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Male Bass in Potomac Producing Eggs

Pollution Suspected Cause of Anomaly in River's South Branch

By David A. Fahrenthold
Washington Post Staff Writer
Friday, October 15, 2004; Page A01

MOOREFIELD, W.Va. -- The South Branch of the Potomac River is as clear as bottled water here, where it rolls over a bed of smooth stones about 230 miles upstream from Washington. But there is a mystery beneath this glassy surface.

Many of the river's male bass are producing eggs.

Scientists believe this inversion of nature is being caused by pollution in the water. But they say the exact culprit is still unknown: It might be chicken estrogen left over in poultry manure, or perhaps human hormones dumped in the river with processed sewage. Chances are, it is not something that federal and state inspectors regularly test for in local waters.

The discovery has made the South Branch the latest example of an emerging national problem: Hormones, drugs and other man-made pollutants appear to be interfering with the chemical signals that make fish grow and reproduce.

While researchers look for answers in West Virginia, other scientists are testing Rock Creek, and another group is seeking financial support to test the rest of the Potomac to see whether they can find the same troubling effects downstream.



"Whatever's doing this to the fish may be the canary in the



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mineshaft," said Margaret Janes, a West Virginia activist with the Appalachian Center for the Economy and the Environment.

Scientists say it's still too early to tell what these findings will mean for the bass population in the South Branch; they aren't sure whether the affected males are still able to reproduce. And no one is aware of any effects on human health in the Potomac watershed.

But scientists believe that fish might be the first to absorb any dangerous chemicals that might later affect humans.

"They're likely to be hit first," said Mike Focazio, a researcher with the U.S. Geological Survey. "We look there, and it seems to be happening."

The situation in West Virginia was discovered by accident, when scientists from the state and the geological survey were called in to investigate reports that fish in the South Branch were developing lesions and dying en masse.

They dissected dozens of bass caught last summer, mainly smallmouth bass. They found no obvious cause for the lesions or deaths, but did discover that 42 percent of the male bass had developed eggs inside their sex organs.

The study surprised scientists. Though the South Branch has been cited for problems with bacteria from poultry manure, state officials said it did well on most aspects of water-quality testing.

"We always have, and still do, look at this as one of our highest-quality fisheries," said Patrick Campbell of the state Department of Environmental Protection. "It's counter-intuitive to think we would have this type of problem out there."

But the problem is there: A follow-up survey in the spring found even higher rates of "intersex" bass -- as the affected males are called. A study of 66 male smallmouths from the South Branch found that about

79 percent showed such symptoms, according to U.S. Geological Survey data.

The scientists are now analyzing water samples from the South Branch and the Cacapon River -- a nearby Potomac tributary where intersex bass were also found. The chemicals they're looking for now are not the well-known pollutants that the state already tests for, such as nitrogen and phosphorus from manure and metals from mine runoff.

Instead, the culprit is probably in a class called "emerging contaminants," which includes everything from caffeine and prescription drugs to hormones excreted by livestock or humans.

Some of these pollutants have been linked to developmental problems in wildlife. Scientists believe that fish, especially, absorb hormones from other animals, as well as other chemicals that their bodies mistake for hormones.

One recent study near sewage plants in Colorado found male fish whose bodies were trying to produce eggs and some females whose reproductive systems were out of sync. Other studies have found similar effects from the hormones in cow manure and from chemicals from a wood-pulp plant.

"It is certainly an alarming situation that we're seeing more and more gross effects," said David O. Norris, a professor who worked on the Colorado study.

These emerging contaminants were hard to detect without the finely tuned equipment developed recently. The first nationwide survey, conducted in 1999 and 2000, found hormones in about 37 percent of the streams surveyed and caffeine in more than half.

The only testing in the Potomac, done in Washington in 2002, found low levels of caffeine, plus the insecticide DEET and chemicals produced when a body breaks down nicotine. There were also a few suspected endocrine disruptors, including chemicals found in hand soap and household cleaners.

As of now, little is done to test for these chemicals -- either in river water or in drinking water. The U.S. Environmental Protection Agency has not set standards, saying more research is needed to determine which contaminants are harmful and what levels are unsafe.

West Virginia, Virginia, Maryland and the District do not test river water regularly for drugs or hormones. The same goes for drinking water after it is processed by the Washington Aqueduct, supplying the District, Arlington County and Falls Church, and the Washington Suburban Sanitary Commission.

Still, the West Virginia study has spurred scientists to look for more information. Researchers at the U.S. Fish and Wildlife Service are seeking money for a much larger study across the Potomac watershed. They want to look for intersex bass and potentially disruptive chemicals in sites including the Blue Plains sewage plant in Southwest Washington.

Another federal study is underway in Rock Creek, looking for intersex symptoms and other health problems in a species of fish called white suckers.

Scientists across the region stressed that their work is just beginning. "We really don't know what's going on," said Vicki S. Blazer, a researcher for the geological survey in West Virginia.

Abnormal Fish Found Closer to Washington

Waste Suspected in Egg-Bearing Males

By David A. Fahrenthold
Washington Post Staff Writer
Sunday, December 19, 2004; Page C01

Male fish that are growing eggs have been found in the Potomac River in Maryland, a federal scientist said last week -- indicating that a troubling pollution mystery in West Virginia has spread downstream toward Washington.

Nine male smallmouth bass, taken from the Potomac about 60 miles from the District, were found to have developed eggs inside their sex organs, said Vicki S. Blazer, a scientist overseeing this research for the U.S. Geological Survey.

News of the abnormal fish comes as authorities in West Virginia -- where the fish problem was first noticed in a Potomac tributary -- are investigating whether there is a link to higher rates of certain cancers in people there.

In both places, authorities say the Potomac's problems are likely related to a class of common but little-understood pollutants.

These are spewed out by sewage plants, feedlots and factories, and they apparently are able to interfere with the natural hormone systems that guide all animals' development.

"It's certainly something to be concerned about," said Jim Cummins, director of living resources for the Interstate Commission on the Potomac River Basin. "You don't want to see this kind of change in the biology."

The abnormal Maryland fish were caught near Sharpsburg in Washington County. Blazer, who works at a federal fish lab in West Virginia, said she examined their tissues on slides last week.

"They all have intersex," Blazer said, using the scientific term for a condition in which animals have both male and female elements.

The same symptoms had previously been found about 170 miles farther upstream, in the South Branch of the Potomac in Hardy County, W.Va. Blazer and other scientists discovered the problem there last year as they sought a reason for a rash of mass fish deaths.

Officials are still awaiting the results of water-quality testing that might point to a specific chemical behind the fish problems, Blazer said.

"It certainly indicates something's going on," Blazer said of the new findings in Maryland. "But what, we don't know."

U.S. Fish and Wildlife Service researchers are seeking money for a much larger study across the Potomac watershed.

Similar problems have been found in other types of fish across the country, and scientists believe many of them are caused by pollutants called endocrine disruptors, which short-circuit animals' natural systems of hormone chemical messages.

There turns out to be a vast universe of pollutants capable of driving a hormone system haywire. Some are hormones themselves -- human estrogen from women taking birth-control pills, which can pass through sewage plants untouched, or animal hormones washed downstream with manure. In Hardy County, officials were especially concerned about chicken waste from poultry farms.

Others are hormone "mimics" -- industrial chemicals or factory byproducts which confuse the body because they are chemically similar to natural hormones.

These pollutants are often found in very low concentrations, so until recently no equipment could detect them. But the first nationwide survey in 1999 and 2000 found hormones in about 37 percent of the streams tested.

Many scientists are concerned that people, as well as other animals, might be affected.

"It's not good news that there's something that feminizes male fish in your water," said Gina Solomon, a senior scientist at the Natural Resources Defense Council.

But the Environmental Protection Agency has not set standards for many of these pollutants. Because of this, many drinking-water plants make no special efforts to remove them.

Washington area drinking-water providers said they did not believe that the pollutants presented a problem to their customers.

"As more evidence shows up of other life forms changing, we need to look at the treatment process to make sure it protects the humans," said Tom Jacobus, general manager of the Washington Aqueduct, which supplies the District, Arlington County and Falls Church. "Right now, we think it does."

But the new concerns about cancer in West Virginia underscore how much uncertainty still surrounds these chemicals.

A recent survey of cancer in Hardy County -- where some residents get drinking water from the South Branch -- found rates of cancer of the liver, gallbladder, ovaries and uterus that were higher than the state average.

All four cancers can in some cases grow faster in the presence of estrogen or chemicals that mimic it, cancer experts said. That potential hormone connection made researchers think of the area's abnormal bass.

"It is at least theoretically possible that those two concepts are worth thinking about side-by-side," said Alan Ducatman, chairman of the Department of Community Medicine at West Virginia University.

Scientists in West Virginia are quick to urge caution about their research. For one thing, no similar cancer rates have been discovered downstream in Maryland or Virginia.

For another, the population of Hardy County is so small -- about 13,000 -- that it's a poor sample from which to discern cancer trends. What appears to be a higher-than-average rate of the disease could be a statistical fluke, scientists said.

"It's not so much we've got answers," said Pat Colsher, director of a state cancer-data clearinghouse called the West Virginia Cancer Registry. "It's that we've got

some questions."

So far, the scientists' concerns have generated little public outcry in rural Hardy County, where many work in the poultry industry. Phoebe Heishman, publisher and editor of the weekly Moorefield Examiner newspaper, said that when people hear about the abnormal bass, "It's just like, 'So?' "

"There's no way that we have drawn a direct line from fish to cancer," Heishman said. "Until that happens, there's no way that people are going to get upset about it."

But a few people are worried. Jan Hawse, an employee at a middle school, said she was alarmed by news about the bass and switched from tap to bottled water.

Hawse said she thinks about her father, Robert Hartman, who died five years ago of cancer that probably began in his gallbladder or bile duct.

She wonders now whether something really is in the water.

"If that is the case, then I'm afraid it's too late for me," Hawse said. "I've lived here too long."

Male fish bear eggs in Potomac

Sewage or factory effluent may be cause of 'intersex' abnormality

Tuesday, December 21, 2004 Posted: 10:14 AM EST

SHARPSBURG, Maryland (AP) -- Male fish that are growing eggs have been found in the Potomac River near Sharpsburg, a sign that a little-understood type of pollution is spreading downstream from West Virginia, a federal scientist says.

The so-called intersex abnormality may be caused by pollutants from sewage plants, feedlots and factories that can interfere with animals' hormone systems, The

Washington Post reported Sunday.

Nine male smallmouth bass taken from the Potomac near Sharpsburg, about 60 miles upstream from Washington, were found to have developed eggs inside their sex organs, said Vicki S. Blazer, a scientist overseeing the research for the U.S. Geological Survey.

Authorities say the problems are likely related to a class of pollutants called endocrine disruptors, which short-circuit animals' natural systems of hormone chemical messages.

Officials are awaiting the results of water-quality testing that might point to a specific chemical behind the fish problems, Blazer said.

"It certainly indicates something's going on," Blazer said of the new findings in Maryland. "But what, we don't know."

The Potomac River is the main source of drinking water for the Washington metropolitan area and many upstream communities. It provides about 75 percent of the water supply to the 3.6 million residents of Washington and its Maryland and Virginia suburbs.

Blazer, who works at a federal fish lab in Leetown, West Virginia., said she found the latest abnormalities last week while examining tissues from fish taken from the river near Sharpsburg.

The same symptoms had previously been found about 170 miles upstream, in the South Branch of the Potomac in Hardy County, West Virginia.

Blazer and other scientists discovered the problem there last year while investigating a rash of mass fish deaths.

U.S. Fish and Wildlife Service researchers are seeking money for a much larger study across the Potomac watershed.

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pollutants capable of driving a hormone system haywire. Some are hormones themselves -- such as human estrogen from women taking birth-control pills or animal hormones washed downstream with manure -- that can pass through sewage plants untouched.

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