

REPORTER



High-tech snakeheads. A technician places an electronic tracking unit in the abdomen of a captured snakehead. The unit shown is a little larger than those placed in the studied fish. Below, the technician has completed the placement. The antenna of the transmitter can be seen on the upper half of the photo. About 10 fish are currently being tracked on the Potomac by Virginia fisheries staff. A larger program using more fish will begin soon. (Photos by Steve Owens, VDGIF.)



Snakehead Research and Population Growing

Ongoing research this summer is showing that the northern snakehead fish, first found in the Potomac in 2004, are increasing in population and are being found in more areas.

Although the first snakehead found in the river was captured on the Maryland side of the river, attention shifted the following year to the Virginia embayments, especially Dogue Creek, downstream from Mount Vernon. Research conducted this summer has found the fish in most Maryland embayments from Mattawoman Creek up to the District of Columbia.

Much new information is coming from the efforts of the Virginia Department of Game and Inland Fisheries (VDGIF), which initiated a year-long effort to radio tag and track snakeheads in the river. In addition to their regular duties, Fisheries Biologist John Odenkirk and his crew tagged 20

fish in March, with the intention of following them for a year.

The northern snakehead, native to Asia, is a high-level predator that grows quickly, and takes oxygen both from the water and the atmosphere. Understanding the fish's migratory patterns, spawning behavior, and other traits will be critical to any efforts to control the population of the foreign species, he noted. The snakehead introduction, as with any foreign species, concerns resource managers because the fish may have a ripple effect in the ecology as they compete for food and habitat with other species, particularly the largemouth bass, a favorite of anglers and a significant economic force in regard to recreational dollars spent in the area.

Odenkirk spends a day each week on a boat, hunting down the radio signals from transmitters surgically placed in the fish. He

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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found plenty of fish in the four-to-six-pound range to use as subjects over two days of electro shocking in the Dogue Creek area. Since the program started, there have been a few mortalities, and some fish have shed the units, but he is still tracking about 10 fish. His efforts are bringing a wealth of new information. He noted that the fish seem to have a definite home range, and while they may travel across the river or to nearby Virginia creeks, they seem to return to their "home" creek. He also has noticed that movement increases greatly after major storms, similar to the "exodus" of last year when hundreds of the fish traveled far upstream in Dogue Creek to segments that usually have just a trickle of water. Like many other predatory species, the fish also seem to move locally with the tide.

Odenkirk and crew would really like to observe spawning behavior, but have been unsuccessful so far. One of the concerns about the snakehead is that it may have a larger spawning window than other fish, such as the largemouth bass, a competitive advantage that could contribute to declines of other species that prey on the same food and frequent the same spawning habitat. In Asia, the snakehead prefers to spawn in shallow waters with heavy vegetation, which describes many of the Potomac's embayments between the Occoquan River and Washington, D.C. Based on the species' behavior in their native waters, the fish are thought to make a hollow in dense aquatic vegetation and guard their hatched fry as they stay in the clearing during the first stage of their lives. Yet, no angler or biologist has seen an actual nest, or observed any fry in the river, although they are undoubtedly there. Odenkirk noted that they may have taken up different behavior as they adapt to the Potomac environment, perhaps abandoning the nest-building behavior, or spawning in extremely shallow water of a foot or two.

Although the VDGIF staff has done less electro-shock sampling this year than previously, their catch has gone up exponentially, more than doubling the number captured in 2004-2005 combined. "There has been a big increase in the Occoquan River system," Odenkirk said, and they have been found far upstream. Larger numbers of fish have been found at Belle Haven and in Pohick Bay. Substantial increases have been observed in Oxon Creek on the Maryland side, as well as in Mattawoman Creek. Another snakehead was found along the Anacostia, but not by the usual methods—the fish was found dead, with the telltale punctures from a great blue heron or other fish-eating bird. "We think that one may have been carried there by the bird," Odenkirk said. He added that he had seen a video shot by a recreational angler of an osprey grabbing a snakehead out of the water for lunch. "It

looks like snakeheads are getting hammered by osprey and heron,” Odenkirk said, although he doubts that bird predation will be much of a control on the species.

Recreational anglers, who have been urged to report snakehead catches (and kill any that they catch—possession of live snakeheads is illegal) are up

significantly as well. The reports from anglers are of higher quality than previous years, as anglers get better at telling snakeheads apart from other species.

Steve Chaconas, a professional guide who works the area, is involved in his own type of research, as more of his clients express an interest in targeting snakeheads. “There has definitely been increased angler interest,” he said. In addition to request to go on snakehead trips, a growing number of clients who go out to catch largemouth bass are asking to spend an hour or two of their day in pursuit of the exotic species, which is getting less exotic every day. “I even had a guy call who wanted to go after snakeheads with a fly rod,” Chaconas said, “and I didn’t know what to tell him.” Chaconas said that anglers are still figuring out how to target the species, what lures and techniques will work best. He noted that the fish he has taken have been landed on different lures each time. He is trying to learn their habits and behavior, albeit in a different way than the biologists. Speaking from his boat, Chaconas said that he thought the fish might be spawning again, noting that the fish go through periods where they are not as “spooky” but are ignoring lures presented very close to them. At other times, the fish seem to head for cover, but can strike mightily from beneath the cover that the aquatic grass affords them.

Behaviors that are similar to the king sportfish of the tidal Potomac, the largemouth bass, give concern to fisheries managers. One of the most recent hook-and-line catches was by an angler participating in a large bass tournament centered at Mattawoman Creek, which hosts numerous competitive events. Don Cosden, of the Maryland Department of Natural Resources, noted that the agency’s staff is keeping an eye on possible effects of the snakehead population as a part of its annual assessment of largemouth bass populations in the area. Cosden noted that they haven’t been able to discern any impacts so far. He noted that the bass population in the Potomac is quite healthy and large, with good reproduction, which is why tournaments use the river heavily. He noted



Potomac snakeheads come in all sizes and ages.

S. Owens/VDGIF

that the limiting factor on the fishery is suitable spawning habitat—areas with a good supply of food and plentiful aquatic grasses—similar to the habitat desired by snakeheads.

On the federal level, fisheries scientists are concerned not just with the Potomac, but other areas of the country where snakeheads have taken hold. The publicity surrounding the species has helped to generate interest in the U.S. Fish and Wildlife Service (USFWS) and in Congress, which has tasked the agency with producing a national management plan for the northern snakehead. Meetings of a steering committee earlier this year, in which ICPRB staff participated, has helped the service in creating a draft plan that is being reviewed and may be finalized by the end of the year. The draft plan is focused on various methods that use sound science and management techniques to prevent the introduction of the northern snakehead into new areas and minimize impacts where already established. The plan suggests continuing research to better understand the species and its possible impacts and develop public outreach tools to prevent the spread of the fish. “We need to know a lot more about this fish if we hope to control it,” said Steve Minkinen, who is coordinating the project for USFWS. In Congress, the House has proposed spending \$660,000 for implementing the management plan. No money has been set aside by the Senate, so any decision to fund implementation will have to come out of a conference committee.

In the meantime, Odenkirk’s efforts are about to be complemented by a two-year project carried out by Virginia Tech that will track 50 radio-tagged fish in the Potomac.

While researchers study the fish and plans are created to try and manage it while keeping it from spreading to other areas, snakeheads continue to gain another important foothold—notoriety. The species was the subject of a recent editorial in the Washington Post, noting it as a potential threat to the economically and recreationally important largemouth bass fishery, urging Congress to fund the studies, and reminding anglers to “Catch some good eats and thin the Potomac’s stock [of snakeheads].”

Quiet Work Behind the Scenes Enhances, Protects Water Supply

Most water consumers in the metropolitan Washington Area, more than four-million strong, know very little about how or from where the water gets to their faucet. In fact, polling has indicated that many homeowners don't even know the name of their water utility. It is an issue that can be troubling to water suppliers, who recognize that greater customer awareness and support can help them provide the best quality water in the most economical way.

In another way, the lack of recognition is a testament to the skill and effort put into providing drinking water—it is a resource reliable and economic enough so that the average resident doesn't really spend much time thinking about it.

Yet, the organizations involved, including the ICPRB Section for Cooperative Water Supply Operations on the Potomac (CO-OP), work daily on these issues throughout the year.

The CO-OP Section coordinates operations of the three major metropolitan area water suppliers during droughts and guides the release of stored water that ensures that water suppliers can meet demands while minimizing the impact of withdrawals on the Potomac's ecology. The major "storage bank" for the metropolitan area suppliers (the Washington Suburban Sanitary Commission serving the Maryland suburbs, Fairfax Water serving the Virginia suburbs, and the Washington Aqueduct, which provides water to the Washington, D.C. Water and Sewer Authority and to portions of Northern Virginia) is the Jennings Randolph Reservoir far upstream on the North Branch Potomac, filled in 1982. It is complemented by the much smaller Little Seneca Reservoir in Montgomery County, Md., which filled in 1985.

Active use of the reservoirs to augment water supply has occurred in only two years—1999 and 2002. During such events, ICPRB CO-OP staff collect daily demand and use information from the water utilities, flow information from various points along the river, flow and precipitation forecasts, and other climate data. Aided by computer models, CO-OP staff request releases of stored water from the upstream reservoirs, which from Jennings Randolph Reservoir can take more than a week to reach the suppliers' intakes (smaller releases from Little Seneca reservoir take about 24 hours). Each year, much effort goes into refining methods that allow for releases that both meet demand and conserve the pool of stored water.

Additionally, CO-OP performs periodic analysis of future water needs for the metropolitan area and leads annual



C. Dalpra

CO-OP staffers Mark Lorie (l) and Erik Hagen perform maintenance on the monitoring station at Edwards Ferry.

exercises with the metropolitan water utilities to practice the daily coordination of the system required during drought operations. These activities grow in importance as the region's population grows, and demands on the finite Potomac River resource increase.

Earlier this summer, CO-OP staff braced for what increasingly looked like a season of reservoir releases to augment the river's natural flow. A heavy storm event in June, however, boosted river flow, and more importantly raised groundwater levels to above-normal. "Groundwater levels in the basin are responsible for the river's 'base-flow,' the water still in the river after a long, rainless period," said CO-OP Operations Director Erik Hagen. "In the Potomac system, reservoir releases are triggered by a combination of low groundwater conditions and below-average precipitation. Much of the flow in the river today is baseflow from the rainy period we had in June," Hagen said.

The June storms brought a greatly decreased likelihood of the need for drought operations, but the following very dry period from early July to mid-August has again dropped river flow and groundwater levels, triggering increased monitoring of the river flow and metropolitan area drinking water use.

River flow monitoring is done with the help of a series of gages maintained along the Potomac by the U.S. Geological Survey (USGS). A tightening USGS budget over the years has resulted in the elimination of some river gages in the watershed, and the water suppliers have responded by providing financial support for the gages

important to water supply operations, including partial support of Potomac gages in Maryland at Hancock, Point of Rocks, and Seneca Creek at Dawsonville.

To make drought operations even more efficient (decreasing the size of reservoir releases while still meeting demands), CO-OP staff deployed several wireless, remote stream level monitors along the river in 2005. The monitors are smaller and moveable, unlike the USGS gages that require large, permanent structures. The monitors are set up to automatically alert CO-OP staff when the river dips below a certain level. A small chamber placed a short distance out into the riverbed measures water levels and is connected by



Watching the River Flow

Significant precipitation over much of the basin in June kept Potomac River flows higher than normal until the end of July.

Provisional data collected near Washington, D.C., by the U.S. Geological Survey found June flows averaging about 11 billion gallons per day (bgd), about 68 percent above normal. Daily extremes ranged from a high of 32 bgd on June 29 to a low of one bgd on June 22. Water withdrawn for drinking use averaged about 411 million gallons per day (mgd). Freshwater inflow to the Chesapeake Bay averaged about 71 bgd, about 31 percent above the norm for June. The Potomac contributed a near-average 19 percent of the total.

July flows averaged about 5 bgd, or about 49 percent above the normal flow of 15.4 bgd. Flows ranged from a high of 20 bgd on July 1 falling to a low of about 2.5 bgd on July 31. Water withdrawn for drinking use averaged about 441 mgd. Freshwater inflow to the Chesapeake Bay was about 53 bgd, or about 116 percent above the historical average. The Potomac contributed a below-average 13 percent of the total.

River levels have continued to drop as August remains dry.

an air tube to a steel box placed on the shore that houses a sensor, modem, and a car battery. Staff periodically visit the site to change batteries and maintain the system. “The wireless monitors are a great help to us, in that we can predict flow levels more accurately and save water in Little Seneca Reservoir [used to fine-tune the larger releases made from Jennings Randolph]. The monitors also help us get a good night’s sleep, since we are awakened by an automatic pager if flow levels get low. During low flow events, we used to check the USGS gages at midnight and again at 5 a.m.,” Hagen said.

The probability that reservoir releases will be needed this year is still low, although the likelihood increases as the dry weather continues. If actual operations are not needed a week-long drought exercise will be held in September. The exercise, involving staff from the three water suppliers and CO-OP Section will simulate drought conditions to ensure that everyone involved with the drought operations is familiar with procedures and to continue improving operations.

An actual release from the Little Seneca and Jennings Randolph reservoirs is planned as a part of this year’s drought exercise. The releases are conducted to test the procedures and gain information about travel times to the intakes.

Later in the year, when demands for actual water management become nonexistent, CO-OP staff will be building a watershed runoff model that will be used to assess how changing land use might affect low-flow hydrology.

For more information, visit : http://www.potomacriver.org/water_supply/status.htm.

Swimming, Boating in the Potomac River: How Safe is It?

Residents of the Potomac basin indeed love their rivers and tributaries. The evidence is plain to see, as residents take to their favorite swimming and boating spots. Many people swim and kayak at the river’s mouth. The Beach at Point Lookout State Park is jammed every weekend with sunbathers, swimmers, kayakers, and religious groups that use the river for baptisms. Traveling upstream toward the District of Columbia, people fishing and wading from shore watch sailboats play the breeze. The Shenandoah River emptying into the Potomac at Harpers Ferry can resemble the Washington Beltway, with the vehicles of choice being innertubes, canoes and



kayaks. Areas further upstream can get busy with boating traffic as well, with many relieving the heat by a plunge from the boat into the cooling waters.

While many don't give it a second thought, others wonder about the cleanliness of the water, and if what they are doing is safe. Interest was raised a notch in early August with the release of a Natural Resources Defense Council national study highlighting bacterial contamination of bathing beaches that violate public health standards. Joseph Hoffman, ICPRB executive director, was recently interviewed on a local radio station about the safety of coming in contact with the basin's waters.

During the summer, ICPRB staff fields several calls each week from people wanting to know if their favorite spot on their local river or stream is "safe." With few exceptions, we are unable to provide a definitive answer.

Can I Swim?

The main concern for water contact (swimming, wading, water skiing) generally is bacterial levels. While bacteria are integral parts of any natural system, some kinds, in sufficient numbers, can cause gastrointestinal illness, skin and ear infections, respiratory illness, and sometimes worse problems. At many areas designated as bathing beaches, or at parks where wading or swimming is officially allowed, water testing is conducted weekly for bacterial contamination. Tests involve examining a water sample to test for indicator bacteria that signal conditions conducive to the growth of the several types of bacteria that can cause gastrointestinal illness or other infections in people.

Most people want to know about water contact safety for a particular area, which may or may not have a monitoring station in the general area. Many stations are monitored only monthly. A typical call could be "I like to water ski with my family downstream of Alexandria, Va. Will we get sick?" Although helpful data is not available, we do provide some general guidance, listed below.

Where does the Contamination Come From?

In past decades, sewage treatment plants were a major cause of bacterial loads in the river. That isn't so true any more. Most sewage plants in the region

treat to a high degree and disinfect the water before it is discharged. However, broken sewer pipes that collect waste to transfer to the plant can leak raw sewage into waterways. Heavy rains can cause treatment plants to back up, and like any other mechanical device, plants sometimes break down. Septic systems in rural areas also can fail, or be flooded by rains. Other major sources are mostly related to stormwater runoff. Contaminated stormwater from streets and rooftops of urban and suburban areas carries bacteria-laden trash, pet waste, and other pollutants. In rural areas, agricultural operations can contribute contaminants such as animal manure and processing by-products, sediment, and fertilizer. Beach areas with resident populations of geese and ducks can show elevated bacteria levels after storms. In short, the pace and methods in which land is developed and used can cause bacteria problems in local waterways. Additionally, older urban areas, including a large portion of Washington, are served by old, combined sewer systems that route sewage and stormwater through the same pipes. Significant rains cause the pipes to back up, and a mixture of sewage and stormwater discharges directly to a waterway or river. Under normal conditions, the water/sewage goes to a treatment plant. This kind of pollution affects the Anacostia River and Rock Creek, and can affect the adjacent segment of the Potomac.

What can you tell us about the safety of my local stream or river?

Bacteria levels can change rapidly with rain events. Except for parks and other facilities where swimming and wading is a sanctioned activity, water monitoring is done at often far-spread stations, usually monthly. Many of these areas are heavily used, without reports of outbreaks of gastrointestinal illness. Without good data, people must decide based on their attitude toward risk and their personal level of health. The odds of a person getting sick increase with the amount of bacteria that enter the body. A small amount is unlikely to affect most people. For that reason, boating, where people may just get splashed occasionally, entails much less risk than swimming.

When people do choose to swim in the Potomac, there are a number of things they can do to limit any risk.

***Don't enter the water for several days after a significant rainstorm. Storm flows spike bacteria levels, which decrease after several days.**

***Don't swallow water.**

***Don't enter the water if you have cuts or open sores. These are pathways for bacteria to enter your body.**

***Wash after swimming.**

***People with immuno-suppressive diseases should avoid the river.**

If the residents of the basin want a swimmable Potomac—and its tributaries that make up our local streams—both government and the citizens of the basin will need to make a stronger commitment to water quality. Government agencies tasked with the work will require strong public and monetary support. State and local agencies are always facing budget problems at the same time that land is being developed at a rapid pace. Citizens need to speak out and vote for a cleaner environment while becoming stewards of their local waterways. This is an effort that ICPRB works to promote through a variety of outreach and stewardship projects.

People who want to know about bacterial levels in their local waterway should start

with their county health department, but the information needed may not exist. Maryland and Virginia host websites that list stations tested for bacteria and their current status, with contacts for some county health departments.

For more information, visit:

Maryland: http://mddnr.chesapeakebay.net/eyesonthebay/swim_beach_info.htm

Virginia: <http://www.vdh.state.va.us/epi/dzee/beachmonitoring>

Pennsylvania: call 1-877-PA-HEALTH

West Virginia: Department of Environmental Health, (304) 558-2981, or county health departments.

Washington, D.C.: Swimming is not an approved activity in the waters of the District of Columbia.

Harmful Algae Present in Potomac, but Less Than Predicted

Researchers cruising the Potomac River are detecting blue-green algae colonies, but so far at levels somewhat less than predicted. The Chesapeake Bay program predicted the possibility of “moderately high likelihood” of harmful algae blooms for the middle section of the tidal Potomac River this summer. Recent monitoring cruises have found the blue-greens, most commonly an algae called *Microcystis* in a 20-mile stretch of the river from Maryland Point to Mattawoman Creek. Some of the readings show high enough concentrations to be considered a bloom. Windy, choppy conditions on the river have helped keep surface “slicks” from forming.

In places where the algae is compacted by the wind and waves, green streaks are visible in the water, noted Richard Lacouture, a Morgan State University researcher who has been studying the Potomac’s algae for some years. He noted that while concentrations remained relatively lower than some expected, the areal extent of the algae seems to have grown compared to last season.

Last summer saw higher levels of *Microcystis* and other blue-green algae earlier in the season. Both this year and last

pale in comparison to 2004, when a ten-mile stretch of the river sported what looked like a surface layer of bright green paint in July and August.

While the timing and prevalence of algae blooms are very complex, Lacouture surmised that the dry spring, followed by the short burst of intense rainfall in June may have helped slow algae growth this summer. He noted that the late-season storm may have helped flush some of the reservoir of nutrients that sustain large algae populations further downstream.

While the river is better than in past years, densities are creeping up, said Peter Tango, a Maryland Department of Natural Resources program manager who is part of the Potomac’s algae monitoring team. If the weather stays dry and warm, blue-green algae colonies could grow and persist into mid-September, he said.

Microcystis and other blue-greens, common on the river in the 1980s, can produce a toxin that is harmful to fish or humans that come in contact with it. Heavy blooms can block sunlight needed by aquatic plants that produce oxygen, and can cause anoxia when the blooms die and decompose.

Potomac Basin Wastewater Plants Get New Nutrient Limits

Wastewater treatment plants serving the towns of Brunswick and Thurmont are the first to receive renewed permits that include stringent new requirements for reducing nitrogen and phosphorus in Maryland.

The two Frederick County plants had permits up for renewal and the new nutrient caps were added as part of the state’s

Enhanced Nutrient Removal Strategy, a major component of Maryland’s Chesapeake Bay Tributary Strategy. The recently finalized permits go beyond previously announced strategies and require the plants to achieve annual concentrations of no greater than four milligrams per liter (mg/l) of total nitrogen

and 0.3 mg/l total phosphorus.

The new limits were developed by the Maryland Department of the Environment as part of an agreement among the agency, the Chesapeake Bay Foundation, and the Maryland Association of Municipal Wastewater Agencies.

The facilities are two of the 66 major wastewater plants (discharging one-million

or more gallons per day of effluent) targeted by Maryland's Bay Restoration Fund, passed last year to upgrade to plants to very advanced levels of nutrient removal. Nutrients from all sources will need to be greatly reduced if the region is to meet cleanup goals for the Chesapeake Bay and its tributaries, of which the Potomac is second-largest.

Come Paddle With Us!

Join us for the Fall Foliage River Ramble at the Paw Paw Bends on October 12-15. Participants will camp along the Potomac's banks, paddle the Bends, enjoy fall foliage, and learn about the river's ecology, history, and geology. The trip will begin in Oldtown, Md. and will include a hike through the Paw Paw Tunnel, a storyteller from the French and Indian War, presentations about stream critters, and service opportunities.

Ramblers will meet at Oldtown, Md., on Thursday evening and will take out at Little Orleans, Md., on Sunday. The registration



fee includes meals, shuttle from Oldtown to Little Orleans, programs, camping fees, program materials, and experienced river guide service. For more information, visit www.potomacriver.org; contact Jennifer Dotson at 301.984.1908 x 109 or via email at jdotson@icprb.org.



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