



North Carolina Wildlife Resources Commission



Wildlife Diversity Program Quarterly Update

January - March 2014



A tri-colored bat roosting in a cave in Cherokee County, North Carolina, tested positive for the fungus that causes White-nose Syndrome in February 2014.



In this Issue:

- Page 2 - Citizen Science Groups Help with Nesting Waterbirds
- Page 3 - Riparian Breeding Bird Surveys
- Page 4 - Leatherback Sea Turtle Necropsies
- Pages 5 - Green Growth Toolbox Update
- Page 6 - Mole Salamander Surveys
White-Nose Syndrome Continues
Devastating Impact in N.C.
- Page 7 - Western North Carolina
Amphibian Conservation Update
- Page 8 - Enhancing Habitat for Carolina
Northern Flying Squirrels

Citizen Sciences Groups Help Wildlife Commission and N.C. Audubon with Nesting Waterbirds

The N.C. Wildlife Resources Commission cooperates with several municipalities to delineate nesting areas traditionally used by shorebirds, using posts, signs, string and flagging. The agency, along with N.C. Audubon, is helping these municipalities form citizen scientist groups, or stewards, for their community's nesting birds. The most recently formed group is the Sunset Beach Bird Stewards, which met on March 24 for an introductory program for Mayor Ron Watts and stewards, followed by work at the nesting area.

There will be plenty of work to do for these groups in the coming months because March is the beginning of spring migration for shorebirds, with several species using North Carolina's coast as stop-over sites. During shorebirds' stay along the North Carolina coast, they feed voraciously and then rest. Feeding and resting increase their physiological condition for an energetically demanding breeding season. Some species stop and nest on North Carolina's coast, including the

American oystercatcher, Wilson's plover, piping plover and willet.

As the season progresses, the Wildlife Commission and N.C. Audubon will continue to work with these stewards as well as those at South Wrightsville Beach. Other stewards groups will form at additional beach sites as this program continues.



January - March 2014
N.C. Wildlife Resources Commission





Riparian Breeding Bird Surveys Start Up Again - Volunteers Needed

Wildlife Diversity staff is once again preparing to monitor birds associated with bottomland hardwoods along tributaries in the Piedmont and Coastal Plain.

These Riparian Breeding Bird Surveys (RBBS) are designed to provide abundance estimates for bird species that favor these types of habitats, which are not adequately monitored by the U.S. Geological Surveys road-based Breeding Bird Survey (BBS).

The focus of these efforts is three North Carolina priority species of migratory warblers: cerulean, Kentucky and Swainson's.

Biologists also collect data on an additional 10 species, including wood thrush, swallow-tailed kite and prothonotary warbler. They will begin conducting surveys in mid-to-late May. All routes in 2014 will be situated in the Neuse River Basin.

Volunteers are welcome to help and no birding experience is necessary; however, familiarity with canoeing is required. For more information, contact John Carpenter, Wildlife Diversity Coastal Landbird Biologist at 910-742-7231 or john.carpenter@ncwildlife.org.



Riparian habitat along the Cape Fear River provides ideal habitat for songbirds, such as the cerulean warbler. (Photos by John Carpenter)



Help a Small Raptor in a Big Way

Purchase our limited American Kestrel T-shirt and show your support of wildlife diversity in North Carolina. This 100% cotton T-shirt features North Carolina's smallest raptor flying across the Wildlife Commission's official logo on the front and a colorful assortment of wildlife and fish buttons on the back.

All proceeds from the Wildlife Commission's sales of these American Kestrel shirts benefit the Commission's Wildlife Diversity Program.

Fabrication of the shirts was paid entirely by Neuse Sport Shop in Kinston, which also agreed to donate the proceeds from the shirt sales to the Commission's Wildlife Diversity Program. Give a hand to wildlife and purchase a t-shirt today.

Visit [N.C. Wild Store, www.ncwildstore.com](http://www.ncwildstore.com).



Necropsies Conducted on Three Leatherback Sea Turtles

Since the beginning of 2014, three stranded leatherbacks have been reported in North Carolina. Although only a handful of leatherbacks occur in North Carolina each year, there is widespread interest in studying this species. A full and thorough necropsy was performed on each turtle, which required planning and cooperation with many different agencies and partners, including Cape Hatteras National Seashore, Fort Macon State Park, Atlantic Beach police, Hatteras Island Wildlife Rehabilitators, the N.C. Aquarium at Roanoke Island, the Net-

work for Endangered Sea Turtles, the NCSU Center for Marine Sciences and Technology, and the NCSU College of Veterinary Medicine.

After performing necropsies on the three leatherbacks, biologists discovered a common factor in their stranding: plastic debris in the gastrointestinal tract of each turtle. Plastic is persistent in the environment and poses a threat to many marine species, which may become entangled in or ingest plastic debris. Leatherbacks are a pelagic species that feeds mainly on jellyfish, but leatherbacks may often

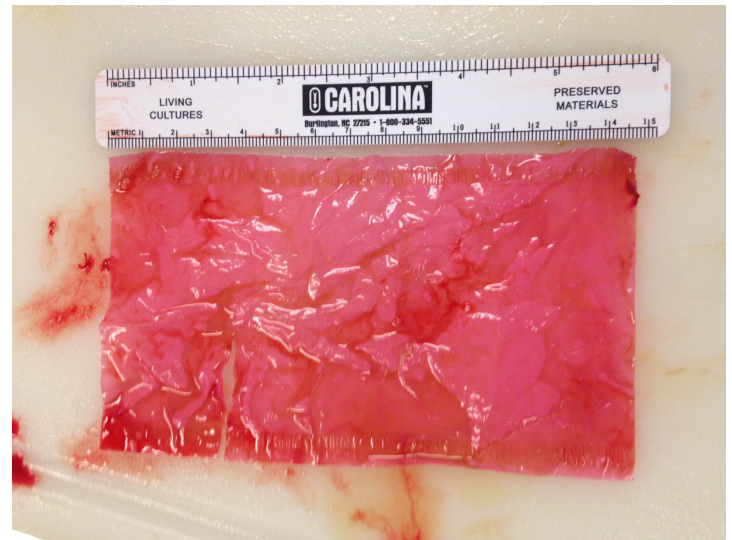
confuse floating plastic debris for their normal prey. Ingestion of plastic can cause blockages in the digestive tract and/or prevent absorption of nutrients, leading to starvation and eventual death. Plastic ingestion by leatherbacks has been increasing since plastics began to be widely used in the late 1950s.

A recent study found that since the first reported incidence of plastic ingested by a leatherback (1968), more than one-third of stranded leatherbacks worldwide have been found with plastic in their digestive tract.



As the largest species of turtle in the world, leatherbacks present a logistical challenge when they strand on our beaches. This leatherback, stranded on Atlantic Beach, weighed in at 682 pounds.

(Photo by Matt Godfrey)



An example of plastic debris found in the digestive tract of one of the three leatherbacks stranded in NC in 2014.

(Photo by Matt Godfrey)

Have you missed a Wildlife Diversity Program Quarterly Update?

No Problem! Access back issues [here](#).





Wildlife Commission Assists Moore County in Land Use Planning

Moore County recently adopted a land use plan that lays the groundwork for enhanced stewardship of priority wildlife habitat. The Moore County Land Use Plan Committee sought information from N.C. Wildlife Resources Commission and the Sandhills Conservation Partnership on the unique natural resources and wildlife habitats of the Sandhills.

The Wildlife Commission participated in many of the Land Use Plan Steering Committee meetings over 1½ years, gave a formal presentation to the group, and contributed edits to the draft document.

The final Land Use Plan discusses the value of Moore County for wildlife and the importance of conserving wildlife resources. One of the guiding principles of the plan is that the county’s economy, culture and natural resources are considered equally. The

plan identifies several goals and objects that call for the protection of natural resources and directs the county to consult the Green Growth Toolbox to inform decisions. The plan includes a “future land use map” where future growth is encouraged within or near existing municipal boundaries, and several high priority regions are prioritized for working lands, open space, or low density development. If implemented through zoning and other policy, this will create a pattern of growth that minimizes sprawl and conserves important rural landscapes and watersheds

The Land Use Plan identified several implementation actions, and at the next Moore County Planning Board meeting the board directed the Planning Department to undertake an Open Space Conservation Plan in tandem with a Parks and Recreation Plan and a Growth Management Plan.



Buy a plate

*Your purchase helps conserve wildlife in North Carolina.
Find out more by visiting www.ncwildlife.org/conserving*

Wildlife Diversity Program Staff Begin Mole Salamander Surveys

Over the past quarter, Wildlife Diversity Program staff began mole salamander surveys in the Uwharries region.

Mole salamanders are classified as a state species of special concern. It has a disjunct distribution in the Piedmont and foothills. There is very little known about its habitat preferences or breeding behavior. Like other ambystomids, it breeds in isolated pools during the winter.

The objectives of this survey are to locate new breeding ponds, characterize these habitats, and learn more

about mole salamander use of upland habitat.

Dipnet surveys have taken place in Davidson, Stanly,



Montgomery and Richmond counties. Coverboard transects are in place at two known breeding pools in the Uwharrie National Forest. These transects go for a ½ mile into the upland. At least one new breeding pool has been identified through this effort. In the coverboard transect, staff found paedomorphic salamanders. The study will be expanded for next winter's breeding season.

Declines from White-nose Syndrome Continue in North Carolina's Hibernating Bats

White-nose Syndrome, the disease that is devastating bat populations across the Eastern United States and Canada, has continued to spread to new sites in 2014. The disease has been confirmed as far north as Maine and Quebec, as far west as Missouri, and as far south as northern Georgia and South Carolina. WNS was first discovered in North Carolina in the western part of the state in February 2011. That first winter, the disease was confirmed in four counties: Avery, McDowell, Transylvania and Yancey. In 2012 and 2013, WNS was found in Haywood, Rutherford, Buncombe and Swain counties. This past winter, two additional counties were added — Jackson and Cherokee — bringing the total number of North Carolina counties confirmed or

suspect for WNS up to 10.

In 2014, several bats found dead in a cave in Jackson County during regular population monitoring tested positive for WNS. A few weeks later, bats in a Cherokee County cave exhibited telltale signs of WNS — fungus growing on the bats' muzzle and forearms. Those bats were swabbed and the fungus that causes WNS, *Pseudogymnoascus destructans*, was confirmed on the bats. Some WNS-infected locations show up to a 99% decline in the total number of hibernating bats compared to the average number two to three years ago, prior to WNS. For example, the total number of hibernating bats at an Avery County mine went from 1,000 bats prior to WNS to 17 bats in the three years since the disease

was discovered. At a mine in Haywood County, the number of hibernating bats dropped from nearly 4,000 bats to about 55 bats in only two years. The species with the steepest declines in North Carolina are the little brown bat, tri-colored bat, and northern long-eared bat, showing declines ranging from 92 —100% in hibernacula that have been infected with WNS for two or three years.

In addition to year-round population monitoring and surveillance for white-nose syndrome, the Wildlife Resources is involved in WNS-related research, including examining how WNS affects North Carolina bats, learning how the disease is spreading, understanding species differences in survival, and determining what can be done to help bats.

Partnerships Advance Western North Carolina Amphibian Conservation

Mountain region conservation projects rely heavily on partnerships with other agencies, universities, NGOs, and private landowners. For example, a collaborative project with Appalachian State University, in Boone, completed over the winter analyzed 250 amphibian skin swabs staff collected from more than 30 salamander and six frog species in the western region from 2008-2013. The goal was to document the presence of *Batrachochytrium dendrobatidis* (*Bd*), a type of chytrid fungus implicated in the global decline of amphibians. Another example is investigating phylogenetics and modeling the effects of climate change on Weller's salamander with Duke University in Durham.

Wildlife Diversity Program staff initiated other partner-driven projects to address research and management priorities outlined in the North Carolina Wildlife Action Plan (WAP). Staff worked with a professor at Western Carolina University in Cullowhee to have Landscape Ecology students complete a GIS-based, landscape analysis of all aquatic breeding habitats for the mountain chorus frog, a state listed and priority species. The landscape analysis will provide baseline information for a subsequent project in 2015, when staff will partner again with Western Carolina University to examine mountain chorus

frog movements and upland habitat use away from breeding sites, which are research objectives outlined in the WAP.

Another new partnership with regional implications that will address WAP objectives is a collaboration with the Georgia Department of Natural Resources (GADNR), Illinois State University (ISU), the North Carolina Zoological Park and the Orianne Society. This project builds upon the Wildlife Commission's existing work investigating the use of environmental DNA (eDNA) techniques to determine presence of state listed, priority aquatic salamanders — the Eastern hellbender and mudpuppy. The new initiative with GADNR and ISU will focus on further testing of eDNA specifically to determine the presence and potential estimates of relative abundance of the mudpuppy, an understudied species in the southern states.

Finally, research on the systematics and metapopulation dynamics of green salamanders and crevice salamanders is being developed with Warren Wilson College, in Swannanoa, to investigate population viability ([see 2013 4th Quarter Report](#)). Partnerships provide expanded capacity for conservation science and management. If applicable, results from these projects will be published collaboratively between the Wildlife Commission and partners.



Hellbender (Photo by Lori Williams)



Mountain Chorus Frog (Photo by Charles Lawson)



Green Salamander (Photo by Lori Williams)



Mudpuppy (Photo by Dorothy Brown)



Weller's salamander (Photo by Lori Williams)

Enhancing Habitat For Carolina Northern Flying Squirrels

Winter is the season of nest box surveys for Carolina northern flying squirrels (CNFS). Wildlife Diversity Program biologists surveyed CNFS in the Great Balsams, Black Mountains, and Unicoi Mountains. In addition, they fitted three flyers with transmitters at a high-capture site in Haywood County. The animals were tracked by Virginia Tech PhD student Cordie Diggins.

Wildlife Commission biologists and Haywood Community College students also assisted with locating diurnal dens and tracking nightly movements.

In partnership with the Wildlife Commission, Diggins is investigating the habitat use and home range of these elusive creatures and developing

protocols for monitoring the species with acoustic detectors. These efforts promise to shed light on the limiting factors of CNFS populations, provide a robust monitoring program, and, it is hoped, lead to recovery of an endangered species. Efforts continue to inventory potential habitat for CNFS using acoustic detectors, a much more efficient inventory tool than nest boxes.

In September 2013, staff and partners implemented the first habitat enhancement efforts for CNFS by planting of 1,135 red spruce seedlings in the Unicoi Mountains. An important food source for CNFS are fungi that are associated with boreal conifers such as Eastern hemlock, red spruce, and Fraser fir. With the demise of most

of the hemlock, red spruce is the only boreal conifer in the Unicois and its establishment was and continues to be a priority for enhancing CNFS habitat. In early 2014, Wildlife Commission biologists and Haywood Community College student, Shelly Read, established permanent Carolina Vegetation Survey plots to monitor growth and survival of the red spruce seedlings planted in Graham County.

Chris Kelly continues to work for CNFS habitat enhancement and restoration through the Southern Appalachian Spruce Restoration Initiative (SASRI) and delivered a presentation on red spruce restoration at the annual meeting of the North Carolina Chapter of The Wildlife Society in February.



Chris Kelly prepares to fit a Carolina northern flying squirrel with a radio transmitter. (Photo by Caleb Hickman)



Shelly Read, a student in Haywood Community College's Fish and Wildlife Management Technology program measures a red spruce seedling that she and her classmates planted last fall.

(Photo by Chris Kelly)



Stay Informed on wildlife activities in North Carolina

Subscribe to **NC Wildlife Update** — news including season dates, bag limits, legislative updates and more — delivered to your inbox from the N.C. Wildlife Resources Commission. Sign up at www.ncwildlife.org/wildlifeemailupdate.

“Like” the Wildlife Resources Commission on **Facebook** and follow us on **Twitter** to see the latest news releases, view photos, get updates on fishing and boating, learn of new regulations or just find out about wildlife and the outdoors in North Carolina.



Wildlife Diversity Program
N.C. Wildlife Resources Commission
1751 Varsity Drive
Raleigh, N.C. 27606
919-707-0050