Recovering the American Shad

After 25 years of failure, scientists are taking a new tack | Photos by Ashleigh Magee

BY EMILY MCCRARY-RUIZ-ESPARZA OCTOBER 18, 2023

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A Virginia Institute of Marine Science researcher handles an American shad.

For more than 200 years, the population of American shad in the James River has been steadily declining. But a new effort hopes to finally reverse that trend.

The American shad lives most of its life in the salt waters of the North Atlantic, but it's born right here in Richmond. Each spring, adult shad swim inland to spawn in freshwater rivers

and culinarily coveted species on the East Coast.

Since the 1990s, scientists and academics have been trying to restore shad populations, and in 1992 what is now the Virginia Department of Wildlife Resources opened a shad hatchery. For over 25 years, the program stocked the James with more than 125 million shad fry, hatchlings that are developed enough to feed on plankton. Two years after the hatchery was opened, the DWR prohibited shad harvesting. In 1999, a fish ladder was introduced in Bosher's Dam just west of Richmond to allow better access to spawning habitats. But so far, the three decades of work to recover the American shad in the James River have failed.

Though there's consensus about the problems contributing to the decline of the shad population — offshore commercial fishing, water pollution, barriers to migration, habitat degradation, the predation of invasive species (such as the blue catfish) and industrial water intakes — the reason attempted solutions haven't been successful has so far eluded scientists and academics.

The **Virginia Institute of Marine Science** has been monitoring the population for 25 years, says Eric Hilton, who runs its American shad and river herring monitoring program. "We can very rigorously and demonstrably show that the populations are disappearing to the point that, in our survey in the spring of 2023, we caught no female American shad."

The DWR also monitors fish populations by counting passage through the fishway at Bosher's Dam, and their counts are just as gloomy. Fewer than 50 American shad have passed through the fishway every year since 2016. DWR estimates that only one was observed in 2019. For comparison: About 3,300

Hilton is leading a project that may turn the trend. With $290,000 awarded by the General Assembly and secured by the **James River Association**, he has spent the last year drafting a plan to recover the American shad.

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Shad populations in states along the Eastern Seaboard have been scarce since the mid 2000s. The U.S. Fish and Wildlife Service has been working for years to remove dams that prevent migratory fish passage, and in 2020 it removed 73 of them in the Northeast, opening migration routes from Virginia to Maine. Maryland took measures in the 1980s and '90s by closing a fishery, mitigating pollution and opening a fish passage, but to no avail; there just weren't enough adults to reproduce. In 2005, an article in The New York Times declared that the shad population in Connecticut may have been at its lowest in 25 years, citing one biologist who speculated that

Though attempts to reinvigorate American shad in the James have never really stopped, some, such as the hatchery program, have been put on hiatus. “It made sense to throw everything at them we could: the stocking, the moratorium and the fish passage,” Alan Weaver at the DWR says. “Hopefully, that was going to extend their spawning range, which it did, but it obviously wasn’t enough.”

“We need to find out what else is causing the problem before we continue to stock,” he says.

Last October, VIMS convened a committee of experts from the natural resources community — including state environmental and wildlife agencies, university researchers, and leaders from the Pamunkey and Mattaponi tribes — for a meeting to discuss believed causes and possible solutions.

For the past year, Hilton has been compiling their ideas, research and feedback into a report. The Virginia Coastal Policy Center is drafting recommendations for legal policies that support recovery. In July, VIMS began testing a new sonar system to collect data about the health of the shad’s habitat in the James.

Hilton plans to take the report back to the natural resources community for feedback before presenting it to the General Assembly this fall.

The proposal has four parts: First is to continue the monitoring program to help measure the progress of restoration projects. The second is to investigate the cause of the shad’s high mortality rates — is it the predatory blue catfish? Catching offshore? Surface water intakes? Third, Hilton says they’ll recommend reopening the hatchery. And

"In the 1990s, I don't think anyone fully appreciated the climate change angle," Hilton says, referring to data showing that the waters of the James, the Chesapeake Bay and the whole North Atlantic are increasing in temperature. Hilton speculates that, as a result, the American shad that do return to spawn in the James arrive in bad shape. "There is some evidence that we're not getting older, healthier fish coming back. The ideal development temperature for eggs is in a fairly narrow window, so when you get higher than that, it might induce a poor year."

A cynic might call Hilton's recommendations more of the same, but he's sure that continuing some of the old projects (with tweaks) and adding new ones will make a difference. There are some factors further projects will have little control over, like climate change, but, Hilton says, "I do believe that the recommendations we are proposing will help, but to be truly effective, these will need to be considered together."

Although past projects were well informed, there was no formal plan for shad restoration in the 1990s, says Bill Street, president and CEO of the James River Association. He believes getting consensus among environmental experts will make a stronger case to policymakers. "They [can] have the confidence that this is something that's backed up by the best science available," he says. "We hope that will accelerate and push our efforts forward."

What if the population collapses? Marine migrants like the American shad enrich inland freshwater systems. "With a healthy run, they're contributing a massive amount of marine-derived nutrients into a relatively less productive freshwater system. If you lose that, then you lose all those primary feeders on the food web," Weaver says. But, given the chance,

saltwater environment, if they're protected and they get the resources they need, they can come back."

by Emily McCrary-Ruiz-Esparza

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