

2016 IOWA FISH TISSUE MONITORING PROGRAM SUMMARY OF ANALYSES

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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 Iowa 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 tissue analyses are completed at the SHL. Historically, the data generated from the IFTMP has 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* (<https://www.legis.iowa.gov/docs/ACO/chapter/567.61.pdf>) 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/Environmental-Protection/Water-Quality/Water-Monitoring/Fish-Tissue>. 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. In 2016, IDNR added five trend sites to fill sampling gaps. However, due to unfavorable sampling conditions encountered in 2016 (high flows), not all of the trend sites, including some of the new trend sites, were sampled. The following 15 sites are current IFTMP trend sites:

Table 1. IFTMP trend site locations and sampling history.

Site #	IFTMP Trend Site Name	County	# Samples	First Sample Year	Last Sample Year
65	Big Sioux River @ Oak Grove Park	Sioux	0	NA	NA
172	Des Moines River at Des Moines	Polk	11	1995	2016
173	Des Moines River NNW of Keosauqua	Van Buren	11	1994	2016
169	Iowa River E of Wapello	Louisa	10	1995	2014
177	Little Sioux River S of Washta	Ida	12	1994	2016
175	Maquoketa River NE of Maquoketa	Jackson	12	1995	2016
174	Mississippi River at Lansing	Allamakee	12	1995	2016
170	Mississippi River at Linwood	Scott	10	1994	2016
143	Mississippi River downstream of Dubuque	Dubuque	12	1994	2016
114	Missouri River at Council Bluffs	Pottawattamie	1	2016	2016
111	Nishnabotna River at Hamburg	Fremont	1	2016	2016
171	Skunk River NE of Wever	Lee	10	1997	2016
129	Thompson Fork of Grand River @ Davis City	Decatur	0	NA	NA
94	Upper Iowa River NE of Freeport	Winneshiek	1	2016	2016
176	Wapsipinicon River SSE of Grand Mound	Scott	9	1994	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.

Random Monitoring:

In 2006, based on recommendations in U.S. EPA's RAFT workplan (U.S. EPA 2006), Iowa began sampling randomly selected 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.

2016 IFTMP Results:

The 2016 IFTMP involved the collection of 59 samples from 25 waterbodies. From June through October 2016, 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 2016). 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 several contaminants, including pesticides, other toxic organic compounds, and toxic metals (Appendix A). IDNR received results of all sample analyses in January 2017.

Trend monitoring in 2016 included the collection of 11 whole fish common carp samples from 11 sites.

Follow-up monitoring in 2016 included the collection of 47 fish samples from 15 sites with 40 of those samples collected from predatory fish and seven samples collected from bottom feeding fish.

Turtle monitoring in 2016 included the collection of one turtle sample from one site.

The 2016 IFTMP monitoring results for the primary contaminants of concern (chlordane, dieldrin mercury and PCBs) are summarized in Tables 2-5 and in Figures 1-2. In addition, Appendices D and E contain all the sampling data generated by the 2016 IFTMP.

The vast majority of contaminant levels in the 2016 IFTMP samples were low or not detected (Tables 2-5; Figures 1-2; Appendices D and E). Any contaminant results over, or near, their respective evaluation criteria (Appendix A) will be 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.

Table 2. Summary of 2016 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.

IFTMP Site Name	County	Species Code	# Fish	Hg AVE	Hg STDEV	Hg MAX	Hg MIN
Brushy Creek Lake	Webster	LMB	5	<0.05	0	<0.05	<0.05
Cedar Lake at Cedar Rapids	Linn	LMB	5	<0.05	0	<0.05	<0.05
Des Moines River at Cliffland Access - S of Ottumwa	Wapello	WHB	4	<0.05	0	<0.05	<0.05
East Fork Des Moines River at Algona	Kossuth	NOP	3	0.155	0.035	0.18	0.13
Little River Lake W of Leon	Decatur	LMB	3	0.453	0.029	0.47	0.42
Mississippi River at Davenport	Scott	WHB	5	0.222	0.103	0.31	<0.05
Mississippi River DS of Burlington	Des Moines	LMB	4	0.258	0.140	0.36	<0.05
North Raccoon River DS of Sac City	Sac	WAE	3	0.250	0.036	0.29	0.22
North Raccoon River NW of Jefferson	Greene	WAE	4	<0.05	0	<0.05	<0.05
Plainfield Lake	Bremer	LMB	4	0.095	0.09	0.23	<0.05

Table 3. Summary of 2016 IFTMP trend site sampling for contaminants of concern in Common Carp. All fish samples were composited whole fish and results are in mg/kg (or ppm).

IFTMP Site Name	County	# Fish	technical chlordane	dieldrin	sum PCBs ¹	Hg ²
Des Moines River at Des Moines	Polk	5	0.04	0.01	<0.06	0.08
Des Moines River NNW of Keosauqua	Van Buren	4	0.12	0.008	<0.06	0.06
Little Sioux River S of Washta	Cherokee	5	0.03	0.01	<0.06	0.06
Maquoketa River NE of Maquoketa	Jackson	5	<0.02	0.006	<0.06	0.05
Mississippi River at Lansing	Allamakee	4	<0.02	<0.005	<0.15	<0.05
Mississippi River at Linwood	Scott	3	0.06	0.019	<0.06	<0.05
Mississippi River downstream of Dubuque	Dubuque	5	<0.02	<0.005	<0.15	0.07
Missouri River at Council Bluffs	Pottawattamie	5	0.05	<0.005	<0.06	<0.05
Nishnabotna River at Hamburg	Fremont	5	0.06	0.014	<0.06	<0.05
Skunk River NE of Wever	Lee	5	0.05	0.018	<0.06	0.08
Upper Iowa River NE of Freeport	Winneshiek	3	<0.02	<0.005	<0.06	0.06
¹ sum PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260						
² Hg = mercury						

Table 4. Summary of 2016 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.

IFTMP Site Name	County	Species Code	# Fish	technical chlordane	dieldrin	sum PCBs ¹	Hg ²
Cedar Lake at Cedar Rapids	Linn	CCF	3	0.05	<0.005	<0.06	<0.05
Cedar River at Cedar Rapids	Linn	CCF	3	<0.02	<0.005	<0.06	0.12
Des Moines River at Cliffland Access - S of Ottumwa	Wapello	CCF	3	<0.02	<0.005	<0.06	0.07
Easter Lake on Yeader Creek SE of Des Moines	Polk	CCF	3	0.04	<0.005	<0.06	<0.05
Little River Lake W of Leon	Decatur	CCF	4	<0.02	<0.005	<0.06	0.09
Mississippi River at Keokuk	Lee	CAP	4	0.05	0.006	<0.06	0.22
Mississippi River at Keokuk	Lee	CAP	3	<0.02	<0.005	<0.06	0.15
¹ sum PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260							
² Hg = mercury							

Table 5. Summary of 2016 IFTMP turtle sampling results for contaminants of concern. All samples were composited left front shoulder tissue and results are in mg/kg (or ppm). See Appendix C for explanation of species codes.

IFTMP Site Name	County	Species Code	# Turtles	technical chlordane	dieldrin	sum PCBs ¹	Hg ²
Belva Deer Lake	Keokuk	SNAP	4	<0.02	<0.005	<0.06	0.06
¹ sum PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260							
² Hg = mercury							

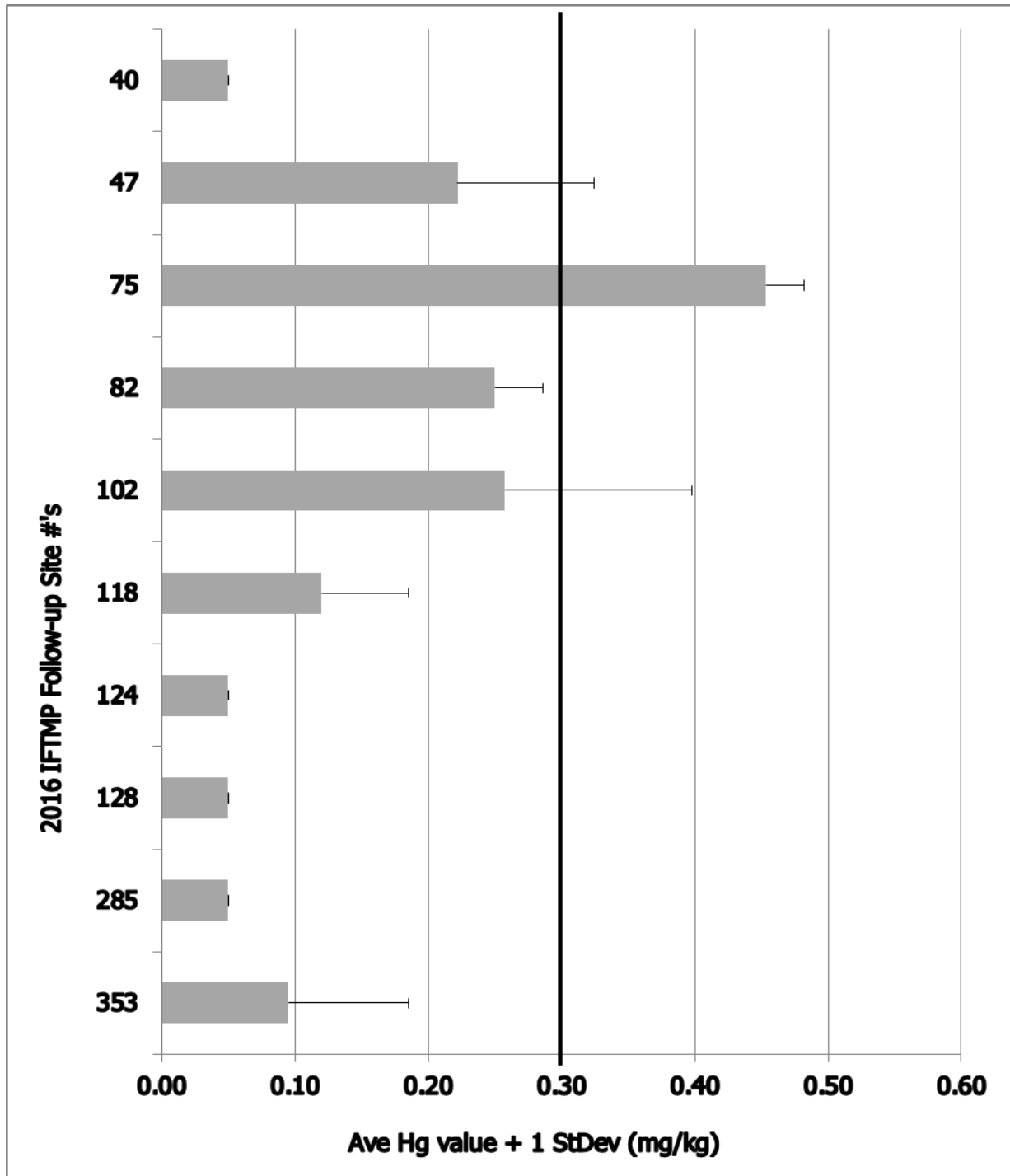


Figure 1. 2016 IFTMP mercury follow-up sample results for predatory fish. All samples were tissue plugs and results are in mg/kg (or ppm). All of the values above the 0.3 mg/kg evaluation criterion (Appendix A) have been, or will be, addressed by IDNR through the issuance or continuation of consumption advisories and/or with follow-up monitoring. See Appendix B for the full list of 2016 IFTMP sites.

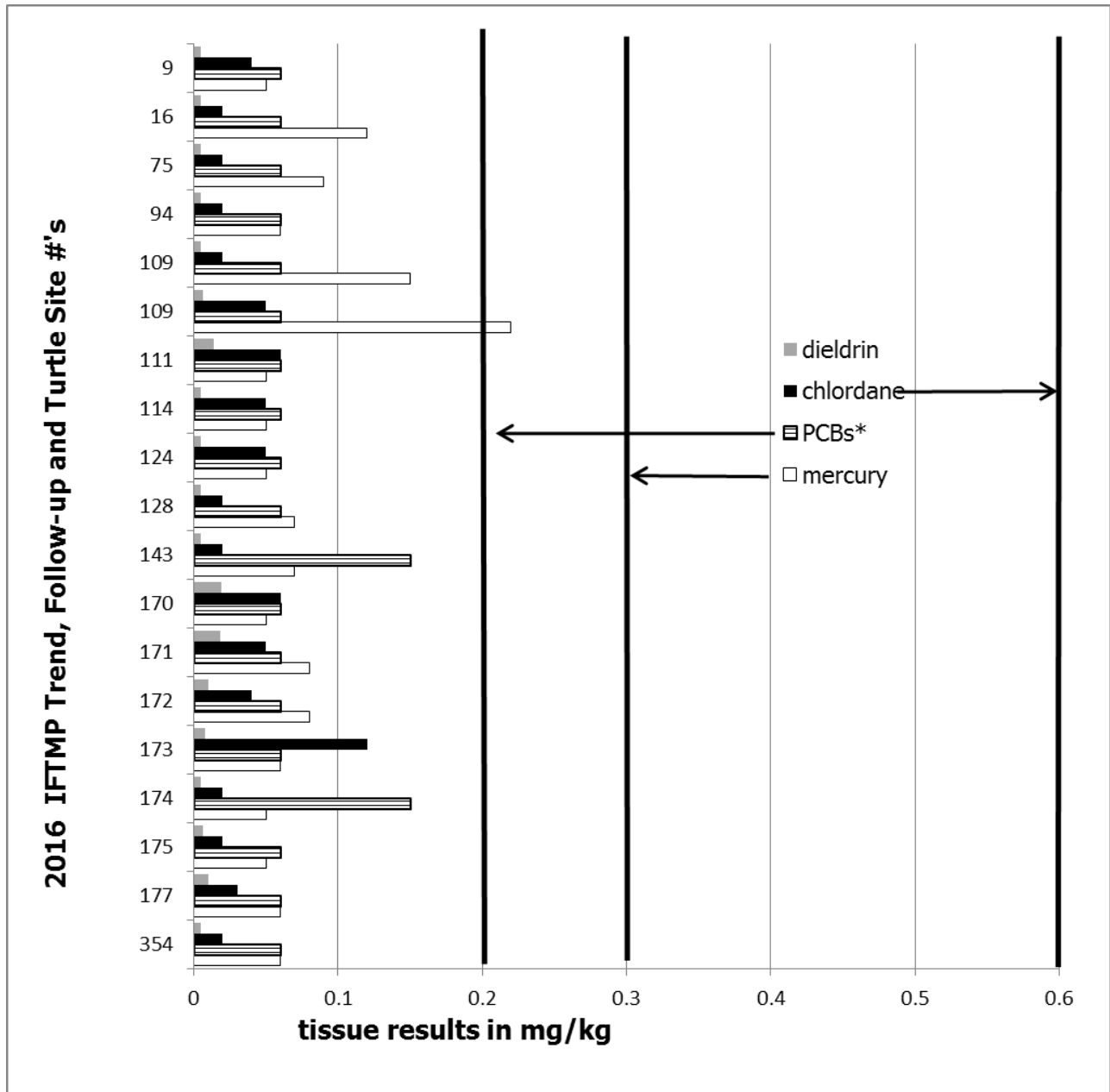


Figure 2. 2016 IFTMP status and follow-up sample results for bottom feeding fish and turtles. All samples were composites of whole fish, fillets or shoulder tissue and results are in mg/kg (or ppm). Solid black lines indicate the evaluation criteria for chlordane, mercury and PCBs (Appendix A). All samples above the 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 2016 IFTMP sites.
 *PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260.

References:

- IDNR. 2006. Fish tissue monitoring in Iowa. Water Fact Sheet 2006-5. Geological and Water Survey, Iowa Department of Natural Resources. 4 pgs.
(<https://www.ihr.uiowa.edu/igs/publications/uploads/wfs-2006-05.pdf>).
- IDNR. 2016. Sampling Procedures for the Iowa DNR Fish Tissue Monitoring Program (IFTMP). Water Quality Bureau, Environmental Services Division, Iowa Department of Natural Resources. 16 pgs.
- 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 of concern and their respective evaluation criteria for IFTMP 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	0.005		
7	DDE, 4,4'-	0.005		

Appendix B

Complete list of the 2016 IFTMP sampling sites.

Site #	IFTMP Site Name	County	Waterbody Type	NAD 83 UTM Easting	NAD 83 UTM Northing
354	Belva Deer Lake	Keokuk	Lake	572693	4581112
285	Brushy Creek Lake	Webster	Lake	418535	4694896
124	Cedar Lake at Cedar Rapids	Linn	Lake	610148	4649488
16	Cedar River at Cedar Rapids	Linn	River	620208	4642950
128	Des Moines River, Cliffland Access, Ottumwa	Wapello	River	555467	4534257
172	Des Moines River at Des Moines	Polk	River	453378	4602302
173	Des Moines River NNW of Keosauqua	Van Buren	River	586394	4512736
118	East Fork Des Moines River at Algona	Kossuth	River	399065	4770403
9	Easter Lake on Yeader Cr. SE of Des Moines	Polk	Lake	453743	4599265
75	Little River Lake W of Leon	Decatur	Lake	434458	4511106
177	Little Sioux River S of Washta	Cherokee	River	275661	4716430
175	Maquoketa River NE of Maquoketa	Jackson	River	696090	4661531
47	Mississippi River at Davenport	Scott	River	705520	4600202
109	Mississippi River at Keokuk	Lee	River	637907	4472940
174	Mississippi River at Lansing	Allamakee	River	644332	4803301
170	Mississippi River at Linwood	Scott	River	693597	4592635
102	Mississippi River downstream of Burlington	Des Moines	River	660460	4514715
143	Mississippi River downstream of Dubuque	Dubuque	River	693895	4704454
114	Missouri River at Council Bluffs	Pottawattamie	River	260105	4563658
111	Nishnabotna River at Hamburg	Fremont	River	276146	4497808
82	North Raccoon River downstream of Sac City	Sac	River	336414	4689468
40	North Raccoon River NW of Jefferson	Greene	River	370002	4661683
353	Plainfield Lake	Bremer	Lake	537437	4744541
171	Skunk River NE of Wever	Lee	River	650459	4510570
94	Upper Iowa River NE of Freeport	Winneshiek	River	605840	4797535

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	<i>Carpodes cyprinus</i>
RBT	Rainbow Trout	<i>Oncorhynchus mykiss</i>
RVC	River Carpsucker	<i>Carpodes 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 2016 IFTMP predator fish sampling results. See Appendix B for a list of 2016 IFTMP site numbers and Appendix C for a list of fish names and species codes.

Samp #	Site #	Site Name	County	Date	Species	Biopart	Sample Type	Length (cm)	Weight (g)	Mercury (mg/kg)
1833	40	North Raccoon River NW of Jefferson	Greene	8/26/16	walleye	plug	followup	34.2	326.0	<0.05
1834	40	North Raccoon River NW of Jefferson	Greene	8/26/16	walleye	plug	followup	30.5	238.0	<0.05
1835	40	North Raccoon River NW of Jefferson	Greene	8/26/16	walleye	plug	followup	32.3	282.0	<0.05
1836	40	North Raccoon River NW of Jefferson	Greene	8/26/16	walleye	plug	followup	32.5	281.0	<0.05
1868	47	Mississippi River at Davenport	Scott	10/17/16	white bass	plug	followup	36.3	600.0	0.24
1869	47	Mississippi River at Davenport	Scott	10/17/16	white bass	plug	followup	38.0	708.0	0.31
1870	47	Mississippi River at Davenport	Scott	10/17/16	white bass	plug	followup	35.0	518.0	<0.05
1871	47	Mississippi River at Davenport	Scott	10/17/16	white bass	plug	followup	40.0	836.0	0.22
1872	47	Mississippi River at Davenport	Scott	10/17/16	white bass	plug	followup	36.3	558.0	0.29
1861	75	Little River Lake W of Leon	Decatur	6/29/16	largemouth bass	plug	followup	38.6	698.0	0.47
1862	75	Little River Lake W of Leon	Decatur	6/29/16	largemouth bass	plug	followup	38.6	748.0	0.42
1863	75	Little River Lake W of Leon	Decatur	6/29/16	largemouth bass	plug	followup	41.4	1039.0	0.47
1837	82	North Raccoon River downstream of Sac City	Sac	8/25/16	walleye	plug	followup	47.7	1033.0	0.24
1838	82	North Raccoon River downstream of Sac City	Sac	8/25/16	walleye	plug	followup	54.1	1222.0	0.29
1839	82	North Raccoon River downstream of Sac City	Sac	8/25/16	walleye	plug	followup	59.1	2221.0	0.22
1848	102	Mississippi River downstream of Burlington	Des Moines	8/24/16	largemouth bass	plug	followup	41.9	1255.0	0.31
1849	102	Mississippi River downstream of Burlington	Des Moines	8/24/16	largemouth bass	plug	followup	44.5	1340.0	0.36
1850	102	Mississippi River downstream of Burlington	Des Moines	8/24/16	largemouth bass	plug	followup	42.1	1141.0	0.31
1851	102	Mississippi River downstream of Burlington	Des Moines	8/24/16	largemouth bass	plug	followup	33.8	590.0	<0.05
1845	118	East Fork Des Moines River at Algona	Kossuth	8/16/16	northern pike	plug	followup	67.3	1775.0	0.13
1846	118	East Fork Des Moines River at Algona	Kossuth	8/16/16	northern pike	plug	followup	74.2	2340.0	0.18
1847	118	East Fork Des Moines River at Algona	Kossuth	8/29/16	northern pike	plug	followup	73.7	2295.0	<0.05
1852	124	Cedar Lake at Cedar Rapids	Linn	8/17/16	largemouth bass	plug	followup	37.7	772.0	<0.05
1853	124	Cedar Lake at Cedar Rapids	Linn	8/17/16	largemouth bass	plug	followup	35.8	612.0	<0.05
1854	124	Cedar Lake at Cedar Rapids	Linn	8/17/16	largemouth bass	plug	followup	40.6	846.0	<0.05
1855	124	Cedar Lake at Cedar Rapids	Linn	8/17/16	largemouth bass	plug	followup	36.0	675.0	<0.05
1856	124	Cedar Lake at Cedar Rapids	Linn	8/17/16	largemouth bass	plug	followup	38.7	951.0	<0.05
1864	128	Des Moines River - S of Ottumwa	Wapello	8/4/16	white bass	plug	followup	26.6	255.0	<0.05
1865	128	Des Moines River - S of Ottumwa	Wapello	8/4/16	white bass	plug	followup	25.6	240.0	<0.05
1866	128	Des Moines River - S of Ottumwa	Wapello	8/4/16	white bass	plug	followup	25.4	220.0	<0.05
1867	128	Des Moines River - S of Ottumwa	Wapello	8/4/16	white bass	plug	followup	31.2	400.0	<0.05

Appendix D, continued

Samp #	Site #	Site Name	County	Date	Species	Biopart	Sample Type	Length (cm)	Weight (g)	Mercury (mg/kg)
1840	285	Brushy Creek Lake	Webster	8/30/16	largemouth bass	plug	followup	43.4	1245.0	<0.05
1841	285	Brushy Creek Lake	Webster	8/30/16	largemouth bass	plug	followup	38.4	851.0	<0.05
1842	285	Brushy Creek Lake	Webster	8/30/16	largemouth bass	plug	followup	40.4	1101.0	<0.05
1843	285	Brushy Creek Lake	Webster	8/30/16	largemouth bass	plug	followup	35.6	729.0	<0.05
1844	285	Brushy Creek Lake	Webster	8/30/16	largemouth bass	plug	followup	35.3	683.0	<0.05
1857	353	Plainfield Lake	Bremer	9/15/16	largemouth bass	plug	followup	31.2	468.0	<0.05
1858	353	Plainfield Lake	Bremer	9/15/16	largemouth bass	plug	followup	31.2	459.0	0.23
1859	353	Plainfield Lake	Bremer	9/15/16	largemouth bass	plug	followup	30.7	486.0	<0.05
1860	353	Plainfield Lake	Bremer	9/15/16	largemouth bass	plug	followup	31.8	515.0	<0.05

Appendix E

Complete listing of the 2016 IFTMP bottom feeding fish and turtle sampling results (in mg/kg). See Appendix B for a list of 2016 IFTMP site descriptions and Appendix C for a list of names and species codes. All samples were analyzed as a composite of whole fish, fillet or shoulder tissue from three to five specimens.

Samp #	Site #	Site Name	County	Date	Species	Biopart	Sample Type	# in Sample	Mean Length (cm)	Mean Weight (g)	Mercury (mg/kg)	sum PCBs (mg/kg)	DDE (mg/kg)	Dieldrin (mg/kg)	Chlordane, technical (mg/kg)
1873	9	Easter Lake SE of Des Moines	Polk	8/26/16	CCF	fillet	followup	3	47.5	970.0	<0.05	<0.06	0.024	<0.005	0.04
1876	16	Cedar River at Cedar Rapids	Linn	8/16/16	CCF	fillet	followup	3	42.6	659.0	0.12	<0.06		<0.005	<0.02
1878	75	Little River Lake W of Leon	Decatur	7/18/16	CCF	fillet	followup	4	59.8	2225.3	0.09	<0.06		<0.005	<0.02
1874	109	Mississippi River at Keokuk	Lee	9/7/16	CAP	fillet	followup	4	69.1	3534.0	0.22	<0.06	0.008	0.006	0.05
1875	109	Mississippi River at Keokuk	Lee	9/7/16	CAP	fillet	followup	3	46.9	1234.0	0.15	<0.06	<0.005	<0.005	<0.02
1877	124	Cedar Lake at Cedar Rapids	Linn	8/18/16	CCF	fillet	followup	3	41.6	588.0	<0.05	<0.06	0.023	<0.005	0.05
1879	128	Des Moines River - S of Ottumwa	Wapello	10/4/16	CCF	fillet	followup	3	38.5	425.0	0.07	<0.06	0.008	<0.005	<0.02
1880	354	Belva Deer Lake	Keokuk	9/23/16	SNAP	shoulder	followup	4	32.7	8009.0	0.06	<0.06		<0.005	<0.02
1828	94	Upper Iowa River NE of Freeport	Winneshiek	8/4/16	CAP	whole	trend	3	49.1	1589.0	0.06	<0.06	0.009	<0.005	<0.02
1825	111	Nishnabotna River at Hamburg	Fremont	8/19/16	CAP	whole	trend	5	53.0	2002.0	<0.05	<0.06	0.01	0.014	0.06
1823	114	Missouri River at Council Bluffs	Pottawattamie	8/18/16	CAP	whole	trend	5	46.7	1378.0	<0.05	<0.06	0.011	<0.005	0.05
1831	143	Mississippi River DS of Dubuque	Dubuque	9/9/16	CAP	whole	trend	5	52.1	2032.0	0.07	<0.15	0.007	<0.005	<0.02
1826	170	Mississippi River at Linwood	Scott	7/21/16	CAP	whole	trend	3	43.1	1304.0	<0.05	<0.06	0.014	0.019	0.06
1829	171	Skunk River NE of Wever	Lee	9/14/16	CAP	whole	trend	5	59.3	2781.0	0.08	<0.06	0.019	0.018	0.05
1824	172	Des Moines River at Des Moines	Polk	8/24/16	CAP	whole	trend	5	44.3	1110.0	0.08	<0.06	0.12	0.01	0.04
1830	173	Des Moines River NNW of Keosauqua	Van Buren	8/1/16	CAP	whole	trend	4	51.0	1682.5	0.06	<0.06	0.012	0.008	0.12
1832	174	Mississippi River at Lansing	Allamakee	10/20/16	CAP	whole	trend	4	42.5	1295.0	<0.05	<0.15		<0.005	<0.02
1827	175	Maquoketa River NE of Maquoketa	Jackson	9/16/16	CAP	whole	trend	5	49.6	1501.8	0.05	<0.06		0.006	<0.02
1822	177	Little Sioux River S of Washta	Cherokee	9/1/16	CAP	whole	trend	5	46.0	1290.0	0.06	<0.06	0.013	0.01	0.03

*sum PCBs = Aroclor 1248 + Aroclor 1254 + Aroclor 1260