



North Carolina Wildlife Resources Commission



Wildlife Diversity Program Quarterly Update

Second Quarter 2015



A male golden-winged warbler (Photo by Chris Kelly)



In this Issue:

- Page 2 - [Gopher Frog Headstarting Project Underway](#)
- Page 3 - [New Waterbird Steward Group Created](#)
[Land Bird Surveys](#)
- Page 4 - [Sea Turtle Stranding and Salvage Network Update](#)
[Tar River Spiny mussel Update](#)
- Page 5 - [Eno River Surveys](#)
[Dan River Fish Surveys](#)
- Pages 6, 7 - [NCPARC News](#)
- Page 8 - [Robust Redhorse Surveys](#)
- Page 9 - [Aquatic Species Propagation Update](#)
- Page 10 - [Western North Carolina Amphibian Update](#)
- Page 11 - [Bat Monitoring Continues](#)
- Pages 12, 13 - [Bird Project Updates](#)

Head-starting Gopher Frog Project Underway

During the second quarter of 2015, Wildlife Commission staff continued a project to augment populations of gopher frogs by captive-rearing and head-starting juveniles. Commission staff is releasing all frogs at the same ponds where eggs were collected.

Gopher frogs are highly imperiled in North Carolina, with only about seven known populations remaining in the state. Many of these populations appear to harbor very few adult individuals, and some populations appear to have been highly impacted by multiple years of low reproduction because of extended drought and other factors.

In an attempt to increase the number of adult gopher frogs remaining, staff is captive-rearing and releasing juveniles at three

locations: Sandhills Game Land, Holly Shelter Game Land and Military Ocean Terminal at Sunny Point. Frogs are being reared in 20 350-gallon tanks located on the Sandhills Game Land and at Fort Fisher Aquarium. Staff collected partial egg masses in March. Approximately 75-80 tadpoles are being reared in each tank until they develop into juveniles. Tadpoles began to metamorphose into juvenile frogs in late June. Following the return of tadpoles to their natal ponds, staff will monitor the ponds to determine the success of this project. For example, staff wants to know if this project is positively impacting the size of the adult population at each pond. Head-starting imperiled frog species should prove an effective way to augment populations or re-introduce some species to areas where they once occurred.



April - June 2015

N.C. Wildlife Resources Commission



Adult gopher frog (Photo by Jeff Hall)



Juvenile gopher frogs (Photo by N. Shepard)

New Volunteer Waterbird Steward Group Helps Protect Least Tern and Piping Plover Nests

A new Volunteer Waterbird Steward group has formed to help protect nesting waterbird habitat, to monitor the nesting birds and to inform curious beachgoers about the birds at the end of Emerald Isle at Bogue Inlet. Wildlife Diversity Program staff conducted a workshop for the stewards, beginning with a presentation and overview of birds that would likely use the nesting habitat. They took the stewards to the area and delineated the potential nesting habitat and erected posts and nailed general information signs to them. They also tied string between the posts and flagged the string so beachgoers could easily see the marked-off area.

Stewards began monitoring the area in late April, visiting more than once a week. By mid-May, least terns were using the areas and volunteers spotted a piping plover foraging. In mid-June, many of the least terns had chicks. Volunteers posted a new area because a large number of

least terns was enjoying area, which provided protection from pedestrian and dogs. In late June, they discovered a piping plover nest among the terns — a great accomplishment for the stewards and their protection of the excellent nesting habitat.

The piping plover pair will be monitored through July to see if the nest survives to hatching. The outreach provided to the volunteers has paid off with great returns.



New volunteer stewards for Emerald Isle

Landbird Surveys Reveal Rare Find

On April 17, biologists with the Commission's Wildlife Diversity Program and the U.S. Marine Corps captured, banded, measured and released two Neotropical warblers of an extremely rare subspecies — the Wayne's black-throated green warbler. They captured the birds in the Greater Sandy Run area of Camp Lejeune in Onslow County.

The nominate race of this species typically breeds in the conifer forests of the Appalachian mountains into Canada; however, the Wayne's is unique in that it occupies a restricted range in the lower Coastal Plain from southeastern Virginia to central South Carolina.

Biologists will return during the next breeding season to continue the banding effort and, it is hoped, confirm if these two individuals survived their migratory journeys between North Carolina and Latin America.



One of two Wayne's black-throated green warblers captured, banded and release by biologists while conducting landbird surveys in April (Photo by John Carpenter)

N.C. Sea Turtle Stranding and Salvage Network Update

The N.C. Sea Turtle Stranding and Salvage Network, coordinated by Wildlife Commission biologists, is tasked with responding to sea turtle strandings throughout coastal waters of North Carolina. When live turtles strand, usually due to injury or illness, they are taken to one of the Commission's rehabilitation partners to receive medical care until they are healthy enough for release.

North Carolina has two dedicated sea turtle rehabilitation facilities. The Karen Beasley Sea Turtle Rescue and Rehabilitation Center on Topsail Island has been operational since 1996. The Sea Turtle Assistance and Rehabilitation (STAR) Center at the N.C. Aquarium on Roanoke Island officially opened in 2014, but rehabilitation efforts at the Roanoke Island Aquarium have been in place since the late 1990s.

The N.C. Aquariums at Pine Knoll Shores and at Fort Fisher also are involved with sea turtle rehabilitation when additional space is needed. These rehabilitation facilities together have successfully rehabilitated and released more than 850 sea turtles that have stranded in North Carolina since 1996. They continue to be integral in educating the public about sea turtles through tours and public releases.

Recently, 12 sea turtles that were rehabilitated at the Karen Beasley Sea Turtle Rescue and Rehabilitation Center returned to sea at a public beach release in Surf City.



A loggerhead sea turtle found stranded (top) in Wilmington in 2013, was rehabilitated by the Karen Beasley Sea Turtle Rescue and Rehabilitation Center and recently released (bottom) in Surf City. (Bottom photo by The Karen Beasley Sea Turtle Rescue and Rehabilitation Center)

Tar River Spiny mussel Augmentation in the Tar River Basin

In June, Wildlife Diversity staff released more than 700 Tar River Spiny mussels into Little Fishing Creek in Halifax County. The mussels were propagated by the Wildlife Commission's Conservation Aquaculture Center and the N.C. State University Aquatic Epidemiology and Conservation Laboratory. This effort represents the second augmentation effort in Little Fishing Creek and staff plans additional releases for the next few years. Staff will be monitoring the survival of the stocked mussels annually, with the first assessment being conducted in August 2015.



Tar River spiny mussel



Eno River Fish and Crayfish Community Surveys

In May and June, fisheries biologists with the Wildlife Commission completed the third year of pre-hydrilla treatment surveys for fish and crayfish in the Eno River. The aquatic community surveys will be used to examine the response of the community to chemical treatment of hydrilla, an aquatic invasive weed.

Biologists conducted surveys at five sites along the Eno River. This year's effort resulted in the collection of over 12,500 fish (34 species) and over 800 crayfish (four species).

Chemical treatment began this summer, which marks the transition from pretreatment to posttreatment surveys and a milestone for the Eno River Hydrilla Management task force to assess and treat hydrilla in the Eno River.



Wildlife Commission biologists Kelsey Lincoln, Jessica Baumann, Corey Oakley, Mark Fowlkes, and technicians use a barge electrofishing unit to collect fish from the Eno River. (Photo by NCWRC)

Dan River Conservation-Priority Fishes Surveys

The Dan River has one of the most unique fish assemblages in North Carolina. Biologists have recorded 68 species in the North Carolina portion of the Dan River and its major tributaries. Of those, seven are federally and/or state-listed species. Surveys to assess the status of conservation-priority fishes in the newly formed Foothills Region are ongoing in the Dan River sub-basin. To date, biologists have surveyed 20 sites.

This project follows up on a study initiated by Wildlife

Diversity Program staff in 2008. So far, staff has observed orangefin madtom, a North Carolina-listed endangered species, at five of the 20 sites with two new locations. Staff also has observed bigeye jumprock, a North Carolina-listed threatened species, at five of the 20 sites with three new locations. Staff with the Inland Fisheries and Engineering Services and Land Management divisions, along with cooperators from Pilot Mountain State Park and Hanging Rock State Park, has assisted with field surveys.



Bigeye jumprock



Orangefin madtom



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

Workshops, training and meetings

The N.C. Partners in Amphibian and Reptile Conservation held a joint meeting with the N.C. Herpetological Society at the Second North Carolina Congress of Herpetology in May. More than 100 participants attended the three-day meeting.

Wildlife Commission staff, along with the N.C. Aquarium at Fort Fisher, planned and executed a clean-up event on Holly Shelter Game Land in Pender County and Stone's Creek Game Land in Onslow County. While there, participants also learned more about the Commission's head-start-

ing efforts for the gopher frog.

The NCPARC coordinator presented Calling Amphibian Survey Program workshops at Harris Lake County Park in Wake County and Cool Springs Environmental Education Center in New Bern. The coordinator also conducted workshops on reptiles and amphibians at Carolina Beach State Park in New Hanover County, Raven Rock State Park in Harnett County and Cool Springs Environmental Education Center.

He gave presentations on reptile and amphibian projects being conducted by Wildlife Commission staff at the North Chapter of The Wildlife Society at Lake Logan in Canton, and at the Chatham County Conservation Partnership meeting in Siler City.

Staff participated in herpetology summer programs through Camp Chestnut Ridge in Efland and at Elon University, in Elon.



Wildlife Diversity Program and N.C. Aquarium staff clean up portions of the Stones Creek Game Land in Onslow County. (Photo by Jeff Hall)



Participants on a field trip conducted by the NCPARC biologist during the Second North Carolina Congress of Herpetology in May (Photo by Jeff Hall)



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

Surveys and research

The NCPARC coordinator, along with Wildlife Diversity Program staff, conducted two weeks of bog turtle surveys in western North Carolina in May and June. They covered many sites during these days with many partners assisting in the effort.

Staff surveyed a privately owned tract of land in Granville County for priority species and for consideration into the Wildlife Conservation Land Program. They saw one adult timber rattlesnake adjacent to the property

and discussed site-specific management activities that could benefit reptiles and amphibians.

Staff continued head-starting efforts for three populations of the gopher frog with staff at the Fort Fisher Aquarium in New Hanover County. This effort is intended to augment wild populations, which are dwindling at all locations.

Staff also continued upland snake surveys by walking recently burned forestland, as well as monitoring cov-



erboard transects at several coastal plain sites, including Croatan National Forest in Carteret County, Holly Shelter Game Land in Pender County, Camp Lejeune in Jacksonville, and Sutton Lake in New Hanover County. Staff detected several priority species including eastern kingsnake and mole kingsnake.



Collecting data on a bog turtle (Photo by Jeff Hall)



Bog turtle found during survey (Photo by Jeff Hall)



Mole kingsnake found during upland snake surveys in the Coastal Plain (Photo by Jeff Hall)

Biologists Continue Robust Redhorse Surveys and Propagation

Wildlife Diversity Program biologists continued a collaborative sampling effort for robust redhorse on the Pee Dee River this spring. Biologists captured 18 robust redhorse downstream of Blewett Falls Dam — a total that includes two that were recaptured during the sampling season.

Five robust redhorse were previously untagged and 11 were among year recaptures, which means the among-year-recapture rate was very high at 68.8 percent. Seven fish were male and nine fish were female. Multiple age classes were present and total length of fish ranged from 21.7 inches to almost 30 inches.

Biologists continued the long-term augmentation program for this very small population. They spawned three females this year. Roughly 70,000 eggs were split and sent to Wildlife Commission and S.C. Department of Natural Resources hatcheries for rearing. Both facilities had excellent hatching rates, and the fish were stocked into hatchery ponds for grow-out. The plan is to stock most of the fish downstream of Blewett Falls Dam this fall. Biologists will hold some of the fish for further grow-out and stocking in 2016.

Despite the extensive sampling in the Tillery reach this spring, and all of the previous sampling, biologists did not collect any robust redhorse

in this section of the Pee Dee River. This reach is being considered for reintroduction, and one option to move forward may include a Candidate Conservation Agreement with Assurances. A CCAA is a formal agreement between the U.S. Fish and Wildlife Service and one or more parties to address the conservation needs of proposed or candidate species, or species likely to become candidates, before they become listed as endangered or threatened.



Ryan Heise, a Wildlife Commission aquatic biologist takes length and weight measurements of a robust redhorse (above) before releasing it back into the Pee Dee River (below). (Photos by Melissa McGaw/NCWRC)



One of 18 robust redhorse biologists captured, measured and tagged this spring (Photo by Melissa McGaw/NCWRC)



Aquatic Species Propagation Updates

The aquatic nongame species program propagated five freshwater mussel species and produced more than 82,824 juvenile mussels from January to June 2015. During the first two quarters, the Conservation Aquaculture Center (CAC) housed 14 mussel species. Staff implemented studies to improve culturing techniques and mussel growth and survival. The CAC collaborated with researchers at N.C. State University’s College of Veterinary Medicine to test the biological fitness of propagated mussels prior to release. The

facility provided larvae from CAC broodstock to the U.S. Fish and Wildlife Service Orangeburg Hatchery in South Carolina for research and propagation.

The Marion hatchery continues to hold seven hellbenders with the ultimate goal of breeding them in captivity to meet the increasing demand as educational and display animals for qualified state agencies, universities and other facilities.

Watha State Fish Hatchery

The Watha State Fish Hatchery, located in Pender County, continues

to hold and maintain an ark population of the Magnificent Ramshorn. An ark population is one that is being held in case the population gets extirpated. In the case of the Magnificent Ramshorn, this small, freshwater, air-breathing snail is on the brink of extinction.



Magnificent ramshorn

Preliminary Nongame Mussel and Fish Production from January through June 2015.

SPECIES	PURPOSE	2015 PRELIMINARY PRODUCTION	COMMENTS
Appalachian Elktoe (<i>Alasmidonta raveneliana</i>)	Cooperative restoration plan for the Cheoah and Cane rivers	Cane: 13,307 Cheoah: 8,099	~600 mussels provided for site suitability studies in the Cane River
Slippershell (<i>Alasmidonta viridis</i>)	Augment populations in the Little Tennessee River	1,911	Continue to hold for long term grow-out and release
Wavy-Rayed Lampmussel (<i>Lampsilis fasciola</i>)	Cooperative restoration plan for the Cheoah and Pigeon rivers	Cheoah: 37,769	Continue to hold for long term grow-out and release
Rainbow Mussel (<i>Villosa iris</i>)	Cooperative restoration project for Western rivers	4,477	Continue to hold for long term grow-out and release
Tar River Spiny mussel (<i>Elliptio steinstansana</i>)	Augment populations in the Upper Tar River basin	25,431	~700 mussels provided to the Eastern Region Aquatic Wildlife Diversity staff for stocking in the upper Tar River basin
Carolina Heelsplitter (<i>Lasmigona decorata</i>)	Ark individuals from the Catawba River basin		Glochidia provided to USFWS Orangeburg Hatchery for propagation and research
Yellow Lance (<i>Elliptio lanceolata</i>)	Augment populations in the upper Tar River basin		~270 mussels provided to the Eastern Region Aquatic Wildlife Diversity staff for stocking in the upper Tar River basin

Western Region Amphibian Conservation Updates

In the second quarter of 2015, Wildlife Diversity staff and volunteers continued to inventory, monitor and research western region priority amphibians. Staff, volunteers and landowners explored rock outcrops on private property in the Hickory Nut Gorge, in Henderson and Buncombe counties. They targeted three Wildlife Action Plan-priority salamander species: Blue Ridge gray-cheeked salamander, crevice salamander and green salamander. Results included new sites documented for all including the first ever Buncombe County record for green salamander, a state-listed endangered species.

Staff conducted other monitoring surveys in the quarter that resulted in updated or new records in at least 10 counties for priority species such as green salamander, Eastern hellbender, Southern zigzag salamander, Weller's salamander, red-legged salamander, Southern pygmy salamander and Northern pygmy salamander.

In May, staff participated in the first ever "Herp Blitz" on the Qualla Boundary of the Eastern Band of Cherokee Indians (EBCI) with EBCI staff, state agency and university collaborators and volunteers. The group documented many new occurrences for priority salamanders on the Qualla, such as Northern pygmy, red-cheeked (=Jordan's) salamander and Santeetlah dusky salamander.

Finally, staff conducted a monitoring survey that produced exceptional results. During the rainy, nighttime search, staff found a rare salamander whose population has the most restricted range of all salamanders in the state: the Waterrock Knob population of imitator salamander. This salamander occupies moist rock faces in high-elevation, spruce/fir and Northern hardwood habitat.

The last survey Wildlife Diversity staff conducted for this species was over 10 years ago with observations of relatively few salamanders. In April 2015, however, staff surveyed the same habitats and found at least 79 imitator salamanders (juveniles and adults) as well as seven Santeetlah dusky salamanders on wet rock outcrops. These results indicate the rare, endemic population of imitator salamanders at Waterrock Knob remains stable to date.



Crevice salamander (Photo by Lori Williams)



This green salamander with a regenerating tail represented a new county distribution record for the species in Buncombe County. (Photo by Alan Cameron)



Imitator salamander from the rare Waterrock Knob population, Jackson County. (Photo by Lori Williams)



Annual Summer Bat Monitoring Continues in Western North Carolina

Wildlife Commission biologists began summer bat-monitoring surveys in May and will continue through the summer. The results they gain from these surveys provide them with insight into the population trends and demographics of bats in western North Carolina. Since bat populations in this area continue to decline due to white-nose syndrome (WNS), monitoring the health of bat populations is crucial to understanding the impacts of WNS.

Long-term surveys include monthly counts of bats roosting in bridges and bat boxes, nighttime capture surveys and the N.C. Bat Acoustic Monitor-

ing Program (NCBAMP). Entering its fifth year, NCBAMP relies on citizen scientists to collect bat echolocation calls by driving routes with a bat detector mounted on their vehicles. Wildlife Commission biologists then classify these echolocation calls to species. This information, along with other surveys, will be used to note changes in species distribution and relative abundance across western North Carolina.

Using multiple methods to monitor multiple species, like bats, can reduce the uncertainty and bias associated with any one method and can provide robust estimates of population trends

for each species. For example, some bat species are difficult to detect or identify with bat detectors while others are difficult to capture in mist-nets.

Results from the surveys indicate that the steepest declines in bat populations in western North Carolina were in the little brown bat, the northern long-eared bat and the tri-colored bat. All of these species saw more than 90 percent declines in populations in the two years after WNS was discovered in the state.

In April 2015, the U.S. Fish and Wildlife Service listed the northern long-eared bat as Threatened over its entire range.



Three eastern small-footed bats roost in the expansion joints of a Swain County bridge.



Eastern red bat (above). Wildlife Diversity Technician, Kevin Parker, measures the forearm of a big brown bat during a Buncombe County bat survey (right).



Wildlife Diversity Technician, Emilie Travis, counts big brown bats roosting in a bat box on a Swain County bridge.



Western North Carolina Bird Projects Update

Each spring, Wildlife Diversity Program biologists conduct a variety of bird surveys ranging from all-species point counts that record every bird seen or heard to focal species surveys for rare or elusive species, such as the golden-winged warbler and peregrine falcon.

In June, biologists conducted baseline bird inventories on two Wildlife Commission-managed game land tracts on the Pisgah Game Land. By conducting an initial baseline inventory, biologists can produce a species list of wildlife found on that particular game land — information that is important when developing the Wildlife Commission's Game Land Management Plans.

Biologists documented 25 species and high concentrations of Canada warblers on the Little Table Rock Mountain tract in McDowell County. On the Roaring Creek tract in Avery County, they documented 21 species, including brown creeper, a species of special concern, and alder flycatcher, a species that is listed as Significantly Rare.

Following an initial bird inventory, semi-annual monitoring of a network of points provides insight into bird population trends, distribution and response to management. Biologists conducted point count surveys at Cold Mountain Game Land in Haywood County, Pond Mountain

Game Land in Ashe County and Green River Game Land in Polk County. The vesper sparrow is a species of Special Concern and the focus of long-term monitoring and habitat-management planning on Pond Mountain where the landscape is changing rapidly as former Christmas tree fields are being converted to higher quality wildlife habitat.

Following forestry projects at Green River that entailed conversion of some closed canopy forest to woodlands, shelterwoods and clearcuts, the bird community shifted to include species favoring partially open canopy, such as red-headed woodpeckers and prairie warblers.

Biologists also conducted focal species surveys for golden-winged warbler, cerulean warbler, nightjar, Northern saw whet owl, peregrine falcon, American kestrel, barn owl and bald eagle. Updates on two species, golden-winged warbler and saw-whet owl, are featured:

Golden-winged Warblers

More than a dozen partner organizations from four states participate in monitoring efforts for golden-winged warblers. Wildlife Commission golden-winged warbler surveys included both long-term monitoring of sites and surveys to fill in distribution gaps in Madison County. Biologists determined the monitoring

sites by using Cornell Lab of Ornithology's Balanced Sampling Design and of timber harvest units in the southwestern mountains.

The Wildlife Commission's seven-year contribution to the Balanced Sampling Design monitoring

continue on page 13



A male golden-winged warbler (Photo by Chris Kelly)



A male golden-winged warbler fitted with a geolocator (Photo by Chris Kelly)

Western North Carolina Bird Projects Update (continued)

effort, whose objective is to detect population trends precisely range-wide, provided key information in a report issued by Cornell this year that noted two important findings: 1) The population trend estimate is 0.95 with very tight confidence intervals, meaning that monitoring detected a 5 percent per year decline with adequate precision and 2) the detection probability for the audio lure segment of the survey is very high (>0.90) compared to the silent observation period (0.68) and Breeding Bird Surveys (0.57), indicating that the survey design and protocol are working effectively.

The objective of monitoring timber units is to increase knowledge of golden-winged warbler distribution and relative abundance and the number of years post-harvest that these timber units are used by golden-winged warblers. Golden-winged warblers were present at eight of 18 timber harvest unit points. For the first time in six years of monitoring, a Brewster's warbler (first generation hybrid between golden-winged and blue-winged warbler) rather than a golden-winged warbler occupied a territory in a 6-year-old timber harvest unit.

Chris Kelly joined Curtis Smalling, who works with Audubon North Carolina, for a morning to learn how to attach a geolocator to a golden-

winged warbler, so that Wildlife Commission biologists may learn more about migration paths and wintering sites for effective, full life-cycle conservation.

Saw-Whet Owl

Currently no systematic monitoring is in place for populations of the state-listed threatened Northern saw-whet owl. To address this issue, staff tested a survey technique using silent listening alternating with a conspecific audio lure in high-quality habitat across five weekly visits during peak calling season. They documented Northern saw-whet owls at five of six points. Analysis of data will determine occupancy rate and detection probability and inform decisions on how to develop a monitoring program that can detect population changes.



Saw-whet owllets (Photo by Wikipedia)



A blue grosbeak at Green River Game Land (Photo by Chris Kelly)



In addition to conducting bird surveys this spring, Wildlife Diversity Program staff led bird identification refresher trips for other Wildlife Commission staff and partners, with 27 people in attendance.



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 species 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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