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Living on hollow ground

Group kicks off program on caves, springs geology

By Mike Bollinger • Staff Writer

Karst is known to have caves as one of its features. This cave is located in the Burnsville/Williamsville area. Marek Smith, Allegheny Highlands program director for the Nature Conservancy, stands in front of the entrance to illustrate its size. Smith is about six feet tall. (Recorder photo by Mike Bollinger)

WARM SPRINGS — If you don't know what karst topography is, where it's located and why it is important, several organizations are coming together this year to help you out.

The Nature Conservancy, Mountain Soil and Water Conservation District, the Virginia Department of Conservation and Recreation and the Homestead Preserve Foundation are teaming up to present a series of programs on karst and its importance to the region throughout 2009.

Sally Johnson, executive director of the foundation, said the groups have been meeting since May 2006 as the Allegheny Highlands Environmental Council. Johnson is coordinating the programs that will be presented.

"Much of Bath and Highland sits on top of karst. Our concerns are mainly about water quality," Johnson said.

Bill Jones of Warm Springs, a karst hydrologist and chairman of the Karst Waters Institute board of directors, said karst is essentially a landscape developed by soluble rocks, mainly limestone. The main factors that form a karst landscape, Jones said, are erosion and weathering.

Characteristics of karst topography include sinkholes, springs, caves and sinking streams. In a karst area, groundwater is returned to the aquifer very quickly. Since the water moves through the ground fast, there is little filtering and thus, water quality must be a concern, Jones said.

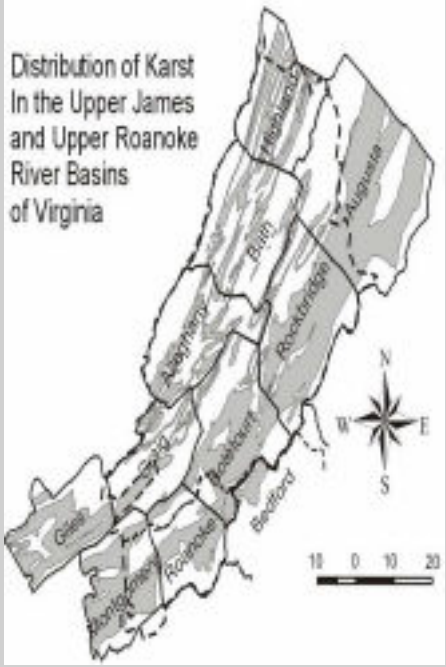
Jones estimated that one-third of Bath and Highland counties, and perhaps slightly more than that, sits on karst areas.

One of the major features of karst topography is springs, and this one comes out of the ground in the Muddy Run area. Karst hydrologist Bill Jones of Warm Springs said the spring returns underground at least twice before emptying into the Jackson River. (Recorder photo by Mike Bollinger)

Johnson said the council recently received a grant from Virginia Naturally, and karst was a topic that had been coming up in the group's meetings as important, so they agreed to develop an educational program. "We'll be talking about it to just about everybody," Johnson said. "Various types of critters live in caves that don't live anywhere else. Also, we are the headwaters of the upper James, so this water winds up in the Chesapeake Bay."

Jones, who decided to participate in the project after being contacted by Johnson, said karst tends to be fragile and easily contaminated. "Karst in general makes a very attractive landscape, and some of our best tourist destinations are on karst. This is about protecting the water and the viewshed, two values that make our area attractive," he said.

Jones said the Burnsville and Williamsville areas have many caves and sinkholes and a large karst spring is located in the Muddy Run area. In addition, he said much of the Jackson River runs through karst. A large portion of the karst in Bath and Highland is under forest cover and is hard to see, he explained. "A lot of it is sub-surface, basically caves," he said.



Faye Cooper, who works with the Highlands Action Program, a federally funded organization based at DCR, said coordinators look for ways to educate citizens about natural resources, and when Johnson contacted her, the project immediately caught her eye.

This spectacular scene in Highland County illustrates two of karst features, a cave and a spring. The Lockbridge Aqua Spring emerges from a cave on state-owned land near Burnsville and Williamsville. (Recorder photo by Mike Bollinger)

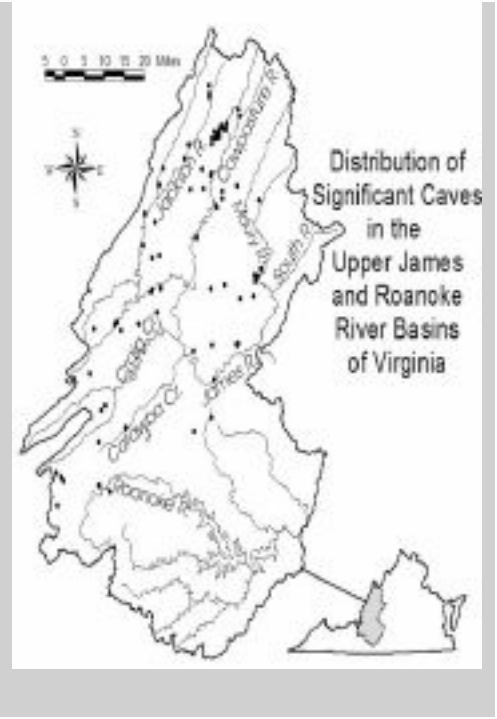
"I think Bath and Highland counties are two special counties in terms of natural resources. The more that people know up front about the importance of land use, the better it will be," Cooper said.

Cooper said the main goal of the project is to raise awareness so citizens will know what karst is and how it affects water quality. "Water can become rapidly degraded in karst landscapes. People need to understand that when they drop things in sinkholes or ground runoff gets into the aquifer, it affects the water. I feel it is important for people to realize the connections between what they put on the landscape and how it affects other things," she said.

Marek Smith, Allegheny Highlands program director for The Nature Conservancy, said the council was discussing topics that needed to be addressed, and karst was mentioned frequently.

"Underground natural resources are tied to all of the organization's missions. There is not a lot we can do individually to raise awareness, but as a group, this is a great topic to build a project around," Smith said.

Johnson said the group is hopeful programs can start this spring. "We want to get on the schedule of the county officials such as planning and zoning, the supervisors and the county administrator for a basic educational program on karst and



groundwater. We want to show why we need to protect cave entrances and springs and why it is important to realize what kind of landscape you are building on," she said.

The Allegheny Highlands Environmental Council has applied for a $5,000 private grant that would require either matching dollars or in-kind services. However, Johnson said most of the programs would proceed with or without the grant.

According to Johnson, the goals of the program are:

- To create an understanding of karst features present in the Allegheny Highlands, for example caves, sinkholes, sinking creeks and springs.
- To highlight the biological diversity of caves.
- To demonstrate land use planning and development methods that avoid or minimize impacts to karst watersheds.
- To build a sense of stewardship among community members with regard to cave, sinkhole and other karst resource protection.

Beginning this month, The Recorder will publish a regular column called "Beneath our Feet" that will be written by a variety of experts. Topics will include karst water systems, cave biology, the history of the springs, cave entrance and sinkhole protection, land use strategies and water conservation. In addition, the local community radio stations will air short announcements on the same topics featured in the newspaper columns, and these will be played throughout the year.

The Nature Center at the Homestead Preserve Old Dairy will be dedicated to the karst project throughout the year, Johnson said, with rotating displays focused on geology, cave life and water conservation. The center is open from 9 a.m. until 5 p.m. every day and is available for school field trips.

The Homestead Preserve Foundation Trust will coordinate volunteers and provide resources to collect stories of local people related to their experiences with the caves and springs of the region. Some of these could be published in the newspaper, with permission, and archived at the historical societies. Johnson said this part of the program would be organized in cooperation with historical societies and libraries.

Several times during the year, Johnson said, regular work sessions with supervisors and planning

and zoning boards will be held to present short, educational programs and question and answer sessions. These will be organized in connection with the DCR's karst program.

The 10th annual meeting of the Karst Waters Institute will be held at the Homestead Preserve Dairy Barn March 21. The group is a non-profit whose mission is to improve the fundamental understanding of karst water systems through sound scientific research and the education of professionals and the public. At its awards dinner, the institute will honor Dr. Janet Herman of U. Va., who will speak after dinner on, "Waterfalls and Limestone: Above-ground cave deposits." The gathering is open to the public; there is a fee to attend.

In April, a two-day workshop created and implemented by the Virginia Tech Department of Urban Affairs and Planning that brings together geologists, engineers, land use planners and remediation specialists to discuss how to manage development pressures in karst areas will be held.

Those invited will include watershed and storm water managers, county planners, planning and zoning staff, engineers, realtors, developers and contractors, local elected officials, farmers and landowners and landscapers and urban foresters, Johnson said.

This workshop includes a halfday in the field with a dye-tracing demonstration and a tour of karst features. According to Johnson, other presentations and field excursions may include karst and spring characteristics of the Appalachian ridge and valley, sinkhole detection and remediation techniques, policies for groundwater protection, stormwater recharge issues and revisions to the Virginia stormwater management handbook, cave biology, hydrogeologic investigations and well monitoring, alternative septic systems and water use allocations and drought planning.

Presentations will be made by the Karst Waters Institute, DCR, U.S. Army Corps of Engineers, U. S. Geological Survey, Potomac Professionals and Virginia Tech Urban Affairs and Planning.

Virginia Cave Week is April 20-24, and Johnson said curriculum and activities for classroom teachers will be organized in cooperation with the Virginia Cave Board that will focus on the elementary schools in Bath and Highland.

From April through July, a guided karst tour will focus on sinkholes, sinking streams, springs and limestone outcroppings. There will be a field day for high school students and scheduled tours for the general public, Johnson said.

On June 20, there will be a Musselrama Festival on the Cowpasture River. Coordinated by the U. S. Fish and Wildlife Service, Virginia Tech and the Virginia Department of Game and Inland Fisheries, this public festival will focus on the endangered James spiny mussel restoration efforts

and provide participants with the opportunity to watch the tiny mussel larvae being released into the river along with their fish hosts.

In addition, Johnson said, nature craft activity tents will provide children the opportunity to create fish prints, mussel magnets and watch live fish and mussels in action. There will also be invited speakers, exhibits, vendor booths and demonstrations on water conservation.

The annual meeting of the Cowpasture River Preservation Association in July will focus on karst education, Johnson said.

In the spring and summer, the Mountain Soil and Water Conservation District will host farm tours that will feature demonstrations of mitigation and best land use practices in Bath and Highland.

In late June, there will be a bat mist-netting demonstration, Johnson said. This will be a two to three-hour evening field trip to observe biologists from the Virginia Department of Game and Inland Fisheries capturing bats at either a winter hibernation area or a summer foraging site.

Using fine, mesh nets knows as mist nets, biologists will capture and introduce participants to several bat species while discussing their adaptation skills to a dark environment. The demonstration may also include sampling for the white nose syndrome, a deadly disease affecting bats throughout the east.

In the fall, Project Underground teacher training will take place, Johnson said. Project Underground is a K-12 curriculum designed to create and build awareness of and responsible attitudes toward karst and cave resources and their management needs.

This will be conducted as a fullday, in-service training for science and teachers and other interested staff. A curriculum guide and other materials will be provided, and a per diem for substitute teachers will be offered. Continuing education credits will be available to teachers.

In September, Rob Mies, director of the Organization for Bat Conservation, will make a live animal presentation to educate people on the importance of bats to the ecosystem. In addition, the program will seek to dispel myths about bats, detail the benefits of bats to the world and encourage conservation efforts.

The program will include at least three live bats, including fruit bats with a six-foot wingspan, Johnson said. The program will be repeated at all area elementary schools.

On a date to be determined, a sinkhole clean-up day will be held. This will be a half-day

community service project involving area residents, school and scout groups and agency staff in the clean-up of one or more waste-filled sinkholes. A picnic lunch will be held following the clean-up.

For more information about the karst education program or to see how to get involved, contact Johnson at [540] 839-2407.