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species has steadily declined over four decades

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American shad were favorites of Native Americans and early settlers in Virginia more than 400 years ago. H recent years, so has the motivation to continue funding eff orts to counteract the decline of the species.
P. KEVIN MORLEY, RICHMOND TIMES-DISPATCH

MATT KIEWIET
Richmond TimesDispatch

Over the past four decades, the American shad population in Virginia — specifically the James River — collapsed. Humans are largely to blame.

Dams, pollution, commercial fishing bycatch, water withdrawals and invasive species either impede habitat access, hinder spawning, consume living shad or all of the above. Climate change also complicates things.

A once-beloved and cherished species in the James River and Chesapeake Bay watershed, the population has steadily declined since the 1970s. In recent years, scientists who attempt to net American shad for the purpose of estimating the population in the James River haven't caught any.

"There is a population there. It's just an extremely low-level population," said Patrick McGrath, a marine scientist senior with the Virginia Institute of Marine Science at William & Mary. "I can't imagine American shad ever being extirpated from the James River. I think it will always support, at the minimum, a very low population."

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The York and Rappahannock rivers also have seen a decline in recent years.

As the population dwindles, so does motivation to continue funding efforts to counteract the decline of American shad.

"The fish haven't been here for a long time. Old farts like myself, we'll still talk about (shad)," said Albert Spells, a former employee of the U.S. Fish and Wildlife Service of 40 years, who is now retired. "But a lot of people don't talk about it. They're not commercially available in Virginia anymore."

The anadromous — fish that spend portions of their life in both fresh and saltwater — American shad, or Alosa sapidissima, was a major commercial fishery along the Atlantic coast until the 1980s when numbers began to crater.

The Department of Wildlife Resources (DWR) tried supplementing the population through fish-stocking. Those efforts spanned from 1992 until 2017 and were deemed unsuccessful.

"DWR put the James American Shad stocking program on hiatus in 2017 because we were not able to document a population level response to stocking the number of Shad fry that ranged from only 2 million in some years up to more than 10 million in some years," said Alan Weaver, a fish passage coordinator with DWR, in an email to The Richmond Times-Dispatch.

"When you think about how many fry a single, healthy group of Shad (1 female plus 3-5 males) can produce, stocking only 2 million fry wasn't going to result in much increase."

The U.S. Fish and Wildlife Service came aboard in 1994 by way of the Harrison Lake National Fish Hatchery in Charles City.

Spells has decades of hands-on experience helping with and overseeing various fish restoration projects, including the hatchery program at Harrison Lake.

"There was one year after we started the hatchery program (to supplement stocking) where it seemed there was a bump (in American shad numbers)," he said. "It seemed like there was a bump in returning fish, and we thought we had made it. We thought we arrived.

"Never happened again." It's a confluence of issues leading to the bleak outlook of the American shad in the James.

Folks in the trenches say it's a complex puzzle that can be solved – if people care to solve it.

'Culturally, it was a huge thing'

In "John Smith's Chesapeake Voyages, 1607-1609," authors Helen C. Roundtree and Wayne E. Clark attempted to paint for readers a picture of native life – living and working the land – during that time.

In early spring, village morale was often at a low point. Native Americans had just (hopefully) survived the coldest months of the year, meanwhile food reserves and game animal fat were likely running low.

They might have been cold and hungry for days at a time.

But low and behold, once the water crept toward 55 degrees, upstream came the American shad, and other migratory fish, making their annual run from the Atlantic Ocean to spawn.

It may have signaled survival. They weren't going to starve.

As colonists learned the seasonal runs of migratory fish, they began to harvest them, too.

This rite of passage carried on for centuries in Virginia. Families who lived along the James near spawning areas caught shad and ate them.

"It was just one of those things that people did in the spring every year," Spells said. "Families would come around and they would eat shad, but all that's lost now."

From 1949 to 2017, the Wakefield Ruritan Club hosted an event called Shad Planking. The event revolved around eating smoked shad.

"Culturally, it was a huge thing," Spells said.

The Shad Planking was an annual political rite in which political hopefuls and their followers gathered in the woods of Sussex County. Politicians on stage would make their case, often poking fun at their

rivals, while supporters drank beer or sipped something stronger and ate shad that was smoked on wooden planks. The age-old joke was that the fish tasted like the planks.

What is happening?

Although there is still a population in the James River, fewer American shad from this body of water are completing their cycle than ever before.

The life cycle of the American shad begins in freshwater — where they are born — during the spring. After gaining strength throughout the summer, by fall the young shad make their way to the Atlantic Ocean. Once sexually mature around the age of 3, they come back to spawn in the river or stream in which they were born when the water reaches around 55 degrees.

Spawning takes place in freshwater ranging from about 55 to 68 degrees.

"About 60-65 is the peak temperature for their spawning," Weaver said in an email.

Shad, and herring, are known as "prolific spawners," according to Weaver. A female might have 1 million eggs, but on average only four return as adults to repeat the process.

As American shad attempt to make their way up the James, they are met with obstacle after obstacle. Even after several completed dam removals and fish passage projects in the James, a large portion of historical habitat remains inaccessible, according to the James River Association.

Nutrient pollution is harming the remaining habitat. With the James being an urban waterway, unfavorable amounts of sediment and sewage can sometimes seep into it.

"The CSO (combined storm overflow) discharges into the river have always been a concern and can still deposit raw sewage into the river during a major rain event because the treatment plant has only so much capacity," Weaver said. "If that happens at inopportune times such as during spawning or early life stages of several fish species, that can be detrimental to their success."

These pollutants also rob the river of dissolved oxygen (DO), which is valuable to both fish and their habitat.

The EPA notes: "Embedded sediments can prevent DO from permeating interstitial areas."

In marine ecology, interstitial areas are the spaces between individual grains of sand — where fish habitat could sprout in the right conditions.

The list grows. Power plants — like the power stations in Chesterfield and Surry — agriculture or any other structure or process that draws vast quantities of water from the river can kill the eggs of would-be shad, according to Weaver.

Climate change also can bring abnormal or extreme weather patterns, which can lead to a sudden increase or decrease in water temperature.

Weaver explained that volatile conditions — like RVA saw this spring, for example — can negatively affect the spawning process. Weather patterns can also affect the supply of phytoplankton and zooplankton, which shad fry eat once they are about a week old.

If shad survive this gauntlet, they must then live out their freshwater days avoiding what Spells calls the apex predator of the river, blue catfish.

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