FOSR
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FRIENDS OF THE SHENANDOAH RIVER
WE ALL LIVE DOWNSTREAM

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## Frances Ann Clarke Endicott

Fran Endicott, a past President and long time Member of the Board of Directors of the Friends of the Shenandoah River, died on October 13 at her home on Calmes Neck at the age of 89. Fran had lived at Calmes Neck since 1975 where she worked ceaselessly to protect the Shenandoah River and its natural surroundings.

Perhaps her greatest accomplishment among many for the River was securing State Scenic River Status from the Virginia General Assembly covering the main stem from the Clarke County border downstream to Lockes Landing initially and then securing an extension to the West Virginia Border, all of this with close friend and General Assembly Delegate Andy Guest. She chaired the initial Shenandoah State Scenic River Advisory Board.

Known as "the lady who keeps calling about the river," Fran received many awards for her efforts including the Governor's Environmental Stewardship Award, the Piedmont Environment Council Conservation Award and the Pierce Conservation Award from the Northern Shenandoah Valley Audubon Society. She was the inaugural recipient of the annual Andy Guest Conservation Award from the Friends of the Shenandoah River.

We will all miss the benefits of Fran's vigorous protection of the River she loved so much.

Memorial contributions may be made to the Fran Endicott Endowment Fund, Friends of the Shenandoah River, 1460 University Drive, Winchester, VA 22601.

## Executive Summary Excerpts of Final Report of the Status of Water Quality in the Shenandoah River Watershed – funded by the Robbins Foundation

**prepared by Charles Vandervoort (see full report at www.fosr.org)**

The Shenandoah River is endangered. This has been reported widely in the local press, national newspapers, and by environmental organizations such as American Rivers and the Chesapeake Bay Journal. The causes are high runoff of pollution from farms and urban areas, as well as over-burdened sewage treatment plants. Fish-kills are an immediate and severe problem.

With support from the Robbins Foundation, the FOSR since 2002 has prepared a report on the health of the river for each county in the Shenandoah River Watershed. This report updates the earlier reports and addresses the water quality for the entire Shenandoah River Basin.

On the basis of established criteria it was found that many sections of the River and its tributaries were highly polluted. These findings support the statement that the Shenandoah River is endangered now and suggest worsening conditions in the future without substantially increased corrective measures. Given these conditions, phenomena such as the fish kills and the Shenandoah River watershed's contribution to

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eutrophication of the Chesapeake Bay come as no surprise.

A major source of pollution is runoff from urban and agricultural areas during periods of heavy precipitation where receiving streams are not protected by vegetated or forested buffers and/or other protective measures. Development projects that disturb land without adhering to best management practices (BMPs) are a major source of sediment. Cattle in streams contribute to stream bank erosion and grind up stream beds as well as add manure with its nutrients and oxygen demand directly to the stream. Runoff from agricultural land contributes both nutrients and sediments to surface waters.

Progress is being made in some areas. Factors helping to improve water quality include:

1. Virginia now requires all wastewater treatment plants with a daily capacity of 500,000 gallons or more to upgrade their discharges to "BNR" standards by 2010.
2. Virginia is providing substantial funding to help in reducing non-point sources of pollution from agriculture, and by proceeding with the Total Maximum Daily Load (TMDL) program.
3. Conversion of forest land to agricultural and urban development use is slowing.
4. Movement towards collaborative partnerships and pooling of resources among the many watershed organizations is increasing.
5. Advances in water resources planning should help.

Other factors continue to impose water quality problems in the Shenandoah Valley.

1. Growing urbanization and slow adoption of measures for environmentally friendly development.
2. Although almost all communities in the Shenandoah Valley have adequate laws to control soil erosion, there are too few inspectors to monitor and enforce these laws.
3. It is not sufficiently appreciated that forests provide many valuable services such as climate regulation, erosion control, absorption of carbon dioxide, oxygen generation, and recreational opportunities. Although there are measures that can make the economic benefits of improving the environment explicit to farmers, developers, or households, such measures are difficult to make operational.

Action Priorities. One cannot go wrong by concentrating on the worst problems.

1. The North River and the North Fork of the Shenandoah River.
2. Cleaning up the seven most impaired tributaries at: Muddy Creek – North River (JR01), Pleasant Run – North River (JR10), Long Glade Creek – North River (JR06), Cooks Creek – North River (JR07) , Mill Creek – Page County (FP13), Christians Creek – Augusta County (GA290, and Wheat Spring Branch – Clarke County (FC32).

## SUPPORT FROM SENATORS

Two State Senators receive special thanks from FOSR. Senators Russ Potts and Emmett Hanger carried the day in the General Assembly in 2007 in securing funding for the special replacement equipment FOSR needs to measure water quality from samples collected by its volunteers. These special funds will pay for a new Lachet machine to process 30 water samples at a time to measure levels of nitrate, ammonia and phosphate. The $65,000 appropriated for this purpose will allow replacement of worn out similar equipment secured in 2000 with the help of Delegate Joe May. At the request of the Department of Environmental Quality the new equipment will also measure total nitrogen and phosphorus. We deeply appreciate the recognition provided by General Assembly representatives for our important water quality monitoring work.

## STATUS OF THE FISH KILLS

by Jeff Kelble

Well, we haven't had indications of any fish kills since last spring. In the meantime Virginia's Fish Kill Task Force has been working on quite a few projects. Among the most pressing right now is fundraising as we're not getting very strong funding signals even from our State's General Assembly. The Task Force is trying to leave no stone unturned for private funding as members approach the large businesses in the Valley which have effects on water quality. We were pleased to see the Poultry Federation already donate tens of thousands and among others in consideration are Merck, Coors and Invista. We're also in the process of courting local and national foundations.

The Fish Kill Task Force convened on Wednesday, December 12th, for the first meeting in quite a number of months. Since the last meeting when committees were developed for science and fundraising among others, committees have been actively planning. Quite a few ongoing studies are still running including Virginia Tech's Macroinvertebrate Study, USGS' Histopathological Study, Virginia Department of Game and Inland Fisheries' populations survey, and passive chemical sampling by Friends of the North Fork and USGS. Several of these studies are quite cumbersome and complex with progress reports expected during upcoming meetings.

On a new front, the Task Force's Research Advisory Committee has recommended a complex array of new studies designed to drill down to the core of the problem:

*Eco-toxicants work will examine the complex array of toxic substances found in the river and try to determine which ones our affected rivers have in common. This will assist in developing lab exposure studies among other things. (Ed. Note: in case you thought this would be simple, the following are the toxic substances to be investigated:

***Organochlorine Pesticides and PCBs* *** Polycyclic Aromatic Hydrocarbons (PAHs)**** Agricultural Pesticides**** Wastewater Indicator Chemicals* *** Pharmaceutcals*Trifluralin Naphthalene EPTC Tetrachloroethylene 1,7-Dimethylxanthine Hexachlorobenzene Acenaphthylene Trifluralin Bromoform Albuterol Pentachloroanisole Acenaphthene Desisopropylatrazine Isopropylbenzene (cumene) Acetaminophen-enzenehexachloride Fluorene Desethylatrazine Phenol Caffeine Diazinon 1,4-Dichlorobenzene Lindane Anthracene Prometon *** d*-Limonene Codeine -Benzenehexachloride Fluoranthene Simazine Acetophenone Cotinine Heptachlor Pyrene Atrazine *** para*-Cresol Dehydronifedipine-Benzenehexachloride Benz[a]anthracene Propazine Diazinon Camphor Diphenhydramine Chlorpyrifos Benzo[b]fluoranthene Terbuthylazine Menthol Sulfamethoxazole Oxychlordane Benzo[k]fluoranthene Fonofos Methyl salicylate Thiabendazole Heptachlor Epoxide Benzo[a]pyrene Acetochlor Dichlorvos Trimethoprim ***trans*-Chlordane Indeno[i,2,3-c,d]pyrene Alachlor Isoquinoline Warfarin ***trans*-Nonachlor Dibenz[a,h]anthracene Metribuzin Indole ***o,p'*-DDE Benzo[g,h,i]perylene Prometryn ***N,N*-diethyltoluamide (DEET) ***cis*-Chlordane Endosulfan 2-methylnaphthalene Ametryn 4-***tert* -Octylphenol ***p,p'*-DDE 1-methylnaphthalene Methyl Parathion Benzophenone Dieldrin Biphenyl Terbutryn Tributyl phosphate ***Hormones* ***o,p'*-DDD 1-ethylnaphthalene Malathion Ethyl citrate 17-Estradiol Endrin ***trans*-Permethrin Benzo[e]pyrene Traseolide (ATII) Total PCB Perylene Galaxolide (HHCB) Tonalide (AHTN) Carbaryl Metalaxyl Bromacil Anthraquinone Chlorpyrifos Tri(dichloroisopropyl) phosphate Tri(butoxyethyl) phosphate Triphenyl phosphate Diethylhexylphthalate (DEHP) Cholesterol and about 100 more)

* Biological Pathogens work will continue and narrow the search for primary biological agents which could be at the root of the problems.

* A Geospatial Data Portal will be developed to archive and selectively distribute a complex and growing database of information related to the fish kills.

* Finally a Causal Analysis study will be conducted to determine if Shenandoah, Upper James River and Upper Potomac Fish Health problems are related.

Stay tuned Friends!

## WHO WE ARE

This column is an introduction to our readers of the backgrounds of FOSR monitors, staff and Officers/Directors. We begin with the monitoring team from Clarke County led by Charles Vandervoort.

Robert S. Friedensen. I have lived in Clarke County for close to twenty-five years, on the mountain above the Shenandoah River. I restore 18th and 19th century furniture. I developed a love for fish and fishing on Long Island Sound. In my late forties I took up fly fishing which led me to the Winchester Chapter of Trout Unlimited and later to FOSR. I became a monitor about six years ago. I find it tremendously rewarding no matter what the weather may be, and more important all the time, especially in light of the many fish kills we have experienced in recent years.

Terry Lay. As a native of Washington State, I have long been conservation minded. I am particularly fond of taking kayaks and canoesonto large and small bodies of water and have been on offshore ocean and white water river trips from Alaska to Florida. 10 years ago I "escaped" from the greater Reston, Virginia area and moved to Clarke County, where I happily settled on a Shenandoah River front property and first learned of FOSR. I was glad to be invited to join the monitoring group and have an opportunity to help protect and preserve this magnificent and irreplaceable natural resource.

Tim Lawrence. I have been a river monitor since 1997. I moved to Winchester in 1996, and fell in love with the natural beauty of the Shenandoah River. When I travel through the Valley, I recognize what a masterpiece it truly is. Growing up in Galax, Virginia, I was lucky to be able to enjoy the New River. The Shenandoah helped me to overcome my feelings of homesickness. Dan Frese took me for a drive one day. At the time I didn't realize he was recruiting me to become a monitor. He was taking samples and showing me the creeks and streams. When we began to see heron, osprey, and eagles, I was hooked. If I wanted to protect those beautiful creatures, I needed to do my part. As someone who loves to raft, fish, and canoe, I knew that I needed to help take care of the river that was giving me so much enjoyment. Every time I collect water samples I see something magnificient. I certainly haven't been disappointed by the experience. Even though I have fallen in creeks chasing buckets, driven numerous miles, and frozen to death on different occasions, the experience has given me a sense of satisfaction that is hard to match.

Bud Nagelvoort. Black water from a car battery factory flowing into my favorite Smallmouth Bass river in 1950, living on a lake that received partially treated sewage and turned green every summer with algae, forty square miles of thick algae in the middle of Lake Erie - all this and more stirred my interest in clean water. Involvement in politics allowed me to help in the development of the Clean Water Acts of 1972 and 1977. Moving to the River bank near Berryville in 1988 I saw the Health Department fish advisory at Lockes Landing and learned about Avtex. Fran Endicott enticed me to the FOSR Board. Monitoring evolved under Meryl Christiansen's leadership. I'm pleased to encourage the use of FOSR data by the Lord Fairfax Soil and Water Conservation District in its non-point source pollution control efforts.

Charles Vandervoort. I have a wife who is my monitoring partner, and children with jobs with considerable environmental content in Colorado and Texas. I am a development economist and work mostly overseas related to infrastructure development and trade. In 2000 we built a house at Calmes Neck overlooking the River. In my years of working overseas I saw how decades of neglect of the health of the rivers resulted in their biologically "death." In 1975 the Rhine had deteriorated to where it was called the "sewer of Europe" and it took more than twenty years to restore. Monitoring the water quality in the Shenandoah River is an essential step to correct degradation of the river.

Mark Zimmerman. My wife and I moved to this lovely area from North Carolina in the summer of 2003, and I was immediately struck by the beauty of the Shenandoah River. After learning of the FOSR group and its work, and becoming aware of the fish kills in the river system, I joined the Clarke County monitoring team three years ago. I enjoy all types of fresh water and saltwater fly fishing. I'm also an active member of the Winchester VA TU chapter, and Vice President of Education/Outreach on the Virginia State Council of TU. This fall, I was involved with establishing a "Trout in the Classroom" program in four area schools, where teachers and students are raising brook trout. The trout fry will be released in Redbud Run, in Frederick County, next spring.

## FOSR/FNFSR PRESS RELEASE

By John Watson

State Halts Funding of Shenandoah River Citizen Volunteer Water Quality Monitoring

Twice a month, volunteers from the Friends of the North Fork of the Shenandoah River (FNFSR) and the Friends of the Shenandoah River (FOSR) and cooperating groups collect over 130 water samples that are analyzed for pollutants at the FOSR state certified laboratory. The water quality data produced is used by US EPA, the state, environmental researchers and the public to identify and track water quality in the Shenandoah River. This month, both groups received a form letter from Ellen Gilinsky, the Director of the Virginia Dept. of Environmental Quality (DEQ) Water Quality Programs, indicating that state funding for citizen volunteer water quality-monitoring programs has been suspended.

Since 1998, DEQ has provided grant funds to citizen volunteer groups ranging from $1,000 to $5,000. These state funds are critical to defraying the costs of monitoring equipment, laboratory supplies, training, and sample analysis. The program is a bargain for the state because the state receives valuable water quality data gathered at a fraction of the actual cost. For example, the cost to the FOSR for analyzing one sample is $40, which adds up to over $115,000 per year. This year, with the recognition of the importance of the water quality data being provided by the collaborative effort, DEQ offered the FNFSR and the FOSR a joint grant of $12,000 that has now been cut.

Both groups consider environmental monitoring to be a paramount responsibility shared by citizen monitoring groups and the state; however, while Virginia has over 50,000 stream miles, only about 20% are monitored by DEQ. Volunteer monitors play a significant role in assessing the 40,000 stream miles untouched by DEQ. In the 2006 305(b)/303(d) Integrated Water Quality Assessment Report, DEQ used data from 757 citizen monitoring sites throughout Virginia. Moreover, the Governor has mandated the increased use of volunteer water monitoring data. This year the House passed bill 1859, that set a goal for DEQ to assist volunteers in achieving 3,000 stream miles monitored by citizen groups by the year 2010. The relationship between local volunteer water monitors and the state has been a win-win relationship. Our volunteers are able to help with critical water quality monitoring and the state gets the needed data at bargain rates.

Yet this win-win relationship has turned to win-lose. The State still benefits by utilizing the data generated by the volunteer groups without providing any monetary support. Both Friends groups are looking for other sources of funds but we are now forced to develop plans to cut the monitoring program in 2008. We know of no State plan to continue this critical monitoring function. We are particularly disappointed that the funds were cut completely and with no discussions or negotiations of how the program could be preserved.

This State decision could not have come at a worse time. The Shenandoah River has been named one of the most endangered rivers in the US. Four consecutive years of fish kills remain a mystery and are still under investigation. The state is legally required to develop clean-up plans for several sections of the river that are violating water-quality standards. The state is required to cut phosphorus and nitrogen loads to address local and regional deterioration of the river and the Chesapeake Bay. We do not see how these efforts can go forward without the documentation provided by monitoring. You cannot solve water quality problems that you do not measure.

Want to help or have questions, call us or go to our websites: FOSR call (540) 665-1286 or www.fosr.org, FNFSR call (540) 459-8550 or go to http://www.fnfsr.org.

## THE SOUTH RIVER SCIENCE TEAM IS SEVEN YEARS OLD

by Bob Luce

Seven years ago, the South River Science Team (SRST) was formed by DEQ and DuPont to augment DEQ's 100-year program of monitoring mercury in the South River and South Fork of the Shenandoah River. Mercury, which had been used in a catalyst by DuPont at its Waynesboro synthetic fiber plant from 1929 to 1950, was found in the 1970's to have contaminated the South River. The 100-year

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program began mercury analyses of fish, sediments, water and the floodplain in 1990, but by 1999, it was realized that the mercury concentrations were not decreasing by natural attenuation as expected. The rather unique SRST was born from this realization. It is composed of scientists from state agencies, DuPont, academia, and citizens' groups. It plans and carries out research in a cooperative, open, and transparent manner.

One or two members of the Friends of the Shenandoah River have been to almost all of the quarterly meetings of the SRST that have been held since 2000. It is a pleasure to go to these meetings because the SRST members are competent scientists with diverse backgrounds. The presentations and discussions are stimulating and they concern the Shenandoah River. We want our organization and other citizen groups to be informed when the conclusions and recommendations of the SRST are released for public comment.

Until this past year, I was apprehensive that the SRST studies, well done as they were, might not lead to an improvement in the health of the South and Shenandoah Rivers. Early studies didn't show significant detrimental effects to biota except for fish tissue. Sampling of water and sediments revealed no source areas of highly concentrated mercury in, beneath, or adjacent to the river; rather, it is dispersed at varying low concentrations. Would the SRST conclude that mercury affected too few receptors and also that the contamination problem would be too expensive or impossible to fix?

I don't recall having heard the word "remediation" at an SRST meeting until this past year. Happily, it was used a lot at the SRST annual Expert Panel Meeting on October 10-11. Maybe this change came about because of a nudge by the NRDC, but most likely it is due to the fact that sufficient knowledge has been obtained to allow the unspoken endpoint word to be uttered. Some important findings in 2007 that contributed to this are:

Loading studies suggest that inputs of total Hg to the South River are continuous under baseline conditions, flooding can increase the amount of Hg and methyl mercury (MeHg) sorbed to particulates to100 times that at low flows, but filtered (dissolved) Hg and MeHg don't change much, MeHg concentrations increase both as dissolved and as sorbed phases in spring and early summer season. Reproductive deficits due to mercury were found for tree swallows. Other receptors under study are earthworms, amphibians, reptiles, bats and mallard ducks,

Geomorphic studies find that steep riverbanks having horizons enriched in Hg are important sources of Hg to the river. A pilot study of the effectiveness of bank stabilization as a remediation tool for the South River is beginning.

A long list of findings/working hypotheses regarding sources of Hg and MeHg, transport of Hg and MeHg, and conditions conducive for methylation, has been compiled and distributed to SRST members for their comments and suggestions. We'll keep you informed.

## 2007 Year-end Financial Reports

by Bud Nagelvoort, FOSR Treasurer

Finances of Friends of the Shenandoah River have been a minor concern in 2007 due to the loss of several funding sources during the year and late grant receipts resulting in Expenditures exceeding Income by $5,327. A statement of Income and Expenditures for 2007 is available by visiting our web page at www.fosr.org. Our budgeted Income and Expenditures for 2008 are available from the same source.

## CHESAPEAKE BAY'S CRAB POPULATION EBBS

"Harvesting the crabs is not the problem. It's what we're putting in the bay that's the problem," says Larry Simms, President of the Maryland Watermen's Association.

The following are excerpts from an article in the Winchester Star on November 22, 2007, by David A. Fahrenthold writing for the Washington Post.

"The Chesapeake Bay's famous blue crabs - feisty crustaceans that are both a regional symbol and a multimillion-dollar catch - are hovering at historically low population levels, scientists say, as pollution, climate change and overfishing threaten the bay's ultimate survivor.

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The reasons for the decline probably include climate change, because the water now is often too warm for a grass species the crabs use as shelter.

But the causes also include two problems that governments have promised - and failed - to fix.

One is the water.

Rain washes down manure, treated sewage and suburban fertilizer, which cause algae blooms that remove oxygen from the bay's water. Low-oxygen "dead zones" can kill crabs or push them out of their preferred habitat. State and federal governments promised to clean up the pollution by 2010.

Now officials admit that the effort - led by the Environmental Protection Agency - is far behind schedule. The remaining tasks are massive: stopping runoff at tens of thousands of farms, replacing hundreds of thousands of septic tanks, overhauling numerous sewage plants.

The work will cost billions, officials estimate, and much of the money is not available. 'We know what to do' to clean it up, said Ann Pesiri Swanson, the executive director of the Chesapeake Bay Commission, an advisory group of state officials from around the watershed. 'We just bloody don't have the money to do it.'"

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