



# The Conservation Strip

CONSERVING NATURAL RESOURCES FOR A BETTER ENVIRONMENT

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## Fish Kills, Girlie Fish, and PPCP's

By Chuck Hoysa,  
Conservation Education Specialist

Fish kills have been occurring the last three springs in parts of the Shenandoah River system, and reports of fish kills have already surfaced from the spring of 2007. Despite the efforts of state agencies from Virginia, West Virginia, and Maryland, and the assistance of federal partners, no cause has been pinpointed, yet.

As scientists looked for causes, they dissected fish and examined tissues and organs under the microscope. To their surprise, they discovered that some of the male fish exhibited female traits (girlie fish). Male smallmouth bass were found to have sex organs that contained sperm as well as immature eggs. They were also producing a material called vitellogenin, which is an egg yolk producer typically found in female fish. These fish are called inter-sex fish, and they have made the headlines in newspapers around Virginia, Washington D.C., and much of the nation.

Inter-sex fish have been documented throughout the Potomac/Shenandoah watershed, with some local areas approaching 100% of smallmouth bass exhibiting male/female characteristics. Largemouth bass and other species are affected to a lesser extent. Scientists are not sure if there is a connection between the fish kills and the inter-sex fish, but the possibility is being explored.

The Potomac/Shenandoah watershed is not the only area experiencing the phenomenon. Inter-sex fish have been found in recent years in Florida, Minnesota, Colorado, California, Europe, and China. They have been found in both fresh and salt water environments. Chemical pollutants are suspected, and one large cate-

gory that is being scrutinized are pharmaceuticals and personal care products (PPCP's).

With almost 3 billion prescriptions filled on an annual basis, Americans flush tons of medications and personal care products down toilets and drains. Many of these products pass right through sewage treatment plants into our streams and rivers. Birth control products, Prozac, Tylenol, and a host of other products can be found in water and fish samples.



Smallmouth bass are most likely to exhibit inter-sex characteristics. There are no external clues a fish is inter-sex, it takes a microscopic examination of sex organs to determine the condition. Photo from Sonoma County Water Agency

Many of these products are known endocrine disruptors. Endocrine disruptors mimic estrogen and distort

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# Great Run, Carter Run, Thumb Run, and Deep Run TMDL Implementation Plan

By Melissa Hooper, TMDL Specialist

## What is TMDL?

TMDL or Total Maximum Daily Load is the maximum amount of pollutant a water body can assimilate without surpassing state water quality standards. If a body of water surpasses the standard 10.5% of the time during an assessment period, the water body is placed on Virginia's Section 303(d) List of Impaired Waters.

## Are water bodies in Fauquier County designated as "impaired" or TMDL waters?

Yes, among others, Great Run, Carter Run, Thumb Run, and Deep Run are listed on Virginia's Section 303(d) List of Impaired Waters. These four watersheds also have an Implementation Plan underway.

## What is a TMDL Implementation Plan?

The TMDL implementation process for these four watersheds included a study to determine the non-point sources of bacteria such as livestock, humans, pets, and wildlife. The study also identified needed reductions to meet Virginia's water quality standards and specific strategies to prompt these reductions. Throughout the process, developers utilized methods (i.e., public meetings, focus groups) to inform residents, determine concerns, seek input, and provide guidance.

## What types of bacteria are monitored?

The type of bacteria monitored is Fecal Coliform Bacteria (FCB). It originates from the intestines of warm-blooded animals such as humans, livestock, and wildlife. Higher levels of FCB in impaired waters may indicate the presence of dangerous viral and bacterial pathogens.

## What steps must be taken to meet water quality standards in Great Run, Carter Run, Thumb Run, and Deep Run?

The TMDL implementation plan outlines several methods to meet water quality standards. Methods include:

- Excluding most/all livestock from streams,
- Reducing non-point sources loads on pasture and cropland in the watersheds,
- Identifying and correcting all straight pipes and failing septic systems,
- Reducing pet bacteria loads on residential lands, and
- Reducing wildlife bacteria loads.

## What is John Marshall Soil and Water Conservation District's role in the TMDL implementation plan?

In a cooperative effort, John Marshall SWCD and the Virginia Department of Health (VDH) are responsible for designing and implementing an outreach campaign to increase awareness of TMDL implementation goals. To date, the cooperative effort has provided an informative letter explaining the TMDL program to over 4,000 residents in these impaired watersheds. Over 4,000 residents also received a water quality fact sheet. Additional outreach efforts included windshield surveys and stream walks to identify specific problem areas. Many landowners have expressed interest in the installation of conservation practices to improve water quality in these watersheds. One of the more effective practices to address bacteria associated with livestock operations focuses on developing an alternative water source and fencing out livestock from streams. This practice eliminates the direct deposition of bacteria into the stream. Currently, John Marshall SWCD is working with over 10 landowners on projects to install practices in Great Run, Carter Run, Thumb Run, and Deep Run. VDH is interested in working with residents to evaluate and repair failing septic systems, and pump out septic tanks. The cooperative effort will continue to develop outreach methods to increase awareness of TMDL implementation goals.

For information on practices for agriculture operations, please contact John Marshall SWCD at (540) 347-3120 ext. 3. For information on evaluating and repairing septic systems, please contact the Fauquier County Health Department at (540) 347-6363 ext. 107.

## USDA's Conservation Reserve Enhancement Program (CREP)

## John Marshall's Newest Employee

The end of December 2007 marks the final days of the USDA's CREP as we know it. This is when the current farm bill is scheduled to expire and with it any authorization for new CREP contracts.

Many hope this program will be reauthorized but that is not yet known. What is known is that USDA has a great interest in getting contracts signed before that date. Currently there are signing bonuses (\$10/ac/yr), rental payments (about \$73/ac/yr), cost share (50% of costs), practice incentives (40% of costs), State tax credits (25% of cooperator costs), and a newly increased CREP easement option (\$500-\$1000/ac).

If you have been considering creating riparian buffers on your farm this may be the last chance to have CREP play a roll in that. It many cases it has proven to be the most cost effective state or federal program used for protecting water quality through stream fencing and developing alternative water systems for livestock. For more information contact your local USDA/Natural Resources Conservation Service representative at (540) 347-3120 x 3. The office is located at 98 Alexandria Pike in Warrenton, in the high rise building next to the DMV.

Heather Ambrose is John Marshall's newest E&S control specialist. Heather recently relocated from northern California. She received her B.S. in Biology from Virginia Tech in 1999. In 2003 she received her M.S. in Fisheries Biology from Humboldt State University in northern California, where she has spent the last few years re-searching Pacific salmon and water quality on the Trinity River.



Heather lives in Middletown, Virginia with her husband Brent, and her two dogs, Marley and Bandit. During her free-time she enjoys running, rafting, gardening and creating mosaic art.



Fencing streambanks, planting riparian buffers, and developing alternative watering systems have proven beneficial for water quality and livestock health. These practices are part of the CREP program and interested landowners should contact the local NRCS office soon if they wish to participate.

## Potomac Forum August 10, 2007

Mark your calendars for Friday, August 10 to attend the Potomac Forum V at George Mason University in Manassas. This year's theme is "Conserve Land to Conserve Water".

Topics for the day include Tools For Open Space Preservation, Easements, Purchase of Development Rights, Low Impact Development, and Public/Private Collaborations.

The Forum, which runs from 9:00 am to 3:00 pm is designed to be of interest to representatives of local governments, environmental organizations, private industry, and interested citizens.

Registration information and brochures should be available by early July. Contact the John Marshall SWCD for more details.

## Successful E&S Workshop

On May 31, 2007, the John Marshall Soil and Water Conservation District (JMSWCD) held an erosion and sediment control plan development workshop. The workshop provided an opportunity for the JMSWCD staff to present the new erosion and sediment control checklist that will be required with all plan review submittals from local developers and engineers. The county engineer led a discussion on plan amendments, revisions and variances. In addition, the Department of Conservation and Recreation (DCR) gave a presentation on the Virginia Stormwater Management Program.

The workshop was funded in part through a grant with funding from the Environmental Protection Agency's Chesapeake Bay Program through the Virginia Department of Conservation and Recreation. The main purpose was to develop a better working relationship between engineers, developers and the district in working towards common goals in conjunction with erosion and sediment control plans. Improved erosion and sediment control plans and the implementation of these plans, will lead to better water quality.

Mission accomplished! More than forty people took part in the workshop. There were some excellent questions, comments, food and door prizes. Thanks to all who participated.



Marian Carroll of the Department of Conservation and Recreation made a presentation on the Virginia Stormwater Management Program.

## Third Grade Farm Tours



Over 800 students, teachers, and chaperones toured local farms on April 26 and 27. Here they visit the barn and tractors at Inglewood Farm in Bealeton.



Numerous volunteers and agency professionals made the event possible. Jim Sawyer, Fauquier County Soil Scientist, instructed students at Blue Ridge Farm in Upperville.



Morgan Ott brought beef and dairy animals to Inglewood Farm.

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the hormonal signals in fish. Wild fish and captive fish exposed to these chemicals have developed sex abnormalities. Endocrine disruptors can also affect other body functions such as thyroid and immune systems.

Most of the dead and dying fish associated with recent fish kills exhibit skin lesions. At this time, there is no direct correlation between the fish kills and the inter-sex fish, but scientists are studying the effects of chronic stress and fish immune systems.

A recent study in Colorado found inter-sex fish common below two different sewage treatments plants, and virtually absent above the plants. Scientists in West Virginia found traces of chemicals used in plastics, flame retardants, and banned pesticide products in water samples. Some of these products can also mimic estrogen. Manure of farm animals that is spread as fertilizer also contains estrogens and traces of antibiotics. The fact that so many sources of potential pollutants have been identified makes pinpointing the cause of inter-sex fish and/or fish kills a daunting task.

Most of the streams and rivers that produce inter-sex fish pass all normal water quality tests and many serve as sources of drinking water. The chemicals in question occur at very low levels, usually in parts per billion or trillion. The technology to measure these levels did not even exist until recent years. Despite these very low levels, scientists are concerned because some of the products are very powerful endocrine disruptors and the fish are exposed to them constantly.

While it is relatively easy to test an individual chemical, there are a host of potential compounds that could form once all these products enter our waterways. These compounds could also be influenced by water chemistry, temperature, stream flow, and a host of other natural or man-made stressors.

For anyone who regularly fishes in the Potomac/Shenandoah watershed, there is no way of knowing if any fish caught are inter-sexed. It takes a microscopic examination to determine these traits. It is not known how long inter-sex fish have been around, because they were not looked for or known until the recent fish kills.

Although research around the country has shown that inter-sex fish produce fewer, and less mobile sperm, biologists from the Virginia Department of Game and Inland Fisheries have documented above average spawning success in the Shenandoah for smallmouth bass the last two years. There is no data to suggest that inter-sex fish are unsafe to eat.

The Shenandoah River Fish Kill Task Force was formed to concentrate studies on the fish kills. It includes scientists from the Virginia Department of Environmental Quality, Department of Game and Inland Fisheries, state universities, and local citizen and angler groups. Citizens can help by reporting fish kills on the Shenandoah River or its tributaries to the Department of Environmental Quality at 1-800-592-5482, or online at [fishreports@deq.virginia.gov](mailto:fishreports@deq.virginia.gov).

***The Conservation Strip*** is a quarterly publication of the **JOHN MARSHALL SOIL AND WATER CONSERVATION DISTRICT**, 98 Alexandria Pike, Suite 31, Warrenton, VA 20186

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# 2007 Virginia Waterways Cleanup

Every October, for the past several years, the John Marshall SWCD staff has participated in the Virginia Waterways Cleanup. The Cleanup is part of a larger event known as the International Coastal Cleanup. Groups all around the nation pick up litter on beaches, in estuaries, and along inland rivers where much debris originates.

In 2006, over 4,000 volunteers collected 151,000 pounds of litter in Virginia. The staff of John Marshall SWCD picks up litter along the Rappahannock River where it is crossed by Rt. 802 (Springs Road). Each year, numerous garbage bags are filled with cups, bottles, cans, and food packaging. In addition, there are usually a few tires and other large items tossed in the nearby woods. Unfortunately, about the same amount of litter is picked up each year.

As volunteer groups pick up litter, they usually divide into groups of two or three. One person serves as a recorder and uses a checklist to record the number and types of litter found. This information is all turned in to the cleanup coordinators and the data is analyzed and used to develop litter reduction strategies.

In Virginia, the cleanup is coordinated by Clean Virginia Waterways, a nonprofit organization affiliated with Longwood University in Farmville. They provide garbage bags, data sheets, and full instructions. Anyone who wants to form a cleanup group can learn more about the program and even register at their website at <http://www.longwood.edu/cleanva/index.htm>. Although they usually set a date for the annual cleanup, groups have the flexibility to set a date that suits their schedule in September or October.

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