



North Carolina Wildlife Resources Commission



# Wildlife Diversity Program Quarterly Update

July - September 2013





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**Coastal Rare Fishes Distribution Surveys Conducted in Cape Fear and Lumber River Basins**

Distribution surveys for rare coastal fish species continued in 2013. Priority species included the ironcolor shiner, the taillight shiner and the thinlip chub.

Statewide surveys completed by Wildlife Commission staff in the 1960s showed the ironcolor shiner, which closely resembles the more common dusky shiner, to be widespread across North Carolina's entire coastal plain ecoregion.

However, 2012 surveys at 35 stream reaches in the southeastern coastal plain drainages of the Cape Fear and Lumber River basins revealed no individuals.

Twenty sites in the Cape Fear and Lumber River basins have been sampled in 2013. No ironcolor shiners have been found, but three sites contained thinlip chubs and ten contained taillight shiners. Surveys will continue through the rest of the 2013 field season.



Taillight shiner

Brena Jones



Northeast Cape Fear River

Brena Jones



July - September

N.C. Wildlife Resources Commission

## Sea Turtle Stranding and Salvage Network Provides Statewide Information on Sea Turtle Strandings

The North Carolina Sea Turtle Stranding and Salvage Network (NC STSSN) collects information about stranded sea turtles statewide. The project is coordinated by Wildlife Diversity Program biologists, utilizing hundreds of volunteers and collaborators to cover the coast.

An average of 490 sea turtles strand in North Carolina each year. As of Sept. 25, 410 sea turtles were reported stranded in the state. This number included 143 loggerheads, 166 green turtles, 88 Kemp's ridleys, four leatherbacks, and nine specimens for which species could not be determined.

Project participants collect data from each stranded sea turtle, including species, stranding location, standard measurements, stranding cause,

and presence of identifying tags. Sea turtle monitoring programs all over the world deploy tags to learn more about populations and individual life histories. Unique tag numbers are stored in a database, along with corresponding information about the turtle carrying those tags. If a turtle is encountered carrying tags (i.e., a "tag return"), biologists can consult the database to learn when and where that animal was tagged, how much it has grown since tagging, and more.

Due to the wide-ranging nature of sea turtles, biologists sometimes get interesting information from tag returns. In July, volunteers encountered an adult female leatherback carrying tags that were placed while the turtle nested on the Caribbean Island of Tobago in

2011. Five other tag returns have been found in North Carolina this year, including another adult female leatherback from Central America. The NC STSSN found four juvenile sea turtles carrying tags in 2013: one green turtle, one Kemp's, and two loggerheads, three of which were released by rehabilitation facilities in North Carolina or South Carolina. One loggerhead had been tagged and released by the St. Lucie Power Plant in Florida. Collaborators with the N.C. Sea Turtle Project tag nesting females they encountered during night monitoring on Bear Island and Bald Head Island.

Turtles that are recovered alive through the NC STSSN are sent to rehabilitation facilities and also are tagged before release.



A metal flipper tag is visible in the right rear flipper of a loggerhead turtle.

Dr. Matthew Godfrey



This adult female leatherback, stranded in North Carolina, was tagged while nesting on the island of Tobago.

Cape Hatteras National Park Service



## Collaborative Nesting Survey on Piping Plovers and American Oystercatchers Being Conducted

The Wildlife Commission’s Wildlife Diversity Program has begun work on a collaborative project with the USGS National Wetland Research Center, National Park Service (Cape Hatteras and Cape Lookout National Seashores), U.S. Fish and Wildlife Service (Pea Island National Wildlife Refuge), and N.C. State University, to examine hurricane impacts on nesting areas used by shorebirds. Focal nesting species are the piping plover and American oystercatcher. Immediately after the 2013 nesting season, Wildlife Commission staff collected GPS and ground-based LIDAR data at piping plover and American oystercatcher nest sites in Cape Hatteras National Seashore.

The greatest needs within the parks and refuges are long-term, high-resolution mapping of barrier islands over time to document changes relative to storms, and research on nest site characterization and nest site locations.

Similar data on Commission-managed, dredged-material islands in the Pamlico Sound, west of the barrier islands of the Outer Banks, will be collected.

Analyses of Lidar data collected during September are underway. Lidar scans provide data in 3-dimensional space and will provide a rugosity index (“roughness”) that can be compared among sites relative to bird selection and environmental conditions. Ultimately, these data will determine nesting habitat enhancement and restoration.



Biologists are analyzing Lidar data to determine nesting habitat enhancement and restoration for piping plovers and American oystercatchers.



Piping plover



American oystercatcher



Oystercatcher chicks



## Meherrin River Surveys Yield Three Chowanoke Crayfish and One Triangle Floater

On Aug. 16, Wildlife Diversity Program staff partnered with the U.S. Fish and Wildlife Service to conduct a survey for Chowanoke crayfish on the upper portion of the Meherrin River in the Chowan River basin. The freshwater crustacean is state listed as special concern and currently under review for possible Federal listing.

The survey was a collaborative effort to collect data from an area that had not been surveyed before and to assist the N.C. Coastal Land Trust with a grant application to purchase additional property along the Meherrin River.

Biologists were able to capture Chowanoke crayfish at three new locations on the Meherrin River, which extended the known range approximately 13 river miles upstream of other known locations in the Meherrin River. In addition, biologists searched muskrat middens (clam and mussel shell piles left by



Tyler Black

foraging muskrat) for freshwater mussel shells to determine what species were present. Most middens comprised the invasive Asian clam and native eastern elliptio; however, the shell of one state threatened species, the Triangle floater, was found during the survey.

The observation of Triangle floater in the Meherrin River represents the first known occurrence in the North Carolina portion of the river.



Tyler Black

Biologists use a seine net to survey for Chowanoke crayfish (left). Finding the shell of the Triangle floater (above) marked the first time biologists had seen the mussel in the North Carolina portion of the Meherrin River.

This survey accomplished two goals by providing valuable information needed to assess the status of native freshwater biodiversity and giving the N.C. Coastal Land Trust species distribution information needed to apply for a land purchase grant.

If the grant is approved, the land purchase will help protect the waters of the state and the animals that inhabit our aquatic habitats.

## Wildlife Commission Provides Habitat Conservation Recommendations for Chatham Park Master Plan

Wildlife Diversity Program staff developed recommendations for the Town of Pittsboro's Board of Commissioners to improve wildlife habitat conservation measures in the Chatham Park Master Plan. The Chatham Park Master Plan provides a description of a 7,120-acre multi-use development to be built within the jurisdiction of Pittsboro.

This development is proposed to be built over a significant natural heritage area and in proximity to the Haw River State Park lands and Jordan Lake Game Land. Development along the fringe of the game land could lead to restriction of hunting on the game land. The recommendations provided the commissioners were based on scientifically researched principles available to the public in the Wildlife Commission's document entitled, "Conservation Recommendations for Priority Terrestrial Wildlife Species and Habitats in North Carolina."

Wildlife Commission staff will continue to work with the developer and the Town of Pittsboro to help minimize impacts to the wildlife within adjacent game lands, state park lands, and within the proposed development.



## New and Improved 2nd Edition of the Green Growth Toolbox Now Available

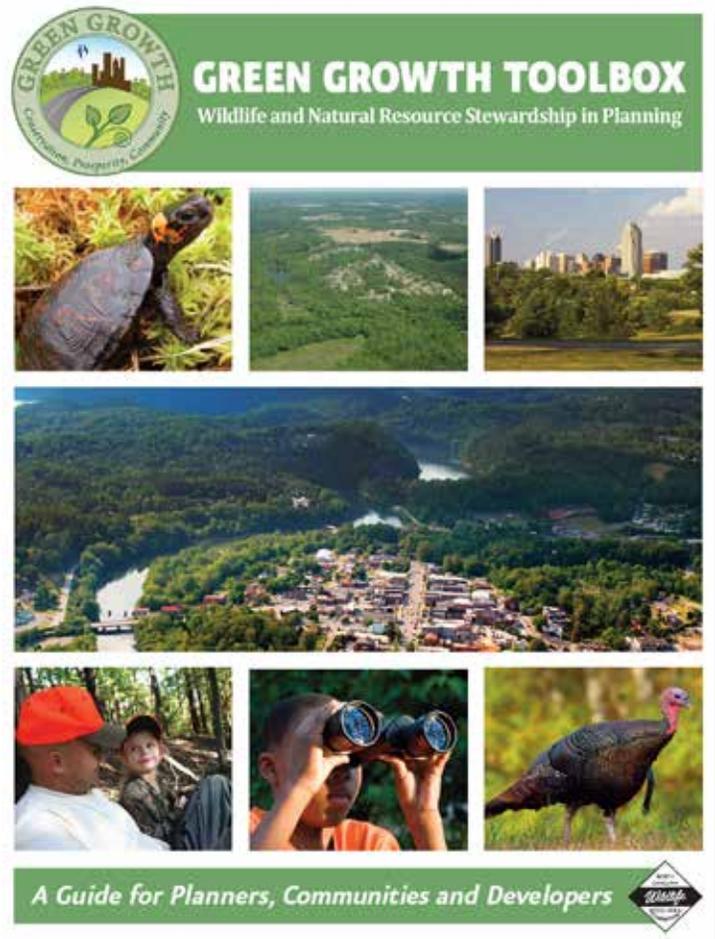
The N.C. Wildlife Resources Commission has published a second edition of the Green Growth Toolbox handbook and materials. This second edition provides more detailed information to assist planners, local governments, communities and developers with conserving wildlife habitat and biodiversity through land use planning, incentives, policies and development design.

The updated handbook, conservation mapping data, and example plans, incentives, ordinances and developments are available on the Green Growth Toolbox website at:

[www.ncwildlife.org/greengrowth](http://www.ncwildlife.org/greengrowth).

### What's New in the Green Growth Toolbox?

- Information from more than 65 peer-reviewed articles on the economic and societal benefits of green growth.
- More detailed step-by-step guidance on conservation of wildlife habitat through land use and development planning, based on more than 140 peer-reviewed articles and case studies from North Carolina and across the country.
- More case studies to provide examples of how North Carolina and nationwide communities have tailored their land use planning, incentives, ordinances and developments to reduce habitat fragmentation and better safeguard their natural resources for the future.
- Information on climate change, how it affects wildlife and how we can better safeguard our communities by conserving certain types of habitat.
- A focus on the North Carolina Conservation Planning Tool and how it can be used with other Conservation Data for Green Growth to map and understand priority conservation areas across the state better.
- Detailed guidance on the amount of habitat needed by priority wildlife to remain in developing landscapes.
- Visual examples of how to use the Conservation Data for Green Growth and how to design wildlife friendly developments.

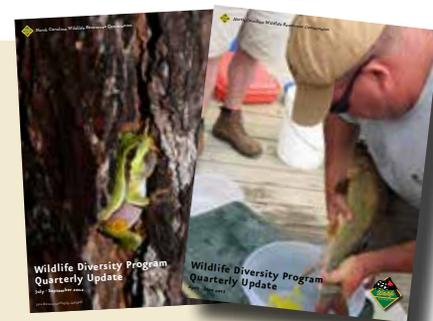


The second edition of the Green Growth Toolbox handbook is now available free of charge to planners, local governments, communities and developers.

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Visit [www.ncwildlife.org/conserving](http://www.ncwildlife.org/conserving)





### Wildlife Commission Staff Creates Wetland on Sandhills Game Land for Gopher Frogs

Staff created a 1/3-acre wetland in early October to provide more suitable habitat for the Carolina gopher frog and other imperiled amphibians on Sandhills Game Land.

Gopher frogs, which once were found across the Sandhills and Coastal Plain of North Carolina, are now down to seven known populations in the state because of the destruction and alteration of wetlands and upland longleaf pine habitats. For breeding, gopher frogs require large, isolated, grassy, temporary wetlands that fill and dry seasonally.

However, long-term droughts have caused the naturally occurring isolated wetlands across the Sandhills to hold too little water to support any gopher frog breeding over the past three years.

Because the average life span of a wild gopher frog is not much more than three years, the population of gopher frogs on Sandhills Game Land, which numbered fewer than 200

three years ago, could be in serious peril.

The Commission worked with Tom Bebighauser, who is well known for creating hundreds of ponds across North America. Twenty-nine staff members and volunteers, using heavy equipment, created a plastic-lined, 140-ft diameter pond where gopher frogs are known to occur.

Wetland plants and seeds will be brought to the site to mimic naturally occurring isolated wetlands in the Sandhills.

Staff will monitor the pond for amphibian use over the coming years, with the hope that gopher frogs and other amphibians will find the pond on their own and begin to use it for breeding.



Jeff Hall

1



Initial pond excavation site

Jeff Humphries

2



Installing pond liner

Jeff Humphries

3



Replacing topsoil

Jeff Humphries

4



Completion of created pond

Jeff Humphries

## Lake Waccamaw Treated for Hydrilla

Hydrilla, a federal and state listed noxious weed, was first reported in Lake Waccamaw in October 2012. This invasive plant poses a significant threat to the endemic species of Lake Waccamaw, a Carolina Bay, located in Columbus County that is unique because of its water quality, large size, and high number of endemic species.

Wildlife Commission staff served on the newly formed Lake Waccamaw Hydrilla Management Technical

Advisory Committee, which includes members from universities, state and federal agencies, NGOs, and other stakeholders.

The group determined that the application of an herbicide, fluridone, was the best option. Treatment of the hydrilla began in early June with a subsequent application in late June.

Because of the early detection and treatment, staff believes that control efforts may be successful.



Hydrilla

Chris Evans

## Priority Fish Surveys and Quantitative Mussel Surveys Conducted in Lake Waccamaw

Wildlife Commission staff conducted standardized surveys for priority fish in Lake Waccamaw. The mean number of Waccamaw Silversides collected per minute of seining has varied over the past five years and was 9.1 fish/minute of seining in 2013. The mean catch rate was the highest in 2009 at 23.5 fish/minute and lowest in 2011 at 2.9 fish/minute of seining. This variability in catch rate is expected due to the fish's schooling behavior and preference for open waters of the lake.

Young-of-the-year silversides comprised the majority of the individuals that staff collected, indicating successful reproduction continues to occur. Staff also collected Waccamaw killifish with minimal effort at study sites suggest-

ing that abundant populations persist within Lake Waccamaw. Because of the high, dark-stained waters in the lake this summer due to above average rainfall, visual observations for Waccamaw darters were not effective and staff will continue these surveys next year.

Staff also conducted quantitative mussel surveys in Lake Waccamaw. Endemic species of mussels and snails persist, although the densities are lower than historical surveys indicate, especially for snails. The Waccamaw spike is the exception — population densities of this species have increased from previous surveys. Waccamaw spike and tidewater mucket were the most abundant mollusks found in study sites at Lake Waccamaw.



Mussel sampling in Lake Waccamaw



Lake Waccamaw



John Carpenter

### Bachman's Sparrow Habitat Mapping Project Underway

Wildlife Diversity Program staff and research faculty from NCSU are collaborating on a project to map Bachman's sparrow habitat in North Carolina using aerial imagery from the 2012 National Agriculture Imagery Program.

The preferred habitat of this species is open longleaf pine forest that is burned regularly to maintain and enhance the diverse ground cover where it builds its nest. A Geographic information system (GIS) and imagery will be used to identify key habitat characteristics of sites where Bachman's sparrows were found during the 2011

and 2012 breeding season. These characteristics will be used to locate similar areas across the landscape throughout the sparrows' range in North Carolina. Data collected at more than 1,000 additional survey locations will be used to help validate and refine the results.

This effort will help to delineate Bachman's sparrow populations, identify their associations with landscape-level habitat characteristics, and detect areas to target for land conservation and restoration, particularly on privately owned lands, which will ultimately increase longleaf pine habitat connectivity.

### Many Private Landowners Cooperate with Bachman's Sparrow Survey

In addition to mapping Bachman's sparrow habitat, Wildlife Program Diversity staff elicited the help of landowners to determine the bird's current distribution. Wildlife Diversity and Private Lands staff visited locations of historic observations and identified potential habitat across the historic range, regardless of land ownership. While most of the current records exist on public lands, it is important to know the bird's status on private lands and the success of this project depends on the cooperation of private landowners.

Personnel reached out to 268 private landowners via letters and personal contacts. They sent letters to 199 landowners and 75 (38%) granted permission to conduct a survey, 25 denied per-

mission (13%), and 97 had no response (49%). They also asked permission via phone and in person with landowners that they knew and asked permission through other natural resource professionals with landowner relationships. The U.S. Fish and Wildlife Service's Safe Harbor program and the Commission's Corporate CURE program yielded 62 "yes" and four "no" replies, and four "no responses."

Staff conducted bird surveys on the property of more than 100 private landowners and provided most of them with a letter detailing the results of the survey, offering suggestions for enhancing habitat on their properties, and providing a list of resources for technical and financial assistance.



Jeff Hall

Bachman's sparrows prefer open longleaf pine forests that are burned regularly to maintain and enhance diverse ground cover.

So far at least one landowner has acted on staff suggestions for habitat improvement. Several are planning to continue beneficial practices that they already started. Several others have asked for more information or are considering staff recommendations.



**North Carolina Partners in Amphibian and Reptile Conservation (NCPARC)**  
*Workshops, training and meetings*



Wildlife Diversity Program staff facilitated many presentations and field demonstrations on topics such as amphibians and reptiles, survey techniques, Calling Amphibian Survey Program, frog call identification, and pond restoration. These were given to both internal and ex-

ternal groups. Internal groups included Nongame Wildlife Advisory Council, Coastal Ecoregion staff meeting, and the Wildlife Commission's Law Enforcement staff. External groups included Elon University, East Carolina University, Clemson University, University of North

Carolina-Wilmington, MCB Camp Lejeune, and Camp Rockfish.

Three NCPARC working group meetings also took place during the quarter. The Education & Outreach working group met and the Policy, Regulation & Trade working group met twice.

**Surveys and research - Several Priority Species Detected During Bioblitz at Bladen Lakes**

Wildlife Diversity Program staff, along with more than 30 volunteers from partner agencies and the public (including many from out-of-state), conducted a herps bioblitz of the Bladen Lakes PARCA (Priority Amphibian and Reptile Conservation Area).

PARCAs are sponsored by Partners in Amphibian and Reptile Conservation and are similar to the Audubon Society's Important Bird Area program.

The Oriante Society, along with NCPARC members, is currently working on finalizing the PARCAs for North Carolina. Read more about their

efforts by visiting: [www.oriannesociety.org/parcas](http://www.oriannesociety.org/parcas).

Several N.C. Wildlife Action Plan priority species were detected during the bioblitz including timber rattlesnake, scarlet snake, mud snake, eastern box turtle, lesser siren, many-lined salamander, and eastern spadefoot.



Eastern spadefoot

Jeff Hall



Mud snake

Jeff Hall



Scarlet snake

Jeff Hall



**North Carolina Partners in Amphibian and Reptile Conservation (NCPARC)**  
*Surveys and research - Reptiles and Amphibian Surveys along the Coast*



Wildlife Diversity Program staff assisted N.C. Museum of Natural Sciences biologists with reptile and amphibian surveys on the Albemarle-Pamlico Peninsula. Fewer reptile and amphibian records and specimens exist from this area of the coast, prompting this particular survey effort.

Staff also participated in fall bog turtle surveys, monitoring, and management in Buncombe and Wilkes counties. Staff found 15 bog turtles at seven sites. Of

those, 12 were recaptures and three were newly found turtles.

Staff and volunteers continued other amphibian and reptile surveys and monitoring at several long-term locations, including Camp Lejeune, Croatan National Forest, and Holly Shelter Game Land.

Of particular note, Croatan National Forest staff found a recently metamorphosed juvenile gopher frog on forest land and sent a photograph to Wildlife Diversity Program biologists for species

confirmation. The location of this juvenile frog led to the discovery of several possible new breeding ponds, none of which had previously been documented as gopher frog breeding sites.



Wildlife Diversity Program and Croatan National Park staff survey a pond in the Croatan after a recent prescribed fire. Part of what makes ponds like this so valuable for amphibians is that they dry during the summer. Some species, like the gopher frog, require large, isolated, grassy, temporary wetlands that fill and dry seasonally.



Pine woods treefrog

Jeff Hall



Gopher frog

Jeff Hall



## North Carolina Partners in Flight & North Carolina Birding Trail

On Aug. 25-27, N.C. Wildlife Resources Commission staff participated in the Fifth International Partners in Flight Conference and Conservation Workshop, developing a conservation business plan that considers full life-cycle concerns of migratory species.

Participants from North and South America identified and prioritized specific projects designed to conserve birds in different habitats. The result was a first draft of a plan that will be completed in early 2014. Wildlife Commission staff will continue to participate in finalizing the plan in the coming months.

Migratory birds present a unique conservation challenge for state wildlife agencies like the N.C. Wildlife Resources Commission. Sixty percent of bird species that can be found in North Carolina spend a significant por-

tion of their lives outside the state on breeding or wintering grounds. For example, the golden-winged warbler (below), a species of concern in the N.C. Wildlife Action Plan, breeds on

high mountain shrublands in North Carolina, throughout the Appalachians, and in the Great Lakes region, but winters in open woodlands and shade-coffee plantations in Central and South America. Therefore, state agencies must take into account birds' full life cycle when prioritizing conservation

efforts. Work may increase breeding habitat for a declining species, but the species may continue to decline if issues on wintering grounds or during migration are not addressed.

*Partners in Flight is an international partnership designed to approach bird conservation through partnerships that cross state and international boundaries.*



Ken McFarland



## Support the Wildlife Diversity Program and Help Keep North Carolina Wild!



Whether you hunt, fish, watch or just appreciate wildlife, you can help conserve North Carolina's wildlife and their habitats and keep North Carolina wild for future generations to enjoy. To make a direct donation to conserve North Carolina's wildlife, send this form, along with a check or money order payable to the N.C. Wildlife Resources Commission, to: N.C. Wildlife Resources Commission, 1702 Mail Service Center, Raleigh, N.C. 27699-1702. Or pay by credit card.



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### Spotfin Chub Monitoring in the Little Tennessee River

In early August, Wildlife Diversity Program staff, along with partners from the U.S. Fish and Wildlife Service, Conservation Fisheries, Inc., N.C. Natural Heritage Program, and Appalachian State University, completed field surveys for the 7<sup>th</sup> year of a 10-year project to monitor status and population dynamics of the federal and North Carolina listed threatened fish species, spotfin chub, in the Little Tennessee River in Macon and Swain counties.

Snorkelers visually surveyed five sites along 50m transects and during timed random area searches in the same locations sampled since 2007. Analyses of data collected to date show variations in abundance that appear to drop following years with significant high flow events. As expected, this year's results showed lower abundance than seen in previous years following a record long period of high flows throughout much of 2013. However, overall, the population remains well distributed and if past patterns persist, abundance is expected to rebound when normal water levels return.

Populations of spotfin chub have generally become more abundant and have increased their occupied range in recent years. Several reintroduction efforts, such as in the Cheoah River in Graham County and others in Tennessee and Alabama, show positive results and are well on their way to establishing healthy new populations.

Criteria for recovering the species and removing it from the federal threatened species list are defined in the species recovery plan and include the establishment of new populations, as well as at least 10 years documenting no significant declines in the populations known at the time of listing.

Data collected in this new monitoring effort are intended to provide that information for the Little Tennessee River population, as well as provide valuable insight into population dynamics and the effects of annual flow variability on recruitment and abundance.



A snorkeler looks for spotfin chubs in typical adult habitat, Little Tennessee River, Macon County.



Female (left) and male (right) spotfin chubs, which are a federal and state-listed threatened species.

# Buy a plate

Your purchase helps conserve wildlife in North Carolina.



### Appalachian Elktoe Monitoring and Restoration

The Nolichucky River (French Broad River basin) and its tributaries in Yancey and Mitchell counties support a relatively extensive population of the federal and North Carolina listed endangered mussel species Appalachian elktoe. Reaches of the Nolichucky, North and South Toe, and Cane rivers are designated critical habitat for the species. This often patchy population has been increasing overall in density and range following substantial water quality improvements beginning in the 1970s. However, monitoring data from the late 1990s-2000s show much variation in density over time and from place to place.

High flows following two tropical storms in 2004 caused a drastic reduction in densities at all monitoring sites in the system. But over the next five years, good reproduction and recruitment had increased abundances to pre-2004 levels at many sites. An exception was the Cane River where a waste water treatment plant (WWTP) failure at Burnsville in 2008 wiped out most of the population there. In 2012, biologists began a pilot study to test the feasibility of reintroduction of Appalachian elktoe to the Cane River. Mussels were released at a study site within the reach previously affected by the WWTP failure. Biologists assessed survival and growth over the next year.

Five-year interval population monitoring surveys were again conducted at sites on the Nolichucky, North Toe and Cane rivers in September. Population densities have decreased throughout the system, apparently as a result of extended high flows throughout 2013. However, while they were recovered in low numbers, the mussels released in Cane River survived, grew, and were apparently as healthy as mussels seen at other sites in the system.

Earlier in 2013, a settlement was reached between the town of Burnsville, the U.S. Fish and Wildlife Service, and the Wildlife Commission for the town to provide funding to the Wildlife Commission to restore Appalachian elktoe to the affected reach by propagating juveniles at the Conservation Aquaculture Center (CAC) at Marion State Fish Hatchery and restocking with the mussels produced. The results of the feasibility study, along with recent success in producing high numbers of juvenile Appalachian elktoe at the CAC, set the stage for future restoration work.



Appalachian elktoe



#### Help a Small Raptor in a Big Way

Purchase our new 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).





## Western North Carolina Amphibian Conservation - Aquatic Salamander Research, Monitoring and Inventory

This past summer, despite the rainiest year on record in western North Carolina, Wildlife Diversity Program staff continued to research, monitor and inventory priority and state-listed aquatic salamanders.

Although most river surveys — both visual and snorkeling — were canceled repeatedly due to high water levels, swift current and high turbidity, staff and project partners from the N.C. Zoo and University of Idaho continued a DNA research project started in 2012. The project evaluated the use of environmental DNA (eDNA) in river water samples to detect target species: Eastern hellbender and mudpuppy.

Results from 2012 proved the technique worked to detect species presence, and biologists determined that the amount of eDNA collected increases significantly during hellbender breeding season, which is September. In 2013, biologists have taken this research to the next level by not only continuing to test water at more than 30 new, potential sites, but also testing water before and after hellbender eggs hatch.

The goal is to determine if a spike in eDNA later in the fall could indicate a successful hatch, thus documenting reproductive success. The lack of records for larval and juvenile hellbenders continues to be a challenge for determining overall population health and status in North Carolina.



Eastern Hellbender eggs outside of a nest rock, French Broad River basin.

Lori Williams



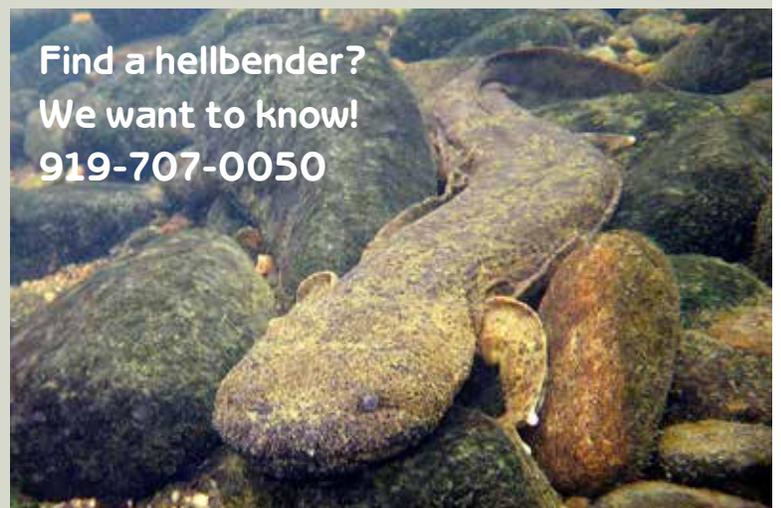
Eastern Hellbender breeding season activity, French Broad River basin.

Lori Williams

## Going Fishing in Western North Carolina? Watch Out for Water Dogs!

Did you know Eastern Hellbenders (aka water dogs) are harmless, nonvenomous giant, crayfish-eating aquatic salamanders that are indicators of good water quality and healthy streams?

The Wildlife Commission wants to conserve this amazing mountain animal and needs your help. If you accidentally catch a hellbender on hook and line, immediately release the animal at the spot of capture by carefully removing the hook, if possible, or cutting the line as close as possible. If you find one, let us know so we can map their distribution.



Find a hellbender?  
We want to know!  
919-707-0050

TR Russ

## Wildlife Commission Plants Red Spruce to Improve Flying Squirrel Habitat

Just a few weeks after the newly formed [Southern Appalachian Spruce Restoration Initiative's](#) (SASRI) summer meeting, Wildlife Diversity Biologist Chris Kelly led the first annual fall red spruce planting event in September on the Nantahala National Forest.

The purpose was to supplant dying eastern hemlock trees with red spruce to maintain a mixed conifer-hardwood forest for resident Carolina northern flying squirrels. Wildlife Commission staff, U.S. Forest Service staff, and Haywood Community College's Forestry and Wildlife students tackled the laborious task of planting 1,135 seedlings over the course of four days. They had to develop their own red spruce seedling supply. Until the project began, there was no nursery source for spruce seedlings in western North Carolina.

A Transylvania County-based non-profit nursery, The Southern Highlands Reserve ([www.southernhighlandsreserve.org](http://www.southernhighlandsreserve.org)), partnered with the Wildlife Commission to grow the 1-gallon potted seedlings from seed collected in the Great Balsam range by Kelly in 2009 and 2010. In the future, to ensure the seedlings get plenty of sunlight to grow, Commission staff will remove clumps of small hardwoods to open the canopy.

"We're excited to partner with Haywood Community College Forestry students to monitor seedling growth and survival," Kelly said.

This is the second half of an effort to fortify Carolina northern flying squirrel habitat in the Unicoi Mountains Recovery Area. The first half of the project, to restore connectivity across the Cherohala Skyway by erecting crossing structures, was completed in 2008, and flying squirrels readily took to the structures. That project was published in the June 2013 issue of *The Wildlife Society Bulletin* ([onlinelibrary.wiley.com/doi/10.1002/wsb.249/abstract](http://onlinelibrary.wiley.com/doi/10.1002/wsb.249/abstract)) and recently featured in the Fall 2013 issue of *The Wildlife Professional*.

Spruce planting in the Unicoi Mountains is part of the broader U.S. Forest Service's Upper Santeetlah Forest Management Project, which will include prescribed burns and creating early successional forest across 17 shelterwood units over the next several years.

At the successful conclusion of this initial spruce planting event, SASRI partners mobilized to collect cones from red spruce and Fraser fir.



Mike Carraway

Carolina northern flying squirrel



Chris Kelly

Planted red spruce seedling



Chris Kelly

Wildlife Diversity Program Technician Charles Lawson (left) instructs Haywood Community College volunteers on proper planting techniques.



## Habitat Management for Bog Turtles Conducted at a Southern Appalachian Bog

In September, Wildlife Diversity Biologist Gabrielle Graeter coordinated two days of habitat management for bog turtles at a Southern Appalachian bog in Buncombe County.

Bog turtles are federally and state listed as threatened and are a high priority in the N.C. Wildlife Action Plan.

The bog turtle population at this location is suspected to be declining, likely due to degradation of the habitat over time from succession of trees, isolation on the landscape due to habitat fragmentation, and invasion of non-native plants into their primary habitat.

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.

Unfortunately at this site, the primary habitat where bog turtles were known to spend much of their time had become completely shaded by trees growing within and adjacent to the bog. This site was past due for removal of trees to improve the quality of the habitat for bog turtles and their ecological community.

Graeter improved the habitat by coordinating assistance from Wildlife Commission staff, professors and students from an Environmental Restoration class at UNC-Asheville, an invasive plant expert at Western North Carolina Alliance, and members of Project Bog Turtle. Graeter visited the UNC-Asheville class

the week prior to the workdays to present background information about the bog, the habitat needs of bog turtles, and the habitat management objectives.

On the workday, the group cut and removed trees from the primary bog area, which was less than ½ acre, to allow more sunlight penetration. The group also searched for and treated any non-native invasive plants in the focal area. The two workdays proved insufficient to meet all objectives.

With more work needing to be done at this site, Graeter looked to another local college for assistance. In October, this project was completed with the assistance of the Forestry and Wildlife class from Haywood Community College. The students came for an entire day to assist with removal of the tree limbs and thinning of the shrub layer in the primary habitat.

“Partnerships with local colleges and universities have been an invaluable resource for this type of project,” Graeter said. “Not only does it help Wildlife Commission employees immensely to have the assistance of an entire class in the field, it also provides students with hands-on experience of the conservation work that the Wildlife Commission accomplishes.”

Gabrielle Graeter



In preparation for the habitat management workdays, all trees to be cut were marked with flagging to ensure that the established objectives were met.

Gabrielle Graeter



Prior to habitat management, the primary bog habitat was shaded by tall trees that had grown within the bog.



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