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Endocrine Disruptors and Pathogens and Parasites Likely Causes for Smallmouth Bass Population Decline in Susquehanna River

Harrisburg, PA – Based on a multi-agency, multi-year study of one of the most complex river systems in Pennsylvania, the two most likely causes for the population decline of smallmouth bass in the Susquehanna River are endocrine-disrupting compounds and herbicides; and pathogens and parasites.

The Pennsylvania Department of Environmental Protection (DEP) and the Pennsylvania Fish and Boat Commission (PFBC), along with nearly 50 participants and 6 partner agencies, released the findings today that narrow the likely causes from an initial field of 14 candidate causes to those two. More research into these causes is needed, but evidence collected during the study points to these likely sources more than any other candidate causes.

Following a smallmouth bass population crash in 2005, and additional observed maladies, such as tumors and lesions on smallmouth bass, the team used ground-breaking monitoring strategies to collect more than 30,000 water quality records annually, along with review of existing research to isolate the possible causes keeping young-of-the-year (YOY) smallmouth bass from growing to adulthood.

The panel of experts was challenged by the fact that the Susquehanna River is a complex system in which the tributaries at times don't mix for more than 40 miles. "What looks like just one body of water acts like five unique rivers, all with different characteristics," said John Quigley, DEP Secretary. The Juniata, West Branch, and main stem each tend to run in their own isolated lanes in the riverbed, with the smaller tributaries hugging both shorelines.

Collaborating scientists began the study in 2014, using a scientific protocol known as CADDIS (Causal Analysis/Diagnosis Decision Information System). Of the 14 initial candidate causes identified by the workgroup, only two were determined to be likely causes of the poor recruitment: Endocrine disrupting compounds/herbicides, and pathogens and parasites.

"We appreciate the assistance of the U.S. EPA, DEP and our other partners in the evaluation of many possible stressors to the smallmouth bass population using the CADDIS process" said Executive Director of the Pennsylvania Fish and Boat Commission John Arway. "The health of the smallmouth bass in the Susquehanna River continues to be compromised and this analysis rules out certain causes, prioritizes other uncertain causes for further study and most importantly identifies likely causes which can be targeted for action."

The original potential causes included high flows, pH and dissolved oxygen (deemed unlikely as a result of this study), as well as invasive species, habitat, and algal blooms (deemed uncertain).

The next step is to focus on identifying the sources of the endocrine-disrupting compounds and herbicides, and what is causing the increased prevalence and lethality of the pathogens and parasites in smallmouth bass, including monitoring in the tributaries of the Susquehanna.

The U.S. Environmental Protection Agency (EPA) developed CADDIS to help agencies conduct causal assessments in aquatic systems. This scientific panel represents DEP, PFBC, the Susquehanna River Basin Commission (SRBC), the United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS), Susquehanna River Heartland Coalition for Environmental Studies and nearly 50 staff from federal and state agencies and partner organizations.

“This study does not identify a single smoking gun,” said Quigley “But it does point the way toward likely causes, which we will continue to pursue. On top of that, through this study, DEP staff developed new approaches to monitoring this complex system, dramatically increasing our water quality monitoring capacity in the Susquehanna River, and providing tools that we can use to ensure fishable, drinkable water statewide.”

“The Susquehanna River's smallmouth bass fishery once attracted anglers from all over the world,” said Arway. “I am confident that the results from the CADDIS study along with the continued commitment by DEP to identify the causes and reduce the sources will provide for the recovery and return of that once world class recreational fishery.”

Details of the study, a webinar to present the findings of the study and the full report can be [found here](#).

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