

REPORTER



ICPRB's Jan Ducnuigeen and COG's Phong Trieu electroshock for herring on Paint branch.

C. Dalpra

Stocking of River Herring Continues

As the Chesapeake Bay is characterized by what flows into it from its tributaries, such as the Potomac, the river's status is in turn defined by the quality of its tributaries. Ongoing work by ICPRB and its partners is helping to improve the quality of the Anacostia and Rock Creek tributaries by restoring populations of river herrings, an ecologically important species. A critical problem for the herring is the many small dams, exposed pipelines, and other blockages that prohibit them from swimming far upstream to spawn in the spring. The multi-year project is helping to boost future reproduction by stocking herring fry in upstream areas currently blocked to spawning runs. This season, some 2.7-million herring fry were released in those areas.

Patterned after efforts to reestablish the American shad in the Potomac mainstem (see May/June 2001 *Reporter*), the project targets a historically important species with similar problems. A cousin of the shad, river herring (blueback herring

and alewife), are anadromous fish that spawn in freshwater after living in the ocean for several years. Like the shad, numbers of these fish have declined due to loss of habitat, over-fishing, and pollution.

The fish are important to the Potomac and its tributaries in serving as a valuable food source for other fish. "The river herring are one of the 'clockspring' species in the 'ecological machine' that is the Potomac system," noted ICPRB Living Resources Director Jim Cummins. "These fish, near the base of the food chain, help to power the system by feeding on plankton in the water. This plankton is converted to protein further up the chain as the herring are eaten by fish, eagles, and other creatures. This element (including shad) has been lacking in the system for decades, and restoring it can go a long way toward improving the health of the river," Cummins said.

The project, in its second of five years, has fisheries researchers surveying Anacostia River tributary streams for signs of the migrating fish in early spring. Pool areas below the most downstream

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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Ducnuigeen and Trieu sort the catch.

blockages on the streams are scrutinized closely, as the fish congregate as far upstream as possible to spawn.

The fish are captured with nets, and “ripe” females are stripped of their eggs. In the field, sperm is taken from captured males and the eggs are fertilized and taken to the Maryland Department of Natural Resources Manning Fish Hatchery in Charles County, Md., to be hatched and grown out for several days.

The fry are returned to the streams upstream of the blockages, which are being removed as part of the Anacostia Watershed Restoration Program, coordinated by the Metropolitan Washington Council of Governments (COG), a partner in the herring restoration effort. Some of the fry are placed in Rock Creek, another urban Potomac tributary. The released fry will remember these upstream areas, and return to spawn there in several years, at which time the blockages will have been removed. In this way, the stocking program will accelerate the use of the opened upstream areas for future spawning.

The project became a reality as part of a mitigation package for impacts to wetlands and submerged vegetation that will occur in the replacement of the Woodrow Wilson Bridge across the Potomac at the District of Columbia's southern border. The ICPRB and COG are working with Potomac Crossing Consultants (PCC), formed to perform the mitigation work related to the bridge's construction. The project was developed with the help of the Anacostia Fish Passage Working Group, composed of local, regional and state representatives.

Coupled with the restocking effort is a reconnaissance study to verify the strength of the herring's spawning run, and identify the best locations for collection of herring in subsequent years. The monitoring has also yielded other benefits. “Our reconnaissance has identified new stream blockages that weren't readily apparent,” said Jan Ducnuigeen, an ICPRB staff member

working on the project. “Sediment moves around and changes the stream, and undercuts buried sewer pipes that become a barrier to fish migration. These streams are dynamic, and can change from year to year.”

The reconnaissance work allowed the restocking team—Ducnuigeeen, Phong Trieu of COG and Jennifer Sunley of PCC, to surpass the restocking goal for the second straight year. During April and May, the 2.7-million fry were stocked at five Anacostia stocking sites. For the two years of the stocking program, 5.3 million fish have been stocked.

Many Anacostia residents have seen the crew at work along streams or have attended demonstrations that draw residents into a greater understanding of the project

and the watershed. Some river groups, such as the Anacostia Watershed Society, have made note of the importance of the effort. Plans are being made to bring greater public involvement to the project. This spring, tests were conducted to determine if herring fry could be raised in school classrooms using the same equipment employed in the American shad restoration project. “River herring were successfully raised in the classroom in tanks at Piney Branch Elementary School, with the fry released into Sligo Creek in April,” Cummins said. “We are hoping to have the partnerships in place to expand the Schools in Schools project for next year,” he noted.

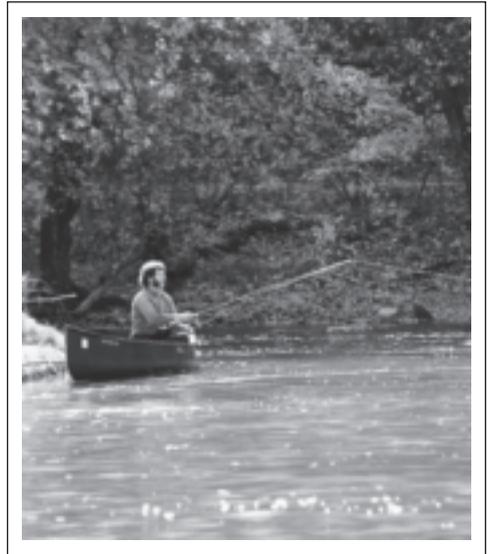
For further information, contact Jim Cummins at ICPRB.

Potomac Unusually Cloudy, Fishing a Challenge this Summer

The calls started coming in to the commission in early June, and have persisted through the summer. Canoeists, anglers, and others with a regular view of the river continue to notice a persistent cloudiness in the nontidal Potomac upstream of Washington that they don’t remember seeing in previous years.

The Potomac, like many rivers, can become quite cloudy when spring rains bring sediment and nutrients that, given some sunlight, can quickly grow a springtime bloom of algae that sometimes creates floating mats that persist for a period of time. Usually, the river clears out as water levels drop, reaching a normal summer color and clarity. Subsequent rainstorms can bring several days of murky water before clearing. That didn’t happen this summer by many accounts, with the river retaining a “cloudiness” or “stain.” Also noticed was a lack of submerged plants growing in the river in the spring, where there had been a green carpet the previous year. Experienced anglers and professional fishing guides wondered if the lack of plants and the “stained” appearance of the water was at least in part responsible for one of the most difficult smallmouth bass seasons they have seen in several years.

“I’ve been fishing the Potomac for 15-plus years,” noted recreational angler Jeff Bates in an email. This year, “I’ve observed the water to be murky and green. There are no apparent algae blooms, and there is no grass which we normally see this time of year...Typically, the river is near crystal clear in this area [upstream of Great Falls], but the water has been very cloudy all year. Even when there has been a rainstorm, the water is never this cloudy or this color.”



Bates’ message described what many river users have been observing along the river from Washington up the mainstem Potomac, suggesting that the concern does not stem from particular points on the river, such as discharge pipes or land development sites.

Although these many observations agree that something unusual is occurring, the Potomac, like all rivers, is an extremely complex chemical/biological system that defies simple answers. Suspended dirt, algae, and bacteria, as well as dissolved substances like tannic acids (from decomposing plant matter) all absorb light and cloud the water. They can enter the river from numerous sources or be created by the river itself. Researchers generally agree that the river’s clarity and color is out of the ordinary, but none of them has a conclusive answer at this point, or can

strongly connect what is happening to any fisheries problems that may be causing a decrease in angling success.

Researchers noted that unusual weather in the spring and early summer created poor growing conditions for submerged plants. These plants are important to the water quality of the river by trapping sediment and consuming nutrients. Large storm events can bring more nutrients into the river system, where they can fuel the growth of algae, which increases turbidity and limits sunlight needed by aquatic plants. Observers noted, however, that what they were and are seeing does not seem to be sediment, and to many, is a different color than that associated with algae commonly found in the river.

Regularly collected monitoring data for the summer season won't be available until later in the year. Some data taken for particular purposes was examined, however. The region's major water treatment plants regularly assess the water they take from the river for drinking. Thomas Bonaquisti, of the Fairfax County Water Authority, reported that the utility had noted higher than usual turbidity at their intake upstream of Great Falls this summer. Danny Pendergraft, chief plant operator for the Washington Suburban Sanitary Commission's Potomac Filtration Plant said that turbidity levels were up slightly this summer as compared with previous years. He also noted that weather conditions were conducive to algae growth this summer. Nancy Rybicki, a U.S. Geological Survey (USGS) scientist who studies the Potomac's aquatic plant populations (see "Diversity" article in this issue), noted that the river upstream of Great Falls does seem less clear than usual. She recorded Secchi readings (a secchi disk, with white and black quadrants, is lowered into the water on a line until it cannot be seen, and the depth at which it disappears is noted) that are lower than in 1999 when vegetation was dense, and have increased during the summer. She also noted that the color of the river seemed somewhat unusual, or at least not the color usually associated with the algae that are commonly found in the river. She collected some water samples in June and August that will be analyzed for turbidity and chlorophyll (an indication of algal levels), and phytoplankton (algae) abundance. Submerged vegetation in the Potomac downstream of Washington, unlike upstream areas, has been lush this season.

Given this complexity, what can be said about the river's observed condition in relation to the relatively poor fishing that some bass guides and other anglers have reported? Has fishing success been down this year for a variety of other reasons, or has the river's condition had an effect on

the fishery itself? Ed Enamait, a Maryland Department of Natural Resources fishery manager, has surveyed areas of the nontidal Potomac this summer. While he has some concerns and questions about the river's color, he has found healthy fish and good to excellent reproduction of smallmouth bass this summer.

The cloudiness of the river has been a challenge for monitoring the fisheries this summer, Enamait said. The numbers of fish sampled have decreased, because they captured fewer fish. "We captured fish at a low, but not alarming level," Enamait said. The fish they surveyed were healthy, and have been feeding through the summer, he noted. Because smallmouth bass, the most targeted sportfish in the river, are sight-feeders, they may not be as easy for anglers to catch in the cloudy water. The stomach contents of smallmouth bass examined earlier in the season showed a greater amount of bottom-dwelling invertebrates such as crawfish, rather than small, faster-moving fishes that can use the cover of stained water to their advantage. He said that examinations later in the summer, when the water had cleared somewhat, revealed that the smallmouth were feeding more on other fish.

Enamait also noted that fishing could be more of a problem because of the amount of mature smallmouth in the river's population. The floods of 1996 greatly decreased smallmouth populations followed by a strong reproduction during the 1997 season. The decreased numbers of adult fish meant a larger food source for that year-class of fish, with less competition. This strong year-class of fish is entering its fifth year—an age where there is a noticeable natural mortality. "We didn't see any sign of that last fall," Enamait said, and added that the winter was not severe. The cool spring and slow start could have contributed to mortality. "It's something I would like to do some more research on," he said.

Continuing with his view that the fishery is in good shape, Enamait also was pleased with the amount of prey species in the river that will allow this year's hatchlings to grow. Some of that prey may still be in the river because the clouded waters hid them from the fish in the same way that anglers lures weren't seen well by the smallmouth. "The silver lining in this may be that there is a tremendous food base in the river right now," Enamait said. "The bass should really be able to be 'fat and sassy' this fall if the water clears.

Returning to the subject of the complexities of the Potomac ecosystem, and trying to make sense of what is observed, Enamait looked beyond the rise and fall of fish populations over years and weather changes. What we really need is stronger watershed management all the time," he said.

Diversity Growing in Potomac



Nancy Rybicki checks the grass beds.

C. Dalpra

As the small boat glides along just downstream of Belle Haven Marina on the Virginia shore of the Potomac downstream of Alexandria, Nancy Rybicki of the U.S. Geological Survey (USGS) stands in the bow, garden rake in hand. She stares down at the water inching by, squinting through the glare. Near the boat, a water snake peers up between thick fronds of grasses. She sees something, and the rake goes deep in the water, returning with its tines full of three different kinds of aquatic plants.

The diversity of plant species growing in the river is good news. For decades, the Potomac, crippled by pollution and sediment, held no submerged aquatic vegetation (SAV). Improvements in the river resulted in the growth of plants in the early 1980s, in the form of the exotic plant hydrilla in the upper tidal Potomac. The sudden growth of large stands of hydrilla alarmed some natural resources managers, concerned that the plant would cause problems similar to what was occurring in places like Florida, where the plant choked canals and waterways. As area officials met to discuss the issue, some advocated the use of herbicides in the river, although the final answer to navigational concerns was a program of mechanical harvesting of the plants in shipping and boating channels that continues to this day. Even those encouraged by the growth of any aquatic plants in the river had concerns that hydrilla would foster a monoculture, crowding out native plants that might try to repopulate the Potomac. Now, the extensive beds that once were mostly hydrilla are mixed beds, often of seven different species of plants, providing a variety of food and habitat that

fosters more types of animals and improves water quality. Seven other species of plants also call the river home, although they are rare.

Rybicki and fellow USGS aquatic plant researcher Al Lombana are spending most of August performing an annual shoreline survey of SAV along the Potomac, concentrating their efforts in the tidal river from Washington, D.C., to Maryland Point (about 12 miles upstream of the Md. Route 301 river crossing), and in a section of the nontidal Potomac from Great Falls to Point of Rocks. They are working cooperatively with scientists in the District of Columbia who are assessing the Potomac and Anacostia rivers in the District. The information collected is used by USGS, the Chesapeake Bay Program, the regional Aquatic Plant Management Committee administered by the Metropolitan Washington Council of Governments, and the U.S. Fish and Wildlife Service. The work helps these researchers to gain understanding of the annual variations in species coverage in the river.

Using aerial photographs as a general map of the beds, Lombana and Rybicki visited by boat to ground-truth the photography, identify the plant types in the major beds, and provide a rough estimate of the coverage of each species in the Potomac. They have divided the tidal area of the river into distinct reaches that allow them to assess the health and growth of the grass beds in relation to water quality data for each reach.

Understanding the water quality of the river, which can be greatly influenced by plants, is a key to understanding the health of the plant beds themselves, and how greater SAV production can be fostered in the Potomac and other Chesapeake Bay tributaries. The expansion of SAV throughout the bay system is a major effort in the regional program to restore the bay.

The plant communities in the river are very dynamic, Rybicki noted, lifting a rake filled with hydrilla, water stargrass, and wild celery. Beds can appear strong and healthy for several seasons, only to be absent for the next season or two. Weather conditions including rainfall, amount of sunlight, and temperature, along with water quality, nutrient conditions, amount of predation by animals, and human activity such as dredging and shellfishing can all impact SAV levels.

Rybicki, who has studied plant populations since their resurgence in the Potomac in the 1980s, sees the need for additional research about the near-shore habitat conditions of the SAV beds, since most

long-term data focus on water quality in the channel. She noted that programs come and go, leaving gaps in datasets. Long-term data often is on a larger scale that is of limited use in assessing vegetation in particular areas. As an example, she cited something of a crash in the hydrilla population in 1989 that was likely brought on by unusual spring weather conditions. Intensive surveys of hydrilla tuber growth (the most important of several ways that hydrilla propagates each spring) in the river bed were discontinued by the National Park Service the previous year. Research performed during that period could provide valuable information on how the plants survive under changing conditions.

"There is a lot more I would like to know," Rybicki said, referring to interactions between SAV and the ecosystem. Greater

knowledge of the relationships of SAV with birds, fish, and other organisms could help us in our understanding of the river system as a whole, and particularly the near-shore habitat, she said.

The information gained could be important to future management of both SAV and the Potomac system. Rybicki has been examining some plant beds to assess the amounts of nitrogen and other nutrients that the plants remove from the water that flows by them, with early results showing a significant removal of nitrogen. Knowing which plants are best at removing various nutrients, which serve as the greatest food source for different animals, and which make for the best habitat can all help managers to improve the Potomac and the quality of its resident's lives.

River Critters: **Can you Name this Potomac Denizen?**



Watching the River Flow

Flow of the Potomac River measured near Washington, D.C., was near the long-term average in June and July, according to the U.S. Geological Survey.

June flow averaged about 6.4 billion gallons per day (bgd), about seven percent more than the long-term average. Daily extremes ranged from a high of about 13.4 bgd on both June 9 and 25 to a low of about 3.3 bgd on June 21.

Diversions of the river for water use for the month averaged about 430 million gallons per day (mgd), about three percent more than June 2000.

Chesapeake Bay freshwater inflow averaged about 32.6 bgd, or 19 percent less than average. The Potomac contributed about 26 percent of the total.

July flow averaged about 2.6 bgd, or 20 percent less than average. Extremes ranged from a high of about 5.1 bgd on July 5 to a low of about 1.5 bgd on July 28. Diversions averaged about 436 mgd during the month, about three percent more than July 2000. Chesapeake Bay freshwater inflow averaged about 15.3 bgd, about 22 percent less than average. The Potomac contributed a higher than average 33 percent. The normal Potomac contribution is about 21 percent.



C. Dalpra

Have you ever seen one of these in your trips to the Potomac or Anacostia rivers? Several were spotted mired in the grass beds being surveyed by the U.S. Geological Survey (see related story). About the size of a soccer ball, the orb's exterior seemed firm but slimy, with a gelatinous interior. They seemed like the egg mass of some large amphibian, larger than you might want to meet while swimming.

They are not eggs at all, but bryozoa, also known as "moss animals" that form colonies in a way similar to coral. Each of the tiny individuals (zooids) that form the colony possess a set of tentacles that capture the plankton on which they feed.

Jim Cummins, ICPRB associate director for Living Resources, sees them with some regularity while conducting studies in the Potomac and the Anacostia. "I've found them nearly two feet in diameter," Cummins

said. He often sees them growing attached to a stick or other structure in the river. "When they get large enough, they can break off, and be found just floating along in the water," Cummins said.

Bryozoans can reproduce sexually or asexually by budding off new zooids, which is the main way that a colony expands in size. They also can form masses of cells that can remain dormant, withstanding freezing and drying, until conditions become favorable for growth.

The bryozoans include about 50 freshwater species and several thousand marine species with many different forms and habitats. They have been around a long time, and show up as fossils in some limestone areas. Bryozoans date back in the fossil record to about 500-million years.

An internet search of "freshwater bryozoa" will connect you with several interesting sites on these unusual creatures.

ICPRB, ARBC To Launch New Campaign

The ICPRB and the Anacostia River Business Coalition (ARBC) will be launching a new public awareness campaign dubbed, "A Cleaner Anacostia: Make It Happen", this winter. The campaign, funded through the Chesapeake Bay Small Watershed Grant program, builds on a public awareness campaign begun by ARBC in 1998.

The campaign aims to educate the public about how everyday activities impact the water quality of the Anacostia River and its tributaries. Many everyday activities, such as car and lawn maintenance, result in pollutants entering waterways. The project focuses on non-point source pollution in five categories: trash, lawn fertilization, pesticide application, motor oil, and car maintenance such as washing and fluid changes. The campaign will include advertisements in regional Metro stations and the development of environmental education materials for distribution to area school teachers.

The project is one of 59 funded through the National Fish and Wildlife Foundation's Chesapeake Bay Small Watershed Grants Program. Funding for the program is provided by the U.S. Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture-Forest Service, the U.S. Fish and Wildlife Service, and the Dover Corporation.

W.Va. Monitors South Branch Potomac



If you were out on the South Branch of the Potomac River this summer and early fall, you may have seen a team of scientists from the West Virginia Department of Environmental Protection (DEP). The team spent the season out in the South Branch of the Potomac watershed collecting water samples and examining biological organisms found in the water. The team also was examining the overall habitat of the streams by looking at the stream bank condition, stream-side vegetation, and man-made disturbances that may affect water quality.

Over the next year, the team of scientists will be analyzing and compiling all of the data they collected this summer. The information will be compiled into an assessment report which will be available next year, according to DEP officials. The assessment report is a valuable tool to help resource managers protect and improve the water quality in the state.

All of this is part of West Virginia's Watershed Assessment Program, which helps the state assess the health of its waterways, in this case, the South Branch of the Potomac. The Watershed Assessment Program assesses all waterways in the state on a five-year cycle. The South Branch of the Potomac was last assessed in 1996.

The 1996 Watershed Assessment of the South Branch of the Potomac found that most of the waterways met designated water quality standards. The study recommended development of total maximum daily loads (TMDLs) for the most impacted streams and DEP has been working to create and implement them since the study was completed. The report also included specific recommendations for further study to determine and understand the sources of contamination in efforts to develop better water protection strategies. The information will add to the state's Department of Agriculture, which has been conducting baseline studies of the South Branch.

Currently, the Watershed Assessment Program reports from previous years can be accessed via DEP's website at www.dep.state.wv.us. Once on the website, follow the links to the Division of Water Resources. The current year study, once completed, will also be available on the website, according to the agency.

POTOMAC CALENDAR

Pennsylvania to Hold Nutrient Management and Sediment Control Forum in 2002

The Pennsylvania departments of Environmental Protection and Agriculture, in cooperation with several other co-sponsoring organizations and agencies, will present a Nutrient Management and Sediment Control Innovative Technology Forum, February 12 to 14, 2002, at the Holiday Inn in Grantville, Dauphin County.

The forum will help municipal and agricultural interests take advantage of new

and innovative approaches to controlling discharges of nutrients and sediment to Pennsylvania streams and rivers, and also to the Chesapeake Bay. The forum will provide an opportunity for technology users to interact with providers and to see and hear real-life examples of how existing and new technology can help address these challenges.

The general goals of the forum will be to focus on practical, cost-effective solutions to nutrient and sediment control problems; to educate and build trust among those involved in implementing those solutions; to create partnerships and ongoing relationships in addressing areas of mutual interest; and to help break down real or perceived barriers to using new and innovative technology. Stay tuned for more information and registration details.

For more information, contact Peter Slack at 717 787-3481 or e-mail pslack@state.pa.us

Potomac Watershed Weekend

The Potomac Conservancy and Potomac Watershed Partnership are working with organizations throughout the watershed to raise awareness about land and water protection efforts as part of the Potomac Watershed Weekend, October 20-21. As part of the events, conservation groups throughout the watershed will be participating in "Growing Native", a native seed collection effort to increase the diversity of native tree stock for local restoration projects. For more information about events scheduled throughout the weekend, contact Potomac Conservancy at (703)276-2777.



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Permit No. 800

Potomac Basin

REPORTER

Editors: Curtis M. Dalpra
Jennifer J. Caddick
(ISSN 1072-8627)

Published six times a year by the Interstate Commission on the Potomac River Basin, Suite 300, 6110 Executive Blvd., Rockville, MD 20852. (301) 984-1908.

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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.

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Suite 300
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Rockville, Maryland 20852

Address Service Requested

Printed on recycled paper

July/August 2001