

Fish Tales

FISHERIES EXPERTISE LEADS TO
SCIENTIST'S APPOINTMENT

BY ELIZABETH O. COOPER





From flourishing striped bass populations to declining oyster and blue crab harvests, Virginia's fisheries represent a mixed bag with the potential to influence the state's economy over the next generation.

"We want to keep the fish population healthy for the grandchildren of all Virginians so that they will have fresh seafood and a vibrant economy around the bay," says Cynthia Jones, professor of biological sciences and a member of the Virginia Marine Resources Commission. Governor Mark Warner appointed Jones to serve on the commission in 2002, making her the first fisheries scientist to join the board formed in 1875.

After spending several decades investigating the data found in fish ear bones (formally known as otoliths), as well as other academic pursuits, Jones has eagerly parlayed her knowledge to protect and enhance Virginia's marine industries. She joined the commission without a set agenda, only a desire to introduce ideas about population dynamics and modeling without an abundance of mathematical and scientific jargon. "I take the very rigorous scientific training I have and translate that into management decisions that scientists make," she adds.

Jones' scientific background and expertise about the Chesapeake Bay have given her insights into many of the issues currently facing the commission. Her work with fish ear bones, which she started in the late 1970s, led her into pioneering research using rings present in the structures to track the age, origins, growth and longevity of fish. "The underlying purpose of otoliths is to estimate the vital rates of the population and project what will happen with the population coming into the bay," she explains. "If they're coming from other states like North Carolina or New Jersey, it's important that they manage their resources well. Virginia could be doing a good job, but there will be problems if other states aren't doing the same."

Recreational Fishing Adds to State's Coffers

That potential exists for striped bass, which is enjoying a resurgence in Virginia. "The striped bass have rebounded, and landings are way up because of good management and environmental changes and a moratorium on striped bass fishing for a few years. But many of those fish are migrants, so that affects not only Virginia but other coastal states as well," Jones says.

Along with striped bass, croaker, spot and black drum are also doing well, leading to a profitable recreational fishing industry. "Recreational fishing is important to the bay and is a big source of Virginia's tourism income," Jones notes.

While these fish are on the upswing, the bluefish population is diminishing. Jones and her colleagues have been trying to determine the reason behind the decline, but have yet to uncover anything concrete. "If we could answer that question, it would truly win the prize."

Her latest research looks into the health of seagrass and ecosystems and their influence on fish. "We can now tie fish to the environment directly and see the consequences a year or two later because they carry the mark of the specific seagrass throughout their lives," Jones says. "We're the first ones looking at this in the Chesapeake Bay and pioneering it around the world."

Balancing Needs of Commercial and Recreational Fisheries

Jones' research has proven especially valuable as the commission examines habitat usage to develop a balance acceptable to both recreational and commercial fishermen. "We want to improve habitat degradation, but the commercial and recreational people are in conflict over the share of these resources," Jones notes. "To me it looks like a struggle over an ever-diminishing pie. I would rather see the focus on restoring the lost habitat so there are more fish for everybody. When the population is more abundant, you can withstand environmental conditions better; but when you start having marginal habitats, the marginal population there can't withstand natural phenomena."

Much of this loss can be traced to the construction and agricultural runoff that has mushroomed along the coast. "The Virginia waterfront used to be trees and tidal marshes down to the ocean," Jones notes. "Now there is construction and agricultural runoff. That and over-fishing combine to create too much stress."

Habitat loss and over-fishing have nearly wiped out the state's oyster and blue crab populations. "Virginia used to have prime oyster and blue crab fisheries, but now they're in awful states," Jones notes. "Oysters are at 1 percent of their original abundance, and we may see the loss of the Virginia oyster from the Chesapeake Bay."

One proposal currently before the commission advocates introducing the Asian oyster to replenish the Virginia oyster. Jones, however, opposes this remedy. "I'm always concerned with bringing in non-natural species. It could destroy the population."

To protect and augment habitats, the commission has instituted transferable fishing quotas for commercial fisheries, but Jones is concerned about the fairness of these rations. "The question is: how do you essentially privatize a fishery and do it fairly where it's a public trust so that you meet the obligation to all Virginians?"

Even people who do not live along the coast or own a rod and reel are affected by fisheries industries, Jones asserts, adding that each resident of the state has a stake in what transpires in the Chesapeake Bay and the surrounding waters. "Every single Virginian owns Virginia's portion of the Chesapeake Bay," she says. "The farmer in Blacksburg is an owner as much as the waterman from Chincoteague. We are trying to use the resources to benefit all Virginians, not just one group."

Watermen, as well as farmers and other groups, have been impacted by menhaden, a small fish that is inedible for humans but is prey for many other species of fish. Menhaden also act as filter feeders, scooping up massive amounts of water and consuming both phytoplankton and zooplankton, which in turn, leads to cleaner water. It is also used to produce fish oil and fish meal for livestock, providing a high-protein blend of nutrients that improve growth rates.

"It is an important industry for some areas of Virginia," Jones says, adding that it is on the decline in other areas along the East Coast. "The recreational angling community would rather see that fishery barred so that menhaden is available as a prey item and not taken by humans."

However, for many watermen and recreational fishermen, menhaden is not the biggest fish story. The snakehead fish, a carnivorous alien fish with an insatiable appetite and the ability to slither short distances on land, has recently been found in waters in several U.S. states, including Maryland. Although none of these fish have been discovered in Virginia waters, Jones says the state is not immune to the unwelcome guests. "All coastal states need to be concerned about invasive species brought in through ballast water. It could happen anywhere."

From Boredom to Outstanding Virginia Scientist

Jones' appointment to the commission is not her only recent accolade. Last year, she was one of two researchers honored with the Outstanding Virginia Scientist Award, in recognition of her pioneering work in fisheries ecology. Jones is the second woman and the first scientist in the field of natural resources and fish to receive the award.

"I did not expect it at all," she says. "It gives me validation. Fisheries is very rewarding work. It can tie the very pure science together with applied science and you can see an immediate value to your work because the research can be used for management decisions."

Monitoring fish populations is a major leap for someone who, despite having a love of science, was not encouraged to pursue a career in the profession. "I grew up in a time when women weren't expected to be research scientists. I was in a teaching program, but one of my biology professors saw that I was bored and asked me to help him in his lab. It was fantastic. It taught me that to be a successful scientist, I was going to have to be interdisciplinary."

After attaining her degree in zoology from Boston University, Jones enrolled in the graduate school of oceanography at the University of Rhode Island, where she received less than a warm welcome. "I was only the third woman in the oceanography program and initially couldn't go out on research vessels."

After completing her master's degree, Jones worked for a consulting company where she realized that math and quantitative skills are invaluable tools for understanding the world. That led her to return to Rhode Island for her doctorate, with the goal of entering the fisheries industry. "In those days, fisheries was among the most mathematical."

Today, fisheries as a specialty area within biology is slowly growing at Old Dominion, with about 20 undergraduate and graduate students assisting in research at the university's Center for Quantitative Fisheries Ecology, which Jones heads. "Fishery science is very demanding to do well, but this work is likely to impact science in Virginia," she says. "Persistence is probably more important than brilliance. Having a love for it helps because just loving it deep down inside is going to get you through all the difficult times."

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