carp	+	X	+	X	na	na		No
		Northern Pike	X			na	na	na		No
		Redhorse Sucker	+	X		na	na	na		No
		Smallmouth Bass	X	X		na	na	na		No
		Walleye	X	X	+	na	+	na		No
Lake Huron										
2012215	Les Cheneaux Islands	Carp	+	X	+	X	na	na	+	No
		Largemouth Bass	X			na	na	na		Yes
		Pumpkinseed	X			na	na	na		Yes
		Rock Bass	X			na	na	na		Yes
		Smallmouth Bass	X			na	na	na		Yes
		Yellow Perch	+			X	na	na		No
2013260	Au Sable River	Rainbow Trout (Steelhead)	+	X		na	+	na		No
2013201	at Oscoda	Walleye	+	+		na	+	na		No
St. Marys River										
2012229	Munuscong Bay	Carp	+	X	+	na	na	na		No
		Pumpkinseed	X			na	na	na		Yes
		Redhorse Sucker	X			na	na	na		No
		Rock Bass	X			na	na	na		Yes
		Smallmouth Bass	X			na	na	na		Yes
		Walleye	X	X		na		na		No
		Yellow Perch	X			na	na	na		No

X = primary cause of advisory; + = secondary cause of advisory;
blank = assessed but would not cause advisory; na = not assessed

Table 11 (continued). Summary of contaminants causing consumption guidance for fish taken from Great Lakes and connecting channels in 2010, 2011, and 2012.

Visit I.D.	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	New Guideline?	
St. Clair River											
2012228	Algonac	Carp	+	X	+	X	na	na		No	
		Rock Bass	X			na	na	na		Yes	
		Smallmouth Bass	X	+		na	na	na		Yes	
		Yellow Perch	X			na	na	na		Yes	
Lake St. Clair											
2010303	10-Mile Canals (TMC), St. Clair Shores	Black Crappie		X		na	na	na		Yes	
		Carp		X		na	na	na		Yes	
		Largemouth Bass		X		na	na	na		Yes	
		Pumpkinseed		X		na	na	na		Yes	
2011501, 2011502, 2011521, & 2011522	St. Clair Shores nearshore, < 2 Miles from TMC	Bluegill/Pumpkinseed	na	X		na	na	na		Yes	
		Carp	+	X	+	+	na	na		No	
		Smallmouth Bass				insufficient sample size					
		Walleye (see <i>L. Erie</i>)	<i>St. Clair R., L. St. Clair, Detroit R., L. Erie combined</i>								
		Yellow Perch	+	X		na	na	na		Yes	
2010258, 2011503, 2011504, 2011505, 2011523, 2011524, & 2012251	Anchor Bay & St. Clair Shores nearshore, > 2 Miles from TMC	Bluegill/Pumpkinseed		X		na	na	na		Yes	
		Carp	+	X	+	na	na	na		No	
		Channel Catfish	+	+		X	na	na		No	
		Freshwater Drum	X	X		na	na	na		No	
		Large/Smallmouth Bass	X	X		na	na	na		No	
		Muskellunge	X	+	+	na	na	na		No	
		Northern Pike	X	+		na	na	na		No	
		Rock Bass	+	X	+	na	na	na		Yes	
Walleye (see <i>L. Erie</i>)	<i>St. Clair R., L. St. Clair, Detroit R., L. Erie combined</i>										
Yellow Perch	X			na	na	na		Yes			

X = primary cause of advisory; + = secondary cause of advisory; blank = assessed but would not cause advisory; na = not assessed

Table 11 (continued). Summary of contaminants causing consumption guidance for fish taken from Great Lakes and connecting channels in 2010, 2011, and 2012.

Visit I.D.	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	New Guideline?	
Detroit River											
2010207, 2011245, 2011247, & 2011248	Belle Isle, Celeron Island, & Grassy island	Bullhead	+	X		na	na	na		No	
		Carp	+	X	+	X	na	na		No	
		Channel Catfish	+	X		X	na	na		Yes	
		Large/Smallmouth Bass	+	X		na	na	na		Yes	
		Northern Pike	X	+		X	na	na		No	
		Rock Bass	X	X		na	na	na		Yes	
		Walleye (see <i>L. Erie</i>)	<i>St. Clair R., L. St. Clair, Detroit R., L. Erie combined</i>								
		White Bass (see <i>L. Erie</i>)	<i>St. Clair R., L. St. Clair, Detroit R., L. Erie combined</i>								
		Yellow Perch	+	X		na	na	na		No	
Lake Erie											
2011224, 2012252, & 2012350	Luna Pier & Monroe	Carp	+	X	+	X	na	na		No	
		Channel Catfish	+	X		X	na	na	+	No	
		Walleye	+	X		X	+	na	na		No
		White Bass	+	X		+	na	na		No	
		White Perch	+	X		na	na	na		No	
		Yellow Perch	+	X		na	na	na		No	

X = primary cause of advisory; + = secondary cause of advisory;
blank = assessed but would not cause advisory; na = not assessed

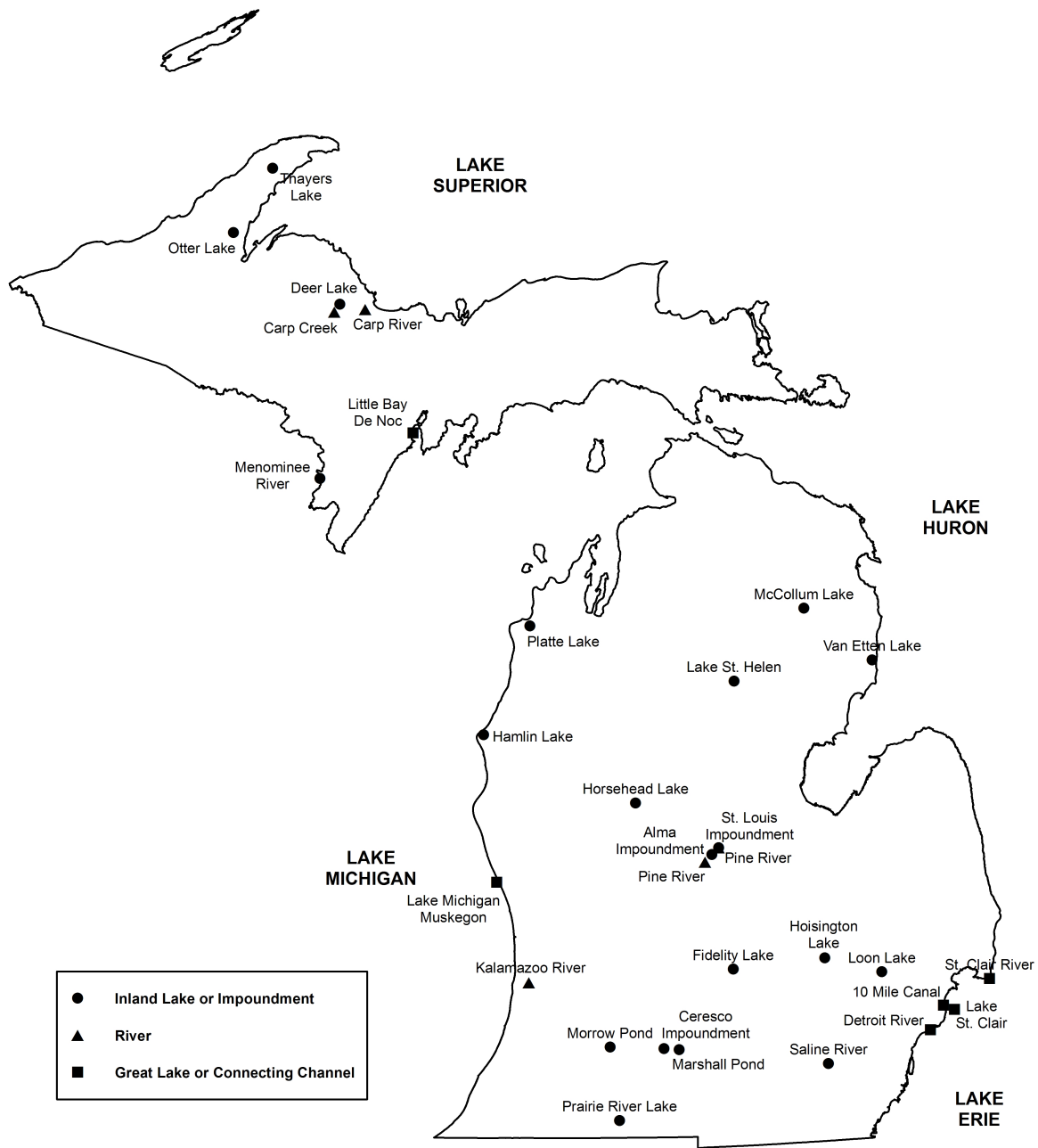


Figure 1. Edible portion sites sampled in 2010.



Figure 2. Edible portion sites sampled in 2011.



Figure 3. Edible portion sites sampled in 2012.

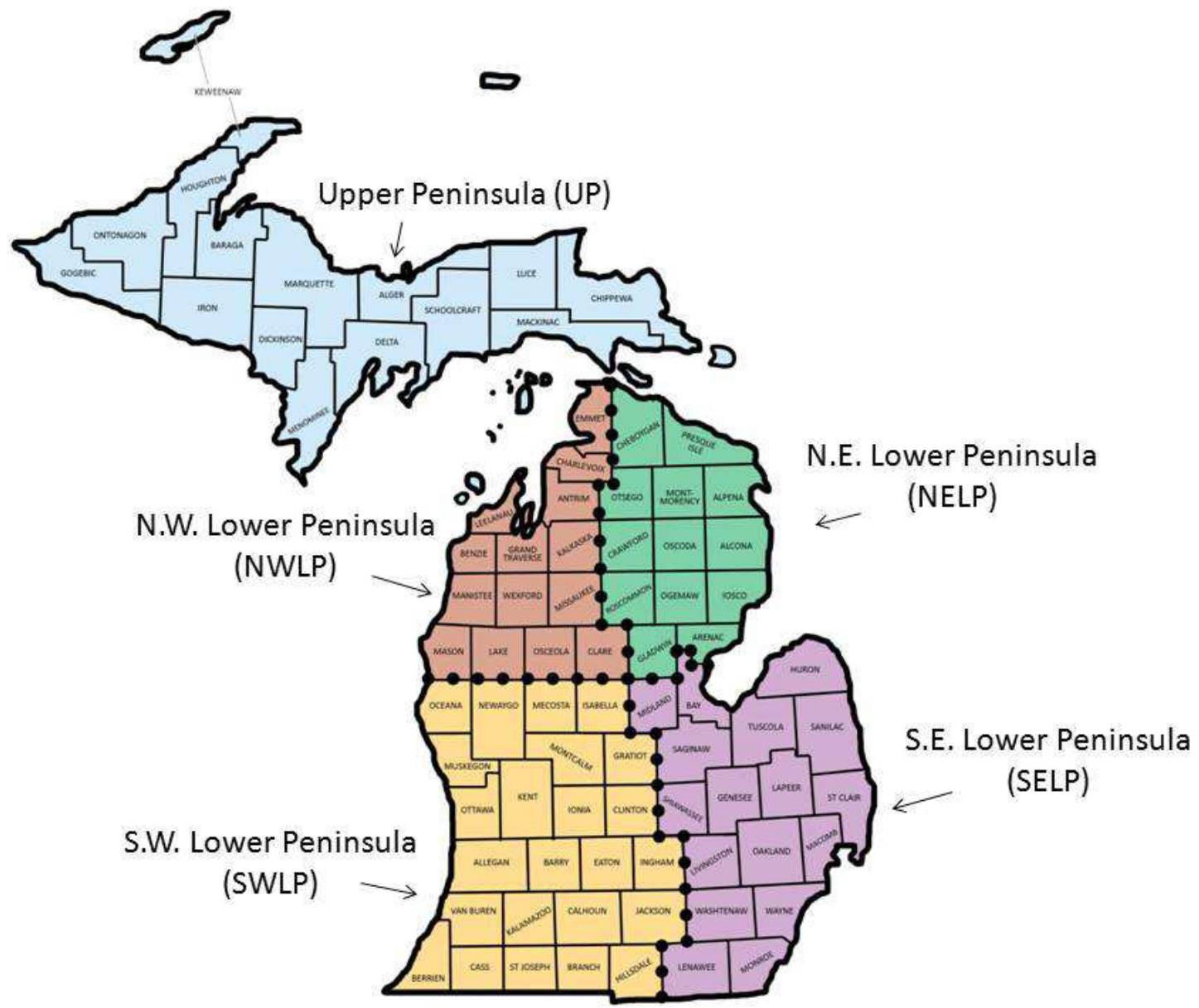


Figure 4. Five regions of Michigan used in the Department of Community Health “Eat Safe Fish Guide”.

Appendix A. Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
1980				
1/1/1980	80002	Lake Macatawa	Ottawa County	Black Crappie, Bluegill, Carp, Channel Catfish, Northern Pike, Smallmouth Bass, Walleye, White Sucker, Yellow Perch
7/2/1980	80001	White Lake	Muskegon County	Carp, Largemouth Bass, Northern Pike, Redhorse Sucker, Smallmouth Bass, White Sucker, Yellow Perch
1981				
6/3/1981	81006	Shiawassee River	Shiawassee County, Byron Road	Black Crappie, Carp, Northern Pike, Redhorse Sucker, Rock Bass, Sunfish
6/3/1981	81007	Shiawassee River	Genesee County, Duffield Road	Carp, Northern hogsucker, Northern Pike, Rock Bass, Sunfish
6/3/1981	81008	Shiawassee River	Shiawassee County, New Lothrop Road	Black Crappie, Carp, Minnow, Northern hogsucker, Rock Bass, Sunfish, White Sucker
6/3/1981	81009	Shiawassee River	Shiawassee Pond	Black Bullhead, Carp, Sunfish
6/3/1981	81004	Shiawassee River, South Branch	Livingston County, Chase Lake Road	Carp, Minnow, Northern Pike, Rock Bass, Sunfish, White Sucker, Yellow Bullhead
6/3/1981	81005	Shiawassee River, South Branch	Livingston County, Oak Grove Road	Black Crappie, Carp, Rock Bass, White Sucker
6/3/1981	81003	Shiawassee River, South Branch	Livingston County, Marr Road	Carp, Minnow, Northern Pike, Sunfish, White Sucker, Yellow Bullhead
6/3/1981	81002	Shiawassee River, South Branch	Livingston County, Bowen Road	Black Bullhead, Minnow, Northern Pike, Sunfish, White Sucker
6/3/1981	81001	Shiawassee River, South Branch	Livingston County, Grand River Road	Minnow, Sunfish, White Sucker
1983				
4/15/1983	83003	Clinton River	Macomb County above I-94 overpass	Carp, Walleye, White Sucker
9/12/1983	83002	Huron River	Ford Lake	Black Crappie, Brown Bullhead, Carp, Largemouth Bass, Walleye, White Sucker
5/1/1983	83034	Kalamazoo River	Lake Allegan	Largemouth Bass, Sunfish
7/1/1983	83005	Kalamazoo River	Plainwell Dam Reservoir	Carp
7/1/1983	83006	Kalamazoo River	Mosel Avenue	Carp
7/1/1983	83007	Kalamazoo River	Lake Allegan	Carp
5/1/1983	83032	Lake Huron	Saginaw Bay, Sand Point	Walleye
10/8/1983	83041	Lake Huron	Au Sable River	Chinook
10/11/1983	83014	Lake Huron	Au Sable River	Chinook
10/11/1983	83009	Lake Huron	Tawas River	Chinook, Coho
10/25/1983	83018	Lake Huron	Hammond Bay	Lake Trout, Lake Whitefish
11/8/1983	83024	Lake Huron	Marquette Island	Lake Trout
11/8/1983	83025	Lake Huron	East of Bois Blanc Island	Lake Trout
5/6/1983	83028	Lake Michigan	Pentwater	Chub
5/12/1983	83029	Lake Michigan	Manistee	Chub
8/8/1983	83030	Lake Michigan	South Haven	Chub
8/16/1983	83016	Lake Michigan	Grand Traverse Bay	Lake Whitefish
9/20/1983	83020	Lake Michigan	Manistee River	Chinook
9/20/1983	83040	Lake Michigan	Platte River	Coho
9/27/1983	83021	Lake Michigan	Little Traverse Bay	Lake Trout
10/5/1983	83010	Lake Michigan	St. Joseph River, Berrien Springs	Chinook, Coho
10/6/1983	83015	Lake Michigan	Grand River, Webber Dam	Chinook, Coho
10/7/1983	83011	Lake Michigan	Platte River	Chinook, Coho
10/20/1983	83031	Lake Michigan	Manitou Islands	Chub
10/20/1983	83023	Lake Michigan	Sturgeon Bay	Lake Trout
10/20/1983	83017	Lake Michigan	Little Bay De Noc	Lake Trout, Lake Whitefish
10/20/1983	83022	Lake Michigan	Glen Haven	Lake Trout
10/31/1983	83012	Lake Michigan	Thompson Creek	Chinook, Coho
11/8/1983	83019	Lake Michigan	Epoufette	Lake Whitefish
11/29/1983	83026	Lake Michigan	Grand Traverse Bay	Lake Trout
11/29/1983	83027	Lake Michigan	South Fox Island	Lake Trout
10/31/1983	83001	Pine River	Gratiot County, below St Louis Dam	Brown Bullhead, Carp, Common Shiner, Rock Bass, Smallmouth Bass, White Sucker
5/1/1983	83033	St. Joseph River	Chapin Lake	Smallmouth Bass

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
1984				
9/27/1984	84012	Carp River	M-35	Brook Trout, White Sucker, Yellow Perch
9/8/1984	84007	Chippewa River	Midland County	Black Crappie, Channel Catfish, Redhorse Sucker, Smallmouth Bass, White Sucker
9/23/1984	84014	Clinton River	Ryan Road, Utica	Carp, White Sucker
10/9/1984	84011	Deer Lake	Marquette County	Northern Pike, White Sucker, Yellow Perch
8/29/1984	84006	Grand River	Clinton County, State Road	Carp, Largemouth Bass, Smallmouth Bass
7/1/1984	83008	Kalamazoo River	Kalamazoo Lake	Carp
1/1/1984	84050	Lake Erie	Huron River, Flat Rock	Coho
6/4/1984	84042	Lake Huron	Saginaw Bay, near Saginaw River mouth	Carp, Channel Catfish
7/31/1984	84043	Lake Huron	Saginaw Bay, Bay Port	Carp
9/19/1984	84046	Lake Huron	Au Sable River	Chinook
9/27/1984	84044	Lake Huron	Saginaw Bay, Charity Island	Walleye
9/30/1984	84054	Lake Huron	Swan River	Coho
10/1/1984	84056	Lake Huron	Tawas River	Coho
4/10/1984	84002	Lake Macatawa	Ottawa County	Carp, Walleye
8/22/1984	84019	Lake Michigamme	Marquette County	Northern Pike, Rock Bass, Walleye, White Sucker, Yellow Perch
3/1/1984	84031	Lake Michigan	Grand Traverse Bay, East Arm	Lake Trout
3/20/1984	84032	Lake Michigan	Grand Traverse Bay, West Arm	Lake Trout
3/20/1984	84033	Lake Michigan	Norwood	Lake Trout
4/9/1984	84034	Lake Michigan	Pentwater	Lake Trout
4/15/1984	84035	Lake Michigan	Point Betsie	Lake Trout
5/2/1984	84036	Lake Michigan	Little Traverse Bay	Lake Trout
5/29/1984	84037	Lake Michigan	Grand Traverse Bay, West Arm	Lake Trout
6/4/1984	84040	Lake Michigan	Glen Haven	Chub
8/2/1984	84041	Lake Michigan	Pentwater	Chub
8/6/1984	84049	Lake Michigan	Leland	Chub
9/6/1984	84045	Lake Michigan	Manistee River	Chinook, Coho
9/19/1984	84047	Lake Michigan	Manistee River	Chinook
9/28/1984	84055	Lake Michigan	Grand River, Grand Rapids	Coho
9/30/1984	84048	Lake Michigan	Platte River	Coho
10/3/1984	84051	Lake Michigan	St. Joseph River, Berrien Springs	Coho
10/9/1984	84053	Lake Michigan	Platte River	Coho
10/17/1984	84052	Lake Michigan	Thompson Creek	Coho
5/10/1984	84003	Lake Superior	Tahquamenon River	Lake Whitefish
6/15/1984	84005	Lake Superior	Grand Marais Harbor	Lake Trout
10/18/1984	84009	Manistique River	d/s Manistique Papers Dam	Redhorse Sucker, Walleye, White Sucker
8/1/1984	84017	Menominee River	Iron County	Rock Bass
6/1/1984	84026	Michigamme River	Michigamme Reservoir	Northern Pike, Walleye, White Sucker
8/10/1984	84023	Michigamme River	Peavy Pond	Northern Pike, Rock Bass, Walleye, White Sucker, Yellow Perch
8/16/1984	84021	Michigamme River	Republic, Marquette County	Northern Pike, Walleye
8/24/1984	84025	Michigamme River	Iron County, Michigamme Falls Impoundment	Black Crappie, Northern Pike, Pumpkinseed, Smallmouth Bass, Walleye, Yellow Perch
8/31/1984	84022	Michigamme River	Iron County	Walleye
8/28/1984	84024	Paint River	Paint River Pond	Muskellunge, Rock Bass, Walleye, Yellow Perch
8/16/1984	84020	Perch Lake	Marquette County	Lake Whitefish, Longnose Sucker, Northern Pike, Rock Bass, Smallmouth Bass, White Sucker, Yellow Perch
6/28/1984	84015	Raisin River	Monroe, below Winchester Bridge	Carp, Largemouth Bass, Rock Bass, Smallmouth Bass
8/9/1984	84013	Saginaw River	Bay County, LaFayette	Carp, Northern Pike, White Bass
6/2/1984	84008	Shiawassee River, South Branch	Livingston County, Bowen Road	Black Crappie, Grass Pickerel, Northern Pike, Rock Bass, White Sucker
10/3/1984	84004	St. Joseph River	Berrien Springs, below Dam	Carp, Smallmouth Bass
4/3/1984	84010	Tittabawassee River	Midland County, below Dow Dam	Carp, Walleye, White Sucker
7/24/1984	84001	White Lake	Muskegon County	Carp, Northern Pike, Redhorse Sucker, Smallmouth Bass, Walleye

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
1985				
1/31/1985	85039	Cass River	Saginaw County, Dixie Highway	Carp, Freshwater Drum, Smallmouth Bass
8/29/1985	85003	Cass River	Bridgeport	Black Bullhead, Channel Catfish
6/8/1985	85005	Chippewa River	Midland County, M-20	Carp
6/19/1985	85010	Detroit River	Grassy Island	Carp
6/19/1985	85009	Detroit River	Belle Isle	Carp
6/26/1985	85029	Escanaba River	Delta County, Dam 3	Rock Bass
7/24/1985	85004	Grand River	Clinton County, State Road	Carp
5/15/1985	85035	Hersey River	Osceola County, Diamond Road	Brown Trout, White Sucker
7/1/1985	85049	Kalamazoo River	Morrow Pond	Carp, Largemouth Bass, Smallmouth Bass
7/1/1985	85051	Kalamazoo River	Mosel Avenue	Carp, Smallmouth Bass
7/1/1985	85052	Kalamazoo River	Plainwell Dam Reservoir	Carp, Smallmouth Bass
7/1/1985	85053	Kalamazoo River	Lake Allegan	Carp, Largemouth Bass, Smallmouth Bass
7/1/1985	85054	Kalamazoo River	Kalamazoo Lake	Carp, Largemouth Bass, Smallmouth Bass
7/30/1985	85062	Lake Gogebic	Gogebic/Ontonagon County	Walleye, White Sucker
4/26/1985	85064	Lake Huron	Saginaw Bay, Wildfowl Bay	Carp, Channel Catfish
5/23/1985	85031	Lake Huron	Saginaw Bay	Channel Catfish
5/23/1985	85033	Lake Huron	Saginaw Bay, Wildfowl Bay	Carp
5/28/1985	85034	Lake Huron	Saginaw Bay, near Saginaw River mouth	Carp, Channel Catfish
9/25/1985	85063	Lake Huron	Saginaw Bay, Wildfowl Bay	Carp
10/8/1985	85056	Lake Huron	Tawas River	Coho
10/10/1985	85024	Lake Huron	Alpena	Brown Trout
10/10/1985	85025	Lake Huron	Oscoda	Brown Trout
10/22/1985	85027	Lake Huron	Lexington	Brown Trout
10/23/1985	85026	Lake Huron	Port Sanilac	Brown Trout
5/15/1985	85036	Lake Michigan	Manistique River	Rainbow Trout
9/9/1985	85021	Lake Michigan	Little Manistee River Weir	Brown Trout
9/19/1985	85059	Lake Michigan	St. Joseph River, Berrien Springs	Coho
9/19/1985	85058	Lake Michigan	Thompson Creek	Coho
9/20/1985	85023	Lake Michigan	St. Joseph River, Berrien Springs	Brown Trout
9/25/1985	85022	Lake Michigan	Platte River	Brown Trout
9/25/1985	85055	Lake Michigan	Platte River	Coho
9/25/1985	85066	Lake Michigan	Manistee River	Chinook
9/25/1985	85068	Lake Michigan	Platte River	Coho
9/27/1985	85057	Lake Michigan	Grand River, Webber Dam	Coho
10/15/1985	85020	Lake Michigan	Thompson Creek	Brown Trout
7/15/1985	85013	Lake St. Clair	St. Johns Marsh	Carp
9/10/1985	85014	Lake St. Clair	Michigan waters	Muskellunge
8/1/1985	85028	Lake Superior	Ontonagon	Lake Trout, Lake Whitefish, White Sucker
6/1/1985	85008	Manistique River	d/s Manistique Papers Dam	Carp, Largemouth Bass, Walleye
10/25/1985	85019	Marten Lake	Iron County	Brown Bullhead, Northern Pike
6/18/1985	85061	Milakokia Lake	Mackinac County	Walleye, White Sucker
4/11/1985	85060	Pine River	Midland County, Homer Road	Carp, Smallmouth Bass, White Sucker
8/6/1985	85007	Pine River	Gratiot County, below St Louis Dam	Carp
7/1/1985	85050	Portage Creek	Bryant Mill Pond	Carp
6/19/1985	85011	Rouge River	Wayne County, below Jefferson Ave	Carp
6/19/1985	85012	Rouge River	Wayne County, above turning basin	Carp
6/11/1985	85018	Runkle Lake	Iron County	Northern Pike
7/17/1985	85001	Shiawassee River	Shiawassee County, New Lothrop Road	Carp, Crappie, Rock Bass
7/17/1985	85002	Shiawassee River	Shiawassee County, Byron Road	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
10/10/1985	85006	St. Clair River	St. Clair	Walleye
4/17/1985	85015	Tittabawassee River	Midland County, Smiths Crossing Road	Walleye
5/23/1985	85016	Tittabawassee River	Midland County, Smiths Crossing Road	Black Crappie, Northern Pike, Smallmouth Bass, White Bass
7/16/1985	85017	Tittabawassee River	Midland County, Smiths Crossing Road	Walleye
1986				
7/31/1986	86037	Au Sable River	Oscoda	Carp
10/29/1986	86062	Bear Lake	Muskegon County	Carp, Largemouth Bass, Northern Pike
5/21/1986	86004	Caribou Lake	Chippewa County	Rock Bass, Walleye
5/22/1986	86006	Chicagon Lake	Iron County	Rock Bass, Smallmouth Bass, Walleye
8/26/1986	86044	Clinton River	Macomb Co above Utica, Avon Road	Carp, Walleye
6/16/1986	86015	Clinton River	Macomb County, Mt. Clemens	Carp, Largemouth Bass, Smallmouth Bass, Walleye
7/29/1986	86033	Crego Park Pond	Lansing	Black Bullhead, Bluegill, Goldfish
6/3/1986	86063	Detroit River	Fighting Island	Carp
6/3/1986	86011	Detroit River	Gibraltar Bay	Carp
6/3/1986	86064	Detroit River	Grassy Island	Walleye
7/8/1986	86029	Duck Lake	Gogebic County	Northern Pike, Rock Bass, Walleye
5/28/1986	86009	Ellsworth Lake	Antrim County	Largemouth Bass, Northern Pike, White Sucker
5/14/1986	86003	Erickson Power Plant Pond	Eaton County	Brown Bullhead, Sunfish, Yellow Perch
7/30/1986	86065	Escanaba River	Escanaba, river mouth	Walleye
8/4/1986	86039	Grand River	Grand Haven, river mouth	Carp, Largemouth Bass, Walleye
6/9/1986	86013	Hersey River	Osceola County, Reed City	Brown Trout, Northern Pike, White Sucker
7/9/1986	86027	Kalamazoo River	Kalamazoo Lake	Carp, Largemouth Bass
7/7/1986	86026	Kalamazoo River	Lake Allegan	Carp
7/7/1986	86022	Kalamazoo River	Morrow Pond	Carp
7/7/1986	86024	Kalamazoo River	Mosel Avenue	Carp
7/8/1986	86025	Kalamazoo River	Plainwell Dam Reservoir	Carp
4/22/1986	86002	Lake Erie	Off Monroe	Carp, Channel Catfish, Walleye
9/26/1986	86052	Lake Huron	Au Sable River	Chinook
5/27/1986	86007	Lake Huron	Port Austin	Lake Trout
6/19/1986	86021	Lake Huron	Rockport	Lake Trout
6/25/1986	86028	Lake Huron	Saginaw Bay, Caseville	Channel Catfish, Walleye
6/23/1986	86068	Lake Huron	Saginaw Bay, Pinconning	Carp, Channel Catfish
4/22/1986	86069	Lake Huron	Saginaw Bay, Sebawaing	Channel Catfish
4/21/1986	86070	Lake Huron	Saginaw Bay, Wildfowl Bay	Carp
5/12/1986	86071	Lake Huron	Saginaw Bay, Wildfowl Bay	Channel Catfish
7/21/1986	86072	Lake Huron	Saginaw Bay, Wildfowl Bay	Carp
10/7/1986	86055	Lake Huron	Swan River	Chinook
10/10/1986	86067	Lake Huron	Swan River	Coho
9/26/1986	86051	Lake Huron	Tawas River	Chinook, Coho
7/23/1986	86046	Lake Huron	Thunder Bay	Brown Trout
6/6/1986	86012	Lake Michigan	Charlevoix	Brown Trout, Chinook, Lake Trout
4/4/1986	86001	Lake Michigan	Grand Haven	Lake Trout, Yellow Perch
10/3/1986	86050	Lake Michigan	Grand River, Webber Dam	Coho
10/6/1986	86053	Lake Michigan	Little Manistee River Weir	Brown Trout, Chinook, Rainbow Trout
10/10/1986	86066	Lake Michigan	Manistee River	Chinook, Coho
10/6/1986	86054	Lake Michigan	Platte River	Coho
6/7/1986	86008	Lake Michigan	South Haven	Brown Trout, Chinook, Rainbow Trout
9/15/1986	86048	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
9/15/1986	86049	Lake Michigan	St. Joseph River, Berrien Springs	Coho
10/17/1986	86060	Lake Michigan	Thompson Creek	Coho

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
6/17/1986	86017	Lake St. Clair	Bouvier Bay	Carp, Smallmouth Bass
6/6/1986	86031	Lake Superior	Marquette	Lake Trout, Lake Whitefish
7/8/1986	86030	Langford Lake	Gogebic County	Bluegill, Northern Pike, Walleye
7/31/1986	86035	Manistique River	Manistique, river mouth	Carp, Walleye
10/9/1986	86058	Menominee River	Dickinson County, Vulcan	Northern Pike, Redhorse Sucker, Smallmouth Bass, Walleye
10/29/1986	86061	Muskegon Lake	Muskegon County	Carp, Largemouth Bass, Northern Pike, Walleye
5/22/1986	86005	Ottawa Lake	Iron County	Northern Pike, Rock Bass, Walleye
7/29/1986	86041	Pine River	Montcalm County, Edmore	Brown Trout, Northern hogsucker, Redhorse Sucker, White Sucker
8/7/1986	86042	Pine River	St. Louis Impoundment	Carp, Crappie, Largemouth Bass, Northern Pike, Smallmouth Bass
7/8/1986	86023	Portage Creek	Bryant Mill Pond	Carp
8/12/1986	86043	Prairie River Lake	St. Joseph County	Largemouth Bass
6/19/1986	86019	Raisin River	Monroe, below Winchester Bridge	Carp, White Bass
6/24/1986	86016	Rouge River	Dearborn, river mouth	Carp
6/10/1986	86014	Saginaw River	Bay County	Carp, Walleye
7/30/1986	86036	Shiawassee River, South Branch	Livingston County, Chase Lake Road	Carp, Northern Pike, Rock Bass, White Sucker
10/7/1986	86056	Smokey Lake	Iron County	Lake Trout, Rock Bass, Smallmouth Bass, White Sucker
6/18/1986	86018	St. Clair River	Algonac	Carp, Walleye
7/31/1986	86038	St. Clair River	Port Huron	Freshwater Drum, Walleye
8/26/1986	86045	St. Marys River	Munuscong Bay	Northern Pike, Walleye
6/3/1986	86010	Thompson Lake	Livingston County	Carp, Northern Pike, Yellow Perch
1987				
4/14/1987	87003	Au Train Lake	Alger County	Northern Pike, Walleye
6/24/1987	87036	Bear Lake	Kalkaska County	Brown Trout, Smallmouth Bass
4/28/1987	87005	Beatons Lake	Gogebic County	Largemouth Bass, Rainbow Trout
6/17/1987	87039	Beaufort Lake	Baraga County	Northern Pike, Walleye
6/3/1987	87022	Beaver Lake	Alpena County	Northern Pike, Smallmouth Bass
9/16/1987	87095	Bellaire Lake	Antrim County	Splake, Walleye
5/27/1987	87019	Bird Lake	Hillsdale County	Bluegill, Northern Pike, Yellow Perch
5/12/1987	87014	Bishop Lake	Livingston County	Largemouth Bass, Northern Pike
5/5/1987	87013	Black Creek	Muskegon County, US-31	Brown Trout, Carp, White Sucker
10/23/1987	87089	Carp Lake	Chippewa County	Northern Pike, Walleye
6/8/1987	87037	Chaney Lake	Gogebic County	Black Crappie, Northern Pike
10/26/1987	87099	Deer Lake	Marquette County	Brown Bullhead, Northern Pike, Walleye, Yellow Perch
10/22/1987	87088	Grand Sable Lake	Alger County	Lake Trout, Northern Pike
1/1/1987	87038	Gratiot Lake	Keweenaw Co.	Rock Bass, Smallmouth Bass
8/5/1987	87063	Houghton Lake	Roscommon County	Carp, Northern Pike, Walleye
7/22/1987	87048	Kalamazoo River	Ceresco Impoundment, 15 Mile Road	Carp, Largemouth Bass, Smallmouth Bass
3/31/1987	87010	Kalamazoo River	Kalamazoo Lake	Eggs, Northern Pike, Rainbow Trout, Rock Bass, Walleye, White Sucker, Yellow Perch
7/13/1987	87046	Kalamazoo River	Kalamazoo Lake	Carp
7/14/1987	87045	Kalamazoo River	Lake Allegan	Carp, Northern Pike, Smallmouth Bass
7/14/1987	87043	Kalamazoo River	Morrow Pond	Carp, Smallmouth Bass
7/14/1987	87044	Kalamazoo River	Plainwell Dam Reservoir	Carp
10/20/1987	87093	Lake Erie	Off Monroe	Walleye
7/22/1987	87059	Lake Fenton	Genesee County	Largemouth Bass
9/17/1987	87079	Lake Huron	Au Sable River	Chinook
6/22/1987	87017	Lake Huron	Saginaw Bay, Au Gres	Carp, Channel Catfish, Walleye, Yellow Perch
5/12/1987	87015	Lake Huron	Saginaw Bay, Bay Port	Carp, Channel Catfish, Walleye, Yellow Perch
5/17/1987	87016	Lake Huron	Saginaw Bay, off Saginaw River	Carp, Channel Catfish, Walleye, Yellow Perch
9/18/1987	87080	Lake Huron	Swan River	Chinook
7/16/1987	87061	Lake Macatawa	Ottawa County	Carp, Walleye

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
4/7/1987	87011	Lake Michigan	Grand Haven	Lake Trout
9/23/1987	87086	Lake Michigan	Grand River, Webber Dam	Chinook
4/14/1987	87004	Lake Michigan	Little Bay De Noc	Northern Pike, Walleye
10/6/1987	87091	Lake Michigan	Platte River	Chinook
6/13/1987	87034	Lake Michigan	South Haven	Lake Trout
4/7/1987	87001	Lake Michigan	St. Joseph River, Berrien Springs	Rainbow Trout
9/30/1987	87084	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
9/30/1987	87085	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
10/1/1987	87094	Lake Michigan	Thompson Creek	Chinook
5/29/1987	87021	Lake Orion	Oakland County	Largemouth Bass
6/18/1987	87035	Lake St. Clair	Michigan waters	Bluegill, Channel Catfish, Freshwater Drum, Largemouth Bass, Rock Bass, Smallmouth Bass, Walleye
4/29/1987	87007	Lake Superior	Copper Harbor	Lake Trout
6/26/1987	87072	Lake Superior	Manitou Island	Siscowet
4/27/1987	87009	Lake Superior	Marquette	Lake Trout
8/10/1987	87069	Lake Superior	Munising	Siscowet
4/28/1987	87008	Lake Superior	West of Keweenaw Peninsula	Lake Trout
6/25/1987	87071	Lake Superior	West of Keweenaw Peninsula	Siscowet
10/21/1987	87090	Manistique River	Manistique, above Dam	Northern Pike, Redhorse Sucker
7/29/1987	87070	Marion Lake	Gogebic County	Rock Bass, Walleye
7/14/1987	87056	Mona Lake	Muskegon County	Carp, Smallmouth Bass
7/7/1987	87054	Muskegon Lake	Muskegon County	Largemouth Bass, Smallmouth Bass, Walleye
9/25/1987	87087	Orchard Lake	Oakland County	Largemouth Bass, Northern Pike
9/24/1987	87082	Pickerel Lake	Dickinson County	Largemouth Bass, Northern Pike
6/2/1987	87042	Pine Lake	Manistee County	Brown Trout, Largemouth Bass, Rock Bass
7/14/1987	87047	Portage Creek	Bryant Mill Pond	Carp
6/9/1987	87024	Raisin River	Monroe County, above Monroe Dam	Carp, Smallmouth Bass
6/17/1987	87031	Rouge River	Eliza Howell Park; u/s 153	White Sucker
6/17/1987	87029	Rouge River	Oakland County, Lahser Road	Carp, Rock Bass, White Sucker
6/16/1987	87025	Rouge River, Lower Branch	Wayne County, Gully Road	Carp
6/16/1987	87027	Rouge River, Middle Branch	Wayne County, Haggerty/Hines Drain	Rock Bass, Smallmouth Bass, White Sucker
6/16/1987	87026	Rouge River, Middle Branch	Wayne County, Inkster Road	Goldfish
6/16/1987	87028	Rouge River, Upper Branch	9 Mile Road	Brown Bullhead, Carp, Channel Catfish, Rock Bass, White Sucker
6/17/1987	87032	Rouge River, Upper Branch	Oakland County, Powers Road	White Sucker
6/17/1987	87030	Rouge River, Upper Branch	Wayne County, 7 Mile Road	White Sucker
9/23/1987	87083	Round Lake	Delta County	Northern Pike, Walleye
7/28/1987	87062	Shiawassee River	Oakland County, Fish Lake Road	Carp, Largemouth Bass, Rock Bass
8/5/1987	87064	Shiawassee River	Saginaw County below Chesaning	Carp, Rock Bass, Smallmouth Bass
7/30/1987	87066	Shiawassee River	Shiawassee County, New Lothrop Road	Carp, Northern Pike, Smallmouth Bass
7/29/1987	87065	Shiawassee River, South Branch	Livingston County, Marr Road	Rock Bass, White Sucker
6/17/1987	87033	Siskiwit Lake	Isle Royale	Lake Trout
6/9/1987	87020	South Lake	Washtenaw County	Largemouth Bass, Northern Pike, Rock Bass
11/18/1987	87096	St. Joseph River	Berrien Springs, below Dam	Carp, Smallmouth Bass, Walleye
11/19/1987	87097	St. Joseph River	Chapin Lake	Carp, Smallmouth Bass
9/11/1987	87049	St. Marys River	Sugar Island	Northern Pike, Walleye, White Sucker
7/21/1987	87058	Tannery Creek	Emmet County	Brook Trout
4/7/1987	87002	Tittabawassee River	Midland County, below Dow Dam	Walleye
7/2/1987	87041	Todd Lake	Osceola County	Largemouth Bass, Northern Pike
6/4/1987	87023	Walloon Lake	Charlevoix County	Smallmouth Bass
7/14/1987	87057	White Lake	Muskegon County	Smallmouth Bass, Walleye
1988				

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
5/24/1988	88004	Antoine Lake	Dickinson County	Largemouth Bass, Smallmouth Bass, Walleye
11/3/1988	88039	Au Sable River, North Branch	Otsego County, Dam #2	Brown Trout
10/6/1988	88054	Big Blue Lake	Muskegon County	Largemouth Bass, Northern Pike
11/3/1988	88059	Big Creek, West Branch	Crawford County, County Road 612	Brown Trout
10/5/1988	88055	Bills Lake	Newaygo County	Largemouth Bass, Walleye
5/26/1988	88005	Cable Lake	Iron County	Largemouth Bass, Walleye
10/6/1988	88068	Carp River	Eagle Mills Pump House	Northern Pike, Yellow Perch
6/7/1988	88009	Cass River	Tuscola County, above Frankenmuth	Redhorse Sucker, Rock Bass, Smallmouth Bass
5/30/1988	88008	Cass River	Upstream of Caro	Carp, Northern Pike
7/11/1988	88030	Cisco Lake	Gogebic County, Cisco Lake Chain	Northern Pike, Walleye
9/29/1988	88043	Clark Lake	Jackson	Black Crappie, Largemouth Bass, Rock Bass
10/31/1988	88061	Coldwater Lake	Branch County	Largemouth Bass, Northern Pike, Rock Bass
10/6/1988	88067	Deer Lake	Marquette County	Brook Trout, Northern Pike, Yellow Perch
10/4/1988	88047	Escanaba River	Delta County, between Dams 1 & 2	Northern Pike, White Sucker
10/4/1988	88046	Fish Lake	Marquette County	Largemouth Bass, Northern Pike, Sunfish, Yellow Perch
10/6/1988	88045	Goose Lake	Marquette County	Northern Pike, Walleye, Yellow Perch
10/12/1988	88050	Hagerman Lake	Iron County	Smallmouth Bass, Walleye
10/27/1988	88038	Higgins Lake	Roscommon County	Brown Trout, Lake Herring, Lake Trout
5/10/1988	88003	Huron River	Belleville Lake	Carp, Walleye
8/4/1988	88027	Kawkawlin River	Bay County, M-247	Carp, Northern Pike
5/25/1988	88006	Lake Emily	Iron County	Largemouth Bass, Walleye
6/14/1988	88010	Lake Huron	Saginaw Bay, Wildfowl Bay	Carp, Channel Catfish, Walleye, Yellow Perch
9/1/1988	88090	Lake Huron	Swan River	Chinook
9/19/1988	88041	Lake Michigan	Grand River, Webber Dam	Coho
7/19/1988	88057	Lake Michigan	Green Bay, Cedar River	Longnose Sucker, White Sucker
9/10/1988	88092	Lake Michigan	Manistee River	Chinook, Chinook Eggs, Coho
10/12/1988	88052	Lake Michigan	Menominee River	Brown Trout
6/1/1988	88060	Lake Michigan	Muskegon	Carp, Walleye
9/10/1988	88091	Lake Michigan	Platte River	Coho, Coho Eggs
9/26/1988	88066	Lake Michigan	Platte River	Coho
9/15/1988	88032	Lake Michigan	St. Joseph River, Berrien Springs	Coho
9/18/1988	88048	Lake Michigan	Thompson Creek	Coho
8/19/1988	88026	Lake St. Clair	Michigan waters	Bluegill, Freshwater Drum, Smallmouth Bass, White Bass, Yellow Perch
9/27/1988	88036	Lake Superior	Laughing Whitefish River	Chinook
9/14/1988	88033	Lincoln Lake	Kent County	Northern Pike, Rock Bass, Walleye
8/3/1988	88017	Manistique River	d/s Manistique Papers Dam	Channel Catfish
10/11/1988	88053	Menominee River	Below Quinnesec	Northern Pike, Redhorse Sucker, Smallmouth Bass, Walleye
5/26/1988	88007	Menominee River	Menominee, river mouth	Carp, Walleye
5/3/1988	88002	Morrison Lake	Ionia County	Carp, Largemouth Bass, Walleye, White Sucker
10/18/1988	88035	Mullett Lake	Cheboygan County	Northern Pike, Smallmouth Bass, Walleye
7/6/1988	88065	Ontonagon River	Victoria Impoundment	Northern Pike, Walleye
10/12/1988	88051	Perch Lake	Iron County	Northern Pike, Walleye
8/4/1988	88016	Portage Lake	Houghton County	Brown Trout, Northern Pike, Walleye
8/22/1988	88040	Rifle River	Arenac County	Redhorse Sucker, Rock Bass
6/30/1988	87040	Roland Lake	Houghton County	Rock Bass, Smallmouth Bass
7/19/1988	88011	Rouge River, Middle Branch	Newburgh Lake	Largemouth Bass, Northern Pike, White Sucker
7/19/1988	88012	Rouge River, Middle Branch	Phoenix Lake	Carp, Northern Pike, White Sucker
10/20/1988	88037	Sebewaing River	Huron County	Carp, Northern Pike
9/19/1988	88062	South Lake	Washtenaw County	Largemouth Bass, Northern Pike
9/20/1988	88034	South Manistique Lake	Mackinac County	Rock Bass, Walleye

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
10/11/1988	88049	Sunset Lake	Iron County	Northern Pike, Walleye
8/8/1988	88028	Tahquamenon River	Luce County, Slater's Landing	Northern Pike, Walleye
10/14/1988	88058	Tawas River	Iosco County	Northern Pike, White Sucker
8/23/1988	88015	Torch Lake	Houghton County	Northern Pike, Smallmouth Bass, Walleye
9/27/1988	88042	Vandercook Lake	Jackson County	Carp
5/16/1988	88029	Vermilac Lake	Baraga County	Northern Pike, Yellow Perch
8/24/1988	88031	Walled Lake	Oakland County	Carp, Northern Pike
1989				
6/28/1989	89010	Bishop Lake	Livingston County	Largemouth Bass, Northern Pike
2/1/1989	90052	Black Lake	Cheboygan County	Lake Sturgeon
4/20/1989	89017	Black River	Sanilac County, Croswell Impoundment	Carp
7/7/1989	89020	Black River, South Branch	Downstream of Bangor Dam	Carp, Largemouth Bass, Northern Pike, Rock Bass, White Sucker
5/1/1989	89033	Brevoort Lake	Mackinac County	Rock Bass, Walleye
5/8/1989	89031	Carney Lake	Dickinson County	Northern Pike, Walleye
8/2/1989	89058	Cheboyganing Creek	Saginaw County	Carp, Northern Pike
8/9/1989	89061	Coldwater Lake	Isabella County	Largemouth Bass, Walleye
8/23/1989	89074	Craig Lake	Baraga County	Walleye
6/4/1989	89057	Crooked Lake	Emmet County	Largemouth Bass, Walleye
8/1/1989	89077	Crystal Lake	Benzie County	Brown Trout, Lake Trout, Yellow Perch
5/18/1989	89041	Flint River	Holloway Reservoir	Black Crappie, Channel Catfish, Largemouth Bass, Smallmouth Bass
7/27/1989	89054	Grand River	Moore's River Impoundment	Channel Catfish, Largemouth Bass, Northern Pike, Smallmouth Bass, Walleye
11/1/1989	89073	Gull Lake	Kalamazoo County	Largemouth Bass, Northern Pike
10/16/1989	89076	Hubbard Lake	Alcona County	Northern Pike, Walleye
5/2/1989	89026	Huron River	Ford Lake	Black Crappie, Walleye
6/21/1989	89047	Jordan Lake	Ionia/Barry County	Largemouth Bass
5/31/1989	89013	Lake Ann	Benzie County	Northern Pike, Smallmouth Bass
5/9/1989	89037	Lake Fenton	Genesee County	Largemouth Bass
4/3/1989	89003	Lake Hudson	Lenawee County	Carp, Muskellunge, Northern Pike
10/11/1989	89062	Lake Huron	Au Sable River	Chinook
5/30/1989	89050	Lake Huron	Grindstone City	Lake Trout
11/1/1989	89068	Lake Huron	Harbor Beach	Brown Trout
5/15/1989	89049	Lake Huron	Rockport	Lake Trout
10/20/1989	89064	Lake Huron	Swan River	Chinook
6/29/1989	89051	Lake Huron	Thunder Bay River	Carp, Channel Catfish, Walleye
5/8/1989	89034	Lake Independence	Marquette County	Northern Pike, Walleye
6/7/1989	89036	Lake Lansing	Ingham County	Black Crappie, Largemouth Bass
5/17/1989	89043	Lake Michigan	Charlevoix/Little Traverse Bay	Lake Trout
4/10/1989	89032	Lake Michigan	Little Bay De Noc	Carp
5/2/1989	89039	Lake Michigan	Pentwater	Lake Trout
10/30/1989	89067	Lake Michigan	Platte River	Chinook
10/27/1989	89065	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
10/27/1989	89066	Lake Michigan	St. Joseph River, Berrien Springs	Brown Trout
10/1/1989	89072	Lake Michigan	Thompson Creek	Chinook
10/1/1989	89071	Lake Michigan	Thompson Creek	Brown Trout
6/14/1989	89012	Lake Mitchell	Wexford County	Largemouth Bass, Walleye
6/7/1989	89005	Lake Orion	Oakland County	Largemouth Bass, Northern Pike
4/28/1989	89011	Lake Ovid	Clinton County	Black Bullhead, Black Crappie, Largemouth Bass, Northern Pike, Tiger Muskie, Yellow Bullhead
8/9/1989	89046	Lake Superior	Isle Royale	Lake Trout
4/24/1989	89029	Lake Superior	Keweenaw Bay, L'Anse Bay	Lake Trout
4/27/1989	89028	Lake Superior	Marquette	Lake Trout

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
9/12/1989	89078	Menominee River	Dickinson County, below Piers Gorge	Redhorse Sucker, Walleye
4/21/1989	89079	Menominee River	Dickinson County, Little Quinnesec Flowage	Carp, Walleye, White Sucker
5/11/1989	89038	Millecoquins Lake	Mackinac County	Northern Pike, Walleye
6/20/1989	89055	Nawakwa Lake	Alger County	Northern Pike, Walleye
5/1/1989	89030	Net River	Iron County, The Wide Waters	Northern Pike, Walleye
6/7/1989	89048	North Manistique Lake	Luce County	Northern Pike, Walleye, Yellow Perch
6/7/1989	89006	Orchard Lake	Oakland County	Largemouth Bass, Northern Pike, Smallmouth Bass
8/23/1989	89075	Pere Marquette Lake	Mason County	Largemouth Bass, Northern Pike
5/23/1989	89069	Pickerel Lake	Emmet County	Largemouth Bass, Smallmouth Bass, Walleye
6/28/1989	89056	Pike Lake	Luce County	Walleye
4/27/1989	89027	Pine River	St. Louis Impoundment	Black Crappie, Carp, Largemouth Bass
5/23/1989	89042	Portage Lake	Jackson County	Black Crappie, Largemouth Bass, Northern Pike
5/10/1989	89009	Portage Lake	Washtenaw/Livingston County	Largemouth Bass, Walleye
9/20/1989	89070	Reed's Lake	Kent County	Largemouth Bass, Northern Pike
7/12/1989	89053	Robinson Creek	Roscommon	Brook Trout, Brown Trout
5/23/1989	89044	Shupac Lake	Crawford County	Largemouth Bass, Rainbow Trout, Smallmouth Bass, Yellow Perch
6/28/1989	89008	South Lake	Washtenaw County	Largemouth Bass, Northern Pike
5/8/1989	89018	Squaw Lake	Dickinson/Marquette County	Rainbow Trout, Splake, Yellow Perch
5/11/1989	89035	St. Marys River	N. Drummond Island	Yellow Perch
4/16/1989	89025	Stony Creek Impoundment	Macomb County	Crappie, Northern Pike, Walleye
6/29/1989	89052	Thunder Bay River	Alpena County, Lake Besser	Carp, Redhorse Sucker, Smallmouth Bass, Walleye
4/7/1989	89004	Tittabawassee River	Sanford Lake	Black Crappie, Northern Pike, Walleye
5/2/1989	89007	Unnamed Lake	Washtenaw County	Bullhead, Largemouth Bass
5/19/1989	89040	Wamplers Lake	Jackson/Lenawee County	Black Crappie, Largemouth Bass, Northern Pike
1990				
6/13/1990	90007	Adrian Lake	Lenawee County	Carp, Northern Pike
8/30/1990	90060	Au Train Basin	Alger County	Northern Pike, Yellow Perch
5/7/1990	90061	Burt Lake	Cheboygan County	Northern Pike, Walleye
10/9/1990	90067	Cedar Lake	Alcona County	Largemouth Bass, Northern Pike
11/2/1990	91032	Deer Lake	Marquette County	Walleye
8/27/1990	90031	Detroit River	Belle Isle	Freshwater Drum, Walleye
8/30/1990	90032	Detroit River	Trenton Channel	Carp, Freshwater Drum, Walleye
9/12/1990	90023	Elk Lake	Grand Traverse/Antrim County	Lake Trout
11/13/1990	90071	Escanaba River	Delta County, between Dams 1 & 2	Northern Pike, White Sucker
7/18/1990	90016	Fawn River	St. Joseph County, Stubey Road	Carp, Redhorse Sucker, Smallmouth Bass, White Sucker
5/29/1990	90012	Fortune Lake	Iron County	Largemouth Bass, Smallmouth Bass
10/26/1990	90062	Fremont Lake	Newaygo County	Carp
5/25/1990	90011	Fumee Lake	Dickinson County	Smallmouth Bass
10/18/1990	90053	Glen Lake	Leelanau County	Lake Trout, Smallmouth Bass
9/6/1990	90022	Grand River	Clinton County, State Road	Carp, Largemouth Bass, Smallmouth Bass
8/23/1990	90029	Grand River	Kent County, below Grand Rapids	Carp
8/14/1990	90021	Grand River	Maple Grove Road	Carp, Walleye
5/15/1990	90015	Gulliver Lake	Schoolcraft County	Northern Pike, Smallmouth Bass, Walleye
5/1/1990	90004	Hawk Lake	Oakland County	Brown Bullhead, Northern Pike
9/19/1990	90044	Intermediate Lake	Antrim County	Rock Bass, Smallmouth Bass, Walleye
10/11/1990	90050	Kalamazoo River	Lake Allegan	Carp
7/18/1990	90017	Kent Lake	Oakland County	Black Crappie, Largemouth Bass, Smallmouth Bass, Walleye
10/2/1990	90034	Klinger Lake	St. Joseph County	Largemouth Bass
11/1/1990	90051	Lake Charlevoix	Charlevoix County	Brown Trout, Lake Trout
5/23/1990	90005	Lake Fenton	Genesee County	Largemouth Bass, Northern Pike, Walleye

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
6/1/1990	90072	Lake Geneserath	Charlevoix County, Beaver Island	Largemouth Bass, Northern Pike
10/10/1990	90068	Lake Huron	Tawas Bay	Burbot
10/15/1990	90069	Lake Huron	Thunder Bay	Brown Trout
5/30/1990	90059	Lake Michigan	Big Bay De Noc	Lake Whitefish
9/25/1990	90046	Lake Michigan	Grand River, Webber Dam	Coho
11/11/1990	90065	Lake Michigan	Grand Traverse Bay, East Arm	Lake Whitefish, Yellow Perch
6/20/1990	90066	Lake Michigan	Grand Traverse Bay, West Arm	Lake Whitefish
2/28/1990	90001	Lake Michigan	Little Bay De Noc	Burbot
10/21/1990	90058	Lake Michigan	Ludington	Yellow Perch
5/30/1990	90009	Lake Michigan	Muskegon	Lake Whitefish
10/1/1990	90048	Lake Michigan	Platte River	Coho
9/11/1990	90041	Lake Michigan	South Haven	Yellow Perch
9/19/1990	90042	Lake Michigan	St. Joseph River, Berrien Springs	Brown Trout
9/20/1990	90043	Lake Michigan	St. Joseph River, Berrien Springs	Coho
7/15/1990	90054	Lake St. Clair	Michigan waters	Lake Sturgeon
8/23/1990	90064	Lily Lake	Clare County	Largemouth Bass, Northern Pike
10/1/1990	90035	Long Lake	Ionia County	Largemouth Bass
6/12/1990	90036	Long Lake	Iosco County	Largemouth Bass, Northern Pike
9/27/1990	90049	Lower Trout Lake	Oakland County	Largemouth Bass, Northern Pike
10/1/1990	90055	Menominee River	Lower Scott Flowage, between Dams 1 and 2	Rock Bass, Walleye
9/20/1990	90057	Menominee River	Upper Scott Flowage, Chappee Rapids	Rock Bass, Walleye
9/27/1990	90056	Menominee River	Upper Scott Flowage, Highway JJ	Rock Bass, Walleye
6/12/1990	90008	Portage Lake	Manistee County	Largemouth Bass, Northern Pike, Smallmouth Bass
9/21/1990	90045	Rainbow Lake	Montcalm County	Largemouth Bass, Northern Pike
6/27/1990	90014.2	Randall Lake Chain	Craig Lake	Largemouth Bass, Northern Pike
6/27/1990	90014.1	Randall Lake Chain	Randall Lake	Black Crappie, Largemouth Bass, Northern Pike
5/31/1990	90013	Stanley Lake	Iron County	Largemouth Bass, Smallmouth Bass, Walleye
6/6/1990	90010	Van Eitten Lake	Iosco County, Oscoda	Carp, Channel Catfish, Walleye
9/25/1990	90047	Wabasis Lake	Kent County	Largemouth Bass, Northern Pike

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
1991				
10/1/1991	91057	Barton Lake	Kalamazoo County	Carp, Largemouth Bass, Northern Pike
10/24/1991	91004	Battle Creek River	Battle Creek, Division St.	Carp, Smallmouth Bass
6/13/1991	91005	Black Creek	Lenawee County	Carp
9/26/1991	91006	Boardman Lake	Grand Traverse County	Northern Pike, Walleye, White Sucker
9/26/1991	91007	Cass Lake	Oakland County	Northern Pike, Smallmouth Bass, Walleye
6/4/1991	91028	Craig Lake	Baraga County	Northern Pike, Walleye
7/18/1991	91008	Dowagiac River	Cass County, M-51	Carp
9/4/1991	91034	Fish Lake	Barry County	Largemouth Bass, Northern Pike
4/16/1991	91009	Five Lakes	Clare County	Largemouth Bass, Northern Pike
3/20/1991	91036	Grand River	Kent County, below Grand Rapids	Walleye
2/5/1991	90070	Hamlin Lake	Mason County	Black Crappie, Northern Pike
9/4/1991	91033	Hopkins Lake	Shiawassee County	Largemouth Bass
9/30/1991	91048	Lake Huron	Au Sable River	Chinook
5/20/1991	91052	Lake Huron	Port Austin	Lake Trout
4/26/1991	91023	Lake Huron	Rock Falls Creek	Rainbow Trout
9/25/1991	91037	Lake Huron	Saginaw Bay, Au Gres	Carp, Channel Catfish, Walleye, White Sucker, Yellow Perch
10/1/1991	91038	Lake Huron	Saginaw Bay, Fish Point	Carp, Channel Catfish, Walleye, White Sucker, Yellow Perch
9/30/1991	91047	Lake Huron	Swan River	Chinook
6/19/1991	91053	Lake Huron	Thunder Bay	Brown Trout
10/10/1991	91045	Lake Michigan	Grand River, Webber Dam	Chinook
10/29/1991	91061	Lake Michigan	Grand Traverse Bay	Lake Whitefish
4/16/1991	91022	Lake Michigan	Little Bay De Noc	Longnose Sucker, Walleye
4/12/1991	91025	Lake Michigan	Pentwater	Brown Trout, Lake Trout
10/9/1991	91055	Lake Michigan	Platte River	Chinook
9/30/1991	91043	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
10/28/1991	91056	Lake St. Clair	Michigan waters	Lake Sturgeon, Walleye
5/1/1991	91060	Lake Superior	Keweenaw Bay, Traverse Island	Lake Trout
6/19/1991	92042	Lake Superior	Marquette	Siscowet
9/16/1991	91049	Maceday Lake	Oakland County	Northern Pike
6/19/1991	91015	Manistee Lake	Manistee County	Smallmouth Bass, Walleye
7/8/1991	91030	Menominee River	Chalk Hills Impoundment	Carp, Walleye
4/20/1991	91040	Menominee River	Menominee, river mouth	Lake Sturgeon
8/29/1991	91051	Raisin River, South Branch	Lenawee County, below Adrian	Carp, Northern Pike, Redhorse Sucker
6/27/1991	91019.2	Red Cedar River	Gramer Road	Carp
6/27/1991	91019.1	Red Cedar River	Gregory Road	Carp, Northern Pike
6/27/1991	91019.3	Red Cedar River	M-52	Carp, Northern Pike
5/2/1991	91027	Rice Lake	Houghton County	Northern Pike, Walleye
5/14/1991	91031	St. Clair River	Marine City	Walleye
6/12/1991	91026	St. Joseph River	Union Lake	Carp, Channel Catfish, Crappie, Northern Pike
4/23/1991	91021	St. Marys River	Munuscong Bay	Walleye
9/11/1991	91035	Torch Lake	Antrim County	Lake Trout, Smallmouth Bass
8/21/1991	91046	White Lake	Muskegon County	Carp, Walleye

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
1992				
8/25/1992	92016	Black River	South Haven	Carp, Northern Pike
7/21/1992	92035	Cass River	Bridgeport	Carp, Channel Catfish, Largemouth Bass, Northern Pike
7/30/1992	92045	Escanaba River	Greenwood Reservoir	Black Crappie, Largemouth Bass, Northern Pike
8/4/1992	92072	Fenner Lake	Allegan County	Carp, Largemouth Bass
8/6/1992	92017	Galien River	New Buffalo	Carp, Largemouth Bass, Rock Bass
10/1/1992	92051	Grand River	Portland Impoundment	Carp
5/7/1992	92021	Huron River	Barton Pond	Carp, Smallmouth Bass
5/5/1992	92020	Huron River	Ford Lake	Carp, Walleye
10/27/1992	92019	Kalamazoo River	Lake Allegan	Carp
10/15/1992	92062	Lake Erie	Brest Bay	Walleye
4/9/1992	92006	Lake Huron	Rock Falls Creek	Rainbow Trout
9/23/1992	92054	Lake Huron	Saginaw Bay, near Saginaw River mouth	Lake Whitefish, Walleye
6/2/1992	92055	Lake Huron	South Point	Lake Trout, Lake Whitefish
6/1/1992	92057	Lake Huron	Thunder Bay	Brown Trout, Lake Whitefish
9/22/1992	92052	Lake Michigan	Grand River, Webber Dam	Coho
8/5/1992	92060	Lake Michigan	Grand Traverse Bay	Brown Trout, Lake Whitefish
4/29/1992	92022	Lake Michigan	Green Bay, Cedar River	Brown Trout, Chinook, Rainbow Trout, Smallmouth Bass, Splake, Walleye
6/4/1992	92049	Lake Michigan	Little Bay De Noc	Walleye
9/23/1992	92068	Lake Michigan	Platte River	Coho
10/21/1992	92069	Lake Michigan	Platte River	Brown Trout
9/22/1992	92067	Lake Michigan	St. Joseph River, Berrien Springs	Coho
8/19/1992	92076	Lake Superior	Central	Lake Trout
8/4/1992	92063	Lake Superior	Isle Royale	Lake Trout
7/31/1992	92073	Lake Superior	Keweenaw Bay, Keystone Point	Lake Whitefish, Siscowet
8/18/1992	92074	Lake Superior	Marquette	Lake Whitefish, Siscowet
7/13/1992	92077	Lake Superior	West of Keweenaw Peninsula	Siscowet
5/12/1992	92027	Manistee Lake	Manistee County	Black Crappie, Largemouth Bass, Rock Bass
10/21/1992	92041.2	Mann Creek	Moraine Lake	Northern Pike
10/21/1992	92041.1	Mann Creek	Sloan Lake	Northern Pike
4/17/1992	92024	Menominee River	Badwater Impoundment	Walleye
7/28/1992	92048	Menominee River	Below Sturgeon Falls Dam	Carp, Walleye
9/14/1992	92075	Michigamme River	Michigamme Reservoir	Northern Pike, Walleye
8/5/1992	92071	Millecoquins Lake	Mackinac County	Lake Sturgeon
7/30/1992	92009	Pine River	St. Clair County, Griswold Road	Carp
7/15/1992	92036	Saginaw River	Saginaw County, Crow Island	Carp
5/22/1992	92058	Sand Lake	Newaygo County	Black Crappie, Largemouth Bass
8/7/1992	92047	Schweitzer Creek	Schweitzer Reservoir	Northern Pike, Smallmouth Bass, Walleye
9/22/1992	92012	Shiawassee River	Henderson	Carp, Smallmouth Bass
4/2/1992	92031	St. Joseph River	St. Joseph County, Constantine	Carp, Walleye
4/3/1992	92032	St. Joseph River	St. Joseph County, Three Rivers	Walleye
10/30/1992	92064	Tittabawassee River	Midland County, below Dow Dam	Carp, Walleye
6/9/1992	92038	Whitmore Lake	Livingston County	Carp, Largemouth Bass, Northern Pike
6/1/1992	92015	Wolf Creek	Montcalm County, Vickeryville Road	Brown Trout, Rock Bass

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
1993				
5/11/1993	93066	Arbutus Lake	Grand Traverse County	Northern Pike
5/11/1993	93048	Au Train Lake	Alger County	Northern Pike, Walleye
5/4/1993	93091	Austin Lake	Kalamazoo County	Carp, Largemouth Bass
11/2/1993	93002	Bear Lake	Muskegon County	Northern Pike, Walleye
7/23/1993	93074	Carp River	Eagle Mills Pump House	Brook Trout, Northern Pike
6/3/1993	93049	Chaney Lake	Gogebic County	Northern Pike, Yellow Perch
10/4/1993	93067	Coldwater Lake	Branch County	Largemouth Bass, Northern Pike
9/14/1993	93083	Deer Lake	Marquette County	Northern Pike, Walleye
4/1/1993	93068	Detroit River	Michigan waters	Lake Sturgeon
9/1/1993	93020	Detroit River	Trenton Channel	Freshwater Drum, Northern Pike, Redhorse Sucker, Yellow Perch
8/12/1993	93075	Escanaba River	Delta County, between Dams 1 & 2	Northern Pike, Yellow Perch
6/2/1993	93032	Escanaba River	Escanaba, river mouth	Carp
8/30/1993	93005	Flint River	Birch Run Road	Carp
6/9/1993	93036	Grand River	Grand Haven, river mouth	Carp
5/11/1993	93065	Green Lake	Grand Traverse County	Northern Pike, White Sucker
6/10/1993	93064	Gull Lake	Kalamazoo County	Largemouth Bass, Northern Pike
6/1/1993	93050	Houghton Lake	Roscommon County	Walleye
10/11/1993	93073.3	Kalamazoo River	Above Otsego City Dam	Walleye
6/8/1993	93035	Kalamazoo River	Kalamazoo Lake	Carp
10/9/1993	93073.6	Kalamazoo River	Kalamazoo Lake	Walleye
9/16/1993	93073.1	Kalamazoo River	Lake Allegan	Walleye
10/15/1993	93073.2	Kalamazoo River	Morrow Pond	Walleye
10/15/1993	93073.5	Kalamazoo River	Mosel Avenue	Walleye
9/21/1993	93073.4	Kalamazoo River	New Richmond	Walleye
4/1/1993	93082	Lake Erie	Western Basin	Carp, Channel Catfish, Gizzard Shad, White Bass, Yellow Perch
10/12/1993	93060	Lake Huron	Au Sable River	Chinook
4/25/1993	93051	Lake Huron	Nunns Creek	Rainbow Smelt
6/4/1993	93069	Lake Huron	Saginaw Bay, near Saginaw River mouth	Alewife, Brown Trout, Carp, Lake Trout, Northern Pike, White Bass, Yellow Perch
4/19/1993	93009	Lake Huron	Saginaw Bay, Rifle River	Rainbow Trout, White Sucker
10/13/1993	93052	Lake Huron	Swan River	Chinook
6/14/1993	93070	Lake Huron	Thunder Bay	Alewife, Brown Trout, Carp, Channel Catfish, Chub, Lake Trout, Walleye
9/21/1993	93077	Lake Michigan	Grand River, Webber Dam	Chinook
6/7/1993	93088	Lake Michigan	Grand Traverse Bay, West Arm	Brown Trout, Lake Whitefish
4/18/1993	93078	Lake Michigan	Green Bay	Brown Trout, Splake
4/27/1993	93079	Lake Michigan	Little Bay De Noc	Carp, Yellow Perch
9/29/1993	93053	Lake Michigan	Platte River	Chinook
9/9/1993	93061	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
5/19/1993	93054	Lake Superior	Keweenaw Bay	Rainbow Smelt
7/1/1993	93089	Lake Superior	Marquette	Lake Whitefish
7/30/1993	93090	Lake Superior	Whitefish Bay	Yellow Perch
5/27/1993	93062	Lower Trout Lake	Oakland County	Largemouth Bass
6/2/1993	93033	Manistique River	d/s Manistique Papers Dam	Carp
6/1/1993	93031	Menominee River	Menominee, river mouth	Carp
8/19/1993	93071	Muskegon Lake	Muskegon County	Carp, Walleye
6/9/1993	93038	Muskegon River	Muskegon, river mouth	Carp

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
4/4/1993	93011	Muskegon River	Newaygo County, below Croton Dam	Walleye
9/29/1993	93047	Ottawa River	Mouth	Carp, Largemouth Bass
6/9/1993	93037	Pere Marquette River	Ludington, river mouth	Redhorse Sucker
8/17/1993	94032	Pere Marquette River, Little South Branch	Taylor Bridge	Brown Trout
11/1/1993	93072	Rogue River	Kent County, Rockford Dam Pond	White Sucker
11/17/1993	93014	Rouge River, Middle Branch	Newburgh Lake	Northern Pike, White Sucker
5/20/1993	93057	Selkirk Lake	Allegan County	Largemouth Bass, Yellow Bullhead
5/20/1993	93029	Siskiwit Lake	Isle Royale	Lake Trout, Lake Whitefish, Northern Pike
6/1/1993	93058	Sporley Lake	Marquette County	White Sucker
5/18/1993	93059	Squaw Lake	Dickinson/Marquette County	Largemouth Bass, White Sucker
6/8/1993	93034	St. Joseph River	Benton Harbor, river mouth	Carp
5/12/1993	93016	Thornapple Lake	Barry County	Largemouth Bass, Redhorse Sucker
8/30/1993	93017	Thread Creek	Genesee County	Carp, Northern Pike
11/3/1993	93085	Torch Lake	Antrim County	Brown Trout, Lake Trout
1994				
8/30/1994	94034	Bad River	Saginaw County	Channel Catfish, Northern Pike
8/1/1994	94035	Cheboyganing Creek	Saginaw County	Carp
4/27/1994	94022	Chicagon Lake	Iron County	Walleye
5/25/1994	94003	Clinton River	Ryan Road, Utica	Carp, Rock Bass, White Sucker
4/12/1994	94019	Coldwater Lake	Branch County	Bluegill, Largemouth Bass, Northern Pike
8/25/1994	94018	Detroit River	Grassy Island	Carp
5/23/1994	94011	Duck Lake	Calhoun County	Bluegill, Largemouth Bass, Redear Sunfish, Walleye, Yellow Perch
6/9/1994	94063	Ellsworth Lake	Antrim County	Brown Bullhead, Largemouth Bass, White Sucker
9/20/1994	94062.2	First Sister Lake	Washtenaw County	Brown Bullhead, White Crappie
4/19/1994	94024	Hamilton Lake	Dickinson County	Northern Pike, Walleye
6/22/1994	94025	Kalamazoo River	Lake Allegan	Carp
4/19/1994	94027	Lake Erie	Off Monroe	Walleye
9/27/1994	94038	Lake Huron	Saginaw Bay, near Saginaw River mouth	Walleye, White Perch
10/1/1994	94059	Lake Michigan	Grand River, Grand Rapids	Rainbow Trout
9/15/1994	94043	Lake Michigan	Grand River, Webber Dam	Coho
4/20/1994	94042	Lake Michigan	Little Bay De Noc	White Sucker
11/7/1994	94044	Lake Michigan	Little Manistee River Weir	Rainbow Trout
10/1/1994	94045	Lake Michigan	Platte River	Coho
10/15/1994	94046	Lake Michigan	Platte River	Rainbow Trout
10/19/1994	94060	Lake Michigan	Platte River Hatchery	Coho
7/1/1994	94057	Lake Michigan	Southern	Lake Sturgeon
9/12/1994	94048	Lake Michigan	St. Joseph River, Berrien Springs	Rainbow Trout
9/29/1994	94047	Lake Michigan	St. Joseph River, Berrien Springs	Coho
8/24/1994	94049	Lake St. Clair	L'Anse Creuse Bay	Smallmouth Bass, Yellow Perch
11/2/1994	94061	Lake Superior	Chocolay River	Coho
12/16/1994	94056	Lake Superior	Munising	Lake Herring
7/20/1994	94051	Langford Lake	Gogebic County	Northern Pike, Walleye
5/25/1994	94001	Mann Creek	Sloan Lake	Bluegill, Northern Pike
6/21/1994	94031	Milakokia Lake	Mackinac County	Walleye, White Sucker, Yellow Perch
5/10/1994	94036	Orchard Lake	Oakland County	Northern Pike
8/23/1994	94021	Pine River	Gratiot County, below St Louis Dam	Carp
9/13/1994	94015	Rouge River	Eliza Howell Park; u/s 153	White Sucker
9/20/1994	94062.1	Second Sister Lake	Washtenaw County	Brown Bullhead
8/25/1994	94008	St. Clair River	Rivermouth, North Channel	Carp, Freshwater Drum
7/15/1994	94054	Torch Lake	Antrim County	Lake Whitefish

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
10/17/1994	94055	Wamplers Lake	Jackson/Lenawee County	Largemouth Bass, Northern Pike
1995				
6/20/1995	95063	Bass Lake	Grand Traverse County	Bluegill, Northern Pike, Yellow Perch
8/14/1995	95031	Cisco Lake	Gogebic County, Cisco Lake Chain	Bluegill, Walleye
6/21/1995	95060	Echo Lake	Grand Isle, Alger County	Northern Pike, Yellow Perch
5/22/1995	95015	Grand Lake	Presque Isle County	Rock Bass, Smallmouth Bass, Walleye
10/31/1995	95057.1	Higgins Lake	Roscommon County	Lake Herring, Lake Trout
6/10/1995	95033	Lake 27	Osago County	Northern Pike
4/26/1995	95008	Lake Erie	N. Maumee Bay	Carp
4/26/1995	95040	Lake Erie	Off Monroe	Freshwater Drum, White Bass, White Perch
10/11/1995	95058	Lake Erie	Western Basin	Walleye
10/18/1995	95053	Lake Huron	Black River	Chinook
4/17/1995	95003	Lake Huron	Les Cheneaux Islands	Yellow perch
10/10/1995	95048	Lake Huron	Swan River	Chinook
5/9/1995	95009	Lake Independence	Marquette County	Lake Herring, Northern Pike, Walleye
5/5/1995	95006	Lake Macatawa	Ottawa County	Carp, Walleye
3/31/1995	95002	Lake Margrethe	Crawford County	Walleye
10/12/1995	95054	Lake Michigan	Grand River, Webber Dam	Chinook
2/12/1995	95016	Lake Michigan	Little Bay De Noc	Lake Sturgeon
10/9/1995	95049	Lake Michigan	Platte River	Chinook
9/24/1995	95064	Lake Michigan	Southern	Lake Sturgeon
10/13/1995	95055	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
10/4/1995	95021	Lake Superior	Carp River	Coho
10/26/1995	95022	Lake Superior	Chink Creek	Coho
12/13/1995	95065	Lake Superior	Marquette	Siscowet
7/27/1995	95066	Lake Superior	Munising	Lake Herring
5/24/1995	95014	Littlefield Lake	Isabella County	Bluegill, Largemouth Bass
6/7/1995	95019	Manistee Lake	Manistee County	Bluegill
4/17/1995	95034	Menominee River	Big Quinnesec Falls Flowage	Rock Bass, Walleye, White Sucker
10/3/1995	95061	Michigamme River	Michigamme Reservoir	Northern Pike, Walleye
6/5/1995	95032	Nettie Lake	Presque Isle County	Largemouth Bass, Northern Pike
3/20/1995	95001	Pine Lake	Barry County	Black Crappie, Northern Pike
6/7/1995	95018	Pine River	Alma Impoundment	Carp, Largemouth Bass
4/24/1995	95005	Pine River	St. Louis Impoundment	Black Crappie, Carp
4/24/1995	95059	Rouge River	d/s M-153, u/s Ford Dam	Carp, Northern Pike, White Sucker
5/30/1995	95024	Rouge River, Middle Branch	Newburgh Lake	Bluegill, Largemouth Bass
6/13/1995	95023	Rouge River, Middle Branch	Phoenix Lake	Bluegill, Carp
6/22/1995	95039	Shiawassee River	City of Byron	Carp, Northern Pike
5/16/1995	95012	Six Mile Lake	Ontonagon/Houghton Counties	Bluegill, Walleye
7/7/1995	95052	St. Joseph River	Above Niles Dam	Carp
7/6/1995	95051.1	St. Joseph River	Chapin Lake	Carp, Smallmouth Bass
8/1/1995	95046	St. Marys River	Michigan Waters	Northern Pike, Walleye, Yellow Perch
4/17/1995	95004.1	St. Marys River	Munuscong Bay	Carp
6/13/1995	95038	Thompson Lake	Livingston County	Black Crappie, Carp
4/6/1995	95013	Tittabawassee River	Midland County, below Dow Dam	White Bass, White Sucker

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
1996				
9/10/1996	96003	Au Sable River, North Branch	Lovells	Brown Trout
6/17/1996	96006	Clinton River, North Branch	Macomb County	Rock Bass, Smallmouth Bass
6/6/1996	96007	Dead River	Forestville Basin	Smallmouth Bass, Walleye
10/2/1996	96008	Deer Lake	Marquette County	Walleye
12/1/1996	96059	Elk Lake	Grand Traverse/Antrim County	Lake Trout
4/16/1996	96011	Flint River	Mott Reservoir	Carp, Walleye
5/7/1996	96013	Grand River	Moores River Impoundment	Carp, Largemouth Bass
10/15/1996	96018	Lake Huron	Black River	Coho
5/16/1996	96019	Lake Huron	Port Austin	Lake Trout, Lake Whitefish
10/18/1996	96021	Lake Huron	Swan River	Chinook
6/26/1996	96022	Lake Huron	Thunder Bay	Lake Trout, Lake Whitefish
8/27/1996	96027	Lake Michigan	Charlevoix	Lake Trout
5/29/1996	96025	Lake Michigan	Grand Haven	Lake Trout
12/5/1996	96024	Lake Michigan	Grand Traverse Bay, East Arm	Lake Whitefish
10/1/1996	96028	Lake Michigan	Platte River	Coho
10/22/1996	96030	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
10/1/1996	96031	Lake Michigan	Thompson Creek	Coho
5/23/1996	96034	Lake Superior	Central	Lake Trout, Lake Whitefish, Siscowet
6/10/1996	96038	Lake Superior	Marquette	Lake Trout, Lake Whitefish, Siscowet
9/15/1996	96037	Lake Superior	Pendills Creek	Coho
4/24/1996	96040	Maceday Lake	Oakland County	Northern Pike
10/13/1996	96041	Menominee River	Chalk Hills Impoundment	Carp, Redhorse Sucker, Walleye
3/29/1996	96042	Muskegon River	Newaygo County, below Croton Dam	Redhorse Sucker, Walleye
10/15/1996	96500	Pine River	St. Louis	Muskrat, Raccoon
8/9/1996	96049	Siskiwit Lake	Isle Royale	Lake Trout
5/21/1996	96054	Tobico Marsh	Bay County	Carp, Northern Pike
3/7/1996	2000125	Torch Lake	Antrim County	Lake Trout
1997				
5/21/1997	97001	Au Sable River	Oscoda	Carp, Walleye
8/13/1997	97005.2	Chippewa River	Upstream of Lake Isabella, Roland/Drew	Rock Bass
8/13/1997	97005.1	Chippewa River	Upstream of Lake Isabella, Wyman Road	Carp, White Sucker
7/23/1997	97061	Crystal Lake	Benzie County	Lake Trout, White Sucker
9/8/1997	97075	Dead River	Forestville Basin	Smallmouth Bass, Walleye
10/2/1997	97070	Deer Lake	Marquette County	Northern Pike, Walleye, Yellow Perch
12/30/1997	97076	Elk Lake	Grand Traverse/Antrim County	Lake Trout
8/26/1997	97062	Hess Lake	Newaygo County	Carp, Largemouth Bass, Mirror Carp
10/17/1997	97018	Lake Erie	Huron River, Flat Rock	Chinook, Rainbow Trout
4/15/1997	97019	Lake Erie	Western Basin	Lake Whitefish, Smallmouth Bass, Yellow Perch
10/6/1997	97022	Lake Huron	Au Sable River	Chinook
10/13/1997	97021	Lake Huron	Swan River	Chinook
6/7/1997	97023	Lake Michigan	Marquette County	Lake Herring, Northern Pike, White Sucker
4/11/1997	97030	Lake Michigan	Grand Haven	Yellow Perch
9/29/1997	97024	Lake Michigan	Grand River, Webber Dam	Chinook
10/2/1997	97025	Lake Michigan	Grand Traverse Bay	Lake Trout
12/30/1997	97077	Lake Michigan	Grand Traverse Bay	Lake Whitefish
5/15/1997	97069	Lake Michigan	Manistee River	Lake Sturgeon
7/1/1997	97027	Lake Michigan	Muskegon	Lake Whitefish
3/26/1997	97028	Lake Michigan	Northern Lake Michigan	Lake Whitefish

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
10/15/1997	97029	Lake Michigan	Platte River	Chinook
10/31/1997	97031	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
10/14/1997	97032	Lake Michigan	Thompson Creek	Chinook
9/11/1997	97033	Lake Nepessing	Lapeer County	Largemouth Bass
6/1/1997	97034	Lake St. Clair	L'Anse Creuse Bay	Black Crappie, Bluegill, Northern Pike, Pumpkinseed, Walleye, White Bass
10/1/1997	97036	Lake Superior	Carp River	Chinook, Coho
5/27/1997	97038	Menominee River	Below Grand Rapids Dam	Carp, Redhorse Sucker
10/30/1997	97043	Michigamme River	Peavy Pond	Burbot, Walleye
9/30/1997	97047	Muskegon River	Newaygo County, Croton Dam Pond	Walleye, White Sucker
1/1/1997	97050	Pearl Lake	Benzie County	Northern Pike
7/29/1997	97060	Pine River	Below Alma Dam	Carp, Largemouth Bass
10/16/1997	97072	Pine River	Gratiot County, below St Louis Dam	Carp
10/17/1997	97071	Pine River	St. Louis Impoundment	Carp, Smallmouth Bass
4/30/1997	97052	Pomeroy Lake	Gogebic County	Walleye
1998				
8/25/1998	1998136	Au Sable River	Chase River Road	Brown Trout, White Sucker
9/8/1998	1998144	Au Sable River	Thendara Road	Brown Trout, White Sucker
5/20/1998	1998073	Au Sable River, Middle Branch	Alcona County, upstream of Alcona Pond	Walleye, White Sucker
8/4/1998	1998006	Bear River	Emmet County	Brown Trout, White Sucker
8/5/1998	1998011	Boyne River	Charlevoix County	Brown Trout, White Sucker
10/27/1998	1998019	Cass River	Caro Impoundment	Carp, Largemouth Bass
8/17/1998	1998020	Cedar River	Antrim County	Brown Trout, White Sucker
10/1/1998	1998147	Chaney Lake	Gogebic County	Northern Pike, Walleye
7/14/1998	1998021	Coldwater River	Brown Road	White Sucker
10/9/1998	1998024	Deer Lake	Marquette County	Northern Pike, Walleye, Yellow Perch
9/2/1998	1998027	Dowagiac Creek	Dutch Settlement Road, u/s LaGrange Lake	Brown Trout, White Sucker
6/4/1998	1998135	Duck Creek	Gogebic County	Brook Trout, White Sucker
10/27/1998	1998035	Flat River	Fallasberg Park, downstream of Fallasberg Dam	Carp
7/30/1998	1998037	Flat River	Ingalls Road, downstream of Belding	Rock Bass
7/30/1998	1998036	Flat River	Long Lake Road, upstream of Belding	Rock Bass
10/8/1998	1998038	Flint River	Flushing	Carp, Smallmouth Bass
3/5/1998	1998148	Grand River	Grand Rapids, below 6th Street dam	Northern Pike, Redhorse Sucker, Walleye
7/8/1998	1998041	Hersey River	Osceola County, Reed City	Brown Trout
11/25/1998	1998042	Higgins Lake	Roscommon County	Lake Trout
6/16/1998	1998127	Houghton Lake	Roscommon County	Carp
6/4/1998	1998045	Iron River	Above Wild River Road	Brown Trout
4/22/1998	1998103	Kalamazoo River, South Branch	Hillsdale County	White Sucker
7/27/1998	1998050	Kent Lake	Oakland County	Carp, Largemouth Bass, Smallmouth Bass
10/14/1998	1998052	Lake Huron	Black River	Coho
9/21/1998	1998140	Lake Huron	Saginaw Bay, near Saginaw River mouth	Carp, Channel Catfish, Walleye
10/1/1998	1998053	Lake Huron	Swan River	Chinook
8/20/1998	1998055	Lake Huron	Thunder Bay	Lake Whitefish
10/28/1998	1998056	Lake Michigan	Grand River, Webber Dam	Coho
9/9/1998	1998141	Lake Michigan	Grand Traverse Bay	Lake Trout
9/24/1998	1998059	Lake Michigan	Platte River	Coho
4/23/1998	1998060	Lake Michigan	South Haven	Rainbow Smelt
9/25/1998	1998152	Lake Michigan	Southern	Rainbow Smelt
9/25/1998	1998061	Lake Michigan	St. Joseph River, Berrien Springs	Coho
10/20/1998	1998062	Lake Michigan	Thompson Creek	Coho
6/15/1998	1998064	Lake St. Clair	L'Anse Creuse Bay	Bluegill, Carp, Channel Catfish, Freshwater Drum, Walleye

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
6/7/1998	1998134	Lake Superior	Mineral River	Longnose Sucker
5/20/1998	1998132	Looking Glass River	Dewitt	Rock Bass, White Sucker
8/26/1998	1998069	Manistee River	Cameron Bridge	Brown Trout
8/27/1998	1998123	Manistee River	M-72	White Sucker
9/29/1998	1998072	Michigamme River	Michigamme Reservoir	Northern Pike, Walleye
10/13/1998	1998145	Michigamme River	Peavy Pond	Lake Whitefish, Northern Pike, Rock Bass, Smallmouth Bass, Walleye, White Sucker, Yellow Perch
10/27/1998	1998076	Morrison Lake	Ionia County	Largemouth Bass
7/29/1998	1998080	Nottawa River	Calhoun County	Brown Trout, Northern Hogsucker, White Sucker
8/19/1998	1998081	Paint Creek	Oakland County	White Sucker
7/9/1998	1998048	Parker Creek	Grand Traverse County	Brown Trout
10/15/1998	1998085	Pine River	Above Alma	Rock Bass, White Sucker
8/5/1998	1998087	Platte River	Burnt Mill Road, Benzie County	Brown Trout, White Sucker
9/15/1998	1998151	Portage Lake	Houghton County	Walleye, White Sucker
9/18/1998	1998089	Raisin River	Monroe, below Winchester Bridge	Carp, Freshwater Drum, Smallmouth Bass
9/1/1998	1998137	Rapid River	Kalkaska County	Brown Trout
10/30/1998	1998094	Reed's Lake	Kent County	Northern Pike, Walleye
8/17/1998	1998095	Rogue River	11 Mile/Granger	Brown Trout, White Sucker
8/19/1998	1998106	Spring Brook	Kalamazoo County	Brown Trout
6/24/1998	1998110	St. Joseph River	Constantine Impoundment	Channel Catfish, Redhorse Sucker
7/6/1998	1998114	Tahquamenon River	Dollarville	Walleye, White Sucker
7/2/1998	1998117	Thornapple River	Gresham Highway	White Sucker
7/28/1998	1998070	W. Branch Maple River	Emmet County	Brown Trout, White Sucker
5/18/1998	1998133	Wabascon Creek	Bedford	Rock Bass, White Sucker
1999				
9/20/1999	1999001	Au Sable River	Oscoda	Carp, Walleye
8/20/1999	1999003	Carp River	Carp River Basin	Brook Trout, Northern Pike
4/19/1999	1999005	Cisco Lake	Gogebic County, Cisco Lake Chain	Walleye
9/20/1999	1999088	Clear Spring Lake	Macomb County	Largemouth Bass
5/4/1999	1999006	Deer Lake	Marquette County	Northern Pike, Walleye, Yellow Perch
10/29/1999	1999007	Detroit River	Wyandotte	Walleye
4/22/1999	1999009	Duck Lake	Gogebic County	Walleye
5/4/1999	1999077	Escanaba River	Greenwood Reservoir	Northern Pike
3/17/1999	1999011	Grand River	Kent County, above 6th St. Dam	Northern Pike
5/19/1999	1999014	Huron River	Belleville Lake	Carp, Gizzard Shad, Walleye, White Sucker
5/19/1999	1999015	Huron River	Ford Lake	Black Crappie, Carp, Channel Catfish, Walleye
10/13/1999	1999085	Kalamazoo River	Above Otsego City Dam	Carp, Smallmouth Bass
10/7/1999	1999082	Kalamazoo River	Ceresco Impoundment, 12 Mile Road	Carp, Smallmouth Bass
11/9/1999	1999092	Kalamazoo River	City of Allegan Dam	Carp, Smallmouth Bass
10/19/1999	1999095	Kalamazoo River	Kalamazoo Lake	Brown Trout, Carp, Smallmouth Bass
10/5/1999	1999087	Kalamazoo River	Lake Allegan	Carp, Channel Catfish, Smallmouth Bass
7/28/1999	1999083	Kalamazoo River	Morrow Pond	Carp, Smallmouth Bass
11/18/1999	1999094	Kalamazoo River	New Richmond	Carp, Channel Catfish, Largemouth Bass, Smallmouth Bass
10/29/1999	1999086	Kalamazoo River	Otsego Dam Impoundment	Carp, Smallmouth Bass
10/12/1999	1999084	Kalamazoo River	Plainwell Dam Reservoir	Carp, Smallmouth Bass
11/3/1999	1999093	Kalamazoo River	Trowbridge Dam Impoundment	Carp, Channel Catfish, Smallmouth Bass
10/21/1999	1999089	Lake Huron	Saginaw Bay, near Saginaw River mouth	Channel Catfish
8/3/1999	1999029	Lake Huron	Thunder Bay	Carp, Lake Whitefish, Walleye
8/2/1999	1999032	Lake Michigan	Green Bay	Lake Whitefish
7/19/1999	2000118	Lake Michigan	Ludington	Lake Sturgeon
11/15/1999	1999040	Lake Superior	Middle Branch Ontonagon River	Brown Trout

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
5/25/1999	1999080	Menominee River	Below Quinnesec	Northern Pike
5/25/1999	1999080	Menominee River	Sturgeon Falls Impoundment	Northern Pike
5/6/1999	1999076	Nawakwa Lake	Alger County	Northern Pike, Walleye
4/18/1999	1999047	Ontonagon River	Bond Falls	Walleye
7/7/1999	1999048	Osmun Lake	Oakland County	Carp, Largemouth Bass
11/1/1999	1999090	Plum Creek	Monroe	Black Buffalo, Carp, Channel Catfish, White Bass
4/28/1999	1999055	Pomeroy Lake	Gogebic County	Walleye
4/6/1999	1999079	Pontiac Lake	Oakland County	Channel Catfish
7/7/1999	1999064	Terry Lake	Oakland County	Carp, Largemouth Bass
4/23/1999	1999065	Thousand Island Lake	Gogebic County, Cisco Lake Chain	Walleye
5/26/1999	1999066	Tittabawassee River	Midland County, below Dow Dam	Carp, Smallmouth Bass
5/20/1999	1999081	Tittabawassee River	Sanford Lake	Black Crappie, Channel Catfish, Rock Bass
6/21/1999	1999075	Walkup Lake	Newaygo County	Bluegill
2000				
7/11/2000	2000105	Boston Pond	Houghton County	White Sucker, Yellow Perch
4/26/2000	2000003	Chaney Lake	Gogebic County	Northern Pike, Walleye, Yellow Perch
11/22/2000	2001007	Chicagon Lake	Iron County	Lake Whitefish
9/18/2000	2000071	Chippewa River	Nature Center	Redhorse Sucker
9/6/2000	2000017	Crystal Lake	Benzie County	Lake Trout, White Sucker
9/18/2000	2000020	Dowagiac River	Cass County, Sink Road	Carp
9/6/2000	2000021	Fawn River	St. Joseph County, Stubey Road	Redhorse Sucker, Rock Bass
5/12/2000	2000022	Four Mile Lake	Washtenaw County	Northern Pike
7/8/2000	2000027	Heron Lake	Oakland County	Largemouth Bass
9/21/2000	2000120	Kalamazoo River	Ceresco Impoundment, 12 Mile Road	Carp, Smallmouth Bass
8/31/2000	2000123	Kalamazoo River	D-Avenue	Carp, Smallmouth Bass
8/29/2000	2000122	Kalamazoo River	Kalamazoo Avenue	Carp, Northern Pike, Rock Bass, Smallmouth Bass
9/18/2000	2000124	Kalamazoo River	Lake Allegan	Black Crappie, Carp, Largemouth Bass, Smallmouth Bass, Walleye
7/7/2000	2000029	Kearsley Creek	Kearsley Reservoir	Carp, Largemouth Bass
4/4/2000	2000030	Lake Erie	Off Monroe	Carp
7/21/2000	2000032	Lake Hudson	Lenawee County	Carp, Largemouth Bass
4/10/2000	2000037	Lake Michigan	Green Bay, Cedar River	Carp
12/14/2000	2000115	Lake Michigan	Millecoquins River	Lake Sturgeon
7/7/2000	2000044	Lake Ponemah	Genesee County	Carp, Largemouth Bass
8/28/2000	2000108	Lake St. Clair	Michigan waters	Lake Sturgeon
10/12/2000	2000045	Lake Superior	Carp River	Chinook
4/30/2000	2000046	Lake Superior	Central	Lake Herring, Lake Whitefish
5/27/2000	2000119	Lake Superior	Otter River Fish Ladder	Lake Sturgeon
4/22/2000	2000047	Lakeville Lake	Oakland County	Carp, Largemouth Bass
7/20/2000	2000050	Loon Lake	Oakland County	Carp, Largemouth Bass, Smallmouth Bass
10/10/2000	2001146	Menominee River	Menominee, river mouth	Lake Sturgeon
9/13/2000	2000052	Michigamme River	Michigamme Reservoir	Northern Pike, Walleye
10/25/2000	2000055	Mona Lake	Muskegon County	Carp, Smallmouth Bass, Walleye
5/17/2000	2000060	Ontonagon River	Victoria Impoundment	Walleye
5/25/2000	2000061	Otter Lake	Houghton County	Walleye, White Sucker
8/10/2000	2000121	Portage Creek	Bryant Mill Pond	Brown Trout, Carp
8/1/2000	2000075	Red Cedar River	MSU	Carp, Northern Pike, Rock Bass, Smallmouth Bass
7/24/2000	2000083	Rouge River, Middle Branch	Wayne County, Merriman Road	White Sucker
9/28/2000	2000092	Thread Creek	Thread Lake	Carp, Largemouth Bass
7/5/2000	2000093	Tittabawassee River	Midland County, below Dow Dam	Smallmouth Bass, Walleye
5/3/2000	2000096	Torch Lake	Houghton County	Northern Pike, Smallmouth Bass, Walleye

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
10/10/2000	2000099	Walloon Lake	Charlevoix County	Rock Bass, White Sucker, Yellow Bullhead, Yellow Perch
9/18/2000	2000103	Wolf Creek	Montcalm County, Grove Road	White Sucker
5/2/2000	2000104	Woodland Lake	Livingston County	Carp, Largemouth Bass
2001				
5/1/2001	2001003	Big Shag Lake	Marquette County	Northern Pike
10/3/2001	2001134	Bob Lake	Houghton County	Walleye
10/10/2001	2001005	Burt Lake	Cheboygan County	Walleye, White Sucker
10/2/2001	2001140	Cary Lake	Branch County	Largemouth Bass, White Sucker
5/1/2001	2001008	Deer Lake	Marquette County	Northern Pike, Walleye, Yellow Perch
10/30/2001	2001010	Detroit River	Grassy Island	Walleye
5/1/2001	2001011	Goose Lake	Marquette County	Northern Pike, Walleye, Yellow Perch
10/3/2001	2001021	Grand River	Eaton Rapids, Gale Road/Waverly Road	Carp, Largemouth Bass, Walleye, White Sucker
9/20/2001	2001049	Kalamazoo River	Above Otsego City Dam	Carp, Smallmouth Bass
10/11/2001	2001042	Kalamazoo River	Ceresco Impoundment, 12 Mile Road	Carp, Smallmouth Bass
9/17/2001	2001052	Kalamazoo River	City of Allegan Dam	Carp, Smallmouth Bass
10/3/2001	2001055	Kalamazoo River	Kalamazoo Lake	Carp, Channel Catfish, Smallmouth Bass
8/23/2001	2001053	Kalamazoo River	Lake Allegan	Carp, Channel Catfish, Smallmouth Bass
8/17/2001	2001043	Kalamazoo River	Morrow Pond	Carp, Channel Catfish, Smallmouth Bass
9/25/2001	2001046	Kalamazoo River	Mosel Avenue	Smallmouth Bass
10/16/2001	2001054	Kalamazoo River	New Richmond	Carp, Flathead Catfish, Smallmouth Bass
9/18/2001	2001050	Kalamazoo River	Otsego Dam Impoundment	Carp, Smallmouth Bass
9/5/2001	2001048	Kalamazoo River	Plainwell Dam Reservoir	Carp, Smallmouth Bass
10/9/2001	2001051	Kalamazoo River	Trowbridge Dam Impoundment	Carp, Smallmouth Bass
8/22/2001	2001145	Klinger Lake	St. Joseph County	Largemouth Bass
7/2/2001	2001061	Lake Huron	Thunder Bay	Carp
10/3/2001	2002112	Lake Michigan	Bridgeman	Lake Sturgeon
4/13/2001	2001066	Lake Michigan	Green Bay	Brown Trout
10/31/2001	2001132	Lake Michigan	Northern Lake Michigan	Burbot
5/1/2001	2001071	Lake Orion	Oakland County	Carp, Largemouth Bass
10/9/2001	2001073	Lake Paradise	Emmet County	Largemouth Bass, Smallmouth Bass, White Sucker
6/26/2001	2001077	Lake St. Clair	Michigan waters	Carp, Muskellunge, Smallmouth Bass, Walleye
6/8/2001	2001079	Lake Superior	Keweenaw Bay, Traverse Island	Siscowet
11/19/2001	2001142	Long Lake	St. Joseph County/Colon Twp	Brown Bullhead, Largemouth Bass
9/13/2001	2001082	Muskegon Lake	Muskegon County	Largemouth Bass, Smallmouth Bass
10/17/2001	2001084	Norvell Lake	Jackson County	Carp, Largemouth Bass
8/30/2001	2001141	Palmer Lake	St. Joseph County	Largemouth Bass
8/29/2001	2001044	Portage Creek	Bryant Mill Pond	Carp, White Sucker
10/17/2001	2001045	Portage Creek	Monarch Pond	Carp
4/27/2001	2001096	Red Cedar River	MSU	Carp, Northern Pike, Rock Bass
10/30/2001	2001097	Rouge River, Middle Branch	Newburgh Lake	Carp, Channel Catfish, Largemouth Bass, White Sucker
10/30/2001	2001098	Rouge River, Middle Branch	Phoenix Lake	Carp, Channel Catfish, Northern Pike
9/13/2001	2001131	Ruddiman Creek	Lagoon	Carp, Largemouth Bass
9/10/2001	2001143	Stanley Lake	Iron County	Walleye
10/3/2001	2001144	Sudden Lake	Ontonagon County	Walleye
10/8/2001	2001110	Torch Lake	Antrim County	Lake Whitefish, Yellow Perch
10/4/2001	2001135	Vermilac Lake	Baraga County	Walleye
10/18/2001	2001111	White Lake	Oakland Co.	Brown Bullhead, Rock Bass
2002				
9/23/2002	2002008	Black River, South Branch	Downstream of Bangor Dam	Carp, Northern Pike, White Sucker

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
9/23/2002	2002106	Black River, South Branch	Upstream of Bangor Dam	Carp, Northern Pike, White Sucker
5/15/2002	2002009	Bristol Lake	Barry County	Largemouth Bass, White Sucker
6/6/2002	2002110	Emily Lake	Houghton County	Walleye
10/3/2002	2002113	Grand River	Maple Grove Road	Northern Pike
4/5/2002	2002045	Lake Erie	Western Basin	Channel Catfish
4/28/2002	2002046	Lake Gogebic	Gogebic/Ontonagon County	Walleye
6/19/2002	2002104	Lake Le Vasseur	Marquette County	Northern Pike
4/11/2002	2002054	Lake Michigan	Green Bay	Brown Trout
5/17/2002	2003155	Lake Michigan	Kalamazoo River mouth	Lake Sturgeon
5/13/2002	2002060	Lake Superior	Marquette	Lake Trout, Lake Whitefish
5/24/2002	2002043	Little Lake	Marquette County	Walleye
10/16/2002	2002064	Long Lake	Kalamazoo County	Black Crappie
7/8/2002	2002069	Mona Lake	Muskegon County	Carp
5/15/2002	2002070	Muskallonge Lake	Luce County	Brown Bullhead, Northern Pike
9/4/2002	2002071	Muskegon Lake	Muskegon County	Carp, Walleye
4/26/2002	2002078	North Lake Leelanau	Leelanau County	White Sucker
8/19/2002	2002108	Portage Creek	Bryant Mill Pond	Carp
9/6/2002	2002084	Rouge River, Middle Branch	Inkster Road; d/s Nankin Dam	White Sucker
9/24/2002	2002085	Rouge River, Middle Branch	Newburgh Lake	Carp, Channel Catfish, Northern Pike, White Sucker
10/22/2002	2002086	Rouge River, Middle Branch	Phoenix Lake	Carp, Northern Pike, White Sucker
6/19/2002	2002111	Silver Lake	Dickinson County	Walleye
6/29/2002	2002105	Siskiwit Lake	Isle Royale	Lake Trout
5/8/2002	2002096	Stevenson Lake	Isabella County	Brown Bullhead, Largemouth Bass, Northern Pike, Yellow Bullhead
6/25/2002	2002036	Thompson Lake	St. Joseph County	Brown Bullhead, Largemouth Bass
10/15/2002	2002097	Thunder Bay River	Seven Mile Pond	Brown Bullhead, Largemouth Bass
5/29/2002	2002100	Union Lake	Oakland County	Largemouth Bass, Smallmouth Bass
5/16/2002	2002102	Wixom Lake	Gladwin County	Channel Catfish, Northern Pike
2003				
6/10/2003	2003002	Au Sable River	Alcona Dam Pond	Carp, Northern Pike, Walleye
7/21/2003	2003154	Austin Lake	Kalamazoo County	Carp, Largemouth Bass, Yellow Bullhead
8/28/2003	2003150	Beaver Lake	Alger County	Walleye, Yellow Perch
5/21/2003	2003015	Camp Lake	Kent County	Brown Bullhead, Largemouth Bass, Northern Pike
10/16/2003	2003017	Chenango Lake	Livingston County	Largemouth Bass, Yellow Bullhead
9/19/2003	2003020	Crooked Lake	Barry County	Brown Bullhead, Largemouth Bass
10/30/2003	2003021	Deer Lake	Charlevoix County	Largemouth Bass, Northern Pike
5/3/2003	2003161	Deer Lake	Marquette County	Northern Pike, Walleye
5/29/2003	2003023	Ess Lake	Montmorency County	Northern Pike
7/29/2003	2003031	Flat River	Ingalls Road, downstream of Belding	Rock Bass, White Sucker
7/29/2003	2003032	Flat River	Miller Rd, upstream of Greenville	Rock Bass, White Sucker
5/8/2003	2003040	Gaylanta Lake	Montmorency County	Northern Pike
6/4/2003	2003139	Green Lake	Grand Traverse County	Lake Trout
8/18/2003	2003142	Kalamazoo River	Trowbridge Dam Impoundment	Carp, Smallmouth Bass
5/29/2003	2003047	Kingston Lake	Alger County	Largemouth Bass, Muskellunge, Smallmouth Bass, Walleye
5/22/2003	2003050	Lake Emma	Presque Isle County	Northern Pike
6/18/2003	2003052	Lake Esau	Presque Isle County	Smallmouth Bass
10/14/2003	2003156	Lake Gogebic	Gogebic/Ontonagon County	Rock Bass
9/5/2003	2003159	Lake Michigan	Bridgeman	Lake Sturgeon
4/10/2003	2003148	Lake Michigan	Green Bay	Brown Trout
7/10/2003	2003158	Lake Michigan	Manistee Lake	Lake Sturgeon
8/19/2003	2003160	Lake Michigan	New Buffalo	Lake Sturgeon

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
5/1/2003	2003141	Lake Mitchell	Wexford County	Largemouth Bass
6/25/2003	2003152	Lake Ovid	Clinton County	Largemouth Bass
9/15/2003	2003069	Lake St. Clair	Michigan waters	Smallmouth Bass
5/29/2003	2003070	Lake Superior	Keweenaw Bay	Siscowet
9/12/2003	2003157	Lake Superior	Portage Lake/Dollar Bay	Lake Sturgeon
5/20/2003	2003072	Lobdell Lake	Genesee County	Carp, Largemouth Bass
3/28/2003	2003153	Long Lake	Kalamazoo County	Brown Bullhead
4/25/2003	2003075	Manistique Lake	Mackinac County	Walleye
10/7/2003	2003077	Manistique River	d/s Manistique Papers Dam	Redhorse Sucker, Smallmouth Bass, Walleye
7/1/2003	2003500	Marion Lake	Gogebic County	Northern Pike, Smallmouth Bass, Walleye, Yellow Perch
7/7/2003	2003065	Montcalm Lake	Montcalm County	Largemouth Bass
6/15/2003	2003081	Morrison Lake	Ionia County	Carp
10/21/2003	2003082	North Lake Leelanau	Leelanau County	Lake Trout
4/24/2003	2003083	North Manistique Lake	Luce County	Walleye, Yellow Perch
6/11/2003	2003144	Paint Lake	Iron County	Northern Pike
5/5/2003	2003086	Pere Marquette Lake	Mason County	Northern Pike, White Sucker
5/22/2003	2003095	Pratt Lake	Gladwin County	Largemouth Bass
9/17/2003	2003098	Rabbit River	d/s Hamilton Dam	Carp, Largemouth Bass, Northern Pike, Redhorse Sucker, Rock Bass
9/17/2003	2003096	Rabbit River	u/s Hamilton Dam	Carp, Largemouth Bass, Northern Pike, Redhorse Sucker
4/21/2003	2003104	Runkle Lake	Iron County	Northern Pike
10/14/2003	2003200	Saginaw River	Bay County	Lake Sturgeon
5/29/2003	2003107	Sand Lake	Lenawee County	Walleye
7/22/2003	2003109	Shiawassee River	Exchange Road	Carp, Smallmouth Bass
5/8/2003	2003110	Six Mile Lake	Charlevoix County	Northern Pike
6/4/2003	2003146	South Groveland Pond	Dickinson County	Walleye
6/17/2003	2003135	St. Joseph River	Union Lake	Carp, Channel Catfish, Largemouth Bass, Walleye
5/29/2003	2003126	Sunday Lake	Gogebic County	Black Crappie, Northern Pike, Walleye, Yellow Perch
6/19/2003	2003145	Tepee Lake	Iron County	Northern Pike
4/2/2003	2003132	Tittabawassee River	Midland County, Smiths Crossing Road	Carp, Channel Catfish, Smallmouth Bass, Walleye, White Bass
2004				
6/23/2004	2004003	Bad River	Saginaw County	Carp, Channel Catfish, Northern Pike
6/10/2004	2004004	Battle Creek River	Battle Creek, Division St.	Carp, Smallmouth Bass
5/18/2004	2004133	Big Seven Lake (Seven Lakes)	Oakland County	Largemouth Bass
6/23/2004	2004007	Boot Lake	Schoolcraft County	Walleye
8/18/2004	2004009	Carp River	Landfill Rd.	Brook Trout
8/17/2004	2004010	Carp River	M-35	Brook Trout, White Sucker
6/24/2004	2004011	Cass River	Bridgeport	Carp, Channel Catfish
8/9/2004	2004013	Cheboyganing Creek	Saginaw County	Carp
6/15/2004	2004014	Clifford Lake	Montcalm County	Largemouth Bass
10/7/2004	2004015	Clinton River	Ryan Road, Utica	Carp, Northern Pike, Rock Bass, White Sucker
6/2/2004	2004019	Deer Lake	Alger County	Northern Pike
7/20/2004	2004021	Detroit River	Michigan waters	Carp, Freshwater Drum, Redhorse Sucker, Yellow Perch
6/11/2004	2004024	Dinner Lake	Gogebic County	Black Crappie, Largemouth Bass, Northern Pike, Smallmouth Bass, Walleye
6/23/2004	2004026	Emerald Lake	Newaygo County	Largemouth Bass, Northern Pike
7/27/2004	2004028	Escanaba River	Cataract Basin	Walleye
5/11/2004	2004131	Five Lakes	Clare County	Largemouth Bass
5/26/2004	2004029	Frenchman Lake	Chippewa County	Northern Pike
6/16/2004	2004147	Grand River	Downstream of Dimondale	Northern Pike
7/1/2004	2004146	Grand River	Eaton Rapids, Gale Road/Waverly Road	Channel Catfish, Northern Pike, Smallmouth Bass, Walleye
6/9/2004	2004148	Grand River	Moores River Impoundment	Northern Pike

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
6/2/2004	2004034	Hardwood Lake	Ogemaw County	Northern Pike
8/25/2004	2004143	Kalamazoo River	Trowbridge Dam Impoundment	Carp
8/10/2004	2004039	Kawkawlin River	Bay County, M-247	Carp, Northern Pike
5/11/2004	2004040	Kent Lake	Oakland County	Black Crappie, Walleye
9/28/2004	2004041	Lake Cadillac	Wexford County	Northern Pike, Smallmouth Bass
4/20/2004	2004043	Lake Erie	Western Basin	Walleye, White Bass, White Perch
5/10/2004	2004130	Lake Huron	Grindstone City	Lake Trout
9/10/2004	2004046	Lake Huron	Saginaw Bay, Bay Port	Carp, Channel Catfish, Walleye, White Bass, White Sucker, Yellow Perch
5/24/2004	2004145	Lake Huron	Thunder Bay	Lake Trout
6/15/2004	2004050	Lake Medora	Keweenaw Co.	Smallmouth Bass, Walleye
4/8/2004	2004054	Lake Michigan	Green Bay	Smallmouth Bass, White Sucker
4/1/2004	2004200	Lake Michigan	Lake Muskegon	Lake Sturgeon
9/10/2004	2004150	Lake Michigan	Little Bay De Noc	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye
4/1/2004	2004055	Lake Michigan	Manistee River	Rainbow Trout
6/15/2004	2004051	Lake Michigan	South Haven	Round Goby
3/26/2004	2004060	Lake Michigan	St. Joseph River, Berrien Springs	Rainbow Trout
4/14/2004	2004066	Long Lake	Presque Isle County	Smallmouth Bass, White Sucker
8/2/2004	2004072	Manistique River	d/s Manistique Papers Dam	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye
6/2/2004	2004074	McCormick Lake	Montmorency County	Brown Trout
5/20/2004	2004062	Montcalm Lake	Montcalm County	Largemouth Bass
9/7/2004	2004076	Nevins Lake	Montcalm County	Largemouth Bass
5/18/2004	2004080	Peach Lake	Ogemaw County	Northern Pike
9/3/2004	2004081	Pere Marquette River	Lake County	Brown Trout
8/24/2004	2004082	Pere Marquette River, Little South Branch	Lake County	Brown Trout, White Sucker
7/11/2004	2004151	Platte Lake	Benzie County	Channel Catfish, Northern Pike, Smallmouth Bass, Walleye
10/11/2004	2004144	Portage Lake	Manistee County	Carp, Largemouth Bass, Northern Pike
6/22/2004	2004083	Pretty Lake	Luce County	Walleye
10/6/2004	2004085	Raisin River	Monroe County, above Monroe Dam	Carp
5/6/2004	2004095	Robinson Lake	Newaygo County	Northern Pike
5/28/2004	2004099	Ruppert Lake	Kalamazoo County	Largemouth Bass
3/23/2004	2004100	Rush Lake	Van Buren County	Northern Pike
8/9/2004	2004113	Saginaw River	Bay County, LaFayette	Carp
8/11/2004	2004114	Sebewaing River	Huron County	Carp, Northern Pike
7/13/2004	2004101	Shiawassee River, South Branch	Between M59 & Byron	Carp, Rock Bass, White Sucker
5/10/2004	2004117	Sporley Lake	Marquette County	Splake
10/14/2004	2004119	St. Joseph River	Sturgis Impoundment	Carp, Largemouth Bass
4/19/2004	2004120	St. Marys River	Michigan Waters	Northern Pike, Walleye
9/7/2004	2004149	St. Marys River	Munuscong Bay	Northern Pike
6/22/2004	2004141	Sylvan Lake	Newaygo County	Largemouth Bass, Northern Pike
5/11/2004	2004122	Teal Lake	Marquette County	Smallmouth Bass, Walleye
3/23/2004	2004125	Van Auken Lake	Van Buren County	Northern Pike
9/13/2004	2004126	White Lake	Muskegon County	Carp, Smallmouth Bass, Walleye
2005				
6/6/2005	2005108	Aligan Lake	Baraga County	Largemouth Bass, Northern Pike, Yellow Perch
11/10/2005	2005001	Antoine Lake	Dickinson County	Northern Pike, Walleye
10/3/2005	2005002	Au Sable River	Oscoda	Carp, Walleye
9/12/2005	2005003	Au Train Lake	Alger County	Walleye, Yellow Perch
8/18/2005	2005004	Baldwin River	near M-37	Brown Trout
8/25/2005	2005013	Carp Creek	u/s Deer Lake	Brook Trout, White Sucker
8/9/2005	2005014	Cass River	Upstream of Caro	Redhorse Sucker, Rock Bass

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
11/8/2005	2005015	Craig Lake	Baraga County	Black Crappie, Northern Pike, Walleye, White Sucker
6/1/2005	2005017	Dead River	Forestville Basin	Northern Pike, Walleye
1/1/2005	2005200	Detroit River	Michigan waters	Lake Sturgeon
9/14/2005	2005019	Fawn River	St. Joseph County, Stubby Road	Carp, Smallmouth Bass
5/16/2005	2005020	Fletcher Pond	Alpena County	Northern Pike
6/22/2005	2005021	Fremont Lake	Newaygo County	Carp, Largemouth Bass
5/26/2005	2005126	Gourdneck Lake	Kalamazoo County	Northern Pike
5/25/2005	2005025	Gratiot Lake	Keweenaw Co.	Northern Pike, Smallmouth Bass, Walleye
5/2/2005	2005028	Hanbury Lake	Dickinson County	Largemouth Bass
4/30/2005	2005037	King Lake	Baraga County	Largemouth Bass
4/29/2005	2005045	Lake Independence	Marquette County	Walleye
5/16/2005	2005047	Lake Macatawa	Ottawa County	Carp, Walleye
4/15/2005	2005050	Lake Michigan	Green Bay, Cedar River	Longnose Sucker, Smallmouth Bass, Walleye, White Sucker
6/14/2005	2005201	Lake St. Clair	Michigan waters	Lake Sturgeon
11/1/2005	2005056	Little Oxbow Lake	Gogebic County	Largemouth Bass, Walleye
9/21/2005	2005114	Nettie Lake	Presque Isle County	Smallmouth Bass
11/1/2005	2005071	Ormes Lake	Gogebic County	Largemouth Bass
6/28/2005	2005129	Pigeon River	Ottawa Co, at 136th Ave	White Sucker
9/14/2005	2005076	Pigeon River	Vistula Rd.	Redhorse Sucker, Rock Bass, Smallmouth Bass
9/2/2005	2005160	Platte Lake	Benzie County	Rock Bass
11/4/2005	2005077	Rouge River	d/s Lower Rouge confluence	Carp, Redhorse Sucker
11/3/2005	2005078	Rouge River, Middle Branch	d/s Nankin Dam	Carp, Rock Bass, White Sucker
6/2/2005	2005079	Rouge River, Middle Branch	Newburgh Lake	Carp, Channel Catfish, Northern Pike, White Sucker
11/3/2005	2005080	Rouge River, Middle Branch	u/s Nankin Dam	Carp, Northern Pike, Rock Bass, White Sucker
6/7/2005	2005081	Round Lake	Marquette County, Champion Twp	Largemouth Bass
10/27/2005	2005098	St. Joseph River	Chapin Lake	Carp, Largemouth Bass, Smallmouth Bass
5/3/2005	2005124	Sullivan Creek	USFWS-Sullivan Creek Hatchery	Lake Trout
7/14/2005	2005105	Tahquamenon River	Luce County, Slater's Landing	Walleye, Yellow Perch
6/1/2005	2005106	Teal Lake	Marquette County	Walleye
5/18/2005	2005107	Thompson Lake	Livingston County	Black Crappie, Carp, Northern Pike
7/19/2005	2005130	Thornapple River	Ada Impoundment	Carp, Smallmouth Bass
7/19/2005	2005131	Thornapple River	Cascade Impoundment	Smallmouth Bass
6/3/2005	2005127	Tucker Lake	Leelanau County	Brown Bullhead

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
2006				
5/25/2006	2006002	Big Twin Lake	Kalkaska County	Lake Herring
7/1/2006	2006005	Campbell Lake	Kent Co.	Largemouth Bass
6/13/2006	2006006	Caribou Lake	Chippewa County	Rock Bass, Smallmouth Bass
7/13/2006	2006104	Cass River	Caro Impoundment	Carp, Largemouth Bass
11/28/2006	2006125	Coldwater Lake	Branch County	Northern Pike
6/6/2006	2006009	Crockery Lake	Ottawa County	Largemouth Bass
6/18/2006	2006120	Crooked Lake	Baraga County	Largemouth Bass
6/8/2006	2006011	Deer Lake	Iron County	Northern Pike
6/14/2006	2006121	Dodge Lake	Schoolcraft County	Largemouth Bass, Northern Pike
4/11/2006	2006012	Elk Lake	Grand Traverse/Antrim County	Brown Trout, Lake Trout, Northern Pike, Walleye
6/6/2006	2006013	Engman Lake	Marquette County	Northern Pike
7/11/2006	2006103	Grand River	at Ionia	Carp, Channel Catfish, Redhorse Sucker, Walleye
6/1/2006	2006014	Gun Lake	Barry County	Largemouth Bass
5/10/2006	2006017	Hubbard Lake	Alcona County	Walleye, White Sucker
5/16/2006	2006018	Huron River	Ford Lake	Black Crappie, Carp, Channel Catfish, Walleye
9/5/2006	2006164	Kalamazoo River	Above Otsego City Dam	Carp
8/8/2006	2006160	Kalamazoo River	Ceresco Impoundment, 12 Mile Road	Carp, Smallmouth Bass
9/7/2006	2006167	Kalamazoo River	City of Allegan Dam	Carp, Channel catfish, Smallmouth Bass
9/29/2006	2006170	Kalamazoo River	Kalamazoo Lake	Carp
9/27/2006	2006168	Kalamazoo River	Lake Allegan	Carp, Channel Catfish, Smallmouth Bass
8/29/2006	2006161	Kalamazoo River	Morrow Pond	Carp, Smallmouth Bass
9/20/2006	2006162	Kalamazoo River	Mosel Avenue	Carp, Smallmouth Bass
10/3/2006	2006169	Kalamazoo River	New Richmond	Carp, Channel Catfish, Flathead Catfish, Smallmouth Bass
9/19/2006	2006165	Kalamazoo River	Otsego Dam Impoundment	Carp
9/22/2006	2006163	Kalamazoo River	Plainwell Dam Reservoir	Carp, Smallmouth Bass
9/6/2006	2006166	Kalamazoo River	Trowbridge Dam Impoundment	Carp, Channel Catfish, Smallmouth Bass
12/5/2006	2006126	Klinger Lake	St. Joseph County	Northern Pike
4/19/2006	2006023	Lake Charlevoix	Charlevoix County	Walleye, White Sucker
9/26/2006	2006025	Lake Erie	N. Maumee Bay	Carp, Largemouth Bass, Yellow Perch
4/24/2006	2006099	Lake Erie	Off Monroe	Carp, Freshwater Drum, Smallmouth Bass, White Bass, Yellow Perch
4/22/2006	2006035	Lake Michigamme	Marquette County	Rock Bass, Walleye
6/1/2006	2006501	Lake Michigan	Bridgeman	Lake Sturgeon
4/20/2006	2006111	Lake Superior	Huron Bay	Rainbow Trout, Walleye
4/17/2006	2006043	Lake Superior	Keweenaw Bay	Rainbow Trout
12/20/2006	2007254	Lake Superior	Portage Lake/ Sturgeon River	Burbot, Burbot Liver
11/19/2006	2006199	Little Round Lake	Alger Co.	Bluegill
6/15/2006	2006044	Long Lake	Kent Co.	Largemouth Bass
5/11/2006	2006046	Long Lake	Montmorency County	Smallmouth Bass
5/25/2006	2006045	Long Lake	Presque Isle County	Brown Bullhead, Smallmouth Bass
7/11/2006	2006150	Maple River	u/s Matherton	Carp
4/10/2006	2006097	Menominee River	Menominee, river mouth	Carp, Walleye
5/1/2006	2006049	Millecoquins Lake	Mackinac County	Rock Bass, Walleye
6/6/2006	2006050	Muskegon Lake	Muskegon County	Northern Pike
9/26/2006	2006109	Ottawa River	Mouth	Carp, Largemouth Bass
9/27/2006	2006048	Paw Paw River	Maple Lake	Carp, Largemouth Bass
6/15/2006	2006064	Perch Lake	Iron County	Northern Pike, Walleye
9/18/2006	2006172	Portage Creek	Bryant Mill Pond	Carp, White Sucker
9/19/2006	2006171	Portage Creek	Monarch Pond	Carp
5/25/2006	2006066	Proud Lake	Oakland County	Carp, Largemouth Bass

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
5/15/2006	2006072	Silver Lead Creek	Marquette County, K.I. Sawyer AFB	Brook Trout
5/20/2006	2006076	St. Clair River	Marine City	Carp, Walleye
5/17/2006	2006500	Tawas Lake	Iosco County	Black Crappie
4/12/2006	2006081	Thornapple Lake	Barry County	Largemouth Bass
6/14/2006	2006100	Thornapple River	d/s Nashville	White Sucker
6/20/2006	2006102	Thornapple River	LaBarge Impoundment	Carp
6/14/2006	2006101	Thornapple River	Middleville Impoundment	White Sucker
5/25/2006	2006082	Thunder Bay River	4-Mile Pond	Smallmouth Bass
5/24/2006	2006083	Thunder Bay River	Alpena County, Lake Besser	Brown Bullhead, Smallmouth Bass
4/18/2006	2006086	Walloon Lake	Charlevoix County	Brown Bullhead, Northern Pike, Rainbow Trout, Smallmouth Bass, Walleye, White Sucker
6/1/2006	2006088	Wells Lake	Osceola County	Northern Pike
2007				
4/24/2007	2007262	Big Star Lake	Lake Co	Largemouth Bass
11/8/2007	2007263	Black River	Sanilac County, Croswell Impoundment	Carp
6/19/2007	2007207	Blind Sucker Flooding	Luce County	Yellow Perch
6/5/2007	2007302	Boardman Lake	Grand Traverse County	White Sucker
5/23/2007	2007301	Boardman River	Brown Bridge Pond	Northern Pike, White Sucker
6/19/2007	2007303	Boardman River	Sabin Pond	White Sucker
5/9/2007	2007268	Budd Lake	Clare Co	Largemouth Bass
5/23/2007	2007212	Cranberry Lake	Clare Co	Largemouth Bass
6/5/2007	2007213	Cusino Lake	Schoolcraft Co	Yellow Perch
6/5/2007	2007202	East Bass Lake	Marquette County	Northern Pike
6/1/2007	2007214	Fire Lake	Iron County	Northern Pike
9/18/2007	2007215	Galien River	New Buffalo	Carp
4/17/2007	2007216	Glen Lake	Leelanau County	Lake Trout, Rainbow Trout
6/18/2007	2007300	Grand River	Grand Rapids, below 6th Street dam	Northern Pike
5/8/2007	2007218	Hutchins Lake	Allegan County	Northern Pike
5/22/2007	2007225	Lake Fannie Hooe	Keweenaw Co.	Smallmouth Bass
9/4/2007	2007270	Lake Huron	Saginaw Bay, Charity Island	Freshwater Drum
10/23/2007	2007269	Lake Huron	Thunder Bay	Lake Whitefish
5/8/2007	2007227	Lake Margrethe	Crawford County	Walleye
5/15/2007	2007231	Lake Superior	Keweenaw Bay	Lake Whitefish
5/15/2007	2007230	Lake Superior	Keweenaw Bay	Lake Herring, Siscowet
5/1/2007	2007267	Lake Superior	Marquette	Lake Whitefish
5/22/2007	2007234	Long Lake	Grand Traverse Co	Walleye, White Sucker
4/17/2007	2007235	Long Lake	Iron County	Walleye
6/5/2007	2007237	Lost Lake	Presque Isle County	Largemouth Bass
4/17/2007	2007238	Manistique River	d/s Manistique Papers Dam	Walleye
5/9/2007	2007240	Middle Straits Lake	Oakland County	Northern Pike
5/22/2007	2007241	Milakokia Lake	Mackinac County	Walleye
4/12/2007	2007243	Murphy Lake	Tuscola Co	Northern Pike
5/24/2007	2007265	Osterhout Lake	Allegan County	Largemouth Bass
5/22/2007	2007244	Otsego Lake	Otsego Co	Walleye
6/20/2007	2007245	Pere Marquette Lake	Mason County	Northern Pike
5/15/2007	2007246	Pike Lake	Houghton Co	Northern Pike
4/19/2007	2007247	Portage Lake	Houghton County	Walleye
4/6/2007	2007242	Randall Lake Chain	Morrison Lake	Northern Pike
5/30/2007	2007248	Rock Lake	Montcalm Co	Largemouth Bass, Walleye
6/12/2007	2007275	Shakey Lakes	Menominee Co	Northern Pike
6/5/2007	2007251	Silver Lake	Grand Traverse Co	Walleye

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
10/30/2007	2007253	Stony Creek Impoundment	Macomb County	Northern Pike
5/16/2007	2007264	Three Mile Lake	Van Buren County	Northern Pike
5/15/2007	2007255	Tittabawassee River	Sanford Lake	Channel Catfish
5/30/2007	2007256	Tobico Marsh	Bay County	Carp, Largemouth Bass, Northern Pike
4/25/2007	2007257	Torch Lake	Houghton County	Northern Pike, Walleye, White Sucker
6/12/2007	2007258	White Lake	Muskegon County	Carp, Northern Pike
6/5/2007	2007259	White Lake	Oakland Co.	Walleye
2008				
5/12/2008	2008200	Au Sable River	Cooke Pond	Northern Pike
4/10/2008	2008203	Bad River	Saginaw County	Northern Pike
5/7/2008	2008263	Beatons Lake	Gogebic County	Largemouth Bass, Smallmouth Bass
5/14/2008	2008208	Chicagon Lake	Iron County	Walleye
5/13/2008	2008210	Crooked Lake	Clare Co	Largemouth Bass
9/14/2008	2008211	Deer Lake	Marquette County	Northern Pike, Walleye, White Sucker, Yellow Perch
9/22/2008	2008212	Diamond Lake	Newaygo Co	Largemouth Bass
6/3/2008	2008213	Eagle Lake	Kalamazoo Co	Largemouth Bass
5/20/2008	2008216	Fine Lake	Barry Co	Northern Pike, Walleye
8/20/2008	2008217	Flat River	Fallasberg Park, downstream of Fallasberg Dam	Rock Bass, White Sucker
10/13/2008	2008273	Flat River	Lowell Impoundment	Carp
5/20/2008	2008219	Flint River	Holloway Reservoir	Channel Catfish
5/28/2008	2008220	Floyd Lake	Iosco County	Largemouth Bass
6/8/2008	2008221	Goose Lake	Marquette County	Northern Pike, White Sucker
5/21/2008	2008222	Houghton Lake	Roscommon County	Carp
5/6/2008	2008223	Huron River	Geddes Pond	Carp
5/6/2008	2008224	Indian Lake	Iron Co	Northern Pike
6/26/2008	2008225	Johnson Lake	Marquette CO	Northern Pike
4/16/2008	2008227	Kawkawlin River	Bay County, M-247	Carp
5/5/2008	2008750	Kingston Lake	Alger County	Largemouth Bass
4/14/2008	2008266	Lake Erie	Off Monroe	Channel Catfish
9/12/2008	2008271	Lake Huron	Saginaw Bay	Walleye, White Bass
5/12/2008	2008262	Lake Macatawa	Ottawa County	Largemouth Bass, Walleye
4/22/2008	2008232	Lake Michigan	Little Bay De Noc	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass
4/22/2008	2008280	Lake Michigan	Little Bay De Noc	Smallmouth Bass
5/15/2008	2008267	Lake Superior	Isle Royale	Lake Trout
6/1/2008	2008268	Lake Superior	Munising	Lake Trout
4/18/2008	2008254	Lake Superior	Tahquamenon River	Walleye
5/14/2008	2008234	Little Whitefish Lake	Montcalm Co	Largemouth Bass
5/28/2008	2008235	Manistique River	d/s Manistique Papers Dam	Carp, Pumpkinseed, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye, White Sucker
7/10/2008	2008236	Mary Lake	Dickinson County	Largemouth Bass
6/29/2008	2008237	Michigamme River	Michigamme Reservoir	Northern Pike, Walleye
5/5/2008	2008751	Muskallonge Lake	Luce County	Walleye
5/15/2008	2008239	Muskegon Lake	Muskegon County	Walleye
5/15/2008	2008240	Muskegon River	Newaygo County, below Croton Dam	Redhorse sucker, Walleye
6/10/2008	2008241	Nawakwa Lake	Alger County	Rock Bass, Walleye
6/14/2008	2008247	Raisin River	Monroe, below Winchester Bridge	Carp, Channel Catfish, Freshwater Drum, Smallmouth Bass, White Bass
10/1/2008	2008272	Schweitzer Creek	Schweitzer Reservoir	Northern Pike
5/14/2008	2008250	South Lake	Washtenaw County	Northern Pike
4/16/2008	2008251	Stony Creek Impoundment	Macomb County	Northern Pike
5/21/2008	2008242	Sylvan/Otter Lake	Oakland Co	Carp, Largemouth Bass
5/28/2008	2008255	Tank Lake	Luce Co.	Splake

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
5/20/2008	2008257	Thumb Lake	Charlevoix Co.	Largemouth Bass, Smallmouth Bass
5/28/2008	2008260	Whitmore Lake	Livingston County	Carp, Northern Pike
2009				
6/9/2009	2009200	Au Sable River	Mio Dam Pond	Northern Pike
5/20/2009	2009234	Avery Lake	Montmorency County	Largemouth Bass
5/6/2009	2009201	Baseline Lake	Livingston/Washtenaw County	Carp, Largemouth Bass
7/14/2009	2009246	Big Creek, West Branch	CR 489	Brown Trout, Brown Trout Liver
5/27/2009	2009203	Big Crooked Lake	Van Buren Co	Largemouth Bass
6/4/2009	2009204	Bobcat Lake	Gogebic Co.	Northern Pike
6/30/2009	2009205	Bodi Lake	Luce Co.	Northern Pike
6/2/2009	2009206	Chaney Lake	Gogebic County	Northern Pike
5/5/2009	2009208	Clear Lake	St. Joseph Co.	Northern Pike
5/5/2009	2009209	Clearwater Lake	Gogebic Co.	Northern Pike
6/10/2009	2009210	Crooked Lake	Alcona County	Walleye
5/7/2009	2009400	Detroit River	Michigan waters	Lake Sturgeon
6/10/2009	2009211	Eel Lake	Gogebic Co.	Black Crappie
6/9/2009	2009212	Fish Lake	Marquette County	Northern Pike
6/1/2009	2009236	Glen Lake	Leelanau County	Lake Trout, Northern Pike
5/27/2009	2009235	Horseshoe Lake	Ogemaw Co.	Largemouth Bass
9/25/2009	2009403	Kalamazoo River	Otsego Dam Impoundment	Carp, Smallmouth Bass
9/15/2009	2009407	Kalamazoo River	Plainwell Dam #2	Carp
9/15/2009	2009401	Kalamazoo River	Plainwell Dam #2	Smallmouth Bass
9/14/2009	2009402	Kalamazoo River	Plainwell Dam Reservoir	Smallmouth Bass
9/14/2009	2009406	Kalamazoo River	Plainwell Dam Reservoir	Carp
10/8/2009	2009217	Lake Huron	Black River	Chinook
10/7/2009	2009310	Lake Huron	Swan River	Chinook
10/29/2009	2009309	Lake Michigan	Grand Traverse Bay	Lake Trout
10/6/2009	2009218	Lake Michigan	Platte River	Chinook, Coho
10/1/2009	2009219	Lake Michigan	St. Joseph River, Berrien Springs	Chinook
4/23/2009	2009220	Lake Orion	Oakland County	Carp
6/10/2009	2009222	Monacle Lake	Chippewa Co.	Walleye
4/5/2009	2009238	Mullett Lake	Cheboygan County	Smallmouth Bass
5/6/2009	2009223	Payne Lake	North of Gun Lake	Northern Pike
7/14/2009	2009245	Perry Creek	Hoskins Mfg	Brown Trout, Brown Trout Liver
11/24/2009	2009247	Perry Creek	Oscoda County	Brown Trout
5/20/2009	2009225	Portage Lake	Washtenaw/Livingston County	Carp, Walleye
5/11/2009	2009227	Reed's Lake	Kent County	Northern Pike
7/13/2009	2009229	Rifle River	Arenac County	Redhorse Sucker, Rock Bass
5/12/2009	2009231	Thunder Bay River	Seven Mile Pond	Smallmouth Bass
3/15/2009	2009300	Torch Lake	Antrim County	Lake Trout, Rainbow Trout
6/22/2009	2009233	Twin Lake	Luce Co	Northern Pike

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
2010				
8/4/2010	2010260	Carp Creek	u/s Deer Lake	White Sucker
8/4/2010	2010261	Carp River	Carp River Basin	Northern Pike
4/12/2010	2010205	Deer Lake	Marquette County	Yellow Perch
5/7/2010	2010207	Detroit River	Belle Isle	Bullhead, Carp, Channel Catfish, Largemouth Bass, Northern Pike, Rock Bass, Smallmouth Bass, White Bass
6/15/2010	2010270	Fidelity Lake	Ingham County	Black Crappie, Bluegill, Largemouth Bass
6/8/2010	2010217	Hamlin Lake	Mason County	Largemouth Bass, Northern Pike, Walleye
5/25/2010	2010218	Hoisington Lake	Livingston County	Black Crappie, Carp, Largemouth Bass
6/22/2010	2010219	Horsehead Lake	Mecosta County	Largemouth Bass
10/28/2010	2010502	Kalamazoo River	Ceresco Impoundment, 12 Mile Road	Carp, Rock Bass
8/2/2010	2010300	Kalamazoo River	Marshall Pond	Carp, Smallmouth Bass
10/28/2010	2010503	Kalamazoo River	Morrow Pond	Bluegill, Carp, Rock Bass
4/19/2010	2010304	Kalamazoo River	New Richmond	Lake Sturgeon
4/1/2010	2010277	Lake Michigan	Little Bay De Noc	Northern Pike
5/1/2010	2010310	Lake Michigan	Muskegon	Lake Sturgeon
4/28/2010	2010303	Lake St. Clair	10 Mile Canal	Black Crappie, Carp, Largemouth Bass, Pumpkinseed
5/5/2010	2010258	Lake St. Clair	Michigan waters	Perch
6/8/2010	2010228	Lake St. Helen	Roscommon Co	Walleye
5/11/2010	2010233	Loon Lake	Oakland County	Carp
6/2/2010	2010235	McCullum Lake	Oscoda/Alcona Co.	Largemouth Bass
4/27/2010	2010237	Menominee River	Chalk Hills Impoundment	Redhorse Sucker, Walleye
5/19/2010	2010240	Otter Lake	Houghton County	Walleye
9/30/2010	2010321	Pine River	Alma Impoundment	Carp
9/29/2010	2010320	Pine River	Between Harrison and Polk Road	Redhorse Sucker, Smallmouth Bass
9/28/2010	2010322	Pine River	Griatiot County, below St Louis Dam	Carp, Redhorse Sucker, Smallmouth Bass
6/12/2010	2010262	Pine River	St. Louis Impoundment	Sucker
5/26/2010	2010242	Platte Lake	Benzie County	Rock Bass, Smallmouth Bass, Walleye
5/25/2010	2010243	Prairie River Lake	St. Joseph County	Largemouth Bass, Northern Pike
4/13/2010	2010247	Saline River	Saline Pond	Bluegill, Largemouth Bass
6/23/2010	2010306	St. Clair River	Algonac	Lake Sturgeon
6/16/2010	2010252	Thayers Lake	east of Mohawk	Yellow Perch
5/25/2010	2010253	Van Etten Lake	Iosco County, Oscoda	Walleye, White Sucker
2011				
9/28/2011	2011246	Au Sable River	d/s Whirlpool	Smallmouth Bass, White Sucker
6/21/2011	2011205	Big Lake	Otsego County	Smallmouth Bass
9/29/2011	2011207	Carp River	Carp River Basin	Northern Pike, Walleye, White Sucker, Yellow Perch
8/8/2011	2011301	Clarks Marsh	Site 1	Pumpkinseed
8/8/2011	2011302	Clarks Marsh	Site 2	Pumpkinseed
8/8/2011	2011303	Clarks Marsh	Site 3	Golden Shiner, Pumpkinseed
8/8/2011	2011304	Clarks Marsh	Site 4	Bluegill, Common Shiner, Pumpkinseed
5/17/2011	2011210	Crotched Lake	Oakland County	Black Crappie, Carp
5/3/2011	2011212	Deer Lake	Marquette County	Northern Pike, Walleye, White Sucker, Yellow Perch
5/10/2011	2011248	Detroit River	Belle Isle	Carp, Channel Catfish
7/22/2011	2011245	Detroit River	Celeron Island	Carp, Channel Catfish
5/20/2011	2011247	Detroit River	Grassy Island	White Bass, Yellow Perch
5/10/2011	2011213	East Long Lake	Branch County	Northern Pike
9/12/2011	2011103	Higgins Lake	Roscommon County	Lake Trout
8/29/2011	2011402	Kalamazoo River	Ceresco Impoundment, 12 Mile Road	Carp, Rock Bass, Smallmouth Bass
8/29/2011	2011401	Kalamazoo River	Marshall Pond	Carp, Largemouth Bass, Rock Bass, Smallmouth Bass

Appendix A. (Continued) Edible portion sampling sites and species sampled by year, 1980 through 2012.

Date	Visit ID	Waterbody Name	Location	Species Sampled
8/29/2011	2011403	Kalamazoo River	Morrow Pond	Bluegill, Carp
6/3/2011	2011226	Lake 15	Montmorency County	Largemouth Bass
10/11/2011	2011224	Lake Erie	Off Monroe	Carp, Channel Catfish, White Bass
5/24/2011	2011225	Lake Fenton	Genesee County	Carp, Largemouth Bass
8/26/2011	2011550	Lake Michigan	Muskegon	Lake Sturgeon
6/1/2011	2011227	Lake Nepessing	Lapeer County	Carp, Northern Pike
7/19/2011	2011501	Lake St. Clair	St. Clair Shores N1	Bluegill, Carp, Yellow Perch
7/19/2011	2011502	Lake St. Clair	St. Clair Shores N2	Bluegill, Carp, Yellow Perch
7/19/2011	2011503	Lake St. Clair	St. Clair Shores N3	Bluegill, Carp, Smallmouth Bass, Yellow Perch
7/19/2011	2011504	Lake St. Clair	St. Clair Shores N4	Bluegill, Bullhead, Carp, Channel Catfish, Smallmouth Bass, Walleye, Yellow Perch
7/19/2011	2011505	Lake St. Clair	St. Clair Shores N5	Bluegill, Carp, Pumpkinseed, Smallmouth Bass, Yellow Perch
7/19/2011	2011521	Lake St. Clair	St. Clair Shores S1	Bluegill, Carp, Pumpkinseed, Smallmouth Bass, Walleye, Yellow Perch
7/19/2011	2011522	Lake St. Clair	St. Clair Shores S2	Bluegill, Carp, Pumpkinseed, Smallmouth Bass, Yellow Perch
7/19/2011	2011523	Lake St. Clair	St. Clair Shores S3	Bluegill, Carp, Smallmouth Bass, Yellow Perch
7/19/2011	2011524	Lake St. Clair	St. Clair Shores S4	Bluegill, Carp, Smallmouth Bass, Yellow Perch
5/19/2011	2011231	Manistee River	Tippy Impoundment	Northern Pike
9/13/2011	2011243	Ruddiman Creek	Lagoon	Carp, Largemouth Bass
5/25/2011	2011239	Six Lakes	Montcalm County	Northern Pike
6/15/2011	2011551	Sturgeon Lake	St. Joseph County	Northern Pike
4/21/2011	2011250	Thornapple Lake	Barry County	Largemouth Bass
2012				
6/27/2012	2012353	Au Sable River	Oscoda	Bluegill, Pumpkinseed, Rock Bass, Smallmouth Bass
4/6/2012	2012208	Dead River	Hoist Basin	Walleye
5/15/2012	2012213	Huron River	Belleville Lake	Carp, Channel Catfish, Walleye
10/22/2012	2012400	Kalamazoo River	Morrow Pond	Smallmouth Bass
10/9/2012	2012350	Lake Erie	Luna Pier	White Bass, White Perch, Yellow Perch
10/9/2012	2012252	Lake Erie	Off Monroe	Walleye
5/17/2012	2012215	Lake Huron	Les Cheneaux Islands	Brown Bullhead, Carp, Largemouth Bass, Pumpkinseed, Rock Bass, Smallmouth Bass, Yellow Perch
4/9/2012	2012217	Lake Michigan	Little Bay De Noc	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye
4/26/2012	2012251	Lake St. Clair	Anchor Bay	Carp, Walleye
5/9/2012	2012221	Manistique River	d/s Manistique Papers Dam	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye
7/19/2012	2012300	Manistique River	d/s Manistique Papers Dam	Redhorse Sucker, Rock Bass
7/19/2012	2012360	Manistique River	d/s Manistique Papers Dam	Rock Bass
10/1/2012	2012355	Menominee River	Lower Scott Flowage, between Dams 1 and 2	Carp, Redhorse Sucker, Rock Bass, Smallmouth Bass
5/15/2012	2012250	Menominee River	Menominee, river mouth	Black Crappie, Bluegill, Carp, Northern Pike, Smallmouth Bass, Yellow Perch
10/23/2012	2012500	Pine Creek	Pine Creek Impoundment	Bluegill, Carp, Largemouth Bass
6/15/2012	2012228	St. Clair River	Algonac	Carp, Rock Bass, Smallmouth Bass, Yellow Perch
5/16/2012	2012229	St. Marys River	Munuscong Bay	Brown Bullhead, Carp, Pumpkinseed, Redhorse Sucker, Rock Bass, Smallmouth Bass, Walleye, Yellow Perch
4/4/2012	2012230	Stager Lake	Iron County	Walleye
5/30/2012	2012231	Tobico Marsh	Bay County	Carp, Northern Pike
6/27/2012	2012351	Van Etten Lake	Iosco County, Oscoda	Pumpkinseed, Rock Bass

Appendix B1. Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Alger	Au Train Basin		Yellow Perch	X	na	na	na	na	na	na	
			Northern Pike	X	na	na	na	na	na	na	
	Au Train Lake		Walleye	X	na	na	na	na	na	na	
			Yellow Perch	X	na	na	na	na	na	na	
	Beaver Lake		Walleye	X	na	na	na	na	na	na	
			Yellow Perch	X	na	na	na	na	na	na	
	Deer Lake		Northern Pike	X			na	na	na		
	Echo Lake		Northern Pike	X			na	na	na		
			Yellow Perch	X	na	na	na	na	na	na	
	Grand Sable Lake		Lake Trout	X	na	na	na	na	na	na	
	Kingston Lake		Largemouth Bass	X	na	na	na	na		na	
	Little Round Lake		Bluegill	X	na	na	na	na	na	na	
	Nawakwa Lake		Northern Pike	X	na	na	na	na	na	na	
			Rock Bass	X	na	na	na	na		na	
		Walleye	X	na	na	na	na		na		
Baraga	Aligan Lake		Largemouth Bass	X	na	na	na	na	na	na	
			Northern Pike	X	na	na	na	na	na	na	
			Yellow Perch	X	na	na	na	na	na	na	
	Beaufort Lake		Northern Pike	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Craig Lake		Northern Pike	X			na	na	na		
			Walleye	X			na	na	na		
	King Lake		Largemouth Bass	X	na	na	na	na	na	na	
			Northern Pike	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
Vermilac Lake		Walleye	X	na	na	na	na	na	na		
		Yellow Perch	X	na	na	na	na	na	na		

X = primary cause of advisory; + = secondary cause of advisory;
 blank = assessed but would not cause advisory; na = not assessed

Appendix B1 (Continued). Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Chippewa	Caribou Lake		Smallmouth Bass	X	na	na	na	na	na	na	
			Rock Bass	X	na	na	na	na	na	na	
	Carp Lake		Walleye	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Frenchman Lake		Northern Pike	X	na	na	na	na	na	na	
	Monocle Lake		Walleye	X	na	na	na	na		na	
Delta	Escanaba River	Dam 1 Impoundment	Northern Pike	X			na	na	na		
			White Sucker	X			na	na	na		
		Yellow Perch	X	na	na	na	na	na	na	na	
		Boney Falls to Dam 3	Rock Bass	X	na	na	na	na	na	na	
	Round Lake		Walleye	X	na	na	na	na	na	na	
Dickinson	Lake Antoine		Largemouth Bass	X	na	na	na	na	na	na	
			Northern Pike	X	na	na	na	na	na	na	
			Walleye	X	+		na	na	na		
	Carney Lake		Northern Pike	X	na	na	na	na	na	na	
			Walleye	X			na	na	na		
	Fumee Lake		Smallmouth Bass	X			na	na	na		
	Hamilton Lake		Northern Pike	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Hanbury Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Mary Lake		Largemouth Bass	X	na	na	na	na		na	
	Silver Lake		Walleye	X			na	na	na		
	South Groveland Pond		Walleye	X	na	na	na	na	na	na	
			Rainbow Trout	X	na	na	na	na	na	na	na
	Squaw Lake		Splake	X	na	na	na	na	na	na	na
		White Sucker	X			na	na	na			
		Yellow Perch	X	na	na	na	na	na	na		

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Appendix B1 (Continued). Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula										
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene
Gogebic	Beatons Lake		Largemouth Bass	X	na	na	na	na		na
			Rainbow Trout	X	na	na	na	na	na	na
	Bobcat Lake		Northern Pike	X	na	na	na	na		na
			Black Crappie	X	na	na	na	na	na	na
	Chaney Lake		Northern Pike	X	na	na	na	na		na
			Walleye	X	na	na	na	na	na	na
			Yellow Perch	X	na	na	na	na	na	na
	Cisco Lake		Bluegill	X	na	na	na	na	na	na
			Northern Pike	X	na	na	na	na	na	na
			Walleye	X	na	na	na	na	na	na
	Duck Lake		Rock Bass	X	na	na	na	na	na	na
			Walleye	X	na	na	na	na	na	na
	Eel Lake		Black Crappie	X	na	na	na	na	na	na
			Rock Bass	X	na	na	na	na	na	na
	Lake Gogebic		Walleye	X	na	na	na	na	na	na
			White Sucker	X	na	na	na	na	na	na
			Bluegill	X	na	na	na	na	na	na
	Langford Lake		Northern Pike	X	na	na	na	na	na	na
			Walleye	X	na	na	na	na	na	na
	Little Oxbow Lake		Largemouth Bass	X	na	na	na	na	na	na
	Marion Lake		Rock Bass	X	na	na	na	na	na	na
			Walleye	X	na	na	na	na	na	na
	Ormes Lake		Largemouth Bass	X	na	na	na	na	na	na
Pomeroy Lake		Walleye	X	na	na	na	na	na	na	
Sunday Lake		Black Crappie	X	na	na	na	na	na	na	
		Northern Pike	X	na	na	na	na	na	na	
Thousand Island Lake		Walleye	X	na	na	na	na	na	na	

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Appendix B1 (Continued). Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Houghton	Bob Lake		Walleye	X	na	na	na	na	na	na	
	Boston Pond		White Sucker				na	na	na		
			Yellow Perch	X			na	na	na		
	Emily Lake		Walleye	X			na	na	na		
	Otter Lake		Walleye	X	+		na		na	+	
			White Sucker	X			na	na	na		
	Pike Lake		Northern Pike	X	na	na	na	na		na	
			Brown Trout	X	X	+	na	na	na	+	
	Portage Lake		Northern Pike	X	+		na	na	na		
			Walleye	X	X		na	na	na		
	Rice Lake		Northern Pike	X			na	na	na		
			Walleye	X			na	na	na		
	Roland Lake		Rock Bass	X	na	na	na	na	na	na	
	Six Mile Lake		Bluegill	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Torch Lake		Northern Pike	+	X		na	na	na		
			Smallmouth Bass	X	X		na	na	na		
		Walleye	X	X		na	na	na	+		
		White Sucker	X	X		na	na	na			

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Appendix B1 (Continued). Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula										
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene
Iron	Cable Lake		Walleye	X	na	na	na	na	na	na
			Lake Whitefish	X	+	+	na	na	na	
	Chicagon Lake		Rock Bass	X	na	na	na	na	na	na
			Walleye	X	na	na	na	na		na
	Deer Lake		Northern Pike	X	na	na	na	na		na
	Fire Lake		Northern Pike	X	na	na	na	na		na
	Fortune Lake		Largemouth Bass	X	na	na	na	na	na	na
	Hagerman Lake		Walleye	X			na	na	na	
	Indian Lake		Northern Pike	X	na	na	na	na		na
	Long Lake		Walleye	X	na	na	na	na	na	na
	Lake Emily		Largemouth Bass	X	na	na	na	na	na	na
			Walleye	X	na	na	na	na	na	na
	Marten Lake		Northern Pike	X	na	na	na	na	na	na
	Net River	Wide Waters	Northern Pike	X			na	na	na	
			Walleye	X	+		na	na	na	
	Ottawa Lake		Northern Pike	X	na	na	na	na	na	na
			Rock Bass	X	na	na	na	na	na	na
	Paint Lake		Northern Pike	X	na	na	na	na	na	na
	Perch Lake		Northern Pike	X	na	na	na	na		na
			Walleye	X	na	na	na	na		na
	Runkle Lake		Northern Pike	X			na	na	na	
	Smokey Lake		Rock Bass	X	na	na	na	na	na	na
	Stager Lake		Walleye	X	na	na	na	na	na	na
Stanley Lake		Walleye	X	na	na	na	na	na	na	
Sunset Lake		Walleye	X			na	na	na		
Tepee Lake		Northern Pike	X	na	na	na	na	na	na	

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Appendix B1 (Continued). Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Keweenaw	Gratiot Lake		Rock Bass	X	na	na	na	na	na	na	
	Lake Fannie Hooley		Smallmouth Bass	X	na	na	na	na		na	
	Lake Medora		Smallmouth Bass	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Siskiwit Lake		Lake Trout	X	X	+	na	na	na		
	Thayers Lake		Yellow Perch	X	na	na	na	na	na	na	
Luce	Blind Sucker Flooding		Yellow Perch	X	na	na	na	na	na	na	
	Bodi Lake		Northern Pike	X	na	na	na	na		na	
			Brown Bullhead	X			na	na	na		
			Northern Pike	X			na	na	na		
	Muskallonge Lake		Walleye	X	na	na	na	na		na	
		North Manistique Lake		Walleye	X	na	na	na	na	na	na
				Yellow Perch	X	na	na	na	na	na	na
	Pike Lake		Walleye	X			na	na	na		
	Pretty Lake		Walleye	X	na	na	na	na	na	na	
	Tank Lake		Splake	X			na	na	na		
			Northern Pike	X			na	na	na		
			Walleye	X	na	na	na	na	na	na	
Tahquamenon River		White Sucker	X	na	na	na	na	na	na		
		Yellow Perch	X	na	na	na	na	na	na		
		Northern Pike	X	na	na	na	na		na		
Twin Lake		Northern Pike	X	na	na	na	na		na		
Mackinac	Brevoort Lake		Rock Bass	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Manistique Lake		Walleye	X			na	na	na		
	Milakokia Lake		Walleye	X	na	na	na	na	na	na	
			White Sucker	X	na	na	na	na	na	na	

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Appendix B1 (Continued). Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Mackinac	Millecoquins Lake		Northern Pike	X	na	na	na	na	na	na	
			Rock Bass	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	South Manistique Lake		Rock Bass	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Big Shag Lake		Northern Pike	X	+		na	na	na		
	Carp Creek	u/s Deer Lake	Brook Trout	X	na	na	na	na	na	na	
			White Sucker	X	na	na	na	na	na	na	
	Carp River	d/s Deer Lake	Brook Trout	X	na	na	na	na	na	na	
			Northern Pike	X	na	na	na	na	na	na	
Walleye			X	na	na	na	na	na	na		
White Sucker			X	na	na	na	na	na	na		
Yellow Perch			X	na	na	na	na	na	na		
Dead River	Forestville Basin	Northern Pike	X	na	na	na	na	na	na		
		Smallmouth Bass	X	na	na	na	na	na	na		
		Hoist Basin	Walleye	X	na	na	na		na	na	
Deer Lake		Northern Pike	X	na	na	na	na			na	
		Walleye	X	na	na	na	na			na	
		White Sucker	X	na	na	na	na	na	na	na	
		Yellow Perch	X	na	na	na	na	na	na	na	
		Northern Pike	X	na	na	na	na	na	na	na	
East Bass Lake		Northern Pike	X	na	na	na	na	na	na		
Engman Lake	Cataract Basin	Northern Pike	X	na	na	na	na			na	
		Walleye	X	na	na	na	na	na	na	na	
Escanaba River	Greenwood Reservoir	Black Crappie	X	na	na	na	na	na	na	na	
		Largemouth Bass	X	na	na	na	na	na	na	na	
		Northern Pike	X	na	na	na	na	na	na	na	
	Upper River & Tribs	Brook Trout	na	na	na	na	na	X	na		

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Appendix B1 (Continued). Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Marquette	Fish Lake		Northern Pike	X	na	na	na	na		na	
			Northern Pike	+	X		na	na	+		
	Goose Lake		Walleye	+	X		na	na	na		
				White Sucker		X		na	na	+	
				Yellow Perch	+	X		na	na	na	
	Lake Independence			Northern Pike	X	na	na	na	na	na	na
				Walleye	X	na	na	na	na	na	na
	Lake Le Vasseur			Northern Pike	X	na	na	na	na	na	na
				Lake Herring	X	na	na	na	na	na	na
	Lake Michigamme			Northern Pike	X	na	na	na	na	na	na
				Rock Bass	X	na	na	na	na	na	na
				Walleye	X	na	na	na	na	na	na
				White Sucker	X	na	na	na	na	na	na
				Walleye	X			na	na	na	
	Little Lake			Burbot	X			na	na	na	
				Lake Whitefish	X	na	na	na	na	na	na
	Michigamme River			Northern Pike	X	na	na	na	na	na	na
				Rock Bass	X	na	na	na	na	na	na
				Walleye	X			na	na	na	
				White Sucker	X	na	na	na	na	na	na
				Yellow Perch	X	na	na	na	na	na	na
				Northern Pike	X	na	na	na	na	na	na
	Perch Lake			Northern Pike	X	na	na	na	na	na	na
Round Lake	Champion Twp		Largemouth Bass	X	na	na	na	na	na	na	
Schweitzer Creek	Schweitzer Reservoir		Northern Pike	X	na	na	na	na	+	na	
			Smallmouth Bass	X	na	na	na	na	na	na	
Silver-Lead Creek			Brook Trout	+	X		na	na	na		

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Appendix B1 (Continued). Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Marquette	Sporley Lake		Splake	X			na	na	na		
			White Sucker				na	na	na		
	Teal Lake		Walleye	X	na	na	na	na	na	na	
	Shakey Lakes		Northern Pike	X			na	na			
Menominee	Menominee River	Twin Falls to Upper Scott Dam	Carp	+	X		+	na	na		
			Northern Pike	X	na	na	na	na	na	na	
			Suckers	X	+		na	na	na		
			Rock Bass	X	na	na	na	na	na	na	
		Smallmouth Bass	+	X		na	na	na			
		Walleye	X	+		na	na	na			
		Lower Scott Flowage	Carp	X	X		na	na	na		
			Redhorse Sucker	X	+		na	na	na		
	d/s Menominee Dam	Rock Bass	X	na	na	na	na	na	na	na	
		Walleye	X	na	na	na	na	na	na	na	
		Black Crappie	X	+		na	na	na			
		Bluegill	X			na	na	na			
Carp		+	X	+	na	na	na				
Northern Pike		X	X		na	na	na				
Ontonagon	Ontonagon River	Bond Falls Flowage	Walleye	X	na	na	na	na	na	na	
		Victoria Impoundment	Northern Pike	X	na	na	na	na	na	na	
	Sudden Lake		Walleye	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	

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Appendix B1 (Continued). Summary of contaminants causing fish consumption advisories in the Upper Peninsula of Michigan water bodies.

Upper Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
	Boot Lake		Walleye	X	na	na	na	na	na	na	
	Cusino Lake		Yellow Perch	X	na	na	na	na	na	na	
	Dodge Lake		Largemouth Bass	X	na	na	na	na		na	
			Northern Pike	X	na	na	na	na	na	na	
	Gulliver Lake		Northern Pike	X	na	na	na	na	na	na	
				Walleye	X	na	na	na	na	na	na
Schoolcraft	u/s Manistique Dam		Redhorse Sucker	X			na	na	na		
			Carp	+	X	+	na	na	na		
			Channel Catfish	+	X	+	na	na	na	+	
	Manistique River	d/s Manistique Dam		Pumpkinseed	+	X		na	na	na	
				Rock Bass	X	+		na	na	na	
				Smallmouth Bass	+	X		na	na	na	
				Suckers	+	X		na	na	na	
				Walleye	+	X		na	na	na	

Summary of Basis for Fish Consumption Advice

	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene
Number of Sample Sets Analyzed	242	70	70	1	2	29	70
Primary Cause	225	24	0	0	0	1	0
as % of Sets Analyzed	93.0%	34.3%	0.0%	0.0%	0.0%	3.4%	0.0%
Secondary Cause	14	12	6	1	0	3	4
as % of Sets Analyzed	5.8%	17.1%	8.6%	100%	0.0%	10.3%	5.7%
Not a Cause	3	34	64	0	2	25	66

X = primary cause of advisory; + = secondary cause of advisory;
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Appendix B2. Summary of contaminants causing fish consumption advisories in northwest lower Michigan water bodies.

Northwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Antrim	Lake Bellaire		Splake	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Ellsworth Lake		Largemouth Bass	X			na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
			White Sucker	X			na	na	na		
	Intermediate Lake		Rock Bass	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Torch Lake		Brown Trout	+	X	+	na	na	na	+	
			Lake Trout	+	X	+	X	na	na		
			Lake Whitefish	+	X	+	X	na	na		
			Smallmouth Bass	X	+		na	na	na		
			Yellow Perch	X			na	na	na		
			Lake Trout	+	X	+	na	na	na		
	Benzie	Crystal Lake		White Sucker	+	X	+	na	na	na	
			Yellow Perch	X	+		na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
Lake Anne			Smallmouth Bass	X	na	na	na	na	na	na	
			Rock Bass	X			na	na	na		
Platte Lake			Smallmouth Bass	X	+		na	na	na		
			Walleye	X			na	na	na		
			Largemouth Bass	X	na	na	na	na	na	na	
Charlevoix	Deer Lake		Northern Pike	X	na	na	na	na	na	na	
			Brown Trout	+	X	+	na	na	na	+	
	Lake Charlevoix		Lake Trout	+	X	+	na	na	na	+	
			Walleye	X	na	na	na	na	na	na	
			White Sucker	X	X		na	na	na		
	Six Mile Lake		Northern Pike	X	na	na	na	na	na	na	
	Thumb Lake		Largemouth Bass	X	na	na	na	na	na	na	

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Appendix B2 (Continued). Summary of contaminants causing fish consumption advisories in northwest lower Michigan water bodies.

Northwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Charlevoix	Walloon Lake		Bullhead	X			na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
			Rainbow Trout	X	X		na	na	na		
			Rock Bass	X			na	na	na		
			Smallmouth Bass	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
			White Sucker	X	+		na	na	na		
			Yellow Perch	X			na	na	na		
Clare	Budd Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Cranberry Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Crooked Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Five Lakes		Largemouth Bass	X			na	na	na		
			Northern Pike	X			na	na	na		
	Lily Lake		Northern Pike	X	na	na	na	na	na	na	
Emmet	Crooked Lake		Largemouth Bass	X	+		na	na	na		
			Walleye	X	+		na	na	na		
	Lake Paradise		Largemouth Bass	X			na	na	na		
			White Sucker	X			na	na	na		
	Pickerel Lake		Largemouth Bass	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Tannery Creek		Brook Trout	X			na	na	na		
Grand Traverse	Arbutus Lake		Northern Pike	X	na	na	na	na	na	na	
	Bass Lake		Bluegill	X	na	na	na	na	na	na	
			Northern Pike	X	na	na	na	na	na	na	
	Boardman River	u/s 6th Street Dam		Northern Pike	X	na	na	na	na	na	na
				Walleye	X	+		na	na	na	
				White Sucker	X			na	na	na	
	Green Lake		Lake Trout	X	X	+	X	na	na		
			Northern Pike	X	na	na	na	na	na	na	
			White Sucker	X	na	na	na	na	na	na	
		Long Lake		Walleye	X	na	na	na	na	na	na
Silver Lake			Walleye	X	na	na	na	na	na	na	

X = primary cause of advisory; + = secondary cause of advisory;
blank = assessed but would not cause advisory; na = not assessed

Appendix B2 (Continued). Summary of contaminants causing fish consumption advisories in northwest lower Michigan water bodies.

Northwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Grand Traverse & Antrim	Elk Lake		Lake Trout	X	X	+	na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
Kalkaska	Bear Lake		Smallmouth Bass	X	na	na	na	na	na	na	
	Big Twin Lake		Lake Herring	X			na	na	na		
Lake	Big Star Lake		Largemouth Bass	X	na	na	na	na	na	na	
Leelanau	N. Lake Leelanau		White Sucker	+	X		na	na	na		
			Lake Trout	+	X	+	+	na	na		
	Tucker Lake		Brown Bullhead				na	na	na		
	Glen Lake		Lake Trout	+	X	+	X	na	na	X	
Manistee	Manistee Lake		Rainbow Trout	X	X		na	na	na		
			Smallmouth Bass	X	na	na	na	na	na	na	
			Black Crappie	+	X		na	na	na		
			Bluegill	+	X		na	na	na		
	Pine Lake		Largemouth Bass	+	X	+	na	na	na		
			Rock Bass	X	+		na	na	na		
			Rock Bass	X	na	na	na	na	na	na	
Portage Lake		Carp	X	X	+	na	na	na			
		Largemouth Bass	X	X		na	na	na			
		Northern Pike	X	X		na	na	na			
	Manistee River	Tippy Impoundment	Northern Pike	X	na	na	na	na	na	na	
Mason	Hamlin Lake		Black Crappie	X			na	na	na		
			Largemouth Bass	X	na	na	na	na	na	na	
			Northern Pike	X			na	na	na		
			Walleye	X	na	na	na	na	na	na	
Mason/Lake/Newaygo	Pere Marquette River		Brown Trout	+	X	+	na	na	na		
			Northern Pike	X	X		na	na	na		
			Suckers	X	X		na	na	na		

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Appendix B2 (Continued). Summary of contaminants causing fish consumption advisories in northwest lower Michigan water bodies.

Northwest Lower Peninsula										
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene
Osceola	Hersey River		Brown Trout	X	X	na	na	na	na	na
			White Sucker	X	+	na	na	na	na	na
	Todd Lake		Northern Pike	X	na	na	na	na	na	na
			Largemouth Bass	X	na	na	na	na	na	na
			Northern Pike	X	na	na	na	na	na	na
Wexford	Lake Cadillac		Northern Pike	X			na	na	na	
			Smallmouth Bass	X	+		na	na	na	
	Lake Mitchell		Largemouth Bass	X			na	na	na	
			Walleye	X			na	na	na	

Summary of Basis for Fish Consumption Advice								
	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Number of Sample Sets Analyzed	97	56	54	5	0	0	54	
Primary Cause	82	25	0	4	--	--	1	
as % of Sets Analyzed	84.5%	44.6%	0.0%	80.0%	--	--	1.8%	
Secondary Cause	14	10	14	1	--	--	3	
as % of Sets Analyzed	14.4%	17.8%	25.9%	20.0%	--	--	5.5%	
Not a Cause	1	21	40	0	--	--	50	

X = primary cause of advisory; + = secondary cause of advisory;
 blank = assessed but would not cause advisory; na = not assessed

Appendix B3. Summary of contaminants causing fish consumption advisories in northeast lower Michigan water bodies.

Northeast Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Alcona	Crooked Lake		Walleye	X	na	na	na	na	na	na	
	Hubbard Lake		Northern Pike	X			na	na	na		
	Hubbard Lake		Walleye	X	na	na	na	na	na	na	
	McCollum Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Beaver Lake		Northern Pike	X	na	na	na	na	na	na	
	Beaver Lake		Smallmouth Bass	X	na	na	na	na	na	na	
Alpena	Thunder Bay River	d/s Fletcher Dam	Brown Bullhead	X			na	na	na		
			Carp	X	X		na	na	na		
			Largemouth Bass	X			na	na	na		
Alpena	Thunder Bay River	Fletcher Pond	Walleye	X	+		na	na	na		
Alpena	Thunder Bay River	Fletcher Pond	Northern Pike	X	na	na	na	na	na	na	
Alpena/Presque Isle	Long Lake		Brown Bullhead	X			na	na	na		
			Smallmouth Bass	X			na	na	na		
			White Sucker	X			na	na	na		
Arenac	Rifle River		Redhorse Sucker	X	+		na	na	na		
			Rock Bass	X			na	na	na		
Roscommon	Au Sable River	South Branch	Brown Trout	X			na	na	na		
Crawford/Oscoda	Au Sable River	u/s Mio Dam	Brown Trout	X	+		na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
Oscoda/Alcona/Iosco	Au Sable River	between Mio & Foote	Northern Pike	X			na	na	na	na	
			Walleye	X			na	na	na	na	
Iosco	Au Sable River	d/s Foote Dam	Carp	+	X	+	na	na	na		
			Rock Bass	X	na	na	na	X	na	na	
			Smallmouth Bass	+			na	X	na		
			Walleye	+	X	+	na	na	na	+	
			White Sucker	+			na	X	na		

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Appendix B3 (Continued). Summary of contaminants causing fish consumption advisories in northeast lower Michigan water bodies.

Northeast Lower Peninsula										
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene
Cheboygan	Burt Lake		Northern Pike	X	+		na	na	na	
			Walleye	X			na	na	na	
			White Sucker	X			na	na	na	
	Mullet Lake		Smallmouth Bass	X	na	na	na	na	na	na
			Walleye	X	+		na	na	na	
Crawford	Lake Margrethe		Walleye	X	na	na	na	na	na	na
	Shupac Lake		Largemouth Bass	X	na	na	na	na	na	na
Gladwin	Pratt Lake		Yellow Perch	X	na	na	na	na	na	na
			Largemouth Bass	X	na	na	na	na	na	na
			Channel Catfish	X	+	na	na	na	na	na
Iosco	Van Etten Lake		Northern Pike	X	na	na	na	na	na	na
			Sunfish	na	na	na	na	X	na	na
			Largemouth Bass	X	na	na	na	na	na	na
			Black Crappie	X			na	na	na	
			White Sucker	X	+		na	na	na	
			Channel Catfish	+	X	+	na	na	na	
			Pumkpinseed	na	na	na	na	+	na	na
Manistee	Manistee River	u/s Tippy Dam	Rock Bass	na	na	na	na	+	na	na
			Walleye	X			na	+	na	
			White Sucker	X			na	+	na	
			Northern Pike	X	na	na	na	na	na	na
Montmorency	Avery Lake		Largemouth Bass	X	na	na	na	na	na	na
	Ess Lake		Northern Pike	X	na	na	na	na	na	na
	Gaylanta Lake		Northern Pike	X	na	na	na	na	na	na
	Lake 15		Largemouth Bass	X	na	na	na	na	na	na
	Long Lake		Smallmouth Bass	X	na	na	na	na	na	na
	McCormick Lake		Brown Trout	X			na	na	na	
	Ogemaw	Hardwood Lake		Northern Pike	X	na	na	na	na	na
Horseshoe Lake			Largemouth Bass	X	na	na	na	na	na	na
Peach Lake			Northern Pike	X	na	na	na	na	na	na
Oscoda/Alcona/Iosco	McCollum Lake		Largemouth Bass	X	na	na	na	na	na	na

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Appendix B3 (Continued). Summary of contaminants causing fish consumption advisories in northeast lower Michigan water bodies.

Northeast Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Otsego	Big Lake		Smallmouth Bass	X	na	na	na	na	na	na	
	Otsego Lake		Walleye	X	na	na	na	na	na	na	
Presque Isle	Grand Lake		Rock Bass	X	na	na	na	na	na	na	
			Smallmouth Bass	X	na	na	na	na	na	na	
		Walleye	X	na	na	na	na	na	na	na	
	Lake Emma		Northern Pike	X	na	na	na	na	na	na	
	Lake Esau		Smallmouth Bass	X	na	na	na	na	na	na	
	Lost Lake		Largemouth Bass	X	na	na	na	na	na	na	
Roscommon	Nettie Lake		Largemouth Bass	X	na	na	na	na	na	na	
			Brown Trout		X		na	na	na		
	Higgins Lake		Lake Herring	X	+	+	na	na	na		
			Lake Trout	X	X	+	na	na	na		
	Houghton Lake		Carp	X			na	na	na		
			Walleye	X			na	na	na		
Lake St. Helen		Walleye	X	na	na	na		na	na		

Summary of Basis for Fish Consumption Advice								
	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Number of Sample Sets Analyzed	68	34	33	0	9	0	32	
Primary Cause	62	6	0	--	4	--	0	
as % of Sets Analyzed	91.2%	17.6%	0.0%	--	44.4%	--	0.0%	
Secondary Cause	5	8	5	--	4	--	1	
as % of Sets Analyzed	7.4%	23.5%	15.2%	--	44.4%	--	3.1%	
Not a Cause	1	20	28	--	1	--	31	

X = primary cause of advisory; + = secondary cause of advisory;
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Appendix B4. Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Allegan	Fenner Lake		Largemouth Bass	X	+		na	na	na		
	Rabbit River	Hamilton Impoundment	Carp	+	X		na	na	na		
			Redhorse Sucker	X	+		na	na	na		
		d/s Hamilton Dam	Rock Bass	X	+		na	na	na		
	Hutchins Lake		Northern Pike	X			na	na	na		
	Osterhout Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Selkirk Lake		Largemouth Bass	X	+		na	na	na		
			Yellow Bullhead	X	+	+	na	na	na		
			Bluegill	+	X	na	na	na	na	na	
	Pine Creek Impoundment		Carp	+	X	na	na	na	na	na	
		Largemouth Bass	X	+	na	na	na	na	na		
		White Sucker	X	+		na	na	na			
Barry	Bristol Lake		Brown Bullhead	X			na	na	na		
	Crooked Lake		Largemouth Bass	X			na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
	Fine Lake		Walleye	X	na	na	na	na	na	na	
			Largemouth Bass	X	na	na	na	na	na	na	
	Gun Lake		Northern Pike	X	na	na	na	na	na	na	
	Payne Lake		Black Crappie	X	na	na	na	na	na	na	
	Pine Lake		Northern Pike	X	na	na	na	na	na	na	
			Largemouth Bass	X			na	na	na		
	Thornapple Lake		Redhorse Sucker	X			na	na	na		
		Carp	+	X		na	na	na			
Berrien	Galien River										

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Appendix B4 (Continued). Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Branch	Cary Lake		Largemouth Bass	X			na	na	na		
			White Sucker	X	+		na	na	na		
	Coldwater Lake		Bluegill	X	na	na	na	na	na	na	
			Largemouth Bass	X	na	na	na	na	na	na	
			Northern Pike	X	na	na	na	na	na	na	
			Northern Pike	X	na	na	na	na	na	na	
	East Long Lake		Northern Pike	X	na	na	na	na	na	na	
			Black Crappie	X			na	na	na		
			Largemouth Bass	X			na	na	na		
	Randall Lake Chain		Northern Pike	X	+		na	na	na		
		Carp	+	X	+	na	na	na			
		Smallmouth Bass	+	X		na	na	na			
Calhoun	Battle Creek River		Bluegill	X	na	na	na	na	na	na	
			Yellow Perch	X	na	na	na	na	na	na	
Cass	Dowagiac River		Carp	+	X	+	na	na	na		
Clinton	Lake Ovid		Bullhead	X			na	na	na		
			Largemouth Bass	X	na	na	na	na	na	na	
Montcalm	Flat River	u/s Greenville Dam	Rock Bass	X			na	na	na		
			White Sucker	X			na	na	na		
Ionia	Flat River	Belding to Fallasburg Dam	Rock Bass	X	+		na	na	na		
			White Sucker	+	X		na	na	na		
		Fallasburg to Lowell Dam	Carp	+	X		na	na	na		
			Rock Bass	X			na	na	na		
Eaton/Ingham	Grand River	u/s Smithville	White Sucker	X	+		na	na	na		
			Carp	+	X	+	na	na	na		
			Largemouth Bass	X	X		na	na	na		
			Walleye	+	X		na	na	na		
			White Sucker	+	X		na	na	na		

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Appendix B4 (Continued). Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Eaton/Ingham		Smithville to Moores Park	Carp	+	X	+	na	na	na		
			Channel Catfish	+	X	+	na	na	na		
			Largemouth Bass	X	+	+	na	na	na		
			Northern Pike	X	X	+	na	na	na		
			Walleye	X	X		na	na	na		
Ingham/Ionia	Grand River	Moores Park to Webber	Carp	+	X	+	na	na	na		
			Carp	+	X	+	na	na	na		
Ionia/Kent/Ottawa		Webber Dam to mouth	Channel Catfish	+	X		na	na	na		
			Northern Pike	+	X		na	na	na		
			Redhorse Sucker	+	X		na	na	na		
			Walleye	+	X		na	na	na		
				Bluegill	X	na	na	na	na	na	na
Hillsdale	Bird Lake		Yellow Perch	X	na	na	na	na	na	na	
			Bluegill	X		na	na	na			
Ingham	Fidelity Lake		Largemouth Bass	X			na	na	na		
			Lake Lansing	Black Crappie	X		na	na	na		
	Red Cedar River		Carp	+	X	+	na	na	na		
			Northern Pike	X	X		na	na	na		
			Rock Bass	X	+		na	na	na		
Ionia/Barry	Jordan Lake		Smallmouth Bass	X	X		na	na	na		
			Largemouth Bass	X	+		na	na	na		
Ionia	Morrison Lake		Carp				na	na	na		
			Largemouth Bass	X			na	na	na		
			Walleye	X	+		na	na	na		
			White Sucker		X		na	na	na		

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Appendix B4 (Continued). Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Isabella	Chippewa River	u/s Lake Isabella	Rock Bass	X			na	na	na		
			White Sucker	X			na	na	na		
	Littlefield Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Stevenson Lake		Bullhead	X			na	na	na		
			Northern Pike	X			na	na	na		
Jackson	Clark Lake		Black Crappie	X	na	na	na	na	na	na	
			Rock Bass	X	na	na	na	na	na	na	
	Norvell Lake		Carp	X	X		na	na	na		
	Portage Lake		Black Crappie	X			na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
	Vandercook Lake		Carp	X			na	na	na		
Kalamazoo	Austin Lake		Carp		X		na	na	na		
			Largemouth Bass	X			na	na	na		
			Yellow Bullhead	X			na	na	na		
	Barton Lake		Carp	+	X	+	na	na	na		
			Northern Pike	X	+		na	na	na		
	Eagle Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Gourdneck Lake		Northern Pike	X	na	na	na	na	na	na	
	Gull Lake		Largemouth Bass	X	+		na	na	na		
			Northern Pike	X	+		na	na	na		
	Long Lake		Black Crappie	X			na	na	na		
			Brown Bullhead				na	na	na		
	Portage Creek	d/s Monarch Dam		Carp	na	X	na	na	na	na	na
				White Sucker	na	X	na	na	na	na	na
	Monarch Pond		Carp	na	X	na	na	na	na	na	
Ruppert Lake			Largemouth Bass	X	na	na	na	na	na	na	

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Appendix B4 (Continued). Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Kent	Camp Lake		Brown Bullhead	X	X	X	na	na	na		
			Largemouth Bass	X			na	na	na		
	Campbell Lake		Largemouth Bass	X	na	na	na	na	na	na	
			Rock Bass	X	na	na	na	na	na	na	
	Lincoln Lake		Walleye	X	na	na	na	na	na	na	
			Largemouth Bass	X	na	na	na	na	na	na	
	Long Lake		Largemouth Bass	X	X	X	na	na	na		
			Northern Pike	X	X	+	na	na	na		
			Walleye	X	X	X	na	na	na		
Wabasis Lake			Largemouth Bass	X			na	na	na		
Mecosta	Horsehead Lake		Largemouth Bass	X	na	na	na	na	na	na	
Montcalm	Clifford Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Little Whitefish Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Montcalm Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Nevins Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Rainbow Lake		Northern Pike	X			na	na	na		
Montcalm	Rock Lake		Largemouth Bass	X	na	na	na	na	na	na	
			Walleye	X	na	na	na	na	na	na	
	Six Lakes		Northern Pike	X	na	na	na	na	na	na	
	Wolf Creek		Rock Bass	X			na	na	na		
			White Sucker	X			na	na	na		
Calhoun	Kalamazoo River	u/s Marshall Dam	Carp	X	X		na	na	na		
			Largemouth Bass	X	+		na	na	na		
			Rock Bass	X			na	na	na		

X = primary cause of advisory; + = secondary cause of advisory;
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Appendix B4 (Continued). Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula												
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene		
Calhoun/Kalamazoo		Marshall to Morrow Dam	Bluegill		X		na	na	na			
			Carp	+	X		X	na	na			
			Channel Catfish	na	X		X	na	na			
			Largemouth Bass	+	X		na	na	na			
			Rock Bass	X			na	na	na			
Allegan/Kalamazoo		Morrow to Allegan Dam	Bluegill/Sunfish	+	X		na	na	na			
			Carp	+	X		+	na	na			
			Channel Catfish	na	X	na	na	na	na	na		
Allegan	Kalamazoo River	d/s Lake Allegan	Largemouth Bass	+	X		na	na	na			
			Black Crappie	na	X	na	na	na	na	na		
			Bluegill	na	X	na	na	na	na	na		
			Brown Trout	na	X	na	na	na	na	na		
			Carp	na	X	na	X	na	na	na		
			Channel Catfish	na	X	na	na	na	na	na		
			Smallmouth Bass	+	X	na	na	na	na	na		
			Northern Pike	na	X	na	na	na	na	na		
			Rainbow Trout	na	X	na	na	na	na	na		
			Rock Bass	na	X	na	na	na	na	na		
			Walleye	na	X	na	na	na	na	na		
			White Sucker	na	X	na	na	na	na	na		
			Yellow Perch	na	X	na	na	na	na	na		

X = primary cause of advisory; + = secondary cause of advisory;
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Appendix B4 (Continued). Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Muskegon	Muskegon Lake		Carp	+	X	+	na	na	na	+	
			Largemouth Bass	+	X	+	na	na	na		
			Northern Pike	X	X		na	na	na		
			Walleye	X	X	+	na	na	na	+	
	Big Blue Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Black Creek		Carp	+	X	+	na	na	na		
			White Sucker	+	X	+	na	na	na		
	Mona Lake		Carp	+	X	X	na	na	na		
			Smallmouth Bass	+	X	+	na	na	na		
			Walleye	+	X	+	na	na	na		
	Ruddiman Creek	Lagoon	Carp	+	X	+	na	na	na		
			Largemouth Bass	+	X		na	na	na		
	White Lake		Carp	+	X	+	na	na	na		
			Largemouth Bass	X	+		na	na	na		
			Northern Pike	X	X		na	na	na		
			Redhorse Sucker	+	X		na	na	na		
Walleye			+	X	+	na	na	na			
Redhorse Sucker			X			na	na	na			
Newaygo/Muskegon	Muskegon River	d/s Croton Dam	Walleye	+	X		na	na	na		
		Hardy to Croton Dams	Walleye	X	+		na	na	na		
			White Sucker	X	X		na	na	na		
		Newaygo	Bills Lake		Largemouth Bass	X	na	na	na	na	na
Diamond Lake			Largemouth Bass	X	na	na	na	na	na	na	
Emerald Lake			Northern Pike	X	na	na	na	na	na	na	
Fremont Lake			Carp	+	X	+	na	na	na		
			Largemouth Bass	X	+		na	na	na		

X = primary cause of advisory; + = secondary cause of advisory;
blank = assessed but would not cause advisory; na = not assessed

Appendix B4 (Continued). Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Newaygo	Hess Lake		Carp	+	X	+	na	na	na		
			Largemouth Bass	X			na	na	na		
	Robinson Lake		Northern Pike	X	na	na	na	na	na	na	
	Sand Lake		Black Crappie	X			na	na	na		
	Sylvan Lake		Largemouth Bass	X	na	na	na	na	na	na	na
			Northern Pike	X	na	na	na	na	na	na	na
	Walkup Lake		Bluegill		na	na	na	na	na	na	na
Crockery Lake		Largemouth Bass	X	na	na	na	na	na	na	na	
Ottawa	Lake Macatawa		Carp	+	X	+	+	na	na		
			Largemouth Bass	X	X		na	na	na		
			Walleye	+	X	+	na	na	na		
	Pigeon River		White Sucker	X			na	na	na		
Gratiot/Montcalm		u/s Alma Dam	Carp	+	X	+	na	na	na		
			Redhorse Sucker	X			na	na	na		
			Smallmouth Bass	X			na	na	na		
Gratiot/Midland	Pine River	d/s Alma dam	Bluegill	+	X	X	na	na	na		
			Carp	+	X	X	na	na	na		
			Channel Catfish	+	X	X	na	na	na		
			Crappie	+	X	X	na	na	na		
			Largemouth Bass	+	X	X	na	na	na		
			Rock Bass	+	X	X	na	na	na		
			White Sucker	+	X	X	na	na	na		

X = primary cause of advisory; + = secondary cause of advisory;
blank = assessed but would not cause advisory; na = not assessed

Appendix B4 (Continued). Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
St. Joseph	Clear Lake		Northern Pike	X	na	na	na	na	na	na	
			Carp	X	+		na	na	na		
	Fawn River		Rock Bass	X	na	na	na	na	na	na	
			Smallmouth Bass	X	+		na	na	na		
			Suckers	X	na	na	na	na	na	na	
			Largemouth Bass	X	+		na	na	na		
	Klinger Lake		Northern Pike	X	na	na	na	na	na	na	
			Brown Bullhead	X	X		na	na	na		
	Long Lake		Largemouth Bass	X	+		na	na	na		
			Largemouth Bass	X			na	na	na		
	Palmer Lake		Largemouth Bass	X			na	na	na		
			Redhorse Sucker	+	X		na	na	na		
	Pigeon River		Rock Bass	X			na	na	na		
			Smallmouth Bass	X	+		na	na	na		
			Largemouth Bass	X	na	na	na	na	na	na	
Prairie River Lake		Northern Pike	X	na	na	na	na	na	na		
		Northern Pike	X	na	na	na	na	na	na		
Sturgeon Lake		Northern Pike	X	na	na	na	na	na	na		
		Brown Bullhead				na	na	na			
Thompson Lake		Largemouth Bass	X			na	na	na			
		Carp	X	X		na	na	na			
Branch		Union Lake	Channel Catfish	+	X		na	na	na		
			Largemouth Bass	X			na	na	na		
			Walleye	X	+		na	na	na		
			Mottville to Union Lake Dam	Carp	X			na	na	na	
Branch/St. Joseph	St. Joseph River	Mottville to Union Lake Dam	Largemouth Bass	X			na	na	na		
		Mottville to Union Lake Dam	Walleye	X	X		na	na	na		
Berrien/Cass/St. Joseph		Berrien Springs to Mottville D	Carp	+	X		na	na	na		
		Berrien Springs to Mottville D	Largemouth Bass	X	X		na	na	na		
Berrien		d/s Berrien Springs Dam	Carp	+	X	+	na	na	na	+	
		d/s Berrien Springs Dam	Smallmouth Bass	+	X	+	na	na	na		
		d/s Berrien Springs Dam	Walleye	+	X		na	na	na		

X = primary cause of advisory; + = secondary cause of advisory;
blank = assessed but would not cause advisory; na = not assessed

Appendix B4 (Continued). Summary of contaminants causing fish consumption advisories in southwest Michigan water bodies.

Southwest Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Barry/Eaton	Thornapple River	u/s Irving Dam	Largemouth Bass	X			na	na	na		
Barry		u/s Middleville Dam	White Sucker	X			na	na	na		
Kent/Barry/Eaton		u/s Ada dam	Carp	X	X		na	na	na		
Kent/Barry		Ada to Middleville Dam	Smallmouth Bass	X			na	na	na		
Van Buren	Black River		Carp	+	X	+	na	na	na		
			White Sucker	X	X		na	na	na		
	Big Crooked Lake		Largemouth Bass	X			na	na			
	Paw Paw River	Maple Lake		Carp	+	X		na	na	na	
				Largemouth Bass	X	na	na	na	na	na	na
		Rush Lake		Northern Pike	X	na	na	na	na	na	
	Van Auken Lake		Northern Pike	X	na	na	na	na	na		

Summary of Basis for Fish Consumption Advice								
	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Number of Sample Sets Analyzed	219	181	162	5	0	1	164	
Primary Cause	151	102	11	3	--	0	0	
as % of Sets Analyzed	68.9%	56.4%	6.8%	60.0%	--	0.0%	0.0%	
Secondary Cause	61	28	31	2	--	0	3	
as % of Sets Analyzed	27.9%	15.5%	19.1%	40.0%	--	0.0%	1.0%	
Not a Cause	7	51	120	0	--	1	161	

X = primary cause of advisory; + = secondary cause of advisory;
 blank = assessed but would not cause advisory; na = not assessed

Appendix B5. Summary of contaminants causing fish consumption advisories in southeast lower Michigan water bodies.

Southeast Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Bay	Kawkawlin River		Carp	+	X	+	na	na	na		
			Northern Pike	+	X	+	na	na	na		
	Tobico Marsh		Carp		X		na	na	na		
			Largemouth Bass	X			na	na	na		
			Northern Pike	X			na	na	na		
Genesee	Flint River	d/s Flint	Carp	+	X	+	na	na	na		
			Smallmouth Bass	+	X		na	na	na		
			Black Crappie	X			na	na	na		
	Holloway Reservoir		Channel Catfish	X	+		na	na	na		
			Largemouth Bass	X	+		na	na	na		
	Mott Reservoir		Carp	+	X		na	na	na		
	Kearsley Creek	Kearsley Reservoir		Carp	+	X	+	na	na	na	
				Largemouth Bass	X	+		na	na	na	
	Lake Fenton		Largemouth Bass	X	+		na	na	na		
			Northern Pike	X	+		na	na	na		
	Lake Ponemah		Carp	+	X	+	na	na	na		
			Largemouth Bass	X	+		na	na	na		
			Carp		X	+	na	na	na		
	Lobdell Lake		Largemouth Bass	X	+		na	na	na		
			Walleye	X	+		na	na	na		
Thread Creek		Carp	+	X	+	na	na	na			
Huron	Sebawaing River		Carp	+	X	+	na	na	na		
			Northern Pike	+	X		na	na	na		
Lapeer	Lake Nepessing		Carp	+	X	+	na	na	na		
			Largemouth Bass	X	+		na	na	na		

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Appendix B5 (Continued). Summary of contaminants causing fish consumption advisories in southeast lower Michigan water bodies.

Southeast Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Lenawee	Adrian Lake		Carp	X			na	na	na		
	Black Creek		Carp	+	X	+	na	na	na		
	Lake Hudson		Carp	X			na	na	na		
			Largemouth Bass	X			na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
	River Raisin	South Branch	Carp	+	X	+	na	na	na		
	Sand Lake		Walleye	X	+		na	na	na		
	Wamplers Lake		Black Crappie	X			na	na	na		
Largemouth Bass			X	na	na	na	na	na	na		
Livingston	Baseline Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Bishop Lake		Largemouth Bass	X	na	na	na	na	na	na	
			Northern Pike	X	+		na	na	na		
	Chenango Lake		Largemouth Bass	X			na	na	na		
			Yellow Bullhead	X			na	na	na		
	Hoisington Lake		Carp	X	X		na	na	na		
			Largemouth Bass	X	na	na	na	na	na	na	
	Portage Lake		Carp	+	X	+	na	na	na		
			Walleye	X	+		na	na	na		
			Bluegill	X	na	na	na	na	na	na	
	Mann Creek	Sloan Lake	Northern Pike	X	na	na	na	na	na	na	
			Black Crappie	+	X		na	na	na		
	Thompson Lake		Carp	+	X	+	na	na	na		
			Northern Pike	+	X		na	na	na		
	Whitmore Lake		Carp		X	+	na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
Woodland Lake		Carp		X		na	na	na			
		Largemouth Bass	X	+		na	na	na			

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 blank = assessed but would not cause advisory; na = not assessed

Appendix B5 (Continued). Summary of contaminants causing fish consumption advisories in southeast lower Michigan water bodies.

Southeast Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Clinton/Gratiot/Shiawassee	Maple River	u/s Matherton	Carp	X	+		na	na	na		
Isabella/Midland	Chippewa River		Carp	X	+	+	na	na	na		
			Sucker	X	X	X	na	na	na		
Macomb	Clear Spring Lake		Largemouth Bass	X	X		na	na	na		
	Clinton River	d/s Yates Dam	Carp	+	X	+	na	na	na		
			Rock Bass	X	+		na	na	na		
			White Sucker	X	X		na	na	na		
	Stony Creek	Stony Creek Lake	Black Crappie	X	+		na	na	na		
			Northern Pike	X			na	na	na		
Walleye			X	+		na	na	na			
Midland	Tittabawassee River	Sanford Lake	Black Crappie	X			na	na	na		
			Channel Catfish	X	+		na	na	na		
			Northern Pike	X	+		na	na	na		
			Rock Bass	X			na	na	na		
			Walleye	X	+		na	na	na		
Midland/Saginaw	Tittabawassee River	d/s Midland	Black Crappie	na	X		na	na	na		
			Smallmouth Bass	+	X	+	X	na	na		
			White Sucker	+	X	+	na	na	na		
Monroe	Ottawa River		Largemouth Bass	+	X		na	na	na		
	River Raisin		Smallmouth Bass	+	X		na	na	na		
Gratiot/Saginaw	Bad River		Carp	+	X		na	na	na		
			Channel Catfish	+	X		na	na	na		
			Northern Pike	X	X		na	na	na		

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Appendix B5 (Continued). Summary of contaminants causing fish consumption advisories in southeast lower Michigan water bodies.

Southeast Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Oakland	Shiawassee River		Rock Bass	X	+		na	na	na		
			Carp	+	X	+	na	na	na		
Livingston/Shiawassee	Shiawassee River	South Branch	Rock Bass	+	X		na	na	na		
			White Sucker	+	X		na	na	na		
			Carp	+	X		na	na	na		
			Northern Pike	+	X		na	na	na		
Shiawassee	Shiawassee River	Byron to Owosso	Redhorse Sucker	+	X		na	na	na		
			Rock Bass	na	X		na	na	na		
			Smallmouth Bass	+	X		na	na	na		
			Carp	+	X	+	na	na	na		
Shiawassee/Saginaw	Shiawassee River	d/s Owosso	Rock Bass	X			na	na	na		
			Smallmouth Bass	X			na	na	na		
	Big Seven Lake		Largemouth Bass	X	na	na	na	na	na	na	
	Cass Lake		Walleye	X	X	+	na	na	na		
	Crotched Lake		Carp	+	X		na	na	na		
	Heron Lake		Largemouth Bass	X			na	na	na		
			Black Crappie	+	X		na	na	na		
	Kent Lake		Carp	+	X	+	na	na	na		
			Largemouth Bass	+	X	+	na	na	na		
			Walleye	+	X	+	na	na	na		
Oakland	Lake Orion		Carp		X	+	na	na	na		
			Largemouth Bass	X			na	na	na		
	Lakeville Lake		Carp		X	+	na	na	na		
			Largemouth Bass	X			na	na	na		
	Loon Lake		Carp	+	X	+	na	na	na		
			Largemouth Bass	X	+		na	na	na		
	Lower Trout Lake		Largemouth Bass	X			na	na	na		
	Maceday Lake		Northern Pike	X	+	+	na	na	na		
	Middle Straits Lake		Northern Pike	X	na	na	na	na	na	na	

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Appendix B5 (Continued). Summary of contaminants causing fish consumption advisories in southeast lower Michigan water bodies.

Southeast Lower Peninsula												
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene		
Oakland	Orchard Lake		Largemouth Bass	X	+	+	na	na	na			
			Northern Pike	X	+	+	na	na	na			
	Osmun Lake		Carp	+	X	+	na	na	na			
			Largemouth Bass	X	X		na	na	na			
	Paint Creek			White Sucker	X			na	na	na		
	Pontiac Lake			Channel Catfish	+	X	+	na	na	na		
	Proud Lake		Carp	X	+		na	na	na	na		
			Largemouth Bass	X	na	na	na	na	na	na	na	
	Sylvan/Otter Lake		Carp	+	X	+	na	na	na	na	na	
			Largemouth Bass	X	na	na	na	na	na	na	na	
	Terry Lake			Carp	+	X	+	na	na	na		
				Largemouth Bass	X	X		na	na	na		
	Union Lake			Largemouth Bass	X	+		na	na	na		
	Walled Lake			Carp	+	X	+	na	na	na		
	White Lake			Rock Bass	X			na	na	na		
Walleye				X	+		na	na	na			
Saginaw	Cass River		Carp	+	X	+	X	na	na			
			Channel Catfish	+	+		X	na	na			
	Cheboyganing Creek			Carp	+	X		na	na	na		
			Northern Pike	na	X	na	na	na	na	na		
Sanilac	Black River	Croswell Imp.	Carp	X			na	na	na			
St. Clair	Pine River		Carp	+	X		na	na	na			

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Appendix B5 (Continued). Summary of contaminants causing fish consumption advisories in southeast lower Michigan water bodies.

Southeast Lower Peninsula											
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Tuscola	Cass River	u/s Caro Dam	Carp	X	X		na	na	na		
			Largemouth Bass	X	na	na	na	na	na	na	
			Northern Pike	X	na	na	na	na	na	na	
			Redhorse Sucker	X			na	na	na		
	Murphy Lake	u/s Frankenmuth	Rock Bass	X	+		na	na	na		
			Northern Pike	X	na	na	na	na	na	na	
			Carp	+	X	+	na	na	na		
Washtenaw	Huron River	Barton Pond	Smallmouth Bass	X	+	+	na	na	na		
		Geddes Pond	Carp	+	X	+	na	na	na		
			Black Crappie	+	X		na	na	na		
	Ford Lake	Carp	+	X	+	na	na	na			
		Channel Catfish	+	X	+	na	na	na			
		Walleye	+	X	+	na	na	na			
		White Sucker	na	X	+	na	na	na			
Wayne	Huron River	Belleville Lake	Carp	+	X	+	na	na	na		
			Channel Catfish	+	X	+	na	na	na		
			Gizzard Shad		X	+	na	na	na		
			Walleye	+	X		na	na	na		
			White Sucker	+	X	+	na	na	na		
Washtenaw	First Sister Lake		Brown Bullhead	X	+	+	na	na	na		
	Four Mile Lake		Northern Pike	X	na	na	na	na	na	na	
	Saline River	Saline Pond	Bluegill	X	na	na	na	na		na	
			Largemouth Bass	X			na	na			
	Second Sister Lake		Brown Bullhead	X	+		na	na	na		
			Largemouth Bass	X			na	na	na		
	South Lake		Northern Pike	X	na	na	na	na	na	na	
			Rock Bass	X	na	na	na	na	na	na	
Unnamed Lake			Largemouth Bass	X	na	na	na	na	na	na	

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Appendix B5 (Continued). Summary of contaminants causing fish consumption advisories in southeast lower Michigan water bodies.

Southeast Lower Peninsula												
County	Water Body	Location	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene		
Wayne	Rouge River	Ford Dam to mouth	Carp	+	X	+	na	na	na			
			Carp	+	X	+	na	na	na			
		Nankin to Newburgh Dam	Northern Pike	+	X	+	na	na	na			
			Rock Bass	X	X		na	na	na			
	Middle Rouge River	Newburgh Lake	White Sucker	+	X		na	na	na			
			Carp	+	X	+	na	na	na			
			Channel Catfish	+	X	+	na	na	na			
			Largemouth Bass	+	X	+	na	na	na			
		Phoenix Lake	Northern Pike	+	X	+	na	na	na			
			White Sucker	+	X	+	na	na	na			
			Bluegill	X	+		na	na	na			
			Carp	+	X	+	na	na	na			
	Wayne/Oakland	Rouge River	Upper & Main Branches	Northern Pike	+	X	+	na	na	na		
				White Sucker	+	X	+	na	na	na		
White Sucker				+	X	+	na	na	na			

Summary of Basis for Fish Consumption Advice								
	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene	
Number of Sample Sets Analyzed	167	151	150	4	0	3	150	
Primary Cause	89	91	1	3	--	0	0	
as % of Sets Analyzed	53.3%	60.3%	0.7%	75.0%	--	0.0%	0.0%	
Secondary Cause	70	35	61	0	--	0	0	
as % of Sets Analyzed	41.9%	23.2%	40.7%	0.0%	--	0.0%	0.0%	
Not a Cause	8	25	88	1	--	3	150	

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Appendix C. Summary of contaminants causing fish consumption advisories in Michigan waters of the Great Lakes and connecting channels.

Water Body	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene
Lake Superior	Brown Trout	+	X		na	na	na	
	Burbot	+	X	+	na	na	na	
	Chinook Salmon	+	X	+	na	na	na	+
	Coho Salmon	+	X		na	na	na	+
	Lake Herring	X	+		na	na	na	
	Lake Trout	+	X	+	na	na	na	+
	Lake Whitefish	+	X		X	na	na	+
	Suckers	+	+		na	na	na	X
	Rainbow Trout	+	X		na	na	na	
	Siscowet	+	X	+	+	na	na	X
	Walleye	X	+		na	na	na	
Yellow Perch	X			na	na	na		
St. Marys River	Carp	+	X	+	na	na	na	+
	Northern Pike**	X	na	na	na	na	na	na
	Pumpkinseed	X			na	na	na	
	Rock Bass	X			na	na	na	
	Smallmouth Bass	X			na	na	na	
	Suckers	X	+		na	na	na	
	Walleye	X	+		na		na	
	Yellow Perch	X			na	na	na	
** - insufficient number of legal size fish								
Lake Michigan	Brown Trout	+	X	+	+	na	na	+
	Burbot	+	X		na	na	na	
	Carp	+	X	+	X	na	na	
	Chinook Salmon	+	X		na	na	na	
	Coho Salmon	+	X		na	na	na	
	Lake Trout	+	+	+	X	na	na	
	Lake Whitefish		X	+	X	na	na	+
	Northern Pike	X			na	na	na	
	Rock Bass	X			na	na	na	
	Smallmouth Bass	X	X		na	na	na	
	Suckers	+	X		na	na	na	
	Rainbow Smelt		X		na	na	na	
	Rainbow Trout	+	X	+	na	na	na	
Walleye	+	X	+	na	+	na	+	

X = primary cause of advisory; + = secondary cause of advisory;
blank = assessed but would not cause advisory; na = not assessed

Appendix C (Continued). Summary of contaminants causing fish consumption advisories in Michigan waters of the Great Lakes and connecting channels.

Water Body	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene
Lake Huron (incl. Saginaw Bay)	Brown Trout	+	X	+	na	na	na	
	Carp	+	X	+	X	na	na	+
	Channel Catfish	+	+		X	na	na	+
	Chinook Salmon	+	X		na	na	na	
	Coho Salmon	+	X		na	na	na	
	Freshwater Drum	X	+		na	na	na	
	Lake Trout	+	X	+	X	na	na	
	Lake Whitefish	+	+		X	na	na	
	Northern Pike	+	X		na	na	na	
	Pumpkinseed	X			na	na	na	
	Rainbow Smelt		X		na	na	na	+
	Rainbow Trout	+	X		na	+	na	
	Rock Bass	X			na	na	na	
	Smallmouth Bass	X			na	na	na	
	Walleye	+	X		X	+	na	
	White Bass	+	X		X	na	na	+
	White Perch	+	X		na	na	na	
	White Sucker		X		na	na	na	
Yellow Perch	+	+		X	na	na		
St. Clair River	Carp	+	X	+	na	na	na	
	Freshwater Drum	X	X		na	na	na	
	Rock Bass	X			na	na	na	
	Smallmouth Bass	X	+		na	na	na	
	Yellow Perch	X			na	na	na	
Lake St. Clair (Incl. 10-Mile canals)	Black Crappie	X	X		na	na	na	
	Bluegill/Pumpkinseed		X		na	na	na	
	Carp	+	X	+	+	na	na	
	Channel Catfish	+	+		X	na	na	
	Freshwater Drum	X	X		na	na	na	
	Largemouth Bass	X	X		na	na	na	
	Muskellunge	X	+	+	na	na	na	
	Northern Pike	X	+		na	na	na	
	Rock Bass	+	X	+	na	na	na	
	White Bass	+	X	+	na	na	na	+
Yellow Perch	X	X		na	na	na		

X = primary cause of advisory; + = secondary cause of advisory;
blank = assessed but would not cause advisory; na = not assessed

Appendix C (Continued). Summary of contaminants causing fish consumption advisories in Michigan waters of the Great Lakes and connecting channels.

Water Body	Species	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene
Detroit River	Bullhead	+	X		na	na	na	
	Carp	+	X	+	X	na	na	
	Channel Catfish	+	X		X	na	na	
	Freshwater Drum	+	X		na	na	na	
	Largemouth Bass	+	X		na	na	na	
	Northern Pike	X	+		X	na	na	
	Redhorse Sucker	+	X		na	na	na	
	Rock Bass	X	X		na	na	na	
	Walleye	+	X		X	na	na	
	White Bass	+	X		X	na	na	
	Yellow Perch	+	X		na	na	na	
Lake Erie	Carp	+	X	+	X	na	na	
	Channel Catfish	+	X		X	na	na	+
	Chinook Salmon	+	X	+	na	na	na	+
	Freshwater Drum	+	X		na	na	na	
	Lake Whitefish		X	+	+	na	na	
	Largemouth Bass	+	X		na	na	na	
	Rainbow Trout	+	X	+	na	na	na	
	Walleye	+	X		X	+	na	
	White Bass	+	X		na	na	na	
	White Perch	+	X		na	na	na	
	Yellow Perch	+	X		na	na	na	
All GL& CC	Lake Sturgeon	+	X	+	na	na	na	+

Basis for Fish Consumption Advice

	Mercury	PCB	DDT	Dioxin	PFOS	Se	Toxaphene
Number of Sample Sets Analyzed	92	91	91	24	5	0	91
Primary Cause	29	64	0	20	0	0	2
as % of Sets Analyzed	31.5%	70.3%	0.0%	83.3%	0	-	2.2%
Secondary Cause	57	15	25	4	4	0	16
as % of Sets Analyzed	62.0%	16.5%	27.5%	16.7%	80%	-	17.6%
Not a Cause	6	12	66	0	1	0	75

X = primary cause of advisory; + = secondary cause of advisory;
blank = assessed but would not cause advisory; na = not assessed

Appendix D1. Eat Safe Fish guidance, 2015 update recommendations, Upper Peninsula.

Walleye

Stager Lake

Iron County

Hg Analysis:

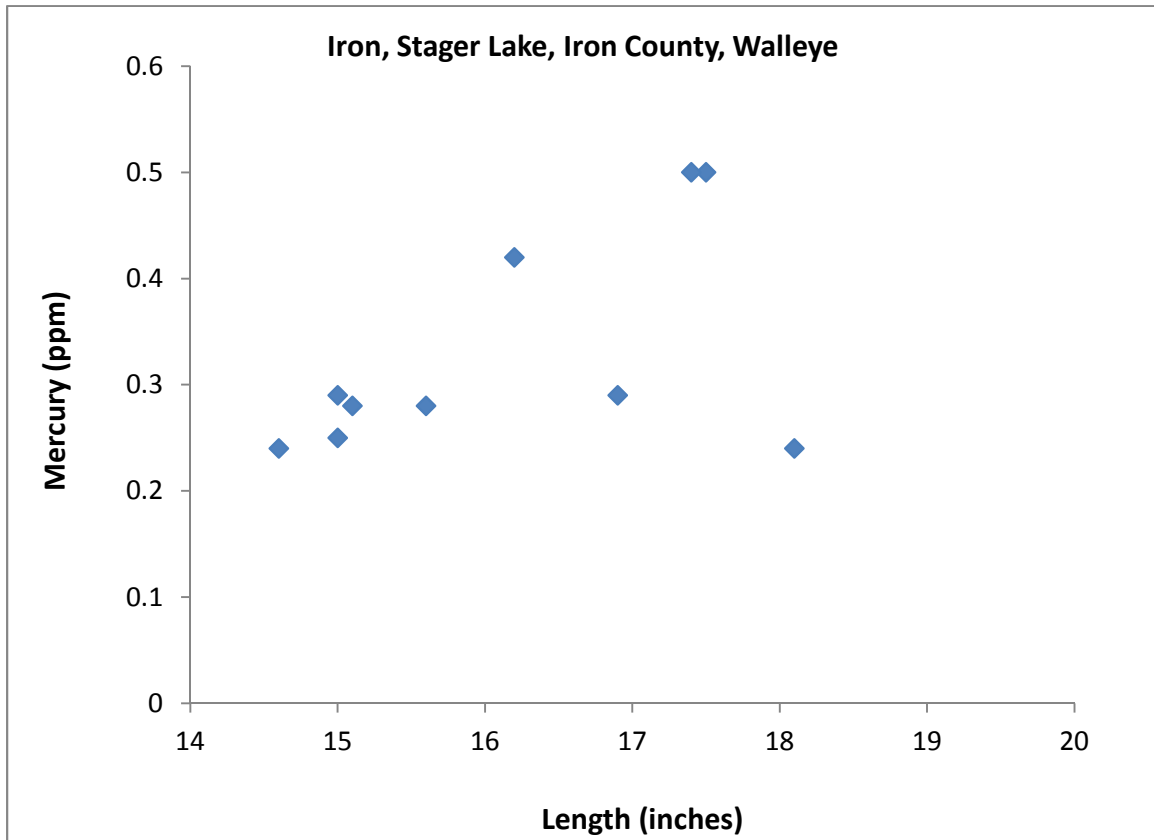
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	14.6	15	14.6	18.1
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.33	0.24	0.50	0.40	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.261	0.238				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Current Advice: Stager Lake walleye are covered by the statewide mercury advisory.

Recommendation: No one should eat more than 2 meals per month of walleye smaller than 20 inches or more than 1 meal per month of walleye larger than 20 inches due to mercury. The statewide length break was applied as the size range of fish was limited.



Appendix D1. Eat Safe Fish guidance, 2015 update recommendations, Upper Peninsula.

Walleye

**Dead River
Hoist Basin**

Marquette County

Hg Analysis:

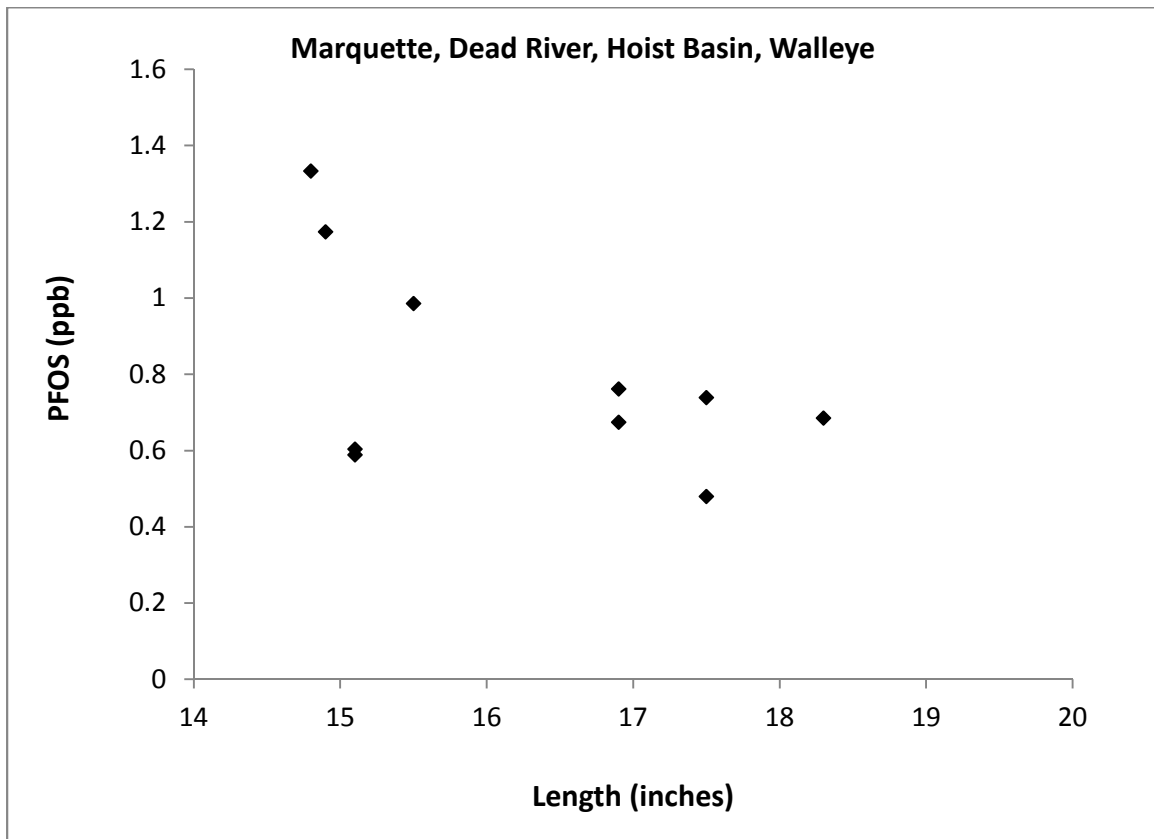
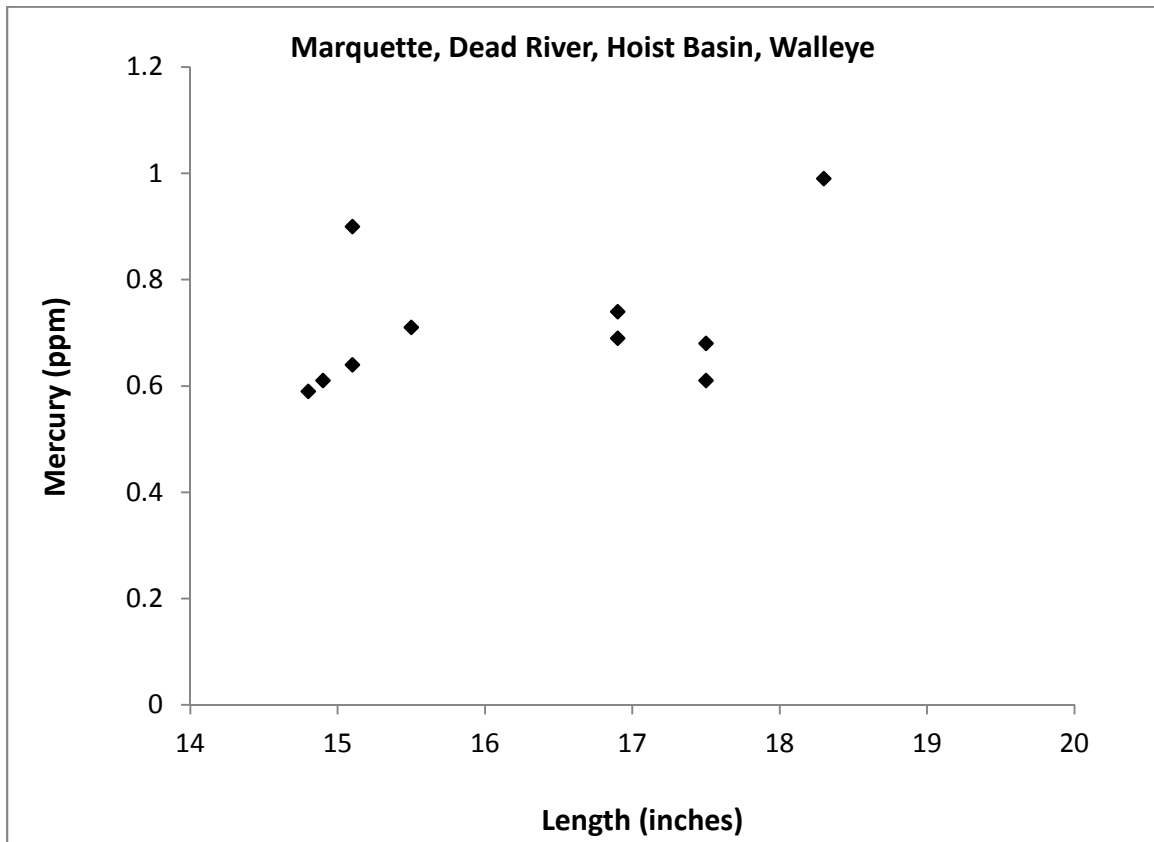
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	14.8	15	14.8	18.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.72	0.59	0.99	0.81	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.146	0.146				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	14.8	15	14.8	18.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	10	0.80 ppb	0.48 ppb	1.33 ppb	1.0 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.300	0.264	Final meal category based on UCL:			1

Current Advice: Hoist Basin walleye are covered under the MDCH statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per year of Hoist Basin walleye less than 20 inches or 6 meals per year of those fish over 20 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.



Carp

**Menominee River
Lower Scott Flowage (Impoundment)**

Menominee County

Hg Analysis:

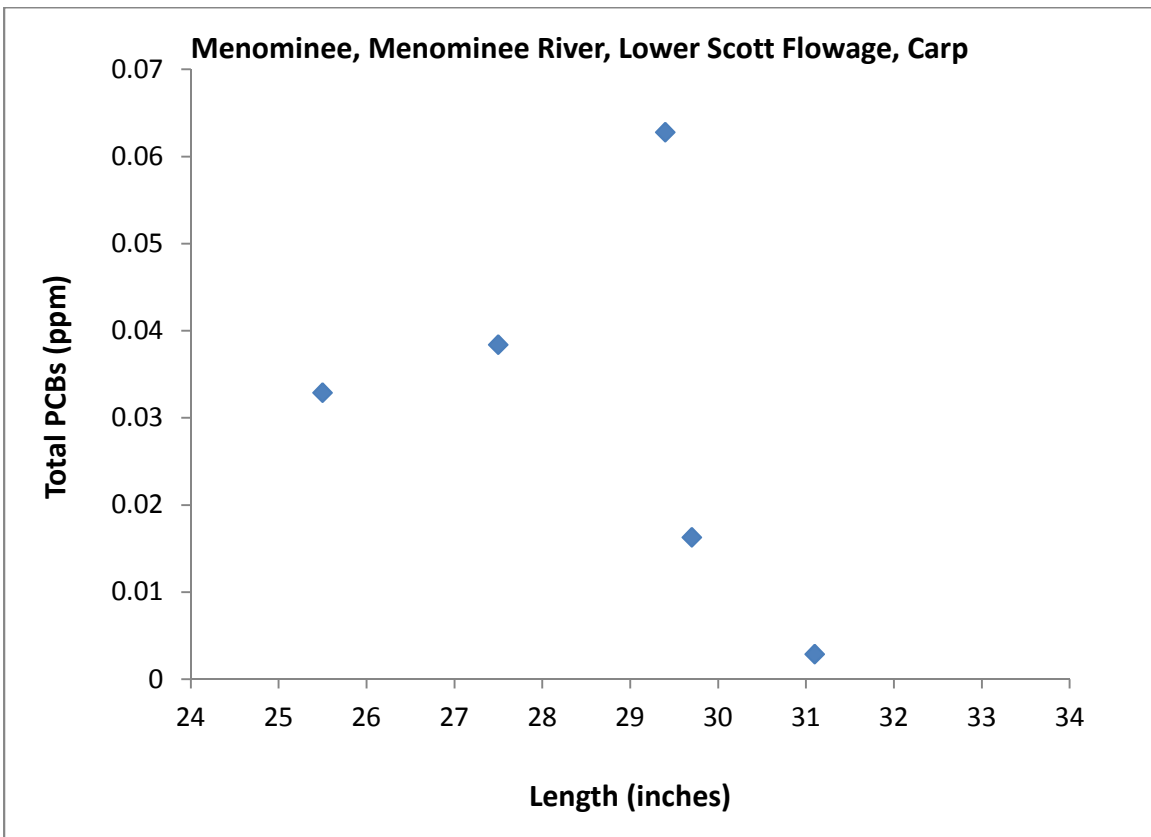
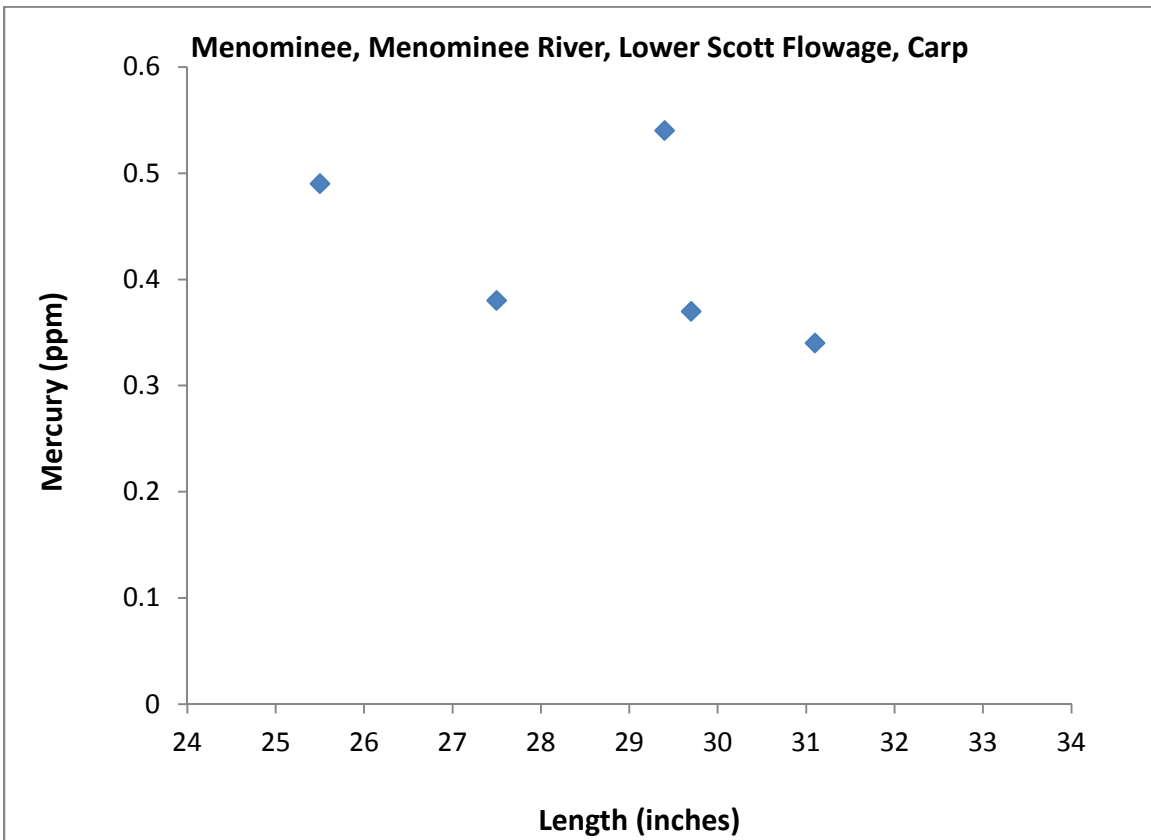
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	5	25.5	na	25.5	31.1
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.42	0.34	0.54	0.53	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.197	0.233				

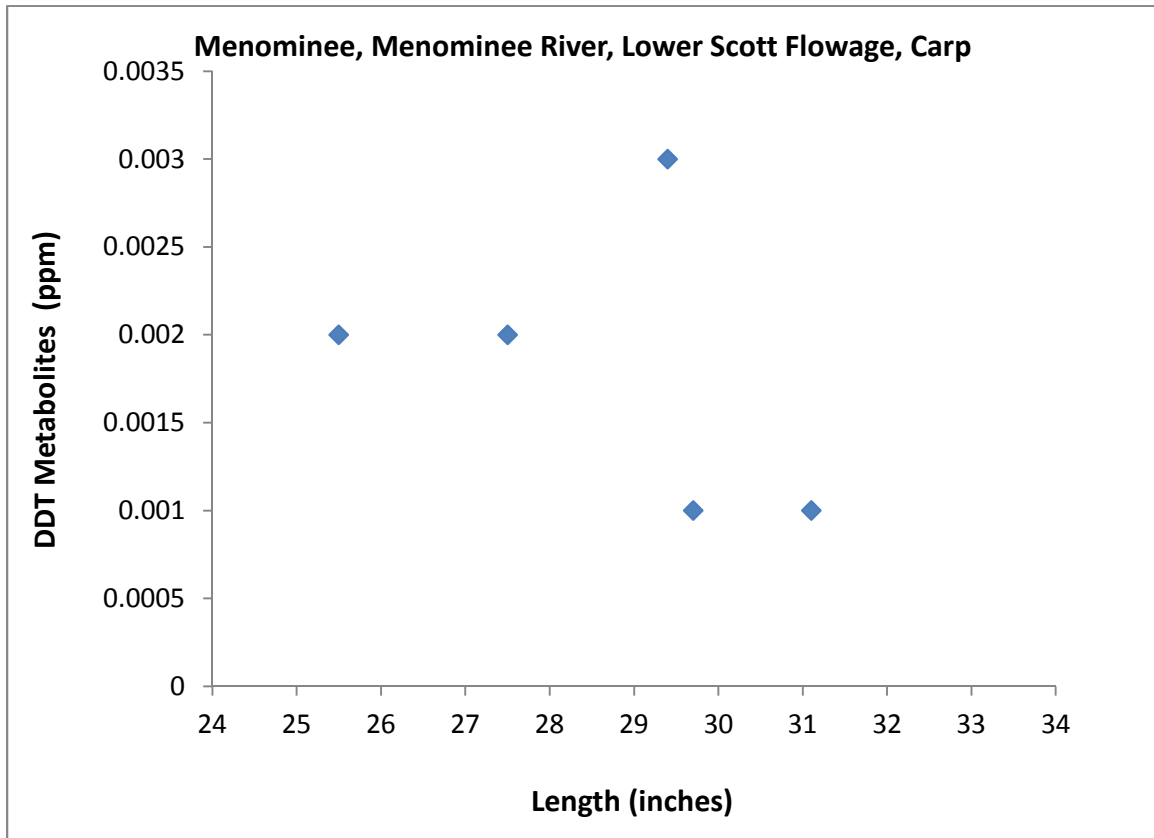
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	5	25.5	na	25.5	31.1
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.03	0.003	0.06	0.06	2
DDT	5	0.002	0.001	0.003	0.003	16
Chlordane	5	ND	--	--	--	--
Toxaphene	5	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.143	0.377				
DDT	0.144	0.258				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing MDCH Advisory: Carp from the Lower Scott Flowage are covered by the statewide advisory.

Recommendation: No one should eat more than 2 meals per month of carp from the Lower Scott Flowage (Menominee River between Menominee Dam and Upper Scott Dam) due to elevated concentrations of PCBs and mercury.





Redhorse Sucker

**Menominee River
Lower Scott Flowage (Impoundment)**

Menominee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	5	19.4	na	19.4	20.9
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.77	0.27	1.10	1.17	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.964	0.907				

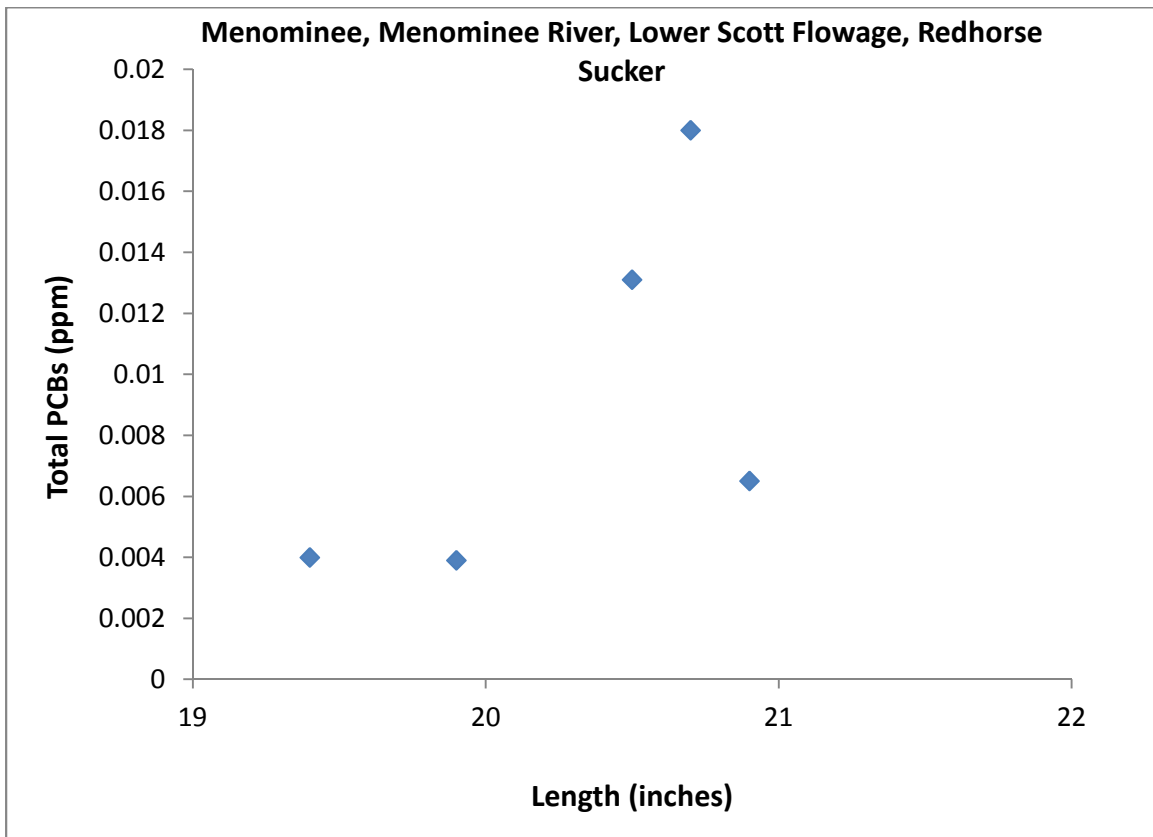
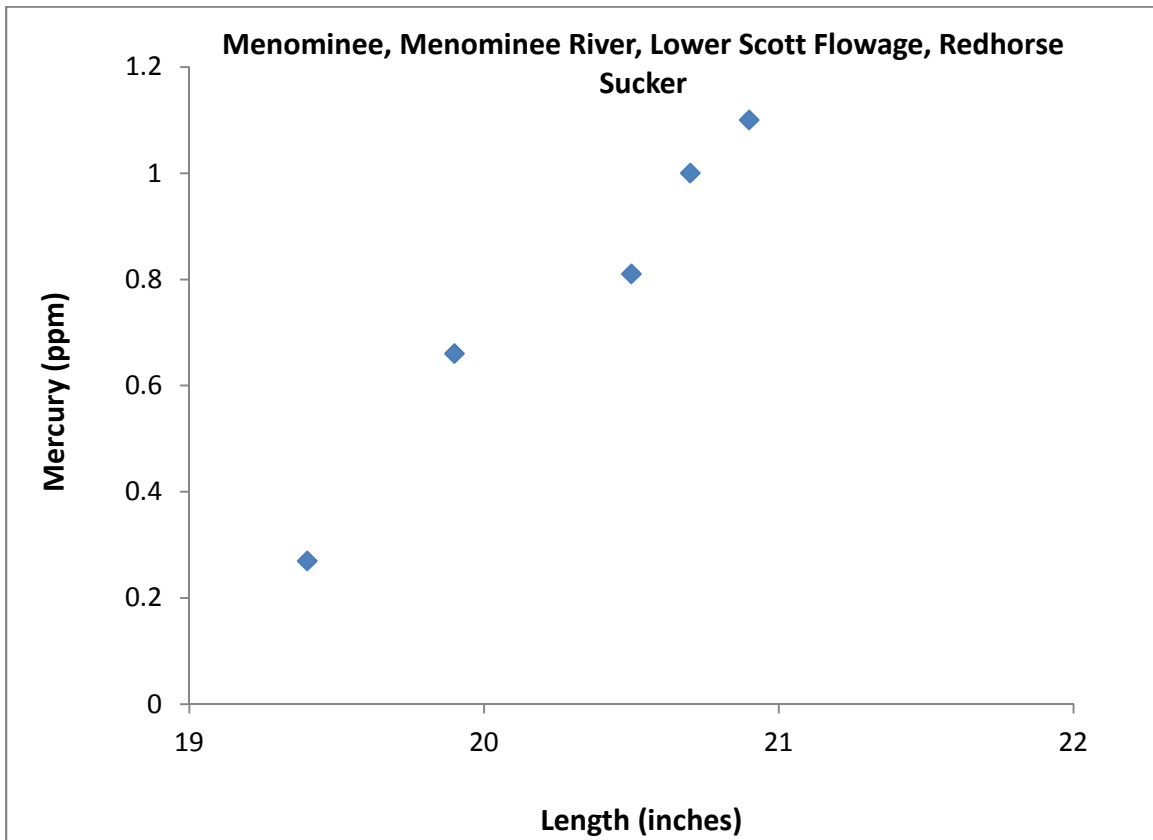
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	5	19.4	na	19.4	20.9
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.009	0.004	0.02	0.02	12
DDT	5	ND	--	--	--	--
Chlordane	5	ND	--	--	--	--
Toxaphene	5	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.379	0.493				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

Existing MDCH Advisory: Specific guidelines for Lower Scott Flowage sucker were not developed since data were not available previously.

Recommendation: No one should eat more than 6 meals per year of sucker from the Lower Scott Flowage (Menominee River between Menominee Dam and Upper Scott Dam) due to elevated concentrations of mercury. PCBs would cause an advisory.

NOTE: very limited size range



Rock Bass

**Menominee River
Lower Scott Flowage (Impoundment)**

Menominee County

Hg Analysis:

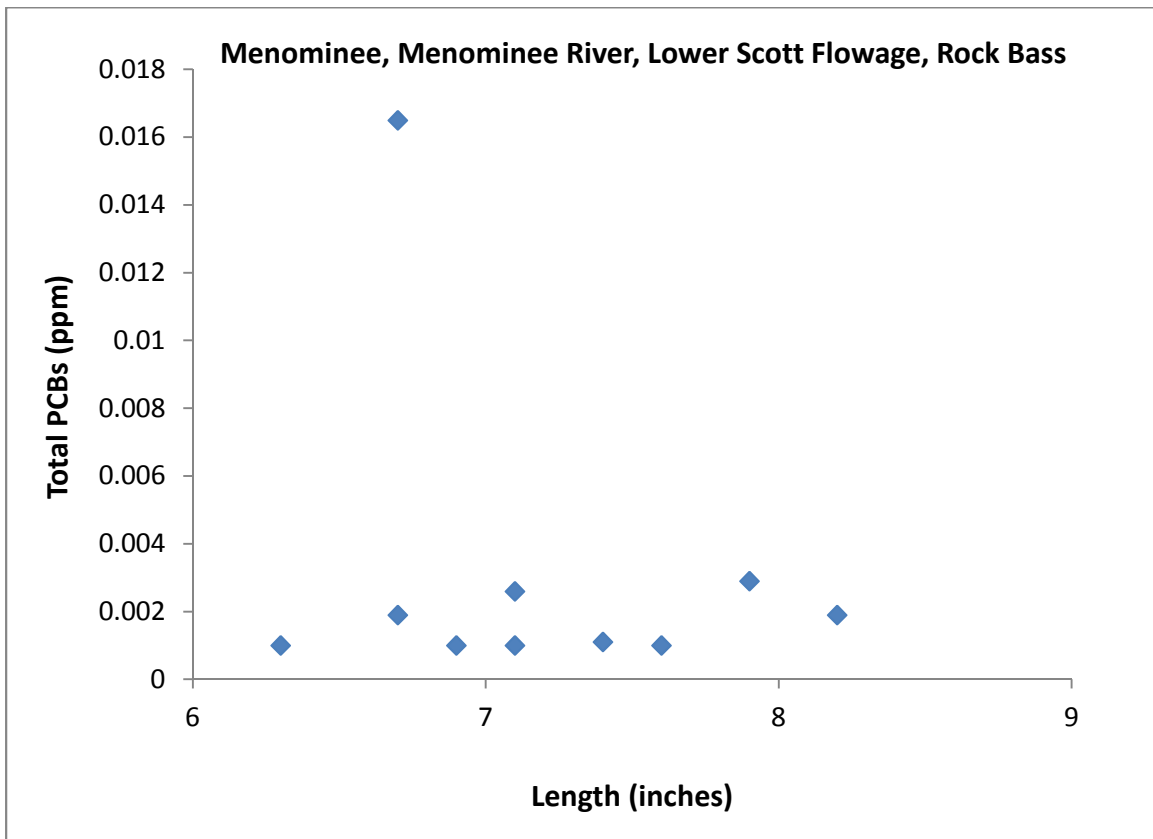
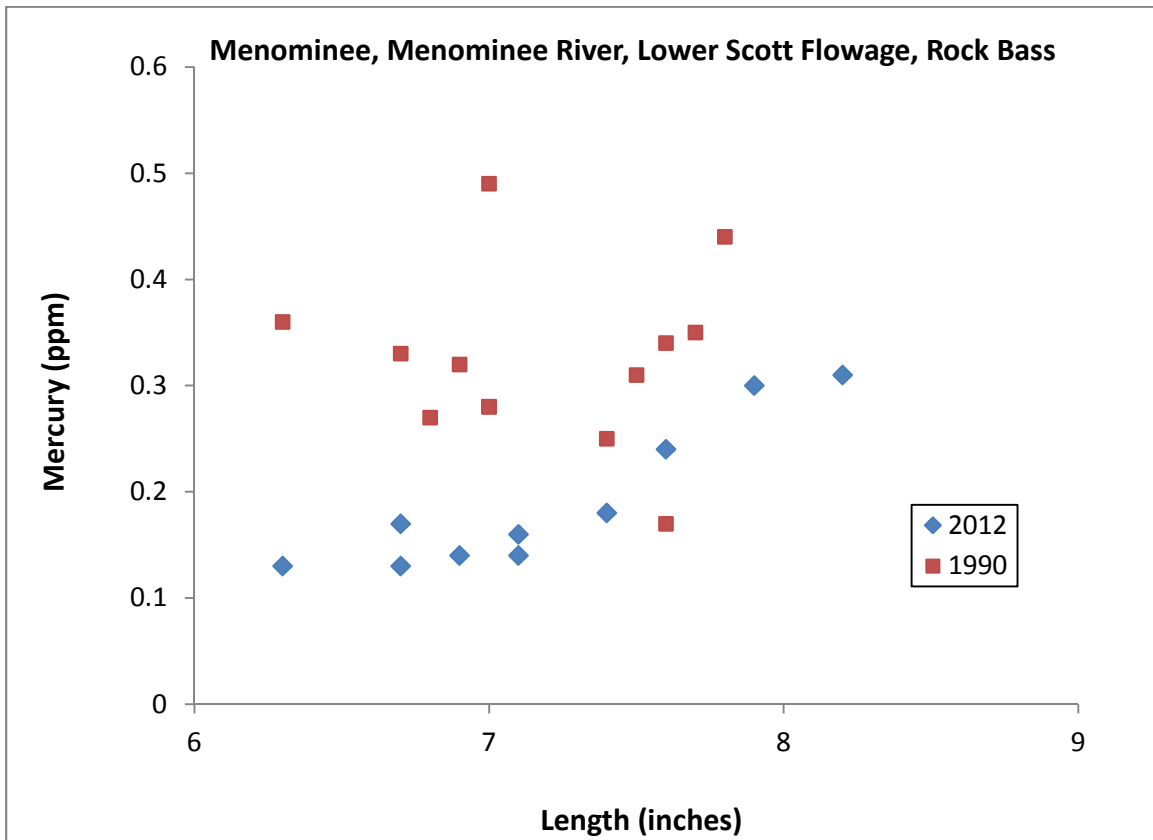
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	2012	23	6.3	na	6.3	8.2
Datasets available: 1990, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	23	0.26	0.13	0.49	0.31	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.074	0.103				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.3	na	6.3	8.2
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.003	0.001	0.02	0.01	16
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.055	0.006				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing MDCH Advisory: No one should eat more than 2 meals per month of rock bass from the Lower Scott Flowage (Menominee River between Menominee Dam and Upper Scott Dam) due to mercury.

Recommendation: No change.



Smallmouth Bass

**Menominee River
Lower Scott Flowage (Impoundment)**

Menominee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	1	15.8	na	15.8	15.8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	0.42	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	1	15.8	na	15.8	15.8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1	0.001	--	--	--	--
DDT	1	ND	--	--	--	--
Chlordane	1	ND	--	--	--	--
Toxaphene	1	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing MDCH Advisory: Lower Scott Flowage smallmouth bass are covered by the statewide mercury advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide advice due to mercury applies to largemouth and smallmouth bass from the Lower Scott Flowage (Menominee River between Menominee Dam and Upper Scott Dam): No one should eat more than 2 meals per month of legal size largemouth or smallmouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches.

Black Crappie

**Menominee River
Downstream of Lower Scott Dam**

Menominee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	7.7	na	7.7	13.6
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.14	0.09	0.27	0.19	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.808	0.842				

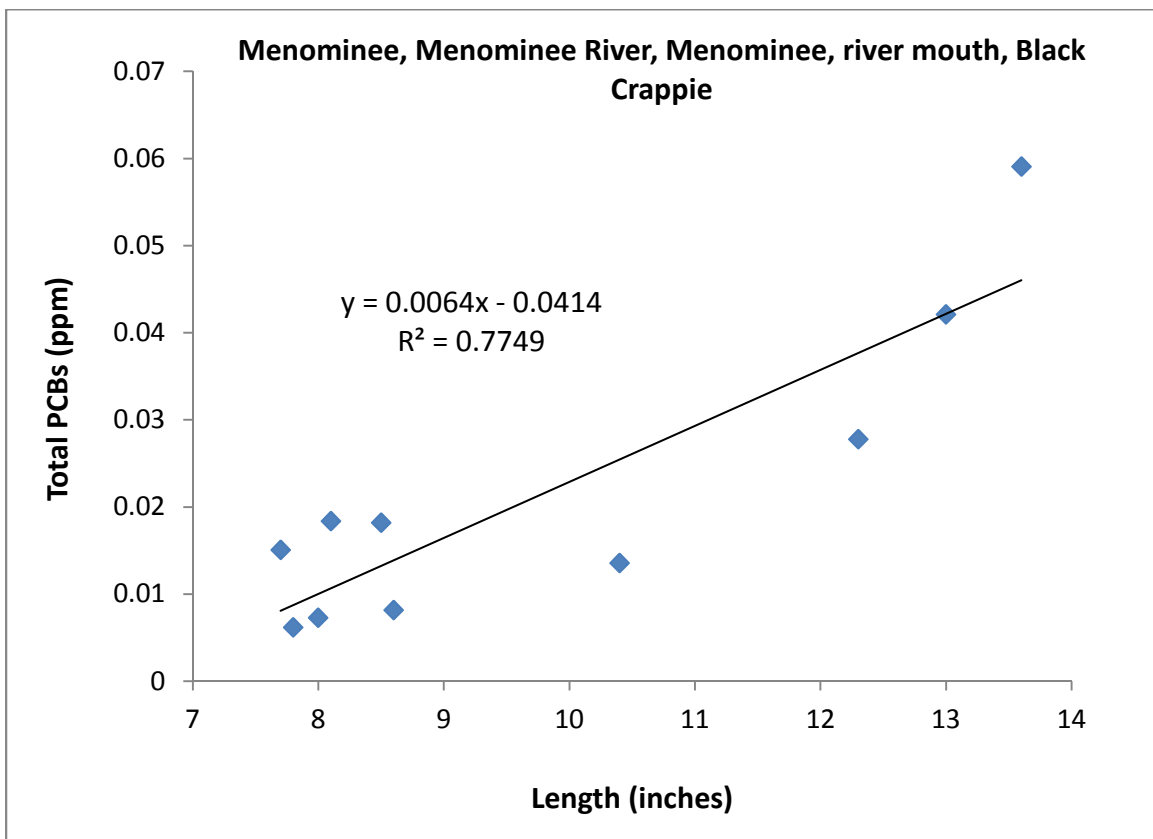
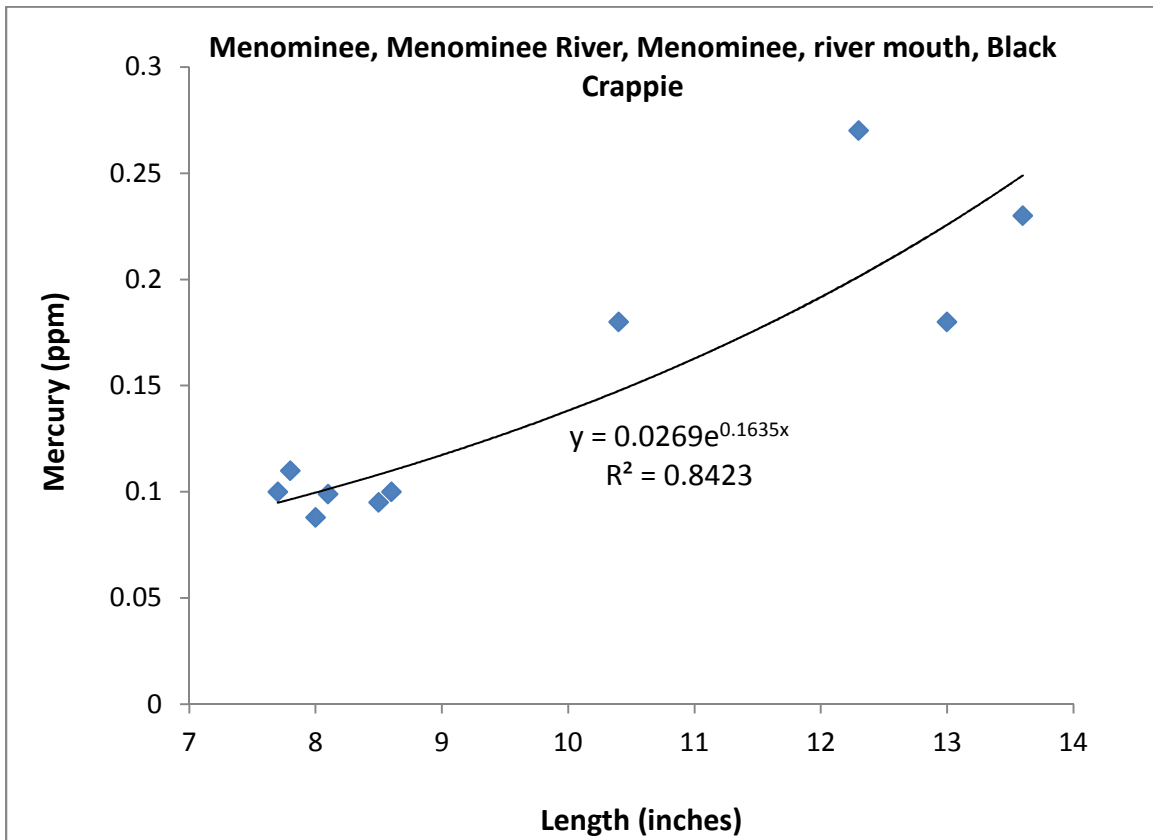
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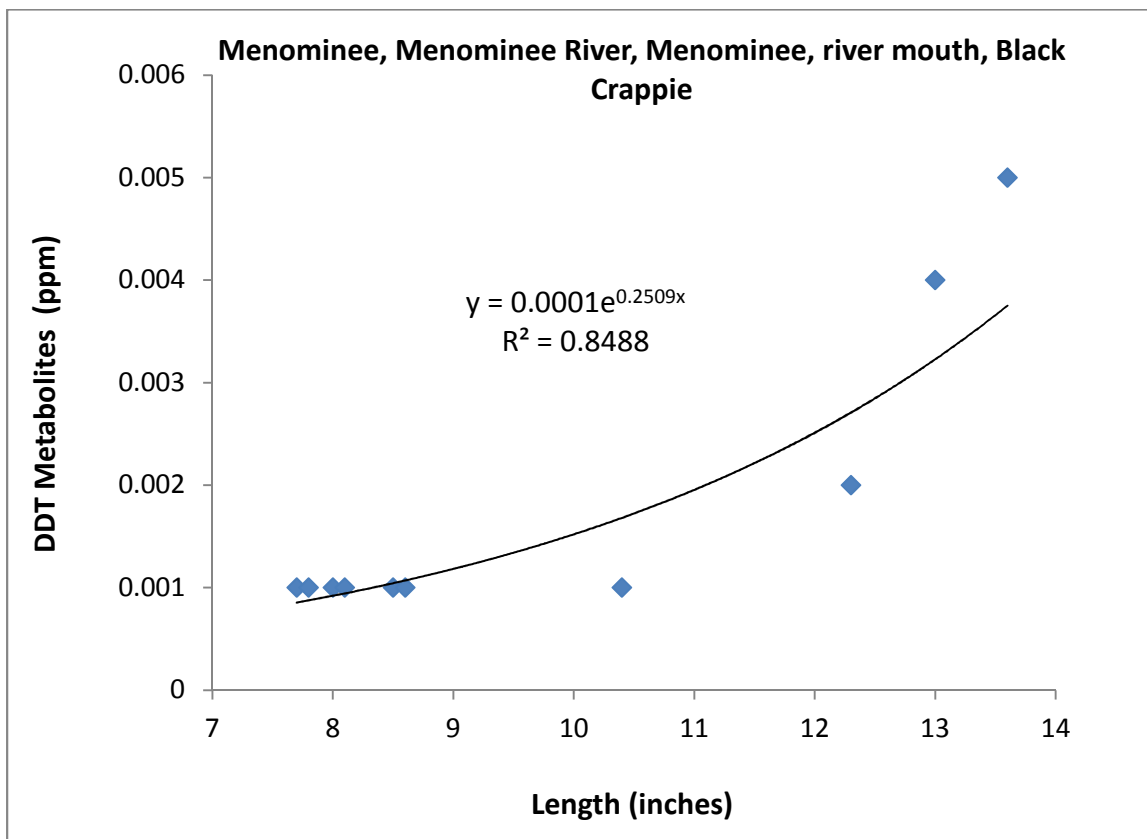
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	7.7	na	7.7	13.6
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.02	0.01	0.06	0.03	8
DDT	10	0.002	0.001	0.005	0.003	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.775	0.715				
DDT	0.777	0.849				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Current Advice: Specific guidelines for Menominee River black or white crappie were not developed since data were not available previously.

Recommendation: No one should eat more than 8 meals per month of black or white crappie smaller than 10 inches from the Menominee River downstream of the Lower Scott (Menominee) Dam or more than 4 meals per month of those fish larger than 10 inches due to elevated concentrations of mercury. PCBs would cause an advisory.

Length (Inches)	Hg	Meal Category	PCB	Meal Category
	Regression Equation Estimate (ppm)		Regression Equation Estimate (ppm)	
6	0.07	12	-0.003	16
7	0.08	12	0.003	16
8	0.10	8	0.01	16
9	0.12	8	0.016	12
10	0.14	4	0.023	8
12	0.19	4	0.04	4
14	0.26	4	0.05	4
<i>Shaded area denotes extrapolated estimates</i>				





Bluegill

**Menominee River
Downstream of Lower Scott Dam**

Menominee County

Hg Analysis:

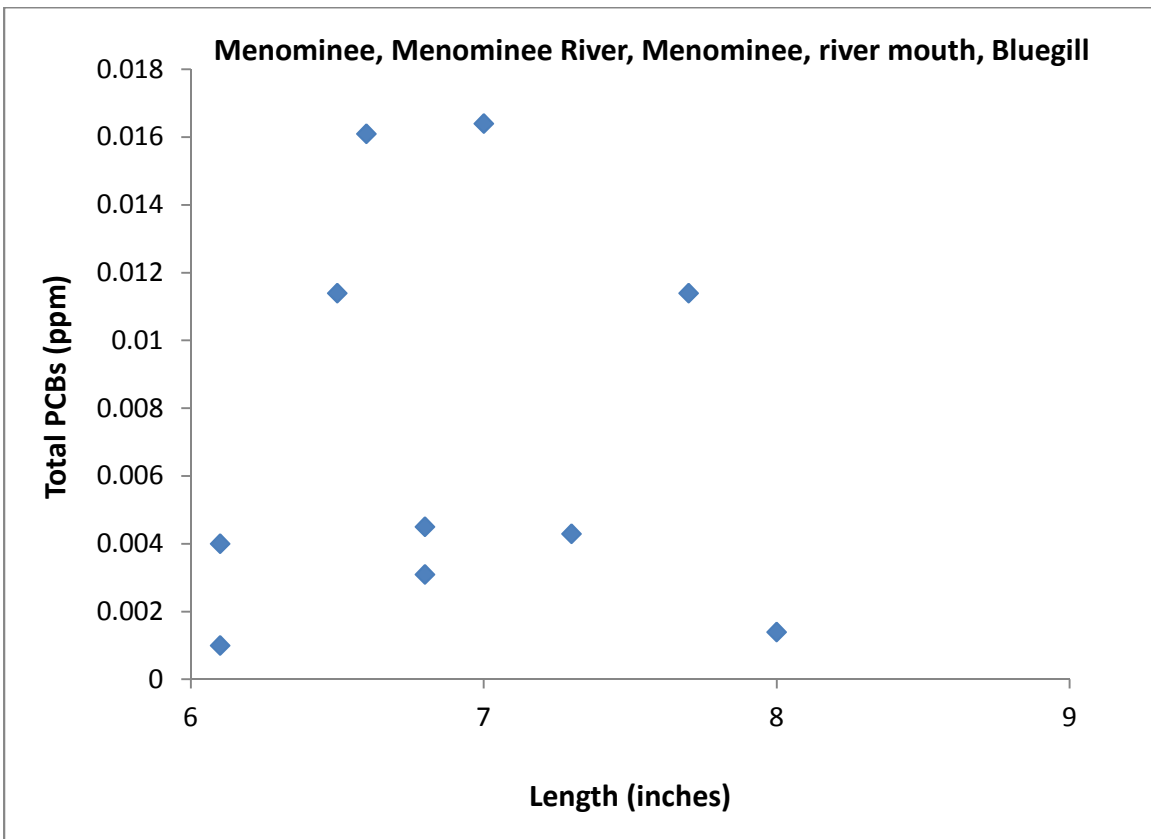
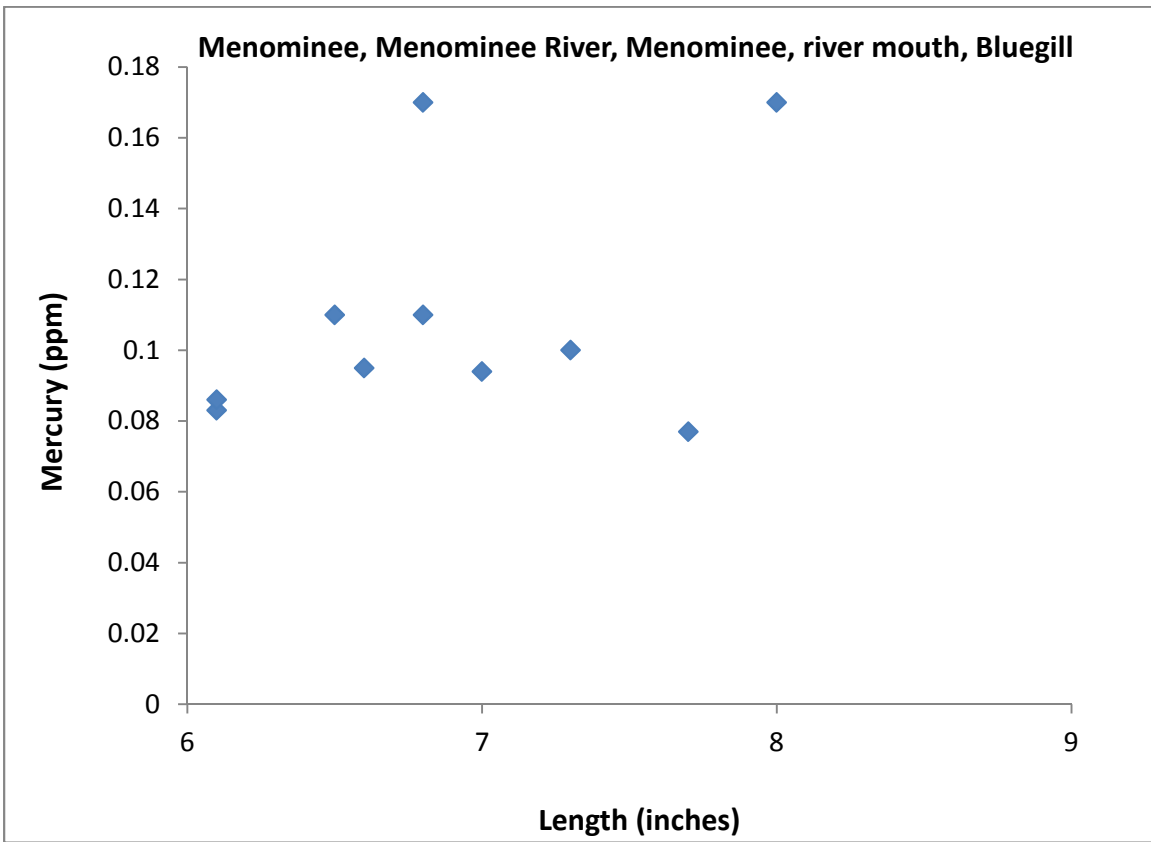
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.1	na	6.1	8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.11	0.08	0.17	0.13	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.148	0.128				

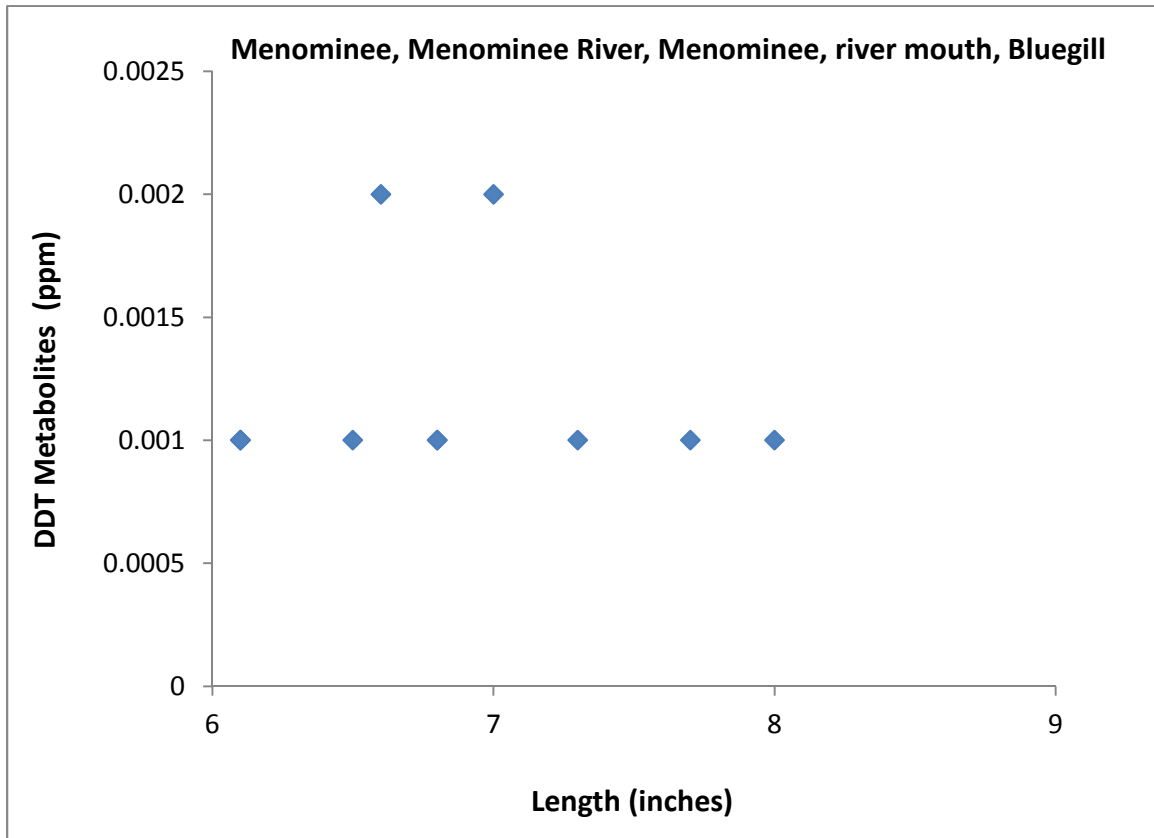
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.1	na	6.1	8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.01	0.001	0.02	0.01	16
DDT	10	0.001	0.001	0.002	0.002	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.000	0.001				
DDT	0.006	0.006				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						8

Current Advice: Specific guidelines for Menominee River black crappie were not developed since data were not available previously.

Recommendation: No one should eat more than 8 meals per month of bluegill or pumpkinseed from the Menominee River downstream of the Lower Scott (Menominee) Dam due to elevated concentrations of mercury.





Carp

**Menominee River
Downstream of Lower Scott Dam**

Menominee County

Hg Analysis:

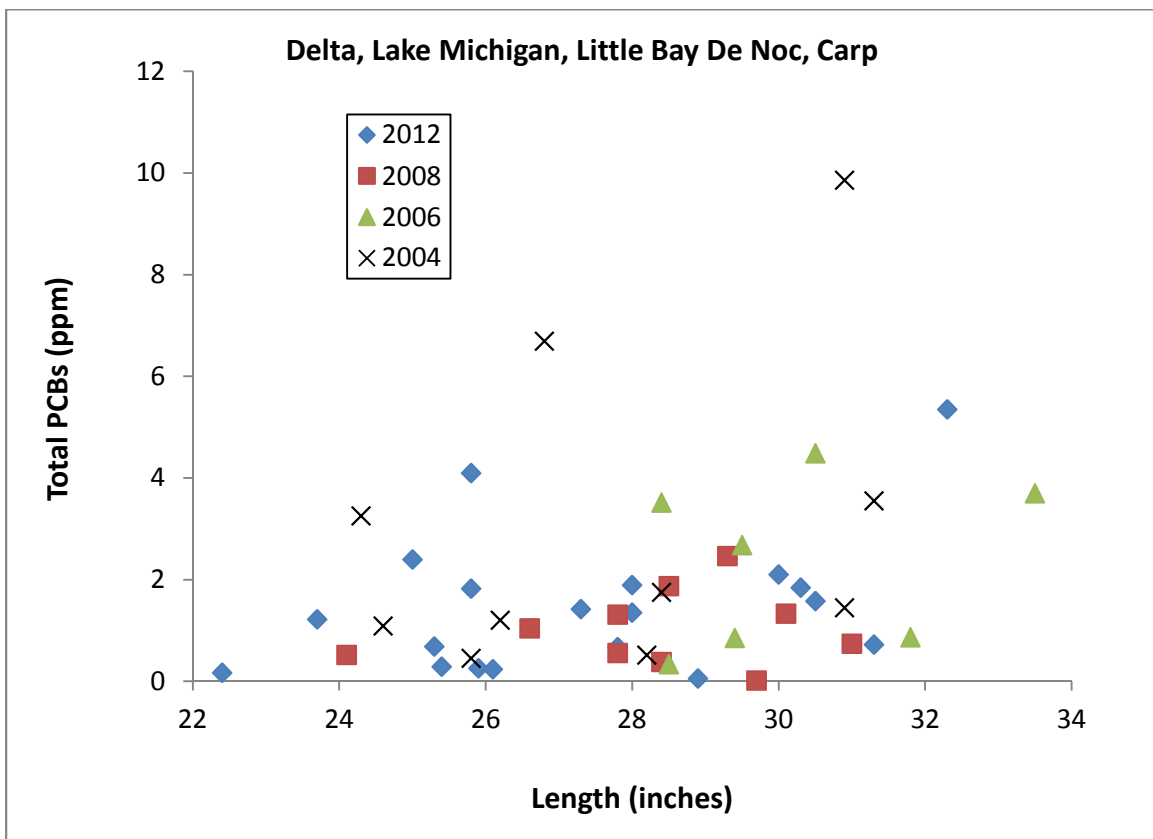
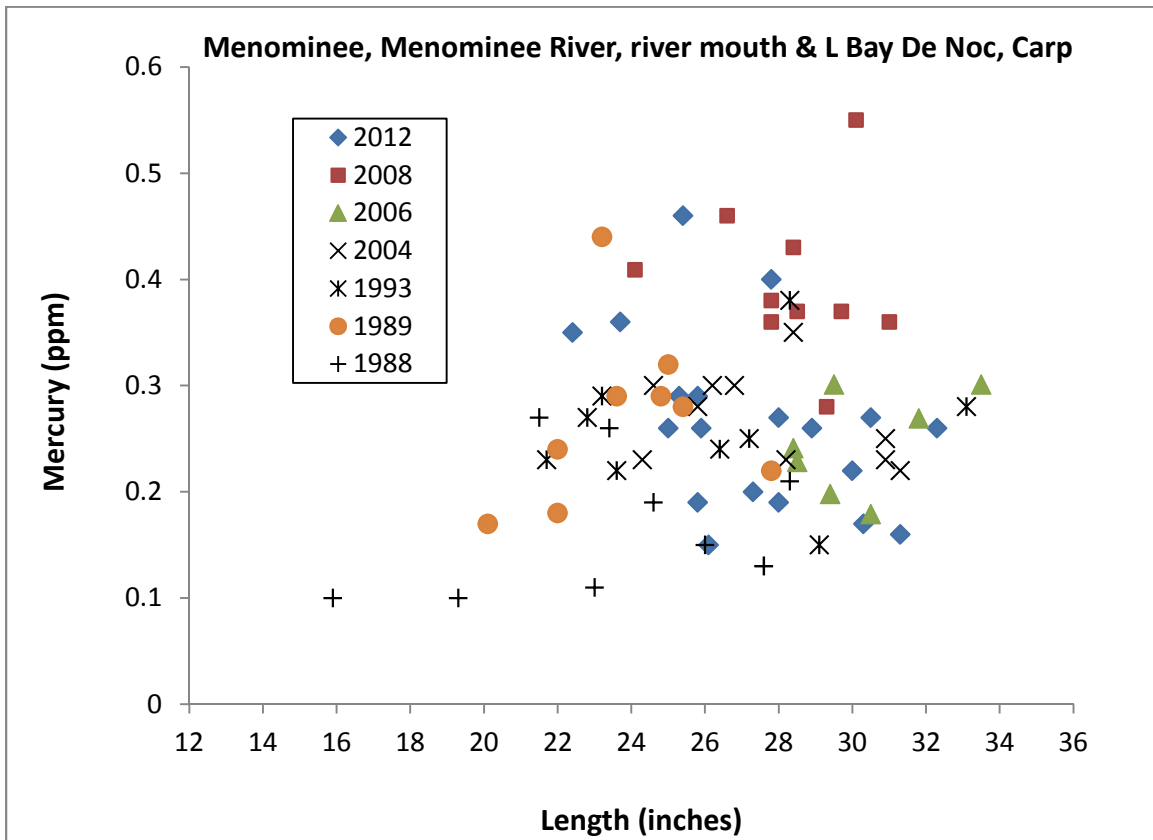
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1988	2012	84	15.9	na	15.9	34.6	
Datasets available: 1988, 1989, 1993, 2000, 2004, 2006, 2008, 2012							
Chemical	Sample Size (Legal)	Mean Conc. (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	84	0.27		0.10	0.55	0.29	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.023	0.046					

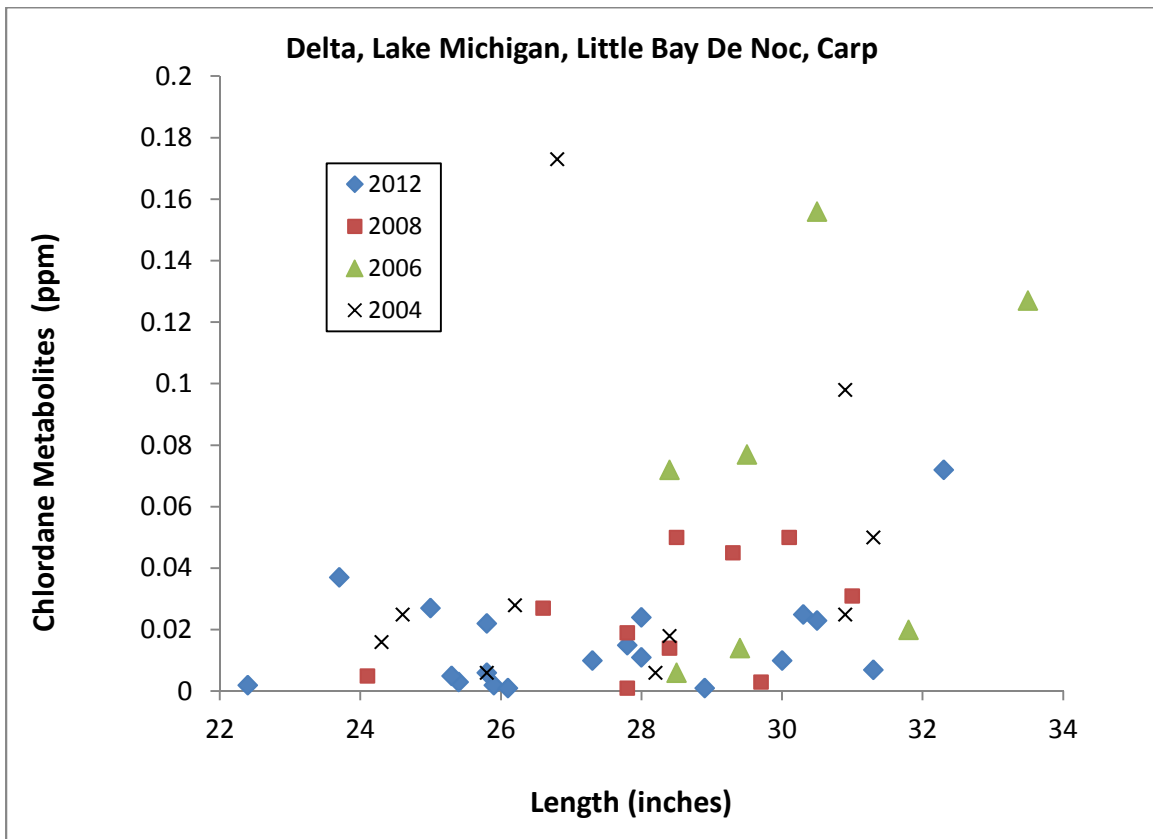
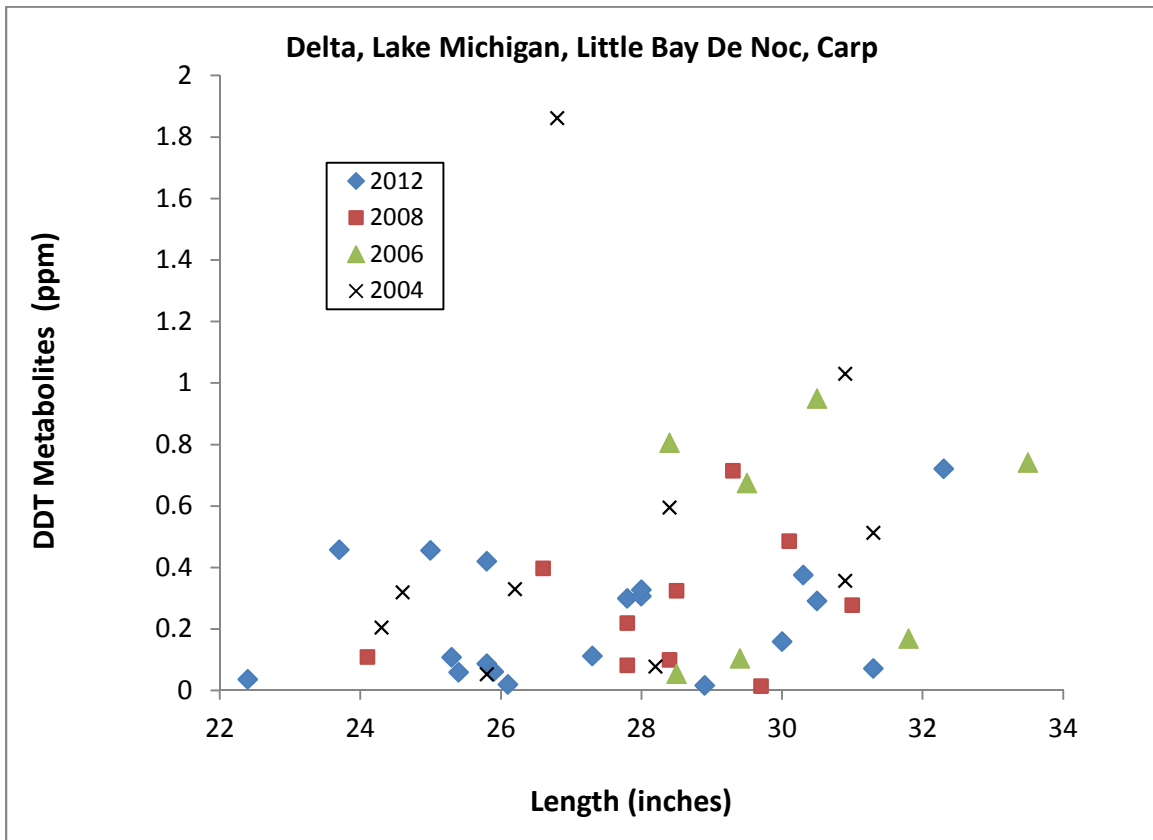
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2004	2012	46	22.4	na	22.4	33.5	
Datasets available: 1988, 1989, 1993, 2000, 2004, 2006, 2008, 2012							
Chemical	Sample Size (Legal)	Mean Conc. (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	46	1.84		0.02	9.86	2.41	Limited
DDT	46	0.35		0.01	1.86	0.45	4
Chlordane	46	0.03		0.001	0.17	0.04	--
Toxaphene	46	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.088	0.060					
DDT	0.065	0.082					
Chlordane	0.137	0.172					
Toxaphene	--	--					
Final meal category based on UCL:							Limited

Current Advice: No one should eat carp from the Menominee River downstream of the Menominee/Hattie Street Dam due to PCBs.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should limit consumption of carp from the Menominee River downstream of the Lower Scott (Menominee) Dam to no more than 1 or 2 meals per year due to PCBs. Mercury and DDT would cause advisories.





Appendix D1. Eat Safe Fish guidance, 2015 update recommendations, Upper Peninsula.

Northern Pike

**Menominee River
D-S of Menominee Dam & LBDN**

**Delta & Menominee
Counties**

Hg Analysis:

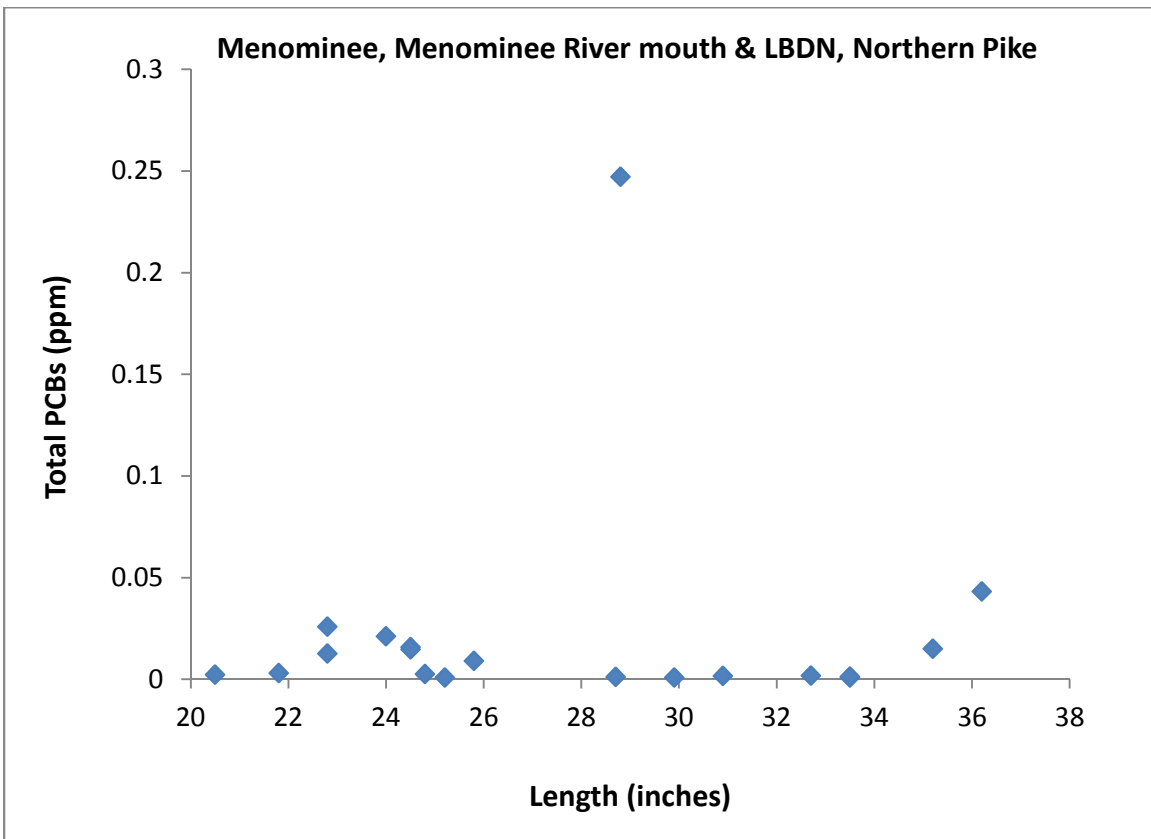
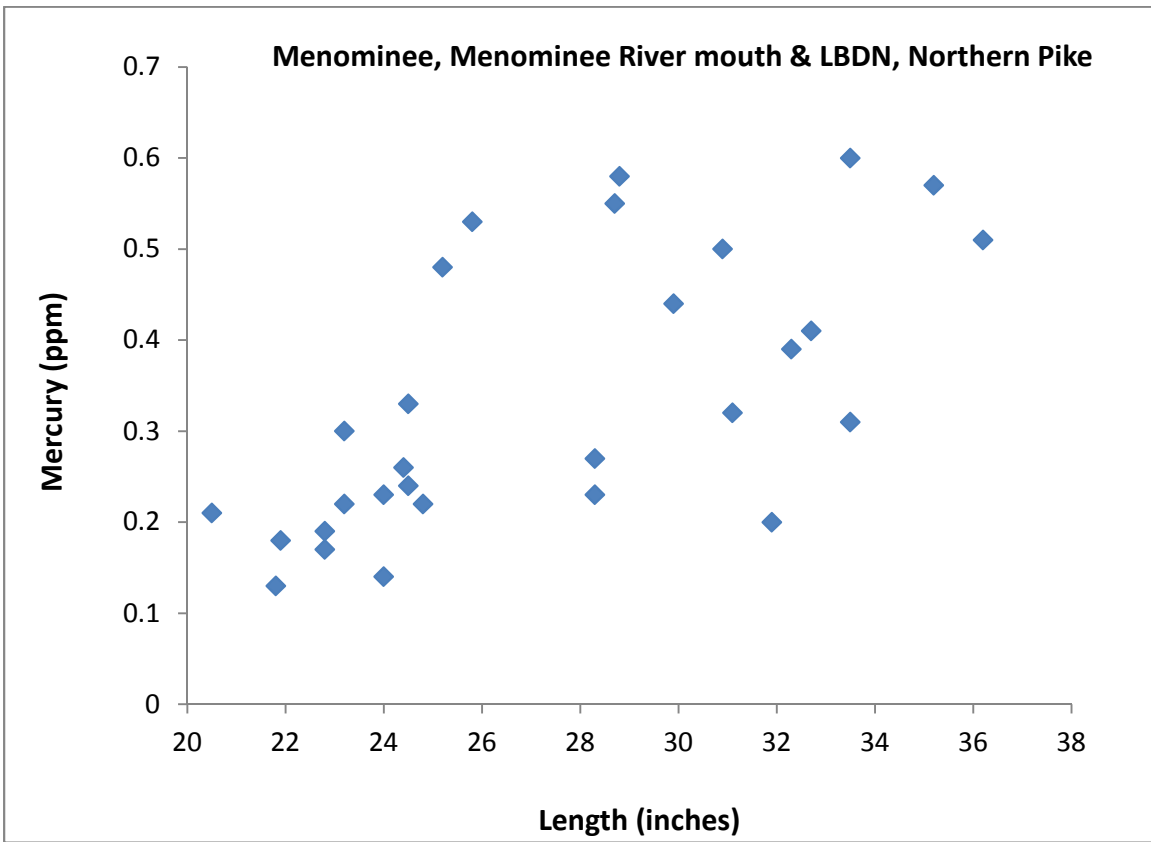
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2010	2012	29	20.5	24	24	36.2	
Datasets available: 1987, 2010, 2012							
Chemical	Sample Size (Legal)	Mean Conc. (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	22	0.38		0.14	0.60	0.44	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.422	0.445					

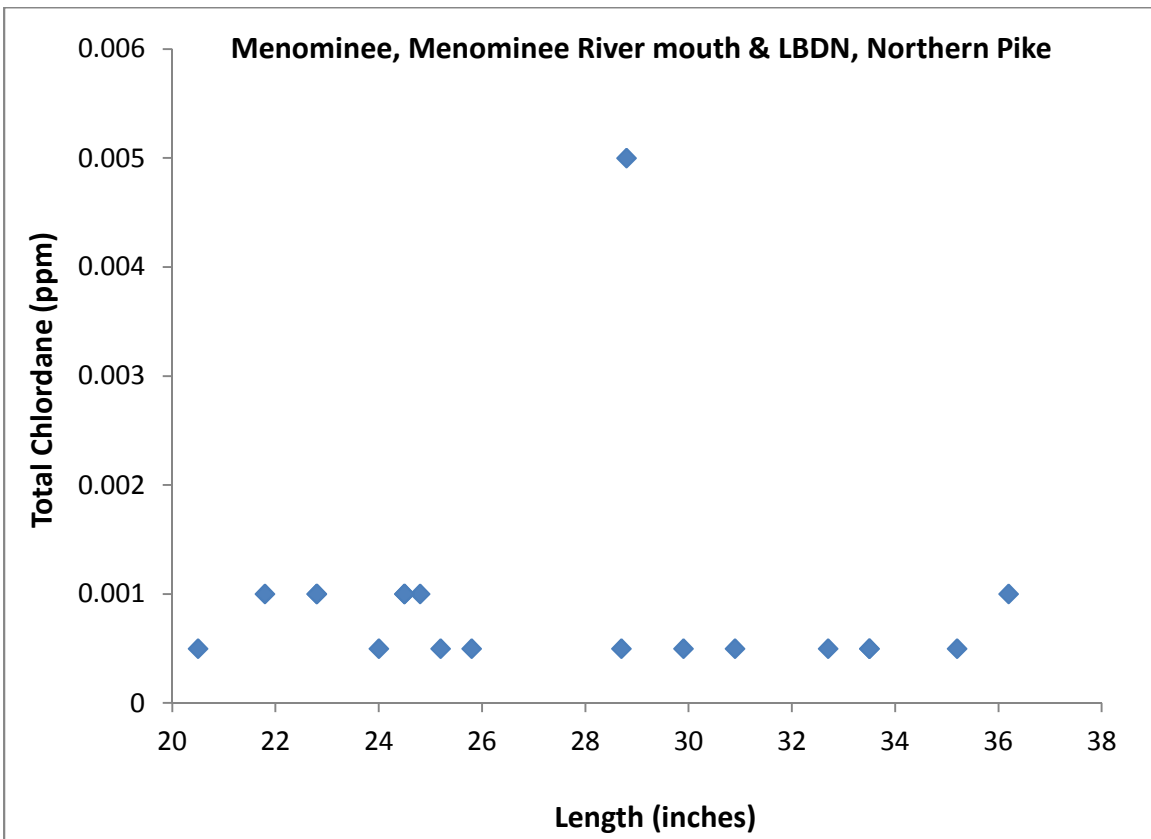
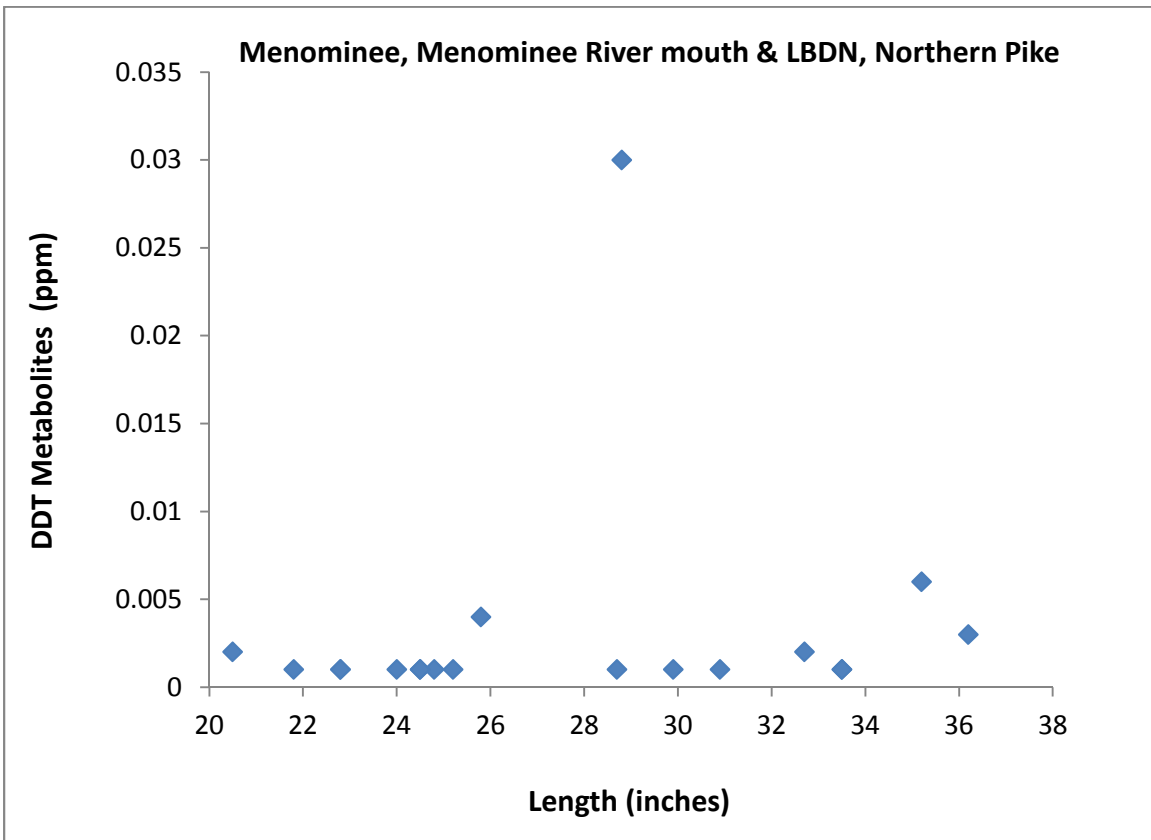
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2010	2012	19	20.5	24	24	36.2	
Datasets available: 1987, 2010, 2012							
Chemical	Sample Size (Legal)	Mean Conc. (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.02		0.001	0.25	0.06	2
DDT	15	0.004		0.001	0.03	0.01	16
Chlordane	15	0.001		0.0005	0.005	0.002	--
Toxaphene	15	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.005	0.007					
DDT	0.018	0.082					
Chlordane	0.001	0.031					
Toxaphene	--	--					
Final meal category based on UCL:							2

Current Advice: No one should eat more than 1 meal per month of northern pike from Green Bay, Little Bay De Noc, or the Menominee River downstream of the Menominee/Hattie Street Dam due to mercury.

Recommendation: No one should eat more than 2 meals per month of northern pike from Green Bay, Little Bay De Noc, or the Menominee River downstream of the Lower Scott (Menominee) Dam due to mercury and PCBs.





Smallmouth Bass

**Lake Michigan
Green Bay/LBDN/Menominee River mouth**

**Delta & Menominee
Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	2012	70	9.6	14	13.5	20.5
Datasets available: 1992, 2004, 2005, 2008, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	60	0.38	0.09	0.95	0.42	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.496	0.627				

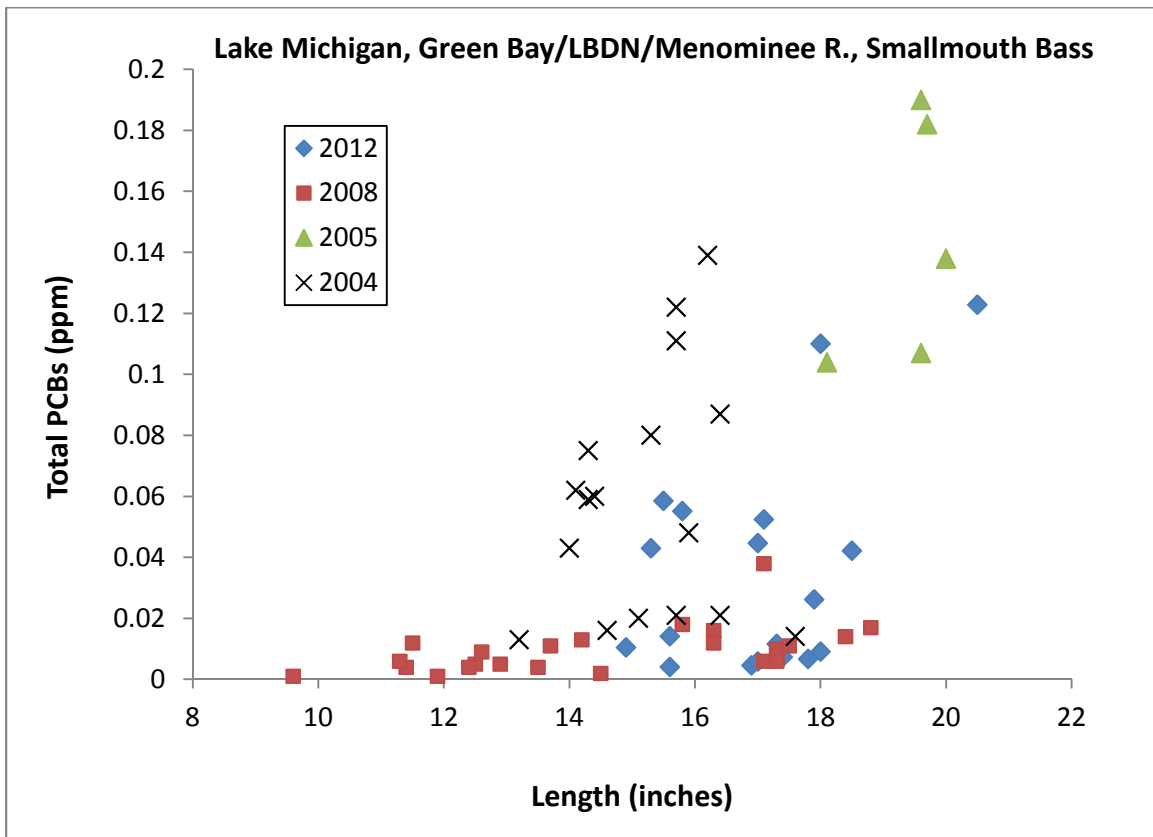
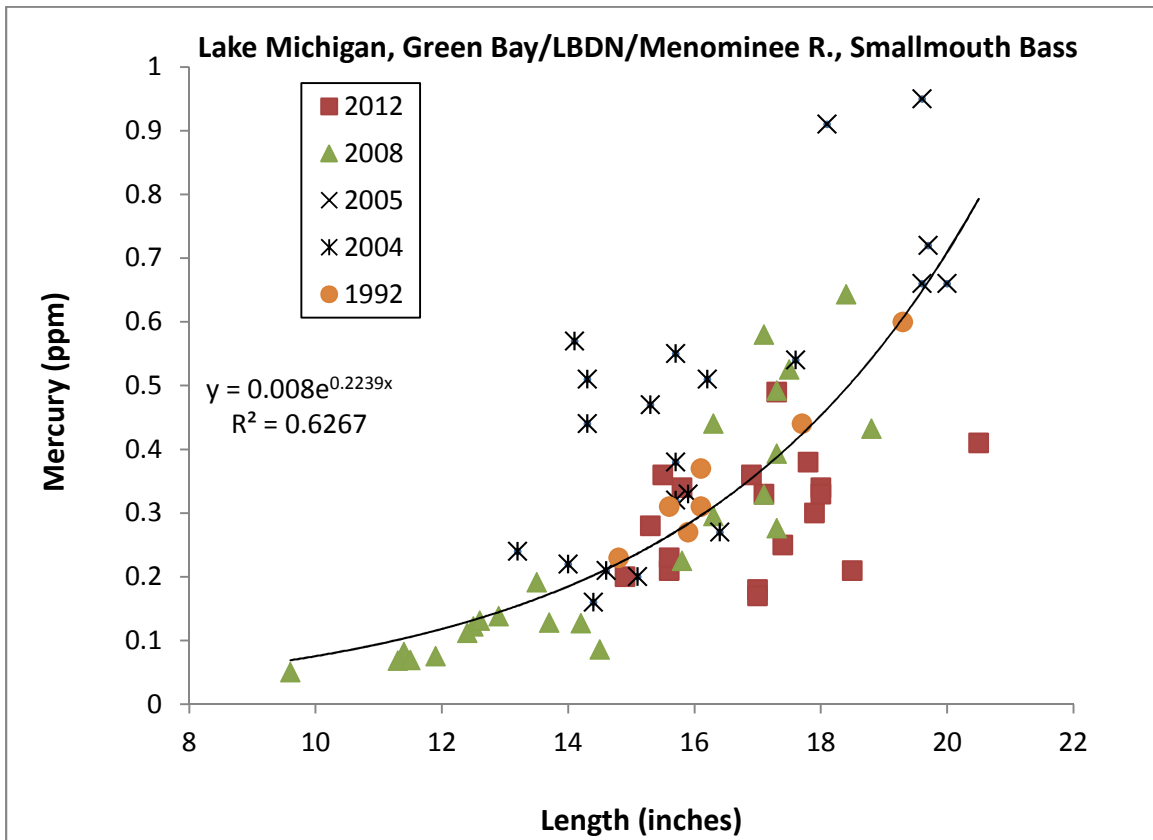
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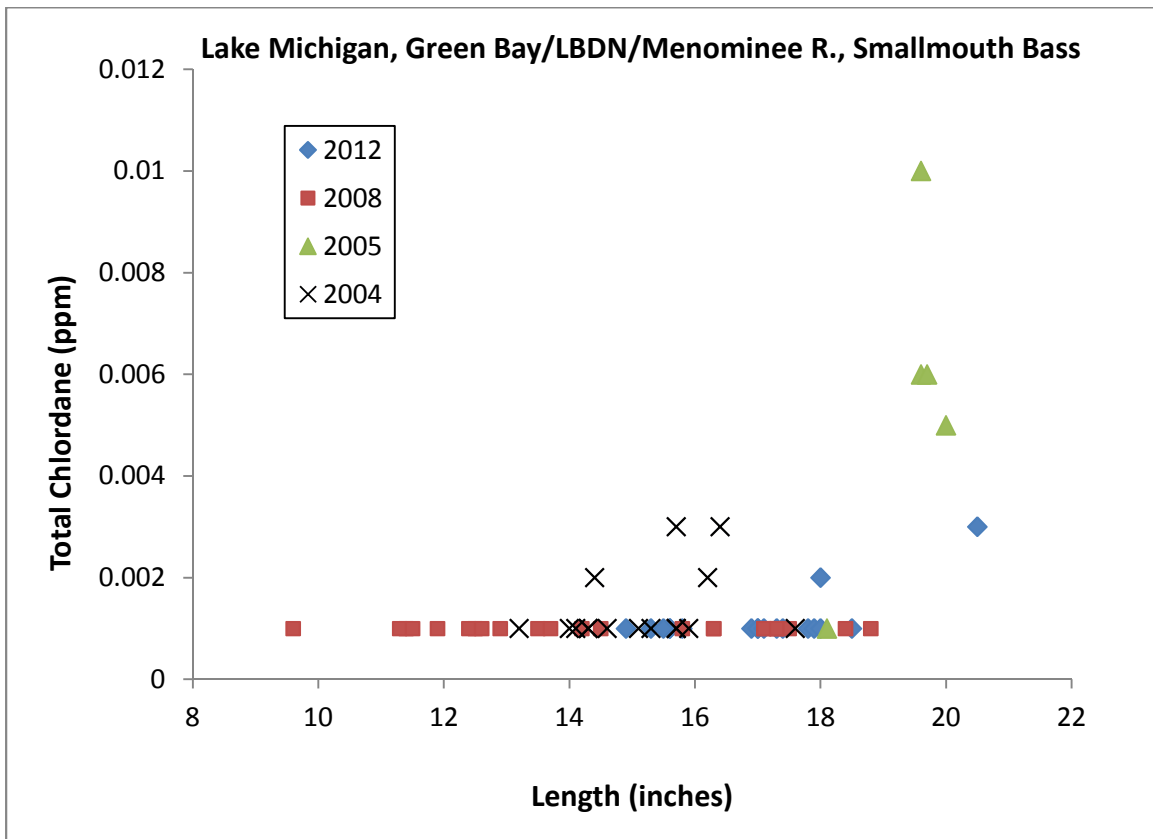
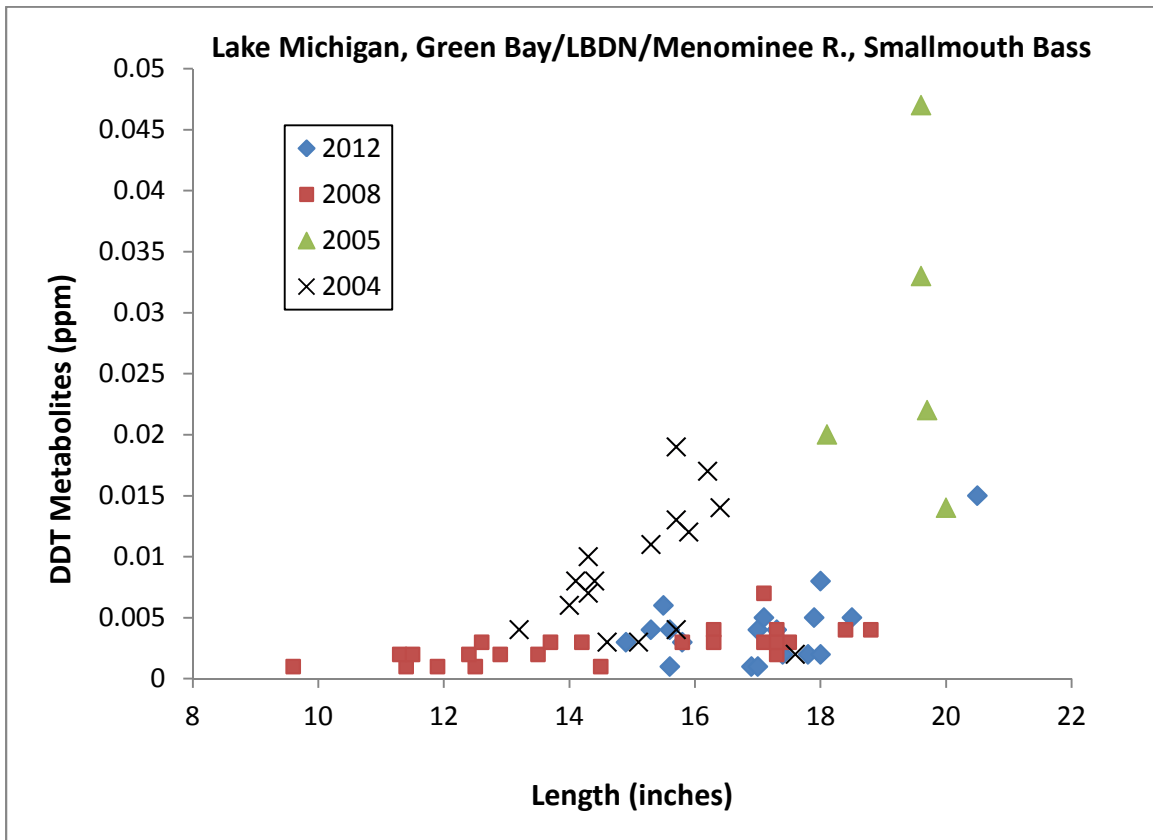
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	64	9.6	14	9.6	20.5
Datasets available: 1992, 2004, 2005, 2008, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	54	0.047	0.002	0.19	0.06	2
DDT	53	0.007	0.001	0.05	0.01	16
Chlordane	53	0.002	0.001	0.01	0.002	--
Toxaphene	53	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.220	0.269				
DDT	0.209	0.255				
Chlordane	0.199	0.217				
Toxaphene	--	--				
Final meal category based on UCL:						2

Current Advice: No one should eat more than 2 meals per month of smallmouth or largemouth bass from Green Bay or Little Bay De Noc smaller than 16 inches or more than 1 meal per month of smallmouth or largemouth bass larger than 16 inches due to elevated concentrations of mercury and PCBs.

Recommendation: No one should eat more than 2 meals per month of smallmouth or largemouth bass smaller than 16 inches from Green Bay, Little Bay de Noc, or rivers tributary to those waters up to the first dam due to mercury and PCBs, or more than 1 meal per month of those fish larger than 16 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
12	0.12	8
14	0.18	4
16	0.29	2
18	0.45	2
20	0.7	1
22	1.1	1
24	1.73	0.5
<i>Shaded area denotes extrapolated estimates</i>		





Yellow Perch

**Menominee River
D-S of Menominee Dam**

Menominee County

Hg Analysis:

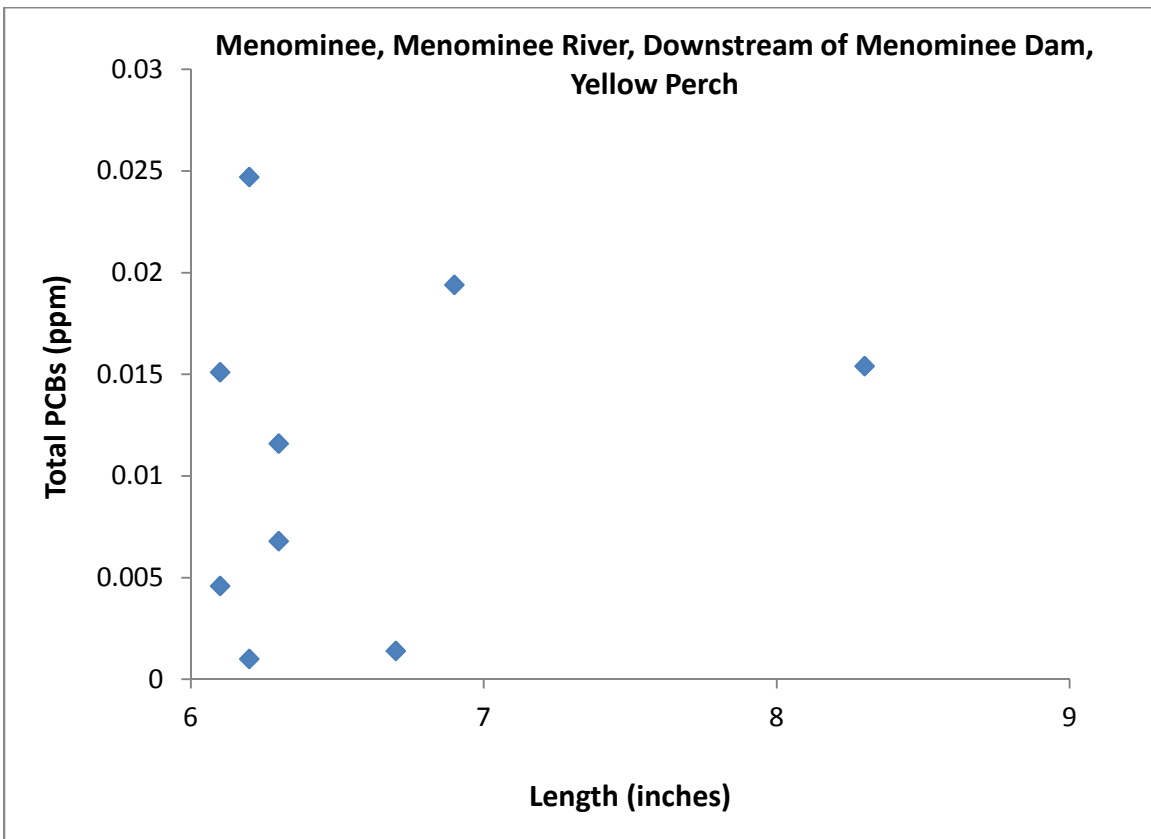
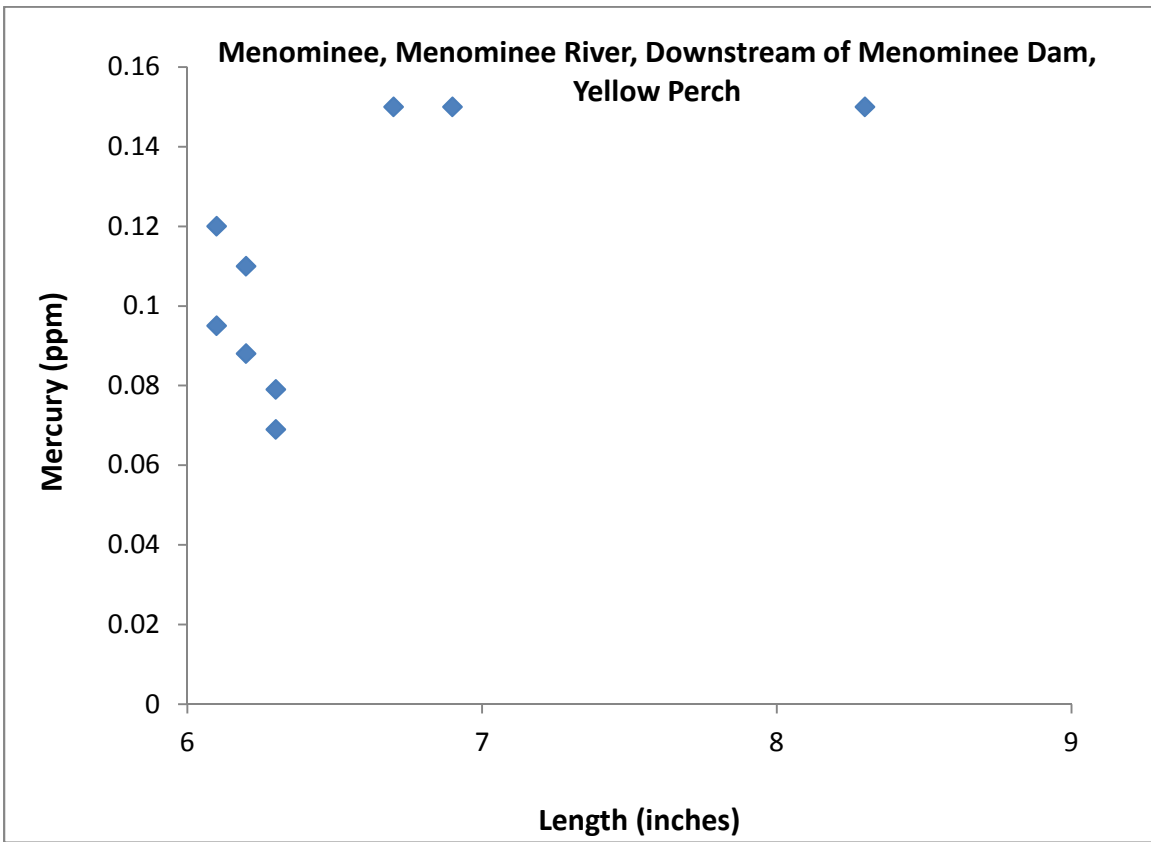
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	9	6.1	na	6.1	8.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.11	0.07	0.15	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.424	0.366				

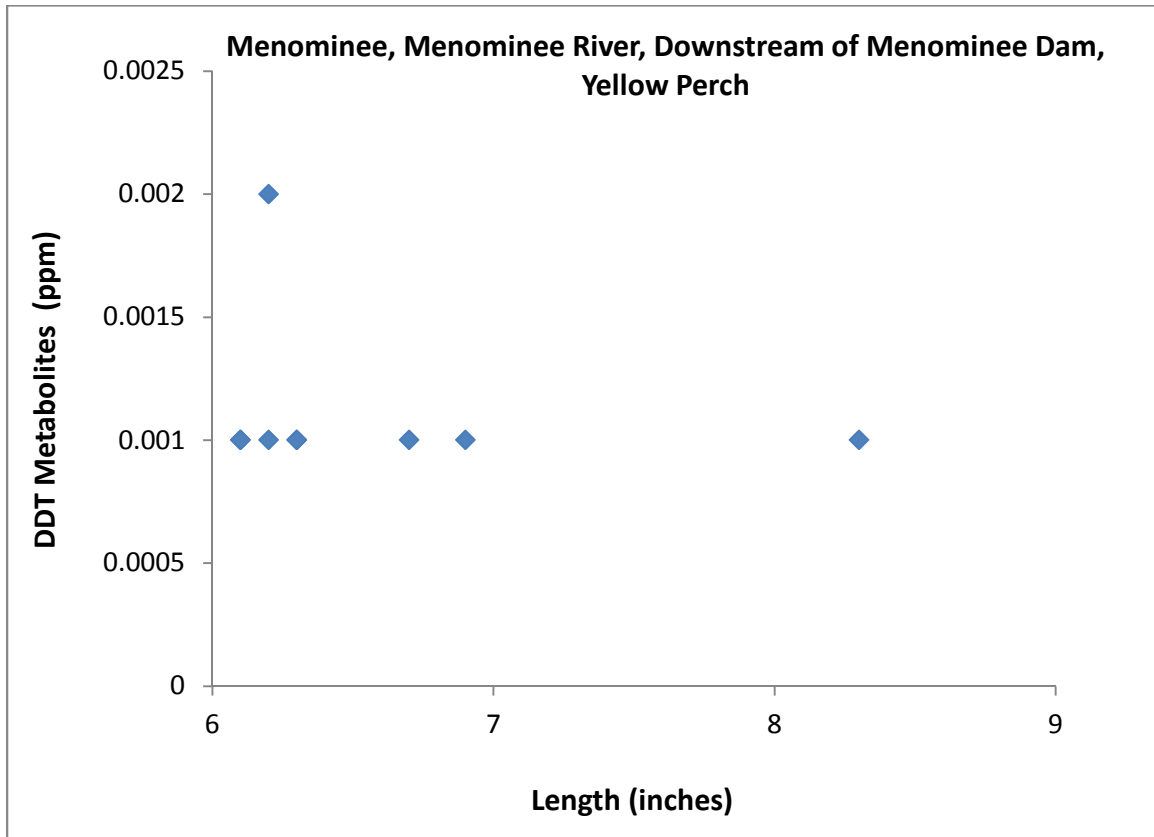
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	9	6.1	na	6.1	8.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.01	0.001	0.025	0.02	12
DDT	9	0.001	0.001	0.002	0.001	16
Chlordane	9	ND	--	--	--	--
Toxaphene	9	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.044	0.050				
DDT	0.038	0.038				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Current Advice: Specific guidelines for Menominee River yellow perch were not developed since data were not available previously.

Recommendation: No one should eat more than 4 meals per month of yellow perch from the Menominee River downstream of the Menominee Dam due to mercury. PCBs would cause an advisory.





Carp

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	2012	45	20.5	na	20.5	31.1
Datasets available: 1985, 1986, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	45	0.30	0.10	0.75	0.34	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.134	0.190				

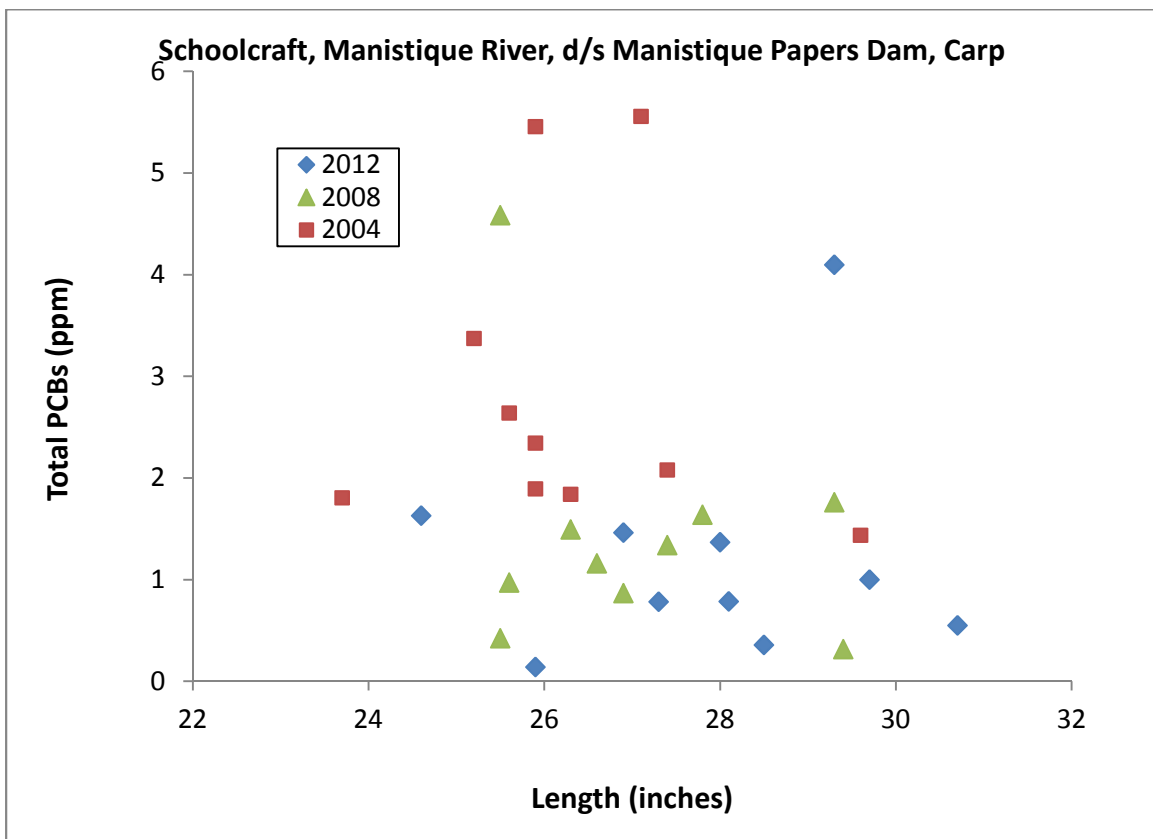
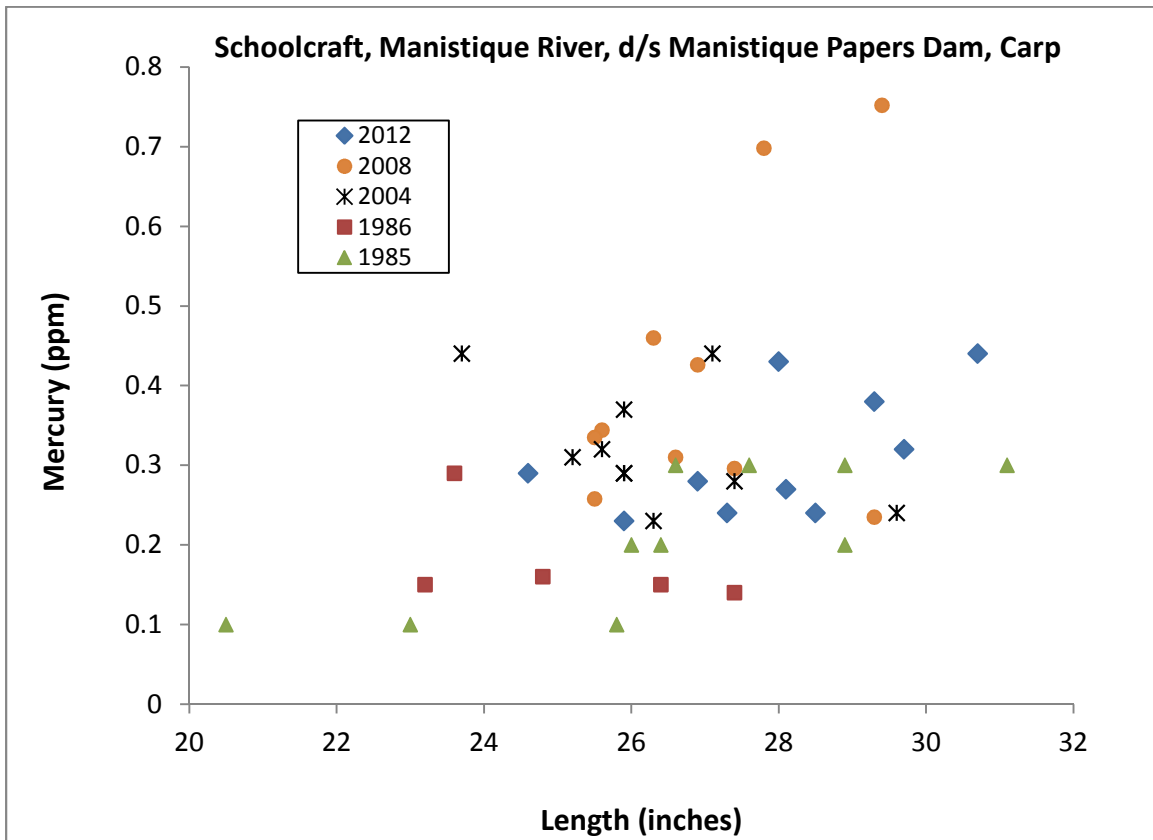
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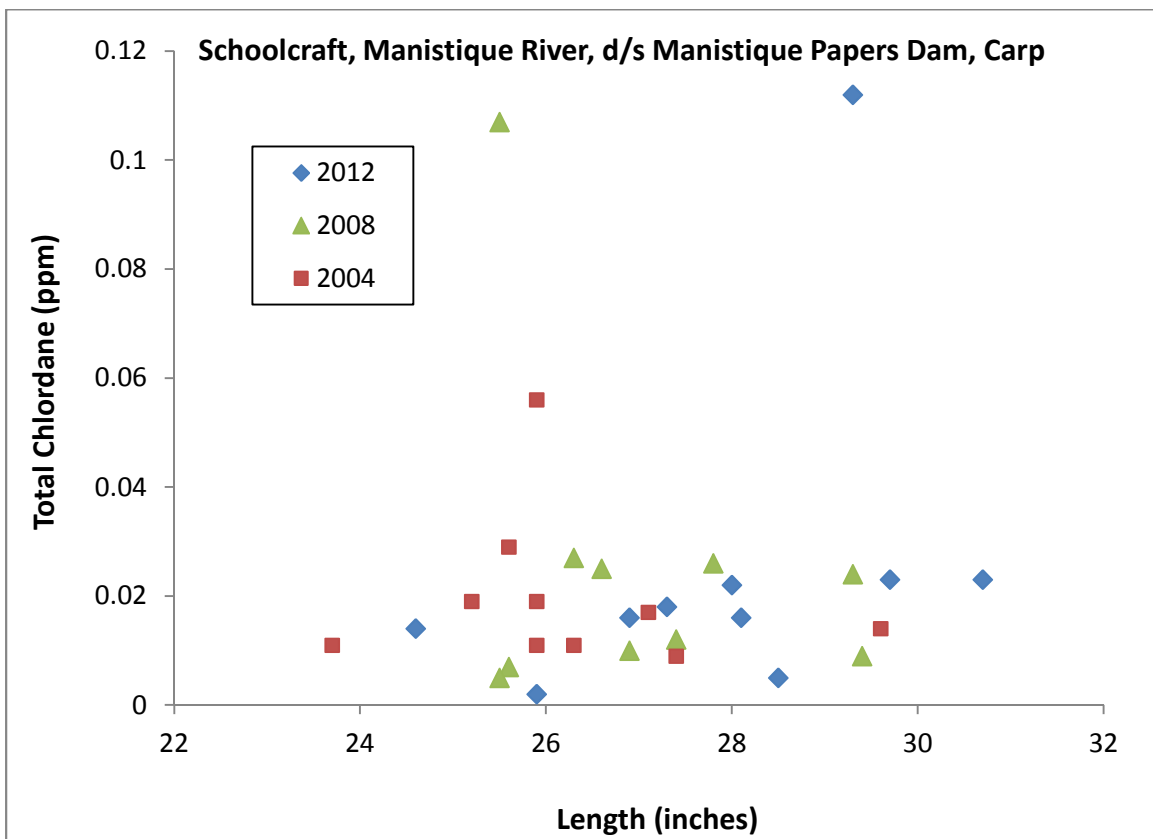
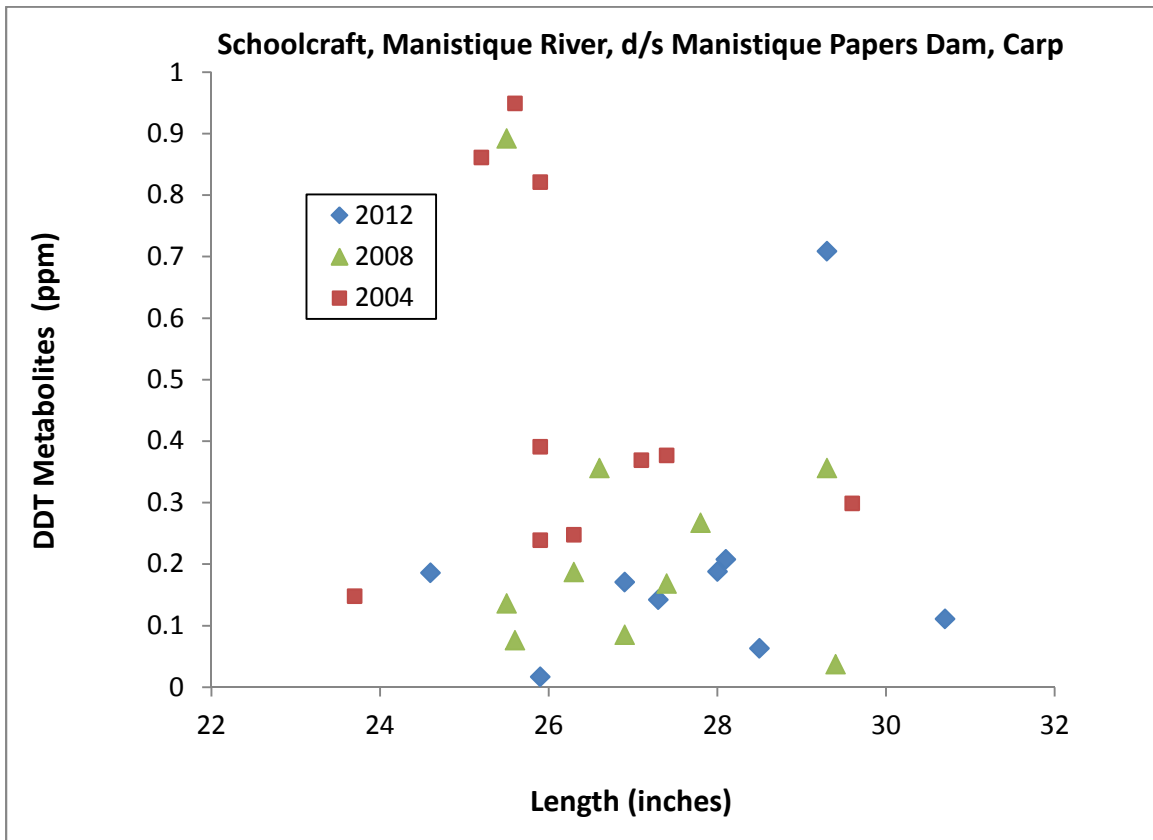
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	30	23.7	na	23.7	30.7
Datasets available: 1985, 1986, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	30	1.84	0.14	5.56	2.38	Limited
DDT	29	0.31	0.02	0.95	0.42	1
Chlordane	30	0.02	0.002	0.11	0.03	--
Toxaphene	30	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.057	0.062				
DDT	0.041	0.020				
Chlordane	0.006	0.022				
Toxaphene	--	--				
Final meal category based on UCL:						Limited*

Existing MDCH Advisory: No one should eat carp of any size from the Manistique River downstream of Manistique Papers dam due to PCBs. Mercury and DDT would cause advisories.

Recommendation: No change.

*Uncertainty due to uncontrolled sources and yet to be determined remediation actions is the basis for continuing the no consumption advisory for everyone.





Appendix D1. Eat Safe Fish guidance, 2015 update recommendations, Upper Peninsula.

Sucker
Redhorse and White
Hg Analysis:

Manistique River
d/s Manistique Papers Dam

Schoolcraft County

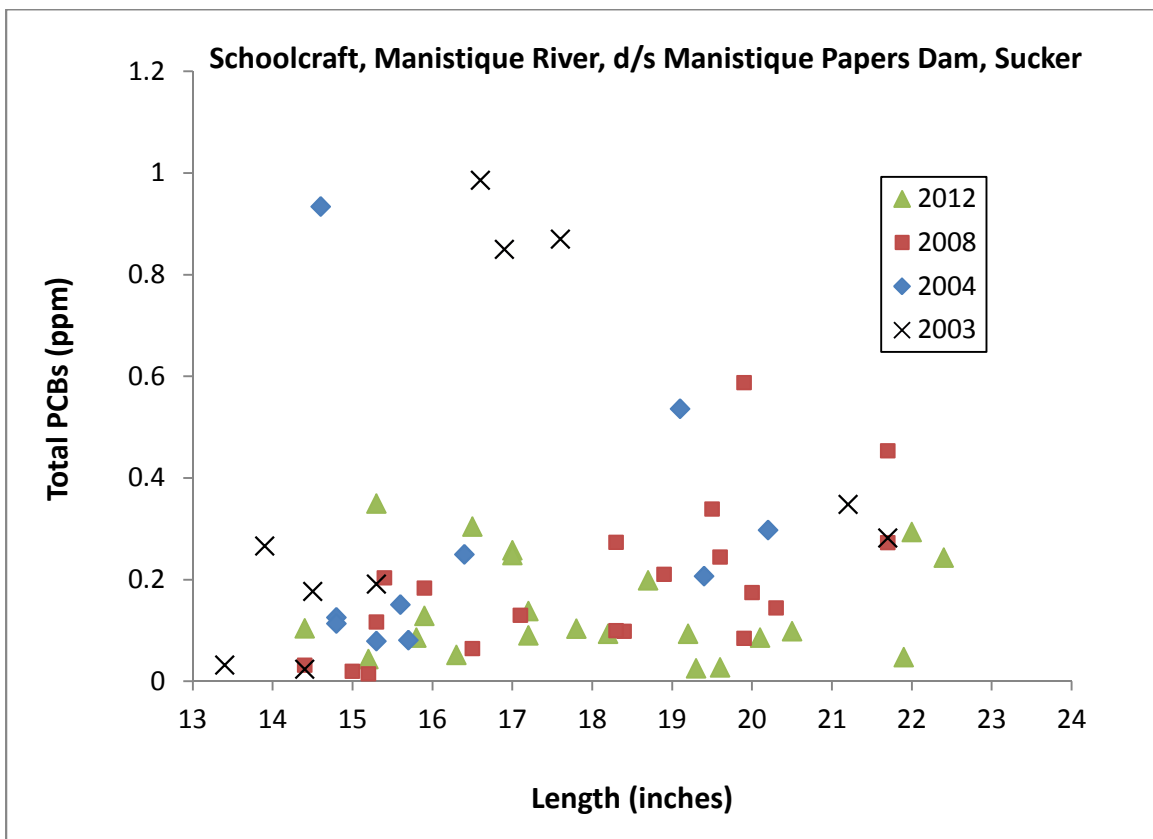
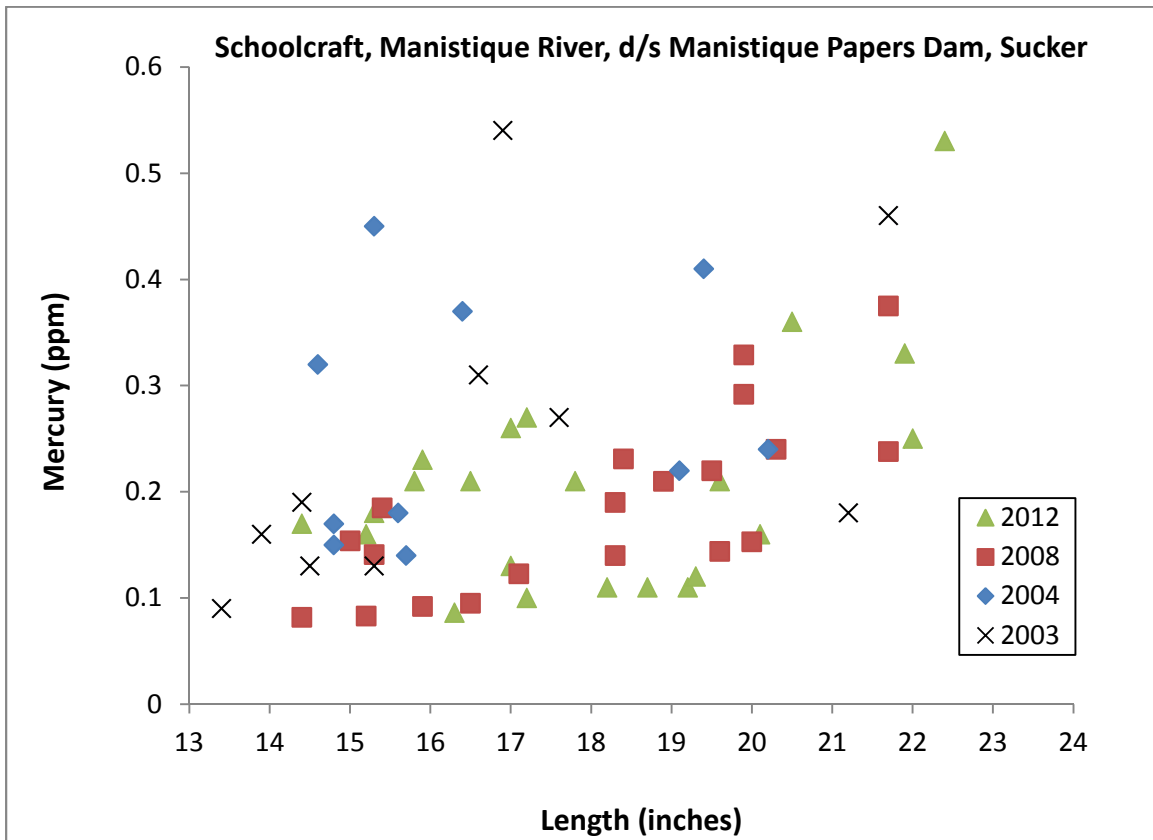
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	62	14.4	na	13.4	22.4
Datasets available: 2003, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	62	0.22	0.08	0.54	0.24	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.168	0.186				

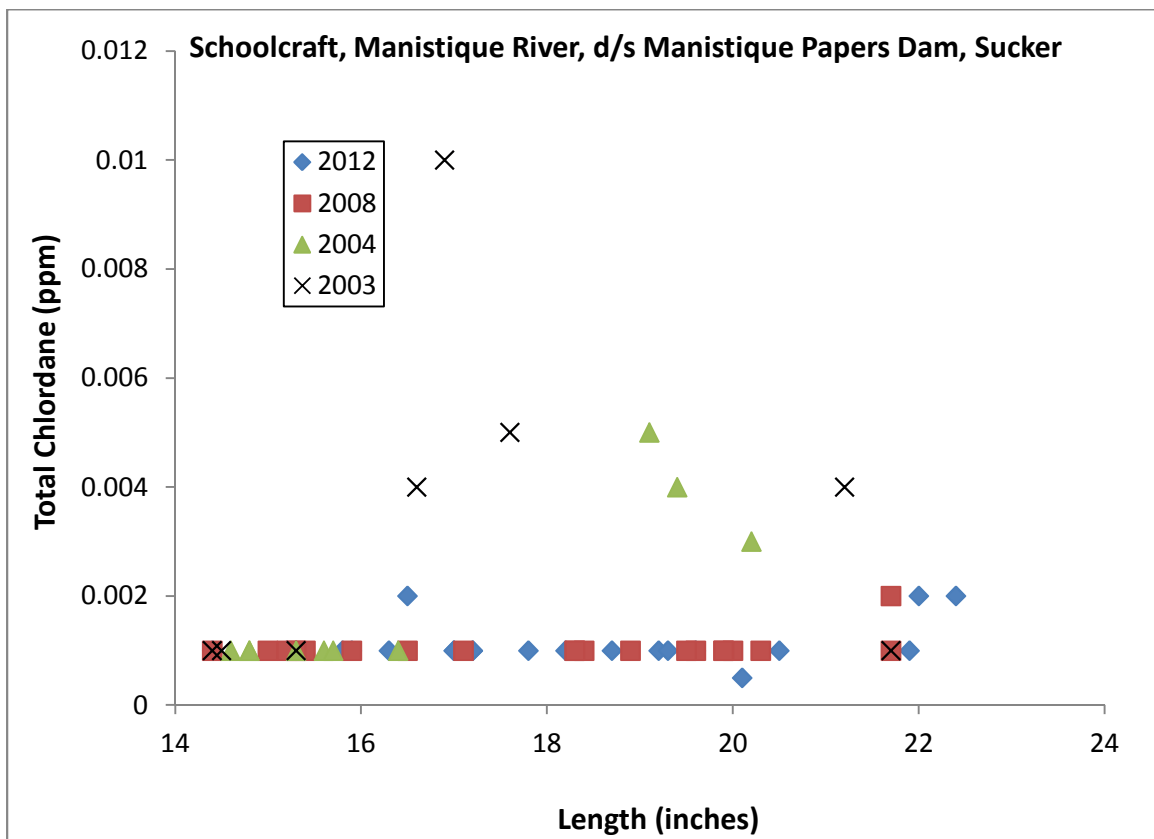
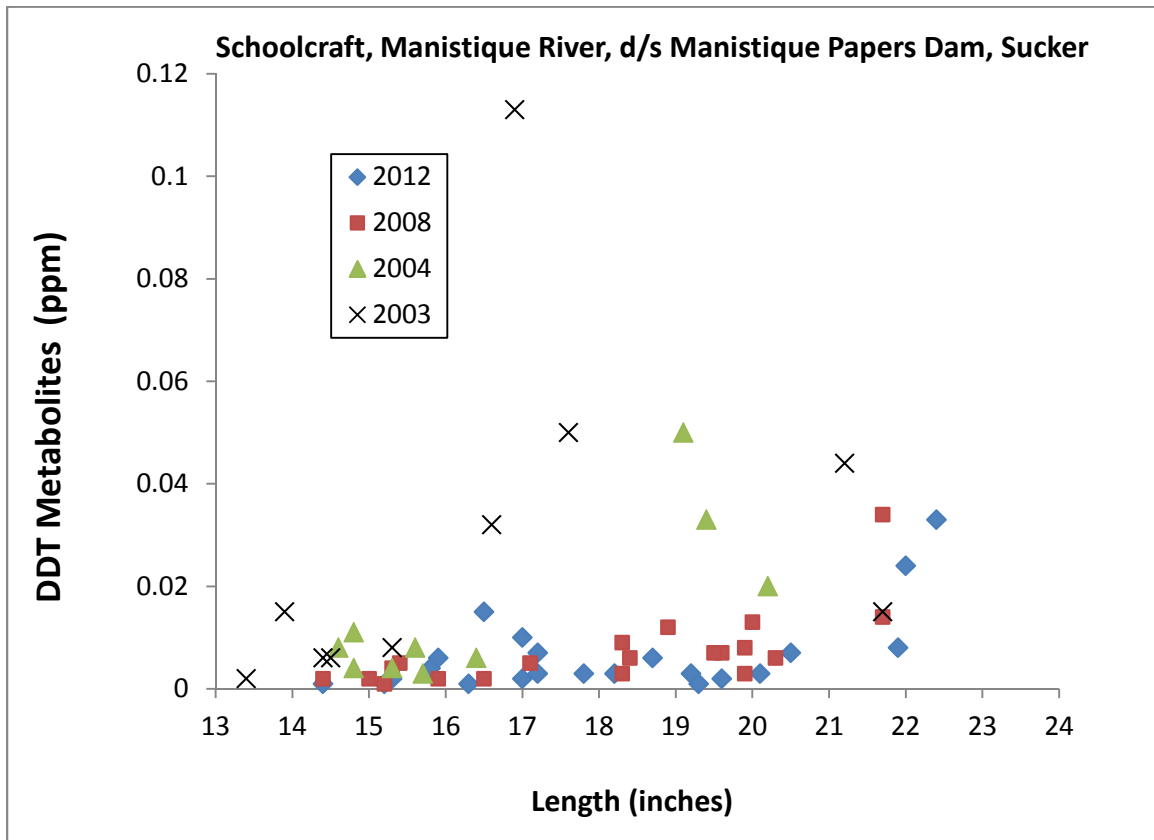
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	52	14.4	na	13.4	22.4
Datasets available: 1984, 2003, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	62	0.22	0.02	0.99	0.23	0.5
DDT	62	0.01	0.001	0.11	0.01	16
Chlordane	62	0.002	0.00051	0.01	0.001	16
Toxaphene	--	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.011	0.064				
DDT	0.062	0.176				
Chlordane	0.018	0.045				
Toxaphene	--	--	Final meal category based on UCL:			0.5

Existing MDCH Advisory: No one should eat more than 6 meals per year of suckers from the Manistique River downstream of the Manistique Papers dam due to elevated levels of PCBs. Mercury would cause an advisory.

Recommendation: No change.





Rock Bass

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

Hg Analysis:

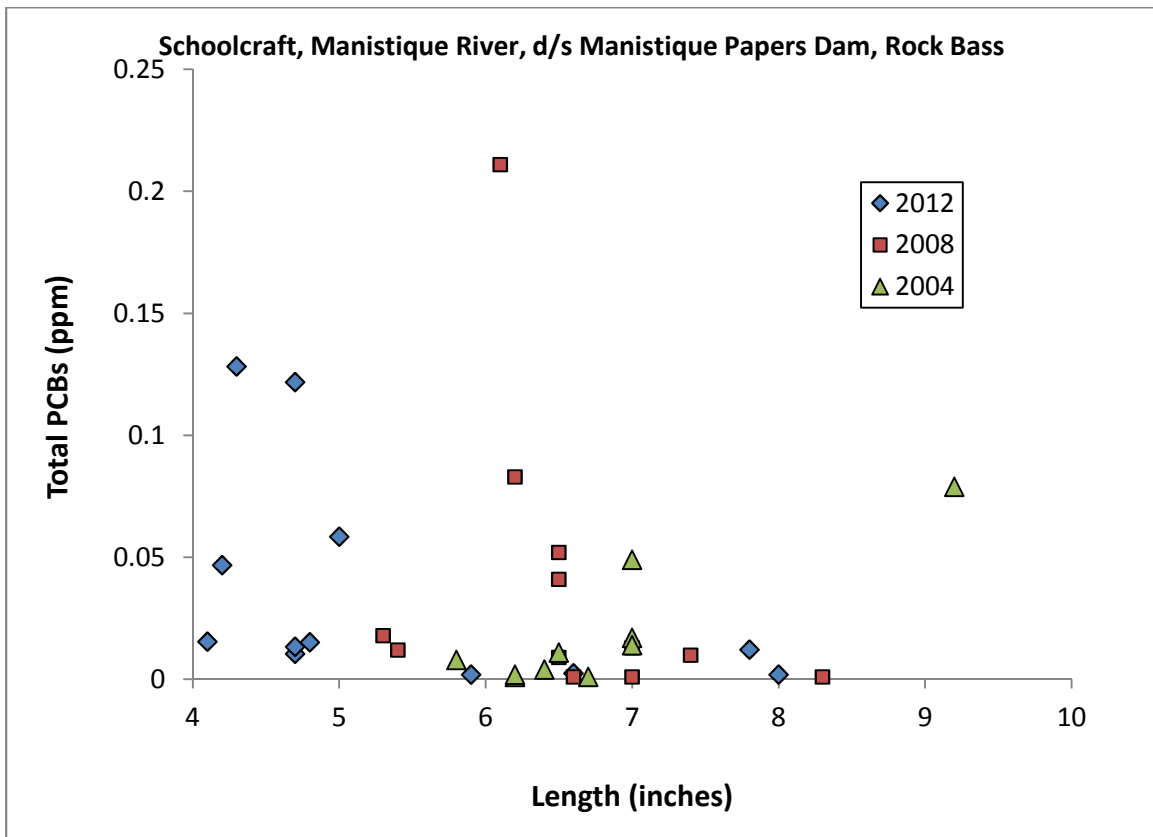
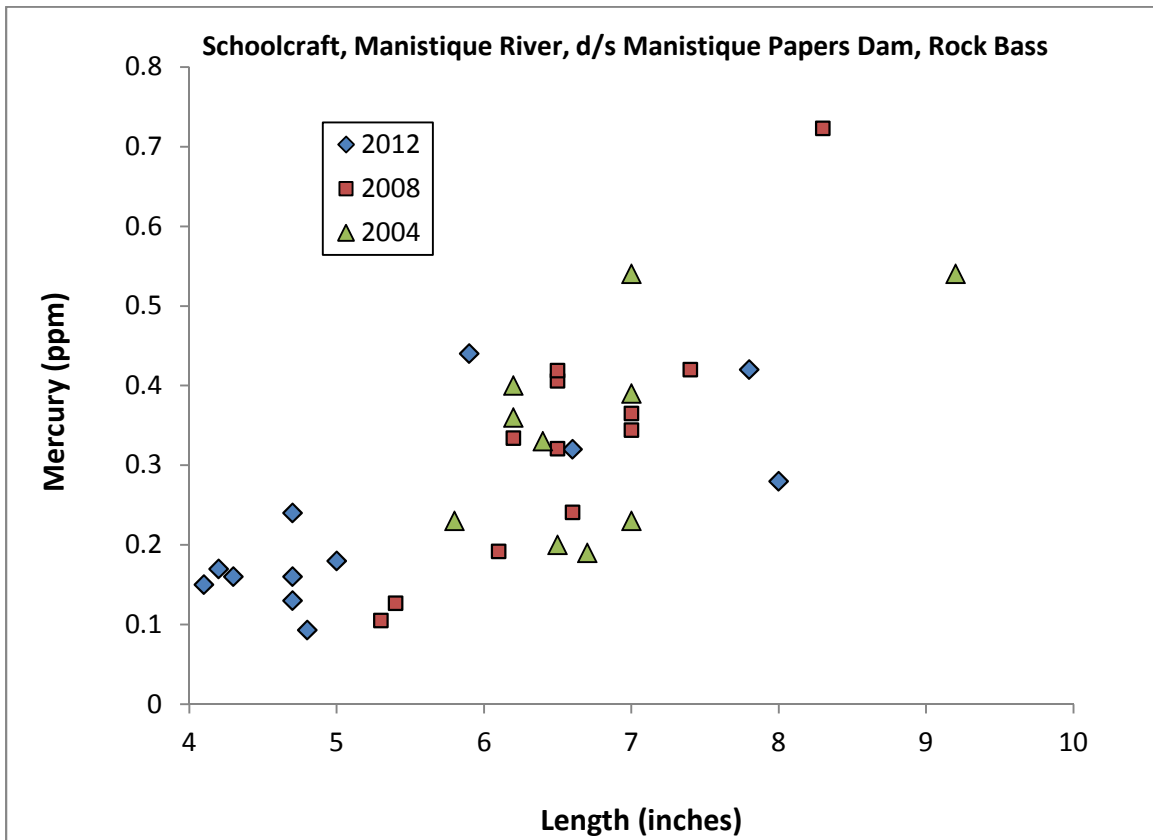
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	34	4.1	na	4.1	9.2
Datasets available: 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	34	0.30	0.09	0.72	0.35	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.563	0.575				

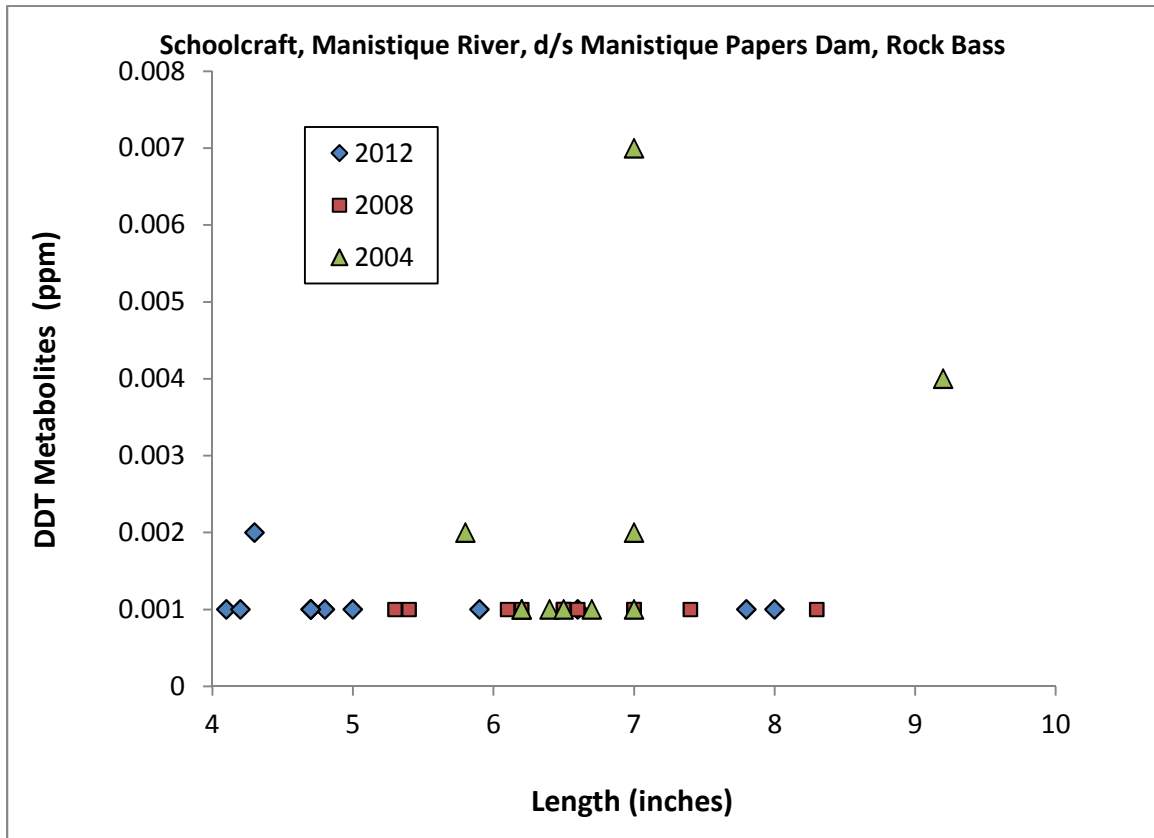
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	34	4.1	na	4.1	9.2
Datasets available: 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	34	0.03	0.001	0.21	0.05	4
DDT	34	0.001	0.001	0.01	0.001	16
Chlordane	34	ND	--	--	--	--
Toxaphene	34	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.040	0.092				
DDT	0.068	0.068				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing MDCH Advisory: No one should eat more than 2 meals per month of rock bass from the Manistique River downstream of the Manistique Papers Dam due to mercury. PCBs would cause an advisory.

Recommendation: No change.





Smallmouth Bass

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

Hg Analysis:

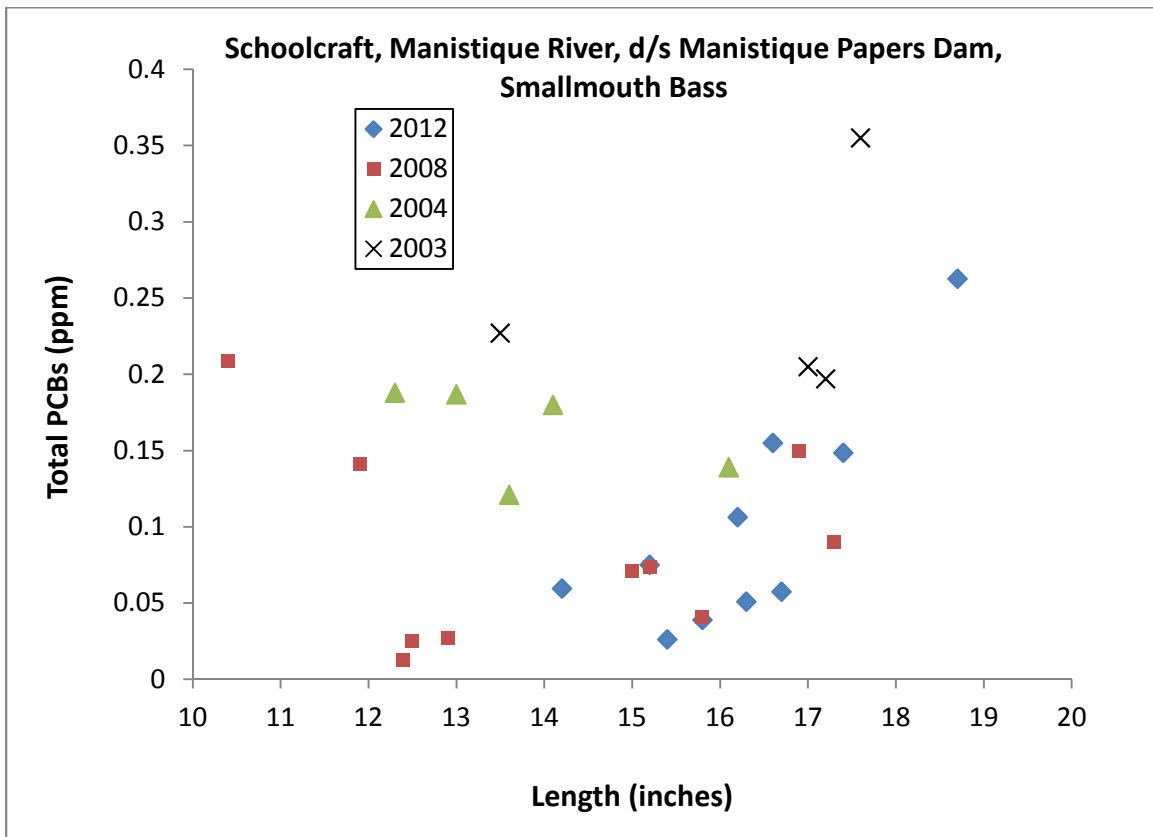
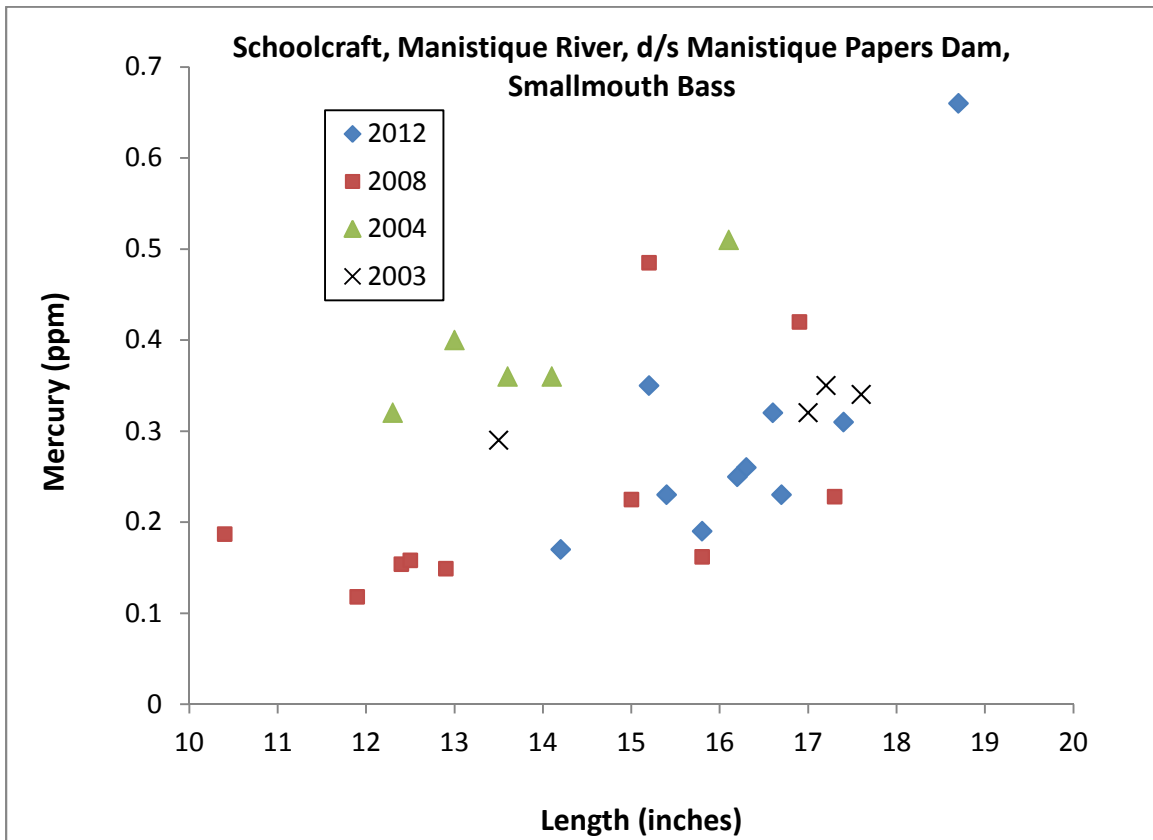
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	29	10.4	14	13.5	18.7
Datasets available: 2003, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	22	0.32	0.16	0.66	0.37	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.224	0.256				

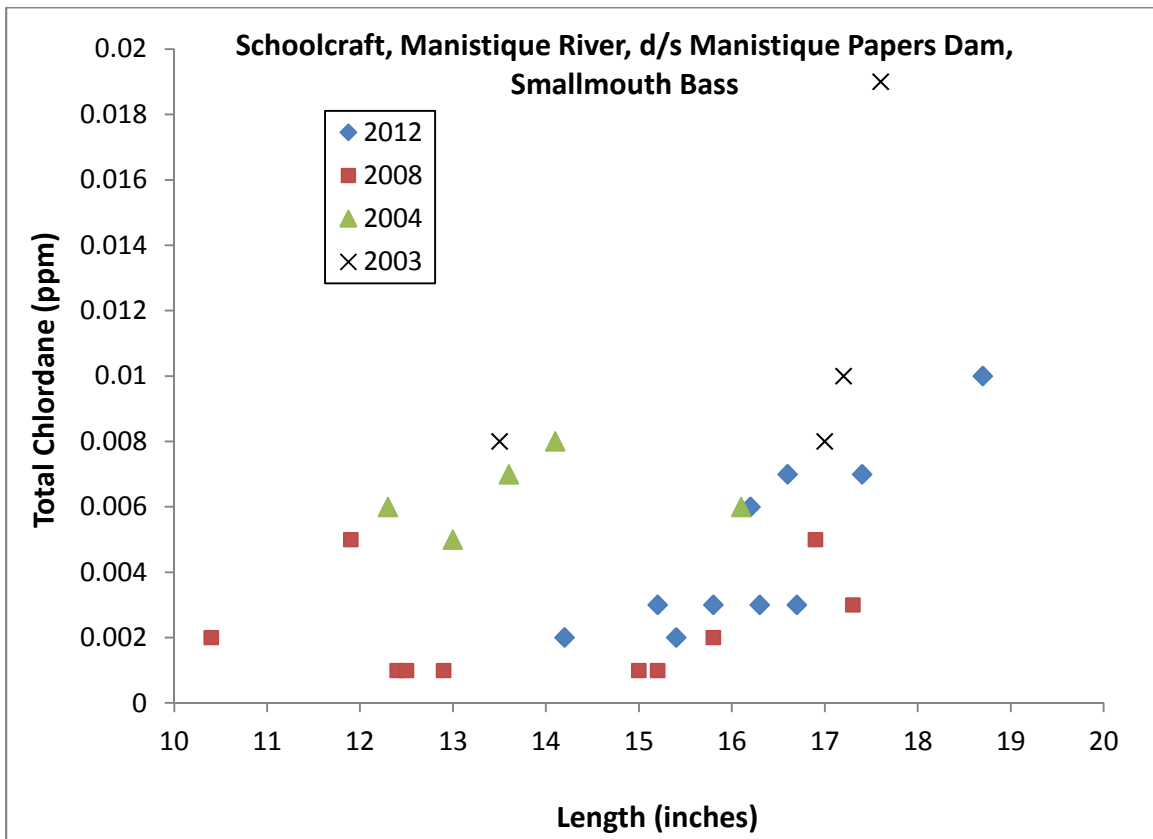
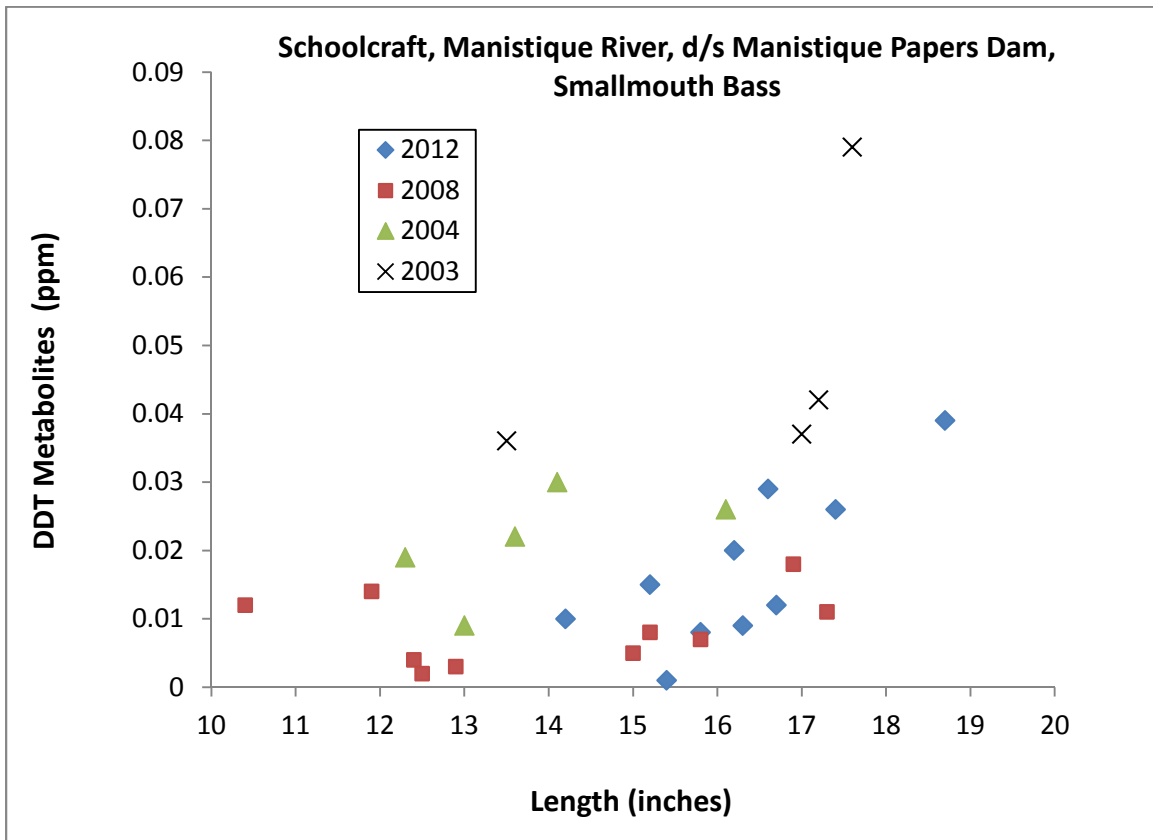
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	29	10.4	14	13.5	18.7
Datasets available: 2003, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	22	0.13	0.026	0.36	0.17	1
DDT	22	0.02	0.001	0.08	0.03	16
Chlordane	22	0.01	0.001	0.02	0.01	--
Toxaphene	22	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.039	0.053				
DDT	0.206	0.167				
Chlordane	0.186	0.189				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing MDCH Advisory: No one should eat more than 1 meal per month of largemouth or smallmouth bass from the Manistique River downstream of Manistique Papers dam due to elevated concentrations of PCBs. Mercury would cause an advisory.

Recommendation: No change.





Walleye

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	2012	45	12.7	15	14.9	28.4
Datasets available: 1986, 2003, 2004, 2007, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	37	0.38	0.07	0.96	0.44	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.685	0.723				

Organics Analysis:

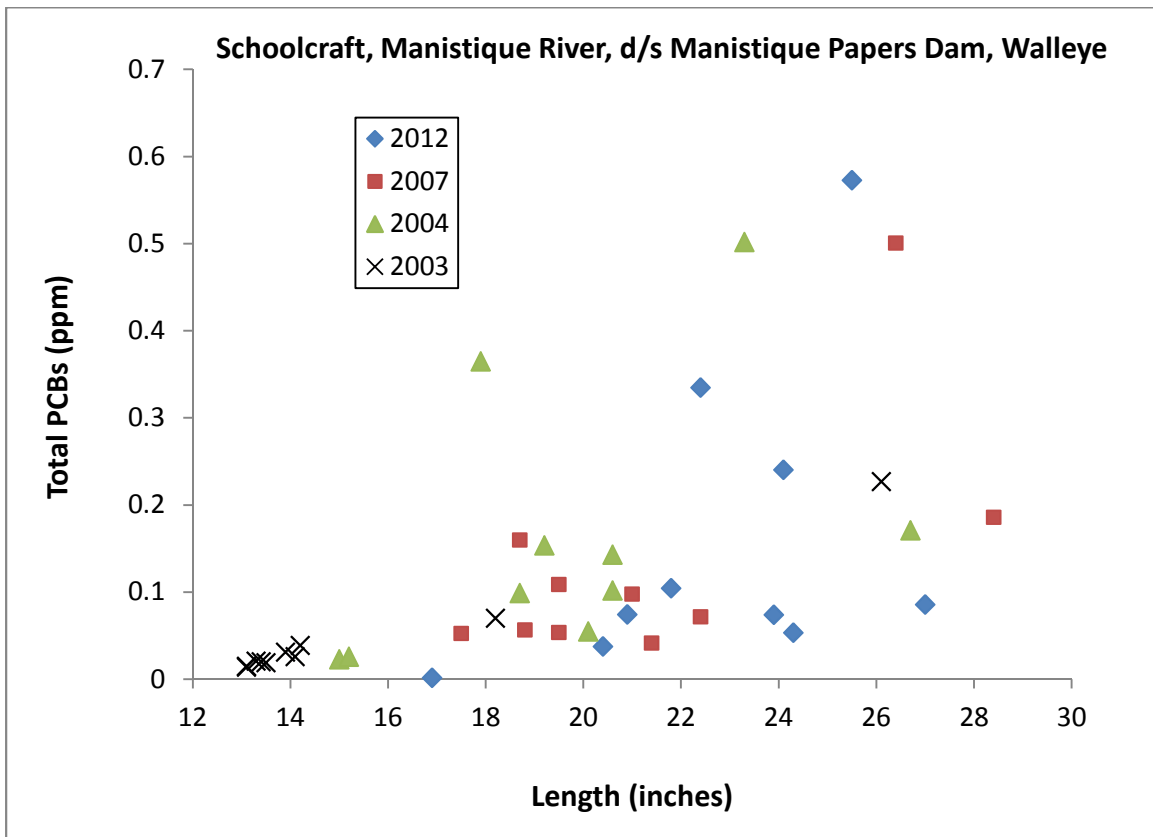
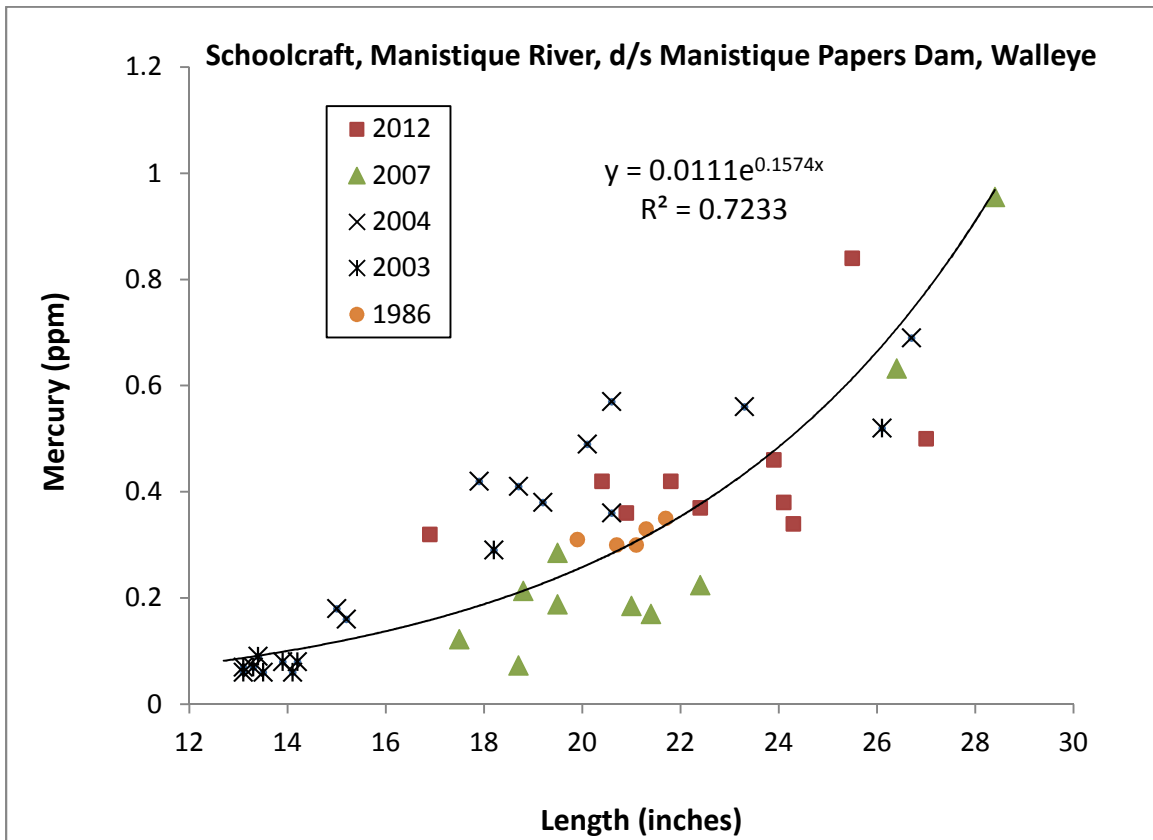
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	40	13.1	15	15	28.4
Datasets available: 1984, 1985, 1986, 2003, 2004, 2007, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	32	0.152	0.002	0.57	0.21	1
DDT	32	0.048	0.001	0.20	0.07	16
Chlordane	32	0.013	0.001	0.06	0.02	--
Toxaphene	32	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.319	0.488				
DDT	0.227	0.357				
Chlordane	0.293	0.551				
Toxaphene	--	--				
Final meal category based on UCL:						1

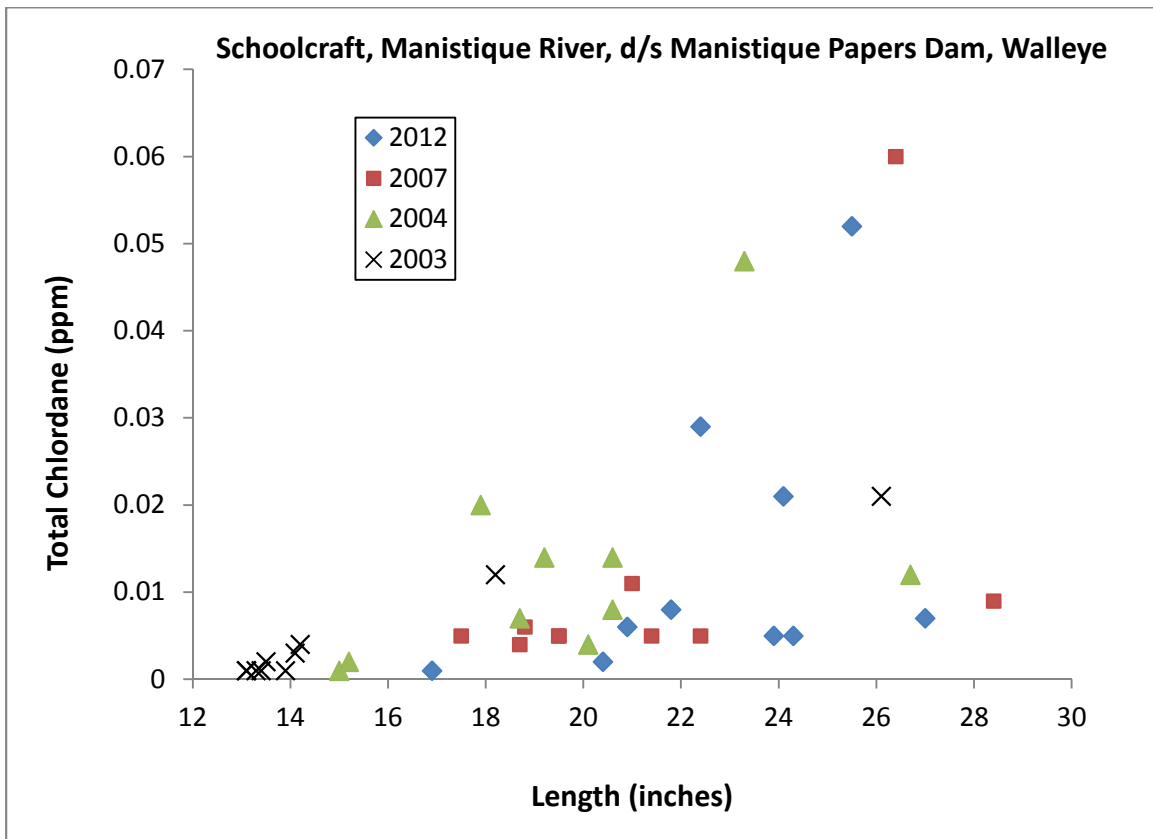
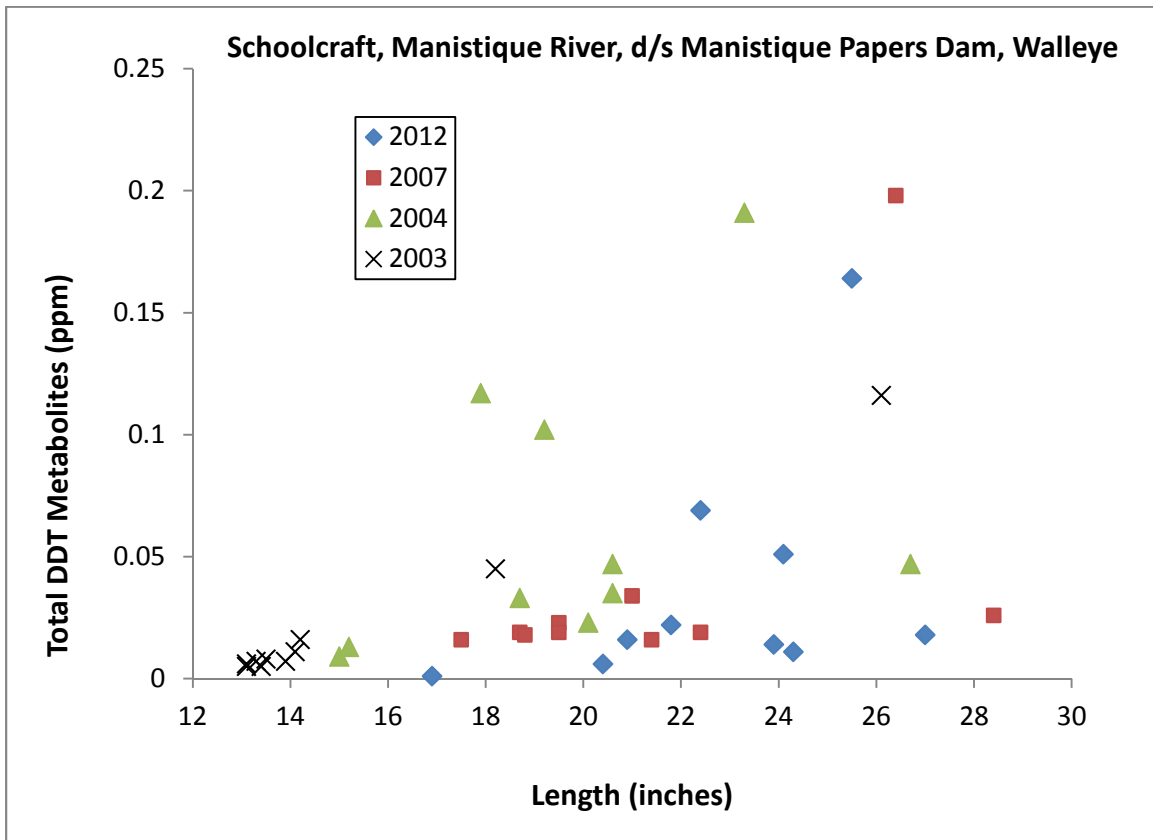
Existing MDCH Advisory: No one should eat more than 2 meals per month of walleye less than 20 inches due to mercury and PCBs and no more than 6 meals per year of walleye larger than 20 inches due to elevated levels of PCBs. Mercury would cause an advisory.

Recommendation: No one should eat more than 1 meal per month of walleye due to elevated levels of PCBs. Mercury would cause an advisory.

Note: Evaluating PCBs for only 2007 & 2012 did not improve regression equation or lead to relaxed PCB advice.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.1	8
16	0.14	4
18	0.19	4
20	0.26	4
22	0.35	2
24	0.49	2
26	0.66	1
28	0.91	1
30	1.25	0.5
<i>Shaded area denotes extrapolated estimates</i>		





Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.

Bluegill & Pumpkinseed
Hg Analysis:

Au Sable River
Oscoda

Iosco County

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	4	4.4	na	4.4	6.5
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.10	0.06	0.15	0.17	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.410	0.516				

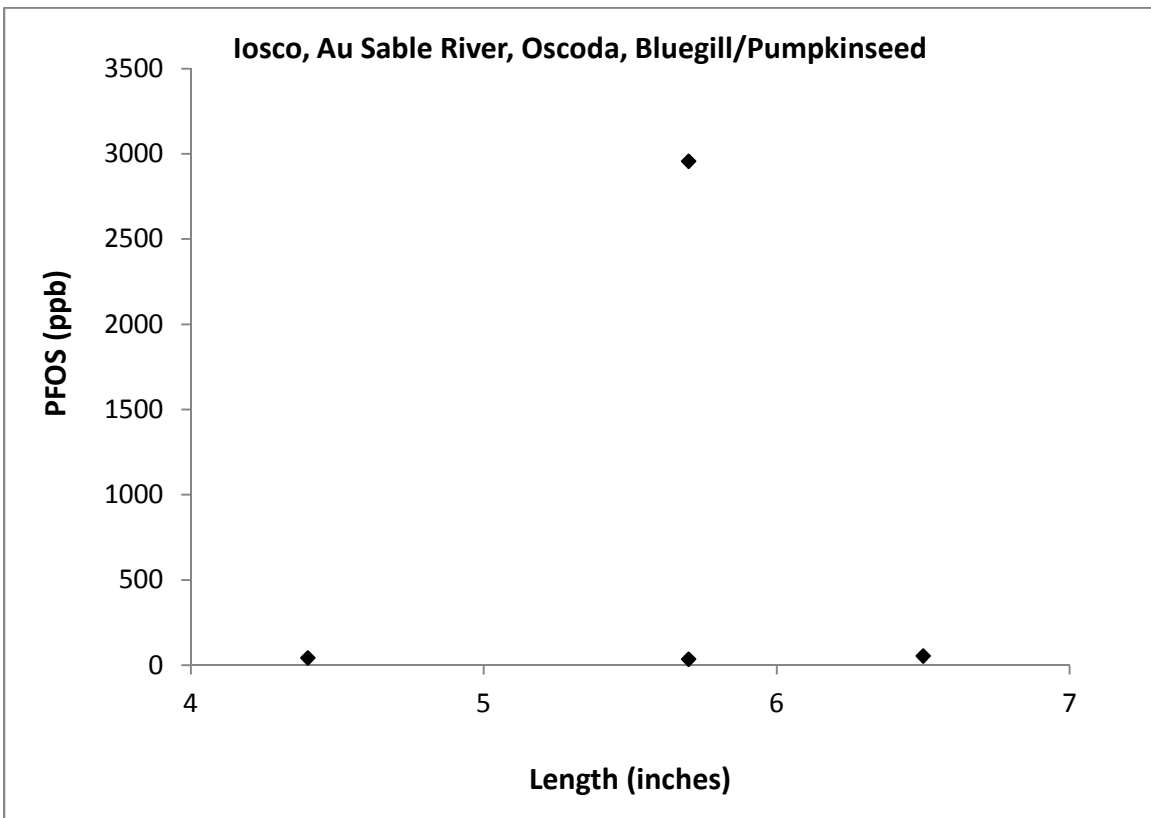
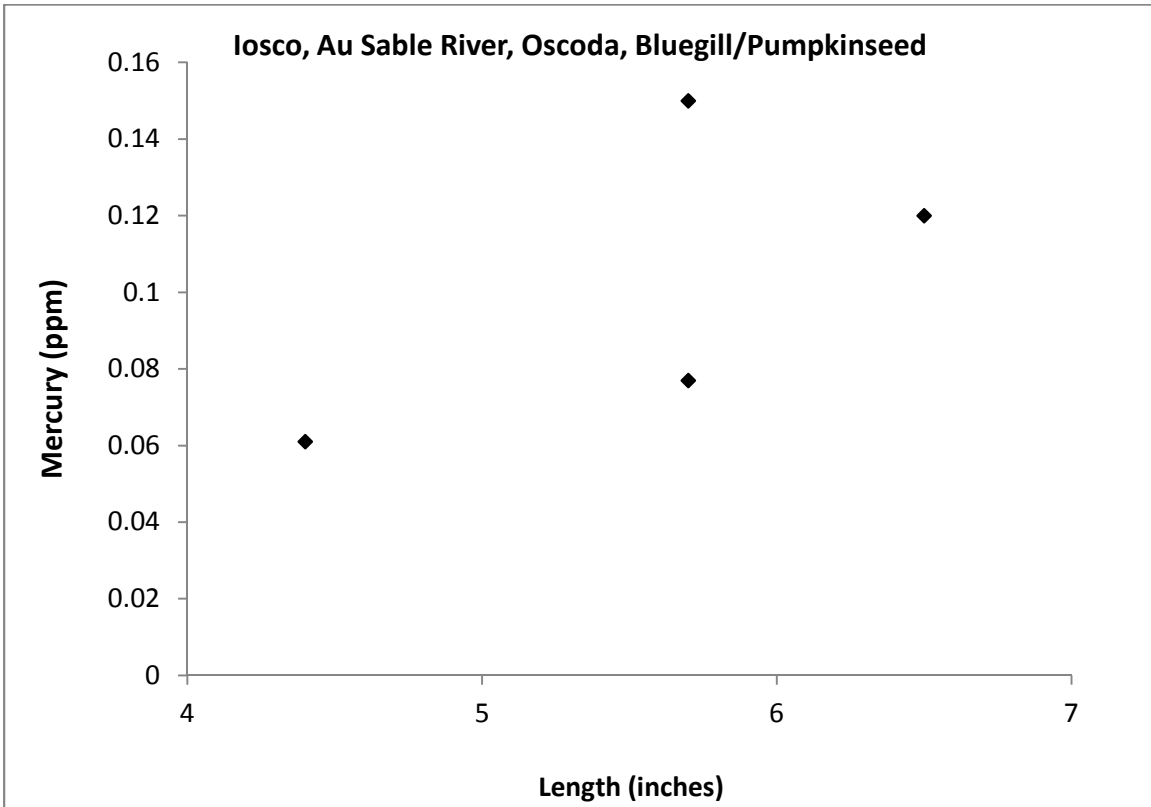
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	4	4.4	na	4.4	6.5
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	4	771 ppb	35 ppb	2956 ppb	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.010	0.018				
Final meal category based on UCL:						--

Current Advice: MDCH recommends that no one eat non-migratory species of fish (including bluegill/pumpkinseed) from the Au Sable River downstream of Foote Dam due to high concentrations of PFOS.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The current do not eat advice should remain until sufficient additional samples are analyzed and PFOS remediation activities are implemented.

Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.



Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.

Rock Bass

**Au Sable River
Oscoda**

Iosco County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	8	5.3	na	5.3	8.7
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	0.15	0.07	0.23	0.18	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.403	0.593				

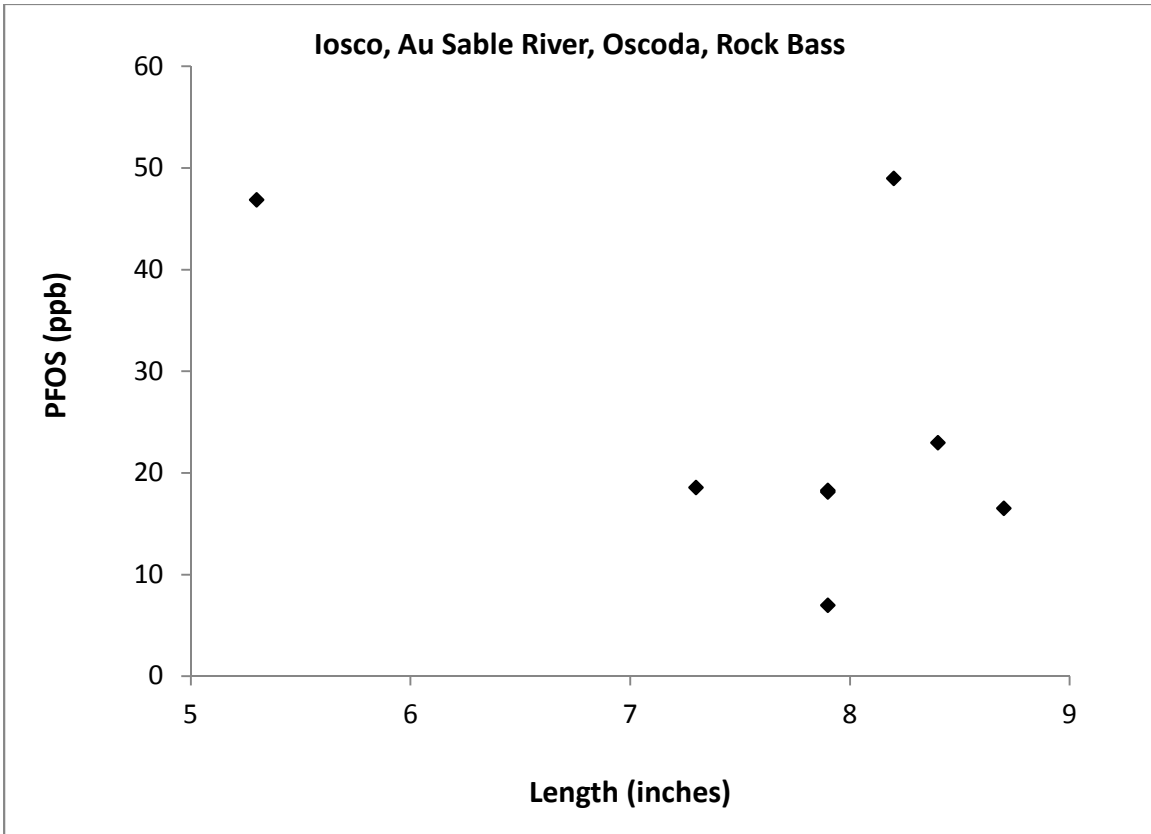
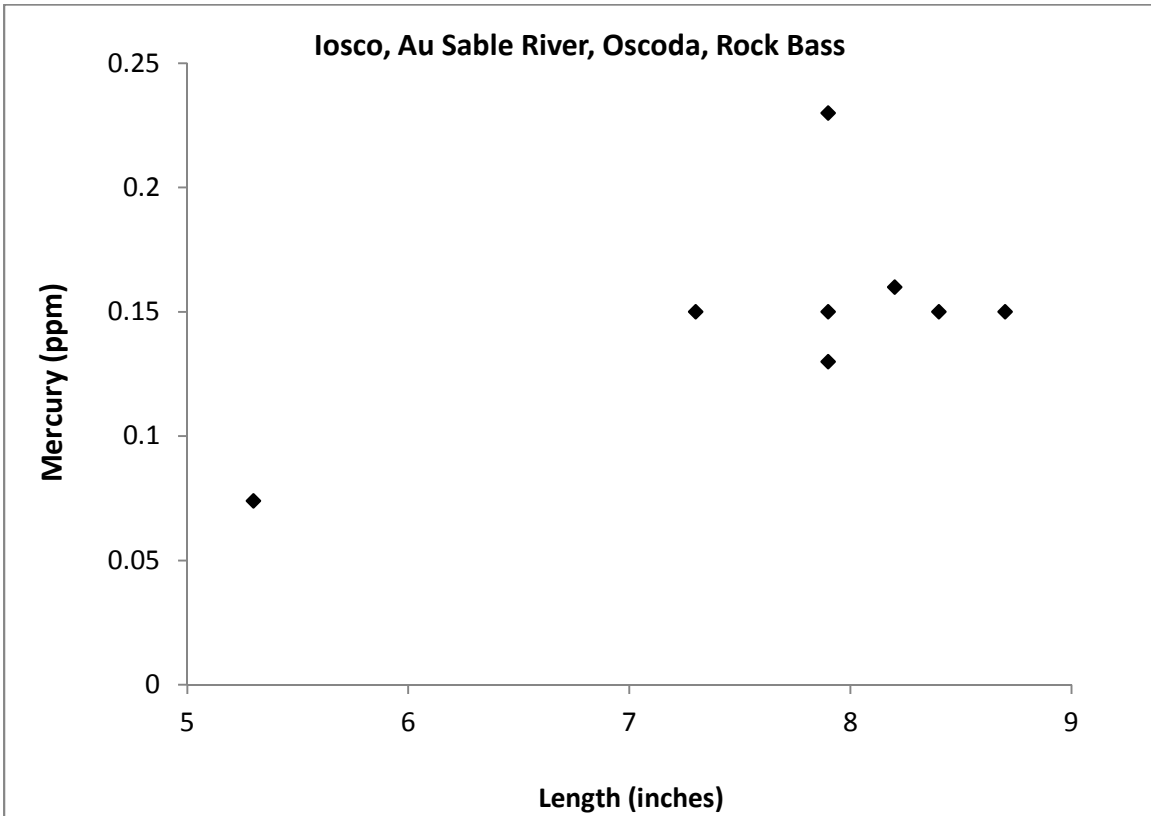
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	8	5.3	na	5.3	8.7
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	8	24.7 ppb	7 ppb	49 ppb	37 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.237	0.173				
Final meal category based on UCL:						4

Current Advice: MDCH recommends that no one eat non-migratory species of fish (including rock bass) from the Au Sable River downstream of Foote Dam due to high concentrations of PFOS.

Recommendation: The do not eat recommendation for non-migratory fish should be retained pending additional sampling and implementation of PFOS remediation activities. Results for sunfish collected from the Au Sable River at Oscoda indicate PFOS concentrations in all species have not been adequately characterized (see pumpkinseed/bluegill data summary).

Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.



Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.

Smallmouth Bass

**Au Sable River
Oscoda**

Iosco County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2011	2012	20	12.3	14	13.5	18.3
Datasets available: 2011, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	15	0.23	0.13	0.50	0.29	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.341	0.370				

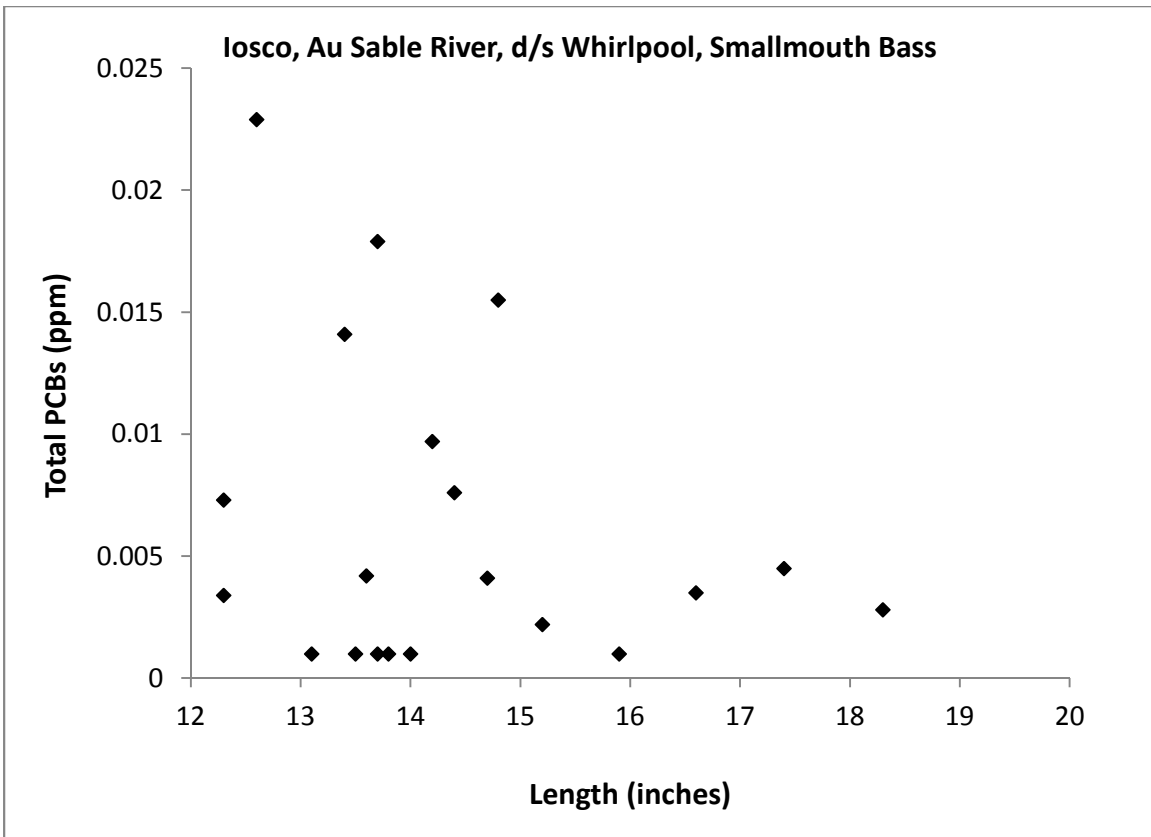
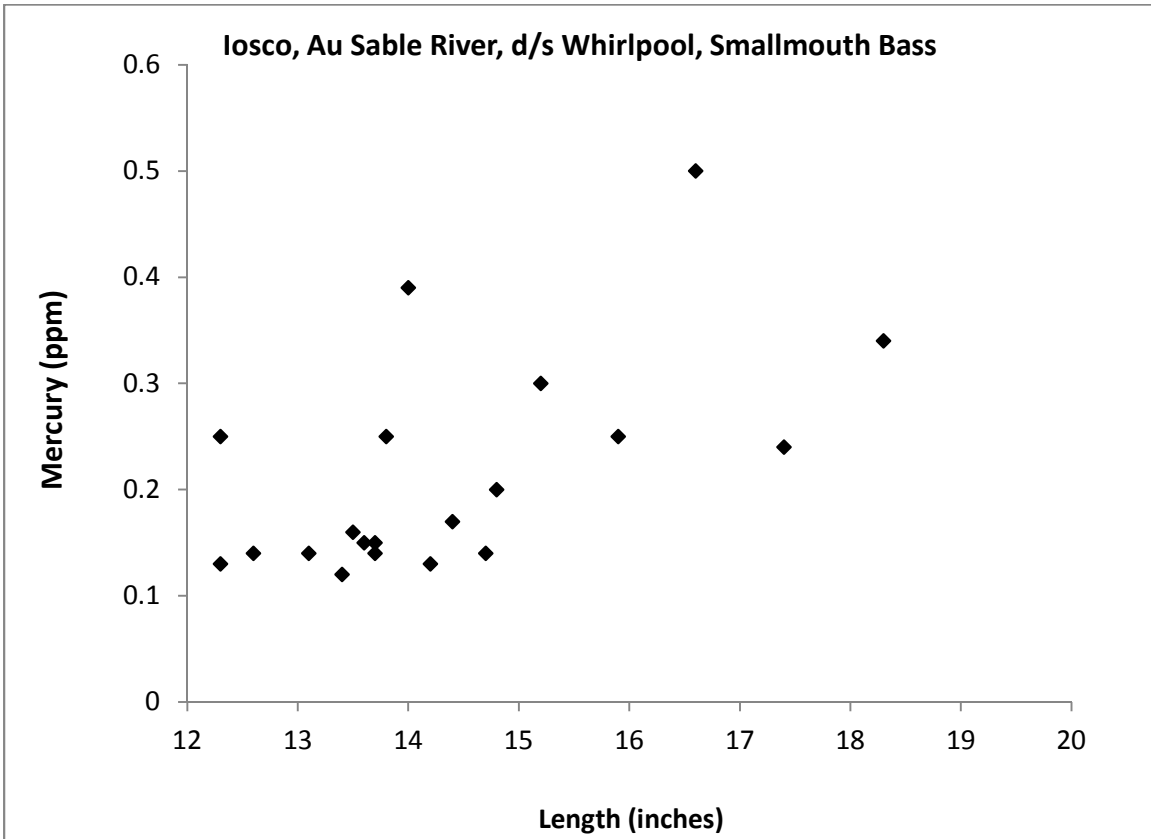
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2011	2012	20	12.3	14	13.5	18.3
Datasets available: 2011, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.005	0.001	0.0179	0.010	16
DDT	15	0.002	0.001	0.003	0.000	16
Chlordane	15	ND	--	--	--	--
Toxaphene	15	ND	--	--	--	--
PFOS	15	97.5 ppb	19.0 ppb	424 ppb	157 ppb	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.072	0.019				
DDT	0.003	0.012				
Chlordane	0.241	0.241				
Toxaphene	--	--				
PFOS	0.302	0.284				
Final meal category based on UCL:						0.5

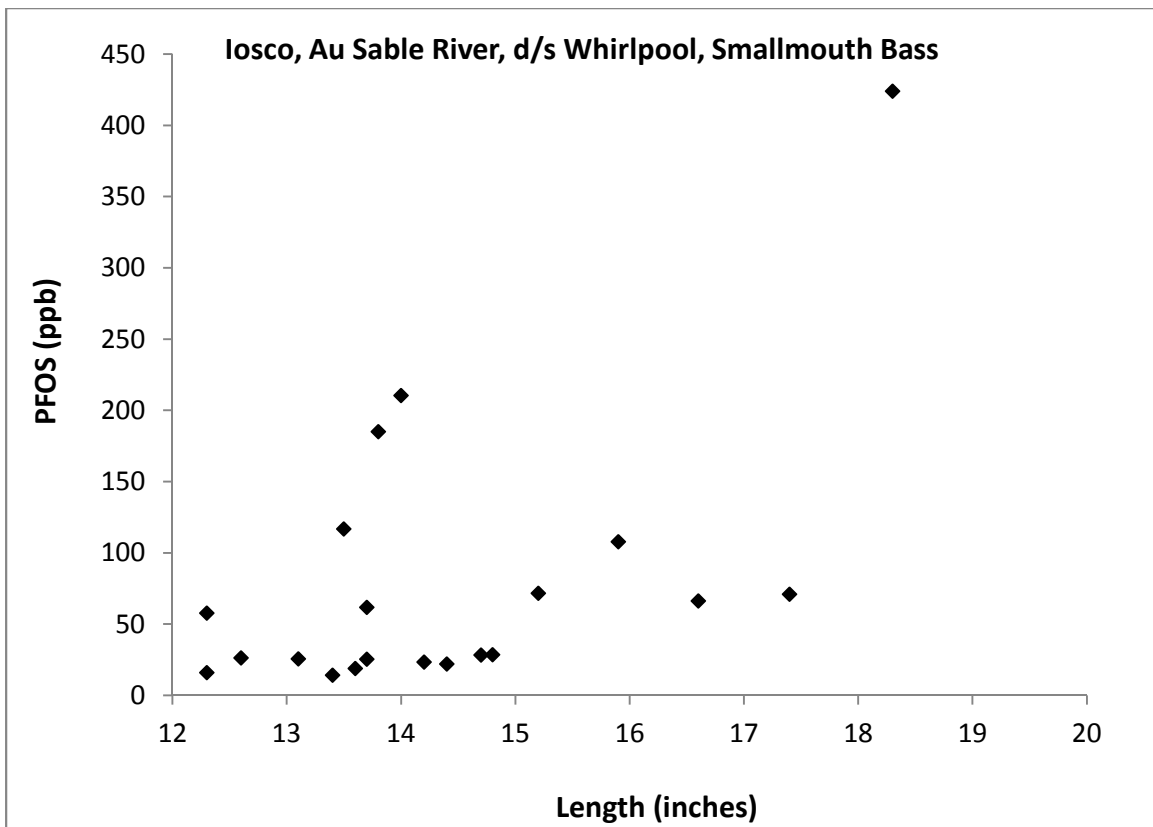
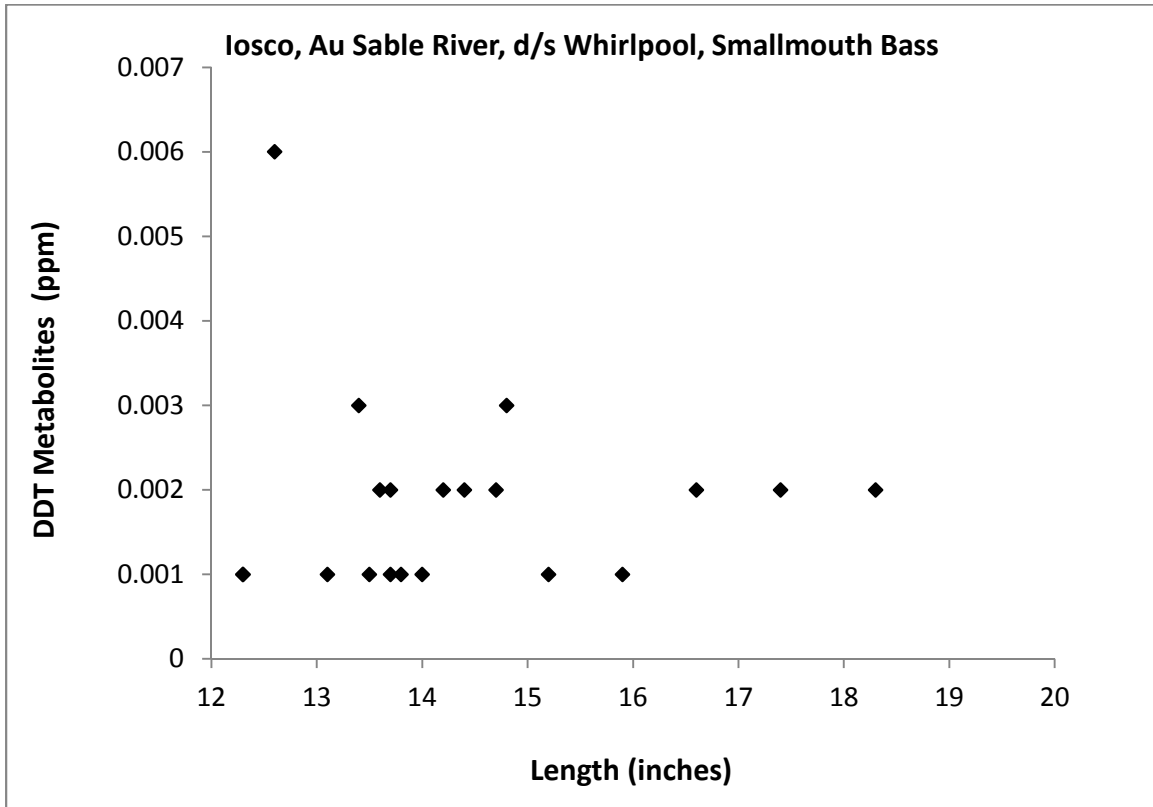
Current Advice: MDCH recommends that no one eat non-migratory species of fish (including smallmouth bass) from the Au Sable River downstream of Foote Dam due to high concentrations of PFOS.

Recommendation: The do not eat recommendation for non-migratory fish should be retained pending additional sampling and implementation of PFOS remediation activities. Results for sunfish collected from the Au Sable River at Oscoda indicate PFOS concentrations in all species have not been adequately characterized (see pumpkinseed/bluegill data summary).

Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.



Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.



Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.

Lake Trout

Higgins Lake

Roscommon County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1995	2011	27	20.1	15	20.1	37.6	
Datasets available: 1988, 1995, 1998, 2011							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	27	0.33		0.14	0.85	0.41	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.588	0.610					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1998	2011	20	20.1	15	20.1	37.6	
Datasets available: 1988, 1998, 2011							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.45		0.016	3.81	0.85	Limited
DDT	20	0.81		0.03	8.47	1.69	1
Chlordane	20	0.14		0.01	0.88	0.24	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.192	0.658					
DDT	0.138	0.680					
Chlordane	0.347	0.771					
Toxaphene	--	--					
Final meal category based on UCL:							Limited

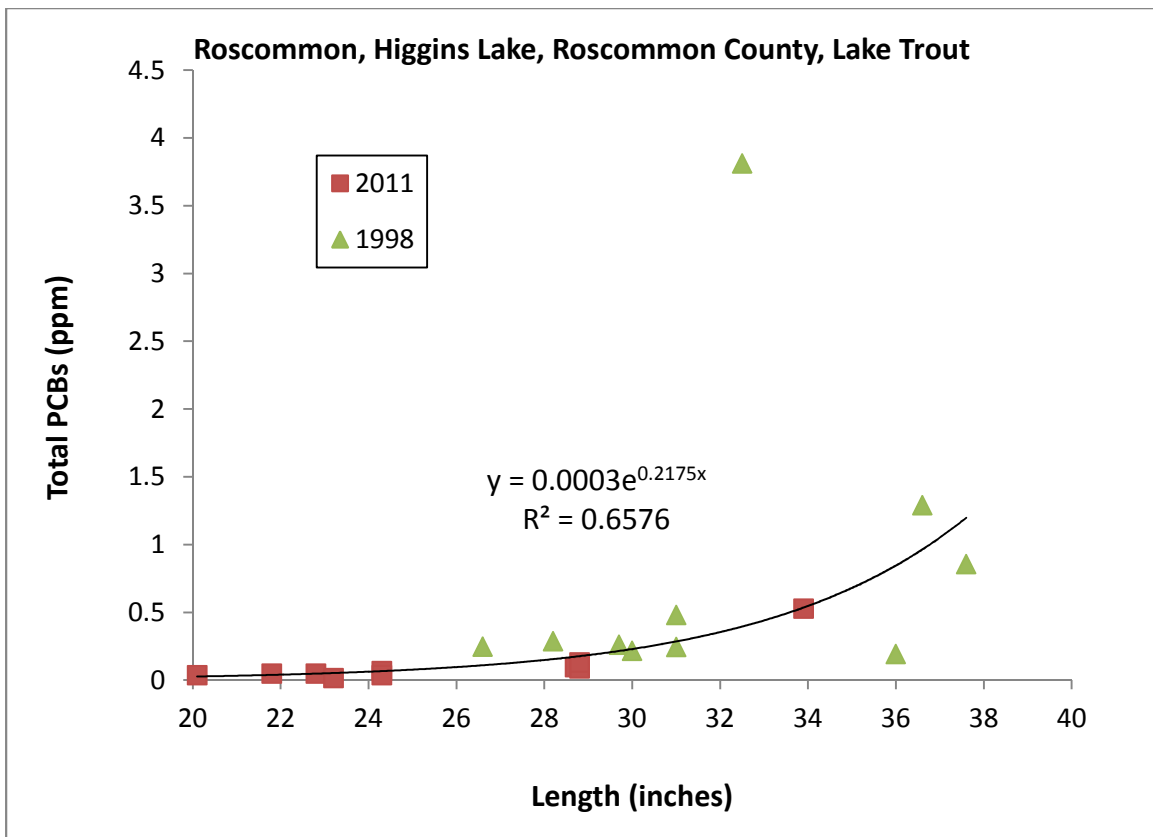
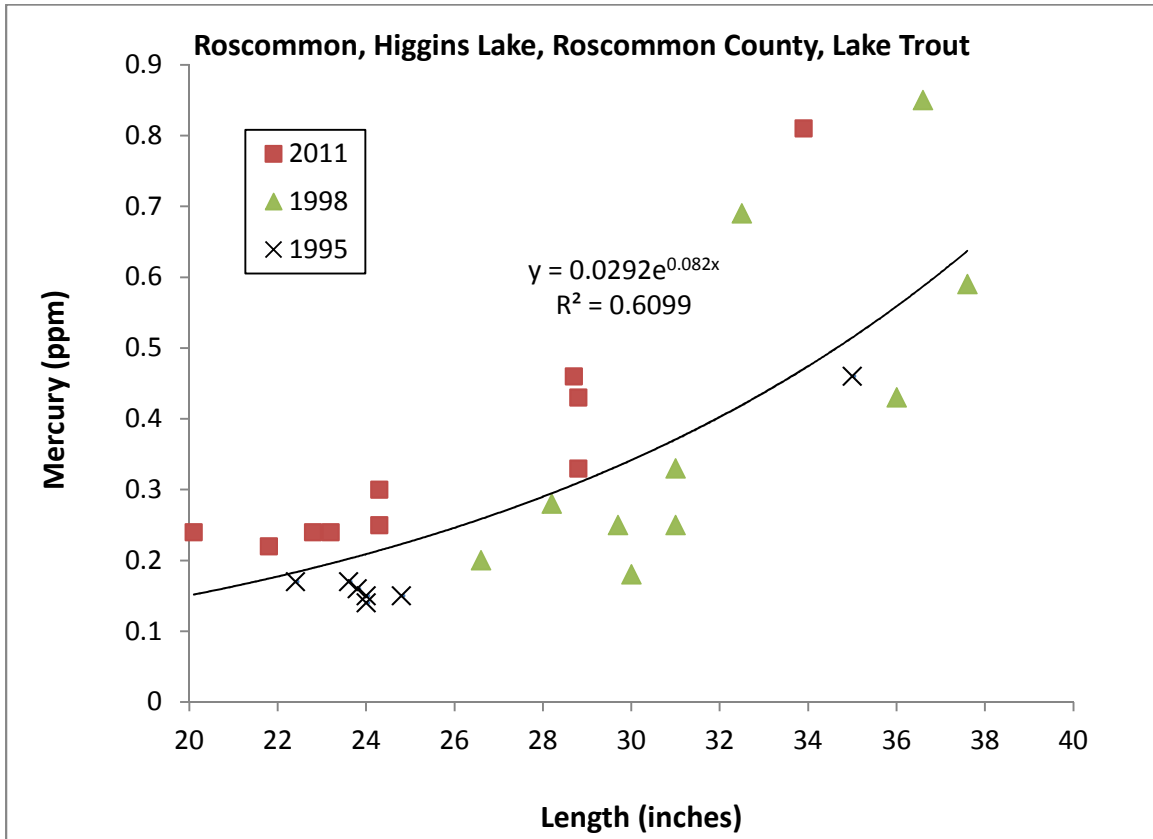
Existing MDCH Advisory: Sensitive populations should not eat these fish. Healthy adults should not eat more than 1 or 2 meals per year of Higgins Lake lake trout due to PCBs.

Recommendation: No one should eat more than 4 meals per month of Higgins Lake lake trout smaller than 22 inches due to mercury, or more than 1 meal per month of those fish between 22 and 30 inches due to PCBs. Sensitive populations should not eat Higgins Lake lake trout larger than 30 inches while healthy adults should not eat more than 1 or 2 meals per year of those fish. DDT would cause an advisory.

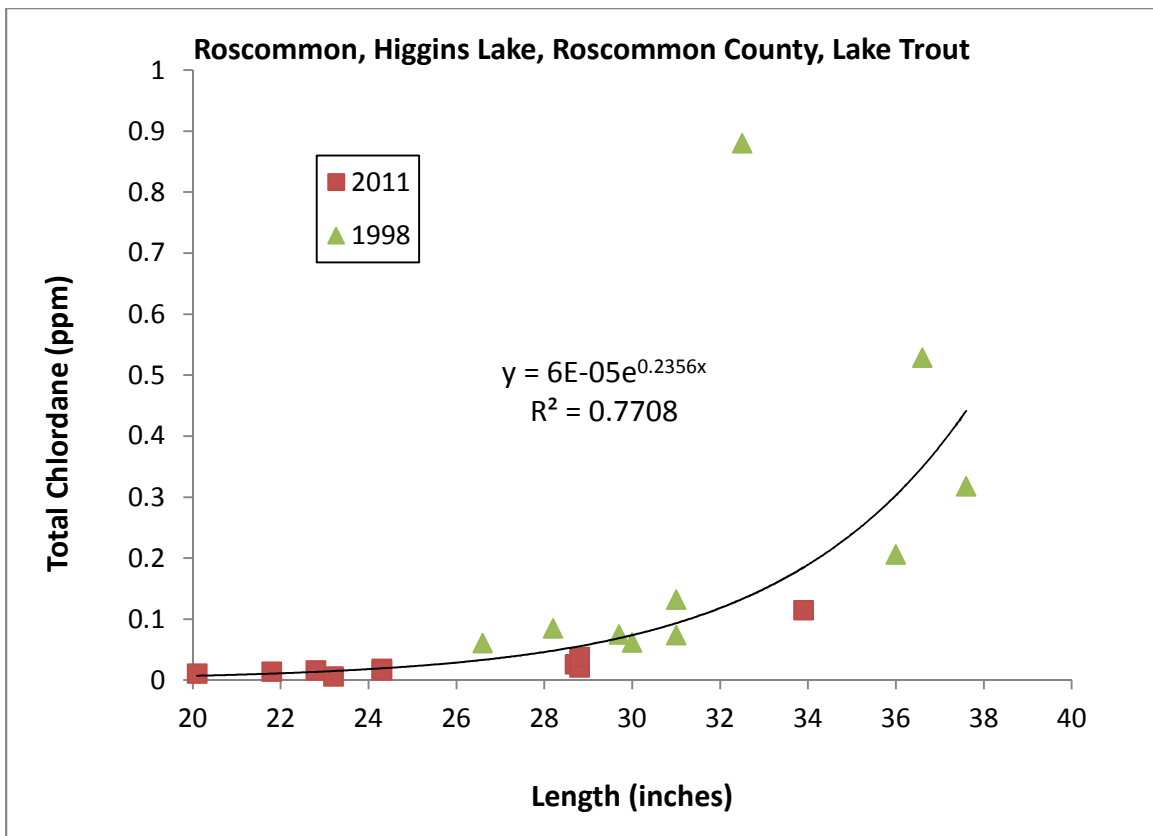
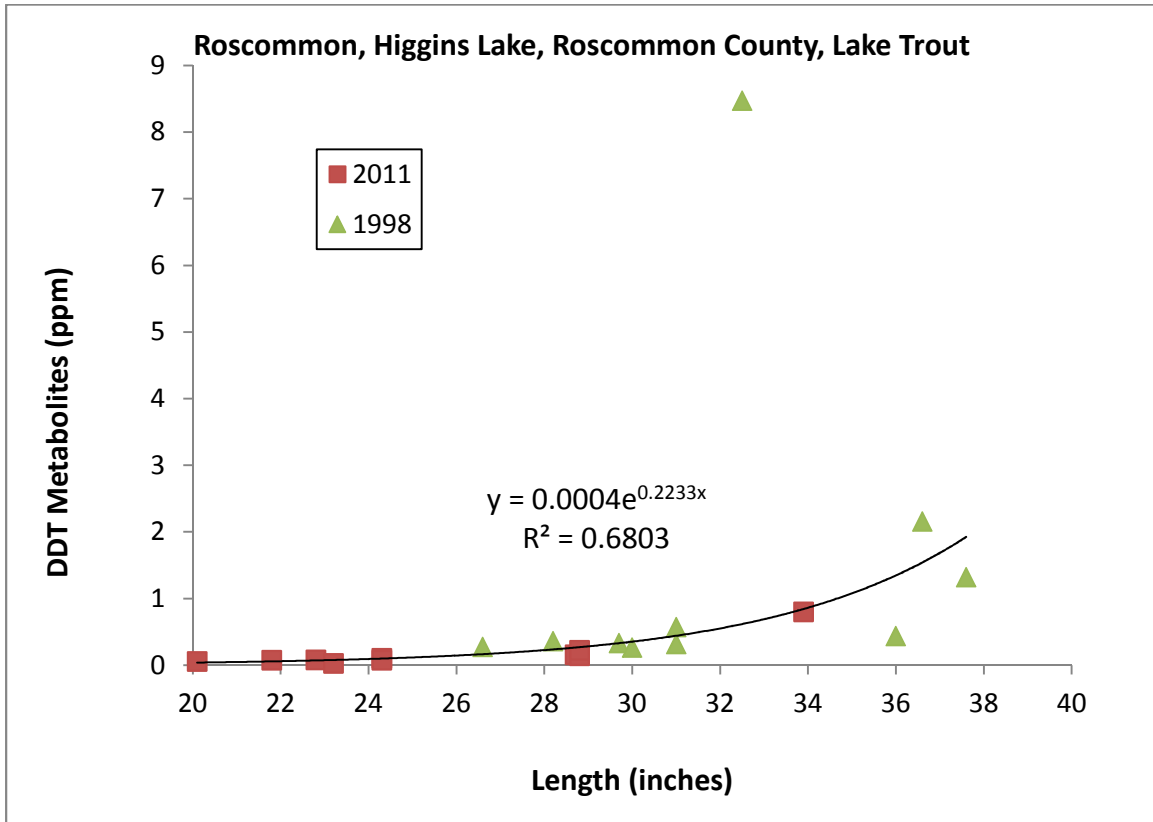
Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category	PCB Regression Equation Estimate (ppm)	Meal Category	DDT Regression Equation Estimate (ppm)	Meal Category
16	0.11	8	0.01	16	0.01	16
18	0.13	8	0.02	12	0.02	16
20	0.15	4	0.02	12	0.03	16
22	0.18	4	0.04	4	0.05	16
24	0.21	4	0.06	2	0.09	16
26	0.25	4	0.09	2	0.13	12
28	0.29	2	0.13	1	0.21	8
30	0.34	2	0.2	1	0.32	4
32	0.4	2	0.32	0.5	0.51	2
34	0.47	2	0.49	Limited	0.79	2
36	0.56	1	0.75	Limited	1.24	1
<i>Shaded area denotes extrapolated estimates</i>						

Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.



Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.



Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.

Pumpkinseed

Van Etten Lake

Iosco County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

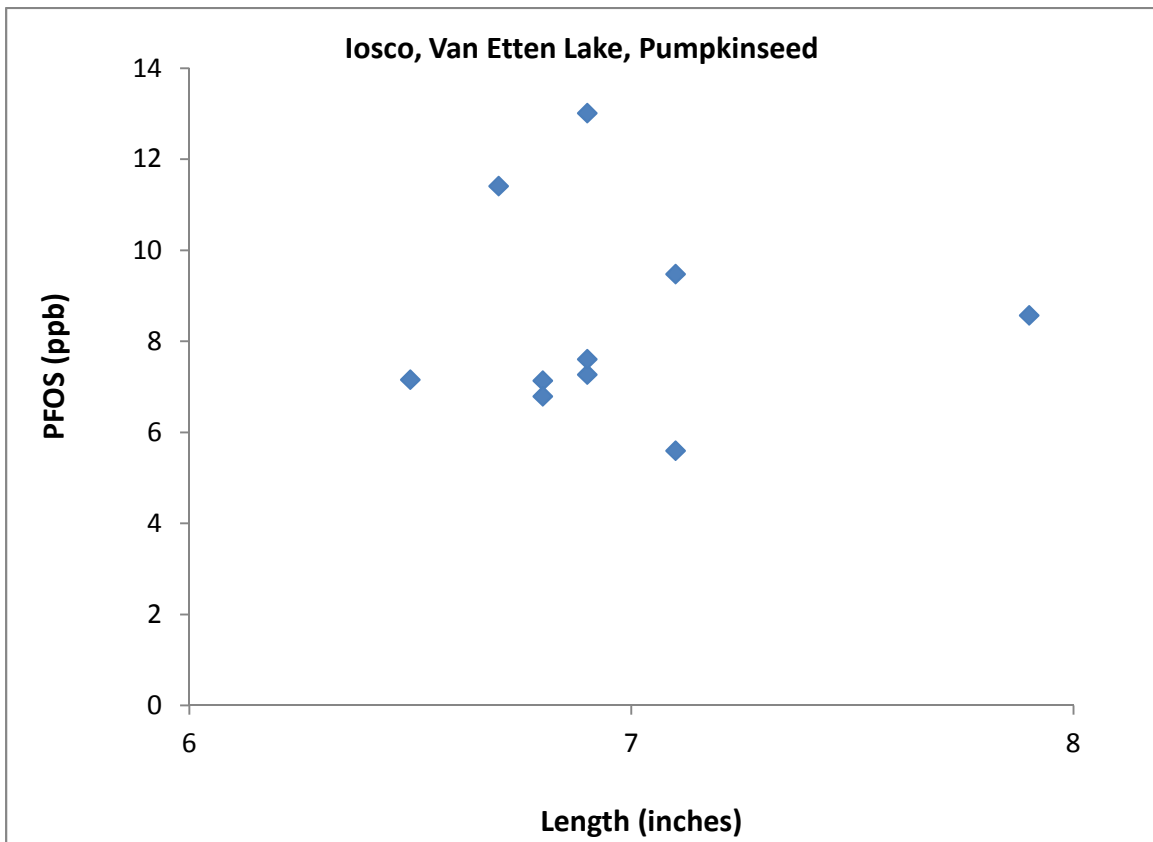
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.5	na	6.5	7.9
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	10	8.4 ppb	5.6 ppb	13.0 ppb	10.0 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.000	0.001				
Final meal category based on UCL:						12

Current Advice: The statewide consumption guidelines recommend that no one eat more than 8 meals per month of sunfish from inland waters due to mercury.

Recommendation: No change because the Statewide Guidelines apply. PFOS would cause an advisory.

Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.



Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.

Rock Bass

Van Etten Lake

Iosco County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	--	--	--	--	--	--
Selenium	--	--	--	--	--	--
Chemical	Linear Regression R ²	Exponential Regression R ²				
Mercury	--	--				

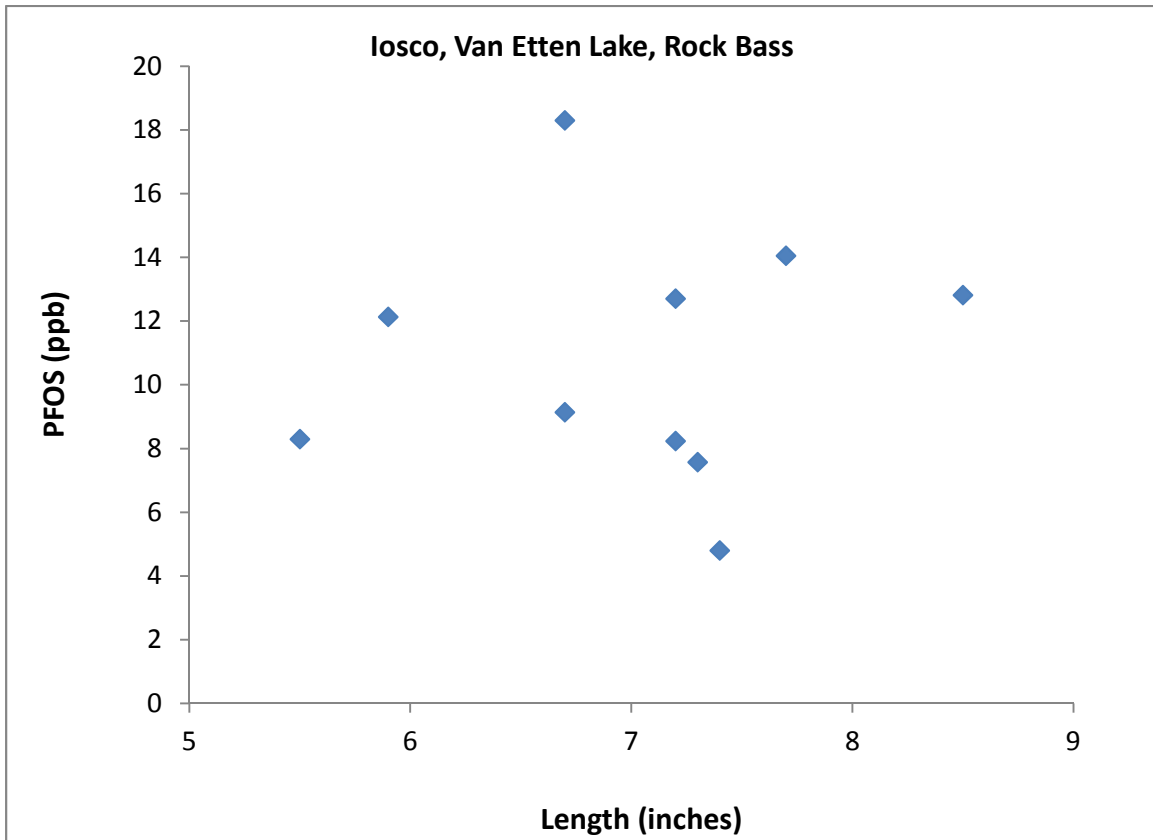
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	5.5	na	5.5	8.5
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	10	10.8 ppb	4.8 ppb	18.3 ppb	13.6 ppb	8
Chemical	Linear Regression R ²	Exponential Regression R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.006	0.003	Final meal category based on UCL:			8

Current Advice: The statewide consumption guidelines recommend that no one eat more than 4 meals per month of rock bass from inland waters.

Recommendation: No change because the Statewide Guidelines apply. PFOS would cause an advisory.

Appendix D2. Eat Safe Fish guidance, 2015 update recommendations, Northeast Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Largemouth Bass

Thornapple Lake

Barry County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2011	20	13.6	14	13.6	17.1
Datasets available: 1993, 2006, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.52	0.29	0.80	0.60	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.614	0.581				

Organics Analysis:

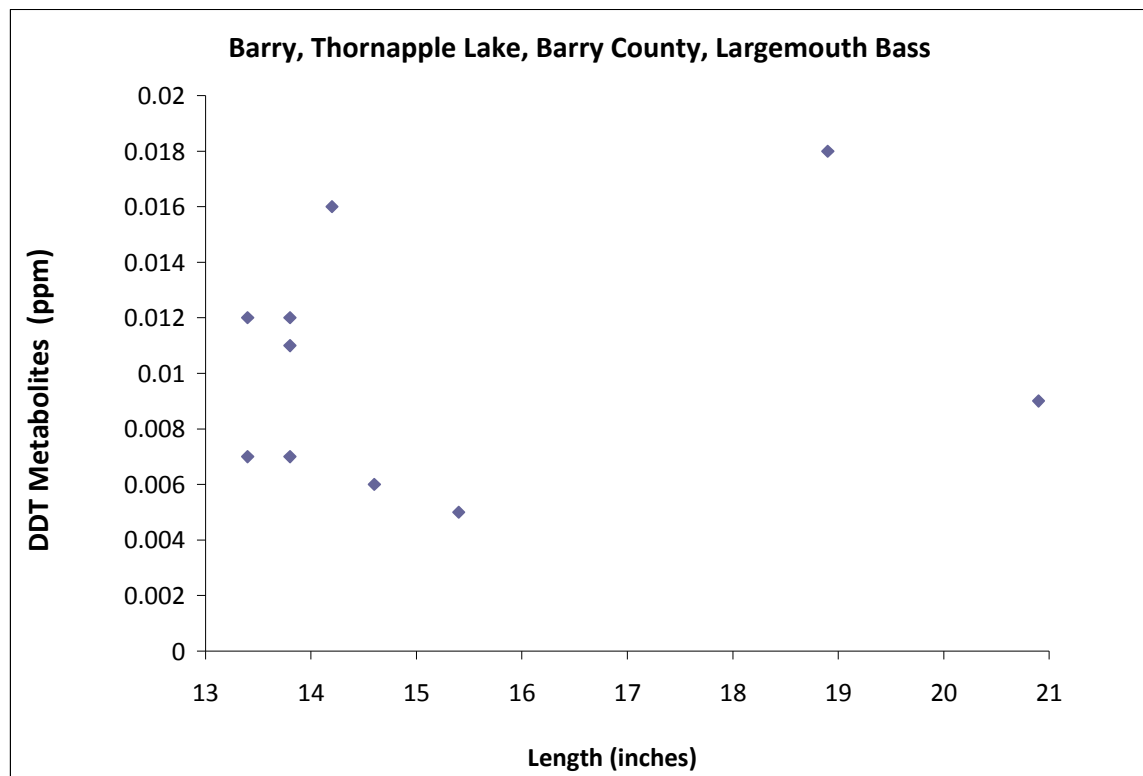
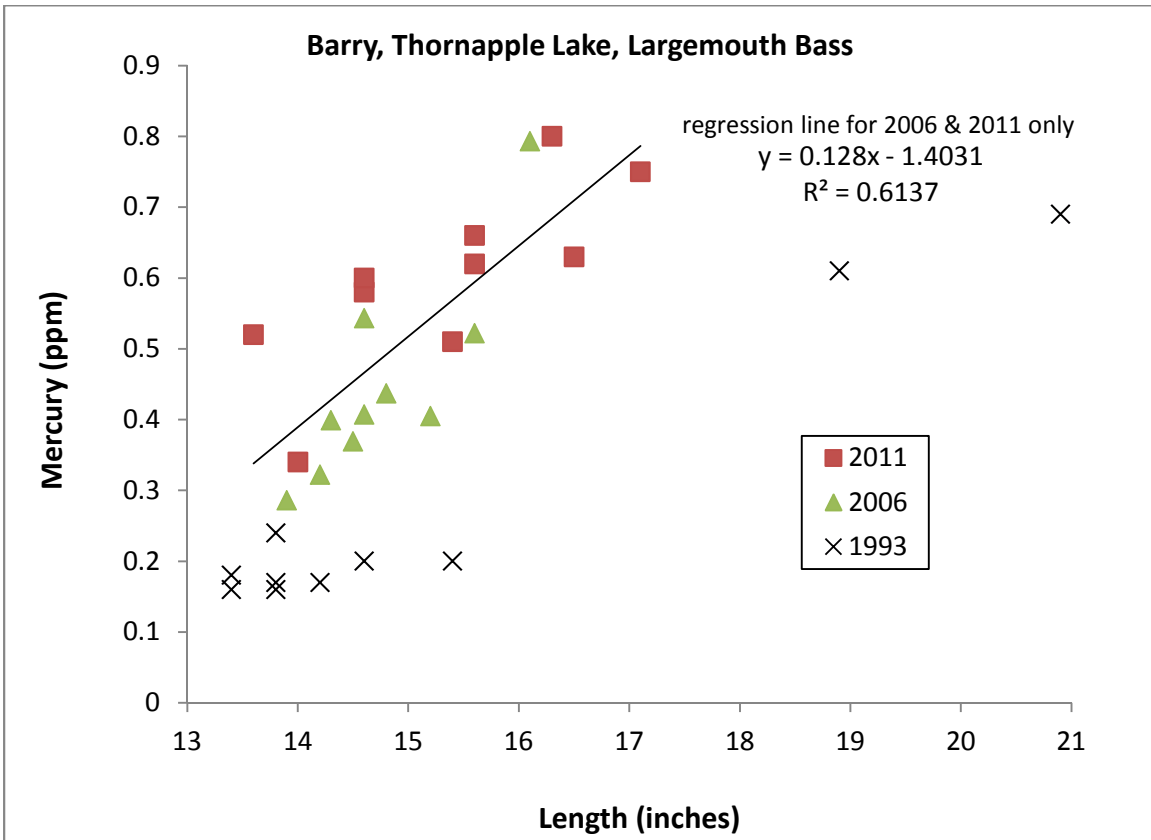
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1993	1993	20	13.4	14	13.8	20.9
Datasets available: 1993						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	8	ND	--	--	--	--
DDT	8	0.01	0.01	0.02	0.01	16
Chlordane	8	ND	--	--	--	--
Toxaphene	8	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.044	0.030				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing MDCH Advisory: No one should eat more than 2 meals per month of Thornapple Lake largemouth bass or smallmouth bass less than 18 inches or 1 meal per month of those greater than 18 inches due to mercury. Statewide length break applied due to limited sample size greater than 18 inches.

Recommendation: No one should eat more than 1 meal per month of Thornapple Lake largemouth bass or smallmouth bass less than 18 inches or 6 meals per year of those greater than 18 inches due to mercury. Statewide length break applied due to limited sample size greater than 18 inches.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.39	2
16	0.64	1
18	0.9	1
20	1.16	0.5
22	1.41	0.5
24	1.67	0.5
<i>Shaded area denotes extrapolated estimates</i>		

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Carp

Ruddiman Creek Lagoon

Muskegon County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	20	14.6	na	14.6	32.5
Datasets available: 2001, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.09	0.03	0.26	0.12	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.538	0.584				

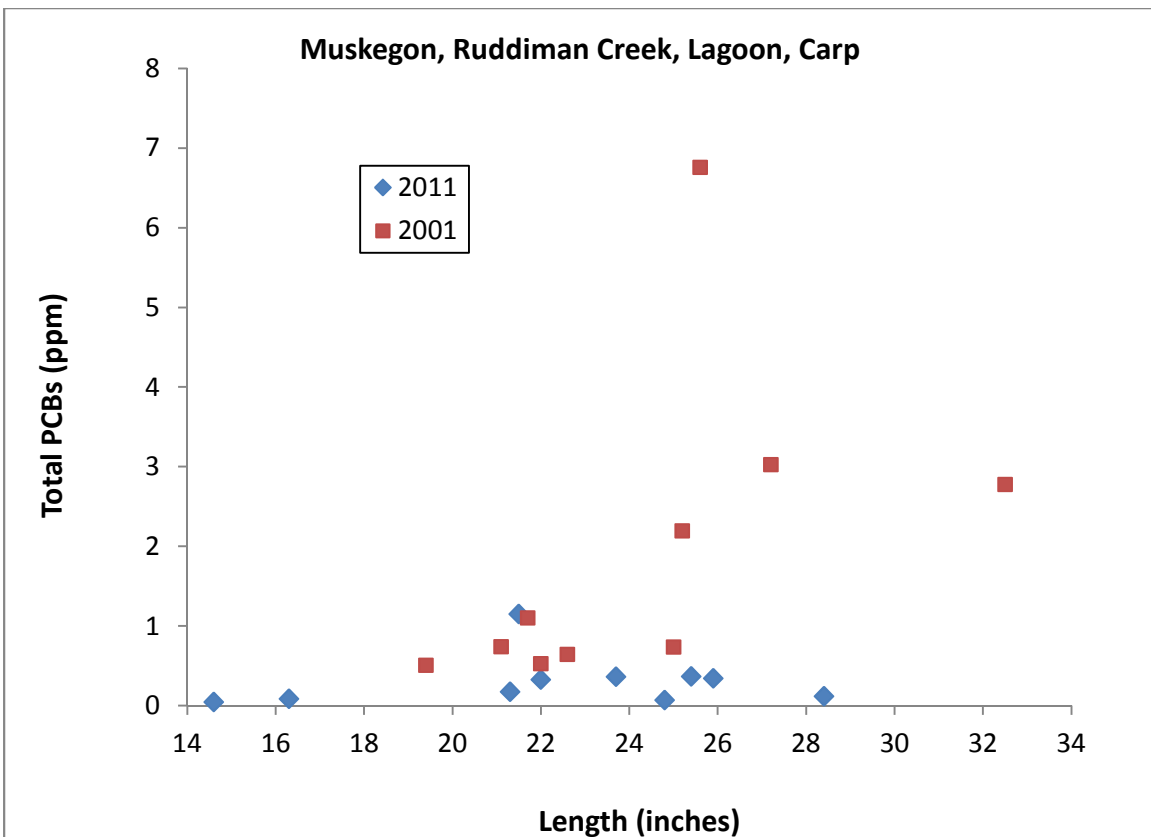
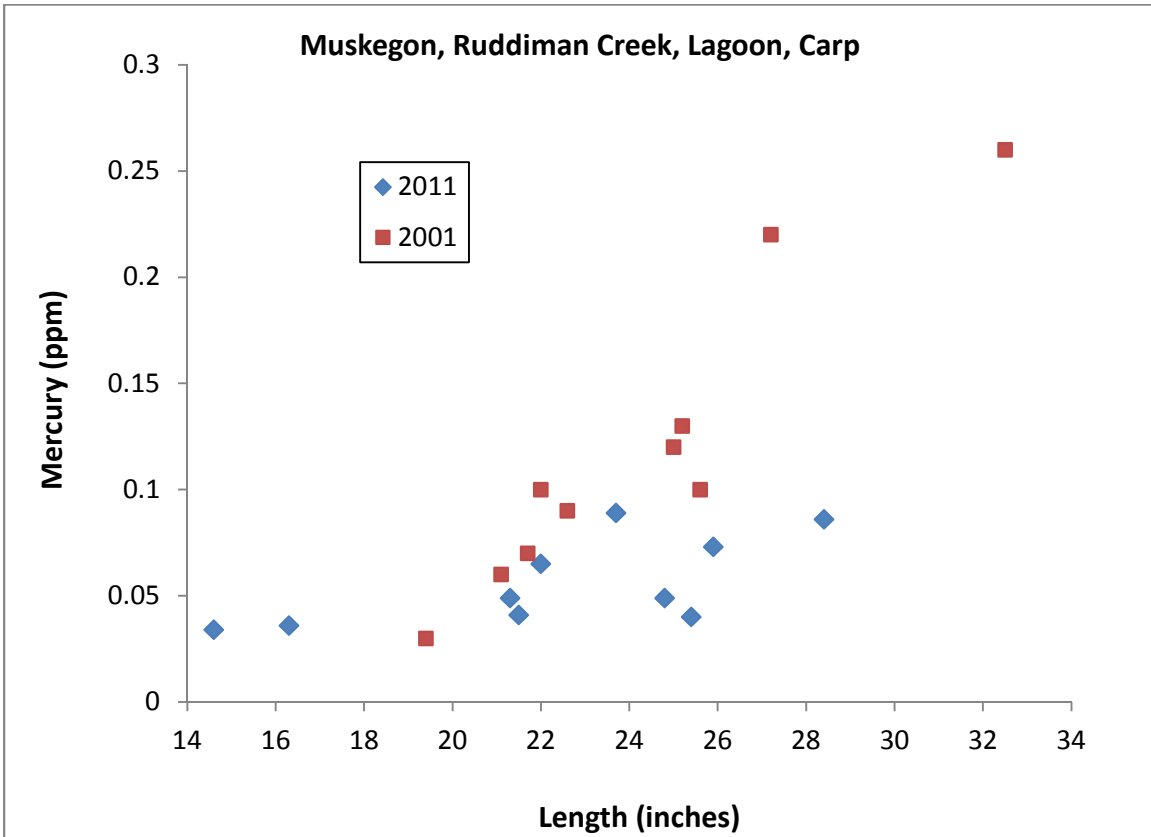
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	20	14.6	na	14.6	32.5
Datasets available: 2001, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	1.105	0.049	6.76	1.85	Limited
DDT	20	0.243	0.002	1.41	0.42	4
Chlordane	20	0.095	0.001	0.46	0.15	--
Toxaphene	20	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.169	0.261				
DDT	0.198	0.230				
Chlordane	0.149	0.212				
Toxaphene	--	--				
Final meal category based on UCL:						Limited

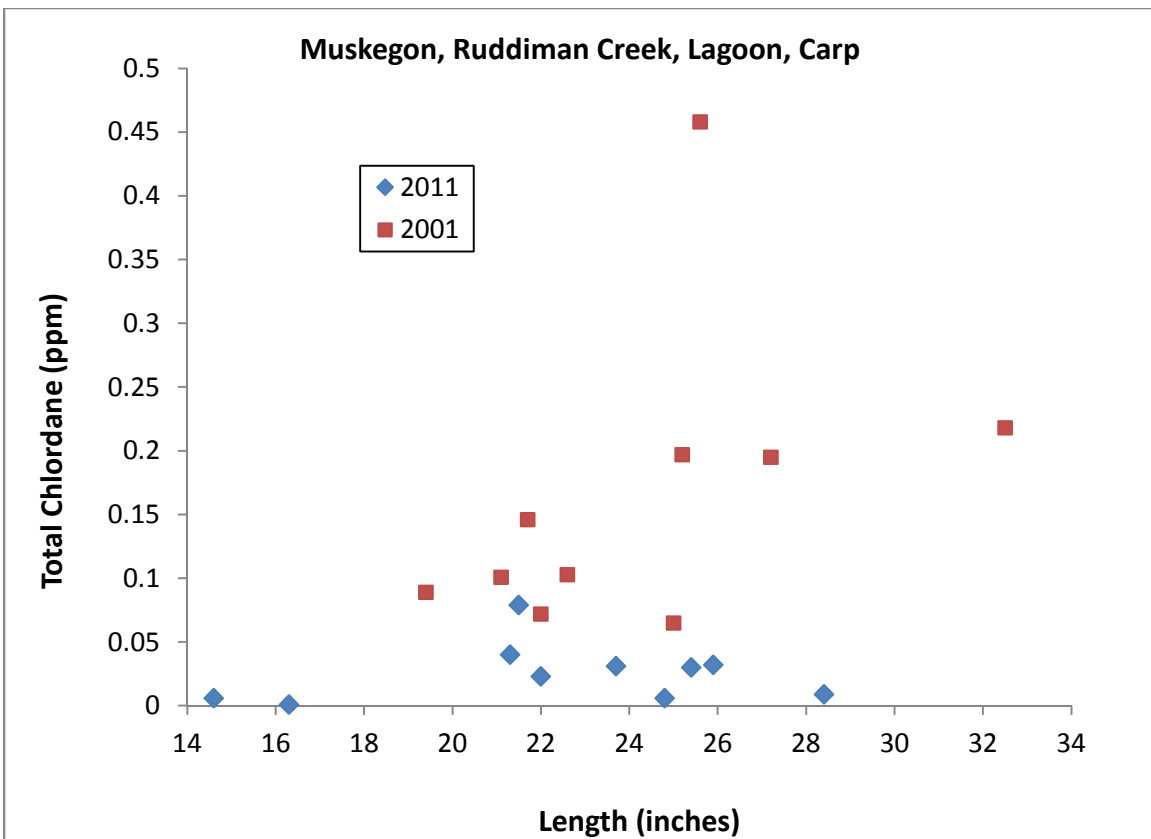
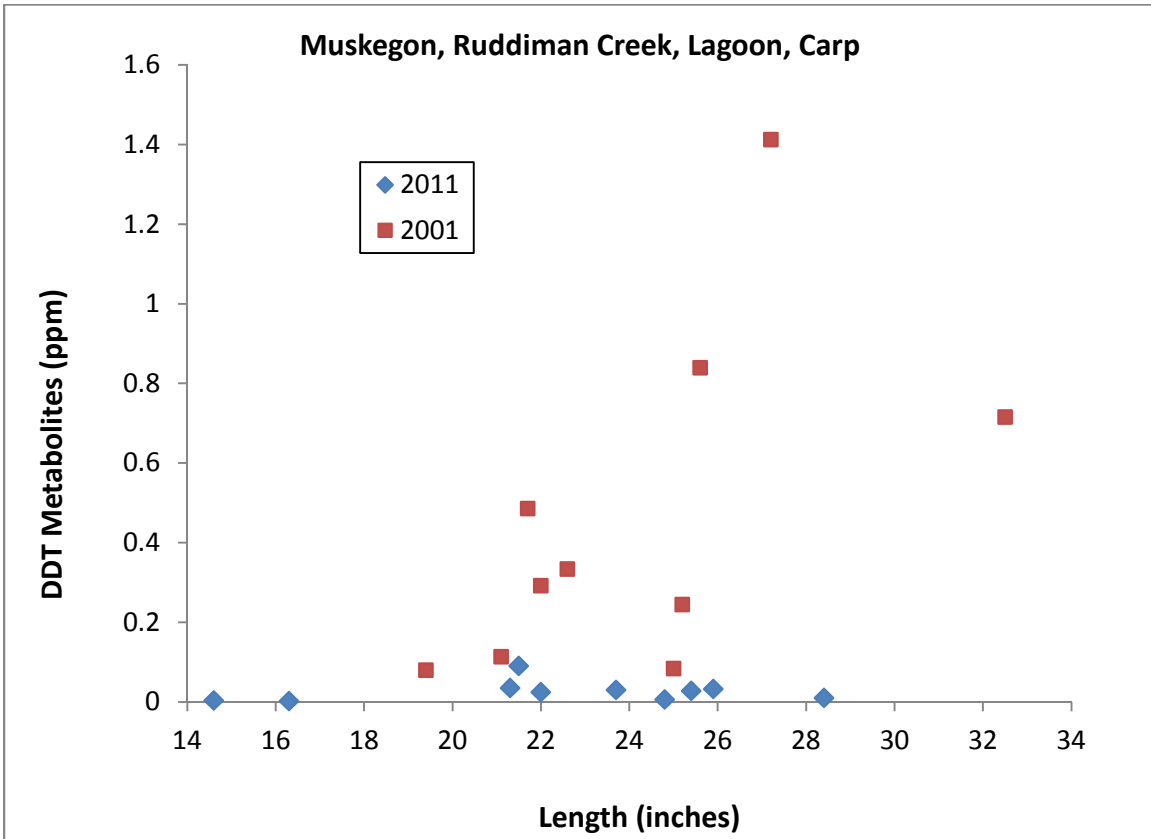
Existing MDCH Advisory: No one should eat carp from Ruddiman Creek or Ruddiman Creek lagoon due to PCBs. DDT and mercury would cause advisories.

Recommendation: No change. The PCB concentrations may have declined sufficiently to relax the advice, but additional samples are needed to verify the change.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Largemouth Bass

Ruddiman Creek Lagoon

Muskegon County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	20	11.5	14	11.5	16.5
Datasets available: 2001, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	11	0.23	0.15	0.41	0.30	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.782	0.879				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	20	11.5	14	11.5	16.5
Datasets available: 2001, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	11	0.12	0.04	0.24	0.16	1
DDT	11	0.01	0.001	0.03	0.02	16
Chlordane	11	0.01	0.001	0.02	0.02	--
Toxaphene	11	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.222	0.240				
DDT	0.364	0.394				
Chlordane	0.405	0.423				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing MDCH Advisory: No one should eat more than 6 meals per year of largemouth or smallmouth bass due to PCBs.

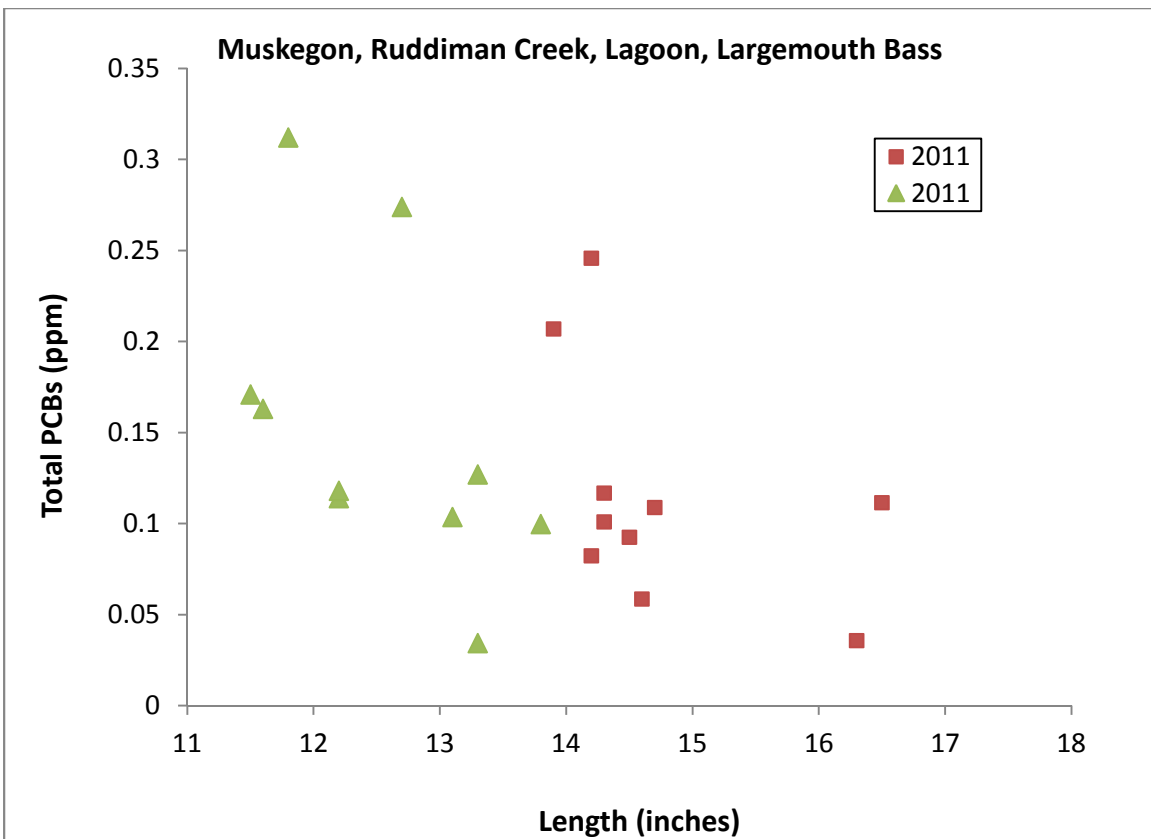
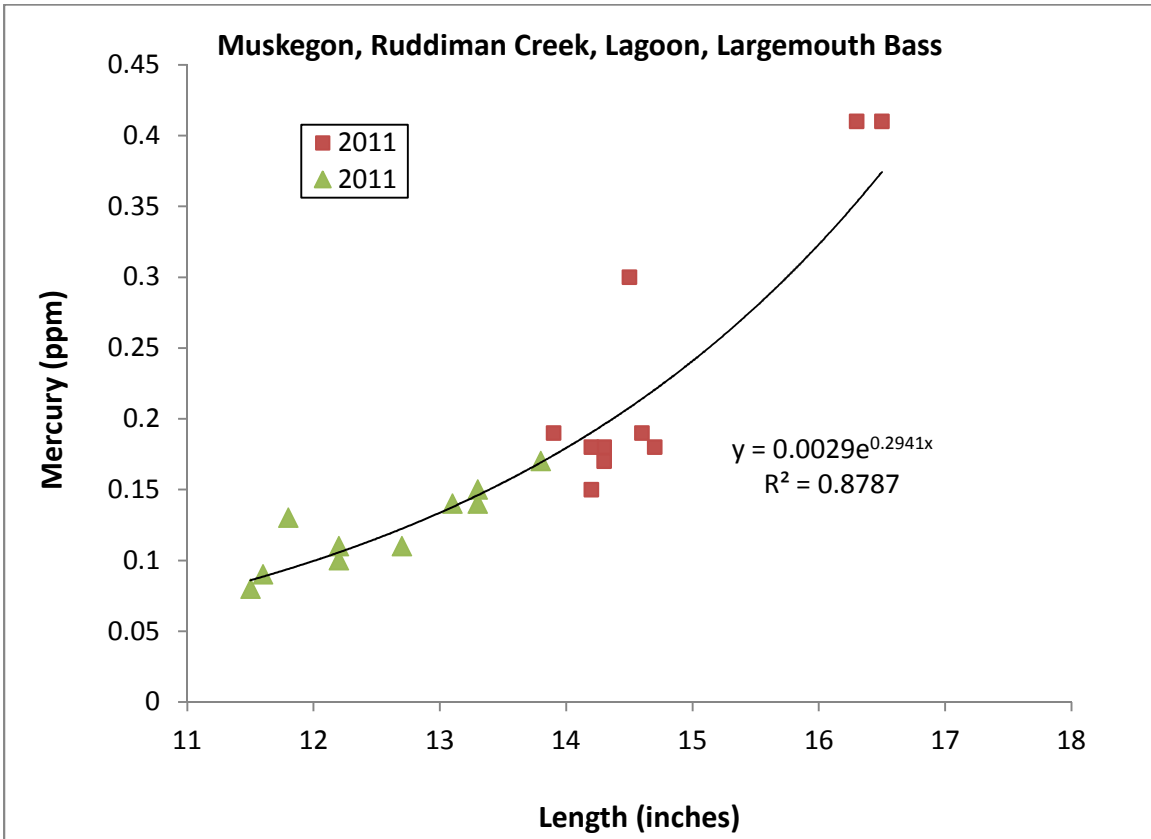
Recommendation: No one should eat more than 1 meal per month of largemouth or smallmouth bass due to PCBs. Mercury would cause an advisory.

Note: Previous advice was based on Muskegon Lake and Bear Lake samples due to a small Ruddiman Lagoon sample size.

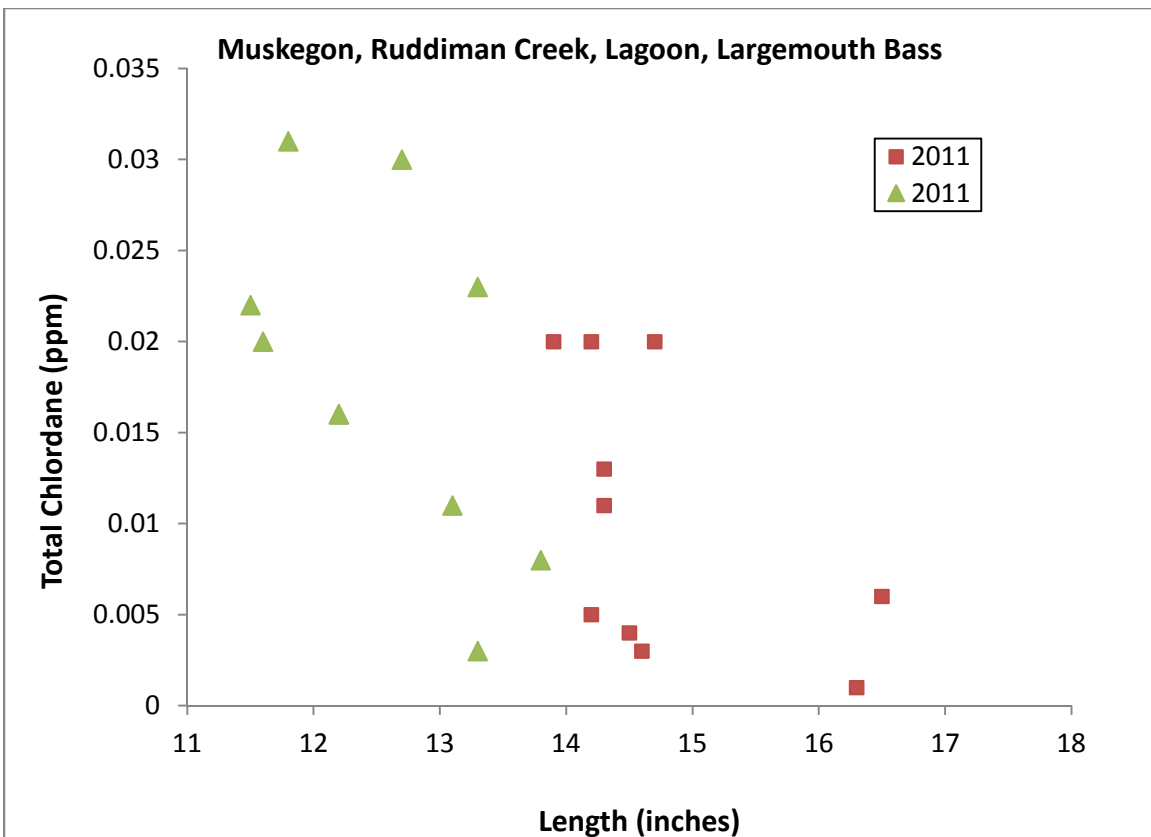
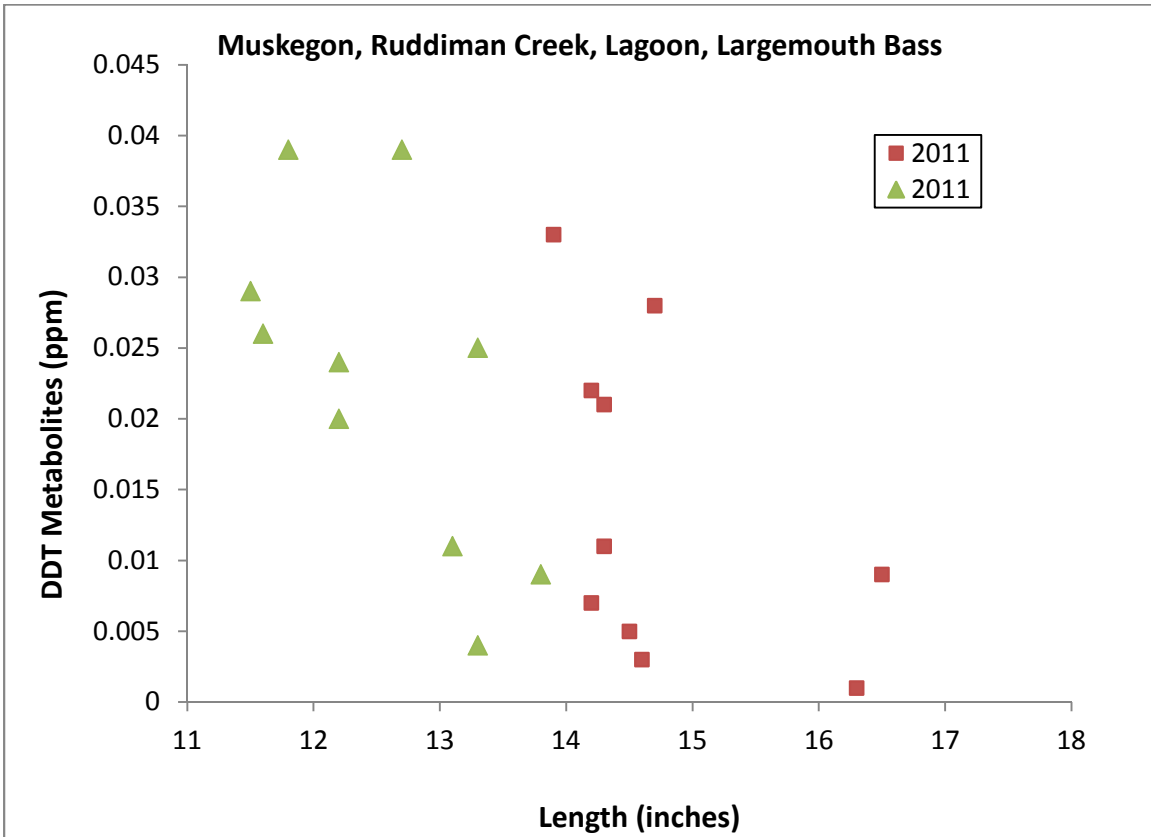
Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.18	4
15	0.24	4
16	0.32	2
17	0.43	2
18	0.58	1
19	0.77	1
20	1.04	1
21	1.4	0.5
22	1.87	0.5

Shaded area denotes extrapolated estimates

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Bluegill

**Kalamazoo River
Marshall Dam to Morrow Dam**

**Calhoun &
Kalamazoo Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2011	9	3.7	na	3.7	7.4
Datasets available: 2010, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.04	0.02	0.06	0.05	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.559	0.562				

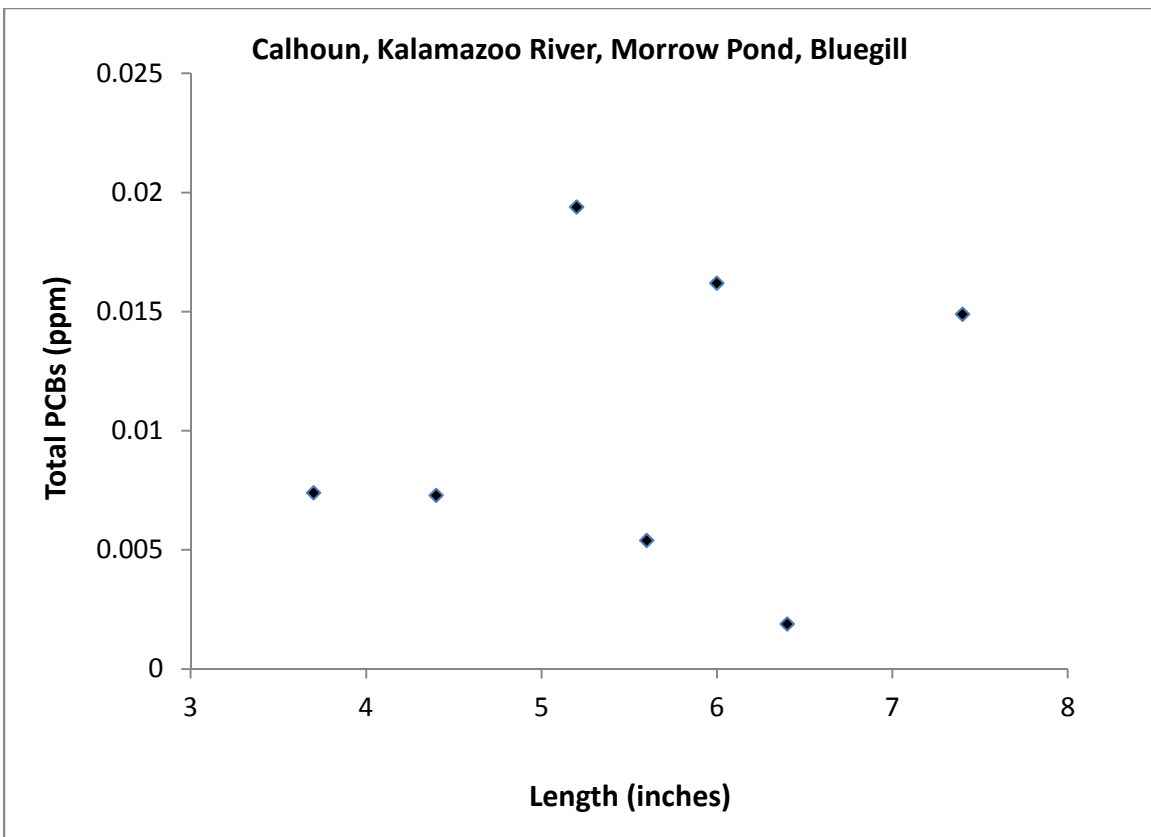
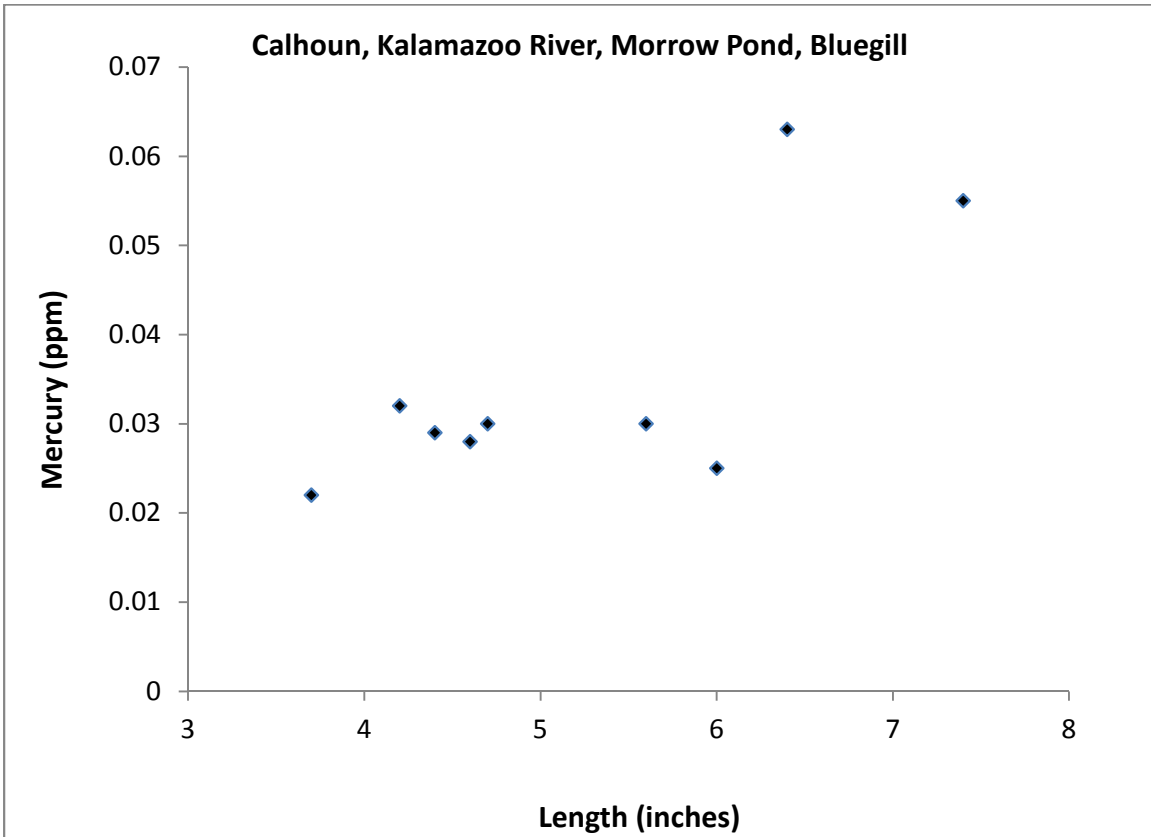
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2011	9	3.7	na	3.7	7.4
Datasets available: 2010, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	7	0.01	0.002	0.02	0.02	12
DDT	7	0.004	0.001	0.02	0.01	16
Chlordane	7	0.002	0.001	0.006	0.003	--
Toxaphene	7	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.038	0.001				
DDT	0.024	0.076				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						12

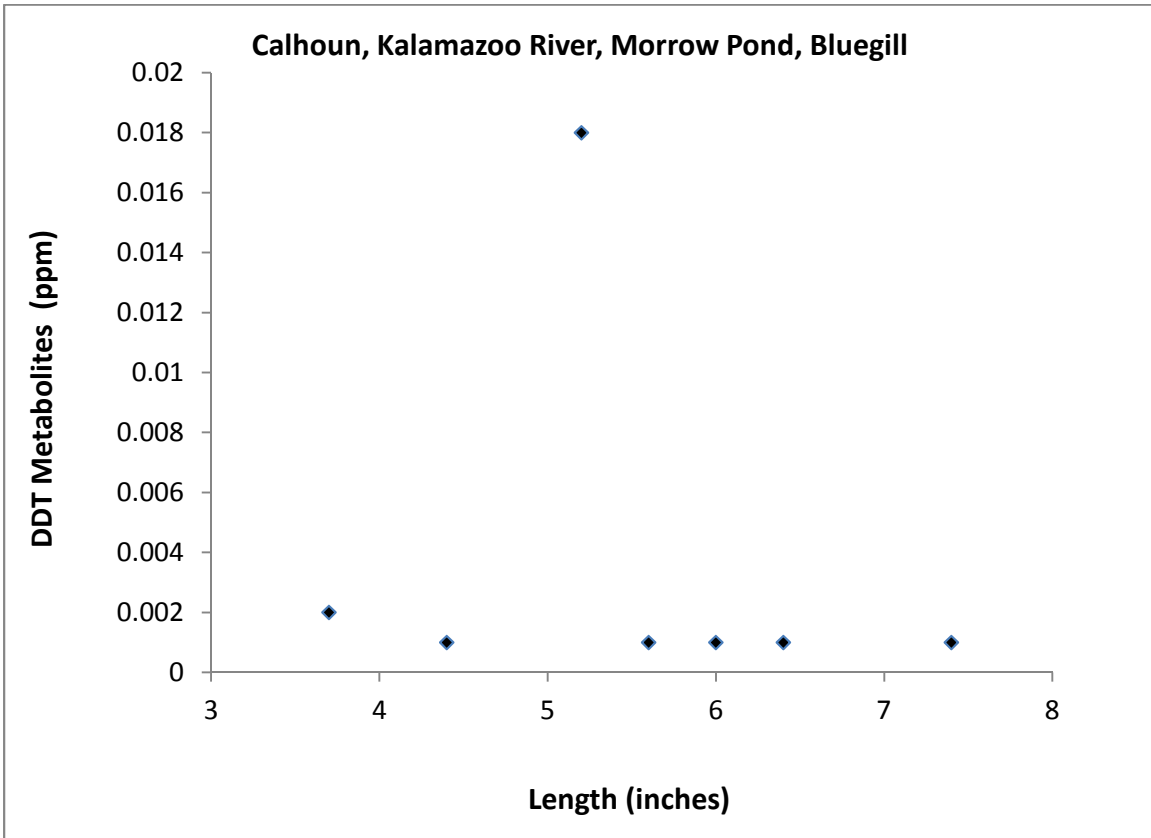
Existing MDCH Advisory: A temporary “do not eat” advisory is in place following the 2010 oil spill.

Recommendation: No one should eat more than 12 meals per month of bluegill or other sunfish from the Kalamazoo River between Marshall Dam and Morrow Dam due to PCBs.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Carp

**Kalamazoo River
Marshall Dam to Morrow Dam**

Calhoun County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2011	40	17.1	na	17.1	30.5
Datasets available: 2010, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	40	0.16	0.06	0.65	0.19	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.061	0.143				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2011	40	17.1	na	17.1	30.5
Datasets available: 1987, 1999, 2000, 2001, 2006, 2010, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	40	0.17	0.004	0.83	0.24	0.5
DDT	40	0.02	0.002	0.10	0.03	16
Chlordane	40	0.003	0.001	0.01	0.004	--
Toxaphene	40	ND	--	--	--	--
TEQ	8	9.8 ppt	3.0 ppt	14.5 ppt	13.2 ppt	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.177	0.178				
DDT	0.126	0.096				
Chlordane	0.002	0.000				
Toxaphene	--	--				
TEQ*	0.032	0.032	Final meal category based on UCL:		0.5	

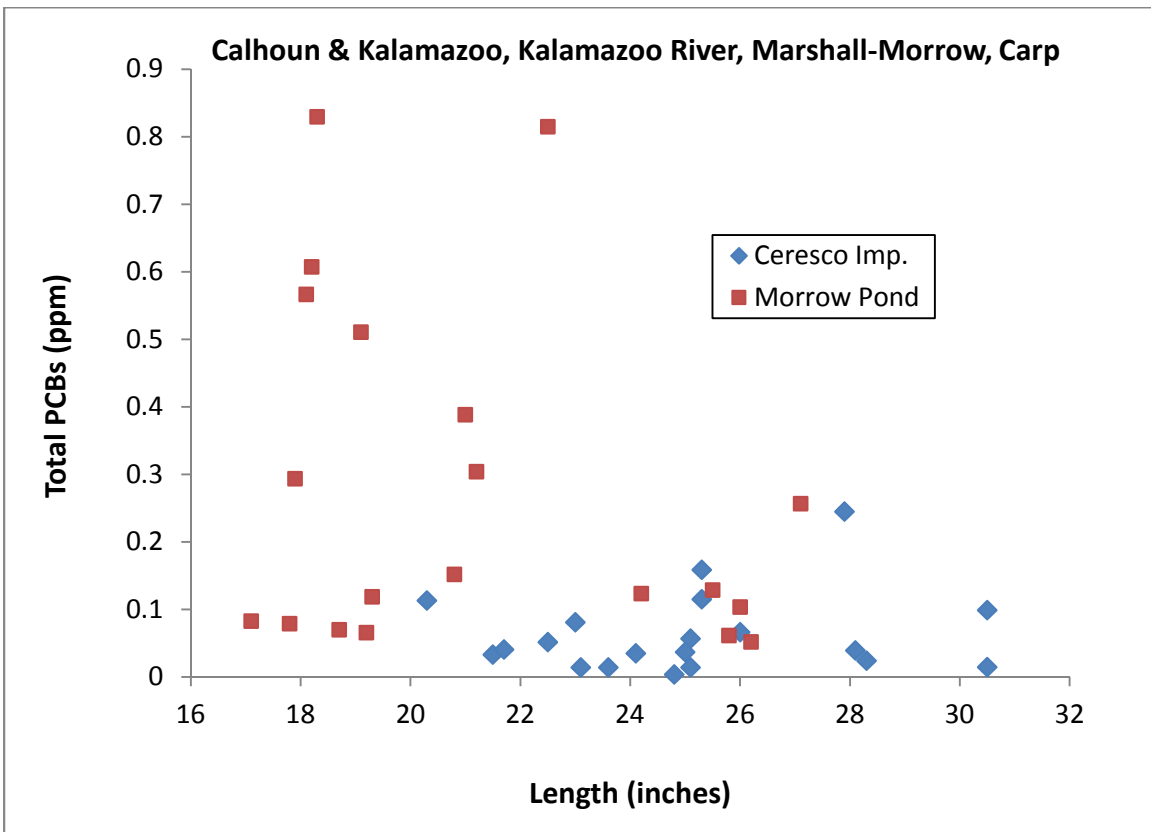
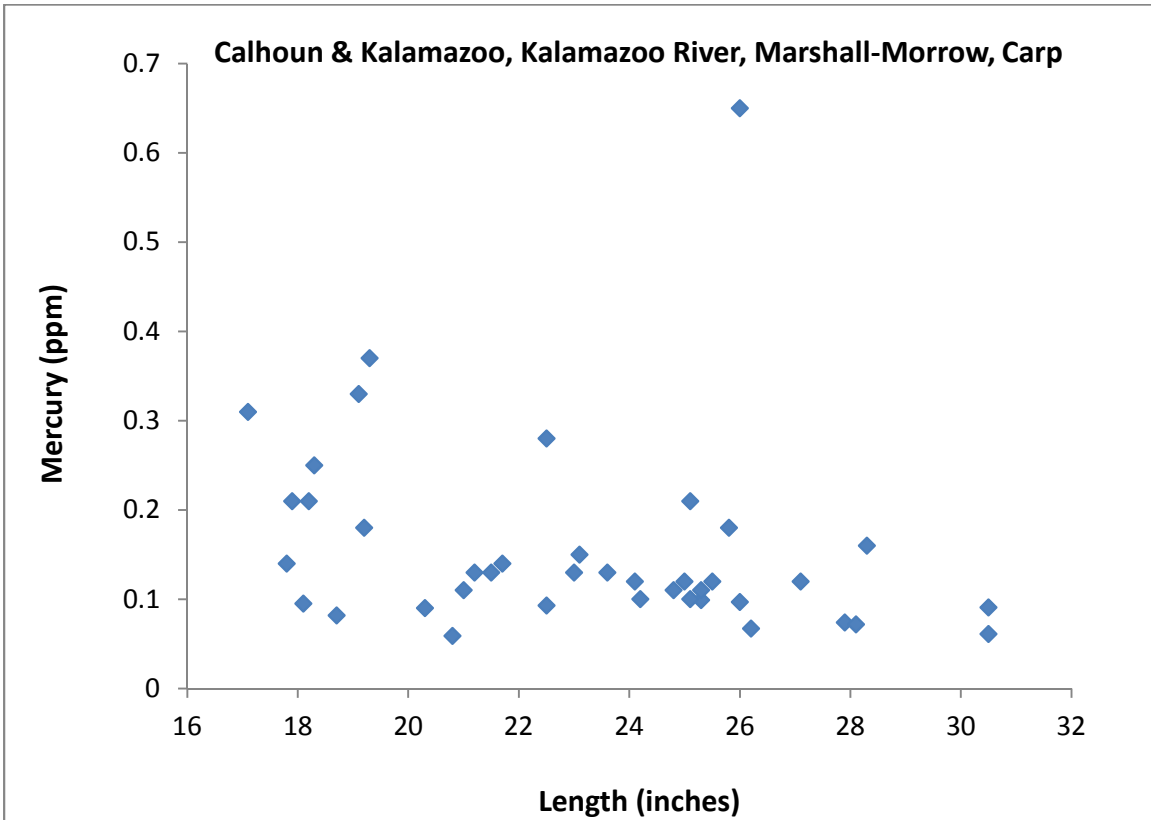
* - 2005 WHO; dl-PCBs included

Existing MDCH Advisory: No one should eat more than 2 meals per month of carp from the Kalamazoo River between the Marshall and Ceresco Dams due to PCBs, or more than 6 meals per year of carp from the river between the Ceresco and Morrow Dams due to PCBs and dioxin. Mercury would cause an advisory.

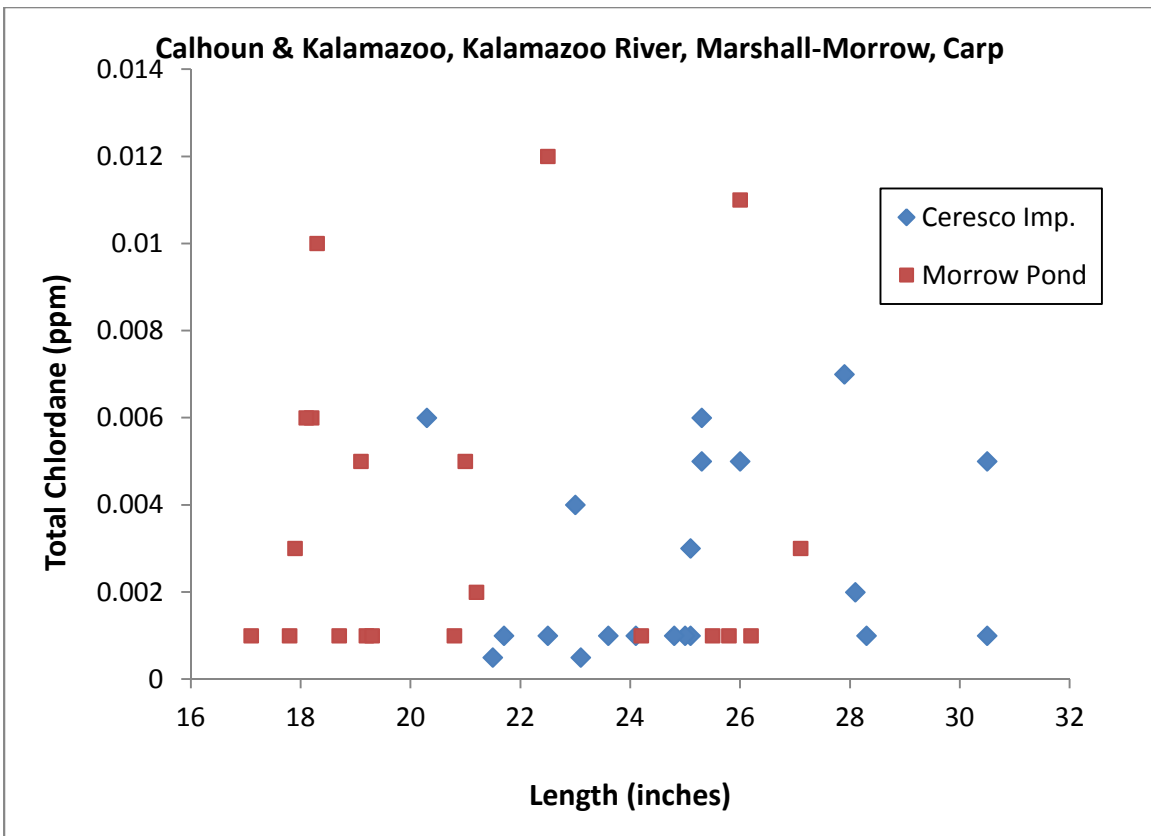
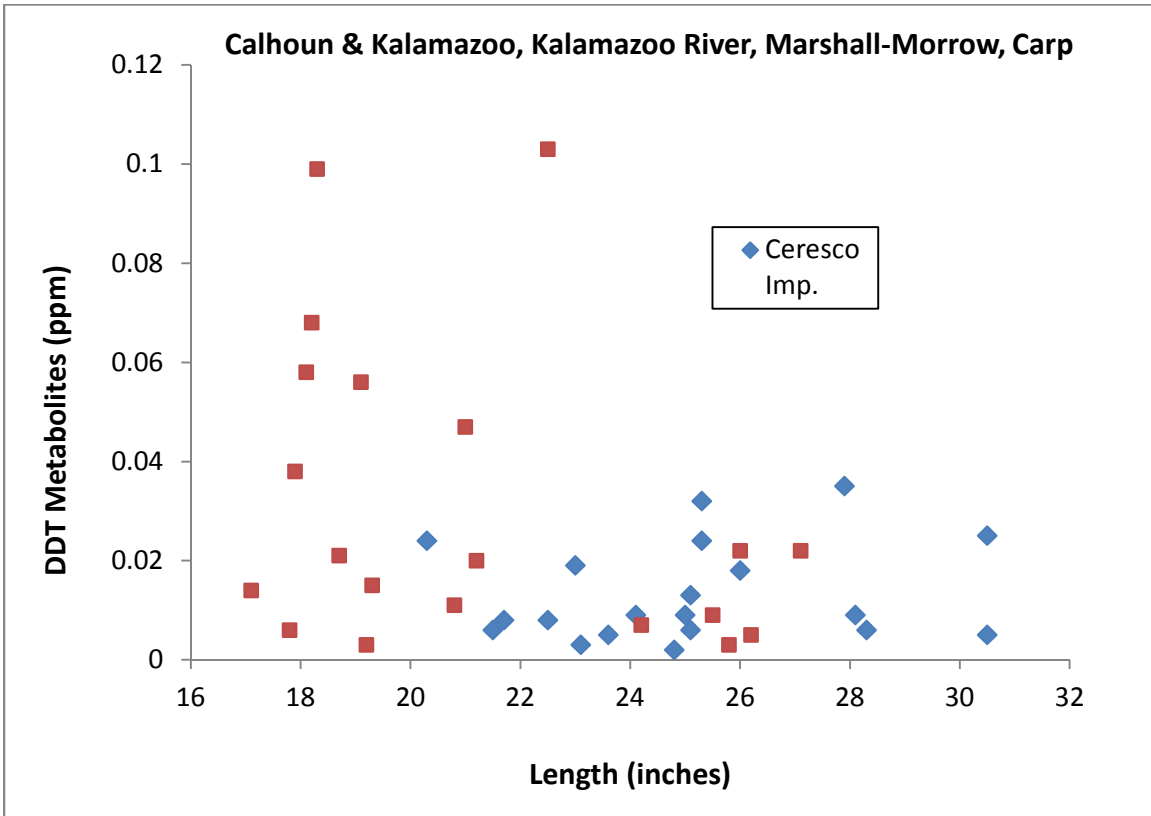
Recommendation: No one should eat more than 6 meals per year of carp from the Kalamazoo River between the Marshall and Morrow Dams due to PCBs and dioxin. Mercury would cause an advisory.

Note: Ceresco Dam removal opened river from Morrow to Marshall Dams; previous advice for Morrow Pond carp was 6 meals/year (95% UCL PCB=0.40 ppm; TEQ only from Morrow).

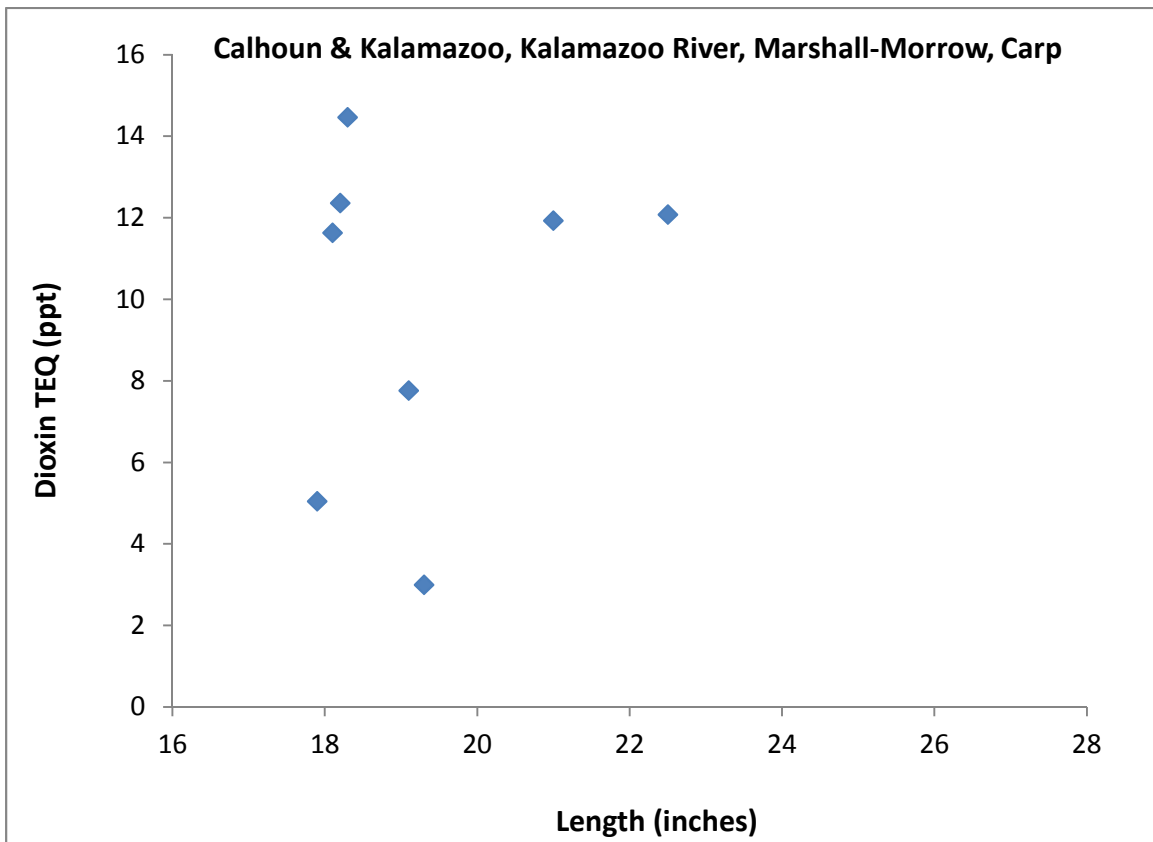
Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Channel Catfish

**Kalamazoo River
Marshall Dam to Morrow Dam**

**Calhoun &
Kalamazoo Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	--	--	--
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2001	1	21.5	12	21.5	21.5
Datasets available: 2001						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1	0.34	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						--

Existing MDCH Advisory: A temporary “do not eat” advisory is in place following the 2010 oil spill. Previously women and children were advised not to eat more than 1 meal per month of channel catfish from the Kalamazoo River between Ceresco and Morrow Dams due to PCBs.

Recommendation: There are insufficient data available to develop specific advice for catfish from this reach of the Kalamazoo River. Since catfish generally have contaminant loads similar to carp from the same water, no one should eat more than 6 meals per year of catfish from the Kalamazoo River between Marshall and Morrow Dams due to PCBs and dioxin. This action was a management determination.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Largemouth & Smallmouth Bass **Kalamazoo River Marshall Dam to Morrow Dam** **Calhoun County**
Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2006	2012	29	10.7	14	13.5	19.3	
Datasets available: 2006, 2011, 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	17	0.23		0.12	0.38	0.27	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.462	0.550					

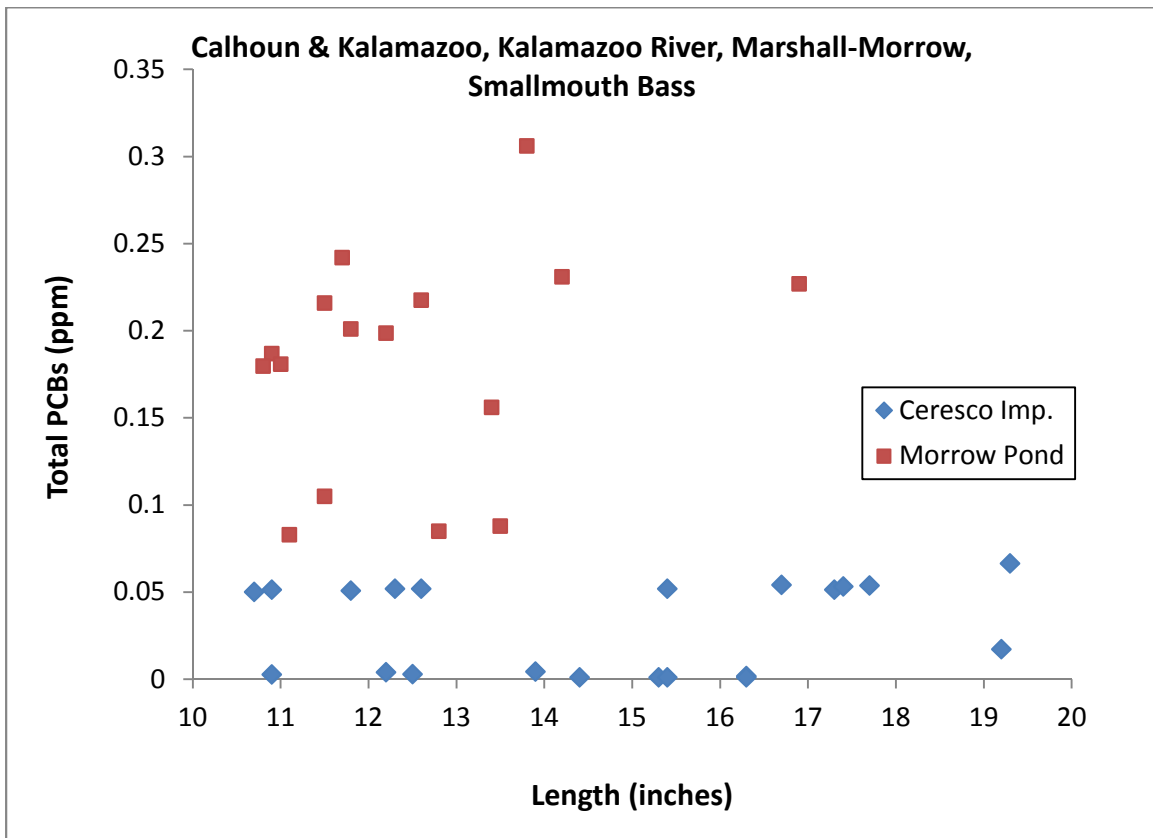
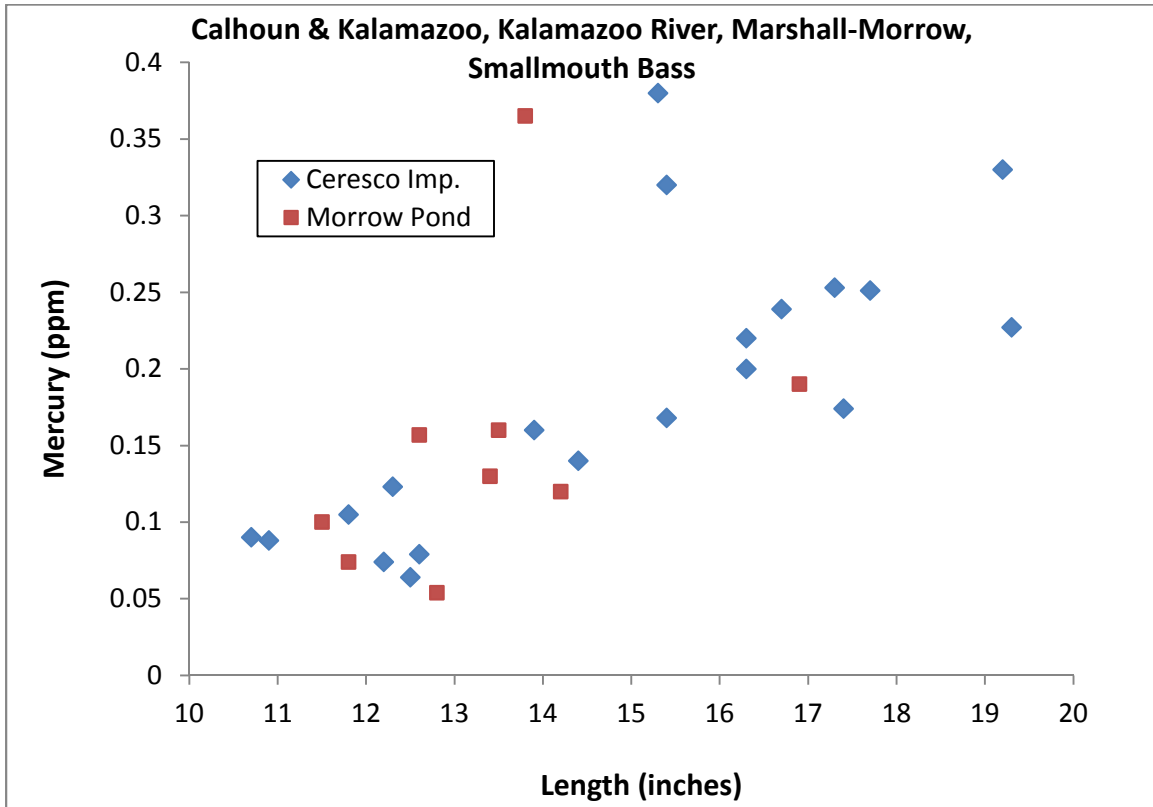
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2006	2012	38	9.6	14	9.6	19.3	
Datasets available: 1987, 1999, 2000, 2001, 2006, 2011, 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	17	0.07		0.001	0.31	0.12	1
DDT	7	0.002		0.001	0.01	0.004	16
Chlordane	7	ND		--	--	--	--
Toxaphene	7	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.128	0.085					
DDT	0.111	0.005					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							1

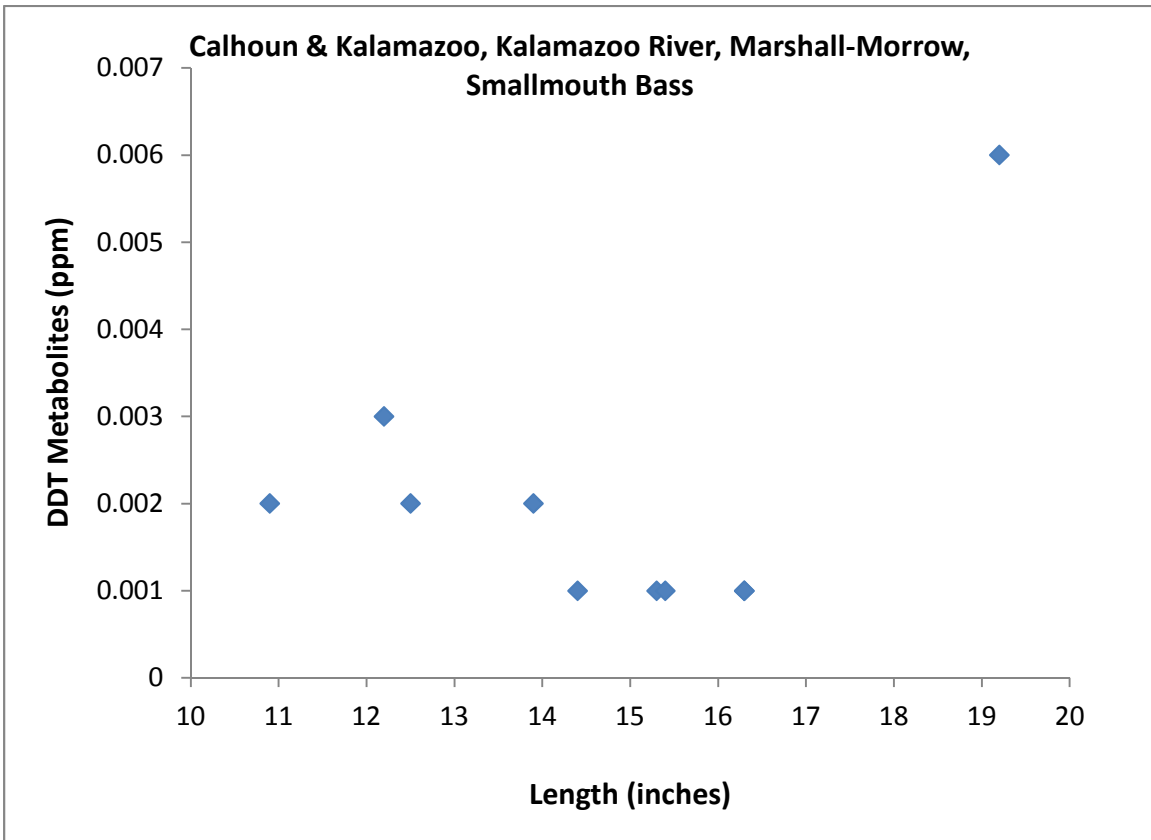
Existing MDCH Advisory: No one should eat more than 4 meals per month of largemouth or smallmouth bass smaller than 18 inches from the Kalamazoo River between Marshall Dam and Ceresco Dam due to mercury and PCBs or more than 2 meals per month of those fish larger than 18 inches due to mercury. PCBs would cause an advisory. In addition, the statewide consumption guidelines recommend that no one eat more than 2 meals per month of legal size largemouth bass or smallmouth bass from between the Ceresco and Morrow Dams under 18 inches or more than 1 meal per month of those fish larger than 18 inches.

Recommendation: No one should eat more than 1 meal per month of largemouth or smallmouth bass from the Kalamazoo River between the Marshall and Morrow Dams due to PCBs. Mercury would cause an advisory.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Rock Bass

**Kalamazoo River
Marshall Dam to Morrow Dam**

Calhoun County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2011	20	4.7	na	4.7	7.3
Datasets available: 2010, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.08	0.03	0.14	0.09	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.168	0.244				

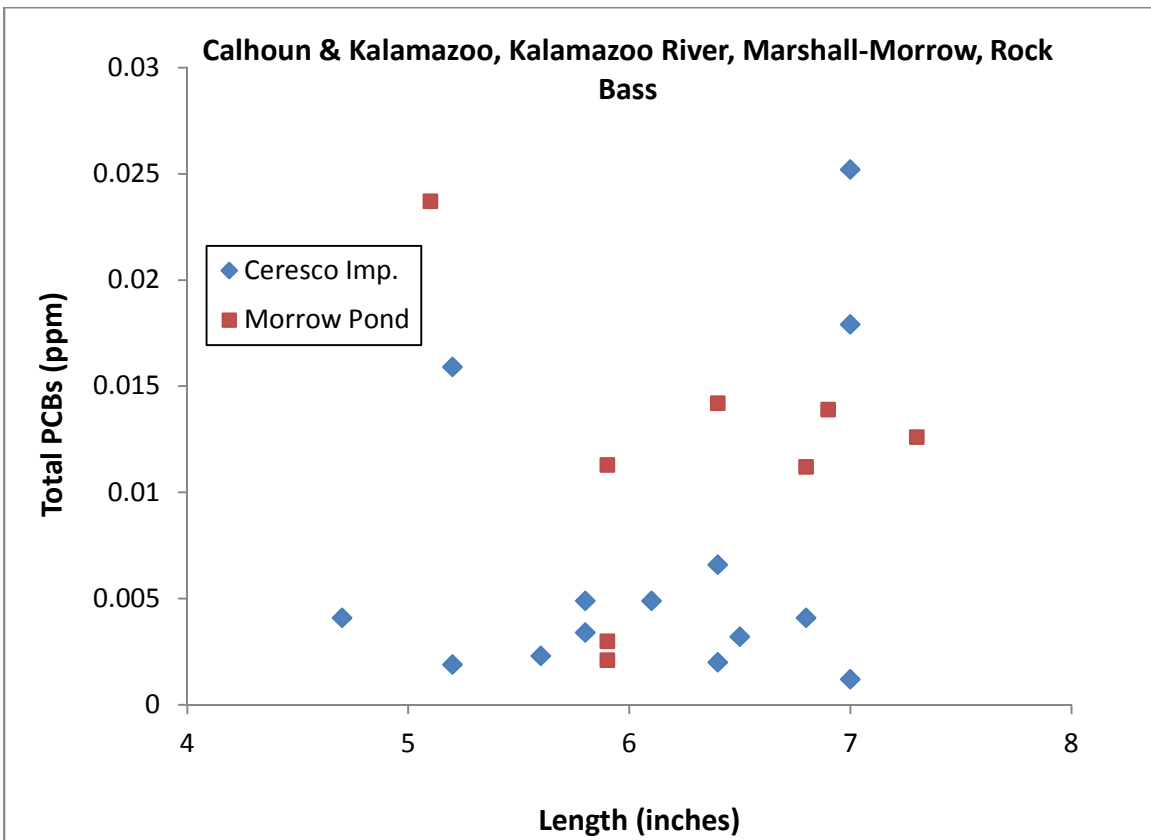
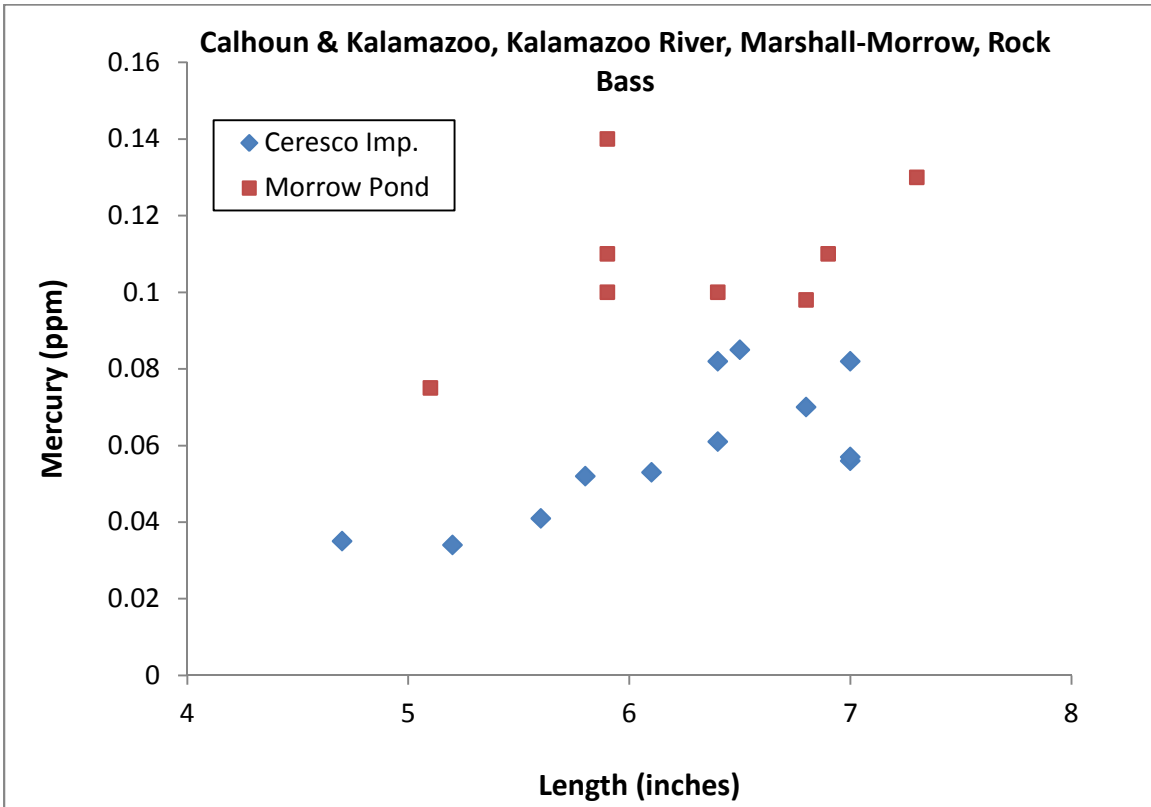
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2011	22	4.7	na	4.7	7.3
Datasets available: 2010, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	22	0.01	0.001	0.02	0.01	16
DDT	22	0.001	0.001	0.003	0.002	16
Chlordane	22	ND	--	--	--	--
Toxaphene	22	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.084	0.027				
DDT	0.147	0.169				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						12

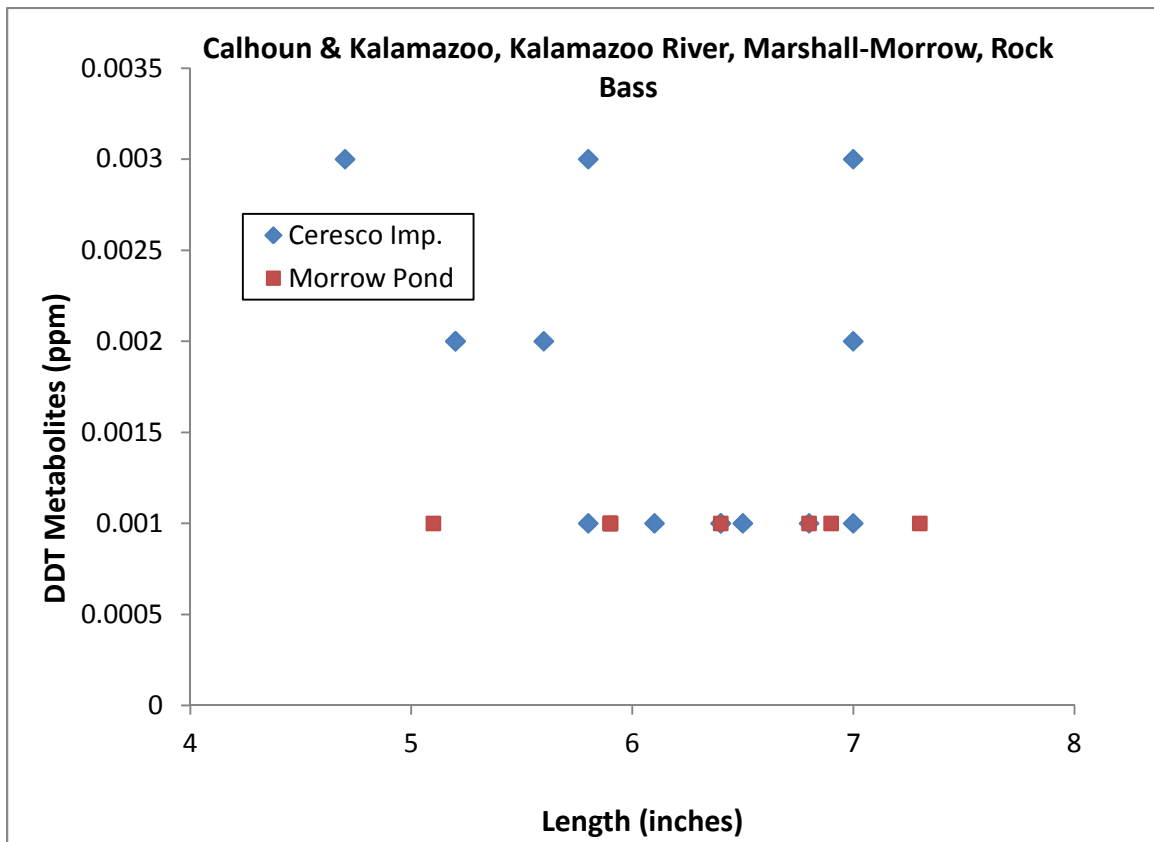
Existing MDCH Advisory: No one should eat more than 12 meals per month of rock bass larger than 7 inches from the Kalamazoo River between Marshall Dam and Ceresco Dam due to mercury, or more than 8 meals per month of rock bass from the Kalamazoo River between Ceresco and Morrow Dams due to mercury. PCBs would cause an advisory for the latter.

Recommendation: No one should eat more than 12 meals per month of rock bass from the Kalamazoo River between the Marshall and Morrow Dams due to mercury.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Walleye

**Kalamazoo River
Marshall Dam to Morrow Dam**

**Calhoun &
Kalamazoo Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	--	--	--
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1993	1993	3	18.1	15	18.1	20.1
Datasets available: 1993						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	3	0.228	0.168	0.330	--	--
DDT	3	0.049	0.046	0.053	--	--
Chlordane	3	0.006	0.004	0.008	--	--
Toxaphene	3	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						--

Existing MDCH Advisory: A temporary “do not eat” advisory is in place following the 2010 oil spill. Previously Morrow Impoundment walleye were covered by the statewide mercury advisory.

Recommendation: There are insufficient data available to develop specific advice for Morrow Impoundment walleye. The statewide consumption guidelines recommend that no one eat more than 1 meal per month of walleye over 20 inches in length or more than 2 meals per month of legal size walleye under 20 inches in length.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Carp

**Kalamazoo River
Morrow Dam to Allegan Dam**

**Allegan &
Kalamazoo Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1990	2013	39	14.6	na	14.6	24.3	
Datasets available: 1990, 1992, 1994, 2013							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	39	0.29		0.09	0.49	0.32	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.213	0.395					

Organics Analysis:

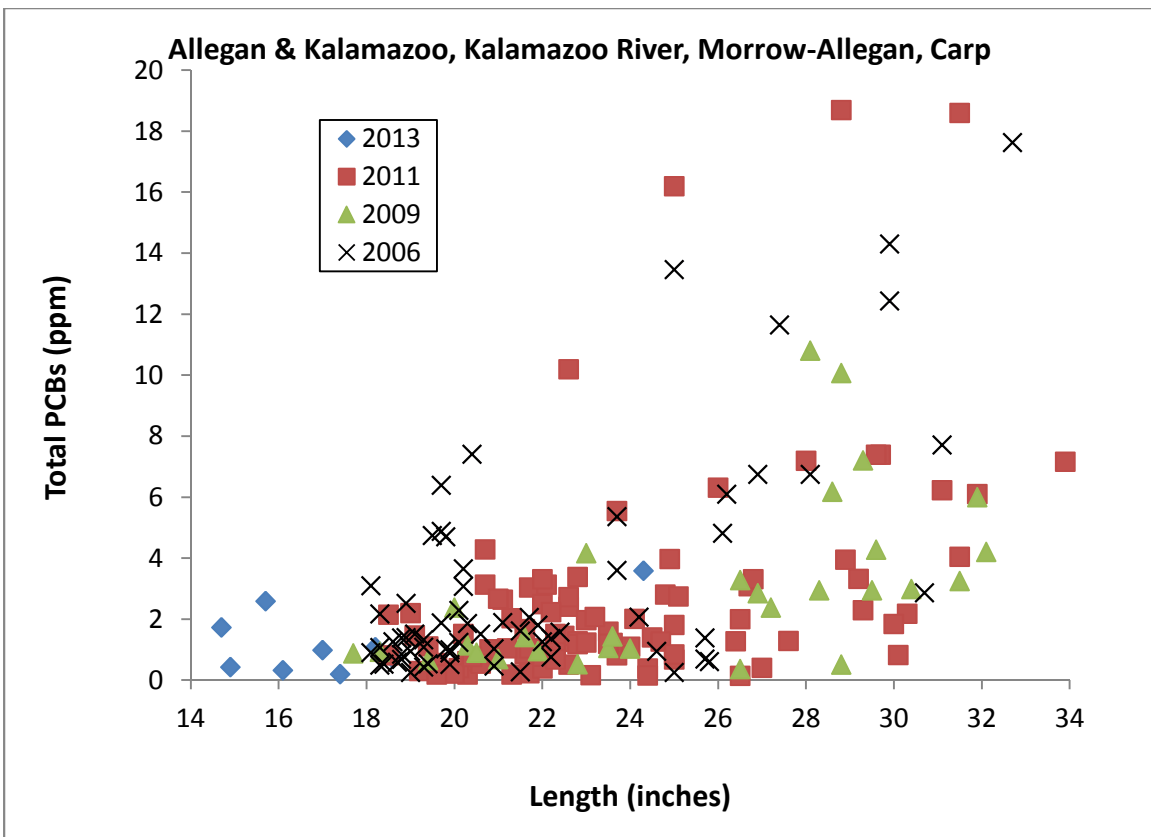
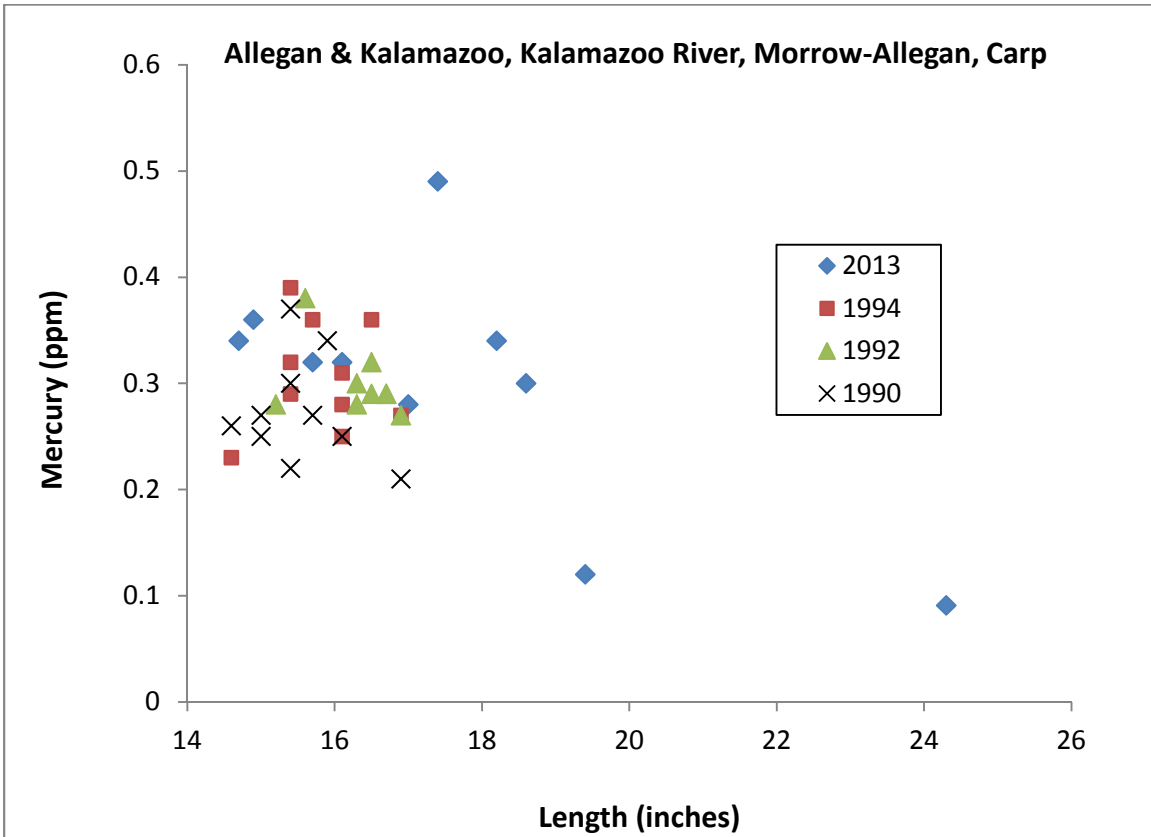
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2006	2013	205	14.7	na	14.7	33.9	
Datasets available: 1983, '85, '86, '87, '90, '92, '94, '99, 2000, '01, '03, '04, '06, '09, '11, '13							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	205	2.7		0.15	18.7	3.16	0
DDT	10	0.057		0.01	0.18	0.10	16
Chlordane	10	0.008		0.001	0.02	0.01	--
Toxaphene	10	ND		--	--	--	--
TEQ	22	26.0 ppt		3.9 ppt	98.5 ppt	35.3 ppt	Limited
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.274	0.260					
DDT	0.278	0.099					
Chlordane	0.217	0.047					
Toxaphene	--	--					
TEQ	0.037	0.027					
Final meal category based on UCL:							0

* - 2005 WHO; dl-PCBs included

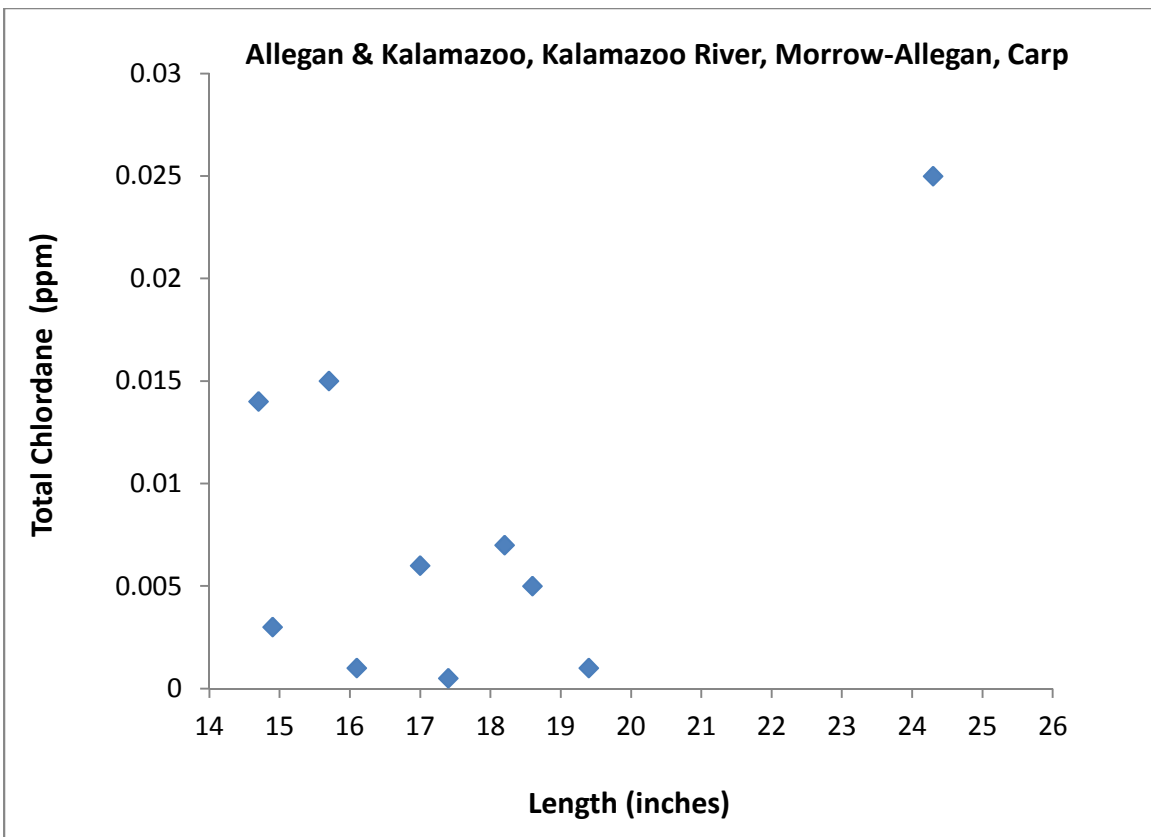
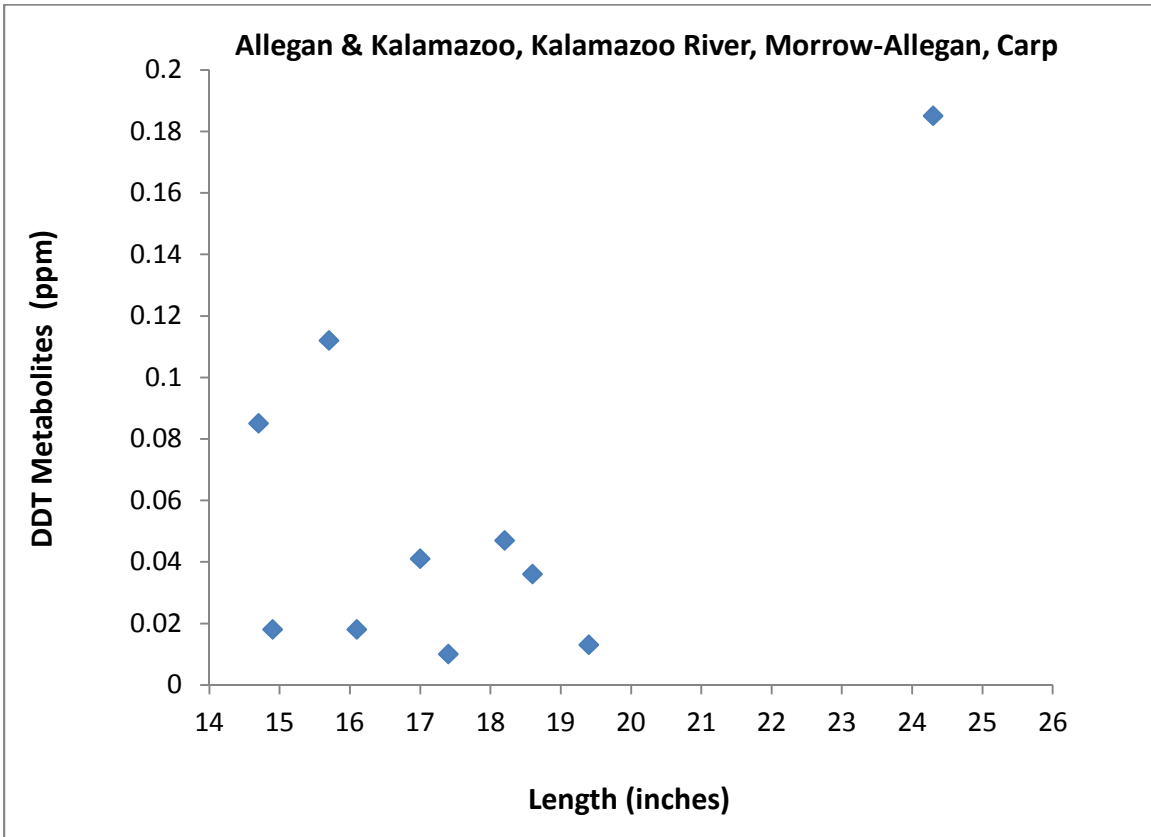
Existing MDCH Advisory: No one should eat carp from the Kalamazoo River between Morrow Dam and Allegan Dam due to PCBs. Mercury would cause an advisory.

Recommendation: No one should eat carp from the Kalamazoo River between Morrow Dam and Allegan Dam due to PCBs. Dioxin and mercury would cause an advisory.

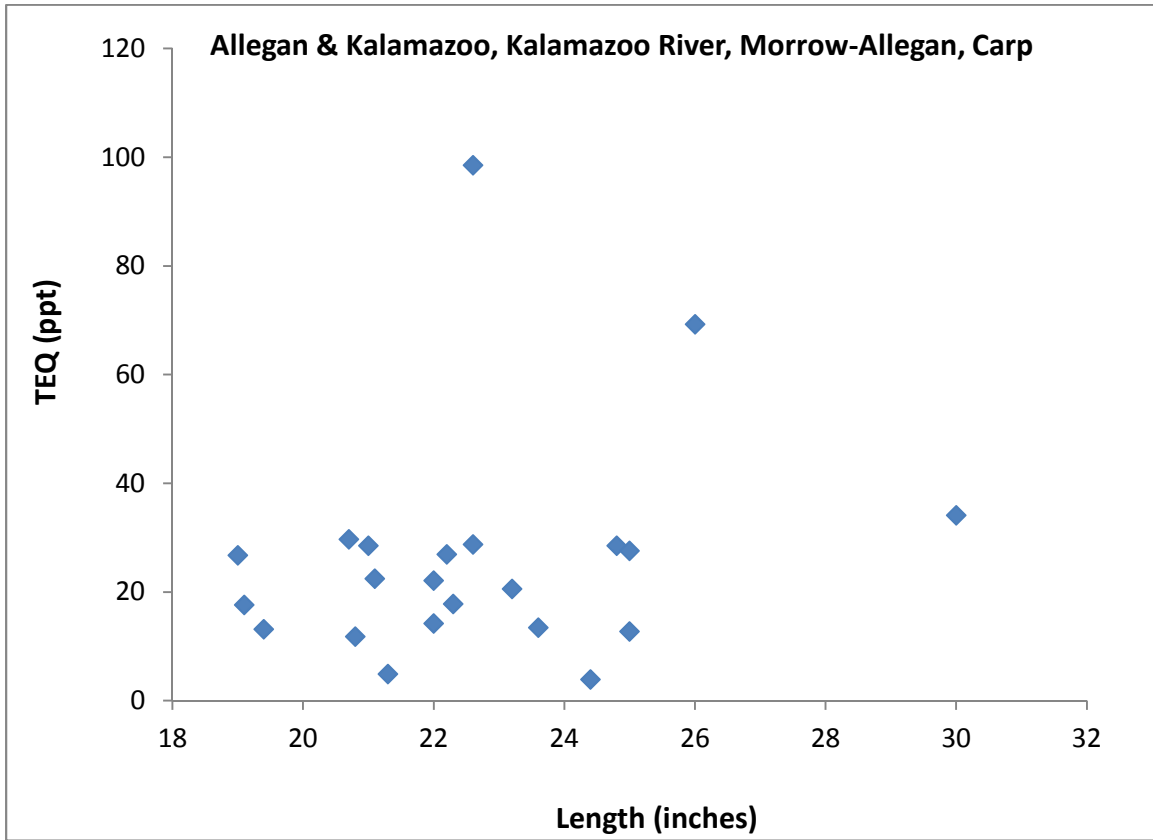
Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Channel Catfish

**Kalamazoo River
Morrow Dam to Allegan Dam**

**Allegan &
Kalamazoo Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	--	--	--
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

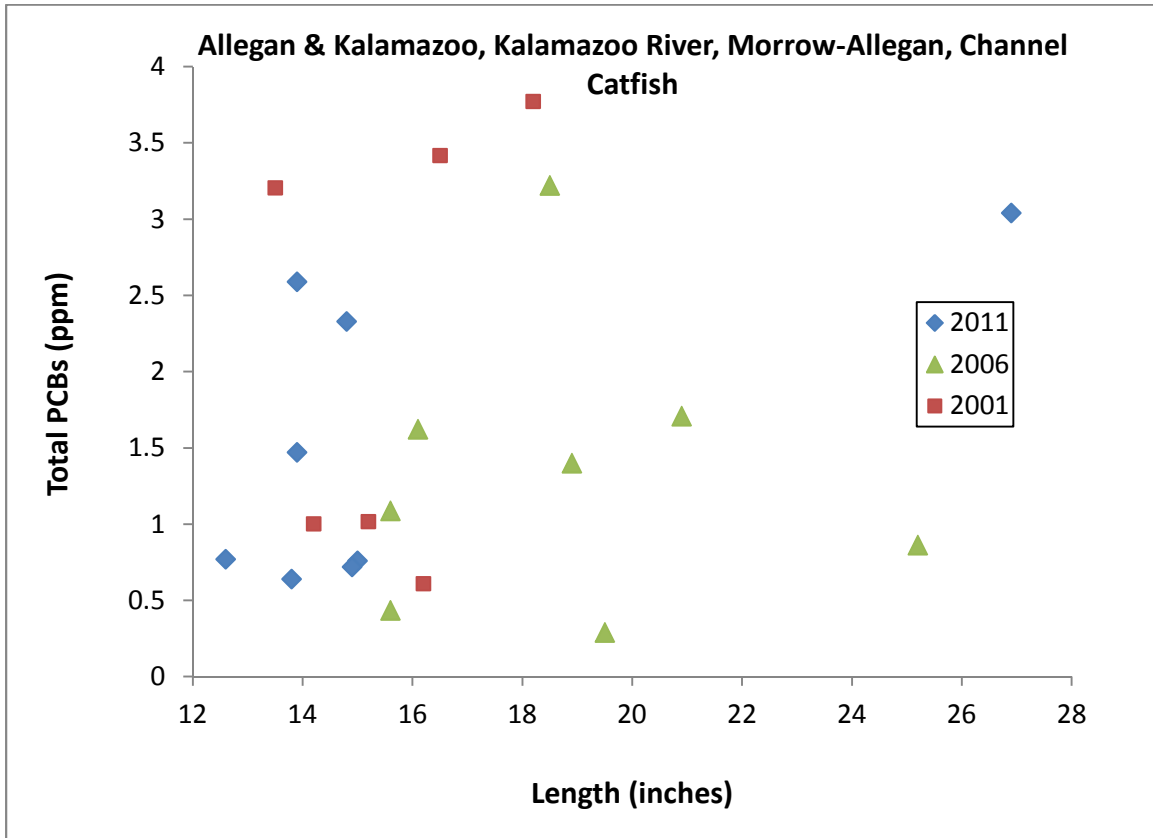
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	22	12.6	12	12.6	26.9
Datasets available: 1999, 2001, 2006, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	22	1.64	0.29	3.77	2.12	Limited*
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.033	0.020				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						Limited*

Existing MDCH Advisory: No one should eat channel catfish from the Kalamazoo River between Morrow Dam and Allegan Dam due to PCBs.

Recommendation: Sediment remediation projects are ongoing in this reach of the Kalamazoo River. *No one should eat catfish from the Kalamazoo River between Morrow Dam and Allegan Dam due to PCBs. Management determination used to set this guideline.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Smallmouth Bass

**Kalamazoo River
Morrow Dam to Allegan Dam**

**Allegan &
Kalamazoo Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2013	46	10.3	14	13.5	17.1
Datasets available: 2006, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	18	0.27	0.12	0.53	0.32	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.236	0.296				

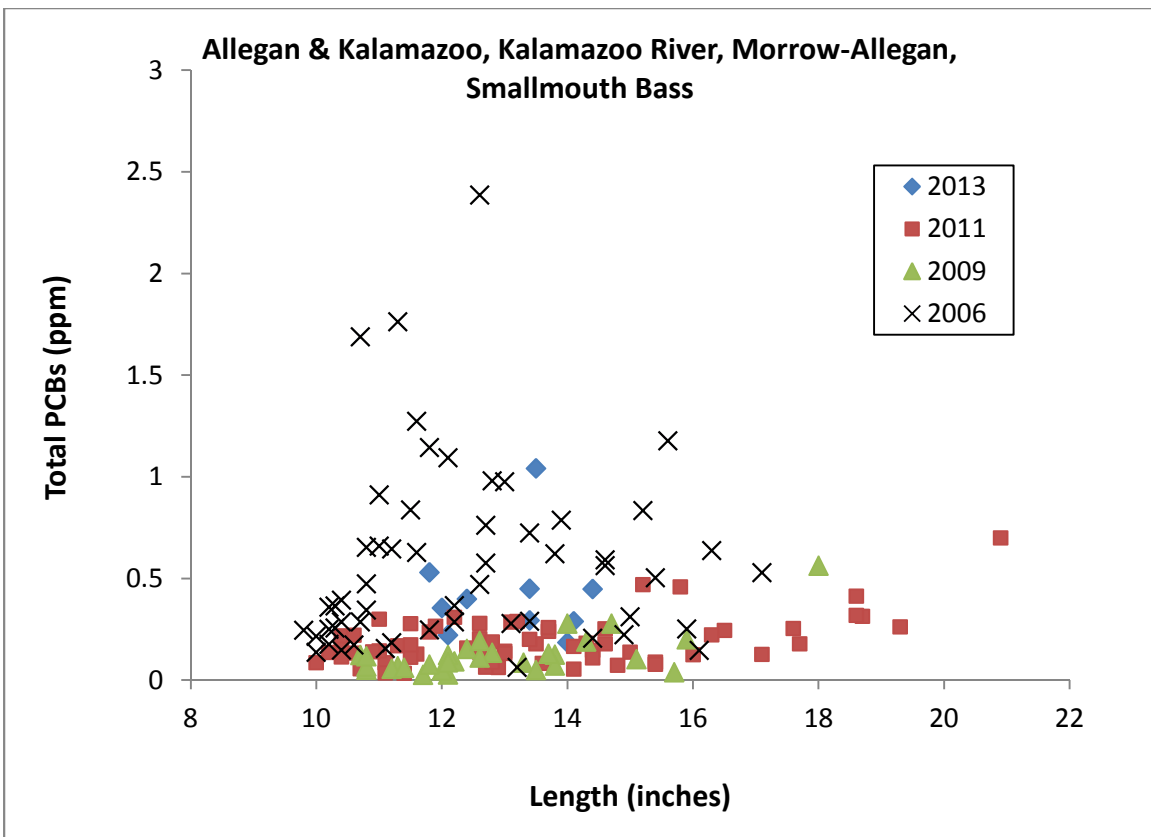
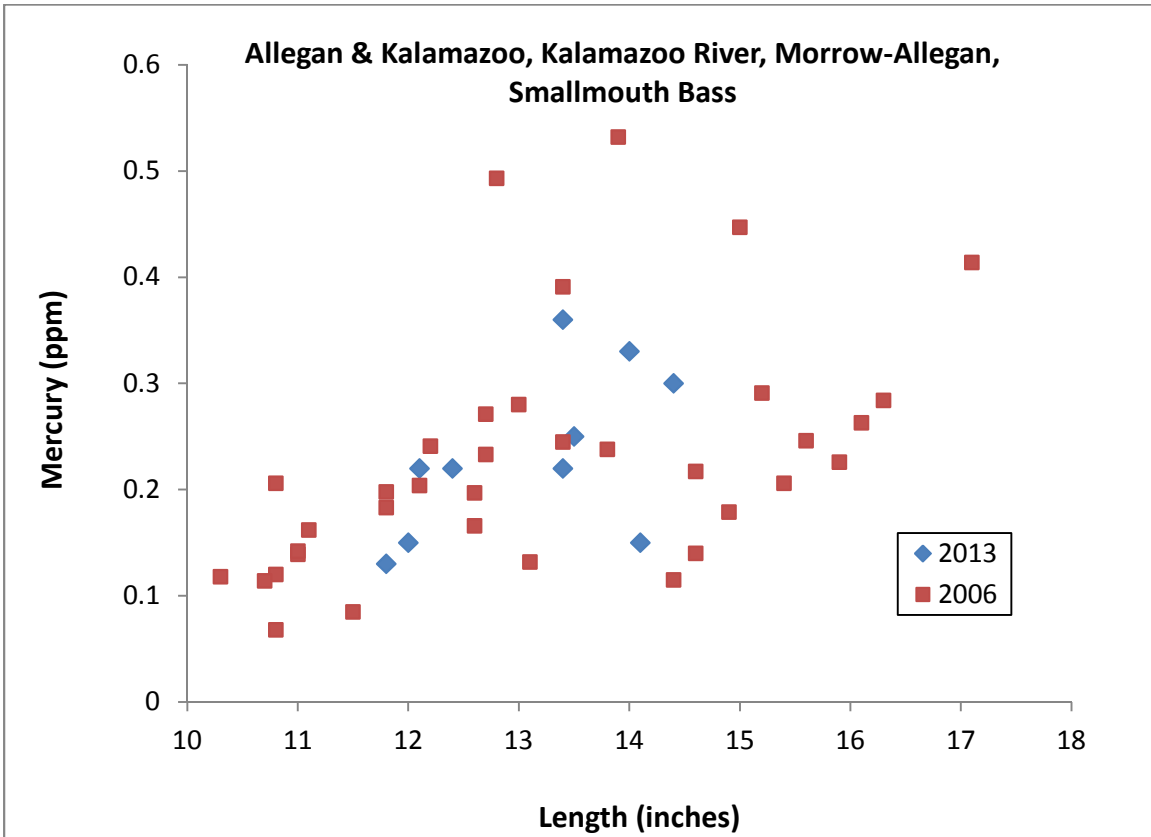
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2013	158	9.8	14	13.5	20.9
Datasets available: 1983, '85, '87, '99, '00, '01, '06, '09, '11, '13						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	57	0.31	0.04	1.18	0.380	0.5
DDT	4	0.03	0.01	0.06	0.065	--
Chlordane	4	0.003	0.001	0.008	0.008	--
Toxaphene	4	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.001	0.015				
DDT	0.001	0.008				
Chlordane	0.001	0.022				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						0.5*

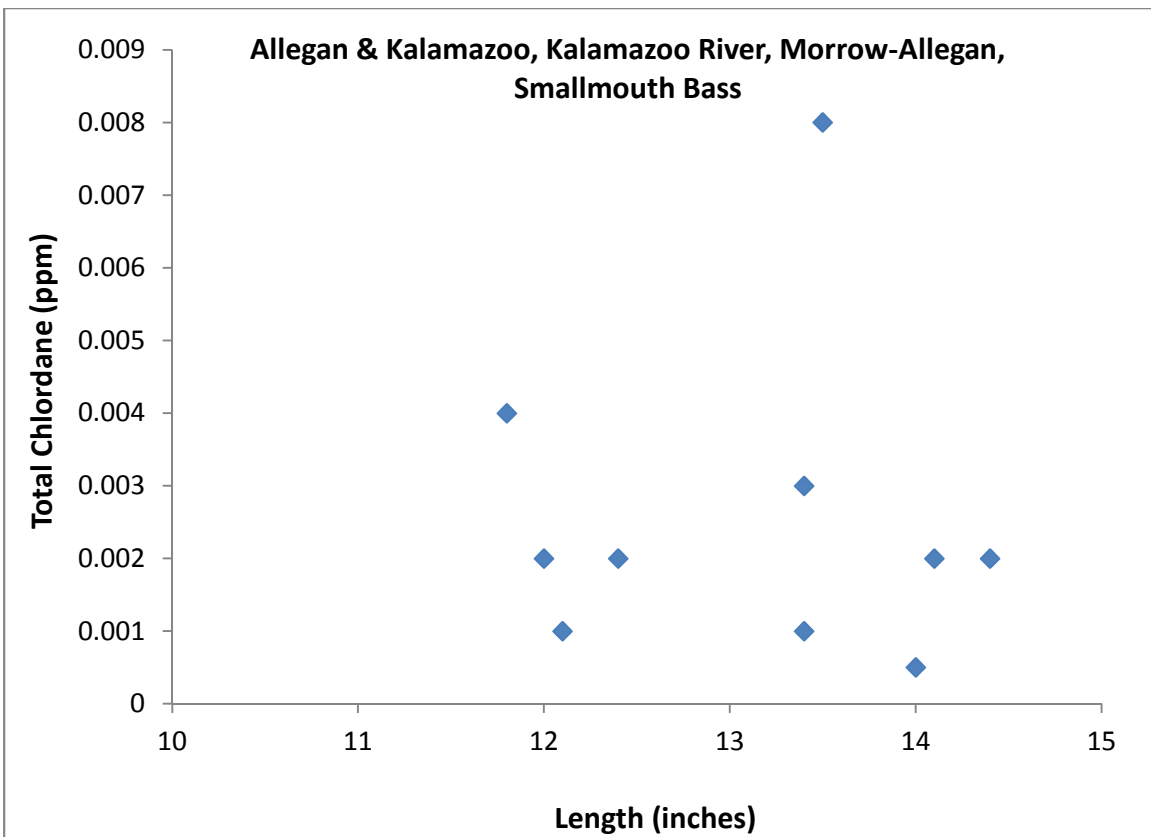
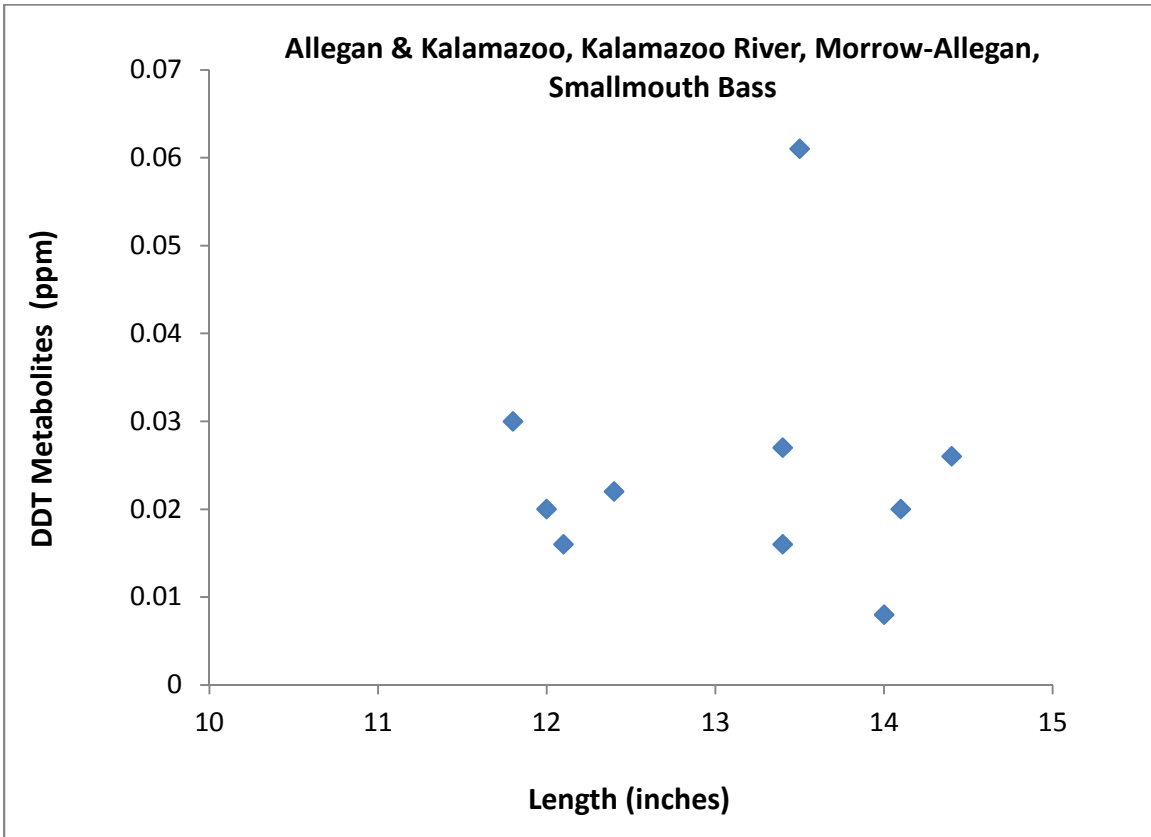
Existing MDCH Advisory: No one should eat largemouth or smallmouth bass from the Kalamazoo River between Morrow and Allegan Dams due to PCBs.

Recommendation: Sediment remediation projects are ongoing in this reach of the Kalamazoo River. *No one should eat smallmouth bass or largemouth bass from the Kalamazoo River between Morrow Dam and Allegan Dam due to PCBs. Mercury would cause an advisory. Management determination used to set this guideline.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Bluegill/Pumpkinseed

**Kalamazoo River
Morrow Dam to Allegan Dam**

**Allegan &
Kalamazoo Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	10	5.4	na	5.4	8.3
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.08	0.04	0.15	0.11	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.510	0.584				

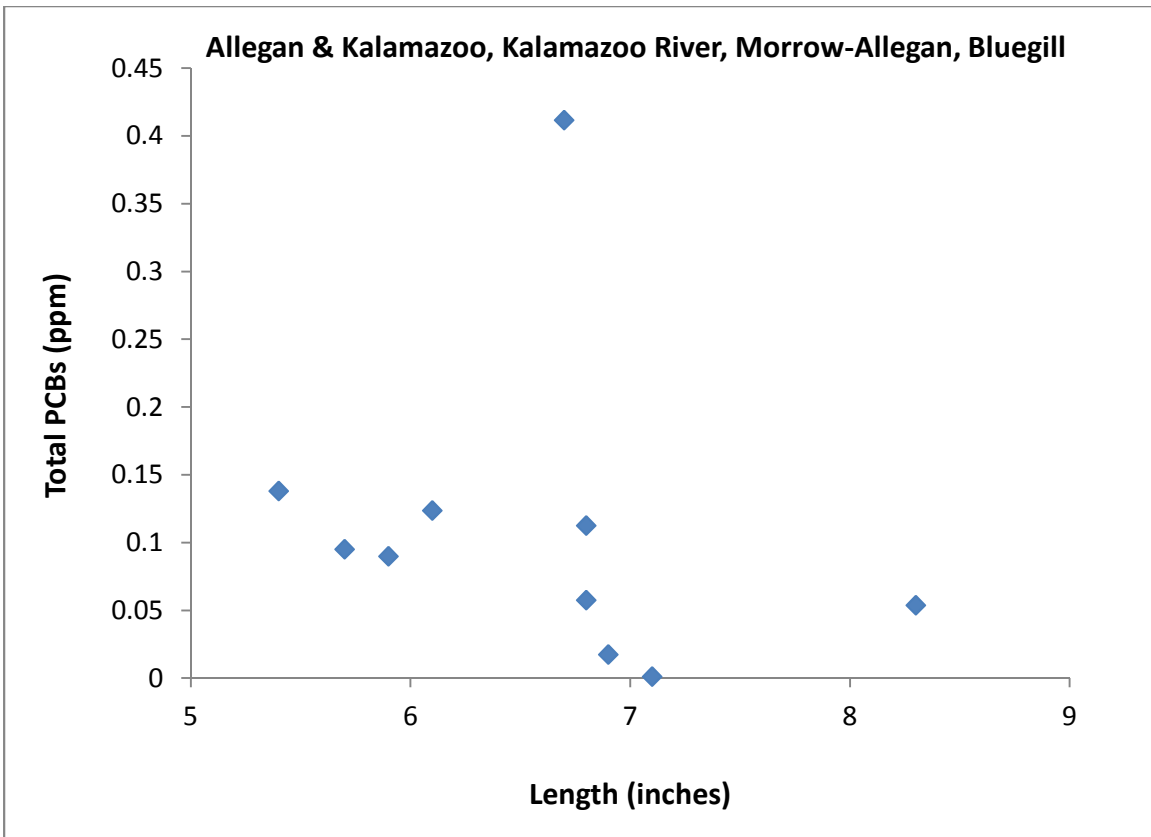
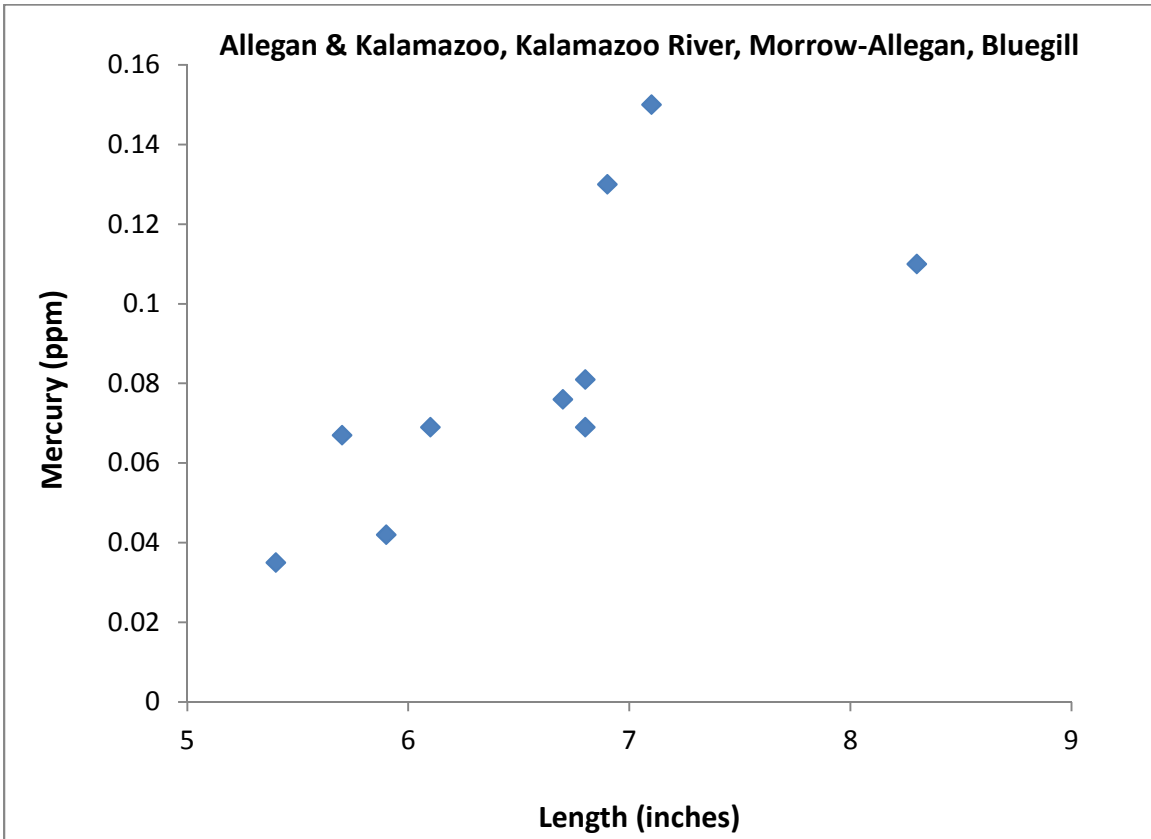
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	10	5.4	na	5.4	8.3
Datasets available: 1983, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.11	0.001	0.41	0.19	1*
DDT	10	0.01	0.001	0.03	0.01	16
Chlordane	10	0.001	0.001	0.003	0.001	--
Toxaphene	10	ND	--	--	--	--
TEQ	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.039	0.127				
DDT	0.018	0.116				
Chlordane	0.003	0.003				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						1*

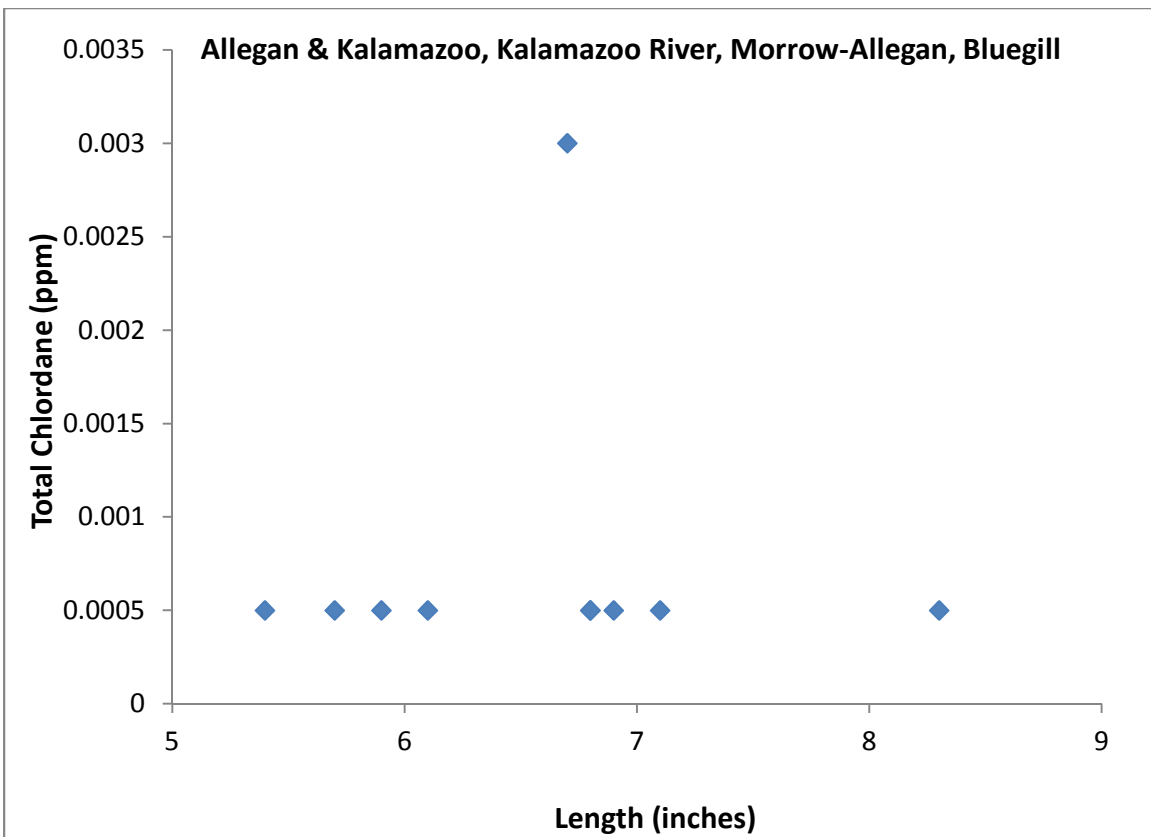
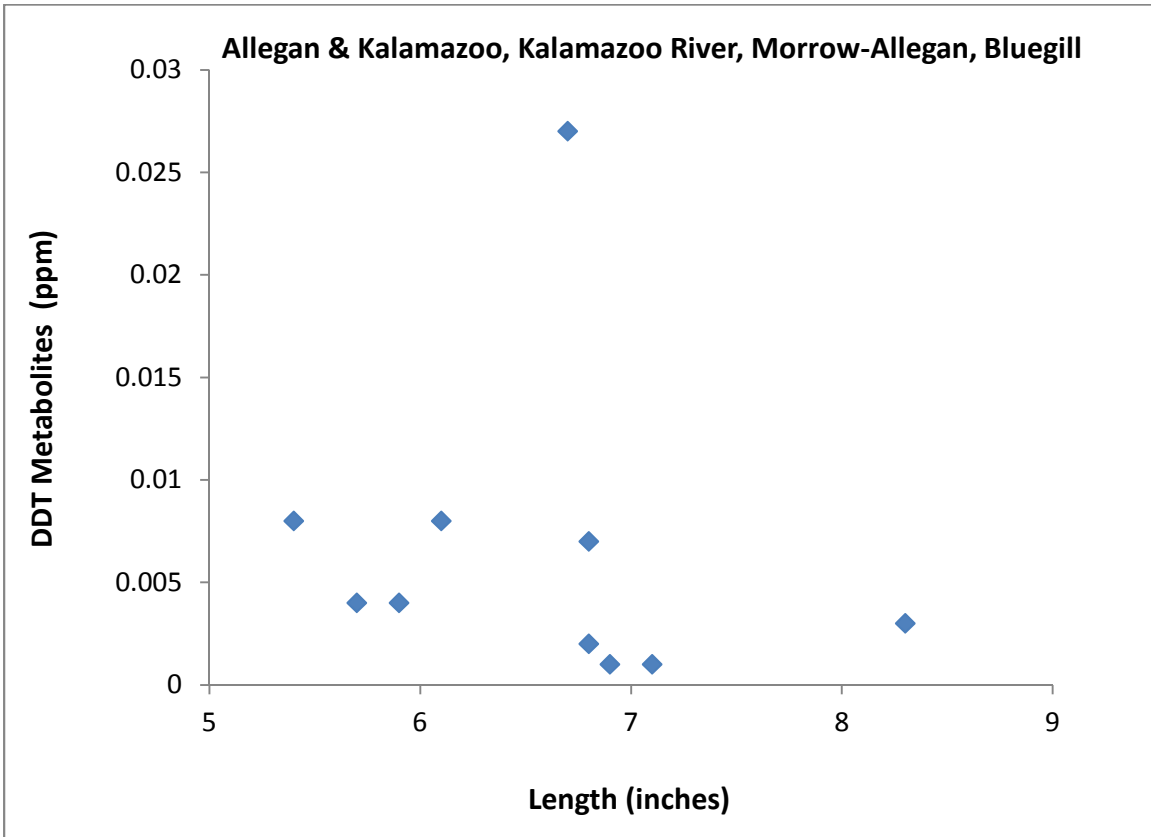
Existing MDCH Advisory: No fish should be eaten from this segment of river due to PCB contamination.

Recommendation: Sediment remediation projects are ongoing in this reach of the Kalamazoo River. *No one should eat sunfish from the Kalamazoo River between Morrow Dam and Allegan Dam due to PCBs. Management determination used to set this guideline. Mercury would cause an advisory.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Carp

**Kalamazoo River
Allegan Dam to River Mouth**

Allegan County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	na	--	--
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

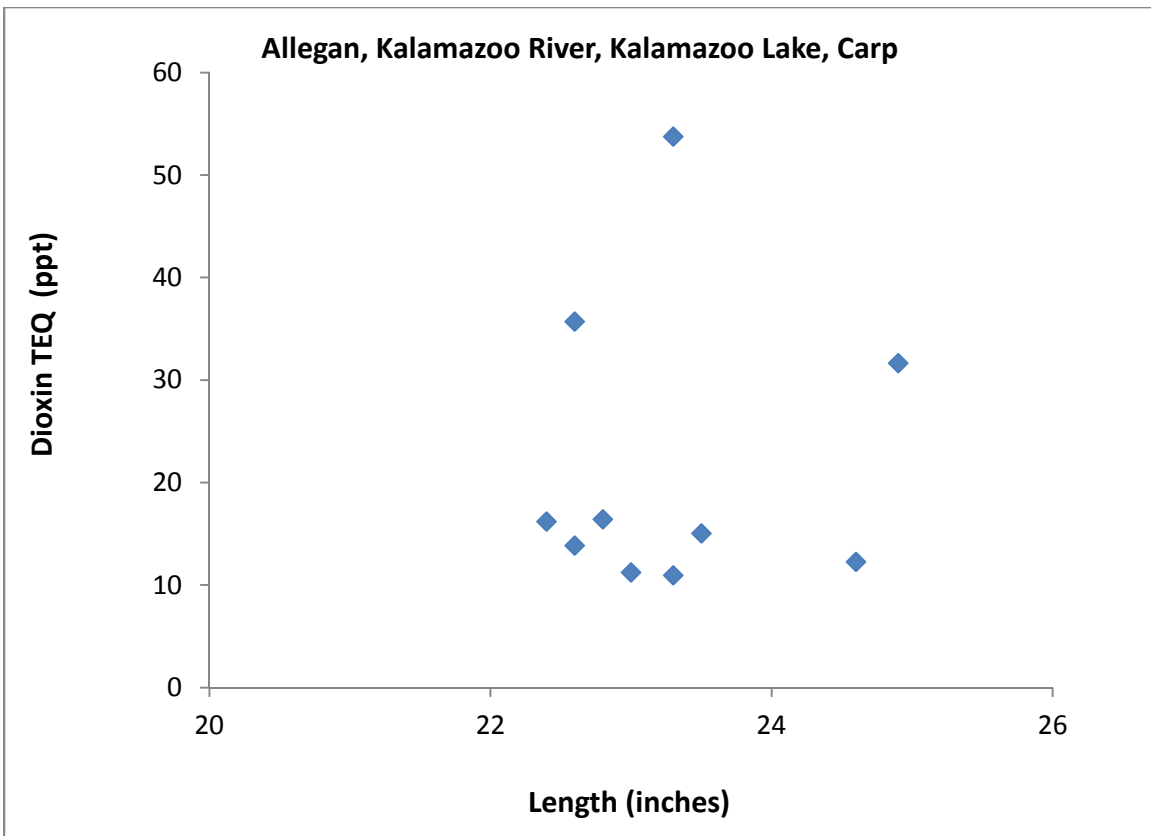
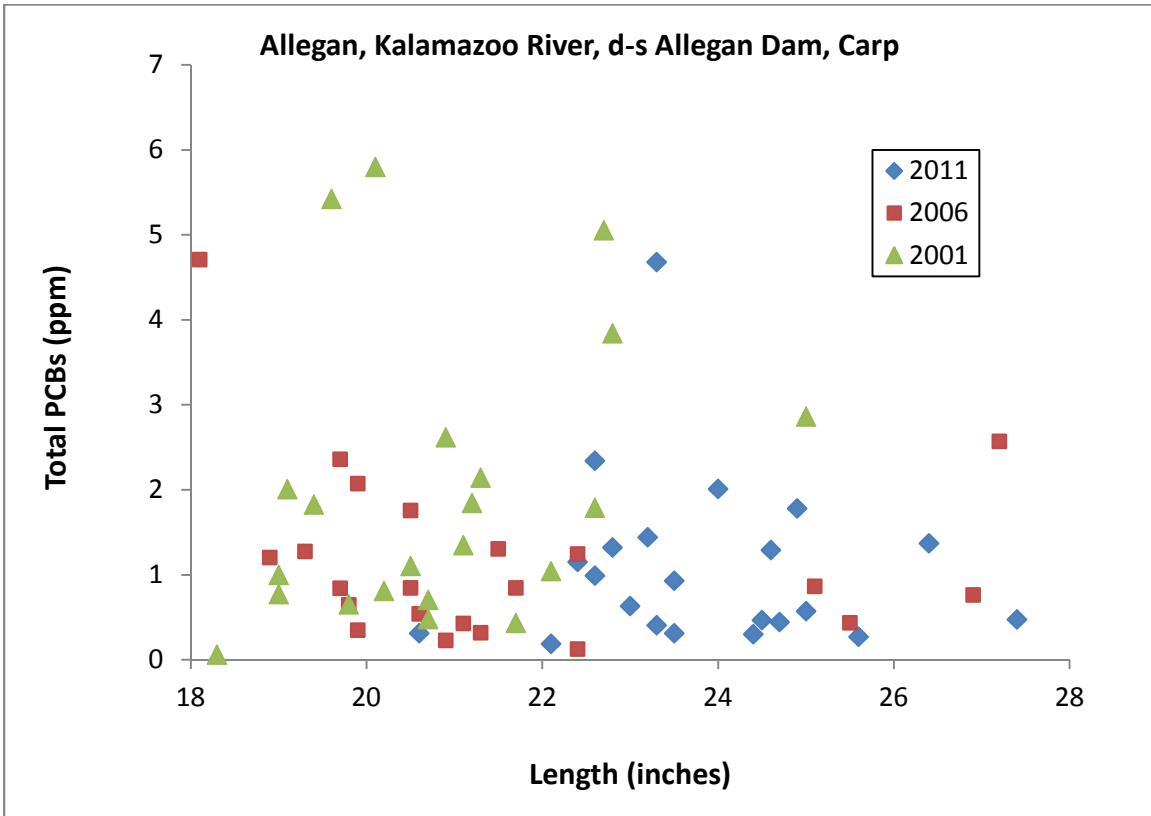
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	66	18.1	na	18.1	27.4
Datasets available: 1984, '85, '86, '87, '93, '99, '01, '06, '11						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	66	1.41	0.06	5.8	1.73	Limited
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
TEQ	10	21.7	11.0	53.8	31.8	Limited
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.015	0.004				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	0.007	0.007	Final meal category based on UCL:		Limited*	

Existing MDCH Advisory: No one should eat carp from the Kalamazoo River downstream of the Allegan Dam due to PCBs.

Recommendation: No one should eat carp from Kalamazoo River downstream of the Allegan Dam due to PCBs and dioxin. *Remediation efforts are ongoing and PCBs source material remains in the area. Management determination used to set this guideline.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

**Channel Catfish
& Flathead Catfish
Hg Analysis:**

**Kalamazoo River
Allegan Dam to River Mouth**

Allegan County

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

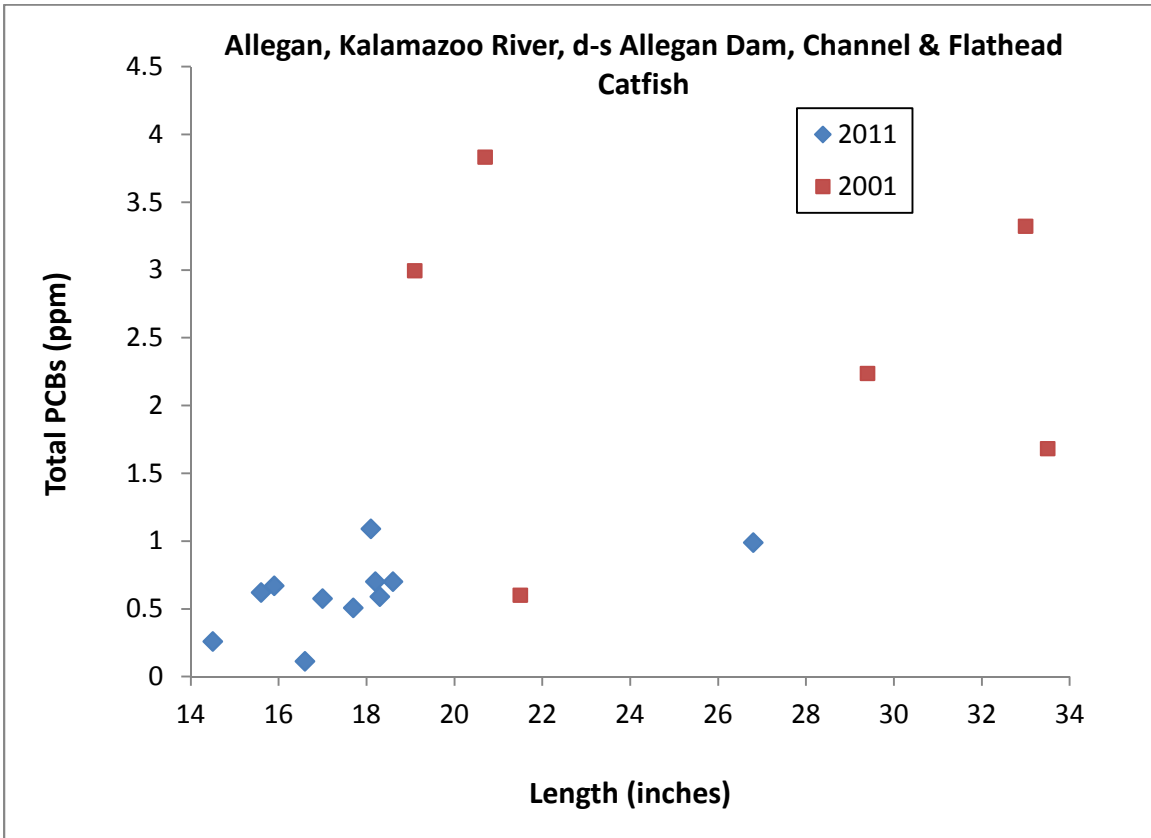
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	17	19.1	12/15	14.5	33.5
Datasets available: 1987, 1999, 2001, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	17	1.26	0.11	3.83	1.85	Limited
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
TEQ	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.306	0.383				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						Limited*

Existing MDCH Advisory: No one should eat catfish from the Kalamazoo River downstream of the Allegan Dam due to PCBs.

Recommendation: No one should eat channel or flathead catfish from the Kalamazoo River downstream of the Allegan Dam due to PCBs. *Remediation efforts are ongoing and PCBs source material remains in the area. Management determination used to set this guideline.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Largemouth and Smallmouth Bass **Kalamazoo River** **Allegan County**
Allegan Dam to River Mouth
Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	11.4	14	13.9	15.4
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	6	0.26	0.20	0.32	0.31	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.714	0.751				

Organics Analysis:

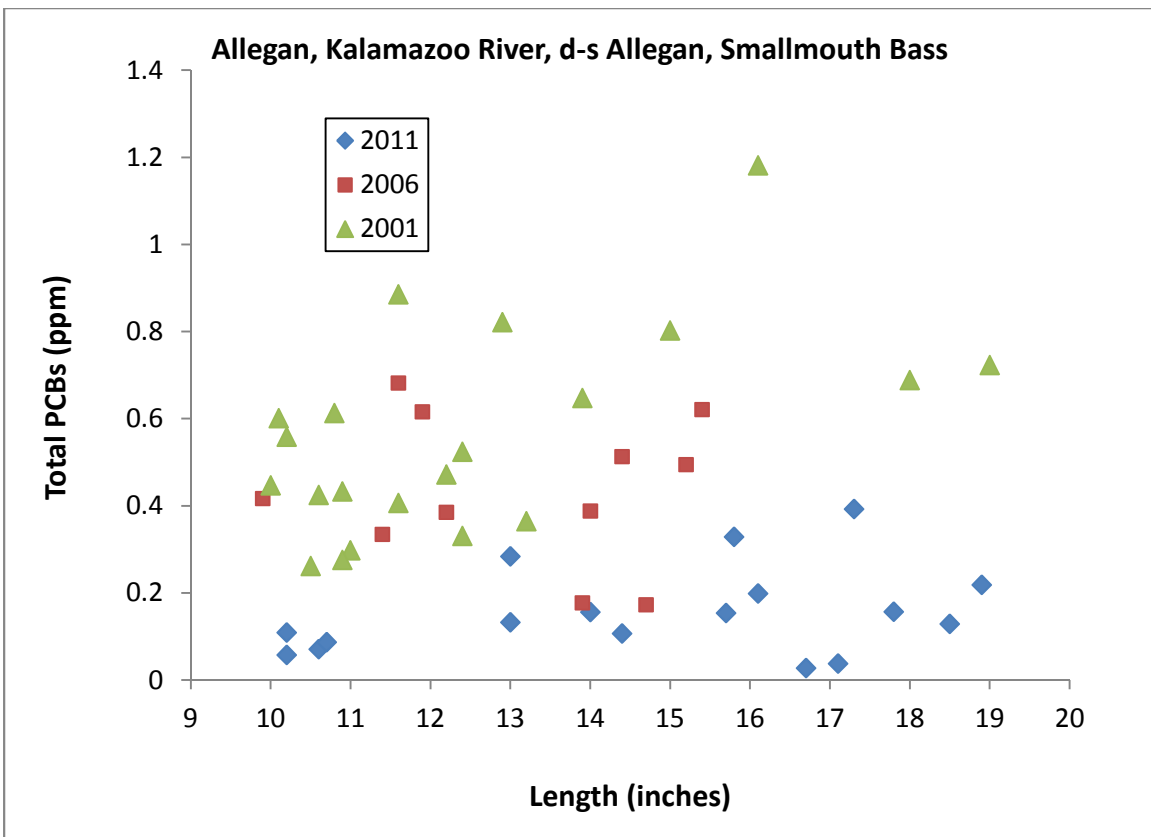
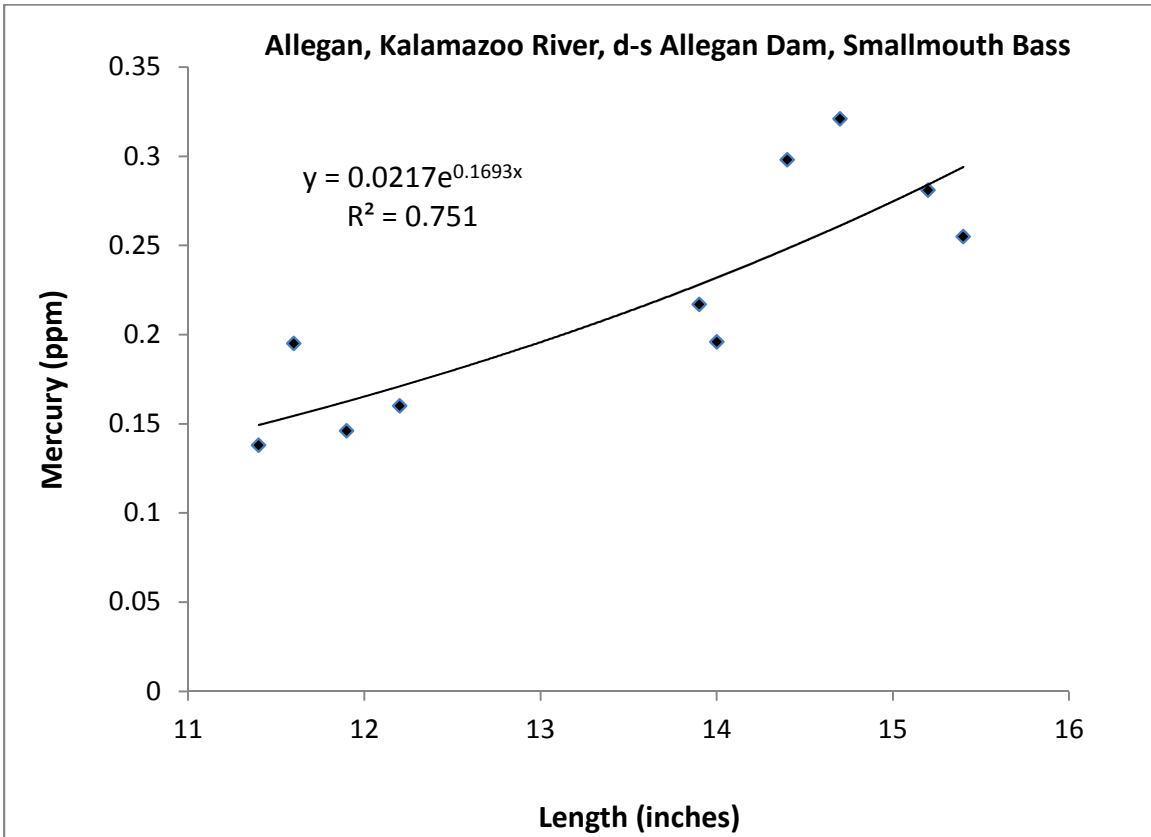
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	49	9.9	14	13.9	19
Datasets available: 1985, '86, '87, '99, '01, '06, '11						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	22	0.38	0.03	1.18	0.51	Limited
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
TEQ	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.000	0.011				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						Limited

Existing MDCH Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of largemouth and smallmouth bass from the Kalamazoo River downstream of the Allegan Dam to no more than 1 or 2 meals per year due to PCBs. Mercury would cause an advisory.

Recommendation: No change.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
13	0.20	4
14	0.23	4
15	0.275	2
16	0.33	2
17	0.39	2
18	0.46	2
19	0.54	1
<i>Shaded area denotes extrapolated estimates</i>		

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Bluegill

**Pine Creek
Impoundment**

Allegan County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	11	5.9	na	5.9	8.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	11	0.07	0.05	0.10	0.09	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.159	0.152				

Organics Analysis:

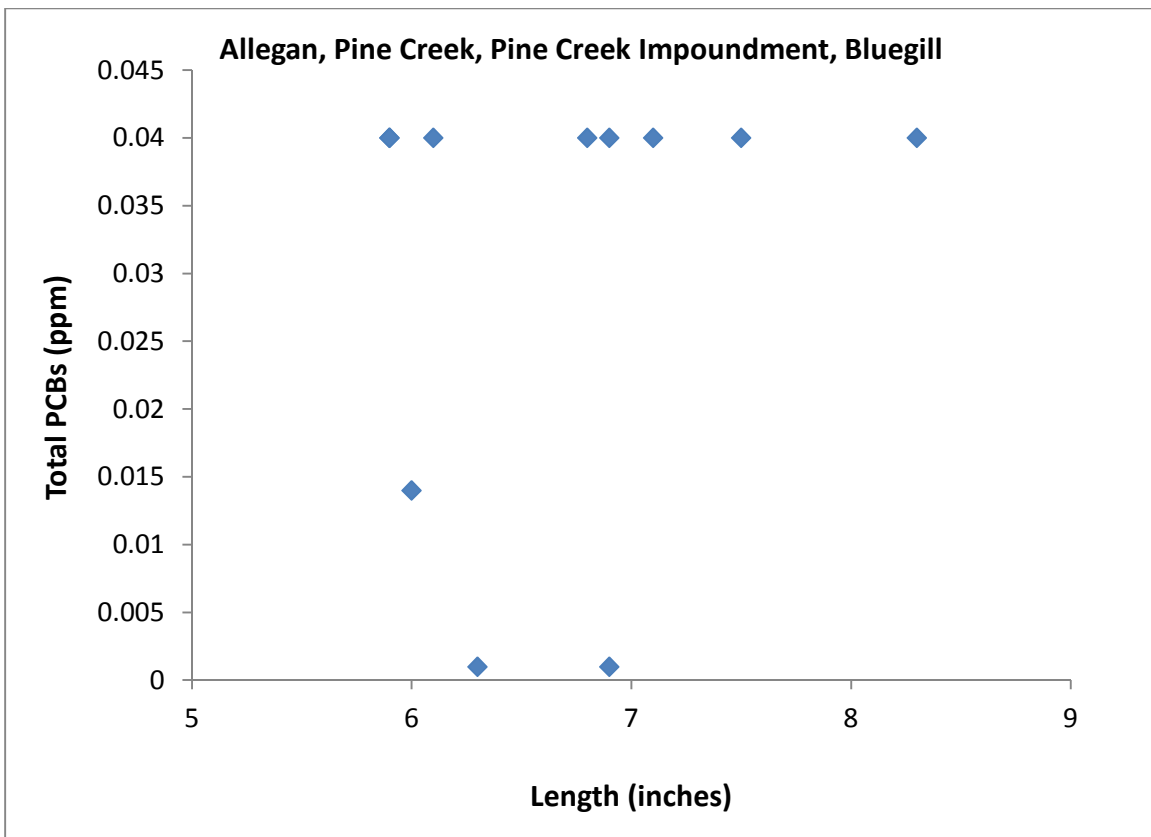
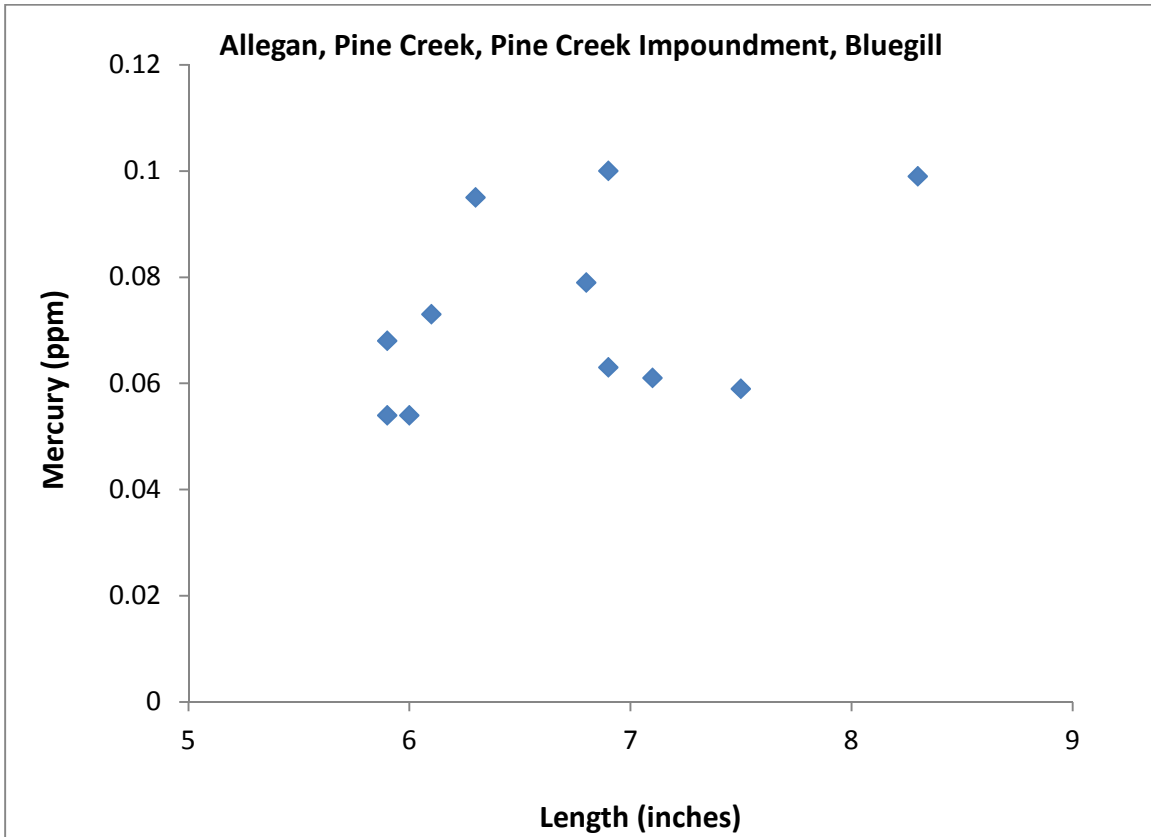
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	11	5.9	na	5.9	8.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	11	0.03	0.001	0.04	0.04	4
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
TEQ	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.043	0.017				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						4

Existing MDCH Advisory: Specific guidelines for Pine Creek Impoundment bluegill were not developed since data were not available previously.

Recommendation: No one should eat more than 4 meals per month of bluegill or pumpkinseed from the Pine Creek Impoundment due to PCBs. Mercury would cause an advisory.

Note: This stretch of Pine Creek had a legacy point-source release of PCBs and empties into the Kalamazoo River between the Morrow Pond Dam and Allegan Dam, which is also contaminated with PCBs; however, a dam impedes movement of fish from the Kalamazoo River to Pine Creek.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Carp

Pine Creek Impoundment

Allegan County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	11	24.1	na	24.1	31.1
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	11	0.18	0.11	0.31	0.22	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.430	0.468				

Organics Analysis:

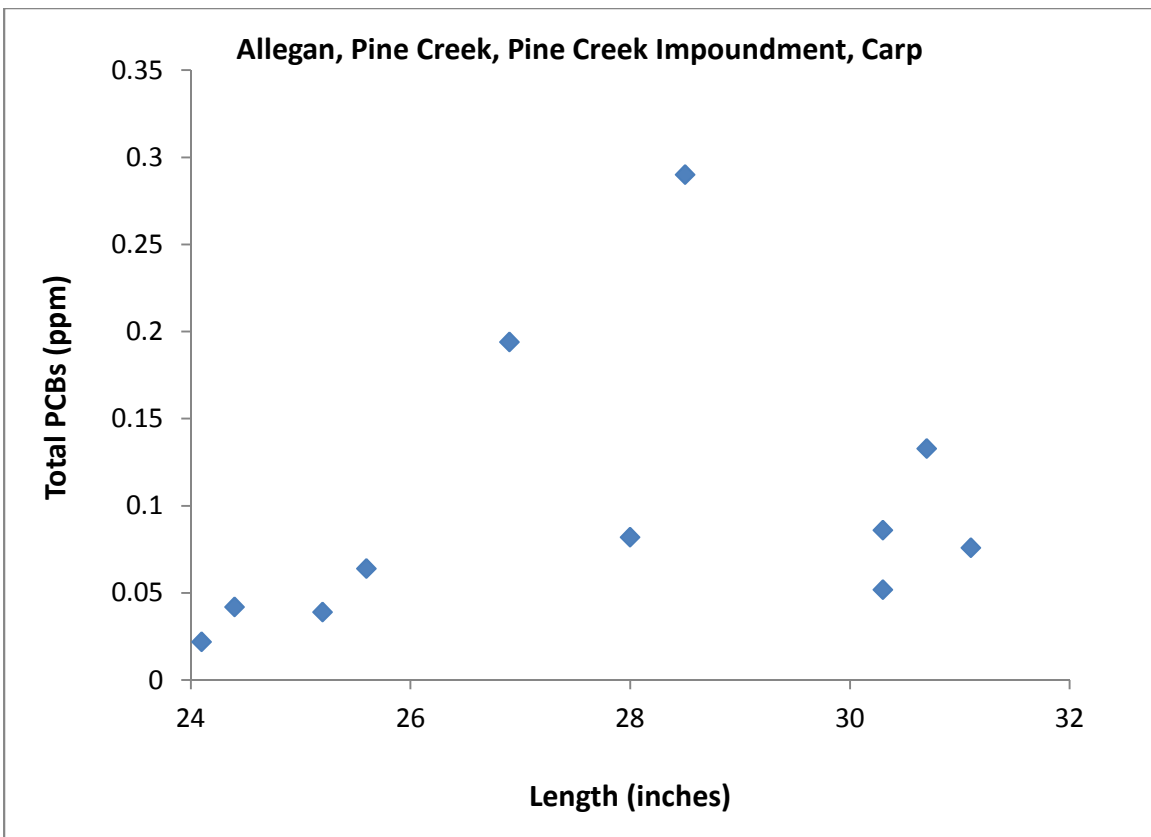
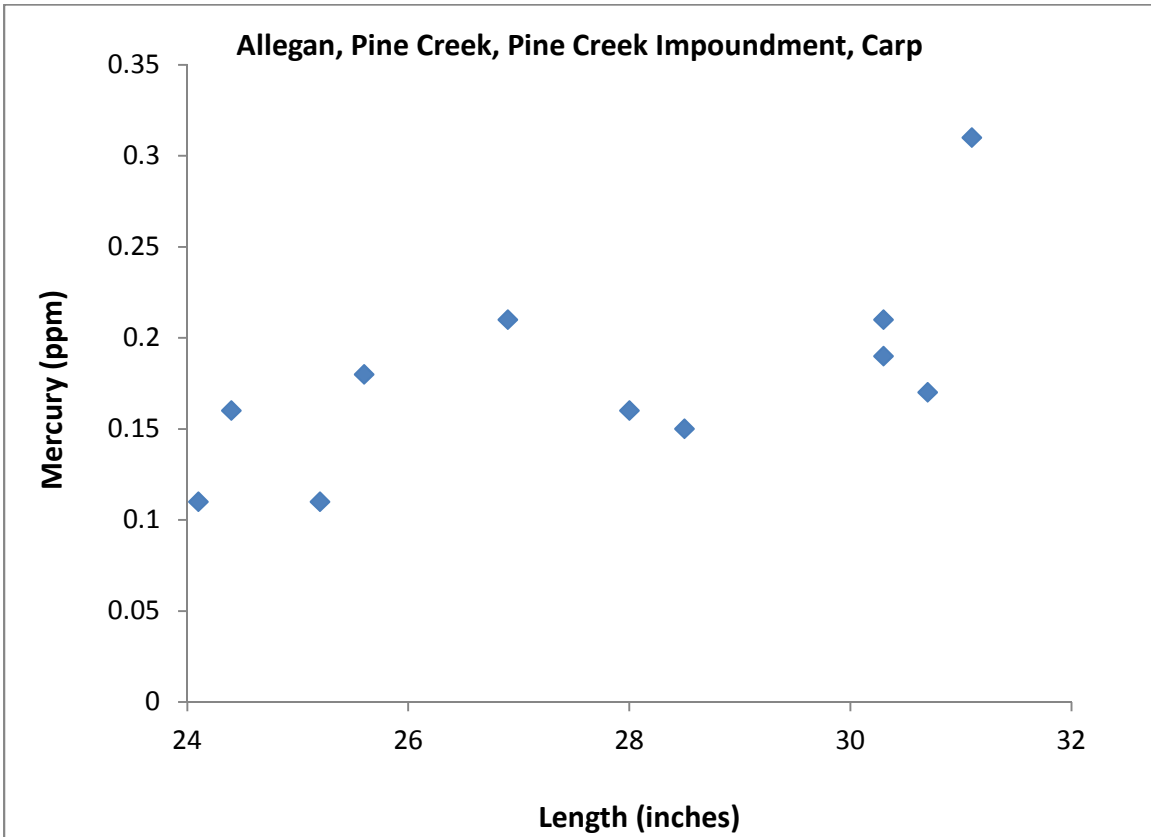
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	11	24.1	na	24.1	31.1
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	11	0.10	0.02	0.29	0.15	1
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
TEQ	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.088	0.249				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						1

Existing MDCH Advisory: Specific guidelines for Pine Creek Impoundment carp were not developed since data were not available previously.

Recommendation: No one should eat more than 1 meal per month of carp from the Pine Creek Impoundment due to PCBs. Mercury would cause an advisory.

Note: This stretch of Pine Creek had a legacy point-source release of PCBs and empties into the Kalamazoo River between the Morrow Pond Dam and Allegan Dam, which is also contaminated with PCBs; however, a dam impedes movement of fish from the Kalamazoo River to Pine Creek.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Largemouth Bass

Pine Creek Impoundment

Allegan County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	7	11.4	14	14.6	17.8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.45	0.22	0.61	0.63	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.806	0.753				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	7	11.4	14	14.6	17.8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.04	0.04	0.04	0.04	4
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
TEQ	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						1

Existing MDCH Advisory: Specific guidelines for Pine Creek Impoundment largemouth or smallmouth bass were not developed since data were not available previously.

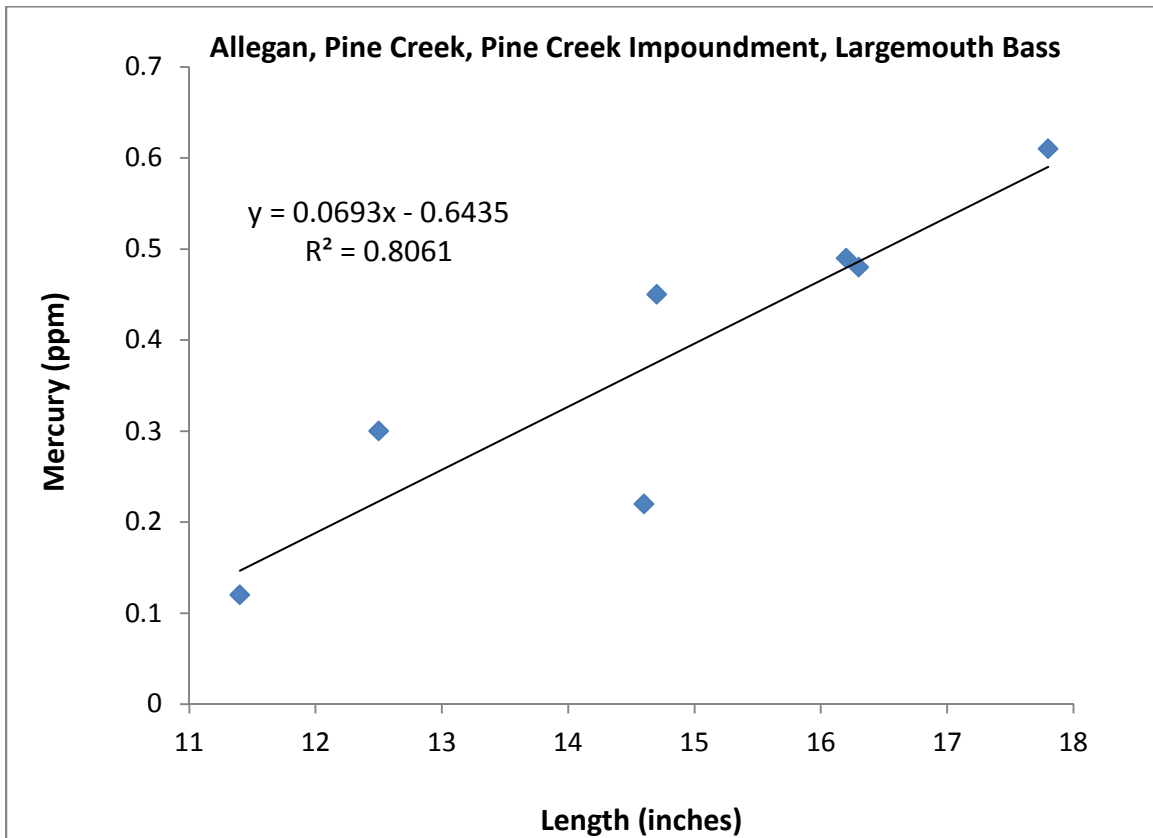
Recommendation: No one should eat more than 2 meals per month of largemouth or smallmouth bass from the Pine Creek Impoundment smaller than 18 inches, or more than 1 meal per month of those fish larger than 18 inches due to mercury. PCBs would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.33	2
15	0.4	2
16	0.47	2
17	0.53	2
18	0.6	1
20	0.74	1
22	0.88	1

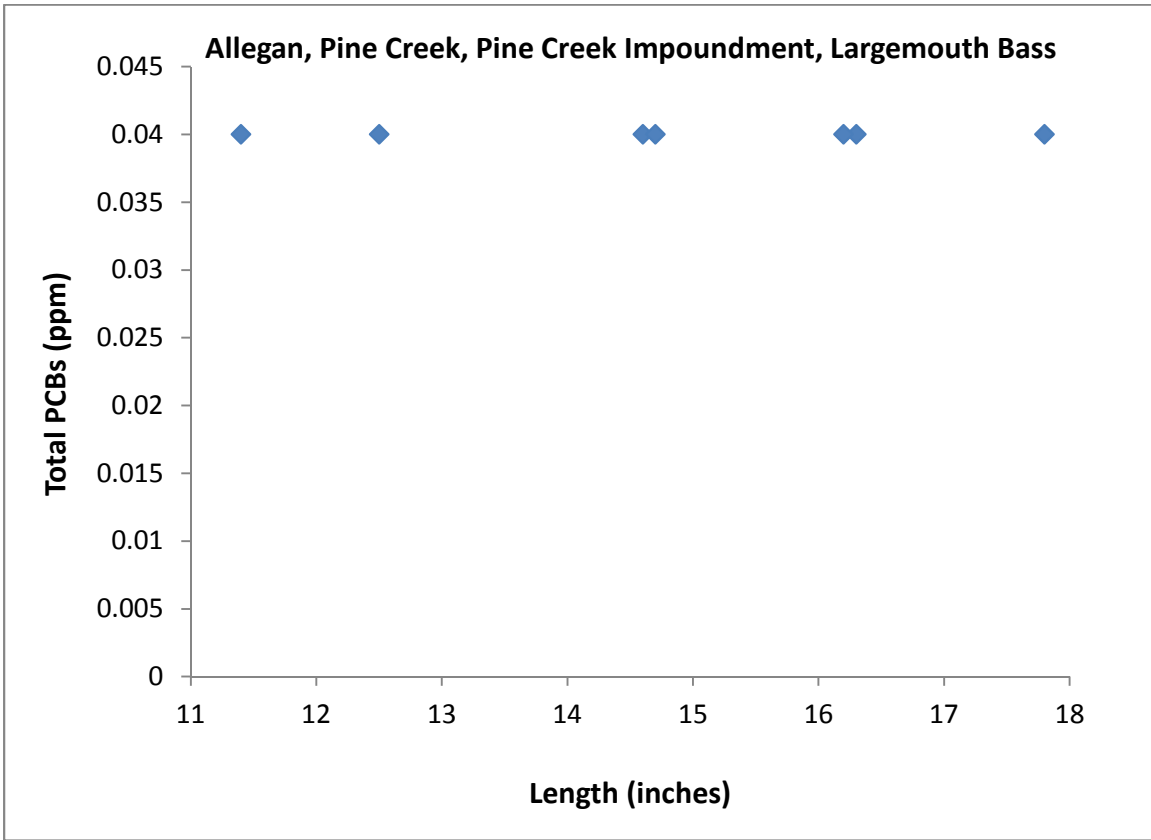
Shaded area denotes extrapolated estimates

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Note: This stretch of Pine Creek had a legacy point-source release of PCBs and empties into the Kalamazoo River between the Morrow Pond Dam and Allegan Dam, which is also contaminated with PCBs; however, a dam impedes movement of fish from the Kalamazoo River to Pine Creek.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Carp

**Portage Creek
Bryant Mill Pond / d-s Monarch Dam**

Kalamazoo County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	na	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

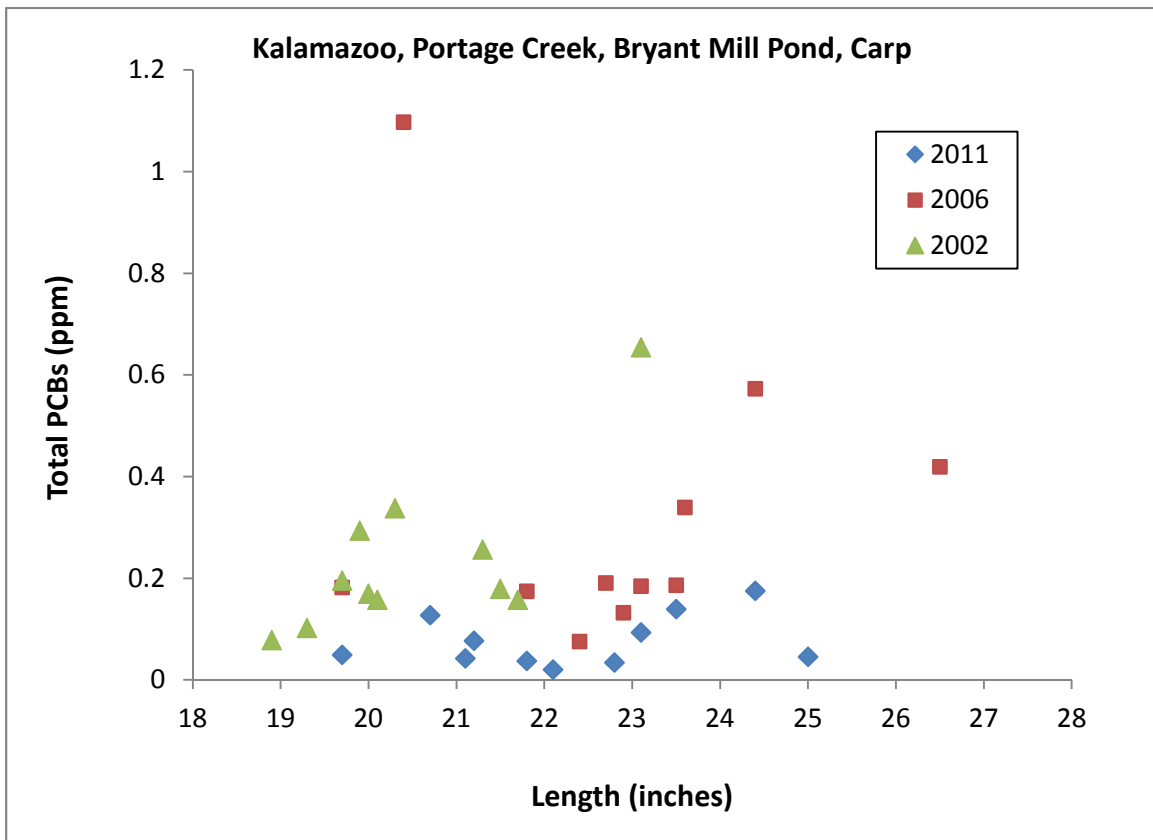
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2011	33	18.9	na	18.9	26.5
Datasets available: 1985,'86,'87,2000,'01,'02,'06, '11						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	33	0.21	0.02	1.10	0.29	0.5
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.010	0.012				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

Existing MDCH Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of carp from Portage Creek downstream of Monarch Dam to no more than 1 or 2 meals per year due to PCBs.

Recommendation: No change. Additional data is needed in order to relax this advisory.

Note: This stretch of Portage Creek had a legacy point-source release of PCBs and empties into the Kalamazoo River between the Morrow Pond Dam and Allegan Dam, which is also contaminated with PCBs. A waterbody-wide advisory ("All Other Species") is applied to this segment of Portage Creek.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.

Carp

**Portage Creek
Monarch Pond**

Kalamazoo County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	na	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

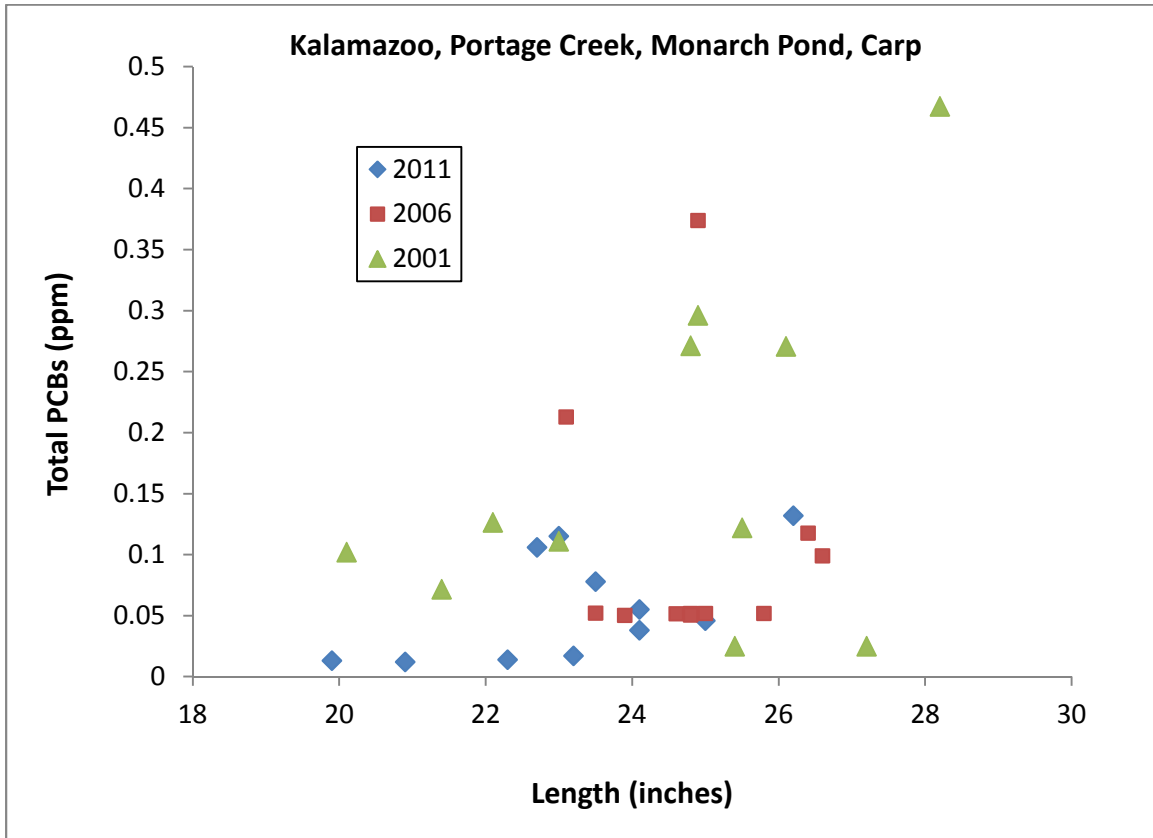
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	33	19.9	na	19.9	28.2
Datasets available: 2001, 2006, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	33	0.11	0.01	0.47	0.15	1
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.149	0.150				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing MDCH Advisory: No one should eat more than 1 meal per month of carp from Portage Creek upstream of the Monarch Mill Dam due to PCBs.

Recommendation: No change.

Appendix D3. Eat Safe Fish guidance, 2015 update recommendations, Southwest Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.

Largemouth Bass

Lake Fenton

Genesee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2011	24	9.8	14	13.8	19.7
Datasets available: 1987, 1989, 1990, 2011						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.42	0.22	0.74	0.54	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.708	0.664				

Organics Analysis:

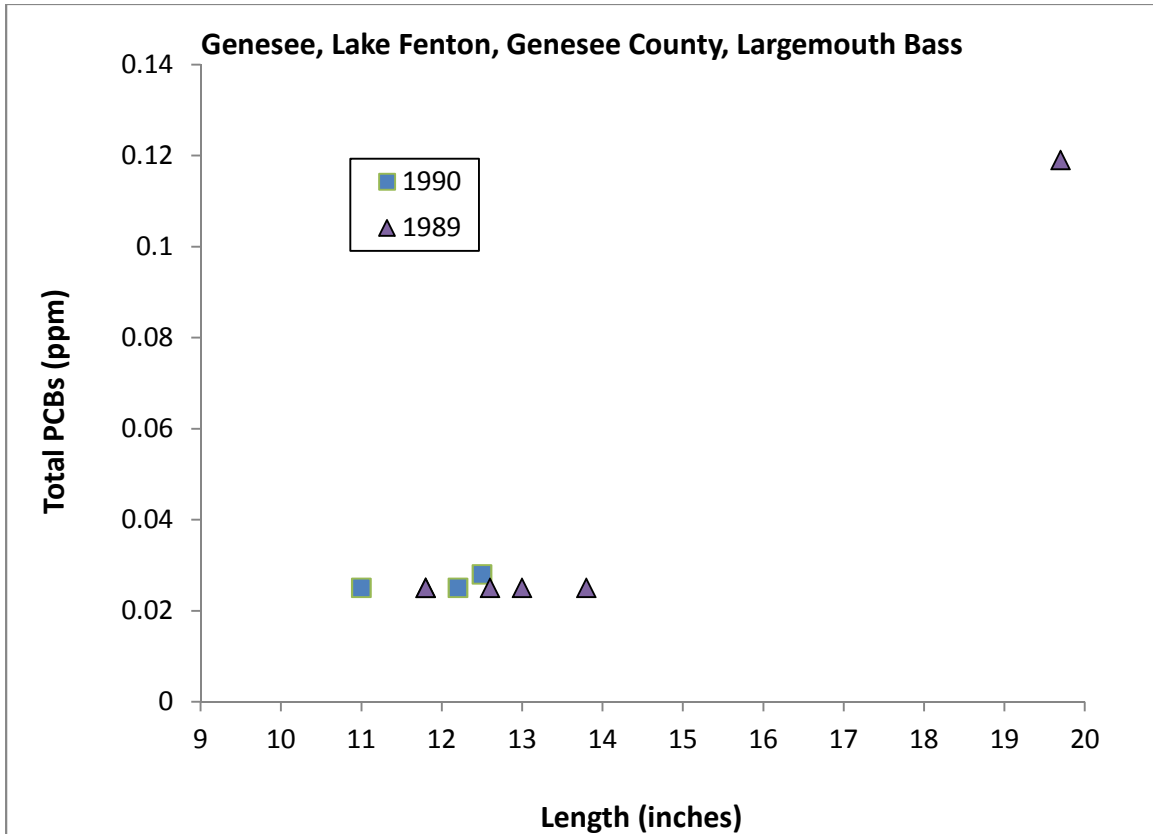
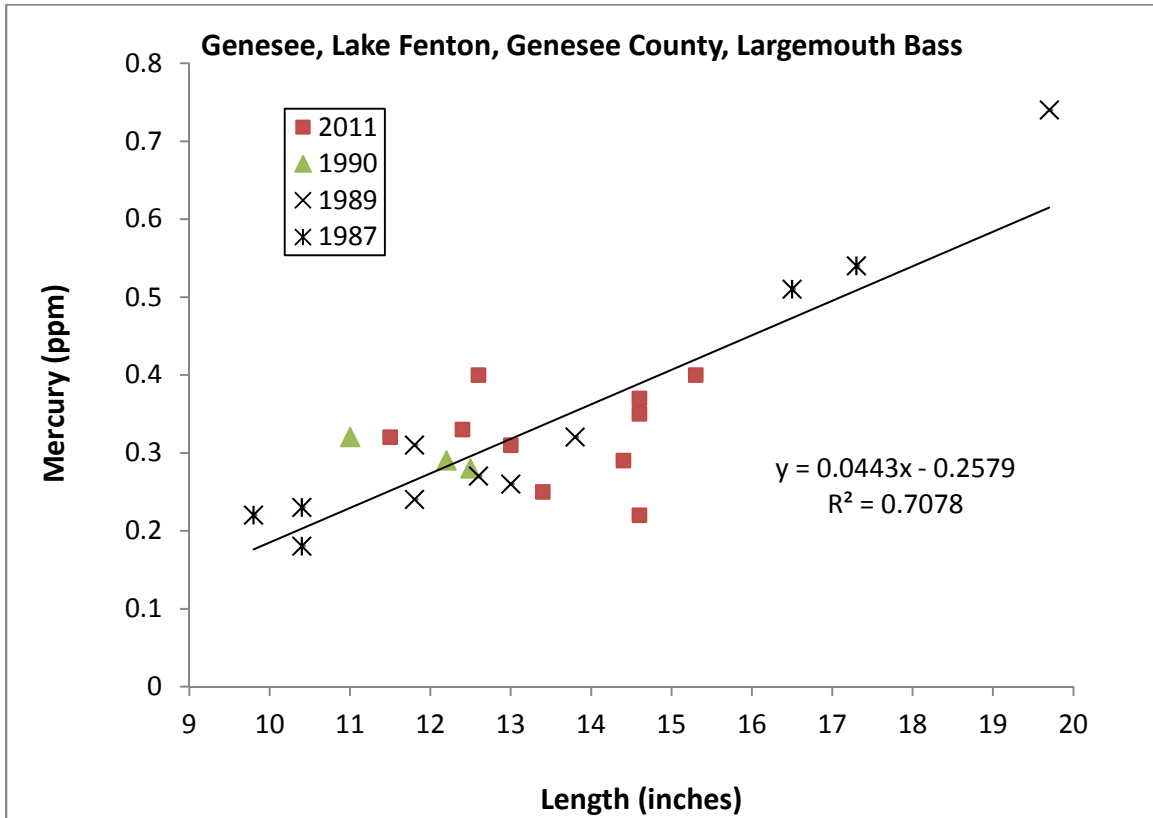
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1990	9	11	14	13.8	19.7
Datasets available: 1989, 1990						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2	0.07	0.02	0.12	0.67	--
DDT	2	0.16	0.02	0.29	1.85	--
Chlordane	2	0.01	0.003	0.02	0.13	--
Toxaphene	2	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.906	0.904				
DDT	0.793	0.571				
Chlordane	0.895	0.865				
Toxaphene	--	--				
* - regressions all driven by 1 elevated concentration						
Final meal category based on UCL:						1

Existing MDCH Advisory: Statewide guidelines apply to Fenton Lake largemouth bass. No one should eat more than two meals per month of Lake Fenton largemouth bass less than 18 inches, or one meal per month of Lake Fenton largemouth bass greater than 18 inches due to mercury.

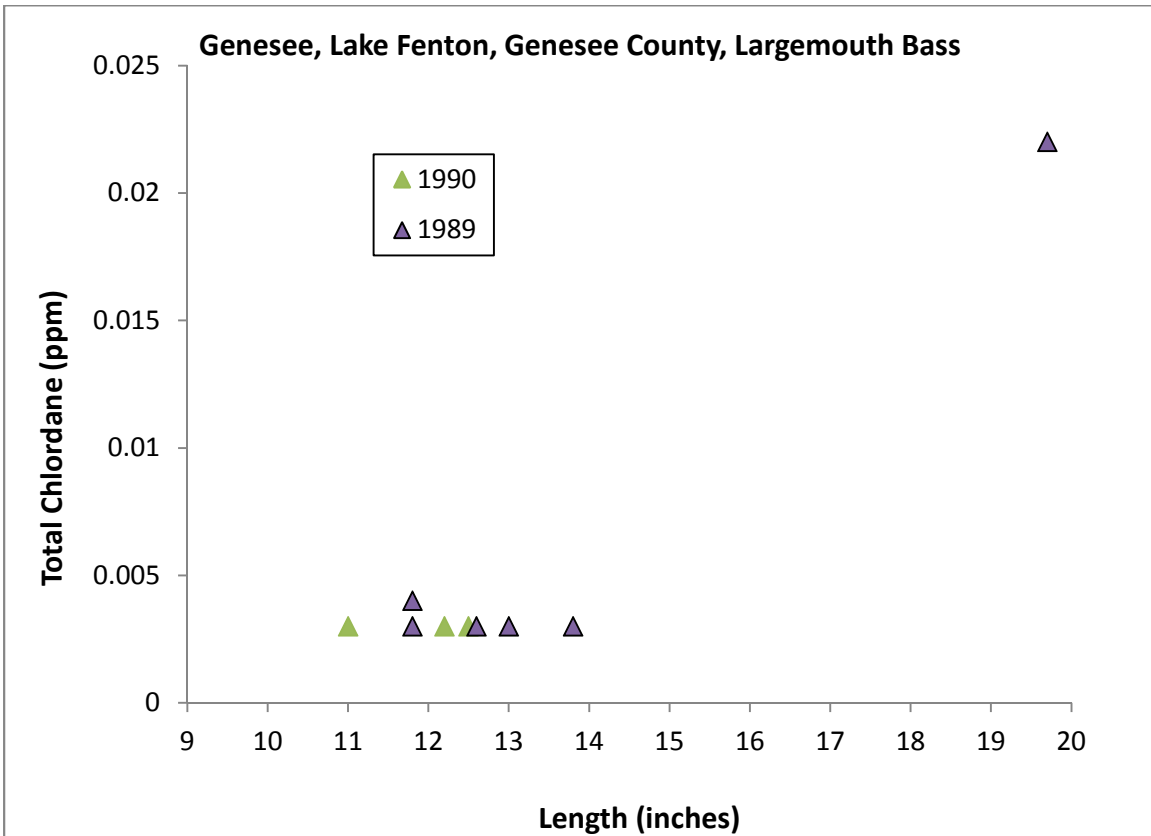
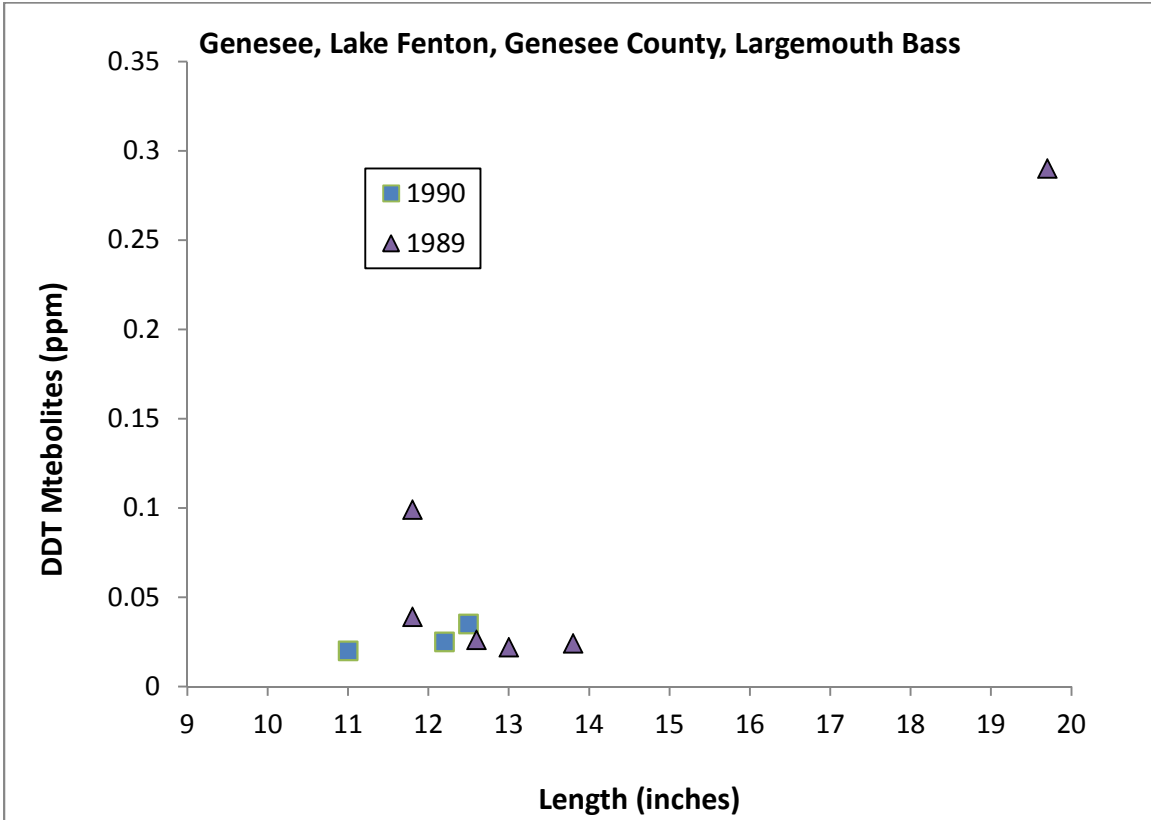
Recommendation: No change.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.36	2
16	0.45	2
18	0.54	1
20	0.63	1
22	0.72	1
24	0.81	1
26	0.89	1
<i>Shaded area denotes extrapolated estimates</i>		

Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.

Carp

**Tobico Marsh
(Wetland)**

Bay County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1996	2012	30	13.6	na	13.6	25.4	
Datasets available: 1996, 2007, 2012							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.04		0.01	0.10	0.05	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.007	0.005					

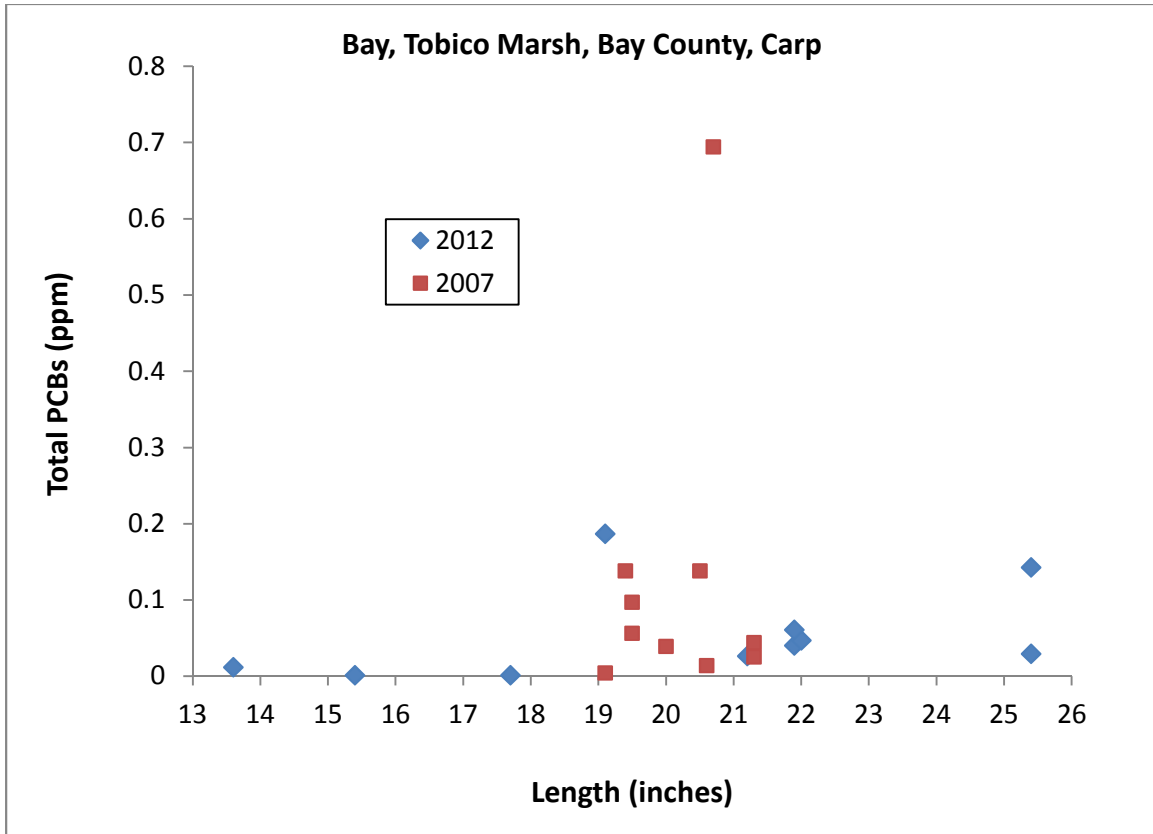
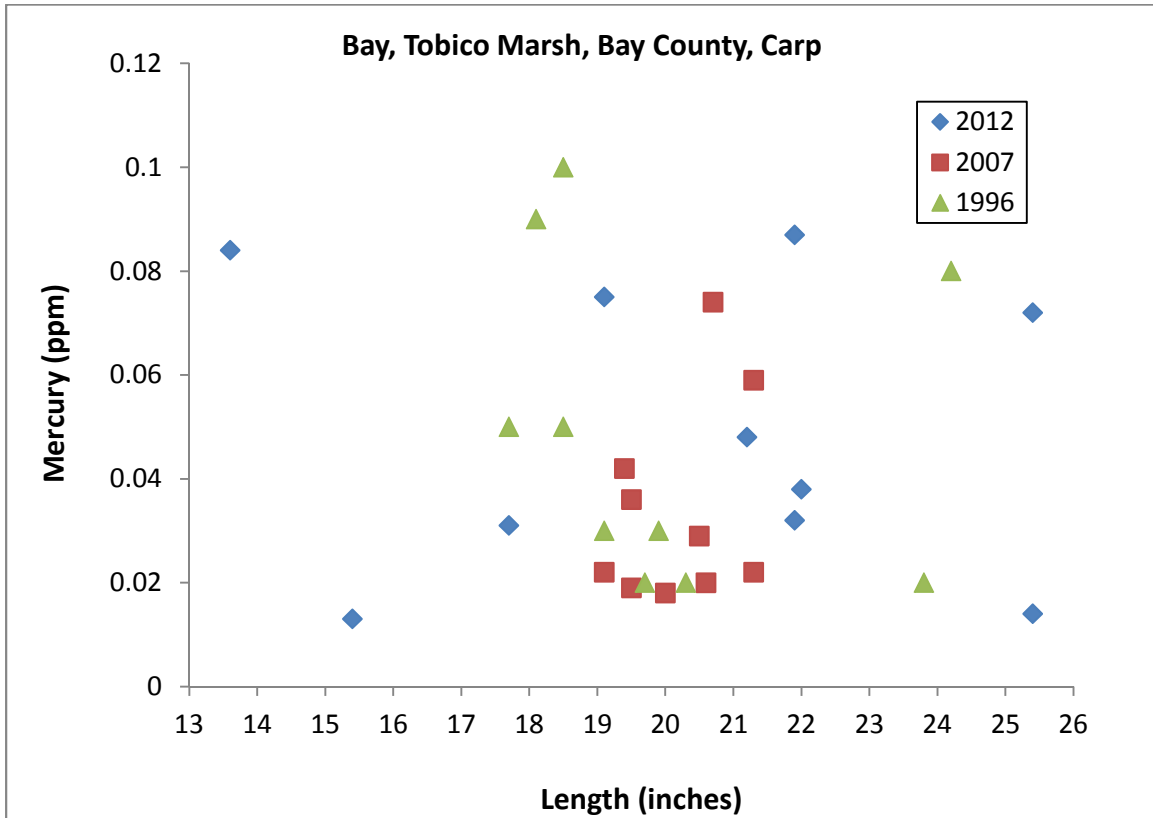
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2007	2012	20	13.6	na	13.6	25.4	
Datasets available: 1996, 2007, 2012							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.09		0.001	0.69	0.16	1
DDT	20	0.03		0.002	0.08	0.04	16
Chlordane	20	0.001		0.001	0.005	0.002	--
Toxaphene	20	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.016	0.225					
DDT	0.052	0.241					
Chlordane	0.021	0.042					
Toxaphene	--	--					
Final meal category based on UCL:							1

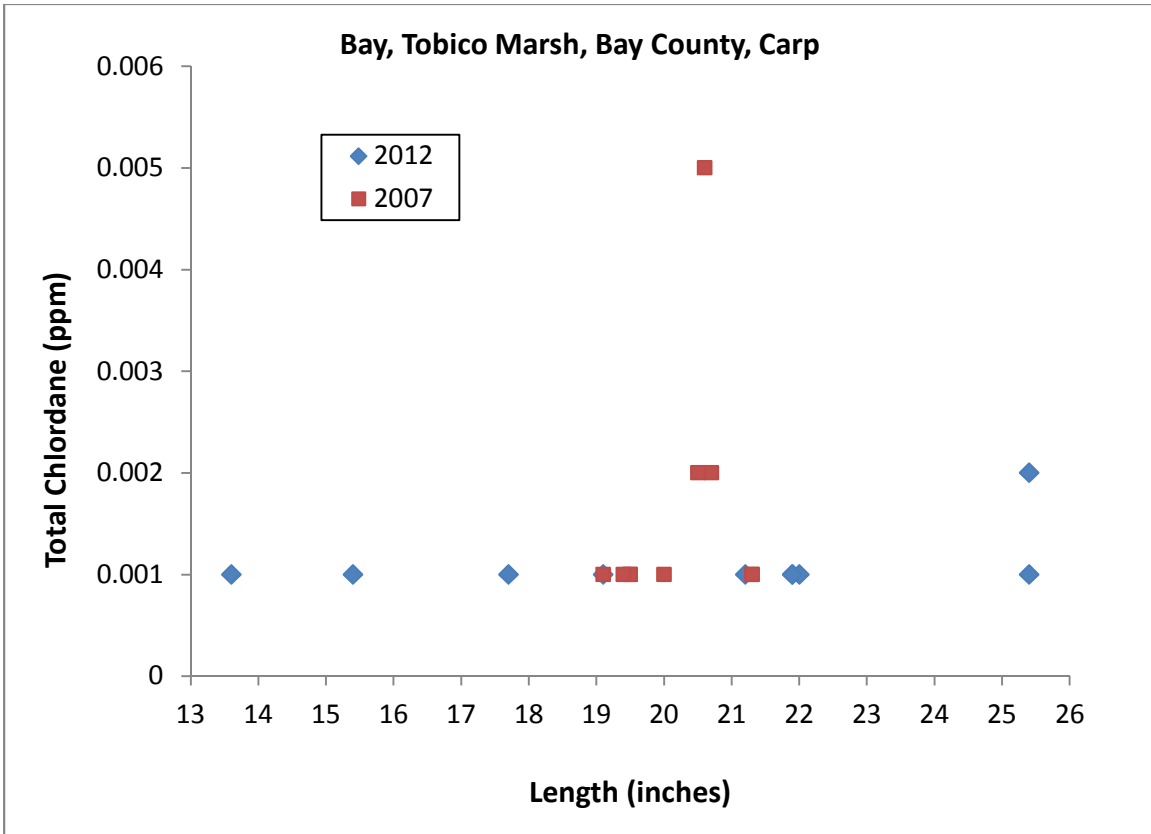
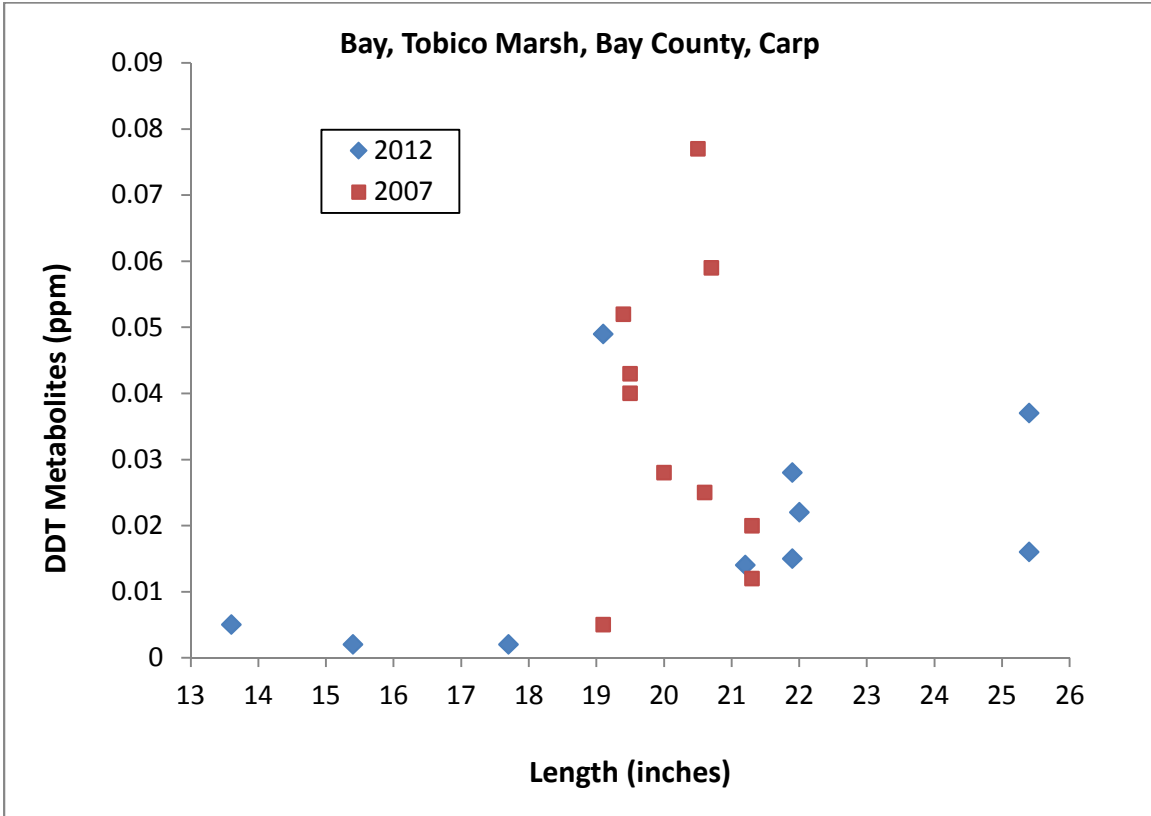
Existing MDCH Advisory: No one should eat more than 6 meals per year of Tobico Marsh carp due to PCBs.

Recommendation: No one should eat more than 1 meal per month of Tobico Marsh carp due to PCBs.

Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.

Northern Pike

**Tobico Marsh
(Wetland)**

Bay County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1996	2012	26	19.3	24	24.0	29.1	
Datasets available: 1996, 2007, 2012							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	17	0.16		0.08	0.30	0.19	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.161	0.202					

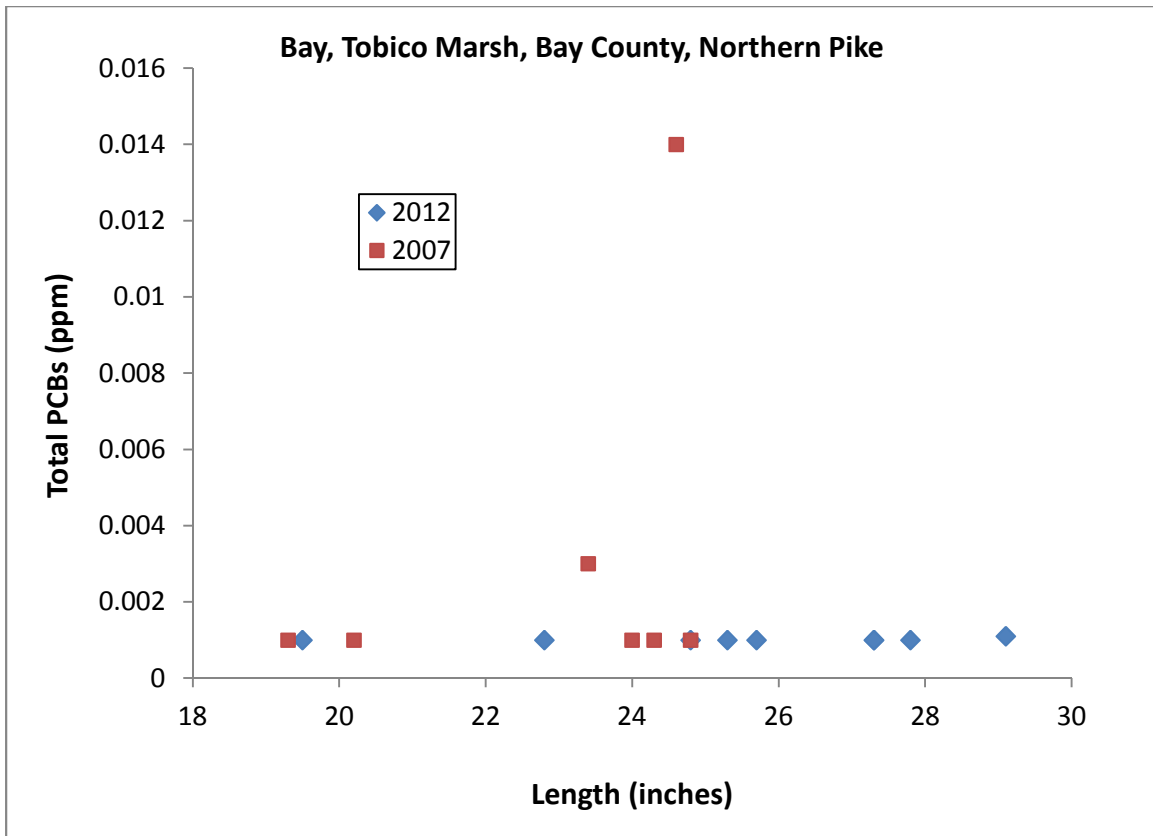
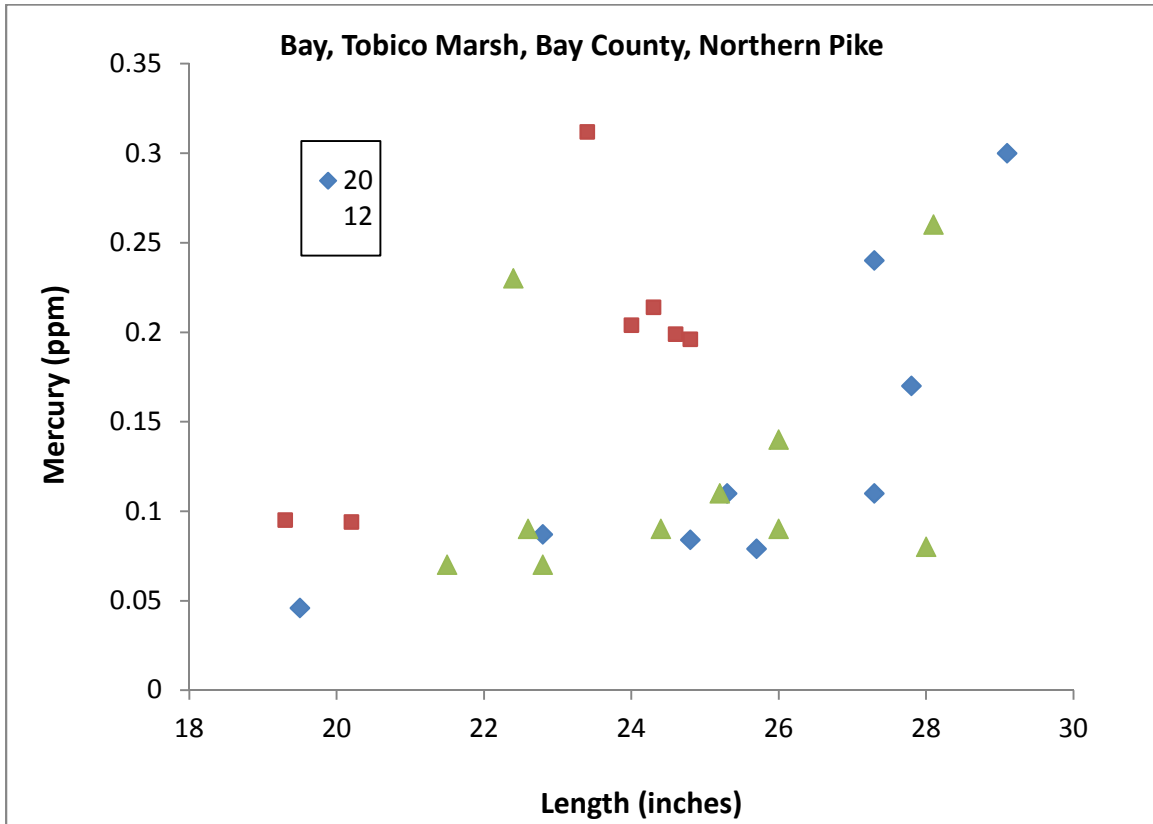
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2007	2012	16	19.3	24		29.1	
Datasets available: 1996, 2007, 2012							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	11	0.002		0.001	0.014	0.005	16
DDT	11	0.002		0.001	0.01	0.004	16
Chlordane	11	ND		--	--	--	--
Toxaphene	11	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.000	0.000					
DDT	0.010	0.059					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							4

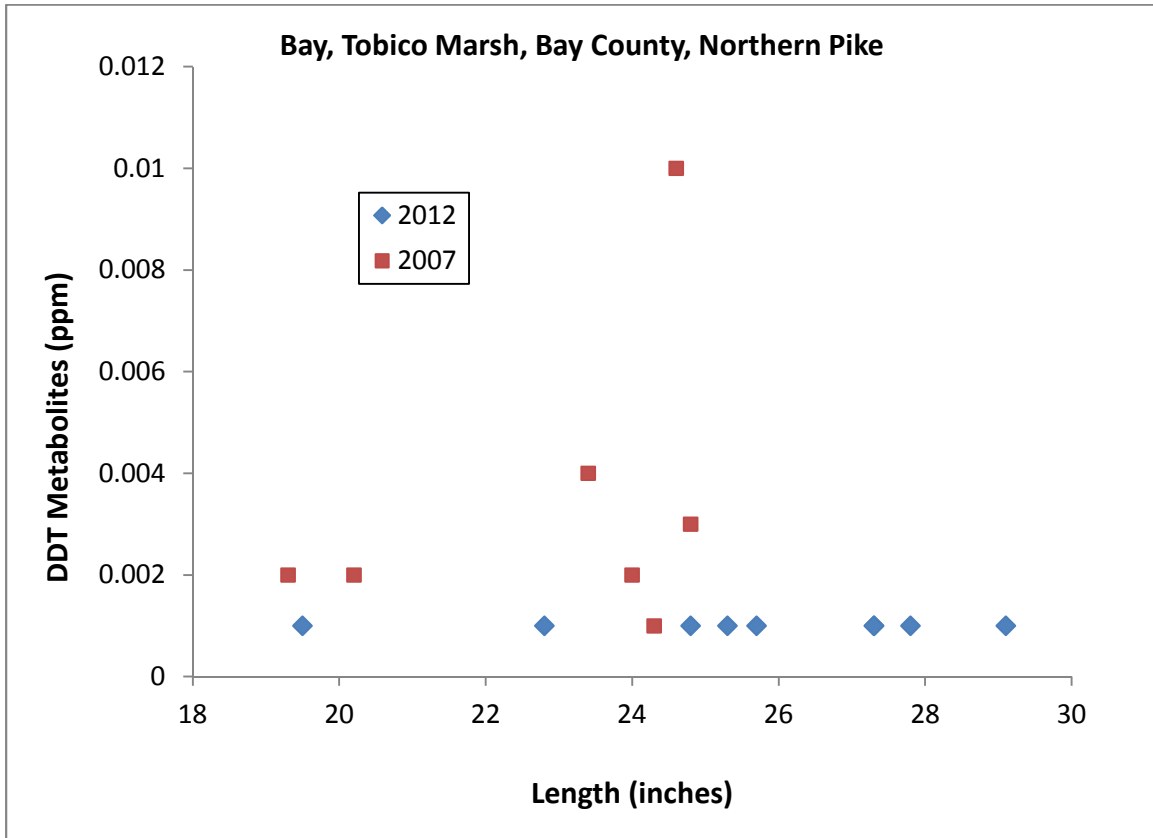
Existing MDCH Advisory: No one should eat more than 4 meals per month of Tobico Marsh northern pike less than 30 inches, or 2 meals per month of northern pike greater than 30 inches due to mercury.

Recommendation: No change.

Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.

Carp

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1988	2012	28	17.8	na	17.8	33.5	
Datasets available: 1988, 1999, 2012							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	28	0.09		0.02	0.15	0.11	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.008	0.000					

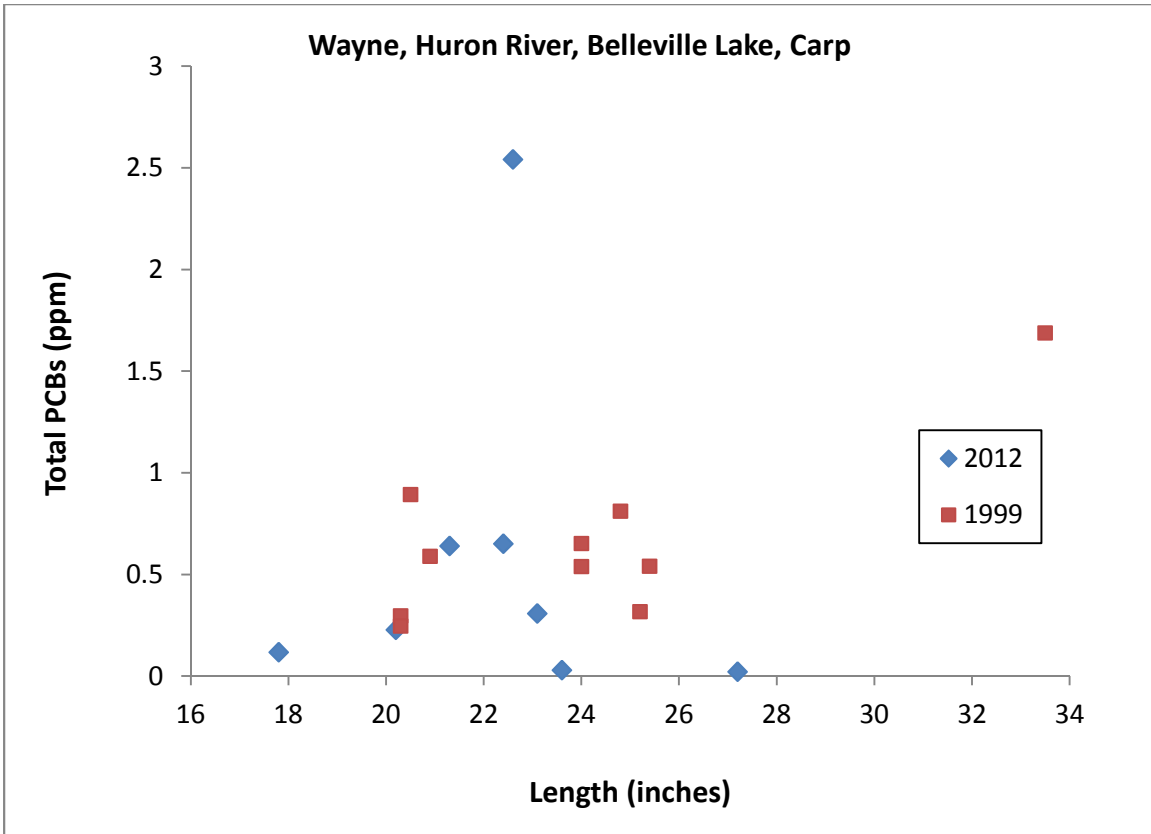
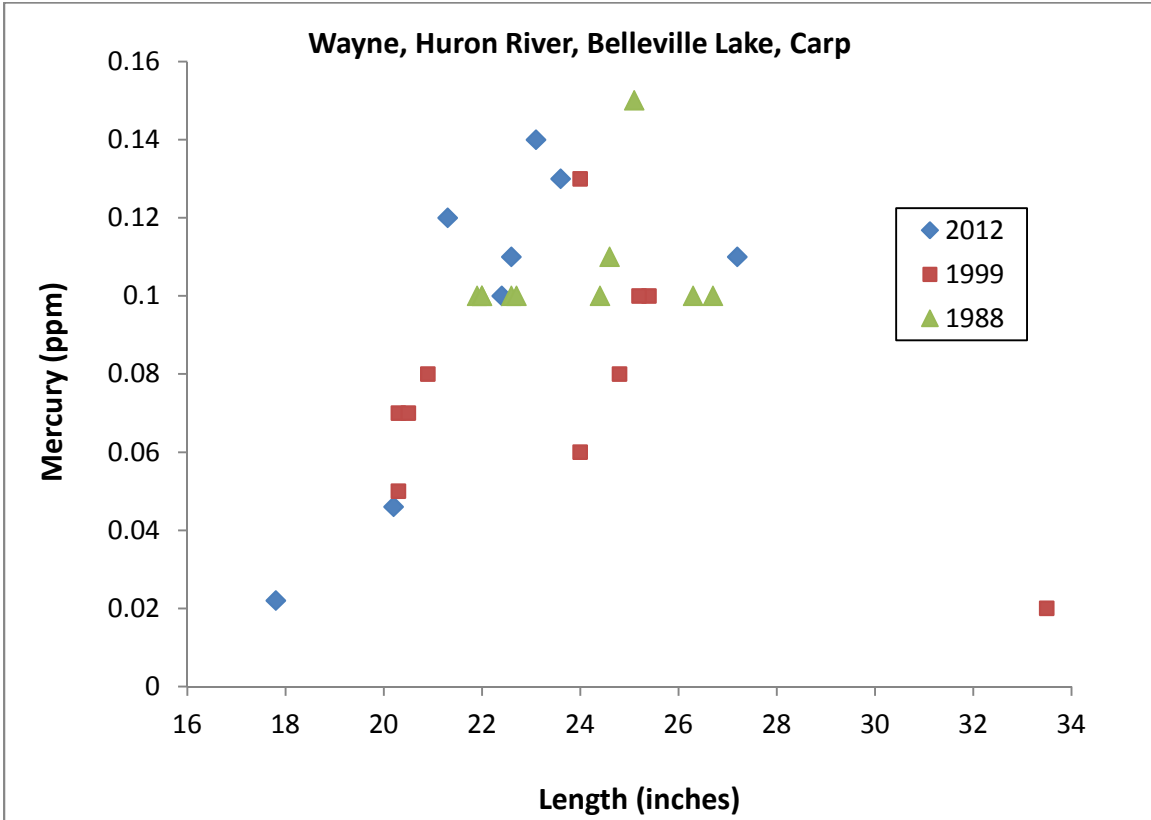
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1999	2012	18	17.8	na	17.8	33.5	
Datasets available: 1988, 1999, 2012							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	18	0.62		0.022	2.54	0.93	Limited
DDT	18	0.13		0.003	0.44	0.19	8
Chlordane	18	0.01		0.001	0.05	0.02	--
Toxaphene	18	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.106	0.017					
DDT	0.266	0.022					
Chlordane	0.311	0.087					
Toxaphene	--	--					
Final meal category based on UCL:							Limited

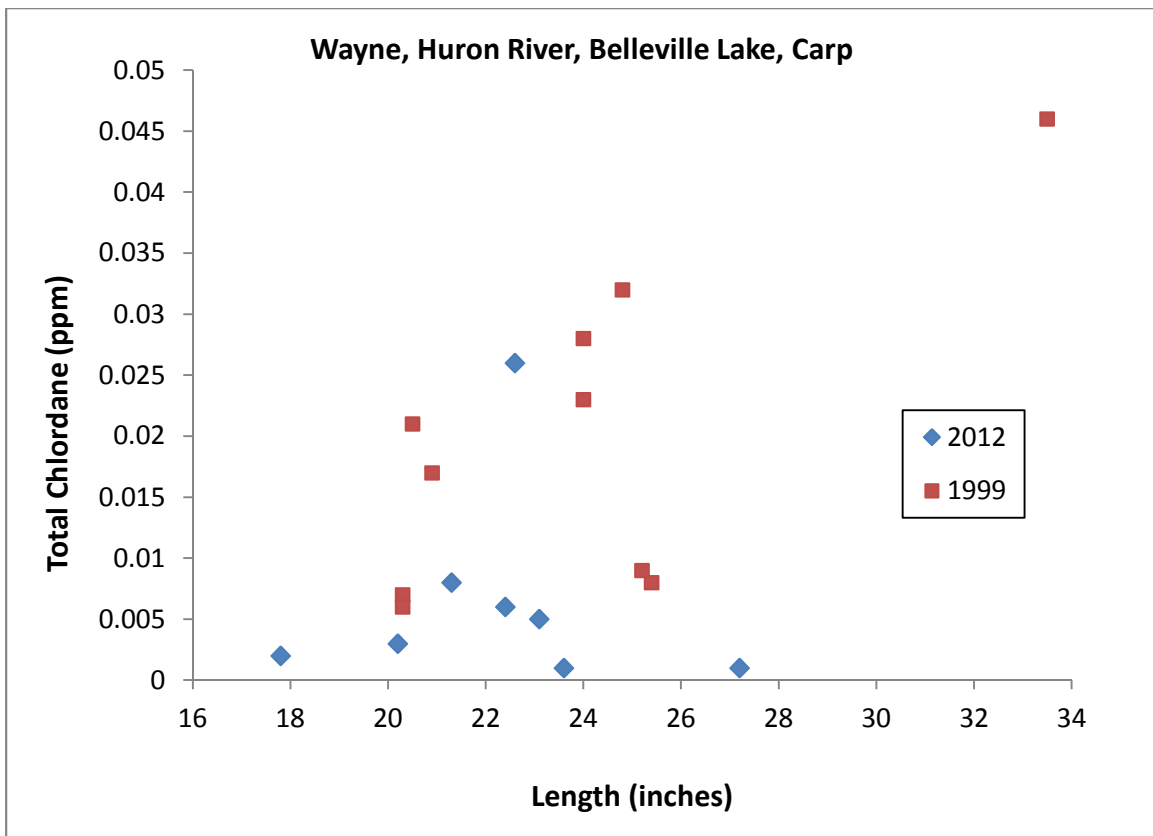
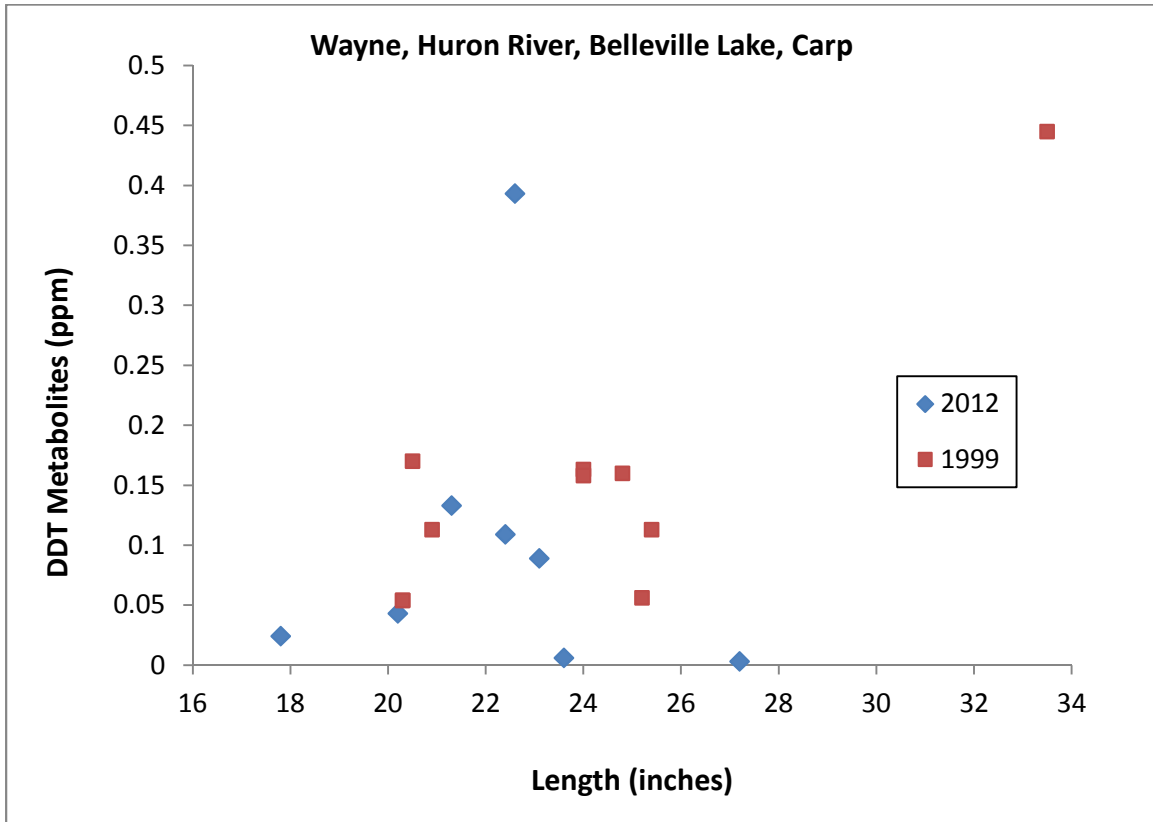
Existing MDCH Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of Belleville Lake carp to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories. Belleville Lake has legacy contamination from a point source for PCBs.

Recommendation: No change.

Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.

Channel Catfish

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
2012	2012	10	15.1	12	15.1	25.6		
Datasets available: 2012								
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	10	0.09		0.05	0.26	0.13	8	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.204	0.254						

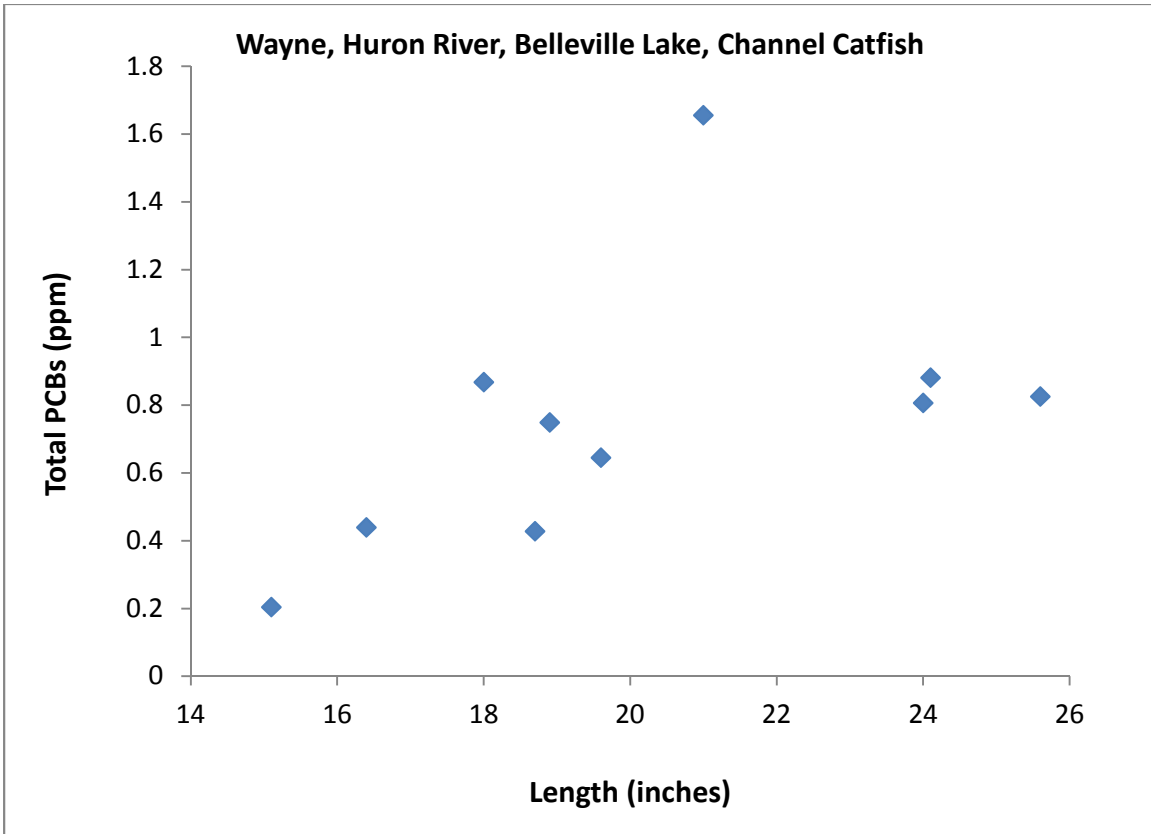
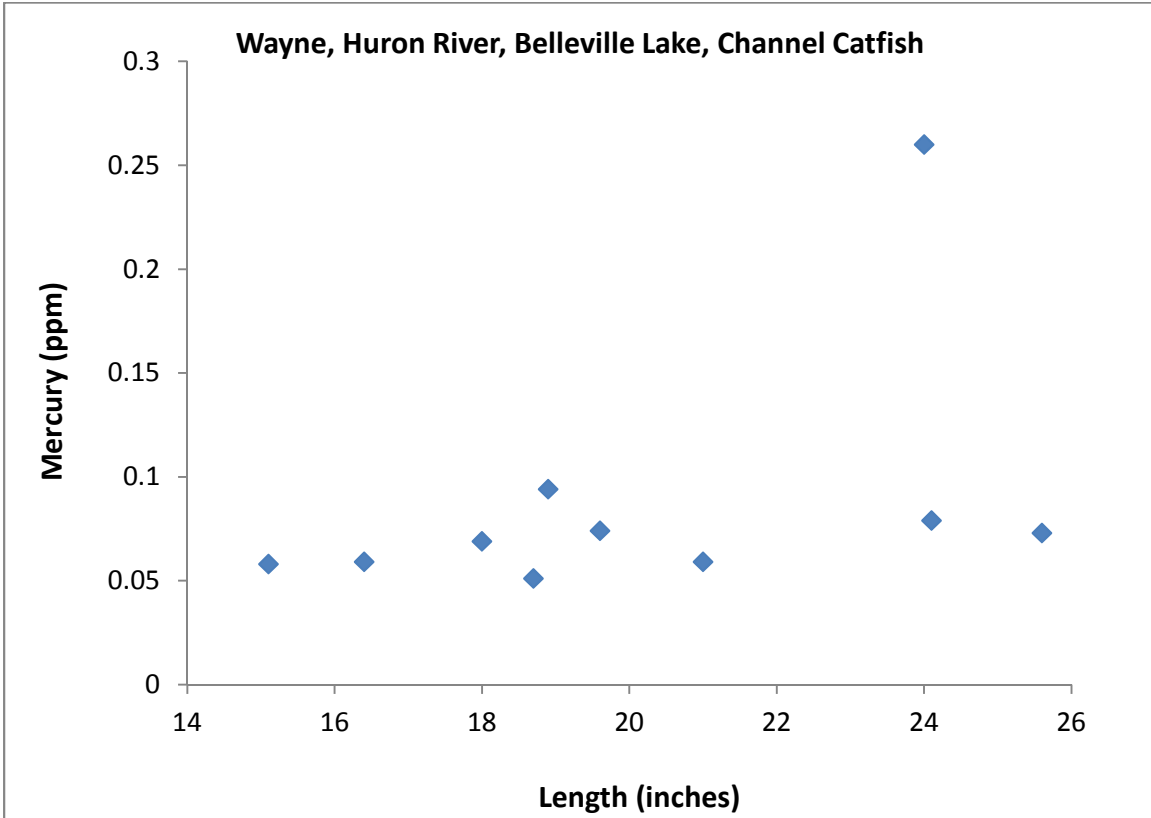
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent				Min	Max			
2012	2012	10	15.1	12	15.1	25.6			
Datasets available: 2012									
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
PCB	10	0.75		0.20	1.66	1.03	Limited		
DDT	10	0.20		0.08	0.38	0.26	4		
Chlordane	10	0.02		0.01	0.04	0.02	--		
Toxaphene	10	ND							
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	0.250	0.410							
DDT	0.323	0.416							
Chlordane	0.251	0.374							
Toxaphene	--	--							
Final meal category based on UCL:							Limited		

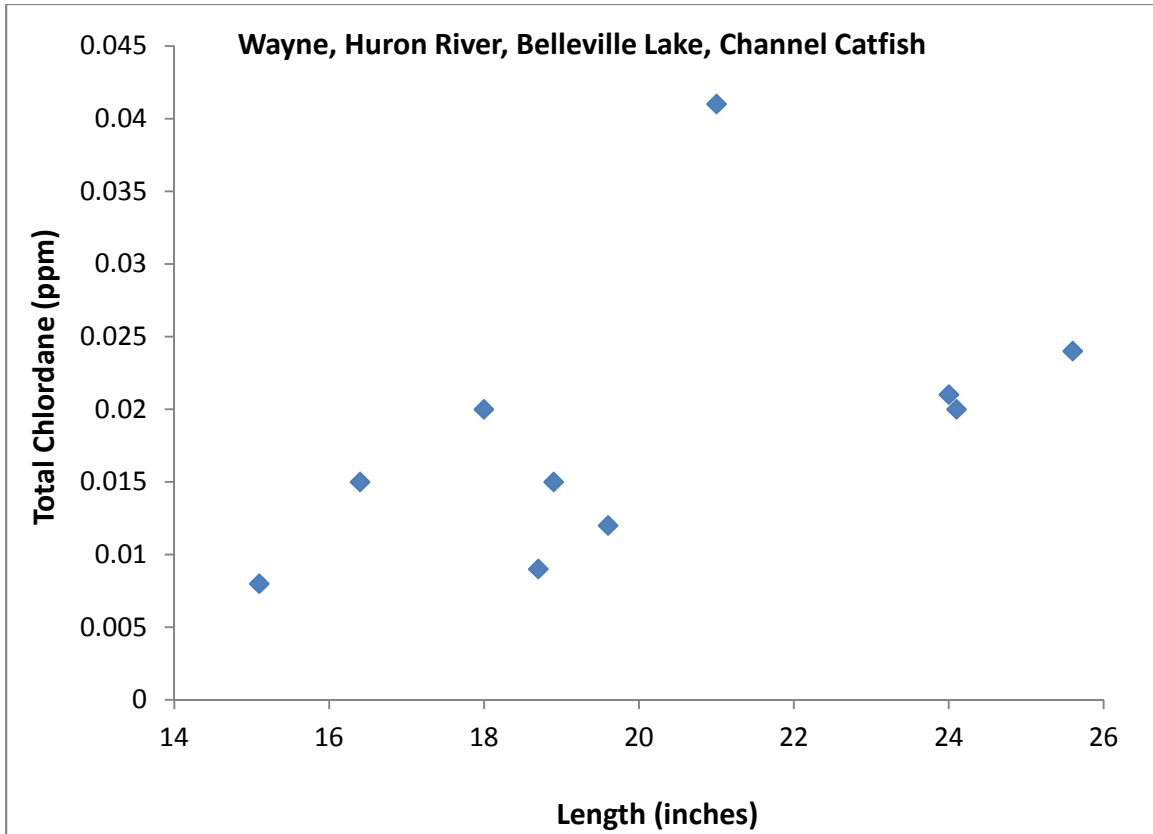
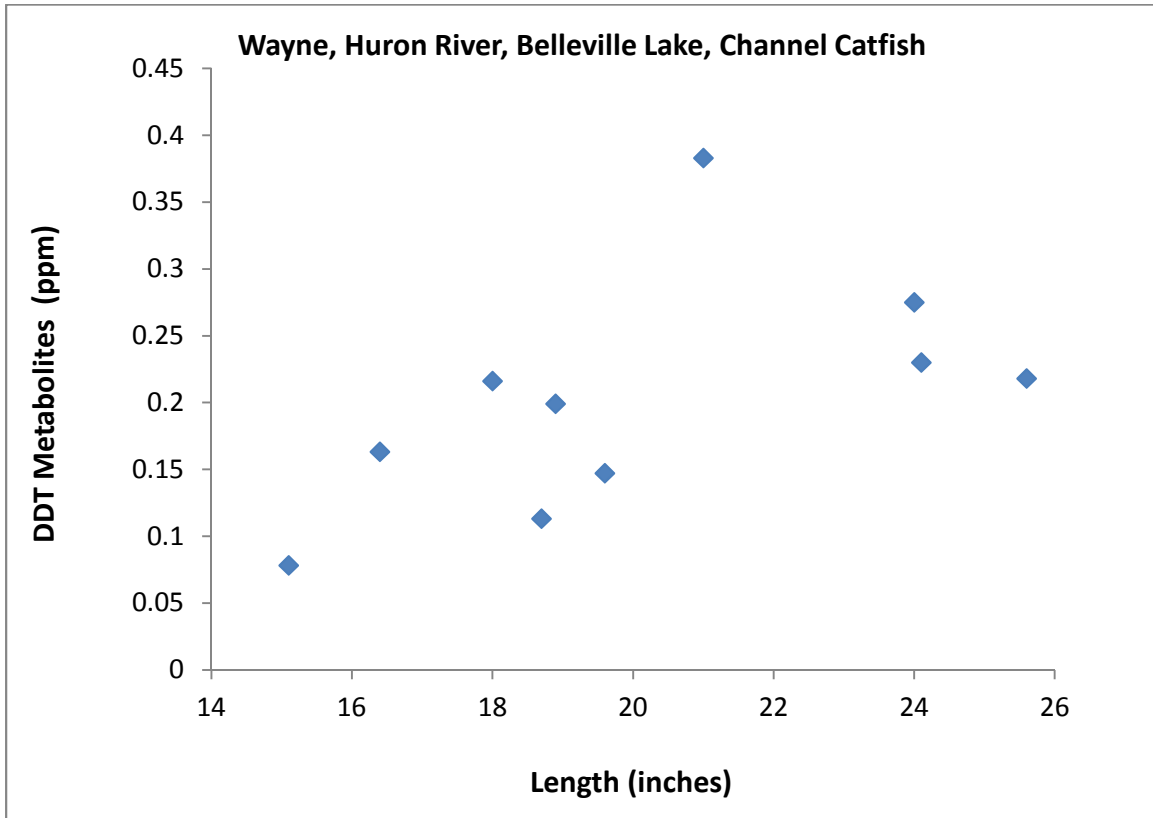
Existing MDCH Advisory: Specific guidelines for Belleville Lake channel catfish were not developed since data were not available previously.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should limit consumption of Belleville Lake channel catfish to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories. Belleville Lake has legacy contamination from a point source for PCBs.

Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.

Walleye

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
1988	2012	30	9.9	15	15.3	23		
Datasets available: 1988, 1999, 2012								
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	25	0.15		0.03	0.53	0.20	4	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.103	0.224						

Organics Analysis:

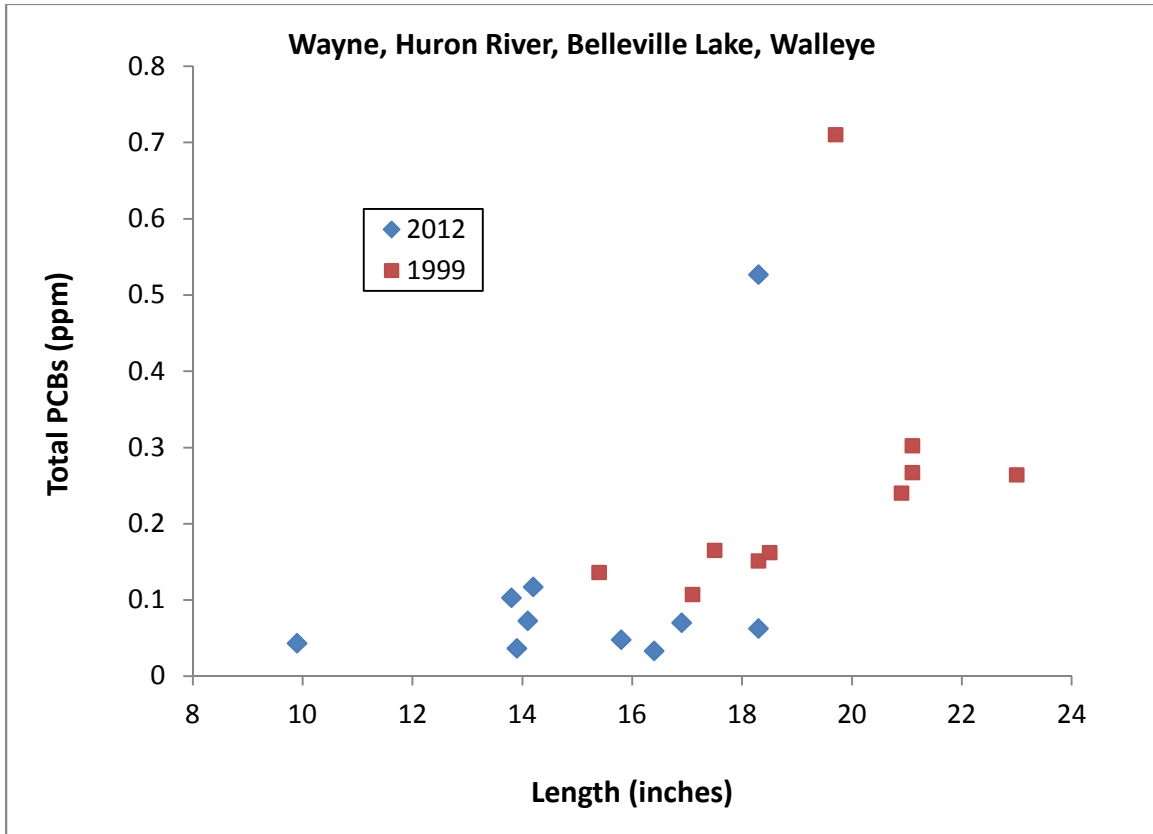
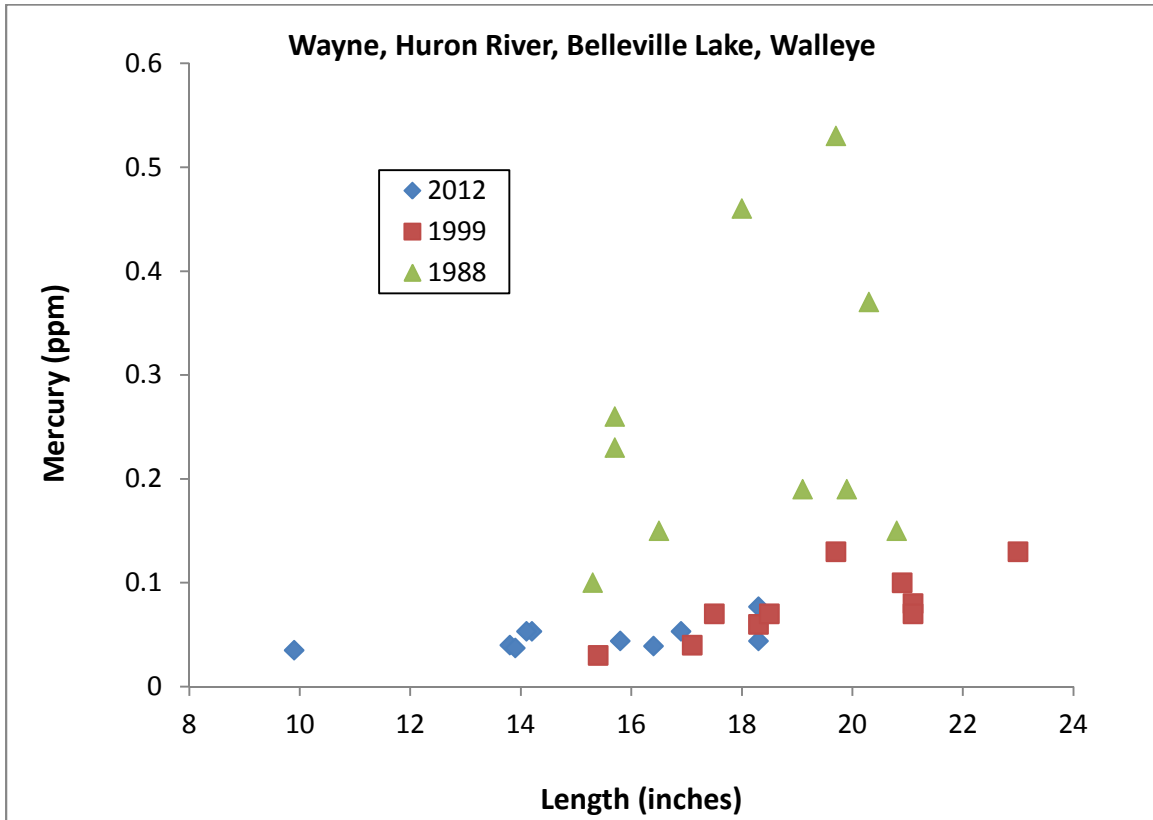
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
1999	2012	20	9.9	15		23		
Datasets available: 1988, 1999, 2012								
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	15	0.22		0.033	0.71	0.32	0.5	
DDT	15	0.04		0.002	0.12	0.06	16	
Chlordane	14	0.004		0.001	0.01	0.01	--	
Toxaphene	15	ND						
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	0.303	0.478						
DDT	0.274	0.272						
Chlordane	0.224	0.410						
Toxaphene	--	--						
Final meal category based on UCL:							0.5	

Existing MDCH Advisory: No one should eat more than 6 meals per year of Belleville Lake walleye due to PCBs. Mercury would cause an advisory. Belleville Lake has legacy contamination from a point source for PCBs; the site has been remediated.

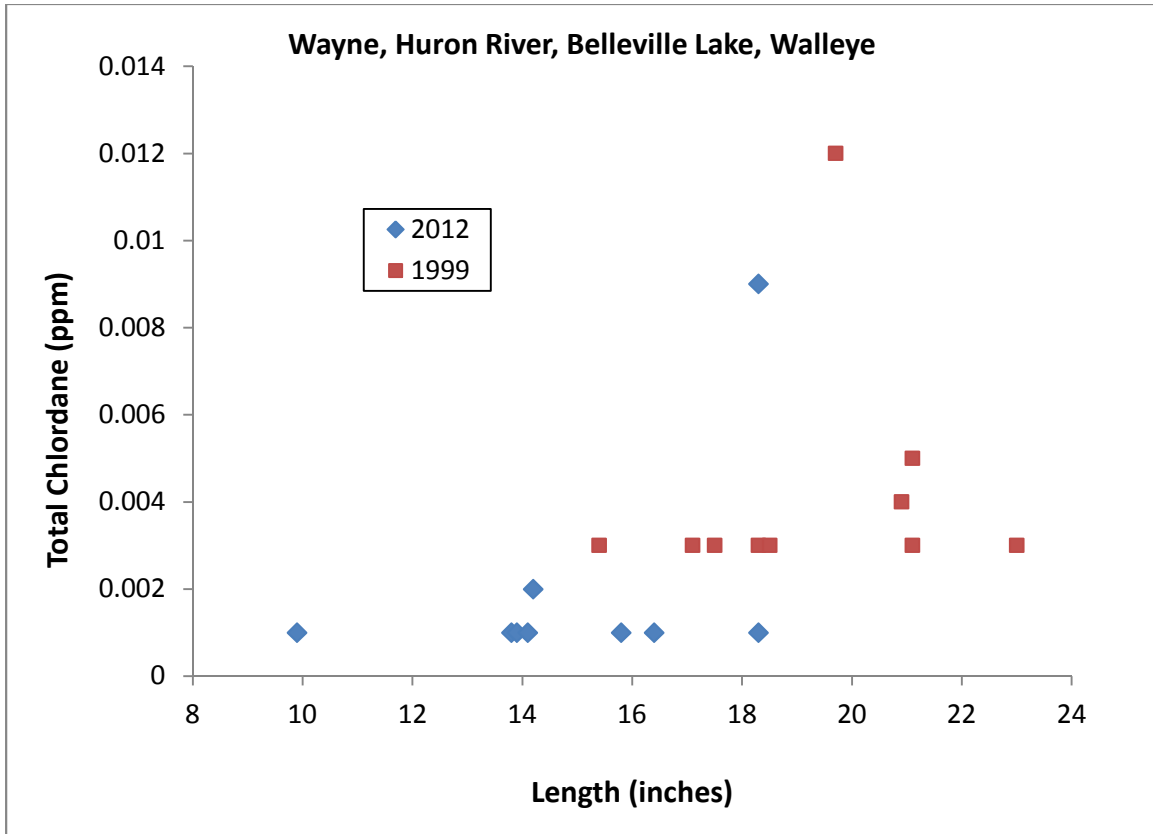
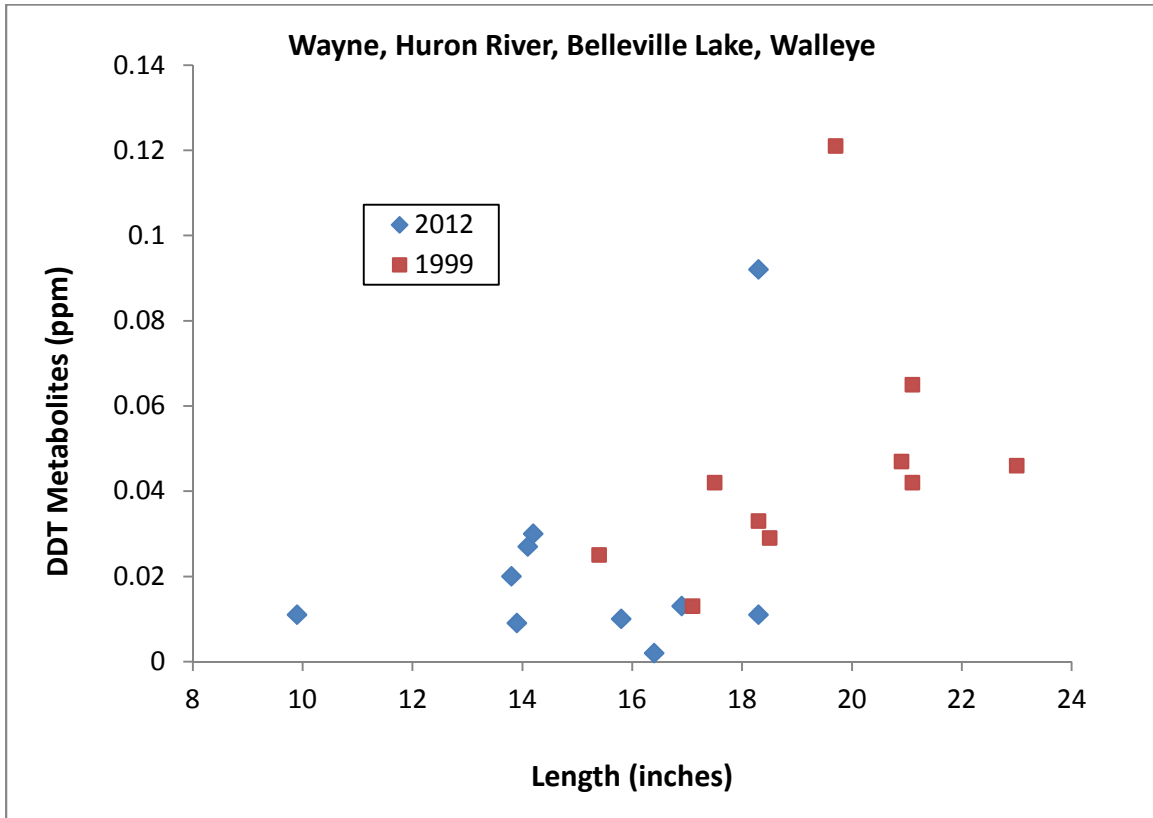
Recommendation: No change.

Note: The results suggest that mercury concentrations may have declined since 1988; the R² for only the 1999/2012 exponential regression is 0.62

Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D4. Eat Safe Fish guidance, 2015 update recommendations, Southeast Lower Peninsula.



Appendix D5. Eat Safe Fish guidance, 2015 update recommendations, St. Marys River

Carp

St. Marys River

Chippewa County

Hg Analysis:

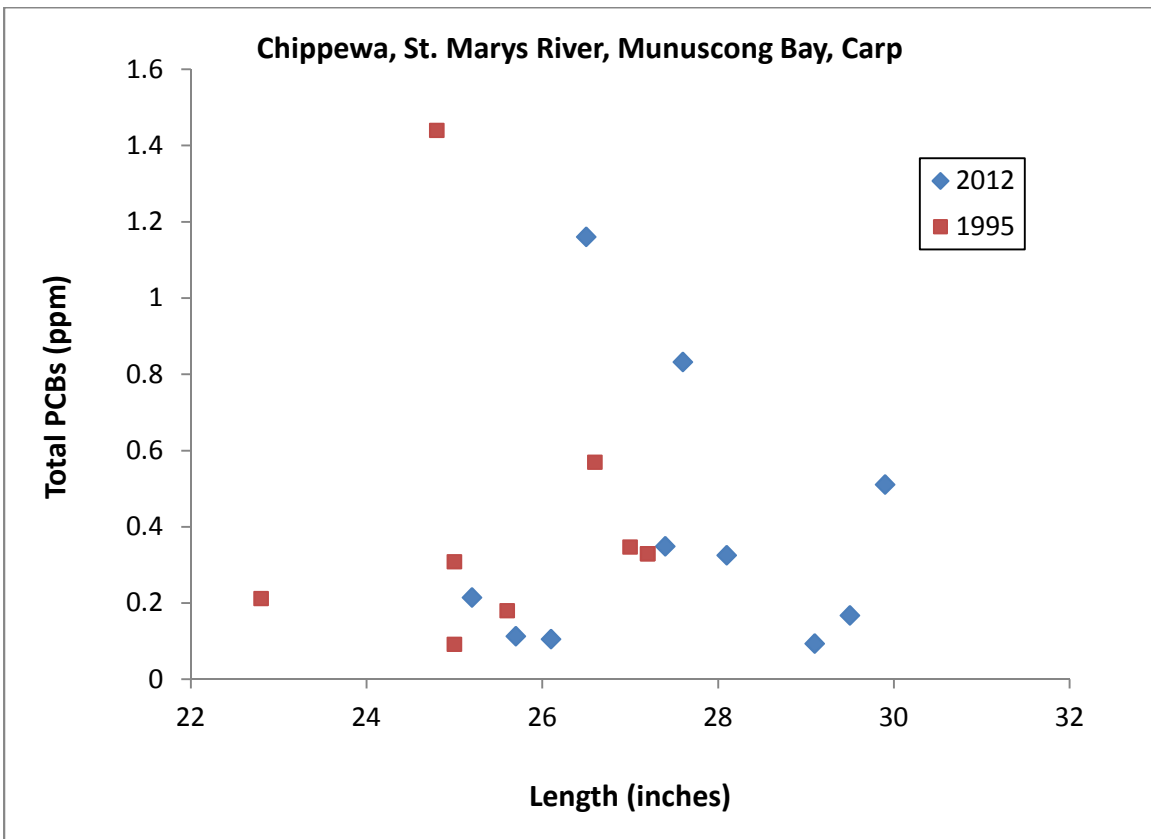
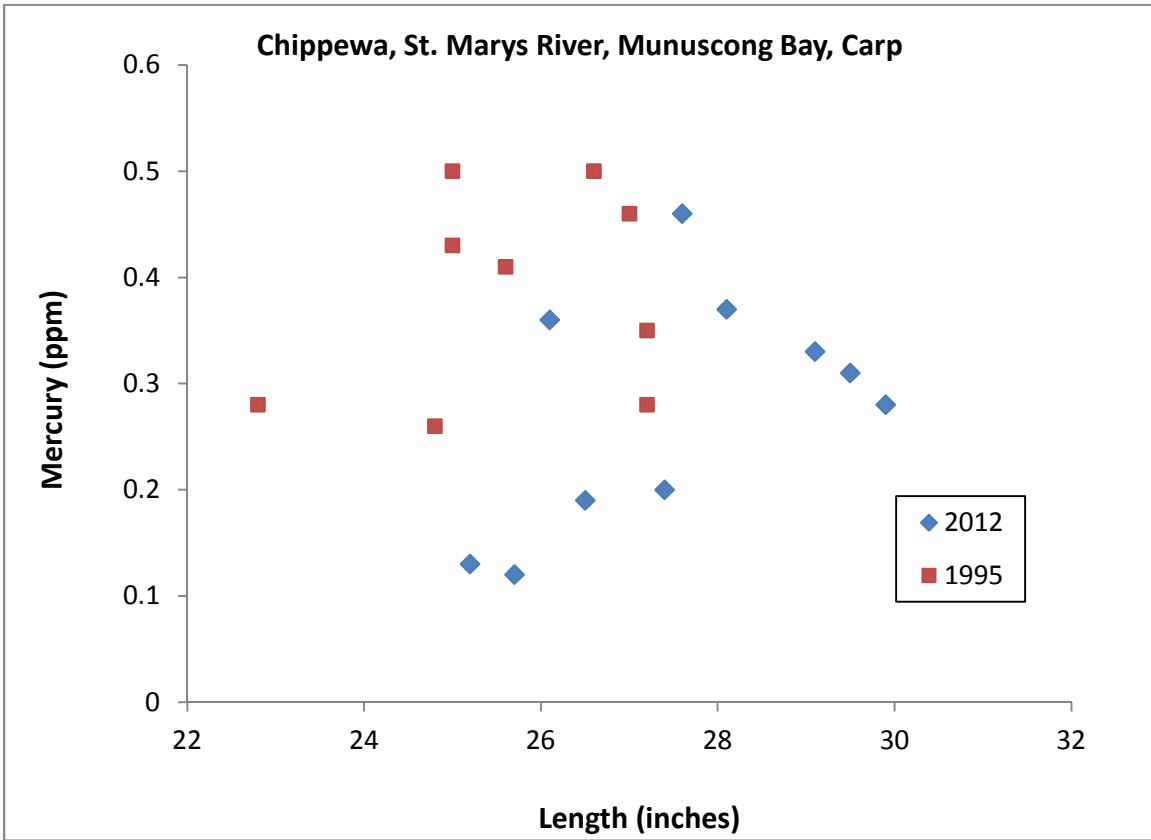
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	2012	19	22.8	na	22.8	29.9
Datasets available: 1995, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	19	0.33	0.12	0.50	0.38	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.002	0.012				

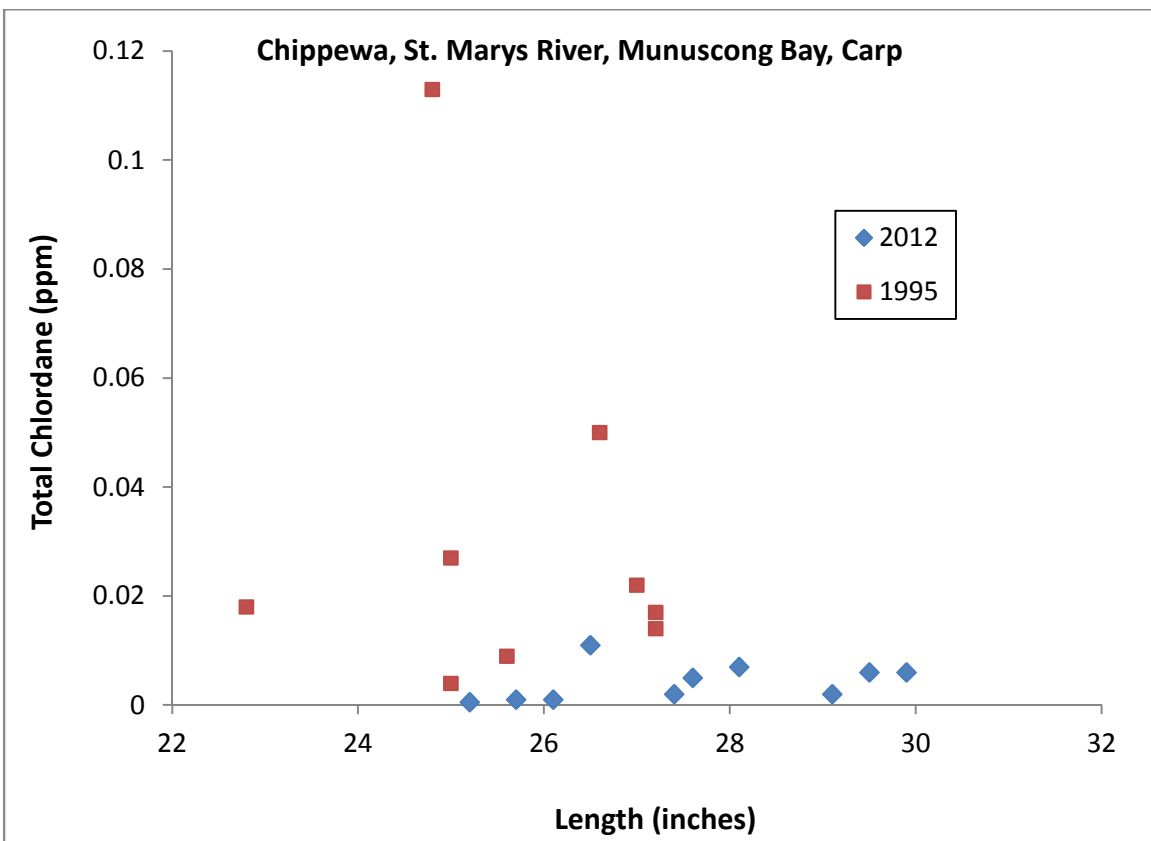
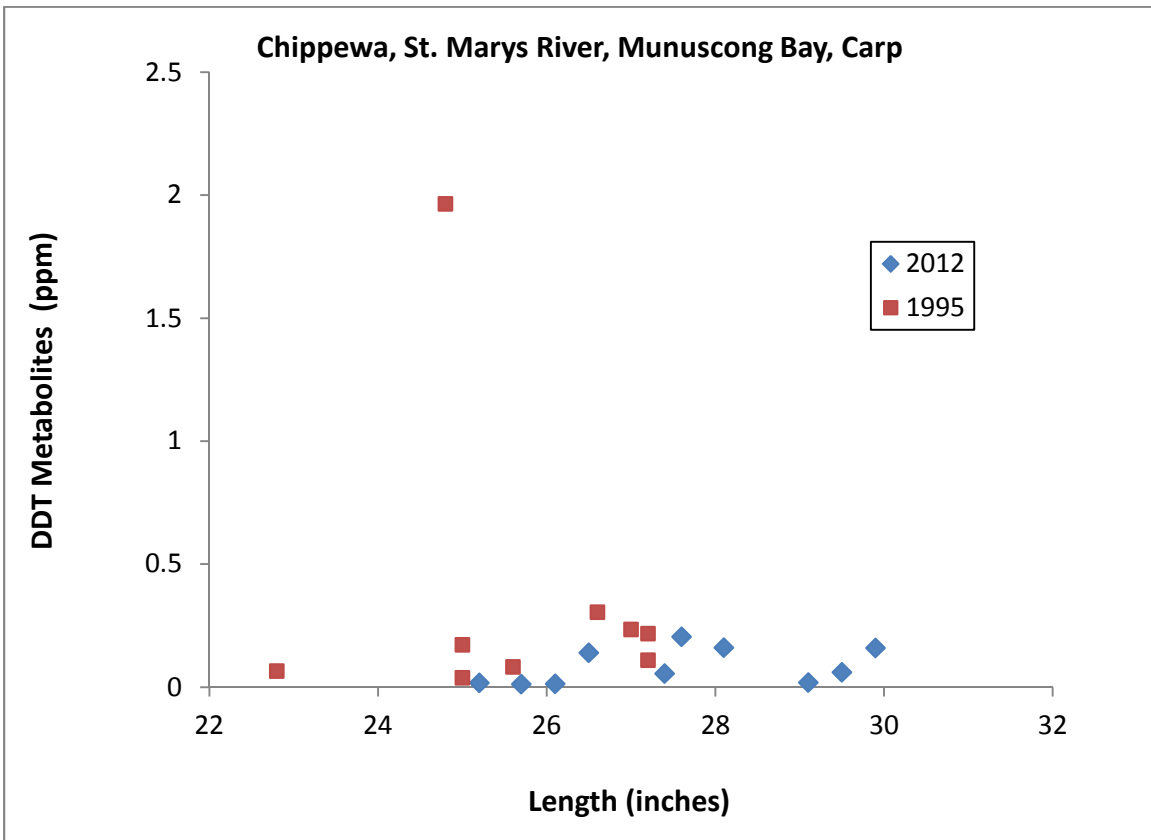
Organics Analysis:

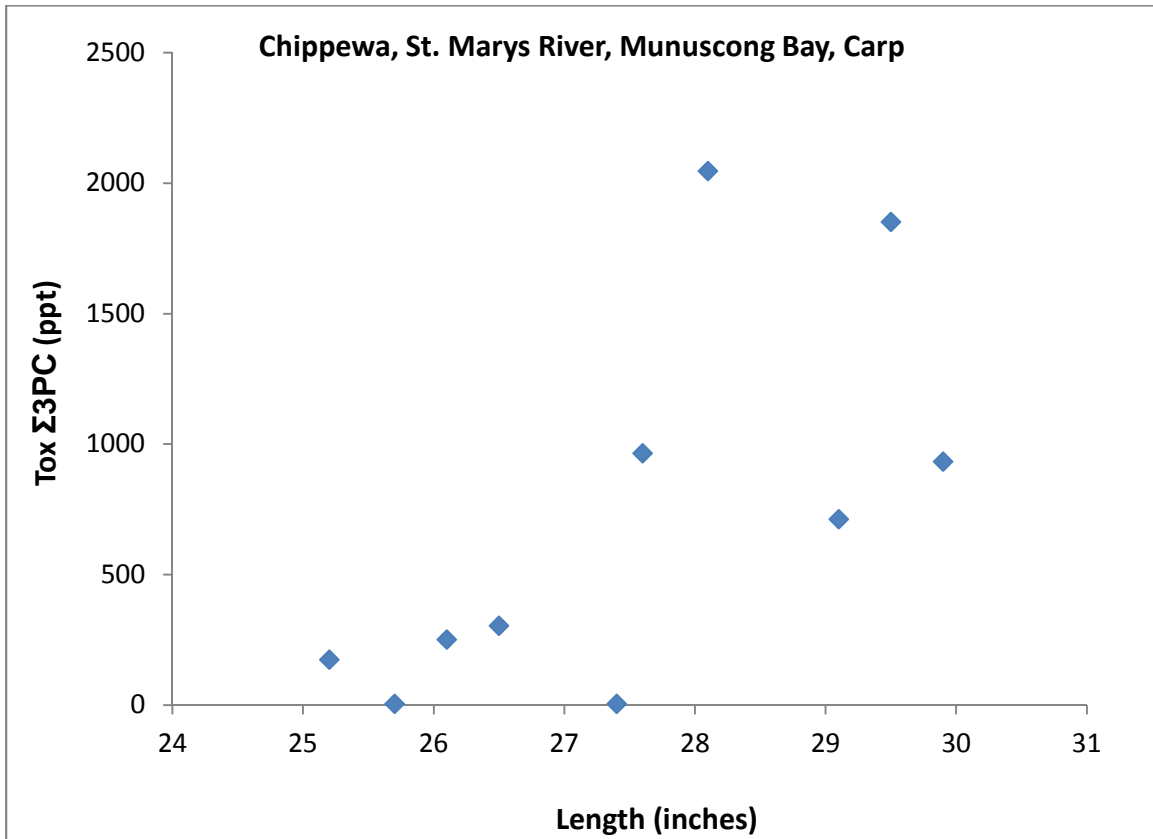
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	2012	19	22.8	na	22.8	29.9
Datasets available: 1995, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	19	0.40	0.09	1.44	0.58	Limited
DDT	19	0.21	0.01	1.96	0.42	4
Chlordane	19	0.02	0.001	0.11	0.03	--
Tox Σ3PC	10	0.72	ND	2.04 ppb	1.25 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.003	0.002				
DDT	0.044	0.000				
Chlordane	0.097	0.030				
Tox Σ3PC	0.449	0.316				
Final meal category based on UCL:						Limited

Existing MDCH Advisory: No one should eat more than 6 meals per year of St. Marys River carp due to PCBs. Mercury and DDT would cause advisories.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should not eat more than 1 or 2 meals per year of St. Marys River carp due to PCBs. Mercury, DDT, and toxaphene would cause advisories.







Pumpkinseed

St. Marys River

Chippewa County

Hg Analysis:

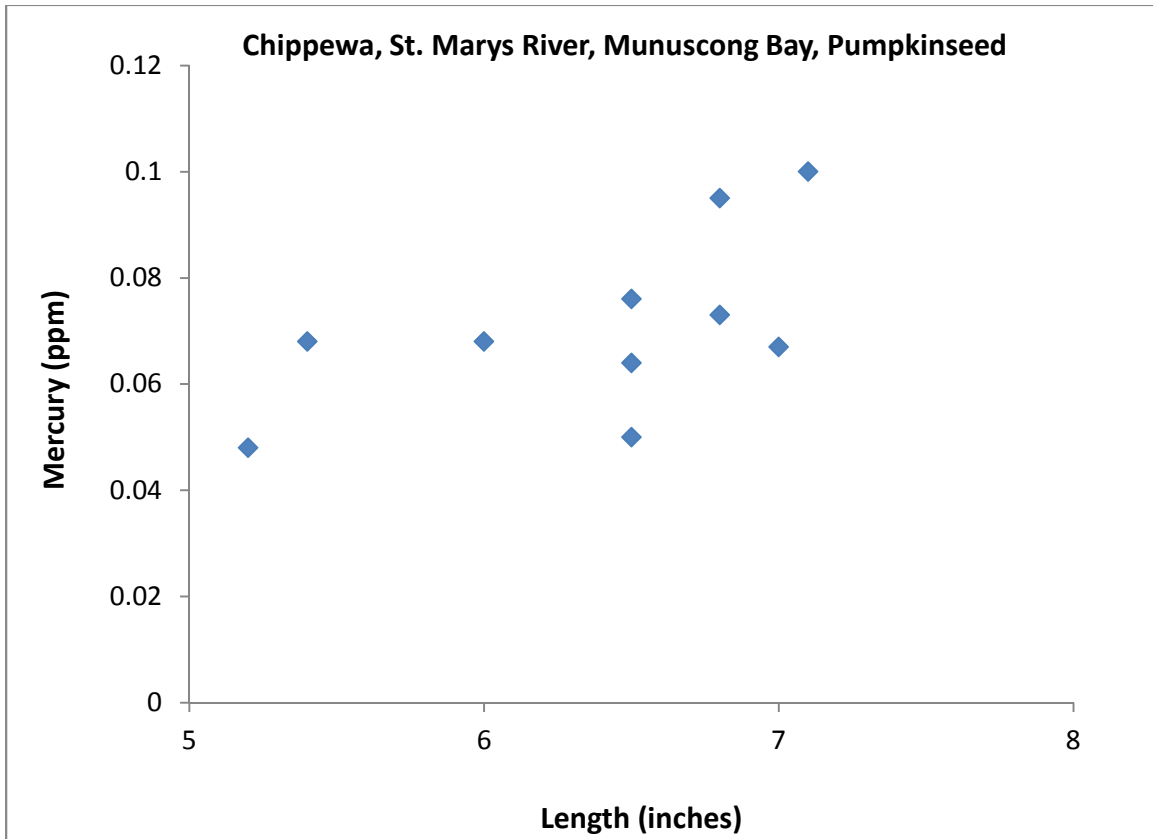
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	5.2	na	5.2	7.1
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.07	0.05	0.10	0.08	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.352	0.357				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	5.2	na	5.2	7.1
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	--	--	--	--
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						12

Current Advice: Specific guidelines for St. Marys River pumpkinseed were not developed since no data were available previously.

Recommendation: No one should eat more than 12 meals per month of St. Marys River pumpkinseed due to elevated concentrations of mercury.



Appendix D5. Eat Safe Fish guidance, 2015 update recommendations, St. Marys River

Redhorse and White Sucker

St. Marys River

Chippewa County

Hg Analysis:

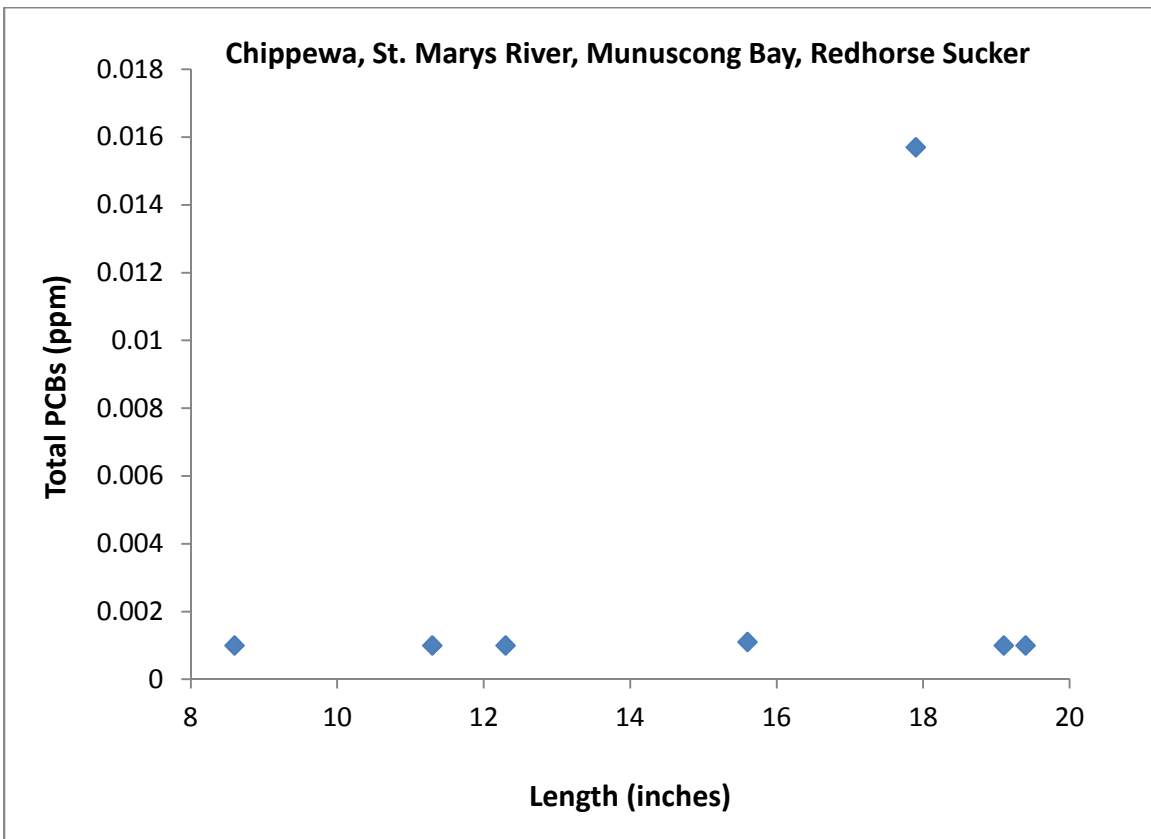
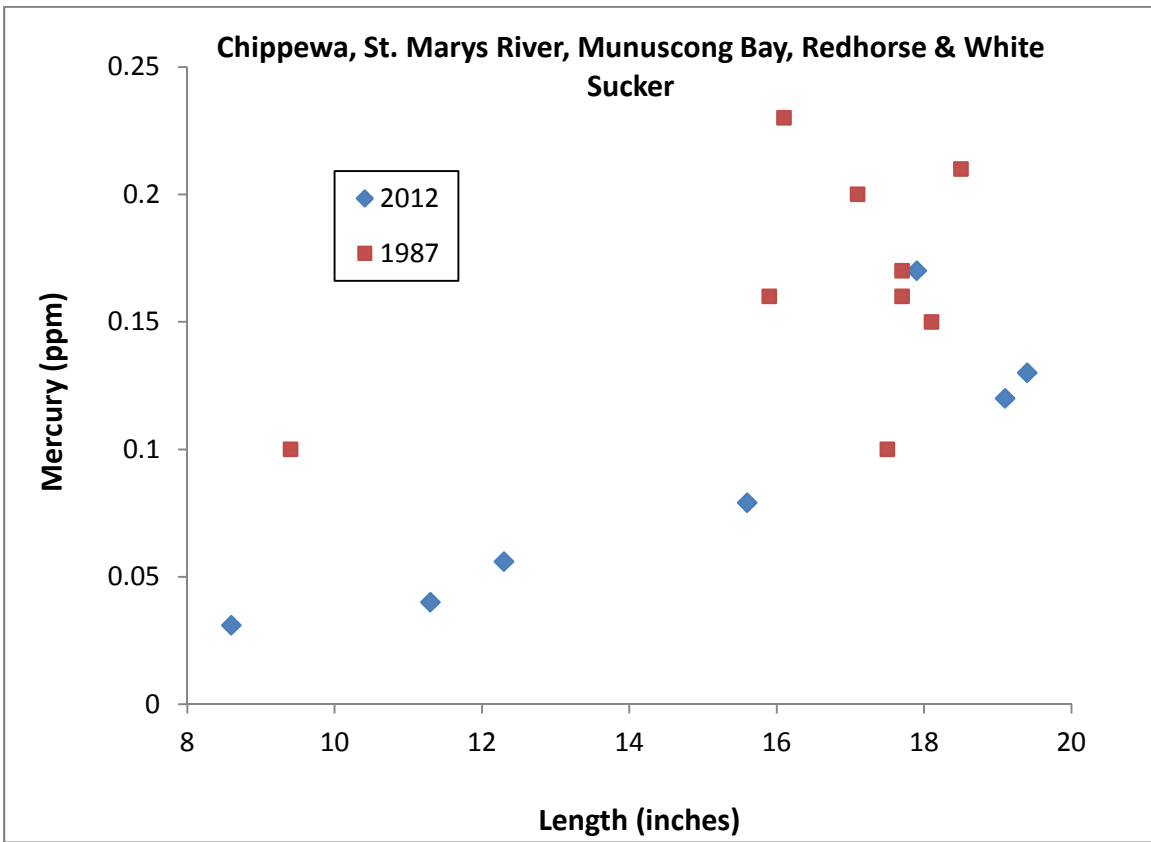
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2012	16	8.6	na	8.6	19.4
Datasets available: 1987, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	16	0.13	0.03	0.23	0.16	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.454	0.582				

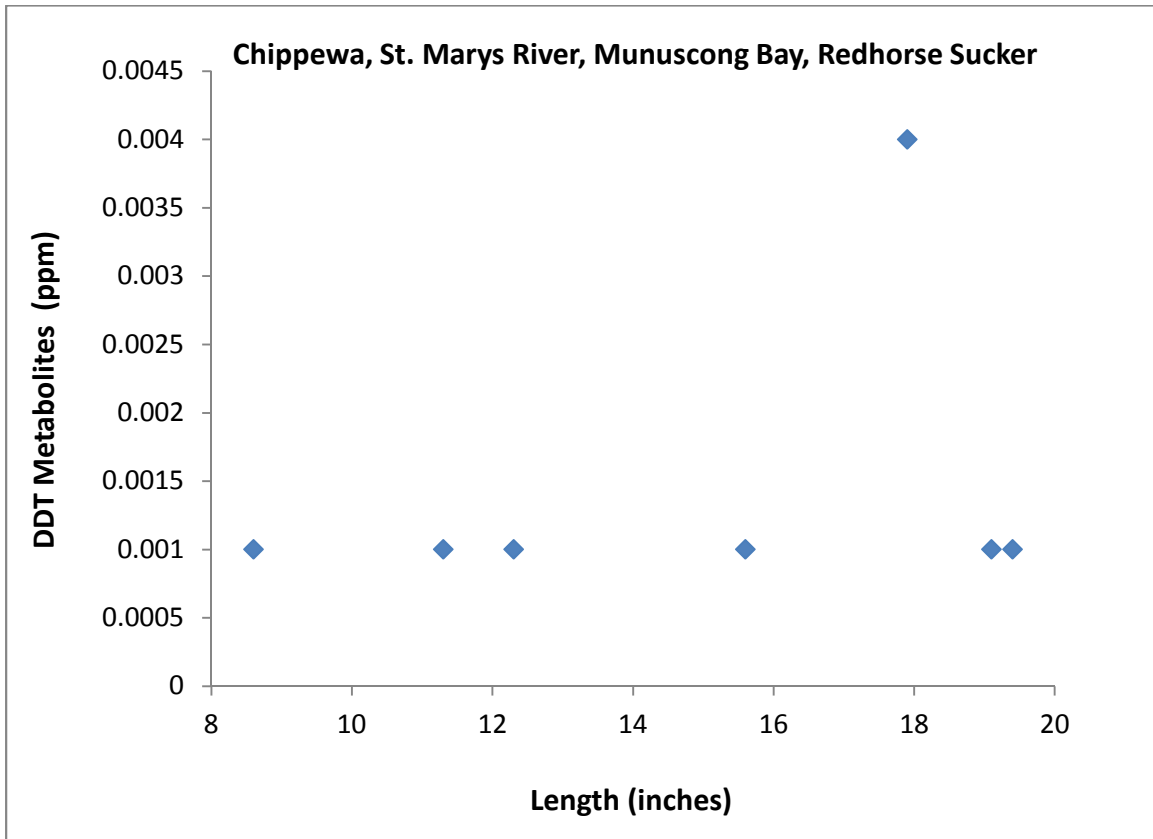
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	7	8.6	na	8.6	19.4
Datasets available: 1987, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	7	0.003	0.001	0.02	0.01	16
DDT	7	0.001	0.001	0.004	0.002	16
Chlordane	7	ND	--	--	--	--
Toxaphene	7	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.100	0.102				
DDT	0.099	0.099				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Current Advice: No one should eat more than 4 meals per month of St. Marys River sucker due to mercury. PCBs would cause an advisory.

Recommendation: No one should eat more than 4 meals per month of St. Marys River sucker due to mercury.





Rock Bass

St. Marys River

Chippewa County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.3	na	6.3	8.4
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.19	0.11	0.43	0.26	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.642	0.703	$y = 0.0059e^{0.47}$			

Organics Analysis:

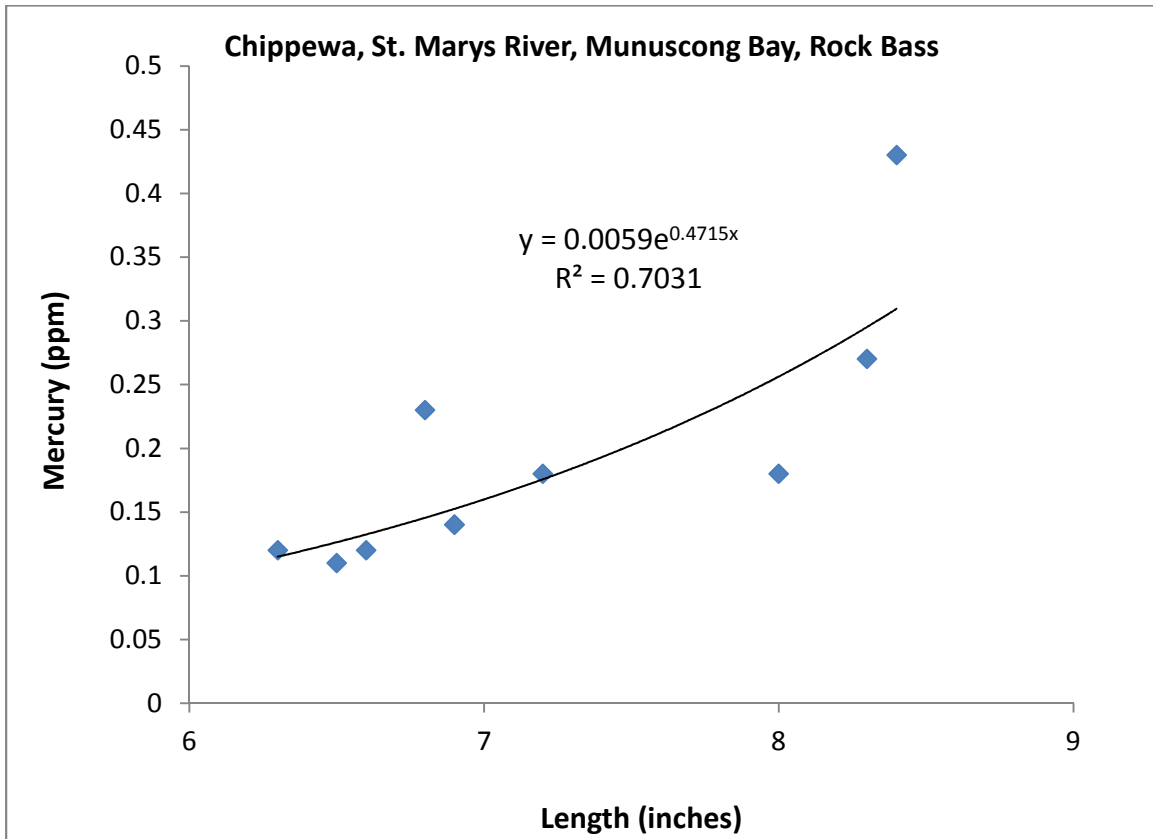
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.3	na	6.3	8.4
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	--	--	--	--
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Current Advice: Specific guidelines for St. Marys River rock bass were not developed since data were not available previously.

Recommendation: No one should eat more than 4 meals per month of St. Marys River rock bass smaller than 8 inches or more than 2 meals per month of those fish larger than 8 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
6	0.1	8
7	0.16	4
8	0.26	4
9	0.41	2
10	0.66	1

Shaded area denotes extrapolated estimates



Smallmouth Bass

St. Marys River

Chippewa County

Hg Analysis:

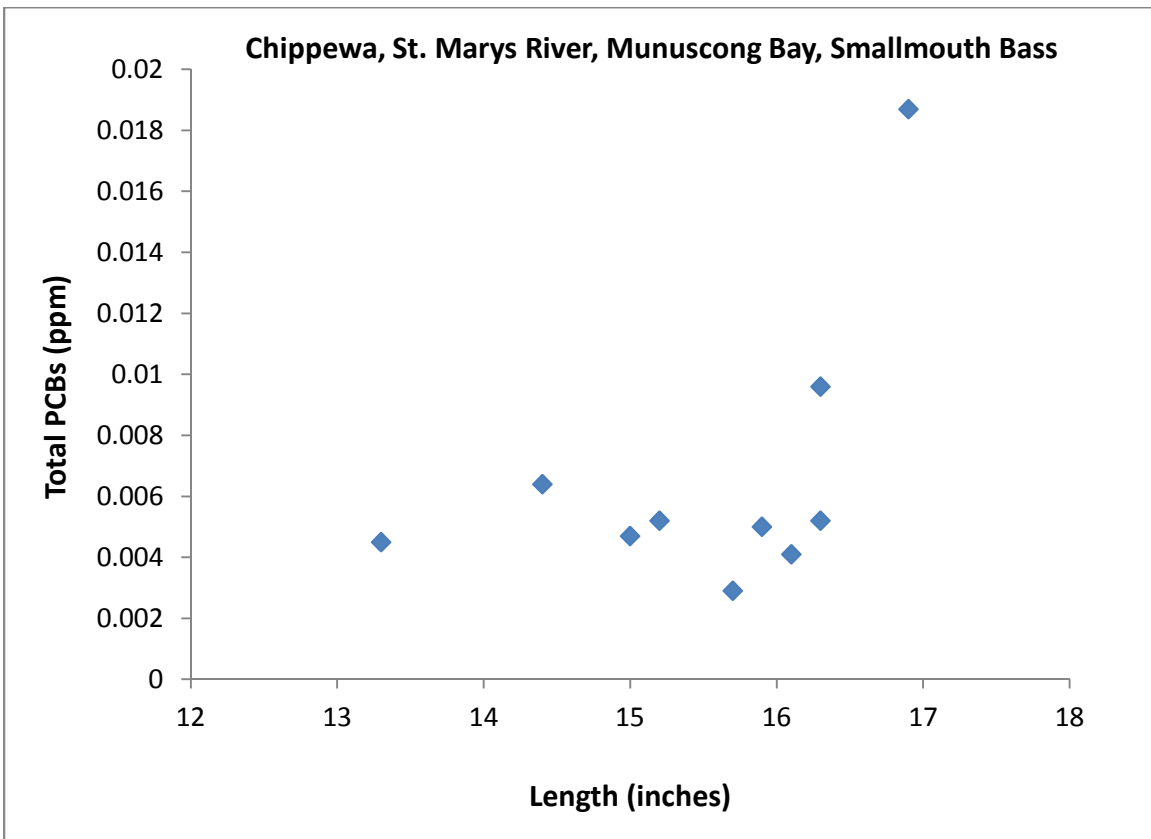
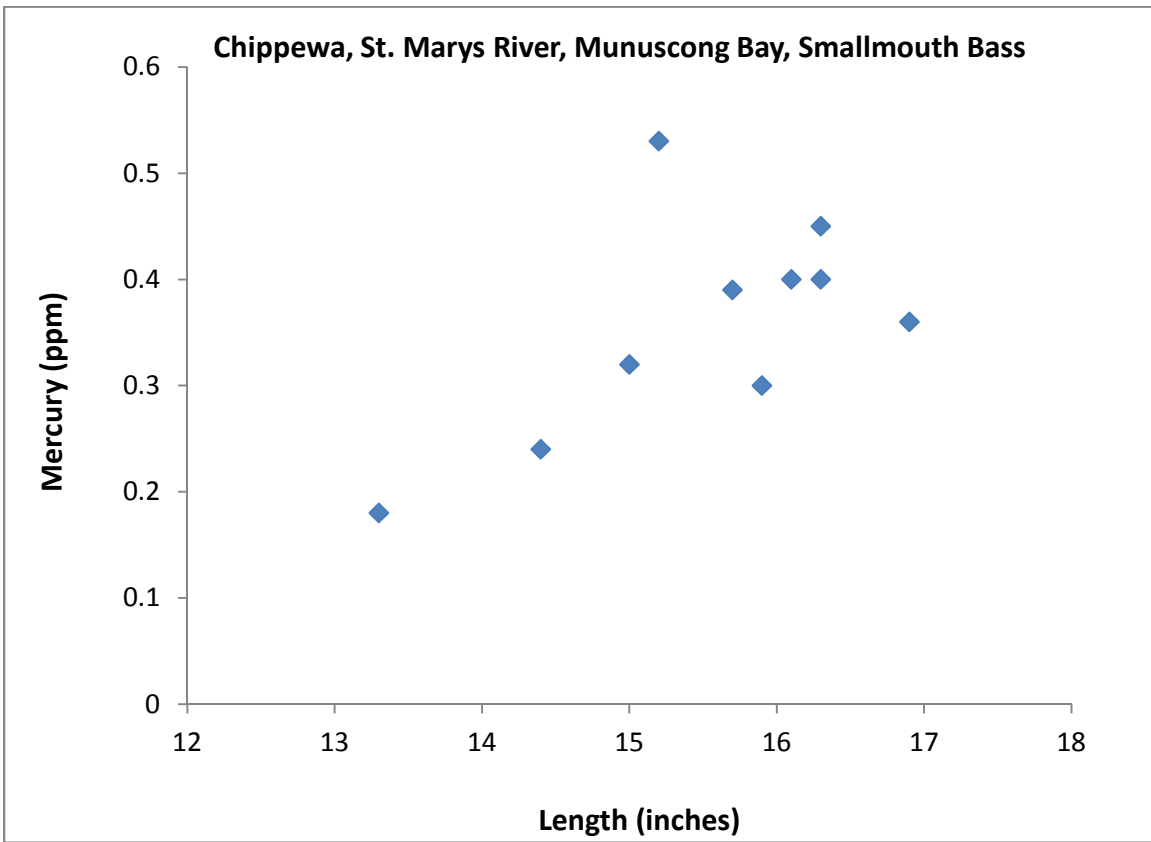
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	13.3	14	14.4	16.9
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.38	0.24	0.53	0.44	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.389	0.525				

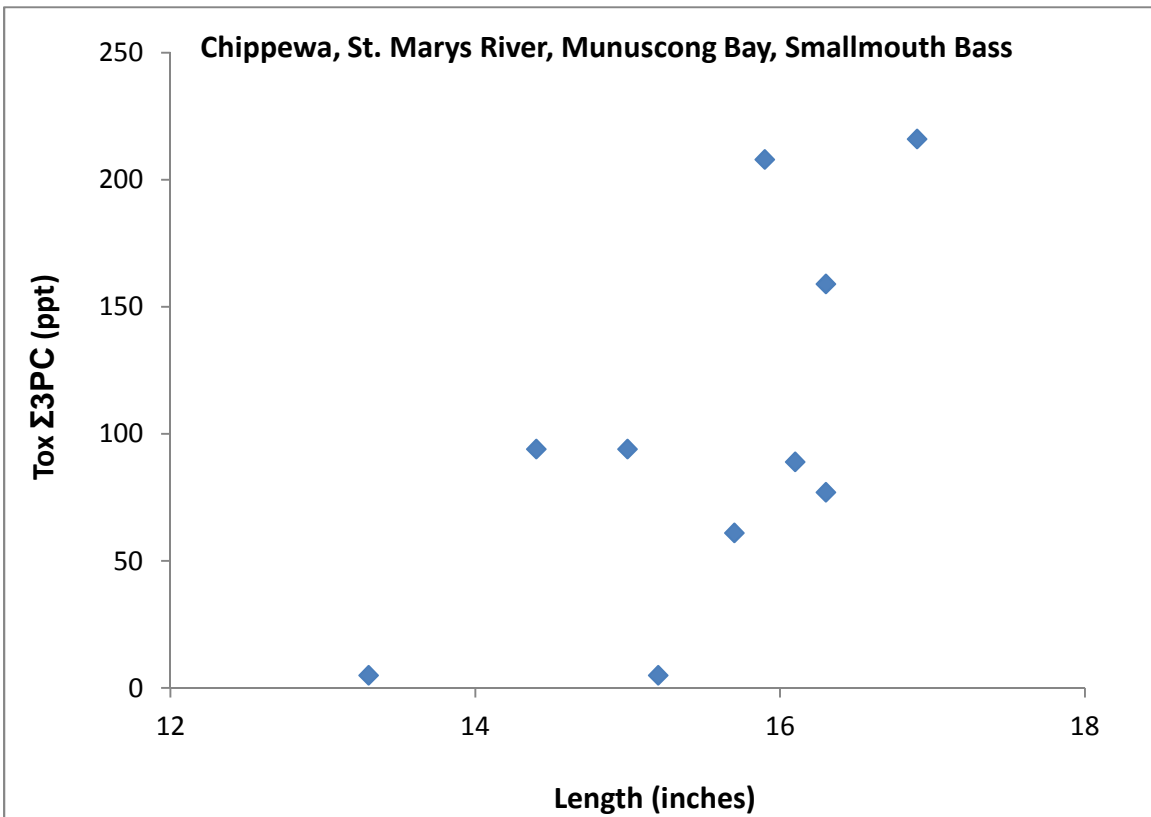
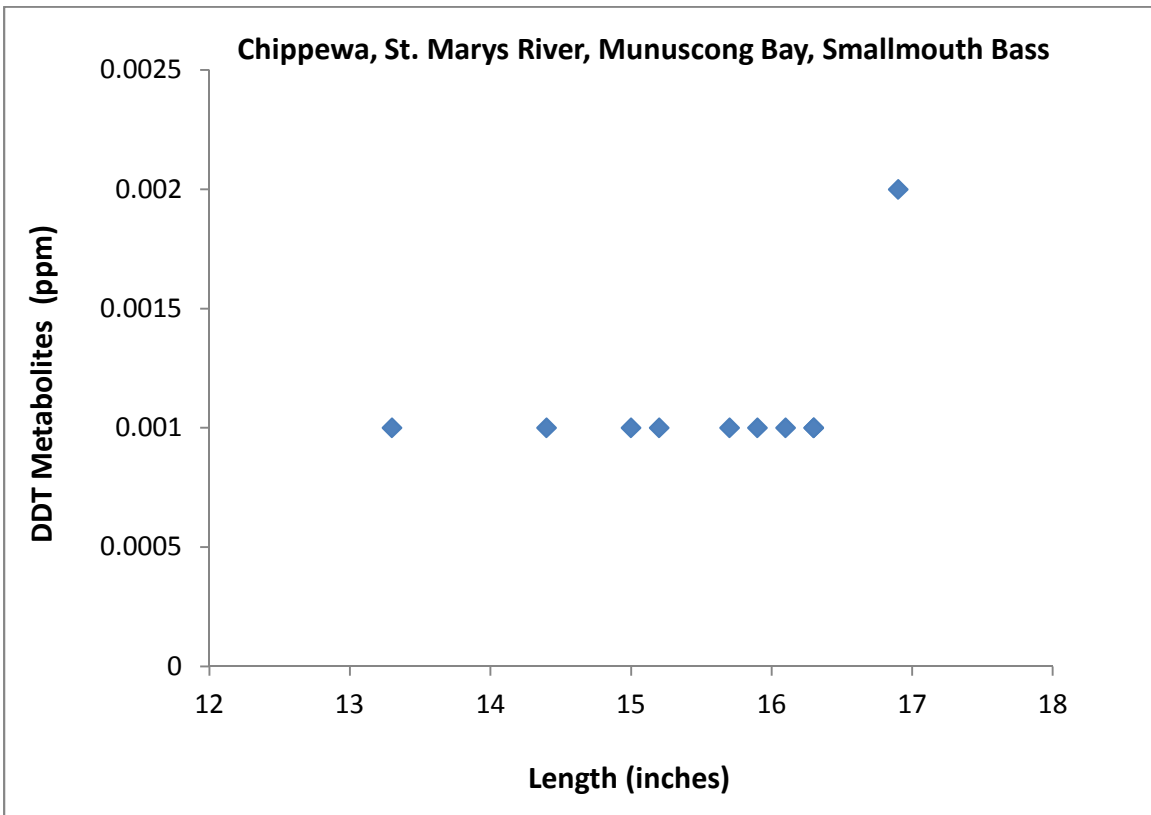
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	13.3	14	14.4	16.9
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.007	0.003	0.02	0.01	16
DDT	9	0.001	0.001	0.002	0.001	16
Chlordane	9	ND	--	--	--	--
Tox Σ3PC	9	0.11 ppb	ND	0.22 ppb	0.16 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.240	0.188				
DDT	0.211	0.211				
Chlordane	--	--				
Tox Σ3PC	0.438	0.465				
Final meal category based on UCL:						2

Current Advice: Specific guidelines for St. Marys River smallmouth bass were not developed since data were not available previously.

Recommendation: No one should eat more than 2 meals per month of St. Marys River largemouth or smallmouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches. The statewide length break was applied as the size range of fish was limited.





Walleye

St. Marys River

Chippewa County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1986	2012	44	13	15	14.6	27.6
Datasets available: 1986, 1987, 1991, 1995, 2004, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	40	0.43	0.10	1.0	0.52	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.663	0.709				

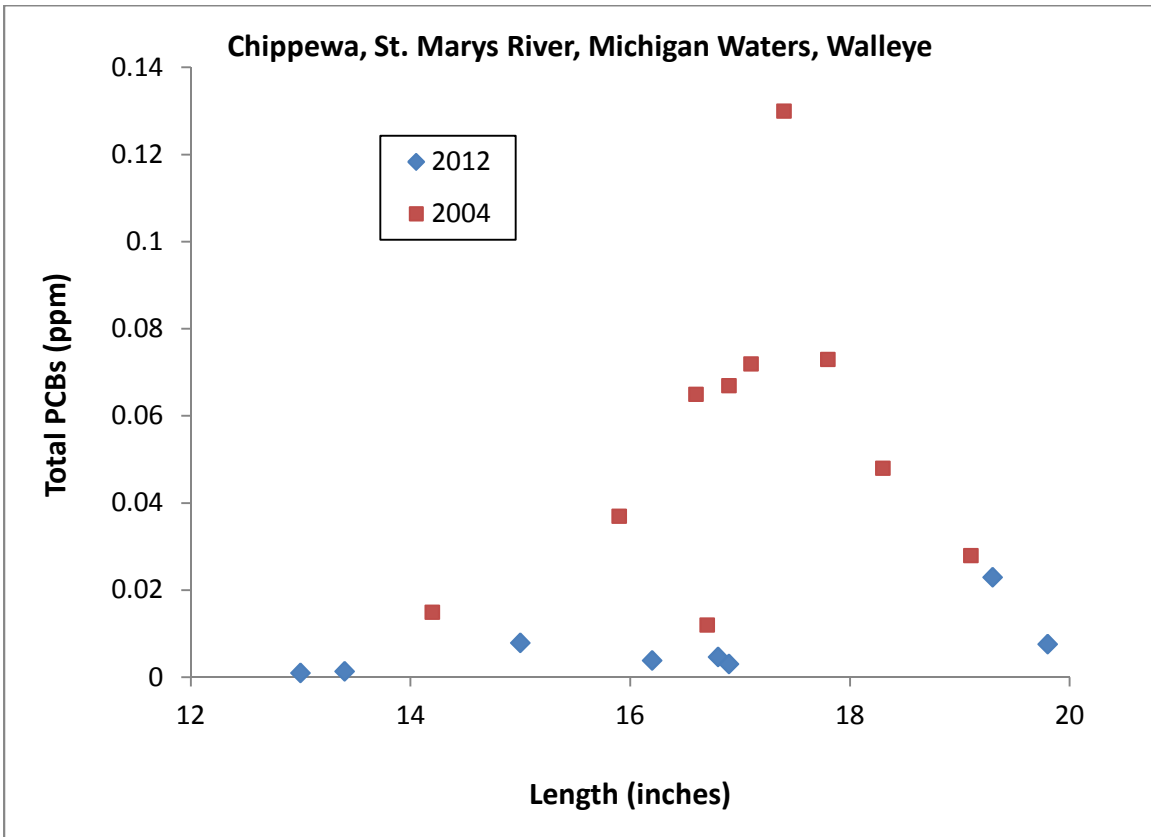
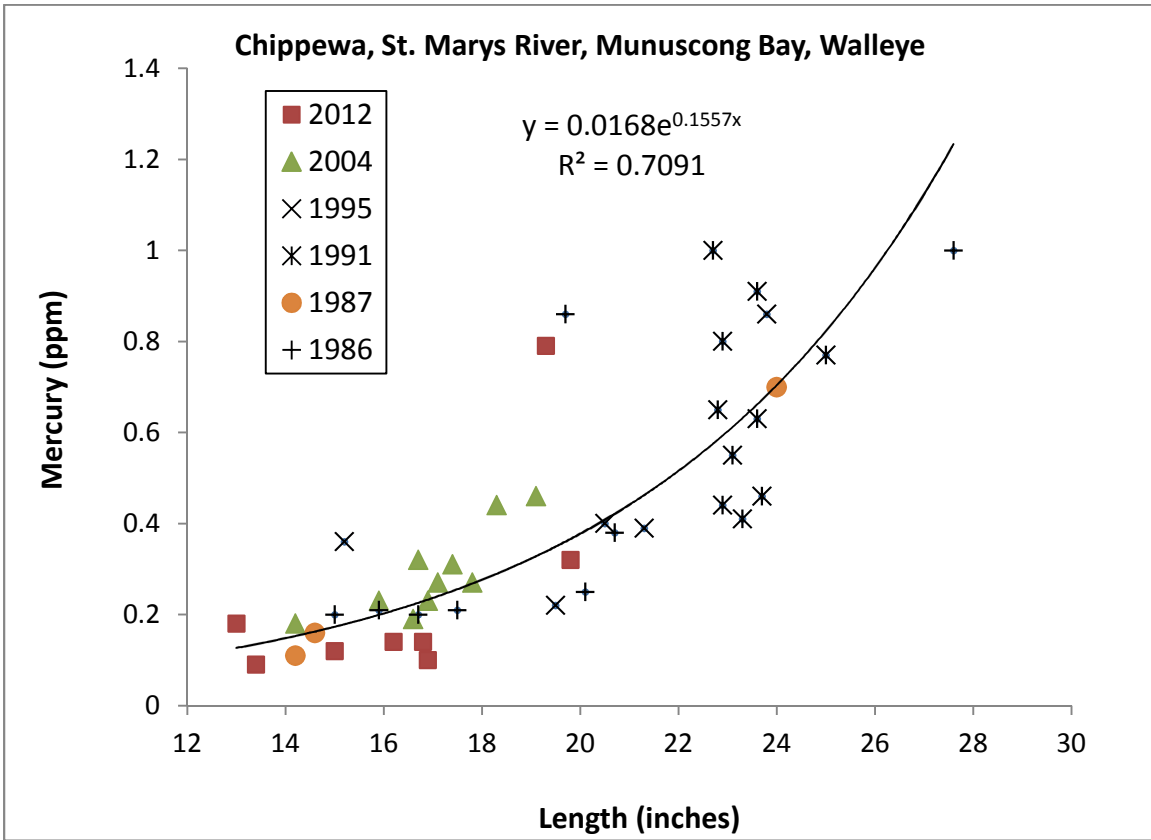
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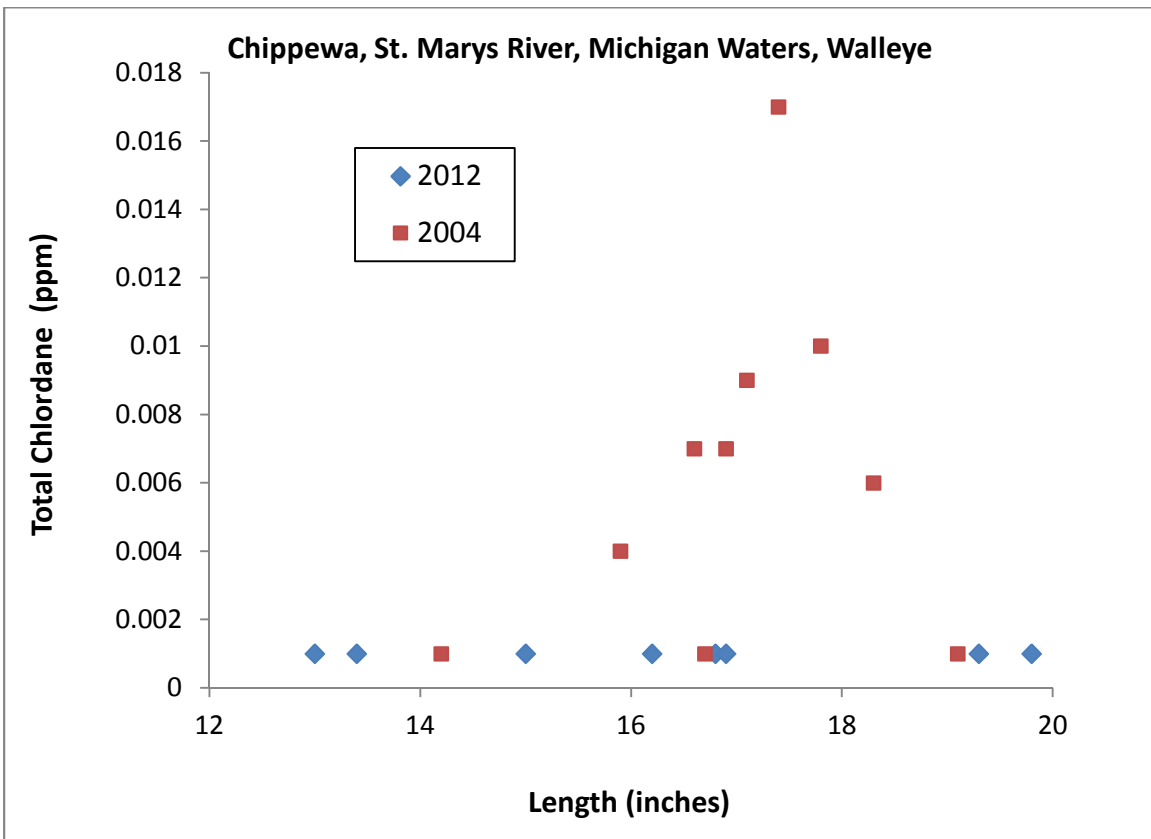
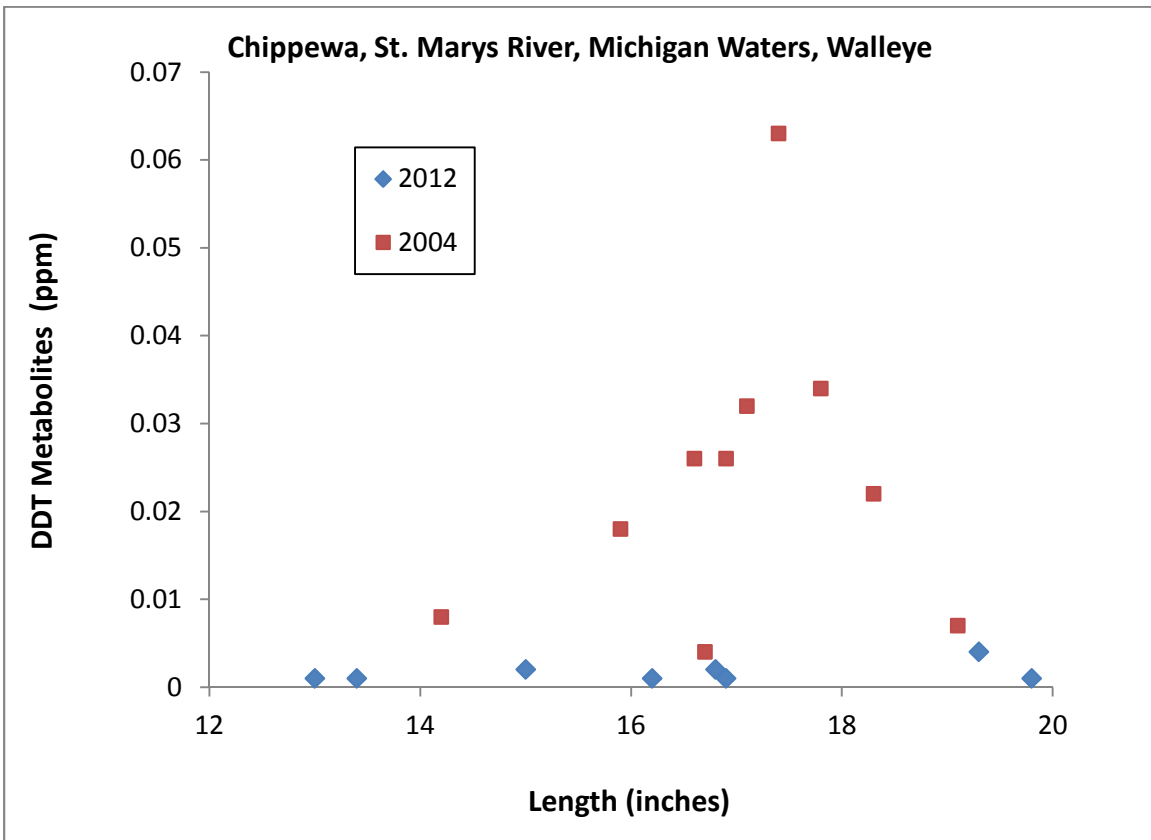
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	18	13	15	15	19.8
Datasets available: 1986, 1987, 1991, 1995, 2004, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.04	0.003	0.13	0.06	2
DDT	15	0.02	0.001	0.06	0.03	16
Chlordane	15	0.01	0.001	0.02	0.01	16
Tox Σ3PC	6	0.24 ppb	ND	0.43 ppb	0.42 ppb	16
PFOS	6	5.3 ppb	0.9	8.1	8.2	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.093	0.278				
DDT	0.048	0.079				
Chlordane	0.045	0.048				
Tox Σ3PC	0.018	0.008				
PFOS	0.090	0.059				
Final meal category based on UCL:						2

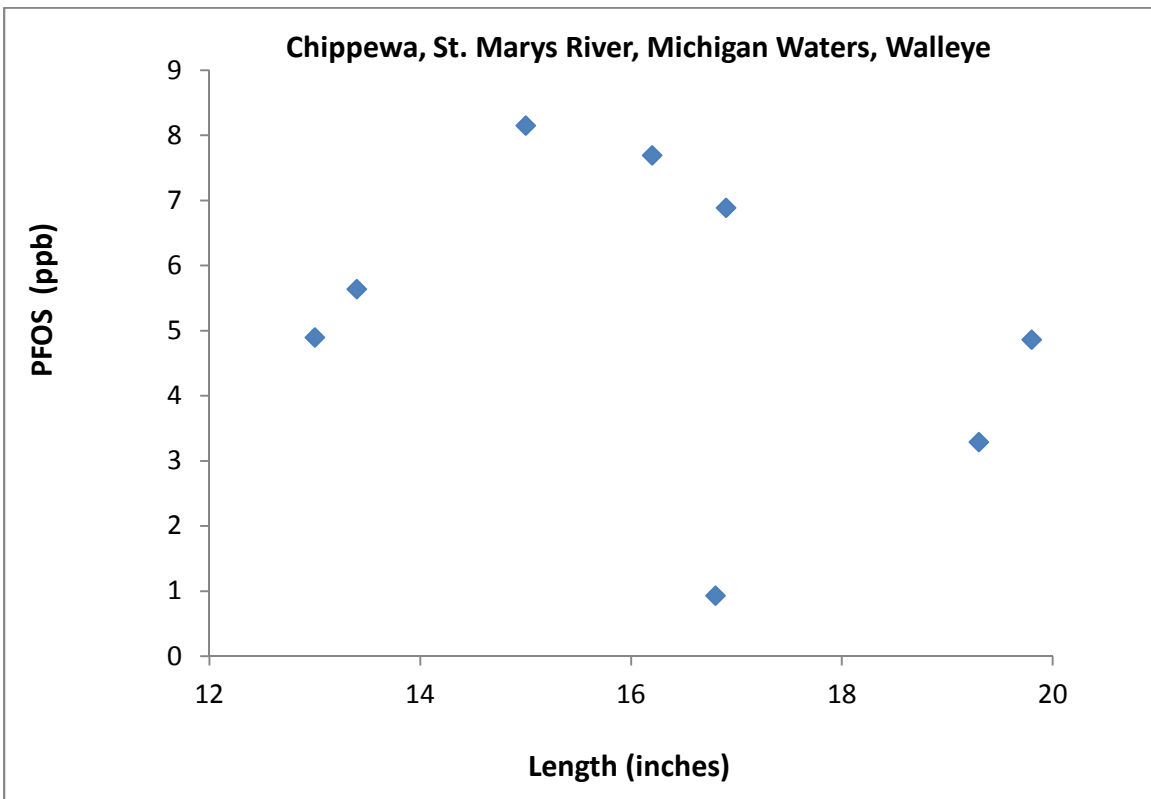
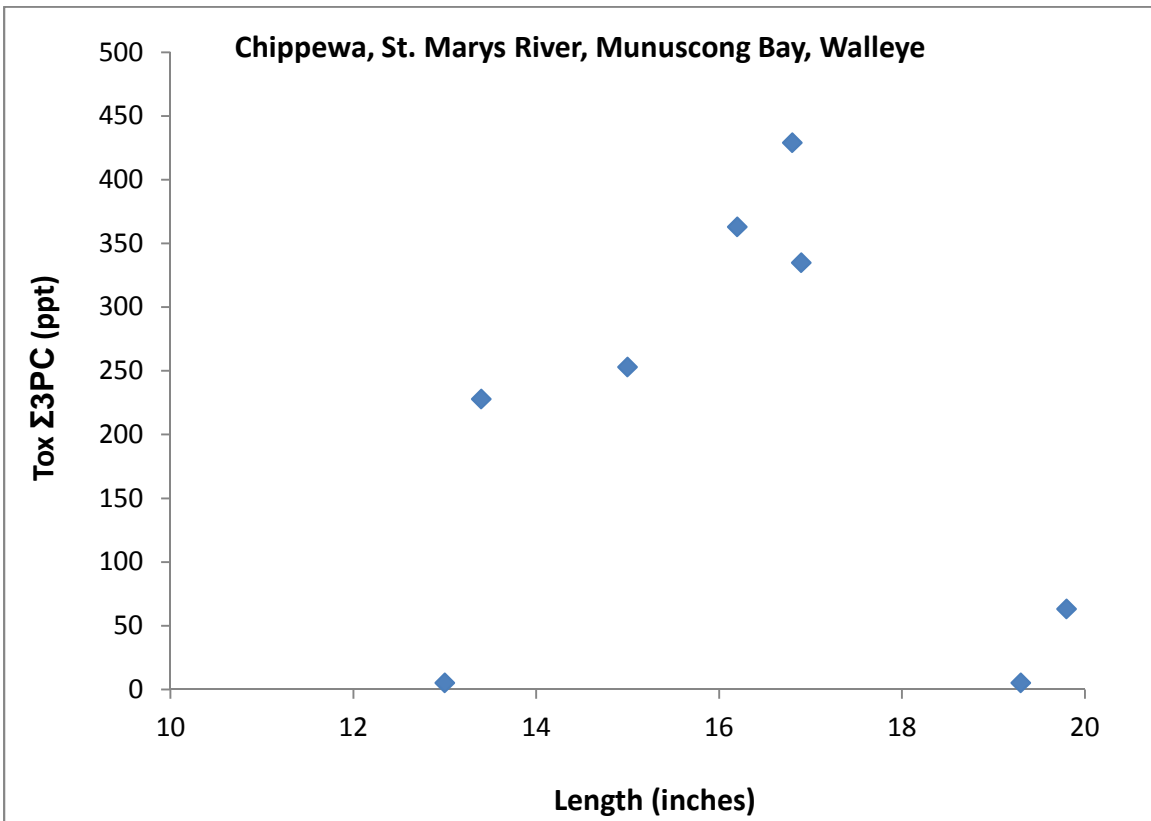
Existing MDCH Advisory: No one should eat more than 2 meals per month of St. Marys River walleye smaller than 24 inches due to PCBs and mercury or more than 1 meal per month of those fish larger than 24 inches due to mercury.

Recommendation: No one should eat more than 2 meals per month of St. Marys River walleye smaller than 22 inches due to PCBs and mercury or more than 1 meal per month of those fish larger than 22 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.15	4
16	0.2	4
18	0.28	2
20	0.38	2
22	0.52	2
24	0.7	1
26	0.96	1
28	1.31	0.5
30	1.79	0.5
<i>Shaded area denotes extrapolated estimates</i>		







Yellow Perch

St. Marys River

Chippewa County

Hg Analysis:

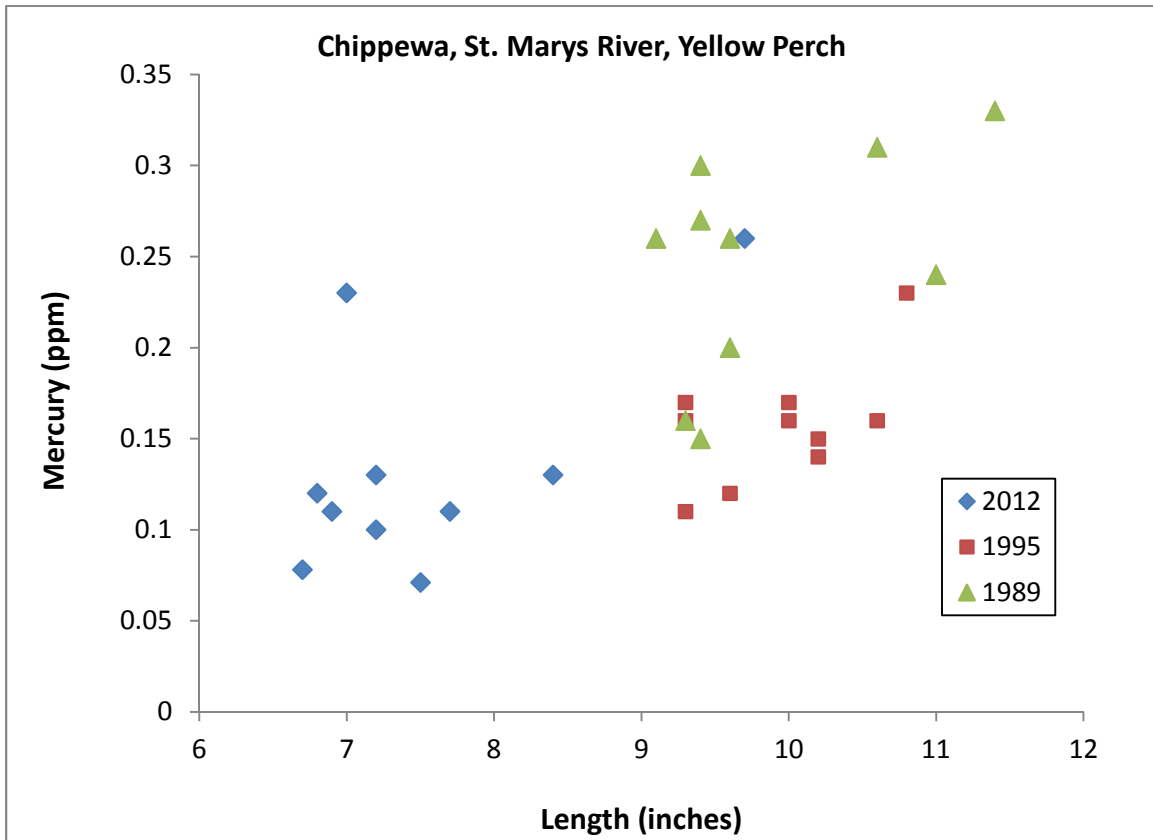
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2012	30	6.7	na	6.7	11.4
Datasets available: 1989, 1995, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.18	0.07	0.33	0.21	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.348	0.403				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.7	na	6.7	9.7
Datasets available: 1989, 1995, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	--	--	--	--
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing MDCH Advisory: No one should eat more than 4 meals per month of St. Marys River yellow perch due to mercury.

Recommendation: No change.



Appendix D6. Eat Safe Fish guidance, 2015 update recommendations, Lake Michigan

Carp

**Lake Michigan
Green Bay & L. Bay De Noc**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2012	64	20.1	na	20.1	34.6
Datasets available: 1988, '89, '93, 2000, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	64	0.29	0.10	0.55	0.31	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.021	0.034				

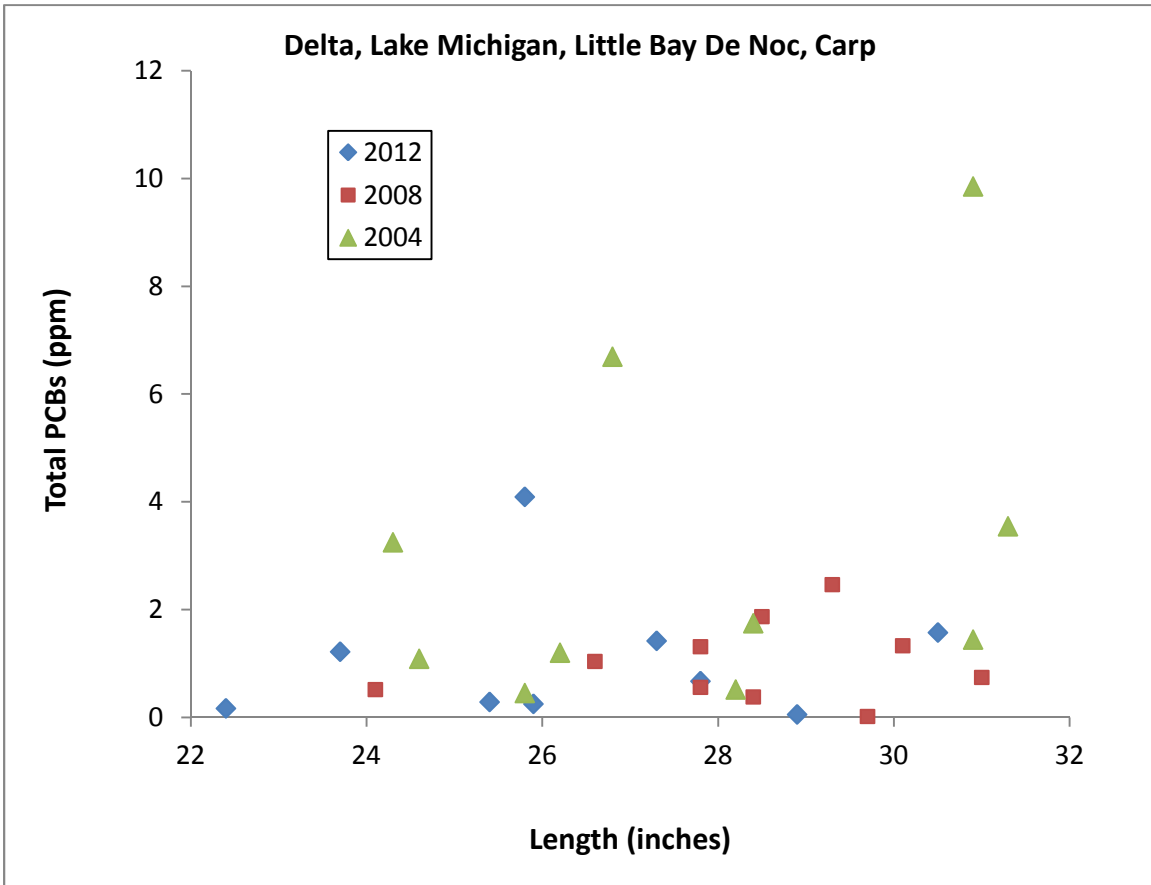
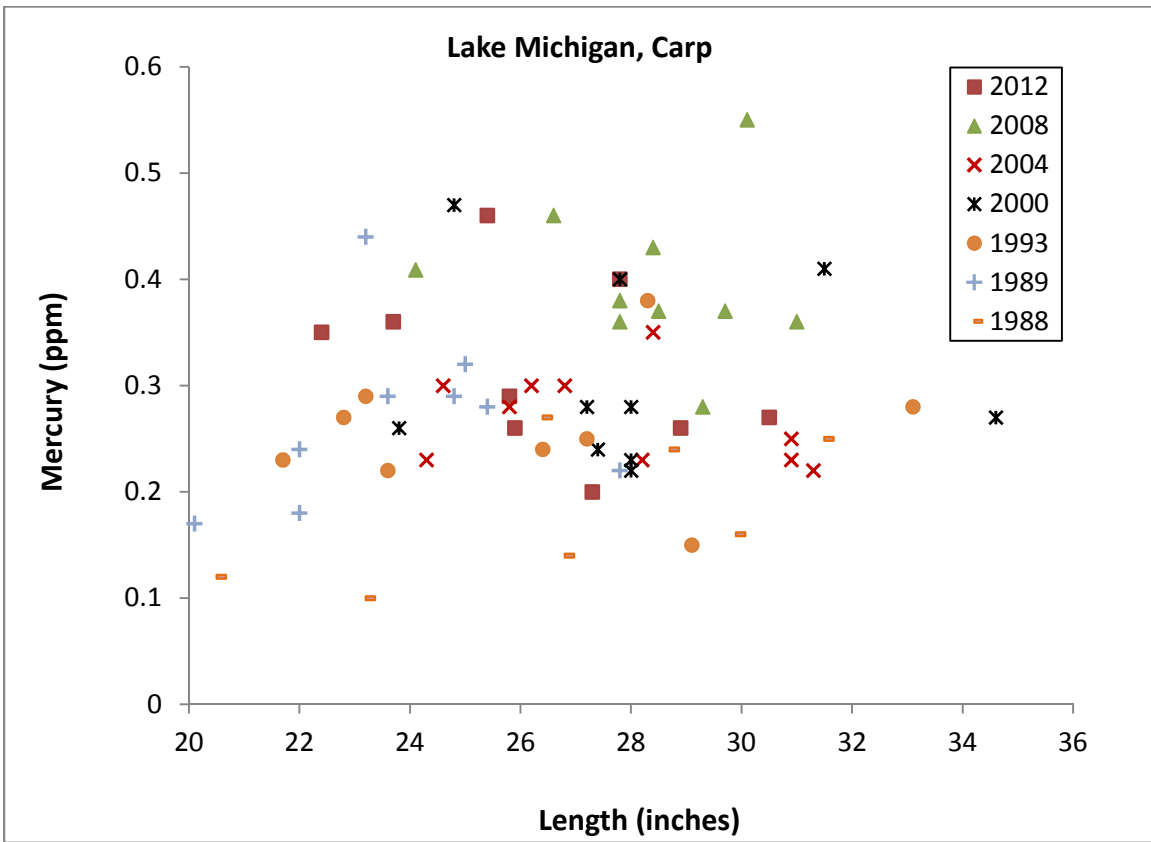
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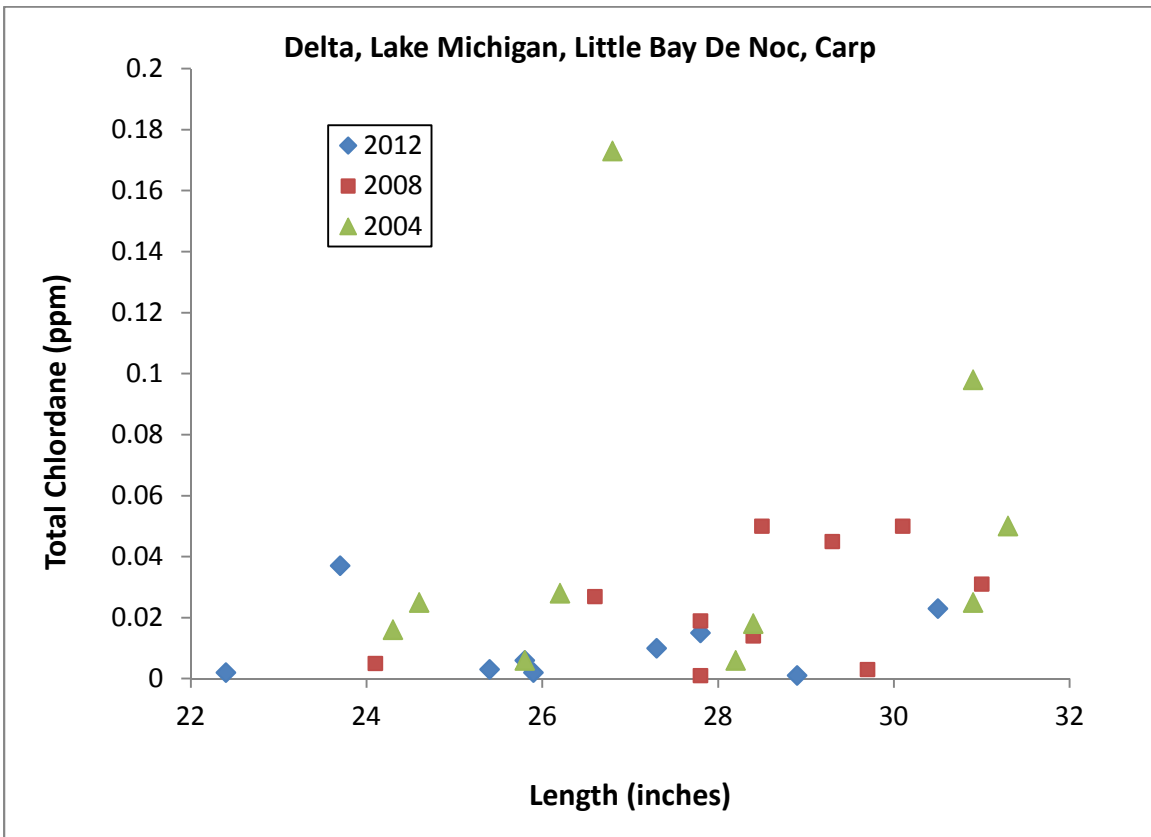
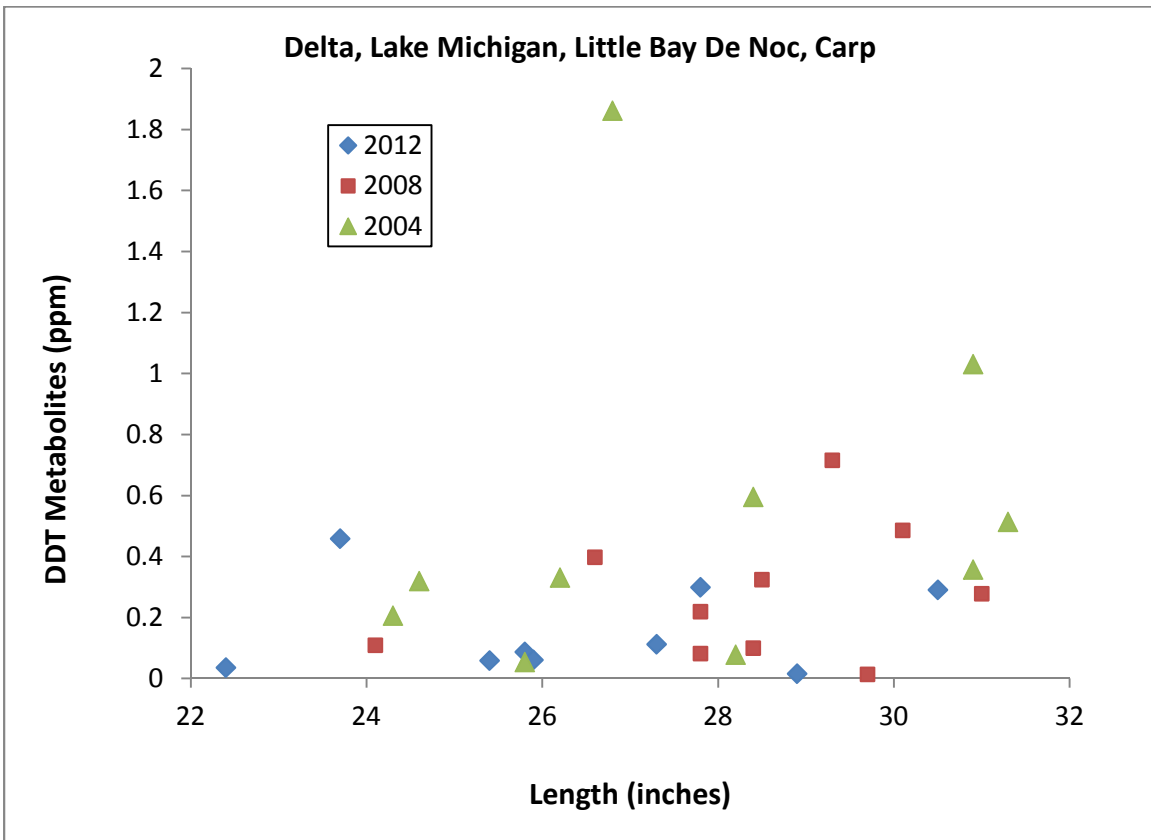
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	29	22.4	na	22.4	31.3
Datasets available: 1988, '89, '93, 2000, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	29	1.72	0.02	9.86	2.53	Limited
DDT	29	0.33	0.01	1.86	0.47	2
Chlordane	29	0.03	0.001	0.17	0.04	--
Toxaphene	29	ND	--	--	--	--
TEQ*	9	22.8	4.6 ppt	46.6 ppt	35.8 ppt	Limited
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.054	0.018				
DDT	0.047	0.064				
Chlordane	0.056	0.110				
Toxaphene	--	--				
TEQ*	0.012	0.042				
Final meal category based on UCL:						Limited*

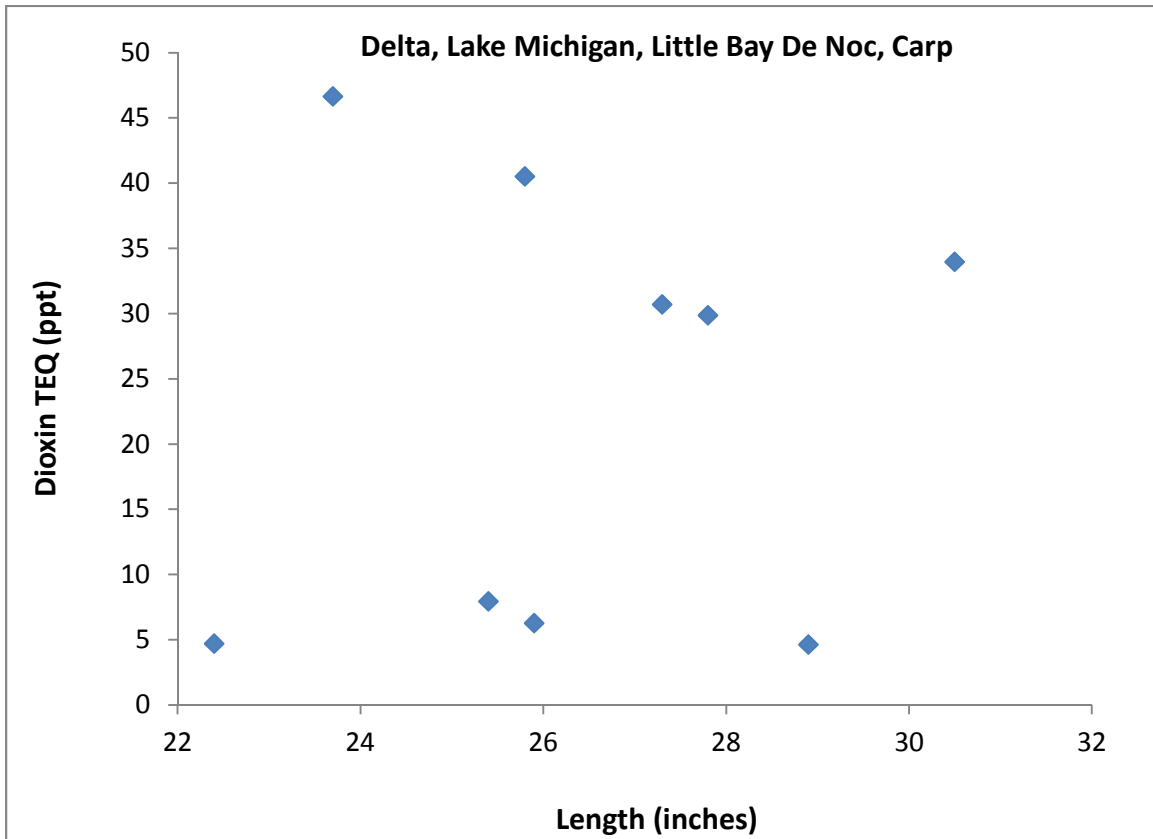
* - 2005 WHO TEFs; dl-PCBs included

Existing MDCH Advisory: No one should eat carp from Lake Michigan, Green Bay, or Little Bay De Noc, due to elevated concentrations of PCBs. Mercury and DDT would cause advisories.

Recommendation: Add TEQ to advisory cause, otherwise no change recommended. *An additional year of sampling is needed to confirm the lowered PCB levels and monitor TEQ. Mercury and DDT would cause advisories.







Sucker
White, Longnose, Redhorse **Lake Michigan**
Green Bay & L. Bay De Noc

Hg Analysis:

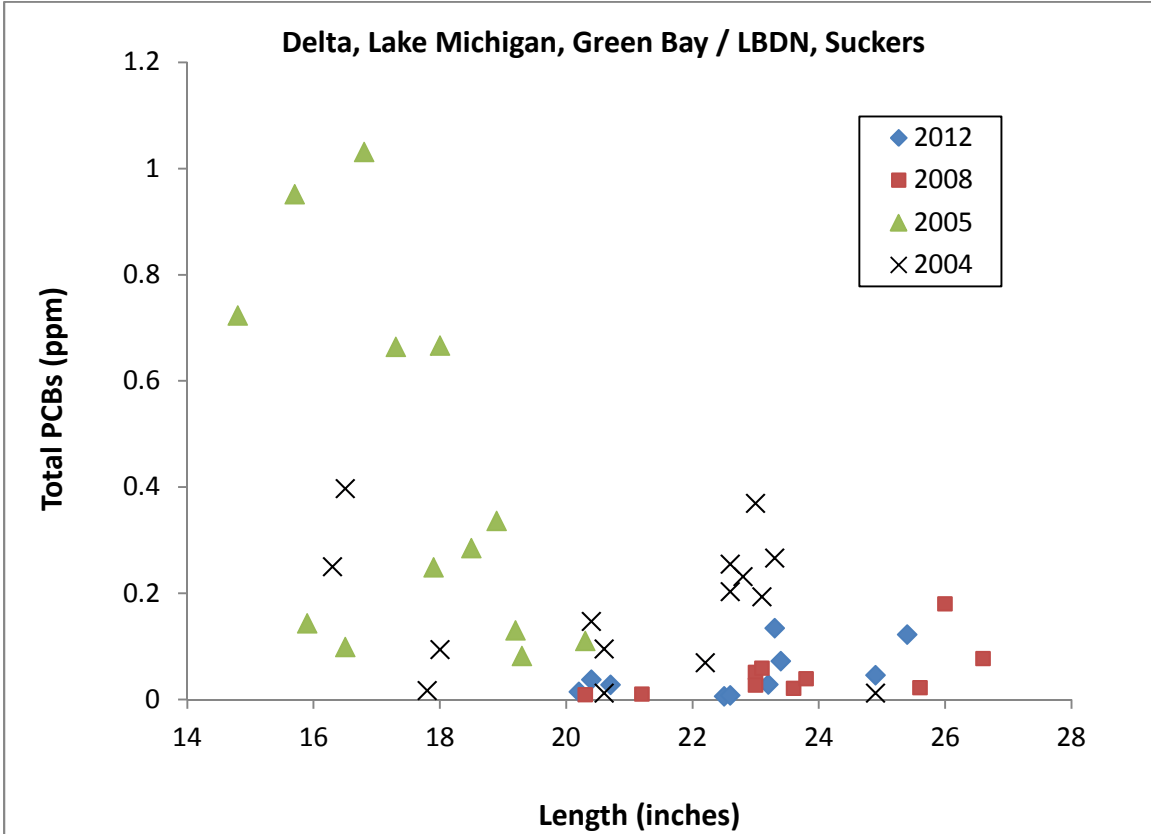
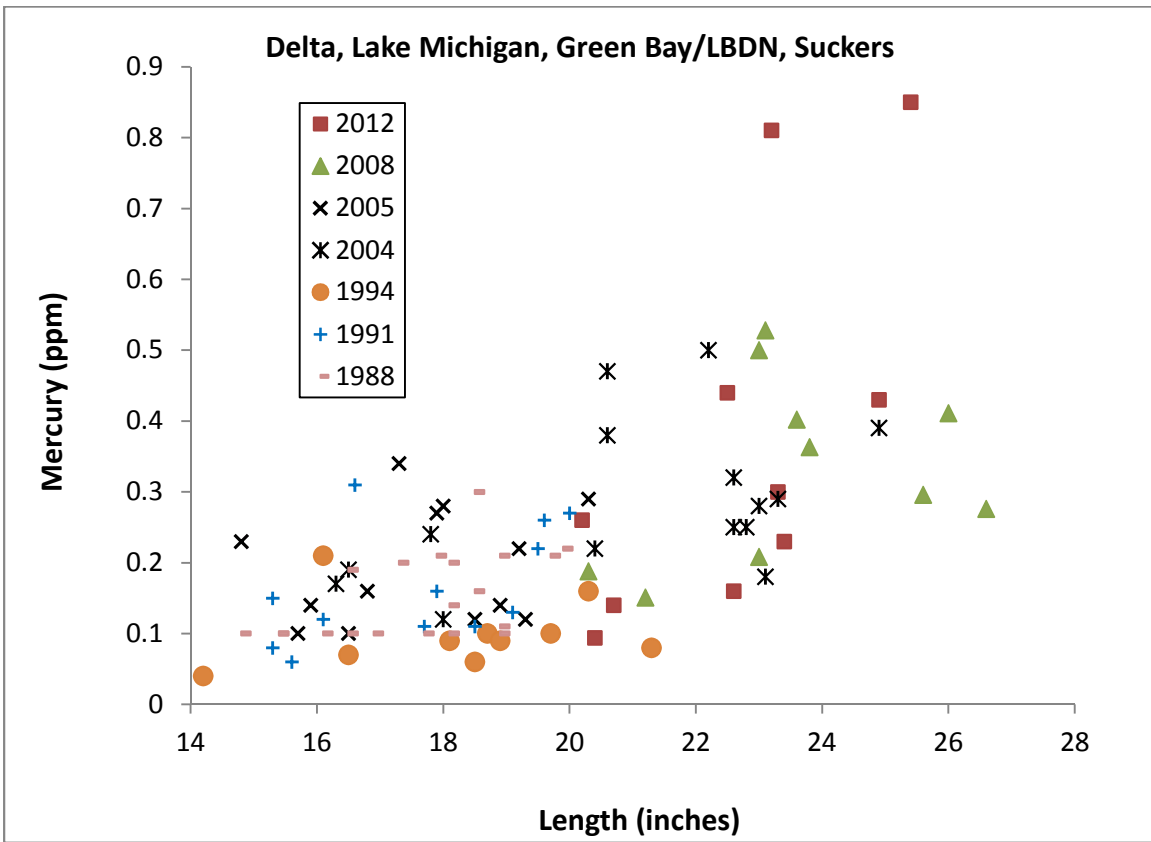
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2012	90	14.2	na	14.2	26.6
Datasets available: 1988, 1991, 1994, 2004, 2005, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	90	0.22	0.04	0.85	0.25	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.397	0.429				

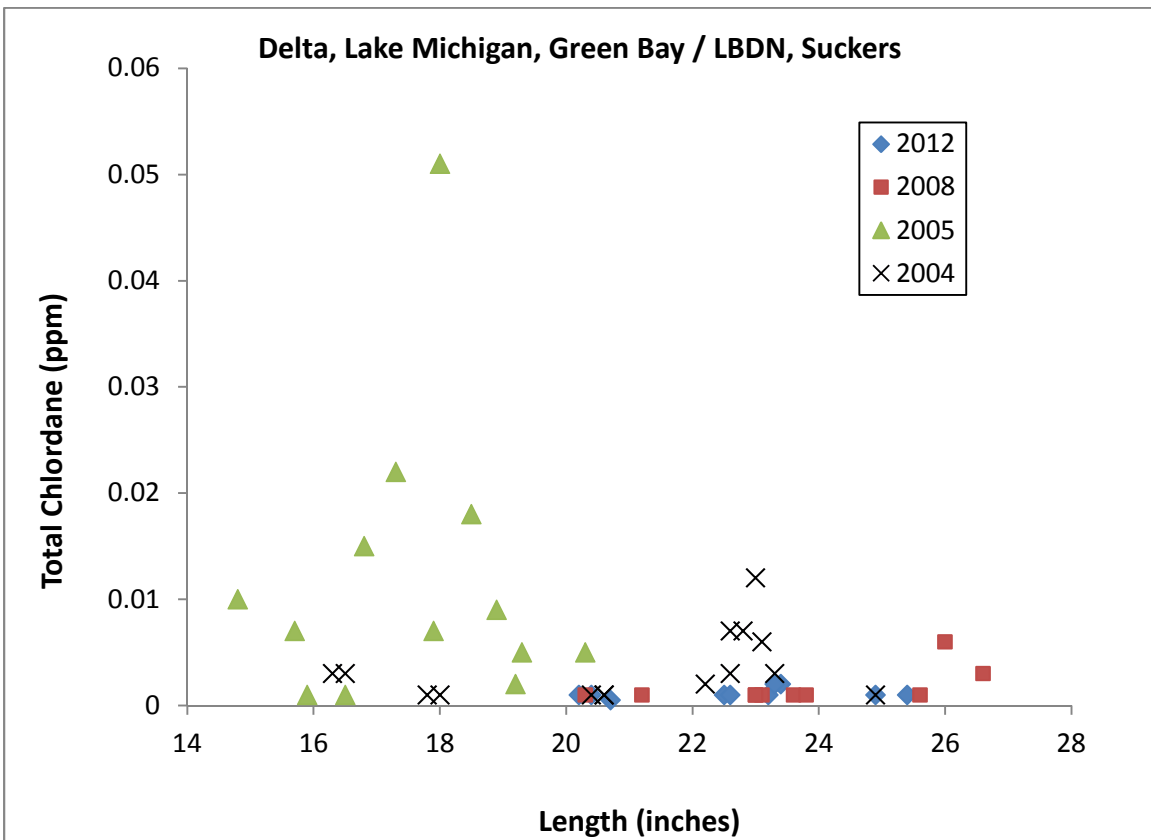
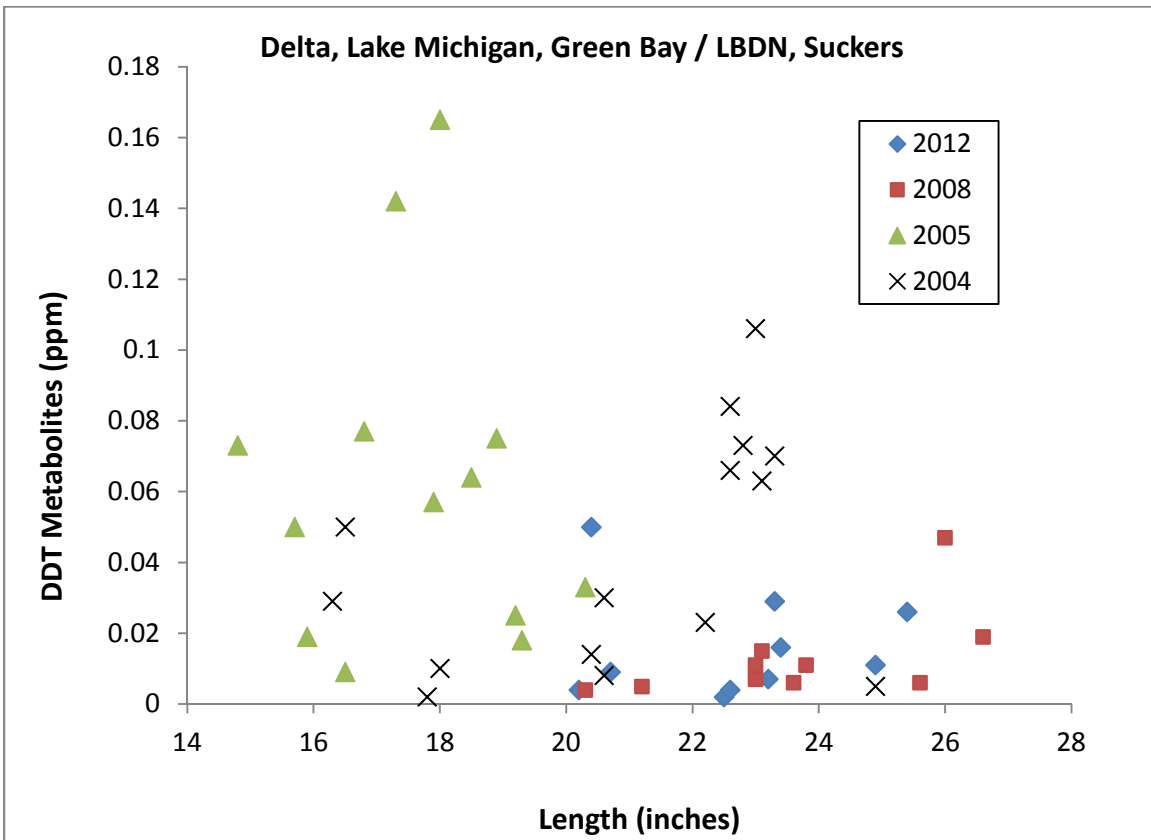
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	48	14.8	na	14.8	26.6
Datasets available: 1988, 1991, 1994, 2004, 2005, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	48	0.19	0.006	1.03	0.26	0.5
DDT	48	0.04	0.002	0.16	0.05	16
Chlordane	48	0.005	0.001	0.05	0.01	--
Toxaphene	48	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.302	0.191				
DDT	0.080	0.063				
Chlordane	0.098	0.110				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

Existing MDCH Advisory: No one should eat more than 6 meals per year of suckers from Lake Michigan, Green Bay or Little Bay De Noc due to elevated levels of PCBs. Mercury would cause an advisory.

Recommendation: No change.





Smallmouth Bass

**Lake Michigan
Green Bay & L. Bay De Noc**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	2012	62	9.6	14	13.5	20
Datasets available: 1992, 2004, 2005, 2008, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	52	0.39	0.09	0.95	0.44	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.578	0.699				

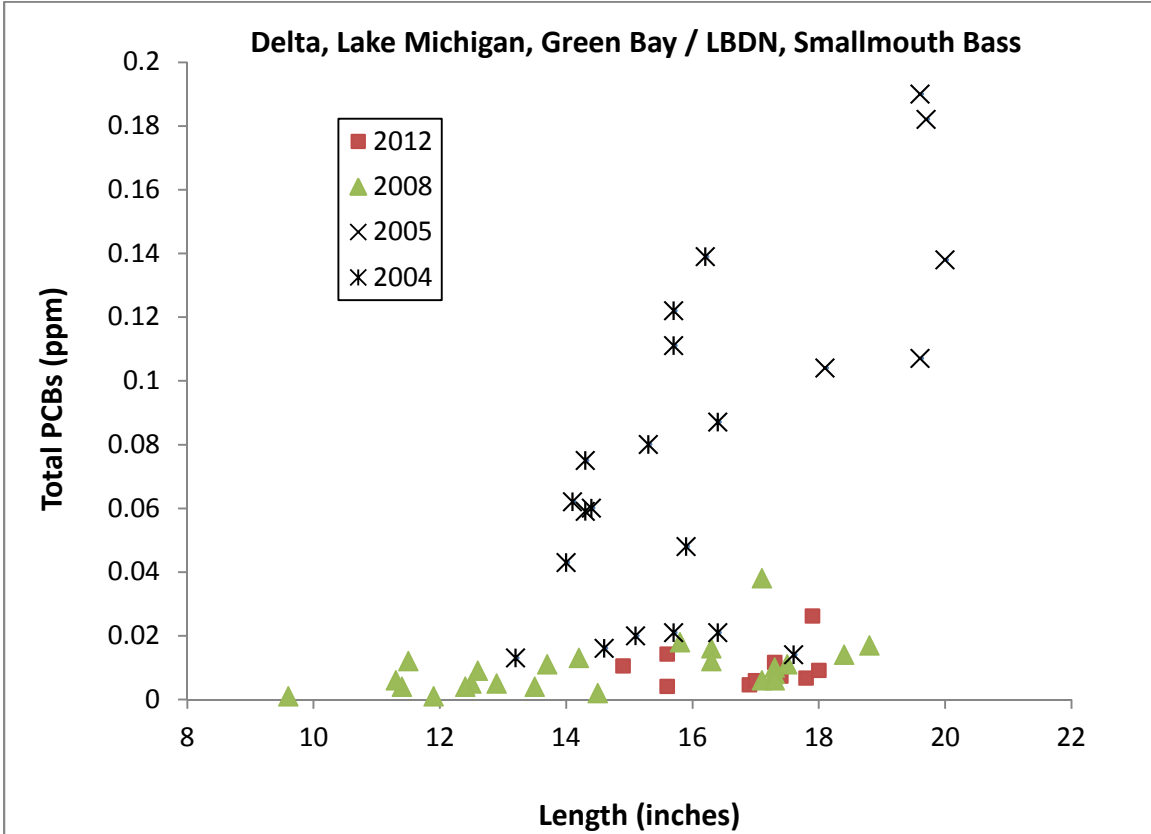
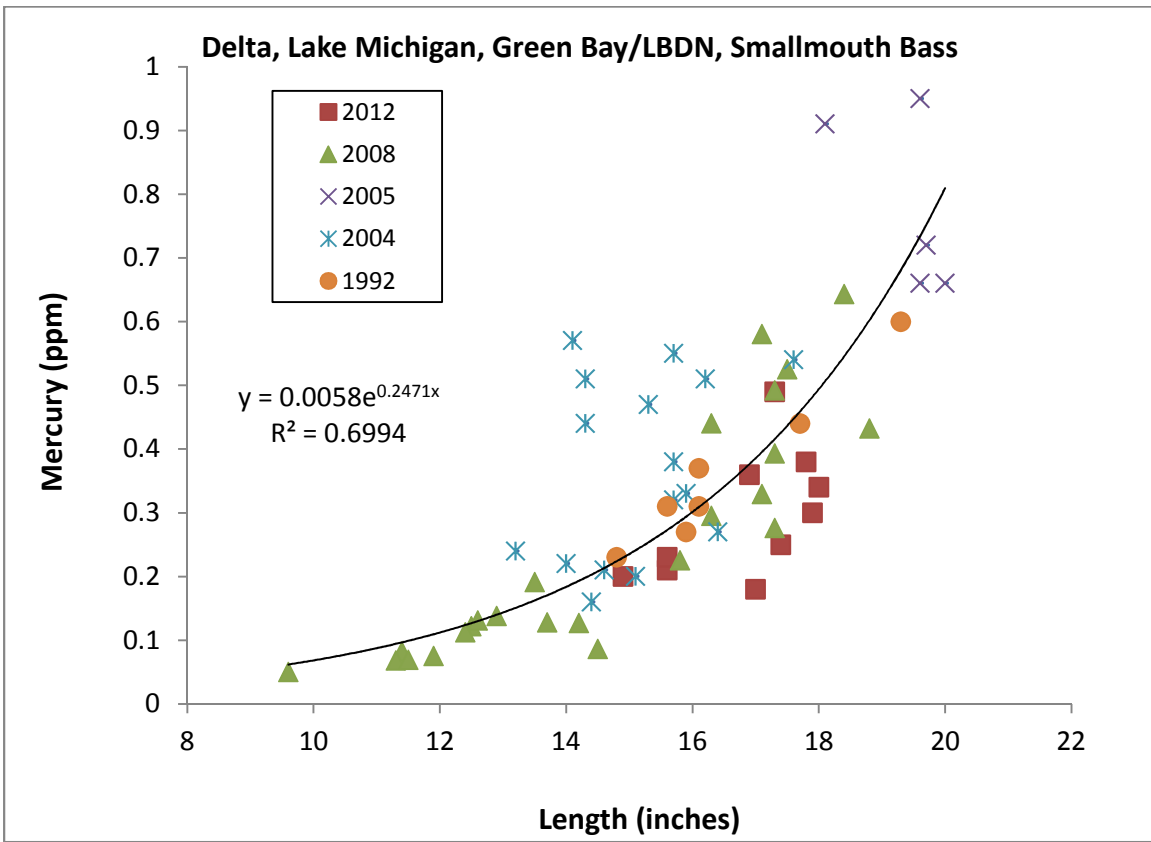
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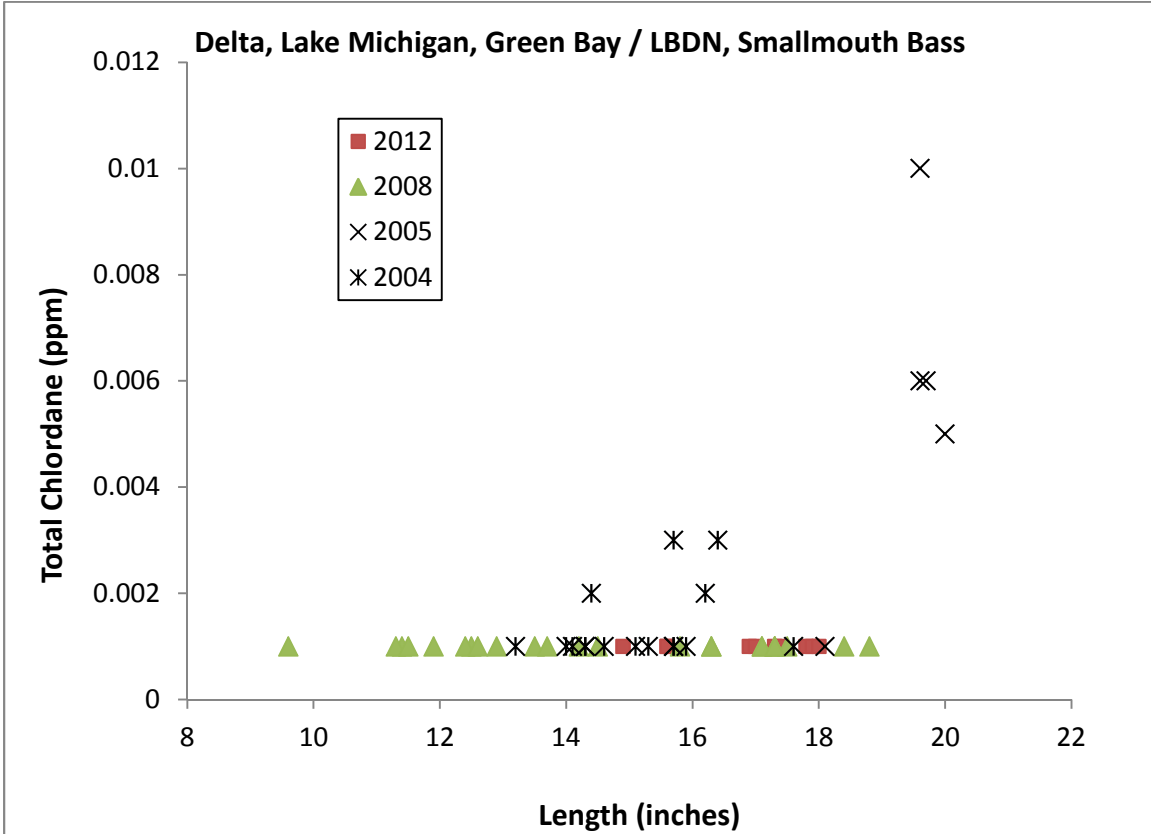
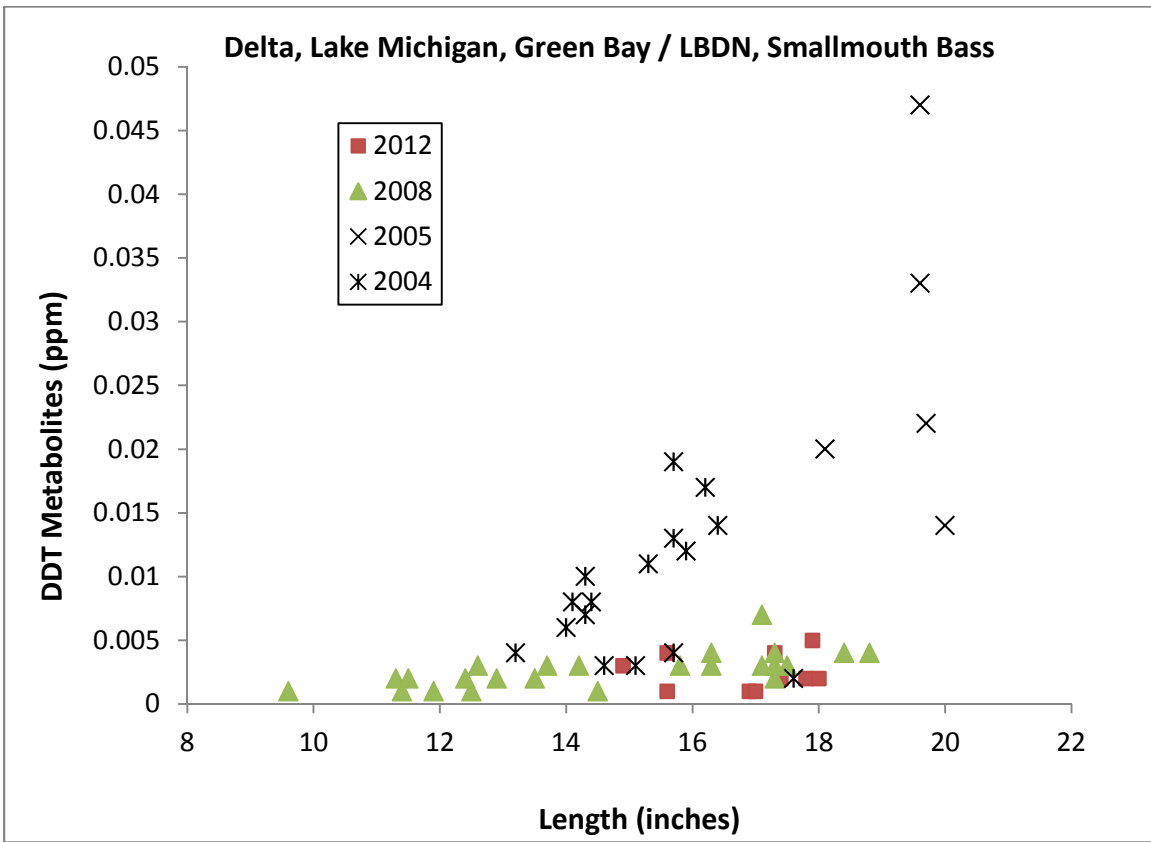
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	55	9.6	14	13.5	20
Datasets available: 1992, 2004, 2005, 2008, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	46	0.04	0.002	0.19	0.06	2
DDT	45	0.01	0.001	0.05	0.01	16
Chlordane	45	0.002	0.001	0.01	0.002	--
Toxaphene	45	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.182	0.234				
DDT	0.212	0.232				
Chlordane	0.205	0.204				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing MDCH Advisory: No one should eat more than 2 meals per month of smallmouth or largemouth bass from Green Bay or Little Bay De Noc smaller than 16 inches or more than 1 meal per month of smallmouth or largemouth bass larger than 16 inches due to elevated concentrations of mercury and PCBs.

Recommendation: No one should eat more than 2 meals per month of smallmouth or largemouth bass from Green Bay or Little Bay De Noc smaller than 18 inches or more than 1 meal per month of smallmouth or largemouth bass larger than 18 inches due to elevated concentrations of mercury and PCBs.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
10	0.07	16
12	0.11	8
14	0.18	4
16	0.3	2
18	0.49	2
20	0.81	1
22	1.33	0.5
24	2.18	0.5
<i>Shaded area denotes extrapolated estimates</i>		





Walleye

**Lake Michigan
Green Bay & Little Bay De Noc**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2012	70	15.4	15	15.4	29.4
Datasets available: 1987, 1991, 1992, 2004, 2005, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	70	0.46	0.10	1.15	0.54	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.662	0.625				

Organics Analysis:

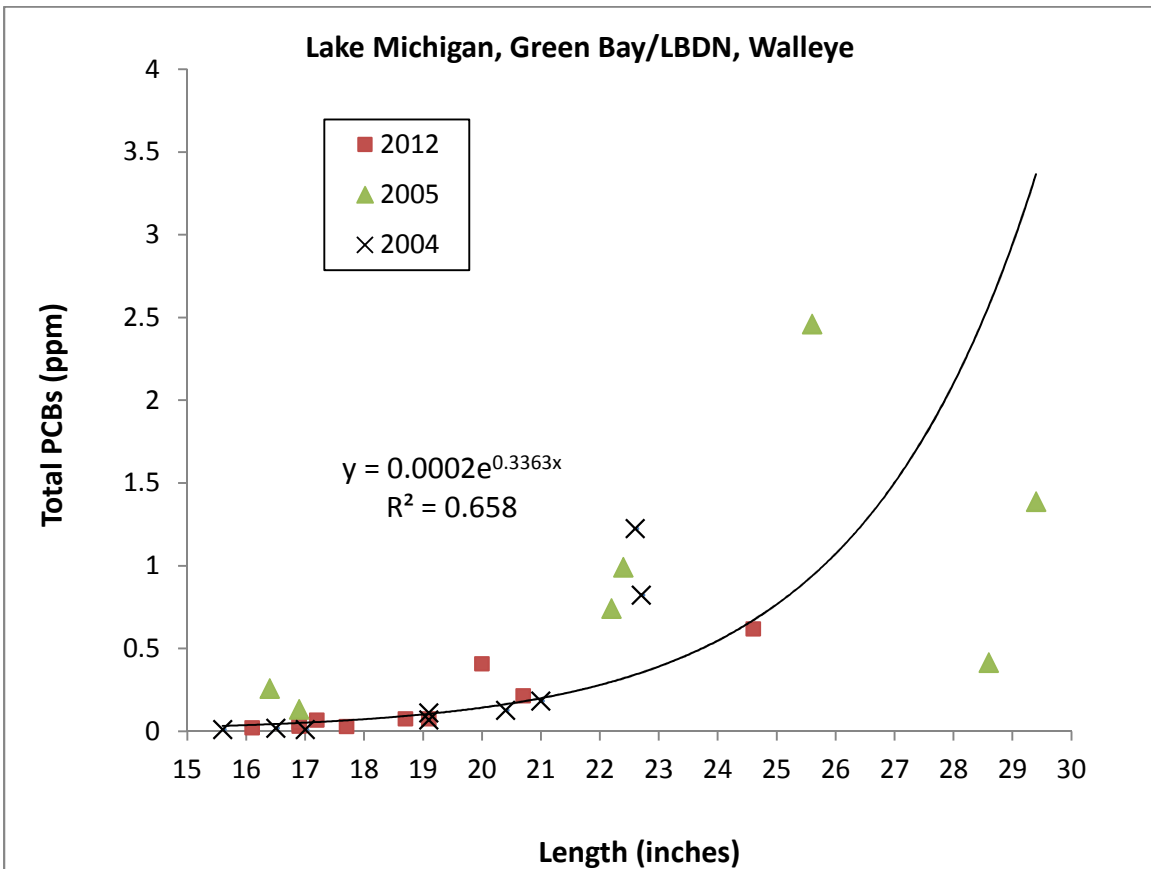
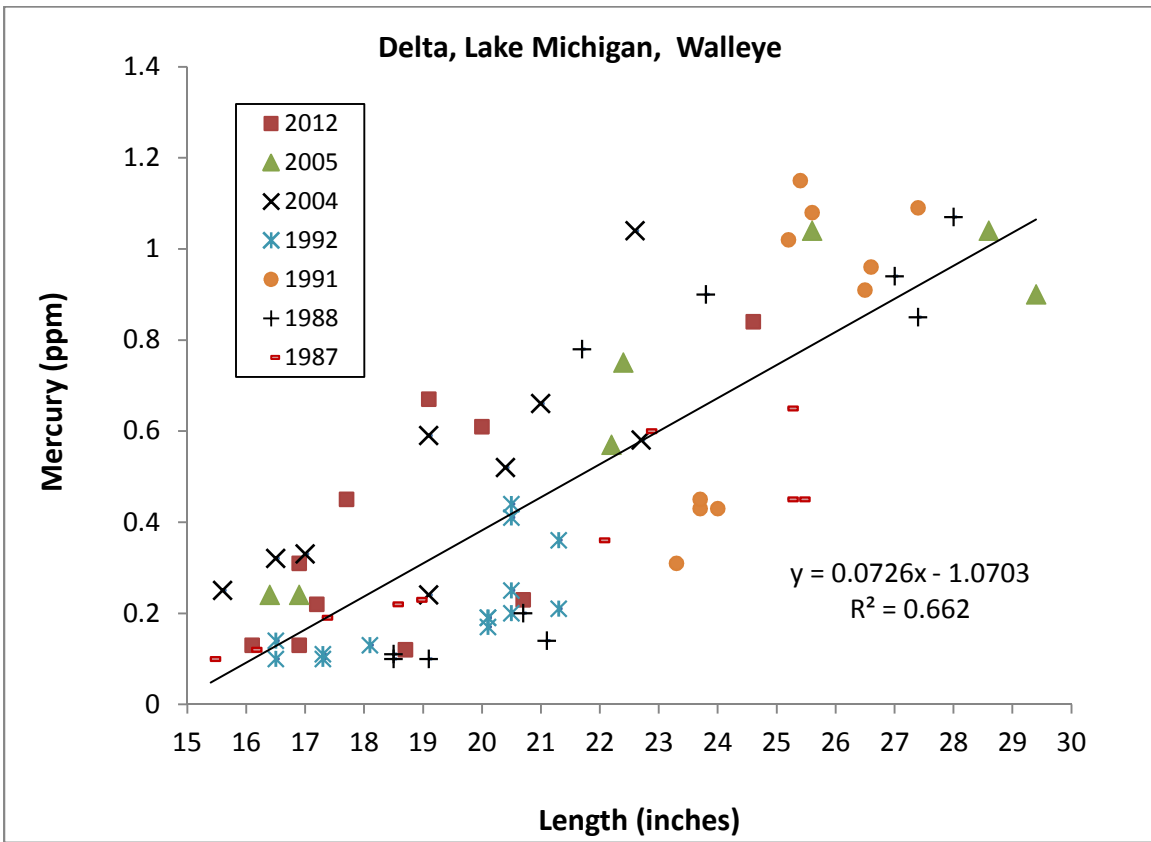
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	26	15.6	15	15.6	29.4
Datasets available: 1987, 1991, 1992, 2004, 2005, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	26	0.41	0.01	2.46	0.64	Limited
DDT	26	0.10	0.003	0.70	0.17	8
Chlordane	26	0.02	0.001	0.14	0.03	--
Tox Σ3PC	10	0.66 ppb	ND	2.2 ppb	1.22 ppb	12
PFOS	10	9.6 ppb	4.3 ppb	14.8 ppb	11.9 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.519	0.658				
DDT	0.209	0.435				
Chlordane	0.354	0.620				
Tox Σ3PC	0.646	0.471				
PFOS	0.014	0.005				
Final meal category based on UCL:						Limited

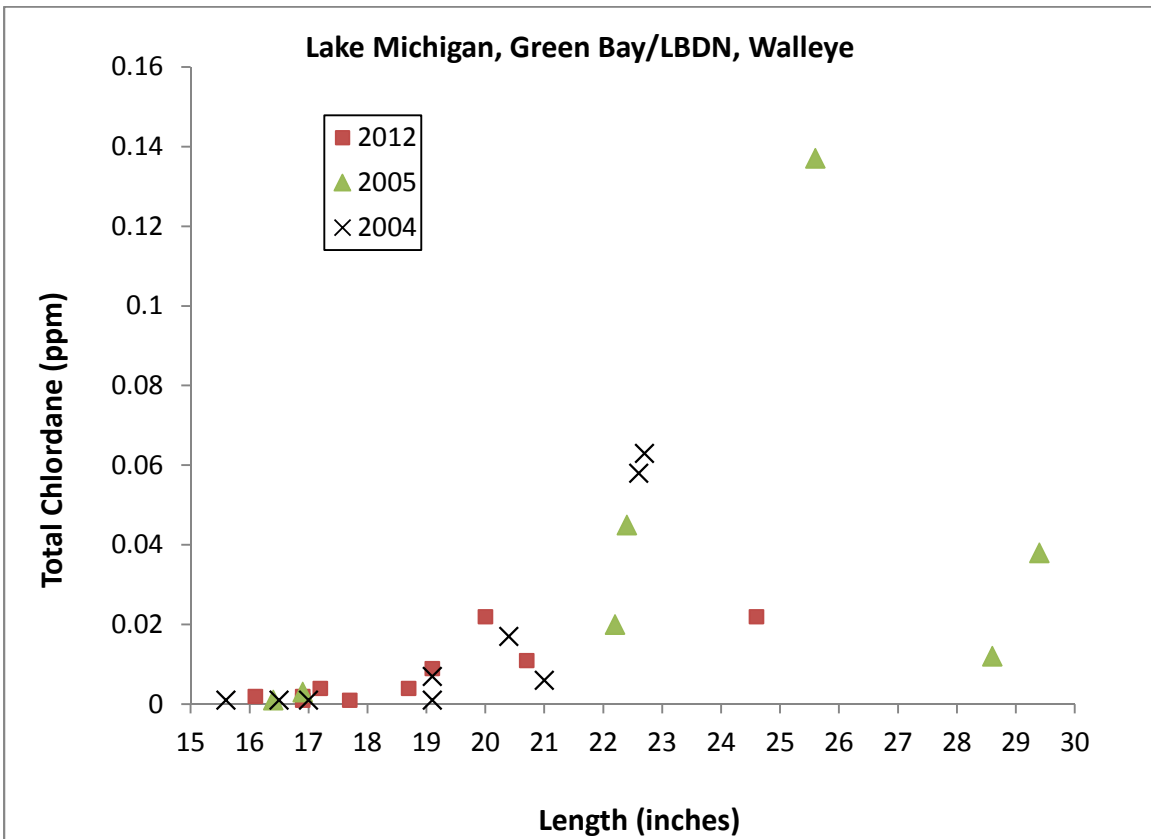
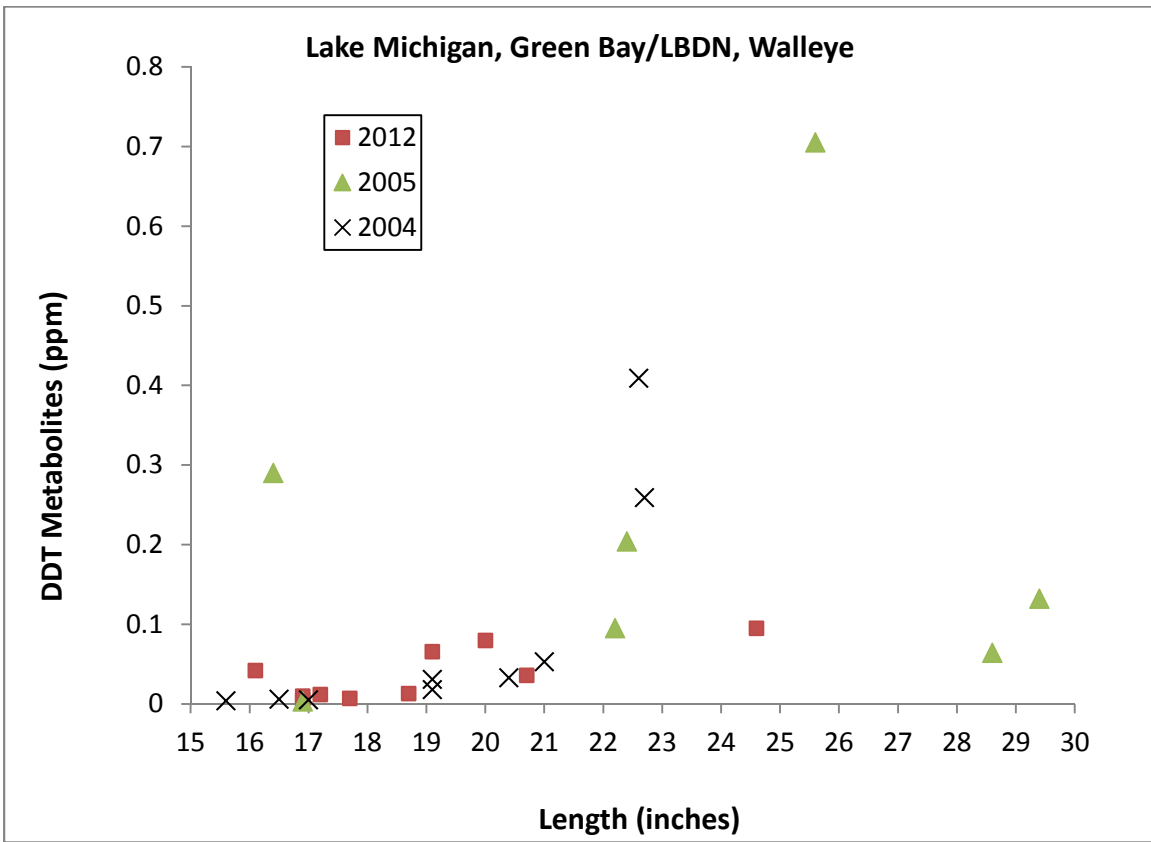
Existing MDCH Advisory: No one should eat more than 2 meals per month of Lake Michigan walleye smaller than 18 inches due to mercury and PCBs. Sensitive populations should not eat Lake Michigan walleye larger than 18 inches due to PCBs. Healthy adults should limit consumption to no more than 1 or 2 meals per year of walleye larger than 18 inches due to elevated concentrations of PCBs. Mercury and DDT would cause advisories.

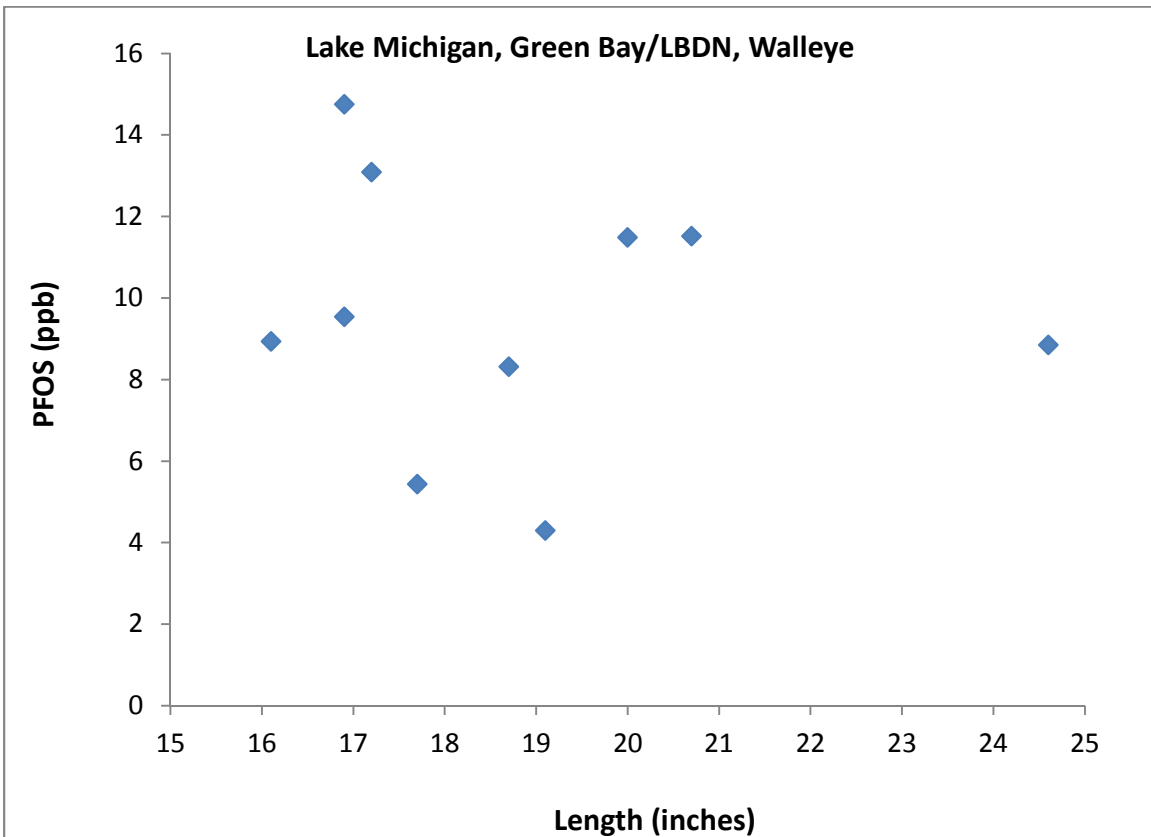
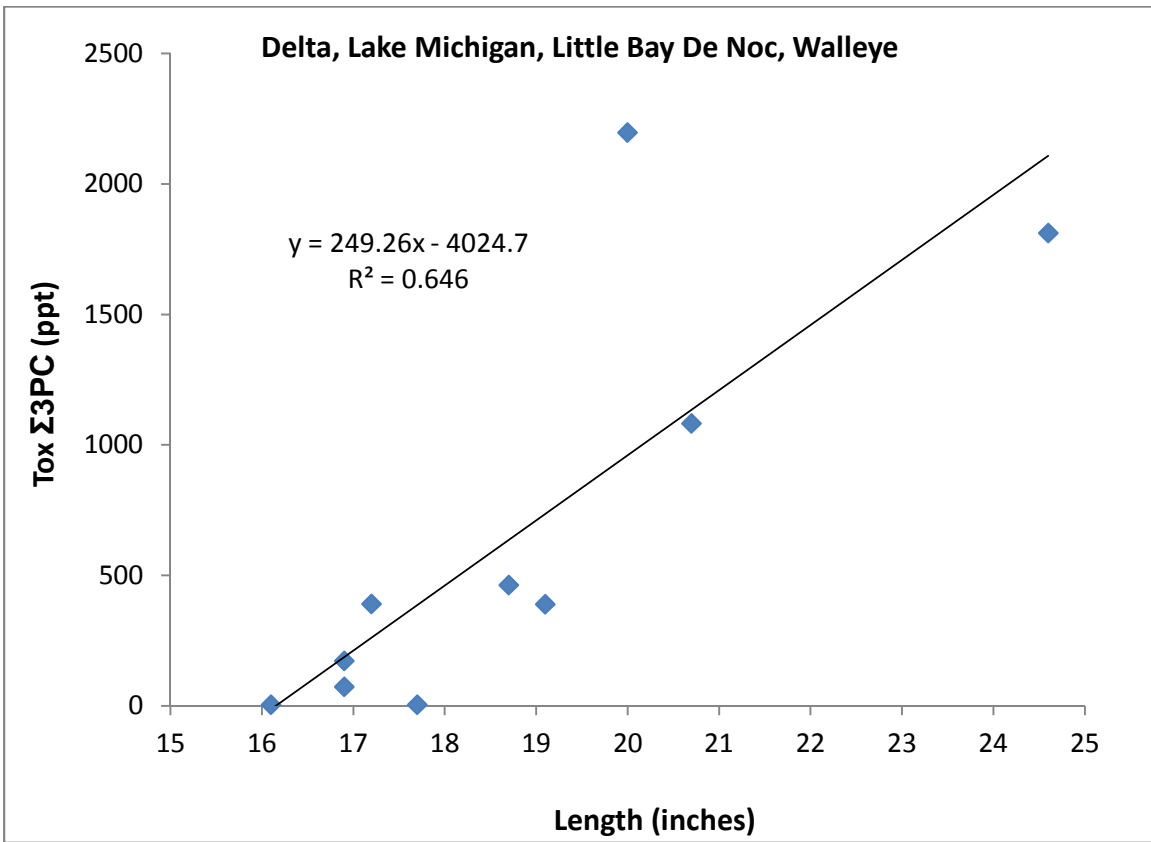
Recommendation: No change to guideline. Mercury, PFOS, toxaphene, and DDT would cause advisories.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category	PCB Regression Estimate (ppm)	Meal Category
14	(-0.05)	16	0.02	12
16	0.09	12	0.04	4
18	0.24	4	0.09	2
20	0.38	2	0.17	1
22	0.53	2	0.33	0.5
24	0.67	1	0.64	Limited
26	0.82	1	1.25	Limited
28	0.96	1	2.46	Limited
30	1.11	0.5	4.82	0

Shaded area denotes extrapolated estimates







Appendix D7. Eat Safe Fish guidance, 2015 update recommendations, Lake Huron

Carp

Lake Huron

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
1987	2012	106	15	na	15	31.4	
Datasets available: 1987, '88, '89, '91, '93, '98, '99, 2001, 2004, 2012							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category	
Mercury	106	0.14	0.04	0.43	0.15	4	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.074	0.062					

Organics Analysis:

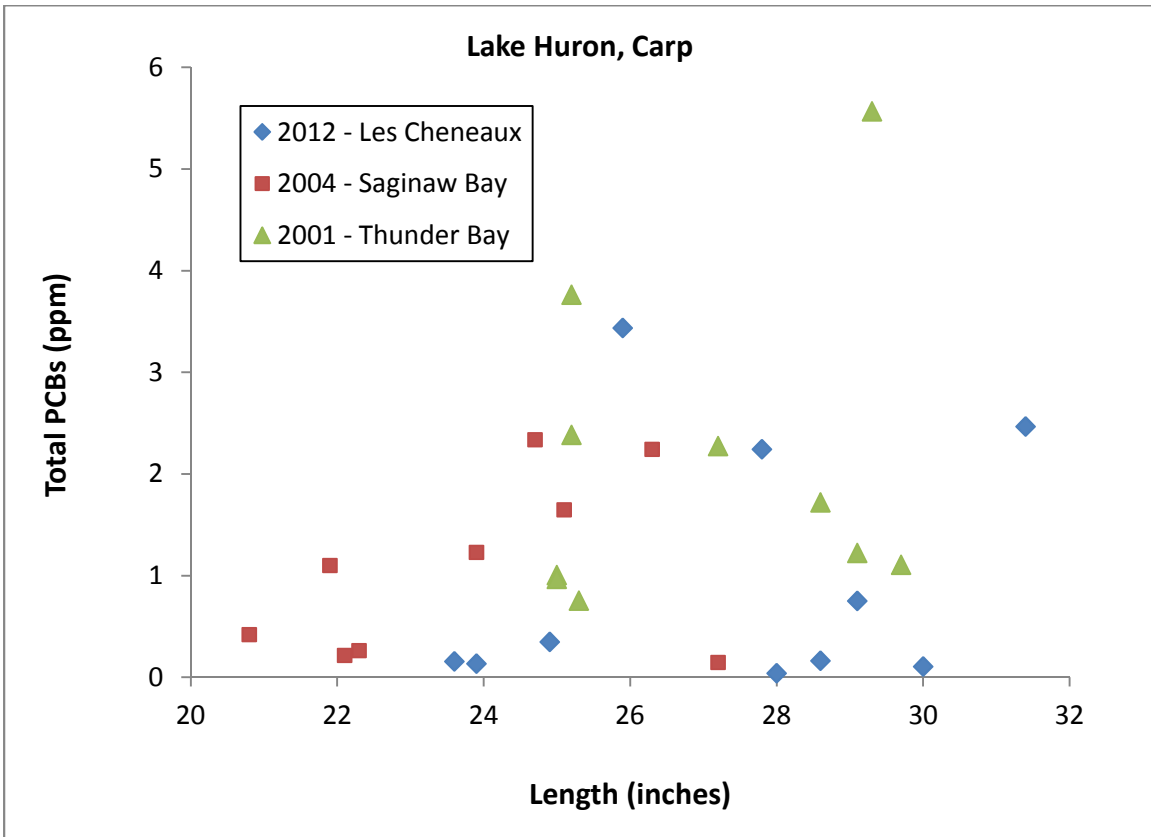
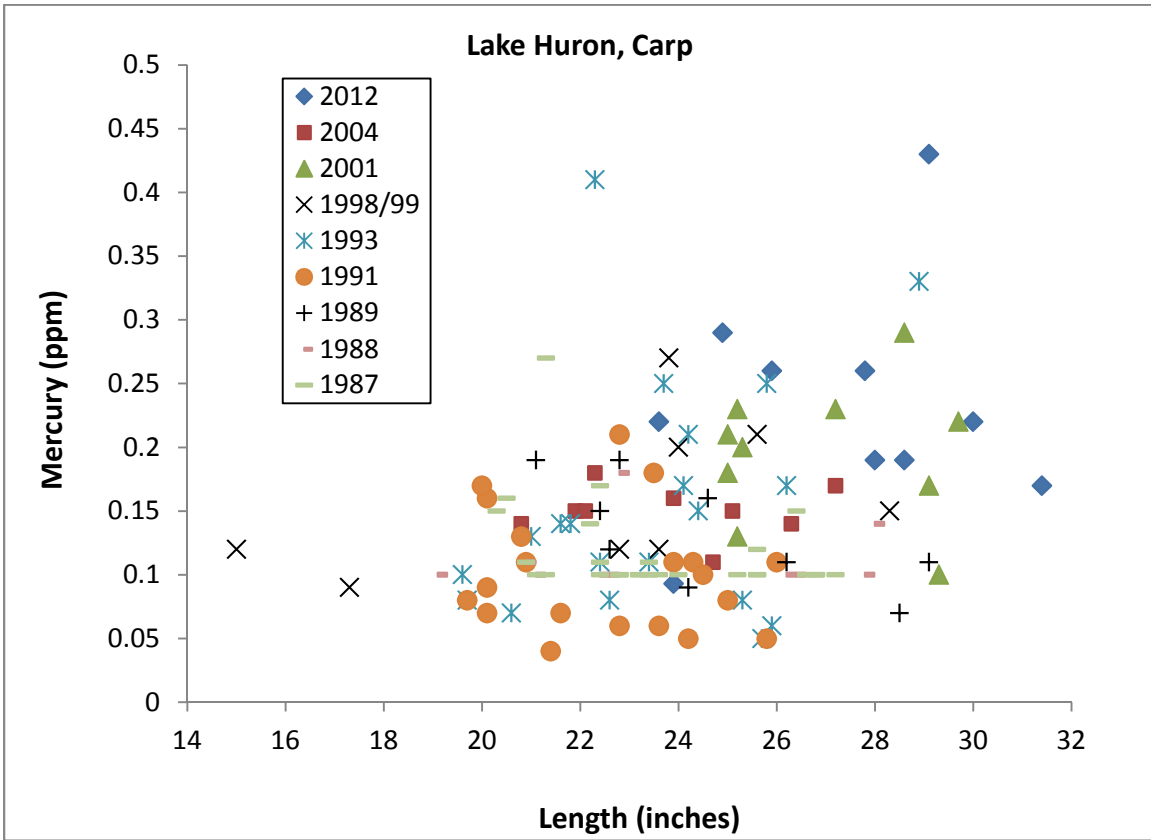
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2001	2012	29	20.8	na	20.8	31.4	
Datasets available: 1984, '87, '88, '89, '91, '93, '98, '99, 2001, 2004, 2012							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category	
PCB	29	1.39	0.042	5.57	1.89	Limited	
DDT	29	0.29	0.01	1.17	0.41	4	
Chlordane	29	0.03	0.001	0.13	0.05	--	
Toxaphene	29	0.11	0.05	1.16	0.19	1	
TEQ*	18	42.2 ppt	3.8 ppt	187 ppt	66 ppt	Limited	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.068	0.022					
DDT	0.056	0.040					
Chlordane	0.076	0.037					
Toxaphene	0.005	0.000					
TEQ*	0.002	0.011					
Final meal category based on UCL:						Limited	

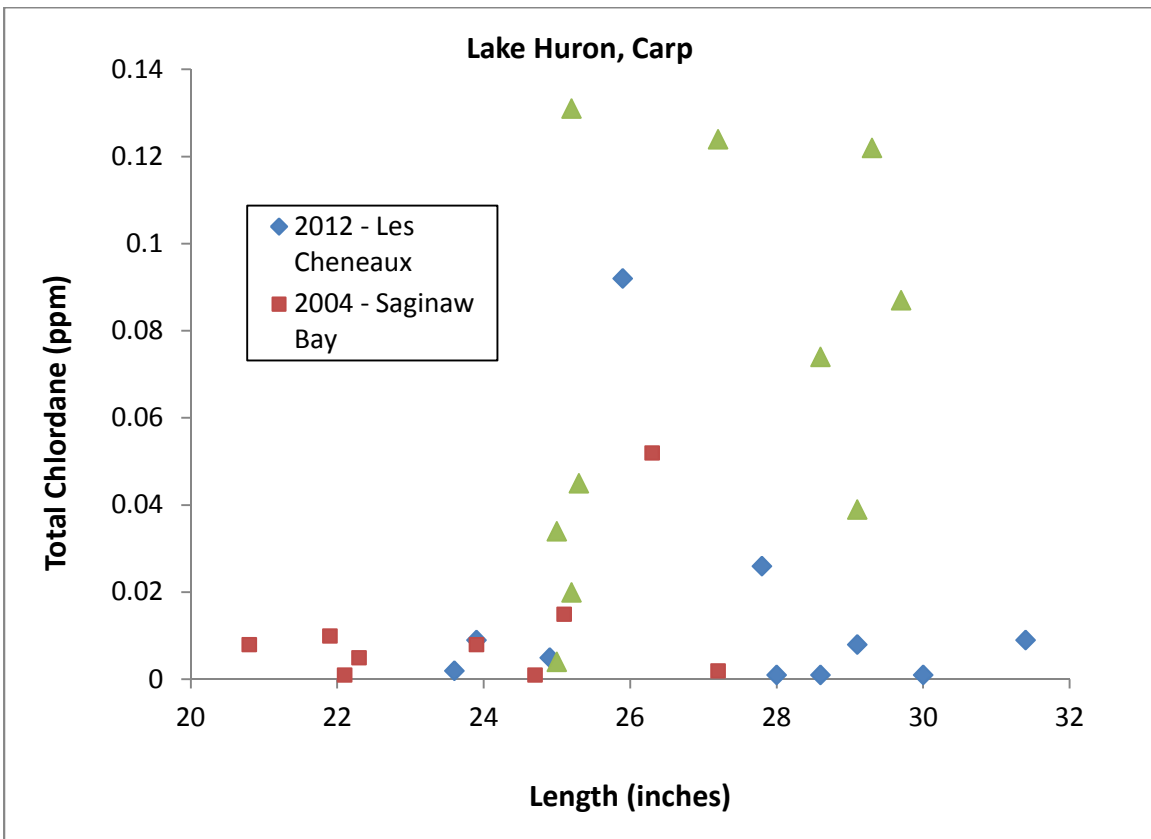
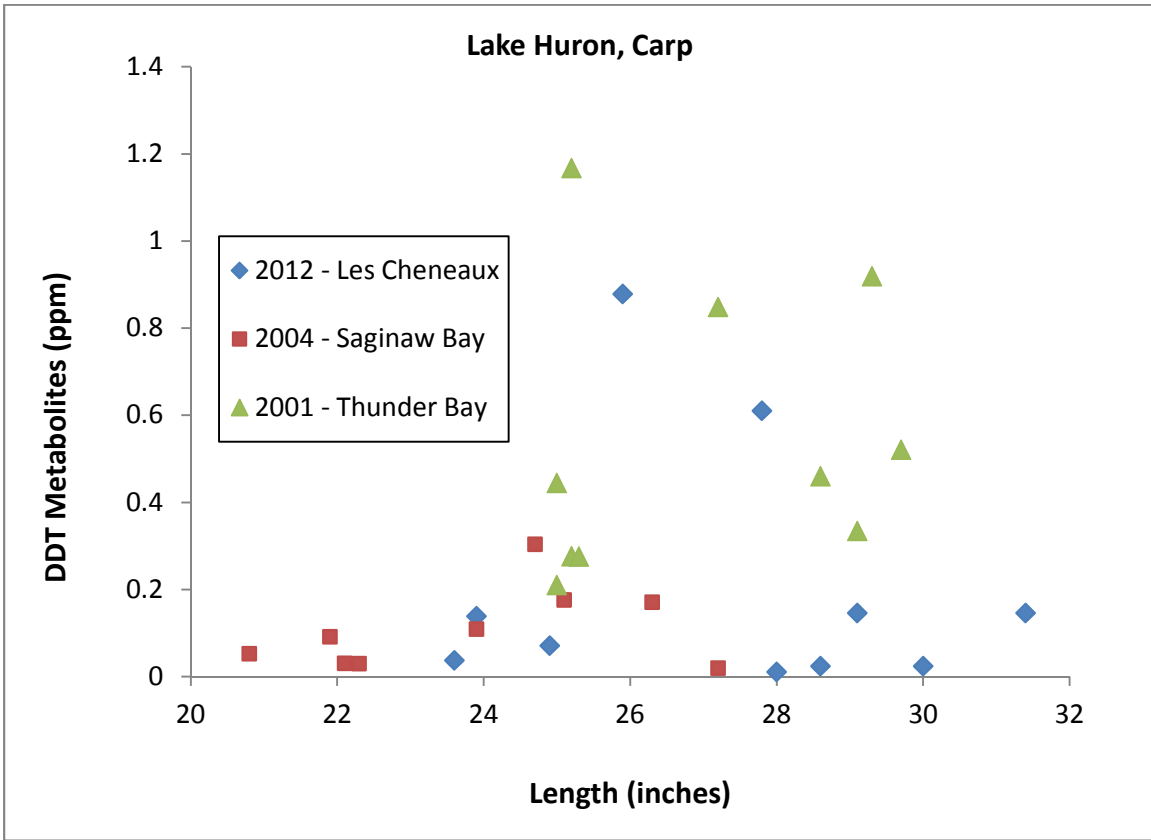
* 2005 WHO; dl-PCBs included

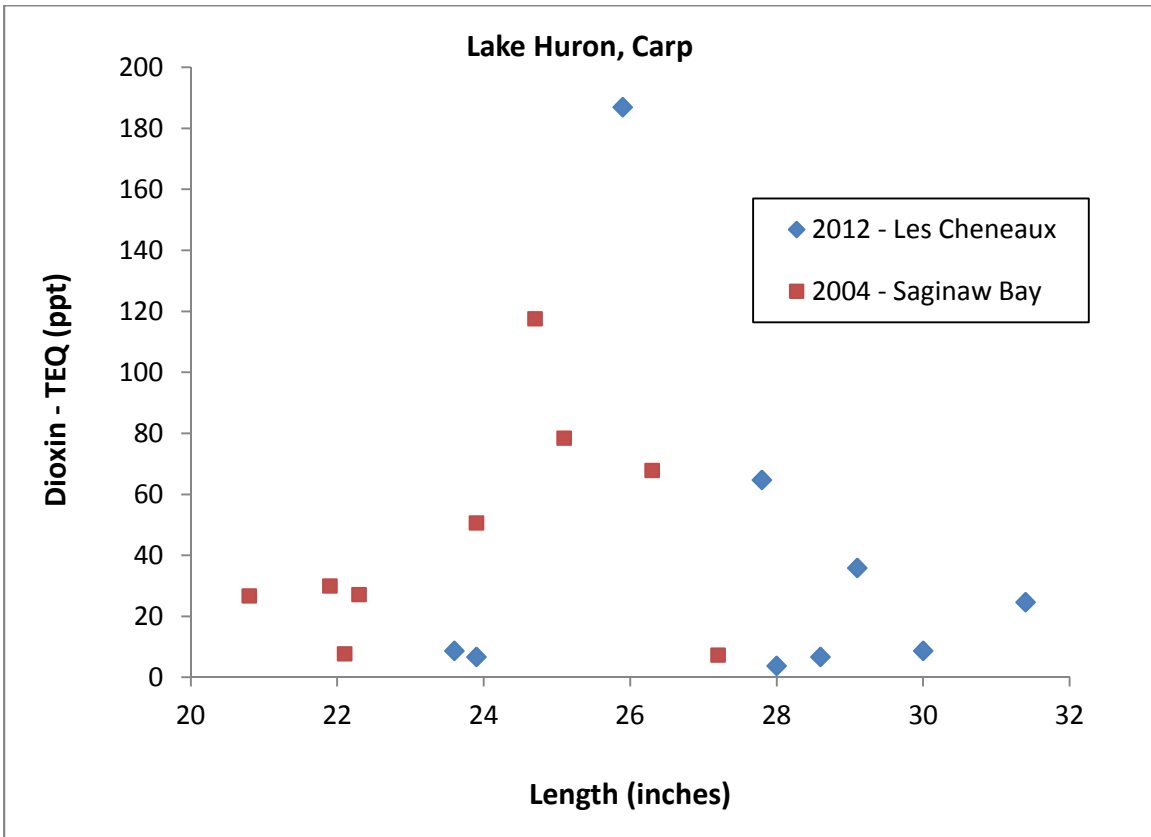
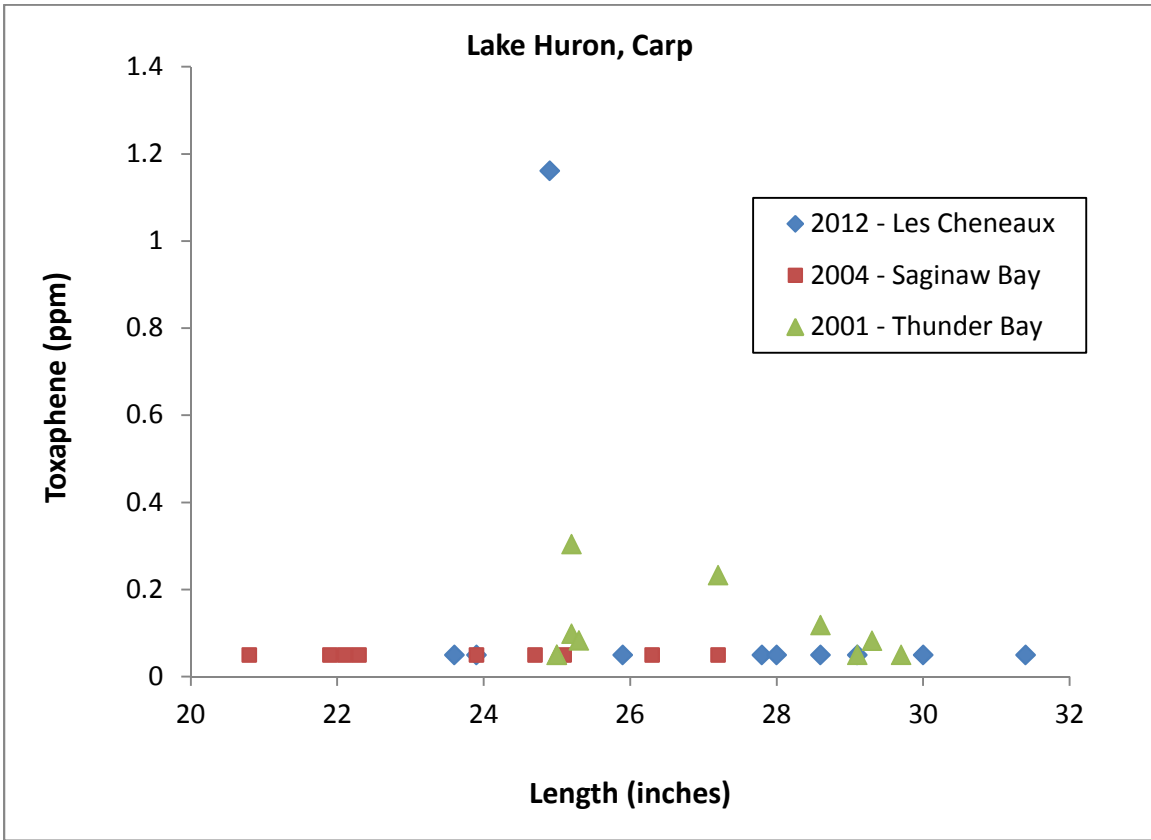
Existing MDCH Advisory: Sensitive populations should not eat these fish. Healthy adults should not eat more than 1 or 2 meals per year of Lake Huron carp due to PCBs and dioxin. Mercury and DDT would cause advisories.

Recommendation: No change.

Appendix D7. Eat Safe Fish guidance, 2015 update recommendations, Lake Huron







Largemouth & Smallmouth Bass
Hg Analysis:

Lake Huron Les Cheneaux

Mackinac

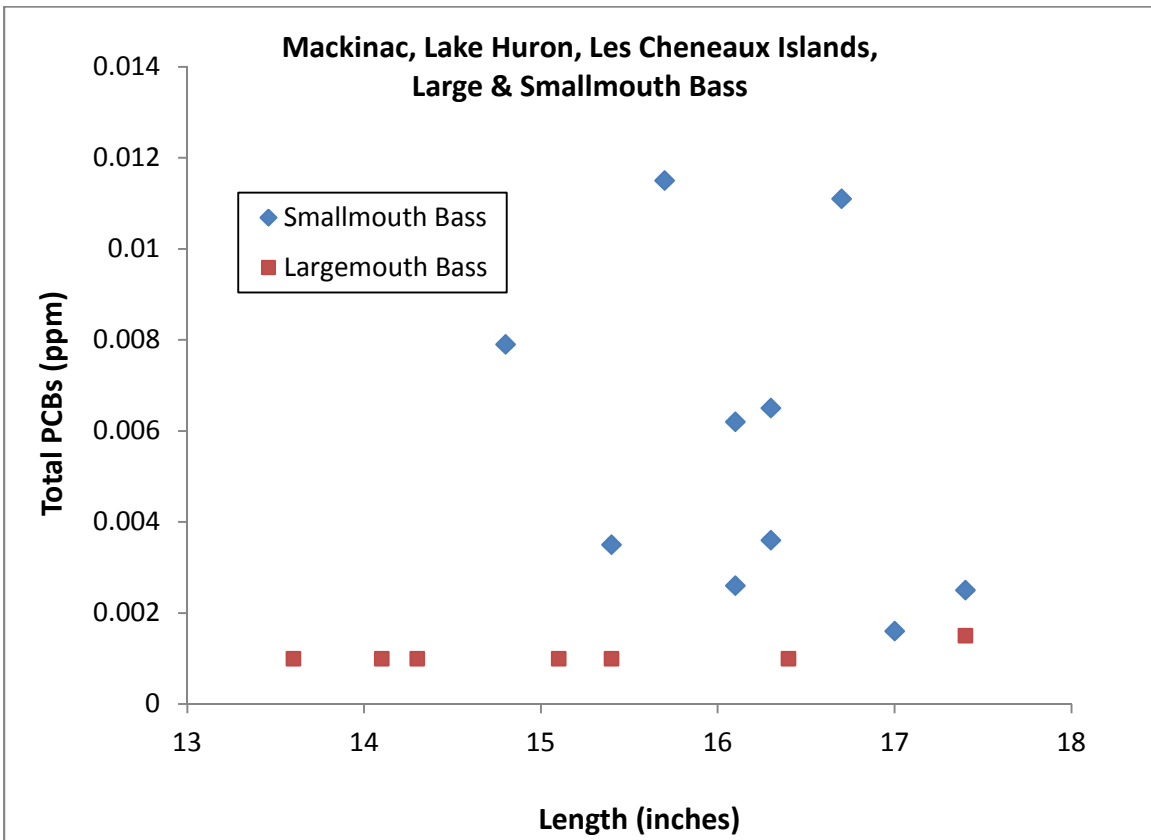
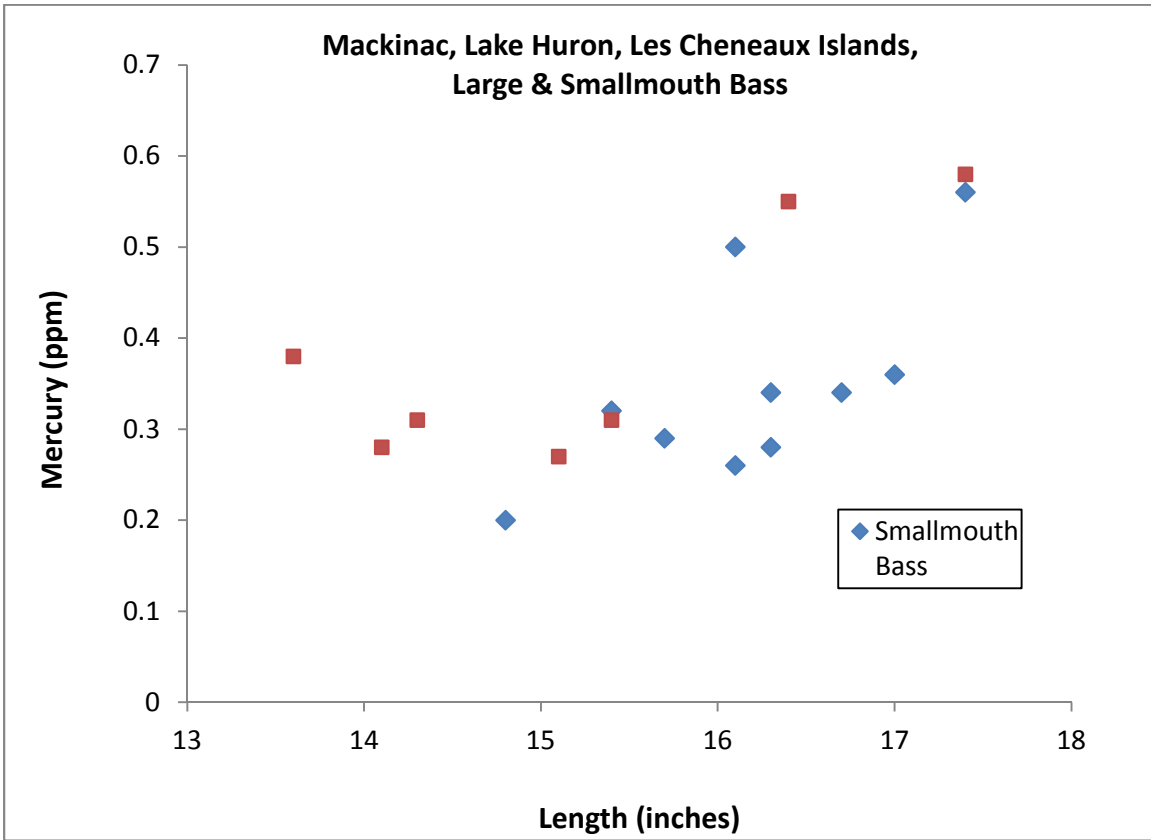
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	17	13.6	14	13.6	17.4
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	17	0.36	0.20	0.58	0.42	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.314	0.296				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	17	13.6	14	13.6	17.4
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	17	0.004	0.001	0.01	0.01	16
DDT	17	0.002	0.001	0.004	0.002	16
Chlordane	17	ND	--	--	--	--
Toxaphene	17	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.033	0.089				
DDT	0.038	0.033				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing MDCH Advisory: Specific guidelines for Lake Huron largemouth and smallmouth bass were not developed since data were not available previously.

Recommendation: The size range of fish in this sample set is limited. The statewide guidelines apply: No one should eat more than 2 meals per month of Lake Huron largemouth or smallmouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches.



Pumpkinseed

**Lake Huron
Les Cheneaux**

Mackinac

Hg Analysis:

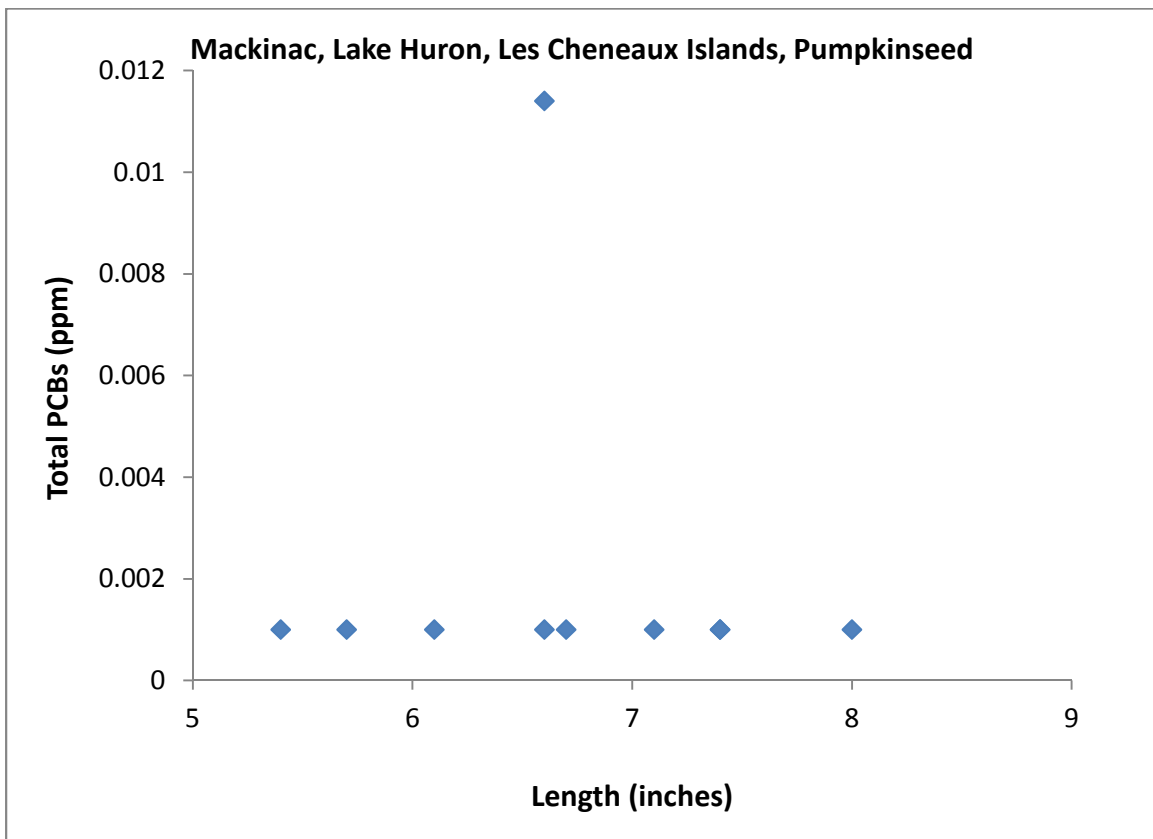
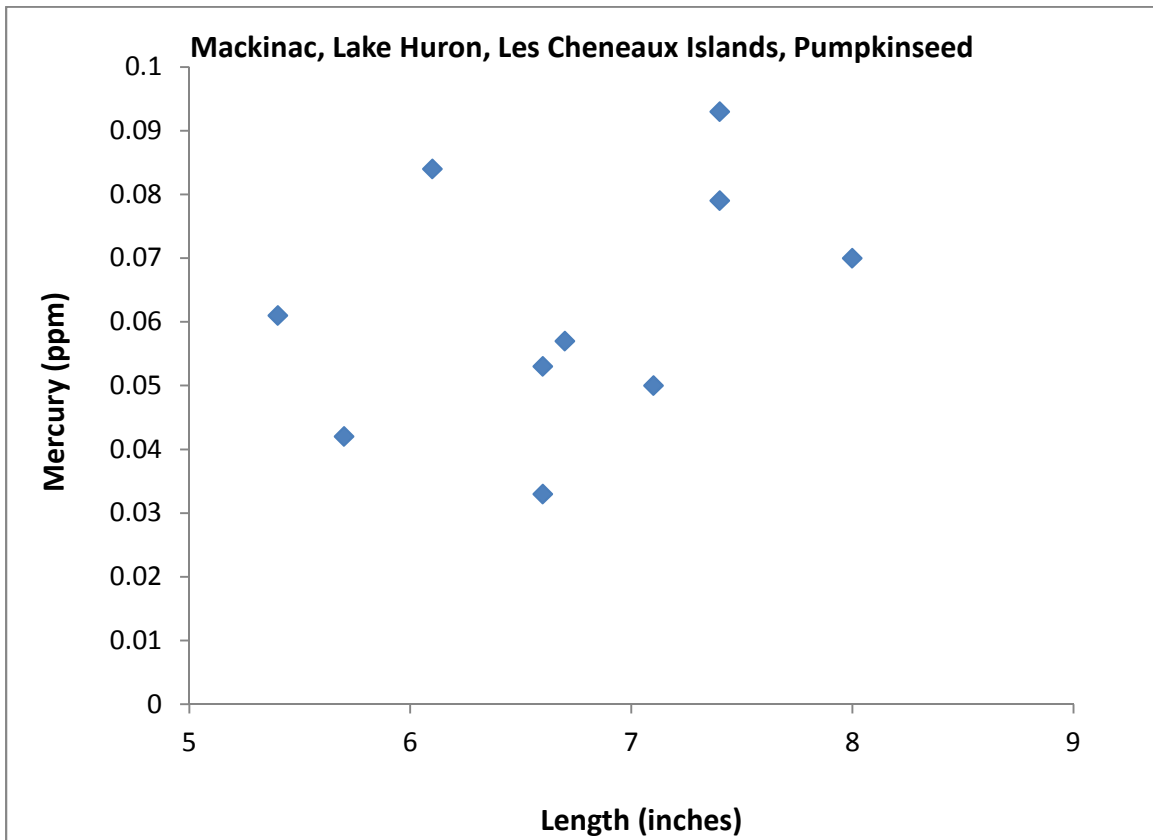
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	5.4	na	5.4	8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	10	0.06	0.03	0.09	0.08	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.135	0.125				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	5.4	na	5.4	8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	10	0.002	0.001	0.01	0.004	16
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.002	0.002				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						12

Existing MDCH Advisory: Specific guidelines for Lake Huron pumpkinseed were not developed since data were not available previously.

Recommendation: No one should eat more than 12 meals per month of pumpkinseed or bluegill from Lake Huron due to mercury.



Rock Bass

**Lake Huron
Les Cheneaux**

Mackinac

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	5.3	na	5.3	9.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	10	0.10	0.08	0.15	0.12	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.684	0.634				

Organics Analysis:

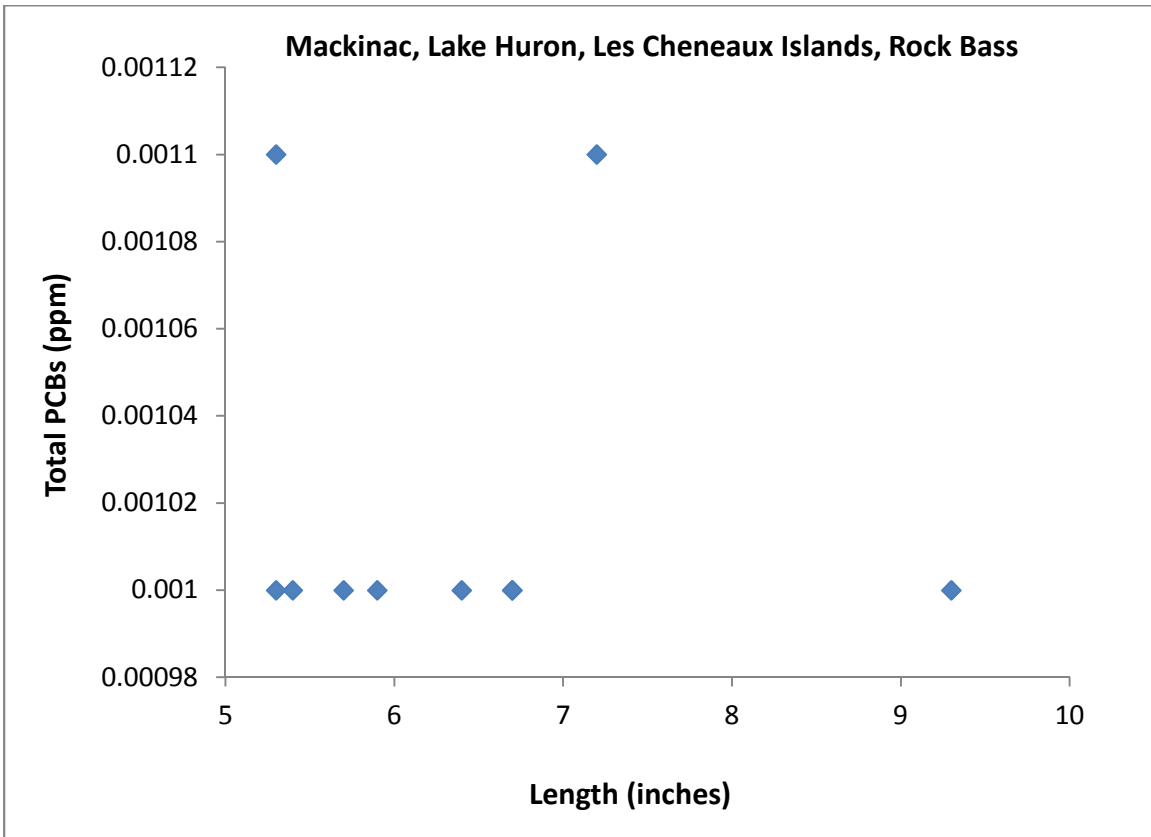
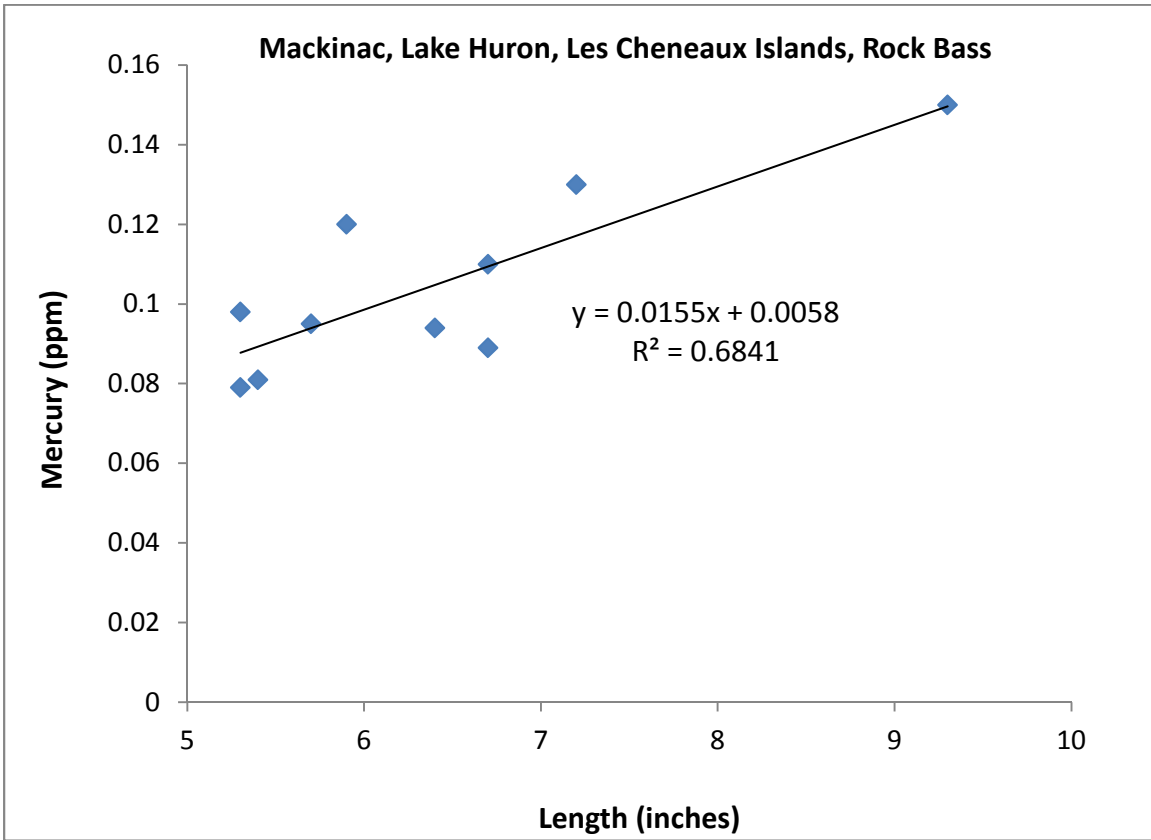
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	5.3	na	5.3	9.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	10	0.002	0.001	0.001	0.004	16
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.002	0.002				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						8

Existing MDCH Advisory: Specific guidelines for Lake Huron pumpkinseed were not developed since data were not available previously.

Recommendation: No one should eat more than 8 meals per month of rock bass from Lake Huron smaller than 8 inches or more than 4 meals per month of those fish larger than 8 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
5	0.08	12
6	0.1	8
7	0.11	8
8	0.13	8
9	0.15	4
10	0.16	4
11	0.18	4

Shaded area denotes extrapolated estimates



Yellow Perch

**Lake Huron
Saginaw Bay & Les Cheneaux**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
1991	2012	59	6.9	na	6.9	11.3		
Datasets available: 1987, 1991, 1993, 1995, 2004, 2012								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category	
Mercury	59	0.09		0.03	0.25	0.10	8	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.228	0.163						

Organics Analysis:

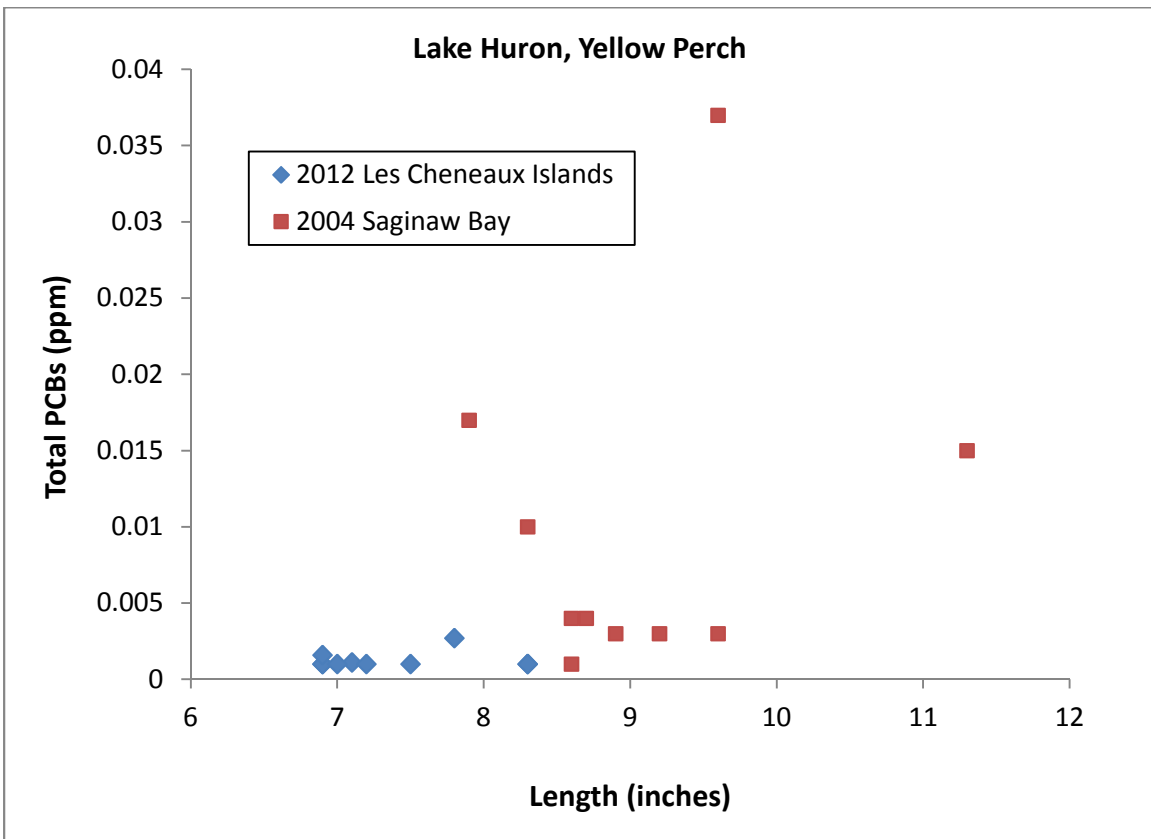
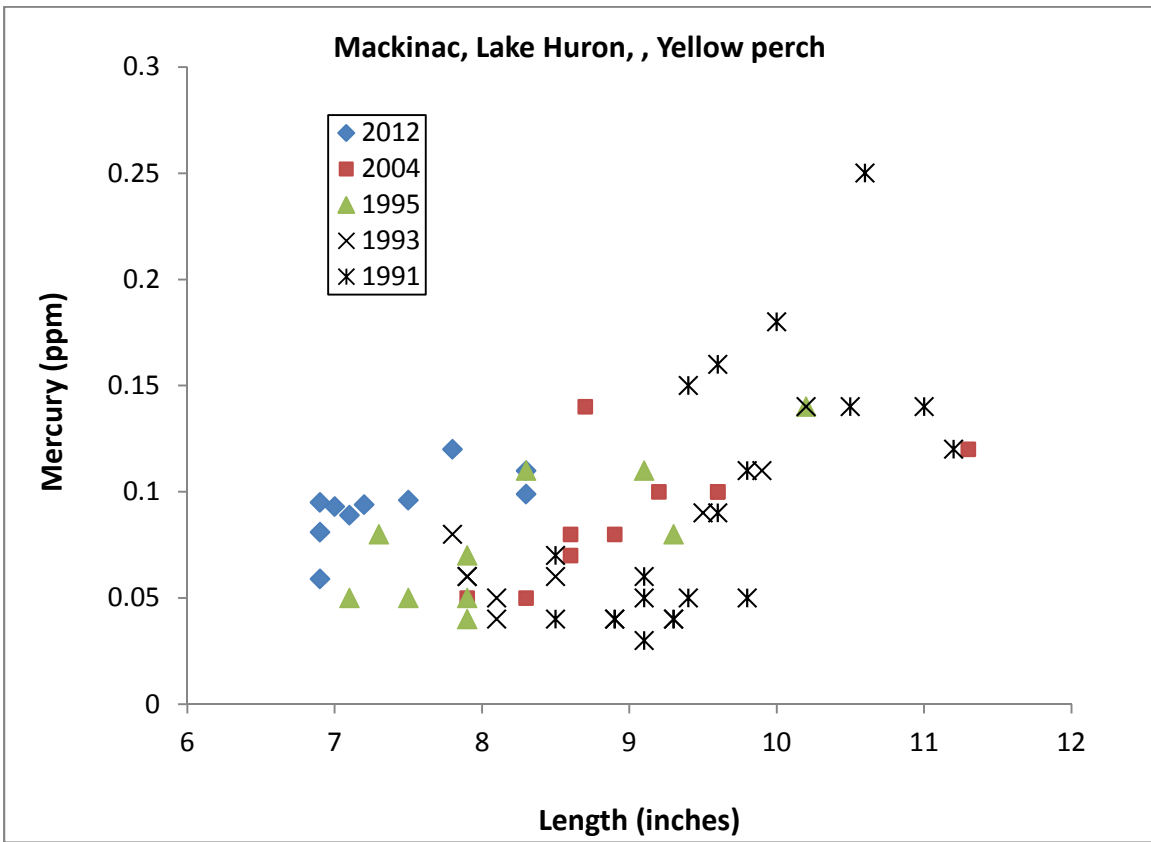
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
2004	2012	20	6.9	na	6.9	11.3		
Datasets available: 1987, 1991, 1993, 1995, 2004, 2012								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category	
PCB	20	0.005		0.001	0.04	0.01	16	
DDT	20	0.001		0.001	0.004	0.002	16	
Chlordane	20	ND		--	--	--	--	
Toxaphene	20	ND		--	--	--	--	
TEQ*	7	1.4 ppt		0.3 ppt	4.1 ppt	2.8 ppt	2	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	0.244	0.412						
DDT	0.015	0.022						
Chlordane	--	--						
Toxaphene	--	--						
TEQ*	0.305	0.283						
							Final meal category based on UCL: 2	

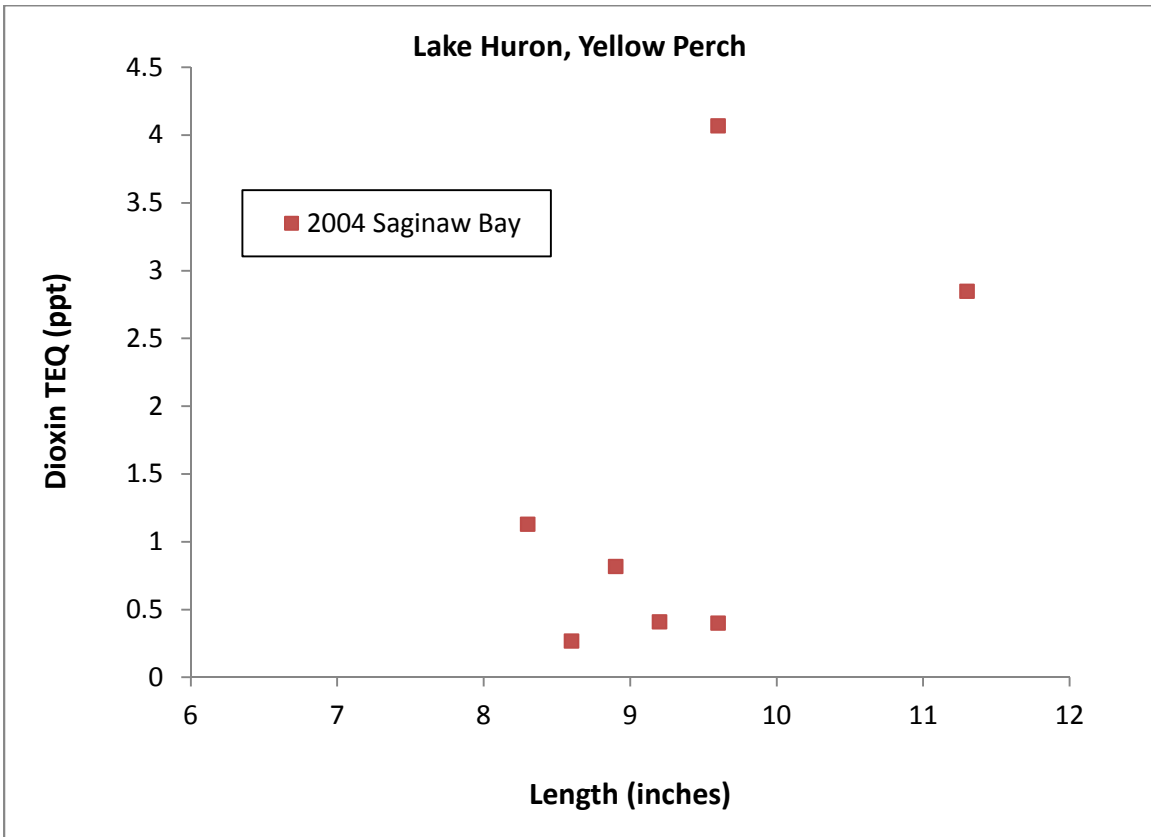
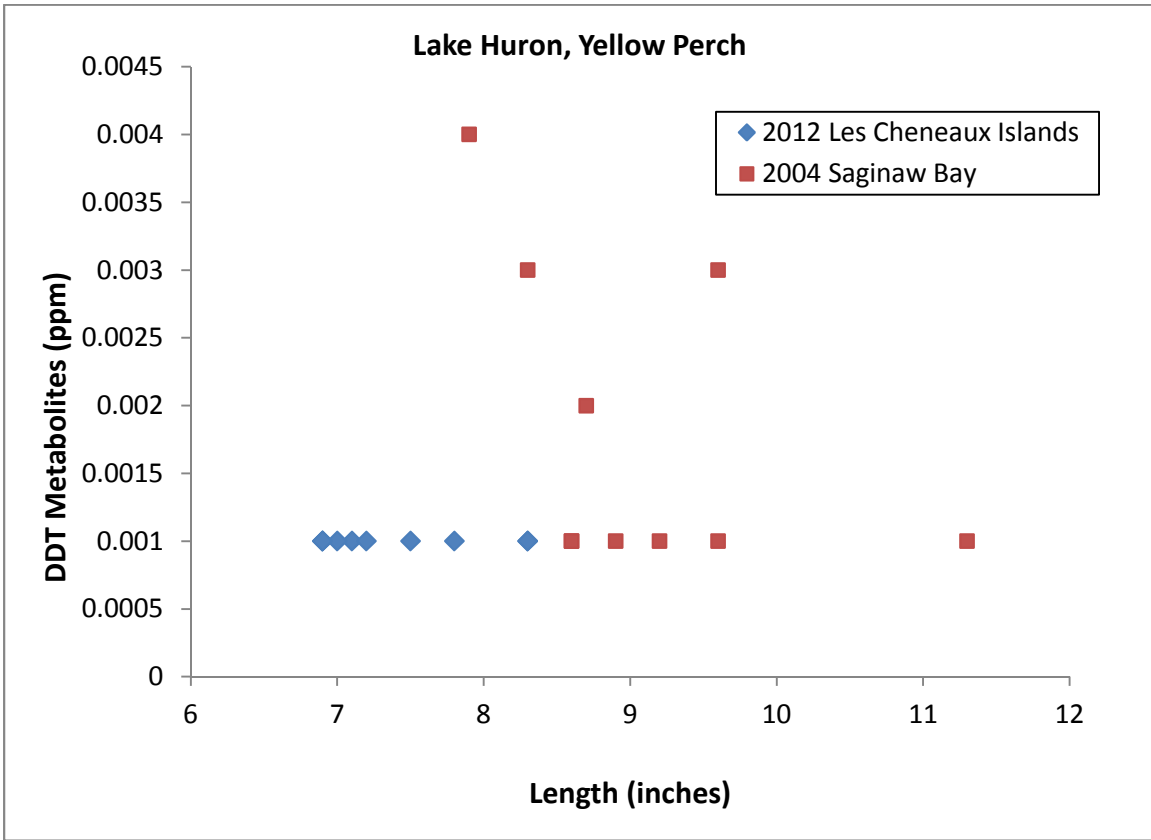
*- 2005 WHO; dl-PCBs included

Existing MDCH Advisory: No one should eat more than 2 meals per month of Lake Huron yellow perch due to dioxins. PCBs and mercury would cause advisories.

Recommendation: No change in advice; PCBs could be removed from list.

Note: Consideration should be given to having separate advice for northern Lake Huron, but updated TEQ data (temporally & spatially) are needed to justify a distinction.





Rainbow Trout

Lake Huron

Hg Analysis:

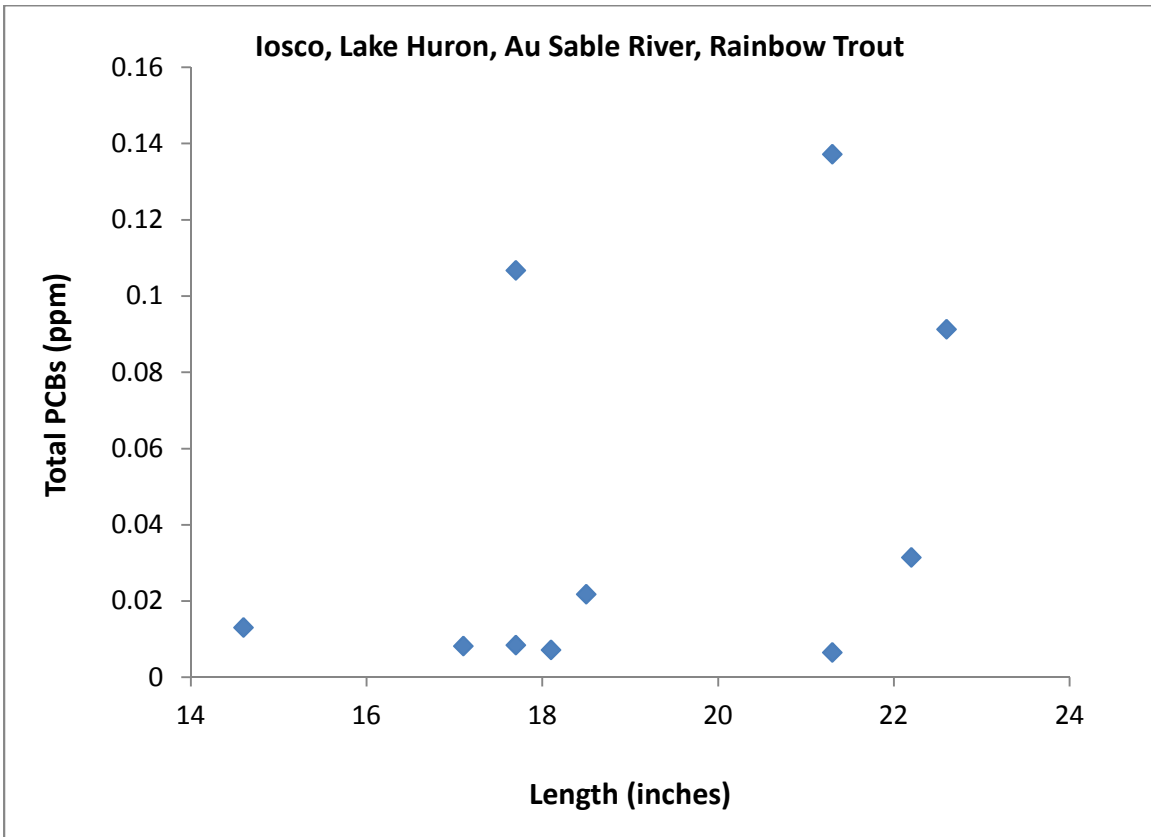
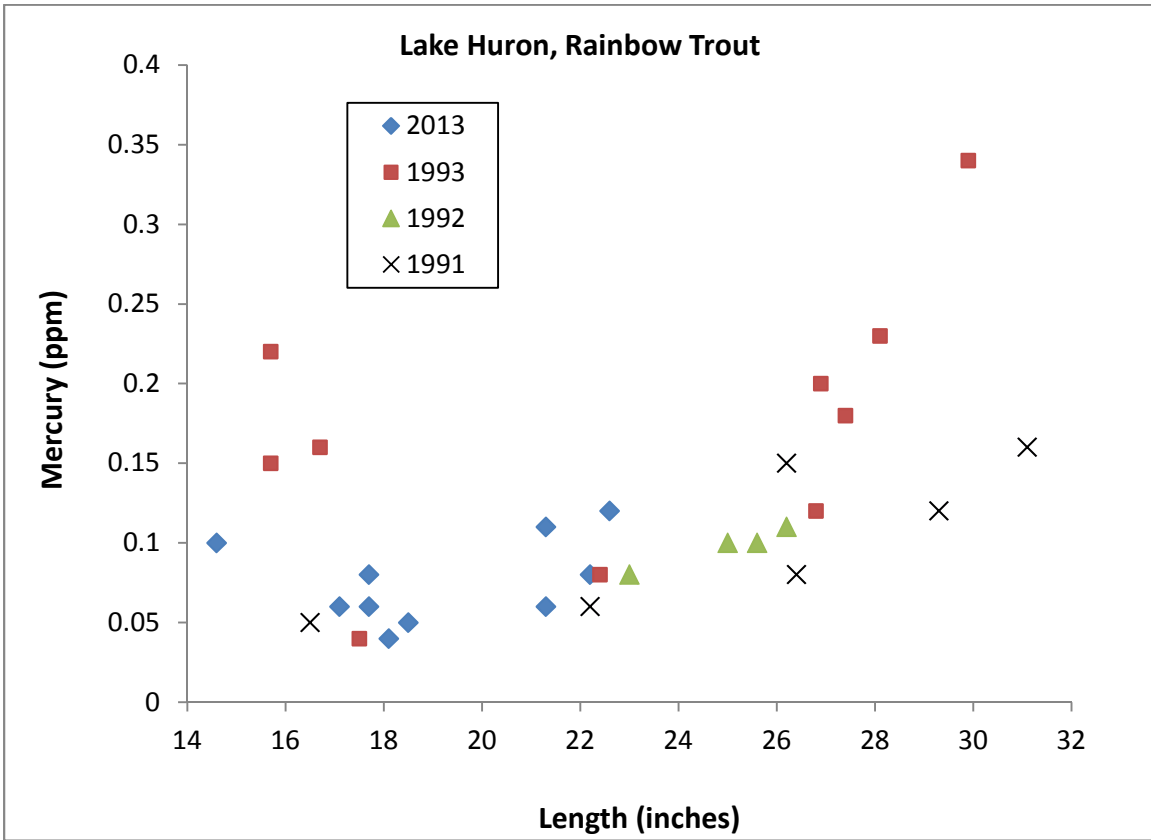
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	2013	30	14.6	10	14.6	31.1
Datasets available: 1991, 1992, 1993, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	30	0.12	0.04	0.34	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.215	0.253				

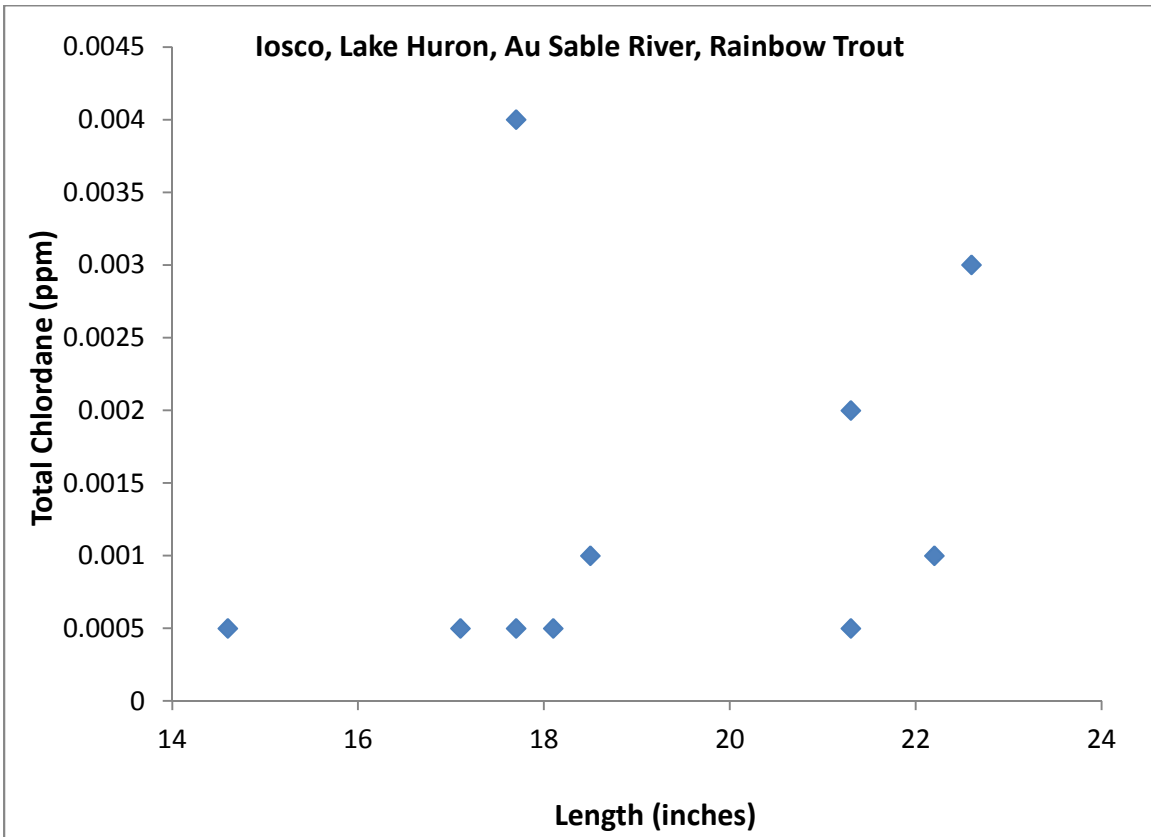
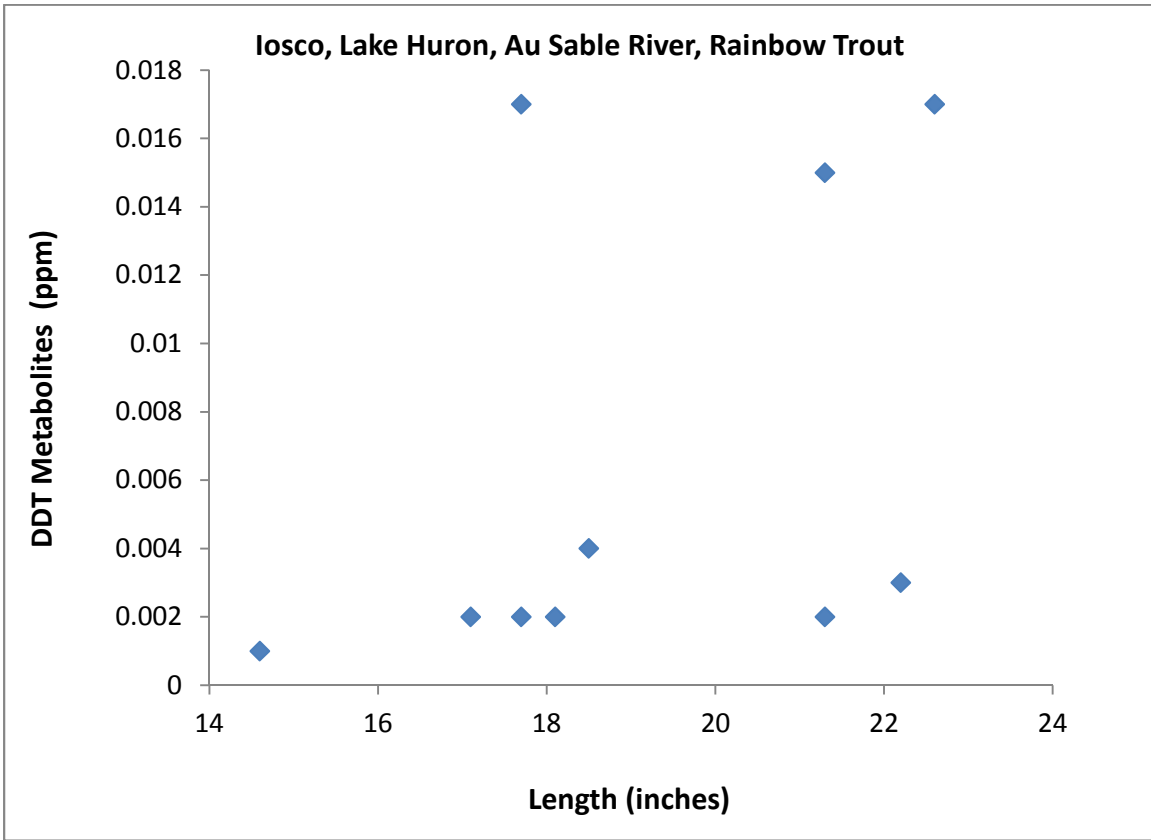
Organics Analysis:

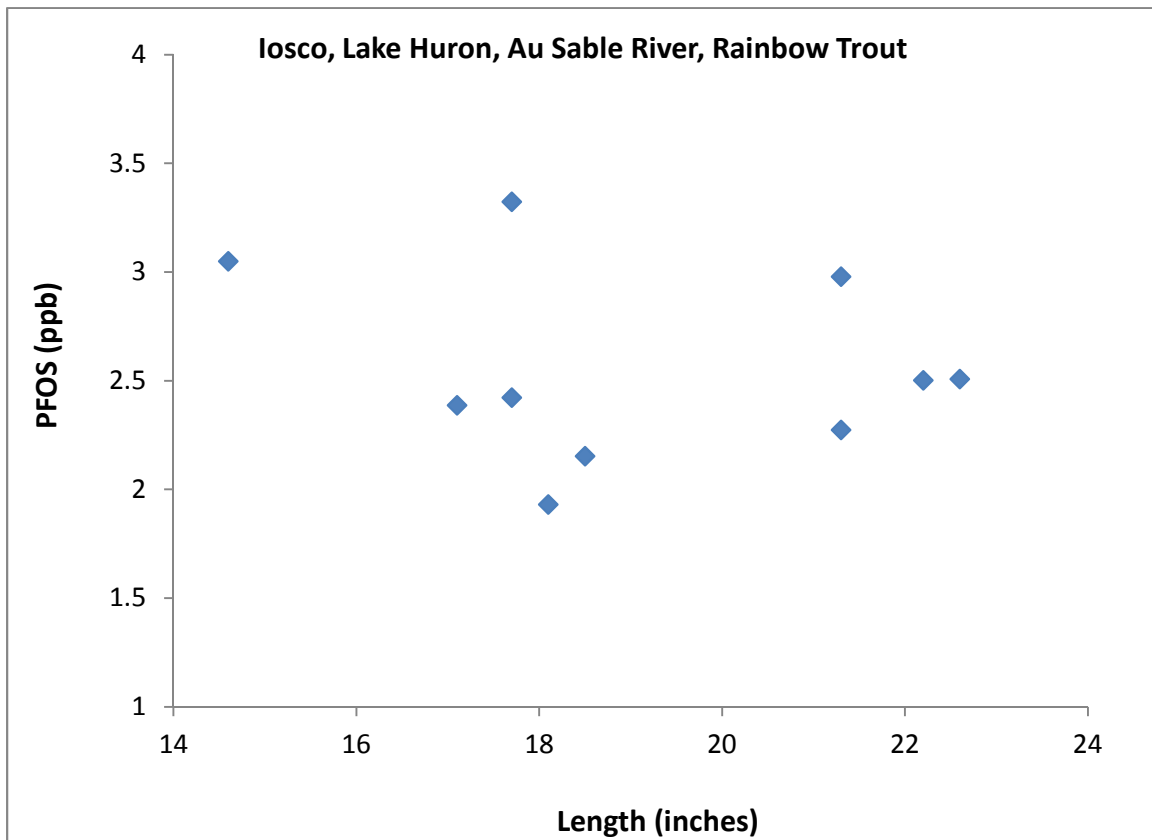
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	10	14.6	10	14.6	22.6
Datasets available: 1991, 1993, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	10	0.04	0.01	0.14	0.08	2
DDT	10	0.01	0.001	0.02	0.01	16
Chlordane	10	0.001	0.001	0.004	0.002	--
Toxaphene	10	ND	--	--	--	--
PFOS	10	14 ppb	7 ppb	28 ppb	19 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.168	0.183				
DDT	0.169	0.273				
Chlordane	0.081	0.178				
Toxaphene	--	--				
PFOS	0.065	0.036				
Final meal category based on UCL:						2

Existing MDCH Advisory: No one should eat more than 6 meals per year of Lake Huron rainbow trout (aka steelhead) due to PCBs.

Recommendation: No change is recommended. Additional sampling is needed to verify the apparently significant reduction in PCB concentrations (previous 95% UCL based on 1991/1993 results was 0.62 ppm).







Appendix D7. Eat Safe Fish guidance, 2015 update recommendations, Lake Huron

Walleye

Lake Huron

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
1986	2013	168	13	15	14.6	28	
Datasets available: 1986, '87, '88, '89, '91, '92, '93, '94, '98, '99, 2004, 2005, 2008, 2013							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category	
Mercury	162	0.19	0.03	0.70	0.21	4	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.570	0.593					

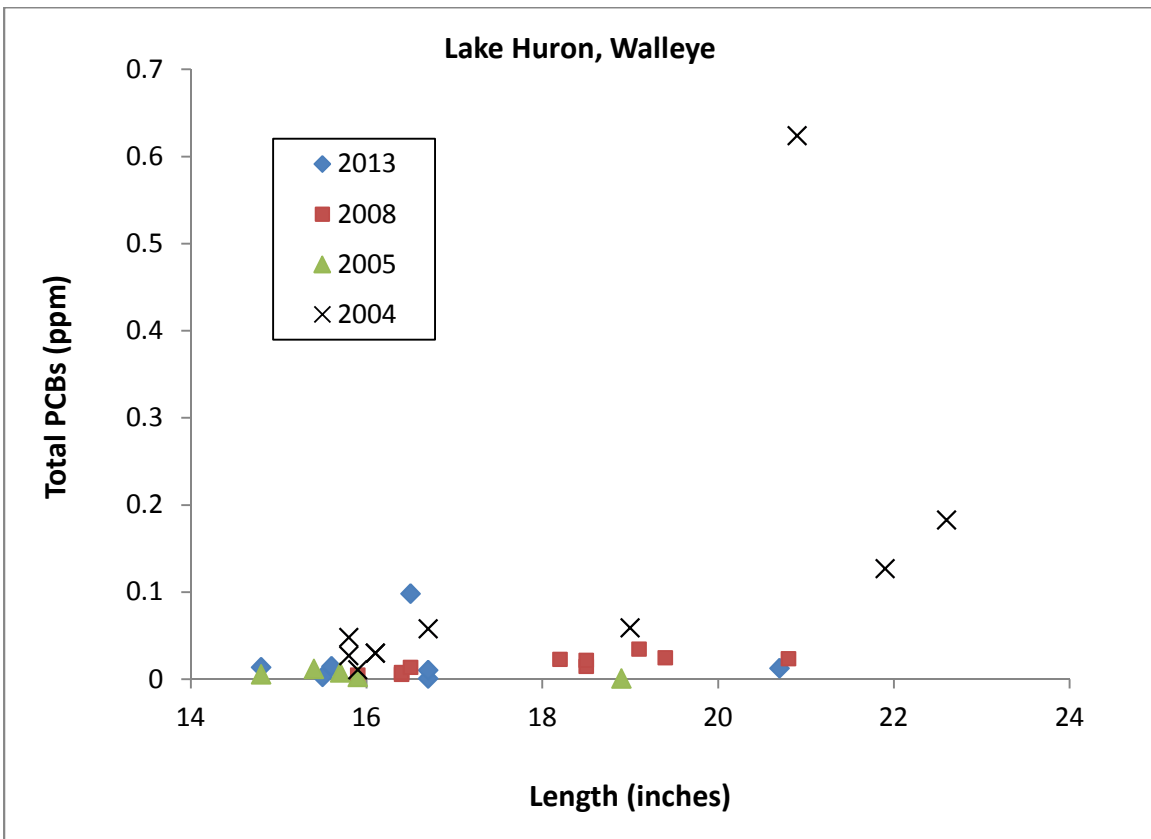
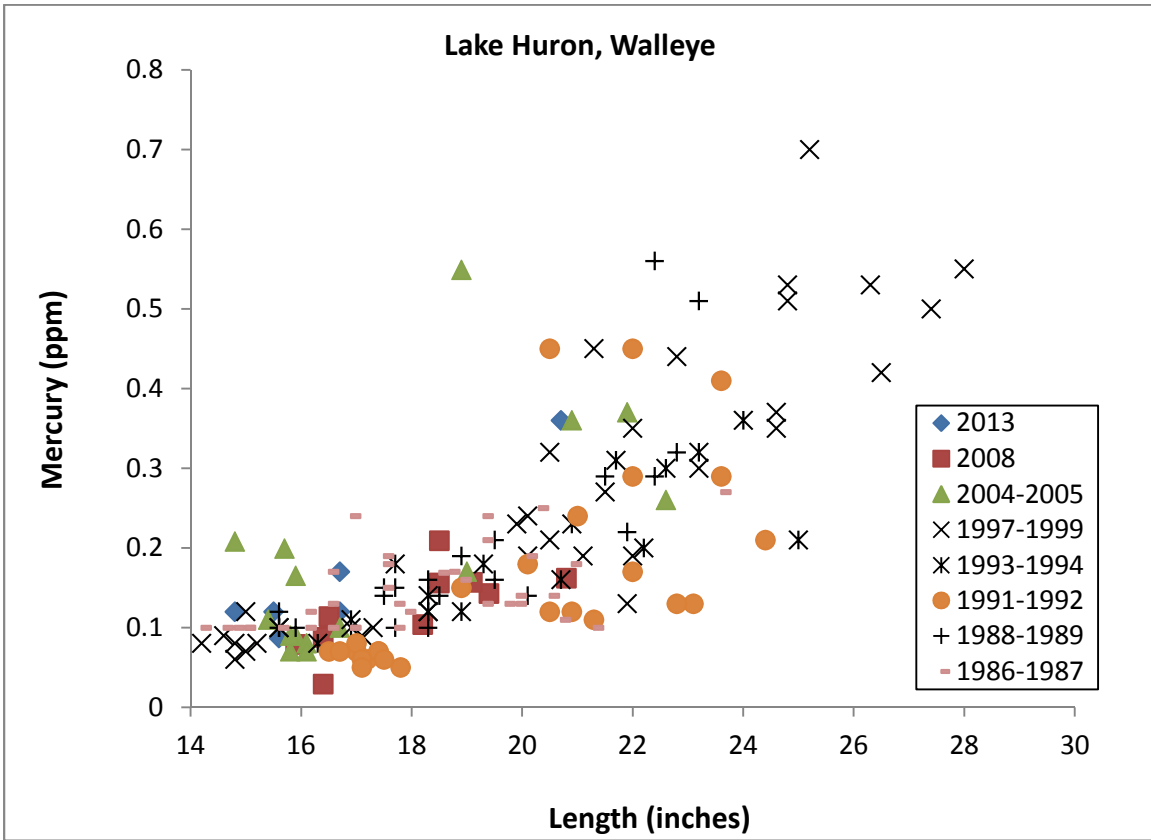
Organics Analysis:

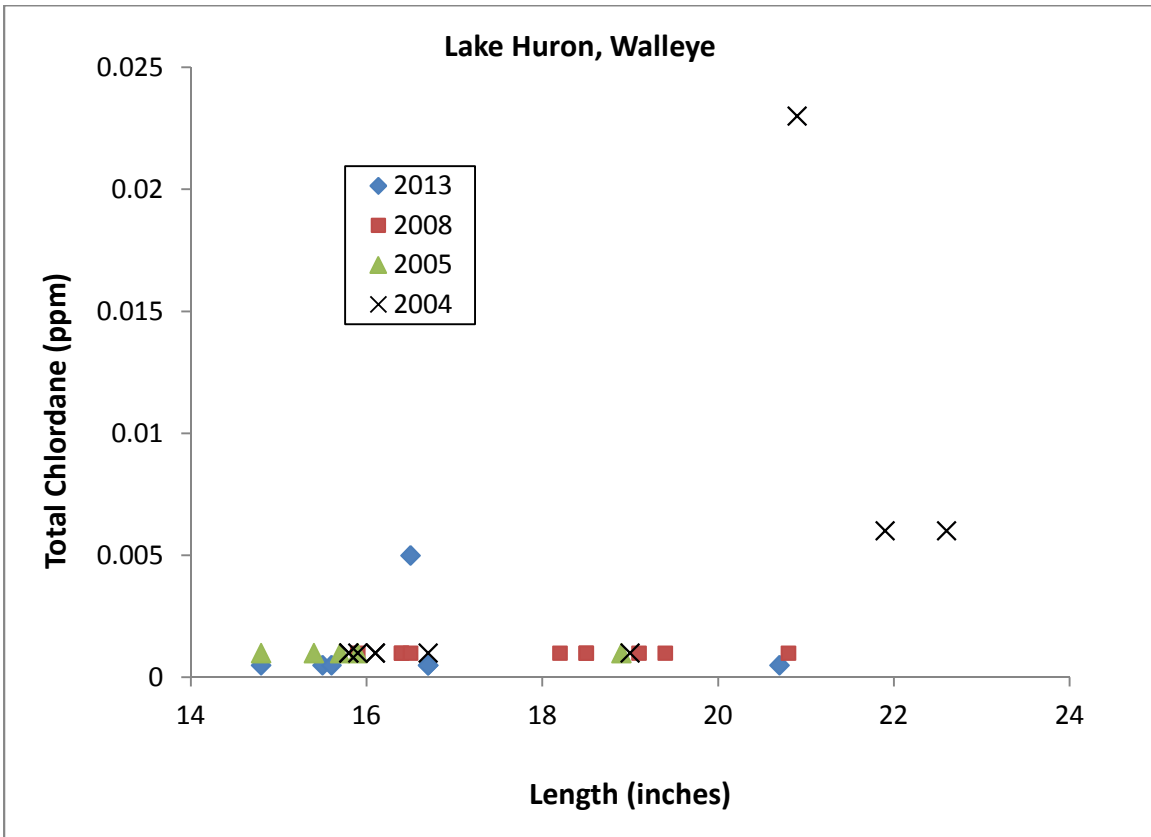
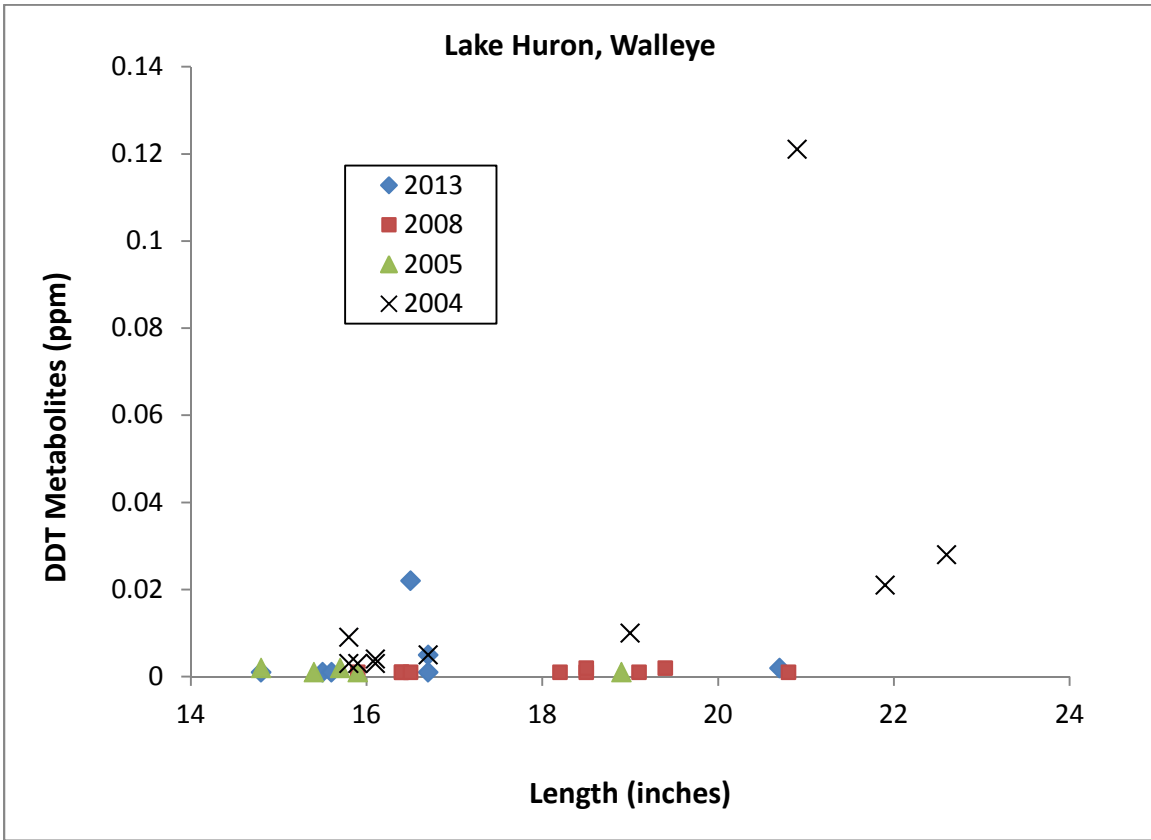
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2004	2014†	32	14.8	15	14.8	22.6	
Datasets available: 1983, '84, '86, '87, '88, '89, '91, '92, '93, '94, '98, '99, 2004, 2005, 2008, 2013, 2014							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category	
PCB	32	0.05	0.001	0.62	0.09	2	
DDT	32	0.01	0.001	0.12	0.02	16	
Chlordane	32	0.002	0.0005	0.02	0.004	--	
Toxaphene	32	ND	--	--	--	--	
PFOS	7	18.7 ppb	9.7 ppb	30.2 ppb	25.2 ppb	4	
TEQ*	20	6.0 ppt	1.4 ppt	39 ppt	10 ppt	0.5	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.223	0.251					
DDT	0.177	0.198					
Chlordane	0.203	0.291					
Toxaphene	--	--					
PFOS	0.260	0.230					
TEQ*	0.276	0.577					
						Final meal category based on UCL:	0.5

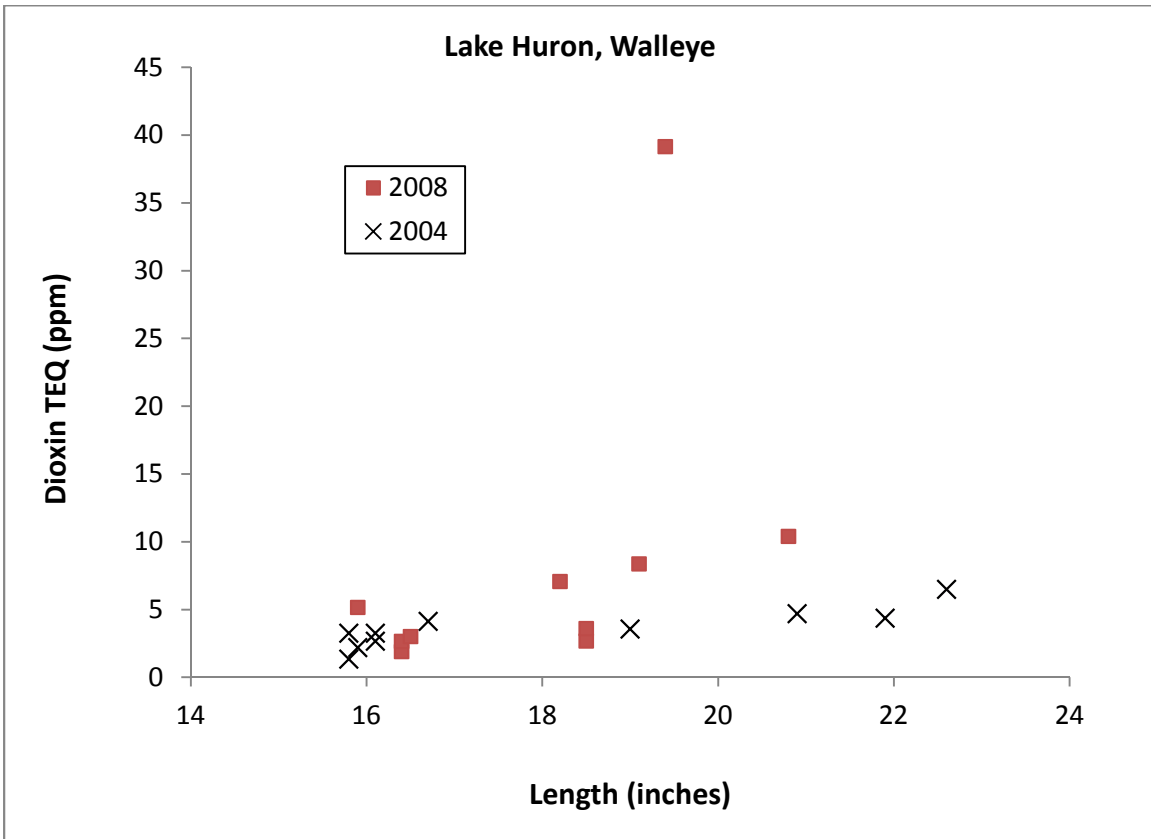
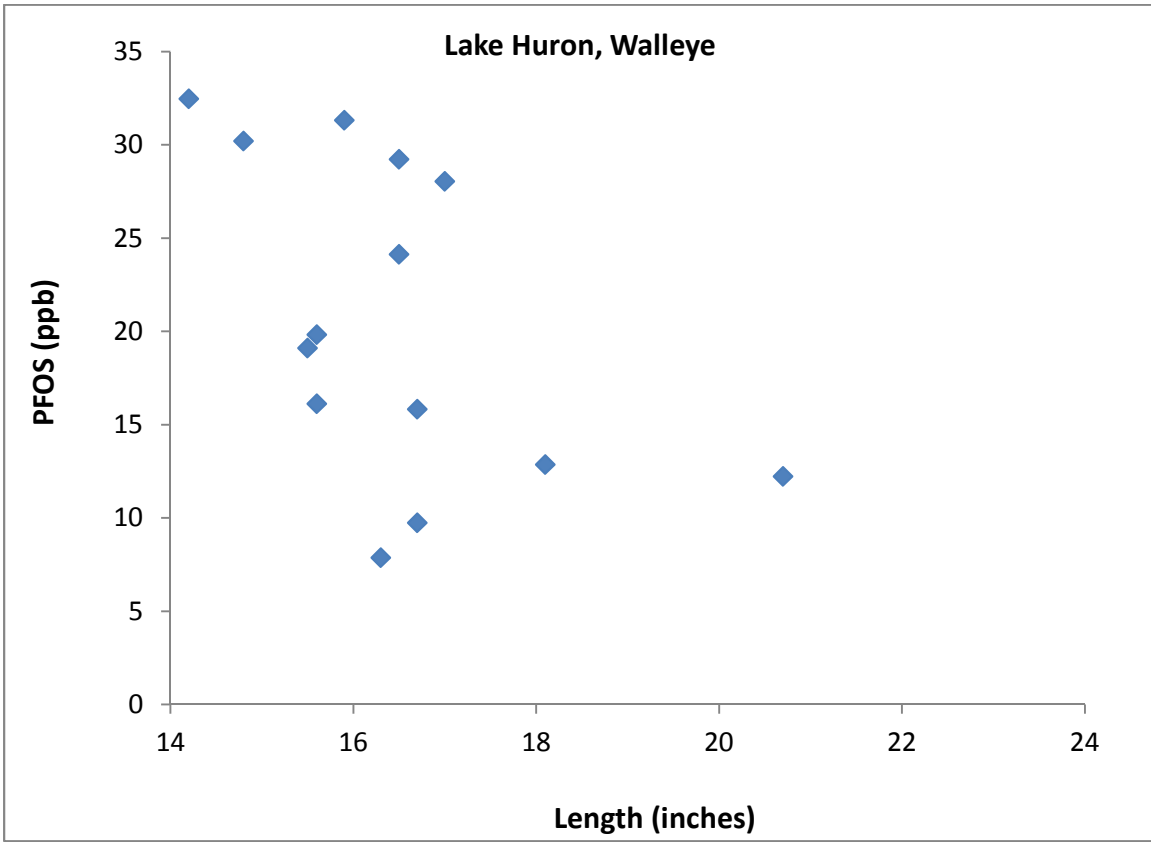
*- 2005 WHO; dl-PCBs included

Existing MDCH Advisory: No one should eat more than 6 meals per year of Lake Huron walleye due to dioxins. PCBs and mercury would cause advisories.

Recommendation: No change. Dioxin TEQ was most recently measured in fillets of walleye from Saginaw Bay in 2008; repeat sampling is recommended.







Appendix D8. Eat Safe Fish guidance, 2015 update recommendations, St. Clair River

Carp

St. Clair River

St. Clair County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1986	2012	38	16.1	na	16.1	32.1
Datasets available: 1986, 1994, 2006, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	38	0.22	0.06	0.58	0.25	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.103	0.150				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2012	18	16.1	na	16.1	32.1
Datasets available: 1986, 1994, 2006, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	18	0.234	0.001	1.54	0.45	Limited
DDT	18	0.086	0.001	0.90	0.19	8
Chlordane	18	0.008	0.001	0.07	0.02	--
Toxaphene	18	ND	--	--	--	--
TEQ*	10	10.4 ppt	0.7 ppt	45.4 ppt	21.5 ppt	Limited
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.003	0.197				
DDT	0.004	0.087				
Chlordane	0.006	0.073				
Toxaphene	--	--				
TEQ*	0.000	0.107	Final meal category based on UCL: Limited			

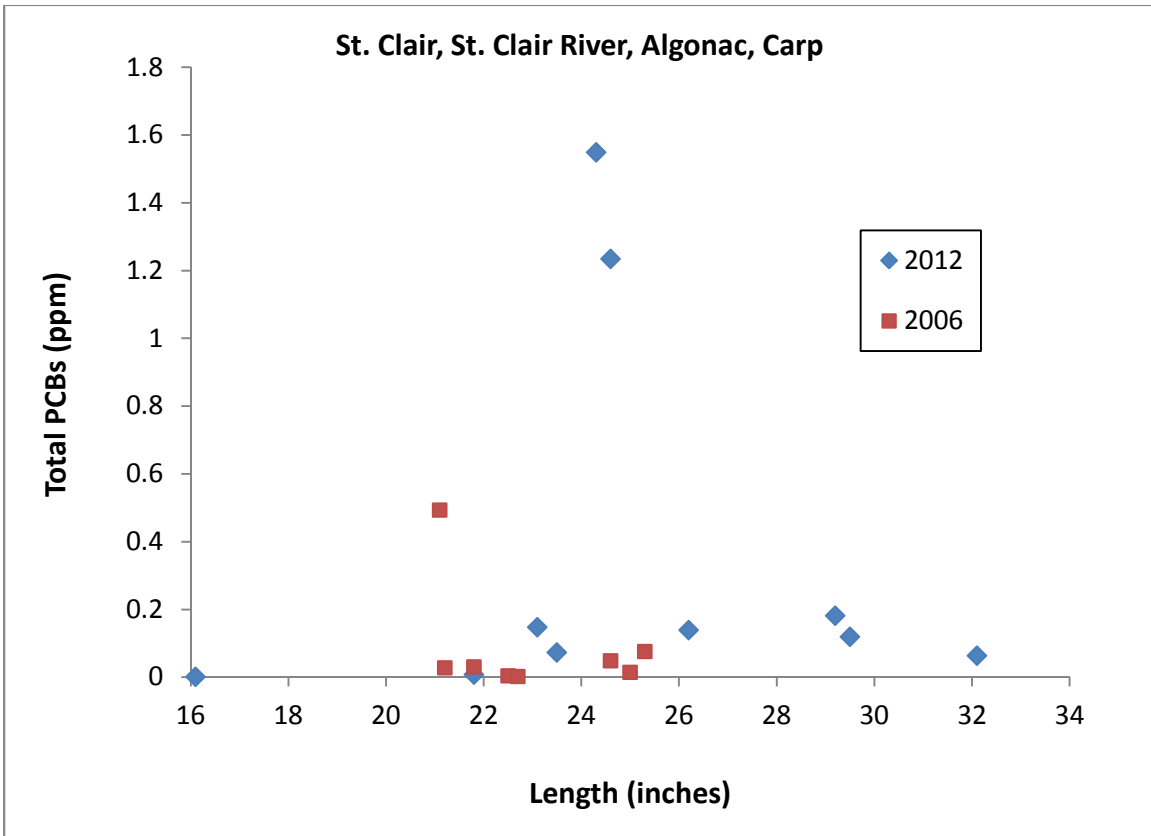
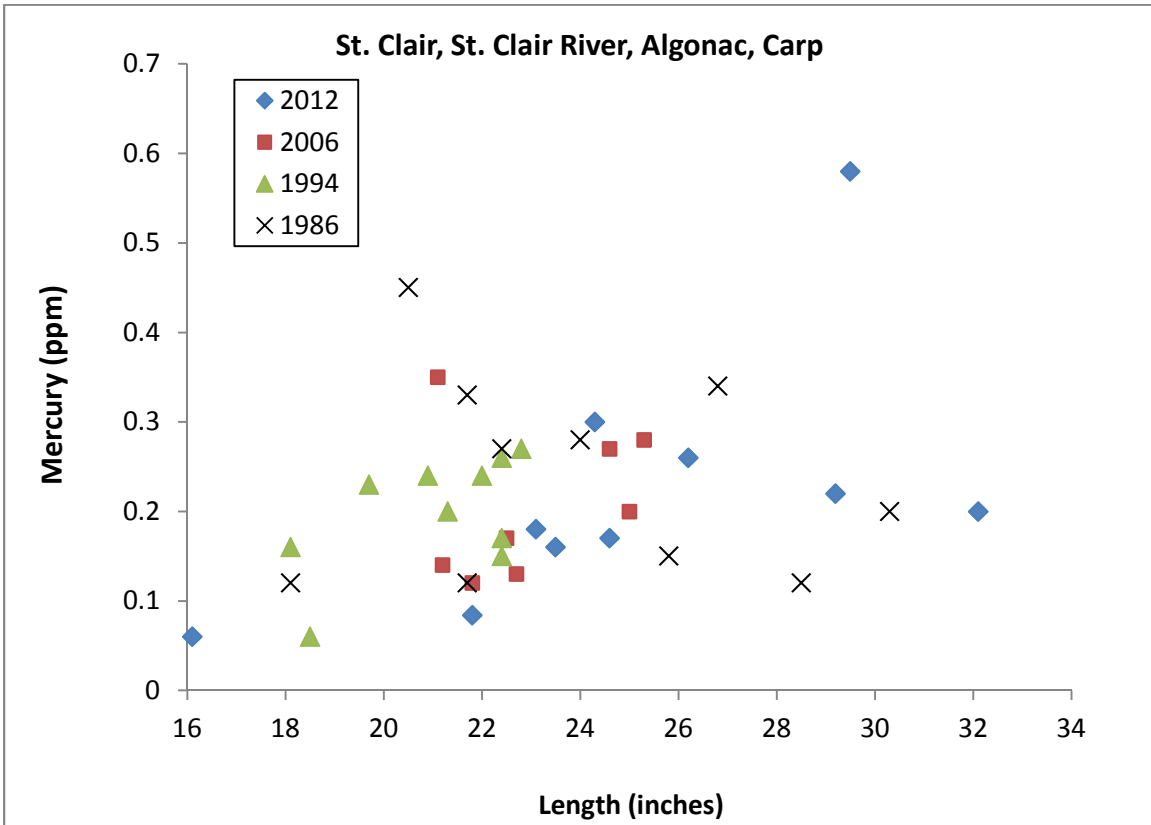
* - WHO 2005 TEFs; dl-PCBs included

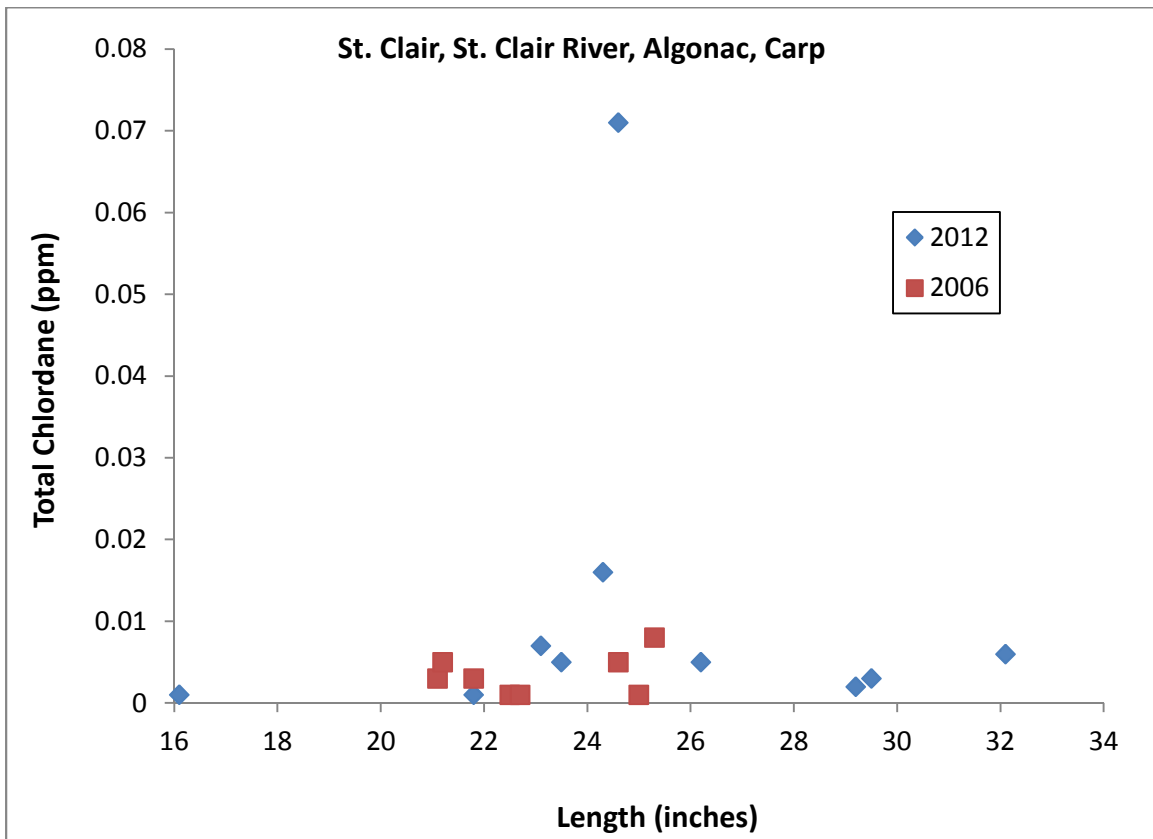
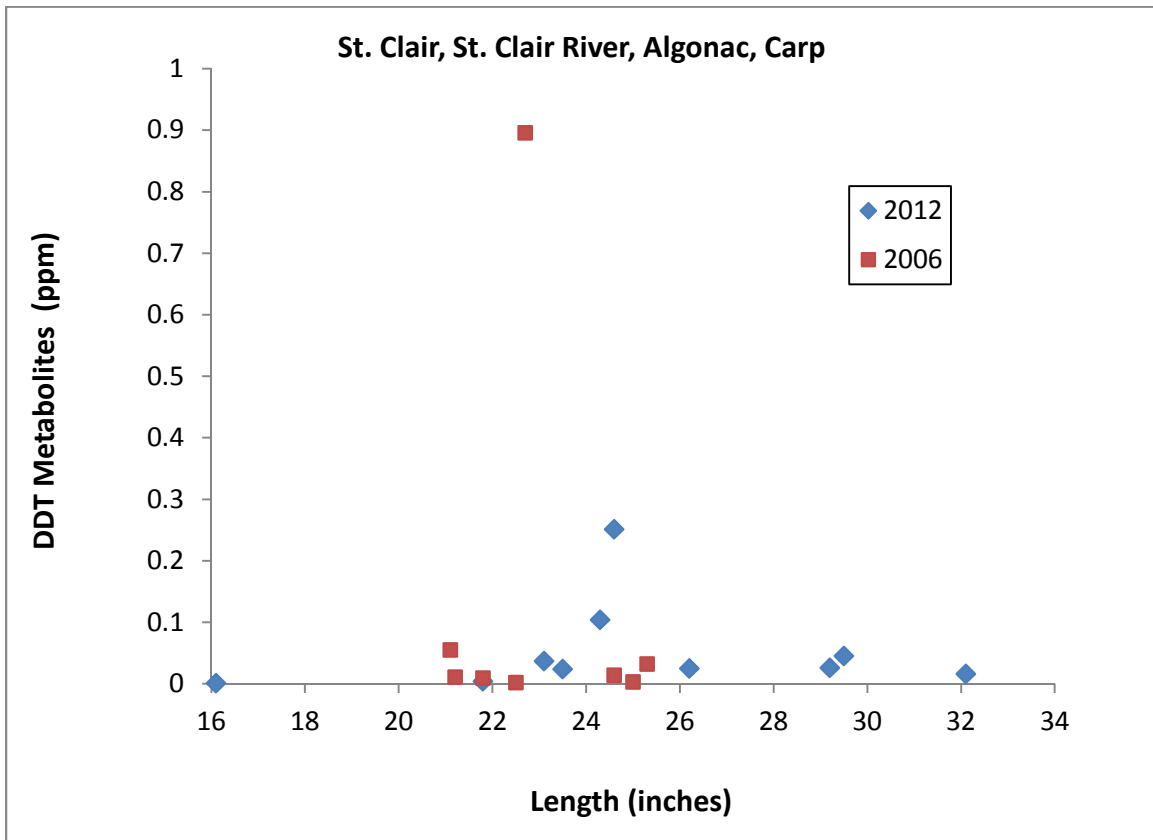
Existing MDCH Advisory: No one should eat more than 6 meals per year of St. Clair River carp due to PCB. DDT and mercury would cause advisories.

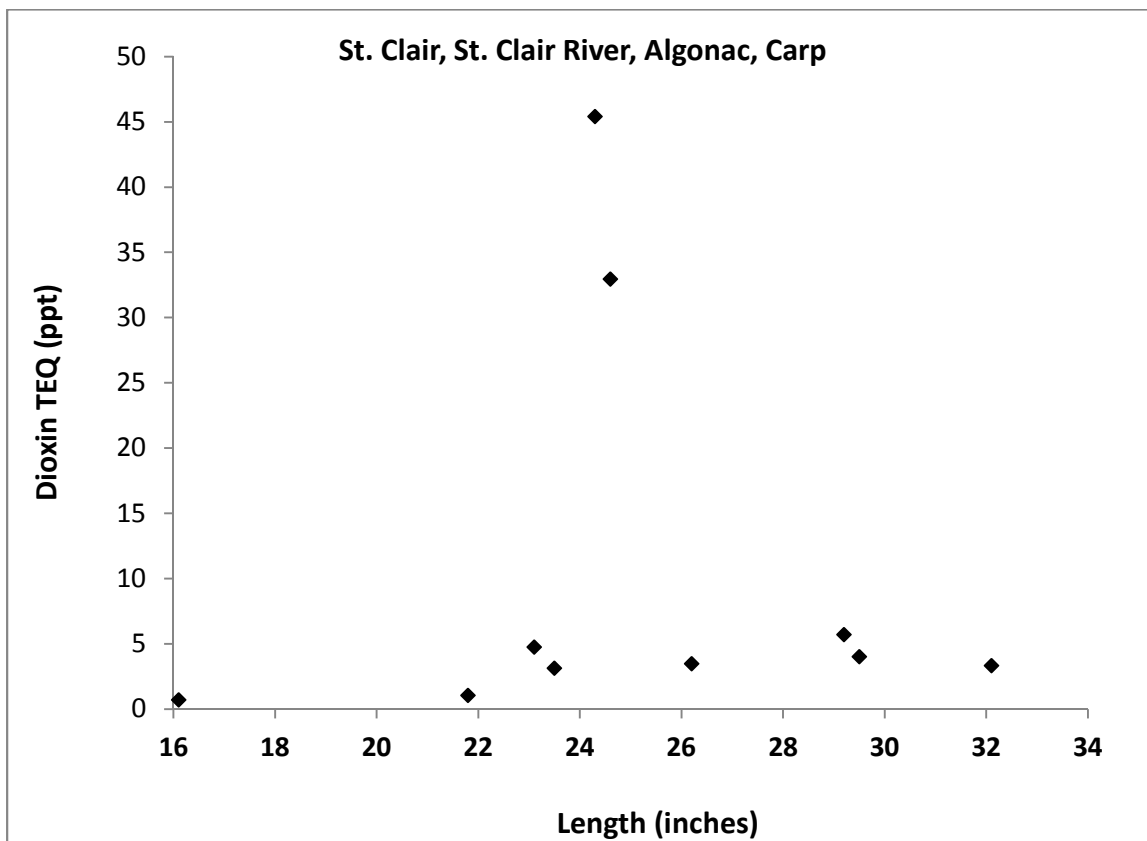
Recommendation: Sensitive populations should not eat these fish. For healthy adults, limit consumption to no more than 1 or 2 meals per year of St. Clair River carp due to PCBs and dioxin. Mercury and DDT would cause an advisory.

Note: more restrictive than previous advice due to 2 elevated PCB results in 2012

Appendix D8. Eat Safe Fish guidance, 2015 update recommendations, St. Clair River







Appendix D8. Eat Safe Fish guidance, 2015 update recommendations, St. Clair River

Rock Bass

St. Clair River

St. Clair County

Hg Analysis:

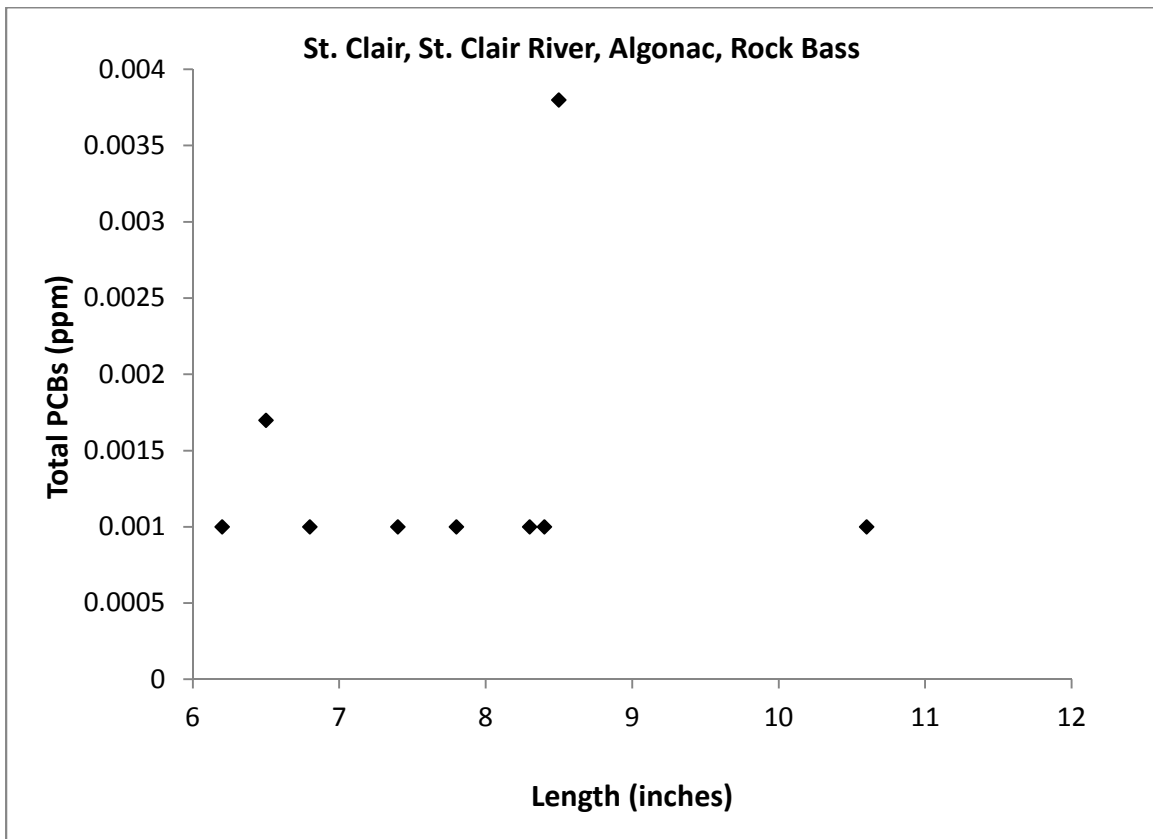
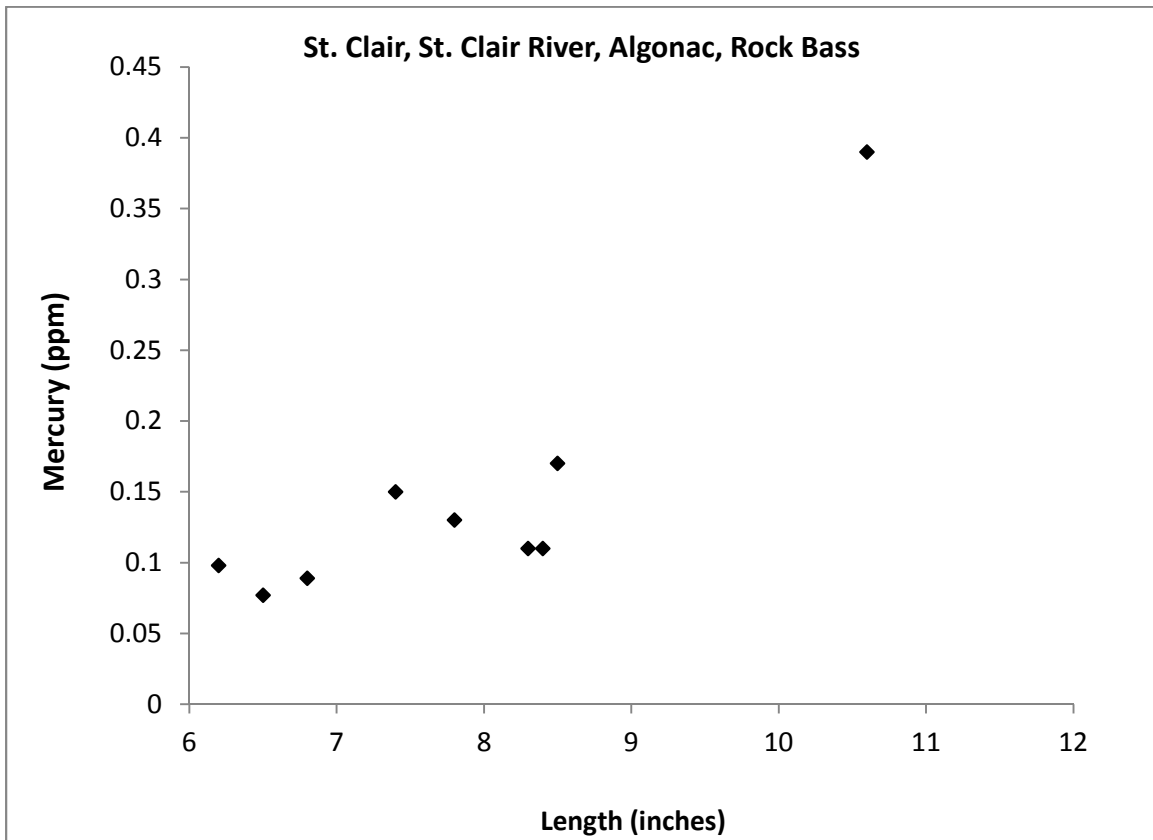
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	5.9	na	5.9	10.6
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.15	0.08	0.39	0.22	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.491	0.427				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	9	6.2	na	6.2	10.6
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.001	0.001	0.004	0.002	16
DDT	9	ND	--	--	--	--
Chlordane	9	ND	--	--	--	--
Toxaphene	9	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.009	0.001				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing MDCH Advisory: Specific guidelines for St. Clair River rock bass were not developed since data were not available previously.

Recommendation: No one should eat more than 4 meals per month of St. Clair River rock bass due to mercury.



Appendix D8. Eat Safe Fish guidance, 2015 update recommendations, St. Clair River

Smallmouth Bass

St. Clair River

St. Clair County

Hg Analysis:

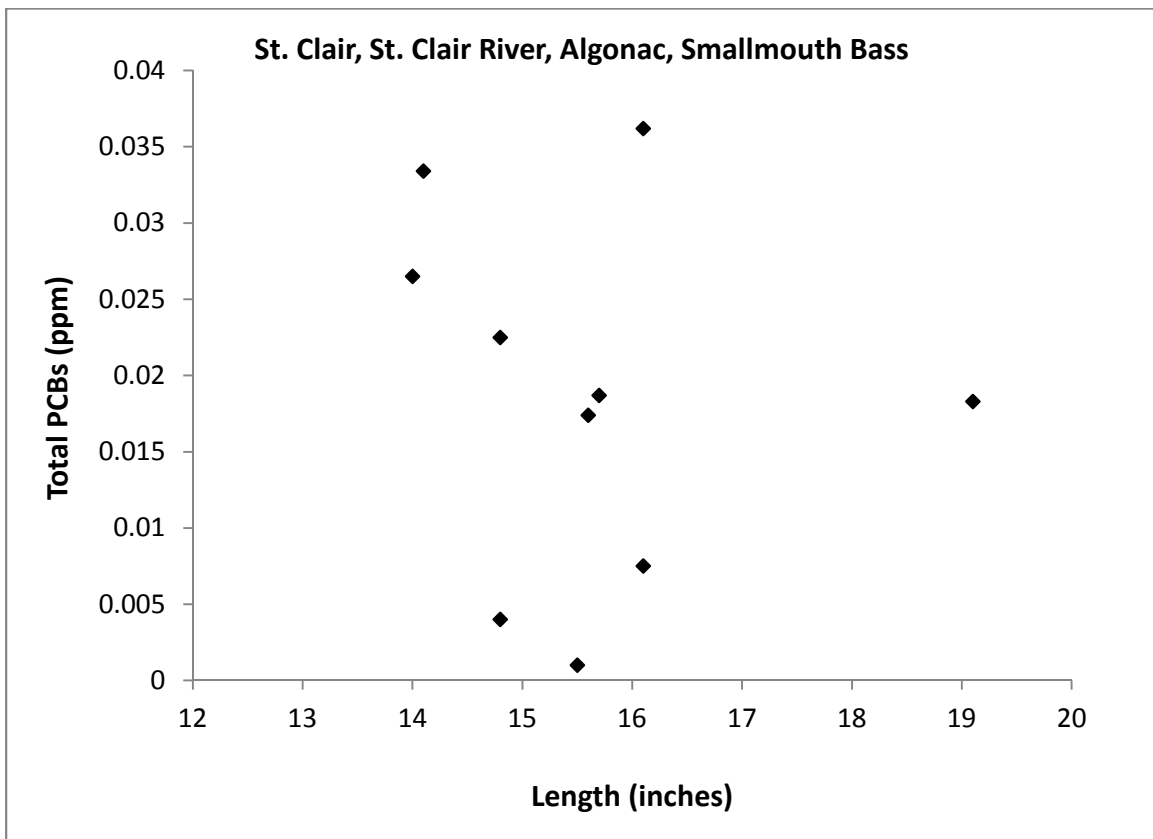
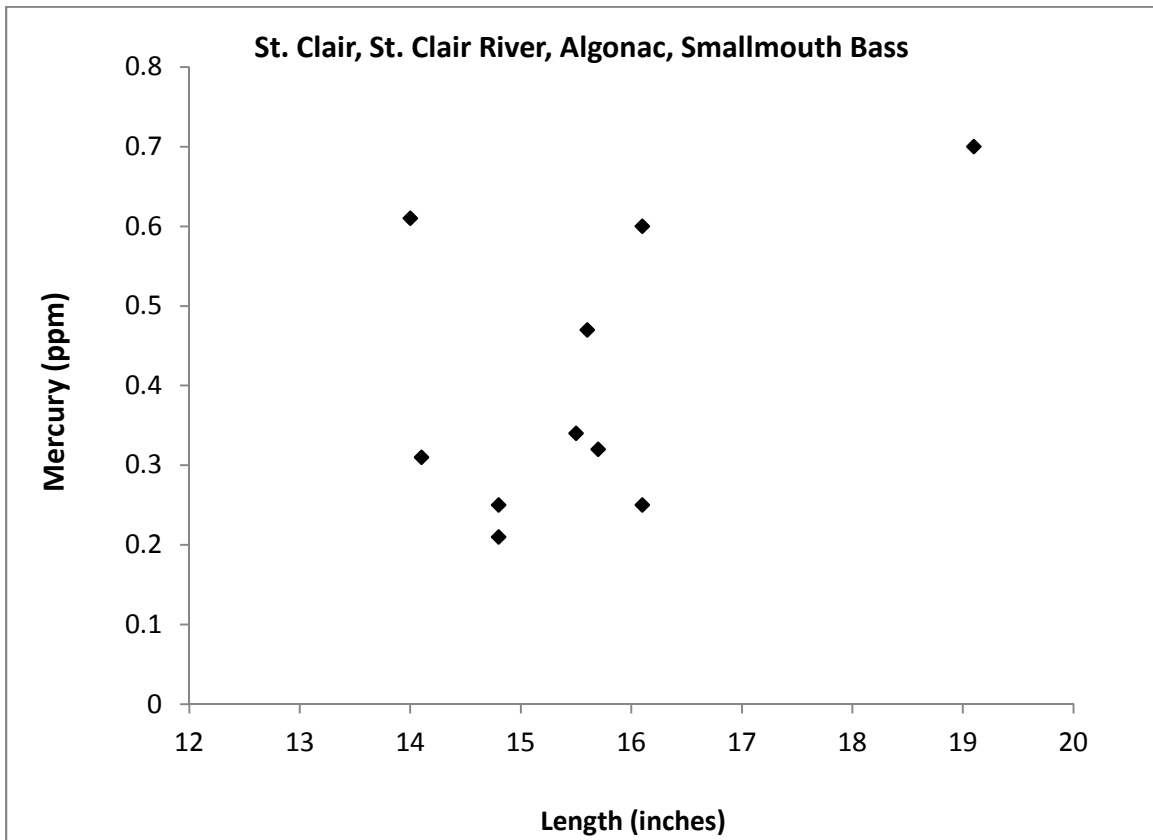
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	14	14	19.1	
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.41	0.21	0.70	0.53	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.250	0.204				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	14	14	19.1	
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.019	0.001	0.0362	0.027	8
DDT	10	0.002	0.001	0.003	0.003	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.021	0.000				
DDT	0.379	0.345				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing MDCH Advisory: Specific guidelines for St. Clair River smallmouth bass were not developed since data were not available previously.

Recommendation: No one should eat more than 2 meals per month of St. Clair River smallmouth or largemouth bass due to mercury. PCBs would cause an advisory.



Yellow Perch

St. Clair River

St. Clair County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.5	na	6.5	9.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.10	0.07	0.13	0.11	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.155	0.155				

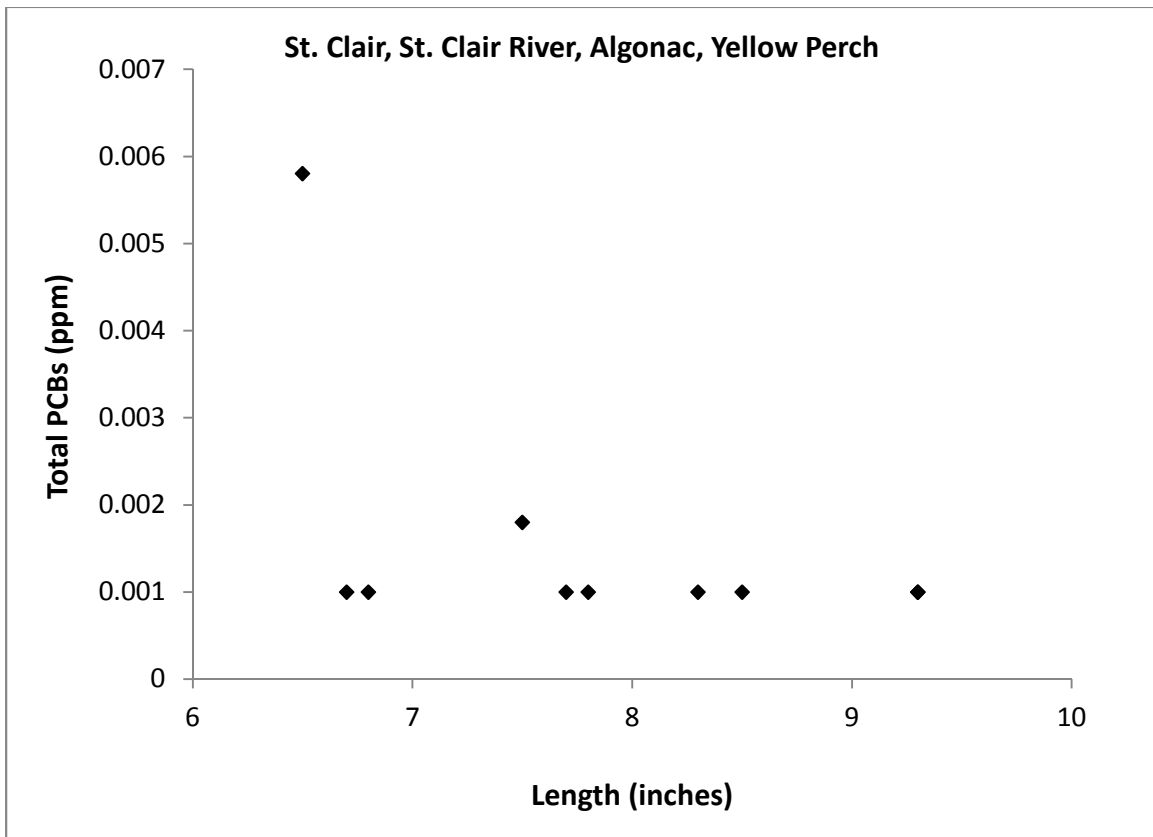
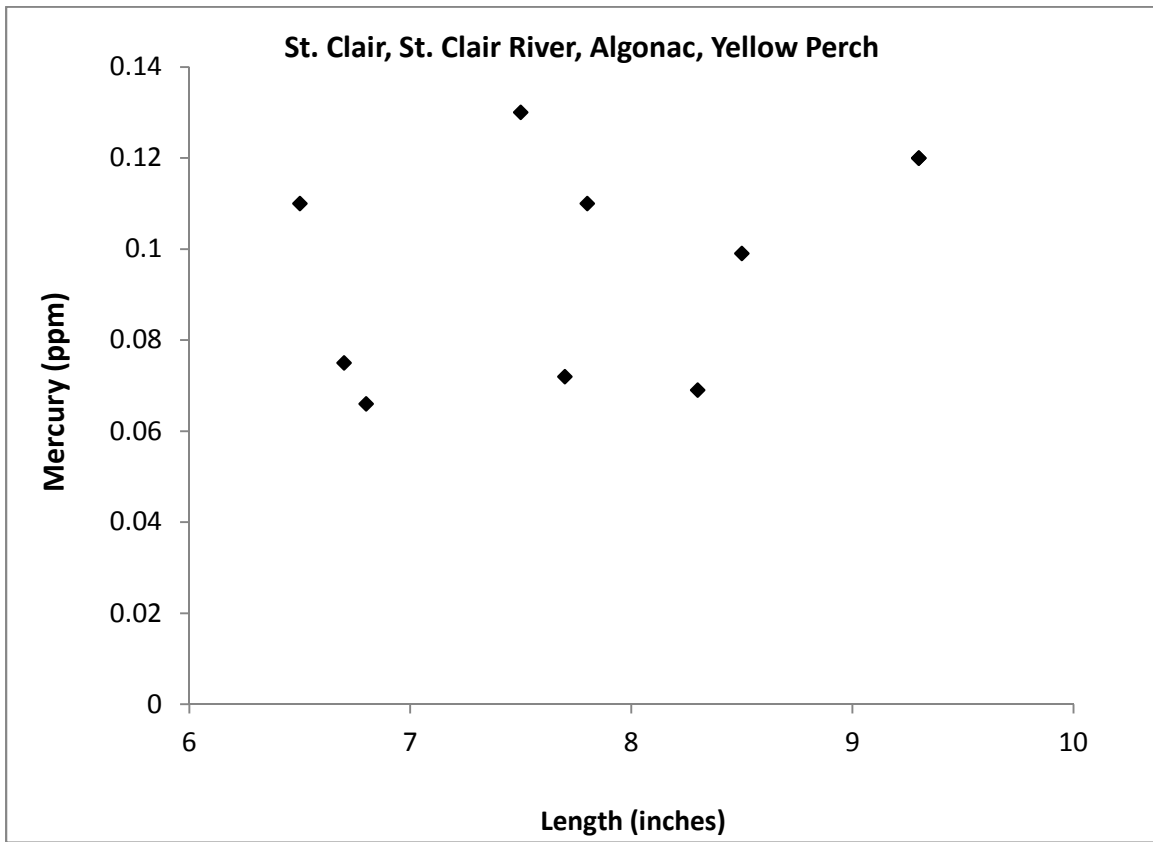
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.5	na	6.5	9.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.002	0.001	0.006	0.003	16
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.237	0.245				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						8

Existing MDCH Advisory: Specific guidelines for St. Clair River yellow perch were not developed since data were not available previously.

Recommendation: No one should eat more than 8 meals per month of St. Clair River yellow perch due to mercury.

Note: graphs show 9 points; the two largest fish had identical results.



Appendix D9. Eat Safe Fish guidance, 2015 update recommendations, Lake St. Clair

Carp

**Lake St. Clair
Including Lower Clinton River**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
1985	2012	68	12.2	na	12.2	31.9	
Datasets available: 1985, 1986, 1994, 1998, 2001, 2004, 2010, 2011, 2012							
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category	
Mercury	68	0.25	0.03	0.87	0.29	2	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.008	0.020					

Organics Analysis:

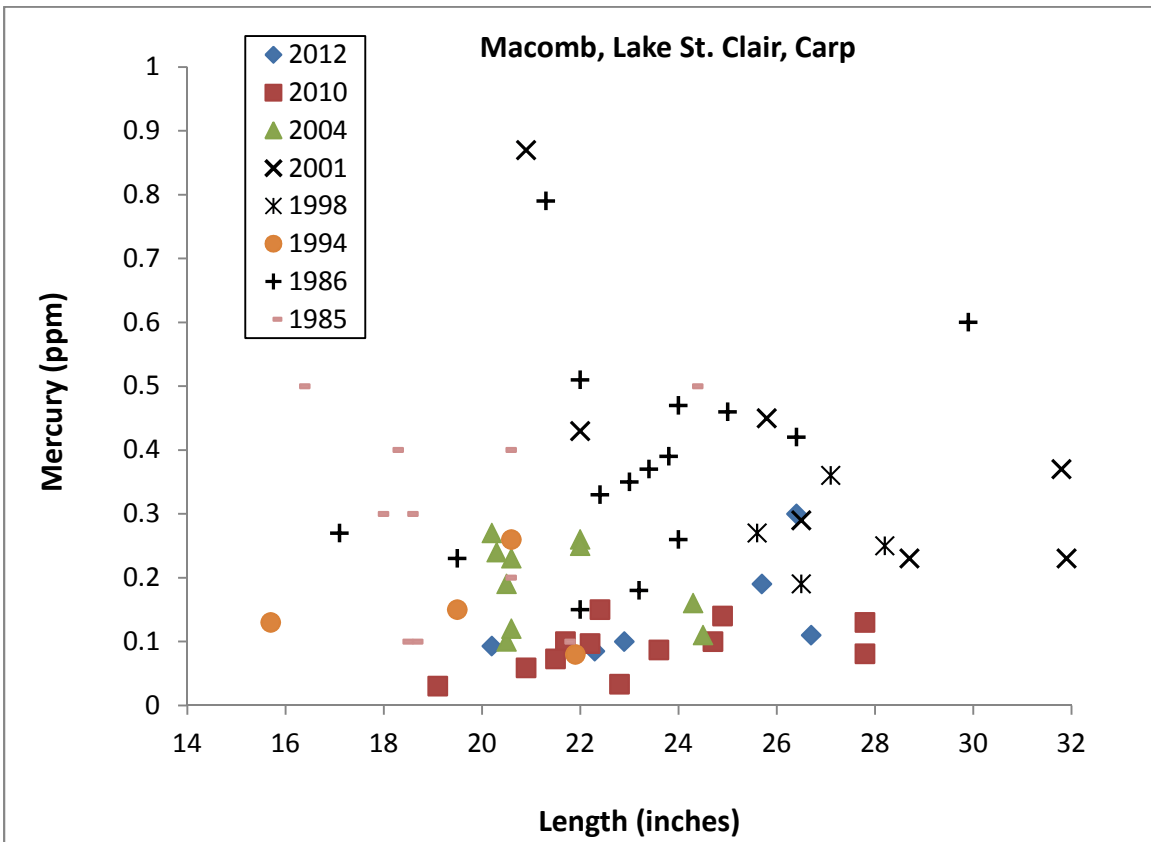
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2004	2012	32	12.2	na	12.2	26.7	
Datasets available: 1985, 1986, 1994, 1998, 2001, 2004, 2011, 2012							
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category	
PCB	32	0.50	0.001	4.40	0.83	Limited	
DDT	32	0.08	0.001	0.41	0.12	12	
Chlordane	32	0.02	0.001	0.14	0.03	--	
Toxaphene	32	ND	--	--	--	--	
TEQ*	4	1.1 ppt	0.2 ppt	1.7 ppt	--	--	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.026	0.292					
DDT	0.003	0.101					
Chlordane	0.078	0.069					
Toxaphene	--	--					
TEQ*	0.041	0.027					
						Final meal category based on UCL: Limited	

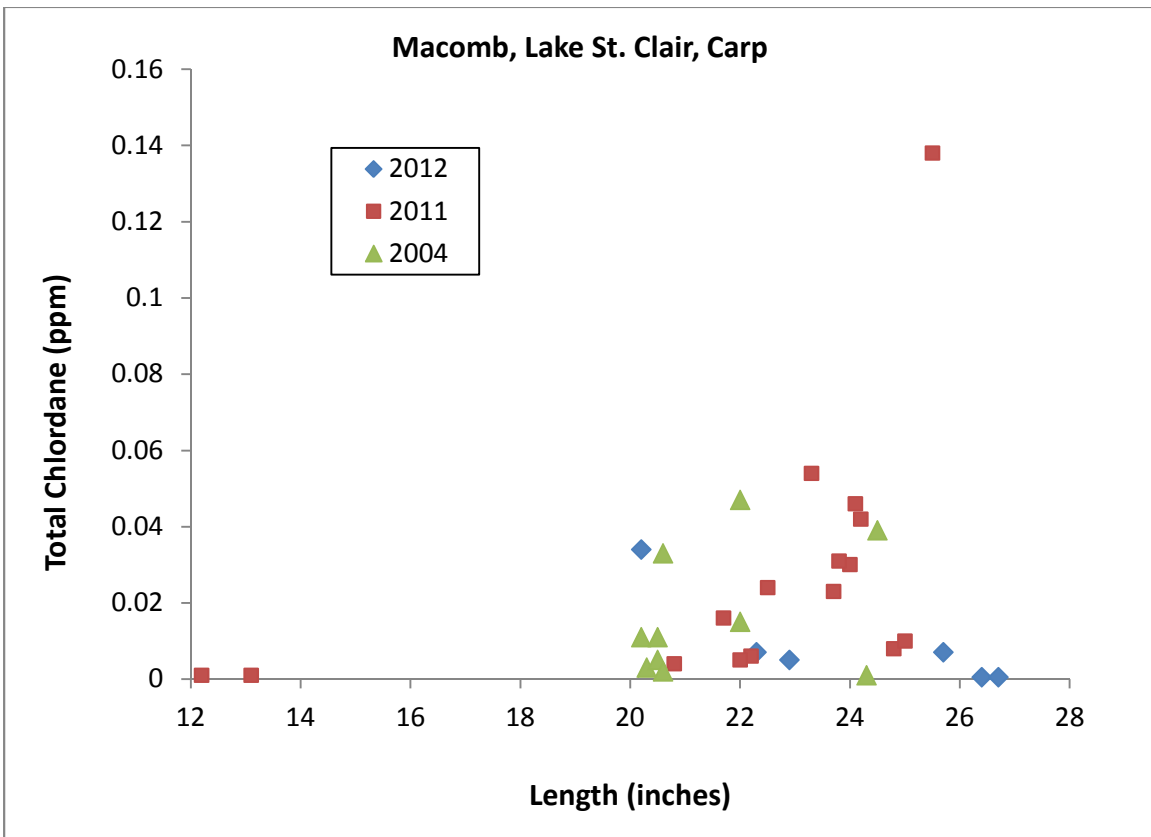
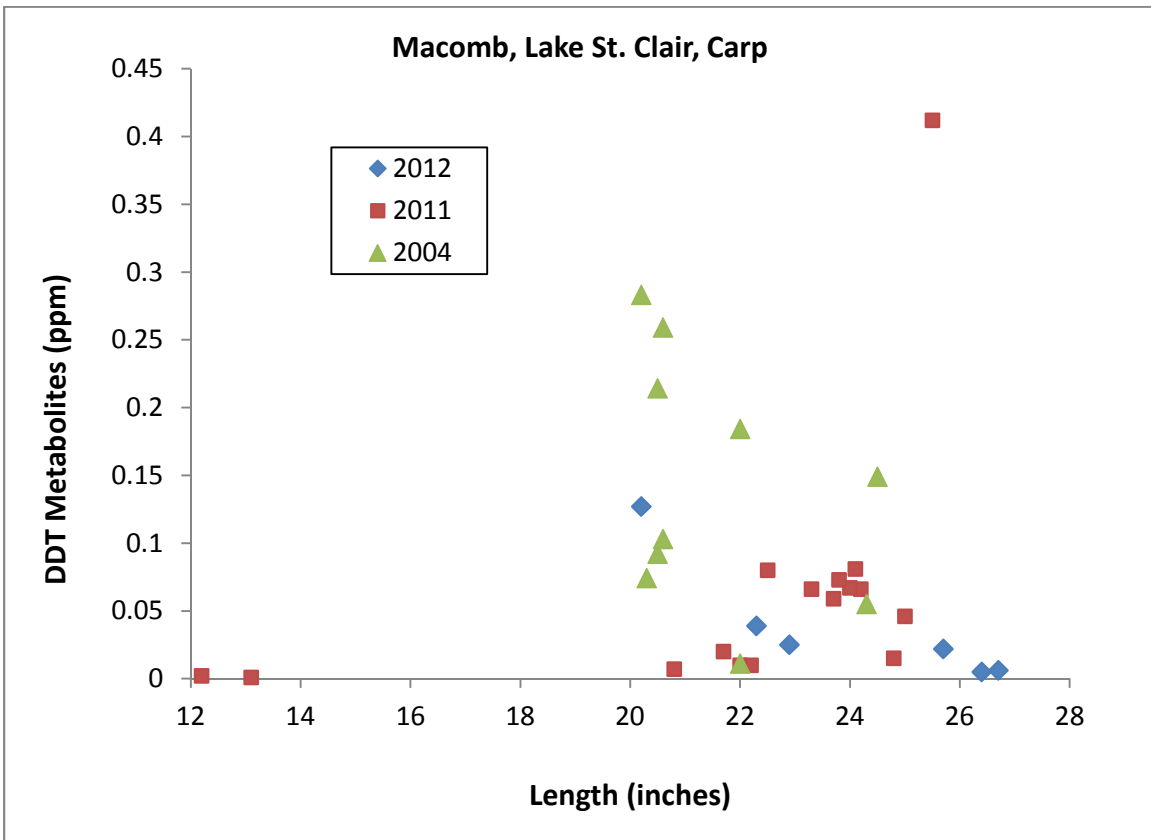
*1998 samples; 2005 WHO; dl-PCBs not included

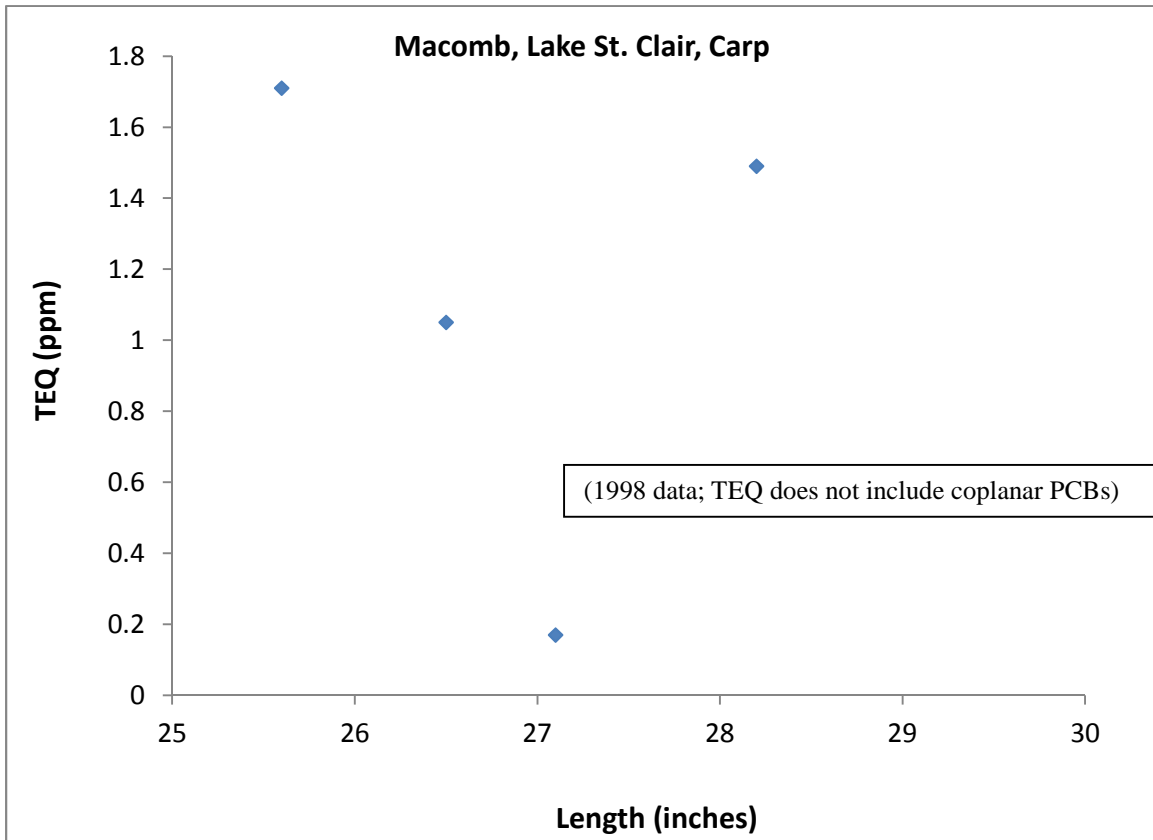
Existing MDCH Advisory: Sensitive populations should not eat these fish. Healthy adults should not eat more than 1 or 2 meals per year of carp from the Lake St. Clair due to of PCBs. Mercury, DDT, and dioxin would cause advisories.

Recommendation: No change.

Appendix D9. Eat Safe Fish guidance, 2015 update recommendations, Lake St. Clair







Walleye

St. Clair River, Lake St. Clair, Detroit River, and Lake Erie

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	2012	225	9.1	15	14.6	28.5
Datasets available: 1985, '86, '87, '90, '91, '92, '94, '97, '98, '99, 2001, 2004, 2006, 2011, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	210	0.28	0.07	1.08	0.31	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.336	0.331				

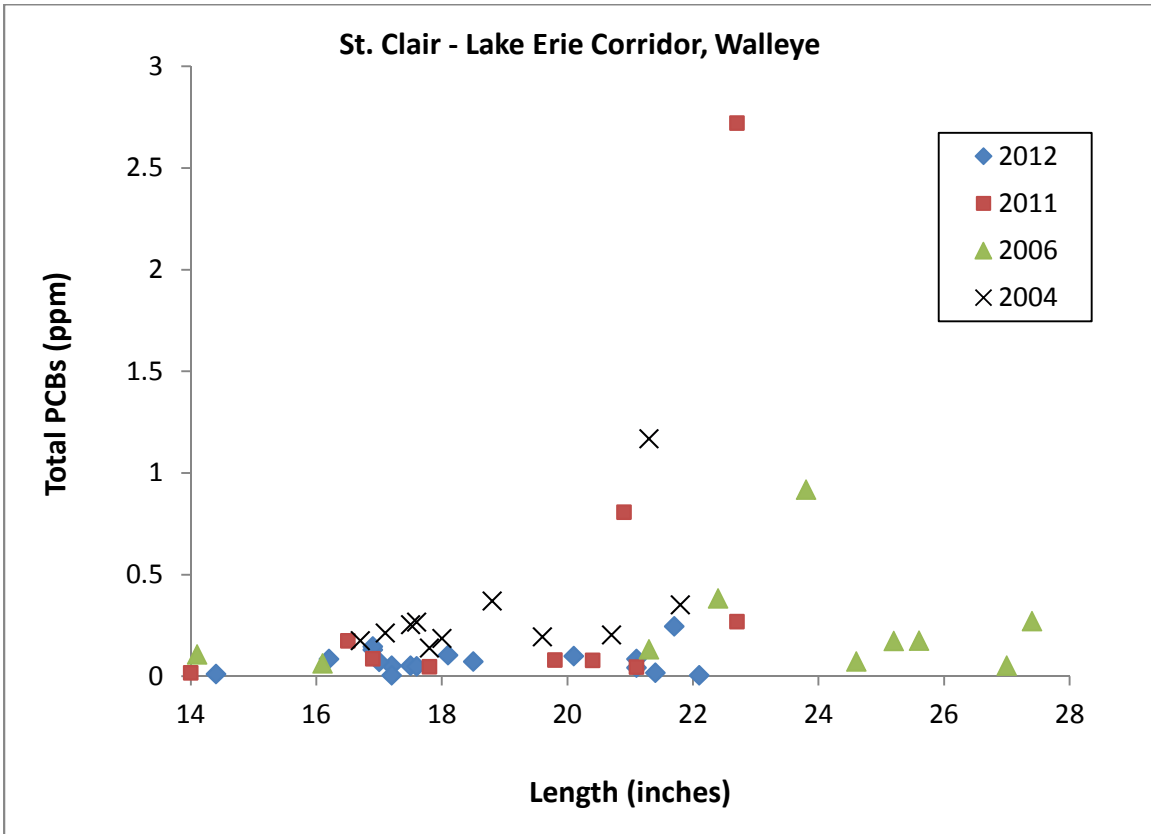
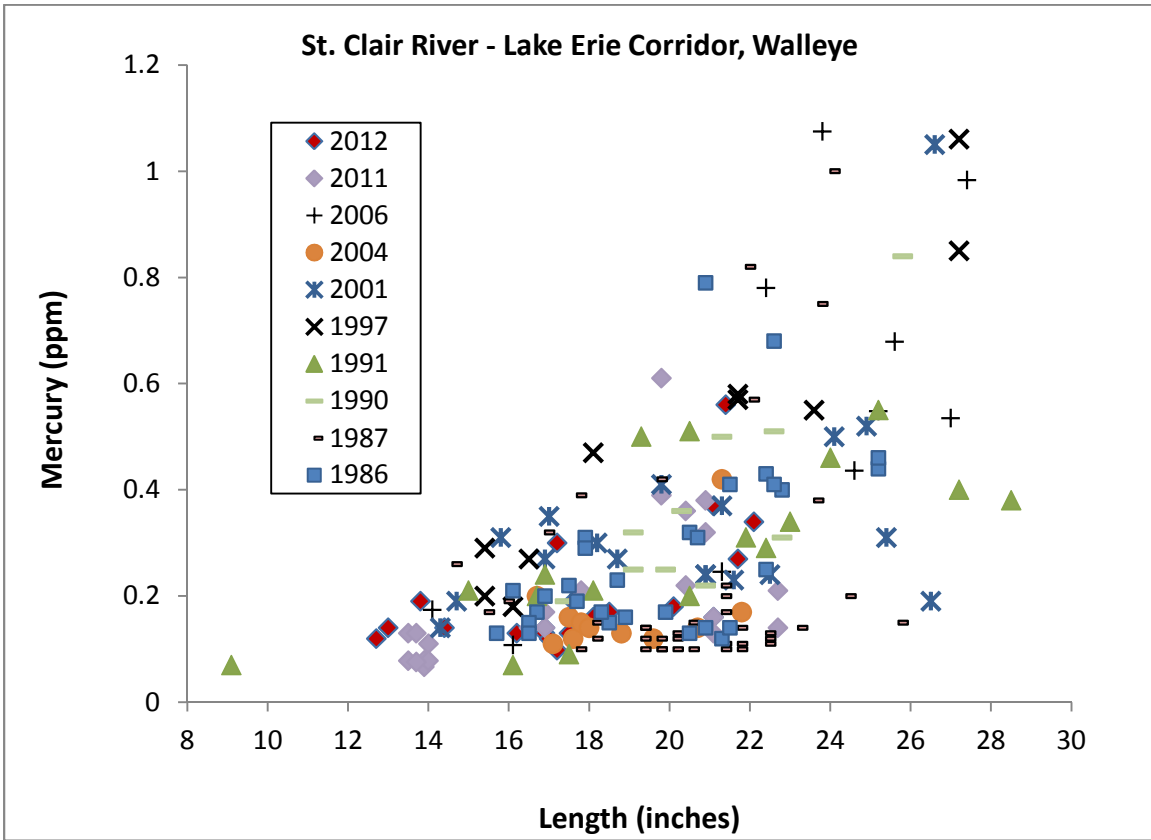
Organics Analysis:

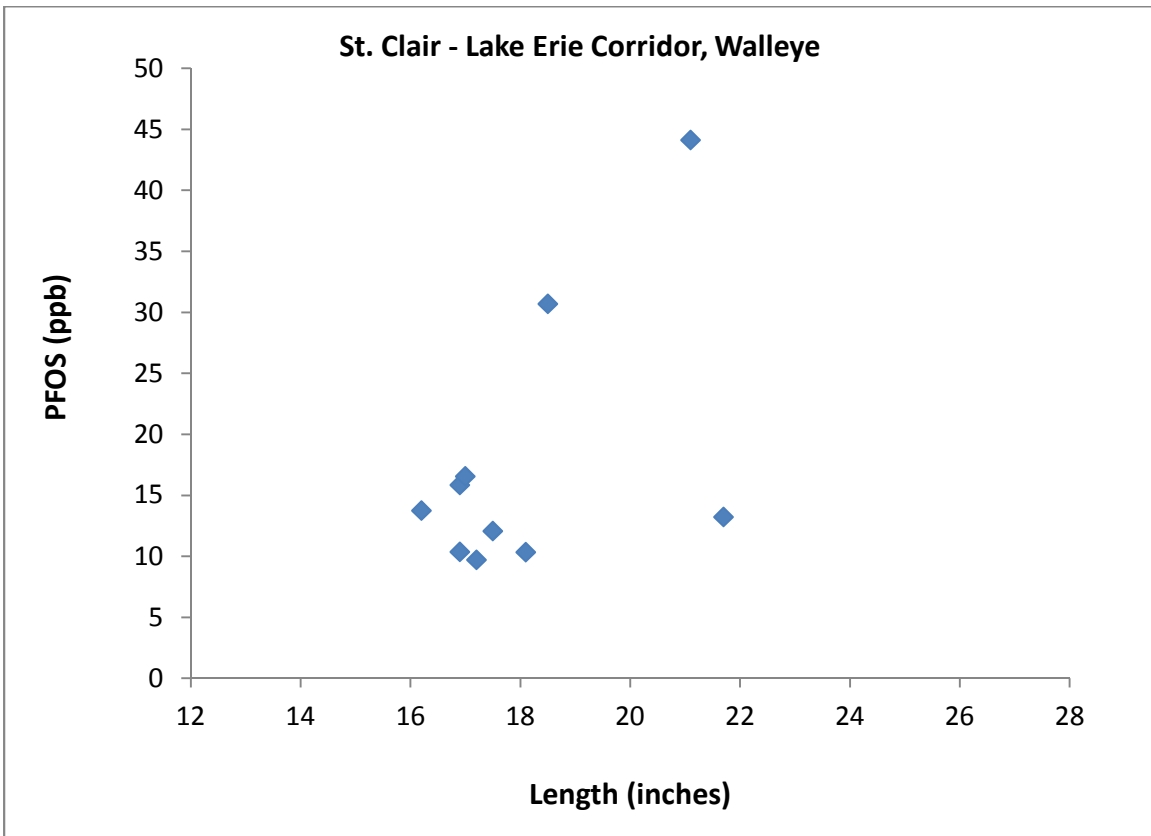
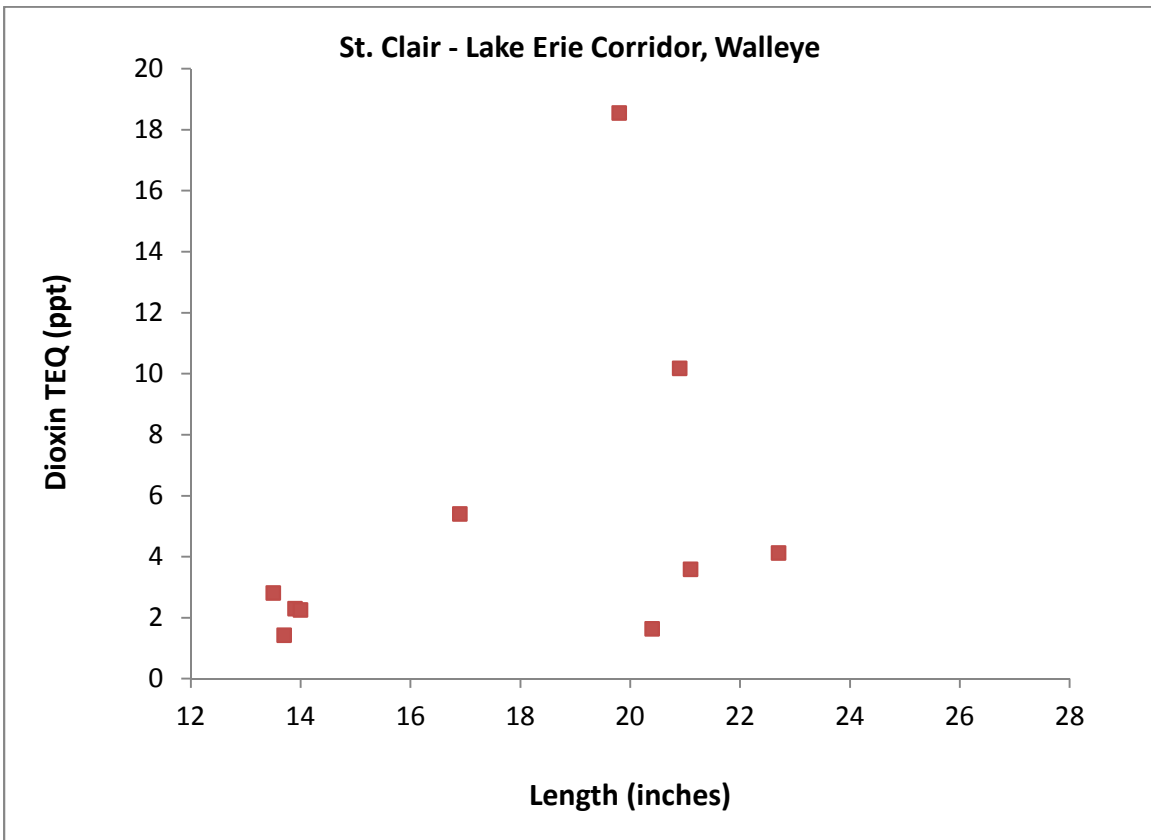
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	54	12.7	15	16.1	27.4
Datasets available: 1985, '86, '87, '90, '91, '92, '94, '95, '97, '98, '99, '01, '04, '06, 2011, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	45	0.25	0.004	2.72	0.38	0.5
DDT	45	0.02	0.001	0.25	0.04	16
Chlordane	45	0.01	0.001	0.06	0.01	--
Toxaphene	45	ND	--	--	--	--
TEQ*	6	7.3 ppt	1.6 ppt	18.6 ppt	13.8 ppt	0.5
PFOS	10	17.7 ppb	9.7 ppb	44.1 ppb	25.6 ppb	16**
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.097	0.227				
DDT	0.214	0.504				
Chlordane	0.258	0.459				
Toxaphene	--	--				
TEQ*	0.160	0.243				
PFOS	0.283	0.236				
Final meal category based on UCL:						0.5

* 2005 WHO; dl-PCBs included; ** - based on provisional screening values

Existing MDCH Advisory: No one should eat more than 6 meals per year of walleye from the St. Clair River, Lake St. Clair, the Detroit River, or Lake Erie due to elevated concentrations of PCBs and dioxin. Mercury would cause an advisory.

Recommendation: No change.





White Bass

St. Clair River, Lake St. Clair, Detroit River, and Lake Erie

[Dataset: Lake Erie, Plum Creek & River Raisin d/s Monroe Dam, Detroit River, Lake St. Clair]

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1986	2012	106	7.5	na	7.5	15.3	
Datasets available: 1986, 1988, 1993, 1995, 1999, 2004, 2006, 2008, 2010, 2011, 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	106	0.22		0.04	0.91	0.25	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.335	0.468					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2004	2012	66	9.4	na	9.4	15.3	
Datasets available: 1988, 1993, 1995, 1999, 2004, 2006, 2008, 2010, 2011, 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	66	0.50		0.037	4.4	0.64	Limited
DDT	66	0.03		0.01	0.09	0.04	16
Chlordane	66	0.01		0.001	0.02	0.01	--
Toxaphene	ND	--		--	--	--	--
TEQ*	20	12.4 ppt		1.9 ppt	33.4 ppt	16.2 ppt	Limited
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.134	0.082					
DDT	0.054	0.031					
Chlordane	0.050	0.050					
Toxaphene	--	--					
TEQ*	0.586	0.647					
Final meal category based on UCL:							Limited

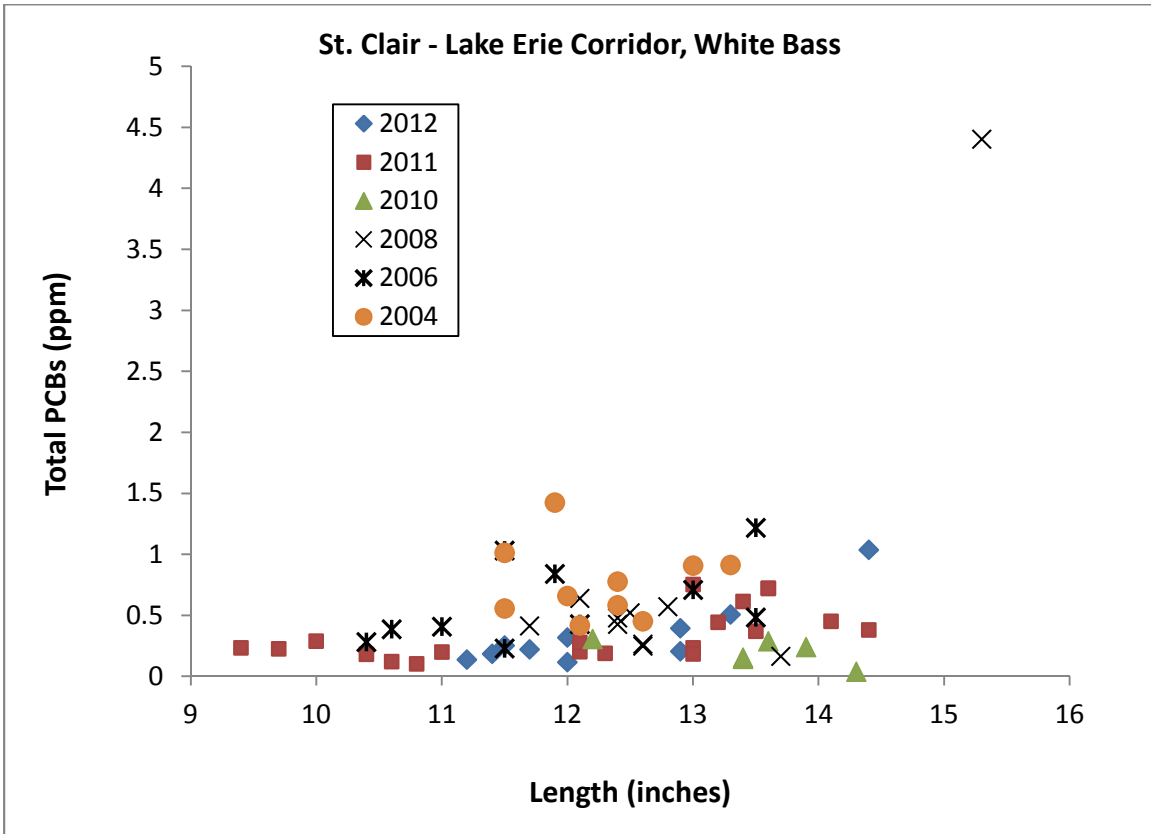
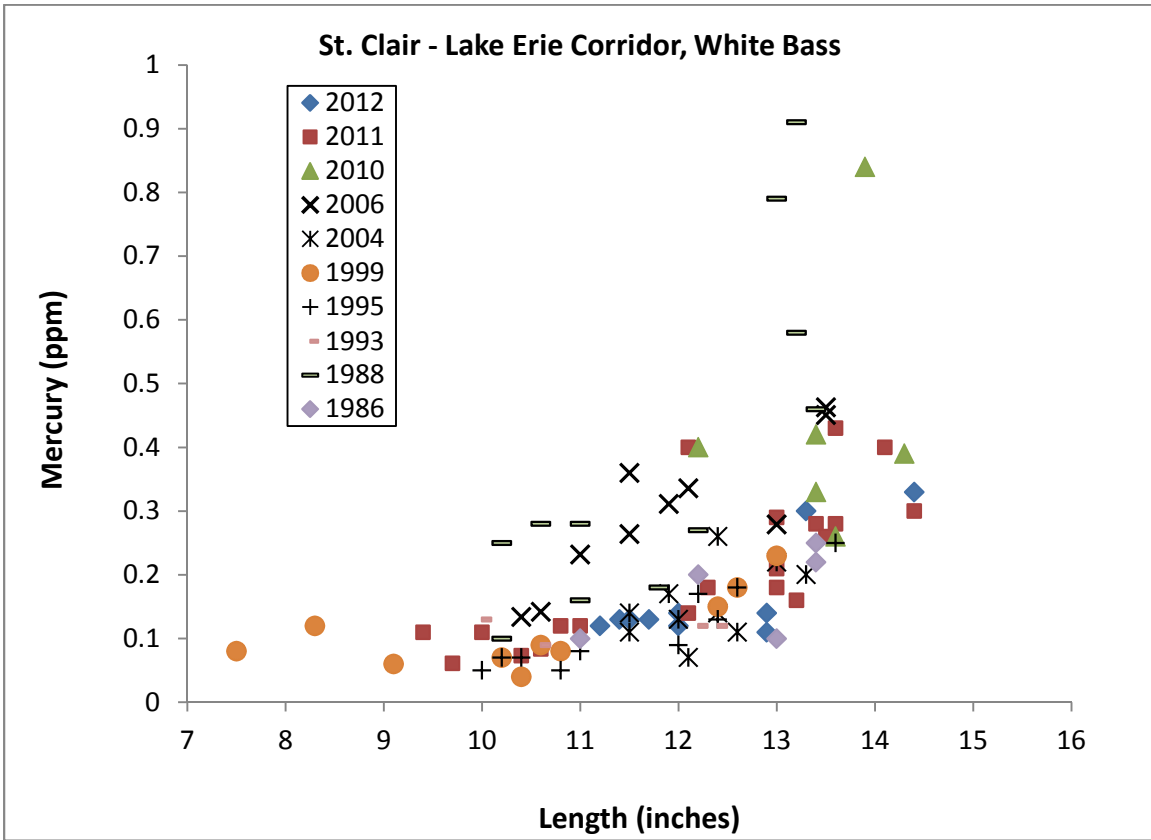
* - 2005 WHO; dl-PCBs included

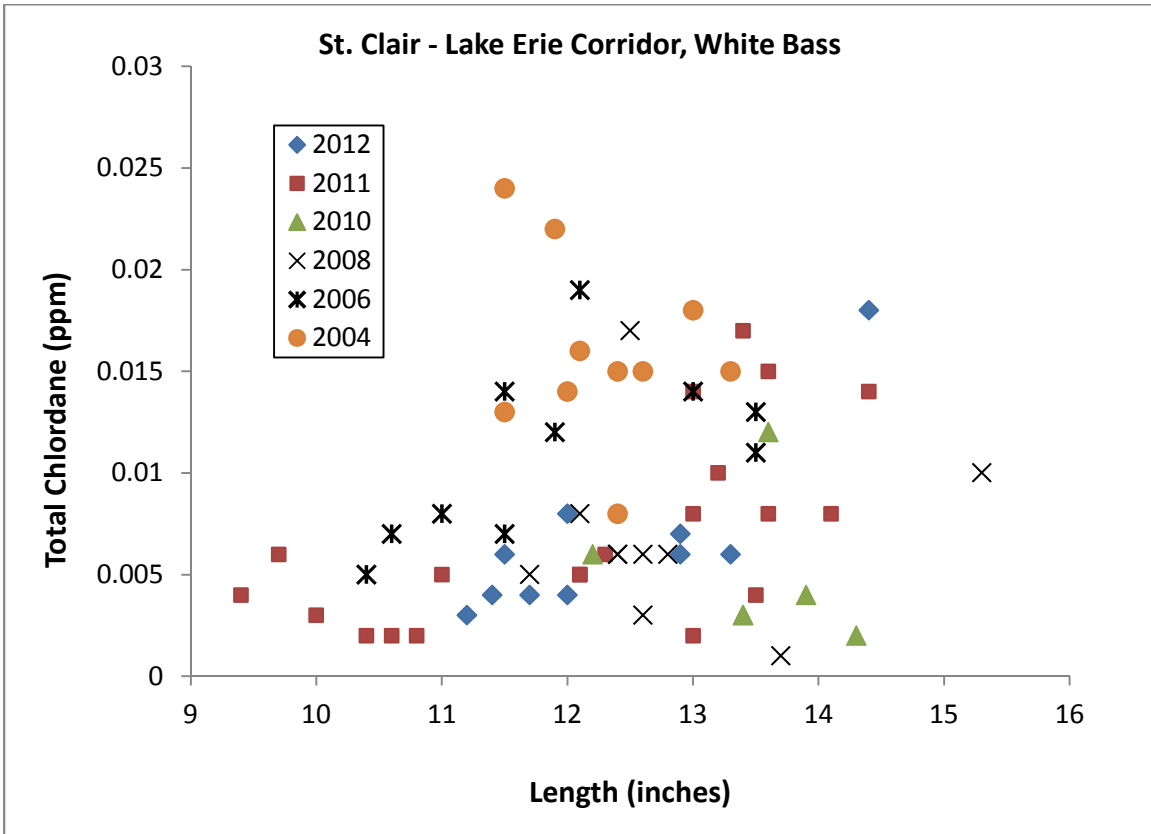
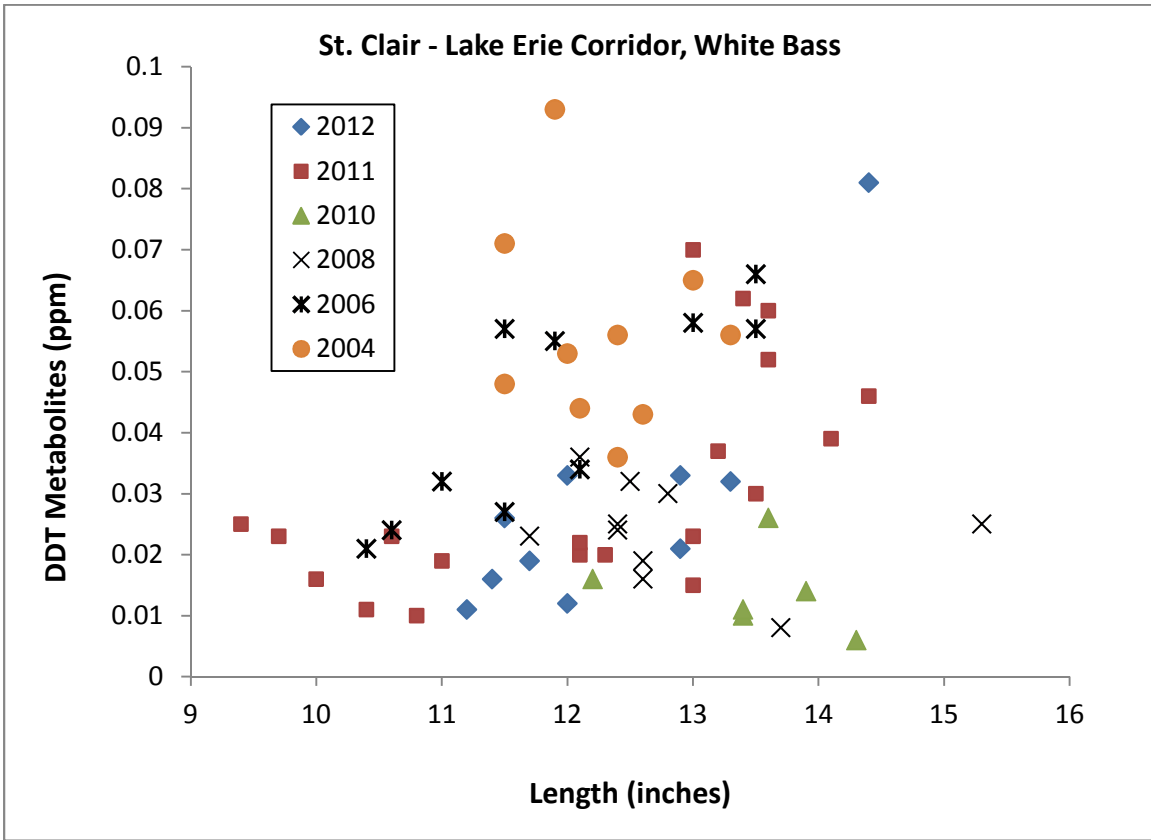
Existing MDCH Advisory: Sensitive populations should not eat white bass from Lake Erie, Plum Creek, or the River Raisin downstream of the Monroe Dam due to PCBs, the Detroit River due to PCBs and dioxin, or Lake St. Clair due to PCBs. Healthy adults should limit consumption of white bass to no more than 1 or 2 meals per year. Mercury would cause an advisory.

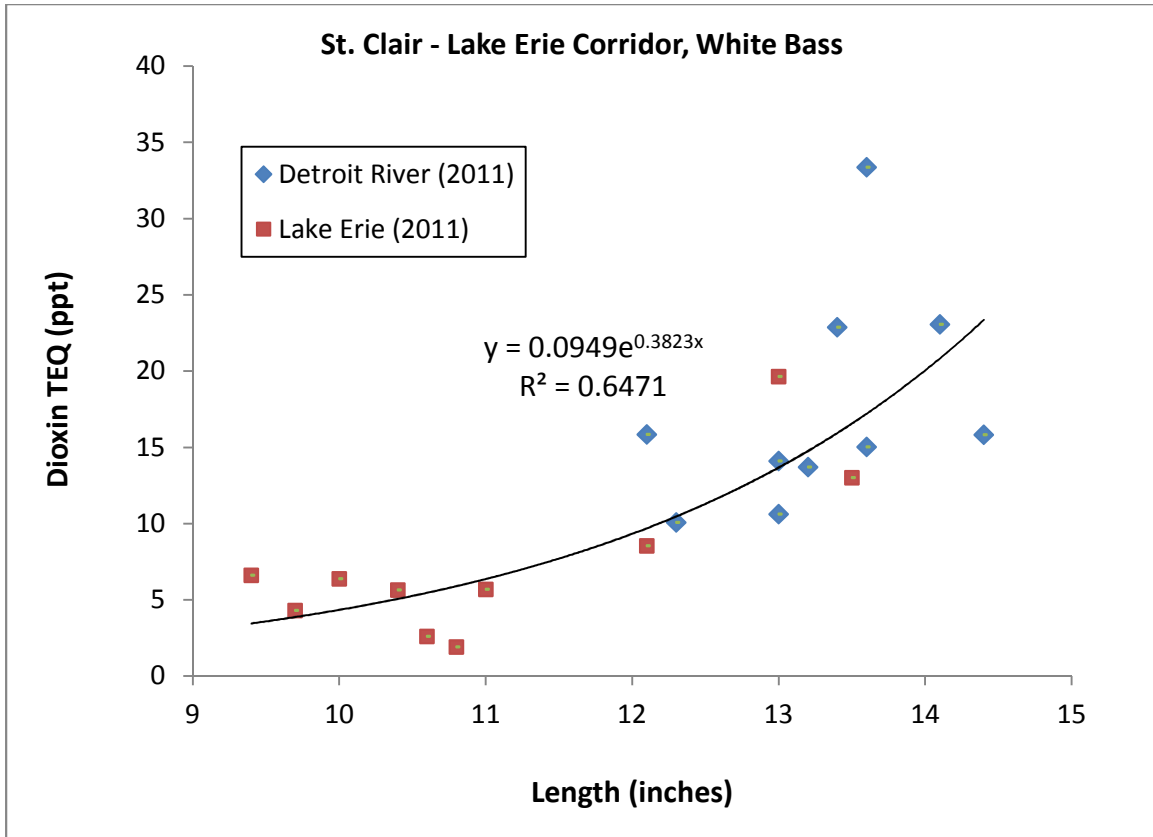
Recommendation: No change.

Length (Inches)	TEQ Regression Equation Estimate (ppt)	Meal Category
8	2	2
9	3	2
10	4.3	1
11	6.4	1
12	9.3	0.5
13	13.7	0.5
14	20	Limited
15	29.4	Limited
16	43	Limited

Shaded area denotes extrapolated estimates







Appendix D10. Eat Safe Fish guidance, 2015 update recommendations, Lake Erie

White Perch

**Lake Erie
Western Basin**

Monroe County

Hg Analysis:

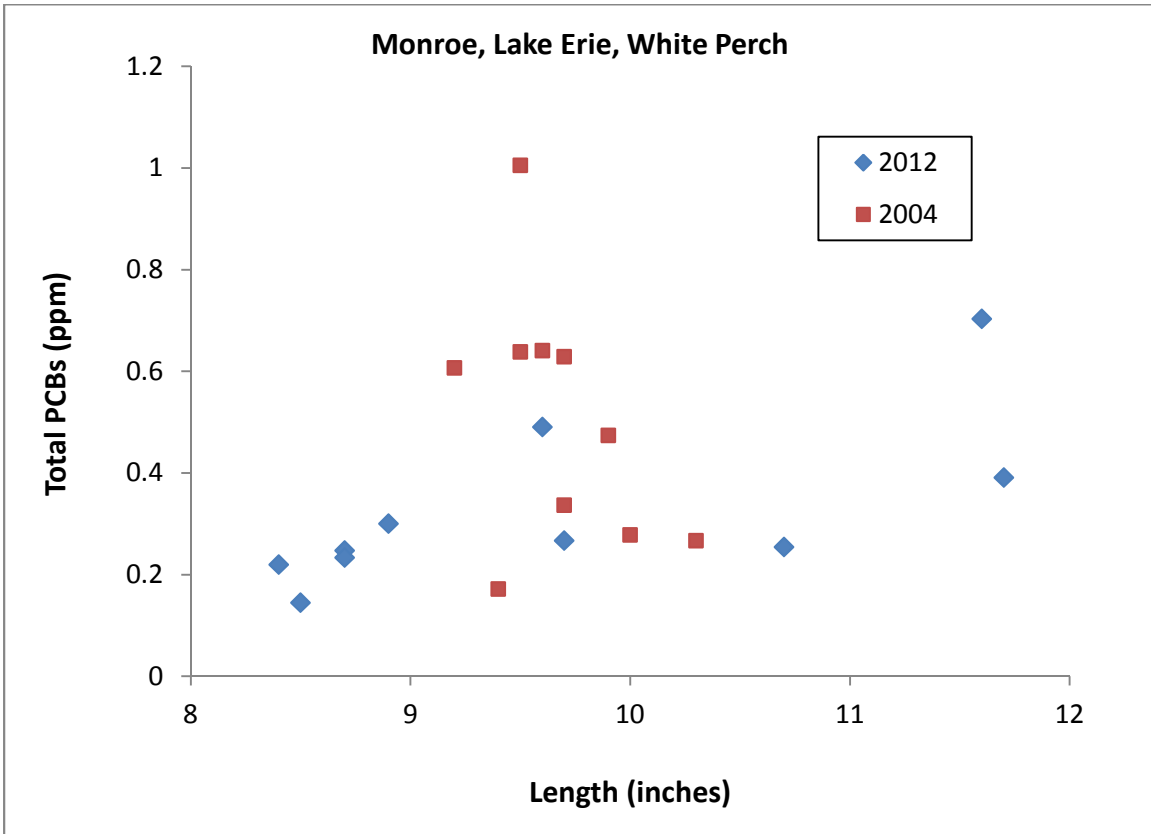
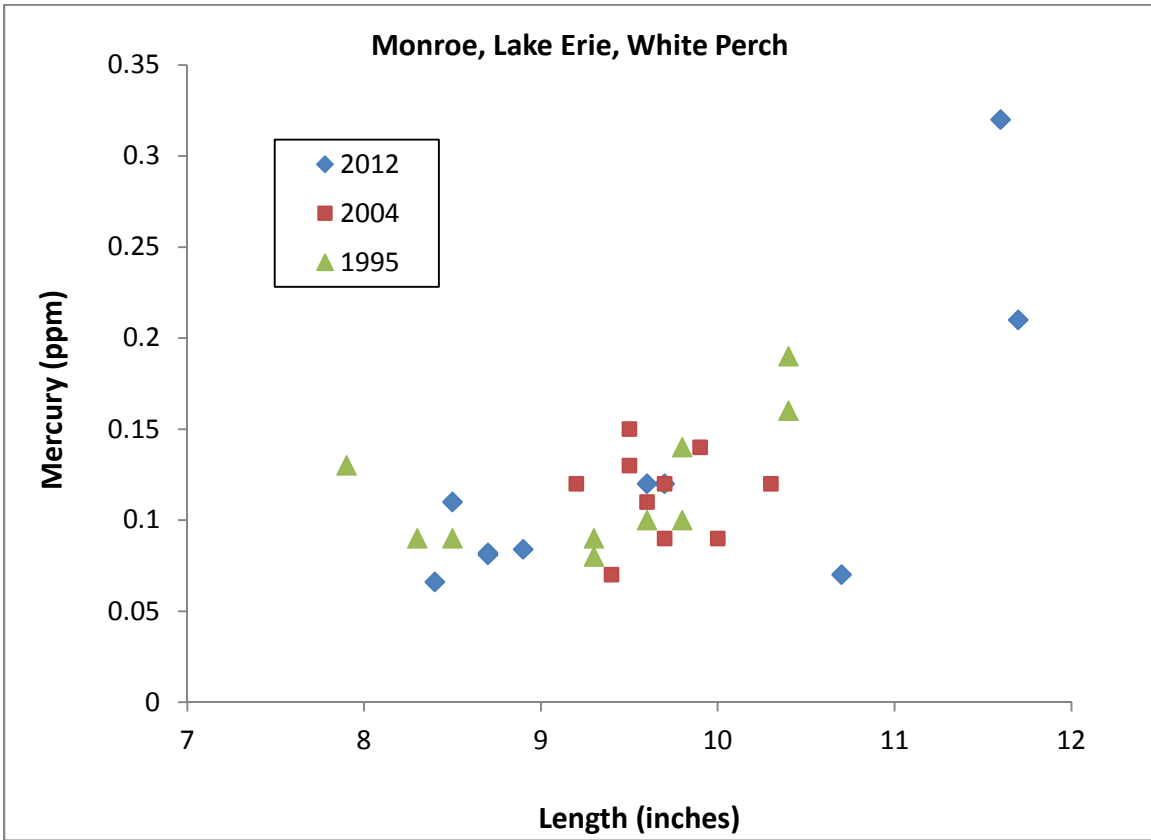
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	2012	30	7.9	na	7.9	11.7
Datasets available: 1995, 2004, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.12	0.07	0.32	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.435	0.382				

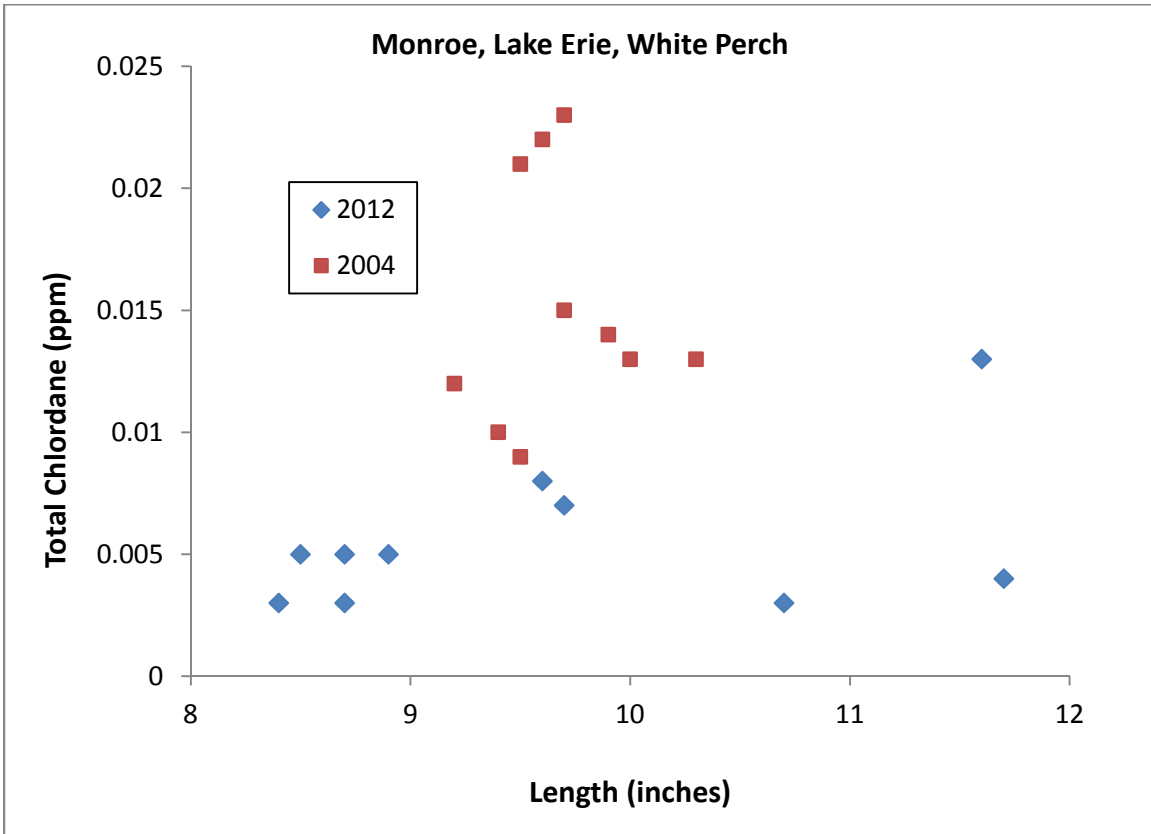
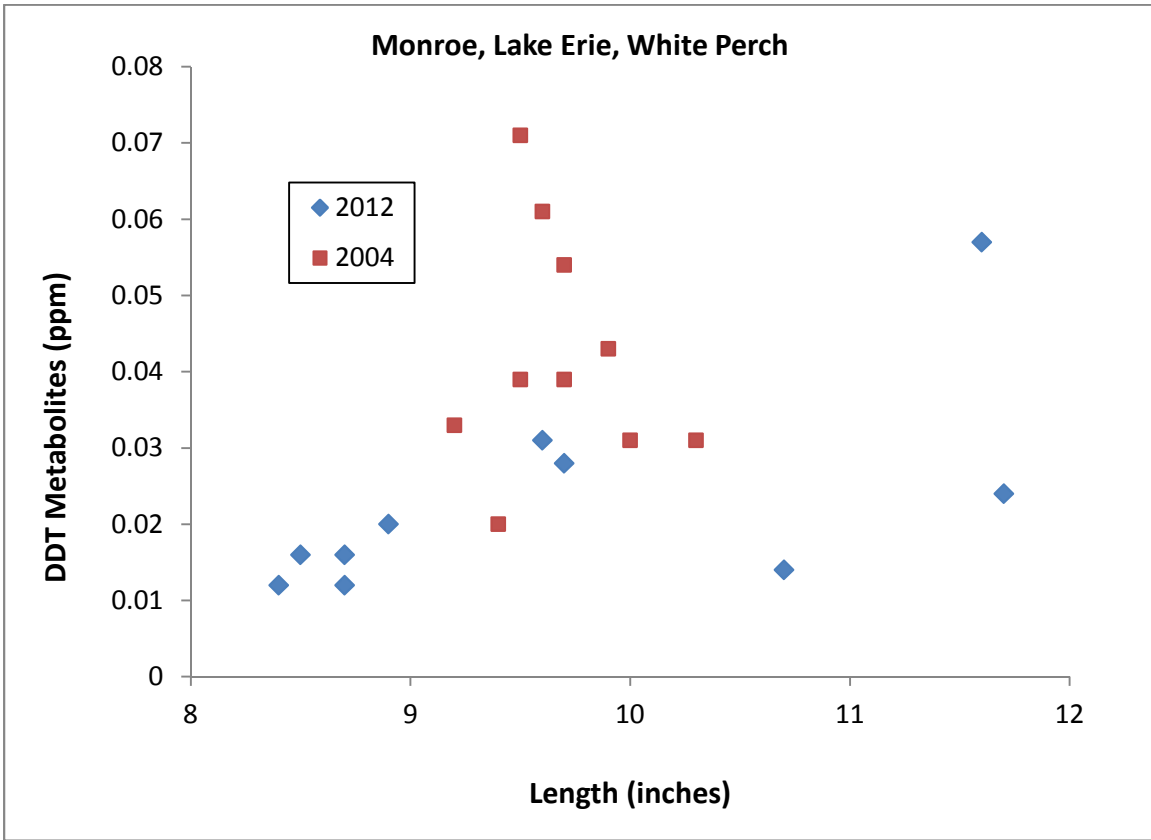
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	20	8.4	na	8.4	11.7
Datasets available: 1995, 2004, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.42	0.14	1.0	0.52	Limited
DDT	20	0.03	0.01	0.07	0.04	16
Chlordane	20	0.01	0.003	0.02	0.01	--
Toxaphene	10	--	--	--	--	--
TEQ	0					
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.071	0.122				
DDT	0.108	0.155				
Chlordane	0.026	0.037				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						Limited

Existing MDCH Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of white perch from Lake Erie to no more than 1 or 2 meals per year due to PCBs. Mercury would cause an advisory.

Recommendation: No change.





Appendix D10. Eat Safe Fish guidance, 2015 update recommendations, Lake Erie

Yellow Perch

**Lake Erie
Western Basin**

Monroe County

Hg Analysis:

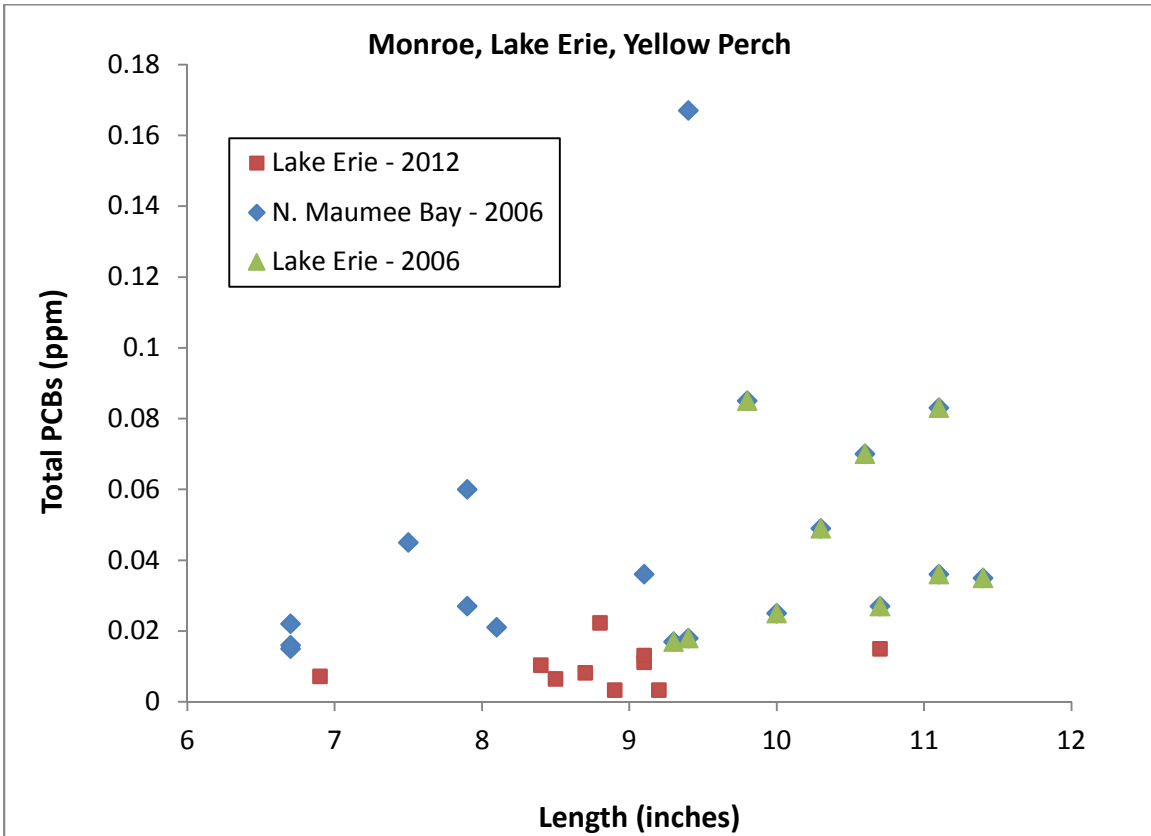
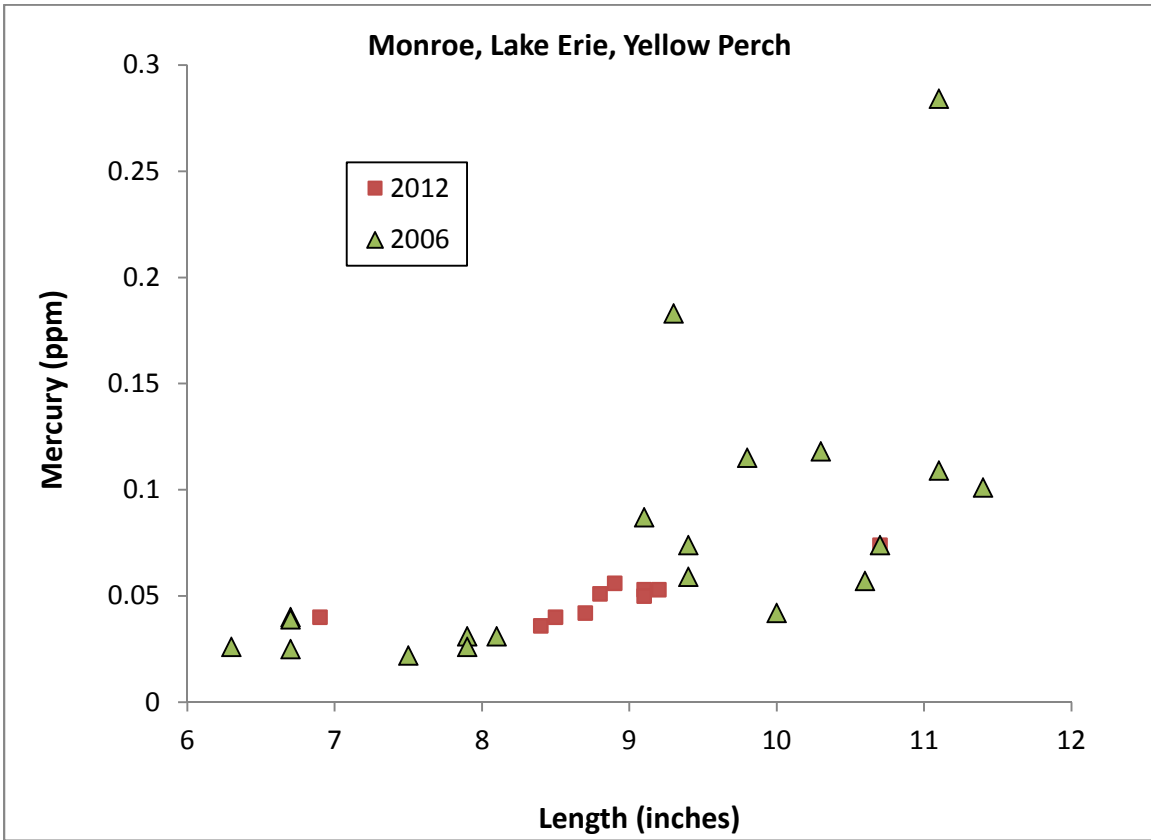
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2012	30	6.3	na	6.3	11.4
Datasets available: 1993, 1997, 2006, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.07	0.02	0.28	0.09	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.362	0.573				

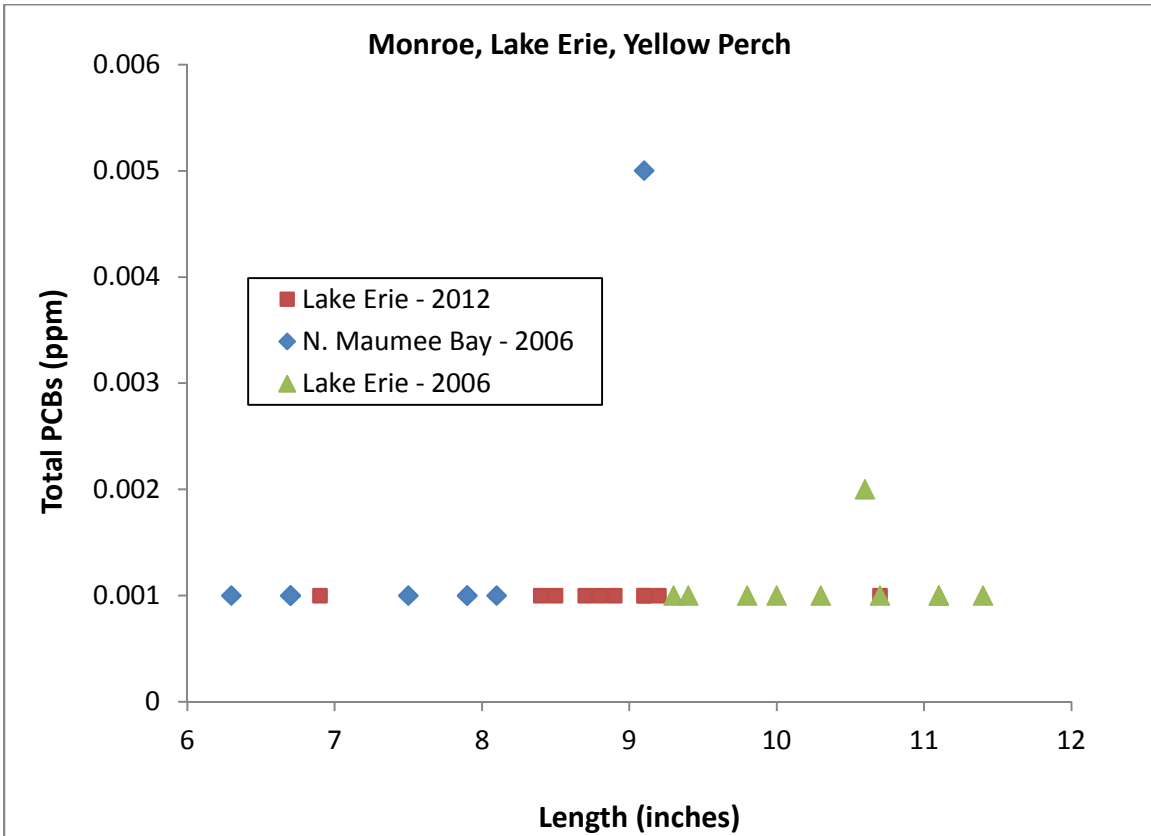
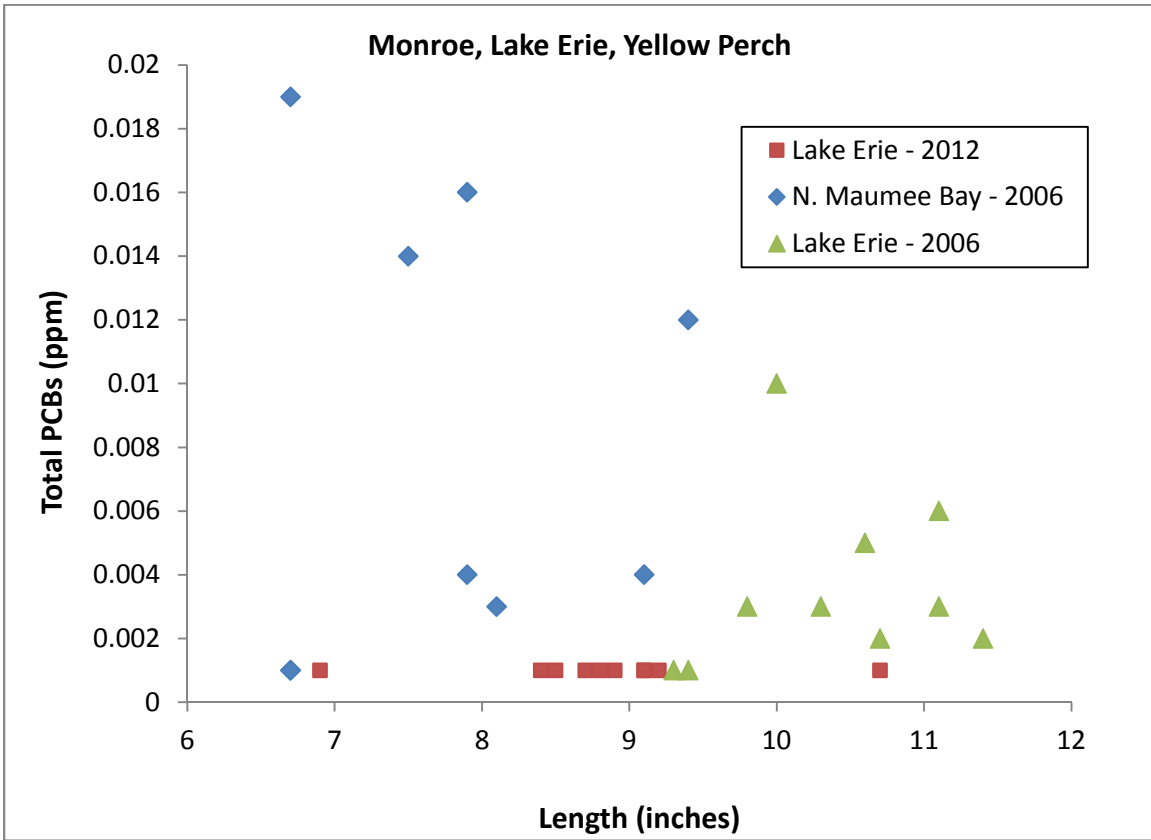
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2012	20	6.3	na	6.3	11.4
Datasets available: 1993, 1997, 2006, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	29	0.03	0.003	0.17	0.05	4
DDT	29	0.004	0.001	0.02	0.01	16
Chlordane	29	0.001	0.001	0.005	0.001	--
Toxaphene	29	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.088	0.111				
DDT	0.048	0.000				
Chlordane	0.011	0.018				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						4

Existing MDCH Advisory: No one should eat more than 2 meals per month of Lake Erie yellow perch due to PCBs. Mercury would cause an advisory.

Recommendation: No change. At least one more sampling event should be conducted before relaxing the advisory based on PCB concentrations.





Appendix E. Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Mercury (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	0	---	---	---	---	---	---
1984	212	3.2	Deer Lake	Marquette County	Northern pike	0.1	12.3
1985	194	3.7	Lake St. Clair	Michigan waters	Muskellunge	0.1	7.2
1986	672	1.7	Langford Lake	Gogebic County	Walleye	0.1	16.5
1987	1001	4.4	Deer Lake	Marquette County	Northern pike	0.1	22.4
1988	839	3.7	Deer Lake	Marquette County	Northern pike	0.1	15.3
1989	951	2.1	Orchard Lake	Oakland County	Northern pike	0.01	3.8
1990	638	1.64	Lower Trout Lake	Oakland County	Northern pike	0.01	0.0
1991	505	1.67	Craig Lake	Baraga County	Northern pike	0.01	0.0
1992	443	1.65	Escanaba River	Greenwood Reservoir	Northern pike	0.01	0.0
1993	611	2.6	Deer Lake	Marquette County	Northern pike	0.01	0.0
1994	471	1.57	Orchard Lake	Oakland County	Northern pike	0.01	0.0
1995	585	1.38	Pine Lake	Barry County	Northern pike	0.01	0.0
1996	297	1.38	Deer Lake	Marquette County	Walleye	0.01	0.0
1997	400	5.74	Deer Lake	Marquette County	Northern pike	0.01	0.0
1998	802	10.47	Deer Lake	Marquette County	Northern pike	0.01	0.0
1999	514	5.87	Deer Lake	Marquette County	Northern pike	0.01	0.0
2000	499	1.71	Chaney Lake	Gogebic County	Northern pike	0.01	0.2
2001	460	1.91	Lake St. Clair	Michigan waters	Muskellunge	0.01	0.0
2002	383	2.7	Lake Le Vasseur	Marquette County	Northern pike	0.01	0.0
2003	694	2.16	Deer Lake	Marquette County	Northern pike	0.01	0.0
2004	851	1.84	Deer Lake	Alger County	Northern pike	0.01	0.0
2005	580	3.52	Craig Lake	Baraga County	Northern pike	0.01	0.0
2006	825	1.92	Lake Michigamme	Marquette County	Walleye	0.01	0.2
2007	495	2.34	Torch Lake	Houghton County	Walleye	0.01	0.0
2008	659	2.08	Deer Lake	Marquette County	Northern pike	0.01	0.2
2009	290	1.9	Fish Lake	Marquette County	Northern pike	0.01	0.0
2010	622	2.2	Lake St. Clair	Michigan waters	Muskellunge	0.01	0.0
2011	446	5.5	Deer Lake	Marquette County	Northern pike	0.01	0.0
2012	522	1.1	Menominee River	Lower Scott Flowage	Redhorse sucker	0.01	0.0

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Total PCB-Aroclor (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	51	42	Lake Macatawa	Ottawa County	Carp	0.1	3.9
1981	23	29	Shiawassee River, South Branch	Livingston County, Bowen Road	Black Bullhead	0.1	0
1982	0	---	---	---	---	0.1	
1983	300	15.9	Kalamazoo River	Plainwell Dam Reservoir	Carp	0.1	10.3
1984	502	38	Lake Macatawa	Ottawa County	Carp	0.1	3.8
1985	532	25.6	Detroit River	Grassy Island	Carp	0.1	0.2
1986	907	53.3	Shiawassee River, South Branch	Livingston Co, Chase Lake Road	Carp	0.1	2.6
1987	943	61.7	Shiawassee River, South Branch	Livingston County, Marr Road	White Sucker	0.025	6.2
1988	714	34.9	Lake Michigan	Muskegon	Carp	0.025	27.5
1989	852	17.6	Black River, South Branch	Downstream of Bangor Dam	Carp	0.025	39.8
1990	534	33.9	Detroit River	Trenton Channel	Carp	0.025	27.9
1991	580	8.4	Lake Huron	Saginaw Bay, Fish Point	Carp	0.025	18.8
1992	504	24.7	Saginaw River	Saginaw County, Crow Island	Carp	0.025	17.5
1993	535	31.8	Lake Huron	Thunder Bay	Channel Catfish	0.025	17.6
1994	308	8.32	Cheboyganing Creek	Saginaw County	Carp	0.025	11.0
1995	438	16.1	Lake Macatawa	Ottawa County	Carp	0.025	10.5
1996	336	2.3	Lake Michigan	Grand Haven	Lake Trout	0.025	10.4
1997	358	2.3	Lake Erie	Western Basin	Lake Whitefish	0.025	23.7
1998	775	16.8	Raisin River	Monroe, d-s Winchester Bridge	Carp	0.025	46.2
1999	522	21.5	Kalamazoo River	Plainwell Dam Reservoir	Carp	0.025	5.2

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Total PCB-Congener (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
2000	453	14.8	Lake Erie	Off Monroe	Carp	0.001	20.1
2001	391	6.8	Ruddiman Creek	Lagoon	Carp	0.001	9.5
2002	373	8	Muskegon Lake	Muskegon County	Carp	0.001	31.9
2003	478	9.7	Tittabawassee River	Midland Co, Smiths Crossing Rd	Carp	0.001	18.6
2004	645	15.6	Shiawassee River, South Branch	Between M59 & Byron	Carp	0.001	3.9
2005	370	2.9	Lake Macatawa	Ottawa County	Carp	0.001	11.1
2006	434	7.2	Lake Erie	Off Monroe	Carp	0.001	16.4
2007	304	3.1	White Lake	Muskegon County	Carp	0.001	27.3
2008	402	5.4	Raisin River	Monroe, d-s Winchester Bridge	Carp	0.001	8.7
2009	189	10.8	Kalamazoo River	Plainwell Dam Reservoir	Carp	0.001	10.1
2010*	488	215	Lake St. Clair	10 Mile Canal	Carp	0.001	20.3
2010		5.7	Detroit River	Belle Isle	Carp	0.001	
2011	714	18.7	Kalamazoo River	Lake Allegan	Carp	0.001	7.6
2012	472	5.4	Menominee River	Menominee, river mouth	Carp	0.001	20.8

* - 2010 10-Mile Canal samples (Lake St. Clair) due to recently discovered legacy contamination

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Total DDT (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	52	6.00	Lake Macatawa	Ottawa County	Carp	0.01	0
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	319	5.40	Lake Michigan	Grand Traverse Bay	Lake trout	0.01	12.5
1984	502	13.97	Tittabawassee River	d-s Dow Dam	Carp	0.01	2.0
1985	320	23.83	Pine River	Midland County	Carp	0.001	0.3
1986	211	23.02	Lake Michigan	Grand Haven	Lake trout	0.001	0
1987	752	12.42	Lake Michigan	Grand Haven	Lake trout	0.001	0.8
1988	679	10.84	Lake Michigan	Muskegon	Carp	0.003	6.3
1989	854	35.49	Pine River	St. Louis Impoundment	Carp	0.003	10.9
1990	534	2.68	Glen Lake	Leelanau County	Lake trout	0.003	4.7
1991	580	4.19	Torch Lake	Antrim County	Lake trout	0.003	3.8
1992	504	5.37	Lake Superior	Isle Royale	Lake trout	0.003	8.1
1993	535	4.23	Lake Michigan	Grand Traverse Bay	Lake whitefish	0.003	2.4
1994	319	45.00	Pine River	d-s St. Louis dam	Carp	0.003	6.0
1995	458	41.29	Pine River	St. Louis Impoundment	Carp	0.003	4.8
1996	338	1.53	Torch Lake	Antrim County	Lake trout	0.003	0.6
1997	389	65.33	Pine River	St. Louis Impoundment	Carp	0.003	6.7
1998	775	8.47	Higgins Lake	Roscommon County	Lake trout	0.003	14.3
1999	301	4.23	Au Sable River	Oscoda	Carp	0.003	7.3
2000	453	1.26	Mona Lake	Muskegon County	Carp	0.003	19.6
2001	391	1.41	Ruddiman Creek	Lagoon	Carp	0.001	9.0
2002	373	3.33	Muskegon Lake	Muskegon County	Carp	0.001	7.5
2003	467	14.58	Tittabawassee River	Midland County	Carp	0.001	3.9
2004	644	1.86	Lake Michigan	Little Bay De Noc	Carp	0.001	2.2
2005	370	1.18	Au Sable River	Oscoda	Carp	0.001	11.4
2006	434	0.95	Huron River	Ford Lake	Carp	0.001	7.6
2007	304	1.06	White Lake	Muskegon County	Carp	0.001	8.6
2008	402	0.89	Manistique River	d/s Manistique Papers Dam	Carp	0.001	16.4
2009	128	2.98	Lake Michigan	Platte River	Coho	0.001	12.5
2010	488	12.99	Pine River	Gratiot County, d-s St Louis Dam	Carp	0.001	28.3
2011	416	0.80	Higgins Lake	Roscommon County	Lake Trout	0.001	21.9
2012	437	0.88	Lake Huron	Les Cheneaux Islands	Carp	0.001	39.1

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum 4,4' DDE (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	52	6.00	Lake Macatawa	Ottawa County	Carp	0.01	0
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	181	0.91	Clinton River	Macomb County u-s I-94	Carp	0.01	17.1
1984	344	8.38	Lake Macatawa	Ottawa County	Carp	0.01	2.9
1985	302	9.81	Pine River	Midland County, Homer Rd	Carp	0.003	0.3
1986	136	20.97	Lake Michigan	Grand Haven	Lake Trout	0.003	0
1987	717	10.56	Lake Michigan	Grand Haven	Lake Trout	0.003	0.8
1988	675	8.84	Lake Michigan	Muskegon	Carp	0.003	5.9
1989	854	13.42	Pine River	St. Louis Impoundment	Carp	0.003	10.9
1990	534	2.06	Glen Lake	Leelanau County	Lake Trout	0.003	4.7
1991	580	3.31	Torch Lake	Antrim County	Lake Trout	0.003	4.0
1992	504	4.20	Lake Superior	Isle Royale	Lake Trout	0.003	8.1
1993	535	3.40	Lake Michigan	Grand Traverse Bay	Lake Whitefish	0.003	2.4
1994	319	13.95	Pine River	Gratiot Co, d-s St Louis Dam	Carp	0.003	6.0
1995	458	13.74	Pine River	St. Louis Impoundment	Carp	0.003	4.8
1996	338	1.07	Torch Lake	Antrim County	Lake Trout	0.003	0.6
1997	389	21.51	Pine River	St. Louis Impoundment	Carp	0.003	6.7
1998	775	7.73	Higgins Lake	Roscommon County	Lake Trout	0.003	14.3
1999	301	3.69	Au Sable River	Oscoda	Carp	0.003	7.3
2000	453	0.84	Lake Michigan	Green Bay, Cedar River	Carp	0.003	19.6
2001	391	1.04	Lake Huron	Thunder Bay	Carp	0.001	9.2
2002	373	3.01	Muskegon Lake	Muskegon County	Carp	0.001	7.0
2003	467	3.38	Tittabawassee River	Midland Co, Smiths Crossing Rd	Carp	0.001	3.9
2004	641	1.71	Lake Michigan	Little Bay De Noc	Carp	0.001	1.1
2005	370	1.10	Au Sable River	Oscoda	Carp	0.001	11.6
2006	434	0.90	St. Clair River	Marine City	Carp	0.001	7.6
2007	304	0.90	White Lake	Muskegon County	Carp	0.001	8.6
2008	402	0.82	Manistique River	d/s Manistique Papers Dam	Carp	0.001	16.4
2009	128	1.04	Torch Lake	Antrim County	Lake Trout	0.001	12.5
2010	487	12.98	Pine River	Gratiot Co, d-s St Louis Dam	Carp	0.001	29.4
2011	416	0.73	Higgins Lake	Roscommon County	Lake Trout	0.001	22.1
2012	437	0.82	Lake Huron	Les Cheneaux Islands	Carp	0.001	39.8

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum 4,4' DDD (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	21	0.40	Lake Macatawa	Ottawa County	Carp	0.1	95.2
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	166	0.45	Lake Huron	Saginaw Bay, Sand Point	Walleye	0.01	28.9
1984	336	9.31	Tittabawassee River	Midland County, d-s Dow Dam	Carp	0.01	31.4
1985	302	13.70	Pine River	Midland County, Homer Road	Carp	0.001	25.7
1986	179	1.02	Lake Michigan	Grand Haven	Lake Trout	0.005	5.9
1987	749	1.69	Rouge River	Oakland County, Lahser Road	Carp	0.005	29.8
1988	679	1.92	Lake Michigan	Muskegon	Carp	0.005	51.7
1989	854	23.62	Pine River	St. Louis Impoundment	Carp	0.005	39.1
1990	534	0.36	Glen Lake	Leelanau County	Lake Trout	0.005	40.1
1991	580	0.41	Lake Huron	Saginaw Bay, Fish Point	Carp	0.005	32.4
1992	504	1.64	Tittabawassee River	Midland County, d-s Dow Dam	Carp	0.005	32.3
1993	535	0.65	Lake Erie	Western Basin	Carp	0.005	30.6
1994	319	31.62	Pine River	Gratiot County, d-s St Louis Dam	Carp	0.005	21.9
1995	458	34.80	Pine River	St. Louis Impoundment	Carp	0.005	27.1
1996	338	0.14	Lake Michigan	Grand Traverse Bay, East Arm	Lake Whitefish	0.005	29.9
1997	389	45.18	Pine River	St. Louis Impoundment	Carp	0.005	27.2
1998	775	0.63	Higgins Lake	Roscommon County	Lake Trout	0.005	64.2
1999	301	2.06	Tittabawassee River	Midland County, d-s Dow Dam	Carp	0.005	28.9
2000	453	0.74	Mona Lake	Muskegon County	Carp	0.005	53.4
2001	380	0.48	Ruddiman Creek	Lagoon	Carp	0.001	41.6
2002	357	0.82	Mona Lake	Muskegon County	Carp	0.001	35.2
2003	457	8.96	Tittabawassee River	Midland County, Smiths Crossing Road	Carp	0.001	35.9
2004	596	0.23	Detroit River	Michigan waters	Carp	0.001	24.3
2005	366	0.32	Rouge River	Newburgh Lake	Carp	0.001	39.1
2006	432	0.29	Huron River	Ford Lake	Carp	0.001	33.8
2007	304	0.14	White Lake	Muskegon County	Carp	0.001	61.5
2008	401	0.10	Huron River	Geddes Pond	Carp	0.001	55.1
2009	129	0.10	Baseline Lake	Livingston/Washtenaw County	Carp	0.001	26.4
2010	486	10.44	Pine River	Gratiot County, d-s St Louis Dam	Carp	0.001	45.9
2011	416	0.14	Detroit River	Celeron Island	Carp	0.001	48.3
2012	437	0.08	Huron River	Belleville Lake	Channel Catfish	0.001	69.8

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum 4,4' DDT (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	51	0.02	White Lake	Muskegon County	Carp	0.05	54.9
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	307	5.40	Lake Michigan	Grand Traverse Bay	Lake Trout	0.02	27.4
1984	487	2.28	Lake Michigan	Grand Traverse Bay, East Arm	Lake Trout	0.01	11.9
1985	320	0.78	Lake Michigan	Manistee River	Chinook	0.002	5.9
1986	211	1.03	Lake Michigan	Grand Haven	Lake Trout	0.01	12.8
1987	752	1.32	Lake Superior	Manitou Island	Siscowet	0.005	38.3
1988	679	0.18	Lake Michigan	Green Bay, Cedar River	Longnose Sucker	0.005	66.3
1989	854	1.23	Pine River	St. Louis Impoundment	Carp	0.005	58.7
1990	534	0.26	Glen Lake	Leelanau County	Lake Trout	0.005	59.4
1991	580	0.66	Torch Lake	Antrim County	Lake Trout	0.005	53.6
1992	486	0.90	Lake Superior	Isle Royale	Lake Trout	0.005	53.9
1993	535	0.37	Lake Michigan	Grand Traverse Bay, West Arm	Lake Whitefish	0.005	51.2
1994	319	0.80	Pine River	Gratiot County, d-s St Louis Dam	Carp	0.005	42.3
1995	458	0.75	Pine River	St. Louis Impoundment	Black Crappie	0.005	52.4
1996	338	0.35	Torch Lake	Antrim County	Lake Trout	0.005	44.7
1997	389	2.93	Pine River	St. Louis Impoundment	Carp	0.005	48.8
1998	775	0.19	Lake Michigan	Grand Traverse Bay	Lake Trout	0.005	80.3
1999	301	0.51	Huron River	Ford Lake	Channel Catfish	0.005	77.7
2000	453	0.06	Chippewa River	Nature Center	Redhorse Sucker	0.005	87.4
2001	376	0.06	Torch Lake	Antrim County	Lake Whitefish	0.001	58.0
2002	322	0.10	Rouge River	Newburgh Lake	Channel Catfish	0.001	63.3
2003	405	0.06	Lake Superior	Keweenaw Bay	Siscowet	0.001	65.9
2004	570	0.04	Lake Michigan	Little Bay De Noc	Carp	0.001	61.0
2005	359	0.11	Baldwin River	near M-37	Brown Trout	0.001	64.9
2006	424	0.03	Menominee River	Menominee, river mouth	Walleye	0.001	75.2
2007	294	0.08	Lake Superior	Keweenaw Bay	Siscowet	0.001	74.8
2008	385	0.05	Flint River	Holloway Reservoir	Channel Catfish	0.001	87.8
2009	127	2.94	Lake Michigan	Platte River	Coho	0.001	37.8
2010	487	0.22	Pine River	Gratiot County, d-s St Louis Dam	Carp	0.001	77.4
2011	412	0.01	Higgins Lake	Roscommon County	Lake Trout	0.001	85.0
2012	432	0.01	Manistique River	d/s Manistique Papers Dam	Walleye	0.001	86.1

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum 2,4' DDD (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1997	30	19.20	Pine River	St. Louis Impoundment	Carp	0.005	0.0
1998	0	---	---	---	---	---	---
1999	7	0.45	Tittabawassee River	Midland County, d-s Dow Dam	Carp	0.005	0.0
2000	6	0.001 (K)	no quantifiable results			0.001	100.0
2001	359	0.13	Ruddiman Creek	Lagoon	Carp	0.001	64.1
2002	331	0.14	Mona Lake	Muskegon County	Carp	0.001	68.3
2003	413	2.18	Tittabawassee River	Midland County, Smiths Crossing Road	Carp	0.001	76.5
2004	540	0.04	Detroit River	Michigan waters	Carp	0.001	71.5
2005	363	0.05	Au Sable River	Oscoda	Carp	0.001	70.8
2006	409	0.02	Huron River	Ford Lake	Carp	0.001	80.9
2007	290	0.02	White Lake	Muskegon County	Carp	0.001	93.4
2008	394	0.02	Kawkawlin River	Bay County, M-247	Carp	0.001	87.0
2009	105	0.01	Baseline Lake	Livingston/Washtenaw County	Carp	0.001	88.6
2010	478	1.85	Pine River	Gratiot County, d-s St Louis Dam	Carp	0.001	73.6
2011	409	0.02	Detroit River	Celeron Island	Carp	0.001	81.9
2012	410	0.01	St. Clair River	Algonac	Carp	0.001	93.4

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum 2,4' DDT (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1989	28	4.27	Pine River	St. Louis Impoundment	Carp	0.005	0
1990	0	---	---	---	---	---	---
1991	0	---	---	---	---	---	---
1992	0	---	---	---	---	---	---
1993	0	---	---	---	---	---	---
1994	11	2.91	Pine River	Gratiot County, d-s St Louis Dam	Carp	0.005	0
1995	20	2.61	Pine River	St. Louis Impoundment	Carp	0.005	0
1996	0	---	---	---	---	---	---
1997	60	9.53	Pine River	St. Louis Impoundment	Carp	0.005	30
1998	0	---	---	---	---	---	---
1999	0	---	---	---	---	---	---
2000	8	0.03	Rouge River, Mid Br	Wayne County, Merriman Road	White Sucker	0.001	75
2001	349	0.01	Lake Superior	Keweenaw Bay, Traverse Island	Siscowet	0.001	94.8
2002	294	0.03	Muskegon Lake	Muskegon County	Carp	0.001	96.9
2003	385	0.02	Rabbit River	d/s Hamilton Dam	Carp	0.001	90.9
2004	509	0.03	White Lake	Muskegon County	Carp	0.001	90.6
2005	360	0.01	Rouge River, Mi Br	d/s Nankin Dam	Carp	0.001	92.8
2006	430	0.01	Menominee River	Menominee, river mouth	Carp	0.001	92.1
2007	302	0.02	Lake Superior	Keweenaw Bay	Siscowet	0.001	96.3
2008	402	0.01	Flint River	Holloway Reservoir	Channel Catfish	0.001	97.8
2009	129	0.01	Torch Lake	Antrim County	Lake Trout	0.001	67.4
2010	476	0.55	Pine River	Gratiot County, d-s St Louis Dam	Carp	0.001	88.4
2011	415	0.003	Kalamazoo River	Morrow Pond	Carp	0.001	96.1
2012	436	0.004	Lake Huron	Les Cheneaux Islands	Carp	0.001	95.2

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Total Chlordane (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	24	0.059	White Lake	Muskegon County	Northern Pike	0.01	12.5
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	162	0.302	Clinton River	Macomb County u-s I-94	Carp	0.003	29.0
1984	333	1.34	Lake Macatawa	Ottawa County	Carp	0.003	18.6
1985	298	0.6	Lake Huron	Saginaw Bay, near Saginaw River	Carp	0.003	7.0
1986	184	2.79	Lake Michigan	Grand Haven	Lake Trout	0.003	0
1987	791	2.57	Lake Michigan	Grand Haven	Lake Trout	0.003	20.0
1988	679	2.02	Lake Michigan	Muskegon	Carp	0.003	50.7
1989	854	1.53	Lake Michigan	Pentwater	Lake Trout	0.003	50.0
1990	534	0.85	Glen Lake	Leelanau County	Lake Trout	0.003	32.4
1991	584	0.8	Torch Lake	Antrim County	Lake Trout	0.003	28.1
1992	504	1.5	Lake Superior	Isle Royale	Lake Trout	0.003	22.2
1993	535	0.72	Lake Michigan	Grand Traverse Bay, West Arm	Lake Whitefish	0.003	21.7
1994	309	0.38	St. Clair River	Rivermouth, North Channel	Carp	0.003	25.9
1995	439	1.74	Lake Macatawa	Ottawa County	Carp	0.003	30.5
1996	338	1.026	Torch Lake	Antrim County	Lake Trout	0.003	17.2
1997	389	0.376	Lake Michigan	Grand Traverse Bay	Lake Trout	0.003	26.5
1998	775	0.988	Lake Michigan	Grand Traverse Bay	Lake Trout	0.003	56.5
1999	301	0.493	Au Sable River	Oscoda	Carp	0.003	30.9
2000	453	0.144	Red Cedar River	MSU	Carp	0.001	55.8
2001	391	1.131	Lake Orion	Oakland County	Carp	0.001	40.4
2002	373	0.535	Lake Superior	Marquette	Lake Trout	0.001	45.0
2003	467	0.71	Tittabawassee River	Midland Co, Smiths Crossing Rd	Carp	0.001	44.8
2004	644	0.185	White Lake	Muskegon County	Carp	0.001	34.6
2005	370	0.146	Au Sable River	Oscoda	Carp	0.001	38.6
2006	434	0.225	Huron River	Ford Lake	Carp	0.001	45.4
2007	304	0.444	Lake Superior	Keweenaw Bay	Siscowet	0.001	57.6
2008	402	0.107	Manistique River	d/s Manistique Papers Dam	Carp	0.001	54.2
2009	127	0.158	Torch Lake	Antrim County	Lake Trout	0.001	18.1
2010	488	0.496	Lake St. Clair	10 Mile Canal	Carp	0.001	62.1
2011	416	0.138	Lake St. Clair	St. Clair Shores	Carp	0.001	53.1
2012	437	0.112	Manistique River	d/s Manistique Papers Dam	Carp	0.001	66.6

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum <i>trans</i> -Nonachlor (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	24	0.052	White Lake	Muskegon County	Carp	0.01	16.7
1981	0	---	no data	---	---	---	---
1982	0	---	no data	---	---	---	---
1983	148	0.15	Lake Michigan	St. Joseph River, Berrien Springs	Chinook	0.003	38.5
1984	325	0.36	St. Joseph River	Berrien Springs, below Dam	Carp	0.003	26.8
1985	298	0.289	Pine River	Midland County, Homer Road	Carp	0.003	11.1
1986	184	1.3	Lake Michigan	Grand Haven	Lake Trout	0.003	0
1987	751	1.18	Lake Michigan	Grand Haven	Lake Trout	0.003	16.2
1988	679	0.64	Lake Michigan	Muskegon	Carp	0.003	51.5
1989	846	0.814	Lake Michigan	Pentwater	Lake Trout	0.003	50.4
1990	534	0.443	Glen Lake	Leelanau County	Lake Trout	0.003	32.6
1991	584	0.395	Lake Michigan	Pentwater	Lake Trout	0.003	29.1
1992	504	0.726	Lake Superior	Isle Royale	Lake Trout	0.003	22.8
1993	535	0.36	Lake Michigan	Grand Traverse Bay, West Arm	Lake Whitefish	0.003	22.1
1994	309	0.171	Cheboyganing Creek	Saginaw County	Carp	0.003	25.9
1995	439	0.464	Lake Macatawa	Ottawa County	Carp	0.003	31.7
1996	338	0.499	Torch Lake	Antrim County	Lake Trout	0.003	18.3
1997	389	0.214	Elk Lake	Grand Traverse/Antrim County	Lake Trout	0.003	31.4
1998	775	0.517	Lake Michigan	Grand Traverse Bay	Lake Trout	0.003	56.8
1999	301	0.153	Au Sable River	Oscoda	Carp	0.003	37.2
2000	453	0.054	Red Cedar River	MSU	Carp	0.001	57.8
2001	389	0.318	Lake Orion	Oakland County	Carp	0.001	40.6
2002	373	0.233	Lake Superior	Marquette	Lake Trout	0.001	45.8
2003	467	0.659	Tittabawassee River	Midland Co, Smiths Crossing Rd	Carp	0.001	47.5
2004	633	0.07	Lake Huron	Thunder Bay	Lake Trout	0.001	36.5
2005	370	0.074	Lake Michigan	Green Bay, Cedar River	Walleye	0.001	40.5
2006	433	0.071	Menominee River	Menominee, river mouth	Walleye	0.001	49.4
2007	304	0.203	Lake Superior	Keweenaw Bay	Siscowet	0.001	58.2
2008	401	0.045	Manistique River	d/s Manistique Papers Dam	Carp	0.001	54.9
2009	129	0.085	Torch Lake	Antrim County	Lake Trout	0.001	18.6
2010	486	0.251	Lake St. Clair	10 Mile Canal	Carp	0.001	65
2011	413	0.066	Higgins Lake	Roscommon County	Lake Trout	0.001	57.4
2012	437	0.053	Manistique River	d/s Manistique Papers Dam	Carp	0.001	68.6

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Oxychlorane (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	24	0.025	White Lake	Muskegon County	Carp	0.01	20.8
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	47	0.012	Clinton River	Macomb County u-s I-94	Carp	0.003	89.4
1984	247	0.080	Manistique River	d/s Manistique Papers Dam	White Sucker	0.003	52.6
1985	233	0.100	Lake Huron	Saginaw Bay, near Saginaw River	Channel Catfish	0.003	28.3
1986	144	0.240	Lake Michigan	Grand Haven	Lake Trout	0.003	42.4
1987	701	0.235	Lake Superior	Manitou Island	Siscowet	0.003	56.5
1988	634	0.063	Lake Michigan	Muskegon	Carp	0.003	81.4
1989	779	0.163	Lake Superior	Isle Royale	Lake Trout	0.003	73.3
1990	534	0.060	Lake Michigan	Muskegon	Lake Whitefish	0.003	65.7
1991	584	0.062	Lake Superior	Marquette	Siscowet	0.003	62.7
1992	504	0.200	Lake Superior	Isle Royale	Lake Trout	0.003	50.8
1993	535	0.077	Lake Michigan	Grand Traverse Bay, West Arm	Lake Whitefish	0.003	55.5
1994	309	0.021	Cheboyganing Creek	Saginaw County	Carp	0.003	56.6
1995	439	0.099	Lake Superior	Marquette	Siscowet	0.003	61
1996	338	0.069	Lake Superior	Central	Siscowet	0.003	48.2
1997	389	0.028	Lake Michigan	Muskegon	Lake Whitefish	0.003	60.7
1998	775	0.064	Lake Michigan	Grand Traverse Bay	Lake Trout	0.003	80.1
1999	301	0.026	Huron River	Ford Lake	Channel Catfish	0.003	79.1
2000	453	0.032	Loon Lake	Oakland County	Carp	0.001	95.6
2001	373	0.026	Lake Superior	Keweenaw Bay, Traverse Island	Siscowet	0.001	67.3
2002	351	0.073	Lake Superior	Marquette	Lake Trout	0.001	81.2
2003	450	0.039	Lake Superior	Keweenaw Bay	Siscowet	0.001	84.4
2004	588	0.010	White Lake	Muskegon County	Carp	0.001	80.8
2005	370	0.022	St. Joseph River	Chapin Lake	Carp	0.001	86.2
2006	431	0.007	Menominee River	Menominee, river mouth	Carp	0.001	92.3
2007	304	0.041	Lake Superior	Keweenaw Bay	Siscowet	0.001	89.1
2008	401	0.006	Manistique River	d/s Manistique Papers Dam	Carp	0.001	94.3
2009	128	0.010	Torch Lake	Antrim County	Lake Trout	0.001	53.9
2010	476	0.004	Pine River	Gratiot Co, d-s St Louis Dam	Carp	0.001	94.3
2011	414	0.003	Higgins Lake	Roscommon County	Lake Trout	0.001	90.8
2012	436	0.005	Manistique River	d/s Manistique Papers Dam	Carp	0.001	95.2

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum <i>gamma</i> -Chlordane (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	162	0.180	Lake Huron	Saginaw Bay, Sand Point	Walleye	0.003	32.7
1984	324	0.290	Lake Macatawa	Ottawa County	Carp	0.003	49.1
1985	298	0.128	Lake Michigan	Manistique River	Rainbow Trout	0.003	17.4
1986	184	0.220	Kalamazoo River	Kalamazoo Lake	Carp	0.003	41.8
1987	700	0.174	Lake Michigan	Grand Haven	Lake Trout	0.003	45.3
1988	634	0.412	Lake Michigan	Muskegon	Carp	0.003	79.5
1989	779	0.205	Black River, S. Branch	d-s Bangor Dam	Carp	0.003	73.2
1990	534	0.074	Lake Michigan	Muskegon	Lake Whitefish	0.003	63.1
1991	584	0.061	Torch Lake	Antrim County	Lake Trout	0.003	54.6
1992	504	0.198	Galien River	New Buffalo	Carp	0.003	51.2
1993	535	0.070	Flint River	Birch Run Road	Carp	0.003	55.5
1994	309	0.122	St. Clair River	Rivermouth, North Channel	Carp	0.003	51.5
1995	439	0.398	Lake Macatawa	Ottawa County	Carp	0.003	59.2
1996	338	0.059	Torch Lake	Antrim County	Lake Trout	0.003	52.1
1997	389	0.054	Pine River	Gratiot Co, d-s St Louis Dam	Carp	0.003	62.2
1998	775	0.053	Lake Michigan	Grand Traverse Bay	Lake Trout	0.003	78.8
1999	301	0.070	Osmun Lake	Oakland County	Carp	0.003	65.4
2000	453	0.024	Loon Lake	Oakland County	Carp	0.001	86.1
2001	383	0.268	Lake Orion	Oakland County	Carp	0.001	68.1
2002	336	0.041	Muskegon Lake	Muskegon County	Carp	0.001	76.2
2003	445	0.018	Rabbit River	d/s Hamilton Dam	Carp	0.001	74.6
2004	573	0.029	White Lake	Muskegon County	Carp	0.001	73.1
2005	358	0.016	Fremont Lake	Newaygo County	Carp	0.001	80.4
2006	434	0.019	Ottawa River	Mouth	Carp	0.001	85
2007	304	0.034	White Lake	Muskegon County	Carp	0.001	93.1
2008	401	0.008	Manistique River	d/s Manistique Papers Dam	Carp	0.001	90.5
2009	127	0.012	Baseline Lake	Livingston/Washtenaw County	Carp	0.001	54.3
2010	484	0.072	Lake St. Clair	10 Mile Canal	Carp	0.001	77.5
2011	416	0.028	Lake St. Clair	St. Clair Shores	Carp	0.001	75.2
2012	437	0.009	St. Clair River	Algonac	Carp	0.001	88.3

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum <i>alpha</i> -Chlordane (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	142	0.12	Lake Huron	Saginaw Bay, Sand Point	Walleye	0.003	28.2
1984	327	0.46	Lake Macatawa	Ottawa County	Carp	0.003	35.8
1985	297	0.129	Detroit River	Belle Isle	Carp	0.003	14.5
1986	184	0.553	Lake Michigan	Grand Haven	Lake Trout	0.003	28.3
1987	700	0.433	Lake Michigan	Grand Haven	Lake Trout	0.003	33.1
1988	634	0.578	Lake Michigan	Muskegon	Carp	0.003	63.2
1989	779	0.291	Black River, S. Branch	D-s of Bangor Dam	Carp	0.003	63.5
1990	534	0.156	Glen Lake	Leelanau County	Lake Trout	0.003	44.4
1991	584	0.113	Torch Lake	Antrim County	Lake Trout	0.003	39.4
1992	504	0.34	Galien River	New Buffalo	Carp	0.003	34.3
1993	535	0.123	Lake Huron	Thunder Bay	Channel Catfish	0.003	33.8
1994	309	0.112	St. Clair River	Rivermouth, North Channel	Carp	0.003	30.4
1995	439	0.558	Lake Macatawa	Ottawa County	Carp	0.003	39.4
1996	338	0.156	Torch Lake	Antrim County	Lake Trout	0.003	29
1997	389	0.085	Lake Michigan	Grand Traverse Bay	Lake Whitefish	0.003	44
1998	775	0.185	Lake Michigan	Grand Traverse Bay	Lake Trout	0.003	68.9
1999	301	0.132	Au Sable River	Oscoda	Carp	0.003	38.5
2000	449	0.043	Red Cedar River	MSU	Carp	0.001	71
2001	391	0.408	Lake Orion	Oakland County	Carp	0.001	56.3
2002	373	0.072	Muskegon Lake	Muskegon County	Carp	0.001	56.3
2003	460	0.05	Rabbit River	d/s Hamilton Dam	Carp	0.001	64.1
2004	576	0.054	White Lake	Muskegon County	Carp	0.001	54
2005	362	0.027	Au Sable River	Oscoda	Carp	0.001	51.7
2006	434	0.04	Menominee River	river mouth	Carp	0.001	66.8
2007	304	0.069	White Lake	Muskegon County	Carp	0.001	77
2008	402	0.024	Manistique River	d/s Manistique Papers Dam	Carp	0.001	74.1
2009	129	0.035	Baseline Lake	Livingston/Washtenaw County	Carp	0.001	29.5
2010	487	0.152	Lake St. Clair	10 Mile Canal	Carp	0.001	69.8
2011	416	0.052	Lake St. Clair	St. Clair Shores	Carp	0.001	59.4
2012	437	0.022	St. Clair River	Algonac	Carp	0.001	77.8

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum <i>cis</i> -Nonachlor (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	139	0.040	Lake Michigan	St. Joseph River, Berrien Springs	Chinook	0.003	38.1
1984	333	0.710	White Lake	Muskegon County	Carp	0.003	30.3
1985	283	0.076	Detroit River	Belle Isle	Carp	0.003	17.7
1986	184	0.050	Lake Michigan	Grand Haven	Lake Trout	0.003	5.4
1987	752	0.552	Lake Michigan	Grand Haven	Lake Trout	0.003	27.7
1988	679	0.335	Lake Michigan	Muskegon	Carp	0.003	58.9
1989	854	0.310	Lake Superior	Isle Royale	Lake Trout	0.003	59.3
1990	534	0.152	Glen Lake	Leelanau County	Lake Trout	0.003	53.7
1991	584	0.221	Torch Lake	Antrim County	Lake Trout	0.003	45.2
1992	504	0.373	Lake Superior	Isle Royale	Lake Trout	0.003	37.5
1993	535	0.145	Lake Michigan	Grand Traverse Bay, West Arm	Lake Whitefish	0.003	38.9
1994	309	0.094	Cheboyganing Creek	Saginaw County	Carp	0.003	33
1995	438	0.225	Lake Macatawa	Ottawa County	Carp	0.003	46.1
1996	338	0.263	Torch Lake	Antrim County	Lake Trout	0.003	31.1
1997	389	0.087	Elk Lake	Grand Traverse/Antrim County	Lake Trout	0.003	41.4
1998	775	0.259	Higgins Lake	Roscommon County	Lake Trout	0.003	68.4
1999	301	0.130	Au Sable River	Oscoda	Carp	0.003	49.8
2000	453	0.029	Lake Superior	Carp River	Chinook	0.001	75.7
2001	388	0.128	Lake Orion	Oakland County	Carp	0.001	54.1
2002	359	0.190	Lake Superior	Marquette	Lake Trout	0.001	58.8
2003	463	0.169	Lake Superior	Keweenaw Bay	Siscowet	0.001	57.5
2004	600	0.051	Lake Michigan	Little Bay De Noc	Carp	0.001	48.3
2005	340	0.039	Lake Michigan	Green Bay, Cedar River	Walleye	0.001	62.4
2006	432	0.184	Huron River	Ford Lake	Carp	0.001	58.1
2007	300	0.175	Lake Superior	Keweenaw Bay	Siscowet	0.001	67
2008	393	0.024	Manistique River	d/s Manistique Papers Dam	Carp	0.001	67.4
2009	129	0.055	Torch Lake	Antrim County	Lake Trout	0.001	23.3
2010	488	0.021	Lake St. Clair	10 Mile Canal	Carp	0.001	76.6
2011	416	0.033	Higgins Lake	Roscommon County	Lake Trout	0.001	68.8
2012	437	0.030	Manistique River	d/s Manistique Papers Dam	Carp	0.001	73.5

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Hexachlorobenzene (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	24	0.022	White Lake	Muskegon County	Carp	0.001	54.2
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	131	0.068	Clinton River	Macomb Co u-s I-94	White Sucker	0.001	96.2
1984	289	0.034	Chippewa River	Midland County	Channel Catfish	0.001	49.8
1985	284	0.257	Lake St. Clair	St. Johns Marsh	Carp	0.001	44.0
1986	184	0.17	St. Clair River	Algonac	Carp	0.001	43.5
1987	790	0.31	Lake St. Clair	Michigan waters	Channel Catfish	0.001	63.4
1988	679	0.063	Lake Michigan	Green Bay, Cedar River	Longnose Sucker	0.001	73.5
1989	854	0.027	Lake Superior	Isle Royale	Lake Trout	0.001	72.0
1990	534	0.019	Detroit River	Trenton Channel	Carp	0.001	69.3
1991	580	0.018	Lake Superior	Marquette	Siscowet	0.001	65.2
1992	504	0.1	Lake Superior	Central	Lake Trout	0.001	55.0
1993	535	0.016	Lake Michigan	Grand Traverse Bay	Lake Whitefish	0.001	58.3
1994	319	0.039	Detroit River	Grassy Island	Carp	0.001	60.5
1995	458	0.036	Pine River	St. Louis Impoundment	Carp	0.001	72.9
1996	338	0.017	Torch Lake	Antrim County	Lake Trout	0.001	52.1
1997	389	0.011	Pine River	Gratiot Co, d-s St Louis Dam	Carp	0.001	56.8
1998	775	0.014	Lake Michigan	Grand Traverse Bay	Lake Trout	0.001	67.5
1999	297	0.016	Osmun Lake	Oakland County	Carp	0.001	32.3
2000	452	0.006	Lake Erie	Off Monroe	Carp	0.001	80.5
2001	385	0.067	Lake St. Clair	Michigan waters	Carp	0.001	82.3
2002	373	0.007	Lake Superior	Marquette	Lake Trout	0.001	82.0
2003	462	0.043	Tittabawassee River	Smiths Crossing Road	Carp	0.001	74.5
2004	632	0.017	Clinton River	Ryan Road, Utica	Rock Bass	0.001	81.5
2005	370	0.007	Thompson Lake	Livingston County	Carp	0.001	90.5
2006	434	0.007	Lake Erie	Off Monroe	Carp	0.001	89.2
2007	304	0.006	Lake Superior	Keweenaw Bay	Siscowet	0.001	89.5
2008	402	0.034	Sylvan/Otter Lake	Oakland Co	Carp	0.001	91.8
2009	129	0.006	Lake Michigan	Grand Traverse Bay	Lake Trout	0.001	33.3
2010	488	0.006	Loon Lake	Oakland County	Carp	0.001	82.8
2011	416	0.01	Lake Nepessing	Lapeer County	Carp	0.001	69.0
2012	437	0.003	St. Clair River	Algonac	Carp	0.001	79.6

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum PBB (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	24	0.001 (K)	White Lake	Muskegon County	several	0.001	100
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	33	0.81	Pine River	Gratiot Co, dis St Louis Dam	White Sucker	0.005	75.8
1984	67	0.56	Chippewa River	Midland County	Channel Catfish	0.005	61.2
1985	10	0.8	Pine River	Midland Co, Homer Road	White Sucker	0.005	0
1986	114	0.08	Raisin River	Monroe, d-s Winchester Bridge	Carp	0.005	97.4
1987	701	0.008	Tittabawassee River	Midland County, d-s Dow Dam	Walleye	0.005	99.4
1988	619	0.005 (K)		no quantifiable results		0.005	100
1989	779	0.811	Pine River	St. Louis Impoundment	Black Crappie	0.005	96.8
1990	489	0.005 (K)		no quantifiable results		0.005	100
1991	505	0.005 (K)		no quantifiable results		0.005	100
1992	443	0.005 (K)		no quantifiable results		0.005	100
1993	467	0.005 (K)		no quantifiable results		0.005	100
1994	277	0.06	Bad River	Saginaw County	Northern Pike	0.005	99.6
1995	372	1.45	Pine River	St. Louis Impoundment	Black Crappie	0.005	97.3
1996	271	0.005 (K)		no quantifiable results		0.005	100
1997	300	0.8	Pine River	St. Louis Impoundment	Smallmouth Bass	0.005	93.7
1998	690	0.005 (K)		no quantifiable results		0.005	100
1999	301	0.005 (K)		no quantifiable results		0.005	100
2000	453	0.005 (K)		no quantifiable results		0.005	100
2001	391	0.001 (K)		no quantifiable results		0.001	100
2002	373	0.001 (K)		no quantifiable results		0.001	100
2003	462	0.002	Lake Michigan	Green Bay	Brown Trout	0.001	99.6
2004	644	0.001 (K)		no quantifiable results		0.001	99.8
2005	362	0.001 (K)		no quantifiable results		0.001	96.1
2006	435	0.002	St. Clair River	Marine City	Walleye	0.001	95.6
2007	303	0.002	Lake Superior	Keweenaw Bay	Siscowet	0.001	97.4
2008	401	0.003	Raisin River	Monroe, d-s Winchester Bridge	Channel Catfish	0.001	96.8
2009	170	0.006	Torch Lake	Antrim County	Lake Trout	0.001	86.5
2010	470	0.029	Pine River	Gratiot Co, d-s St Louis Dam	Smallmouth Bass	0.001	86.4
2011	329	0.003	Higgins Lake	Roscommon County	Lake Trout	0.001	98.8
2012	427	0.004	Manistique River	d/s Manistique Papers Dam	Redhorse Sucker	0.001	95.3

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum <i>gamma</i> -BHC (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL (K)
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	105	varied RL		no quantifiable results		varied	100
1984	147	0.025	Lake Huron	Tawas River	Coho	0.005	78.2
1985	75	0.05 (K)		no quantifiable results		0.05	100
1986	169	0.005	Lake Erie	Off Monroe	Channel Catfish	0.005	99.4
1987	539	0.005 (K)		no quantifiable results		0.005	100
1988	679	0.005 (K)		no quantifiable results		0.005	100
1989	779	0.005 (K)		no quantifiable results		0.005	100
1990	489	0.005 (K)		no quantifiable results		0.005	100
1991	580	0.005 (K)		no quantifiable results		0.005	100
1992	486	0.005 (K)		no quantifiable results		0.005	100
1993	535	0.005 (K)		no quantifiable results		0.005	100
1994	319	0.005 (K)		no quantifiable results		0.005	100
1995	458	0.005 (K)		no quantifiable results		0.005	100
1996	338	0.005 (K)		no quantifiable results		0.005	100
1997	389	0.005 (K)		no quantifiable results		0.005	100
1998	775	0.005 (K)		no quantifiable results		0.005	100
1999	301	0.005 (K)		no quantifiable results		0.005	100
2000	452	0.005 (K)		no quantifiable results		0.005	100
2001	269	0.001 (K)		no quantifiable results		0.001	100
2002	267	0.001	Rouge River, Middle Branch	Phoenix Lake	Northern Pike	0.001	99.6
2003	353	0.002	Lake Superior	Keweenaw Bay	Siscowet	0.001	99.7
2004	533	0.003	Saginaw River	Bay County, LaFayette	Carp	0.001	99.4
2005	363	0.001 (K)		no quantifiable results		0.001	100
2006	434	0.001 (K)		no quantifiable results		0.001	100
2007	304	0.002	Lake Superior	Keweenaw Bay	Lake Whitefish	0.001	94.7
2008	402	0.001 (K)		no quantifiable results		0.001	100
2009	128	0.001 (K)		no quantifiable results		0.001	100
2010	470	0.01	Lake St. Clair	10 Mile Canal	Carp	0.001	99.4
2011	415	0.001	Lake St. Clair	St. Clair Shores	Walleye	0.001	99.8
2012	437	0.001 (K)		no quantifiable results		0.001	100

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Aldrin (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	61	0.3	Clinton River	Macomb County u-s I-94	Carp	0.05	95.1
1984	133	0.89	Raisin River	Monroe, d-s Winchester Bridge	Smallmouth Bass	0.05	86.5
1985	2	0.98	Cass River	Saginaw Co, Dixie Highway	Carp	0.05	0
1986	114	0.04 (K)	Lake Michigan	Grand Haven	Lake Trout	0.05	100
1987	509	0.005 (K)		no quantifiable results		0.005	100
1988	619	0.005 (K)		no quantifiable results		0.005	100
1989	779	0.005 (K)		no quantifiable results		0.005	100
1990	489	0.005 (K)		no quantifiable results		0.005	100
1991	505	0.005 (K)		no quantifiable results		0.005	100
1992	443	0.005 (K)		no quantifiable results		0.005	100
1993	467	0.005 (K)		no quantifiable results		0.005	100
1994	277	0.005 (K)		no quantifiable results		0.005	100
1995	382	0.005 (K)		no quantifiable results		0.005	100
1996	271	0.005 (K)		no quantifiable results		0.005	100
1997	300	0.005 (K)		no quantifiable results		0.005	100
1998	775	0.005 (K)		no quantifiable results		0.005	100
1999	301	0.005 (K)		no quantifiable results		0.005	100
2000	453	0.005 (K)		no quantifiable results		0.005	100
2001	391	0.001 (K)		no quantifiable results		0.001	100
2002	373	0.001 (K)		no quantifiable results		0.001	100
2003	467	0.001 (K)		no quantifiable results		0.001	100
2004	644	0.001 (K)		no quantifiable results		0.001	100
2005	368	0.001	Thompson Lake	Livingston County	Northern Pike	0.001	99.7
2006	435	0.001 (K)		no quantifiable results		0.001	100
2007	304	0.001 (K)		no quantifiable results		0.001	100
2008	401	0.001 (K)		no quantifiable results		0.001	100
2009	124	0.001 (K)		no quantifiable results		0.001	100
2010	484	0.001 (K)		no quantifiable results		0.001	100
2011	415	0.001 (K)		no quantifiable results		0.001	100
2012	437	0.001 (K)		no quantifiable results		0.001	100

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Dieldrin (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	24	0.28	White Lake	Muskegon County	Carp	0.01	66.7
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	289	0.41	Lake Michigan	Glen Haven	Lake Trout	0.01	39.1
1984	468	0.93	Lake Michigan	Grand Traverse Bay	Lake Trout	0.01	24.1
1985	313	0.1	Lake Michigan	Manistee River	Chinook	0.01	17.6
1986	156	0.69	Kalamazoo River	Kalamazoo Lake	Carp	0.01	0
1987	752	0.64	Lake Superior	West of Keweenaw	Lake Trout	0.005	33.5
1988	679	0.551	Lake Michigan	Muskegon	Carp	0.005	67.2
1989	854	0.486	Lake Michigan	Pentwater	Lake Trout	0.005	63.7
1990	534	0.499	Lake Michigan	Muskegon	Lake Whitefish	0.005	47.0
1991	580	0.236	Lake Superior	Marquette	Siscowet	0.005	45.7
1992	504	0.307	Galien River	New Buffalo	Carp	0.005	39.5
1993	535	0.281	Lake Michigan	Grand Traverse Bay	Lake Whitefish	0.005	41.9
1994	315	0.211	Cheboyganing Creek	Saginaw County	Carp	0.005	40.6
1995	453	0.393	Lake Macatawa	Ottawa County	Carp	0.005	61.1
1996	338	0.144	Lake Michigan	Grand Haven	Lake Trout	0.005	35.2
1997	389	0.156	Lake Michigan	Muskegon	Lake Whitefish	0.005	52.7
1998	775	0.261	Lake Michigan	Grand Traverse Bay	Lake Trout	0.005	74.1
1999	301	0.071	Lake Michigan	Green Bay	Lake Whitefish	0.005	71.4
2000	453	0.066	Lake Superior	Central	Lake Whitefish	0.001	86.5
2001	391	0.094	Lake Superior	Keweenaw Bay	Siscowet	0.001	59.3
2002	361	0.031	Lake Superior	Marquette	Lake Trout	0.001	74.2
2003	447	0.065	Lake Superior	Keweenaw Bay	Siscowet	0.001	68.0
2004	640	0.028	Lake Michigan	St. Joseph River, Berrien Springs	Rainbow Trout	0.001	70.5
2005	368	0.021	Au Sable River	Oscoda	Carp	0.001	50.8
2006	428	0.03	Ottawa River	Mouth	Carp	0.001	50.5
2007	285	0.047	Lake Superior	Keweenaw Bay	Lake Whitefish	0.001	64.2
2008	398	0.013	Raisin River	Monroe, d-s Winchester Bridge	Channel Catfish	0.001	73.4
2009	127	0.033	Lake Michigan	Grand Traverse Bay	Lake Trout	0.001	42.5
2010	488	0.005	Detroit River	Belle Isle	Carp	0.001	94.7
2011	413	0.013	Lake Erie	Off Monroe	Channel Catfish	0.001	79.9
2012	437	0.009	Manistique River	d/s Manistique Papers Dam	Carp	0.001	87.6

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Apparent Toxaphene (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	165	0.6	Lake Huron	Tawas River	Chinook	0.05	67.3
1984	205	0.153	Lake Huron	Saginaw Bay, Charity Island	Walleye	0.05	65.9
1985	219	1	Lake Michigan	Manistique River	Rainbow Trout	0.05	64.8
1986	81	4.7	Kalamazoo River	Kalamazoo Lake	Carp	0.05	90.1
1987	790	10	Lake Superior	Manitou Island	Siscowet	0.05	78.7
1988	679	2	Lake Michigan	Muskegon	Carp	0.05	83.8
		2	Lake Superior	Laughing Whitefish River	Chinook		
1989	854	8.1	Lake Superior	Isle Royale	Lake Trout	0.05	81.7
1990	534	1.2	Lake Michigan	Muskegon	Lake Whitefish	0.05	78.1
1991	580	3	Lake Superior	Marquette	Siscowet	0.05	75.3
1992	486	8.6	Lake Superior	Isle Royale	Lake Trout	0.05	74.3
1993	534	1.5	Torch Lake	Antrim County	Lake Trout	0.05	78.5
1994	319	0.55	Lake Michigan	Platte River Hatchery	Coho	0.05	84.3
1995	458	4.5	Lake Superior	Marquette	Siscowet	0.05	91.9
1996	338	3	Lake Superior	Central	Siscowet	0.05	55
1997	389	1.5	Lake Superior	Carp River	Chinook	0.05	85.3
1998	775	1.5	Lake Michigan	Grand Traverse Bay	Lake Trout	0.05	83.6
1999	301	1	Au Sable River	Oscoda	Carp	0.05	96.3
2000	453	0.45	Lake Superior	Central	Lake Whitefish	0.05	92.7
2001	391	0.583	Lake Superior	Keweenaw Bay, Traverse Island	Siscowet	0.05	95.1
2002	373	0.466	Muskegon Lake	Muskegon County	Carp	0.05	89.8
2003	467	2.264	Lake Superior	Keweenaw Bay	Siscowet	0.05	93.8
2004	644	0.2	Lake Huron	Thunder Bay	Lake Trout	0.05	98.8
2005	367	0.05 (K)		no quantifiable results		0.05	100
2006	435	0.05 (K)		no quantifiable results		0.05	100
2007	304	0.05	Pere Marquette Lake	Mason County	Northern Pike	0.05	99.7
2008	401	0.05 (K)		no quantifiable results		0.05	100
2009	128	0.05 (K)		no quantifiable results		0.05	100
2010	488	0.05	Loon Lake	Oakland County	Carp	0.05	99.8
2011	415	0.05 (K)		no quantifiable results		0.05	100
2012	437	0.05	Manistique River	d/s Manistique Papers Dam	Carp	0.05	99.5
		0.05	Lake St. Clair	Anchor Bay	Carp		

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Mirex (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	24	0.08	White Lake	Muskegon County	Carp	0.005	60
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	0	---	---	---	---	---	---
1984	0	---	---	---	---	---	---
1985	0	---	---	---	---	---	---
1986	0	---	---	---	---	---	---
1987	515	0.014	Lake St. Clair	Michigan waters	Channel Catfish	0.005	99.4
1988	619	0.005 (K)		no quantifiable results		0.005	100
1989	779	0.005 (K)		no quantifiable results		0.005	100
1990	489	0.005 (K)		no quantifiable results		0.005	100
1991	505	0.005 (K)		no quantifiable results		0.005	100
1992	443	0.005 (K)		no quantifiable results		0.005	100
1993	467	0.005 (K)		no quantifiable results		0.005	100
1994	277	0.005 (K)		no quantifiable results		0.005	100
1995	382	0.005 (K)		no quantifiable results		0.005	100
1996	271	0.005 (K)		no quantifiable results		0.005	100
1997	300	0.005 (K)		no quantifiable results		0.005	100
1998	775	0.005	Lake Huron	Swan River	Chinook	0.005	99.1
1999	301	0.005 (K)		no quantifiable results		0.005	100
2000	449	0.005 (K)		no quantifiable results		0.005	99.9
2001	355	0.007	Grand River	Eaton Rapids, Gale Road	Carp	0.001	94
2002	343	0.027	Lake Superior	Marquette	Lake Trout	0.001	94.1
2003	409	0.026	Lake Superior	Keweenaw Bay	Siscowet	0.001	87.2
2004	602	0.074	White Lake	Muskegon County	Carp	0.001	88.9
2005	369	0.007	Lake Macatawa	Ottawa County	Carp	0.001	86.9
2006	433	0.003	St. Clair River	Marine City	Walleye	0.001	89.1
2007	304	0.056	White Lake	Muskegon County	Carp	0.001	83.8
2008	402	0.005	Raisin River	Monroe, d-s Winchester Bridge	Carp	0.001	86.4
2009	118	0.006	Torch Lake	Antrim County	Lake Trout	0.001	70
2010	487	0.002	Detroit River	Belle Isle	Carp	0.001	80.1
2011	414	0.003	Detroit River	Celeron Island	Carp	0.001	79.8
2012	437	0.004	Manistique River	d/s Manistique Papers Dam	Carp	0.001	86.8

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Octachloro-styrene (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	0	---	---	---	---	---	---
1984	53	0.004	Saginaw River	Bay County, LaFayette	Carp	0.001	58.5
1985	176	1.220	Lake St. Clair	St. Johns Marsh	Carp	0.001	47.2
1986	114	0.170	St. Clair River	Algonac	Carp	0.001	42.1
1987	700	0.686	Lake St. Clair	Michigan waters	Channel Catfish	0.001	68.9
1988	619	0.050	Lake St. Clair	Michigan waters	White Bass	0.001	81.4
1989	779	0.032	Cheboyganing Creek	Saginaw County	Carp	0.001	83.2
1990	489	0.021	Detroit River	Trenton Channel	Carp	0.001	88.3
1991	505	0.067	White Lake	Muskegon County	Carp	0.001	76.4
1992	443	0.404	Tittabawassee River	Midland Co, d-s Dow Dam	Carp	0.001	72.2
1993	467	0.060	Detroit River	Trenton Channel	Redhorse Sucker	0.001	68.1
1994	277	0.077	Detroit River	Grassy Island	Carp	0.001	79.1
1995	382	0.072	St. Marys River	Munuscong Bay	Carp	0.001	80.6
1996	271	0.006	Flint River	Mott Reservoir	Carp	0.001	80.1
1997	300	0.012	Au Sable River	Oscoda	Carp	0.001	61.7
1998	775	0.047	Lake St. Clair	L'Anse Creuse Bay	Channel Catfish	0.001	80.6
1999	301	0.047	Tittabawassee River	Midland Co, d-s Dow Dam	Carp	0.001	70.8
2000	452	0.022	Lake Erie	Off Monroe	Carp	0.001	89.8
2001	385	0.508	Lake St. Clair	Michigan waters	Carp	0.001	88.3
2002	362	0.010	Lake Erie	Western Basin	Channel Catfish	0.001	94.2
2003	355	0.152	Tittabawassee River	Midland Co, Smiths Crossing Rd	Carp	0.001	82.3
2004	608	0.029	White Lake	Muskegon County	Carp	0.001	77.1
2005	370	0.022	Au Sable River	Oscoda	Carp	0.001	96.8
2006	434	0.028	Lake Erie	Off Monroe	Carp	0.001	90.6
2007	304	0.036	White Lake	Muskegon County	Carp	0.001	95.4
2008	402	0.025	Raisin River	Monroe, d-s Winchester Bridge	Carp	0.001	91.5
2009	111	0.001	Torch Lake	Antrim County	Lake Trout	0.001	86.5
2010	488	0.014	Lake St. Clair	Michigan waters	Muskellunge	0.001	85
2011	416	0.018	Detroit River	Celeron Island	Channel Catfish	0.001	76
2012	437	0.017	St. Clair River	Algonac	Carp	0.001	88.6

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Hexachloro-styrene (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	0	---	---	---	---	---	---
1984	0	---	---	---	---	---	---
1985	0	---	---	---	---	---	---
1986	0	---	---	---	---	---	---
1987	509	0.012	Lake Huron	Saginaw Bay, Au Gres	Carp	0.001	97.6
1988	619	0.060	Lake St. Clair	Michigan waters	White Bass	0.001	96.6
1989	779	0.001 (K)		no quantifiable results		0.001	100
1990	489	0.001 (K)		no quantifiable results		0.001	100
1991	505	0.001 (K)		no quantifiable results		0.001	100
1992	443	0.001 (K)		no quantifiable results		0.001	100
1993	467	0.002	Lake Huron	Thunder Bay	Carp	0.001	99.8
1994	277	0.005	Lake St. Clair	L'Anse Creuse Bay	Channel Catfish	0.001	99.6
1995	382	0.002	St. Marys River	Munuscong Bay	Carp	0.001	99.7
1996	271	0.001 (K)		no quantifiable results		0.001	100
1997	300	0.001 (K)		no quantifiable results		0.001	100
1998	690	0.011	Lake St. Clair	L'Anse Creuse Bay	Channel Catfish	0.001	97.8
1999	301	0.001 (K)		no quantifiable results		0.001	100
2000	453	0.001 (K)		no quantifiable results		0.001	100
2001	391	0.001 (K)		no quantifiable results		0.001	100
2002	373	0.001 (K)		no quantifiable results		0.001	100
2003	467	0.001 (K)		no quantifiable results		0.001	100
2004	644	0.001 (K)		no quantifiable results		0.001	100
2005	369	0.001 (K)		no quantifiable results		0.001	100
2006	435	0.001 (K)		no quantifiable results		0.001	100
2007	304	0.001 (K)		no quantifiable results		0.001	100
2008	401	0.001 (K)		no quantifiable results		0.001	100
2009	129	0.001 (K)		no quantifiable results		0.001	100
2010	488	0.001 (K)		no quantifiable results		0.001	100
2011	416	0.001 (K)		no quantifiable results		0.001	100
2012	437	0.001 (K)		no quantifiable results		0.001	100

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Heptachloro-styrene (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	0	---	---	---	---	---	---
1984	0	---	---	---	---	---	---
1985	0	---	---	---	---	---	---
1986	0	---	---	---	---	---	---
1987	509	0.011	Lake Huron	Saginaw Bay, Au Gres	Carp	0.001	96.3
1988	619	0.010	Lake St. Clair	Michigan waters	White Bass	0.001	94.8
1989	779	0.001 (K)		no quantifiable results		0.001	100
1990	489	0.001 (K)		no quantifiable results		0.001	100
1991	505	0.001 (K)		no quantifiable results		0.001	100
1992	443	0.001 (K)		no quantifiable results		0.001	100
1993	467	0.019	Lake Huron	Saginaw Bay, near Saginaw River	Carp	0.001	98.7
1994	277	0.002	Lake St. Clair	L'Anse Creuse Bay	Channel Catfish	0.001	99.6
1995	382	0.002	St. Marys River	Munuscong Bay	Carp	0.001	99.7
1996	271	0.001 (K)		no quantifiable results		0.001	100
1997	300	0.001 (K)		no quantifiable results		0.001	100
1998	690	0.006	Lake St. Clair	L'Anse Creuse Bay	Channel Catfish	0.001	97.8
1999	301	0.001 (K)		no quantifiable results		0.001	100
2000	453	0.001 (K)		no quantifiable results		0.001	100
2001	391	0.001 (K)		no quantifiable results		0.001	100
2002	373	0.001 (K)		no quantifiable results		0.001	100
2003	467	0.001 (K)		no quantifiable results		0.001	100
2004	644	0.001 (K)		no quantifiable results		0.001	100
2005	369	0.001 (K)		no quantifiable results		0.001	100
2006	435	0.001 (K)		no quantifiable results		0.001	100
2007	304	0.001 (K)		no quantifiable results		0.001	100
2008	401	0.001 (K)		no quantifiable results		0.001	100
2009	128	0.001 (K)		no quantifiable results		0.001	100
2010	488	0.001 (K)		no quantifiable results		0.001	100
2011	416	0.001 (K)		no quantifiable results		0.001	100
2012	437	0.001 (K)		no quantifiable results		0.001	100

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Pentachloro-styrene (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	0	---	---	---	---	---	---
1984	0	---	---	---	---	---	---
1985	0	---	---	---	---	---	---
1986	0	---	---	---	---	---	---
1987	509	0.073	Lake Huron	Saginaw Bay, off Saginaw River	Carp	0.001	81.3
1988	619	0.141	Lake St. Clair	Michigan waters	White Bass	0.001	89.2
1989	779	0.069	Cheboyganing Creek	Saginaw County	Carp	0.001	93.3
1990	489	0.023	Van Etten Lake	Iosco County, Oscoda	Channel Catfish	0.001	97.8
1991	505	0.001 (K)		no quantifiable results		0.001	100
1992	443	0.001 (K)		no quantifiable results		0.001	100
1993	467	0.046	Lake Huron	Saginaw Bay, near Saginaw River	Carp	0.001	96.8
1994	277	0.010	Lake St. Clair	L'Anse Creuse Bay	Channel Catfish	0.001	99.6
1995	382	0.003	St. Marys River	Munuscong Bay	Carp	0.001	99.7
1996	271	0.001 (K)		no quantifiable results		0.001	100
1997	300	0.001 (K)		no quantifiable results		0.001	100
1998	690	0.026	Lake St. Clair	L'Anse Creuse Bay	Channel Catfish	0.001	97.8
1999	301	0.001 (K)		no quantifiable results		0.001	100
2000	453	0.001 (K)		no quantifiable results		0.001	100
2001	391	0.001 (K)		no quantifiable results		0.001	100
2002	373	0.001 (K)		no quantifiable results		0.001	100
2003	467	0.001 (K)		no quantifiable results		0.001	100
2004	644	0.001 (K)		no quantifiable results		0.001	100
2005	369	0.001 (K)		no quantifiable results		0.001	100
2006	435	0.001 (K)		no quantifiable results		0.001	100
2007	304	0.001 (K)		no quantifiable results		0.001	100
2008	401	0.001 (K)		no quantifiable results		0.001	100
2009	129	0.001 (K)		no quantifiable results		0.001	100
2010	487	0.001 (K)		no quantifiable results		0.001	100
2011	416	0.001 (K)		no quantifiable results		0.001	100
2012	437	0.001 (K)		no quantifiable results		0.001	100

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Heptachlor (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	25	0.005 (K)			no quantifiable results	0.005	100
1984	44	0.005 (K)			no quantifiable results	0.005	100
1985	0	---	---	---	---	---	---
1986	114	0.005 (K)			no quantifiable results	0.005	100
1987	509	0.005 (K)			no quantifiable results	0.005	100
1988	619	0.005 (K)			no quantifiable results	0.005	100
1989	779	0.005 (K)			no quantifiable results	0.005	100
1990	489	0.005 (K)			no quantifiable results	0.005	100
1991	505	0.005 (K)			no quantifiable results	0.005	100
1992	443	0.005 (K)			no quantifiable results	0.005	100
1993	467	0.005 (K)			no quantifiable results	0.005	100
1994	277	0.005 (K)			no quantifiable results	0.005	100
1995	382	0.005 (K)			no quantifiable results	0.005	100
1996	271	0.005 (K)			no quantifiable results	0.005	100
1997	300	0.005 (K)			no quantifiable results	0.005	100
1998	690	0.005 (K)			no quantifiable results	0.005	100
1999	301	0.005 (K)			no quantifiable results	0.005	100
2000	448	0.005 (K)			no quantifiable results	0.005	100
2001	279	0.001 (K)			no quantifiable results	0.001	100
2002	328	0.001	Wixom Lake	Gladwin County	Channel Catfish	0.001	99.7
2003	334	0.004	St. Joseph River	Union Lake	Channel Catfish	0.001	99.4
2004	409	0.002	Detroit River	Michigan waters	Redhorse Sucker	0.001	99.3
2005	362	0.002	Fawn River	St. Joseph County, Stubey Road	Smallmouth Bass	0.001	98.6
2006	424	0.001	Silver Lead Creek	Marquette Co, K.I. Sawyer AFB	Brook Trout	0.001	99.1
2007	291	0.001 (K)			no quantifiable results	0.001	100
2008	393	0.001	Manistique River	d/s Manistique Papers Dam	Carp	0.001	99.5
		0.001	Lake Superior	Munising	Lake Trout		
2009	127	0.001	Rifle River	Arenac County	Redhorse Sucker	0.001	99.2
2010	459	0.001	Hoisington Lake	Livingston County	Carp	0.001	99.8
2011	405	0.001	Detroit River	Grassy Island	Smallmouth Bass	0.001	99.8
2012	424	0.002	Lake Michigan	Little Bay De Noc	Carp	0.001	99.1

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Terphenyl (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	0	---	---	---	---	---	---
1984	0	---	---	---	---	---	---
1985	129	7.5	Shiawassee River	Shiawassee Co.	Carp	0.250	58.1
1986	0	---	---	---	---	---	---
1987	585	6	Shiawassee River, S. Branch	Livingston Co.	Rock Bass	0.25	93.0
1988	612	0.25(K)		no quantifiable results		0.25	100
1989	837	0.25(K)		no quantifiable results		0.25	100
1990	648	1.7	Detroit River	Trenton Channel	Carp	0.25	99.2
1991	650	0.25(K)		no quantifiable results		0.25	100
1992	683	0.25(K)		no quantifiable results		0.25	100
1993	569	0.25(K)		no quantifiable results		0.25	100
1994	500	0.25(K)		no quantifiable results		0.25	100
1995	495	0.25(K)		no quantifiable results		0.25	100
1996	383	0.25(K)		no quantifiable results		0.25	100
1997	548	0.25(K)		no quantifiable results		0.25	100
1998	633	0.25(K)		no quantifiable results		0.25	100
1999	422	0.25(K)		no quantifiable results		0.25	100
2000	744	0.25(K)		no quantifiable results		0.25	100
2001	626	0.25(K)		no quantifiable results		0.25	100
2002	482	0.25(K)		no quantifiable results		0.25	100
2003	689	0.25(K)		no quantifiable results		0.25	100
2004	745	0.25(K)		no quantifiable results		0.25	100
2005	564	0.25(K)		no quantifiable results		0.25	100
2006	563	0.25(K)		no quantifiable results		0.25	100
2007	532	0.25(K)		no quantifiable results		0.25	100
2008	590	0.25(K)		no quantifiable results		0.25	100
2009	360	0.25(K)		no quantifiable results		0.25	100
2010	595	0.25(K)		no quantifiable results		0.25	100
2011	553	0.25	Kalamazoo River	Morrow Pond	Bluegill	0.25	99.8
2012	559	0.25	Manistique River	d/s Manistique Papers Dam	Carp	0.25	99.6
			Lake St. Clair	Anchor Bay	Carp		

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum Heptachlor Epoxide (mg/Kg)	Water Body	Location	Species	RL (mg/Kg)	% < RL
1980	0	---	---	---	---	---	---
1981	0	---	---	---	---	---	---
1982	0	---	---	---	---	---	---
1983	154	0.019	Clinton River	Macomb County u-s I-94	Carp	0.01	91.6
1984	276	0.1	Lake Macatawa	Ottawa County	Carp	0.01	51.4
1985	260	0.026	Rouge River	Wayne Co, u-s turning basin	Carp	0.01	50.8
1986	184	0.15	Kalamazoo River	Kalamazoo Lake	Carp	0.005	42.4
1987	791	0.113	Lake Michigan	Grand Haven	Lake Trout	0.005	63.5
1988	679	0.137	Lake Michigan	Muskegon	Carp	0.005	78.2
1989	854	0.108	Lake Michigan	Pentwater	Lake Trout	0.005	77.5
1990	534	0.174	Lake Michigan	Muskegon	Lake Whitefish	0.005	70.8
1991	584	0.078	Lake Michigan	Grand Traverse Bay	Lake Whitefish	0.005	69.3
1992	504	0.083	Lake Michigan	Grand Traverse Bay	Lake Whitefish	0.005	59.5
1993	535	0.089	Lake Michigan	Grand Traverse Bay	Lake Whitefish	0.005	65.8
1994	309	0.035	Cheboyganing Creek	Saginaw County	Carp	0.005	61.8
1995	439	0.162	Lake Macatawa	Ottawa County	Carp	0.005	74.9
1996	338	0.065	Lake Superior	Marquette	Siscowet	0.005	60.4
1997	389	0.063	Lake Michigan	Northern Lake Michigan	Lake Whitefish	0.005	78.9
1998	775	0.044	Lake Michigan	Grand Traverse Bay	Lake Trout	0.005	83.1
1999	301	0.029	Lake Michigan	Green Bay	Lake Whitefish	0.005	81.7
2000	453	0.024	Lake Superior	Central	Lake Whitefish	0.005	95.1
2001	391	0.025	Lake Superior	Keweenaw Bay, Traverse Island	Siscowet	0.001	87.2
2002	369	0.013	Lake Superior	Marquette	Lake Whitefish	0.001	89.4
2003	418	0.011	Tittabawassee River	Midland Co, Smiths Crossing Rd	White Bass	0.001	92.3
2004	598	0.007	Detroit River	Michigan waters	Carp	0.001	86.3
2005	370	0.003	Lake Macatawa	Ottawa County	Walleye	0.001	94.6
2006	431	0.003	Ottawa River	Mouth	Carp	0.001	97.2
2007	302	0.017	Lake Superior	Marquette	Lake Whitefish	0.001	90.1
2008	387	0.137	Lake Superior	Isle Royale	Lake Trout	0.001	94.3
2009	129	0.006	Lake Michigan	Grand Traverse Bay	Lake Trout	0.001	85.3
2010	476	0.003	Lake Michigan	Little Bay De Noc	Northern Pike	0.001	98.9
2011	416	0.002	Ruddiman Creek	Lagoon	Carp	0.001	93
2012	437	0.001	Manistique River	d/s Manistique Papers Dam	Walleye	0.001	99.3

Appendix E (Continued). Annual number of samples, maximum observed concentration, and percent of samples with quantifiable results by contaminant, 1980 through 2012.

Year	N of Samples	Maximum TEQ (ng/Kg) Dioxin, Furan, & coPCB	Water Body	Location	Species	RL (ng/Kg)	% < RL
2003	11	21.8	Kalamazoo River	Trowbridge Dam Impoundment	Carp	1	0
2004	76	128.7	Saginaw River	Bay County, LaFayette	Carp	1	0
2005	0	---	---	---	---	1	0
2006	10	193.4	Lake Erie	Off Monroe	Carp	1	0
2007	10	17.7	Lake Huron	Thunder Bay	Lake Whitefish	1	0
2008	29	23.2	Lake Erie	Off Monroe	Channel Catfish	1	0
2009	30	75.7	Torch Lake	Antrim County	Lake Trout	1	0
2010	17	84.4	Lake St. Clair	Michigan waters	Channel Catfish	1	0
2011	90	104.8	Detroit River	Celeron Island	Channel Catfish	1	0
2012	38	186.9	Lake Huron	Les Cheneaux Islands	Carp	1	0

Year	N of Samples	Maximum TEQ (ng/Kg) Dioxin & Furan Only	Water Body	Location	Species	RL (ng/Kg)	% < RL
1991	45	106.1	Lake Huron	Saginaw Bay, Fish Point	Carp	1	0
1992	19	392.1	Tittabawassee River	Midland County, d-s Dow Dam	Carp	1	0
1993	18	26.4	Lake Huron	Saginaw Bay	Lake Trout	1	0
1994	20	26.8	Detroit River	Grassy Island	Carp	1	0
1995	20	28.0	Lake Superior	Marquette	Siscowet	1	0
1996	50	50.1	Lake Huron	Port Austin	Lake Whitefish	1	0
1997	54	24.0	Lake Michigan	Northern Lake Michigan	Lake Whitefish	1	0
1998	37	17.9	Lake Huron	Thunder Bay	Lake Whitefish	1	0
1999	49	67.8	Tittabawassee River	Midland County, below Dow Dam	Carp	1	0
2000	56	21.1	Lake Erie	Off Monroe	Carp	1	0
2001	47	42.7	Lake Huron	Thunder Bay	Carp	1	0
2002	14	15.1	Lake Erie	Western Basin	Channel Catfish	1	0
2003	97	61.7	Tittabawassee River	Midland Co, Smiths Crossing Rd	Carp	1	0
2004	99	40.5	Lake Huron	Saginaw Bay, Bay Port	Carp	1	0
2005	8	4.2	Lake Macatawa	Ottawa County	Carp	1	0
2006	17	36.9	Lake Erie	Off Monroe	Carp	1	0
2007	19	11.2	Lake Superior	Keweenaw Bay	Siscowet	1	0
2008	30	5.8	Lake Huron	Saginaw Bay	White Bass	1	0
2009	30	16.9	Torch Lake	Antrim County	Lake Trout	1	0
2010	17	7.8	Detroit River	Belle Isle	Carp	1	0
2011	104	14.6	Detroit River	Celeron Island	Channel Catfish	1	0
2012	38	8.2	Lake Huron	Les Cheneaux Islands	Carp	1	0

Appendix F. Michigan Department of Environmental Quality whole fish trend monitoring sampling events, 1990 through 2013.

<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
Detroit River	Grassy Island	2009100	Jul/18/2009	Carp
Detroit River	Grassy Island	2011101	Jul/23/2011	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 River	Kent County, above 6th St. Dam	2009101	Sep/22/2009	Carp
Grand River	Kent County, above 6th St. Dam	2011102	Sep/13/2011	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
Gull Lake	Kalamazoo County	2009102	Sep/30/2009	Largemouth Bass
Gull Lake	Kalamazoo County	2012107	May/30/2012	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
Gun Lake	Barry County	2009103	Jul/10/2009	Largemouth Bass
Gun Lake	Barry County	2012108	Oct/17/2012	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

Appendix F (Continued). Michigan Department of Environmental Quality whole fish trend monitoring sampling events, 1990 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Higgins Lake	Roscommon County	2002037	Oct/02/2002	Lake Trout
Higgins Lake	Roscommon County	2005030	Oct/12/2005	Lake Trout
Higgins Lake	Roscommon County	2010100	May/12/2009	Lake Trout
Higgins Lake	Roscommon County	2011218	Sep/01/2011	Lake Trout
Houghton Lake	Roscommon County	92037	Jun/13/1992	Largemouth Bass
Houghton Lake	Roscommon County	94006	Jun/07/1994	Largemouth Bass
Houghton Lake	Roscommon County	1998126	Jun/16/1998	Largemouth Bass
Houghton Lake	Roscommon County	2001026	Oct/11/2001	Largemouth Bass
Houghton Lake	Roscommon County	2004037	May/27/2004	Largemouth Bass
Houghton Lake	Roscommon County	2006016	May/24/2006	Largemouth Bass
Houghton Lake	Roscommon County	2008100	May/21/2008	Largemouth Bass
Houghton Lake	Roscommon County	2010220	May/19/2010	Largemouth Bass
Houghton Lake	Roscommon County	2013100	Jun/06/2013	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
Kalamazoo River	Lake Allegan	2009105	Aug/03/2009	Carp
Kalamazoo River	Lake Allegan	2011104	Sep/21/2011	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 Erie	Brest Bay	2008101	Apr/14/2008	Carp, Walleye
Lake Erie	Brest Bay	2010102	Apr/19/2010	Carp, Walleye
Lake Erie	Brest Bay	2013101	Oct/15/2013	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 Gogebic	Gogebic/Ontonagon County	2009106	Jul/09/2009	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

Appendix F (Continued). Michigan Department of Environmental Quality whole fish trend monitoring sampling events, 1990 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	Saginaw Bay	2009108	Sep/15/2009	Carp, Walleye
Lake Huron	Saginaw Bay	2012100	Sep/17/2012	Carp, Walleye
Lake Huron	Thunder Bay	91054	Jun/25/1991	Walleye
Lake Huron	Thunder Bay	92056	Jun/04/1992	Carp, Lake Trout
Lake Huron	Thunder Bay	94029	Jun/27/1994	Carp, Lake Trout
Lake Huron	Thunder Bay	95036	Jun/16/1995	Carp, Lake Trout, Spottail Shiner, Walleye
Lake Huron	Thunder Bay	1998054	Aug/22/1998	Lake Trout, Walleye
Lake Huron	Thunder Bay	1999028	Sep/28/1999	Carp, Yellow Perch
Lake Huron	Thunder Bay	2001062	Jun/13/2001	Carp, Lake Trout, Walleye
Lake Huron	Thunder Bay	2004048	May/20/2004	Carp, Lake Trout
Lake 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 Huron	Thunder Bay	2008103	Jul/08/2008	Carp
Lake Huron	Thunder Bay	2009107	Jun/16/2009	Lake Trout, Walleye
Lake Huron	Thunder Bay	2010103	Jun/15/2010	Carp
Lake Huron	Thunder Bay	2012101	Jun/08/2012	Carp, Lake Trout, Walleye
Lake Michigan	Grand Traverse Bay	90074	Jun/20/1990	Lake Trout
Lake Michigan	Grand Traverse Bay	92059	Jul/15/1992	Lake Trout
Lake Michigan	Grand Traverse Bay	93010	Aug/12/1993	Carp
Lake Michigan	Grand Traverse Bay	95050	Jul/19/1995	Carp, Lake Trout
Lake Michigan	Grand Traverse Bay	1998057	Oct/07/1998	Lake Trout
Lake Michigan	Grand Traverse Bay	2000036	Sep/13/2000	Carp
Lake Michigan	Grand Traverse Bay	2001065	Aug/15/2001	Lake Trout
Lake Michigan	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	2008350	Jul/01/2008	Carp
Lake Michigan	Grand Traverse Bay	2009109	Oct/29/2009	Lake Trout
Lake Michigan	Grand Traverse Bay	2011105	Oct/14/2011	Carp
Lake Michigan	Grand Traverse Bay	2012102	Nov/01/2012	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 Michigan	Little Bay De Noc	2009110	Apr/21/2009	Carp, Walleye
Lake Michigan	Little Bay De Noc	2013102	May/01/2013	Carp, Walleye

Appendix F (Continued). Michigan Department of Environmental Quality whole fish trend monitoring sampling events, 1990 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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 St. Clair	L'Anse Creuse Bay	2009111	Jun/22/2009	Carp, Walleye
Lake St. Clair	L'Anse Creuse Bay	2011107	May/06/2011	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
Lake Superior	Keweenaw Bay	2010105	May/06/2010	Lake Trout
Lake Superior	Keweenaw Bay	2013105	May/23/2013	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 Croton Damage, between Dams 1 and 2	91039	Jun/26/1991	Carp
Menominee River	Lower Croton Damage, 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
Muskegon River	Newaygo County, Croton Dam Pond	2007115	Sep/11/2007	Carp
Muskegon River	Newaygo County, Croton Dam Pond	2009113	Sep/22/2009	Carp
Muskegon River	Newaygo County, Croton Dam Pond	2012103	Oct/04/2012	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
Pontiac Lake	Oakland County	2008105	Jul/27/2008	Largemouth Bass
Pontiac Lake	Oakland County	2010106	Jun/12/2010	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

Appendix F (Continued). Michigan Department of Environmental Quality whole fish trend monitoring sampling events, 1990 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Raisin River	Above Monroe Dam	2006067	Sep/06/2006	Carp
Raisin River	Above Monroe Dam	2008106	Jun/04/2008	Carp
Raisin River	Above Monroe Dam	2010107	Apr/13/2010	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
South Manistique Lake	Mackinac County	2009114	Apr/27/2009	Walleye
South Manistique Lake	Mackinac County	2012104	Jun/26/2012	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	Algonac	2009115	Jun/22/2009	Carp
St. Clair River	Algonac	2012106	Jun/24/2012	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. Joseph River	Chapin Lake	2009116	May/27/2009	Carp
St. Joseph River	Chapin Lake	2012105	Oct/08/2012	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
St. Marys River	Munuscong Bay	2009150	Apr/28/2009	Carp
St. Marys River	Munuscong Bay	2010108	May/05/2010	Walleye

Appendix G. Michigan Department of Environmental Quality caged fish sampling events, 1988 through 2013.

<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	d/s Van Etten Creek	2011021	Aug/16/2011	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
Au Sable River	Rea Road	2011023	Aug/16/2011	Channel Catfish
Baldwin River	Near M-37	2003005	Jul/16/2003	Channel Catfish
Belle River	Marine City	97002	Sep/17/1997	Channel Catfish
Betsie River	State Game Area	2008001	Jul/22/2008	Channel Catfish
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	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 Croswell 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	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	M-97	2009024	Jul/13/2009	Channel Catfish
Clinton River	Macomb County u-s I-94	97007	Sep/17/1997	Channel Catfish
Clinton River	Macomb County u-s I-94	1999071	Aug/06/1999	Channel Catfish
Clinton River	Macomb County u-s I-94	2000014	Aug/28/2000	Channel Catfish
Clinton River	Macomb County u-s I-94	2009022	Jul/13/2009	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

Appendix G (Continued). Michigan Department of Environmental Quality caged fish sampling events, 1988 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Clinton River	Mt. Clemens, Firehouse	2009023	Jul/13/2009	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	Mt. Clemens, river mouth	2009021	Jul/13/2009	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
Crystal Springs Farm	Muskegon	2011027	Jul/19/2011	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 @ Carpenter Rd	2003036	Aug/21/2003	Channel Catfish
Flint River	Above Flint @ Carpenter Rd	2013001	Oct/31/2013	Channel Catfish
Flint River	d/s Flint @ Mill Rd	2003033	Aug/21/2003	Channel Catfish
Flint River	d/s Flint, near Linden Rd.	2013002	Oct/31/2013	Channel Catfish
Flint River	d/s Montrose	2013003	Oct/13/2013	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	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

Appendix G (Continued). Michigan Department of Environmental Quality caged fish sampling events, 1988 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Huron River	Downstream Belleville Lake	2002041	Aug/20/2002	Channel Catfish
Huron River	Downstream Ford Lake	2002040	Aug/20/2002	Channel Catfish
Huron River	Rockwood, river mouth	91012	Sep/06/1991	Channel Catfish
Huron River	Rockwood, river mouth	96015	Aug/20/1996	Channel Catfish
Huron River	Rockwood, river mouth	2002042	Aug/20/2002	Channel Catfish
Huron River	Upstream Dexter	2002039	Aug/20/2002	Channel Catfish
Kalamazoo River	Above Otsego City Dam	1999096	Sep/08/1999	Channel Catfish
Kalamazoo River	Above Otsego City Dam	2001035	Aug/22/2001	Channel Catfish
Kalamazoo River	Below Lake Allegan Dam	1999020	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Otsego Dam	1999023	Sep/08/1999	Channel Catfish
Kalamazoo River	Below Otsego Dam	2001036	Aug/22/2001	Channel Catfish
Kalamazoo River	Bridge	1999022	Sep/08/1999	Channel Catfish
Kalamazoo River	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
Lake Huron	Saginaw Bay, Gull Island	2005083	Jun/27/2005	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/29/2005	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

Appendix G (Continued). Michigan Department of Environmental Quality caged fish sampling events, 1988 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Manistique River	Manistique, river mouth	2002067	Aug/21/2002	Channel Catfish
Manistique River	Manistique, river mouth	2008007	Oct/27/2008	Channel Catfish
Manistique River	Mouth-Inner Jetty	2008006	Oct/27/2008	Channel Catfish
Manistique River	Mouth-West Jetty	2008005	Oct/27/2008	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
Manistique River	Soo Line RR Bridge	2008009	Oct/27/2008	Channel Catfish
Manistique River	US-2 Bridge	2008008	Oct/27/2008	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
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 Br.	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	Kings Corner Road	2011020	Aug/16/2012	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

Appendix G (Continued). Michigan Department of Environmental Quality caged fish sampling events, 1988 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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
Platte River	d/s of Honor	2008010	Jul/22/2008	Channel Catfish
Portage Creek	Bryant Street	2010001	Jul/07/2010	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
Portage Creek	Mouth/Kalamazoo Ave	2010002	Jul/07/2010	Channel Catfish
Rabbit River	d/s Hamilton, d/s 133TH	2003099	Aug/20/2003	Channel Catfish
Rabbit River	u/s Hamilton, d/s 38th St	2003097	Aug/20/2003	Channel Catfish
Raisin River	Below Turning Basin	1998091	Sep/10/1998	Channel Catfish
Raisin River	Below Turning Basin	2004089	Aug/11/2004	Channel Catfish
Raisin River	Below Turning Basin	2011012	Aug/17/2011	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	Monroe, river mouth	2011013	Aug/17/2011	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	Near Grand Trunk RR Bridge	2011011	Aug/17/2011	Channel Catfish
Red Cedar River	Mouth	2001015	Jul/23/2001	Channel Catfish
Rifle River	Campground/Manor Rd	2009020	Jul/13/2009	Channel Catfish
Rogue River	d/s Rockford	2008011	Jul/22/2008	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
Ruddiman Creek	Glenside Road	2011016	Aug/16/2011	Channel Catfish
Ruddiman Creek	McGraft Park Road	2011015	Aug/16/2011	Channel Catfish
Ruddiman Lagoon	Mouth of Lagoon	2011014	Aug/16/2011	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	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

Appendix G (Continued). Michigan Department of Environmental Quality caged fish sampling events, 1988 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
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	d/s Shiatown Dam	2011037	Aug/17/2011	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	u/s Shiatown Pond	2011036	Aug/17/2011	Channel Catfish
Shiawassee River, South Branch	1/2 mile d/s of Howell	2004106	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	1/2 mile d/s of Howell	2011032	Aug/17/2011	Channel Catfish
Shiawassee River, South Branch	Chase Lake Road	2004108	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	Chase Lake Road	2011034	Aug/17/2011	Channel Catfish
Shiawassee River, South Branch	Howell	2004105	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	Howell	2011031	Aug/17/2011	Channel Catfish
Shiawassee River, South Branch	Marr Road	2004107	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	Marr Road	2011033	Aug/17/2011	Channel Catfish
Shiawassee River, South Branch	u/s Byron	2004109	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	u/s Byron	2011035	Aug/17/2011	Channel Catfish
Shiawassee River, South Branch	u/s M-59	2004104	Aug/11/2004	Channel Catfish
Shiawassee River, South Branch	u/s M-59	2011030	Aug/17/2011	Channel Catfish
South Branch Black River	Downstream of Bangor Dam	2002006	Aug/02/2002	Channel Catfish
South Branch Black River	Upstream of Bangor Dam	2002005	Aug/02/2002	Channel Catfish
St. Joseph River	Above Niles	2001086	Jul/30/2001	Channel Catfish
St. Joseph River	Above Paw Paw River	2001090	Jul/30/2001	Channel Catfish
St. Joseph River	Below Buchanan	97065	Sep/16/1997	Channel Catfish
St. Joseph River	Below Buchanan	2001087	Jul/30/2001	Channel Catfish
St. Joseph River	Below Constantine	2003117	Jul/16/2003	Channel Catfish
St. Joseph River	Below Niles	97066	Sep/16/1997	Channel Catfish
St. Joseph River	Below Sturgis Dam	2003115	Jul/16/2003	Channel Catfish
St. Joseph River	Below Three Rivers	2003116	Jul/16/2003	Channel Catfish
St. Joseph River	Below Union City	2003113	Jul/16/2003	Channel Catfish
St. Joseph River	Below Union Lake	2003114	Jul/16/2003	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	89022	Aug/28/1989	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	93045	Jul/01/1993	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	97063	Sep/16/1997	Channel Catfish
St. Joseph River	Benton Harbor, river mouth	2001091	Jul/30/2001	Channel Catfish
St. Joseph River	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

Appendix G (Continued). Michigan Department of Environmental Quality caged fish sampling events, 1988 through 2013.

<u>Waterbody</u>	<u>Location</u>	<u>Visit ID#</u>	<u>Date</u>	<u>Species</u>
Swartz Creek	Swartz Creek Golf Course	2003127	Aug/21/2003	Channel Catfish
Tawas River	Mouth	2006098	Jul/13/2006	Channel Catfish
Thornapple River	108th Rd, d/s Middleville	2008016	Jul/22/2008	Channel Catfish
Thornapple River	Center Road, d/s Nashville	2008014	Jul/22/2008	Channel Catfish
Thornapple River	Mouth	2001019	Jul/23/2001	Channel Catfish
Thornapple River	Mouth	2008015	Jul/22/2008	Channel Catfish
Thornapple River	Soloman Rd, d/s Hastings	2008013	Jul/22/2008	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	Crossing Road	2000095	Jul/20/2000	Channel Catfish
Tittabawassee River	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	Joy Road	92039	Sep/14/1992	Channel Catfish
Two Hearted River	Mouth	92013	Aug/04/1992	Channel Catfish
Van Etten Creek	d/s CR-F41	2011022	Aug/16/2011	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