

REPORTER



C. Dalpra

FORCE volunteer Peter Eriksson and ICPRB Watershed Coordinator Steve Saari get a helping hand from gravity as they roll a small appliance down a hill to a collection site during the 18th annual Potomac River Watershed Cleanup.

Thousands of Cleanup Volunteers Collect Trash, Information

It was important enough to get into raingear on a Saturday morning, don gloves, and tromp through oozing mud under sheets of rain. The goal was to rid fallow parkland and apartment complex grounds along a Rock Creek tributary of its huge burden of beer bottles, furniture, household appliances, and the range of other jetsam deposited in the area, likely by homeless people and groups who use the woods to party. The group of people working to clean up a local eyesore were among the thousands who cleaned up as part of the 18th Annual Potomac River Watershed Cleanup on April 8, coordinated by the Alice Ferguson Foundation.

Most distressing to site leader and Interstate Commission on the Potomac River Basin (ICPRB) Watershed Coordinator Steve Saari was that he and his group of volunteers from the Friends of Rock Creek's Environment (FORCE) had removed most of the trash from the area

last year during the annual Potomac River Watershed Cleanup, and here they were again. It had been just as wet and perhaps a little windier the previous year. The day before the latest cleanup, he had surveyed the large dumps of bottles strewn through the woods, often near clearings furnished with a couple old chairs and a fire ring. "We left this place pretty clean last year," Saari said. "Its hard to believe all this has happened since then."

The soggy weather kept many volunteers away from the site, but those that came collected a prodigious amount of trash. Bags of bottles and cans were joined by rarer items, including a stethoscope, a mailbox from Boyds, Md. (Anyone up there missing one?) A decades-old tricycle, a pair of boots, a Nehi cooler, and many rusting household appliances. Many of the plastic bags found were filled with other trash. "We call the people who throw these away 'neat litterers,'" Saari said. A convenient hill

Our mission is to enhance, protect and conserve the water and associated land resources of the Potomac River and its tributaries through regional and interstate cooperation.

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C. Dalpra

Force volunteer Peter Eriksson heaves another barrel on the pile for later removal.

allowed for rolling several rusting barrels and appliances down to a dirt path where they could be picked up. There was plenty of trash left over at the site, and two weeks later, students from the Washington Waldorf School of Bethesda, Md., pulled another 250 bags of mostly recyclable trash from the area. Further reclamation plans are being made among the volunteers.

Scenes similar to those along Rock Creek took place at nearly 200 sites around the Potomac watershed as part of the basin-wide cleanup, ICPRB has supported the effort as a partner organization for the last 14 years. More than 60 other sites will have been cleaned during an extended two-week cleanup period. More than 3,800 volunteers participated, collecting more than 141 tons of trash. The haul included more than a thousand tires, 72,500 recyclable containers, and nearly 12,000 plastic bags, according to data collected by the Alice Ferguson Foundation. Plastic bags were a "focus" item for this year's cleanup, which in the past has included balls, plastic barrels, and other items.

Some sites were adopted by businesses, such as Winchester Homes, in a park downstream of the FORCE site on Rock Creek. The Winchester Homes employees brought bags of trash from along the creek to be tallied under a small tent where volunteers took short breaks from the unrelenting rain. Bags and recyclables were tallied, and volunteers were asked if they found any unusual items. At that site, the prize went to someone who had found a portable digital assistant along the stream. It was, however, a relatively quick find as the unit was found to belong to another member of the cleanup crew. One volunteer noted that he found a \$100 bill the previous year. The cash was donated to the cleanup.

Elected officials also came out to join ranks with volunteers. Maryland Congressman Chris Van Hollen joined the Winchester Homes volunteers. "It was great to be out here today with so many engaged citizens who really care about having a

clean environment to live in. It is always eye-opening to see what kind of trash is landing in our community. Together, we need to keep working to eliminate this unacceptable trash issue,” Van Hollen said. Maryland Congressman Steny Hoyer and Department of the Environment Secretary Kendl Philbrick helped pick up at the Alice Ferguson Foundation Hard Bargain Farm environmental education facility, where the cleanup began 18 years ago.

Van Hollen is a strong proponent of a cleaner Potomac and chairs an overarching offshoot of the annual cleanup: the Trash-Free Potomac Initiative organized by the Alice Ferguson Foundation. The initiative, with a goal of a trash-free Potomac by 2013, has gained much support during the past year. Some 22 elected officials have signed the Potomac Watershed Trash Treaty, obligating them to focus greater resources toward a cleaner river, and to collaborate with one another to find answers. The foundation held a Potomac Watershed Trash Summit at the Washington, D.C. headquarters of the World Bank in March. At the summit, 18 area jurisdictions pledged to push forward with an eye toward improving recycling efforts, reducing the output of trash, and boosting public education programs to halt



C. Dalpra

FORCE volunteers stand behind one of several piles of collected urban debris, which included furniture, a tricycle, appliances, and plenty of the ubiquitous tires and beverage containers.

litter. The cleanup itself is feeding the trash initiative with the enthusiasm of the many volunteers, organizations, and governments, but also is increasing data collection on types and sources of trash that can be used to formulate prevention strategies.

“We want to put ourselves [as organizer of the cleanup] out of business,” said Alice Ferguson Foundation Executive Director Tracy Bowen. “The commitment of all these volunteers and organizations over time is impressive and overwhelming, but this problem needs to be addressed at its sources.” She noted that trash-free streams and rivers is an essential element in improving the water quality, habitat, and other values people find in the region’s waterways. “If we improve water quality so that every stream is fishable and swimmable, we still won’t be able to call them restored if the banks are laden with trash,” Bowen said.

Coastal Plain Groundwater Workshop Encourages Cooperation

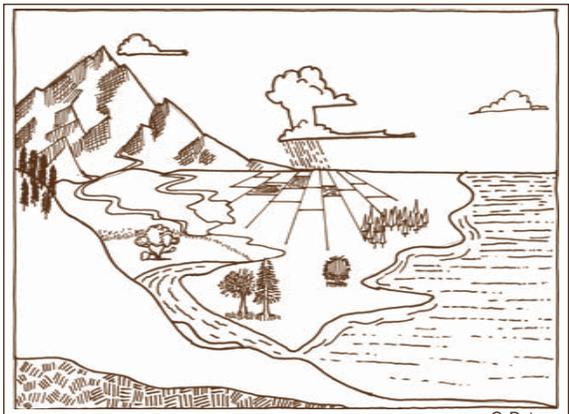
As population in the Potomac region increases, demand for water supply also increases, which in the future could impact groundwater and surface water resources in the area. Surface water, or water in streams, rivers, and lakes is relatively accessible, while groundwater, or water in soil, rocks, and under everything else, is far less accessible. Inaccessibility, particularly in the Potomac’s Coastal Plain, makes the resource difficult to study and manage across jurisdictional boundaries, leaving many managers lacking sufficient data to make informed water supply decisions. The Interstate Commission on the Potomac River Basin (ICPRB), along with Maryland Geological Survey (part of the Maryland

Department of Natural Resources), U.S. Geological Survey (USGS), Maryland Department of Environment (MDE), and Virginia Department of Environmental Quality (DEQ), organized the *Coastal Plain Groundwater: A Regional Perspective* workshop to begin a process to assist in wise decision-making.

With increasing population, particularly in the Coastal Plain of the Potomac region where most drinking water comes from deep aquifers, water supply is diminishing. The *Sustainability of the Ground-Water Resources in the Atlantic Coastal Plain of Maryland* fact sheet (USGS fact sheet FS 2006-3009), created by USGS, MDE, and Maryland Department of Natural Resources,

states that “The current rate of decline in many of the confined aquifers is about two feet per year.” The fact sheet goes on to forecast that “Continued water-level declines at current rates could affect the long-term sustainability of ground-water resources in Maryland’s heavily populated Coastal Plain communities and the agricultural areas of the Eastern Shore.” Groundwater management differences make the resource difficult to manage across jurisdictional boundaries, but ICPRB’s unique interstate composition makes it ideal to foster cooperation among regulatory agencies and local managers. It is these regulatory differences, data needs, hope for cross-jurisdictional cooperation, and reliance on groundwater for water supply that attracted most workshop participants.

In Maryland, groundwater is regulated by a permitting system through the MDE Water Appropriations Permit Program, permitting users to take out a certain amount and requiring them to report the amount taken. “In the Virginia Coastal Plain, there are two Ground Water Management Areas that require withdrawal permits and users to report the number of gallons taken from the wells,” said DEQ Groundwater Geologist Scott Bruce. Other areas in the Virginia Coastal Plain do not require permits, but users are asked to report the number of gallons they use to DEQ. Northern Neck (Va.) Planning District Commission Environmental Planner Stuart McKenzie noted that his relatively sparsely populated area is sandwiched between two big water users, the Smurfit-Stone paper



The water cycle is an important factor in understanding water supply and quality. As rain falls, water soaks into the soil, replenishing groundwater and filtering contaminants. That groundwater provides the base flow for rivers and streams. Impervious surfaces reduce infiltration, and sends water racing over ground directly into streams, carrying sediment and contaminants. Though most Potomac basin residents’ drinking water comes from rivers, about 38 percent comes from underground sources.

mill in West Point, Va., and the growing communities of southern Maryland. McKenzie noted that the Northern Neck area is filled with vacation homes now, with relatively few full-time groundwater users, but “if everyone started living in their vacation homes year-round, we might be in trouble.”

Aquifers, or underground areas that are able to store water, provide much of the groundwater for the basin’s residents. Experts estimate that 181 million gallons of groundwater is pumped from the Potomac region every day, serving about one quarter of the basin’s 5.5 million people, many in the Coastal Plain of Virginia and Maryland. In mountainous and foothill areas, groundwater is relatively accessible,

ICPRB, Partners Providing Needed Groundwater Planning Information

According to Chesapeake Bay Program estimates, the Potomac basin’s population is expected to increase by about 19 percent from 2000 to 2020. Because water demand also is expected to rise, ICPRB, with grant funding through the U.S. Geological Survey, began conducting a comprehensive assessment of the Potomac basin’s groundwater resources. The assessment will provide information and tools to assist jurisdictions in management and planning involving groundwater availability and the relationship between the basin’s groundwater and surface water resources. Some milestones follow.

*Since the project’s inception three years ago, ICPRB has fostered a network of monitoring wells that provide real-time monitoring data throughout the basin and is using it to understand how groundwater and surface water are related, and is identifying areas in need of the most attention.

*With dwindling funding, real-time groundwater monitoring will end, limiting the data available for the project assessments and future understanding of our integrated water supplies.

*Maryland, Virginia, and Pennsylvania have provided funding to continue the real-time monitoring project into the fall, but funding is uncertain for continuing the project into 2007.

*While the groundwater project is providing valuable data about the watershed’s groundwater resources, much more is needed, as evidenced by the results of the Coastal Plain conference.

sometimes at about 100 to 300 feet below the surface. Suitable groundwater in the Coastal Plain is about 1200 to 3000 feet below the surface, deep under the surface aquifers. Water extraction in the Coastal Plain can be particularly daunting because of the region's sandy soils and geology. Though shallower wells have been used for water supply, water quality issues in the upper unconfined aquifers typically force users to access deeper aquifers for clean water.

Surface water and groundwater occasionally come together, especially near the fall zone, the boundary between the



Watching the River Flow

Provisional data collected near Washington, D.C., by the U.S. Geological Survey found February flows averaging about 9.9 billion gallons per day (bgd), or about 17 percent below normal flow for the month. Daily extremes ranged from a high of about 11.7 bgd on February 7 to a low of about 3.7 bgd on February 28.

Water withdrawn from the river for drinking use averaged about 332 million gallons per day (mgd). Freshwater inflow to the Chesapeake Bay averaged about 68 bgd, about two percent above the normal bay flows. The Potomac contributed about 29 percent of the total. The long-term average Potomac contribution is about 21 percent.

March flows slowed to a trickle, averaging about 3.8 bgd, or about 75 percent below the normal flow of 15.4 bgd. Daily flows ranged from a high of about 5.3 bgd on March 1 to a low of about 3 bgd on March 31. Groundwater levels in monitoring wells, which had remained in the normal range for some time, began to fall. Water withdrawn for drinking use averaged about 342 mgd. Freshwater inflow to the Chesapeake Bay was about 33.3 bgd, about 65 percent below the historical average. Total March freshwater inflows to the bay set a new March record low. The Potomac contributed an above-average 24 percent of the total.

foothills and Coastal Plain regions. If surface water is contaminated with pesticides, salt, industrial waste, sewage, or other toxins, some will travel into the groundwater table. From there, some water slowly moves through the soil into the deeper aquifers. Likewise, if groundwater is contaminated with toxins, natural or otherwise, it could contaminate surface water as they come together. In the Coastal Plain, the length of time and distance the water travels helps purify it before reaching deeper aquifers, while water entering shallower aquifers does not get filtered as well. While surface- and groundwater are important resources for consumptive use, precipitation also contributes to the available water.

Precipitation does not immediately influence groundwater levels in the deep, confined aquifers, but will affect it thousands of years from now. Of the average 40 inches of precipitation per year, most travels directly to unconfined, or upper aquifers or is lost to runoff and evapotranspiration noted DEQ's Scott Bruce. That leaves about one inch of water per year to start its way to the deeper aquifers, which equates to about a trillion gallons per year that is recharged across the Coastal Plain. Recharge is completed when water finally reaches the deeper aquifers. Tri-County Council for Southern Maryland Executive Director David Jenkins said "All the water supply for Charles, Calvert, and St. Mary's County is groundwater-based. Some of the recharge areas for our wells are outside the tri-county area," indicating the resource's complicated composition and a specific need for intercounty and interstate cooperation.

Water pulled from wells today started its journey into the deeper aquifers 5,000 to 40,000 years ago. The deeper, confined aquifers are recharged with water that travels through tiny pores between soil and sand grains, moving from high to low pressure. Bruce noted that as water is pulled from the ground via a well, the pressure in the aquifer drops, making it more difficult to pull the water from the ground. However, the recharge water can move more quickly through the soil pores near the confined aquifer because of lower pressure--that is to say, a difference of a droplet of water traveling one inch in ten years versus one inch in 100 years.

The ICPRB's Hydrogeologist Jim Palmer said, "The area around the well can form a cone of depression, an area where the water level is lowered because water was removed from the aquifer. If the water level is lowered too much, the sand and gravel can compact and cause subsidence, which can mean a drop in the landscape of two to three feet or even up to ten feet." These cones of depression are beginning to appear in parts of the Maryland Coastal

Plain, where heavy development demands have decreased groundwater supplies. “The cone of depression is probably extending under the river and possibly into Virginia, where recent development has raised the issue of groundwater supply and management for that area. Because the new Virginia development is not in a Ground Water Management Area and historical data is lacking, it is unclear how the water supply for both sides of the river will be affected,” said Palmer.

The deeper groundwater levels can fluctuate depending on the aquifer pressure, or based on how many wells there are in one place and how much water is removed. Bruce noted that during dry summer months, more water is pumped from the aquifer, causing a drop in aquifer

pressure and that groundwater levels in some areas have dropped because of the number of wells and number of gallons removed for consumption. “We need to start rethinking how we use water. We need to get serious about some options,” said Jenkins, whose area is estimated to see a population increase of about 100,000 people by 2030.

Managers, local and regional leaders, government agencies, and others are just beginning to piece together information about groundwater and are realizing the importance of interjurisdictional cooperation. While no formal plans were developed at the workshop for future management of the resource, agencies and organizations are working more closely with one another to better understand the Coastal Plain’s groundwater.

Fish Kills Continue in Shenandoah Watershed

The Virginia Department of Environmental Quality, the Department of Game and Inland Fisheries (VDGIF), and their partners in the Shenandoah River Fish Kill Task Force are investigating the latest reports of scattered fish kills and fish with bacterial lesions. The investigations primarily focus on adult smallmouth bass, redbreast sunfish, and, to a much lesser degree, a few other species. The problem again seems centered in the North Fork of the Shenandoah River. Fisheries and water quality staffs from Virginia and federal agencies are continuing an intensive effort of fish and water quality data collection to determine the cause(s) of the problem, but have not found a “smoking gun.”

The unexplained fish kills this spring have been concentrated in the North Fork in a segment from Woodstock, Va., to Strasburg. Live fish sampled were observed with skin lesions, fin rot, and other maladies. Some reports noted very small numbers of rockbass, bluegill, and young smallmouth bass affected, according to VDGIF Fisheries Biologist Steve Reeser.

The reports from this spring are the latest in several years of similar disturbing news. A first kill of smallmouth bass with lesions occurred in the South Branch Potomac in 2002. The fish kills in the Shenandoah were first noted in 2004 in a segment of the North Fork tributary. The following year, another kill occurred on the South Fork from its source to beyond Front Royal. The fish develop infections and die off slowly, rather than a more usual situation when a single event causes massive die-offs. Many of the live bass sampled had lesions that look like burns, caused by what is thought to be a common bacteria in the water. During the last two years of kills, an estimated 80 percent of the adult smallmouth bass

population has been lost.

Except for the smaller number of fish found this spring, what fisheries crews observed is “almost identical to what we saw in 2004 on the North Fork,” Reeser said. While the numbers of dead fish this spring are smaller, part of the reason could be the greatly reduced numbers of adults that survived the previous kills. This year, however, all the reports of dead or ailing fish have come from just a segment of the North Fork, rather than river-wide. Additionally, a few reports of sick or dead fish have come from the South River this spring.

Although researchers are working feverishly to collect data and find answers to the causes of the infections and kills, answers remain elusive. Major areas of investigation include pathogens affecting adult fish, bioaccumulation of an unidentified pollutant, disease, parasites, spawning stress, or poor water quality caused by runoff (non-point pollution), sewage plant outfalls, or other factors. “It is just too early [in the investigation] to speculate,” Reeser said. “There is so much we just don’t know.” This spring’s dry conditions have dampened one idea: that torrential spring rains, bringing large amounts of polluted runoff into the river system, created conditions that weakened the fish, allowing infection and death. While 2004 and 2005 were very wet springs, conditions this year were dry, with extremely low and clear water conditions.

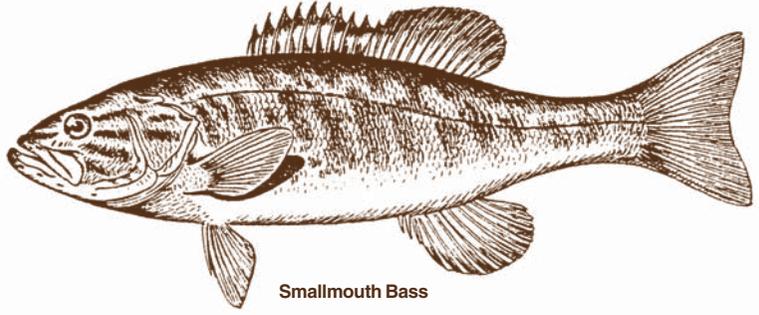
The lack of any strong clues to a cause is frustrating for researchers. “We would like to know now [about what is causing the problem],” Reeser said. “These fish are out there with these problems, and I keep asking myself if there is something we should be doing that we aren’t, but we just don’t know enough,” he said. A silver lining,

of sorts, is the level of monitoring being performed. In addition to tracking kill reports and sampling them, real-time data is being collected at stations that only had monthly readings before, daily water testing is

being performed in the North and South Forks, and extensive studies of various aspects of fish health, including looking for parasites, pathogens, and other aspects. This data will provide a very detailed assessment of the rivers that can be used for other water quality studies, improving the knowledge base for researchers working on other aspects of the river resource.

The current round of data collection will end in June, and after analysis, a report will be published for wide distribution throughout the scientific community. Reeser noted that a wide distribution of the data can foster input from outside the task force.

The earlier fish kills also led to the discovery of male smallmouth bass bearing eggs in their testes, a condition known as "intersex." The condition may be the result of contaminants that mimic natural hormones, causing the fish to display some traits of both sexes. While the effects of intersex on fish health and reproduction are being investigated, the latest data points



Smallmouth Bass

away from intersex as a cause of the kills. The intersex condition found in smallmouth bass in parts of the Shenandoah and the Potomac are shared by fish sampled from a control river in the James River basin, where no fish kills have been reported.

While the Shenandoah has lost up to 80 percent of its adult smallmouth bass, spawning success has been good during the last two years. A healthy population of smallmouth bass will again return to the Shenandoah system if researchers can learn the cause of the sick fish and reduce or eliminate the causes.

What has happened in the Shenandoah and Potomac in the last few years is being linked by some to observations of diseased and wasting fish populations in systems outside the Potomac, and to the mycobacterial lesions being seen in striped populations in Chesapeake Bay. While no links have been established, it does raise questions about aspects of the quality of the nation's waters, and whether as a society we are doing enough to protect them.



C. Dalpra



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April saw Potomac basin residents helping fish successfully migrate. At the annual Herring Aid event in Rock Creek National Park, EPA Administrator Stephen L. Johnson joined volunteers in a bucket brigade to move spawning river herring upstream of Peirce Mill Dam, which is being modified with a fish passage. At the Congressional Casting Call event at Fletcher's Boat House in Washington, D.C., ICPRB's Jim Cummins helps students release American shad fry they raised in their classroom. A series of federal initiatives to increase fish habitat was announced at the annual congressional event.

River Rambles Rally Environmental Stewards

Join the ICPRB for the year's best river adventures! Travel down the river, camp on its banks, sit by a fire at night, and learn about the river's ecology, history, geology, and environmental issues during the ICPRB's two weekend *River Rambles*.

American shad will be the topic of discussion and culinary delight during the spring ramble on the tidal Potomac. Ramblers will meet at Fort Washington National Park in Maryland on the evening of Friday, May 19, attend a Saturday shad planking and end the trip with bird- and wildlife-watching around Mason Neck Wildlife Refuge on Sunday, May 21.

Fall foliage, geology, and river history will be the focus for the autumn ramble, October 12-15. The adventure will begin in Oldtown, Md., passing through to Paw Paw, W.Va., Bonds Landing, and Little Orleans, Md. Take a hike through the Paw Paw Tunnel to learn about the historical importance of the architectural feat and the geology of the region and watch the fall scenery as you paddle one of the most beautiful sections of the river.



E. Vance

For more information and to register, visit the ICPRB's website at www.potomacriver.org, or call Steve Saari at (301) 984-1908 x 103.



Potomac Basin

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**Editors: Curtis M. Dalpra
Jennifer K. Dotson**

Published six times a year by the Interstate Commission on the Potomac River Basin, 51 Monroe St., Suite PE-08, Rockville, MD 20850. (301) 984-1908.

(ISSN 1072-8627)

**E-Mail: info@icprb.org
Internet: <http://www.potomacriver.org>**

Joseph K. Hoffman, Executive Director

This publication does not necessarily reflect official Commission policies. Funds for the *Reporter* are provided by the U.S. Environmental Protection Agency and the signatory bodies to ICPRB: District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia.

Non-Profit Org.
U.S. Postage
PAID
Rockville, MD
Permit No. 800

Interstate Commission on the Potomac River Basin
51 Monroe St., Suite PE-08
Rockville, MD 20850

Address Service Requested

Printed on recycled paper with soy-based ink

March/April 2006