



NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

WILDLIFE DIVERSITY PROGRAM QUARTERLY REPORT

January-March 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.

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Cover photos (clockwise from top): NCWRC biologist John Carpenter with banded Black-throated Green Warbler; Collecting Gopher Frog eggs for captive rearing and head-starting; Blue Ridge Parkway Biologist, Bob Cherry, and Wildlife Diversity Technician, Kristi Confortin, record counts of Virginia big-eared bats; Posting nesting waterbird signs along the coast.

Nearly 300 Sea Turtles Rehabilitated and Released Since November

Dr. Matthew Godfrey, Sea Turtle Biologist

One component of the North Carolina Sea Turtle Stranding and Salvage Network, coordinated by N.C. Wildlife Resources Commission (NCWRC) biologists, is to expedite the release of successfully rehabilitated sea turtles from various facilities in the state. This can be a challenge in winter months, when coastal water temperatures are normally too cold for beach releases, even though there are often many turtles that have finished their treatment for hypothermia (cold-stunning).

One option for release is to engage various partners to transport turtles to warmer waters near the Gulf Stream off North Carolina, including the U.S. Coast Guard, research vessels from local universities and charter fishing boats. A second option is to drive the turtles to or near Florida where they can be re-

leased from beaches that have warmer water. This latter action often requires the cooperation of partners from various states who help with some or all the transport and/or release. Between Nov. 1, 2019 and March 24, 2020, 478 live sea turtles were recovered along the coast and taken for rehabilitation. Of these, 299 have been released back to the ocean, including 146 released offshore by boats and 124 released from beaches in Florida or southern Georgia. More recently, a shift in the Gulf Stream resulted in warm waters reaching the eastern beaches of South Core Banks, in Cape Lookout National Seashore. Taking advantage of this situation, NCWRC staff and volunteers released 29 more turtles from this beach in mid-March. All released turtles were tagged with internal PIT tags, in case they are seen again. ↔

A juvenile loggerhead successfully treated for cold stunning at the NC Aquarium at Roanoke Island is released to the ocean on the eastern side of South Core Banks. (Photo: Dr. Matthew Godfrey)



Genetic Research Underway to Determine Status of "Wayne's" Warbler

John Carpenter, Eastern Landbird Biologist

Black-throated Green Warblers migrate to North America every year to breed in coniferous forests throughout the southern Appalachian Mountains north to the boreal regions of Canada. In 1918, a very similar looking but smaller version of this species was discovered near Mt. Pleasant, S.C., which was later found to occupy a narrow and isolated range along the South Atlantic Coastal Plain from southeastern Virginia to central South Carolina. These denizens of the Coastal Plain, now colloquially referred to as "Wayne's" warbler, inhabit swamp and bay forests and have for decades been assumed a subspecies due to their differing habitat preference and apparently smaller bill and duller plumage. To complicate matters further, another isolated population occurs in the south-central part of the state at the Uwharrie National Forest.

New advancements in the world of genetic research, notably Whole Genome Resequencing (WGS), is considered a rapid and effective way to study the underlying mechanisms of species development. The NCWRC, in collaboration with Catawba College and Penn State University, is in the early stages of collecting genetic samples to provide definitive proof if these populations differ and confirm "Wayne's" subspecies status. ❖



*NCWRC biologist John Carpenter with banded Black-throated Green Warbler from Bladen County
(Photo: Alex Worm/NCWRC)*



Black-throated Green Warbler (Photo: Andy Reago/Chrissy McClarren-Wikimedia)

Gopher Frog Surveys Continue on the Sandhills Game Land

Dr. Jeff Humphries, Eastern Amphibian and Reptile Biologist

During the first quarter of 2020, NCWRC biologists continued to survey for Gopher Frogs on Sandhills Game Land. This winter, they detected 22 Gopher Frog egg masses at the main breeding pond for the population on the game land. Considering the fairly good weather conditions during February and March (multiple warm, rainy nights), biologists expected a higher breeding output than what occurred. Staff collected small portions of each egg mass and transferred them to The North Carolina Zoo for captive rearing to continue the head-starting program of juvenile Gopher Frogs. In collaboration with the Zoo, staff are raising 400 tadpoles to be released as juvenile frogs during the summer of 2020.

The single population of Gopher Frogs on Sandhills Game Land appears to remain stable, but with only one population existing, the chance of extirpation of this species in the area remains a concern. Despite extensive surveys throughout the Sandhills, Gopher Frog breeding was not detected at any additional wetlands. ♦



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



Gopher Frog (Photo: Jeff Hall/NCWRC)

Posted Nesting Signs Kick off Colonial Waterbird Nesting Season

by Carmen Johnson, Waterbird Biologist

The Wildlife Diversity Program's Waterbirds staff, along with a team of outstanding volunteers, kicked off the 2020 colonial waterbird nesting season by posting area closure signs on several islands along the coast. These islands vary in size and composition, but they all share one unique function: to serve as nesting sites for some of North Carolina's most exceptional species.

As development of the state's coast has increased over the decades, waterbirds have fewer undisturbed areas to raise their young. Protecting these areas is an important part of the work

that staff do each year as part of habitat management for these species. Many of these species nest directly on the ground, and eggs and chicks are at risk of being stepped on or predated if people, dogs or other potential predators enter a nesting area. Eggs and chicks can also over-heat if the adult is forced to leave the nest for prolonged periods to defend against predators or intruders. The signs alert beachgoers and boaters that the area is protected habitat for nesting waterbirds and should not be entered. If you spot these signs on your next trip to your favorite beach, or while out on the water, give the birds the space they need and do not trespass into the area. ♦



The Waterbirds staff and volunteers posted three beaches and 17 islands with areas ranging from a few square meters to 50+ acres (Photo: Carmen Johnson/NCWRC)

The signs help protect nesting waterbirds and their offspring from humans and dogs who could otherwise disturb prime nesting habitat. (Photos: Carmen Johnson/NCWRC)

Staff Begin Propagation of Federally Endangered Dwarf Wedgemussel

by Michael Fisk and Andrew Glen

In March, Wildlife Diversity Program staff began conducting mussel surveys in the Neuse Basin to collect the federally endangered Dwarf Wedgemussel. These broodstock will be used in the agency's propagation program to augment and bolster dwindling populations. The population in the Neuse Basin has been impacted by impaired water quality, degraded habitat, and introduced species, and is at risk of extirpation. To date, staff have collected two male Dwarf Wedgemussels in Swift Creek in Johnston County making them the first Dwarf Wedgemussels collected in the Neuse Basin since 2018. Efforts will continue this spring to collect more to facilitate propagation this year. ♦



One of two male Dwarf Wedgemussel collected from Swift Creek for propagation purposes (Photo: NCWRC)



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

N.C. Partners in Amphibian and Reptile Conservation Updates

by Jeff Hall, Partners in Amphibian and Reptile Conservation Biologist

Several NCWRC staff were able to attend the Southeast PARC meeting from Feb. 27-March 1, 2020. At least three staff were involved in providing posters or giving oral presentations. Approximately 260 participants attended the meeting held in Nauvoo, Alabama at Camp McDowell.

Due to concerns about COVID-19, the NCPARC meeting, planned for March 24-25 in

Ellerbe at Camp Millstone, had to be canceled. The NCPARC steering committee will consider whether to hold the 2021 meeting in the same location or move elsewhere. Several NCPARC working groups were able to still meet during the quarter either in person before the coronavirus spread, or after through online Teams meetings.

Wildlife Diversity Program (WDP) staff visited a landowner in Bladen County to offer technical guidance



on management of ponds for amphibian species. Amphibians of interest in the area include Ornate Chorus Frog, Pine Barrens Treefrog and Mabee's Salamander. The landowner was interested in making his ponds as optimal as possible for these species.



Staff had a very productive time walking prescribed burn areas, which yielded records of several species, including (clockwise from top): Pigmy Rattlesnake, Timber Rattlesnake and Mole Kingsnake.

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

As is often the case, this quarter was especially busy working with multiple species. Field work included: setting up trail cameras for Eastern Diamondback Rattlesnakes, walking prescribed burn areas for Species of Greatest Conservation Need (SGCN) snakes and lizards, and surveys for Gopher Frogs, Southern Chorus Frogs, Ornate Chorus Frogs and Ma-bee's Salamanders.

Field sites included Croatan National Forest and Camp Lejeune; Holly Shelter, Sandhills and Voice of America (VOA) game lands; Military Ocean Terminal at Sunny Point (MOTSU); and several others. Although thought to occur there, Southern Chorus Frogs were finally documented by NCWRC staff on the VOA Game Land this February.

Staff had a very productive time walking prescribed burn areas, which yielded many records of the following species: Pigmy Rattlesnake, Timber Rattlesnake, Mole Kingsnake, Eastern Kingsnake and Corn Snake. NCWRC technician Myles Lance spotted a particularly valuable new record for Jones County when he found a Pigmy Rattle-

snake, a species never previously documented from that county. Way to go Myles!

Continuing partnerships with the North Carolina Aquariums, the North Carolina Zoo, NCSU CMAST, and Carteret Community College, NCWRC staff head-started Gopher Frogs from three locations including Croatan, Holly Shelter and Sandhills. Of note, Gopher Frogs returned to breed in a borrow pit in Holly Shelter following significant restoration work that took place in the summer of 2019. They had not bred in the wetland for several years due to degradation of the site. It was very exciting to see the frogs responding to the great conservation efforts of the NCWRC's Land and Water Access staff. ✦



Gopher frog found in pond on Croatan National Forest (Photo: Jeff Hall/NCWRC)



Southern Chorus Frog found on VOA Game Land (above); Eastern Diamondback Rattlesnake on Camp Lejeune (below) (Photos: Jeff Hall/NCWRC)



Bat Counts Increase after Nearly a Decade of White-Nose Syndrome Declines

by Katherine Etchison, Mammalogist

Biologists noted an encouraging change during this winter's bat hibernacula surveys: counts of tricolored bats increased at six hibernacula in the Mountains. Some increases were minimal (2-6 bats), while others were more substantial (23-51 bats). Before white-nose syndrome (WNS) arrived in North

Carolina in 2011, tricolored bats were the most numerous hibernating species in the state with over 3,500 in a single hibernaculum; however, counts dropped to just nine tricolored bats at this site by 2015. This hibernaculum is among those that showed increases in 2020 and is now up to 45 tricolored bats. While these counts are a frac-

tion of their pre-WNS counterparts, this is still a hopeful sign.

Increased counts were also noted in a Virginia big-eared bat hibernaculum. This species is not susceptible to WNS, but is federally endangered and has an extremely limited distribution in North Carolina. Additionally, eastern small-footed bats,

(continued on next page)



Eastern small-footed bat in Haywood County hibernaculum



A cluster of hibernating little brown bats



A hibernating tri-colored bat in a Rutherford County hibernaculum



which are rarely encountered in hibernacula, increased slightly in the hibernaculum where they are regularly observed. The presence of 35 little brown bats at the only known hibernacula where this species remains in the state was another encouraging sign from the survey season. This count is down from the 2018 survey (43 little browns), but the decrease is less steep than in previous years.

In addition to surveying long-term hibernacula, biologists surveyed 10 new sites this winter. One of these new sites yielded the highest known count of tricolored bats in the state with 69 bats! An interesting observation from these new sites came with the documentation of 12 tricolored bats hibernating in root cellars, prompting the need for more root cellars to be surveyed in the future.

Overall, results from winter bat surveys were more encouraging than they have been since the grim effects of WNS began in 2012. Hopefully these increases in hibernating bats become a widespread trend across western NC in the future. ❖

Blue Ridge Parkway Biologist, Bob Cherry, and Wildlife Diversity Technician, Kristi Confortin, record counts of Virginia big-eared bats. (Photo: Katherine Etchison)



Mountain Chorus Frog's Known Distribution Expands Again

by Lori Williams, Western Amphibian Biologist

In late winter 2020, Wildlife Diversity Program (WDP) staff monitored Mountain Chorus Frogs, a Special Concern species and a Species of Greatest Conservation Need, by conducting frog call surveys and road cruising on rainy nights. Staff documented a new site, which represents a significant distribution extension out of Murphy, northwest 3.5 airline miles toward Andrews, after many years of unsuccessful survey attempts

in this area. This new site is the first for the community of Marble, the first on the east side of the Valley River and Hwy. 19/129 corridor.

Also, staff and a project partner from Young Harris College in Georgia identified five additional new sites in Clay and Cherokee counties at or near the North Carolina/Georgia border. For North Carolina, there are now 179 documented sites for Mountain Chorus Frog; only seven were known prior to the mid-2000s when WDP staff began surveys. Of

the 43 known sites monitored this year, staff detected the species at just nine sites (20.9% success). This survey success is lower than in 2019 (35%) and in 2018 (29%). The next step for this project is to use detection probability and occupancy metrics in repeated surveys of the same sites to establish a framework for more standardized, long-term monitoring. ↵



Typical wetland breeding habitat for Mountain Chorus Frog (Photo: Lori Williams/NCWRC)



Mountain Chorus Frog (Photo: Sam McCoy/NCWRC)

Staff Continue Carolina Northern Flying Squirrel Monitoring

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

After a drop in Carolina northern flying squirrel captures in winter 2019, particularly in the Black Mountains, Wildlife Diversity Program staff were pleased to see improved numbers in 2020. Captures rose 136% in the Black and Craggy mountains. However, the capture of seven individuals in the Craggy Mountains masks a continued dip in captures from

formerly high-capture sites around Mt. Mitchell and Deer Mountain. The Great Balsams, Unicoi Mountains and Grandfather Mountain have smaller box networks by comparison, but still produced captures of adults and subadults.

Among the captures in the Great Balsams was a female that was first tagged as an adult in January 2014. This means she was born no later than summer 2012, making her at

least 8 years old. In fact, biologists have captured her four times over the years. She uses several different boxes on the squirrel box transect in that area. Previous research by NCWRC and Virginia Tech in this area documented female home range sizes of 6.5 hectares, with squirrels concentrating their nightly foraging in sheltered areas with taller conifer trees (Ford et al. 2014). ◊



Although the flying squirrel crew enjoyed a dusting of snow at Grandfather Mountain in January, winter snowfall was quite low in winter 2020. (Photo: NCWRC)



Staff haul spare boxes and a ladder into remote flying squirrel box lines via ATV. (Photo: NCWRC)

Shuler Creek Rainbow Mussels Relocated Ahead of Barrier Removal

by Dylan Owensby, Western Region Aquatic Wildlife Diversity Biologist

In the not so distant past, Western North Carolina fisheries biologists would conduct “renovation” projects in cool water streams to reduce competition with stocked trout. During these projects, fish barriers were constructed at the downstream end of streams and rotenone, a commonly used piscicide, was applied upstream of the barrier to kill off any resident fish. Trout would then be stocked above the barrier.

In 1985, biologists conducted this type of project on Shuler Creek, a tributary to the Hiwassee River, with the hopes of creating a successful wild Brown Trout fishery. Although an initial survey estimated that the rotenone treatment was effective at killing approx-

imately 95% of the fish, a 6-year monitoring project revealed that the nongame fish biomass quickly rebounded close to pre-treatment conditions.

Needless to say, fisheries management has come a long way in the last 35 years. This spring, plans have moved forward to remove the barrier on Shuler Creek. Benefits of barrier removal include stream restoration and habitat connectivity, allowing aquatic species to expand their ranges and facilitate gene flow.

In February, biologists completed a snorkel survey in a 200-meter reach downstream from the barrier to locate and remove any freshwater mussels that might be at risk from the heavy equipment involved in the restoration work. They relocated 30 Rainbow mussels (10 mussels per person-hour) and moved to

suitable habitat approximately 2 km upstream. This was the most successful mussel survey completed to date in Shuler Creek. During past surveys, biologists had only collected a maximum of 6 mussels (2 mussels per person-hour) at any single site. Rainbows are State Listed as Threatened and are Species of Greatest Conservation Need. Biologists plan to monitor this section of the creek to see if mussels are able to recolonize in the restoration site. ⇨



Old U.S. Forest Service Barrier on Shuler Creek-Hiwassee River Basin (Photo: Luke Graeter/NCWRC)



Rainbow Mussels collected in Shuler Creek-Hiwassee River Basin (Photo: Luke Etchison/NCWRC)

Collaboration Key to Success in a Recent Bog Habitat Management Project

by Gabrielle Graeter, Conservation Biologist/Herpetologist

Bog turtles and their habitat – mountain bogs – are a high conservation priority in North Carolina. The bog turtle is federally threatened (S/A) and state threatened. As part of the Wildlife Diversity Program's conservation efforts with this species, the NCWRC manages wetlands with known bog turtle populations. Unfortunately, many of these wetlands have more woody vegetation and more canopy closure than they likely had historically. Various factors have played a role in this change, including increased nutrient input, changes in land-use, development in the surrounding landscape, and differences from historical levels of grazers, fire and beaver activity. The plant communities and wildlife that rely on these areas that are open canopy and predominantly herbaceous vegetation can begin to decline if actions are not taken.

Habitat management in these wetlands often consists of cutting most trees within the wetland, treating invasive plant species, and reducing the amount of shrubby, woody vegetation. Bog turtles lay their eggs in a nest on

the ground within the wetland and thus, require that the nest gets full sun so the eggs can properly develop. They also need some areas for basking. Thus, the goal is for the bog to have a mosaic of various habitat elements, with some areas as shrub-scrub and others predominantly herbaceous vegetation without canopy.

In February 2020, through a collaboration with the Nantahala National Forest, NCWRC, Mountain-True, and a crew from the American Conservation Experience (ACE), a team of people worked for two days to conduct habitat restoration work at a bog on U.S. Forest Service property. The aim of the work was

to restore full sun exposure to a few small areas in the bog by cutting and removing a majority of shrubs and trees. The remainder of the bog is mostly shrub/scrub habitat. Bog turtles and the plant community will benefit from having a mosaic of habitat types and structures with varying degrees of sunlight.

With a lot of preparation, good teamwork, fair weather and a large group assembled ready to work hard, a lot was accomplished in two days. Collaboration with partners was key to the success of these workdays! ✦



Habitat management work underway in the bog with NCWRC and conservation partners (Photo: Gabrielle Graeter/NCWRC)



This sphagnum moss hummock could be excellent bog turtle nesting habitat if it receives enough direct sunlight, something that was addressed in these workdays. (Photo: Gabrielle Graeter/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.

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