

2021 IOWA FISH TISSUE MONITORING PROGRAM SUMMARY OF ANALYSES

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Introduction:

The state of Iowa conducts fish tissue monitoring to supplement other environmental monitoring programs and to protect the health of people consuming fish from waters within this state. Since 1980, the Iowa Department of Natural Resources (DNR) has conducted annual statewide collections of Iowa fish and sent tissue samples to accredited laboratories for the analyses of toxic contaminants. From 1983 to 2013, this monitoring effort was known as the Regional Ambient Fish Tissue Monitoring Program (RAFT). Beginning in 2014, after United States Environmental Protection Agency Region 7 changed their program support, the only statewide fish contaminant-monitoring program in Iowa was changed to the Iowa Fish Tissue Monitoring Program (IFTMP). Historically, the data generated from the IFTMP have enabled DNR to: 1) document temporal changes in contaminant levels; 2) identify Iowa lakes and rivers where high levels of contaminants in fish potentially threaten the health of fish-consuming Iowans and 3) assess the human health designated use (Class HH) for the Integrated Report.

2021 IFTMP Results:

In 2019, DNR began a three year project collecting a variety of fish species from different types of waterbodies across the state. The goal of the project is to establish statewide length-based consumption advisories for each fish species in Iowa. The advisories will apply to the sensitive population as defined by IDPH: pregnant and nursing women, women of childbearing age, and children younger than 12 years old.

From April through November 2021, DNR staff collected processed and prepared fish tissue samples in accordance with IFTMP sampling procedures as part of status monitoring (DNR, 2018). Tissue plug samples were taken from thawed specimens using a biopsy punch. Two fish tissue plugs from each fish were placed in a sample vial and were sent on ice to laboratories for analysis.

For the 2021 IFTMP, the DNR collected 499 samples from 33 waterbodies. The 2021 IFTMP monitoring results are summarized in Table 1 and in Appendix A. All of the individual sample results can be found in the DNR's online water quality database AQuIA - <https://programs.iowadnr.gov/aquia/Facilities/10529659/Detail>.

The vast majority of contaminant levels in the 2021 IFTMP samples were low (Table 1). Any contaminant results over, or near, their respective evaluation criteria (Appendix B) have been or will be addressed by the DNR Fisheries Bureau with the assistance of the DNR Water Quality Monitoring and Assessment section and the Iowa Department of Public Health. A current list of consumption advisories in Iowa can be found here: <https://www.iowadnr.gov/Environmental-Protection/Water-Quality/Water-Monitoring/Fish-Tissue>

Table 1. Summary of 2021 Iowa Fish Tissue Monitoring Program Results

Location	Species	Samples Taken	Mercury			Length (cm)			Weight (g)		
			Avg	Min	Max	Avg	Min	Max	Avg	Min	Max
Big Creek Lake	Muskie	3	0.164	0.101	0.238	90.7	82.8	104.1	6489	4300	10442
Big Spirit Lake	Muskie	3	0.370	0.159	0.517	95.3	76.2	112.3	6218	3600	9402
Brushy Creek Lake	Muskie	1	0.368	0.368	0.368	93.2	93.2	93.2	2633	2633	2633
Cedar River 1	Channel Catfish	5	0.165	0.083	0.231	54.0	46.2	59.4	1564	924	2095
	Common Carp	10	0.109	0.065	0.179	53.8	47.2	60.2	2256	1557	2990
	Walleye	6	0.366	0.141	1.080	45.5	39.4	58.2	918	473	1892
Cedar River 2	Smallmouth Bass	20	0.156	0.069	0.328	27.1	18.8	41.0	316	84	1020
Cedar River 3	Smallmouth Bass	20	0.218	0.088	0.460	31.5	22.1	40.9	446	170	936
	Walleye	2	0.194	0.182	0.206	44.8	43.2	46.4	709	709	709
Clear Lake	Muskie	3	0.240	0.175	0.299	86.6	76.8	95.0	4430	2738	6111
	White Bass	10	0.213	0.095	0.477	35.7	30.2	41.1	546	336	763
	Yellow Bass	20	0.068	0.020	0.174	25.0	17.8	28.7	257	77	368
Coralville	Walleye	2	0.071	0.069	0.072	37.3	36.0	38.5	584	546	622
Des Moines River 1	White Bass	10	0.109	0.086	0.197	33.1	30.4	39.3	497	340	818
Des Moines River 2	Flathead Catfish	10	0.153	0.104	0.265	47.1	39.6	58.4	1278	699	2243
	Shorthead Redhorse	10	0.085	0.024	0.210	41.8	29.2	48.8	905	309	1176
East Nishnabotna River 1	Common Carp	10	0.088	0.070	0.120	55.4	41.7	69.4	2485	1044	4848
East Nishnabotna River 2	Common Carp	10	0.151	0.071	0.237	60.5	39.4	66.3	3292	825	4510
East Okoboji Lake	Black Crappie	3	0.258	0.203	0.364	31.1	30.7	31.5	649	549	749
	Muskie	7	0.596	0.263	1.320	94.9	87.6	107.2	5807	4399	7200
	Northern Pike	1	0.297	0.297	0.297	80.9	80.9	80.9	2951	2951	2951
	Yellow Bass	9	0.106	0.055	0.218	23.0	21.3	27.3	334	200	454
Iowa River 1	Channel Catfish	5	0.107	0.089	0.126	45.3	42.1	51.0	827	622	1346
	Smallmouth Bass	9	0.124	0.075	0.385	26.4	20.0	45.0	345	96	1464
Iowa River 2	Smallmouth Bass	5	0.131	0.123	0.148	25.5	24.0	27.0	254	218	304
Lake Macbride	Hybrid Striped Bass	6	0.090	0.078	0.131	48.3	45.5	54.1	1445	1108	1966
	White Bass	10	0.103	0.046	0.250	30.6	24.0	41.4	377	162	894
Lake Manawa	Hybrid Striped Bass	6	0.020	0.015	0.027	47.0	42.8	51.8	1392	1030	1907
Little Sioux River 1	Channel Catfish	10	0.236	0.100	0.346	52.1	46.5	58.1	1158	746	1594
Little Sioux River 2	Channel Catfish	10	0.143	0.092	0.196	43.4	36.2	51.4	704	386	1307

Table 1. Summary of 2021 Iowa Fish Tissue Monitoring Program Results – continued.

Location	Species	Samples Taken	Mercury			Length (cm)			Weight (g)		
			Avg	Min	Max	Avg	Min	Max	Avg	Min	Max
Maquoketa River 1	Northern Pike	1	0.201	0.201	0.201	61.7	61.7	61.7	1924	1924	1924
	Smallmouth Bass	21	0.156	0.049	0.323	29.4	19.6	40.1	383	101	965
	White Bass	10	0.286	0.088	0.511	35.9	25.9	44.2	603	208	1133
Maquoketa River 2	Northern Pike	2	0.369	0.351	0.386	66.8	62.2	71.3	1648	1169	2126
	Smallmouth Bass	19	0.162	0.056	0.355	28.6	18.8	40.6	292	75	768
Mississippi River (Pool13)	Freshwater Drum	40	0.185	0.088	0.381	47.7	35.0	60.7	1734	504	4112
	Paddlefish	10	0.054	0.016	0.119	69.6	51.7	100.2			
	White Bass	11	0.157	0.084	0.240	36.7	33.4	38.4	666	426	782
Rathbun Reservoir	Flathead Catfish	14	0.357	0.127	0.638	59.6	42.3	67.0	2764	760	4226
Red Rock Reservoir	Flathead Catfish	13	0.089	0.045	0.180	53.7	39.5	67.1	2125	632	4136
Saylorville Lake	Walleye	1	0.268	0.268	0.268	48.1	48.1	48.1	1476	1476	1476
Storm Lake	Northern Pike	2	0.126	0.122	0.130	71.1	65.0	77.2	2697	1739	3656
UMR 11	Freshwater Drum	40	0.338	0.067	0.793	45.5	33.2	64.3	1410	481	3722
UMR 16	Flathead Catfish	7	0.142	0.074	0.221	52.8	43.0	61.7	1840	900	3292
	Northern Pike	7	0.118	0.070	0.193	59.3	48.5	69.8	1359	687	2031
Upper Iowa River 1	Northern Pike	3	0.250	0.120	0.475	68.2	56.4	75.4	2391	1208	3005
Upper Iowa River 2	Northern Pike	1	0.162	0.162	0.162	52.3	52.3	52.3	1162	1162	1162
	Shorthead Redhorse	10	0.217	0.065	0.425	41.7	34.5	46.7	845	445	1249
	Smallmouth Bass	6	0.327	0.148	0.563	32.2	23.1	43.2	503	163	1071
Wapsipinicon River 1	Smallmouth Bass	14	0.116	0.042	0.576	26.3	20.2	43.1	298	114	1152
	Walleye	2	0.228	0.196	0.260	46.8	39.5	54.0	991	554	1427
Wapsipinicon River 2	Smallmouth Bass	20	0.113	0.049	0.249	25.6	18.8	37.3	272	91	746
West Okoboji Lake	Black Crappie	4	0.086	0.072	0.110	24.2	23.6	24.7	225	220	226
	Yellow Bass	1	0.237	0.237	0.237	28.6	28.6	28.6	400	400	400

References:

- DNR. 2018. Sampling Procedures for the Iowa DNR Fish Tissue Monitoring Program (IFTMP). Water Quality Bureau, Environmental Services Division, Iowa Department of Natural Resources. 3 pp.
- IDPH. 2007. Fish consumption advisory protocol in Iowa. Iowa Department of Public Health. 8 pp.

Appendix A

Complete list of the 2021 IFTMP sampling sites.

Site #	IFTMP Site Name	County	Mississippi River Pool #	Waterbody Type
52	Big Creek Lake	Polk		Reservoir
155	Big Spirit Lake	Dickinson		Lake
285	Brushy Creek Lake	Webster		Lake
220	Cedar River 1	Black Hawk		River
106	Cedar River 2	Linn		River
372	Cedar River 3	Black Hawk		River
122	Clear Lake	Cerro Gordo		Lake
290	Coralville Reservoir	Johnson		Reservoir
376	Des Moines River 1	Van Buren		River
386	Des Moines River 2	Van Buren		River
385	East Nishnabotna River 1	Montgomery		River
83	East Nishnabotna River 2	Fremont		River
84	East Okoboji Lake	Dickinson		Lake
373	Iowa River 1	Johnson		River
374	Iowa River 2	Marshall		River
81	Lake Macbride	Johnson		Lake
66	Lake Manawa	Pottawattamie		Lake
7	Little Sioux River 1	Buena Vista		River
387	Little Sioux River 2	Harrison		River
360	Maquoketa River 1	Jackson		River
361	Maquoketa River 2	Delaware		River
384	Mississippi River Pool 11	Clayton	11	River
363	Mississippi River Pool 13	Jackson	13	River
362	Mississippi River Pool 16	Scott	16	River
53	Rathbun Reservoir	Appanoose		Reservoir
324	Red Rock Reservoir	Marion		Reservoir
328	Saylorville Reservoir	Polk		Reservoir
130	Storm Lake	Buena Vista		Lake
230	Upper Iowa River 1	Howard		River
366	Upper Iowa River 2	Allamakee		River
383	Wapsipinicon River 1	Scott		River
382	Wapsipinicon River 2	Buchanan		River
90	West Okoboji Lake	Dickinson		Lake

Appendix B

Mercury advisory levels from the 2007 IDPH Fish consumption advisory protocol document.

Contaminant	DNR/IDPH advisory trigger level mg/kg (ppm)	DNR/IDPH advisory meal allowance
Mercury	0 to 0.3	unrestricted
	>0.3 to <1.0	one meal per week
	≥ 1.0	do not eat