NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

WILDLIFE DIVERSITY PROGRAM QUARTERLY REPORT

January-March 2021

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.

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Barn Owl (Anan Kaewkhammul)

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Clockwise from top left: Share the Shore sign on Emerald Isle (Carmen Johnson); Wildlife Diversity Technician, Kyle Shute, inspects a hibernating tricolored bat in a Caldwell County culvert.(Katherine Etchison); New NCWRC Wildlife Technician Kabryn Mattison with a large, wily Eastern Coachwhip (Jeff Hall); Haywood Community College wildlife student, Rachael Hart, hangs a nest box for northern saw-whet owls at William H. Silver Game Land (Christine Kelly)

North Carolina Bird Atlas Off to a Great Start

by John Carpenter, Eastern Landbird Biologist

The North Carolina Bird Atlas, one of the state's largest citizen scientist projects, has officially launched! Over the last several months, the Atlas team has been busy hosting webinars with the birding community, developing a volunteer handbook, and refining survey strategies to estimate bird abundance and distribution across the state.

Birds are the most accessible form of wildlife for people to witness and observe, and crucial to the health of North Carolina's wild, natural places. Yet, one in four birds has been lost since 1970 nationwide, an estimated total of 2.9 billion. The first step to reversing this trend is having a detailed picture of birds and what they depend on to be healthy in our state.

This can be achieved with the Atlas data collection efforts, which will occur through eBird.org/atlasnc. Volunteer participation is already off to a great start with hundreds of survey checklists submitted in just a few weeks. This project will gather essential information about the current and future distribution and abundance of NC's birds and guide resources to help prevent listing species as endangered or even becoming extinct.

Genetic Analyses of Eggshells Reveal Nesting Distances of Loggerheads

by Dr. Matthew Godfrey, Sea Turtle Biologist

Natal homing, which is the propensity for adults to return to the same location of their birth, has been a hallmark behavior of nesting female sea turtles since monitoring began over 50 years ago. Fundamental research involving genetics, satellite tracking and flipper tagging refined the scale of natal homing of a population to a few hundred kilometers. Current genetic analyses of eggshell samples from every known loggerhead nest laid between Virginia and northern Florida have shown that most loggerhead females lay their eggs within a span of a few dozen kilometers. A subset of turtles lay their eggs within several hundred kilometers, and a smaller number may venture even farther between their nesting sites. For example, one nesting loggerhead in 2019 nested first on the northern Outer Banks of North Carolina at the end of May. Then, in mid-June, she nested just south of Jacksonville, Fla. She laid a third nest that same season in early July at Fort Fisher State Recreation Area in New Hanover County, NC. The total distance she traveled to lay these three nests is unknown, but at minimum was >1400 km (870 miles). While this long-distance dispersal between nesting locations is relatively rare, it demonstrates some plasticity in the selection of nesting beach in this population of loggerheads, and suggests that individuals may be able to find new potential nesting locations made suitable for egg incubation due to changing climate conditions.

Map showing placement of three nests by an individual loggerhead sea turtle during the summer of 2019. These data were derived from genetic samples collected from each nest laid between Virginia and northern Florida.

Rainy Winter Yields Positive Results for "New" Isolated Wetlands

by Dr. Jeff Humphries, Eastern Amphibian and Reptile Biologist

During first quarter 2021, NCWRC biologists working in the Sandhills spent considerable effort surveying for Species of Greatest Conservation Need (SGCN) such as Gopher Frogs, Eastern Tiger Salamanders and Mabee's Salamanders. They have also continued to collect small portions of Gopher Frog egg masses for head-starting and translocation of captive-reared juveniles. This past winter was extremely rainy compared to normal years and the high amount of precipitation presented an opportunity to search for isolated wetlands that may have been overlooked before. Indeed, several "new" wetlands were documented over the past few months on Sandhills Game Land. One of these wetlands is being used by Tiger Salamanders for breeding and another "new" wetland is occupied by Mabee's Salamanders. Discovering more isolated wetlands is important for documenting and monitoring SGCN species, assessing needs for wetland restoration, and directing management to maintain high quality habitat.

Clockwise from top left: Mabee's Salamander; Gopher Frog; Gopher Frog egg mass; Tiger Salamander

All photos: Jeff Hall

Waterbird Team Prepares for Nesting Season by Posting Closure Signs

by Carmen Johnson, Waterbird Biologist

With nesting season around the corner, the Waterbird Team spent March preparing for the return of the birds by posting closure signs on NCWRC-owned islands that are managed for the benefit of waterbirds. One additional site the NCWRC protects for nesting waterbirds is an area known as "the Point" at Emerald Isle. Through a partnership with the Town of Emerald Isle, the NCWRC protects nesting Least Terns and Wilson's Plovers each year at the western end of the beach, and a stewardship group of local volunteers has formed to assist the Waterbird Team in monitoring the birds and maintaining the posting. Staff and stewards set up the enclosure each spring, and the stewards conduct regular checks to monitor how many birds are nesting at the site, any predation events or issues with trespass. This year, some new signs were introduced at the Point to help inform beach goers about ways they can share the shore with beach nesting birds. Developed by the Atlantic Flyway Shorebird Initiative (AFSI), these signs are intended to complement the signs state and federal agencies already use to mark nesting areas by providing information on the birds and how to help birds while enjoying the beach.

Stewards and Waterbird Team staff pose with one of the new AFSI signs at Emerald Isle (Photo: Carmen Johnson)

A few common waterbird species that nest on North Carolina's beaches

Least Tern

Black Skimmer

Common Tern

Piping Plover

Staff Conduct Brook Lamprey Surveys to Determine Species Status

by Michael Fisk, Eastern Region Aquatic Wildlife Diversity Coordinator

The Wildlife Diversity Program Staff conducted surveys for Least Brook Lamprey to collect data on the distribution and life history of this unique fish. To date, no targeted surveys for Least Brook Lamprey have occurred in North Carolina and little is known about their range and habitat use. This is largely due to their cryptic nature where juveniles spend 3–5+ years within sandy substrates, filter feeding on microscopic detritus. Once fully grown at 4–8 inches, they transform into adults and emerge from the substrate in February–March. Once emerged they do not feed, but spawn in shallow, gravel riffles and die soon afterwards. The spawning window is only a few weeks, which makes it difficult to survey for this species. In North Carolina, the species has been documented in small-to medium-sized tributaries in a few watersheds within the Neuse and Tar river basins, mainly in the Piedmont but some records exist in the Coastal Plain as well.

Objectives for the study were to document contemporary distribution for the species and describe their spawning habitat. In March, staff surveyed streams weekly in Wake and Johnston counties within the Neuse Basin by walking the banks, searching for spawning individuals. Least Brook Lamprey will congregate in shallow riffles, and 1–10+ individuals will excavate nests by removing gravel and fine sediments with their mouth and tail. This behavior makes it possible to conduct visual surveys for the species.

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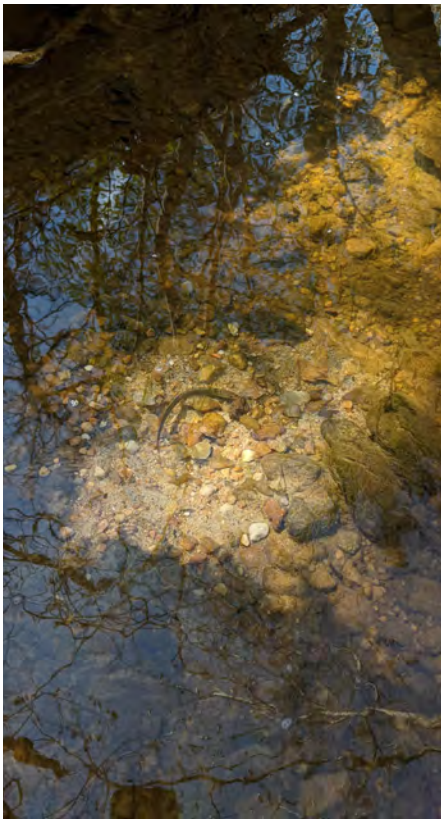
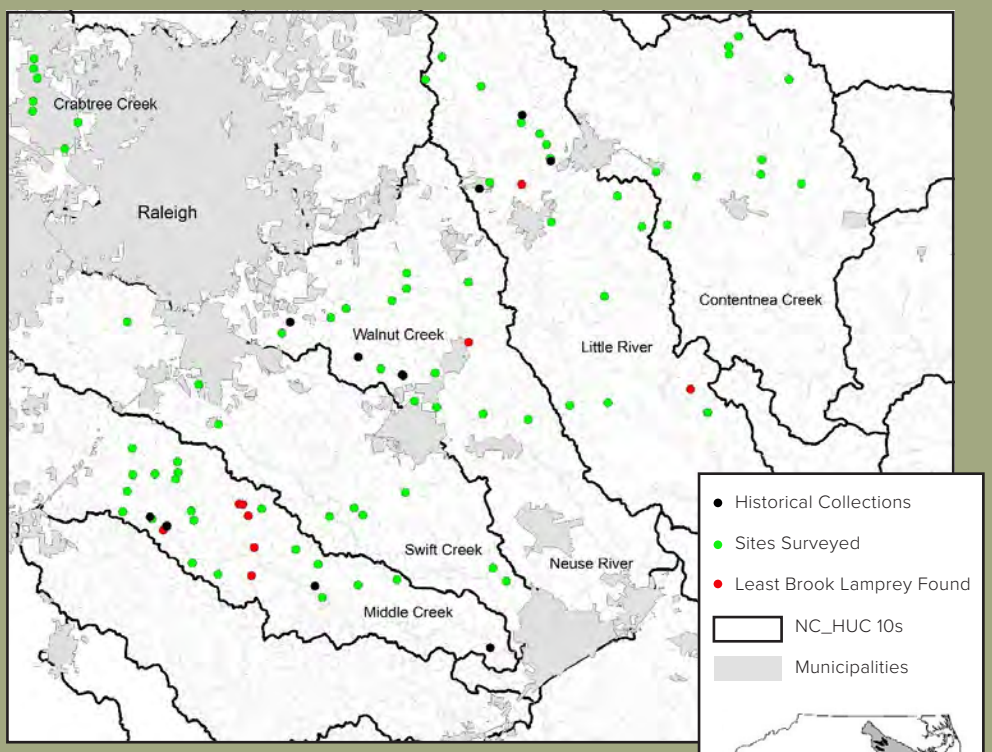


Brook Lamprey in shallow riffle
(Michael Fisk)



Map of historical records, survey locations, and 2021 collections of Least Brook Lamprey in the Neuse Basin in Johnston and Wake counties.

Fifty-one Least Brook Lamprey were observed from nine unique sites out of the 86 sites surveyed. Lamprey were found in the Middle Creek watershed most often, especially in Buffalo Branch and two other tributaries. Collections in the Little River watershed were only form two locations and one individual from each site. Eight of the nine locations where lampreys were observed were from new sites. Lamprey were observed nest building, stagging, and actively spawning in shallow, riffle habitats, typically near the bank in the upstream portion of the riffle. Spawning aggregations ranged from two to 12 lampreys. Observations occurred from March 3–15. Surveys found that habitat in many of the historical collections and other stream reaches has been degraded from urban development in these two fast-growing counties, as well as beaver activity converting lotic habitats into more lentic conditions. Surveys will continue in 2022 focusing on the Tar River Basin and additional sites within the Neuse Basin. These findings are an important step in this multi-year study to determine this species' status in North Carolina and to identify critical habitat for conservation efforts.

Brook Lamprey in hand (Michael Fisk)

Culvert and Bridge Surveys Offer New Opportunities for Winter Bat Data Collection

by Katherine Etchison, Mammalogist

Bat hibernacula surveys shifted focus from typical cave and mine sites to culverts this winter because of the potential risk of transmitting SARS-CoV-2 from humans to bats. The caves and mines originally scheduled to be surveyed this winter have tight passages where surveyors would have been close to bats for a prolonged time with little airflow. Culverts allow greater

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A hibernating big brown bat in a McDowell County culvert. (Katherine Etchison)

airflow than caves and require less time to survey, so these offered a lower risk option for monitoring hibernating bats. Additionally, targeted surveys of culverts during winter had not occurred in the mountains before, so this presented a new opportunity for data collection. Eighty-three culverts were surveyed in 12 mountain counties, yielding eight culverts with bat presence. Big brown bats were found in four culverts and ranged from one to seven individuals, single tricolored bats were found in two culverts, and single gray bats were found in two culverts late in the winter. Overall bat presence was low, which may be related to the many natural opportunities for bat hibernacula in the region.

Along with culverts, a few bridges were surveyed as temperatures climbed in March and bats returned to exposed roosts, like bridges. Highlights from these surveys included three gray bats found roosting in a bridge in Haywood County where this endangered species had not been previously documented. Two Indiana bats were observed roosting under a different bridge in Haywood County, where this species was seen in May 2020. This endangered bat is seldomly encountered after experiencing population declines due to White-nose Syndrome in recent years. Although it wasn't the typical winter survey season, surveying these non-traditional winter sites allowed data collection to continue while presenting a low risk to bats.

Wildlife Diversity Biologist, Katherine Etchison, searches for hibernating bats in a Buncombe County culvert. (Joey Weber)

Wildlife Diversity Technician, Kyle Shute, inspects a hibernating tricolored bat in a Caldwell County culvert. (Katherine Etchison)

A Glimmer of Hope in Bog Turtle Conservation

by: Carl Jacobsen, Wildlife Diversity Technician

The bog turtle (*Glyptemys muhlenbergii*) is listed as Federally Threatened due to Similarity of Appearance (T(S/A)) to the northern population and state listed as Threatened in North Carolina. It has become evident in recent years that the species faces many of the same threats in the southern U.S. An estimated 80-90% of bogs have been lost in North Carolina because of decades of land-use conversion. Bog turtle range in North Carolina is the Blue Ridge Mountains and upper Piedmont eco-regions, with records existing in eight river basins. Relatively few bog turtle populations remain, and most of those appear to be in decline. The threats this species and their habitat – bogs -- face are numerous and include vegetative succession, vehicles, habitat loss and degradation, excessive predation, development and changes in the watershed and barriers to movement.

With population declines and the number of threats the bog turtle faces, it can be overwhelming at times for those working to conserve the species. Fortunately, there are glimmers of hope and progress being made that keep them motivated and working hard to conserve this species. As part of some winter-time visits to assess habitat condition and determine habitat management needs at several bogs, WD staff planned to visit a bog that has only ever had one adult turtle observed despite being discovered in the 1980s. An adult male was found in 2003 and none had been found since. On a cold snowy day in February 2021, a small group explored this bog (Figure 1), recording vegetation and habitat condition, as well as sketching out the beginning of a plan for habitat management. As they were walking around, Gabrielle Graeter, an NCWRC biologist, pointed down at beautiful sphagnum mats and said, “This over here looks like perfect nesting habitat.” Then five seconds later, Carl Jacobsen, a Wildlife Diversity Technician spotted a hatched nest! To his surprise, he spotted three relatively recently hatched

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Figure 1. View of one part of the bogs WD staff visited in February 2021 in western North Carolina. (Carl Jacobsen)

eggs tucked into the sphagnum moss (Figure 2). Literally, everyone cheered. It was obvious the eggs hatched due to the spiral pattern of the remnant eggshell pieces. It was also evident that they were from the previous summer due to how intact and how little decomposition had occurred. In that one moment staff confirmed the recent presence of a breeding adult male, a breeding adult female and multiple hatchlings. With that discovery, the record for this location went from an almost 20-year-old one-turtle record to a present-day successful breeding population. There is much more to do to better understand the status of this population, but the evidence of young turtles gives them hope for this population given that many other populations have no evidence of nesting or young turtles. It was a good day in the field for bog turtle conservation!

Figure 2. Up-close view of the bog turtle nest and eggshell fragments discovered in February 2021. *(Carl Jacobsen)*

How YOU Can Support Wildlife Conservation in North Carolina

Whether you hunt, fish, watch, or just appreciate wildlife, you can help conserve North Carolina's wildlife and their habitats and keep North Carolina wild for future generations to enjoy.

How? It's as easy as 1, 2, 3.

1 Donate to the Nongame and Endangered Wildlife Fund by checking Line No. 30 on your N.C. State Tax Form.

2 Purchase a Wildlife Conservation Plate, which features an illustration of a Pine Barrens Treefrog, for $30, with $20 going to the agency's Nongame and Endangered Wildlife Fund.

3 Donate to the Wildlife Diversity Endowment Fund, a special fund where the accrued interest — not the principal — is spent on programs that benefit species not hunted or fished. ncwildlife.org/donate

Northern Saw-whet Owl Surveys Conducted Using Songmeter Recordings

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

North Carolina's tiniest owl, the northern saw-whet owl, got some attention this quarter. The saw-whet owl is state listed as Threatened, and the breeding population primarily inhabits the spruce-fir zone and high elevation hardwood forests. The first project focused on improving the survey technique for this species. Despite their diminutive size (males weigh as much as an American robin) they can have large territories. Thus, surveys to listen for them at night can be hit or miss, depending on where the owl is perched in its territory as the observer listens. To save some driving and sleep, the bird crew turned to technology. The crew completed a trial run with Songmeter recording units that record passively for many nights. As with other bird surveys, the "multiple visits" that result from recording night after night

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A Songmeter recording unit deployed in northern saw-whet owl habitat. (Christine Kelly)

SPECIES SPOTLIGHT

Very small, mottled-brown owl with round head, yellow eyes, black beak and feathered feet.

Males and females are similar in appearance; juveniles are dark brown with cream yellow breast and belly.

Length: 7-8.3 inches
Weight: 2.3-5.3 oz.

Diet consists mainly of deer mice, voles, sometimes small birds and insects.

Cavity nester but will also use nest boxes.

Lays 5-6 eggs, with only female incubating eggs for 27-29 days.

Information courtesy of The Cornell Lab

increase the odds that a biologist will detect the bird if it is indeed present. These data are being analyzed and staff anticipate working passive recording surveys into their long-term monitoring strategy for this owl.

A second survey employed conventional listening and audio-lure surveys. In March, the bird crew conducted a "blitz" survey focused on northern hardwood forest in the southern mountains. The objective was to fill in distribution gaps and update some old records in the NC Natural Heritage Program database. Johnny Wills, biologist with the Nantahala National Forest, helped the crew as they surveyed the southern Nantahalas, Unicois, and other massifs. Thus far, the only owl detected was at Albert Mountain in Macon County.

Finally, Haywood Community college students built and helped post nest boxes for saw-whet owls on William H. Silver Game Land in Haywood County. If used, these structures not only provide a home for the owl; they also will provide biologists with easy access to capture, band, and tag the owls for future tracking projects.

Left photo: Haywood Community College wildlife student, Rachael Hart, hangs a nest box for northern saw-whet owls at William H. Silver Game Land.

Inset photo: Nest box for northern saw-whet owls

Top photo: At the first tree selected for hanging a nest box, we noticed a fresh killed deer mouse on the forest floor. Could there be saw-whet owls here?

(All photos: Christine Kelly)

Staff Document 48 New Sites for Collinses' Mountain Chorus Frog

by: Lori Williams, Western Amphibian Biologist

In March 2021, Wildlife Diversity staff continued annual inventory and monitoring surveys for a state special concern chorus frog in the far southwestern counties (Cherokee and Clay). Formerly known as the Mountain Chorus Frog (*Pseudacris brachyphona*), in 2020 a research team led by Florida State University officially described the NC populations as a new species, naming it Collinses' Mountain Chorus Frog (*Pseudacris collinsorum*) with a distribution range that includes parts of Georgia, Alabama, and Mississippi. Fortunately, standard survey protocol of nighttime road cruising during wet or foggy conditions and stopping to listen for calling male frogs in breeding habitats is still suitable for the species. During the month of March, severe thunderstorms dumped several inches of rain on multiple occasions in southwestern NC, which may have created more ephemeral aquatic breeding habitats for Collinses' Mountain Chorus Frogs, thus aiding biologists' ability to detect them during surveys. Survey efforts were the most successful of any year since the beginning of the project in 2008. Out of 140 surveys completed, 48 new sites were documented, the most ever in a single year. Out of the known sites surveyed, 38% had Collinses' Mountain Chorus Frogs, the highest percentage in recent years (2020: 21%; 2019: 35%; 2018: 29%). Notable new sites (n=6) occurred directly beside Highway 64 in Murphy, NC, a busy corridor through Cherokee County. One of these new sites is threatened because the small drainage pond the frogs are using is on a vacant lot for sale in the middle of a heavily developed part of town.

Also noteworthy is the oldest historical record the NCWRC has for the species, a site originally found in 1949 where frogs were collected as museum specimens. Despite attempting to detect frogs since 2008 at or near this historic location (now, also in a heavily developed area), staff had always failed until this year. They finally had success in updating this long-standing, historic record.

A newly documented breeding site for Collinses' Mountain Chorus Frog at risk from development along a highway (Lori Williams)

Above: The newly described Collinses' Mountain Chorus Frog is a State Special Concern species found in the southwestern part of the state. (Lori Williams)

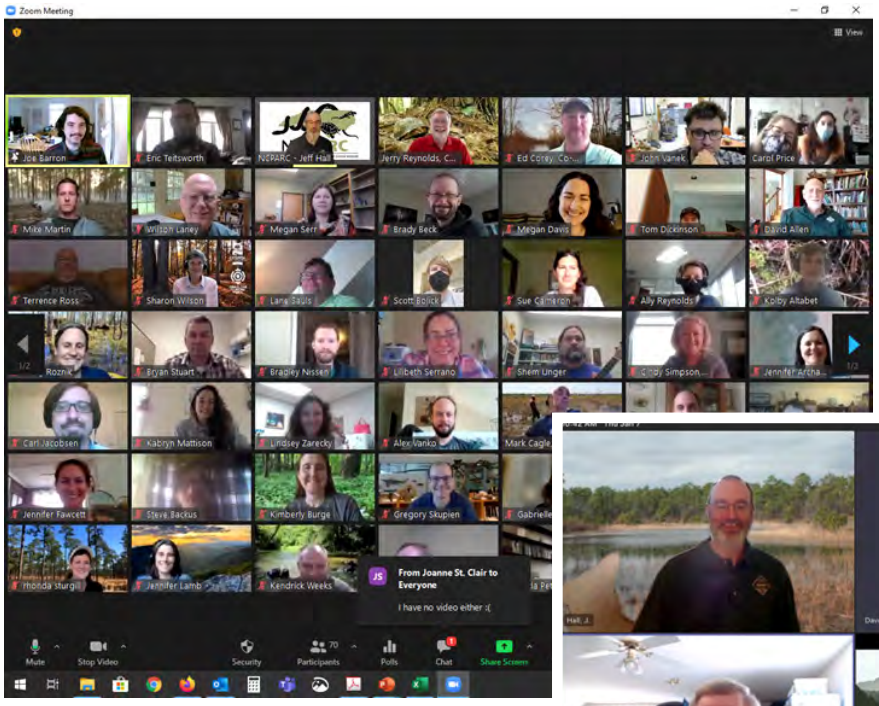
Left: A male Collinses' Mountain Chorus Frog calling from vernal pool habitat (Jonathan Micancin)

N.C. Partners in Amphibian and Reptile Conservation News

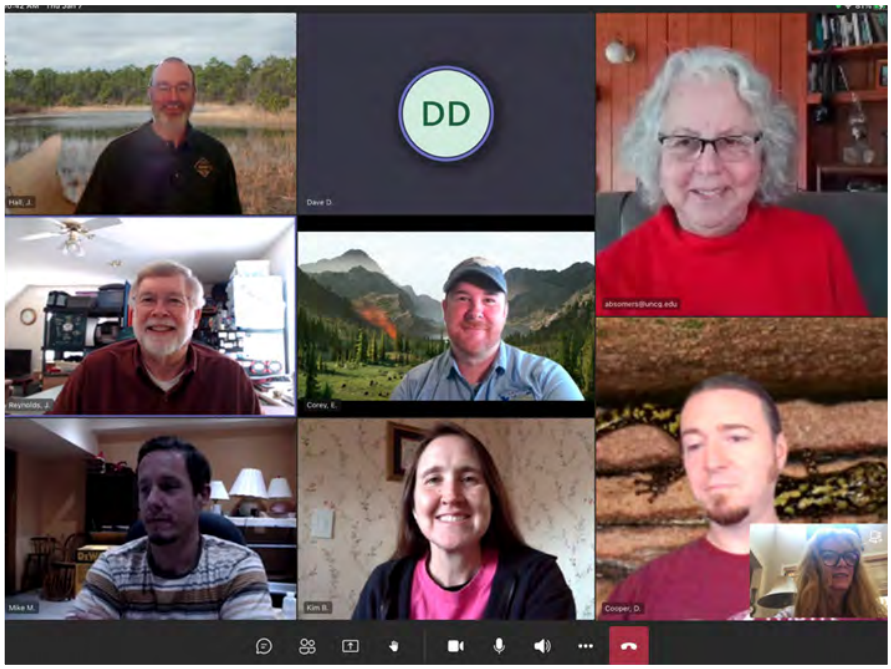
by Jeff Hall, Partners in Amphibian and Reptile Conservation Biologist

The 2021 NCPARC annual meeting was held virtually during this quarter over a two-day period. Over 110 participants registered for the meeting and viewed live presentations on topics ranging from Eastern Hellbender translocations to Bog Turtle site assessments to amphibian road mitigation projects and many others. Lots of positive feedback was received from participants who enjoyed the ability to attend the virtual meeting without constraints over travel. Future NCPARC meetings will likely be a hybrid between in-person and virtual options.

Several NCPARC groups met virtually during this same period including the Steering Committee and the Education and Outreach working group. Applications such as Zoom and Teams have proved invaluable in allowing these types of meetings to continue when in-person meetings were not possible. Although many in-person educational events were canceled, some NCPARC presentations were given virtually to groups.



Screen capture during NCPARC annual meeting (Jeff Hall)

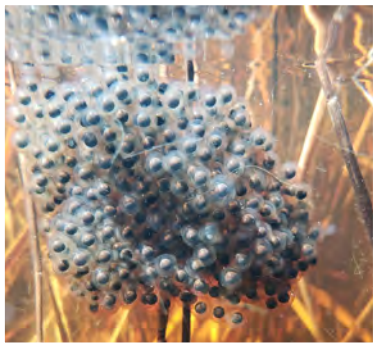


Screen capture of the NCPARC Steering Committee meeting (Jeff Hall)

NCPARC News: Winter Amphibian Surveys Yield Good Results

by Jeff Hall, Partners in Amphibian and Reptile Conservation Biologist

Winter amphibian surveys were conducted across the Coastal Plain for target species such as Gopher Frog, Southern Chorus Frog, Ornate Chorus Frog, Mabee's Salamander and Tiger Salamander. Due to good amounts of winter rains, this period proved to be especially good for the Gopher Frog. Biologists detected Gopher Frog breeding activity, through visual searches for egg masses, in all five of the coastal populations, several of which had gone without signs of breeding for at least a year or more. In addition, in the Croatan population, there were two new breeding ponds detected.



Gopher Frog egg mass (inset); Adult male Gopher Frog

Head-starting activities, involving rearing eggs up to metamorphosis, were initiated at three different Coastal Plain facilities for four different populations. Both the NC Aquarium at Fort Fisher, and the NCSU CMAST facility had participated previously, but this year a new partner was added: the Edenton National Fish Hatchery. Biologists at each facility hope to produce young Gopher Frogs that can then be released, in conjunction with NCWRC staff, back to their natal ponds.

Tiger Salamander

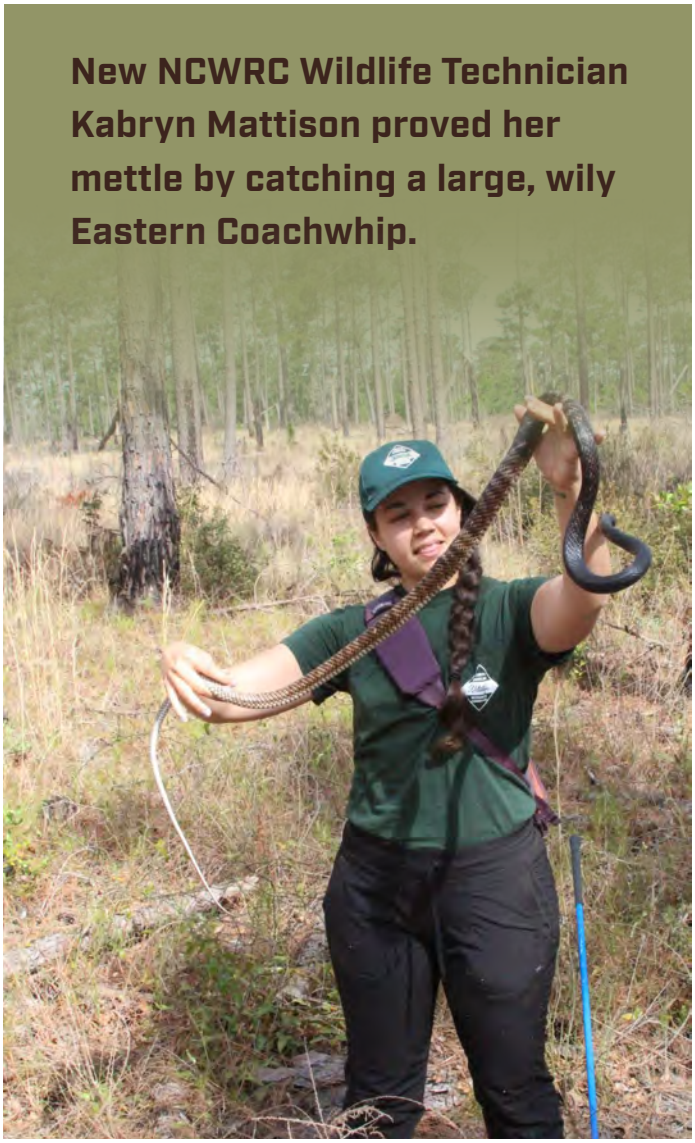
(All photos: Jeff Hall)

NCPARC News: Trail Cam Surveys "Capturing" Rattlers Continue

by Jeff Hall, Partners in Amphibian and Reptile Conservation Biologist

NCWRC staff continued work using trail cameras to "capture" rattlesnake behavior and movements. Twenty-five different cameras were deployed for detecting Eastern Diamondback Rattlesnakes and Timber Rattlesnakes. These trail cameras continue to produce valuable images of these species, along with many others. During a site visit to replace batteries and SD cards for the cameras, NCWRC biologists had the opportunity to view rattlesnakes in habitat as well as other species of interest such as Eastern Coachwhip and Carolina Pigmy Rattlesnake.

In addition, NCWRC biologists were treated to a pair of Eastern Diamondback Rattlesnakes at one of the hibernation locations. Likely this is a breeding pair, and the images from the nearby trail camera may tell the tale.



New NCWRC Wildlife Technician Kabryn Mattison proved her mettle by catching a large, wily Eastern Coachwhip.

Top photo: Trail camera installation for detecting Timber Rattlesnakes. Camera is attached to a tree on the right (red circle); Right photo: pair of Eastern Diamondback Rattlesnakes

(All photos: Jeff Hall)

NORTH CAROLINA & the Recovering America's Wildlife Act

Sustaining North Carolina's Diverse Fish & Wildlife Resources

The Recovering America's Wildlife Act (H.R. 2773) is a bipartisan bill that, if passed, would dedicate over $20 million annually to North Carolina to conserve and restore nearly 500 nongame fish and wildlife species of greatest conservation need, as well as their habitats. RAWA would allow North Carolina to invest in proactive, voluntary, incentive-based, non-regulatory conservation on both private and public lands.

BE A PART OF THE ACTION

The N.C. Wildlife Resources Commission and species experts have identified **nearly 500** species of greatest conservation need in North Carolina. Without conservation and management now, many of these species may not get the conservation work needed to keep them common and off the federal list.

TODAY is the time to invest in the future of our wildlife. Americans love and need our wild places. We want to see wildlife thrive. Through the Recovering America's Wildlife Act, we would secure funding and ensure the health of fish and wildlife for generations to come.

Our Nature. Our Nation. Our Future.

Learn more and share your support of the Recovering America's Wildlife Act:

ncwildlife.org/RAWA

OurNatureUSA.com

#RecoverWildlife