



NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

# WILDLIFE DIVERSITY PROGRAM QUARTERLY REPORT

April-June 2020





The North Carolina Wildlife Resources Commission's (NCWRC) Wildlife Diversity (WD) Program is housed within the agency's Wildlife Management and Inland Fisheries divisions. Program responsibilities principally include surveys, research and other projects for nongame and endangered wildlife species. Nongame species are animals without an open hunting, fishing or trapping season.

## Wildlife Diversity Program Staff

Dr. Sara Schweitzer, Wildlife Diversity Program Coordinator  
[sara.schweitzer@ncwildlife.org](mailto:sara.schweitzer@ncwildlife.org); Wake County

Todd Ewing, Aquatic Wildlife Diversity Program Manager  
[todd.ewing@ncwildlife.org](mailto:todd.ewing@ncwildlife.org); Wake County

Scott Anderson, Bird Conservation Biologist  
[scott.anderson@ncwildlife.org](mailto:scott.anderson@ncwildlife.org); Wake County

David H. Allen, Eastern Wildlife Diversity Supervisor  
[david.h.allen@ncwildlife.org](mailto:david.h.allen@ncwildlife.org); Jones County

John P. Carpenter, Eastern Landbird Biologist  
[john.carpenter@ncwildlife.org](mailto:john.carpenter@ncwildlife.org); New Hanover County

Alicia Davis, Alligator Biologist  
[alicia.davis@ncwildlife.org](mailto:alicia.davis@ncwildlife.org); Wake County

Katharine DeVilbiss, Central Region Aquatic Wildlife Diversity Biologist  
[katharine.devilbiss@ncwildlife.org](mailto:katharine.devilbiss@ncwildlife.org); Granville County

Katherine Etchison, Mammalogist  
[katherine.etchison@ncwildlife.org](mailto:katherine.etchison@ncwildlife.org); Buncombe County

Dr. Luke Etchison, Western Region Aquatic Wildlife Diversity Coordinator  
[luke.etchison@ncwildlife.org](mailto:luke.etchison@ncwildlife.org); Haywood County

Michael Fisk, Eastern Region Aquatic Wildlife Diversity Coordinator  
[michael.fisk@ncwildlife.org](mailto:michael.fisk@ncwildlife.org); Lee County

Sarah Finn, Coastal Wildlife Diversity Biologist  
[sarah.finn@ncwildlife.org](mailto:sarah.finn@ncwildlife.org); New Hanover County

Andrew Glen, Eastern Region Aquatic Wildlife Diversity Biologist  
[andrew.glen@ncwildlife.org](mailto:andrew.glen@ncwildlife.org); Alamance County

Gabrielle Graeter, Conservation Biologist/Herpetologist  
[gabrielle.graeter@ncwildlife.org](mailto:gabrielle.graeter@ncwildlife.org); Buncombe County



Dr. Matthew Godfrey, Sea Turtle Biologist  
[matt.godfrey@ncwildlife.org](mailto:matt.godfrey@ncwildlife.org); Carteret County

Jeff Hall, Partners in Amphibian and Reptile Conservation Biologist  
[jeff.hall@ncwildlife.org](mailto:jeff.hall@ncwildlife.org); Pitt County

Dr. Jeff Humphries, Eastern Amphibian and Reptile Biologist  
[jeff.humphries@ncwildlife.org](mailto:jeff.humphries@ncwildlife.org); Orange County

Carmen Johnson, Waterbird Biologist  
[carmen.johnson@ncwildlife.org](mailto:carmen.johnson@ncwildlife.org); Craven County

Brena Jones, Central Region Aquatic Wildlife Diversity Coordinator  
[brena.jones@ncwildlife.org](mailto:brena.jones@ncwildlife.org); Granville County

Chris Kelly, Western Bird and Carolina Northern Flying Squirrel Biologist  
[christine.kelly@ncwildlife.org](mailto:christine.kelly@ncwildlife.org); Buncombe County

Allison Medford, Piedmont Eco-Region Wildlife Diversity Biologist  
[allison.medford@ncwildlife.org](mailto:allison.medford@ncwildlife.org); Montgomery County

Dylan Owensby, Western Region Aquatic Wildlife Diversity Biologist  
[dylan.owensby@ncwildlife.org](mailto:dylan.owensby@ncwildlife.org); Haywood County

Michael Perkins, Foothills Region Aquatic Wildlife Diversity Biologist  
[michael.perkins@ncwildlife.org](mailto:michael.perkins@ncwildlife.org); McDowell County

TR Russ, Foothills Region Aquatic Wildlife Diversity Coordinator  
[thomas.russ@ncwildlife.org](mailto:thomas.russ@ncwildlife.org); McDowell County

Andrea Shipley, Mammalogist (shared staff with Surveys & Research)  
[andrea.shipley@ncwildlife.org](mailto:andrea.shipley@ncwildlife.org); Nash County

Kendrick Weeks, Western Wildlife Diversity Supervisor  
[kendrick.weeks@ncwildlife.org](mailto:kendrick.weeks@ncwildlife.org); Henderson County

Lori Williams, Western Amphibian Biologist  
[lori.williams@ncwildlife.org](mailto:lori.williams@ncwildlife.org); Henderson County



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Cover photos (clockwise from top): Wildlife Diversity Technician, Kristi Confortin, examines a bridge in Cherokee County for signs for roosting bats; Lt. Mark Cagle, assisted WDP staff with Spotted Turtle surveys; Social distancing was no trouble as surveyors spaced themselves out to walk through colonies while counting nests; Cerulean Warbler; Timber Rattlesnake



## Colonial Waterbird Survey Conducted Amid COVID-19

*Carmen Johnson, Waterbird Biologist*

Every three years, the the N.C. Wildlife Resources Commission's (NCWRC) Waterbird Team sets off to complete the Colonial Waterbird Survey, which occurs during May and June, for colonial waterbirds, such as terns, skimmers, pelicans and egrets. This survey counts all colonial nesting waterbirds in the coastal region and is one of the longest running surveys of its kind, dating back to 1977. Its purpose is to gather data on the population and distribution of these birds, as well as habitat conditions, to aid management decisions by NCWRC and other agencies.

Ten agencies and non-profit organizations surveyed more than 200 sites. Habitats included marsh islands, barrier islands, dredge material islands, shoals and gravel rooftops. Staff typically rely on help from volunteers to complete these surveys, but the safety precautions needed to prevent the spread of COVID-19 required drawing on resources from within NCWRC. Many staff throughout the agency contributed their time and boats to help safely complete this year's count. Data are now being entered in the Colonial Waterbird Database maintained by NCWRC and a report will be completed later this year. ◊



**Juvenile Great Egrets**  
(Photo: Annika Anderssen/NCWRC)



**Juvenile Brown Pelicans**  
(Photo: Sue Cameron/USFWS)



**Least Tern eggs**  
(Photo: Annika Anderssen/NCWRC)



*Social distancing was no trouble as surveyors spaced themselves out to walk through colonies while counting nests. (Photo: Carmen Johnson)*



## Tagged Green Sea Turtle from Florida Found on North Carolina Beach

*Dr. Matthew Godfrey, Sea Turtle Biologist*

On June 18, not long after daybreak on Onslow Beach, on Camp Lejeune Marine Corps Base, an adult female green sea turtle was observed crawling back to the ocean. Just before she entered the water, the base biotechs observed that the turtle had a single metal flipper tag in its right front flipper, with a unique ID: QQR472. This ID was not found in the NCWRC's sea turtle tag database, so the information was sent to the central sea turtle tag database maintained by the University of Florida. Records indicated that the tag came from the Marathon Sea Turtle Hospital in the Florida Keys. Subsequent correspondence revealed that this turtle had been captured as a hatchling in 1993 from a nest that was laid on Hutchinson Island, Florida, and raised in captivity for two years at the Mara-

thon Sea Turtle Hospital as part of various health studies. It was released into the ocean in Florida in May 1995 with a metal flipper tag in each front flipper. This tag recapture is surprising not only because it is rare for a metal flipper tag to remain in place over nearly three decades and on a turtle that has grown from roughly 10 lbs at release to >200 lbs at adulthood, but also because she came from a nest laid in Florida.

Recent analyses suggest that although nesting green sea turtles in North Carolina are genetically distinct from those nesting in Florida, it is likely that the North Carolina population originally came from Florida. This turtle's history demonstrates that green turtles can and do move between nesting areas in Florida and North Carolina. ◆

*Tagged green sea turtle observed nesting on Onslow Beach in Onslow County, NC  
(Photo: Les Pearson, Threatened & Endangered Species Program, Marine Corps Base Camp Lejeune)*





## Biologists Captive Rear Gopher Frogs to Release on the Sandhills Game Land

*Dr. Jeff Humphries, Eastern Amphibian and Reptile Biologist*

During the second quarter, NCWRC biologists, in collaboration with the North Carolina Zoo, captive reared (headstarted) juvenile Gopher Frogs in an effort to create a new population of the species where they once existed. Frogs have been captive reared and released on Sandhills Game Land for over five years in order to augment the remaining single population. This is the first year they are attempting to translocate juvenile frogs to a new population—an effort that is important for the long-term viability of Gopher Frogs on this landscape.

In 2011, NCWRC staff began restoration on a large isolated wetland that had been neglected for decades (e.g., lack of fire, heavy growth of pine and hardwood trees). This involved removal of large trees and subsequent restoration of the natural hydroperiod and herbaceous plant cover. After nine years, this wetland now appears to be suitable for supporting Gopher Frogs.

More than 300 juvenile headstarted Gopher Frogs are being released at the restored site, with the hopes of establishing a self-sustaining population. This is in the experimental phase as of now, but if successful, staff hope to translocate additional Gopher Frogs to this and other restored wetlands in the area in order to create a more robust metapopulation, ensuring that the Sandhills population does not become locally extirpated. Automated frog call loggers and dipnet surveys will be conducted at this particular restoration site over subsequent years to determine success in translocating Gopher Frogs to wetlands likely to have once supported this extremely rare and specialized amphibian. ◆



*Collecting Gopher Frog eggs for captive rearing and head-starting (Photo: Dr. Jeff Humphries/NCWRC)*



*Isolated wetland undergoing restoration on Sandhills Game Land, NC. This site was completely forested until 2011 when vegetation communities and hydroperiod were restored with the intention of providing more breeding and upland habitat for the Gopher Frog and other amphibian species. (Photo: Brady Beck/NCWRC)*



## N.C. Partners in Amphibian and Reptile Conservation Updates

by Jeff Hall, Partners in Amphibian and Reptile Conservation Biologist

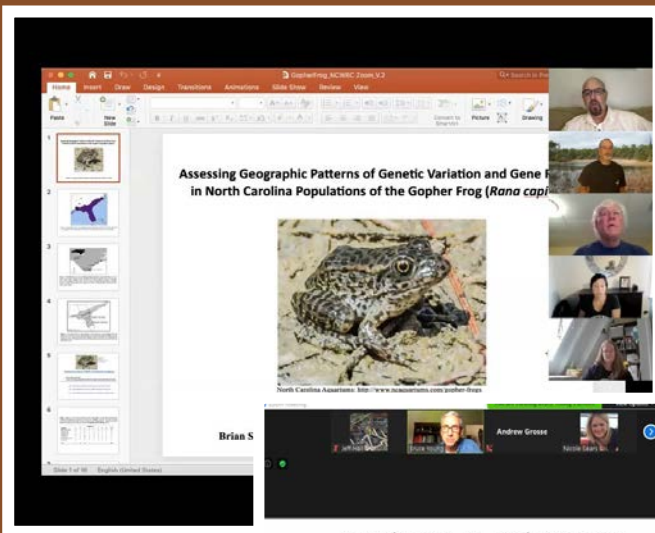
Although concerns about COVID-19 led to the cancellation of many in-person meetings, workshops, and presentations, Wildlife Diversity Program (WDP) staff were able to conduct many of these via on-line platforms such as Teams or Zoom. Staff participated in the hosting of two workshops on frogs, one on salamanders, one on snakes, and one on box turtles. All of these on-line

offerings were very-well attended. Using virtual platforms is an excellent way to reach a larger audience with presentations and holding these types of meetings is likely the path for the future.

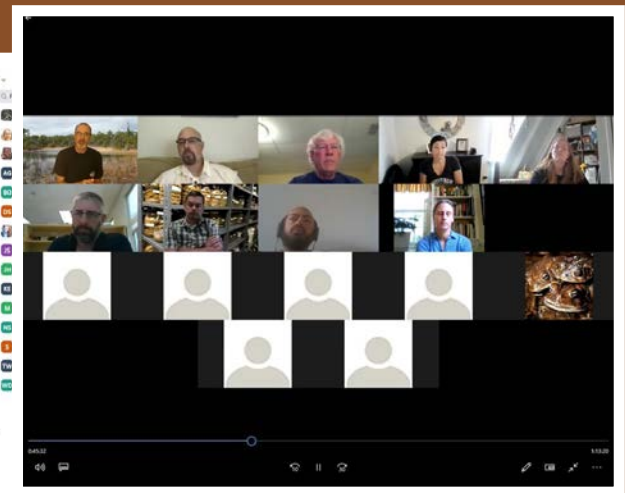
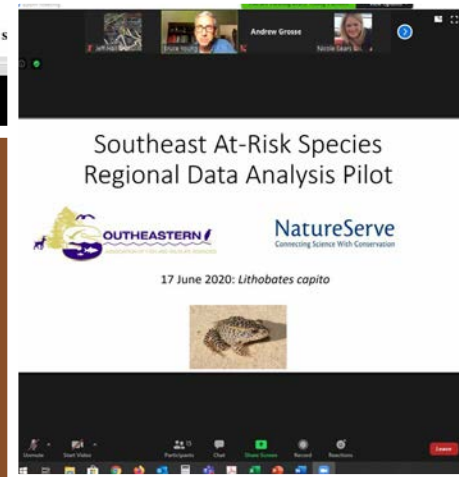
In addition to the meetings mentioned above, staff also participated in several targeted scientific virtual presentations. Two workshops were held on Gopher Frog conservation. One targeted at understanding the genetics of



NC Gopher Frogs and the other at fine-tuning the NatureServe ranking for the species range-wide. An additional NatureServe ranking workshop was held virtually to assess the Eastern Diamondback Rattlesnake.



COVID-19 and its associated "Stay-At-Home" & "Safer at Home" orders resulted in many NCPARC-related meetings, workshops and presentations being conducted remotely via Zoom or Microsoft Teams. Despite this, they were very informative and well attended.







## Other NCPARC News: Reptile & Amphibian Field Surveys Yield Good Results

The spring is an active time for many species. Even with COVID-19 restrictions in place, NCWRC staff managed to conduct significant field work involving multiple species including use of trail cameras, walking prescribed burn areas, installation of coverboard sites, and general visual encounter surveys for Species of Greatest Conservation Need (SGCN) reptiles and amphibians.

In light of an impending U.S. Fish and Wildlife Service's

species status assessment for the Spotted Turtle, NCWRC staff also conducted specific surveys for this species. Staff from multiple divisions helped with this effort. Field sites included many coastal locations.

Gopher Frog head-start work continued through this quarter working with the North Carolina Aquariums, the North Carolina Zoo, NCSU CMAST, and Carteret Community College.

With help from the Land and Water Access Division, WDP staff were also able to locate a coastal

gestational site for Timber Rattlesnakes. Although communal gestational sites are somewhat common in the Mountain region, they are very rare on the Coastal Plain. The site, located in Bladen County, held at least two gravid females basking approximately 6 feet apart. This is the first time this communal basking behavior has been observed in the Coastal Plain by staff, and possibly the first time ever in North Carolina, which is very exciting news for agency. ◆



*Clockwise from top left: Spotted Turtles found during spring surveys; Staff from other agency divisions, such as Lt. Mark Cagle, assisted WDP staff with Spotted Turtle surveys; Barking Treefrog found in game land pond; One of two female Timber Rattlesnake found at gestational site in Bladen County*

*(All photos: Jeff Hall/NCWRC)*



## Biologists Estimate 25-28 Cerulean Warblers in Buncombe County Population

by Christine Kelly, Western Bird and Carolina Northern Flying Squirrel Biologist

In western North Carolina, the largest known population of Cerulean Warblers is found in the Elk Mountains and Bull Mountain of Buncombe County, northeast of Asheville. The prospect of glimpsing a male cerulean glowing like a light tone sapphire in the sunlight draws birders to this area from all over in late April and early May before the trees leaf out. Close monitoring of the Buncombe population has largely been carried out by volunteer birders. The most robust monitoring effort was led by Audubon North Carolina volunteer Charlotte Goedsche from 1998

until 2018. Goedsche is renowned among local birders for her daily visits to record the songs of individual males. Monitoring stopped when Goedsche moved away in 2018, leaving a rich legacy dataset.

In consultation with Goedsche, NCWRC took steps to ensure long-term monitoring of this population. Biologists strove to adapt past monitoring efforts to a user-friendly protocol that could enlist trained volunteers. In 2020, staff conducted a pilot survey consisting of 40 points over a 6-mile stretch of the Blue

Ridge Parkway. At each point, observers watched and listened passively for 5 minutes. Surveys

**With the Parkway closed this spring due to COVID-19 restrictions, Wildlife Diversity Program staff walked and jogged to survey points. Their miles on foot provided rare opportunities to spot female ceruleans during courtship.**

were repeated four times at approximately weekly intervals between April 30 and May 18.

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The Cerulean Warbler is long-winged, long-billed, short-tailed, and a bit pot-bellied.



Male Cerulean Warbler (Photos: Alan Lenk)



## Biologists Estimate 25-28 Cerulean Warblers in Buncombe County Population

To flesh out a population estimate, staff also surveyed the nearby Mountains-To-Sea Trail. Data were analyzed in program Presence using a single-season occupancy model that reports on the proportion of points occupied. Because ceruleans are not always detectable even when they are present (e.g., they might be too busy gobbling caterpillars to sing), data from all four visits were used to calculate a derived estimate of occupancy of 67.4%. The detection probability, which is the chance of seeing or hearing a cerulean if it was indeed present, was estimated at 57%.

Biologists will continue to analyze the pilot dataset and develop a multi-season occupancy monitoring plan for this population. In addition to the occupancy analysis staff estimated the population size by examining all mapped locations of singing males. An estimate of 30-35 males in 2020 is only slightly higher than Goedsche’s estimates of abundance based on in-depth visits between 2014 and 2018. ◆



*The female Cerulean Warbler has been described as a delicate watercolor. (Photo: Alan Lenk)*



## Help Us Keep North Carolina Wild

*Three ways YOU can help.*

- Donating to the North Carolina Tax Check-off for Nongame and Endangered Wildlife Fund, found on line 30 of your North Carolina income tax form each year.
- Purchasing a Wildlife Conservation License plate. This new plate, unveiled in 2019, costs \$30 with \$20 going to the agency's Nongame and Endangered Wildlife Fund.
- Donating to the Wildlife Diversity Endowment Fund, a special fund where the accrued interest – not the principal – will be spent on programs that benefit species that are not hunted or fished.



Nongame projects are primarily funded through these donations and purchases. Every dollar in donations given to the fund is matched with federal and other grants, so donated dollars actually count twice. All donations are tax deductible!

Learn more: [ncwildlife.org/donate](http://ncwildlife.org/donate)



## Staff Conduct Wayne's Black-throated Green Warbler Surveys on Bladen Lakes State Forest

by John Carpenter, Eastern Landbird Biologist

In late April, NCWRC temporary biologist Alex Worm hunkered down in Tatum Millpond of Bladen Lakes State Forest to search for male Wayne's Black-throated Green Warblers that weeks earlier had been captured and released wearing color bands. The primary goals were to collect blood samples for genetic analysis and to confirm that these individuals remained in the area to attempt breeding. This section of Bladen Lakes State Forest hosts an incredibly diverse avian community during the breeding season and includes approximately eight to 10 territorial Black-throated

Green males, which surprisingly and unfortunately, represents some of the highest densities of this species

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**The first breeding evidence of Wayne's Black-throated Green Warbler along the Atlantic Coastal Plain came from Lenoir County in North Carolina, during the summer of 1905. A second nest was described five years later from Lake Ellis, Craven County, in June 1910.**

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in southeast NC. After successfully finding several banded birds, Alex's attention shifted to nest searching, and over the course of three days, four active nests were located. Most nests were found near a canopy gap in otherwise contiguous forest

stands surrounded by large-diameter and tall hardwood and pine trees. Historically, Wayne's were associated mostly with Atlantic White Cedar forests, but the rise of the shingle industry during the late 1800s decimated this unique ecological community in the southeast. Only one nest successfully fledged young, two failed, and the fate of the fourth is unknown. One of the failed nests did occur in a territory that eventually produced young later in the season. Staff will use this sparse but valuable dataset to continue untangling the mysterious ways of the Wayne's Black-throated Green Warbler. ◊



*Wayne's Black-throated Green Warbler nest and attending adult, Bladen County*  
(Photo: Alex Worm/NCWRC)



## Salamander Surveys Conducted on Pisgah and Nantahala National Forests

by Lori Williams, Western Amphibian Biologist

In spring 2020, Wildlife Diversity staff reviewed the U.S. Forest Service’s draft National Forest Management Plan revision, in consideration of amphibian communities and Species of Greatest Conservation Need (SGCN), sensitive habitats, and amphibians with management concerns, particularly for salamanders that thrive in closed-canopy forest conditions. Overall, data on salamander community composition, relative abundance and habitat use

are lacking on National Forest areas slated for timber harvest, but it is important to understand baseline information for salamander communities and populations pre-harvest, so biologists can monitor species presence and examine recolonization in the years that follow forest management actions.

Thus, staff boosted survey effort in timber management units on both Pisgah and Nantahala National Forests this quarter in daytime and nighttime searches. Target areas included forest units in northern Hay-

wood, southern Haywood, and western Macon counties, with plans to begin inventory surveys on upcoming forest management projects in Clay and Graham counties as well.

Staff have conducted 10 surveys so far, and besides a wide variety of common species, have documented SGCN such as Southern Appalachian Salamander, Southern Pygmy Salamander, and Red-legged Salamander in management areas. ◆



*The Red-legged Salamander is a Watch List species and Species of Greatest Conservation Need that often uses mature, mesic forest habitat at mid-to-high elevations. (Photo: B. Dalton)*



*The Southern Appalachian Salamander is a Species of Greatest Conservation Need and is found in mostly closed canopy conditions of mesic forests along a wide elevational gradient. (Photo: B. Dalton)*



*The Southern Pygmy Salamander is a Significantly Rare, Species of Greatest Conservation Need primarily found in high-elevation, mature forest. (Photo: B. Dalton)*



## Bat Surveys Shift Focus During Pandemic

by Katherine Etchison, Mammalogist

Biologists stepped up non-contact bat surveys during May and June amid concerns about the unknown potential for humans to transmit the SARS-CoV-2 virus to North American bats. Until results become available from research trials, bat surveys requiring direct contact were postponed. Typically, mistnetting surveys are the priority from May through August, but biologists shifted

the focus to roost surveys to avoid contact with bats. Some bat species roost in manmade structures, like bat houses and bridges, and can be easily documented by observation. In May and June, 34 bridges and 32 bat boxes were surveyed in 16 counties and resulted in detection of five species. These surveys are conducted each spring and summer on a small scale, but this year's circumstances allowed biologists to check more roosts than ever before. A highlight of these surveys was the sighting of two little brown bats in a bridge previously occupied by a maternity colony before White-Nose Syndrome caused severe population declines in this species.

Biologists also conducted sunset counts of bats emerging from roosts, termed emergence counts. Emergence counts are useful for counting bats that are sensitive to human disturbance or in situations where bats cannot be accurately counted during daytime surveys. A record high number of endangered Virginia big-eared bats was tallied during an emergence count in early June. An emergence count at a bridge roost in Buncombe County totaled 745 bats, with many endangered gray bat calls recorded during the count.

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*A big brown bat roosting in a bat house in Henderson County.*

*(Photo: Katherine Etchison/NCWRC)*



*A big brown bat roosting on the side of a building in Buncombe County. (Photo: Katherine Etchison/NCWRC)*



## Bat Surveys Shift Focus During Pandemic

Finally, the NABat acoustic program afforded another non-contact survey method, in which bats were acoustically recorded during driving transects. This program is statewide and involves WRC staff from 5 divisions, over 30 volunteers, and researchers from UNC Greensboro. This survey method was fitting during socially distant times because participants were required to conduct the survey independently or with household members only. Though this quarter was unusual, bat monitoring continued and in some cases was even improved. ◀



*Wildlife Diversity Biologist, Katherine Etchison, surveys a bridge in Polk County for bats. (Photo: Kristin Confortin/NCWRC)*



*Wildlife Diversity Technician, Kristi Confortin, examines a bridge in Cherokee County for signs for roosting bats. (Photo: Katherine Etchison/NCWRC)*



*Wildlife Diversity Technician, Kristi Confortin, surveys a bat house in McDowell County. (Photo: Katherine Etchison/NCWRC)*



## First Record of Northern Pine Snake Documented in North Carolina Mountains in 10+ Years

by Gabrielle Graeter, Conservation Biologist/Herpetologist & Sam McCoy, Wildlife Diversity Technician, Mountain Reptiles

One of North Carolina's many Species of Greatest Conservation Need as described in the Wildlife Action Plan is the Northern pine snake. This large, nonvenomous snake is also state listed as

Threatened. While it is most commonly encountered in the Sandhills and southern Coastal Plain of North Carolina, there are a handful of records, mostly historic, from the southwestern Mountains. Pine snakes have been reported in Cherokee and Swain coun-

ties, and a few range maps show their distribution extending from Cherokee to Rutherford counties.

The NCWRC began work last year to better understand the pine snake populations in the mountains, and it is beginning to pay off. The first step toward learning more about these populations was to locate some of these elusive animals. Pine

snakes spend most of their time burrowing underground, so it can be difficult to encounter them. Staff partnered with three private landowners in Cherokee County and installed a drift fence with special-



Northern pine snake (Photo: Lori Williams/NCWRC)

ized camera traps on each of their properties. These properties were selected because they all contain potential pine snake habitat; open areas near pine-oak forest.

A drift fence is a common method of capturing reptiles and amphibians. The drift fence acts as a barrier on the landscape to direct the movement of animals and usually has some type of trap attached to it

to capture the animal as it tries to go around the fence. In this case the trap is a camera. This camera trap consists of a modified trail camera suspended in a bucket placed at each end of the

fence to photograph animals moving along the fence. The drift fence cameras are deployed during the pine snake's active season, April through Oct. While they captured images of many species in 2019, including copperhead, five lined skink and six lined racerunner, they did not photograph a

pine snake. But on May 25, they finally photographed one. This is the first confirmed record of a pine snake in Cherokee County, or anywhere in the mountain region of North Carolina, since 2009. Now that biologists have this new record, they hope to expand their camera trapping effort and attempt live trapping in the future.

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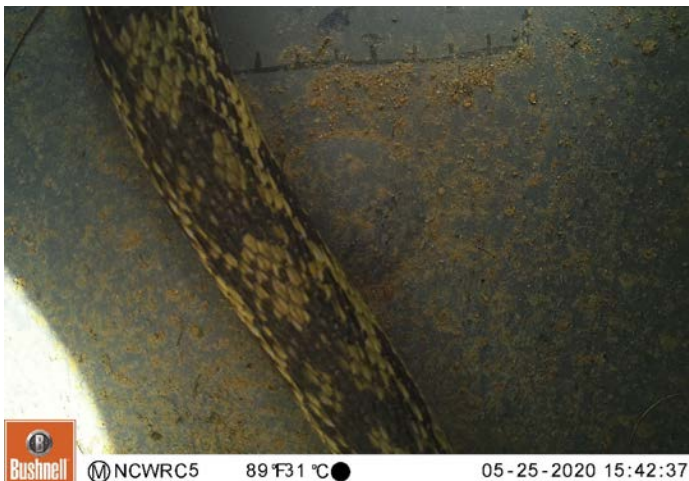




## First Record of Northern Pine Snake Documented in North Carolina Mountains in 10+ years

In addition to the camera trapping, staff have led a public outreach campaign in hopes the public could tell them more about pine snakes in their area. The agency published a news release statewide on April 9 requesting the public report any pine snake observations to [pinesnake@ncwildlife.org](mailto:pinesnake@ncwildlife.org). This news release was picked up by at least four local newspapers in the southwestern mountains (<https://www.ncwildlife.org/News/wildlife-commission-seeks-pine-snake-sightings-in-southwestern-north-carolina>).

To date, biologists have received 45 submissions from the public, which include two confirmed records of pine snakes in Hoke County. Although they have not received any pine snake records from the public yet in western North Carolina, they have received responses from Buncombe, Haywood and Henderson counties, which at least shows that residents of the southern mountains heard their request. Biologists are hopeful that they may yet have a pine snake reported from the western part of the state. ◆



*Photos of the Northern pine snake that was documented by a camera trap in Cherokee County in May 2020.*



*The drift fence in Cherokee County where a Northern pine snake was detected on May 25, 2020. Modified trail cameras are suspended in the buckets at the ends of the fence. (Photo: NCWRC)*



## THE WILDLIFE DIVERSITY PROGRAM

The Wildlife Diversity Program was established in North Carolina in 1983 to prevent nongame species from becoming endangered by maintaining viable, self-sustaining populations of all native wildlife, with an emphasis on species in decline.

More than 700 nongame animals call North Carolina home. Many nongame species, including mammals, birds, amphibians and reptiles, freshwater mussels and fish, are common and can be seen or heard in your own backyard. Other nongame animals, such as bald eagles and peregrine falcons, were, at one time, considered endangered, but now soar high in the sky, thanks to the work conducted by wildlife diversity biologists.

The men and women who work for the Wildlife Diversity Program are dedicated to conserving and promoting nongame wildlife and their habitats through a variety of survey and monitoring programs, species management, and habitat conservation or restoration projects. These programs and projects target nongame animals and their habitats, but game species — such as deer, turkey, mountain trout, and black bass — also benefit because they share many of these same habitats.

You can learn more about the many projects and programs conducted by wildlife diversity personnel on behalf of nongame and endangered wildlife by visiting [www.ncwildlife.org/wdp](http://www.ncwildlife.org/wdp).



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