NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

WILDLIFE DIVERSITY PROGRAM QUARTERLY REPORT

JANUARY-MARCH 2023

The North Carolina Wildlife Resources Commission's (NCWRC) Wildlife Diversity (WD) Program is housed within the agency's Inland Fisheries (Aquatic Wildlife Diversity) and Wildlife Management 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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Painted Bunting (Kevin Le)

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NC Bird Atlas Enters Its Third Year!

by Scott Anderson, Science Support Coordinator and John Carpenter, Eastern Landbird Biologist

Wildlife Diversity staff continue work on the 5-year Bird Atlas Project. From Hiwassee Lake to Cape Hatteras, volunteers (atlasers) and staff have been scouring fields, forests, and city parks — identifying birds and recording behaviors. These behavior observations will help confirm breeding in each of the 937 survey blocks spread across the state. To date, atlasers have contributed 122,819 checklists, confirming breeding for 203 species. Collectively, these 1,923 atlasers have made a staggering 5,515,392 species observations since the project started in 2021! In addition to volunteers, each year we hire skilled staff to canvass hard-to-reach corners of the state. These data will be critical to gaining a comprehensive map of distribution and habitat preferences for more than 200 bird species at the end of the project.

Because North Carolina is positioned squarely in the mid-Atlantic region, many bird species only occur here in winter. Departing from most other Atlases, volunteers and staff collect observations during both the breeding and wintering seasons.

Since 2021, nearly 2,000 atlasers have made more than 5.5 million species observations in the state!

In just the past winter (Nov-Feb), atlasers and staff recorded 284,213 species observations.

In the coming months, we'll bring on more staff to collect data and assist atlasers during the 2023 breeding season. We anticipate making significant progress toward our goal to adequately cover all survey blocks in the state by the end of 2025.

If you want to stay up-to-date on the progress of this project, visit ncbirdatlas.org or subscribe to our monthly newsletter at news.ncbirdatlas.org.

Volunteers and Cooperators Responded to More Than 400 Cold-Stunned Sea Turtles This Winter

by Dr. Matthew Godfrey, Sea Turtle Biologist and Sarah Finn, Coastal Wildlife Diversity Biologist

Volunteers and cooperators with the North Carolina Sea Turtle Stranding and Salvage Network (STSSN), coordinated by NCWRC biologists, responded to more than 400 cold stunned sea turtles during the 2022-2023 winter season. Live turtles were taken to rehabilitation facilities including the Sea Turtle Assistance and Rehabilitation (STAR) Center at NC Aquarium Roanoke Island, NC Aquarium at Pine Knoll Shores, the Karen Beasley Center for Sea Turtle Rescue and Rehabilitation in Surf City, and even the SEALIFE Aquarium in Charlotte. Although not all turtles survived, to date 260 were nursed back to health and cleared for release by vet teams from the NC Aquariums and the College of Veterinary Medicine at NCSU. Most of the turtles were released in warmer waters several miles off the coast of North Carolina by the US Coast Guard near Fort Macon and smaller research vessels operating out of Wilmington, Beaufort, and Hatteras Village. Because of the generosity of these groups, the STSSN minimized the amount of time sea turtles spent in rehabilitation. With the return of warmer waters adjacent to our beaches, any remaining turtles will be released from NC beaches as soon as they are deemed healthy. In addition, facilities outside of North Carolina, including the New England Aquarium, National Aquarium, and Virginia Aquarium, have arranged to release their rehabilitated cold stunned turtles from North Carolina beaches into our warmer coastal waters.

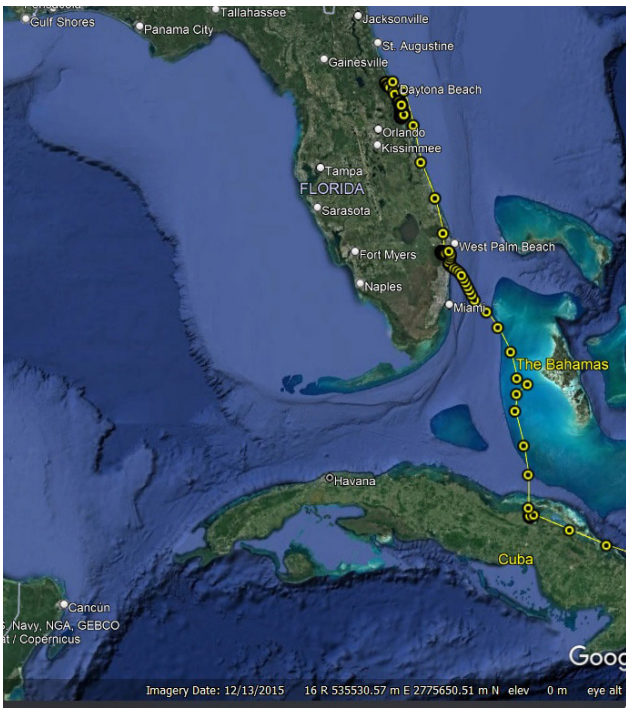
The Coast Guard Cutter "Richard Snyder" based in Fort Macon, NC, transported >100 sea turtles for release into warmer waters off the NC coast at the end of January. (NCWRC)

Coast Guard personnel placing rehabilitated Kemp's ridley sea turtle into warmer waters off North Carolina. (US Coast Guard)

Tagged Snowy Egret Provides Valuable Information on Nesting, Migration

by Carmen Johnson, Waterbird Biologist, Doug Rouse, Waterbird Technician

As part of a project focused on small herons and egrets nesting in North Carolina, Dr. John Brzorad from Lenoir-Rhyne University, 1000 Herons (non-profit) and Alan Maccarone (retired), deployed a CTT transmitter on an adult male Snowy Egret in May 2022. Since that time, the tag has sent data on the movements of the bird, which appeared to be nesting on one of NCWRC's Waterbird Islands in Core Sound. It likely raised chicks based on the daily trips it made between the island and nearby foraging sites. After the nesting season concluded, the egret flew north into the Neuse River estuary before eventually migrating to Cuba where it spent the winter. The egret has now begun its northbound migration and recently arrived in Florida. Drs. Brzorad and Maccarone, as well as NCWRC staff, hope the bird will once again return to the same island to nest this spring, and it may be observed during the triennial Colonial Waterbird Survey. Data gathered by this project will be used to better understand the decline in the number of small herons and egrets (including Snowy Egrets) nesting in North Carolina.



Clockwise from top left: Snowy Egret tagged by Drs. Alan Maccarone and John Brzorad (Dr. Alan Maccarone); Rebecca Fox and Shyanne Dixon, students from Lenoir-Rhyne University, hold the tagged Snowy Egret prior to release. A breathable covering over the bird's head helped to keep it calm while the transmitter was attached. (Dr. Alan Maccarone); Northbound migration of the tagged Snowy Egret

Project Status Update: Interspecific Competition, Population Genetics, Hybridization Zones, and Management of Appalachian Cottontails in Western North Carolina

by Andrea Shipley, Mammalogist

This project is a partnership among the N.C. Wildlife Resources Commission, Tangled Bank Conservation, and Virginia Tech, and it will help us better understand the distribution of Appalachian Cottontails, understand where Appalachian Cottontails co-occur and hybridize with Eastern Cottontails, and provide clear management objectives to both monitor Appalachian Cottontails and promote the habitat that Appalachian Cottontails depend on.

The team has begun planning the sampling design and protocol, which will target 60 sites across western North Carolina, at which scat surveys will be conducted. Twenty-six sites have been selected as priority sampling locations, and 62 transect locations have been selected within them. Additional sites are being selected and access permission is being acquired for sites on private land. The team has scheduled meetings with partners to discuss project planning and details.

The protocol for sampling rabbit scat along transects has been updated by species experts and adjustments were made to the protocol to ensure project objectives will be met. This new scat sampling protocol was field tested during winter 2023, and 22 samples were collected across one site. These winter surveys continued through March 2023 and will resume again in December 2023.

To supplement field-collected scat samples from this project, the team is sorting through a database of scat samples from previous collection efforts. Selected samples will be used to bolster the sample size of scat analyzed for genetic properties, principally, species identification and rate of hybridization.

Appalachian Cottontail (NC State Parks)

Biologists Investigate the Effects of Release Timing and Microbiomes in Two Propagated Mussel Species

by Michael Fisk, Eastern Region Aquatic Wildlife Diversity Coordinator

Aquatic Wildlife Diversity staff are working with NC State University PhD candidate, Madi Polera, investigating the effects of release timing on mucosal microbiomes in propagated Yellow Lance and Dwarf Wedgemussel. A mussel's microbiome is linked to its overall health, but these microbiomes are largely undescribed and its not well understood what factors can impact it. Our objective is to determine how the microbiome is affected by timing of release (i.e., Spring vs Fall) and how it changes over time compared to resident wild mussels. Staff have released Dwarf Wedgemussel into Swift Creek and Little Shocco Creek in Johnston and Franklin counties as well as Yellow Lance into Fishing and Shocco creeks in Halifax and Franklin counties. Releases took place in November 2022 and Spring 2023. Surveys will be conducted this year to recapture tagged individuals and re-swab them to describe and compare microbiomes. By describing and establishing a baseline of health and fitness, a suite of biomarkers and mussel health metrics can be used to assess the health and fitness of mussel populations and can be used to inform management actions, hatchery operations, and species restoration efforts.

Tagged and swabbed Dwarf Wedgemussel ready to be released into Swift Creek (NCWRC)

Reptile and Amphibian Winter Surveys Yield Mixed Results

by Dr. Jeff Humphries; Mike Martin, Conservation Technician

Most winters, reptile and amphibian work focuses on monitoring breeding activity of Species of Greatest Conservation Need (SGCN), such as the Gopher Frog, Eastern Tiger Salamander, Mabee's Salamander, Southern Chorus Frog, and Ornate Chorus Frog. Because we still have a lot to learn about the environmental conditions that trigger migration of these species to wetlands, we closely monitor their activity using automated audio recorders (often called frog loggers) which detect frog vocalizations and help determine activity among various properties.

Sadly, conditions seemed too dry this winter for many of our SGCN frog species to be active, but we have yet to review audio recordings to make determinations about presence and absence among survey sites. On the other hand, visual encounter surveys that attempt to detect migrating amphibians on rainy nights proved fruitful, as Eastern Tiger Salamanders and Mabee's Salamanders were observed at multiple sites. Follow-up surveys for amphibian egg masses proved salamanders actively bred this season, despite low water levels. Low water levels threaten to dry some of these wetlands before larvae can metamorphose and migrate from the wetlands to the surrounding uplands, but variable conditions among the many sites we monitor leave us hopeful that hydroperiod of some wetlands will persist long enough for some larval amphibians to survive this critical period and recruit into future breeding seasons.

Eastern Tiger Salamander (Jeff Hall)

Mabee's Salamander (Jeff Hall)

Despite the lack of Gopher Frog breeding activity in the sandhills region, our partners at the NC Zoo successfully repeated their efforts of using assisted reproduction techniques to produce eggs from captive Gopher Frogs maintained by the zoo. This is a relatively novel approach to our head starting efforts with Gopher Frogs, which aims to raise young frogs from eggs to augment populations of this rare and often isolated species.

Warming weather in late winter to early spring brings many reptiles out to bask on the surface. We survey among recent prescribed burn units and tin transects regularly for snakes. This quarter we have detected Pine Snakes, Coachwhips, Corn Snakes, and Pigmy Rattlesnakes. Both Eastern Hognose Snakes and Southern Hognose Snakes are rarely encountered this time of year, although they're anticipated soon, as warming temperatures increase encounters on roadways.

A priority for conserving many of the Sandhills and Coastal Plain SGCN winter-breeding amphibians involves management of various isolated wetlands on game lands as well as other managed lands. Sarah Hecocks, the ORISE fellow with The Nature Conservancy and the US Fish and Wildlife Service, reached out to update management recommendations for several current and former TNC-owned Carolina

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Bays in and near the sandhills region alongside staff members from the Natural Heritage Program, Scott Pohlman and Nathan Shepard. Sites visited included Antioch Bay, Hamby's Bay, Goose Pond Bay, State Line Prairie Bay, Tunstall Bay, and Cypress Meadow Bay. We collectively agreed that fire was a top management priority among all sites, though sites like State Line Prairie Bay have considerable needs regarding removal of canopy trees.

Highlights included observations of Eastern Tiger Salamander egg masses at one site that coincided with reports of Mabee's salamander eggs from the same site a few weeks before our visit. Management recommendations will be provided to land managers responsible for each site, aiming to maintain biodiversity including, but not limited to rare reptiles and amphibians.

We attended the Southeast Partners in Amphibian and Reptile Conservation conference in late February, which provided the opportunity to share information with various herpetologists from the southeastern US. The Gopher Frog and Crawfish Frog Task Team met, and stakeholders in the region who gather data on these closely aligned species and implement various conservation efforts, shared ideas and information. Additionally, NCWRC and NC Zoo staff held a workshop to discuss various marking techniques and the constantly evolving tools at our disposal for wildlife monitoring and conservation.

SEE A PINE SNAKE? LET US KNOW!

We have recently requested reports of Pine Snake observations throughout the state, formerly focused on targeting possible observations in the mountain region, where few records exist and the species remains enigmatic. Pine Snakes seem to do well on managed lands which include prescribed burning, but learning about Pine Snakes' presence in rapidly changing environments outside managed lands is equally important. We have already received multiple reliable reports, including a very recent submission from a private landowner in an area with little to no detection history for this species. We look forward to engaging landowners to improve conservation of this declining species outside the bounds of our managed lands.

If you see a pine snake in the wild, send an email to pinesnake@ncwildlife.org with the following information:

- A photo (required)
- Date and time the snake was observed
- The location (GPS coordinates are best, but a detailed location description is acceptable)

N.C. Partners in Amphibian and Reptile Conservation News

by Jeff Hall, Partners in Amphibian and Reptile Conservation Biologist

GOPHER FROGS

Due to continuing winter drought, most winter amphibians had a poor breeding year. Gopher Frogs were among the amphibians affected by drought, with only 1 of the 7 known populations showing any reproduction. However, the bright spot is that the population with breeding was the Holly Shelter Game Land population, and staff detected the most egg masses ever found there (28 total egg masses). In addition, in conjunction with Land and Water Access staff, Wildlife Diversity staff have been working on restoration efforts in several ponds on the game land. Gopher Frogs bred in three of those ponds. One of the ponds they bred in had never yielded reproduction before, and it had 4 egg masses this year. Another pond yielded greater production than in any previous year with 7 egg masses this year. Gopher frogs also bred in the same primary pond they have been using in recent years and appear to be making use of the restored vegetation staff have added into that pond as well (17 egg masses). Because of the successful breeding at Holly Shelter, staff have been able to partner with three different locations to continue head-starting efforts: the NC Aquarium at Fort Fisher, NCSU's Center for Marine Science and Technology, and the USFWS National Hatchery at Edenton. Each partner is working on raising tadpoles to frogs that will be released back to Holly Shelter around June or July.

One of 28 egg masses detected at Holly Shelter Game Land this winter (left photo). Staff collected egg masses to conduct head-starting efforts, raising tadpoles in containers (right photo) so that they can be released back to Holly Shelter this summer. *(Jeff Hall)*

N.C. Partners in Amphibian and Reptile Conservation News

NEUSE RIVER WATERDOGS

Staff again assisted NCSU graduate student Eric Teitsworth and his field technicians with survey efforts for the federally threatened Neuse River Waterdog. This is the final survey year for this student's project. Multi-year wide-ranging surveys like these can be helpful for determining the status of a species. In this case, data from this project will go directly toward informing recovery plans for the species.

Neuse River Waterdog (Jeff Hall)

MEETINGS

In February, Southeast Partners in Amphibian and Reptile Conservation (SEPARC) held its annual meeting at the Blue Ridge Assembly in Black Mountain. This was the third time the regional meeting has been held in NC and the second time at this location. As the group has grown, finding a location to hold all the participants has been a challenge, but this western NC location has been up to the task! This year was no different as the meeting attracted 282 in-person attendees and 25 virtual registrants. NCWRC staff were heavily involved in the meeting as moderators for sessions and keynote panels, leaders of task teams, presenters of both talks and posters, and facilitators of workshops. To learn more about the meeting including a full agenda, as well as abstracts for the presentations and posters, visit the SEPARC website.

SGCN SNAKES

Staff have participated in many surveys for upland snakes in areas with recent prescribed fire and have detected numerous Species of Greatest Conservation Need (SGCN) snakes including: Carolina Pigmy Rattlesnake (below, Jeff Hall), Mole Kingsnake, and Eastern Coachwhip.

Staff Conduct Research to Detect Effectiveness of eDNA Methodology

by Lori Williams, Western Amphibian Biologist

In March 2023, Wildlife Diversity staff completed another iteration of a field research project testing the distance Eastern Hellbender environmental DNA (eDNA) can be detected downstream from a source. We conducted several previous pilot studies in the last six years with attempts based at Marion Fish Hatchery with our captive hellbenders in outdoor runs and with attempts in Pisgah National Forest in a stream outside the hellbender's range in the Catawba River drainage (McDowell County). The most successful of our attempts came in 2021 when we met our goal of detecting hellbender eDNA the full 1,000 meters of our study reach. Our methods included dripping water from captive hellbender habitats overnight into the stream to introduce DNA. We also submerged specimens of dead adult hellbenders in minnow traps so they would shed DNA into the stream overnight as well. The next day, we collected water samples at transects every 100 meters from the farthest downstream point, working our way back upstream to the source. We also collected water quality, stream flow, and

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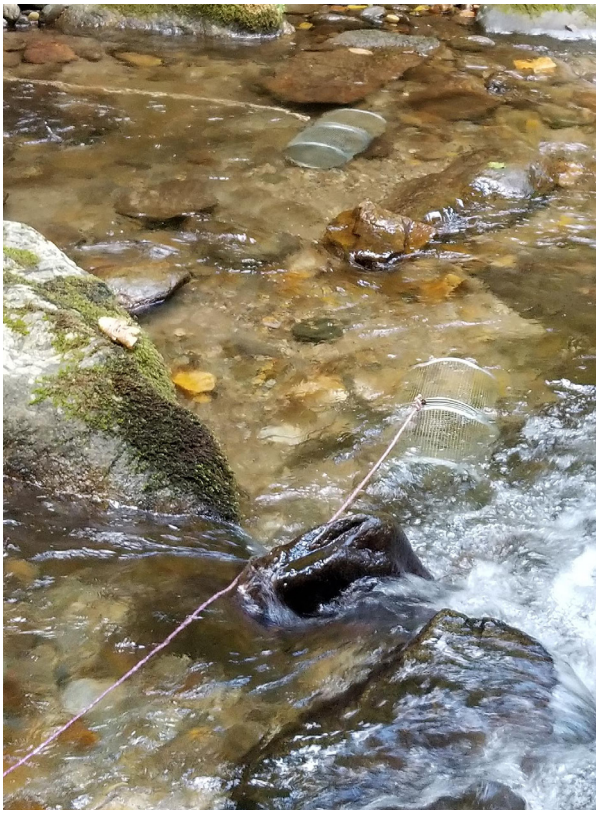
Wildlife Diversity technician, Ben Dalton, and Inland Fisheries biologist, Peter Lamb, setting up the drip station and the hellbender specimens before deployment in the stream, 2021 (Lori Williams)

Overview of the field set up at the start of the study reach with water drip stations and submerged traps with hellbender specimens, 2021 (Lori Williams)

substrate composition data to see if there are any correlations with eDNA at each sampling location. This spring, we replicated what we had done in 2021 but this time increased the study area to 2,500 meters downstream. Water samples are currently being analyzed. If we are successful, we will detect hellbender eDNA at least to 1,000 meters again but hopefully beyond that and with a defined ending so we can get a clearer understanding of the effective distance for hellbender eDNA sampling. These results will help us, and other hellbender researchers, better interpret eDNA results from similar mountain streams in terms of potential locations of source animals.

Wildlife Diversity technician, Reed Rossell, using an electric pump and vacuum flask to filter water samples in the lab, 2021 (Lori Williams)



Two of the submerged minnow traps with hellbender specimens, 2021 (Lori Williams)

Wildlife Diversity technicians (Ben Dalton, Reed Rossell) and Inland Fisheries technician and volunteer (Garrett Wood, Hugh Lamb) conducting pebble counts and measuring stream flow, 2022 (Lori Williams)

First Record of a Southern Flying Squirrel after 20 years of Squirrel Box Surveys: Are They Creeping Upslope?

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

Wintertime in the mountains is time for NCWRC's annual nest box monitoring for the endangered Carolina Northern Flying Squirrel. Biologists bundle up, strap on ice cleats, and head up to the high peaks to check hundreds of snow-encrusted wood boxes for this rare rodent. But winter 2023 wasn't typical, nor was one of the flying squirrels captured in the Black Mountains in Yancey County. On Jan. 30, the NCWRC's flying squirrel team captured a Southern Flying Squirrel in a squirrel box off State Route 128 — the entrance road to Mount Mitchell State Park. This is the first record of a Southern Flying Squirrel in 20 years of monitoring this transect of nest boxes in the Black Mountains massif.

Southern Flying Squirrels are common across North Carolina, but scarce in the high peak forests of western North Carolina. They are occasionally captured incidentally in squirrel boxes or traps during surveys for the rarer Carolina Northern Flying Squirrel in a few areas where their ranges overlap. Those areas of overlap, or sympatry, have remained fairly steady over two plus decades of squirrel box monitoring in the mountains. Records of overlap are found in other high elevation massifs in western North Carolina, including at higher elevations in the more southerly Great Balsams massif. This particular individual was captured at an

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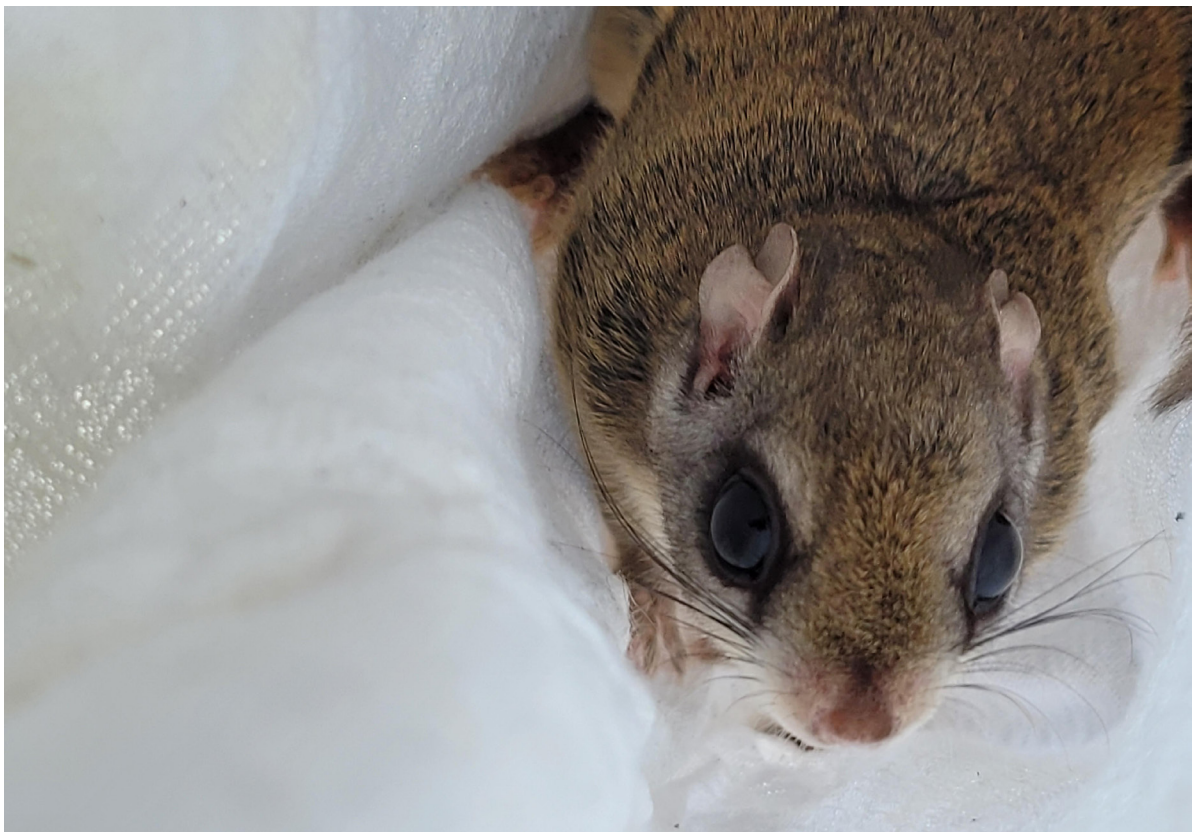

A Southern Flying Squirrel captured in January (Christine Kelly)

elevation of 5,482 feet in a stand of Red Spruce, Fraser Fir, Yellow Birch, and other northern hardwoods with a component of Norway Spruce that was introduced during early efforts in the mid-20th century to restore the logged forest. All previous records of Southern Flying Squirrel captures in the Black Mountains massif have been below 5,000-foot elevation, particularly in areas with a component of oak, beech, and cherry.

Biologists point to a few reasons Southern Flying Squirrels are not typically found at high elevations year-round. The tiny Southern Flying Squirrel loses body heat easily because of its large surface area to volume ratio. To stay warm enough to survive and remain active in the cold at high elevations in winter, it needs a cacheable food source. Most Red Spruce, Fraser Fir, and northern hardwood forests lack a reliable source of hard mast for caching. In contrast, the larger Northern Flying Squirrel does not rely on a cacheable food source to survive the cold winters up high and it loses body heat less rapidly. But winter 2023 featured periods of mild temperatures and very little snow or ice. Mount Mitchell averages 89.1 inches of snow annually, but received only 24.9 inches between December and March. Under those circumstances, a Southern Flying Squirrel could conceivably survive at higher elevations. The individual captured was an adult male in breeding condition, which is often associated with long distance dispersal movements in late winter.

Although this is a single incident, biologists' concern is that the smaller Southern Flying Squirrel could, if more incidents occur, potentially displace the Carolina Northern Flying Squirrel through range expansion, competition for cavities, hybridization, and parasite transmission. Regarding the latter, Southern Flying Squirrels can transmit a parasitic nematode (*Strongyloides robustus*) to Carolina Northern Flying Squirrels through shared den sites. While the Southern Flying Squirrel suffers little in the way of deleterious effects from the parasite, infected Northern Flying Squirrels tend to show poor body condition, which can negatively impact reproduction. Thus, NCWRC biologists are keeping a close eye on changes to these areas of sympatry, particularly with warming climate trends.

Top photo: A Southern Flying Squirrel captured in January (Christine Kelly); *Left photo: Biologists captured a male Southern Flying Squirrel near Mount Mitchell.* (Clifton Avery)

Winter Bat Counts on the Rise

by Katherine Etchison, Mammalogist

NCWRC staff conducted bat hibernacula counts in January and February and noted increasing tricolored bat counts at six of eight long-term sites surveyed. The combined tricolored bat count from all eight sites was up 52% from the previous survey. This species was recently proposed to be listed as endangered by the US Fish and Wildlife Service because of population declines caused by white-nose syndrome (WNS). Winter counts of tricolored bats have declined 95% in western NC since WNS arrived, so this year's increase, though small, is encouraging (Figure 1). A slight increase was also observed in 2020 counts, so perhaps a positive trend will emerge over the coming years. The hibernaculum with the highest number of tricolored bats in the state showed an

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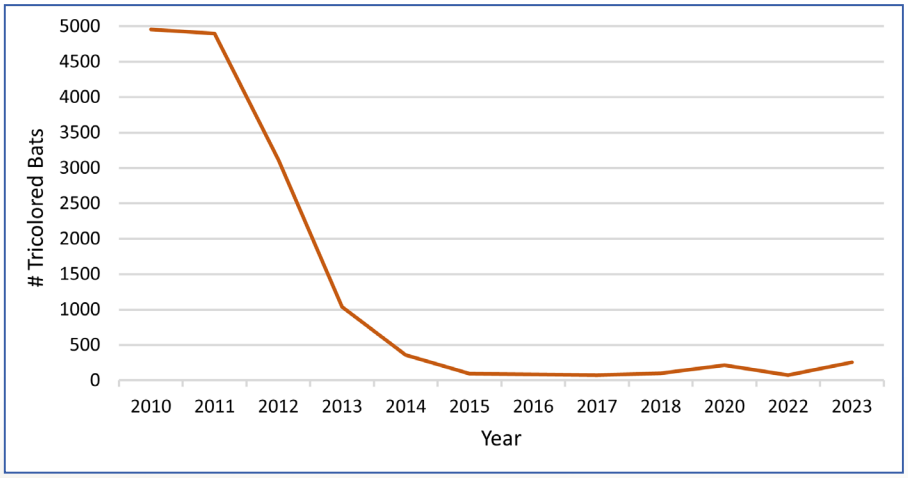

Figure 1. Tricolored bat counts at long-term hibernacula in western NC from 2010 to 2023

Wildlife Diversity Technician, Joey Weber, observes a hibernating tricolored bat. (Katherine Etchison)

Tri-colored bats (Katherine Etchison)

increase from 69 tricolored bats in 2020 to 102 this year. This cave also held one little brown bat, which is a species that has declined 97% in winter counts. The hibernaculum with the last known winter colony of this species was surveyed in February and increased from 35 little browns in 2020 to 43 this winter (Figure 2). This was the first time the count increased instead of decreasing since arrival of WNS in the colony site. Counts of Virginia big-eared bats, a federally endangered species not susceptible to WNS, also increased this winter. The 2023 count of 462 Virginia big-eared bats surpassed the highest count on record, which was 431 in 2007 (Figure 3).

NCWRC staff also conducted bridge surveys for bats on the Coastal Plain after receiving a 20-year-old dataset from NC State University and University of North Carolina Wilmington students. Twenty-one bridges with previous summer evidence of bats were surveyed in January and tricolored bats were found roosting under 9 of these bridges (Figure 4). Roosting data for this species are scarce and the use of bridges is not well understood, so these records are significant. NCWRC staff will continue surveying bridges identified in the historic dataset to better understand tricolored bat occurrence in bridges on the Coastal Plain in winter and summer.

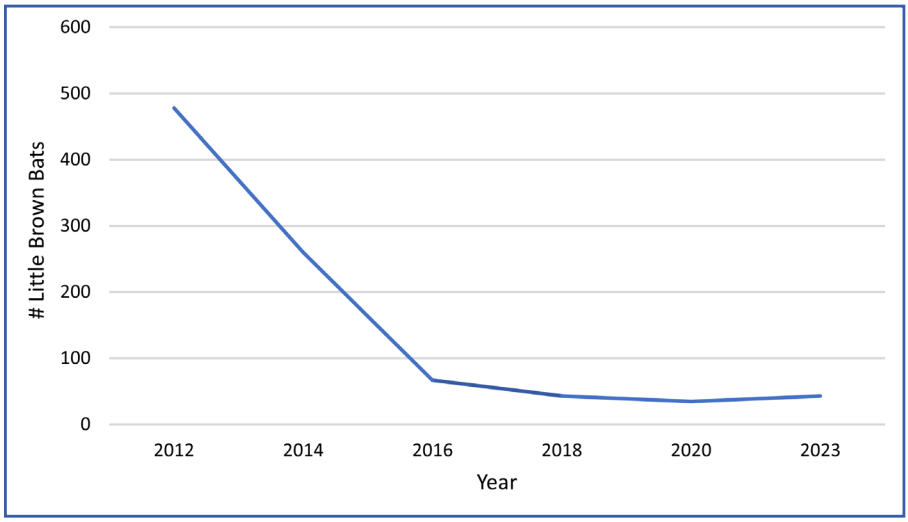

Figure 2. Little brown bat counts at the last known hibernaculum in western NC from 2012 to 2023.

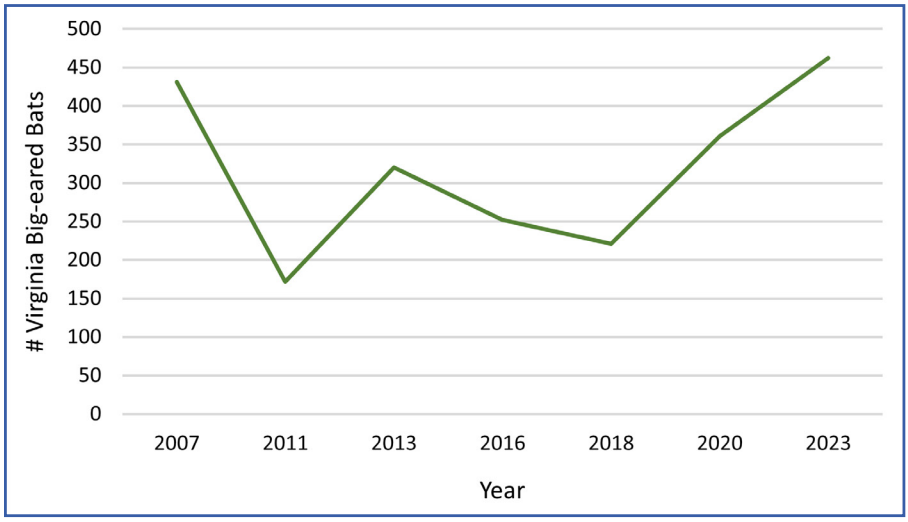

Figure 3. Virginia big-eared bat counts in the primary hibernacula from 2007 to 2023

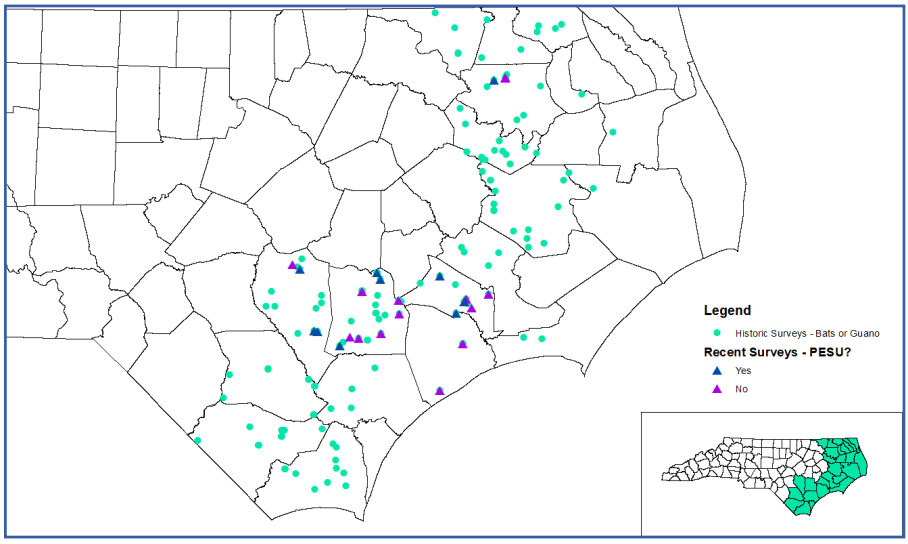

Figure 4. Map of historic bridges with bats or guano and NCWRC 2022-2023 tricolored bat findings (PESU).

Another Successful Box Turtle Connection Training

by Gabrielle Graeter, Conservation Biologist/Herpetologist

In 2008, NCWRC staff, along with other partners, including UNC Greensboro and the NC Division of Parks and Recreation, set up a long-term population study of box turtles in North Carolina called The Box Turtle Connection (BTC). The goal of the BTC is to gather data on population trends and status of box turtles in NC for the next 100 years by engaging community scientists. Each volunteer, or "Project Leader," makes a long-term commitment to study and collect data on the box turtles at their own site, such as a nature center, state park, or their private property. Turtles are permanently marked and measured by the Project Leaders and data are entered into an online database managed by the WRC. We now have more than 40 established study sites across the state. We are the only state that has such a large-scale box turtle study! In 2021, we published our findings from the first 10 years in Ecosphere and you can check out the article for more information.

Every other year we hold a Box Turtle Connection training workshop to train the Project Leaders and occasionally bring new study sites on board. In March 2023, we held a BTC training at Haw River State Park, which was the first in-person training since the Covid-19 pandemic (see Figures 1 & 2). Project Leaders must attend a BTC workshop to undergo the training necessary to lead their site. This year we had an exceptional turnout, with many returning project leaders and new volunteers interested in the BTC. The training workshop consists of various presentations and hands-on skill stations where everyone learns about the biology of box turtles, current conservation issues, and how to properly collect and record data. Visit the Box Turtle Connection for more information.

Keynote speaker and retired NCWRC Wildlife Law Enforcement Sergeant Mark Cagle gives a presentation to BTC participants about the illegal turtle trade in North Carolina.

Participants in the 2023 Box Turtle Connection Training at Haw River State Park

Freshwater Drum Reintroductions in the French Broad River

by Dr. Luke Etchison, Western Region Aquatic Wildlife Diversity Coordinator

Biologists with the Western Region of the Aquatic Wildlife Diversity Program started a reintroduction project aimed at restoring Freshwater Drum populations in the upper French Broad River. Freshwater Drum are one of many fish species that are found in the lower French Broad River that are currently unable to occupy their former native range further upstream. A combination of past water quality issues and three dams on the mainstem French Broad, all of which are located downstream of Asheville, has prevented the fish from returning to large portions of the watershed that they once inhabited.

Reintroduction of species like the Freshwater Drum into its historical range will improve mussel populations by establishing an important host fish for many imperiled mussel species. For example, Freshwater Drum are the only known fish host for the recently discovered Pink Heelsplitter. The Pink Heelsplitter is a rare freshwater mussel species and is proposed as Special Concern in North Carolina. The Pink Heelsplitter is only found where Freshwater Drum occur and they have a limited distribution in the Madison County portion of the French Broad River.

Freshwater Drum from the French Broad River near Marshall, NC (Dr. Luke Etchison)

This spring, 109 Freshwater Drum were collected by Tennessee Wildlife Resources Agency in the French Broad River and Nolichucky River sections of Douglas Reservoir in Tennessee and were translocated to the upper French Broad River near Etowah, NC. Each Freshwater Drum translocated to the upper French Broad was implanted with Passive Integrated Transponder (PIT) tags to evaluate survival and growth of recaptured individuals. PIT tags will also help evaluate the use of restored slough habitats near Mud Creek. The sloughs are outfitted with PIT tag antennas and will detect the tagged Freshwater Drum if they enter the habitat. Biologists will begin long-term monitoring this summer to evaluate survival and establishment of this reintroduced species.

Freshwater Drum collected at Douglas Reservoir, TN (Dr. Luke Etchison)

Pink Heelsplitter from the French Broad River near Hot Springs, NC. (Dr. Luke Etchison)