



*North Carolina
Wildlife Resources Commission*



Wildlife Diversity Program Quarterly Update

First Quarter 2017



Piping Plover (Photo by Mike Creedon)



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Box Turtle Connection Update

During the first quarter of 2017, Wildlife Commission biologists co-organized and conducted the Box Turtle Connection workshop and meeting at Haw River State Park. The Box Turtle Connection project has been ongoing since 2007 and involves citizen scientists collecting data on box turtles throughout North Carolina.

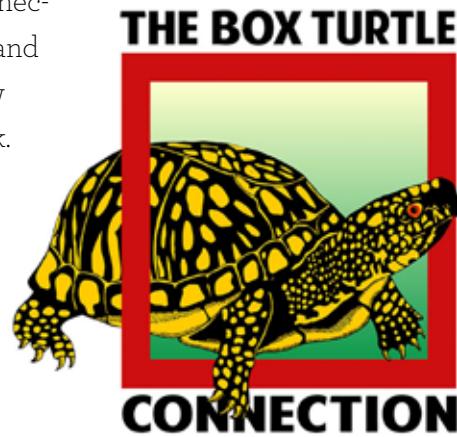
To date, over 35 study sites are continuously monitored, with turtles being individually marked

and measured and data collected on various habitat variables. Over 3,000 individual turtles have been

captured and processed. This is the largest and only state-wide box turtle monitoring project in the United States.

This collaboration between the Wildlife Commission, UNC-Greensboro, and the North Carolina Zoo should provide a framework for using citizen

scientists' effort and data to monitor a relatively common species, with the overall goal of "keeping common species common."



Hatchling eastern box turtle crossing a sand road



Waterbird Winter Update

During winter to early spring 2017, the Waterbirds Investigations and Management Project staff assessed the distribution of shorebirds and colonial waterbirds along North Carolina's coast. These birds use portions of barrier islands, dredge-material islands, natural estuarine islands and sandy shoals for foraging, resting and nesting.

The Waterbirds staff examine bird and habitat survey data to decide where to place signs alerting the public about the importance of

the sites. The Waterbird staff coordinate with federal and state agencies, non-governmental organizations and municipalities to protect habitat.

Hurricane Matthew landed in North Carolina in October 2016, and its winds and rain affected coastal islands, inlets and shoals. Now a few islands are gone so those that remain are increasingly important.

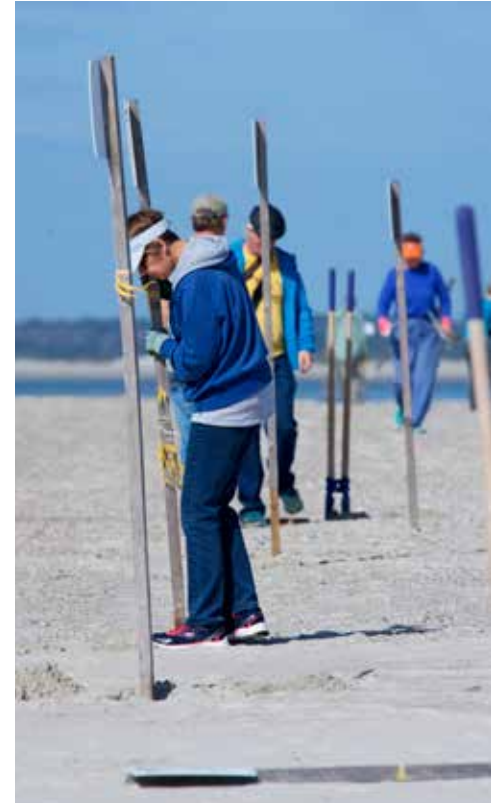
Staff posted 23 sites to inform the public about nesting birds and to protect them from human activities during the breeding season (April

through August). Staff had many volunteers to assist, as well as partners from federal agencies, state parks, National Estuarine Research Reserves, Audubon NC and the Bald Head Island Foundation, who posted important sites within their boundaries.

Preparing for the breeding season by posting areas alerts the public to nesting birds and gives migrating birds peaceful places to rest and feed during their long treks. Staff hope many of the birds will stay and nest in North Carolina.



Piping plover (Photo by Mike Creedon)



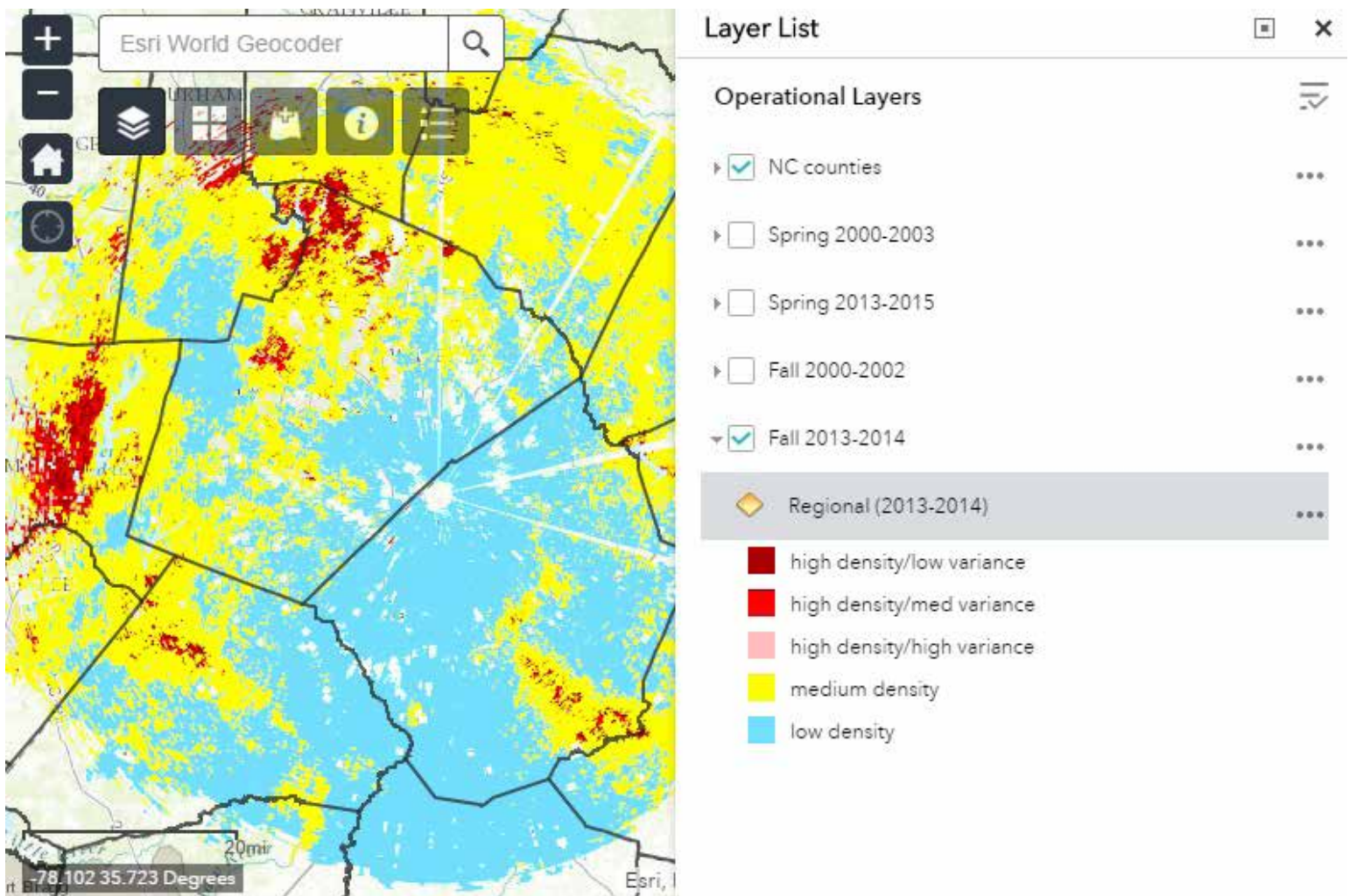
Volunteers posted waterbird nesting signs in Emerald Isle. (Photo by Mike Creedon)

New Maps Displaying Bird Densities Are Now Online

The 2nd Quarterly Update of 2016 highlighted a newly completed project that will help Wildlife Commission biologists better understand migratory bird stopover behavior in North Carolina. To make this information more accessible to the public, the Wildlife Commission has released interactive web maps that allow people to visualize the results for many purposes, including research and conservation planning.

These maps represent two different but very related analyses. The first displays bird densities as measured by five weather surveillance radars (NEXRAD), which are

capable of detecting birds flying within and up to 100 km during evenings with no precipitation. However, these radars do not cover all of North Carolina. Therefore, the second map was developed from statistical models that use data from the NEXRAD radars as well other variables, such as land use/land cover information, to predict stopover use by migrants in the non-sampled areas. Visitors to the webpage will be able to add their own data to each map viewer, view different years simultaneously, and request raw data from the Wildlife Commission. To see these maps and learn more, visit www.ncwildlife.org/migbirdhab.



Web map displaying migratory bird density near Raleigh, N.C., calculated using a NEXRAD weather surveillance radar.



Sea Turtle Recovery Update

Sea turtles that are rehabilitated receive passive integrated transponder (PIT) tags prior to release. When a tagged animal is encountered again, the tag number can be looked up in a database and biologists can learn some information about growth and large scale movements between release and recapture. While recapture rates are low, they provide valuable information about individual life histories as well as general success of sea turtles released after rehabilitation. Recently, Wildlife Commission biologists learned of several recaptured sea turtles that were released after recovering from cold-stunning (Table 1). These turtles were released in various locations, depending on the time of year, water temperatures, and availability of vessels to take them offshore. The fact that these turtles made it back to locations near where they were originally encountered validates their release methods and provides evidence of successful initial rehabilitation.



A Kemp's Ridley is released near the Gulf Stream by the US Coast Guard (Photo: USCG)

Species	Original Stranding	Rehabilitated	Release	Recapture	Outcome
Kemp's Ridley	Cold stun, November 2015 in Massachusetts	National Marine Life Center	January 2016 beach Cape Canaveral, Fl.	Cold stun, November 2016 in Massachusetts	Brought to Karen Beasley Center for Rehabilitation; released March 2017
Kemp's Ridley	Cold stun, November 2015 in Massachusetts	Karen Beasley Center	February 2016 by boat near Gulf Stream	Cold stun, November 2016 in Massachusetts	Rehabilitating at National Marine Life Center
Green	Cold stun, January 2016 Cape Hatteras, N.C.	STAR Center, NC Aquarium Roanoke Island	January 2016 from beach in Flagler County, Fl	Boat strike, August 2016 Ocracoke, N.C.	Died of boat strike injuries
Green	Cold stun, January 2015 Cape Hatteras, N.C.	STAR Center, NC Aquarium Roanoke Island	August 2015 from beach in Nags Head, N.C.	Cold stun, January 2016 Cape Lookout, North Carolina	Died from cold stunning
Green	Cold stun, January 2016 Cape Hatteras, N.C.	STAR Center, NC Aquarium Roanoke Island	January 2016 by USCG near Gulf Stream	Cold stun, March 2017 Cape Hatteras, N.C.	Rehabilitating at STAR Center, NC Aquarium Roanoke Island

Table 1: Recent recaptured cold stuns associated with North Carolina sea turtle rehabilitation centers

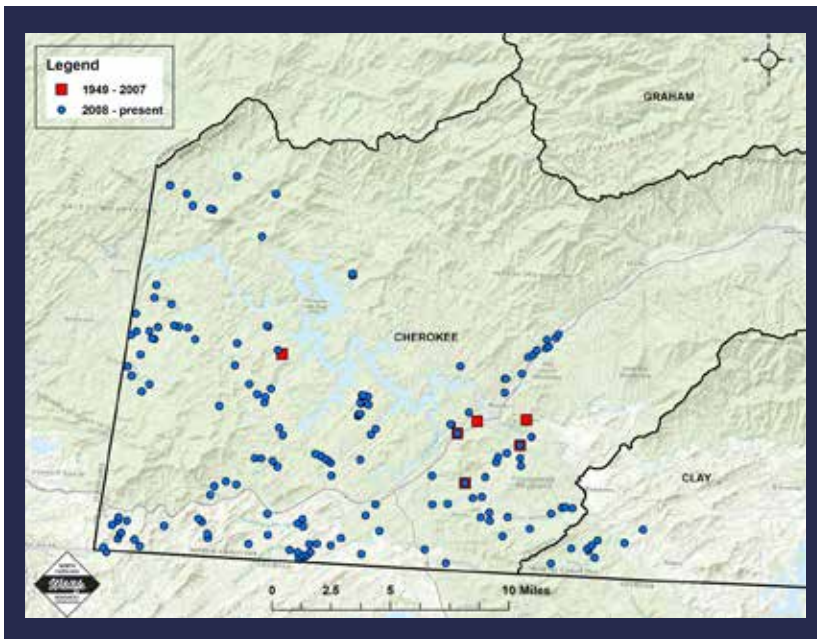
Mountain Chorus Frog Winter Surveys Update



(Photo by Lori Williams)

In the first quarter of 2017, Wildlife Diversity staff continued annual inventory and monitoring surveys for the state special concern Mountain Chorus Frog. Surveys consisted of road cruising at night during wet or foggy conditions and stopping to listen for calling male frogs in breeding habitats. The species is found in North Carolina only in the far southwestern counties (Cherokee and

Clay), which is an area that has experienced severe to exceptional drought for the past year. It is unclear whether or not these drought conditions have significantly affected populations. Staff documented nine new sites this season by driving in parts of Cherokee County not surveyed in previous years, continuing to fill in distribution gaps for the species. Since the project began in 2008, staff and partners have documented over 160 new locations for the frog, including a new county record (Clay) in 2011, and updated records at, or near, all historical sites except for two.



Mountain chorus frog documented occurrences in far southwestern North Carolina; red squares indicate historical records from 1949 to 2007, and blue dots indicate records found since 2008 when the Wildlife Commission began annual inventory and monitoring surveys for the species. (Map by Lori Williams)



The mountain chorus frog is a state special concern species found in the far southwestern part of the state. (Photo by Lori Williams)



Typical wetland breeding habitat for mountain chorus frog (Photo by Lori Williams)

Carolina Northern Flying Squirrel Update

During February, Wildlife Diversity Program staff conducted annual box monitoring for the Carolina northern flying squirrel. Staff encountered 50 northern flying squirrels across three mountain ranges.

Staff also attended the Appalachian Northern Flying Squirrels Working Group, which met in Asheville on Feb. 15. The goals of this working group are to identify research and management priorities for Carolina and Virginia northern flying squirrels in the Appalachians, facilitate collaborative research, monitoring, and management efforts, and improve outreach and communication about both subspecies and associated habitats.



Carolina northern flying squirrel peeking out of a squirrel box (Photo by Chris Kelly)

Peregrine Falcon Update

Peregrine falcon nesting season is underway. In mid-March, Wildlife Diversity Program staff taught volunteers how to recognize telltale nesting behaviors such as an incubation exchange or courtship display.

Volunteers accompanied staff to Looking Glass Rock, Chimney Rock and Buzzard's Roost. Alan Lenk, known among Asheville birders for his vivid bird photography, captured some of the action in pictures.



A yearling male peregrine falcon at Chimney Rock State Park picks up speed as he flies past the eyrie. (Photo by Alan Lenk)

Green River and Sandy Mush Game Land Birding Lists Now Available Online



Just in time for spring, Wildlife Diversity Program staff completed a brand new four-season bird checklist for Green River Game Land and the second edition of the Sandy Mush Game Land checklist. Birders can now download the checklists and maps as PDFs from ncwildlife.org. The [Green River Game Land](#)

[checklist](#) and [Sandy Mush Game Land checklist](#) include eight and 11 Species of Greatest Conservation Need, respectively, that are known or thought to breed on the game land. Numerous other SGCN stopover during migration or overwinter on these game lands. Wildlife Diversity staff engaged the help of local birders to develop the checklists. This year, staff is working on a checklist for Pond Mountain Game Land.

Game Land Reptile Surveys Update

Over the past year, the Wildlife Commission has rejuvenated a project from approximately 10 years ago to inventory the reptile species present on several game lands and other state-owned properties in western North Carolina. These inventories are an important component of conservation. Knowing what species are present in an area is part of the foundation of further, more elaborate, conservation efforts and research. Likewise, consistent inventorying and monitoring can tell researchers and wildlife managers if a population is stable or declining.

One of the most common methods to survey for reptiles is using coverboards. These are usually pieces of wood or metal laid on the ground (top right photo). Reptiles will move under these coverboards for shelter and to thermoregulate. Reptiles are ectotherms, meaning that they maintain their body temperature through their environment. Coverboards, especially if they are pieces of metal, frequently will be warmer than the surrounding environment when the sun shines on them, so reptiles will move under them to raise their body temperature. To survey for reptiles, biologists can then carefully lift a coverboard to discover what lies beneath it. While coverboards might appear to simply be trash and debris scattered on the

ground, they are actually placed with some care. For example, researchers consider how much sunlight a location receives, what direction it faces, and the surrounding habitat when deciding where to place coverboards.

Since 2016, the Wildlife Commission staff has distributed coverboards on several state owned properties. Staff placed coverboards at John's River Game Land, South Mountains Game Land, Sandy Mush Game Land, Nantahala Game Land, Table Rock Fish Hatchery, Talula bog, and Chimney Rock State Park, which were all part of an earlier inventorying effort. Staff also placed coverboards at two new sites—Needmore Game Land and Thurmond Chatham Game Land. They placed 40 tin coverboard at each site. While it can take several months or longer for reptiles to become aware of and utilize coverboards, staff already had some success last year including

a black racer and a wormsnake at South Mountains Game Land. Biologists hope survey efforts this spring will be even more successful.



Tin coverboard from Sandy Mush Game Land



Wormsnake found underneath a coverboard at South Mountains Game Land.



Wildlife Commission biologist, Gabrielle Graeter, holds a black racer found underneath a coverboard at South Mountains Game Land.

Bat Hibernacula Surveys Update

Biologists surveyed hibernating bats in caves and mines in 16 counties across the state to monitor bat populations and continue surveillance for the fungal disease, White-nose Syndrome (WNS). Since the onset of WNS in western North Carolina in 2011, bat counts in the Mountains have steeply declined, often by more than 90 percent.

Hibernacula in the Piedmont and Coastal Plain are not as numerous or as large as their Mountain counterparts, but offer important winter habitat to hibernating tri-colored bats. This bat has seen major population declines from WNS, but its statewide distribution may offer

hope for the species.

WNS thrives only in cold environments like those of a cave or mine and can only grow on bats that are hibernating. The Coastal Plain climate can support insect populations through the winter so bats do not need to sustain such a long hibernation period like in other parts of the state, thus preventing the fungal growth associated with WNS. For this reason, biologists have increased survey efforts statewide to understand better the abundance and distribution of hibernating bats in the state and to document the spread of WNS. This winter, they surveyed over 20 sites, several of

which haven't been surveyed in 30 years. They also conducted fungal swabbing on bats at all Piedmont and Coastal Plain sites.

The season's highlight was the documentation of eight hibernating tri-colored bats in an Onslow County cave. Caves are relatively unknown in this part of the state so this site serves as critical habitat to hibernating bats. Visible signs of WNS were found at a cave in Stokes County, which is the farthest East record of WNS in North Carolina. Fungal swabs will determine whether the fungus associated with WNS is present at any other site surveyed in the Piedmont or Coastal Plain.



Wildlife Commission Eastern Wildlife Diversity Supervisor David Allen and volunteer, Dottie Brown, collect fungal swabs from a cave in Jones County.



Hibernating tri-colored bat with visible signs of White-nose Syndrome in Stokes County, NC. (Photo by Katherine Caldwell)