

Appendix A

Supplemental Information on the Use of Fish Tissue Data

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A.1 Calculation of Fish Concentrations from Water Quality Standard Inputs

Lake Erie Drainage Basin

	PCB	Hexachlorobenzene	Mercury	Lead
WQS	0.026 ng/l	0.45 ng/l	3.1 ng/l	190 ug/l
The following inputs on which the WQS are based are used to calculate fish concentrations*				
Reference dose (RfD) (non-cancer effect)	--	--	1.0 E ⁻⁴ mg/kg/d	4.3 E ⁻⁴ mg/kg/d
Cancer potency (q*1)	2.0 (mg/kg/d) ⁻¹	1.6 (mg/kg/d) ⁻¹	--	--
Cancer Risk Level	1 E ⁻⁵	1 E ⁻⁵	--	--
Body Weight	70 kg	70 kg	65 kg	70 kg
Fish Consumption	0.015 kg/d	0.015 kg/d	0.015 kg/d	0.015 kg/d
Relative Source Contribution (RSC)	--	--	0.8	--

*Sources. PCB, Hexachlorobenzene and Mercury: U.S. EPA. 1995. Great Lakes Water Quality Initiative Criteria Documents for the Protection of Human Health. EPA-820-B-95-006. March 1995.
Lead: Michigan Department of Environmental Quality. Terrestrial toxicity and aesthetics values worksheet for lead. 7/10/97.

For carcinogens, Fish Concentration (mg/kg) =
 $[\text{Cancer Risk Level} / q^*1 \text{ ((mg/kg/d)}^{-1})] \times \text{Body Weight (kg)} / \text{Fish Consumption (kg/d)}$

For noncarcinogens, Fish Concentration (mg/kg) =
 $\text{RfD (mg/kg/d)} \times \text{Body Weight (kg)} \times \text{RSC} / \text{Fish Consumption (kg/d)}$

Lake Erie Drainage Basin PCB Fish Concentration

$$[1 \text{ E}^{-5} / 2.0 \text{ (mg/kg/d)}^{-1}] \times 70 \text{ kg} / 0.015 \text{ kg/d} = 0.023 \text{ mg/kg} = 23 \text{ ug/kg}$$

Lake Erie Drainage Basin Hexachlorobenzene Fish Concentration

$$[1 \text{ E}^{-5} / 1.6 \text{ (mg/kg/d)}^{-1}] \times 70 \text{ kg} / 0.015 \text{ kg/d} = 0.029 \text{ mg/kg} = 29 \text{ ug/kg}$$

Lake Erie Drainage Basin Mercury Fish Concentration

$$1.0 \text{ E}^{-4} \text{ mg/kg/d} \times 65 \text{ kg} \times 0.8 / 0.015 \text{ kg/d} = 0.35 \text{ mg/kg} = 350 \text{ ug/kg}$$

Lake Erie Drainage Basin Lead Fish Concentration

$$4.3 \text{ E}^{-4} \text{ mg/kg/d} \times 70 \text{ kg} / 0.015 \text{ kg/d} = 2.0 \text{ mg/kg} = 2,000 \text{ ug/kg}$$

Ohio River Drainage Basin

	PCB	Hexachlorobenzene	Mercury	Lead
WQS	1.7 ng/l	7.7 ng/l	12 ng/l	--
The following inputs on which the WQS are based are used to calculate fish concentrations*				
Reference dose (RfD) (non-cancer effect)	--	--	--	--
Cancer potency (q*1)	2.0 (mg/kg/d) ⁻¹	1.6 (mg/kg/d) ⁻¹	--	--
Cancer Risk Level	1 x 10 ⁻⁵	1 x 10 ⁻⁵	--	--
Body Weight	70 kg	70 kg	--	--
Fish Consumption	0.0065 kg/d	0.0065 kg/d	--	--
Relative Source Contribution (RSC)	--	--	--	--

*Source. PCB and Hexachlorobenzene: U.S. EPA. 1999. National Recommended Water Quality Criteria - Correction. EPA 822-Z-99-001. April 1999.

For carcinogens, Fish Concentration (mg/kg) =

$$[\text{Cancer Risk Level} / q^*1 \text{ ((mg/kg/d)}^{-1})] \times \text{Body Weight (kg)} / \text{Fish Consumption (kg/d)}$$

The Ohio River Drainage Basin water quality standard for mercury was calculated differently than other standards. Rather than being based on an RfD, it is based on the FDA Action Level in fish of 1.0 mg/kg.

Ohio River Drainage Basin PCB Fish Concentration

$$[1 \text{ E}^{-5} / 2.0 \text{ (mg/kg/d)}^{-1}] \times 70 \text{ kg} / 0.0065 \text{ kg/d} = 0.054 \text{ mg/kg} = 54 \text{ ug/kg}$$

Ohio River Drainage Basin Hexachlorobenzene Fish Concentration

$$[1 \text{ E}^{-5} / 1.6 \text{ (mg/kg/d)}^{-1}] \times 70 \text{ kg} / 0.0065 \text{ kg/d} = 0.067 \text{ mg/kg} = 67 \text{ ug/kg}$$

Ohio River Drainage Basin Mercury Fish Concentration

$$1.0 \text{ mg/kg (FDA Action Level)} = 1,000 \text{ ug/kg}$$

A.2 Detailed Methodology for Use of Fish Tissue Contaminant Data

The following steps were utilized to determine the impairment status for waters based on fish tissue contaminant data:

Step 1: Determine available data

All data in the fish tissue database were evaluated for the 2006 Integrated Report. The most recent 10 years of data collections, 1995-2004, were used for making category 1 and category 5 determinations. In cases where multiple years of data were available in that 10 year window, all data were weighted equally.

Ohio's Credible Data Law states that all data greater than five years in age will be considered historical, and that it can be used as long as justification is provided as to why its use is necessary. In the case of fish tissue, the use of data older than five but ten or fewer years old is necessary because not enough fish tissue samples are gathered from enough locations each year to conduct a thorough assessment of contaminant levels in fish tissue across the state. Frequently, multiple sampling years are needed to make a determination about issuing or rescinding an advisory. Owing to limited staff time and budget resources, it sometimes takes over five years to revisit a location and collect more fish tissue samples. A more complete picture of contaminants in fish tissue is presented when data reaching back 10 years is included.

No data newer than 1994 were available for some sampling locations. In those cases, data were classified as category 3C (see sections below for a complete description of each category and subcategory).

Step 2: Determine fish tissue contaminant concentrations

For both streams and inland lakes, contaminant levels for all fish of the same species were averaged. One year of data was considered adequate to categorize the fish as impaired or unimpaired.

Step 3: Determine adequate species data

For PCBs and other lipophilic compounds, to list the water as category 1, at least three samples of a "bottom feeder" species such as catfish or carp must have contaminant levels below the threshold that would trigger an impairment, and no species could have average contaminant levels above the threshold that would indicate an impairment. If three samples of a "bottom feeder" species were not available, the water body was categorized as having insufficient data.

In other words, if the average concentration of three of any species exceeded the impairment threshold, the water body was listed as impaired. However, if data for three bottom dwellers was not available, and none of other species had an average PCB concentration above the impairment threshold, the water body was considered to have insufficient data and not unimpaired.

For mercury and other non-lipophilic compounds, to list the water as category 1, at least three samples of a predator species such as a largemouth or smallmouth bass or a walleye must have contaminant levels below the threshold that would trigger an impairment, and no species

could have average contaminant levels above the threshold that would indicate an impairment. If three samples of a predator species were not available, the water body was categorized as having insufficient data.

Step 4: Determine appropriate reach (streams only)

For rivers, most of the data do not reach from the headwaters to the mouth. Therefore, it may be necessary to determine the extent of the reach that is being categorized.

The number of sampling locations needed to determine a reach, or to determine a reporting category, will vary depending on the size and drainage area of the water body. In other cases, the reach will be limited by the sampling locations. In these cases, it frequently makes sense to extend the reach to the nearest physical barrier, such as a dam, or significant confluence. This determination will be made by Ohio EPA field staff.

Step 5: Categorize Water Body

Category 5 - Impaired

Any water body with any species with three or more samples having an average fish tissue concentration of PCBs, mercury, lead (Lake Erie Basin only) or hexachlorobenzene above the WQS-based fish tissue concentration was placed into category 5.

Category 1 – Not Significantly Impaired

To be categorized as Category 1, not significantly impaired, a water body must meet the criteria given above. In short, there must be at least three samples of a relevant species from a water body, taken since 1995, and the average concentration of a contaminant must be below the threshold that would trigger an impairment.

Category 3 – Insufficient Data

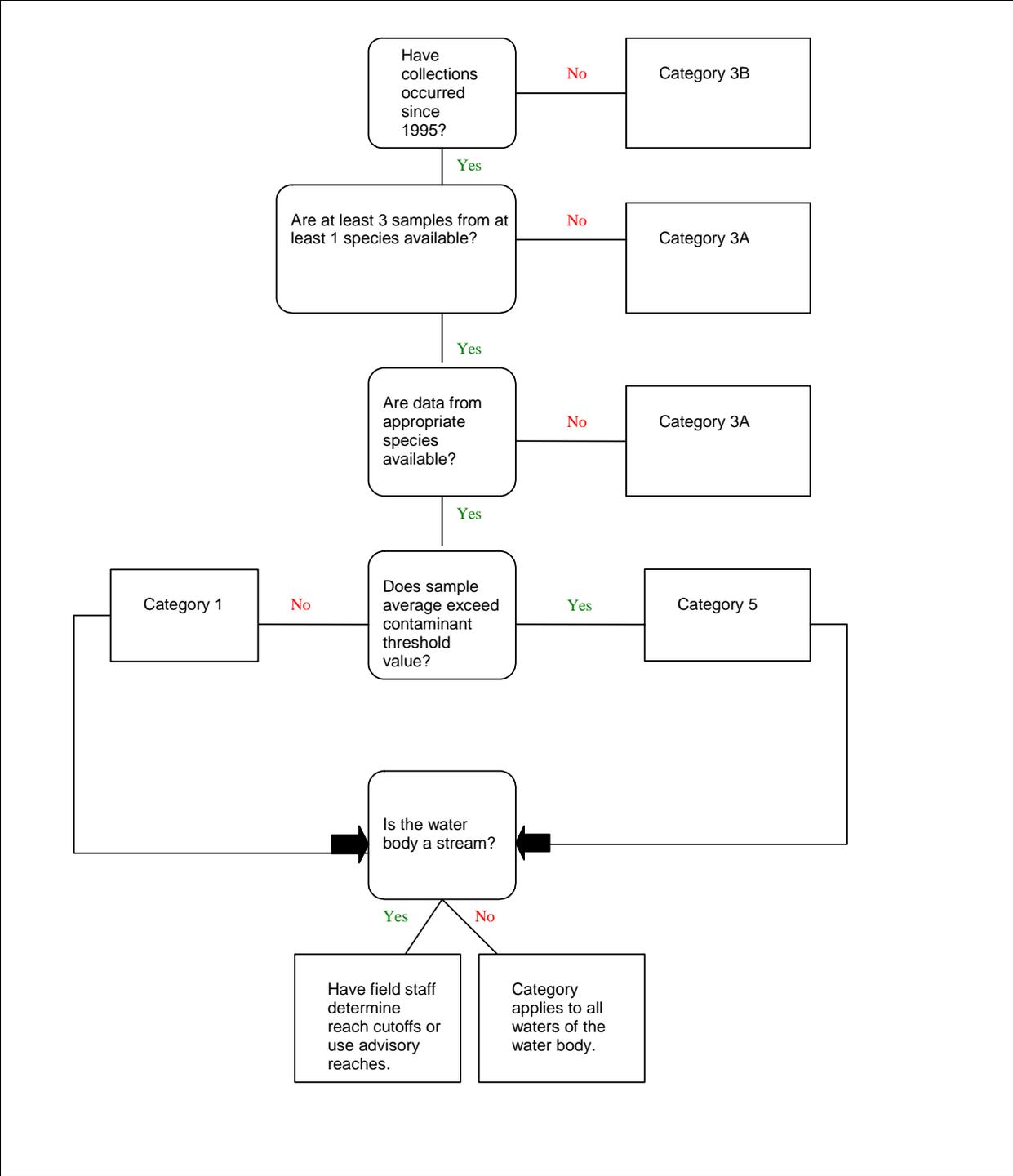
In cases where some of the samples had concentrations in excess of the threshold, but the average concentration is below the threshold, best professional judgment was used to decide if the high concentration(s) was anomalous or if the water body should be categorized as Category 3, insufficient data.

Category 3 has three subcategories:

- 3A Any water body where current data are available but those data are insufficient to categorize the water body as category 1 or 5
- 3B Any water body where data are now more than 10 years old but the water was historically 303(d) listed
- 3C Any water body where data were more than 10 years old

Water bodies in Category 3B are flagged as having historical data but remain on the 303(d) list. On the summary tables for each assessment unit (Appendix E), these are denoted as “Yes (5-Historical Data).”

This procedure is shown in the accompanying figure.



A.3 What's the Difference Between the Fish Consumption Advisory Decision and the Impairment Decision?

Some question may arise as to how the methodology for determining impairment status for the 2006 Integrated Report (2006 IR) for fish tissue relates to the fish advisories issued by the State of Ohio. In the 2006 Integrated Report, the methodology for considering fish tissue data changed from the methodology used in 2004. Rather than building on fish consumption advisory decisions, the new methodology draws directly from the fish tissue contaminant database. This change is possible because of better accessibility to the raw data.

In short, the basis for determining impairment for the IR for fish tissue is similar but unrelated to the basis for determining advisories. The water quality standards calculations assume a certain amount of fish consumption and ensure that level of consumption is safe. The advisory calculations determine what level of fish consumption is safe. Therefore, both are protective of human health. However, advisories and integrated report impairment status are not directly related.

Advisory thresholds are given as one meal per week, one meal per month, one meal every other month, and do not eat. Each threshold is associated with a particular contaminant concentration that is based on consuming an 8 ounce meal. For both PCBs and mercury, those thresholds are 50 parts per billion (ppb) for one meal per week, 220 ppb for one meal per month, 1000 ppb for one meal every other month, and 2000 ppb for do not eat.

The thresholds used for determining IR categories are based on water quality standards for human health. The water quality standards assume that people are eating a certain quantity of different types of fish over time. The Lake Erie basin WQS calculations for mercury and PCBs assume that people are eating 15 grams of fish per day. The Ohio River basin calculations for PCBs and mercury assume that people are eating 6.5 grams of fish per day.

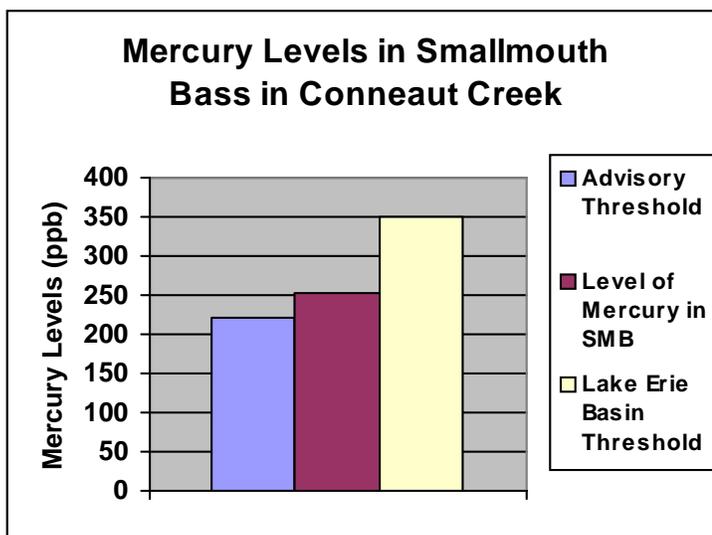
Advisory thresholds are prescriptive, indicating to people how much fish is safe to eat given a certain level of fish contamination. Water quality standard-based thresholds are descriptive, indicating how much contamination is acceptable in fish given that people are eating a certain amount of certain types of fish. In other words, the advisories tell people how much fish they can safely eat, and the water quality standards assume how much fish people are eating and use that information to calculate a "safe" level of contamination in fish.

U.S. EPA, in its guidance on developing the IR, indicates that water quality standards are to be used as the basis for determining impairment categories for fish tissue. Because the assumptions used to calculate the advisories are different than the assumptions used to calculate the water quality standards, this results in cases where some water bodies have advisories against fish consumption but are not listed as impaired, and some water bodies are listed as impaired but no fish advisory is in place. This situation is demonstrated in the following table:

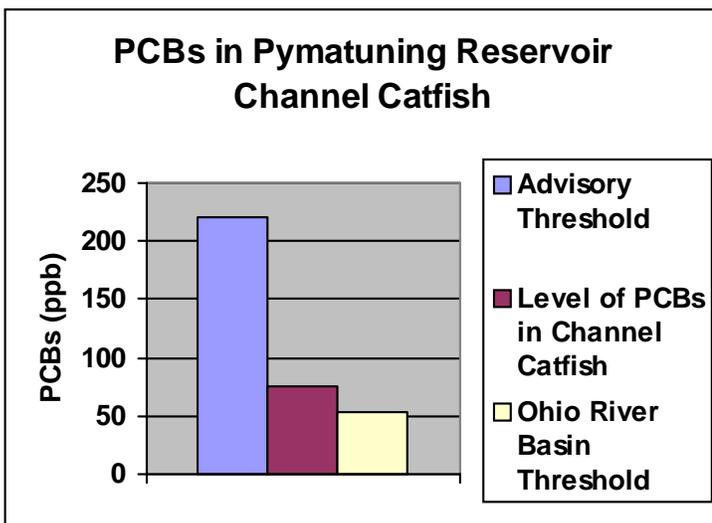
Parameter	Lake Erie Basin	Ohio River Basin	1 meal per week advisory	1 meal per month advisory
Fish Consumed	15 grams/day	6.5 grams/day	32.6 grams/day	7.6 grams/day
Maximum Allowable Fish Concentration				
- PCB Threshold	23 ppb	54 ppb	50 ppb	220 ppb
- Mercury Threshold	350 ppb	1000 ppb	50 ppb	220 ppb

The reason the thresholds are different between the two basins is that the assumed fish consumption levels are different. The reason the water quality standard thresholds are different from the advisory thresholds is both because the fish consumption levels are different, and because for PCBs, a cancer slope factor is used to calculate the water quality standard criteria, which is more strict than the health protection value used to calculate the advisory threshold.

Data for smallmouth bass in Conneaut Creek provide an example where there is an advisory but the water body is not impaired.



Channel catfish in Pymatuning Reservoir show a case where there is no advisory but the water is listed as impaired.



A.4 Waters with Current Fish Tissue Data Where Inadequate Samples Exist to Determine Level of Impairment

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Alum Creek Acorn Farms Nursery to Columbus – Refugee Road	05060001 160
Amicks Reservoir	05060001 090
Anderson Fork Old Winchester Road	05090202 040
Archbold Reservoir #2	04100006 040
Atwood Lake	05040001 080
Barnesville Reservoir #3	05030106 110
Beaver Creek Celina – Meyer Road to Burrville Road	05120101 030
Beaver Creek Reservoir	04100011 110
Belmont Lake	05030106 100
Big Cobb Pond	05030103 040
Big Creek State Route 86	04110004 060
Big Walnut Creek Marengo – Chambers Road to U.S. Route 23	05060001 130 05060001 140 05060001 160
Black Fork Mohican River Charles Mill Dam to Township Road 541	05040002 010
Blue Creek Whitehouse – Finzel Road	04100009 080
Blue Creek State Route 613 at Township Road 137	04100007 100
Broken Sword Creek Wyandot-Crawford County Line to Nevada – County Road 62	04100011 030
Buck Creek Old Reid Park to Snyder Park at RR bridge	05080001 170
Bucyrus Reservoir #2	04100011 020

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Buffalo Fork North Iowa Road to bridge at State Route 146	05040005 020
C.J. Brown Lake	05080001 170
Caesar Creek Spring Valley Paintersville Road to O'Neill Road	05090202 050
Captina Creek Alledonia – State Route 148 to Ohio River	05030106 110
Chagrin River Chagrin Falls Wastewater Treatment Plant to Lake Erie	04110003 020 04110003 030
Charles Mill Reservoir	05040002 010
Clark Lake	05080001 170
Clear Creek Downstream Metroparks Clear Creek Office to mouth	05030204 040
Clear Fork Mohican River Clear Fork Reservoir to State Route 3	05040002 030 05040002 040
Clear Fork Reservoir	05040002 030
Conneaut Creek Center Road to Lake Erie	04120101 010
Conotton Creek State Route 164 to Somervale Road	05040001 070 05040001 080
Cowan Creek Ireland Road to Clarksville Road	05090202 070
Crooked Creek Cambridge – Pigeon Gap Road	05040005 050
Daugherty Lake / Fostoria Reservoir #1	04100010 040
Deer Creek Green Lane to State Route 104	05060002 030 05060002 040
Deer Creek Reservoir	05030103 020
Delta Reservoir #1	04100009 040
Dillon Reservoir	05040006 mainstem
Dow Lake	05030204 100

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Eagle Creek State Route 763 to Ohio River	05090201 070
Eagle Creek Township Road 25 to State Route 15 at U.S. Route 68	04100008 030
Eagle Creek Garrettsville – Silica Sand Road to State Route 534	05030103 040
East Branch Huron River State Route 162 to Lovers Lane Road	04100012 030
East Branch Reservoir	04110002 010
East Branch Rocky River Hinckley Reservation to Spafford Road	04110001 070
East Branch St. Joseph River County Road S to State Route 15	04100003 010
East Fork Duck Creek Harrietsville	05030201 110
East Fork Eagle Creek Brier Ridge Road	05090201 070
Federal Creek Armada – State Route 329 to State Route 144	05030204 090
Ferguson Reservoir	04100007 030
Fields Brook Ashtabula at Ashtabula River	04110003 050
Findlay Reservoir #1	04100008 020
Findley Lake	04110001 020
Flatrock Creek Paulding – U.S. Route 127 to State Route 637	04100007 120
Forked Run Lake	05030202 050
Fostoria Reservoir #3	04100010 040
Fox Lake	05030204 080
French Creek At Black River	04110001 050

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Green Creek Dewey Road	04100011 110
Greenfield Lake	05030204 010
Greenville Creek Spring Grove Road to Greenville Falls	05080001 120
Griggs Reservoir	05060001 mainstem
Hargus Lake	05060002 010
Hellbranch Run Norton Road to Lambert Road	05060001 220
Holes Creek Dayton – McEwen Road	05080002 010
Honey Creek Attica – State Route 4 to State Route 231	04100011 080
Honey Creek Rudy Road	05080001 200
Hoover Reservoir	05060001 130
Hurford Run Canton – Dueber Road	05040001 050
Huron River Lover's Lane to Lake Erie	04100012 030
Indian Guyan Creek State Route 218 to Scottown Covered Bridge	05090101 070
Jackson Lake	05090101 080
Jefferson Lake	05030101 190
Jelloway Creek Howard Danville Road to Kokosing River	05040003 040
Jonathan Creek Mount Perry – State Route 204 to East Fultonham – Carson Road	05040004 040
Joseph Lake	05030204 020
Kelly's Pond	05030103 040
Killdeer Pond #30	04100011 040

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Killdeer Reservoir	04100011 040
Kings Creek Upper Valley Pike	05080001 150
Kiser Lake	05080001 070
Knox Lake	05040003 020
Kokosing Lake	05040003 020
Kokosing River Lucerne – Lucerne Road to Riley Chapel Road	05040003 010 05040003 030 05040003 040
Lake Alma	05090101 050
Lake Ann	04100003 020
Lake Girard	05030103 070
Lake Hamilton	05030103 080
Lake Hope	05090101 020
Lake LaComte	04100010 040
Lake Lamberjack	04100010 040
Lake Loramie	05080001 050
Lake Mel	04100003 020
Lake Rupert	05090101 050
Lake Snowden	05030204 080
Lake White	05060002 110
Lake Wood Duck	04100003 020
Leatherwood Creek State Route 285	05040005 030
Licking River Newark Wastewater Treatment Plant to Dillon Dam	05040006 mainstem
Lima Lake	04100007 030

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Little Auglaize River Middlepoint Road to Melrose – State Route 613	04100007 070
Little Cobb Pond	05030103 040
Little Cuyahoga River Akron – Universal Materials Bridge	04110002 030
Little Miami River Upstream Simpson Creek to downstream State Route 48, upstream Muddy Creek	05090202 mainstem
Little Muskingum River Knowlton Bridge to Marietta	05030201 090 05030201 100
Little Raccoon Creek Wellston – Wellston Park Road to Koontz-Sailor Road	05090101 050
Little Scioto River Marion – Kenton-Galion Road to Marion Wastewater Treatment Plant	05060001 040
Little Scioto River Johnson Road Covered Bridge to Wheelers Mill Road	05090103 040
Little Stillwater River Tappan Lake Dam Spillway	05040001 160
Little Wakatomika Creek Cass Irish Ridge Road to Cass Ridge Road	05040004 030
Lost Creek State Route 202	05080001 080
Lost Creek Reservoir	04100007 030
Lytle Creek Clarksville Road	05090202 070
Madison Lake	05060002 020
Massies Creek Charlton-Mill Road to Wilberforce – Stevenson Road	05090202 020
McComb Reservoir #1	04100010 030
McComb Reservoir #2	04100010 030
McMahon Creek Along State Route 149	05030106 100

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Meadowbrook Lake	04110002 040
Meander Creek Palmyra Road to State Route 46	05030103 070
Meander Creek Reservoir	05030103 070
Meigs Creek County Road 5 to County Road 11	05040004 080
Metzger Reservoir	04100007 030
Middle Branch Portage River Bays Road to Caskie Road	04100010 030 04100010 040
Middle Branch Shade River Township Road 227 Covered Bridge	05030202 030
Middle Fork Salt Creek West Junction Bridge	05060002 080
Mill Creek Marysville – Cotton Slash Road to Bellepoint Road	05060001 070
Mogadore Reservoir	04110002 030
Mosier Lake	04100010 040
Mosquito Creek Dam Road to East Federal Street	05030103 060
Mosquito Creek Reservoir	05030103 060
Moxahala Creek Darlington Road	05040004 050
Muchinippi Creek County Road 54	05080001 020
Muddy Creek U.S. Route 6 to County Line Landfill	04100011 010
Muddy Fork Mohican River State Route 302 to Old Lincoln Way	05040002 060
Muskellunge Creek Fangboner Road	04100011 120
Nettle Lake	04100003 030

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
New Lexington Reservoir	05030204 020
New London Reservoir	04100012 050
North Baltimore Reservoir	04100010 030
North Branch Kokosing River Upper Fredericktown Road to Kokosing River	05040003 020
North Fork Licking River State Route 657 to Newark – Fleek Avenue	05040006 010 05040006 020
North Fork Little Beaver Creek Negley – Stateline Creek to Fredericktown Road	05030101 090
North Fork Paint Creek Musselman Hill Road	05060003 090
North Fork Yellow Creek State Route 213	05030101 190
Norwalk Reservoir #3	04100012 030
O'Bannon Creek Loveland – State Route 48	05090202 090
Oakthorpe Lake	05030204 030
Ohio Brush Creek Marble Furnace Road to Ohio Brush Creek Camp	05090201 050
Olive Green Creek County Road 7 to State Route 83	05040004 110
O'Shaughnessy Reservoir	05060001 mainstem
Oxbow Lake	04100006 060
P.J. Outhwaite Reservoir	04100011 020
Paint Creek Lake	05060003 050
Paulding Reservoir	04100007 120
Pike Lake	05060002 130
Pine Lake	05030103 080
Pleasant Run Blue Sky Park Road	05090202 110

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Powers Reservoir	05060001 090
Punderson Lake	04110002 010
Pymatuning Creek U.S. Route 6 to Brockway Sharon Road	05030102 030
Raccoon Creek Vinton – Dam to State Route 7	05090101 040 05090101 mainstem
Raccoon Creek Bookmeyer Road to U.S. Route 6	04100011 130
Raccoon Creek Reservoir	04100011 130
Rattlesnake Creek State Route 729 to Fishback Road	05060003 030
Rock Mill Reservoir	05030204 010
Rocky Ford Creek Oil Center Road to Mermill Road	04100010 030
Rocky Fork Little Scioto River State Route 139	05090103 030
Rocky Fork Paint Creek Dam	05060003 060
Rush Creek Hansley Road to Larue-Green Camp Road	05030204 030
Rush Creek Lake	05030204 030
Rush Run Lake	05080002 060
Salt Creek Creamery Hill Road to Laurelville – State Route 56	05060002 070
Salt Creek State Route 146	05040004 060
Saltlick Creek U.S. Route 35	05060002 090
Savannah Lake	04100012 050
Schoonover Lake	04100007 030

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Scioto Brush Creek Rarden-Hazelbaker Road to State Route 73	05060002 150
Shelby Reservoir #3	05040002 010
Short Creek Mount Pleasant Road to State Route 150	05030106 010
Shreve Lake	05040003 060
South Branch Caesar Creek Hoop Road	05090202 050
South Branch Portage River Portageview Road to Kemner Road	04100010 040
South Branch Wolf Creek Township Road 172	05040004 100
South Fork Licking River Gale Road to Newark – Second Street	05040006 040
South Fork Sugar Creek At Beach City Reservoir	05040001 110
Spencer Lake	04110001 030
Springfield Lake	04110002 030
Still Fork Sandy Creek Minerva Sportsman Club	05040001 040
Stillwater Creek Piedmont Lake Spillway to Tippecanoe – State Route 800	05040001 140 05040001 150
Stonelick Creek Stonelick Covered Bridge	05090202 130
Stony Creek County Road 65	05080001 040
Straight Creek Old U.S. Route 68	05090201 080
Sugar Creek At Dover	05040001 120
Sugar Creek Slabtown Road to Bluelick Road	04100007 050

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Sulfur Springs Brook Chagrin Falls – Miles Road	04110003 030
Sunfish Creek Altitude-Miller Hill Road to Ohio River	05030201 010
Sunfish Creek Grassy Fork Road to Sunfish Creek Road	05060002 130
Sycamore Creek County Line Road to County Road 37	04100011 070
Symmes Creek State Route 141	05090101 090
Tawawa Creek Tawawa Civic Park	05080001 070
Todd Fork State Route 73 to Roachester-Osceola Road	05090202 070 05090202 080
Turkey Creek Lake	05090201 010
Turtle Creek State Route 2 – Magee Marsh	04100010 010
Tycoon Lake	05090101 060
Upper Sandusky Reservoir	04100011 040
Van Wert Reservoir #1	04100007 090
Van Wert Reservoir #2	04100007 090
Veteran's Memorial Reservoir	04100010 040
Veto Lake	05030202 010
Wabash River Fort Recovery – Purina Mill to Wabash Road	05120101 010
Water Works II	05030103 030
Wellington Reservoir	04110001 020
Wellington South Reservoir	04110001 020
Wellington Upground Reservoir	04110001 020
Wellston City Reservoir	05090101 050

Waters with current fish tissue data where inadequate samples exist to determine level of impairment	
Water Body	Assessment Unit(s)
Wellston Reservoir	05090101 050
West Branch Huron River Townline Road to Lovers Lane Road	04100012 010 04100012 020
West Branch Mahoning River Wayland Road to Newton Falls – County Road 114	05030103 030
West Branch Nimishillen River Canton – Stadium Park to Cleveland Avenue	05040001 050
West Branch St. Joseph River County Road S to State Route 576	04100003 020
West Branch Wolf Creek Barkhurst Mill Bridge to Shinne Covered Bridge	05040004 090
West Fork Duck Creek County Road 40	05030201 120
West Fork Eagle Creek State Route 353	05090201 070
West Fork Little Beaver Creek Y-Camp Road to State Route 7	05030101 080
West Fork Mill Creek Riddle Road to Gardener Park	05090203 010
West Fork Mill Creek Lake	05090203 010
Willard Reservoir	04100012 010
Wolf Run Lake	05030201 120
Zeppernick Lake	05040001 040

A.5 Waters with Only Historical Fish Tissue Data

Waters with only historical fish tissue data	
Water Body	Assessment Unit(s)
Acton Lake	05080002 070
Bresler Reservoir	04100007 040
Cedar Creek Drouillard Road to Cousino Road	04100010 010
Chapman Creek Tremont City Landfill to Tremont City	05080001 160
Clendening Lake	05040001 150
Compton Creek At White Oak	05060003 080
Crane Creek Billman Road	04100010 010
Deer Creek Lake	05060002 030
Dry Creek Lemoyne Road	04100010 010
Duck Creek Toledo – Millard Road	04100009 090
East Branch Middle Fork Little Beaver Creek Leetonia Wastewater Treatment Plant at RR Bridge	05030101 070
East Branch Nimishillen Creek St. Louisville – Meese Road to Canton – Cook Park	05040001 050
East Fork Lake	05090202 110 05090202 120
Findlay Reservoir #2	04100008 020
Grant Lake	05090201 100
Grassy Creek Lime City Road	04100009 090
Guilford Lake	05030101 080
Harrison Lake	04100006 020
Hecklinger Pond	04100009 090

Waters with only historical fish tissue data	
Water Body	Assessment Unit(s)
Jerome Fork Jeromesville – County Road 30A	05040002 050
Kerwin Reservoir Rock Spring Road	05030103 030
Killdeer Plains Pond #27	04100011 040
Killbuck Creek Wooster – Ewing Road to Holmesville – Township Road 346	05040003 050 05040003 060 05040003 070
Kipton Reservoir	04100012 060
Kohler Ditch DERR sampled	05040001 010
LaDue Reservoir	04110002 010
Lake Glacier	05030103 080
Lake Milton	05030102 030
Lake Newport	05030103 080
Lake Vesuvius	05090103 010
Leesville Lake	05040001 070
Long Lake	05040001 010
Loramie Creek Fort Loramie – State Route 66 to Lockington – Landman Mill Road	05080001 050 05080001 060
Mill Creek Youngstown – Lake Cohasset to Youngstown – Lake Glacier	05030103 080
Mohican River Wally Road to State Route 715	05040002 mainstem
Nimisila Reservoir	05040001 030
North Branch Tenmile Creek Sylvania – Monroe Street	04100001 020
Piedmont Lake	05040001 140
Pleasant Hill Lake	05040002 040

Waters with only historical fish tissue data	
Water Body	Assessment Unit(s)
Portage River Brush Wellman to Port Clinton	04100010 070
Raccoon Creek Newark – Cherry Valley Road	05040006 030
Salt Fork Reservoir	05040005 040
Senecaville Reservoir	05040005 010
Shank Lake	04100008 030
Shantee Creek Toledo – Stickney Road	04100001 020
Silver Creek Toledo – Raintree Parkway	04100001 020
Sippo Lake	05040001 030
Stone Mill Run Salem – Cunningham Road	05030101 070
Stonelick Reservoir	05090202 130
Swan Creek Whitehouse – Stitt Road to St. Clair Road	04100009 080
Tenmile Creek Herr Road to Sylvania – Highland Meadows Country Club	04100001 020
Turkeyfoot Lake	05040001 010
Wauseon Reservoir #2	04100009 010
West Branch Reservoir	05030103 030
Wills Creek Byesville Park and Plastics Plant	05040005 020
Wolf Creek Barberton – Wooster Road	05040001 010