

# THE RIVER RUNS

News from the Cowpasture River Preservation Association



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*Sycamore Bend*, by CRPA photographer, Kathy Farmer. This lovely spot was the location for the 2016 Summer Picnic.

See page 9 for details on this year's event!

*Please share your photos of the River and people on it.*

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*Lynne Griffith,*

*Executive Assistant*

Editor: *Michael Hayslett*

Photographer: *Kathy Farmer*

## From the President

Summer is coming slowly to the Alleghany Highlands. After a mild and relatively dry winter, rain has been plentiful over the past two months. In early March, the Cowpasture had looked to be at low, late-August levels; now, in early June, the water is high and fast. The first cutting of hay is in, strawberries are abundant at the farmers market and the bugs are plentiful in the river. Hope the fish are too.



This is my first message as CRPA's president. I was elected to the role at the June 4 board of directors meeting, and proudly accepted. Some of you may have heard from me in past issues and emails. I have been leading the ad hoc Atlantic Coast Pipeline Committee for the past year.

The ACP project is still pending, but we may perhaps have some better protection for our watershed. In collaboration with Bill Wilson of the Jackson River Preservation Association, the CRPA co-hosted a day with David Paylor of the Virginia Department of Environmental Quality, Steven Gibson of the US Army Corps of Engineers and about 20 other participants. Our goal was to let a few influential people see firsthand the rugged terrain and natural beauty of the land and water here in Bath and Highland counties. Paylor and Gibson gave their assurance that if this pipeline is to be built, it will be done with great care for the watershed. Amen.

In this issue: We are delighted to introduce Lynne Griffith. She succeeds Michael Hayslett (our former Executive Director) in the new staff role of Executive Assistant. Lynne and I and the entire CRPA Board are here to serve you as well as our watershed, so reach out to any of us when you need CRPA information or assistance. Also, don't miss "BEST IN CLASS: Karst Sinkhole Buffers" by our former president, Nelson Hoy. It is the latest in his excellent series of conservation essays.

Last but not least, the Annual Picnic is planned for July 29. Please add this to your calendar. We'll be at Glovie and Dick Lynn's spectacular place on the Cowpasture River for food, fun and camaraderie. Details can be found on page 9. I look forward to seeing you there.

Dick Brooks

drabrooks@gmail.com



## Executive Assistant's Corner

Hello! I'm Lynne Griffith, your new Executive Assistant for the Cowpasture River Preservation Association.

I am a recent transplant to the state of Virginia. My husband, Allan, recently retired from his elder law practice in Salem, Oregon. We lived in Oregon for over 16 years, and as beautiful as Oregon is, we were ready for something new and different. Thus began our search for our next destination.

While visiting friends in Charlottesville, we decided to hop in the car and drive around the state to see what Virginia had to offer. While on the interstate, we saw the sign for Lexington and exited the freeway. The moment we drove into town, something resonated for us. After coming back for additional visits, we continued to feel the same way. We had fallen in love with your beautiful state! Then came that fateful day when we met with a realtor and found our dream home. It had 2-1/2 acres and a view of the Blue Ridge Mountains. That did it! We went back to Oregon and began planning our move to Virginia. My husband left his law practice on December 31<sup>st</sup>, and by January 15<sup>th</sup>, we were living in Lexington.



Even though my husband has retired, I knew that I wanted to continue to work on a part-time basis. My background has primarily been in three different arenas – the legal field, the healthcare industry, and the hi-tech industry. Most of my past positions have been of an administrative or outreach nature. When I saw the advertisement for this position, I was especially interested in it because it was for a conservation organization. My husband was one of the founders of a natural history organization that takes people around the world to see birds, and that brought me into the world of “birders.” Their passion for conservation rubbed off on me, and I began to see the importance of preserving our natural habitats. Thus, the Cowpasture River Preservation Association seemed like a great fit because it aligned with my values.

I am thrilled and honored to serve you. My purpose is to assist solely with the administrative needs of this organization. I look forward to doing so. Many thanks to Dick Brooks and Michael Hayslett for their efforts in getting me “up-to-speed.” I have a lot to learn, but I look forward to the journey.

Many thanks,  
Lynne Griffith

**Fall River Clean Up at USFS Walton & Evans Tracts – Saturday, October 21**  
If you're interested in helping, please contact Lynne at [\*\*directorcrpa@gmail.com\*\*](mailto:directorcrpa@gmail.com)



# Monitoring Water Quality

## **BEST IN CLASS: Karst Sinkhole Buffers**

by C. Nelson Hoy, Forester, Rancher and Conservationist

*Editor's note: The following essay is the sixteenth in a five-year series on water resource stewardship in the Cowpasture River Watershed, sponsored by the Cowpasture River Preservation Association and published by The Recorder. The goal of the series is to create awareness among students, citizens and officials of the critical need to protect our surface and ground-water resources, and to stimulate interest in progressive stewardship.*

**WILLIAMSVILLE** – Karst terrain is among the most fragile land forms in the world and it is a defining attribute of the Cowpasture River Valley of Virginia. Karst is a landscape that is formed by the dissolution of soluble rocks such as limestone and it is characterized by drainage systems with sinkholes; sinking, losing or negative streams; and caves.

**Karst Sinkholes and Sinking Streams** – Sinkholes are natural depressions in the surface of the land that are roughly shaped like a bowl. Rain that falls into a sinkhole and water that sheets along the surface or travels through soils and rock layers into a sinkhole then drains downward and recharges the underlying karst aquifer. Sinkholes are further characterized by either open or closed throats. Bullpasture Mountain, Jack Mountain, Tower Hill Mountain, Back Creek Mountain and Little Mountain, and the Burnsville Cove Area and Little Valley are all riddled with sinkholes varying in size from a few feet across to over a mile in length. The Cowpasture River in its northern reaches is a sinking stream as is Dry Run and in the Jackson River watershed Back Creek is a sinking stream.

**Ground Water Contamination** – Karst sinkholes and sinking streams are the primary conduits for contamination such as debris, sedimentation, bacteria, nutrients and industrial chemicals to enter our ground water aquifers. Ground water contamination in karst terrain is a huge problem because cracks, fissures, passageways and caves in limestone formations allow contaminated water to move long distances like miles in short time spans like days and furthermore, without very much filtration or cleansing or none at all. Because there are no practical measures for cleaning up contaminated karst aquifers, the karst water resources can be lost for human and livestock consumption over a lifetime.

**Ground Water Values** – Homesteaders, farmers and businesses in the Cowpasture and Bullpasture Rivers Valley are 100% dependent upon cool, clear, water and use ground water for at least three purposes:

- **Domestic and Public Water Wells** – The water ecosystem services include water for drinking, cooking, bathing, gardening and washing.
- **Farm Livestock Water Supplies** – Services include water for draft horses, beef cattle, dairy cattle, sheep, goats, pigs, poultry and fish.
- **Farm Irrigation Water Supplies** – Agricultural uses includes operations such as commodity crop farms, landscape and horticulture businesses, and tree nurseries.

**Protecting Ground Water Resources** – Neither the Federal government in Washington nor the

*Continued next page...*

Commonwealth of Virginia in Richmond effectively regulate human activity to guarantee the protection of ground water resources in rural communities like those of the Cowpasture and Jackson River valleys of Virginia. Both Bath and Highland Counties lack the subject matter expertise to either formulate or oversee ground water resource protection measures. So homesteaders, farmers, ranchers and businesses in the Cowpasture, Bullpasture and Jackson River valleys must establish for themselves best in class measures for ground water protection. The 12-step process outlined below is a rural community's gold standard for protecting the quality of ground waters with karst sinkhole buffers.

Step No. One – Desk-top Sinkhole Reconnaissance. All private, corporate, utility and government construction permits in karst terrain that involve earth movement and/or stormwater management should be preceded with a desk-top reconnaissance for sinkholes and losing streams including; a review of topographic maps and the interpretation of aerial photography, side-looking radar and space platform imagery.

Step No. Two – On-the-ground Field Assessments. When sinkholes and/or sinking streams are found through reconnaissance within one quarter of a mile of the construction site, regulatory agencies should mandate that a karst-certified geologist conduct an on-the-ground assesment to locate both karst sinkholes and losing stream sinks and to record their GPS-coordinate locations within three feet.

Step No. Three – Identify Pollution Hot-spots. Pollution hot spots within the sinkhole basin must be located and described in terms of the cumulative risks and exposures to the quality of ground water in karst aquifers including: gas transmission compressor stations; pipeline maintenance ports; horizontal directional drilling mud effluent discharge points; surface or ground water withdrawal points; hydrostatic testing water and waste disposal points; storage areas and dispensing facilities for gasoline, diesel fuel, oils and greases; blasting locations and the specific explosive chemicals used; temporary and permanent road crossings of rivers, runs and drafts; vehicle, truck and construction equipment storage, staging or parking areas; locations of dams, impoundments, ponds or catch-basins; Millboro (black) Shale rock and soil exposures; private or public septic fields; agricultural fertilizer storage or stockpiles.

Step No. Four – Delineation of Sinkhole Perimeter and Basin. Construction site plans must delineate the sinkhole throat or lowest point in a closed sinkhole, the sinkhole perimeter or parapet, the immediate surface water drainage area into the sinkhole, and the upland water supply basin for the sinkhole.

Step No. Five – Conduct Dye Tracing Studies. Dye racing studies must be conducted of all sinkholes with open throats where a ground water pollution hot-spot is located within a karst sinkhole basin and determine the karst waters directional flow and resurgence. Dye tracing studies in the Cowpasture and Jackson River Valleys should investigate all domestic wells and resurging springs within a seven mile radius.

Step No. Six – Design and Construction of Three-zone Karst Sinkhole Buffers. Construction site plans must provide for the design, construction and maintenance of a three-tier karst sinkhole protection buffer that features: (a) a Critical Sanitary Protection Zone including the sinkhole and parapet with maximum protective measures such as no construction whatsoever, limited access and use, original and natural vegetation, and a perimeter fence; (b) a Contaminant and Microbiology Filtration Zone with the original and natural plant communities of trees, shrubs and grasses, and no earth movement; and (c) an Upland Water Source Capture Zone with strict stormwater discharge measures to keep stormwater out of the ground water recharge basin or divide.

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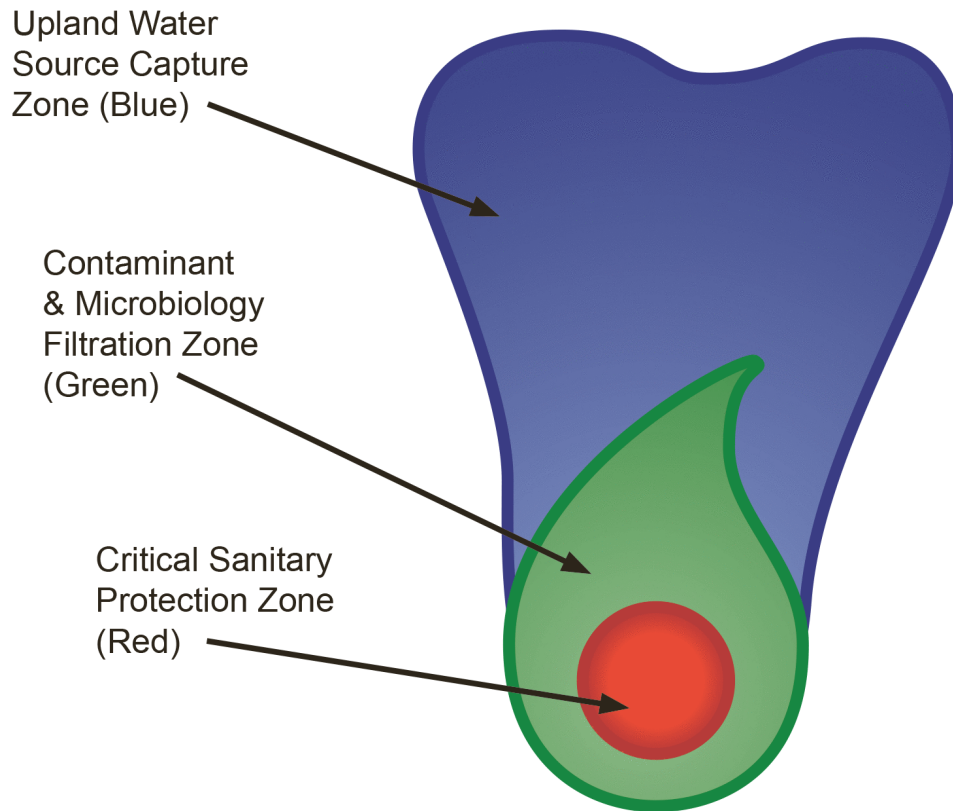


Figure No. 1 – A Three-zone Karst Sinkhole Buffer for the Best in Class Protection of Ground Water Resources in Rural Watersheds.

Step No. Seven – Preserve Natural Vegetation. Ensure that natural vegetation is preserved and particularly well-established and mature trees with deep roots that retain soil and loose rock.

Step No. Eight – Fence Sinkhole Perimeter. Protect the sinkhole at its perimeter or parapet with a livestock-proof fence that also discourages human activity in the sinkhole's Critical Sanitary Protection Zone.

Step No. Nine – Prohibit Construction Activity. Prohibit all earth movement, agricultural and construction activity within the karst sinkhole's Critical Sanitary Protection Zone.

Step No. Ten – Avoid Stormwater In-diversions. Avoid the diversion of stormwater from earth movement and construction activity within either the karst sinkhole's Contaminant & Microbiology Filtration Zone and also, the Upland Water Source Capture Zone.

Step No. Eleven – Deny Injection Well Permits. Deny any and all injection permits for wells that penetrate, intersect or terminate in karst formations.

Step No. Twelve – Establish riparian buffer areas along sinking, losing or negative streams for a sufficient distance upstream to ensure that the waterway naturally cleanses itself of debris, sedimentation, bacteria, nutrients and industrial contaminants. The width of effective riparian buffers varies depending upon both gradient and vegetative cover from 95' along slopes of 3-5% to 775' feet along slopes of 15% – **steeper**

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**slopes require even wider buffer areas.** The length of effective riparian buffers above or upstream from a sink reasonably may be a considerable distance and measured most likely in miles.

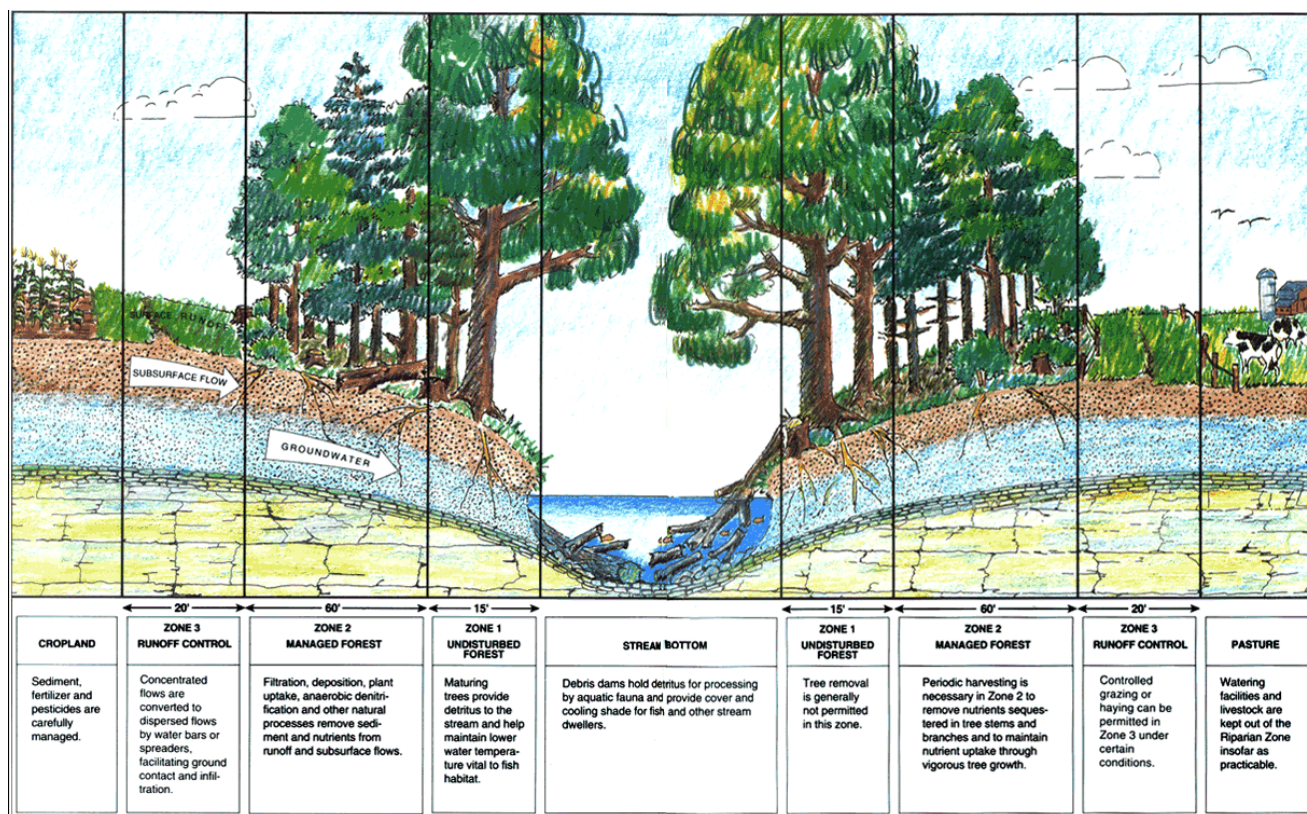


Figure No. 2 – A Riparian Buffer for Protecting a Karst Sinking Stream.

Call for Action – The Cowpasture and Jackson Rivers Preservation Associations should ask the Virginia Department of Environmental Quality to implement this standard for “BEST IN CLASS: Karst Sinkhole Buffers” and the Associations should ask the Federal Energy Regulatory Commission to mandate this “BEST IN CLASS” standard for the Atlantic Coast Pipeline. Local planning commissions should be encouraged to establish these “Karst Sinkhole Buffers” as local land use regulatory requirements.

#### Technical References:

- Kastning, E.H. and Kastning, K.M., 1997, *Buffer Zones in Karst Terranes*, in Younos, T., Burbey, T.J., Kastning, E.H., and Poff, J.A. (editors), *Proceedings, Karst-Water Environment Symposium*, October 30-31, 1997, Hotel Roanoke and Conference Center, Roanoke, Virginia: Virginia Water Resources Research Center, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, p. 80-87.
- Neven Kresic, *Water in Karst: Management, Vulnerability, and Restoration* (New York, New York: McGraw-Hill Professional, 2012), 736 pages.
- Paleone, Roxanne S. and Albert H. Todd (editors), *Chesapeake Bay Riparian Handbook: A Guide for Establishing and Maintaining Riparian Forest Buffers* (Annapolis, Maryland: USDA Forest Service, NA-TP-02-07, Revised June 1998), Approximately 300 pages.
- Natural Resources Conservation Service, *Karst Sinkhole Treatment* (Washington, DC: USDA Natural Resources Conservation Service, Conservation Practice Standard Code 527, September 2015), 3 Pages.
- USEPA Hotspot Site Investigation Worksheet.



## Annual Meeting Highlights



**A BIG TURNOUT** for the 45<sup>th</sup> CRPA Annual Meeting at *Camp Mont Shenandoah* on May 20! 65 folks were in attendance (not all are pictured here). Photo by Nan Mahone Wellborne. BIG THANKS go to our host, Ann Warner, and ...



## Meet Our New Board Members



**Kim Manion**



**Jeremy White**



# **JULY 29, 2017**

## **CRPA ANNUAL PICNIC & FAMILY FUN DAY**

### **COME JOIN IN THE SUMMER FUN!**

**DICK & GLOVIE LYNN'S PLACE – 641 NIMROD DRIVE, MILLBORO, VA 24460**



3:00-5:00 pm (guided river float, games, etc.)

5:30-6:30 pm (cocktail hour)

6:30 pm (picnic dinner) concluding by 8:00 pm

⇒ **Please RSVP your # by July 21** to [directorcrpa@gmail.com](mailto:directorcrpa@gmail.com) or call 540-620-7795.

⇒ Only \$8.00 per person & children **under 12 FREE.**

⇒ Beverages and meats will be provided by the Association.

⇒ **Please bring a covered-dish item and your lawn chairs.**

#### Directions from the Clifton Forge area:

- Starting at the intersection of I-64 and Rt. 42 (Cowpasture River Road), go about 12.3 miles north on Rt. 42 and take a left onto Nimrod Dr. (The left turn is just past the dumpsters which will be on your right.)
- Proceed for 2/3 mile and then take your first left onto a dirt road (before the "End of State Maintenance" sign).
- Go about 1/2 mile down the dirt road and arrive at 641 Nimrod Drive.

#### Directions from the North:

- Starting at the intersection of Hwy. 39 and Rt. 42 in Millboro Springs, take Rt. 42 for 4 miles south and take a right onto Nimrod Dr.
- Proceed for 2/3 mile and then take your first left onto a dirt road (before the "End of State Maintenance" sign).
- Go about 1/2 mile down the dirt road and arrive at 641 Nimrod Drive.



# Water Resources Stewardship

## The North American River Otter

by Michael S. Hayslett, conservation biologist & wetlands consultant

Adore them or abhor them, otters really get around a watershed!

The North American River Otter (*Lontra canadensis Schreber*) is an indigenous, semi-aquatic mammal found across most of our continent which has been becoming increasingly more common in the Eastern United States since restoration efforts began on its behalf some 30 years ago.

This large, playful and curious member of the weasel family (Mustelidae) is among the most entertaining of watchable wildlife, though it also has a reputation among “pisces-ophiles” (fish-lovers) for “cleaning out” their favorite pond or stream. Let’s consider this Cowpasture River critter.

The subspecies of our region is called the Northern River Otter (*Lontra canadensis laxatina*), reaching 50 inches and 20 pounds total, having a slender body and a tapering tail, known as its “rudder”.

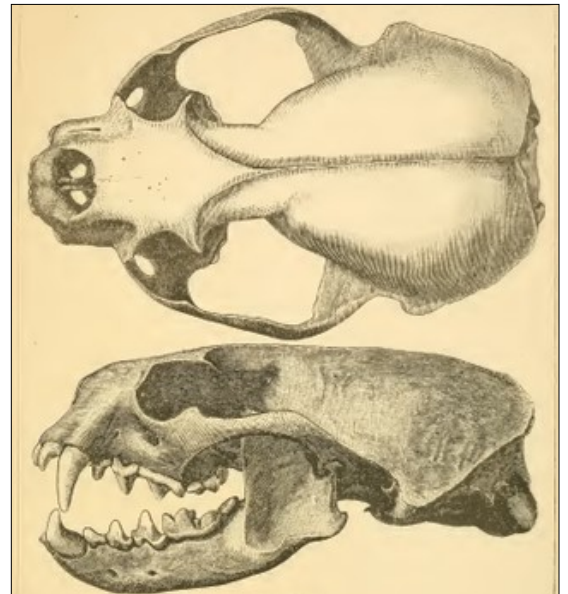
By contrast, the scruffy Sea Otter (*Enhydra lutris*) of the Pacific is twice the size of river otters, is marine and rarely leaves the water (even sleeping afloat in kelp); they have webbed feet, a more restrictive diet and, of course, float on their backs.

The pelt of the river otter was in high demand for fur during early American expansion, and by the early 20<sup>th</sup> century they had been trapped heavily and nearly to extirpation. In one of our country's more successful conservation efforts, river otters were brought back from near extinction through restocking programs in the East.

They were listed as state endangered and their trapping banned in western Virginia by 1978. Seventeen (17) otters were restocked into the Cowpasture River in Bath County from Louisiana by the VDGIF in 1988, to aid in their recovery. Within two years, this fur-bearer was removed from the listing, as numbers rebounded quickly following the reintroduction efforts. Their population levels soon allowed for sustainable trapping once more, with 15 counties being opened in 1990 and the remainder of the state within three years of that date. The season bag limit of 4 otters per trapper per year in our western region helps to prevent over harvesting from occurring. River otter levels are higher in the Piedmont and Coastal Plain regions of Virginia than they are in the western mountains.

### Otter Diet

River otters are rather indiscriminate carnivores and are known from many studies to prey upon fish of numerous kinds, crayfish (*crawdads*), frogs, snakes, small turtles, ducks and other birds (though not their eggs); mussels, snails, clams and aquatic insects – including the larvae of dragonflies, stoneflies and beetles; they even take small mammals, such as voles. Some reports claim otters will occasionally prey upon beavers!



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Their typical predatory technique is to ambush food with a lunge. They can swim at 7 mph underwater, dive down 60 feet and remain submerged for 4 minutes. They could even swim 400 yards distance while submerged.

Otters can consume 2-3 pounds of fish per day, but they tend to prefer larger specimens (6-7" or longer) and slower, bottom-dwelling species, such as suckers, catfish, carp and chubs. They also tend to focus their predatory efforts on fish that are in greater supply, such as dace, shiners and other minnows. The faster, more elusive game fish are harder for otters to catch in open streams; of course, trout-rearing ponds located near streams would make tempting targets for otters, with those fish being confined and easier to chase and capture. Such unique challenges would require special intervention and coordination with the VDGIF Conservation Police Officer (aka, county game warden) to control those "nuisance" otters. In the wild, river otters

don't tend to drastically reduce populations of their prey (such as fish), as is often believed. They tend to shift their location or food choice, based on what is most readily available.



Other studies indicate, in fact, that river otters eat more crayfish during seasons of high water (winter and spring) versus fish during periods of lower water levels (summer), as capture efficiency dictates. The evidence of their recent diet is often apparent in the appearance of their distinctive "spraint" (otter dung), which can be seen along stream banks and on rock bars. Mussel shells with ends bite-broken by otters are sometimes seen.

Common along larger creeks and rivers, river otters are also found to associate with beavers in beaver ponds and have even been reported sharing their lodges without aggression. Otters may, however, compete with their next smallest cousin, the mink (*Mustela vison*), for aquatic food resources.

### Doing What They Otter

Chasing and wrestling are among the "play" behaviors often observed in river otters – primarily among the young, as a means of learning the critical hunting and fighting skills required for survival. Otters commonly slide along on their stomach over snow, ice and muddy banks as a means of rapid travel. They can really get around in their home watersheds and may travel up to 26 miles in a day! Daily movement averages for individuals and families is more like 3-4 miles through the spring to fall seasons. Their activity tends to be nocturnal and at crepuscular times (dawn and dusk), but you're more likely to see them during daylight hours in the winter. They will migrate within and around their watershed, in response to food availability or other environmental conditions. And yes, river otters eat fish. It's the natural order of things.

### Conservation Measures

- Otters may only be harvested within the lawful trapping season and with a Virginia trapping permit, or by special arrangement with the "game warden" to address depredation scenarios.
- Preservation of vegetated riparian (stream-side) corridors provides valuable habitat for otters, as does maintaining healthy water quality in streams generally. These aspects provide needed food resources for otter families and can help distribute their predatory feeding activity across prey groups other than fish.

### Web Resources

- ⇒ <https://www.nwf.org/Wildlife/Wildlife-Library/Mammals/North-American-River-Otter.aspx>
- ⇒ [https://en.wikipedia.org/wiki/North\\_American\\_river\\_otter](https://en.wikipedia.org/wiki/North_American_river_otter)

**Editor's Note: If you have river otter encounters, stories, or photos... please share them with the CRPA.**





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- ☐ \$500 Wallawhatoola Society *Donation*
- ☐ \$1,000 Bedrock Patron *Donation*
- ☐ Groundwater Aquifer *Donation* \$ \_\_\_\_\_
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