

Tagged fish help scientists improve restoration efforts

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The Poplar Island project plans to restore the island to roughly its 1847 footprint. Photo: Maryland Environmental Service. Credit: NOAA Headquarters

NOAA scientists are collaborating with some unique partners to learn more about how several Chesapeake Bay species use natural and restored

areas near Poplar Island, on Maryland's Eastern Shore.

The partners? Nearly 400 fish.

We have caught, tagged, and released fish to help us learn how they use restored marshes at Poplar Island compared with how they use [natural habitat](#) nearby in Back Creek.

Our "partner" fish carry transmitter tags, which are about the size and shape of a pill capsule. Our team carefully implants the tags into the fish. After being caught and measured, we transfer the fish into a bin with water from the same location where they were caught.

Our trained specialist creates a small incision, inserts the tag, and then stitches the incision closed. Only fish that are longer than 8¼ inches are eligible to carry a tag. Then the fish is returned to the same location where it was caught.

We have tagged white perch, red drum, croaker, gizzard shad, striped bass, spot, and American eel. The tags report whenever the fish swims near one of the 15 telemetry receivers in Back Creek, 77 receivers at Poplar Island, or other telemetry receivers in the Chesapeake Bay or beyond. We download the data from the receivers twice each year, and our fisheries biologists then analyze it.

So far, scientists from the NOAA Chesapeake Bay Office have tagged 120 fish in Back Creek. Experts from NOAA's National Centers for Coastal Ocean Science have tagged 300 fish at Poplar Island. The number and diversity of fish tagged should give us a full picture of how they use these areas.

The research will help us understand how these fish use different marsh habitats such as creeks, ponds, edges, and the places where creeks meet

the open waters of the Bay. We'll explore how fish use restored areas at Poplar Island and at natural wetlands at Back Creek.

Findings will help us inform resource managers about which designs fish prefer. Then the people who develop the engineering plans will know which features to include in future restoration projects to provide better fish habitat. We'll also learn more about whether the restored areas are as successful as the natural sites at providing habitat for key species.

The tagging and telemetry project complements [other research](#) into where and when fish use human-made and natural habitat near Poplar Island. The project will continue for two years. The team is already analyzing initial results. Full analysis and publications are expected by spring 2026.

Scientists at the NOAA Chesapeake Bay Office are monitoring fish at the Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island. They plan to conduct field work three times each year (generally, in April, July, and October). They'll keep tabs on how different species of fish may be using habitat in and around Poplar Island. They are seeing indications that restored marsh areas may be providing nursery habitat for some species.



The team tracks down a sampling site in the pre-dawn hours. Credit: NOAA Fisheries/NOAA Chesapeake Bay Office

How to restore an entire island

Back in the mid-1800s, Poplar Island was more than 1,000 acres. In the early 1900s, it was home to a community of about 100 people. But it gradually fell victim to severe erosion, and by the early 1990s, the island had shrunk to only 4 acres.

The U.S. Army Corps of Engineers, Maryland's Port Administration, and other agencies recognized that the loss of Poplar Island meant the loss of remote island habitat. At the same time, they realized that

material dredged from the shipping channels leading into Baltimore Harbor needed to go somewhere. The result? A win-win situation.

Rebuilding Poplar Island is a massive construction project, under way since the mid-1990s. The project, still in progress, uses material dredged from the shipping channels into Baltimore Harbor to restore lost island habitat.

As the project progresses, new "cells" are created to receive the dredged material. Each cell is created to include features like creeks, high marsh, low marsh, and upland areas, in order to provide healthy habitat for Bay species. As we face a changing climate, restored habitat such as this becomes even more important to support healthy fish populations.

Tracking fish use of restored and reference areas

Fish use habitat 24 hours a day, so the [field work](#) to determine which fish use which areas goes on 24 hours a day, too. Each restored marsh cell is monitored for five years. Monitoring is currently under way in three of the completed cells at Poplar Island (three sites in each of the three cells).

Sampling also takes place at three reference sites on the mainland near Tilghman Island. The reference sites were selected to get an idea of how fish might have used areas on Poplar Island before it eroded.

In each location, the team deploys both fyke nets and gill nets. Fyke nets are set against a marshy edge at high tide and retrieved at low tide. Scientists record the species caught, how many of each kind of fish, and how big they are. The gill nets are used in marsh channels and ponds, and are fished overnight for 12 to 14 hours. Fish caught in the gill nets are also tracked for species, number, and length.

As the team conducts this sampling work over time, they will be able to track trends in how different species use the different areas.

Species collected in the fyke nets in the marshy areas include mummichog, silversides, sheepshead minnow, spot, and striped killifish. The gill nets in more open waters collected a slightly different set of species including menhaden, gizzard shad, spot, striped bass, and white perch.

In general, the reference sites caught a greater variety of species than did the recently restored areas. In analyzing the data, the scientists noticed that more juvenile spot (1–2 inches long) were collected in the restored marshes than at the reference sites. This may indicate that the marsh cells on Poplar Island can provide significant nursery habitat for this species.

Monitoring will continue to track the health of newly restored habitat at Poplar Island, and to learn more about how fish [species](#) are using these areas. Some of this work will include using acoustic telemetry to track tagged fish. This is similar to work we do in other parts of the Chesapeake Bay. We look forward to learning more about how [fish](#) use this newly restored habitat.

Provided by NOAA Headquarters

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