

2014 IOWA FISH TISSUE MONITORING PROGRAM SUMMARY OF ANALYSES

Prepared by:

Water Quality Monitoring and Assessment Section
Water Quality Bureau
Environmental Services Division
Iowa Department of Natural Resources

April 2015

Table of Contents	
Introduction.....	2
Status Monitoring	2
Follow-up Monitoring	2
Trend Monitoring.....	3
Turtle Monitoring.....	3
Random Monitoring	3
2014 IFTMP Results.....	4
References.....	11

List of Tables:

Table	Title
1	IFTMP trend site locations and sampling history 3
2	2014 IFTMP status site mercury sampling results from predatory fish 5
3	2014 IFTMP follow-up site mercury sampling results from predatory fish 5
4	2014 IFTMP status site sampling results from bottom feeding fish 6
5	2014 IFTMP follow-up site sampling results from bottom feeding fish 6
6	2014 IFTMP trend site sampling results from bottom feeding fish 7

List of Figures:

Figure	Title
1	2014 IFTMP status and follow-up site mercury sampling results from predatory fish 8
2	2014 IFTMP status site sampling results from bottom feeding fish 9
3	2014 IFTMP trend site sampling results from bottom feeding fish 10

List of Appendices:

Appendix	Title
A	Summary of contaminants and criteria for the Iowa fish tissue monitoring program 12
B	Complete list of the 2014 IFTMP sampling sites 13
C	Sampling species table: common and scientific names and species codes14
D	Full 2014 IFTMP predator fish sampling results 15
E	Full 2014 IFTMP bottom feeding fish sampling results 17

Introduction:

To supplement other environmental monitoring programs and to protect the health of people consuming fish from waters within this state, the state of Iowa conducts fish tissue monitoring. Since 1980, the Iowa Department of Natural Resources (IDNR), the United States Environmental Protection Agency Region VII (U.S. EPA), and the State Hygienic Laboratory (SHL) have cooperatively conducted annual statewide collections and analyses of fish for toxic contaminants. From 1983 to 2014, this monitoring effort was known as the Regional Ambient Fish Tissue Monitoring Program (RAFT). Beginning in 2015, the only statewide fish contaminant-monitoring program in Iowa was changed to the Iowa Fish Tissue Monitoring Program (IFTMP). The IFTMP is administered by IDNR and the analyses are completed at the SHL. Historically, the data generated from the IFTMP have enabled IDNR to document temporal changes in contaminant levels and to identify Iowa lakes and rivers where high levels of contaminants in fish potentially threaten the health of fish-consuming Iowans (see IDNR 2006). The IFTMP incorporates five different types of monitoring sites: 1) status, 2) follow-up, 3) trend, 4) turtle, and 5) random.

Status monitoring:

The majority of IFTMP sites are sampled to determine whether the waterbodies meet the "fish consumption" portion of the fishable goal of the federal Clean Water Act. In other words, these sites are used to screen for contamination problems and to determine the water quality "status" of the waterbodies. Analyses for a variety of pesticides, other toxic organic compounds, and metals are conducted on samples of omnivorous bottom-dwelling fish and carnivorous predator fish. Most status sites on rivers and lakes have either never been sampled or have not been sampled within the last five years (rivers) or 10 years (lakes). Staff of the IDNR divisions of Environmental Services and Conservation and Recreation collaborate to select the status sites. Status monitoring occurs on most types of Iowa waterbodies (interior rivers, border rivers, and manmade and natural lakes) in both rural and urban areas. Lakes and river reaches known to support considerable recreational fishing receive highest priority, but IDNR attempts to sample all lakes and river reaches designated in the *Iowa Water Quality Standards* for recreational fishing. Approximately one-third to one-half of IFTMP status sites are located on lakes; the remaining sites are either located on interior rivers or located on the border rivers (Mississippi, Missouri or Big Sioux rivers).

Follow-up Monitoring:

If the level of a contaminant in a fish tissue sample exceeds IDPH/IDNR advisory trigger levels and/or IDNR levels of concern (Appendix A; IDPH 2007), the IFTMP conducts follow-up monitoring to better define the levels of contaminants. For example, if status monitoring shows that contaminant levels in fish from a waterbody exceed IDPH/IDNR advisory trigger levels, additional samples will be collected as part of follow-up monitoring for the next year's IFTMP. If follow-up monitoring confirms that levels of contamination exceed the advisory trigger levels for protection of human health, a fish consumption advisory is issued. For more information on consumption advisories see the IDNR IFTMP website: http://www.iowadnr.gov/portals/idnr/uploads/fish/fish_consumption_advisories.pdf. If needed, IDNR Fisheries Bureau will conduct follow-up monitoring separately from the IFTMP to verify high levels of contaminants or to better delineate lengths of river consumption advisories. These follow-up samples are collected before the annual IFTMP sampling and are also analyzed at SHL.

Trend monitoring:

In 1994 U.S. EPA Region VII in cooperation with the Region VII states (Iowa, Kansas, Missouri, and Nebraska), identified sites that would be monitored at regular intervals to determine trends in levels of contamination. One composite sample of three to five Common Carp from each site is submitted for whole-fish analysis. Whole-fish samples are more likely to contain detectable levels of most contaminants than are fillet samples (edible portions) or tissue plugs. Examination of the trend monitoring results may help identify temporal changes in contaminant concentrations and may expose new contaminants entering the food chain. From 1996-2005, half of the trend sites were sampled on odd years and the other half were sampled in even years. From 2006-2014, due to a change in old RAFT program design (U.S. EPA 2006), all 10 trend sites were sampled every other year. The following ten sites are current IFTMP trend sites:

Table 1. IFTMP trend site locations and sampling history.

Site #	IFTMP Trend Site Name	County	# Samples	First Sample Date	Last Sample Date
172	Des Moines River at Des Moines	Polk	10	8/17/1995	7/31/2014
173	Des Moines River NNW of Keosauqua	Van Buren	10	8/24/1994	8/8/2014
169	Iowa River E of Wapello	Louisa	10	9/14/1995	9/8/2014
177	Little Sioux River S of Washta	Ida	11	8/9/1994	8/12/2014
175	Maquoketa River NE of Maquoketa	Jackson	11	7/18/1995	8/25/2014
174	Mississippi River at Lansing	Allamakee	11	8/16/1995	8/21/2014
170	Mississippi River at Linwood	Scott	9	8/4/1994	8/1/2014
143	Mississippi River downstream of Dubuque	Dubuque	11	9/15/1994	8/18/2014
171	Skunk River NE of Wever	Lee	9	9/5/1997	9/8/2014
176	Wapsipinicon River SSE of Grand Mound	Scott	9	9/15/1994	9/25/2014

Turtle Monitoring:

In 2009, IDNR fisheries biologists collected snapping turtles from nine Iowa lakes as part of the IFTMP to better define contaminant levels in Iowa turtle populations. This monitoring used the left front shoulder muscle tissue from two or three turtles for the composite sample that was submitted for analysis following the same protocol used for fish. The turtle monitoring continued in 2010 at four Iowa lakes and has since been suspended.

Random Monitoring:

In 2006, based on recommendations in U.S. EPA's RAFT workplan (U.S. EPA 2006), Iowa began sampling random sites across the state as part of an effort to determine the current level of contaminants in fish tissue on a statewide basis. The 2006 sampling sites were selected from a previous random sampling project and data were collected only from large interior rivers. In 2007, the sampling sites were selected from a random list of smaller public lakes and ponds. Due to the fact that EPA Region VII discontinued the RAFT program in 2014, the future of random sampling for Iowa fish contaminants is uncertain.

2014 IFTMP Results:

The 2014 IFTMP involved the collection of 105 samples from 31 waterbodies. The high number of samples reflects the switch from fillet predator samples to tissue plug predator samples where the samples are individually analyzed and not composited. The use of tissue plugs allows the Hg concentration in individual fish be compared to length data and theoretically, the fish can be released thus increasing mortality rates of sampled fish. In June through October 2014, IDNR fisheries biologists collected, processed and prepared the IFTMP samples. These activities were conducted according to procedures described in the workplan for the IFTMP (IDNR 2014). Once frozen, samples were transported or shipped to the Ankeny office of the SHL. All fish tissue samples were analyzed at SHL facilities. Samples were analyzed for a variety of contaminants, including pesticides, other toxic organic compounds, and toxic metals (Appendix A). IDNR received results of all sample analyses in April 2015.

Trend monitoring in 2014 included the collection of 10 fish samples from 10 sites with all 10 of those samples collected from Common Carp.

Status monitoring in 2014 included the collection of 35 fish samples from seven sites with 29 of those samples collected from predatory fish and six samples collected from bottom feeding fish.

Follow-up monitoring in 2014 included the collection of 57 fish samples from 17 sites with 53 of those samples collected from predatory fish and four samples collected from bottom feeding fish.

The 2014 IFTMP monitoring results for the primary contaminants of concern (chlordanes, DDE, dieldrin, mercury and PCBs) are summarized in Tables 2-6 and in Figures 1-3. In addition, Appendices D and E contain all the sampling data generated by the 2014 IFTMP.

The vast majority of contaminant levels in the 2014 IFTMP samples were low or not detected (Tables 2-6; Figures 1-3; Appendices D and E). Any contaminant results over, or near, their respective evaluation criteria (Appendix A) are currently being addressed by the IDNR Fisheries bureau with the assistance of the IDNR Water Quality Monitoring and Assessment section and the Iowa Department of Public Health. If contaminant levels were over their respective criteria for the first time in 2014, follow-up monitoring will be conducted in 2015. If contaminant levels were over their respective criteria for the second time in 2014, a fish consumption advisory will be issued in 2015.

Table 2. Summary of 2014 IFTMP Mercury (Hg) status site sampling results from predatory fish. All samples were tissue plugs and Hg results are in mg/kg (or ppm). See Appendix C for explanation of species codes.

Site #	IFTMP Site Name	County	Date	Species Code	# Fish	Hg AVE	Hg STDEV	Hg MAX	Hg MIN
45	Mississippi River E of Bettendorf	Scott	9/11/2014	WHB	5	0.186	0.047	0.240	0.130
103	Lake Cornelia NE of Clarion	Wright	6/23/2014	LMB	4	0.075	0.050	0.150	<0.05
137	Middle River SW of Winterset	Madison	7/23/2014	FCF	5	0.068	0.040	0.140	<0.05
200	Silver Lake near Lake Park	Dickinson	10/24/2014	WAE	5	0.064	0.019	0.090	<0.05
311	Lake Sugema	Van Buren	8/8/2014	LMB	5	0.084	0.033	0.120	<0.05
351	Cherry Lake at Tama	Tama	7/28/2014	LMB	5	0.050	0.000	0.050	<0.05

Table 3. Summary of 2014 IFTMP Mercury (Hg) follow-up site sampling results from predatory fish. All samples were tissue plugs and Hg results are in mg/kg (or ppm). See Appendix C for explanation of species codes.

Site #	IFTMP Site Name	County	Date	Species Code	# Fish	Hg AVE	Hg STDEV	Hg MAX	Hg MIN
61	Cedar River at Midway	Floyd	9/22/2014	SMB	4	0.270	0.147	0.350	<0.05
82	North Raccoon River downstream of Sac City	Sac	8/4/2014	SMB	3	0.160	0.105	0.260	<0.05
102	Mississippi River downstream of Burlington	Des Moines	9/4/2014	LMB	5	0.130	0.179	0.450	<0.05
104	Upper Iowa River at Decorah	Winneshiek	9/6/2014	SMB	3	0.247	0.134	0.400	0.150
114	Missouri River at Council Bluffs	Pottawattamie	9/21/2014	FCF	3	0.090	0.069	0.170	<0.05
162	Yellow Smoke Lake	Crawford	8/4/2014	LMB	5	0.194	0.093	0.290	<0.05
202	Turkey River E of Clermont	Fayette	9/9/2014	SMB	4	0.215	0.192	0.410	<0.05
203	Volga River near Volga Recreation Area	Fayette	8/29/2014	SMB	3	0.287	0.136	0.430	0.160
206	Mississippi River at Marquette/McGregor	Clayton	8/27/2014	LMB	5	0.050	0.000	0.050	<0.05
269	Meadow Lake	Adair	8/8/2014	LMB	5	0.050	0.000	0.050	<0.05
270	Pollmiller Park Lake	Lee	9/8/2014	LMB	4	0.333	0.065	0.420	0.270
289	Cold Springs Lake	Cass	8/8/2014	LMB	5	0.160	0.108	0.270	<0.05
340	West Osceola	Clarke	7/1/2014	LMB	4	0.145	0.112	0.300	<0.05

Table 4. Summary of 2014 IFTMP status site sampling for contaminants of concern in bottom-feeding fish. All fish samples were composited fillets and results are in mg/kg (or ppm). See Appendix C for explanation of species codes.

Site #	IFTMP Site Name	County	Date	Species Code	# Fish	technical chlordane	DDE	dieldrin	Sum PCBs ¹	Hg ²
45	Mississippi River E of Bettendorf	Scott	9/11/2014	CAP	3	0.03	0.008	0.007	<0.06	0.07
103	Lake Cornelia NE of Clarion	Wright	6/23/2014	CCF	4	<0.05	0.01	<0.005	<0.06	0.04
137	Middle River SW of Winterset	Madison	7/23/2014	CCF	5	<0.05	0.02	0.008	<0.06	0.08
200	Silver Lake near Lake Park	Dickinson	7/28/2014	CCF	5	<0.1	0.006	<0.01	<0.06	0.03
311	Lake Sugema	Van Buren	8/14/2014	CCF	3	<0.02	0.009	<0.005	<0.06	0.06
351	Cherry Lake at Tama	Tama	7/28/2014	CCF	4	<0.02	0.01	<0.01	<0.06	0.04
¹ sum PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260										
² Hg = mercury										

Table 5. Summary of 2014 IFTMP follow-up site sampling for contaminants of concern in bottom-feeding fish. All fish samples were composited fillets and results are in mg/kg (or ppm). See Appendix C for explanation of species codes.

Site #	IFTMP Site Name	County	Date	Species Code	# Fish	technical chlordane	DDE	dieldrin	Sum PCBs ¹	Hg ²
45	Mississippi River E of Bettendorf	Scott	9/11/2014	CAP	3	<0.02	0.02	<0.02	0.42	0.11
124	Cedar Lake at Cedar Rapids	Linn	7/31/2014	CCF	3	0.07	0.05	0.01	<0.06	NA
152	Mississippi River upstream of Princeton	Scott	9/17/2014	CAP	5	0.03	0.007	<0.005	<0.06	0.18
170	Mississippi River at Linwood	Scott	8/1/2014	CAP	5	<0.1	0.01	0.009	<0.06	<0.05
¹ sum PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260										
² Hg = mercury										

Table 6. Summary of 2014 IFTMP trend site sampling for contaminants of concern in bottom-feeding fish. All samples were composited whole fish Common Carp and results are in mg/kg (or ppm). See Appendix C for explanation of species codes.

Site #	IFTMP Site Name	County	Date	Species Code	# Fish	technical chlordane	DDE	dieldrin	Sum PCBs ¹	Hg ²
11	Skunk River at Augusta	Des Moines	9/8/2014	CAP	3	<0.05	0.07	0.03	<0.24	0.12
32	Iowa River at Wapello	Louisa	9/8/2014	CAP	3	0.12	0.1	0.06	<0.24	0.11
143	Mississippi River downstream of Dubuque	Dubuque	8/18/2014	CAP	5	0.08	0.006	0.005	<0.24	0.05
170	Mississippi River at Linwood	Scott	8/1/2014	CAP	4	0.11	0.02	0.02	<0.24	0.09
172	Des Moines River at Des Moines	Polk	7/31/2014	CAP	5	<0.1	0.22	<0.02	<0.39	0.05
173	Des Moines River NNW of Keosauqua	Van Buren	8/8/2014	CAP	4	<0.1	<0.01	<0.02	<0.39	0.04
174	Mississippi River at Lansing	Allamakee	8/21/2014	CAP	5	<0.2	<0.01	<0.05	<0.75	0.07
175	Maquoketa River NE of Maquoketa	Jackson	8/25/2014	CAP	5	<0.06	<0.01	<0.02	<0.24	0.06
176	Wapsipinicon River SSE of Grand Mound	Scott	9/25/2014	CAP	3	0.11	0.06	0.02	<0.24	0.1
177	Little Sioux River S of Washta	Cherokee	8/12/2014	CAP	5	<0.06	0.02	0.02	<0.24	0.05
¹ sum PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260										
² Hg = mercury										

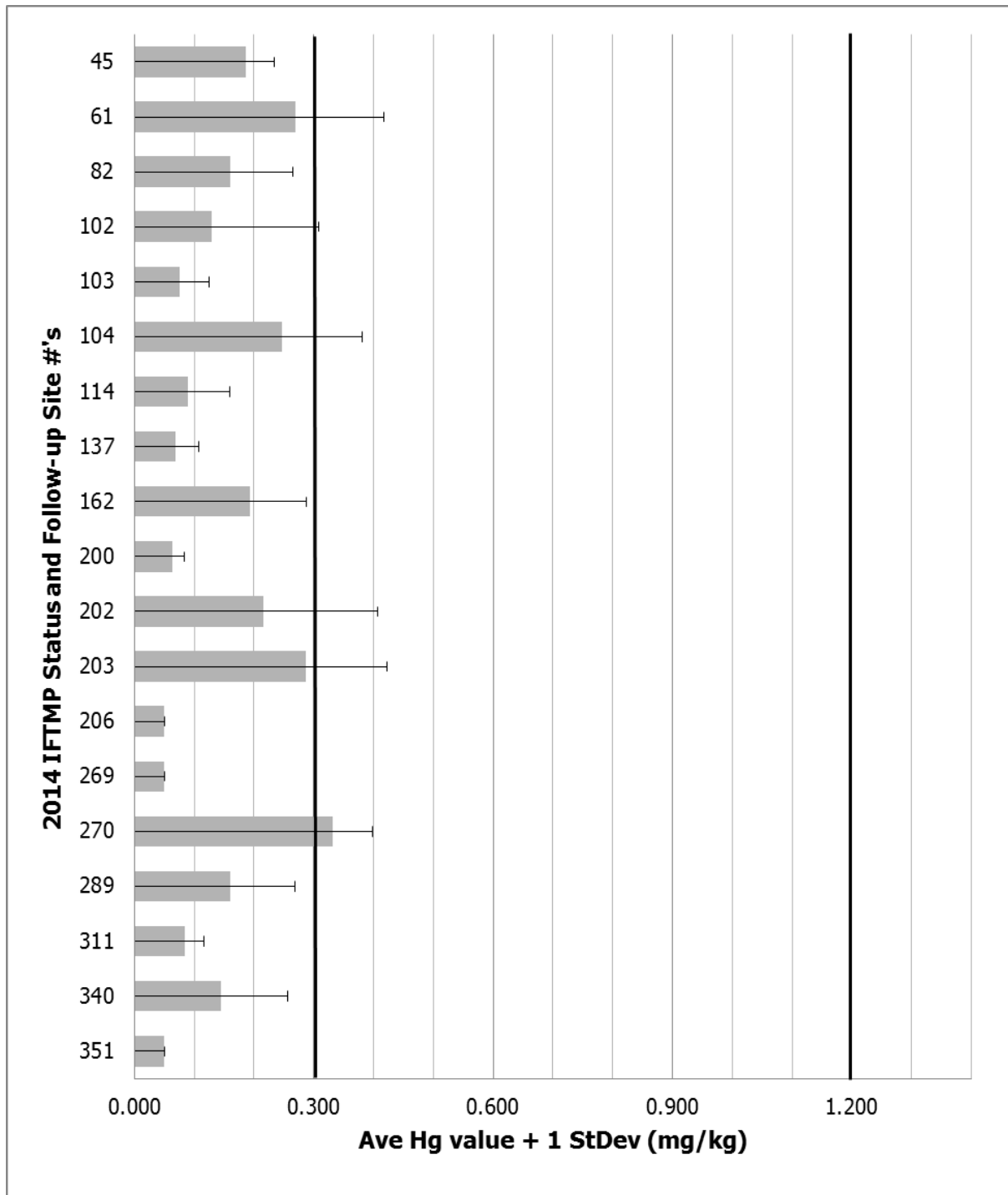


Figure 1. 2014 IFTMP mercury status and follow-up sample results for predatory fish. All samples were tissue plugs and results are in mg/kg (or ppm). All of the values above the 0.3 mg/kg evaluation criterion (Appendix A) have been, or will be, addressed by IDNR through the issuance or continuation of consumption advisories and/or with follow-up monitoring. See Appendix B for the full list of 2014 IFTMP sites.

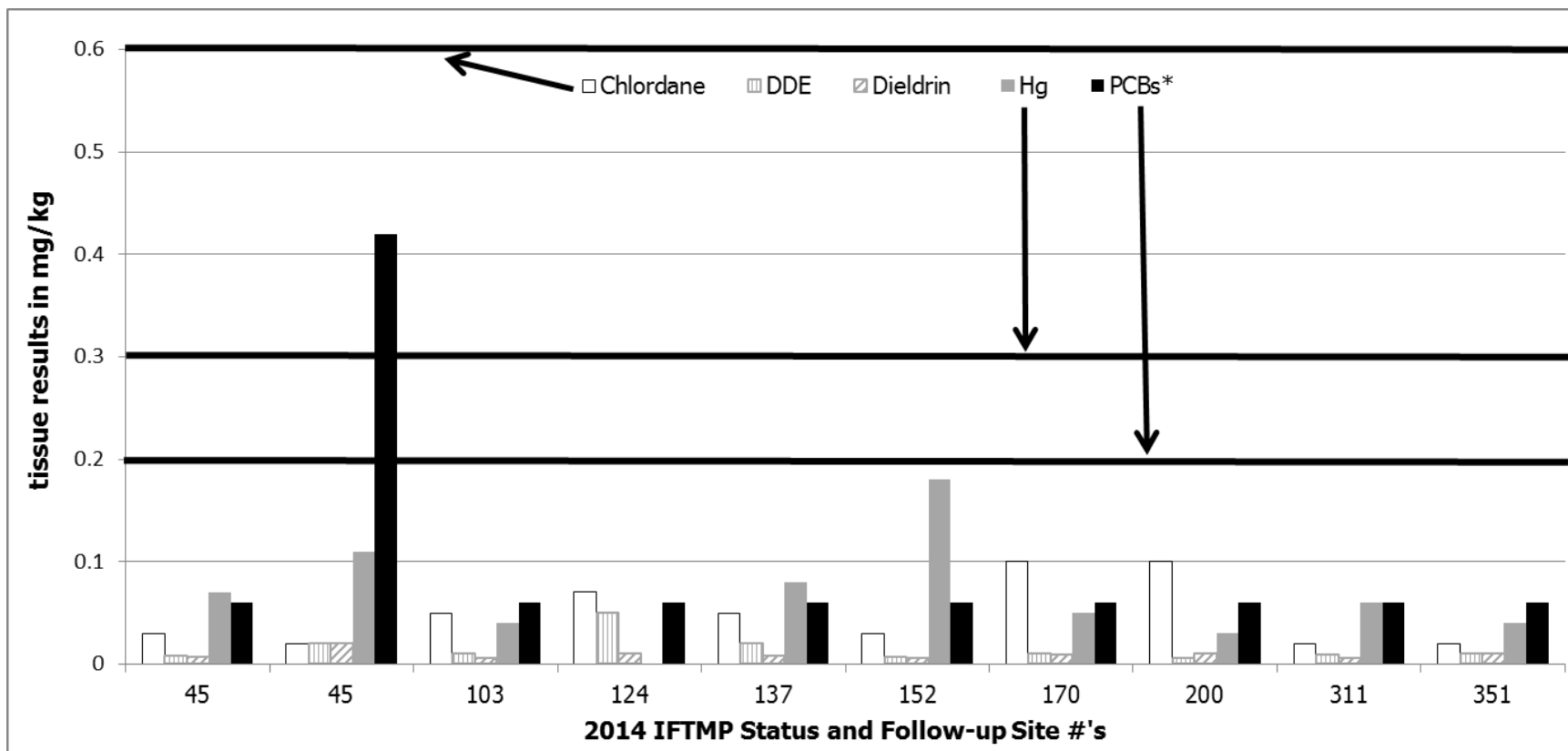


Figure 2. 2014 IFTMP status and follow-up sample results for bottom feeding fish. All samples were composited fillet samples from Common Carp or Channel Catfish and results are in mg/kg (or ppm). Solid black lines indicate the evaluation criteria for chlordane, mercury and PCBs (Appendix A). All samples above the the corresponding criteria have, or will be, addressed by IDNR through the issuance or continuation of consumption advisories or with follow-up monitoring. See Appendix B for the full list of 2014 IFTMP sites. *PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260.

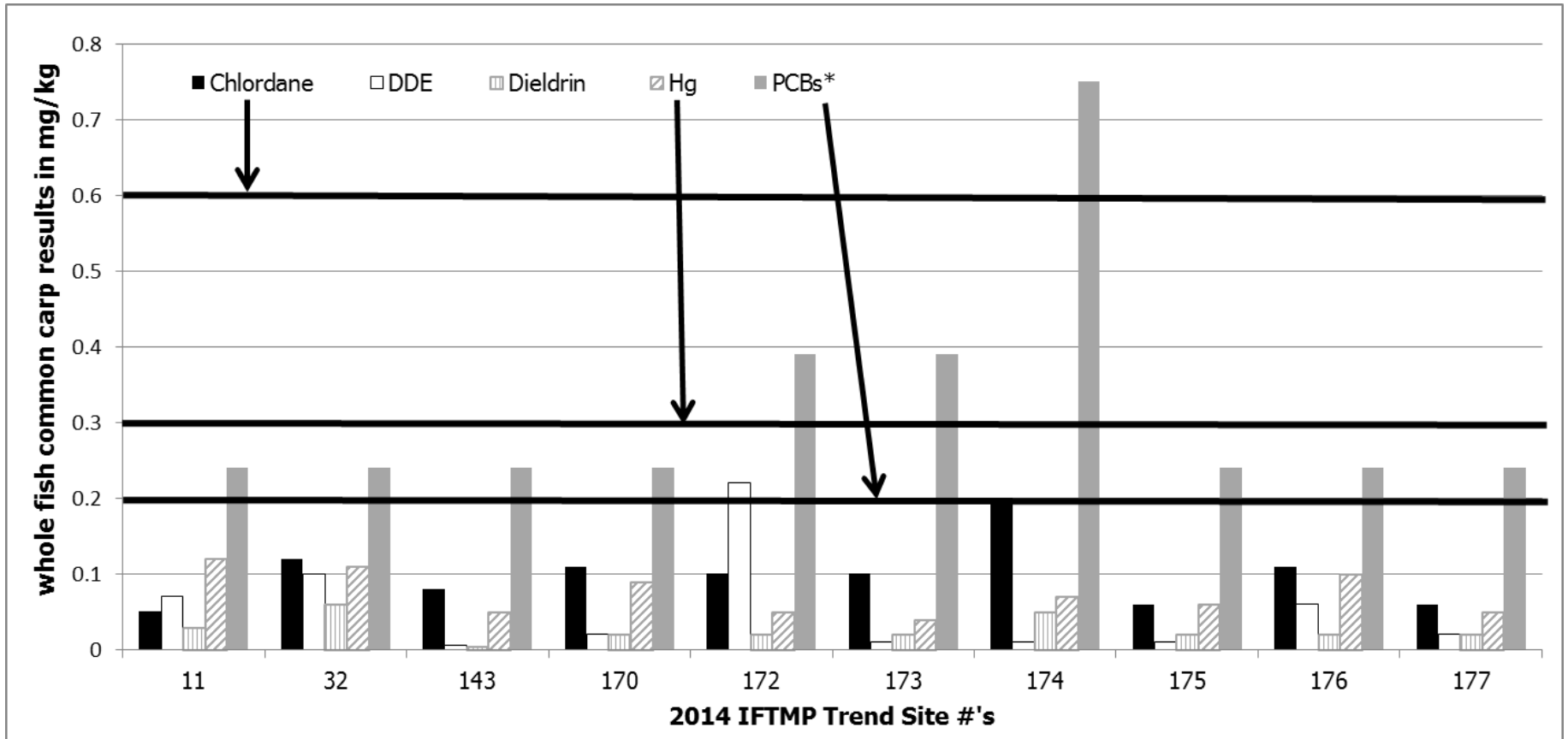


Figure 3. 2014 IFTMP trend site sample results (in mg/kg or ppm). All samples were composited whole Common Carp. Solid black lines indicate the evaluation criteria for chlordane, mercury and PCBs (Appendix A). See Appendix B for the full list of the 2014 IFTMP sites. *PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260; Due to the analytical methods used for PCBs, detection levels of the three Aroclors ranged from <0.02 to <0.25 mg/kg. Thus, for a given sample, the sum of the detection levels for the three Aroclors to determine the “total PCB” concentration can appear to be well above the 1 meal/week advisory trigger level of 0.2 mg/kg. IDNR will address this laboratory analysis issue in the future.

References:

- IDNR. 2006. Fish tissue monitoring in Iowa. Water Fact Sheet 2006-5. Geological and Water Survey, Iowa Department of Natural Resources. 4 pgs
(<ftp://ftp.igsb.uiowa.edu/igspubs/pdf/WFS-2006-05.pdf>).
- IDNR. 2014. Sampling Procedures for the Iowa DNR Fish Tissue Monitoring Program (IFTMP). Water Quality Bureau, Environmental Services Division, Iowa Department of Natural Resources. 16 pp.
- IDPH. 2007. Fish consumption advisory protocol in Iowa. Iowa Department of Public Health. 8 pgs.
- U.S. EPA. 2006. EPA Region 7 Regional Ambient Fish Tissue Monitoring Program (RAFTMP) program rationale, design and implementation plans for 2006 - 2010. Environmental Services Division, U.S. Environmental Protection Agency Region 7 and the Region 7 Fish Tissue Monitoring Workgroup. 24 pgs.

Appendix A

Summary of contaminants and respective evaluation criteria for IFTMP fish tissue samples.

#	contaminant	SHL current lowest detection levels (ppm)	IDNR/IDPH advisory trigger level (ppm)	IDNR/IDPH advisory meal allowance
1	chlordane, technical	0.02	0 to 0.6	unrestricted
			>0.6 to <5.0	one meal per week
			≥5.0	do not eat
2	mercury	0.05	0 to 0.3	unrestricted
			>0.3 to <1.0	one meal per week
			≥1.0	do not eat
3	PCB, Aroclor 1248	0.02	sum = 0 to 0.2	unrestricted
4	PCB, Aroclor 1254	0.02	sum >0.2 to <2.0	one meal per week
5	PCB, Aroclor 1260	0.02	sum 2.0 and over	do not eat
6	dieldrin	0.01		
7	DDE, 4,4'-	0.01		

Appendix B

Complete list of the 2014 IFTMP sampling sites.

Site #	IFTMP Site Name	County	Waterbody Type	NAD 83 UTM Easting	NAD 83 UTM Northing
11	Skunk River at Augusta	Des Moines	River	645598	4512760
32	Iowa River at Wapello	Louisa	River	652490	4560365
45	Mississippi River E of Bettendorf	Scott	River	712281	4600952
61	Cedar River at Midway	Floyd	River	532404	4761558
82	North Raccoon River downstream of Sac City	Sac	River	336414	4689468
102	Mississippi River downstream of Burlington	Des Moines	River	660460	4514715
103	Lake Cornelia NE of Clarion	Wright	Lake	443942	4737462
104	Upper Iowa River at Decorah	Winneshiek	River	598939	4795981
114	Missouri River at Council Bluffs	Pottawattamie	River	260105	4563658
124	Cedar Lake at Cedar Rapids	Linn	Lake	610148	4649488
137	Middle River SW of Winterset	Madison	River	410581	4572581
143	Mississippi River downstream of Dubuque	Dubuque	River	693895	4704454
152	Mississippi River upstream of Princeton	Scott	River	722205	4620705
162	Yellow Smoke Lake	Crawford	Lake	308012	4655516
170	Mississippi River at Linwood	Scott	River	693597	4592635
172	Des Moines River at Des Moines	Polk	River	453378	4602302
173	Des Moines River NNW of Keosauqua	Van Buren	River	586394	4512736
174	Mississippi River at Lansing	Allamakee	River	644332	4803301
175	Maquoketa River NE of Maquoketa	Jackson	River	696090	4661531
176	Wapsipinicon River SSE of Grand Mound	Scott	River	693096	4625653
177	Little Sioux River S of Washta	Cherokee	River	275661	4716430
200	Silver Lake near Lake Park	Dickinson	Lake	310987	4812771
202	Turkey River E of Clermont	Fayette	River	610647	4757895
203	Volga River near Volga Recreation Area	Fayette	River	600275	4744517
206	Mississippi River at Marquette/McGregor	Clayton	River	648683	4766651
269	Meadow Lake	Adair	Lake	379691	4582747
270	Pollmiller Park Lake	Lee	Lake	632103	4508044
289	Cold Springs Lake	Cass	Lake	325327	4573509
311	Lake Sugema	Van Buren	Lake	584033	4504662
340	West Osceola	Clarke	Lake	432355	4543125
351	Cherry Lake at Tama	Tama	Lake	534498	4645542

Appendix C

Fish and turtle species table that includes: species codes, common and scientific names.

Species Code	Common Name	Scientific Name
BGB	Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>
BKB	Black Buffalo	<i>Ictiobus niger</i>
BLB	Black Bullhead	<i>Ameiurus melas</i>
BLC	Black Crappie	<i>Pomoxis nigromaculatus</i>
BLG	Bluegill	<i>Lepomis macrochirus</i>
BRT	Brown Trout	<i>Salmo trutta</i>
CCF	Channel Catfish	<i>Ictalurus punctatus</i>
CAP	Common Carp	<i>Cyprinus carpio</i>
FCF	Flathead Catfish	<i>Pylodictis olivaris</i>
FRD	Freshwater Drum	<i>Aplodinotus grunniens</i>
GOR	Golden Redhorse	<i>Moxostoma erythrurum</i>
LMB	Largemouth Bass	<i>Micropterus salmoides</i>
NHS	Northern Hog Sucker	<i>Hypentelium nigricans</i>
NOP	Northern Pike	<i>Esox lucius</i>
PAH	Paddlefish	<i>Polyodon spathula</i>
ULL	Quillback Carpsucker	<i>Carpiodes cyprinus</i>
RBT	Rainbow Trout	<i>Oncorhynchus mykiss</i>
RVC	River Carpsucker	<i>Carpiodes carpio</i>
SAR	Sauger	<i>Sander canadensis</i>
SHR	Shorthead Redhorse	<i>Moxostoma macrolepidotum</i>
SHG	Shortnose Gar	<i>Lepisosteus platostomus</i>
SMB	Smallmouth Bass	<i>Micropterus dolomieu</i>
SAB	Smallmouth Buffalo	<i>Ictiobus bubalus</i>
SNAP	Snapping Turtle	<i>Chelydra serpentina</i>
SOFT	Softshell Turtle	<i>Apalone spp.</i>
WAE	Walleye	<i>Sander vitreus</i>
WHB	White Bass	<i>Morone chrysops</i>
WHC	White Crappie	<i>Pomoxis annularis</i>
WHS	White Sucker	<i>Catostomus commersonii</i>
YLB	Yellow Bass	<i>Morone mississippiensis</i>
YEB	Yellow Bullhead	<i>Ameiurus natalis</i>
YEP	Yellow Perch	<i>Perca flavescens</i>

Appendix D

Complete listing of the 2014 IFTMP predator fish sampling results. See Appendix B for a list of 2014 IFTMP site numbers and Appendix C for a list of fish names and species codes.

Sample #	Site #	Lab	Species Code	Biopart	Sample Type	Total Length (cm)	Weight (g)	Mercury (mg/kg)
1557	351	SHL	LMB	plug	status	37.9	840	<0.05
1558	351	SHL	LMB	plug	status	35.6	654	<0.05
1559	351	SHL	LMB	plug	status	36.8	763	<0.05
1560	351	SHL	LMB	plug	status	40.4	804	<0.05
1561	351	SHL	LMB	plug	status	36.8	763	<0.05
1562	103	SHL	LMB	plug	status	35.4	645	<0.05
1563	103	SHL	LMB	plug	status	32.2	465	<0.05
1564	103	SHL	LMB	plug	status	34.1	595	0.15
1565	103	SHL	LMB	plug	status	38.2	675	<0.05
1566	311	SHL	LMB	plug	status	27.9	275	0.11
1567	311	SHL	LMB	plug	status	27.6	260	0.12
1568	311	SHL	LMB	plug	status	28.7	315	<0.05
1569	311	SHL	LMB	plug	status	25.6	210	<0.05
1570	311	SHL	LMB	plug	status	25.6	200	0.09
1571	137	SHL	FCF	plug	status	64.8	3062	<0.05
1572	137	SHL	FCF	plug	status	78.7	6291	<0.05
1573	137	SHL	FCF	plug	status	83.3	7602	0.14
1574	137	SHL	FCF	plug	status	71.1	4051	<0.05
1575	137	SHL	FCF	plug	status	78.2	5262	<0.05
1576	45	SHL	WHB	plug	status	34.1	486	0.17
1577	45	SHL	WHB	plug	status	33.7	456	0.24
1578	45	SHL	WHB	plug	status	35.4	514	0.23
1579	45	SHL	WHB	plug	status	36.1	615	0.13
1580	45	SHL	WHB	plug	status	33.5	496	0.16
1581	200	SHL	WAE	plug	status	44.5	1009.2	0.08
1582	200	SHL	WAE	plug	status	49.8	1424.3	0.09
1583	200	SHL	WAE	plug	status	42.4	834.6	<0.05
1584	200	SHL	WAE	plug	status	45.2	988.8	<0.05
1585	200	SHL	WAE	plug	status	46	1143.1	<0.05
1592	114	SHL	FCF	plug	follow-up	44.4	900	<0.05
1593	114	SHL	FCF	plug	follow-up	39.6	660	<0.05
1594	114	SHL	FCF	plug	follow-up	44.2	660	0.17
1595	104	SHL	SMB	plug	follow-up	28.4	303	0.19
1596	104	SHL	SMB	plug	follow-up	35.3	537	0.4
1597	104	SHL	SMB	plug	follow-up	29	336	0.15
1598	289	SHL	LMB	plug	follow-up	33.3	486	<0.05
1599	289	SHL	LMB	plug	follow-up	34	484	0.27
1600	289	SHL	LMB	plug	follow-up	34.3	479	0.26
1601	289	SHL	LMB	plug	follow-up	33	485	<0.05
1602	289	SHL	LMB	plug	follow-up	33.8	456	0.17
1603	269	SHL	LMB	plug	follow-up	33.8	532	<0.05
1604	269	SHL	LMB	plug	followup	33.8	538	<0.05
1605	269	SHL	LMB	plug	followup	33.3	474	<0.05
1606	269	SHL	LMB	plug	followup	33.8	529	<0.05

Appendix D, continued.

Complete listing of the 2014 IFTMP predator fish sampling results, continued.

Sample #	Site #	Lab	Species Code	Biopart	Sample Type	Total Length (cm)	Weight (g)	Mercury (mg/kg)
1607	269	SHL	LMB	plug	follow-up	33.8	505	<0.05
1608	206	SHL	LMB	plug	follow-up	30.7	414	<0.05
1609	206	SHL	LMB	plug	follow-up	28.4	378	<0.05
1610	206	SHL	LMB	plug	follow-up	29.1	288	<0.05
1611	206	SHL	LMB	plug	follow-up	32.8	487	<0.05
1612	206	SHL	LMB	plug	follow-up	29	335	<0.05
1613	102	SHL	LMB	plug	follow-up	43.8	1373	0.45
1614	102	SHL	LMB	plug	follow-up	37.3	780	<0.05
1615	102	SHL	LMB	plug	follow-up	37	723	<0.05
1616	102	SHL	LMB	plug	follow-up	46.3	1520	<0.05
1617	102	SHL	LMB	plug	follow-up	38.1	864	<0.05
1618	82	SHL	SMB	plug	follow-up	36.3	713	0.26
1619	82	SHL	SMB	plug	follow-up	42.7	1137	0.17
1620	82	SHL	SMB	plug	follow-up	34.5	677	<0.05
1621	270	SHL	LMB	plug	follow-up	32.2	433	0.27
1622	270	SHL	LMB	plug	follow-up	35	567	0.42
1623	270	SHL	LMB	plug	follow-up	30.6	386	0.34
1624	270	SHL	LMB	plug	follow-up	30.1	331	0.3
1625	340	SHL	LMB	plug	follow-up	44.2	1279	0.15
1626	340	SHL	LMB	plug	follow-up	41.4	748	<0.05
1627	340	SHL	LMB	plug	follow-up	46.7	1805	0.3
1628	340	SHL	LMB	plug	follow-up	41.4	812	0.08
1629	162	SHL	LMB	plug	follow-up	38.9	910	0.24
1630	162	SHL	LMB	plug	follow-up	37.8	740	0.23
1631	162	SHL	LMB	plug	follow-up	40.4	926	0.29
1632	162	SHL	LMB	plug	follow-up	40.1	988	<0.05
1633	162	SHL	LMB	plug	follow-up	39.9	877	0.16
1634	61	SHL	SMB	plug	follow-up	39.1	763	0.35
1635	61	SHL	SMB	plug	follow-up	38.4	703	0.33
1636	61	SHL	SMB	plug	follow-up	36.1	667	0.35
1637	61	SHL	SMB	plug	follow-up	26.9	245	<0.05
1638	202	SHL	SMB	plug	follow-up	41.7	677	0.35
1639	202	SHL	SMB	plug	follow-up	25.9	215	<0.05
1640	202	SHL	SMB	plug	follow-up	24.4	175	<0.05
1641	202	SHL	SMB	plug	follow-up	45.2	671	0.41
1642	203	SHL	SMB	plug	follow-up	34.5	505	0.43
1643	203	SHL	SMB	plug	follow-up	38.9	780	0.27
1644	203	SHL	SMB	plug	follow-up	28.4	278	0.16

Appendix E

Complete listing of the 2014 IAFTMP bottom-feeding fish sampling results (in mg/kg). See Appendix B for a list of 2014 IFTMP site descriptions and Appendix C for a list of fish names and species codes. All samples were analyzed as a composite of tissue from three to five fish.

Sample #	Site #	Lab	Species Code	Bio-part	Sample Type	Chlordane, Technical	DDE	Dieldrin	Mercury	PCB, Aroclor 1248	PCB, Aroclor 1254	PCB, Aroclor 1260	*Total PCBs (sum Aroclors)	Mean Total Length (cm)	Mean Weight (g)	# of Fish in Sample
1547	172	SHL	CAP	whole	trend	<0.1	0.22	<0.02	0.05	<0.13	<0.13	<0.13	<0.39	45.9	1383	5
1548	173	SHL	CAP	whole	trend	<0.1	<0.01	<0.02	0.04	<0.13	<0.13	<0.13	<0.39	55.3	2221	4
1549	32	SHL	CAP	whole	trend	0.12	0.1	0.06	0.11	<0.08	<0.08	<0.08	<0.24	59.4	2946	3
1550	177	SHL	CAP	whole	trend	<0.06	0.02	0.02	0.05	<0.08	<0.08	<0.08	<0.24	46.8	1426	5
1551	175	SHL	CAP	whole	trend	<0.06	<0.01	<0.02	0.06	<0.08	<0.08	<0.08	<0.24	46.8	1329.6	5
1552	174	SHL	CAP	whole	trend	<0.2	<0.01	<0.05	0.07	<0.25	<0.25	<0.25	<0.75	57.8	2648	5
1553	143	SHL	CAP	whole	trend	0.08	0.006	0.005	0.05	<0.08	<0.08	<0.08	<0.24	51.3	1947.2	5
1554	170	SHL	CAP	whole	trend	0.11	0.02	0.02	0.09	<0.08	<0.08	<0.08	<0.24	46.8	1401	4
1555	11	SHL	CAP	whole	trend	<0.05	0.07	0.03	0.12	<0.08	<0.08	<0.08	<0.24	61.3	3204	3
1556	176	SHL	CAP	whole	trend	0.11	0.06	0.02	0.1	<0.08	<0.08	<0.08	<0.24	55.4	2422	3
1586	351	SHL	CCF	fillet	status	<0.02	0.01	<0.01	0.04	<0.02	<0.02	<0.02	<0.06	46	915	4
1587	103	SHL	CCF	fillet	status	<0.05	0.01	<0.005	0.04	<0.02	<0.02	<0.02	<0.06	44.8	756	4
1588	311	SHL	CCF	fillet	status	<0.02	0.009	<0.005	0.06	<0.02	<0.02	<0.02	<0.06	56	2090	3
1589	137	SHL	CCF	fillet	status	<0.05	0.02	0.008	0.08	<0.02	<0.02	<0.02	<0.06	56.4	1627	5
1590	200	SHL	CCF	fillet	status	<0.1	0.006	<0.01	0.03	<0.02	<0.02	<0.02	<0.06	45	948.9	5
1591	45	SHL	CAP	fillet	status	0.03	0.008	0.007	0.07	<0.02	<0.02	<0.02	<0.06	48.4	1986	3
1645	152	SHL	CAP	fillet	followup	0.03	0.007	<0.005	0.18	<0.02	<0.02	<0.02	<0.06	67.9	4912	5
1646	45	SHL	CAP	fillet	followup	<0.02	0.02	<0.02	0.11	<0.02	0.38	<0.02	0.42	67.8	4769	3
1647	170	SHL	CAP	fillet	followup	<0.1	0.01	0.009	<0.05	<0.02	<0.02	<0.02	<0.06	66.9	4055	5
1648	124	SHL	CCF	fillet	followup	0.07	0.05	0.01	NA	<0.02	<0.02	<0.02	<0.06	44.2	772	3

*Total PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260; Due to the analytical methods used for PCBs, detection levels of the three Aroclors ranged from <0.02 to <0.25 mg/kg. Thus, for a given sample, the sum of the detection levels for the three Aroclors to determine the "total PCB" concentration can appear to be well above the 1 meal/week advisory trigger level of 0.2 mg/kg. IDNR will address this laboratory analysis issue in the future.