



Wildlife Diversity Program Quarterly Update

Fourth Quarter





In this Issue:

Page 2 - [Neuse River Waterdog Surveys in Progress](#)

Page 3 - [Voice of America Site Management Agreement Tar River Spiny mussel Stocking in Little Fisher Creek](#)

Page 4 - [Beach-Nesting Waterbirds Show Population Declines](#)

Page 5 - [Sea Turtles Release](#)

Page 6 - [NCPARC News](#)

Page 7 - [Robust Redhorse Stocking](#)

Page 8 - [Carolina Heelsplitter Stocking](#)

Page 9 - [Green Salamander Surveys](#)

Page 10 - [High-Elevation Restoration and Conservation](#)

Page 11 - [Conservation Efforts for Southern Appalachian Bog Habitat](#)

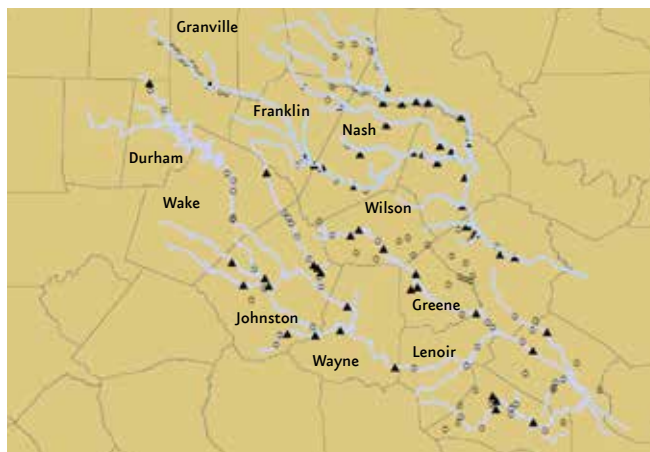
Neuse River Waterdog Surveys in Progress

Wildlife Commission biologists, along with other collaborators, have been conducting surveys for Neuse River waterdogs since 2011. The purpose of these surveys is to assess the current status of this species compared to historical trapping data collected 35+ years ago. Biologists conducted preliminary analysis of trapping data during this quarter. Following are the preliminary results of the trapping efforts:

Wildlife Commission biologists and collaborators surveyed 136 of the 361 sites originally surveyed during the historic study (Fig. 1), totaling 4,486 trap nights. They captured 81 waterdogs, with a maximum of 13 waterdogs captured at a single site. In recent surveys, 45 sites were positive for waterdogs,

which is a 33 percent success rate. Historically, these same sites were 66 percent positive for waterdogs, suggesting a 50 percent decline in capture success compared to 35+ years ago.

Surveys for Neuse River waterdogs will continue through this winter and results will be compiled and analyzed to determine the present status of this species. Specifically, in the following year, biologists will focus on filling in the major gaps in the survey effort, mainly in the upper Tar and Neuse River basins. They also are planning to conduct studies to address the capture probability of waterdogs in order to provide a more accurate assessment of this species' status based on standardized surveys.



Survey results for Neuse River waterdogs conducted by Wildlife Commission staff and collaborators from 2011-2014. Triangles indicate positive sites and open circles indicate negative sites.



October - December 2014
N.C. Wildlife Resources Commission





Wildlife Commission Working with Beaufort County on Agreement for Voice of America A site

The Wildlife Commission is working with Beaufort County officials to draft an agreement to manage a significant portion of the Voice of America Site A, which is expected to become property of the county in 2015. The Voice of America Site A is a 2,822-acre site off Cherry Run Road in Beaufort County.

One species of particular interest to Wildlife Commission biologists that inhabits this site's grassland habitat is the Henslow's sparrow. This songbird is considered to be one of the most vulnerable nongame species found in eastern North Carolina. It is known to breed reliably at only two locations in the southeastern United States: Voice of America Sites A and B, which comprises 2,715 acres near Blackjack in Pitt County.



Henslow's sparrow (Photo by John Carpenter)

These populations have survived because of the size of the sites and the control of woody vegetation through annual mowing. However, the number of birds detected and their distribution at both locations has declined steadily because of a lack of a comprehensive management plan.

The Wildlife Commission has proposed to manage roughly 1,600 acres primarily through the use of prescribed fire to maintain the unique grassland habitat, increase productivity of fire-dependent plant species, and reduce the likelihood of wildfires by controlling potentially hazardous fuel loads. Additionally, Wildlife Commission staff plan to build wildlife-viewing platforms and construct a multi-use shooting range designed to current National Rifle Association guidelines.

Biologists Stocks Little Fishing Creek with Tar River SpinyMussels

In December, personnel with the Wildlife Commission, N.C. State University and the U.S. Fish and Wildlife Service stocked 260 propagated Tar River spiny mussels into Little Fishing Creek, in the Tar River Basin in Halifax County. They transported the mussels in an aerated cooler from the Wildlife Commission's Conservation Aquaculture Center in Marion to the augmentation site downstream of S.R. 1338 bridge over Little Fishing Creek.

They sorted and pit tagged each mussel before stocking them into six different sites in the creek. Within minutes of placing mussels into the substrate, biologists observed the mussels actively siphoning and displaying some movement. They will conduct a follow-up survey in weeks with a pit tag reader wand and visual surveys to assess acute mortality or displacement at stocked locations. They plan to stock additional mussels this month and into the spring.



Biologists with the Wildlife Commission, N.C. State University and the U.S. Fish and Wildlife Service stocked 260 Tar River spiny mussels into Little Fishing Creek in December to augment the population. (Photo by Rob Nichols)

Beach-Nesting Waterbird Species Show Population Declines, According to Report

The final report for the coast-wide survey of colonial-nesting waterbirds is completed and shows several wading bird species are experiencing population declines, including cattle egrets, tricolored herons, little blue herons and snowy egrets. The report also identified several beach-nesting species that have decline substantially, including the common tern, gull-billed tern and Forster's tern.

Not all colonial-nesting waterbirds were declining in numbers; a few, such as the brown pelican, white ibis, black-crowned night heron, least tern and laughing gull, increased in numbers. These species are thriving in North Carolina's coastal region,

adapting well to available nesting sites and seem to be less affected by human activities.

Commission biologists and partners recorded 66,797 colonial waterbird nests, or nesting pairs, which exceeded the average of 12 coast-wide surveys ($61,135 \pm 3,276$ nests). They noted 297 colonies on 123 sites. The sites were wide-ranging and sometimes unusual — islands within sounds, both natural and dredge material, large shoals, barrier islands, flat gravel roofs and even a gravel parking lot. Most sites are protected to varying degrees by National Seashores, the N.C. National Estuarine Research Reserves, U.S. Marine

Corps, Audubon NC, the Wildlife Commission and the U.S. Fish and Wildlife Service. Some sites, however, are threatened by coastal engineering projects, such as inlet dredging, beach nourishment or fill. Other threats are pedestrians, dogs, vehicles, boats and predators, including free-ranging cats.

The report, which was conducted from May 7 through June 30, 2014, was finalized in October. Data from the survey are entered into the online Colonial Waterbird Database, which is maintained by the Wildlife Commission. These data and the final report are available upon request.



White ibis (Photo by Mark Buckler)



Brown pelicans (Photo by Jeff Marcus)



Gull-billed terns on nest

According to a coast-wide survey of colonial-nesting waterbirds, several wading bird species are experiencing substantial population declines, such as the gull-billed tern. Other species, however, are thriving along North Carolina's coast such as white ibis and brown pelicans.

Cold-Stunned Sea Turtles Released Safely in Warm Gulf Stream Waters

The North Carolina Sea Turtle Stranding and Salvage Network, coordinated by Wildlife Commission biologists, responds throughout the year to stranded sea turtles all along North Carolina's coast. During winter months, sea turtles are affected by rapidly falling water temperatures, leading to hypothermia or cold-stunning.

Cold-stunned sea turtles tend to show up once water temperatures have dropped below 50 degrees Fahrenheit. Typically, this occurs between November and February. So far for the 2014-2015 season, biologists and volunteers have seen 59 cold-stunned sea turtles, 43 of which were alive and taken to rehabilitation facilities.



All 50 turtles arrived in banana boxes, with medical records attached. Each turtle was given a full veterinary evaluation, initial treatment, and sent to one of three rehabilitation facilities in North Carolina.



A Kemp's ridley sea turtle, transported to North Carolina from Massachusetts, awaits veterinary evaluation before transport to one of North Carolina's rehabilitation facilities.

Though this season has not yet produced as many cold-stunned sea turtles in North Carolina as in years past, there have been other areas of the United States that saw large numbers of cold-stunned sea turtles. In particular, Cape Cod, Massachusetts had more than 1,200 cold-stunned sea turtles in November and December 2014. The majority were alive and needed treatment. Three facilities in North Carolina offered space and care for 50 turtles from Cape Cod: N.C. Aquarium at Pine Knoll Shores, N.C. Aquarium at Fort Fisher, and the Karen Beasley Sea Turtle Rescue and Rehabilitation Center.

The turtles arrived in North Carolina via a private plane whose pilot donated his time to help transfer animals from New England to other areas of the country. So far, some of the northern cold-stunned turtles have made a quick turnaround and have been released in warmer waters near the Gulf Stream via the US Coast Guard, while others have not yet been cleared for release.



The U.S. Coast Guard Cutter Kodiak Island departs Atlantic Beach for the warm waters of the Gulf Stream. Aboard are 19 rehabilitated sea turtles, including some from Cape Cod, on their release voyage.



North Carolina Partners in Amphibian and Reptile Conservation (NCPARC) News

Workshops, training and meetings

Workshops, trainings, and presentations given during this quarter included topics on wetland restoration and creation, ecology and management for amphibians and reptiles, and survey techniques.

Groups included: Coastal Wildlife

Surveys and research

Wildlife Diversity Program staff continued road-cruising efforts for upland snakes in the fall, especially in the Sandhills region. Priority snake species encountered included northern pine snakes, southern hognose snakes, eastern coachwhips, mole kingsnakes, timber rattlesnakes, pigmy rattlesnakes and corn snakes.

Diversity Program meeting in New Bern, Southeastern Association of Fish and Wildlife Agencies meeting in Destin, Fla., and two amphibian workshops at Weyerhaeuser's Cool Springs Environmental Education Center near New Bern.

Additionally, Wildlife Commission staff attended a meeting on alligators and management issues throughout the Southeast, held in Newton, Ga.



staff to prepare for possible rearing of Carolina gopher frog tadpoles during the 2015 breeding season. This effort would mimic successful augmentation work completed in 2011.

Finally, staff conducted a collaborators meeting in December for field work surveying for the Neuse River waterdog in 2015.



Juvenile Mabee's salamander (Photo by Jeff Hall)



Southern hognose (Photo by Jeff Hall)



Juvenile coachwhip (Photo by Jeff Hall)



Eastern narrowmouth toad (Photo by Jeff Hall)



Mud salamander (Photo by Jeff Hall)



Squirrel treefrog (Photo by Jeff Hall)

Robust Redhorse Stocking Effort Conducted in Pee Dee River in Richmond County

In October, fisheries biologists with the Wildlife Commission, S.C. Department of Natural Resources and Duke Energy, released 13,000 robust redhorse, averaging 4 inches in length, into a stretch of the Pee Dee River, just downstream of Blewett Falls Dam in Richmond County. The stocking effort was the latest step in a long-term conservation plan by members of the Robust Redhorse Conservation Committee, who are leading the effort to restore the imperiled fish in a river where it was once commonly found.

Robust redhorse are large, long-lived member of the sucker group that can reach up to 31 inches in length and weigh up to 18 pounds. Its thick, robust body with rose-colored fins and a fleshy lower lip give the fish its descriptive name. It is a priority species for the Wildlife Commission's Wildlife Action Plan and has been petitioned for federal listing. In North Carolina, the robust redhorse is found only in the Pee Dee River below Blewett Falls dam. Population estimates by Wildlife Commission biologists place the number of adult robust redhorse in the Pee Dee River at less than 100. This stocking effort is part of a larger effort to preclude the need to list this species.

In May, Wildlife Commission staff collected robust redhorse brood stock from the Pee Dee River and propagated and reared the fish at the McKinney Lake State Fish Hatchery and a fish hatchery in South Carolina.

More than 6,000 robust redhorse were produced by North Carolina and approximately the same amount were produced by South Carolina. Staff stocked the fish when they reached approximately 4 inches in size. They were placed into the spawning shoals where the brood stock were collected.

The Wildlife Commission is a member of the Robust Redhorse Conservation Committee, which was formed in 1995 to improve the status of the fish throughout its former range. The Committee comprises 12 private and

public entities including power companies, conservation groups, and state/federal agencies from North Carolina to Georgia.



Ryan Heise, a Wildlife Diversity Program biologist and lead coordinator of the Robust redhorse stocking effort, releases a netful of juvenile robust redhorse into a shallow reach of the Pee Dee River. (Photo by Jodie Owen)



Juvenile robust redhorse before stocking (Photo by Jodie Owen)



A section of the Pee Dee River near where the juvenile robust redhorse were stocked (Photo by Jodie Owen)

Biologists Conduct Carolina Heelsplitter Augmentation Project

In December, biologists with the Wildlife Commission and U.S. Fish and Wildlife Service stocked 399 Carolina heelsplitters into designated critical habitat in Goose and Duck creeks in Union County. The stocking of this federally endangered mussel is part of an augmentation project started back in 2007, after drought conditions threatened the continued existence of the Goose and Duck Creek populations of the Carolina heelsplitter.

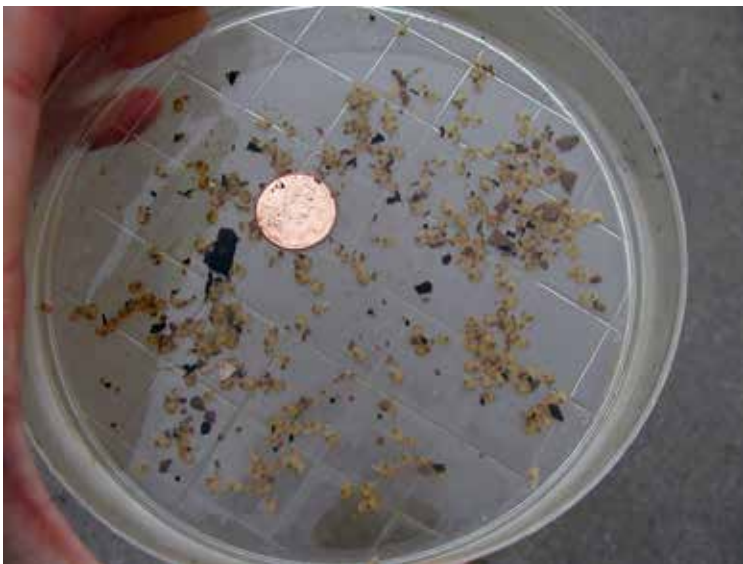
Biologists with the Wildlife Commission and the U.S. Fish and Wild-

life Service collected Carolina heelsplitters from the creeks and brought them to the Wildlife Commission's Conservation Aquaculture Center, located in Marion. Using these mussels, and other, more recently collected individuals, staff with the Wildlife Commission and N.C. State University conducted life history studies and successfully propagated this species for restocking back in the Duck and Goose Creeks.

Before stocking each mussel, biologists laser-tagged them with a unique three-digit number and mea-

sured them. They stocked 30 percent, or 116 individuals, into Duck Creek and the remaining 70 percent, or 273 individuals, back into Goose Creek. They also re-stocked the six that were collected originally from Goose Creek and the four adults that were collected from Duck Creek back the original creeks.

Biologists will begin monitoring surveys this fall and continue every other year to assess the results of this augmentation effort. They will measure, photograph and release recaptured individuals.



6 month old Carolina heelsplitters (Photo by Chris Eads/NCSU)



1 1/2 year old Carolina heelsplitters



Green Salamander Surveys Conducted on Pre- and Post-Prescribed Burn Habitats

In the fall, Wildlife Diversity Program staff and volunteers, in collaboration with the N.C. Forest Service, completed a fifth year of ongoing, applied research on green salamanders, a N.C. Wildlife Action Plan priority and state endangered species, and the effects of prescribed fire in a state forest.

Research objectives include comparing pre and post-burn population occupancy, detection probability, survey covariates (e.g., macrohabitat weather station data and microhabitat temperature and relative humidity), and nest success at rock outcrops, which are the primary habitats of green salamanders.

Study sites include 40 treatment and 40 control sites, and burn units covering nearly 1,000 acres of state forest land in Henderson and Transylvania counties. Goals of using prescribed fire in the forest include managing for wildlife habitat, reducing fuel loads, and restoring forest diversity in fire-adapted systems. However, prescribed fire also reduces the amount of understory shrub across the landscape such as mountain laurel and rhododendron. While usually not desired in abundance from a forest health perspective, these shrubs help shade and cool rock outcrops and provide arboreal habitat for green salamanders.

To conduct this research, staff and

volunteers complete multiple surveys in late summer through fall.

These repeat visits allow them to monitor population status over time. Since 2010, staff and volunteers have completed 1,609 surveys at the 80 study sites in this project, with all 40 treatment sites receiving at least one year of pre-burn surveys in 2010 before the first sites were burned in 2011. Out of the 40 treatment sites, 14 have yet to burn but are on schedule to be completed late winter 2015.

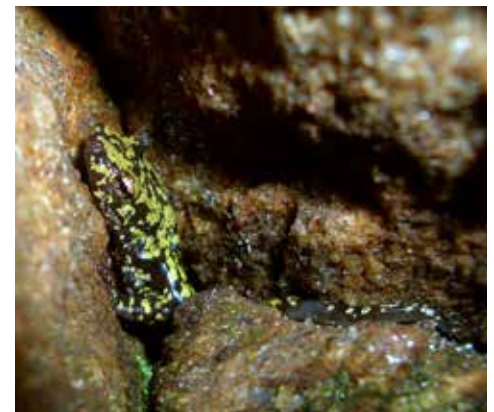
Initial data analysis of population metrics is underway now, but raw data include observations of more than 1,200 green salamanders, of all age classes. Photographs suggest some observations were repeated sightings of the same individuals. Examining raw data for the 226 sur-



veys conducted at control sites, they found green salamanders 51 percent of the time, while success at treatment sites was 30 percent pre-burn (n=132 surveys) and 19 percent post-burn (n=82 surveys).

So far, six control sites and seven pre-burn sites have shown a nest success, or hatching, rate of 92 percent (34 of 37 and 11 of 12 nests, respectively), while four post-burn sites have had a nest success rate of 86 percent (6 of 7 nests).

Because of invaluable volunteer help, Wildlife Commission biologists will continue this study for the long-term, possibly through a second or third round of fire. The study will serve as a valuable tool for long-term population monitoring across the forest within a land management context.



Green salamanders require cool, moist rock crevices free of soil and plant debris. (Photo by Alan Cameron)

High-Elevation Conservation and Restoration

Wildlife Diversity Program biologists conducted post-treatment monitoring of their first red spruce planting project and began planning the next habitat enhancement and restoration project during the fourth quarter of 2014.

In November, they conducted a second monitoring session of red spruce seedlings that were planted in the Unicoi Mountains (Graham County) in September 2013. These planted seedlings alleviate the loss of Eastern hemlock killed by hemlock woolly adelgid, so that a conifer component is retained in this southernmost recovery area for the endangered Carolina northern flying squirrel. Habitat enhancement with spruce is important for the truffles that grow on the roots and the squirrel depends upon for food. Staff collected data on five plots encompassing 43 seedlings and observed growth, which showed good to excellent vigor. All 43 seedlings have survived so far.

While they could not check all 1,135 planted seedlings, they did walk through planted areas and observed good survival and growth. Between February 2014 and November 2014, mean height of sampled seedlings increased from 8.8 inches (22.4 cm) to 10.8 inches (27.4 cm). Most seedlings (22) put on between

nearly 1 inch (2.5 cm) and 2.4 inches (6 cm) in the last eight and a half months.

To jumpstart planning of the next project, Wildlife Diversity Program biologist Chris Kelly organized a small group of Southern Appalachian Spruce Restoration Initiative (SASRI) partners, including wildlife biologists, foresters, botanists, a university professor and a student, to participate in a brainstorming session field trip to the U.S. Forest Service-owned Flat Laurel Branch (Haywood County) in late November. This area was industrially logged after the civil war and was the victim of railroad-induced fires that greatly degraded the soil conditions necessary for spruce regeneration. The need for restoration of high-elevation forests in this area was recognized as early as 1941 when the United Daughters of the Confederacy and the U.S. Forest Service planted 125 acres with 125,000 red spruce trees as a living memorial. The science of restoration was in its infancy then and the memorial and surrounding forest have not recovered its former vegetation composition in the 100 or so years since the forests were first cut.

Potential treatments for restoring the high-elevation forest include release of existing red spruce and

yellow birch, planting red spruce seedlings, and release of planted seedlings. The group outlined a potential pre-treatment assessment of site conditions in order to delineate areas of differing vegetation conditions. This effort will help biologists make management recommendations for habitat enhancement and restoration as the SASRI partners continue to work towards the conservation of high elevation forest biodiversity.



A red spruce seedling planted in 2013 grows vigorously in the Unicoi Mountains. (Photo by Chris Kelly)



Conservation Efforts for Southern Appalachian Bog Habitat

In fall 2014, Wildlife Diversity Program Biologist Gabrielle Graeter accomplished a variety of conservation actions at Southern Appalachian Bog habitat in western North Carolina. This habitat is rare, with only about 10 to 20 percent of the bogs remaining that once existed on the landscape due to human activities such as damming, agriculture and other development.

A variety of plants and animals, both common and rare, rely on this habitat for some portion of their life cycle. One such species is the bog turtle. Bog turtles are federally and state listed as threatened and are a high priority in the N.C. Wildlife Action Plan. Bog turtles live in freshwater wetlands that are usually spring fed, with slow moving rivulets, deep, soft soils, a continuously saturated upper layer of soil, and some open sunny areas dominated by low grasses, sedges, and sphagnum.

Graeter helped plan and complete habitat management efforts at a number of bogs during this time. For example, plans are underway at a site in Gaston County that needs hydrologic restoration to address erosion problems. She also spent a couple of days at two bogs in Henderson County treating invasive plants and thinning out shrubs to create a more ideal microclimate within certain areas of each bog. In October, Gabri-

elle participated in a Bog Learning Network “bog managers” field trip to visit and learn about techniques used at several bog restoration sites in eastern Tennessee. Collaboration and sharing of ideas between bog managers are of great benefit, as each site is unique and requires a plan that is site-specific.

During this time, Graeter carried out a variety of other tasks, including assessing the habitat suitability for bog turtles at six sites, across four counties —Macon, Henderson, Transylvania and Alleghany counties. This involves walking around the site and looking for key features, like saturated soils, nesting habitat, and a mosaic mix of open, sunny, herbaceous-dominated areas as well as some areas that are more shrub-dominated. In early October, Graeter organized surveys for bog turtles at a site in Wilkes County as part of long-term monitoring. She also provided technical guidance on bog turtles and their habitat for a planned wetland mitigation bank. Graeter also has worked to protect a privately owned bog in western North Carolina that harbors bog turtles.

Partnerships are an integral part of these efforts and Wildlife Diversity Program staff is able to accomplish much more in conjunction with partners than it would alone. Partners in Southern Appalachian

bog conservation include the U.S. Fish & Wildlife Service, N.C. Natural Heritage Program, Carolina Mountain Land Conservancy, Project Bog Turtle, The Nature Conservancy, U.S. Forest Service, N.C. Division of Parks & Recreation, among others. Many other partnerships have emerged from interactions at the Bog Learning Network and Project Bog Turtle meetings and field trips.

In November, Graeter attended and presented at the annual Project Bog Turtle meeting — a collaborative meeting that brings together all the individuals working with bog turtles in Virginia, North Carolina, Tennessee, Georgia and South Carolina, including state and federal biologists, zoo personnel, university researchers, museum staff and dedicated bog turtle field experts.



Gabrielle Graeter weighs a juvenile bog turtle before releasing it as part of bog turtle monitoring efforts in western North Carolina.



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 1,000 nongame animals call North Carolina home. Many nongame species, including mammals, reptiles, birds, amphibians, snails, 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/conserving.

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