

Removal Recommendation for the Degradation of Fish and Wildlife Populations Beneficial Use Impairment in the Ashtabula River Area of Concern

Issue

This beneficial use contains two components, fish populations and wildlife populations. The Ashtabula River Remedial Action Plan Advisory Council does not list the wildlife population component as an impaired beneficial use in the Area of Concern. This removal recommendation, therefore, deals only with the listed impaired component, fish populations.

The river was called Hash-tah-buh-lah, or river of many fish, by Native Americans, but commercial port development and improvements degraded fish populations. By the middle 1800s the Ashtabula River and Harbor area had become a significant Lake Erie port, receiving vast amounts of coal and iron ore and transporting these commodities to the expanding railway system. Modifications that were made to the river to facilitate port operations, such as channel dredging and sheet-piling of river banks severely modified or removed critical aquatic habitat and limited fish populations. In addition, contamination of river sediments from numerous chemical operations located around Fields Brook further degraded fish populations.

Due to recent remedial dredging projects and habitat restoration activities, fish populations in the Ashtabula River AOC now meet not only BUI removal criteria but are approaching or exceeding Ohio water quality standards. The Ashtabula River Remedial Action Plan Advisory Council and Ohio EPA request concurrence with this recommendation to remove the Degradation of Fish and Wildlife Population Beneficial Use Impairment (BUI) in the Ashtabula River AOC. This recommendation is made with the support of staff from the Ohio EPA Division of Surface Water. 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).

Removal Criteria

Ohio EPA's approach to surface water monitoring and management essentially serves as an environmental feedback process taking "cues" from environmental indicators to effect needed changes or adjustments within water quality management. The presence, condition, and numbers of the types of fish, insects, algae, plants and other aquatic life provide accurate information about the health of freshwater resources.

For aquatic life uses, the community and population response parameters that are represented by the biological indices that comprise Ohio EPA's biological criteria are the principal response indicators. The principal biological evaluation tools used by Ohio EPA are the Index of Biotic Integrity (IBI), the Modified Index of Well-Being (MIwb) and the Invertebrate Community Index (ICI). These three indices are based on species richness, trophic composition, diversity, presence of pollution-tolerant individuals or species, abundance of biomass, and the presence of diseased or abnormal organisms. The IBI and the MIwb apply to fish; the ICI applies to macroinvertebrates. Ohio EPA uses the results of sampling reference sites to set minimum criteria index scores for aquatic life use designations in water quality standards.

Biological information provided by the agency's Index of Biotic Integrity (IBI) and Modified Index of Well-being (MIwb) furnish numeric measures of the current condition of resident fish populations and are often used to demonstrate progress in ecological restoration. These indices are used by Ohio RAP organizations to determine the status of the fish population component of the Fish and Wildlife Consumption beneficial use impairment.

According to the Ohio delisting guidance, the fish population component of this BUI can be considered restored when:

1. Index of Biotic Integrity (IBI) and Modified Index of Well Being (MIwb) values do not significantly diverge from state applicable ecoregional biological criteria.
2. For lacustraries and nearshore areas, IBI and MIwb values do not significantly diverge from target scores based on Thoma 1999.

Type	State Water Quality Attainment Criteria/Target		Ohio AOC Non-Significant Departure Value	Ohio AOC Removal Target
	Warmwater Habitat (WWH) Streams	IBI	40 *	4
MIwb		8.7 *	0.5	8.2
Lacustraries	L-IBI	42 **	4	38
	MIwb	8.7 *	0.5	8.2

* From Ohio WQS

** From recommended target

The Ashtabula River AOC is wholly within the lacustrary so restoration target #2, above, is the applicable BUI delisting target. The Ohio delisting guidance specific for this BUI can be seen in Attachment B.

Fish Population Assessments

Data from fish population assessments in the Ashtabula River AOC are generally available from 1989 to 2011 with most assessment sites centrally located in the 2.32 mile AOC, around River Miles 1.1 and 1.3, the location of recently constructed in-water and riparian habitat improvements.

River Mile	1989	1993	1995	1998	2002	2003	2004	2005	2009	2011	2013
0.30		4.68		4.74							
0.60	2.59									9.3	
0.73			3.81								
0.90										9.35	
1.10				8.19		8.49	7.85	8.86	8.72	8.71	
1.20										9.92	11.7
1.25	6.02		6.52	7.47	9.43	8.16	7.59	8.65	8.37	8.96	11.4
1.60										9.01	
1.80	7.97										
2.25			8.82	9.27							
2.32										9.01	
Average, by year	5.53	4.68	6.38	7.42	9.43	8.33	7.72	8.76	8.55	9.18	11.55
BUI Removal Target	8.2										
% of Removal Target	67.4%	57.1%	77.8%	90.5%	115.0%	101.5%	94.1%	106.8%	104.2%	112.0%	140.9%

Table 5. Ashtabula River AOC IBI Data (1989 – 2013)											
River Mile	1989	1993	1995	1998	2002	2003	2004	2005	2009	2011	2013
0.30		25.1		28.5							
0.60	27									42	
0.73			30								
0.90										40	
1.10				32.5		44	40	37.5	44	37	
1.20										46	48
1.25	31.4		24.5	33.5	37.3	34.5	44	36	46	45.8	52
1.60										45.5	
1.80	36.4										
2.25			45	44							
2.32										44	
Average, by year	31.6	25.1	33.2	34.6	37.3	39.3	42.0	36.8	45.0	42.9	50.0
BUJ Removal Target	38										
% of Removal Target	83.2%	66.1%	87.3%	91.1%	98.2%	103.3%	110.5%	96.7%	118.4%	112.9%	131.6%

Below, the fish community improvement, over time, is depicted graphically:

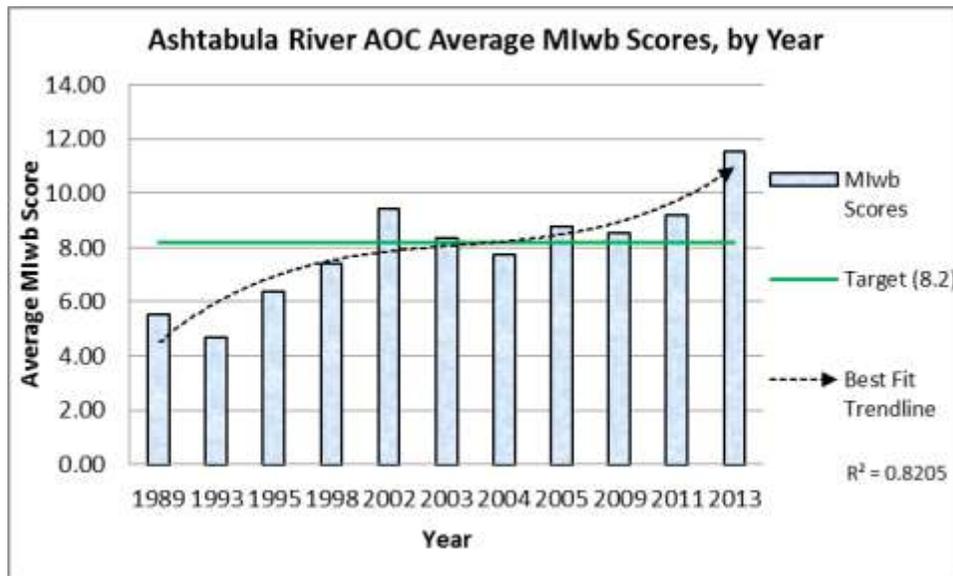


Figure 1. Ashtabula River AOC Average MIwb Scores

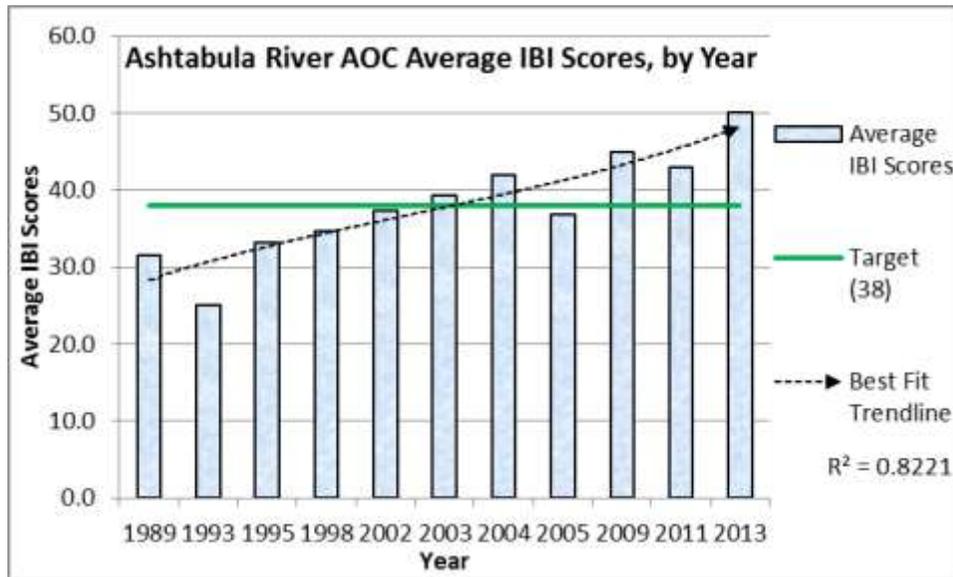


Figure 2. Ashtabula River AOC IBI Scores

Conclusions

As can be seen in the trend lines in the above graphs, both fish community indices showed a remarkable and consistent improvement in the Ashtabula River AOC. In addition, the fish communities exceeded the MIwb restoration target in the last four assessments and six of the last seven. For the L-IBI assessments, the AOC fish communities met or exceeded the restoration target in the last three assessments and in five of the last six. Since consistent improvement in fish community scores has been noted since 1989 and that Ohio delisting criteria has been met, removal of the Degradation of Fish and Wildlife Populations BUI is warranted.

With the strategic navigation dredging of the upper river channel, the GLRI-funded dredging of Jack's Marine North Slip (both scheduled for completion in 2013), the completion and maturation of NRDA habitat projects and finally the maturation of the fish habitat shelves at the 5 ½ Slip (which was completed in 2011), the upward trends seen in the above charts are expected to continue in the Ashtabula River AOC.

Recommendation

With the Wildlife Population component of this BUI not impaired and upon a review of the Fish Population data and technical input from Ohio EPA, removal of the Restrictions on Fish and Wildlife Population BUI in the Ashtabula River AOC is recommended. The data and this Removal Recommendation were discussed with the Ashtabula River RAP Advisory Council at their July 2, 2013 RAP meeting. At the meeting, 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.