

Removal Recommendation for the Restrictions on Fish and Wildlife Consumption Beneficial Use Impairment in the Ashtabula River Area of Concern

Issue

The Ashtabula River Remedial Action Plan Advisory Council and Ohio EPA request concurrence with this recommendation to remove the Restrictions on Fish and Wildlife Consumption BUI in the Ashtabula River AOC. This recommendation is made with the support of staff from the Ohio EPA Division of Surface Water (including the Water Quality Standards and Technical Support Section). This request is made in accordance with the process and criteria set forth in the *Delisting Targets for Ohio Areas of Concern* (Ohio EPA, 2008) and the *Restoring United States Great Lakes Areas of Concern: Delisting Principles and Guidelines* (US Policy Committee, 2001).

This beneficial use contains two components, fish consumption and wildlife consumption. Snapping turtles are currently the only wildlife species with a consumption advisory in effect in the Ashtabula River AOC as issued by the Ohio Department of Health. This advisory was listed based on the results of a one-time study done in 1997. All turtles had high levels of PCB and mercury in fat and liver tissue and advisories stress not eating those portions of the turtle. Currently, turtles from the Black, Ashtabula and Maumee Rivers have a one meal per week advisory for mercury which is similar to the statewide blanket advisory for fish, and therefore the levels of contamination found in turtle tissues in these rivers are considered to be background levels and the wildlife consumption component of this BUI is not considered impaired by the individual RAP organizations, including the Ashtabula River RAP Advisory Council, and the State of Ohio. For the consumption of snapping turtles, the Ottawa River has a 'do not eat' advisory due to mercury, and it is the only portion of an Ohio AOC where impairment is listed for wildlife consumption.

Fish consumption advisories, in varying frequencies, have been posted for the lower reach of the Ashtabula River that eventually was designated as the AOC. Prior to being designated a Great Lakes Area of Concern, an advisory was issued in 1983 by the Ohio Department of Health and Ohio EPA that recommended that no fish caught in the lower two miles of the Ashtabula River should be eaten. That advisory was based on results of fish tissue sampling conducted between 1978 and 1981. At the time, forty-five organic chemicals had been detected in fish tissues including PCBs, hexachlorobenzene, hexachlorobutadiene, pentachlorobenzene, tetrachloroethane and octachlorostyrene. Many of the identified chemicals were classified as carcinogens.

Year(s)	Species	Contaminant(s)	Advisory Frequency
1983 - 1997	All	PCBs, Hexachlorobenzene, Pentachlorobenzene, Tetrachloroethane	Do Not Eat Any Fish
1998 – 2003	Smallmouth Bass	PCBs	1 Meal / Week
	Largemouth Bass, Walleye	Mercury, PCBs	1 Meal / Month
	Channel Catfish, Common Carp	PCBs	1 Meal / 2 Months
2004 - 2007	Channel Catfish, Common Carp	PCBs	1 Meal / 2 Months
	Brown Bullhead, Yellow Bullhead	PCBs	1 Meal / Month
	Largemouth Bass, Walleye	Mercury, PCBs	1 Meal / Month
2007 - 2013	All	PCBs	Do Not Eat Any Fish *
2013	Common Carp, Freshwater Drum	PCBs	1 Meal / Month

- * The 2007–2013 Do Not Eat Any Fish advisory was a precautionary advisory issued for the period of time during and immediately after the remedial dredging project and was replaced with the 2013 advisories which were based on tissue samples collected in 2011.

Although ambient concentrations of the organic contaminants in the water column were very low or below detectable limits, the chemicals found in fish tissue were also detected in the sediments of the lower Ashtabula River and the tributary system, Fields Brook. The contaminated sediments were identified as a concentrated source of pollutants causing contamination of fish tissue, particularly since the highest tissue contaminant levels had been found in bottom feeding fish species. Sediment sampling subsequent to the posting of the 1983 consumption advisory found surficial sediments to contain much lower levels of contamination than deeper sediments and fish tissue sampling at the time indicated that contaminant tissue levels had also declined.

After many years spent in securing the necessary funds to clean up the river sediments, a federal-state-local agreement was signed in 2005, to fund and carry out a \$75 million cleanup of contaminated sediment from the Ashtabula River, under the Great Lakes Legacy Act of 2002. US EPA in cooperation with the Ashtabula City Port Authority (the non-federal sponsor) agreed to clean up 600,000 cubic yards of PCB-contaminated sediment from a one-mile stretch of river. The State of Ohio provided \$7 million as part of the Port Authority's cost share. Additional dredging of 130,000 cubic yards was also made available under the Water Resource and Development Act (WRDA) of 1990. The complete dredging project was completed in October 2009, with the closing of the consolidation facility.

Impairment Listing Criteria

Ohio's delisting guidance states that this beneficial use shall be listed as impaired if an advisory or restriction to fish or wildlife consumption of one meal per month (or more stringent) is imposed by the Ohio Department of Health and is due to sources within the AOC. Starting in 2003, the Ohio Department of Health began advising that everyone limit consumption of sport fish caught from all water bodies in Ohio to one meal per week due to mercury, unless there is a more restrictive advisory.

The IJC listing criteria states that “an impairment will be listed when contaminant levels in fish or wildlife populations exceed current standards, objectives or guidelines, or public health advisories are in effect for human consumption of fish or wildlife. Contaminant levels in fish and wildlife must be due to contaminant input from the watershed.” Ohio's current sport fish consumption advisory committee issues public health advisories related to fish consumption under a Memorandum of Understanding (MOU) among Ohio EPA, Ohio Department of Natural Resources, and Ohio Department of Health (ODH). Agency technical staffs meet periodically to coordinate fish consumption advisories and other issues related to fish contaminants.

Because of the “Do Not Eat” any fish advisory of 1983-1997, the RAP Advisory Council was justified when it listed, in the December 1991 RAP Stage 1 Report, that this beneficial use was impaired. (The Advisory Council did not list wildlife consumption as impaired as there was no information on wildlife tissue contamination available and no state consumption advisories had been issued.)

Impairment Removal Criteria

Ohio's guidance document states that the removal of the fish consumption portion of this BUI can occur when no fish consumption advisories of one meal per month (or more stringent) have been issued by the Ohio Department of Health that can be attributed to sources within the AOC. Therefore, the removal of the fish consumption portion of this BUI is solely based upon the frequency of fish consumption advisories issued by the state and the advisory frequency compared to background levels of contamination. In addition to the one meal per week state-wide advisory noted above, there are consumption advisories listed for specific fish species caught from Lake Erie and Lake Erie tributary waters. Both the state-wide and specific Lake Erie and Lake Erie tributary advisories are considered to be regional, background levels of contamination.

The Ashtabula River AOC is wholly located within the Ashtabula River lacustrary. A lacustrary is a fresh water estuary or a place where river flow is affected by wind patterns and lake levels, sometimes halting or reversing river flow, pushing lake water into the lacustrary, and causing the lake-affected portion of the river system to act more as a component or bay of the larger lake system. With unrestricted access between the lake and lacustrary, fish species can and do readily move between the two areas. The primary contaminant of concern for Ashtabula River AOC fish consumption advisories is PCB. Once in the environment, PCBs do not readily break down and therefore may remain for long periods of time cycling between air, water, and soil. PCBs can be carried long distances and are found across the globe (US EPA 2013). PCBs have been found in numerous Lake Erie fish species, particularly in the same Ashtabula River AOC species for which consumption advisories have been issued.

At present, the State delisting guidance document is being revised to be more reflective of current science and to provide more specificity to removal criteria. The Fish Consumption Advisory BUI currently relies upon attributing an advisory to a source within the AOC. This portion of the removal criteria is difficult to determine and is therefore likely to be revised in the next version of the State delisting document. However, Ohio EPA and the Ashtabula RAP believe that there is a large amount of data available to demonstrate that the BUI can be removed and validates an alternative approach to address the local source requirement. The concentrations of contaminants in the AOC, as compared to the background levels of Lake Erie and its tributaries adequately show that there is no difference in concentration or advice between similar species and size fish in the AOC and the background locations, warranting the removal of the BUI.

Tissue Sample Collection

Ohio's current sport fish consumption advisory committee functions under a Memorandum of Understanding (MOU) among Ohio EPA, Ohio Department of Natural Resources, and Ohio Department of Health (ODH). Agency technical staffs meet periodically to coordinate fish advisories and other issues related to fish contaminants. The fish contaminant monitoring sites are typically selected to coordinate with other water quality monitoring survey sites on an annual basis. The State of Ohio Cooperative Fish Tissue Monitoring Program Sport Fish Tissue Consumption Advisory Program (last revised October 2010) provides the assessment procedures for evaluating fish tissue data and advisory decision making and is available online at <http://www.epa.ohio.gov/portals/35/fishadvisory/FishAdvisoryProcedure.pdf>. In cases where an advisory decision is needed for constituents not addressed in the protocol, the protocol is used as a framework for developing appropriate thresholds.

Ohio EPA is responsible for collecting Ohio fish tissue samples for Ohio's Fish Tissue Monitoring Program. Fish tissue collection is performed in accordance with the Ohio Fish Tissue Collection Manual. For fish tissue contamination, levels of the contamination are tiered in accordance with five levels of consumption frequency, developed to be protective of human health. In the Ashtabula River AOC, the current contaminant of concern is polychlorinated biphenyls, or PCBs and the tiered levels of consumption frequency is shown below.

Table 2. Ohio Fish Consumption Advisory Chemicals: (ODH 10/25/99) Fillet Chemical Upper Bound Limit Concentrations (PPM) and Advisory Meal Consumption Rate Using the Great Lakes' Governors Procedure					
Chemical	Unrestricted	1 / week	1 / month	1 / 2 months	Do Not Eat
PCBs	<0.050	0.220	1.000	1.999	> 1.999

In order to be proactively protective of human health, Ohio Department of Health, Ohio DNR and Ohio EPA issued a precautionary do not eat any fish advisory in 2007. This advisory was issued for the time during and immediately after the remedial dredging operation that occurred in 2007-2008 and would remain in effect until new fish tissue results showed that the advisory could be revised. In 2011, tissue

samples were collected from sport fish caught from the Ashtabula River and Lake Erie, according to the State of Ohio's Sport Fish Tissue Monitoring Program. Table 3 provides a summary of the 2011 average PCB tissue concentrations. Please note that in 2011, the average length of common carp individuals caught in the Ashtabula River AOC was 20.75 inches (minimum of 15.75 inches and maximum of 23.50 inches). A common carp individual of almost 27" was found to contain a PCB tissue concentration that triggered a more stringent one meal per two month advisory level for larger individuals caught from Lake Erie waters. A total of 15 fish were collected from the Ashtabula and 56 from Lake Erie; tissue concentrations were determined according to procedures outlined in the State of Ohio's Sport Fish Tissue Consumption Advisory Program

LE Fish		Ashtabula River AOC Fish	
Common Carp		Common Carp	
0.749		0.642	
2.381 *			
Freshwater Drum		Freshwater Drum	
0.398		0.367	

* In 2011, the average length of common carp individuals caught in the Ashtabula River AOC was 20.75 inches (minimum of 15.75 inches and maximum of 23.50 inches). The common carp from Lake Erie with the 2.381 ppm PCB concentration came from an individual that was 26.73 inches in length, warranting a more stringent consumption advisory.

Comparison Ashtabula River AOC and Lake Erie Fish Consumption Advisories

The PCB tissue concentrations in Ashtabula River AOC common carp and freshwater drum species were sufficient to cause the posting of a one meal per month advisory for both species. However, the tissue concentrations in the Ashtabula River AOC fish were lower than what was detected in same species samples from Lake Erie.

According to fish tissue results from this assessment, the advisory was revised in 2013 for the Ashtabula River AOC to include only common carp and freshwater drum to an advisory frequency of one meal per month. In 2013, the advisories posted for Lake Erie fish species also included common carp and freshwater drum. The Lake Erie advisories for these fish species were equal to or more stringent than the same fish found in the Ashtabula River AOC. A comparison of advisory frequency for these fish species in the AOC and Lake Erie is shown in Table 4.

Species	Lake Erie Advisory Frequency		Ashtabula River AOC Advisory Frequency	Comparison
Common Carp	For individuals \geq 27"	1 Meal / 2 Months	1 Meal / Month (regardless of size)	AOC Advisory is identical to or less stringent than Lake Erie advisories
	For individuals < 27"	1 Meal / Month		
Freshwater Drum	1 Meal / Month		1 Meal / Month	AOC Advisory is identical to Lake Erie advisory

Conclusions

Aside from the precautionary Do Not Eat any fish advisory of 2007–2013, the advisories listed for the Ashtabula River AOC showed continued improvement over time (Table 1). From 1983 to 2007, the improvement has been attributed to cleaner surficial sediments which prevent access to the older and more contaminated deeper sediment layers. Since the remedial dredging, the improvements can be attributed to the removal of the contamination pathway through the efforts of the remedial dredging operation.

In spite of that, the concentration of PCBs found in Ashtabula River fish in 2011, used for the posting of the 2013 advisory frequencies, are lower than the concentration of PCBs found in Lake Erie fish of the same species. In fact, no Ashtabula River common carp were found with a tissue contaminant concentration as high as was found in the larger (≥ 27) Lake Erie common carp. The Ashtabula River AOC fish consumption advisories are equal to or less stringent than the advisories posted for Lake Erie fish of the same species.

It's noted that the current Ashtabula consumption advisories are based off a single year of fish tissue data. This is not unusual; limited resources often dictate that a water body is sampled for fish tissue only one or two times during the ten-year analysis window used by the advisory program. Normally, Ohio EPA requires two years' worth of tissue data to rescind an advisory such as a "Do Not Eat" advisory. However, in the case of the Ashtabula the "Do Not Eat" advisory was precautionary; fish tissue data never indicated tissue contamination warranting this stringent advisory, and the advisory committee felt that a single year's worth of data post-dredging was sufficient to issue the revised "Once Per Month" advisory for the river. Also, a comparison of the two most recent years of tissue data for the Ashtabula shows a fish tissue PCB decrease of more than 80% for both common carp and freshwater drum between 2002 and 2011. Although this trend analysis is based on a limited sample size, it supports the advisory committee's decision to post a less-restrictive "Once Per Month" advisory.

Ohio Department of Health, Ohio DNR and Ohio EPA has issued consumption advisories for two Ashtabula River AOC fish species (common carp and freshwater drum) that are equal to or less stringent than the advisories posted for Lake Erie fish of the same species.

As described above, the Fish Consumption BUI currently relies upon attributing an advisory to a source within the AOC. However, Ohio EPA and the Ashtabula RAP believe that the information and data summarized above demonstrate that the BUI can be removed by documenting that the advisory levels and fish tissue contaminant levels are no worse than the current Lake Erie advisory levels and contaminant levels. The concentrations of contaminants in the AOC, as compared to the background levels of Lake Erie and its tributaries adequately show that there is no difference in concentration or advice between similar species and size fish in the AOC and the background locations, warranting the removal of the BUI.

Recommendation

Based upon review of the data and technical input from Ohio EPA, removal of the Restrictions on Fish and Wildlife Consumption BUI in the Ashtabula River AOC is being recommended. This Removal Recommendation was discussed with the Ashtabula River RAP Advisory Council at their July 2, 2013 RAP meeting where the RAP Council voted to proceed with the removal of this impairment. The Ashtabula River RAP Advisory Council submitted a formal letter of support for removal of the BUI, dated July 17, 2013.