

MICHIGAN WILDLIFE CONTAMINANT TREND MONITORING

2009-2013 REPORT

NESTLING BALD EAGLES

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Abstract

The bald eagle (*Haliaeetus leucocephalus*) is a widely distributed bird of prey that has been extensively studied due to its susceptibility to the effects of environmental contaminants. As a long-lived apex predator, the species is exposed to the effects of biomagnification, and analysis of tissue samples can produce valuable information about organisms positioned lower in the food chain and water quality. In addition, bald eagles are territorial nesters; therefore, nestlings provide a representation of the contaminant levels of the surrounding environment. Legacy contaminants of concern that include organochlorine (OC) pesticides and polychlorinated biphenyls (PCBs) continue to be monitored in the Great Lakes ecosystem under the Clean Michigan Initiative of 1999. Spatial and temporal trends of OCs and PCBs in nestling bald eagles of Michigan were evaluated from 1999-2013 over three 5 year periods, 1999-2003 (T1), 2004-2008 (T2) and 2009-2013 (T3). Statewide geometric mean concentrations of DDE had observable, but not statistically significant, increases during the two most recent time periods (T2 to T3) from 9 to 13 $\mu\text{g}/\text{kg}$, and Sum PCBs remained steady between T2 and T3 with geometric means of 14 and 13 $\mu\text{g}/\text{kg}$, respectively. This study also found that geometric mean concentrations of DDE and Sum PCBs increased at all spatial scales except in Sum PCBs in the Inland Upper Peninsula subpopulation, the Lake Erie Inland Lower Peninsula, and the Lake Michigan Inland Upper Peninsula watersheds. Geometric mean concentrations of DDE also increased above the No Observable Adverse Effects Concentrations (NOAEC) of 11.4 $\mu\text{g}/\text{kg}$ in the lakes Michigan, Huron, Superior, and Erie subpopulations, and the Lake Superior Great Lakes, Lake Michigan Great Lakes, Lake Huron Great Lakes, Lake Erie Great Lakes, and Lake Erie Inland Lower Peninsula watersheds. Geometric mean concentration of Sum PCBs increased above the NOAEC of 36.4 $\mu\text{g}/\text{kg}$ in the lakes Michigan and Erie subpopulations, and the Lake Michigan Great Lakes and Lake Erie Great Lakes watersheds.

INTRODUCTION

The bald eagle (*Haliaeetus leucocephalus*) is a large bird of prey that is indigenous to North America. This species of sea eagle inhabits areas with large bodies of water with adequate food supply and prefers super-canopy trees for nesting and roosting. Bald eagles are a top predator in aquatic food chains giving preference to fish but will also actively hunt birds, mammals, and reptiles as well as scavenge carrion and steal from other predators (Buehler 2000). During the winter, bald eagles within the Great Lakes region typically do not migrate; however, some birds may fly long distances in order to find food. Bald eagles are considered to be territorial, defending breeding areas consisting of an occupied nest tree and possibly several alternate nests. Eagles reach reproductive age once they are in full adult plumage at 4 to 6 years of age. A breeding pair will attempt to reproduce in one nest per year and clutch sizes vary from 1-3 eggs (Stalmaster 1987).

The survival of the species became a topic of concern in the 1960s after a dramatic decrease in the population due a combination of hunting pressure, and the exposure and effects of anthropogenic pollutants, dichlorodiphenyltrichloroethane (DDT) and polychlorinated biphenyls (PCBs). Eagle numbers reached their lowest in 1961 with only 52 breeding pairs recorded in the state of Michigan. Bald eagles were placed on the federal Endangered Species List as Endangered in 1976 throughout its range with the exception of Alaska. This mandated protection afforded the eagle reprieve from hunting, and once DDT and PCB were officially outlawed in 1972 and 1976, respectively, the population began to rebound. Nationwide monitoring efforts were put into place to evaluate population growth with aerial and ground surveys. As of 2013, there are greater than 700 active breeding eagle pairs in Michigan and numbers are still increasing. The total number of young produced each year has also increased from 34 in 1961 to 642 in 2013.

Currently, the bald eagle is widely distributed, and has been extensively studied due to its susceptibility to the effects of environmental contaminants such as PCB, DDT, and mercury (Hg) (Bowerman et al 2002). As a long-lived apex predator, the species is exposed to the effects of biomagnification, and analysis of tissue samples can produce valuable information about organisms positioned lower in the food chain. In addition, bald eagles are territorial nesters that seek out prey items within their breeding area; therefore, samples from nestlings provide a representation of the contaminant levels of the surrounding environment (Bowerman et al. 2002).

Blood and blood components are often sampled and analyzed to monitor the environmental exposure of contaminants in birds (Bowerman et al 1998; 2003; Olsson et al 2000; Dykstra et al 2005). The levels of OC pesticides and PCBs in nestling eagle blood is directly related to their dietary exposure from food brought by adult bald eagles hunting within the breeding area. Therefore, measures of contaminants in blood from a nestling eagle are an appropriate way to determine the level of contamination in the surrounding habitat, further validating the bald eagle as a suitable bioindicator of ecosystem quality (Bowerman et al 202). This localized

representation of contamination allows for the evaluation of spatial and temporal trends throughout the study area.

Organochlorine pesticides, particularly DDT, are synthetic compounds that were applied in agricultural settings and are highly persistent in the environment. DDT biomagnifies within food chains, and breaks down into metabolites with the majority being in the toxic form of the para, para isomer of DDT, Dichlorodiphenyldichloroethane (p,p'-DDE). The p,p'-DDE metabolite is likely responsible for eggshell thinning in birds. DDT was banned in 1972; however, there is still a potential for exposure within the environment. Other banned or restricted OCs that are included in this study methoxychlor, dieldrin, aldrin, endrin, chlordane, endosulfan, and lindane which have similar chemical properties with varying negative biological effects.

Polychlorinated biphenyls are synthetic, highly stable organic compounds that biomagnify within food chains. They were almost exclusively used as insulating or cooling agents and were primarily released into the environment via industrial discharge, leaks, improper disposal, and atmospheric deposition of incompletely incinerated waste (Eisler 2007). There are 209 possible congeners, which are numbered based on the condition of chlorination, each with varying degrees of toxicity and biological activity. PCBs were banned in 1979 but still persist. In birds, PCBs can disrupt growth, reproduction, metabolism and behavior in addition to the compounds having teratogenic, mutagenic, carcinogenic properties (Eisler 2007).

In 1999, the Michigan Department of Environmental Quality (MDEQ) implemented the Michigan Bald Eagle Biomonitoring Project under the Clean Michigan Initiative. In addition to population productivity and individual bird biometrics, this long term monitoring effort provides information about persistent environmental contaminants including PCBs, organochlorine pesticides such as DDT, and heavy metals such as Hg. Blood and feather samples and biometrics are taken from nestling bald eagles throughout the state on an annual basis to evaluate spatial and temporal trends of relevant measures. Long-term monitoring has allowed for the determination that bald eagle productivity is increasing spatially and temporally in congruence with the decline of PCB and DDT concentrations below lowest observed adverse effect levels (LOAELS).

This report includes the analysis of 22 congeners of PCBs, DDT and its metabolites, and 18 additional OC pesticides. Due to its toxicological effects and data showing that 95% of total DDT in eagle plasma was in the form of p,p'-DDE, a summary of p,p'-DDE data are provided in this report. PCBs are reported as a sum of the analyzed congeners. The other 18 OC pesticides and associated compounds measured are not reported here because they failed to be detected in 50% of the analyzed samples.

METHODS

Study Area

Blood and feather samples were collected annually from nestlings in active bald eagle breeding areas throughout the state of Michigan.

Field Methods

Aerial Surveys

Michigan Department of Natural Resources (MDNR) pilots and experienced nest observers were contracted to conduct annual aerial surveys. Flights were conducted first in early spring to determine which nests were occupied, and again in late spring to establish which nests were successful. Observers provided the following location information: approximate latitude and longitude of nest tree, nest tree species, reproductive status (e.g., eggs, chicks, or adult brooding behavior). If the nest was successful, observers provided the number of young, stage of nestling development based on size and color, tree condition, and potential nest access from the ground.

Nestling Eagle Capture

Field crews sampled nestlings that were approximately five to nine weeks post-hatch. Lower Peninsula nests were sampled in May, and Upper Peninsula nests were visited in June. Once at the nest, a certified climber ascended the nest tree using spur-climbing techniques, and secured the nestlings in a restraining bag. The bag was lowered to ground where it was handled by a trained sample collector.

Sample Collection

Standard handling and sampling procedures were conducted under a United States Fish and Wildlife Bird Banding (USFWS) Permit, MDNR Scientific Collecting Permit, and Clemson University Animal Use Protocol. Nestlings were banded using a size nine (USFWS) bird band. Approximately 10 mL of blood was drawn via the brachial vein. Blood samples were centrifuged for 10 minutes at 2000 rpm. The plasma was removed and stored frozen until time of analysis. Nestlings were placed back into the restraining bag, raised, and released back into the nest. All samples were transferred to Clemson University for analysis via the chain-of-custody system.

Sample Selection

Samples were selected for analysis by ensuring that only one sample from each breeding area (defined below in 'Spatial Analysis') was sampled, since the breeding area is considered the sampling unit for this project. It was also ensured that all breeding areas were sampled in the analysis.

Lab Methods

Solid-Phase Extraction

An extraction and cleanup of nestling plasma was performed using the solid-phase micro extraction procedure for organochlorine compounds as described in Sundberg et al. (2006). Briefly, nestling plasma samples (0.1-ml) were fortified with surrogate compounds, to assess consistency in the extraction and cleanup process, and an approximately 8M solid urea solution. Two 0.1-mL volumes of sterile chicken plasma were also fortified with surrogate compounds and solid urea solution, for use as control samples in every batch of eagle samples. Additionally, two 0.1-mL volumes of chicken plasma were fortified with surrogate compounds, solid urea solution, and known amounts of all analytes of interest, known as spikes, to examine recovery from the extraction and cleanup process for quality assurance purposes. The plasma samples were diluted with 0.9 mL of Nanopure water and stirred for 25 minutes. Each sample was passed through a 30 mg Oasis HLB solid-phase micro-extraction cartridge and both sample vials and cartridges were rinsed with Nanopure water. Analytes were eluted from the cartridges using 2-1 ml volumes of dichloromethane (DCM). The sample elutions were concentrated under a gentle stream of nitrogen gas until dry. Finally, internal standard compound was added to monitor Gas Chromatograph (GC) performance, and a final volume of 0.1 mL was achieved using hexane.

OC and PCB Analysis

Individual analytes were quantified using an Agilent 7890 GC with an Electron Capture Device (ECD). GC settings were consistent with the quantitation methods described in EPA method 8081 and 8082. The GC was configured with a split injection with dual columns and ECD detectors to confirm the detection of each analyte. Individual analyte calibration curves were used for individual analyte quantification. Two blanks and a calibration solution were also analyzed with every set of extracted eagle samples to monitor for calibration performance and possible GC contaminations. Method detection limits (MDLs) and quantification limits were calculated for each analyte. For quality control purposes, reported values were first detected on both GC columns, and detections of an analyte was above the detection and quantification limits. Only analytes that were detected in a minimum of 50% of all nestling plasma samples are reported. Geometric means were calculated for spatial and temporal analyses (see sections below for definitions). Values that fell below the MDL were set at half the detection limit for that compound (Leith et al., 2010), which ranged from 0.54 to 1.95 ng/mL, depending on the compound. For simplicity and thoroughness, the MDL was set at 2ng/mL (Wierda et al., 2016). DDT is reported as p,p'-DDE and the PCBs are reported as Sum PCBs. The sum concentration of PCBs is a subset of 22 non-coplanar congeners of PCBs which act as a surrogate for coplanar PCB since they are often difficult to detect and quantify (Bergen et al. 1996).

Quality assurance protocols required spike recoveries for each batch of extracted eagle samples to average between 70 to 130% of the nominal amount of analytes. If the spikes of a batch did not meet these criteria, they proceeded through the extraction and cleanup method again.

Temporal Analysis

Temporal analyses were conducted for the following three sampling periods: 1999-2003 (T1), 2004-2008 (T2), and 2009-2013 (T3) at Statewide, Category, Subpopulation, and Great Lakes Watershed spatial scales (Roe 2001; Bowerman et al 1995). Spatial scales are defined below.

Spatial Analysis

Organochlorine pesticide and PCB concentrations in nestling bald eagle plasma were compared at three spatial scales: Category; Subpopulation; and Great Lakes Watershed (Roe 2001). Breeding area, which included all nests within a breeding pair of bald eagles' defended territory, was the sampling unit used for all analyses. The breeding areas were then grouped at each spatial scale for comparison.

The Category spatial scale was defined by whether the breeding area was considered to be inland (IN) or along the Great Lakes (GL) shoreline. The GL variable was defined as those breeding areas that were within 8.0 km of the Great Lakes shoreline and/or along tributaries open to anadromous Great Lakes fish. The IN variable included all breeding areas that were located beyond 8 km of the Great Lakes shorelines and not along anadromous tributaries.

The Subpopulation spatial scale subdivided the Category spatial scale into breeding areas that were located within four GL and two IN groups. The GL subpopulations were those within 8 km of Lake Superior (LS), Lake Michigan (LM), Lake Huron (LH), and Lake Erie (LE). The IN subpopulations consisted of those breeding areas beyond 8 km and located in either the Upper Peninsula (INUP) and Lower Peninsula (INLP).

At the Great Lakes Watershed spatial scale, breeding areas were sorted into ten groups which assigned a peninsula affiliation based on Great Lakes Basin drainages. This scale included four GL and six IN groupings. The GL groups included breeding areas within Lake Superior Great Lakes (LSGL), Lake Michigan Great Lakes (LMGL), Lake Huron Great Lakes (LHGL), and Lake Erie Great Lakes (LEGL) drainages. The IN groups were Lake Huron Inland Lower Peninsula (LHINLP), Lake Huron Inland Upper Peninsula (LHINUP), Lake Michigan Inland Lower Peninsula (LMINLP), Lake Michigan Inland Upper Peninsula (LMINUP), Lake Superior Inland (LSIN), and Lake Erie Inland (LEIN).

Statistical Methods

As is often the case in contaminants research, distributions of contaminant concentrations were right-skewed and bound by zero on the left (Leith et al 2010). A generalized linear model (GLM) was used with the response modeled as a Gamma distribution to account for the distribution of the data. The model formula consisted of the contaminant concentration of interest as the response variable on the left side of the formula, and an intercept term and predictor variable of

interest on the right. Difference of least squares means was then used to test for differences between different levels of the predictor variable of interest (package = lsmeans). All analyses were performed using the R statistical language (R 2014). Statistical significance was determined at $\alpha < 0.05$.

RESULTS

From 1999-2013, 738 nestling bald eagle plasma samples from 368 breeding areas were analyzed for OCs and PCBs (Appendix 1). Concentrations of 4,4'-DDE were detected in 695 samples and total PCBs were detected in 644 samples. Concentrations of 4,4'-DDE ranged from non-detectable limits (ND) to 257 $\mu\text{g}/\text{kg}$ and total PCBs ranged from ND to 498 $\mu\text{g}/\text{kg}$. It should be noted that siblings were sampled in the following territories and years: AG-20 in 2009, BG-04 in 2006, DI-09 in 2005, and ET-05 in 1999. Additionally, Appendix 1 highlights the values for the two compounds for each individual that are above the no observable adverse effect concentration (NOAEC) for productivity. The productivity NOAEC for total PCBs is 36.4 $\mu\text{g}/\text{kg}$ (shaded in yellow), and the productivity NOAEC for 4,4'-DDE is 11.4 $\mu\text{g}/\text{kg}$ (shaded in red). These values have previously been reported by Bowerman et al. (2003).

Temporal Trends

For the entire State of Michigan, concentrations of DDE declined from T1 to T2. There was an observable increase during T3 to levels higher than those measured during T1; however, this increase was not statistically significant (Table 1). Concentrations of PCBs decreased from T1 to T2. There was slight decrease from T2 to T3, but not high enough to be considered significantly different from the previous two time periods (Table 2).

Concentrations of DDE and PCBs decreased significantly at the Category spatial scale among GL breeding areas between T1 and T2, and then increased during T3. However, this increase in concentration was not enough to differ statistically from T1 and T2 (Tables 3 and 4). Inland sites had observable increases in DDE and PCBs from T1 and T2, and from T2 and T3; but these trends were not statistically significant (Tables 3 and 4). The observable increases in both DDE and PCB concentrations are likely localized and driven by elevated concentrations at a small number of breeding territories.

Only statistically significant changes in concentrations of DDE and PCBs between time periods at the Subpopulation and Great Lakes Watershed spatial scales are reported. The Lake Michigan Subpopulation and Lake Michigan Great Lake Watershed scales had statistically significant decreases in DDE and PCB concentrations from T1 to T2. Increases in concentrations of DDE and PCBs were observed at both the Lake Superior Subpopulation and Lake Superior Great Lake Watershed scales from T2 to T3 which were likely driven by localized high levels at a small number of territories (Tables 5 and 6).

Spatial Trends

During the entire time period, 1999-2013, concentrations of DDE and PCBs were higher in GL breeding areas compared to those IN (Tables 7 and 8). Geometric means of DDE concentrations were 16 and 7 µg/kg, and 31 and 5 µg/kg for PCBs for GL and IN sites, respectively. At the Subpopulation spatial scale, concentrations of DDE in Lakes Huron, Michigan, and Superior were significantly higher than INLP and INUP sites. For PCB concentrations, all Great Lakes sites (LE, LH, LM, LS) were significantly higher than those located inland (INLP, INUP) (Tables 7 and 8). Geometric means ranged from 6 to 23 µg/kg for DDE and 5 to 69 µg/kg for PCBs. At the Great Lakes Watershed spatial scale, DDE concentrations at LMGL were higher than sites located at LHGL, LHINLP, LMINLP, LMINUP, and LSINUP (Table 7). Geometric means of DDE ranged from 5 to 23 µg/kg. PCB concentrations in all GL sites were higher than those in LHINLP, LMINLP, LMINUP, and LSINUP at the Great Lakes Watershed spatial scale. Geometric means ranged from 2 to 69 µg/kg (Table 8).

T1 (1999-2003)

Category

Concentrations of DDE differed significantly between GL and IN sites, and ranged from ND to 257 and ND to 96 µg/kg, respectively. Geometric means were 18 µg/kg for GL and 5 µg/kg for IN (Table 9). PCB concentrations were greater in GL versus IN sites and ranged from ND to 304 for GL and ND to 123 µg/kg for IN. Geometric means were 36 and 4 µg/kg, respectively (Table 10).

Subpopulation

LM and LS had DDE concentrations that were significantly higher than those located in INLP and INUP. Geometric means for these areas were 33, 12, 5, and 4 µg/kg, respectively (Table 9). The highest DDE concentration of 257 µg/kg was found along LS. PCB concentrations in all Great Lake sites (LE, LH, LM, LS) were significantly higher than inland sites (INLP, INUP). Geometric means were 114, 38, 54, 19, 4, and 4 µg/kg, respectively (Table 10). The highest PCB concentration of 261 µg/kg was found along LS.

Great Lakes Watershed

At the Great Lakes Watershed spatial scale, concentrations of DDE were higher at LMGL sites than in INLHLP. Geometric means ranged from 4 to 33 µg/kg. Concentrations of PCBs were higher at LEGL than LHINLP and LMINUP. Geometric means ranged from 3 to 114 µg/kg (Tables 9 and 10).

T2 (2004-2008)

Category

Concentrations of DDE varied significantly between GL and IN sites, and ranged from ND to 129 and ND to 141 µg/kg, respectively. Geometric means were 12 for GL and 6 µg/kg for IN (Table 11). PCB concentrations were greater in GL versus IN sites, and ranged from ND to 141 for GL and ND to 145 µg/kg for IN. Geometric means were 26 and 6 µg/kg, respectively (Table 12).

Subpopulation

DDE concentrations did not vary significantly at the Subpopulation spatial scale. Geometric means ranged from 6 to 16 µg/kg (Table 11). The highest DDE concentration of 141 µg/kg was found within INLP. LE, LH, and LM had PCB concentrations that were significantly higher than those located inland (INLP and INUP). Geometric means for these areas were 40, 34, 30, 5 and 7 µg/kg, respectively (Table 12). The highest PCB concentration of 145 µg/kg was found within INLP.

Great Lakes Watershed

Concentrations of DDE and PCBs did not vary at the Great Lakes Watershed spatial scale (Tables 11 and 12).

T3 (2009-2012)

Category

Concentrations of DDE varied significantly between GL and IN sites, and ranged from ND to 220 and ND to 77, respectively. Geometric means were 18 for GL and 9 µg/kg for IN (Table 13). PCB concentrations were greater in GL versus IN sites, and ranged from ND to 498 and ND to 114 µg/kg, respectively. Geometric means were 32 for GL and 5 µg/kg for IN (Table 14).

Subpopulation

LM, LS and LH had DDE concentrations that were significantly higher than those located in INUP. Geometric means for these areas were 24, 19 and 14 µg/kg, respectively (Table 13). The highest DDE concentration of 220 µg/kg was found along LS. PCB concentrations in all Great Lake sites (LE, LH, LM, LS) were significantly higher than inland sites (INLP, INUP). Geometric means were 76, 35, 36, 16, 6, and 4 µg/kg, respectively (Table 14). The highest PCB concentration of 498 was found along LM.

Great Lakes Watershed

At the Great Lakes Watershed spatial scale, concentrations of DDE were higher at LSGL and LMGL sites than in LHGL, LHINLP, LMINLP, LMINUP, and LSINUP (Table 13). Geometric means ranged from 7 to 55 µg/kg for these sites. Concentrations of PCBs were higher at LEGL than at LHINLP, LMINLP, and LMNUP. Geometric means ranged from 2 to 76 µg/kg (Table 14).

DISCUSSION

The observable fluctuations in concentrations of contaminants between the time periods may be due to changes in the environment which alter the bioavailability of the compounds. These factors include bioremediation, water level fluctuations, and temperature (Pittman 2014; Fuentes 2013).

In the 1970s new environmental regulations almost eliminated direct sources of PCBs and OCs (Anthony et al 2007). However, in recent decades long-range transport and atmospheric deposition have emerged as new sources of contaminants along with relic sources and persistent contaminations (Anthony et al 2007). The combination of new emerging global sources of contaminants and relic regional sources make the continued monitoring of these contaminants in the environment essential to ensure the health of aquatic ecosystems. In general, the findings within this report suggest that concentrations of DDE and PCBs may be increasing at several areas between the two most recent sampling periods (T2 and T3) indicating that potential input sources of these contaminants, the persistence of relic contaminants, and/or changes in bioavailability of contaminants in the aquatic ecosystems of Michigan and the surrounding Great Lakes may still exist. This being the case, geometric mean concentrations of DDE and PCBs in some areas at the Subpopulation and Great Lakes Watershed spatial scales increased beyond the No Observable Adverse Effect Concentrations (NOAEC) of 11.4 µg/kg for DDE and 36.4 µg/kg for Sum PCBs (Bowerman et al 2003). In the most recent sampling period (T3), these elevated concentrations were found in watersheds associated with lakes Superior, Michigan, Huron, and Erie, and Inland sites beyond Lake Erie for DDE and lakes Michigan and Erie for PCBs. Also, concentrations in T3 related to the Great Lakes of both DDE and PCBs are higher than observed in the other upper Midwest regions over the same period (Pittman et al 2015).

Increases in geometric mean DDE concentrations from T2 to T3 were observed at the Great Lakes Watershed scale in all watersheds that were sampled in both time periods. Also, increases in geometric mean concentrations of Sum PCBs at the Great Lakes Watershed scale were observed in all watersheds sampled in both periods (T2 and T3) with the exception of LEINLP and LMINUP which could be attributed to small sample size. LSINUP had no change between T2 and T3. Although geometric mean concentrations were increasing in both DDE and PCBs, statistically significant increases of DDE and PCBs were only measured in the Lake Superior Great Lakes watershed, with increases from 7 to 19 µg/kg and 14 to 16 µg/kg, respectively. On the contrary, during these same periods, trends in concentrations of DDE and PCBs have decreased in other upper Midwest areas (Pittman et al 2015). The observable

increases in both DDE and PCB concentrations are likely localized at this time and driven by elevated concentrations at a small number of breeding territories.

Observed increases in concentrations of DDE and Sum PCBs at a small number territories is likely a direct result of either the increased input of contaminants into the environment or the increased bioavailability of relic contaminants. Since contaminants increased in localized areas across most watersheds, global use of contaminants and long-range transport could be a possible explanation. Many countries in Asia and Africa still have minimal regulations on the use of OCs and PCBs, resulting in higher levels and continued deposition of these compounds (Hoff et al 1992; Anthony et al 2007; Odabasi et al 2008; Kim et al 2009) and these countries could be a source for atmospheric concentrations (Jaward et al 2004; Pozo et al 2006, 2009; Lee et al 2007). In addition, significant increases in DDE in the Great Lakes watersheds could be a result of the distribution and concentration of contamination from relic sources in these watersheds. In either event, any increase is cause for concern and increases in a majority of watersheds throughout Michigan poses potential hazards to ecosystem health. These concerns have also be echoed at other trophic levels in the Great Lakes aquatic ecosystems as increases in contaminant concentration have been observed in fish over similar study periods (Monson 2009; Bhavsar et al 2010).

Recommendations

Overall, remediation has positively affected the Great Lakes region. However, with the current rise in contaminant concentrations at a number of territories within most watersheds, and the emerging threats of a changing climate, land-use practices, and human population, management strategies should be planned cautiously to incorporate these dynamic conditions—particularly along Michigan’s Great Lakes coast lines and related watersheds. Possible mechanisms causing increased DDE and Sum PCBs in these areas and across the state are localized relic sources of contaminations and new emerging inputs from atmospheric sources at both the regional and global scales. Also, the effects of changing climate on environmental factors that have been found to influence contaminant concentrations like lake pH, water level fluctuations, precipitation, and temperature will be important to take into account along with ecosystem health monitoring data similar to those presented in this report. All of these factors contribute to the environmental concentrations of these contaminants and are all potentially influenced directly by human actions and climate change.

Based on the results stated in this report, we recommend:

- Continue monitoring bald eagle productivity and the collection of nestling plasma samples statewide, with priority given to nestlings in areas known to have elevated contamination, to determine if the observed increases are related to cyclic variations in environmental conditions or due to new input sources in the environment.

- Examine these data and future data and compare to other sources of contaminant monitoring data such as passive air sampling, other avian indicators, and lower trophic level indicators of contaminant concentration.
- Evaluate these data and future data in relation to land use change, anthropogenic disturbance, and climate patterns.

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Table 1: Sample sizes and medians, ranges and geometric means ($\mu\text{g}/\text{kg}$) of DDE in plasma samples of nestling bald eagles for the state of Michigan.

| Whole State | N | median | range | g-mean | |
|--------------------|----------|---------------|--------------|---------------|----|
| 1999-2003 | 242 | 10 | ND-257 | 10 | A |
| 2004-2008 | 223 | 10 | ND-141 | 9 | B |
| 2009-2013 | 279 | 14 | ND-220 | 13 | AB |

For each analysis significant differences are indicated by different letters.

Table 2: Sample sizes and medians, ranges and geometric means ($\mu\text{g}/\text{kg}$) of PCB in plasma samples of nestling bald eagles for the state of Michigan. For each analysis significant differences are indicated by different letters.

| Whole State | N | median | range | g-mean | |
|--------------------|----------|---------------|--------------|---------------|----|
| 1999-2003 | 242 | 22 | ND-304 | 14 | A |
| 2004-2008 | 223 | 17 | ND-145 | 14 | B |
| 2009-2013 | 279 | 16 | ND-498 | 13 | AB |

For each analysis significant differences are indicated by different letters.

Table 3. Sample sizes and medians, ranges and geometric means ($\mu\text{g}/\text{kg}$) of DDE in plasma samples of nestling bald eagles for the Category designation.

| Category | Sampling Period | N | median | range | g-mean | |
|-----------------|------------------------|----------|---------------|--------------|---------------|----|
| Great Lakes | 1999-2003 | 142 | 18 | ND-257 | 18 | A |
| | 2004-2008 | 133 | 14 | ND-129 | 12 | B |
| | 2009-2013 | 140 | 18 | ND-220 | 18 | AB |
| Inland | 1999-2003 | 100 | 4 | ND-96 | 5 | A |
| | 2004-2008 | 90 | 5 | ND-141 | 6 | A |
| | 2009-2013 | 139 | 10 | ND-77 | 9 | A |

For each analysis significant differences are indicated by different letters.

Table 4: Sample sizes and medians, ranges and geometric means ($\mu\text{g}/\text{kg}$) of PCB in plasma samples of nestling bald eagles for the Category designation.

| Category | Sampling Period | N | median | range | g-mean | |
|-----------------|------------------------|----------|---------------|--------------|---------------|----|
| Great Lakes | 1999-2003 | 142 | 39 | ND-304 | 36 | A |
| | 2004-2008 | 133 | 30 | ND-141 | 26 | B |
| | 2009-2013 | 140 | 38 | ND-498 | 32 | AB |
| Inland | 1999-2003 | 100 | 3 | ND-123 | 4 | A |
| | 2004-2008 | 90 | 7 | ND-145 | 6 | A |
| | 2009-2013 | 139 | 5 | ND-114 | 5 | A |

For each analysis significant differences are indicated by different letters.

Table 5: Significant differences in nestling plasma concentrations of DDE between all sampling periods at the Subpopulation and Great Lakes watershed spatial scales. Increases are indicated by a + and decreases are indicated by a -. Time periods are 1999-2003 (T1); 2004-2008 (T2); 2009-2013 (T3).

| Comparison | DDE | |
|-----------------------------------|-------|---------|
| | Trend | p-value |
| Subpopulation | | |
| Lake Michigan T1:T2 | - | 0.05 |
| Lake Superior T2:T3 | + | 0.02 |
| Great Lakes Watershed | | |
| Lake Michigan Great Lake T1:T2 | - | 0.04 |
| Lake Superior Great Lake T2:T3 | + | 0.01 |

Table 6: Significant differences in nestling plasma concentrations of Sum PCBs between all sampling periods at the Subpopulation and Great Lakes watershed spatial scales. Increases are indicated by a + and decreases are indicated by a -. Time periods are 1999-2003 (T1); 2004-2008 (T2); 2009-2013 (T3).

| Comparison | Sum PCBs | |
|-----------------------------------|----------|---------|
| | Trend | p-value |
| Subpopulation | | |
| Lake Michigan T1:T2 | - | 0.04 |
| Lake Superior T2:T3 | + | 0.04 |
| Great Lakes Watershed | | |
| Lake Michigan Great Lake T1:T2 | - | 0.02 |
| Lake Superior Great Lake T2:T3 | + | 0.03 |

Table 7. Sample sizes and medians, ranges and geometric means ($\mu\text{g}/\text{kg}$) of DDE in plasma samples of nestling bald eagles collected within Michigan, 1999-2013. Comparisons were made at 3 geographic scales; Category, Subpopulation, and Great Lakes Watersheds.

| Comparison | 4,4'-DDE | | | | |
|---|----------|--------|--------|--------|------|
| | N | median | range | g-mean | |
| Category | | | | | |
| GL | 415 | 17 | ND-257 | 16 | A |
| IN | 329 | 7 | ND-141 | 7 | B |
| Subpopulation | | | | | |
| LE | 19 | 11 | 4-27 | 11 | ABC |
| LH | 159 | 16 | ND-129 | 15 | B |
| LM | 137 | 25 | ND-145 | 23 | A |
| LP | 203 | 7 | ND-141 | 7 | C |
| LS | 100 | 11 | ND-257 | 11 | AB |
| UP | 126 | 6 | ND-69 | 6 | C |
| Great Lakes Watershed | | | | | |
| Lake Erie Great Lake | 19 | 11 | 4-27 | 11 | ABCD |
| Lake Huron Great Lake | 159 | 16 | ND-129 | 15 | BC |
| Lake Michigan Great Lake | 137 | 25 | ND-145 | 23 | A |
| Lake Superior Great Lake | 100 | 11 | ND-257 | 11 | AB |
| Lake Erie Inland Lower Peninsula | 3 | 11 | 5-55 | 15 | ABCD |
| Lake Huron Inland Lower Peninsula | 131 | 6 | ND-141 | 7 | D |
| Lake Michigan Inland Lower Peninsula | 69 | 10 | ND-96 | 8 | CD |
| Lake Huron Inland Upper Peninsula | 3 | 7 | 2-17 | 7 | ABCD |
| Lake Michigan Inland Upper Peninsula | 78 | 7 | ND-69 | 6 | D |
| Lakes Michigan/Superior Upper Peninsula | 6 | 9 | ND-20 | 6 | ABCD |
| Lake Superior Inland Upper Peninsula | 39 | 6 | ND-14 | 5 | D |

Great Lakes breeding areas are within 8.0 km of a Great Lake or along rivers open to Great Lakes fish runs and inland breeding areas are greater than 8.0km from a Great Lake and not along anadromous fish runs. For each analysis significant differences are indicated by different letters.

Table 8: Sample sizes and medians, ranges and geometric means ($\mu\text{g}/\text{kg}$) of PCB in plasma samples of nestling bald eagles collected within Michigan, 1999-2013. Comparisons were made at 3 geographic scales; Category, Subpopulation, and Great Lakes Watersheds.

| Category | Comparison | N | Sum PCBs | | | |
|------------------------------|---|-----|----------|--------|--------|----|
| | | | median | range | g-mean | |
| GL | | 415 | 36 | ND-498 | 31 | A |
| IN | | 329 | 5 | ND-145 | 5 | B |
| Subpopulation | | | | | | |
| LE | | 19 | 69 | 13-213 | 69 | A |
| LH | | 159 | 37 | ND-183 | 36 | AB |
| LM | | 137 | 41 | ND-498 | 39 | AB |
| LP | | 203 | 5 | ND-145 | 5 | C |
| LS | | 100 | 15 | ND-332 | 16 | B |
| UP | | 126 | 5 | ND-121 | 5 | C |
| Great Lakes Watershed | | | | | | |
| | Lake Erie Great Lake | 19 | 69 | 13-213 | 69 | A |
| | Lake Huron Great Lake | 159 | 37 | ND-183 | 36 | A |
| | Lake Michigan Great Lake | 137 | 41 | ND-498 | 39 | A |
| | Lake Superior Great Lake | 100 | 15 | ND-332 | 16 | A |
| | Lake Erie Inland Lower Peninsula | 3 | 5 | 3-21 | 7 | AB |
| | Lake Huron Inland Lower Peninsula | 131 | 5 | ND-145 | 5 | B |
| | Lake Michigan Inland Lower Peninsula | 69 | 5 | ND-123 | 5 | B |
| | Lake Huron Inland Upper Peninsula | 3 | 4 | 1-27 | 5 | AB |
| | Lake Michigan Inland Upper Peninsula | 78 | 6 | ND-121 | 6 | B |
| | Lakes Michigan/Superior Upper Peninsula | 6 | 2 | ND-16 | 2 | AB |
| | Lake Superior Inland Upper Peninsula | 39 | 3 | ND-34 | 3 | B |

Great Lakes breeding areas are within 8.0 km of a Great Lake or along rivers open to Great Lakes fish runs and inland breeding areas are greater than 8.0km from a Great Lake and not along anadromous fish runs. For each analysis significant differences are indicated by different letters.

Table 9: Sample sizes and medians, ranges and geometric means ($\mu\text{g/kg}$) of DDE in plasma samples of nestling bald eagles collected within Michigan, 1999-2003. Comparisons were made at 3 geographic scales; Category, Subpopulation, and Great Lakes Watersheds.

| Comparison | N | 4,4'-DDE | | | |
|--|-----|----------|--------|--------|----|
| | | median | range | g-mean | |
| Category | | | | | |
| Great lakes | 142 | 18 | ND-257 | 18 | A |
| Inland | 100 | 4 | ND-96 | 5 | B |
| Subpopulation | | | | | |
| Lake Erie | 5 | 9 | 5-19 | 9 | AB |
| Lake Huron | 49 | 15 | 2-61 | 16 | AB |
| Lake Michigan | 45 | 34 | 6-145 | 33 | A |
| Lower Peninsula | 50 | 4 | ND-96 | 5 | B |
| Lake Superior | 43 | 11 | ND-257 | 12 | A |
| Upper Peninsula | 50 | 4 | ND-69 | 4 | B |
| Great Lakes Watershed | | | | | |
| Lake Erie Great Lake | 5 | 9 | 5-19 | 9 | AB |
| Lake Huron Great Lake | 49 | 15 | 2-61 | 16 | AB |
| Lake Michigan Great Lake | 45 | 34 | 6-145 | 33 | A |
| Lake Superior Great Lake | 43 | 11 | ND-257 | 12 | AB |
| Lake Erie Inland Lower Peninsula | . | . | . | . | . |
| Lake Huron Inland Lower Peninsula | 34 | 4 | ND-81 | 4 | B |
| Lake Michigan Inland Lower Peninsula | 16 | 9 | 2-96 | 9 | AB |
| Lake Huron Inland Upper Peninsula | 1 | . | 2 | 2 | AB |
| Lake Michigan Inland Upper Peninsula | 32 | 5 | ND-69 | 5 | AB |
| Lakes Michigan/Superior Inland Upper Peninsula | 3 | 3 | ND-20 | 4 | AB |
| Lake Superior Inland Upper Peninsula | 14 | 3 | ND-10 | 3 | AB |

Great Lakes breeding areas are within 8.0 km of a Great Lake or along rivers open to Great Lakes fish runs and inland breeding areas are greater than 8.0km from a Great Lake and not along anadromous fish runs. For each analysis significant differences are indicated by different letters.

Table 10: Sample sizes and medians, ranges and geometric means ($\mu\text{g}/\text{kg}$) of PCB in plasma samples of nestling bald eagles collected within Michigan, 1999-2003. Comparisons were made at 3 geographic scales; Category, Subpopulation, and Great Lakes Watersheds.

| Comparison | N | median | Sum PCBs | | |
|---|-----|--------|----------|--------|-----|
| | | | range | g-mean | |
| Category | | | | | |
| Great lakes | 142 | 39 | ND-304 | 36 | A |
| Inland | 100 | 3 | ND-123 | 4 | B |
| Subpopulation | | | | | |
| Lake Erie | 5 | 149 | 57-213 | 114 | A |
| Lake Huron | 49 | 38 | 2-183 | 38 | A |
| Lake Michigan | 45 | 55 | 6-304 | 54 | A |
| Lower Peninsula | 50 | 3 | ND-123 | 4 | B |
| Lake Superior | 43 | 21 | ND-261 | 19 | A |
| Upper Peninsula | 50 | ND | ND-121 | 4 | B |
| Great Lakes Watershed | | | | | |
| Lake Erie Great Lake | 5 | 149 | 57-213 | 114 | A |
| Lake Huron Great Lake | 49 | 38 | 2-183 | 38 | AB |
| Lake Michigan Great Lake | 45 | 55 | 6-304 | 54 | AB |
| Lake Superior Great Lake | 43 | 21 | ND-261 | 19 | AB |
| Lake Erie Inland Lower Peninsula | . | . | . | . | . |
| Lake Huron Inland Lower Peninsula | 34 | 3 | ND-82 | 3 | C |
| Lake Michigan Inland Lower Peninsula | 16 | 5 | ND-123 | 6 | ABC |
| Lake Huron Inland Upper Peninsula | 1 | . | ND | ND | ABC |
| Lake Michigan Inland Upper Peninsula | 32 | 5 | ND-121 | 6 | BC |
| Lakes Michigan/Superior Upper Peninsula | 3 | ND | ND-16 | 3 | ABC |
| Lake Superior Inland Upper Peninsula | 14 | ND | ND-17 | 2 | ACB |

Great Lakes breeding areas are within 8.0 km of a Great Lake or along rivers open to Great Lakes fish runs and inland breeding areas are greater than 8.0km from a Great Lake and not along anadromous fish runs. For each analysis significant differences are indicated by different letters.

Table 11: Sample sizes and medians, ranges and geometric means ($\mu\text{g}/\text{kg}$) of DDE in plasma samples of nestling bald eagles collected within Michigan, 2004-2008. Comparisons were made at 3 geographic scales; Category, Subpopulation, and Great Lakes Watersheds.

| Comparison | N | median | 4,4'-DDE | | |
|--|-----|--------|----------|--------|---|
| | | | range | g-mean | |
| Category | | | | | |
| Great lakes | 133 | 14 | ND-129 | 12 | A |
| Inland | 90 | 5 | ND-141 | 6 | B |
| Subpopulation | | | | | |
| Lake Erie | 6 | 10 | 4-24 | 10 | A |
| Lake Huron | 45 | 14 | ND-129 | 13 | A |
| Lake Michigan | 49 | 21 | ND-71 | 16 | A |
| Lower Peninsula | 52 | 6 | ND-141 | 6 | A |
| Lake Superior | 33 | 7 | ND-112 | 7 | A |
| Upper Peninsula | 38 | 6 | ND-41 | 6 | A |
| Great Lakes Watershed | | | | | |
| Lake Erie Great Lake | 6 | 10 | 4-24 | 10 | A |
| Lake Huron Great Lake | 45 | 14 | ND-129 | 13 | A |
| Lake Michigan Great Lake | 49 | 21 | ND-71 | 16 | A |
| Lake Superior Great Lake | 33 | 7 | ND-112 | 7 | A |
| Lake Erie Inland Lower Peninsula | 2 | 8 | 5-11 | 7 | A |
| Lake Huron Inland Lower Peninsula | 33 | 5 | ND-141 | 6 | A |
| Lake Michigan Inland Lower Peninsula | 17 | 5 | ND-20 | 4 | A |
| Lake Huron Inland Upper Peninsula | 2 | 12 | 8-17 | 11 | A |
| Lake Michigan Inland Upper Peninsula | 23 | 5 | ND-41 | 6 | A |
| Lakes Michigan/Superior Inland Upper Peninsula | . | . | . | . | A |
| Lake Superior Inland Upper Peninsula | 13 | 6 | ND-14 | 5 | A |

Great Lakes breeding areas are within 8.0 km of a Great Lake or along rivers open to Great Lakes fish runs and inland breeding areas are greater than 8.0km from a Great Lake and not along anadromous fish runs. For each analysis significant differences are indicated by different letters.

Table 12: Sample sizes and medians, ranges and geometric means ($\mu\text{g/kg}$) of PCB in plasma samples of nestling bald eagles collected within Michigan, 2004-2008. Comparisons were made at 3 geographic scales; Category, Subpopulation, and Great Lakes Watersheds.

| Category | Comparison | N | Sum PCBs | | | |
|--|-------------------|----------|-----------------|--------------|---------------|----|
| | | | median | range | g-mean | |
| Great lakes | | 133 | 30 | ND-141 | 26 | A |
| Inland | | 90 | 7 | ND-145 | 6 | B |
| Subpopulation | | | | | | |
| Lake Erie | | 6 | 46 | 13-74 | 40 | A |
| Lake Huron | | 45 | 36 | 4-141 | 34 | A |
| Lake Michigan | | 49 | 36 | ND-107 | 30 | A |
| Lower Peninsula | | 52 | 5 | ND-145 | 5 | B |
| Lake Superior | | 33 | 14 | ND-91 | 14 | AB |
| Upper Peninsula | | 38 | 10 | ND-51 | 7 | B |
| Great Lakes Watershed | | | | | | |
| Lake Erie Great Lake | | 6 | 46 | 13-74 | 40 | A |
| Lake Huron Great Lake | | 45 | 36 | 4-141 | 34 | A |
| Lake Michigan Great Lake | | 49 | 36 | ND-107 | 30 | A |
| Lake Superior Great Lake | | 33 | 14 | ND-91 | 14 | A |
| Lake Erie Inland Lower Peninsula | | 2 | 12 | 3-21 | 9 | A |
| Lake Huron Inland Lower Peninsula | | 33 | 4 | ND-145 | 5 | A |
| Lake Michigan Inland Lower Peninsula | | 17 | 5 | ND-29 | 4 | A |
| Lake Huron Inland Upper Peninsula | | 2 | 16 | 4-27 | 11 | A |
| Lake Michigan Inland Upper Peninsula | | 23 | 10 | ND-51 | 7 | A |
| Lakes Michigan/Superior Inland Upper Peninsula | | . | . | . | . | A |
| Lake Superior Inland Upper Peninsula | | 13 | 6 | ND-34 | 5 | A |

Great Lakes breeding areas are within 8.0 km of a Great Lake or along rivers open to Great Lakes fish runs and inland breeding areas are greater than 8.0km from a Great Lake and not along anadromous fish runs. For each analysis significant differences are indicated by different letters.

Table 13: Sample sizes and medians, ranges and geometric means ($\mu\text{g/kg}$) of DDE in plasma samples of nestling bald eagles collected within Michigan, 2009-2013. Comparisons were made at 3 geographic scales; Category, Subpopulation, and Great Lakes Watersheds.

| Comparison | N | median | 4,4'-DDE | | |
|--|-----|--------|----------|--------|-----|
| | | | range | g-mean | |
| Category | | | | | |
| Great lakes | 140 | 18 | ND-220 | 18 | A |
| Inland | 139 | 10 | ND-77 | 9 | B |
| Subpopulation | | | | | |
| Lake Erie | 8 | 14 | 8-27 | 14 | ABC |
| Lake Huron | 65 | 17 | ND-33 | 14 | B |
| Lake Michigan | 43 | 23 | 8-71 | 24 | A |
| Lower Peninsula | 101 | 11 | ND-77 | 10 | BC |
| Lake Superior | 24 | 15 | 5-220 | 19 | A |
| Upper Peninsula | 38 | 9 | 2-23 | 8 | C |
| Great Lakes Watershed | | | | | |
| Lake Erie Great Lake | 8 | 14 | 8-27 | 14 | ABC |
| Lake Huron Great Lake | 65 | 17 | ND-33 | 14 | BC |
| Lake Michigan Great Lake | 43 | 23 | 8-71 | 24 | A |
| Lake Superior Great Lake | 24 | 15 | 5-220 | 19 | A |
| Lake Erie Inland Lower Peninsula | 1 | . | 55 | 55 | AB |
| Lake Huron Inland Lower Peninsula | 64 | 10 | ND-77 | 9 | C |
| Lake Michigan Inland Lower Peninsula | 36 | 12 | ND-47 | 11 | C |
| Lake Huron Inland Upper Peninsula | . | . | . | . | . |
| Lake Michigan Inland Upper Peninsula | 21 | 10 | 3-23 | 9 | C |
| Lakes Michigan/Superior Inland Upper Peninsula | 3 | 9 | 9-11 | 9 | ABC |
| Lake Superior Inland Upper Peninsula | 12 | 8 | 2-13 | 7 | C |

Great Lakes breeding areas are within 8.0 km of a Great Lake or along rivers open to Great Lakes fish runs and inland breeding areas are greater than 8.0km from a Great Lake and not along anadromous fish runs. For each analysis significant differences are indicated by different letters.

Table 14: Sample sizes and medians, ranges and geometric means ($\mu\text{g/kg}$) of PCB in plasma samples of nestling bald eagles collected within Michigan, 2009-2013. Comparisons were made at 3 geographic scales; Category, Subpopulation, and Great Lakes Watersheds.

| Comparison | N | median | Sum PCBs | | |
|--|----------|---------------|-----------------|---------------|-----|
| | | | range | g-mean | |
| Category | | | | | |
| Great lakes | 140 | 38 | ND-498 | 32 | A |
| Inland | 139 | 5 | ND-114 | 5 | B |
| Subpopulation | | | | | |
| Lake Erie | 8 | 87 | 28-191 | 76 | A |
| Lake Huron | 65 | 39 | ND-150 | 35 | A |
| Lake Michigan | 43 | 39 | 3-498 | 36 | A |
| Lower Peninsula | 101 | 6 | ND-114 | 6 | B |
| Lake Superior | 24 | 14 | ND-332 | 16 | A |
| Upper Peninsula | 38 | 4 | ND-65 | 4 | B |
| Great Lakes Watershed | | | | | |
| Lake Erie Great Lake | 8 | 87 | 28-191 | 76 | A |
| Lake Huron Great Lake | 65 | 39 | ND-150 | 35 | AB |
| Lake Michigan Great Lake | 43 | 39 | 3-498 | 36 | AB |
| Lake Superior Great Lake | 24 | 14 | ND-332 | 16 | AB |
| Lake Erie Inland Lower Peninsula | 1 | . | 5 | 5 | ABC |
| Lake Huron Inland Lower Peninsula | 64 | 6 | ND-114 | 6 | B |
| Lake Michigan Inland Lower Peninsula | 36 | 5 | ND-60 | 5 | B |
| Lake Huron Inland Upper Peninsula | . | . | . | . | . |
| Lake Michigan Inland Upper Peninsula | 23 | 2 | ND-65 | 4 | BC |
| Lakes Michigan/Superior Inland Upper Peninsula | 3 | 2 | ND-4 | 2 | ABC |
| Lake Superior Inland Upper Peninsula | 12 | 6 | ND-18 | 5 | ABC |

Great Lakes breeding areas are within 8.0 km of a Great Lake or along rivers open to Great Lakes fish runs and inland breeding areas are greater than 8.0km from a Great Lake and not along anadromous fish runs. For each analysis significant differences are indicated by different letters.

Appendix 1

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|------------------------------|----------|----------|
| BAEA-MI-1999-A-001 | MU-02 | c | Muskegon SGA | 22.4590 | 15.9490 |
| BAEA-MI-1999-A-007 | MN-08 | d | Pine/Timmerman L | 2.9760 | 7.5650 |
| BAEA-MI-1999-A-008 | NE-01 | i | Anderson Bayou | 7.5390 | 16.2470 |
| BAEA-MI-1999-A-009 | MN-05 | d | Manistee R SGA | 35.1880 | 23.0050 |
| BAEA-MI-1999-A-013 | AP-08 | d | Devil's L | 29.5440 | 11.1870 |
| BAEA-MI-1999-A-018 | MC-18 | d | Millecoquins L | 66.1710 | 43.6480 |
| BAEA-MI-1999-A-020 | HO-02 | e | Rabbit Bay N | 102.5130 | 41.4060 |
| BAEA-MI-1999-A-021 | BG-10 | d | Huron Bay | 12.3750 | 5.8030 |
| BAEA-MI-1999-A-022 | BG-11 | a | Reed's Pt | 25.0780 | 8.0990 |
| BAEA-MI-1999-A-025 | MQ-22 | a | Harvey | 12.9140 | 8.2300 |
| BAEA-MI-1999-A-029 | AG-20 | a | Hovey L | 34.7030 | 17.2090 |
| BAEA-MI-1999-A-036 | MC-19 | c | Marquette Isd | 24.5270 | 12.4610 |
| BAEA-MI-1999-A-038 | CP-29 | b | Caribou L | 12.0010 | 8.3750 |
| BAEA-MI-1999-B-005 | DI-06 | d | Badwater L S | 26.1740 | 10.2810 |
| BAEA-MI-1999-B-009 | DE-23 | a | Escanaba R-Gladstone | 178.2300 | 77.4250 |
| BAEA-MI-1999-B-013 | SC-15 | c | Mud L Ck | 1.0000 | 1.0000 |
| BAEA-MI-1999-B-019 | IR-22 | c | Camp 6 Ck-Michigamme R | 1.0000 | 2.7680 |
| BAEA-MI-1999-B-024 | MQ-25 | a | Ford R-Margarets Rapids | 54.3890 | 25.8140 |
| BAEA-MI-1999-B-028 | ON-01 | i | Bergland Bay N | 1.0000 | 3.1740 |
| BAEA-MI-1999-B-032 | ON-09 | g | Victoria | 13.5020 | 8.4990 |
| BAEA-MI-1999-B-034 | HO-06 | c | Sturgeon R | 5.8680 | 3.4260 |
| BAEA-MI-1999-B-036 | HO-16 | b | N Portage Canal | 40.0510 | 17.2330 |
| BAEA-MI-1999-B-049 | MQ-07 | e | Squaw/Chief L | 1.0000 | 2.1840 |
| BAEA-MI-1999-B-062 | GO-22 | e | Pomeroy L | 1.0000 | 1.0000 |
| BAEA-MI-1999-B-069 | SC-19 | a | Deer Count Ck | 221.5940 | 96.1930 |
| BAEA-MI-1999-B-071 | DE-09 | f | Moss L | 42.8800 | 29.7290 |
| BAEA-MI-1999-B-072 | ON-20 | a | Carp R-Landlooker Ck | 3.0920 | 5.4930 |
| BAEA-MI-1999-B-073 | GO-12 | j | Presque Isle Park | 67.1830 | 26.8290 |
| BAEA-MI-1999-C-002 | OG-01 | e | Rifle R Rec Area | 10.2800 | 1.0000 |
| BAEA-MI-1999-C-004 | MK-02 | c | Moddersville-New Cranberry L | 2.1210 | 4.6830 |
| BAEA-MI-1999-C-005 | OG-04 | b | No Mans/Augustina L | 5.8370 | 8.8420 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|-------------------------|----------|----------|
| BAEA-MI-1999-C-006 | RO-01 | j | L St Helen E | 5.6480 | 5.1780 |
| BAEA-MI-1999-C-008 | IO-02 | | Cooke Dam | 1.0000 | 5.3940 |
| BAEA-MI-1999-C-011 | OT-07 | a | O'Rourke L | 1.0000 | 7.1510 |
| BAEA-MI-1999-C-016 | MY-05 | c | Black R Ranch | 1.0000 | 3.2950 |
| BAEA-MI-1999-C-017 | ET-05 | a | Walloon L | 82.5370 | 34.8500 |
| BAEA-MI-1999-C-019 | ET-05 | a | Walloon L | 205.4390 | 96.1900 |
| BAEA-MI-1999-C-022 | SC-20 | b | D1 Pool (Seney NWR) | 1.0000 | 2.9730 |
| BAEA-MI-1999-C-023 | CP-22 | g | Duck Bay-Sugar Isd | 5.9120 | 4.8390 |
| BAEA-MI-1999-D-001 | AR-03 | d | Santiago | 25.3650 | 8.0280 |
| BAEA-MI-1999-D-002 | GL-01 | b | Molasses R Fldg | 1.0000 | 2.4580 |
| BAEA-MI-1999-D-007 | MD-01 | a | Sanford L | 2.3310 | 8.1830 |
| BAEA-MI-1999-D-008 | RO-11 | b | W Twin/Woods L | 1.0000 | 1.0000 |
| BAEA-MI-1999-D-013 | PI-03 | b | False Presque Isle | 80.7610 | 29.6180 |
| BAEA-MI-1999-D-015 | MC-07 | c | E L | 1.0000 | 2.2160 |
| BAEA-MI-1999-E-001 | SG-02 | c | Shiawassee NWR #1 | 32.2760 | 8.0250 |
| BAEA-MI-1999-E-002 | BY-01 | c | Skull/Stoney Isd | 85.9580 | 14.8070 |
| BAEA-MI-1999-E-004 | AN-02 | b | Swan Ck-Highbanks | 60.0480 | 11.9200 |
| BAEA-MI-1999-E-005 | MO-03 | d | Raisin R-Monroe | 213.0470 | 8.1220 |
| BAEA-MI-1999-E-006 | AR-04 | b | Big Charity Isd | 31.2220 | 9.4660 |
| BAEA-MI-1999-G-001 | AG-09 | e | Grand Isd-Trout Bay | 20.7370 | 9.3330 |
| BAEA-MI-2000-A-001 | GO-36 | b | W Bay L NE | 1.0000 | 1.0000 |
| BAEA-MI-2000-A-002 | DI-06 | d | Badwater L S | 5.7690 | 1.9800 |
| BAEA-MI-2000-A-005 | DE-16 | b | No-see-um Ck-N L | 152.1030 | 60.6670 |
| BAEA-MI-2000-A-007 | MM-16 | a | Nacomis Ck | 65.9580 | 21.0100 |
| BAEA-MI-2000-A-009 | MQ-25 | a | Ford R-Margarets Rapids | 121.1300 | 50.5040 |
| BAEA-MI-2000-A-011 | HO-06 | c | Sturgeon R | 1.3480 | 1.0120 |
| BAEA-MI-2000-A-012 | BG-10 | d | Huron Bay | 10.4540 | 4.7410 |
| BAEA-MI-2000-A-015 | ON-03 | g | Interior | 1.0000 | 1.0000 |
| BAEA-MI-2000-A-020 | GO-39 | a | Copper Peak | 24.5640 | 14.1310 |
| BAEA-MI-2000-A-028 | MM-12 | b | The Oxbow | 42.4520 | 4.1250 |
| BAEA-MI-2000-A-030 | MQ-24 | a | Escanaba R-Lindsey Ck | 39.1670 | 23.3020 |
| BAEA-MI-2000-A-032 | DE-07 | d | Squaw Ck | 231.3190 | 145.4370 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|--------------------------------|----------|----------|
| BAEA-MI-2000-A-037 | CP-25 | a | Potagonissing Fldg-First L | 20.4050 | 8.7960 |
| BAEA-MI-2000-A-038 | CP-26 | c | Gravel Isd/L | 104.2910 | 40.8560 |
| BAEA-MI-2000-A-042 | MQ-02 | g | Conway L-Salmon Trout R | 36.5800 | 13.2610 |
| BAEA-MI-2000-A-043 | MQ-10 | d | L Independence E-Yellowdog Swp | 29.0750 | 12.5540 |
| BAEA-MI-2000-A-044 | MQ-04 | c | Partridge Isd | 178.9440 | 256.5090 |
| BAEA-MI-2000-A-051 | DE-21 | c | Kregg Bay | 104.5380 | 52.9930 |
| BAEA-MI-2000-A-053 | LU-12 | a | Long L | 16.6640 | 10.0310 |
| BAEA-MI-2000-B-001 | MU-02 | c | Muskegon SGA | 25.8990 | 23.9510 |
| BAEA-MI-2000-B-003 | MN-05 | d | Manistee R SGA | 28.9820 | 21.7100 |
| BAEA-MI-2000-B-004 | LA-02 | a | Syers L | 123.1000 | 95.6290 |
| BAEA-MI-2000-B-005 | MS-03 | c | Hamlin L | 6.4490 | 8.7330 |
| BAEA-MI-2000-B-007 | MN-02 | b | Carlson's/Horseshoe Bend | 67.7240 | 39.5120 |
| BAEA-MI-2000-B-012 | WX-01 | c | Hodenpyle Dam Pd W | 8.3150 | 5.7730 |
| BAEA-MI-2000-C-005 | OG-02 | f | Stylus L E (N) | 13.0110 | 3.6710 |
| BAEA-MI-2000-C-008 | RO-04 | b | Backus L | 7.4150 | 7.1750 |
| BAEA-MI-2000-C-023 | MY-06 | b | Woodmere/W Twin L | 5.0020 | 6.0210 |
| BAEA-MI-2000-C-026 | PI-03 | b | False Presque Isle | 30.7650 | 20.5600 |
| BAEA-MI-2000-C-027 | PI-09 | a | L Augusta | 20.1490 | 15.2990 |
| BAEA-MI-2000-C-030 | ET-06 | a | L Paradise | 23.1370 | 8.0580 |
| BAEA-MI-2000-C-031 | ET-05 | a | Walloon L | 15.2780 | 12.2490 |
| BAEA-MI-2000-C-033 | PI-05 | c | Black Mallard L | 21.2100 | 15.8530 |
| BAEA-MI-2000-D-003 | MO-04 | d | Erie Shooting Club S | 69.1350 | 10.2190 |
| BAEA-MI-2000-D-007 | OT-01 | a | Caulkins Ck | 2.3430 | 3.8590 |
| BAEA-MI-2000-D-008 | OT-03 | l | N Br AuSable R | 2.7320 | 1.7950 |
| BAEA-MI-2000-D-009 | IO-04 | b | Allen L | 37.9270 | 25.3070 |
| BAEA-MI-2000-D-013 | AP-04 | b | Ossineke-S Pt N | 17.1780 | 9.5240 |
| BAEA-MI-2000-D-016 | IO-01 | g | Loud Dam Pd E | 20.8160 | 3.3740 |
| BAEA-MI-2000-D-020 | BZ-04 | b | Upper Herring L | 41.6670 | 27.9910 |
| BAEA-MI-2000-E-001 | CB-13 | a | Tower S-Onaway | 81.9900 | 80.7640 |
| BAEA-MI-2000-E-005 | MY-04 | e | Grass L | 1.0000 | 3.0220 |
| BAEA-MI-2000-E-007 | AG-20 | a | Hovey L | 7.2600 | 7.4050 |
| BAEA-MI-2000-E-008 | CP-19 | b | Harbor Isd NE | 21.3290 | 9.8490 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|--------------------------|----------|----------|
| BAEA-MI-2000-E-010 | MQ-15 | f | L Superior-Saux Head L | 14.0870 | 6.0330 |
| BAEA-MI-2000-E-012 | AG-11 | f | Laughing Fish Pt | 8.6200 | 41.7160 |
| BAEA-MI-2000-E-013 | AG-08 | e | AuTrain L | 5.1250 | 5.6080 |
| BAEA-MI-2000-E-014 | AG-02 | d | Fish/Baldy L | 1.0000 | 2.1240 |
| BAEA-MI-2000-E-016 | AG-09 | e | Trout Bay (Grand Isd) | 23.3830 | 12.3010 |
| BAEA-MI-2000-E-018 | MC-22 | a | Brulee Pt W | 37.0020 | 16.4610 |
| BAEA-MI-2000-E-020 | MC-21 | c | Big St Martin Isd | 25.1210 | 9.9070 |
| BAEA-MI-2001-A-006 | GO-08 | b | Bass L | 1.0000 | 3.8740 |
| BAEA-MI-2001-A-019 | IR-07 | f | Paint L | 1.0000 | 1.0000 |
| BAEA-MI-2001-A-025 | GO-35 | c | Whitefish L | 2.7030 | 5.4260 |
| BAEA-MI-2001-A-035 | HO-03 | e | Prickett Dam N | 6.7070 | 5.5130 |
| BAEA-MI-2001-A-036 | HO-11 | c | Prickett L S | 1.0000 | 1.1610 |
| BAEA-MI-2001-A-044 | MQ-09 | f | Deer L | 9.8880 | 1.9500 |
| BAEA-MI-2001-A-047 | HO-16 | b | N Portage Canal | 5.5460 | 5.1040 |
| BAEA-MI-2001-A-048 | HO-07 | b | Silver Ck-Princess Pt Rd | 2.0930 | 2.6950 |
| BAEA-MI-2001-A-049 | BG-11 | a | Reed's Pt | 24.0530 | 7.9850 |
| BAEA-MI-2001-A-060 | DI-09 | c | Gene Pd | 4.3130 | 5.3780 |
| BAEA-MI-2001-A-061 | DE-16 | b | No-see-um Ck-N L | 252.0910 | 91.5930 |
| BAEA-MI-2001-A-065 | MQ-04 | d | Partridge Isd | 197.1320 | 109.3860 |
| BAEA-MI-2001-A-069 | MQ-15 | g | L Superior-Saux Head L | 3.1250 | 3.2480 |
| BAEA-MI-2001-A-076 | IR-19 | c | Cook's Run-Golden L | 1.0000 | 7.2640 |
| BAEA-MI-2001-A-082 | DE-21 | c | Kregg Bay | 303.6840 | 99.5120 |
| BAEA-MI-2001-A-083 | DE-17 | d | Fishdam R Mouth | 76.2920 | 37.6470 |
| BAEA-MI-2001-A-090 | IR-28 | c | Smoky L | 1.0000 | 2.2500 |
| BAEA-MI-2001-A-097 | GO-24 | d | Marsh/Deer Isd L | 1.0000 | 3.1920 |
| BAEA-MI-2001-A-107 | IR-25 | a | Shank L | 1.0000 | 1.0000 |
| BAEA-MI-2001-A-110 | AG-17 | a | Grand Sable L | 51.6380 | 26.6410 |
| BAEA-MI-2001-A-111 | AG-16 | c | Beaver Basin | 8.0430 | 11.3230 |
| BAEA-MI-2001-B-001 | MU-02 | c | Muskegon SGA | 24.6590 | 35.5230 |
| BAEA-MI-2001-B-004 | NE-01 | i | Anderson Bayou | 21.5500 | 31.5520 |
| BAEA-MI-2001-B-005 | MN-02 | b | Carlson's/Horseshoe Bend | 63.0780 | 44.2200 |
| BAEA-MI-2001-B-006 | MN-05 | d | Manistee R SGA | 60.2230 | 33.5000 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|--------------------------------|----------|----------|
| BAEA-MI-2001-B-010 | WX-02 | a | L Mitchell | 2.6330 | 10.0520 |
| BAEA-MI-2001-C-004 | CL-01 | f | Cranberry L | 1.0000 | 6.7110 |
| BAEA-MI-2001-C-005 | OL-01 | b | Ewart | 1.0000 | 2.8450 |
| BAEA-MI-2001-C-008 | AL-02 | j | Alcona-Bamfield Pd | 1.0000 | 1.9910 |
| BAEA-MI-2001-C-010 | MK-01 | i | Missaukee L | 20.2320 | 11.6540 |
| BAEA-MI-2001-C-014 | OS-03 | e | McKinley | 1.0000 | 1.1480 |
| BAEA-MI-2001-C-025 | PI-01 | a | L Ella | 7.8000 | 10.7900 |
| BAEA-MI-2001-C-027 | PI-09 | a | L Augusta | 76.5480 | 35.5570 |
| BAEA-MI-2001-C-028 | CB-01 | c | Upper Black R | 14.6860 | 11.0060 |
| BAEA-MI-2001-C-031 | AG-11 | f | Laughing Fish Pt | 43.3280 | 47.9560 |
| BAEA-MI-2001-C-034 | CP-02 | e | Sugar Isd S | 22.6080 | 13.4540 |
| BAEA-MI-2001-C-037 | CP-10 | d | Burnt Isd | 42.0020 | 26.6560 |
| BAEA-MI-2001-D-001 | MO-03 | a | Raisin R-Monroe | 152.7750 | 9.4390 |
| BAEA-MI-2001-D-005 | IO-04 | b | Allen L | 28.3440 | 15.5840 |
| BAEA-MI-2001-D-006 | AL-05 | b | Sprinkler L | 1.2060 | 4.2800 |
| BAEA-MI-2001-D-007 | AP-08 | d | Devil's L | 36.6540 | 13.9670 |
| BAEA-MI-2001-D-009 | IO-05 | e | Monument W-Five Channels | 12.5330 | 3.1180 |
| BAEA-MI-2001-D-010 | AR-03 | d | Santiago | 27.8830 | 7.3540 |
| BAEA-MI-2001-D-012 | BY-02 | c | Quanicassee | 62.2010 | 10.8430 |
| BAEA-MI-2001-D-015 | TU-01 | c | Dinsmoore | 74.5070 | 48.0490 |
| BAEA-MI-2001-D-017 | AR-04 | b | Big Charity Isd | 76.9480 | 19.9970 |
| BAEA-MI-2001-D-018 | ET-05 | a | Walloon L | 44.9630 | 25.0770 |
| BAEA-MI-2001-D-021 | MC-23 | b | Duel L-Grants Pt | 150.8010 | 59.5750 |
| BAEA-MI-2001-D-024 | AG-08 | e | AuTrain L | 20.3080 | 10.5480 |
| BAEA-MI-2001-F-001 | SG-02 | c | Shiawassee NWR #1 | 139.4860 | 38.0710 |
| BAEA-MI-2001-F-006 | MO-02 | i | Pte Mouille SGA-Laguna Beach N | 149.4390 | 19.2490 |
| BAEA-MI-2002-A-009 | DI-06 | d | Badwater L S | 38.4900 | 7.4050 |
| BAEA-MI-2002-A-011 | DI-16 | a | Sturgeon Falls Dam N | 57.2860 | 5.4370 |
| BAEA-MI-2002-A-013 | DI-10 | a | Sturgeon Falls Dam-Millers | 25.7500 | 2.0590 |
| BAEA-MI-2002-A-014 | DI-02 | i | Vulcan | 46.4410 | 4.7520 |
| BAEA-MI-2002-A-029 | IR-38 | a | Mud/Anderson L | 1.0000 | 7.5070 |
| BAEA-MI-2002-A-039 | IR-17 | f | Michigamme Res S | 1.0000 | 1.7840 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|--------------------------|----------|----------|
| BAEA-MI-2002-A-040 | IR-22 | c | Camp 6 Ck-Michigamme R | 1.0000 | 4.6190 |
| BAEA-MI-2002-A-046 | IR-20 | b | Iron L | 7.2710 | 9.4140 |
| BAEA-MI-2002-A-063 | DI-15 | a | Blomgren Marsh | 1.3610 | 1.0000 |
| BAEA-MI-2002-A-076 | BG-11 | a | Reed's Pt | 21.6280 | 10.2630 |
| BAEA-MI-2002-A-081 | IR-40 | c | Net R-Widewaters | 1.0000 | 1.0000 |
| BAEA-MI-2002-A-117 | HO-02 | f | Rabbit Bay N | 79.2910 | 69.9890 |
| BAEA-MI-2002-B-008 | AR-04 | c | Big Charity Isd | 182.9450 | 46.4870 |
| BAEA-MI-2002-B-010 | AR-05 | a | Pt AuGres S | 63.1110 | 21.1620 |
| BAEA-MI-2002-C-001 | OS-08 | a | Mio Pd E | 4.0350 | 7.3650 |
| BAEA-MI-2002-C-004 | GL-01 | c | Molasses R Fldg | 26.1980 | 10.1120 |
| BAEA-MI-2002-C-011 | IO-05 | d? | Monument W-Five Channels | 4.4420 | 2.0780 |
| BAEA-MI-2002-C-012 | IO-04 | b | Allen L | 67.1130 | 34.0100 |
| BAEA-MI-2002-C-015 | OG-03 | c | Hardwood L | 18.7130 | 5.7030 |
| BAEA-MI-2002-C-016 | RO-09 | g | Marl L | 32.2750 | 18.7760 |
| BAEA-MI-2002-C-018 | RO-03 | i | Deadstream Fldg S | 7.9980 | 3.6320 |
| BAEA-MI-2002-C-019 | RO-13 | b | Prudenville | 1.0000 | 4.1970 |
| BAEA-MI-2002-D-002 | NE-01 | j | Anderson Bayou | 63.1780 | 47.9640 |
| BAEA-MI-2002-D-004 | IO-01 | g? | Loud Dam Pd E | 2.7850 | 1.3830 |
| BAEA-MI-2002-D-007 | OC-01 | b | Pentwater | 10.0770 | 8.8930 |
| BAEA-MI-2002-D-008 | PI-03 | b | False Presque Isle | 25.5150 | 15.1320 |
| BAEA-MI-2002-D-009 | PI-10 | b | Hoefl SP | 39.8230 | 25.1200 |
| BAEA-MI-2002-D-011 | CR-06 | a | Mason Tract | 1.0000 | 1.7580 |
| BAEA-MI-2002-D-019 | MY-06 | b | Woodmere/W Twin L | 2.4770 | 3.9050 |
| BAEA-MI-2002-D-022 | MC-23 | b | Duel L-Grants Pt | 73.5070 | 46.0720 |
| BAEA-MI-2002-D-023 | AG-19 | b | Echo L N (Grand Isd) | 88.0640 | 25.7400 |
| BAEA-MI-2002-D-025 | DE-09 | f | Moss L | 97.3900 | 52.2830 |
| BAEA-MI-2002-D-026 | DE-26 | a | St Martin Isd | 217.2660 | 81.4100 |
| BAEA-MI-2002-D-027 | DE-08 | c | Little Summer Isd | 217.4800 | 138.0370 |
| BAEA-MI-2002-D-028 | MC-21 | c | Big St Martin Isd | 79.8410 | 45.7660 |
| BAEA-MI-2002-D-029 | CP-33 | a | Sand Isd-Dunbar | 55.5690 | 25.5660 |
| BAEA-MI-2002-D-030 | CP-22 | i | Duck Bay-Sugar Isd | 19.9160 | 7.9730 |
| BAEA-MI-2002-D-031 | CP-10 | d | Burnt Isd | 68.8890 | 35.9650 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|----------------------|----------|----------|
| BAEA-MI-2003-A-001 | GO-36 | _ | W Bay L NE | 5.9180 | 5.2650 |
| BAEA-MI-2003-A-004 | MM-23 | a | Vetorts Pt | 112.4650 | 40.9620 |
| BAEA-MI-2003-A-005 | DE-23 | b | Escanaba R-Gladstone | 10.4480 | 31.3280 |
| BAEA-MI-2003-A-008 | GO-26 | c | Mill L | 1.0000 | 1.0000 |
| BAEA-MI-2003-A-012 | GO-22 | _ | Pomeroy L | 1.0000 | 1.6270 |
| BAEA-MI-2003-A-015 | IR-33 | a | Buck/Armstrong L | 1.0000 | 1.3220 |
| BAEA-MI-2003-A-023 | GO-18 | _ | Montgomery Ck | 1.0000 | 2.6670 |
| BAEA-MI-2003-A-027 | MQ-04 | _ | Partridge Isd | 261.4820 | 130.0720 |
| BAEA-MI-2003-A-032 | DE-25 | a | Hunters Brook | 23.0920 | 50.0570 |
| BAEA-MI-2003-A-033 | MM-07 | a | Hermansville Pd | 78.7510 | 68.6410 |
| BAEA-MI-2003-A-037 | ON-20 | a | Carp R-Landlooker Ck | 15.8799 | 6.8000 |
| BAEA-MI-2003-A-039 | GO-37 | a | Big Bateau L | 15.9120 | 19.8300 |
| BAEA-MI-2003-A-040 | GO-08 | b | Bass L | 1.0000 | 5.7900 |
| BAEA-MI-2003-A-046 | BG-04 | _ | Von Zellens Camp | 51.4980 | 20.0270 |
| BAEA-MI-2003-A-050 | HO-10 | _ | Bootjack-Dreamland | 21.1743 | 10.5800 |
| BAEA-MI-2003-A-053 | GO-15 | _ | Beatons L | 1.0000 | 9.4800 |
| BAEA-MI-2003-A-056 | KW-03 | _ | Betsy/Burnette Park | 33.9621 | 16.0240 |
| BAEA-MI-2003-A-057 | AG-16 | c | Beaver Basin | 15.3422 | 8.2240 |
| BAEA-MI-2003-A-059 | AG-17 | a | Grand Sable L | 4.1970 | 5.5260 |
| BAEA-MI-2003-B-002 | MS-05 | a | Walhalla E | 40.7125 | 37.9221 |
| BAEA-MI-2003-B-005 | MS-06 | a | Walhalla W | 39.8214 | 6.0636 |
| BAEA-MI-2003-B-006 | ML-01 | a | Stanton | 2.4108 | 18.6618 |
| BAEA-MI-2003-B-007 | SG-05 | a | Bridgeport | 16.5295 | 5.7240 |
| BAEA-MI-2003-B-009 | BY-03 | d | Nayanquing Pt | 7.1367 | 1.7270 |
| BAEA-MI-2003-B-013 | RO-12 | e | L St Helen W | 1.0000 | 2.5780 |
| BAEA-MI-2003-C-001 | NE-01 | j | Anderson Bayou | 32.4938 | 27.4593 |
| BAEA-MI-2003-C-002 | AR-03 | d | Santiago | 52.9536 | 11.5760 |
| BAEA-MI-2003-C-003 | AR-05 | a | Pt AuGres S | 103.2488 | 21.2514 |
| BAEA-MI-2003-C-004 | AL-08 | c | Black R-Negwelon S | 71.3994 | 38.0551 |
| BAEA-MI-2003-C-005 | GT-02 | b | Brown Bridge Pd | 67.4586 | 40.1640 |
| BAEA-MI-2003-C-006 | ET-05 | b | Walloon L | 27.4708 | 18.8340 |
| BAEA-MI-2003-C-009 | RO-13 | b | Prudenville | 1.0000 | 2.3640 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|-----------------------|----------|----------|
| BAEA-MI-2003-C-010 | OS-08 | a | Mio Pd E | 1.0000 | 2.2200 |
| BAEA-MI-2003-C-011 | OS-01 | g | Reed Ranch | 11.5860 | 6.6000 |
| BAEA-MI-2003-C-012 | CR-04 | b | Chub L | 1.0000 | 1.5840 |
| BAEA-MI-2003-C-013 | LL-09 | a | L Leelanau | 7.5935 | 9.7509 |
| BAEA-MI-2003-C-014 | LL-07 | c | Cat Head Bay | 29.8857 | 20.2934 |
| BAEA-MI-2003-C-015 | AP-08 | e | Devil's L | 161.8004 | 60.7282 |
| BAEA-MI-2003-C-016 | CX-02 | b | Beaver Isd-Fox L | 41.2576 | 19.5196 |
| BAEA-MI-2003-C-018 | AG-09 | e | Trout Bay (Grand Isd) | 31.4166 | 17.1594 |
| BAEA-MI-2003-C-019 | CX-03 | a | Garden Isd Central | 54.8604 | 23.7223 |
| BAEA-MI-2003-C-020 | MC-22 | a | Brulee Pt W | 70.6449 | 27.2739 |
| BAEA-MI-2003-C-021 | MQ-08 | _ | L Kawbawgam | 111.7143 | 46.7399 |
| BAEA-MI-2003-D-001 | WX-02 | a | L Mitchell | 1.9400 | 10.7219 |
| BAEA-MI-2003-D-003 | AG-08 | e | AuTrain L | 1.0000 | 2.3490 |
| BAEA-MI-2003-D-005 | CP-02 | e | Sugar Isd S | 59.8799 | 20.6933 |
| BAEA-MI-2003-D-008 | DE-17 | d | Fishdam R Mouth | 43.5015 | 19.8872 |
| BAEA-MI-2003-E-001 | SG-02 | c | Shiawassee NWR #1 | 66.4407 | 15.2257 |
| BAEA-MI-2003-E-003 | MO-04 | c | Erie Shooting Club S | 57.2387 | 5.0110 |
| BAEA-MI-2003-E-004 | HU-04 | c | Sand Pt | 44.7249 | 14.4930 |
| BAEA-MI-2003-E-006 | ST-02 | a | Ford Estate-Ruby | 6.5390 | 1.0000 |
| BAEA-MI-2004-A-003 | RO-06 | c | Bear Ck Fldg | 2.0110 | 6.3290 |
| BAEA-MI-2004-A-004 | OG-02 | e | Stylus L E (N) | 1.0000 | 4.0300 |
| BAEA-MI-2004-A-007 | OG-01 | 3 | Rifle R Rec Area | 9.5240 | 4.0570 |
| BAEA-MI-2004-A-009 | KA-04 | e | Big Blue/Bass L | 1.0000 | 1.0000 |
| BAEA-MI-2004-A-010 | RO-08 | d | Wraco Lodge | 1.0000 | 3.3088 |
| BAEA-MI-2004-A-013 | IO-04 | b | Allen L | 45.3659 | 8.5918 |
| BAEA-MI-2004-A-017 | RO-13 | b | Prudenville | 1.0000 | 5.3138 |
| BAEA-MI-2004-A-022 | DE-07 | d | Squaw Ck | 55.3465 | 16.6320 |
| BAEA-MI-2004-A-023 | SC-19 | c | Deer Count Ck | 64.2148 | 35.1888 |
| BAEA-MI-2004-A-024 | AG-20 | a | Hovey L | 8.0100 | 6.5010 |
| BAEA-MI-2004-A-025 | AG-18 | a | Forest L Basin N | 13.5948 | 10.2467 |
| BAEA-MI-2004-A-026 | AG-08 | e | AuTrain L | 1.0000 | 3.2200 |
| BAEA-MI-2004-A-027 | LU-13 | a | Dollarville-Natalie | 6.3600 | 9.0508 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|--------------------------------|----------|----------|
| BAEA-MI-2004-A-028 | MC-07 | c | E L | 4.4600 | 7.6020 |
| BAEA-MI-2004-A-029 | CP-32 | a | Chippewa Co Airport | 26.6421 | 16.7660 |
| BAEA-MI-2004-A-030 | CP-30 | a | Neebish Isd E | 93.0836 | 32.6208 |
| BAEA-MI-2004-A-032 | CP-22 | l | Duck Bay-Sugar Isd | 24.9991 | 8.9739 |
| BAEA-MI-2004-A-035 | CP-10 | d | Burnt Isd | 71.1350 | 33.3640 |
| BAEA-MI-2004-A-036 | CP-37 | a | Potagannissing Dam | 23.0706 | 20.1537 |
| BAEA-MI-2004-A-037 | CP-20 | f | Tahquamenon Bay Swamp | 14.5608 | 11.9939 |
| BAEA-MI-2004-A-038 | SC-04 | c | C2 Pool (Seney NWR) | 16.8342 | 13.2031 |
| BAEA-MI-2004-A-039 | LU-12 | a? | Long L | 1.0000 | 1.0000 |
| BAEA-MI-2004-A-040 | AG-11 | f | Laughing Fish Pt | 18.7841 | 9.2692 |
| BAEA-MI-2004-A-041 | MC-02 | c | Paquin Ck | 1.0000 | 1.0000 |
| BAEA-MI-2004-B-002 | OG-07 | a | Stylus L W (S) | 144.7796 | 78.9037 |
| BAEA-MI-2004-B-005 | MN-06 | e | Wellston | 10.2837 | 11.9343 |
| BAEA-MI-2004-B-006 | MN-10 | a | Little Manistee R | 13.1791 | 12.7587 |
| BAEA-MI-2004-B-007 | MN-04 | c | Tippy Dam | 71.4133 | 42.1876 |
| BAEA-MI-2004-B-008 | MN-11 | a | Manistee Airport | 76.4895 | 39.1356 |
| BAEA-MI-2004-B-012 | NE-01 | i | Anderson Bayou | 25.6913 | 20.6420 |
| BAEA-MI-2004-B-013 | MD-01 | a | Sanford L | 8.3468 | 10.0587 |
| BAEA-MI-2004-B-014 | ET-06 | b | L Paradise | 52.9415 | 58.0158 |
| BAEA-MI-2004-B-015 | AL-05 | c | Sprinkler L | 1.0000 | 1.0000 |
| BAEA-MI-2004-C-001 | MO-02 | k | Pte Mouille SGA-Laguna Beach N | 43.8771 | 3.9860 |
| BAEA-MI-2004-C-003 | IA-02 | b | Weber Dam | 12.9621 | 12.0096 |
| BAEA-MI-2004-C-004 | AR-05 | a | Pt AuGres S | 39.3979 | 12.2560 |
| BAEA-MI-2004-C-005 | AR-05 | a | Pt AuGres S | 37.4676 | 12.7110 |
| BAEA-MI-2004-C-006 | MO-04 | e | Erie Shooting Club S | 48.4651 | 8.7600 |
| BAEA-MI-2004-C-007 | HU-04 | c | Sand Pt | 28.8439 | 14.8768 |
| BAEA-MI-2004-C-008 | AN-04 | b | New Richmond | 107.2994 | 1.0000 |
| BAEA-MI-2004-C-012 | TU-03 | b | Caro | 1.0000 | 9.5490 |
| BAEA-MI-2004-C-015 | BY-01 | d | Skull/Stoney Isd | 36.6942 | 15.3106 |
| BAEA-MI-2005-A-001 | AR-05 | | Pt AuGres | 75.5722 | 21.8003 |
| BAEA-MI-2005-A-003 | AR-03 | | Santiago | 44.2592 | 13.3941 |
| BAEA-MI-2005-A-004 | NE-01 | | Anderson Bayou | 33.9677 | 27.5469 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|-------------------------|----------|----------|
| BAEA-MI-2005-A-008 | MD-01 | | Sanford L | 17.9808 | 13.3663 |
| BAEA-MI-2005-A-009 | OS-10 | | Rhoades L | 2.2577 | 3.1836 |
| BAEA-MI-2005-A-011 | AL-04 | | McCollum L | 6.4275 | 6.9947 |
| BAEA-MI-2005-A-017 | OT-09 | | Olund L | 1.0000 | 4.6310 |
| BAEA-MI-2005-A-018 | MN-10 | | Little Manistee R | 42.5239 | 30.4927 |
| BAEA-MI-2005-A-019 | OL-01 | | Evert | 8.3755 | 6.1048 |
| BAEA-MI-2005-A-024 | AP-02 | | Fletcher Pd NE | 60.2764 | 35.5976 |
| BAEA-MI-2005-A-025 | GT-08 | | Cherry City Airport | 10.9197 | 15.4838 |
| BAEA-MI-2005-A-037 | CX-02 | | Beaver Isd-Fox L | 23.7131 | 18.0819 |
| BAEA-MI-2005-A-040 | CX-01 | | East Jordan | 24.8534 | 20.3230 |
| BAEA-MI-2005-B-001 | MS-06 | | Walhalla W | 40.4987 | 22.7476 |
| BAEA-MI-2005-B-006 | MN-05 | | Manistee R SGA | 53.8507 | 26.3920 |
| BAEA-MI-2005-B-009 | MN-02 | | Carlsons-Horseshoe Bend | 67.6831 | 70.9344 |
| BAEA-MI-2005-B-011 | MN-04 | | Tippy Dam | 82.0145 | 60.4726 |
| BAEA-MI-2005-B-012 | MT-06 | | Jenson L | 3.4473 | 3.9364 |
| BAEA-MI-2005-B-015 | MY-05 | | Black R Ranch | 14.6587 | 7.1497 |
| BAEA-MI-2005-B-021 | PI-03 | | False Presque Isle | 29.7009 | 19.9187 |
| BAEA-MI-2005-B-023 | MY-04 | | Grass L | 5.3734 | 7.5746 |
| BAEA-MI-2005-B-027 | MQ-15 | | Saux Head L | 47.8742 | 4.2581 |
| BAEA-MI-2005-B-028 | DI-09 | | Genes Pd | 14.4997 | 9.0482 |
| BAEA-MI-2005-B-029 | DI-09 | | Genes Pd | 2.3573 | 6.7360 |
| BAEA-MI-2005-B-030 | MQ-02 | | Conway L-Salmon Trout R | 16.4996 | 1.0000 |
| BAEA-MI-2005-B-033 | MQ-04 | | Partridge Isd | 90.6963 | 85.9263 |
| BAEA-MI-2005-B-036 | BG-12 | | Pequaming Pt | 17.8054 | 10.8743 |
| BAEA-MI-2005-B-037 | MQ-25 | | Ford R-Margarette Rpds | 50.7514 | 41.4957 |
| BAEA-MI-2005-B-038 | AG-20 | | Hovey L | 16.3638 | 7.1260 |
| BAEA-MI-2005-B-040 | AG-18 | | Foerst L Basin N | 11.2104 | 9.6101 |
| BAEA-MI-2005-B-043 | AG-13 | | AuSable Pt | 21.0855 | 1.0000 |
| BAEA-MI-2005-B-049 | LU-13 | | Dollarville | 2.8534 | 5.8772 |
| BAEA-MI-2005-C-001 | MO-04 | | L Erie Shooting Club | 58.3765 | 10.9782 |
| BAEA-MI-2005-C-002 | WA-03 | | Campau Rd | 73.5881 | 24.4707 |
| BAEA-MI-2005-C-003 | SG-02 | | Shiawassee NWR #1 | 122.5550 | 29.4934 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|-------------------------|----------|----------|
| BAEA-MI-2005-C-005 | IA-02 | | Webber Dam | 67.0200 | 25.7245 |
| BAEA-MI-2005-C-007 | SG-01 | | Shiawassee SGA #1 | 50.3509 | 14.1409 |
| BAEA-MI-2005-C-008 | NE-03 | | Croton Prairie | 5.2887 | 12.1906 |
| BAEA-MI-2005-C-009 | HU-05 | | Wildfowl Bay | 57.8976 | 18.9575 |
| BAEA-MI-2005-C-010 | BY-01 | | Skull/Stoney Isd | 70.6847 | 18.7322 |
| BAEA-MI-2005-C-011 | HU-04 | | Sand Pt | 27.3344 | 9.4105 |
| BAEA-MI-2005-C-013 | CX-07 | | Beaver Isd-St James | 26.2065 | 16.4309 |
| BAEA-MI-2006-A-001 | OG-03 | | Hardwood L | 10.4358 | 8.3631 |
| BAEA-MI-2006-A-003 | OG-08 | | Devoe L | 66.5098 | 11.7859 |
| BAEA-MI-2006-A-004 | RO-11 | | Woods/Twin L | 134.9446 | 141.1290 |
| BAEA-MI-2006-A-007 | CL-05 | | Long L | 1.0000 | 10.8168 |
| BAEA-MI-2006-A-009 | MT-07 | | Stanwood | 13.7915 | 4.7649 |
| BAEA-MI-2006-A-014 | MS-07 | | Pere Marquette L | 53.7440 | 38.8917 |
| BAEA-MI-2006-A-015 | MS-05 | | Walhalla E | 62.7218 | 43.2762 |
| BAEA-MI-2006-A-017 | MU-03 | | Mona L | 26.2552 | 1.0000 |
| BAEA-MI-2006-A-018 | MN-10 | | Little Manistee R | 32.8180 | 20.3897 |
| BAEA-MI-2006-A-020 | GT-09 | | Old Mission Pt | 35.9585 | 19.5691 |
| BAEA-MI-2006-A-023 | GT-08 | | Cherry City Airport | 11.2632 | 12.3603 |
| BAEA-MI-2006-A-024 | MQ-08 | | Kawbawgam | 10.2096 | 13.3685 |
| BAEA-MI-2006-A-025 | HO-11 | | Prickett L S | 29.2135 | 6.3929 |
| BAEA-MI-2006-A-026 | HO-05 | | Traverse Isd | 57.1164 | 111.7079 |
| BAEA-MI-2006-A-029 | MQ-21 | | Huron Isds NWR W | 79.3198 | 49.1035 |
| BAEA-MI-2006-A-030 | MQ-02 | | Conway L-Salmon Trout R | 14.8416 | 7.1306 |
| BAEA-MI-2006-A-031 | BG-04 | | Von Zellens Camp | 35.4498 | 15.8916 |
| BAEA-MI-2006-A-032 | BG-04 | | Von Zellens Camp | 24.2945 | 14.7710 |
| BAEA-MI-2006-A-035 | BG-18 | | Aura | 5.5959 | 1.0000 |
| BAEA-MI-2006-A-036 | SC-12 | | Thunder L S | 1.0000 | 1.0000 |
| BAEA-MI-2006-A-043 | CP-36 | | Back Bay | 2.4272 | 1.0000 |
| BAEA-MI-2006-A-045 | CP-30 | | Nebish Isd E | 29.4839 | 1.0000 |
| BAEA-MI-2006-A-047 | CP-43 | | Lime Isd South | 4.6098 | 1.0000 |
| BAEA-MI-2006-A-048 | CP-46 | | Rosedale | 29.3489 | 1.0000 |
| BAEA-MI-2006-A-050 | BG-02 | | King L | 1.0000 | 1.0000 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|---------------------|----------|----------|
| BAEA-MI-2006-A-052 | BG-14 | | Vermilac L | 1.0000 | 1.0000 |
| BAEA-MI-2006-A-055 | BG-12 | | Pequaming Pt | 7.5506 | 1.0000 |
| BAEA-MI-2006-A-056 | AG-11 | | Laughing Fish Pt | 8.4875 | 1.0000 |
| BAEA-MI-2006-A-057 | SC-06 | | E1 Pool (Seney NWR) | 11.7471 | 1.0000 |
| BAEA-MI-2006-B-001 | CR-07 | | Bald Hill | 6.6815 | 2.7446 |
| BAEA-MI-2006-B-003 | RO-13 | | Prudenville | 13.9647 | 1.0000 |
| BAEA-MI-2006-B-005 | RO-08 | | Wraco Lodge | 1.0000 | 1.0000 |
| BAEA-MI-2006-B-006 | OS-02 | | Mio Pd W | 9.6663 | 1.0000 |
| BAEA-MI-2006-B-007 | OL-01 | | Evart | 12.3095 | 1.0000 |
| BAEA-MI-2006-B-009 | MD-01 | | Sanford L | 26.3628 | 1.0000 |
| BAEA-MI-2006-B-017 | MN-04 | | Tippy Dam | 57.1098 | 1.0000 |
| BAEA-MI-2006-B-021 | AP-08 | | Devils L | 41.4741 | 40.2699 |
| BAEA-MI-2006-B-022 | AP-13 | | North Pt-Grass L | 140.8778 | 129.2057 |
| BAEA-MI-2006-C-001 | AR-05 | | Pt AuGres | 48.3337 | 11.5751 |
| BAEA-MI-2006-C-003 | BY-03 | | Nayanquing Pt | 36.0693 | 1.0000 |
| BAEA-MI-2006-C-004 | TU-01 | | Dinsmoore | 46.9506 | 12.1374 |
| BAEA-MI-2006-C-005 | SG-06 | | Shiawassee Rookery | 17.2845 | 11.8201 |
| BAEA-MI-2006-C-006 | WA-03 | | Campeau Road | 37.5021 | 11.3923 |
| BAEA-MI-2006-C-012 | MO-08 | | Strasburg | 3.4082 | 5.0274 |
| BAEA-MI-2007-A-006 | MN-10 | | Little Manistee R | 26.9500 | 21.9208 |
| BAEA-MI-2007-A-011 | MN-04 | | Tippy Dam | 37.0770 | 25.2945 |
| BAEA-MI-2007-A-014 | AP-08 | | Devils L | 20.2177 | 13.7494 |
| BAEA-MI-2007-A-015 | MY-10 | | Tomahawk Ck Fldg | 1.0000 | 6.3673 |
| BAEA-MI-2007-A-017 | MM-15 | | Ten Mile Ck-Whitney | 38.6665 | 22.8501 |
| BAEA-MI-2007-A-021 | DI-14 | | L Antoine | 2.7779 | 4.5058 |
| BAEA-MI-2007-A-023 | DI-04 | | Fumee L | 8.3503 | 8.0342 |
| BAEA-MI-2007-A-025 | MM-10 | | Pemebonwon Falls/R | 8.9283 | 2.6491 |
| BAEA-MI-2007-A-029 | IR-33 | | Iron L | 1.0000 | 4.6747 |
| BAEA-MI-2007-A-032 | DE-30 | | Wells | 19.4479 | 12.3185 |
| BAEA-MI-2007-A-033 | AG-13 | | AuSable Pt | 9.6003 | 7.4361 |
| BAEA-MI-2007-A-035 | BG-18 | | Aura | 35.7527 | 18.7527 |
| BAEA-MI-2007-A-037 | BG-11 | | Reeds Pt | 4.8320 | 6.4925 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|---------------------------|----------|----------|
| BAEA-MI-2007-A-042 | SC-06 | | E1 Pool (Seney NWR) | 18.7989 | 24.6216 |
| BAEA-MI-2007-A-046 | MQ-02 | | Conway L-Salmon Trout R | 42.1419 | 22.4408 |
| BAEA-MI-2007-A-053 | IR-28 | | Smokey L | 5.6430 | 5.1769 |
| BAEA-MI-2007-A-054 | CP-34 | | Cedar Isd | 18.4532 | 16.8205 |
| BAEA-MI-2007-A-055 | CP-33 | | Sand Isd-Dunbar | 28.5918 | 19.8674 |
| BAEA-MI-2007-B-004 | MN-05 | | Manistee R SGA | 26.5066 | 22.0120 |
| BAEA-MI-2007-B-013 | MS-05 | | Walhalla E | 56.0461 | 42.6808 |
| BAEA-MI-2007-B-015 | OS-05 | | Garland Golf Course | 1.0000 | 4.6161 |
| BAEA-MI-2007-B-017 | AL-02 | | Alcona-Bamfield Pd | 11.4998 | 9.7909 |
| BAEA-MI-2007-B-025 | NE-03 | | Croton Prairie | 3.4500 | 9.0042 |
| BAEA-MI-2007-B-027 | KA-04 | | Big Blue/Bass L | 6.7932 | 5.5170 |
| BAEA-MI-2007-B-028 | GT-08 | | Cherry City Airport | 18.7741 | 17.5724 |
| BAEA-MI-2007-B-031 | GT-06 | | Yuba Valley | 39.2580 | 29.0576 |
| BAEA-MI-2007-B-037 | MY-12 | | Foch Ls Fldg | 14.9833 | 13.2649 |
| BAEA-MI-2007-B-038 | DE-29 | | Masonville | 37.4983 | 21.2172 |
| BAEA-MI-2007-B-039 | MM-23 | | Vetorts Pt | 45.1945 | 18.2154 |
| BAEA-MI-2007-B-043 | IR-13 | | Dog L-L St Kathryn | 1.0000 | 3.8471 |
| BAEA-MI-2007-B-045 | IR-09 | | Paint R-Lower Hemlock Rpd | 16.7098 | 3.6633 |
| BAEA-MI-2007-B-049 | CP-27 | | Pendills L | 14.1279 | 1.0000 |
| BAEA-MI-2007-B-052 | CP-44 | | Sugar Isd NE | 9.2328 | 6.1707 |
| BAEA-MI-2007-B-053 | CP-26 | | Gravel Isd/L | 10.1524 | 10.9128 |
| BAEA-MI-2007-B-054 | LU-15 | | Culhane L | 5.4071 | 5.6116 |
| BAEA-MI-2007-C-001 | BY-02 | | Quanicassee | 55.3905 | 13.8274 |
| BAEA-MI-2007-C-005 | TU-03 | | Caro | 5.3328 | 5.8321 |
| BAEA-MI-2007-C-006 | HU-08 | | Huron City | 27.4066 | 11.3818 |
| BAEA-MI-2007-C-015 | CB-17 | | Stoney Ck Fldg | 3.4786 | 3.3862 |
| BAEA-MI-2007-C-016 | CB-10 | | Tower N-Kleber Pd | 3.8319 | 3.7325 |
| BAEA-MI-2007-C-017 | CB-13 | | Tower S-Onaway | 3.5496 | 5.8795 |
| BAEA-MI-2007-C-019 | MM-05 | | Grand Rpd's Dam N | 15.9714 | 3.4725 |
| BAEA-MI-2007-D-003 | SG-06 | | Shiawassee Rookery | 27.7805 | 14.6849 |
| BAEA-MI-2007-D-004 | SG-01 | | Shiawassee SGA #1 | 26.9602 | 14.6272 |
| BAEA-MI-2007-D-008 | AR-09 | | Knoll View | 103.9466 | 41.1861 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|-------------------|----------|----------|
| BAEA-MI-2007-D-009 | WA-03 | | Campau Rd | 12.7584 | 9.8428 |
| BAEA-MI-2007-D-010 | OW-04 | | Bass R | 33.7146 | 14.4637 |
| BAEA-MI-2008-A-003 | IO-13 | | Wichert Hills | 1.0000 | 5.0152 |
| BAEA-MI-2008-A-005 | GL-05 | | L 4 | 3.1227 | 2.8764 |
| BAEA-MI-2008-A-006 | OG-01 | | Rifle R Rec Area | 2.1380 | 3.9794 |
| BAEA-MI-2008-A-010 | NE-01 | | Anderson Bayou | 34.2525 | 39.1307 |
| BAEA-MI-2008-A-015 | MS-05 | | Walhalla E | 29.7136 | 24.8406 |
| BAEA-MI-2008-A-020 | GT-06 | | Yuba Valley | 13.9263 | 12.0237 |
| BAEA-MI-2008-A-027 | AP-08 | | Devils L | 51.5963 | 24.7402 |
| BAEA-MI-2008-A-029 | AP-13 | | N Pt-Grass L | 72.3024 | 79.6863 |
| BAEA-MI-2008-A-036 | AP-03 | | N Pt | 33.8935 | 24.2241 |
| BAEA-MI-2008-A-038 | CB-17 | | Stoney Ck Fldg | 2.4534 | 4.2475 |
| BAEA-MI-2008-A-041 | MM-22 | | Deadmans Pt | 99.8840 | 33.4994 |
| BAEA-MI-2008-A-042 | MM-04 | | Shakey R | 13.4559 | 4.5724 |
| BAEA-MI-2008-A-045 | MM-25 | | Poch de Noch | 10.9299 | 6.7714 |
| BAEA-MI-2008-A-053 | GO-42 | | Plymouth Mine | 1.0000 | 4.7389 |
| BAEA-MI-2008-A-058 | HO-04 | | La Chance Bay | 9.1398 | 18.9959 |
| BAEA-MI-2008-A-059 | HO-16 | | N Portage Canal | 7.2089 | 7.0164 |
| BAEA-MI-2008-A-060 | ON-25 | | Three Rapids | 34.4534 | 12.7726 |
| BAEA-MI-2008-A-061 | ON-27 | | Carp R-Escarpment | 14.2843 | 4.7245 |
| BAEA-MI-2008-A-063 | DE-33 | | Days R | 59.6744 | 27.4490 |
| BAEA-MI-2008-A-064 | AG-23 | | Wick Pt-Grand Isd | 12.6242 | 13.4193 |
| BAEA-MI-2008-B-001 | CL-04 | | Doc & Tom L | 28.6036 | 5.2800 |
| BAEA-MI-2008-B-004 | OG-11 | | Edwards L | 17.9376 | 5.4657 |
| BAEA-MI-2008-B-007 | AR-06 | | Forest L | 32.4272 | 7.7725 |
| BAEA-MI-2008-B-012 | AR-10 | | Pt AuGres N | 96.7329 | 29.8637 |
| BAEA-MI-2008-B-015 | AR-07 | | Hickory Isd | 69.1343 | 17.9283 |
| BAEA-MI-2008-B-016 | IO-03 | | Tawas L N | 3.7132 | 8.5569 |
| BAEA-MI-2008-B-021 | RO-19 | | DNR Airport | 1.0000 | 5.2442 |
| BAEA-MI-2008-B-024 | MY-01 | | Valentine I | 2.5083 | 4.3911 |
| BAEA-MI-2008-B-036 | IO-14 | | Monument E | 9.1369 | 5.0751 |
| BAEA-MI-2008-B-043 | OS-09 | | Mack L | 3.0457 | 3.8339 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|-------------------------|----------|----------|
| BAEA-MI-2008-B-050 | ET-06 | | L Paradise | 2.3076 | 18.5383 |
| BAEA-MI-2008-B-057 | CX-03 | | Garden Isd | 46.3837 | 23.4605 |
| BAEA-MI-2008-B-058 | CX-09 | | Beaver Isd-L Geneserath | 12.5780 | 16.9666 |
| BAEA-MI-2008-B-060 | ET-01 | | Wycamp L | 11.4350 | 9.1987 |
| BAEA-MI-2008-B-063 | DI-08 | | Rock L-Carney Outlet | 1.0000 | 3.5373 |
| BAEA-MI-2008-B-068 | DE-30 | | Masonville | 21.7235 | 12.2998 |
| BAEA-MI-2008-B-078 | IR-26 | | Brule L | 7.1351 | 3.3658 |
| BAEA-MI-2008-B-080 | BG-12 | | Pequaming Pt | 2.5125 | 5.8648 |
| BAEA-MI-2008-B-083 | BG-11 | | Reeds Pt | 15.0979 | 11.4030 |
| BAEA-MI-2008-B-085 | ON-26 | | Misery Bay | 7.3265 | 7.2778 |
| BAEA-MI-2008-B-086 | HO-02 | | Rabbit Bay | 10.4834 | 10.3096 |
| BAEA-MI-2008-B-088 | IR-21 | | Michigamme Res NE | 1.0000 | 3.0548 |
| BAEA-MI-2008-B-090 | GO-36 | | W Bay L | 33.4620 | 13.5503 |
| BAEA-MI-2008-B-096 | AG-18 | | Forest L Basin N | 10.9969 | 11.8924 |
| BAEA-MI-2008-B-098 | AG-20 | | Hovey L | 10.1052 | 8.8734 |
| BAEA-MI-2008-D-013 | MO-08 | | Strasburg | 21.3679 | 11.1533 |
| BAEA-MI-2009-A-001 | OG-08 | b | Devoe L | 78.0860 | 18.1000 |
| BAEA-MI-2009-A-003 | OG-01 | f | Rifle R Rec Area | 19.4626 | 12.7126 |
| BAEA-MI-2009-A-008 | RO-07 | j | N Bay Houghton L | 29.8899 | 12.0180 |
| BAEA-MI-2009-A-019 | OS-08 | f | Mio Pd E | 50.9481 | 7.6787 |
| BAEA-MI-2009-A-021 | OS-02 | n | Mio Pd W | 13.8740 | 9.9592 |
| BAEA-MI-2009-A-023 | AL-09 | a | O'Brien L | 114.3719 | 42.1480 |
| BAEA-MI-2009-A-029 | AL-11 | a | Lincoln-Brownley | 44.2357 | 13.2155 |
| BAEA-MI-2009-A-036 | ML-02 | a | Whitefish L | 33.5992 | 39.4230 |
| BAEA-MI-2009-A-043 | AR-10 | a | AuGres-Wigwam-Rifle R | 86.6629 | 17.6691 |
| BAEA-MI-2009-A-050 | OS-05 | a | Garland Golf Course | 4.2284 | 6.5280 |
| BAEA-MI-2009-A-052 | CR-08 | c | Lovells | 16.1059 | 9.0038 |
| BAEA-MI-2009-A-054 | CR-07 | b | Bald Hill | 6.4887 | 5.0650 |
| BAEA-MI-2009-A-055 | CR-12 | a | Sandhill L | 16.3540 | 11.6843 |
| BAEA-MI-2009-A-059 | OT-07 | d? | O'Rourke L | 11.6652 | 14.7306 |
| BAEA-MI-2009-A-071 | MT-04 | b | Chippewa L | 7.5091 | 23.0264 |
| BAEA-MI-2009-A-076 | MT-01 | c | Martiny L | 12.9275 | 15.3240 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|-------------------------|----------|----------|
| BAEA-MI-2009-A-077 | GT-06 | a | Yuba Valley | 23.6311 | 22.8029 |
| BAEA-MI-2009-A-082 | WX-02 | a | L Mitchell | 6.4855 | 24.0946 |
| BAEA-MI-2009-A-084 | OL-03 | a | Eggle L | 30.5045 | 46.8777 |
| BAEA-MI-2009-A-087 | GL-04 | d | Tittabawassee R | 7.7848 | 12.1043 |
| BAEA-MI-2009-A-089 | LU-05 | c | Fork L Ck | 1.0000 | 7.6009 |
| BAEA-MI-2009-A-092 | MC-06 | d | S Manistique L | 4.6046 | 12.4148 |
| BAEA-MI-2009-A-094 | MC-24 | c | Shoepac L/Sprangs Pt | 64.5496 | 23.0783 |
| BAEA-MI-2009-A-103 | CP-14 | g | Munuscong Bay NW | 26.3263 | 17.4148 |
| BAEA-MI-2009-A-104 | CP-33 | a | Sand Isd-Dunbar | 34.1503 | 20.1122 |
| BAEA-MI-2009-A-108 | SC-15 | e | Mud L Ck | 12.9724 | 20.5114 |
| BAEA-MI-2009-A-112 | CP-05 | c | Pt Aux Frenes | 62.6078 | 32.5879 |
| BAEA-MI-2009-A-118 | SC-06 | b | E1 Pool (Seney NWR) | 2.1191 | 10.2793 |
| BAEA-MI-2009-A-126 | CP-44 | a | Whipple Pt-Sugar Isd NE | 70.2820 | 33.0670 |
| BAEA-MI-2009-B-002 | RO-11 | c | W Twin/Woods L | 10.0059 | 13.9164 |
| BAEA-MI-2009-B-006 | CL-02 | b | McKay Ranch | 2.6939 | 10.5352 |
| BAEA-MI-2009-B-007 | MD-01 | c | Sanford L | 12.4103 | 1.0000 |
| BAEA-MI-2009-B-010 | IO-03 | e | Tawas L N | 149.8253 | 33.1784 |
| BAEA-MI-2009-B-011 | AR-03 | d | Santiago | 80.5276 | 26.5351 |
| BAEA-MI-2009-B-013 | AR-06 | a | Forest L | 75.2090 | 14.1930 |
| BAEA-MI-2009-B-022 | MS-07 | a | Pere Marquette L | 159.1074 | 66.0994 |
| BAEA-MI-2009-B-026 | MN-10 | a | Little Manistee R | 87.8554 | 64.1376 |
| BAEA-MI-2009-B-038 | LL-07 | d | Cat Head Bay | 40.1381 | 26.4725 |
| BAEA-MI-2009-B-050 | MD-02 | c | Midland-Gordonville Rd | 45.2782 | 25.4586 |
| BAEA-MI-2009-C-005 | MM-01 | c | Hayward L #1 | 43.6183 | 20.3412 |
| BAEA-MI-2009-C-006 | MM-23 | a | Vetorts Pt | 58.9563 | 16.7777 |
| BAEA-MI-2009-C-008 | DE-29 | a | Wells-Escanaba R Dam | 70.4441 | 25.8349 |
| BAEA-MI-2009-C-009 | AG-20 | a | Hovey L | 5.8733 | 11.6619 |
| BAEA-MI-2009-C-011 | AG-20 | a | Hovey L | 42.3167 | 23.3660 |
| BAEA-MI-2009-C-012 | MQ-12 | c | Huron Isds NWR E | 332.3818 | 200.6439 |
| BAEA-MI-2009-C-014 | MQ-02 | g | Conway L-Salmon Trout R | 20.4064 | 16.4181 |
| BAEA-MI-2009-C-024 | HO-03 | d | Prickett Dam N | 13.9605 | 14.1516 |
| BAEA-MI-2009-C-025 | BG-04 | c | Von Zellens Camp | 41.1458 | 24.7704 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|-------------------------------|----------|----------|
| BAEA-MI-2009-C-031 | GO-20 | e | Montana Ck | 3.8221 | 7.8026 |
| BAEA-MI-2009-C-032 | ON-05 | k | Sleeping Bay-Fourteen Mile Pt | 48.0544 | 26.5160 |
| BAEA-MI-2009-C-034 | DE-33 | a | Days R | 86.0425 | 36.0153 |
| BAEA-MI-2009-D-002 | BY-03 | d | Nayanquing Pt | 83.6345 | 16.5384 |
| BAEA-MI-2009-D-005 | SH-01 | c | Michigan Peat | 5.6004 | 13.8766 |
| BAEA-MI-2009-D-014 | AN-04 | e | New Richmond | 498.2512 | 48.9577 |
| BAEA-MI-2010-A-003 | MD-01 | c | Sanford L | 39.2082 | 22.1012 |
| BAEA-MI-2010-A-005 | AR-10 | a | Pt AuGres N | 39.3611 | 14.0543 |
| BAEA-MI-2010-A-007 | AR-03 | d | Santiago | 69.1023 | 15.6589 |
| BAEA-MI-2010-A-009 | AR-06 | b? | Forest L | 88.6066 | 18.0367 |
| BAEA-MI-2010-A-014 | IO-03 | e | Tawas L N | 42.5048 | 18.7673 |
| BAEA-MI-2010-A-016 | OG-08 | b | Devoe L | 28.2118 | 12.2783 |
| BAEA-MI-2010-A-020 | GL-05 | a | L 4 | 8.6457 | 6.4266 |
| BAEA-MI-2010-A-032 | MT-06 | a | Jehkson L | 8.3762 | 10.6872 |
| BAEA-MI-2010-A-035 | MT-04 | c | Chippewa L | 14.7110 | 23.3406 |
| BAEA-MI-2010-A-039 | CR-12 | a | Sandhill L | 2.8639 | 4.8971 |
| BAEA-MI-2010-A-040 | RO-07 | j | N Bay Houghton L | 19.3081 | 14.7188 |
| BAEA-MI-2010-A-046 | OT-15 | b | Tecon L | 10.0551 | 14.8106 |
| BAEA-MI-2010-A-047 | GT-08 | b | Cherry City Airport | 16.8528 | 20.8658 |
| BAEA-MI-2010-A-050 | MN-10 | a | Little Manistee R | 37.6166 | 24.6973 |
| BAEA-MI-2010-A-062 | LL-07 | d | Cat Head Bay | 27.7392 | 26.6806 |
| BAEA-MI-2010-A-063 | LL-10 | a | Peshawbestown | 5.0831 | 12.7327 |
| BAEA-MI-2010-A-079 | KA-07 | a | Devil Ck | 2.4330 | 11.5898 |
| BAEA-MI-2010-A-082 | MC-06 | d | S Manistique L | 1.0000 | 11.0654 |
| BAEA-MI-2010-A-083 | SC-12 | b | Thunder Ls | 1.0000 | 9.3114 |
| BAEA-MI-2010-A-086 | DE-19 | d | Whitefish R-Haymeadow Ck | 76.4189 | 43.3129 |
| BAEA-MI-2010-A-090 | DE-13 | h | Grandskog L | 48.3821 | 18.9725 |
| BAEA-MI-2010-A-093 | AG-18 | a | Forest L Basin N | 2.8572 | 8.1792 |
| BAEA-MI-2010-A-098 | MM-23 | a | Vetorts Pt | 47.2266 | 15.1349 |
| BAEA-MI-2010-A-100 | DE-29 | a | Wells-Escanaba R Dam | 46.8188 | 21.7942 |
| BAEA-MI-2010-A-104 | DE-33 | a | Days R | 51.8795 | 24.9958 |
| BAEA-MI-2010-A-111 | GO-03 | h | Cisco L E | 9.0356 | 8.9113 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|------------------------|----------|----------|
| BAEA-MI-2010-B-001 | OS-03 | e | McKinley | 1.0000 | 6.9578 |
| BAEA-MI-2010-B-002 | OS-05 | a | Garland Golf Course | 5.4588 | 12.1795 |
| BAEA-MI-2010-B-003 | OS-11 | b | Perry L | 10.9824 | 15.3043 |
| BAEA-MI-2010-B-007 | AL-09 | a | O'Brien L | 64.1637 | 76.7175 |
| BAEA-MI-2010-B-009 | KA-04 | f | Big Blue/Bass L | 2.1469 | 9.6834 |
| BAEA-MI-2010-B-015 | OL-03 | a | Eggle L | 11.4960 | 21.3265 |
| BAEA-MI-2010-B-017 | GT-06 | a | Yuba Valley | 34.5151 | 26.4119 |
| BAEA-MI-2010-B-028 | ON-25 | a | Three Rapids | 17.9511 | 12.9782 |
| BAEA-MI-2010-B-036 | GO-27 | f | Morrison Ck | 5.3266 | 7.2397 |
| BAEA-MI-2010-B-045 | CP-05 | c | Pt Aux Frenes | 20.1227 | 15.4895 |
| BAEA-MI-2010-B-046 | CP-36 | a | Back Bay | 8.0379 | 11.4013 |
| BAEA-MI-2010-B-050 | MQ-15 | g | L Superior-Saux Head L | 232.7814 | 109.9615 |
| BAEA-MI-2010-B-057 | BG-05 | b | Pt Abbaye | 58.9528 | 33.4683 |
| BAEA-MI-2010-B-059 | BG-04 | c | Von Zellens Camp | 329.3072 | 220.0792 |
| BAEA-MI-2010-D-001 | SH-01 | c | Michigan Peat | 27.2394 | 14.9571 |
| BAEA-MI-2010-D-003 | BY-03 | d | Nayanquing Pt | 36.4257 | 12.8712 |
| BAEA-MI-2010-D-007 | WA-03 | c | Campau Rd | 82.2900 | 27.1131 |
| BAEA-MI-2010-D-009 | SG-11 | a | Fergus-Chesaning | 36.3744 | 15.2986 |
| BAEA-MI-2010-D-010 | TU-01 | c | Dinsmoore | 60.8860 | 19.8270 |
| BAEA-MI-2010-D-013 | SG-06 | a | Shiawassee Rookery | 70.9277 | 23.3387 |
| BAEA-MI-2010-D-015 | SG-01 | f | Shiawassee R SGA #1 | 75.3047 | 20.3706 |
| BAEA-MI-2010-D-017 | CH-01 | c | Baker Sanctuary | 16.5131 | 15.0809 |
| BAEA-MI-2010-D-019 | BY-05 | a | Kawkawlin R | 60.7803 | 18.9977 |
| BAEA-MI-2010-D-021 | BY-02 | h | Quanicassee | 71.8962 | 24.8366 |
| BAEA-MI-2011-A-001 | MK-04 | b | Reedsburg | 2.3197 | 11.4854 |
| BAEA-MI-2011-A-004 | GL-01 | e | Molasses R Fldg | 12.2312 | 14.1247 |
| BAEA-MI-2011-A-005 | GL-05 | a | L 4 | 5.0663 | 3.8550 |
| BAEA-MI-2011-A-008 | RO-09 | f | Marl L | 17.3779 | 19.2291 |
| BAEA-MI-2011-A-010 | MN-10 | a | Little Manistee R | 65.9455 | 43.0187 |
| BAEA-MI-2011-A-013 | AR-03 | d | Santiago | 30.6415 | 12.3662 |
| BAEA-MI-2011-A-014 | AR-10 | a | Pt AuGres N | 48.0919 | 16.1629 |
| BAEA-MI-2011-A-015 | AR-05 | c | Pt AuGres S | 58.9044 | 20.3777 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|---|----------|----------|
| BAEA-MI-2011-A-016 | MN-04 | d | Tippy Dam | 39.4016 | 22.5615 |
| BAEA-MI-2011-A-017 | MN-02 | d | Carlson's/Horseshoe Bend | 34.2830 | 25.4226 |
| BAEA-MI-2011-A-019 | KA-07 | a | Devil Ck | 4.3308 | 4.3025 |
| BAEA-MI-2011-A-021 | KA-04 | e | Big Blue/Bass L | 1.0000 | 6.0064 |
| BAEA-MI-2011-A-022 | AL-02 | k | Alcona-Bamfield Pd | 2.0730 | 9.5270 |
| BAEA-MI-2011-A-026 | OS-12 | b | Noodles L | 6.4248 | 4.3979 |
| BAEA-MI-2011-A-032 | AL-05 | c | Sprinkler L | 3.6250 | 3.3593 |
| BAEA-MI-2011-A-036 | OS-11 | b | Perry L | 1.0000 | 8.3647 |
| BAEA-MI-2011-A-038 | GT-08 | b | Cherry City Airport | 7.7360 | 13.5522 |
| BAEA-MI-2011-A-041 | MQ-31 | a | Thoney Pt | 33.1222 | 21.6961 |
| BAEA-MI-2011-A-043 | MQ-09 | g | Deer L | 13.7000 | 6.2575 |
| BAEA-MI-2011-A-050 | DE-19 | d | Whitefish R-Haymeadow Ck | 56.6912 | 35.1605 |
| BAEA-MI-2011-A-054 | SC-17 | d | Indian L | 6.2363 | 11.1014 |
| BAEA-MI-2011-A-057 | BG-05 | c | Pt Abbaye | 17.8834 | 17.7739 |
| BAEA-MI-2011-A-062 | HO-24 | a | Torch L | 9.6595 | 10.5045 |
| BAEA-MI-2011-B-001 | IO-19 | a | Dease L | 2.4378 | 9.2388 |
| BAEA-MI-2011-B-004 | IO-11 | a | L Solitude | 1.0000 | 6.0035 |
| BAEA-MI-2011-B-006 | OG-02 | i | Stylus L E (N) | 6.6751 | 11.3431 |
| BAEA-MI-2011-B-007 | IO-03 | e | Tawas L N | 72.7773 | 33.0887 |
| BAEA-MI-2011-B-008 | IO-18 | a | Spencer L | 34.5532 | 23.3771 |
| BAEA-MI-2011-B-011 | IO-06 | a | Tawas L SW | 18.2269 | 15.1451 |
| BAEA-MI-2011-B-013 | OS-13 | c | Meadows | 31.4063 | 15.6124 |
| BAEA-MI-2011-B-014 | OS-08 | g | Mio Pd E | 2.0778 | 4.3067 |
| BAEA-MI-2011-B-018 | CR-08 | c | Lovells | 4.0216 | 6.6878 |
| BAEA-MI-2011-B-023 | OT-07 | d | O'Rourke L | 5.3481 | 10.8946 |
| BAEA-MI-2011-B-028 | GT-06 | d | Yuba Valley | 19.3070 | 20.1394 |
| BAEA-MI-2011-B-046 | CR-07 | b | Bald Hill | 7.1431 | 11.6111 |
| BAEA-MI-2011-B-068 | DI-16 | a | Sturgeon Falls Dam N | 15.6994 | 3.9916 |
| BAEA-MI-2011-B-075 | IR-04 | l | Hagerman/Ottawa L | 11.0937 | 14.5832 |
| BAEA-MI-2011-B-077 | IR-26 | a | Brule L | 1.0000 | 9.1333 |
| BAEA-MI-2011-B-079 | GO-43 | c | Crystal L (VI75, Crystal L) | 4.0734 | 10.8532 |
| BAEA-MI-2011-B-081 | GO-49 | d | Lac Vieux Desert-Duck Pt (VI103 LVD-DP) | 1.0000 | 8.5783 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------------|-------------------------|----------|----------|
| BAEA-MI-2011-B-085 | CP-05 | c | Pt Aux Frenes | 68.4831 | 29.5996 |
| BAEA-MI-2011-B-087 | CP-36 | a | Back Bay | 6.5461 | 6.1758 |
| BAEA-MI-2011-B-096 | CP-56 | a | Sugar Isd N | 33.7114 | 20.4197 |
| BAEA-MI-2011-B-097 | CP-44 | a | Whipple Pt-Sugar Isd NE | 15.0782 | 17.4627 |
| BAEA-MI-2011-B-099 | CP-57 | a | L George-SW | 21.4462 | 17.2155 |
| BAEA-MI-2011-D-001 | CH-01 | c | Baker Sanctuary | 11.0913 | 12.4422 |
| BAEA-MI-2011-D-003 | SH-01 | c | Michigan Peat | 2.3812 | 14.2754 |
| BAEA-MI-2011-D-012 | BY-05 | b | Kawkawlin R | 35.7294 | 13.4720 |
| BAEA-MI-2011-D-015 | BY-08 | a | Marina | 109.1513 | 22.2081 |
| BAEA-MI-2011-D-017 | TU-01 | c | Dinsmoore | 51.3988 | 17.8075 |
| BAEA-MI-2011-D-019 | WA-07 | b | Humbug Marsh | 117.8899 | 20.7797 |
| BAEA-MI-2011-D-020 | HU-13 | a | Sebewaing | 27.8188 | 13.6894 |
| BAEA-MI-2011-D-022 | ST-03 | a | Harsens Isd | 43.2686 | 13.5088 |
| BAEA-MI-2011-D-036 | MO-03 | g | Raisin R-Monroe | 141.1771 | 14.8427 |
| BAEA-MI-2011-D-037 | KZ-02 | a | Fort Custer | 59.6391 | 26.9298 |
| BAEA-MI-2011-D-040 | BY-07 | a | Golson Park | 76.1950 | 19.6716 |
| BAEA-MI-2012-A-001 | CL-05 | c | Long L | 2.9159 | 13.7956 |
| BAEA-MI-2012-A-007 | MU-05 | a | Muskegon SP | 15.1777 | 18.7132 |
| BAEA-MI-2012-A-014 | MN-06 | e | Wellston | 1.0000 | 6.2178 |
| BAEA-MI-2012-A-020 | CR-02 | e | Wakeley L | 9.4243 | 7.4907 |
| BAEA-MI-2012-A-022 | CR-07 | b | Bald Hill | 6.2143 | 5.2158 |
| BAEA-MI-2012-A-023 | CR-08 | c | Lovells | 2.8016 | 11.6203 |
| BAEA-MI-2012-A-024 | CR-08 | c | Lovells | 8.1423 | 11.5105 |
| BAEA-MI-2012-A-025 | RO-08 | c | Wraco Lodge | 2.0673 | 10.3532 |
| BAEA-MI-2012-A-026 | IO-01 | ?(h or i?) | Loud Dam Pd E | 8.4691 | 4.6208 |
| BAEA-MI-2012-A-027 | IO-08 | a | Loud Dam Pd W | 5.1192 | 3.4964 |
| BAEA-MI-2012-A-028 | OS-08 | g | Mio Pd E | 5.3565 | 6.5023 |
| BAEA-MI-2012-A-031 | OS-13 | c | Meadows | 17.4675 | 23.0319 |
| BAEA-MI-2012-A-033 | OG-02 | i | Stylus L E (N) | 2.3972 | 6.6586 |
| BAEA-MI-2012-A-034 | CR-14 | a | Kellogg Bridge | 12.9225 | 3.7916 |
| BAEA-MI-2012-A-053 | OT-07 | d | O'Rourke L | 2.9164 | 4.7704 |
| BAEA-MI-2012-A-056 | MM-01 | d | Hayward L #1 | 2.7990 | 10.6376 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|---------------------------------|----------|----------|
| BAEA-MI-2012-A-061 | AG-18 | a | Forest L Basin N | 11.8095 | 13.2546 |
| BAEA-MI-2012-A-073 | GO-13 | c | Little Carp R | 5.7798 | 9.2883 |
| BAEA-MI-2012-A-074 | GO-39 | b | Copper Peak | 12.7662 | 19.9838 |
| BAEA-MI-2012-A-075 | DE-42 | a | Indian Pt | 105.5763 | 66.7654 |
| BAEA-MI-2012-A-083 | CP-54 | a | Cedar Pt | 71.2545 | 48.2256 |
| BAEA-MI-2012-A-092 | CP-05 | c | Pt Aux Frenes | 8.6429 | 12.3185 |
| BAEA-MI-2012-A-093 | MM-05 | h | Grand Rpds Dam N (MT08/22, GRD) | 12.2809 | 4.1499 |
| BAEA-MI-2012-A-095 | BG-22 | a | Reeds Pt N | 14.4163 | 10.5213 |
| BAEA-MI-2012-B-001 | MN-04 | a | Sadony Bayou | 16.8695 | 15.9440 |
| BAEA-MI-2012-B-004 | IS-01 | a | L Isabella | 6.8509 | 23.0877 |
| BAEA-MI-2012-B-006 | GT-08 | b | Cherry City Airport | 25.8755 | 16.8468 |
| BAEA-MI-2012-B-007 | MD-01 | d | Sanford L | 30.3590 | 20.8358 |
| BAEA-MI-2012-B-015 | OS-09 | a | Mack L | 4.3915 | 7.0479 |
| BAEA-MI-2012-B-018 | AR-10 | a | Pt AuGres N | 37.7795 | 15.5470 |
| BAEA-MI-2012-B-021 | AR-03 | d | Santiago | 10.6448 | 8.9114 |
| BAEA-MI-2012-B-023 | MU-06 | b | White River | 17.9768 | 1.0000 |
| BAEA-MI-2012-B-027 | OL-03 | L | Eggle L | 4.8141 | 7.6533 |
| BAEA-MI-2012-B-031 | LL-07 | e | Cat Head Bay | 18.8753 | 16.4692 |
| BAEA-MI-2012-B-032 | GT-06 | d | Yuba Valley | 44.3570 | 34.1364 |
| BAEA-MI-2012-B-042 | DE-19 | d | Whitefish R-Haymeadow Ck | 44.5747 | 27.1690 |
| BAEA-MI-2012-B-045 | GO-11 | f | Presque Isle Fldg-Mink L | 6.3082 | 8.2971 |
| BAEA-MI-2012-B-048 | GO-38 | c | Black R Park | 1.0000 | 4.9593 |
| BAEA-MI-2012-B-050 | DE-31 | c | Round Isd | 26.9347 | 22.9020 |
| BAEA-MI-2012-B-051 | DE-41 | a | Fayette | 37.2505 | 32.0622 |
| BAEA-MI-2012-B-052 | DE-38 | a | Pt Detour | 45.5993 | 71.4598 |
| BAEA-MI-2012-B-056 | IR-26 | a | Brule L | 2.4894 | 10.4570 |
| BAEA-MI-2012-B-059 | GO-28 | f | Lac Vieux Desert-Draper Isd | 2.0940 | 8.5137 |
| BAEA-MI-2012-B-061 | GO-02 | e | Sucker L S | 4.0921 | 5.6908 |
| BAEA-MI-2012-D-002 | KZ-02 | a | Fort Custer | 25.2276 | 15.5906 |
| BAEA-MI-2012-D-005 | SG-10 | b | Shiawassee NWR-Eastwood Drain | 42.6642 | 18.6099 |
| BAEA-MI-2012-D-007 | BY-09 | a | Tobico Marsh | 28.6353 | 10.9590 |
| BAEA-MI-2012-D-008 | BY-08 | a | Marina | 46.8396 | 1.0000 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|------------------------------|----------|----------|
| BAEA-MI-2012-D-012 | SG-06 | a | Shiawassee Rookery | 14.0676 | 11.5405 |
| BAEA-MI-2012-D-013 | SG-01 | f | Shiawassee R SGA #1 | 38.7030 | 17.3544 |
| BAEA-MI-2012-D-015 | WA-07 | b | Humbug Marsh | 40.3434 | 12.5786 |
| BAEA-MI-2012-D-035 | AN-04 | e | New Richmond | 104.3975 | 35.3953 |
| BAEA-MI-2012-D-037 | TU-02 | g | New Fish Pt SWA | 39.3517 | 1.0000 |
| BAEA-MI-2012-D-040 | HU-13 | b | Sebewaing | 29.2563 | 14.4093 |
| BAEA-MI-2012-D-042 | TU-05 | a | Gotham-Old Fish Pt SWA | 20.6771 | 14.9354 |
| BAEA-MI-2012-D-046 | BY-07 | a | Golson Park | 60.9704 | 21.2992 |
| BAEA-MI-2013-A-002 | IO-16 | a | Hope Ck | 2.6518 | 3.2775 |
| BAEA-MI-2013-A-004 | OG-02 | i | Stylus LE | 1.0000 | 3.7368 |
| BAEA-MI-2013-A-006 | RO-06 | e | Bear Ck Fldg | 2.0924 | 4.7206 |
| BAEA-MI-2013-A-007 | IO-21 | a | Tuttle Marsh | 1.0000 | 14.1553 |
| BAEA-MI-2013-A-008 | IO-10 | g | Grass L-Oscoda-Dead-Au Sable | 8.3101 | 6.6556 |
| BAEA-MI-2013-A-010 | OG-04 | b | No Mans/Augustina L | 1.0000 | 4.5116 |
| BAEA-MI-2013-A-014 | AR-03 | d | Santiago | 15.1101 | 5.6733 |
| BAEA-MI-2013-A-015 | AR-10 | a | Pt Au Gres N | 33.1338 | 13.8753 |
| BAEA-MI-2013-A-019 | MK-03 | b | Seafuse Marsh | 22.5357 | 26.0878 |
| BAEA-MI-2013-A-022 | CL-08 | b | Haskel L | 8.9096 | 12.9342 |
| BAEA-MI-2013-A-027 | MD-05 | b | Coleman | 1.0000 | 5.5590 |
| BAEA-MI-2013-A-028 | HU-06 | c | Port Austin | 19.7393 | 7.8398 |
| BAEA-MI-2013-A-030 | MN-04 | d | Tippy Dam | 36.5814 | 18.8794 |
| BAEA-MI-2013-A-032 | KA-06 | a | Ingersoll L | 1.0000 | 5.3984 |
| BAEA-MI-2013-A-033 | KA-03 | e | Flowing Well Pd | 1.0000 | 3.6985 |
| BAEA-MI-2013-A-036 | MK-05 | c | Lake City | 1.0000 | 5.8283 |
| BAEA-MI-2013-A-047 | SC-17 | d | Indian L | 2.2018 | 8.2417 |
| BAEA-MI-2013-A-050 | DE-13 | h | Grandskog L | 30.1527 | 13.5359 |
| BAEA-MI-2013-A-059 | DI-02 | k | Vulcan | 6.6917 | 3.3902 |
| BAEA-MI-2013-A-060 | AG-08 | e | AuTrain L | 1.0000 | 7.8417 |
| BAEA-MI-2013-A-062 | AG-20 | a | Hovey L | 1.0000 | 4.3003 |
| BAEA-MI-2013-A-063 | AG-02 | e | Baldy L | 1.0000 | 4.3812 |
| BAEA-MI-2013-A-064 | MQ-10 | g | L Independence-Yellowdog Swp | 2.2809 | 5.8217 |

| Sample ID | Territory # | Nest | Territory Name | Sum PCBs | 4,4'-DDE |
|--------------------|-------------|------|---------------------------|----------|----------|
| BAEA-MI-2013-B-001 | CR-12 | a | Sandhill L | 1.0000 | 1.0000 |
| BAEA-MI-2013-B-002 | CR-02 | e | Wakeley L | 24.1943 | 22.7477 |
| BAEA-MI-2013-B-003 | CR-09 | b | Pickeral L Fldg | 2.5329 | 4.0023 |
| BAEA-MI-2013-B-004 | RO-13 | b | Prudenville | 2.4709 | 8.2419 |
| BAEA-MI-2013-B-005 | RO-09 | f | Marl L | 2.8319 | 5.7752 |
| BAEA-MI-2013-B-013 | MT-07 | a | Stanwood | 24.6817 | 10.6290 |
| BAEA-MI-2013-B-019 | MU-05 | a | Muskegon SP | 23.8265 | 11.3581 |
| BAEA-MI-2013-B-021 | MT-04 | b | Chippewa L | 2.1791 | 15.4289 |
| BAEA-MI-2013-B-022 | OL-04 | b | Sears | 2.2102 | 8.0292 |
| BAEA-MI-2013-B-024 | OL-06 | a | Rose L | 1.0000 | 7.0988 |
| BAEA-MI-2013-B-025 | GL-05 | a | L4 | 1.0000 | 2.6601 |
| BAEA-MI-2013-B-029 | WX-02 | a | L Mitchell | 2.1762 | 12.7723 |
| BAEA-MI-2013-B-034 | KA-01 | b | Manistee L | 1.0000 | 13.7056 |
| BAEA-MI-2013-B-035 | LL-07 | e | Cat Head Bay | 8.1863 | 7.9889 |
| BAEA-MI-2013-B-045 | CP-57 | a | L George SW | 12.0259 | 16.7262 |
| BAEA-MI-2013-B-047 | CP-44 | a | Whipple Pt - Sugar Isd NE | 37.3412 | 17.3491 |
| BAEA-MI-2013-B-048 | CP-56 | a | Sugar Isd N | 10.5588 | 8.9189 |
| BAEA-MI-2013-B-055 | LU-02 | d | Foster Isd | 32.0233 | 10.8343 |
| BAEA-MI-2013-B-056 | GO-47 | a | Cisco L W | 1.0000 | 3.8024 |
| BAEA-MI-2013-B-059 | GO-34 | a | Sundance L | 9.0805 | 11.2121 |
| BAEA-MI-2013-B-060 | IR-04 | l | Hagerman/Ottawa L | 1.0000 | 6.6614 |
| BAEA-MI-2013-B-064 | IR-13 | g | Dog L-L St Kathryn | 1.0000 | 2.1572 |
| BAEA-MI-2013-B-067 | BG-22 | a | Reeds Pt N | 2.5639 | 5.8592 |
| BAEA-MI-2013-D-003 | WA-03 | e | Campau Rd | 27.6131 | 8.2854 |
| BAEA-MI-2013-D-008 | SG-10 | b | Eastwood Drain | 11.7232 | 8.4876 |
| BAEA-MI-2013-D-011 | TU-01 | c | Dinsmoore | 52.3492 | 12.8242 |
| BAEA-MI-2013-D-013 | OA-01 | b | Stoney Ck MP | 4.7759 | 54.7822 |
| BAEA-MI-2013-D-015 | WA-07 | b | Humbug | 92.1253 | 16.3610 |
| BAEA-MI-2013-D-019 | MO-03 | h | Raisin R-Monroe | 190.9991 | 7.7754 |
| BAEA-MI-2013-D-022 | HU-05 | b | Waterfowl Bay | 28.8310 | 8.3989 |

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