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SPORTS, 1B

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An eastern hellbender nestles into a crevice. Hellbenders spend most of their lives under rocks in the streambeds where they live. PROVIDED BY BEN DALTON/NC WILDLIFE RESOURCES COMMISSION

'A good mascot for how ancient these mountains are'

Park embarks on hellbender study using new and old techniques



Nord from the Smokies

Guest columnist

With wrinkly skin that comes in various shades of brown, eastern hellbenders aren't easy to spot. These giant salamanders, which average 20 inches in length, spend most of their lives nearly invisible under rocks on the bottom of cool, fast-flowing streams. In a twoyear research project starting this summer, Great Smoky Mountains National Park will use a combination of cuttingedge technology and traditional survey techniques to solve the mystery surrounding the hellbender's distribution in the Smokies.

"One of the major conservation questions is: Are hellbenders reproducing in our streams?" said Jonathan Cox, wetlands biology technician for the park. "And it's really hard to find that out because their lifespan is so long that you can have a hellbender detected in a stream for multiple decades, but it may be the same individual."

Hellbenders can live for 30 years or more, so figuring out whether the adults alive today are reproducing successfully is imperative to securing the species' future. Hellbender populations have declined significantly over recent decades, leading the US Fish and Wildlife Service to propose that the salamander be listed as an endangered species. A public comment period on the listing proposal is open through Feb. 11.

Data supporting the proposal was gathered prior to Tropical Storm Helene, which wildlife biologists believe had a devastating impact on hellbender populations in Western North Carolina and East Tennessee, home to some of the healthiest across its range. Though



A researcher displays a captured eastern hellbender. These giant salamanders reach an average length of 20 inches and can live for more than 30 years. PROVIDED BY LORI WILLIAMS/NC WILDLIFE RESOURCES COMMISSION

many of the park's streams are too high in the watershed to provide the volume of water hellbenders need to thrive, the Smokies, which escaped the worst of the storm's fury, still hosts some robust hellbender populations. Given the damage Helene wreaked in neighboring communities, Smokies streams, which are supplied by clean water flowing down from the park's highest peaks, have become even more critical to the species' survival.

"The park is an important reservoir of genetic diversity and healthy habitats and populations that will always be protected and is protected at the highest levels of the headwaters," said JJ Apodaca, executive director of the Amphibian and Reptile Conservancy, a nationwide nonprofit that supports conservation in the U.S.

Cox and Apodaca will be closely collaborating on the upcoming research project, which is expected to last for two years and is funded through a \$140,000 allocation from the National Park Service's Natural Resource Condition Assessment Program. Under direc-



Jonathan Cox, left, wetlands biology technician for the park, looks in astonishment at an eastern hellbender captured while monitoring populations in Pisgah National Forest. PROVIDED BY BEN DALTON/NC WILDLIFE

RESOURCES COMMISSION

tion from NPS, Amphibian and Reptile Conservancy researchers will survey hellbender populations within the park and compare their results to baseline data gathered in the early 2000s.

Some new data will be gathered using traditional techniques — snorkeling in wetsuits to search for hellbenders underwater — but the researchers will also be developing a new technique that could greatly decrease the effort involved in surveying hellbender populations, while also multiplying the usefulness of the data.

This method, called environmental RNA, or eRNA for short, involves analyzing genetic material found in water samples from streams thought to contain hellbenders. The process is similar

See KAYS, Page 2A

Additional officials deputized to round up **immigrants**

Lauren Villagran

USA TODAY

In a move that could supercharge the government's deportation forces, the Trump administration late Thursday deputized thousands more federal law enforcement officers to arrest immigrants who are in the country illegally.

On Thursday, Department of Homeland Security acting Secretary Benjamine Huffman expanded the universe of federal law enforcement officers who can investigate and apprehend immigrants. It wasn't immediately clear how many officers would be reassigned to immigration enforce-

"Mobilizing these law enforcement officials will help fulfill President (Donald) Trump's promise to the American people to carry out mass deportations," Huffman said in a statement. "For decades, efforts to find and apprehend illegal aliens have not been given proper resources. This is a major step in fixing that problem."

White House press secretary Karoline Leavitt on Friday said on X, "Deportation flights have begun," with two

See IMMIGRATION, Page 7A

Trump to seek major overhaul of FEMA

Says federal agency could 'go away' entirely

Marina Pitofsky, Riley Beggin, Bart Jansen and Swapna Venugopal Ramaswamy

ASHEVILLE - On a trip to hurricane-damaged western North Carolina, President Donald Trump told reporters he would sign an executive order to begin the process of fundamentally overhauling or even eliminating the Federal Emergency Management Agency so that states respond to their own problems.

"FEMA has turned out to be a disaster," Trump said. "I think we're going to recommend that FEMA go away and we pay directly - we pay a percentage to the state."

After speaking with flood victims in Swannanoa Trump added, "If it was up to me right now, I'd end it right now."

At the same time, he promised North Carolinians that the federal government would supply "a lot of the money" to repair damage from floods and landslides after Hurricane Helene.

"We're going to fix it as fast as we

See TRUMP, Page 6A











MOUNTAINS

Carl Sandburg Home reopens barn for viewing of Connemara goats

Hendersonville Times-News USA TODAY NETWORK

FLAT ROCK — The barn and access to the Connemara goats will be accessible to the public on Wednesday, Jan. 22, as part of the phased re-opening at Carl Sandburg Home National Historic Site. Videos, passport stamps, bark ranger information and junior ranger booklets will be available in the garage near the Sandburg Home.

The hikers' lot currently is the only available parking at the park, with space for 24 cars. The lot is busiest and can be full from 10 a.m.-3 p.m., with weekends being busier than weekdays. Park only in designated spaces. If the lot is full, come back another time. There are no designated parking spaces or sidewalks along Little River Road.

Visitors who require accessible parking should call the phone number posted in the hikers' lot. Limited options may be available.

"We are excited to re-open the barn for visitors to enjoy," said Superintendent Polly Angelakis. "The goats are beloved by many and are just as ready to see you as you are to see them again."

Services and facilities that will remain closed during this phase include the Sandburg Home and tours, park store, Front Lake parking lot and trail, drinking water and flush toilets.

Portable toilets are available for visitors and are located at the hikers' lot, amphitheater entrance, and by the restrooms near the Sandburg Home. Portable toilets will be in use until further notice while the park goes through the funding, compliance, and repair processes to fix the main sewer line, which was destroyed by flooding from Tropical Storm Helene.

Visitors should dress for the weather and bring drinking water as there is no visitor access to water at this time.

Maps showing open or closed areas are posted near the hikers' lot, barn entrance, Sandburg Home garage and restrooms by the Sandburg Home. Signs and barriers are posted by all closed areas. For your safety, please stay out of

The Front Lake parking lot and trail remain closed. Helene flooding washed out two bridges on this trail and carved a deep ravine. There is no way to access park grounds, buildings, or trails from Front Lake. The park is going through the funding, compliance, and contracting processes to install a temporary bridge so the Front Lake parking lot and trail can reopen.

Front Lake dam, which failed in 2022, suffered further destruction by Helene. The new damage is substantial.



The barn at Carl Sandburg Home National Historic Site will be accessible to the public as of Jan. 22 as part of the phased re-opening. You will also get access to see the Connemara goats. PROVIDED BY CARL SANDBURG HOME NATIONAL HISTORIC SITE

The previously approved repair plan (which included design, compliance, contracting, and a 2025-26 timetable) must be redone due to the additional, substantial damage.

The park closed in late September 2024, due to severe impacts from Helene. Since then, emergency cleanup crews have been shared between North Carolina, South Carolina and Tennessee national park units affected by Helene. These units include Blue Ridge Parkway, Great Smoky Mountains, Ninety Six, Cowpens, and Carl Sandburg Home.

The park does not have any other reopening information at this time. Visit Facebook page or www.nps.gov/carl for updates.

Kays

Continued from Page 1A

to eDNA, itself a new technique that researchers have been using for several years to identify individuals of a particular species in a given sample. However, while DNA reveals the genetic material that separates one individual from another, RNA goes a step further to show which genes are expressed. By analyzing eRNA, researchers hope to screen samples for specific gene expressions such as those found only during the hellbender's larval stage, like tail fins and external gills.

'Through this method, we'll be able to collect a water sample and say, 'Yes, there's larvae in the stream,' or 'No, there isn't," Cox said. "It should hopefully be a really good management tool for conservation, and not just in the

If Cox and Apodaca are successful in their use of eRNA, wildlife agencies across the country could benefit from the techniques they develop — as would the hellbenders under their care. At the North Carolina Wildlife Resources Commission, wildlife biologist Lori Williams said that she and one technician are the agency's only two employees tasked with working on mountain amphibian populations in Western North Carolina.

"I'm all for any technique that we can scale up to make our work more efficient and reveal meaningful information about hellbender populations," she said.

Currently, the best way to survey for hellbenders is to search for them while

snorkeling in the cold water, said Chris Ogle, biodiversity survey manager for the Tennessee Wildlife Resources Agency. It's a difficult and labor-intensive process, and much-smaller juvenile hellbenders are especially difficult to spot during these surveys. The emerging eRNA technique could prove helpful in those efforts.

"Science is always progressing with new and updated features that allow you to do things more passively, which is a great thing for efficiency but also because every time we put hands on the animal, that's putting stress on the animal as well," Ogle said. "A lot of times, that's the only way to monitor how their populations are doing."

The Smokies project will seek to answer other hellbender-related questions as well, analyzing the DNA of captured animals to determine their genetic lineage and ascertain whether some populations are becoming isolated, leading to genetic bottlenecking and inbreeding.

If we know that those streams' populations are experiencing reduced genetic diversity from geographic isolation, that might change our decisionmaking when weighing NPS operations like building a new trail or road and bring more intense conservation actions onto the table, like translocations and reintroductions," Cox said.

He's particularly interested in the state of hellbender genetics near Fontana Dam, which cuts off the natural flow of streams leaving the park's southwestern side. Hellbenders aren't known to travel far during their lives according to the USFWS, the average home range is between 322 and 23,810 square feet, smaller than half a football field — and dams are thought to be impenetrable barriers to the species' natural dispersal.

"The last record we have of hellbenders on that side of the park is from 2015 or 2016, so we don't actually know that they've been in any of those streams over the last decade," Cox said. "Some subject matter experts think they may no longer be over there."

The project will also take a close look at the Deep Creek area, home to a known population of hellbenders. Anecdotal evidence from the 2010s suggested that activities such as trampling, rock stacking, and damming - all associated with tubing, a popular activity on Deep Creek — might be resulting in death or loss of limbs for hellbenders; researchers will attempt to find out if that's the case.

"When you see a hellbender, it's hard to believe that an animal like that exists," Apodaca said. "But it fits so well into the Southern Appalachians and really represents the region. It's a good mascot for how ancient these mountains are and how special that biodiversity is."

But that biodiversity is under threat, as the listing proposal indicates and Helene's aftermath highlights. Many hellbenders died in the flood, and others passed away later, after their attempts to escape the roiling floodwaters left them stranded without the moisture they needed to survive. Cox is worried that a future flood could flush the park's hellbenders too far downstream for them to return, leading to extirpation in

parts of the Smokies.

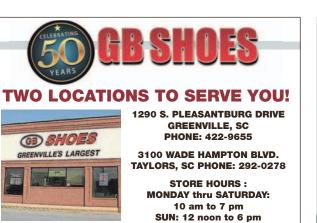
It's unknown how hellbenders fared in Cataloochee, Big Creek, and Raven Fork, the areas of the park that endured the worst damage from Helene. These areas would appear to hold quality hellbender habitat but have no known populations. Some have undergone eDNA surveys but came up negative. The upcoming study will give Cox a more solid baseline to compare against any future floods or other events that shift Smokies hellbender populations.

When completed, the study will join a growing body of research from dedicated scientists looking for ways to better monitor hellbender populations, improve their habitat, and help them reproduce successfully. Despite the challenges facing the species, this gathering constellation of data leaves Cox opti-

"I think there's a lot to be hopeful with on hellbenders," he said. "There's so much good research being done, so I think the future is bright in that sense. With all of this research, I think we'll be able to make a big difference."

Holly Kays is the lead writer for the 29,000-member Smokies Life, a nonprofit dedicated to supporting the scientific, historical, and interpretive activities of Great Smoky Mountains National Park by providing educational products and services such as this column. Learn more at SmokiesLife.org or reach the author hollyk@smokieslife.org. To learn more about the hellbender listing proposal or comment by Feb. 11, search docket number FWS-R3-ES-2024-0152 on Regulations.gov.







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