



North Carolina Wildlife Resources Commission



# Wildlife Diversity Program Quarterly Update

April - June 2013







## In this Issue:

Page 2 - Great Year for Sea Turtle Nests

Page 3 - Swallow-tailed Kite Nest  
American Oystercatcher Survey

Page 4 - Coastal Rare Fishes Survey  
Cape Fear Shiner Augmentation

Page 5 - Collaborative Wetland  
Restoration Study Under Way

Page 6 - Green Growth Toolbox  
Uwharrie Game Land Expansion

Page 7 - Riparian Bird Surveys  
Robust Redhorse Surveys

Pages 8 - Eno River Aquatic Surveys  
Captive Propagation

Pages 9, 10 - NCPARC

Page 10 - Reptile & Amphibian Surveys

Page 11 - Mussel Surveys in Yadkin-  
Pee Dee  
Salamander Surveys in  
Western North Carolina

Page 12 - Bat Monitoring Program

Page 13 - Bird Conservation in Western  
North Carolina

Page 14 - Restoration on the Cheoah  
Sicklefin Redhorse Monitoring

Page 15 - N.C. Birding Trail Update



April - June 2013

N.C. Wildlife Resources Commission

## 2013 is Banner Year for Sea Turtle Nests

North Carolina beaches have seen their best loggerhead nesting season to date.

Sea turtle nesting in North Carolina for the 2013 season began on May 12 when volunteers found a freshly laid clutch of loggerhead eggs on Oak Island. Since then, there have been more than 1,148 nests observed and protected by volunteers and cooperators with the N.C. Sea Turtle Project, which is coordinated by the N.C. Wildlife Resources Commission.

Nearly all these nests were laid by loggerhead sea turtles although there also have been almost two dozen nests laid by green turtles and one leatherback nest laid in

Fort Fisher Recreation Area, which is located in New Hanover County. Volunteers and cooperators with the N.C. Sea Turtle Project keep an eye on nests during incubation, and a few days after the hatchlings emerge and enter the sea, the volunteers and cooperators collect data on hatching success and submit the information to the Wildlife Resources Commission.

These data are used to keep track of the reproductive success of sea turtles in North Carolina and are shared with the U.S. Fish and Wildlife Service, the federal agency that is responsible for managing nesting sea turtles, their eggs and hatchlings.



*A freshly created nesting crawl from a loggerhead on Shackleford Banks, Carteret County (left). The clutch of eggs is located roughly 45 cm below the sand surface. Hatchlings make their way to the ocean (above). (Photos by Matthew Godfrey)*



## Biologists Discover First Nesting Record of Swallow-tailed Kites

On May 7, 2013, Wildlife Diversity Program staff discovered the first nesting record of the swallow-tailed kite in North Carolina, along the Cape Fear River in Bladen County.

This unique, black-and-white raptor is currently listed as a priority species in the N.C. Wildlife Action Plan and a Species-at-Risk by the U.S. Fish and Wildlife Service because of a population of less than 2,500 breeding pairs and continued threats to its breeding and wintering habitats.

Despite declines throughout much of their range, swallow-tailed kites have begun to expand slowly northward along the East Coast and were first documented in North Carolina as far back as April 15, 1972.

Birds have been seen regularly during the breeding season for the last decade near the Cape Fear River in Bladen and Pender counties; however, breeding within North Carolina had not been confirmed until now.

A manuscript detailing the discovery has been submitted for publication in *The Chat*, the journal of The Ornithological Society of the Carolinas.



John Ennis

## Coast-Wide Survey for American Oystercatcher Nesting Territories Under Way

In April, the Wildlife Diversity Program began a coast-wide survey for American oystercatcher nesting territories. This survey has been conducted every three years since 2004, and this year, it is being conducted with partners from N.C. State University, the National Park Service, U.S. Fish and Wildlife Service, N.C. Audubon, U.S. Marine Corps, N.C. National Estuarine Research Reserves, and several volunteers.

The North Carolina coast was sorted into plots and each plot was surveyed by one of the partners, and several plots are being surveyed repeatedly. Results will be analyzed using statistical models to estimate probability of presence of American oystercatcher pairs, and estimates of error associated with surveys.

This year is a pilot year for these methods; hence, the results will guide surveys conducted along the Atlantic Coast for American oystercatcher territories and will provide population estimates for this species of special concern.

Biologists hope the intensive management and research on the American oystercatcher throughout its range since the late 1990s have resulted in increases in population sizes.



American oystercatcher



American oystercatcher chicks





## Coastal Rare Fishes Survey Continue in 2013

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 the Commission 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.

So far, 2013 surveys have had the same result. Biologists sampled 13 sites in the Cape Fear River basin in 2013 and found no ironcolor shiners. However, three sites contained thinlip chubs and nine sites contained taillight shiners. Surveys will continue through the rest of the 2013 field season.



Taillight shiner (Photo by Brena Jones)



Dusky shiner

## Cape Fear Shiner Augmentation Project Started

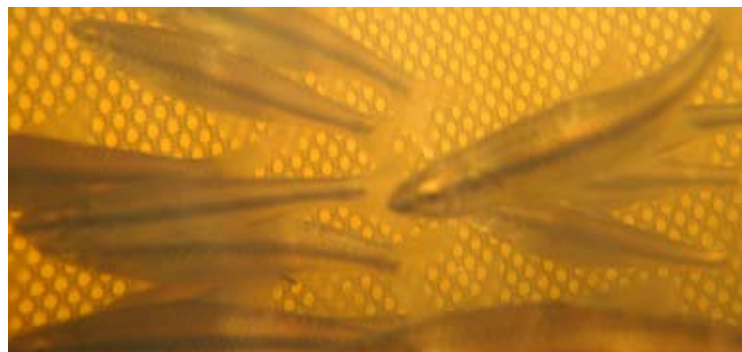
In the spring of 2013, three batches of Cape Fear shiners, totaling 97 individuals, were collected from three locations in Chatham County.

One collection site was located at the confluence of the Rocky and Deep rivers, the second in Bear Creek and the Rocky River below the Rocky River Hydropower Dam, and the third at the Hwy 15/501 crossing of the Rocky River.

All fish were translocated to the release site at the Pittsboro-Goldston Road crossing of the Rocky River.

The goal of the translocation is to augment the population of Cape Fear shiners in the Rocky River above the hydropower dam, an area that is currently designated Critical Habitat by the U.S. Fish & Wildlife Service.

A subset of the collected fish was fin-clipped for later genetic analyses of the population. Monitoring of this translocation effort was conducted in July of 2013.



Cape Fear shiners waiting to be released. (Photos by Brena Jones)



## Collaborative Wetland Restoration Study Under Way

N.C. Wildlife Resources Commission biologists began the fieldwork portion of a partnership with the N.C. Division of Water Quality to conduct research on isolated wetlands in eastern North Carolina.

The study is part of a grant from the U.S. Environmental Protection Agency, titled "Evaluation of Success Criteria and Restoration Techniques to Promote Aquatic Biota in North Carolina Mitigation Wetlands."

They are studying how well mitigated wetlands function with regard to plant and animal diversity in comparison to three other types of isolated wetlands: natural open-canopy wetlands; natural closed-canopy wetlands; and, isolated wetlands that the Commission is in the process of

restoring to open-canopy. The Commission's main role in this study is to survey the amphibian assemblages among the 16 study sites, using automated recorders, dipnetting, egg mass counts, and opportunistic surveys.

During this quarter, biologists made three field trips to each wetland to identify larval amphibians and to install automated recorders. Hundreds of hours of audio recordings are currently being analyzed in order to identify amphibian species calling at each wetland.

The results of this study will be used to guide wetland mitigation practices in North Carolina, as well as to guide overall management of isolated wetlands in order to promote biological diversity.

*The N.C. Wildlife Resources Commission is studying how well mitigated wetlands function in comparison to other types of isolated wetlands, such as closed-canopy wetlands (top photo) and open-canopy wetlands (middle photo). The Commission is restoring isolated wetlands to open-canopy wetlands (bottom photo) to promote biological diversity.*



Jeff Humphries



Jeff Humphries



Jeff Humphries



Red dots indicate the sites for the restoration study.



## Funding Obtained for Green Growth Toolbox Project in Triangle



Over the past quarter, Wildlife Diversity Program staff, in collaboration with the N.C. Natural Heritage Program and the N.C. Forest Service, obtained grant funding for the N.C. Forest Service to begin a conservation and land use planning project to protect contiguous forest blocks adjacent to Jordan Lake Game Land and the Haw River.

The grant is part of the U.S. Forest Service Redesign Program that supports state and private forestry efforts to optimize public benefits from trees and forests. With partners, Commission staff will be working with the Town of Pittsboro, or another community in the Triangle, to help it

control future growth in a way that protects wildlife habitat and corridors. Pittsboro is the future home of [Chatham Park](#) — a 7,000 acre multiuse development that is estimated to bring in more than 50,000 people

The major components of this project include: (1) a compilation of updated conservation data for Pittsboro; (2) a canopy assessment and ecosystem services analysis; (3) ordinance and zoning review (related to natural resource protection); (4) development of ordinance language to improve protection of natural resources; (5) an economic impact analysis of ordinance implementation; (6) community outreach; and, (7) a creation of a case study for conservation planning tools and publications.

## North Carolina Wild Turkey Federation Commits Funds to Expand the Uwharrie Game Land

The North Carolina Wild Turkey Federation committed \$20,000 to the N.C. Wildlife Resources Commission toward the planned purchase of 288 acres adjacent to the Uwharrie Game Land on the Uwharrie National Forest Birkhead Wilderness Area. The land was saved from development by the LandTrust for Central North Carolina. The Commission sought to purchase the tract from the LandTrust to enable public access and habitat management. The LandTrust offered a bargain price to help expand public game lands in this priority conservation area.

This land is home to priority wildlife species such as the

four-toed salamander, eastern box turtle, timber rattlesnake and three-lined salamander. Habitats include Oak-Hickory forest, a Significant Natural Heritage Area and a globally imperiled hillside seepage bog. This addition will add a third public access to the Birkhead Wilderness Area and forms the only protected wildlife habitat corridor to an isolated block of the National Forest to the east.

Laura Fogo with the U.S. Fish & Wildlife Service, Greg Queen from the Commission and other members of the Greater Uwharrie Conservation Partnership played a key role in obtaining support from the Federation.



*The purchase of the Birkhead Wilderness Area will benefit many wildlife species, including box turtles, three-lined salamanders (left) and timber rattlesnakes (above). Photos by Jeff Hall*





## Inventory of Cape Fear Basin for Riparian Birds Completed



*Wildlife Diversity staff conducted the second full field season of canoe-based surveys for riparian birds like the cerulean warbler. (Photo by John Carpenter)*

Many birds associated with riparian habitats (i.e., forests adjacent to rivers and streams) are not well surveyed by existing, road-based bird counts.

The N.C. Wildlife Resources Commission conducted its second full field season of canoe-based surveys for riparian birds. This year, staff covered 32 river segments spread among every major waterway in the Cape Fear River basin.

The primary target species are Swainson's warbler, Kentucky warbler, and cerulean warbler, and data were collected on 10 additional riparian birds. Some rivers, like the Deep River in Randolph, Chatham, Moore and Lee counties, support a high diversity and abundance of riparian birds, while

other waterways, like Rockfish Creek in Hoke and Cumberland counties, support relatively few.

Cerulean warblers do not appear to occur in the Cape Fear basin. Swainson's warblers were detected on about half of the segments surveyed, and are patchily distributed in relatively low numbers. Kentucky warblers were found in just a few waterways. The first confirmed nest of swallow-tail kite in North Carolina was observed on the main stem Cape Fear this year.

The results of this study will be used to inform conservation efforts for these species and will provide baseline data for long term monitoring to determine population and distribution trends.

## Robust Redhorse Surveys in the PeeDee Conducted

In a collaborative effort with the Robust Redhorse Conservation Committee, staff reinitiated its spring electrofishing surveys in the Pee Dee River. The goals were to conduct a population assessment and to collect brood fish for a pilot propagation study. This spring, 15 robust redhorse (including recaptures) were captured. Several females were spawned and returned to the river and the eggs were hatched at the Commission's McKinney Lake State Fish Hatchery. Trials are being conducted to determine the best way to raise this species.

Beginning in the spring of 2014, the Commission will begin augmenting this very small population of robust redhorse downstream of Blewett Falls Dam. River basin.



*Wildlife Diversity biologist Ryan Heise releases a robust redhorse back into the PeeDee. Spawning a female robust redhorse before returning it to the river.*





## Eno River Baseline Aquatic Community Surveys Conducted

The Eno River has a widespread, high density, and established population of the invasive aquatic weed, hydrilla. The Eno River has a diverse aquatic community that includes several listed aquatic species and some species that biologists do not know much about, e.g., freshwater snails.

The Eno River watershed did not evolve with hydrilla and therefore, the long-term impacts of the infestation upon the aquatic community are not known.

A collaborative partnership between state agencies and local authorities decided to chemically treat the hydrilla over an extended number of years. Fisheries biologists began a baseline before, after, and control

impact-monitoring study to examine the aquatic community responses to hydrilla treatment. Taxa groups targeted for the biological study include fish, crayfish, mussels, and snails.

Wildlife Diversity staff assisted fishery biologists with surveying the fish community using IBI methodology with a barge electrofisher at five sites in the Eno River.

They also conducted crayfish sampling using semi-quantitative techniques and surveyed for freshwater mussels using timed snorkel surveys. They hope to conduct surveys for freshwater snails and mussels in the last quarter of 2013 and if the rainy season slows down.



*Hydrilla is an invasive aquatic weed that can have devastating impacts on waterbodies. (Photo by Chris Evans, Illinois Wildlife Action Plan, Bugwood)*

## Captive Propagation at Conservation Aquaculture Center In Marion

Aquatic species restoration efforts around the state are supported by captive culture of rare species at the Conservation Aquaculture Center (CAC) at Marion Fish Hatchery.

Spring was a busy time with spawning of this year's crop and release of previously propagated species grown out to optimize survival.

The Cheoah River restoration project was supported by collection of gravid female wavy-rayed lampmussels, rainbow mussels, and slippershell mussels from the Little Tennessee River and subsequent infestation of host fishes, collection of metamorphosed juveniles, and ad-

equating life support for early development provided at the CAC. Likewise, wavy-rayed lampmussels from the upper Pigeon River were collected and juveniles produced to support restoration in the recovering lower Pigeon River in Haywood Co.

In June, Commission staff released 261 spotfin chubs that were spawned in captivity by partners Conservation Fisheries, Inc., and grown out at the CAC since late last summer, in the Cheoah River. Staff also released 150 each of wavy-rayed lampmussels and rainbow mussels propagated in 2011 in the Cheoah in June.



*The Conservation Aquaculture Center in Marion is the hub of the Commission's efforts to propagate rare species of fish and mussels.*





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



Wildlife Diversity staff helped plan and execute an annual meeting for the NCPARC membership. This year's meeting was held jointly with the N.C. Herpetological Society at the N.C. Zoo in Asheboro. The meeting was a huge success, with more than 100 people attending. Highlights included keynote speakers Whit Gibbons and Kraig Adler; training workshops on topics such as herp medicine, photography and field techniques; many informative talks; and field trips to surrounding local areas.

Additionally, staff facilitated several workshops, presentations, and field tours on topics such as amphibians and reptiles, North Carolina herp laws, survey techniques, Calling Amphibian Survey Program (CASP), frog call identification, and pond restoration. Staff worked with

groups from N.C. State University, the Commission's Law Enforcement staff, Clemson, Weyerhaeuser's Cool Springs Environmental Education Center, Junior Curators of the N.C. State Museum of Natural Sciences, Elizabeth City grounds and maintenance staff, Howell Woods Education Center, and Camp Chestnut Ridge to facilitate these workshops, presentations and tours.



Southern leopard frogs in pitfall buckets along drift fences at Weyerhaeuser's Cool Springs EE Center. (Photo by Jeff Hall)



Jeff Hall gives a presentation on herp-related mobile apps at the 1st North Carolina Congress of Herpetology, held jointly by NCPARC and the N.C. Herpetological Society in April.



Participants at a herp camp conducted by Wildlife Diversity Program Staff at Cool Springs Environmental Education Center got an up-close and personal view of a dragonfly. (Photo by Jeff Hall)

# Buy a plate



*Your purchase helps conserve wildlife in North Carolina.*

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

### Surveys and research - Bog Turtles

Wildlife Diversity Program staff, along with staff from several partner agencies, surveyed for bog turtles in many wetland sites. Several new sites were surveyed and bog turtles were found in at least one of these.

The landowner at the site with the new turtles was very interested and spent the entire time with the group out looking for turtles. Although he did not find one, he was standing only a few feet away when the first turtle was found and was very excited at the discovery.



Bog turtle (Photo by Jeff Hall)

### Surveys and research - Alligators and other Reptiles and Amphibians

The second year of alligator surveys were undertaken during June by participants from multiple divisions of the Wildlife Resources Commission. Amphibian and reptile surveys were continued by Wildlife Diversity Program staff and volunteers at several locations including Camp Lejeune, Croatan National Forest, and Holly Shelter and Sandhills game lands. Some of the priority species from the N.C. Wildlife Action Plan that staff detected included ornate chorus frogs, gopher frogs, eastern spadefoot toads, spotted turtles, and eastern kingsnakes.



Among the reptiles and amphibians Wildlife Diversity Program staff (bottom left photo) found during spring surveys in the coastal region and Sandhills were an eastern kingsnake (above left photo), spotted turtles (top photo) and an eastern spadefoot toad tadpole cluster (left photo). (All photos by Jeff Hall)





## Mussel Surveys Conducted in the Yadkin-Pee Dee River

There are 19 species of mussels, including 12 N.C. Wildlife Action Plan priority species, which have been documented from the mainstem of the Pee Dee River. This June, Wildlife Resources Commission and Duke Energy Progress staffs continued their long-term quantitative surveys for priority mussel species in the Yadkin-Pee Dee River downstream of Falls, Tillery and Blewett Falls dams.

These data will be compared to future studies to determine if there are changes in diversity or abundance. The species diversity of mussels was excellent with 12 species of mussels collected downstream of Blewett Falls Dam, 12 species collected downstream of Tillery Dam and seven species collected downstream of Falls Dam.



*Surveying for mussels on the Yadkin-Pee Dee River is a collaborative effort between staffs with the Wildlife Commission and Duke Energy Progress.*

## Western North Carolina Amphibian Conservation Efforts Continue - Salamander Surveys

In spring 2013, Wildlife Diversity Program staff and a project partner from Duke University conducted visual encounter surveys in high-elevation spruce-fir and northern hardwood forests in Madison, Yancey, Avery and Ashe counties for the Weller's salamander, a Wildlife Action Plan (WAP) priority and special concern (SC) species, and the Northern pigmy salamander, a WAP priority and Significantly Rare (SR) species.

Two new populations of both species were documented in these surveys, one in the newest addition to Pond Mountain Game Land in Ashe County and one in Pisgah

National Forest in Madison County. The state previously had no known records of Weller's salamanders for Madison County according to the N.C. Natural Heritage Program database.

Besides inventorying high-elevation salamander communities, these collaborative efforts with Duke University had another purpose—to collect tissue samples for phylogenetic analysis as well as to collect habitat data for use in predictive models of possible effects of climate change on a high-elevation habitat specialist like the Weller's salamander.



*Staff with the Wildlife Diversity Program found new populations of Weller's Salamander (left), a SC and WAP priority species, and northern pigmy salamander (right), which is listed as significantly rare and is also a WAP priority species. (Photos by Lori Williams)*



## North Carolina Bat Acoustic Monitoring Program (NCBAMP) Launches into Third Year

North Carolina is home to 17 species of bats, all of which are insectivores. The impact these species have on insect populations makes them extremely beneficial to humans, both ecologically and economically.

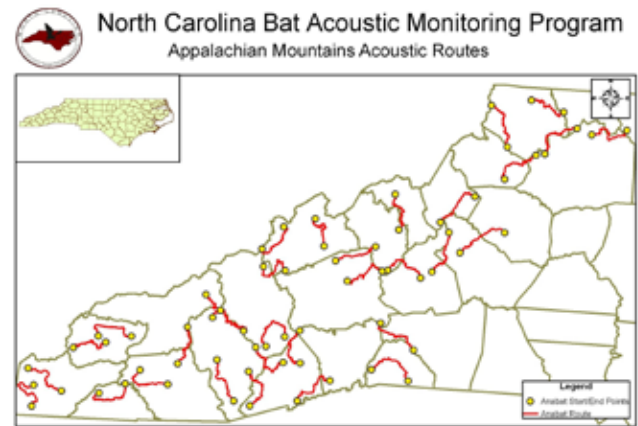
Bats are considered to be indicator species, and, therefore are key in assessing the health of an ecosystem. However, dramatic declines in North American bat populations from White-nose Syndrome (WNS) and wind energy development have highlighted the urgent need to have a more robust bat monitoring program in place. A national protocol was developed for state and federal agencies to establish acoustic routes on public and private lands to obtain information about regional trends of bat populations.

In 2011, the Wildlife Commission developed the North Carolina Bat Acoustic Monitoring Program (NCBAMP) based after this protocol, slightly adjusting the protocol based on the needs and capabilities of the Commission and its partners.

Since cave dwelling bats are negatively affected by WNS and most hibernacula occur in the mountain region, these car-based driving routes for NCBAMP were first initialized in the mountain region of the state. Thirty-two routes were established and each route is run twice between May 15 and July 15. For each route, an acoustic recording device is placed on top of the vehicle and a designated 20 miles are driven at 20 mph, recording bats along that segment of road. Although the effort is coordinated by a Commission staff member, the majority of these routes are run by dedicated citizen scientists. Biologists are currently wrapping up the third year of data collection for NCBAMP in the mountains.

In the first two years of the program, they recorded approximately 26,000 total sound files, with about 9,600 of those being identified as bat calls. In preliminary analyses of the 24 routes run in both 2011 and 2012, the number of bat calls and the number of bat calls per mile decreased from one year to the next (5131 to 3651 total bat calls; 5.4 to 3.8 bat calls per mile).

They will use quantitative methods to analyze call se-



*The 32 acoustic routes of the mountain region of North Carolina. All routes are 20 miles long. Areas where routes are not present is a result of dense human population or lack of roadways.*

quences to genus or species. Using quantitative methods for the identification analysis of bat call sequences is a more reliable way to manage a long-term data set because quantitative methods are consistent between surveyors and do not require extensive specialized training of people, like qualitative analysis.

Although there are multiple companies with automated bat call identification software programs, none of them have proven accurate enough to receive approval of the U.S. Fish & Wildlife Service. Once Commission staff is able to run data through a reliable and accurate automated bat call identification software program, it will compare the average for each route between years using a multivariate analysis to look for significant changes in total number of bat calls or number of calls per species. Changes in average number of bat calls will be compared between routes over the region to look at the overall bat activity in western North Carolina.

In the future, the Commission hopes to have the funding for the necessary equipment and staff to expand the program to the rest of the state. The coastal plain region and the Outer Banks are in great need of this type of monitoring program for bats. Little information exists on bat populations in these areas and the potential for off-shore wind energy development makes gathering information in the eastern region of the state increasingly important.





## Bird Conservation Efforts Conducted in Western North Carolina

Second quarter efforts focused on western region bird surveys. In preparation for surveys, Chris Kelly, a Wildlife Diversity Program biologist, led two bird refreshers at Needmore and South Mountains game lands.

In addition to game land point count surveys at Green River, Pond Mountain, and Cold Mountain game lands, staff carried out focal species surveys across western North Carolina. Annual cerulean warbler monitoring focused on the core population in Graham County, documenting 10 cerulean warblers across 36 survey points. Golden-winged warbler surveys included both long-term monitoring of timber units and Golden-winged Warbler Atlas Protocol points and surveys of the Roan Highlands, focusing on the Yellow Mountain Game Land.

In planning this year's efforts at Roan, staff helped test the newly released mapping tool developed by Appalachian Mountains Joint Venture.

Additional focal species surveys documented blue-winged warbler at two historical locations in Cherokee County, abundant whip-poor-wills on South Mountains Game Land, a successful bald eagle nest on Needmore Game Land and, at Sandy Mush Game Land, a successful barn owl nest and 12 successful American kestrel nests producing at least 53 nestlings.

Staff and partners from Southern Appalachian Raptor Research fitted nestlings with color-bands to assess survival and return rates. Northern saw whet owls were not detected at Pond Mountain Game Land or Sugar Mountain during limited surveys. Staff also contributed to monitoring of additional bald eagle nests and U.S. Nightjar Survey Network surveys.



Commission staff get a bird refresher from Chris Kelly, a Wildlife Diversity Program biologist, in preparation for bird surveys in western North Carolina (top photo). Among the species found were a kestrel (middle left) and a barn owl (middle right), as well as this male golden-winged warbler that was defending his territory in old field habitat recently acquired by the Nantahala National Forest in Jackson County. (Photos by Chris Kelly)



## Restoration Efforts Conducted on the Cheoah River

Following restoration of minimum flows in 2005 to the Cheoah River downstream from Santeetlah Dam, staff has cooperated with the U.S. Fish and Wildlife Service and others to restore native fishes and mussels to the river in Graham County.

The federal and state-listed threatened fish species spotfin chub and the mussel species wavy-rayed lampmussel (species of concern in North Carolina), and rainbow, (threatened in North Carolina), are target species in that effort and have been the focus of captive breeding programs to support their reintroduction since 2008.

Surveys performed in the Cheoah in early June produced positive results for each species. Spotfin chubs have been very successful, now occupying more than four miles of river with much evidence of reproduction and recruitment in their new home. They are now found in

densities in the recovering reach that are comparable to their healthiest known population in the Little Tennessee River. Also, both mussel species were found to be surviving and healthy at two release sites, with a high percentage of females collected that were gravid (holding juveniles). A third release site had experienced much scour during recent high water events, and none of the released mussels were recovered.



*Mature male spotfin chub defending a spawning site in the Cheoah River*

## Monitoring Efforts Conducted for Sicklefin Redhorse

In April, Commission staff again led cooperative efforts to monitor an important spawning population of sicklefin redhorse, a candidate for federal listing under the Endangered Species Act. They collected fertilized eggs for captive propagation and reintroduction, and will assess restoration efforts.

For the past six years, partners from the U.S. Fish and Wildlife Service, Conservation Fisheries, Inc., and Eastern Band of Cherokee Indians have cooperated with the Commission to sample a spawning population in the Little Tennessee River in Macon County to assess and monitor population size, demographics, and genetic structure, and to collect eggs and milt for a captive breeding program to support reintroduction of the species to the upper Tuckasegee River and the Oconaluftee River.

All sicklefin redhorse collected throughout the effort are implanted with Passive Integrated Transponder (PIT)

tags. Their reproductive condition is assessed, individual size and age data are collected, genetic samples are taken, and eggs and milt are collected from ripe individuals, before they're release.

Much population data have been collected since the project began. Population estimates from recapture of tagged fishes and effective breeding population size calculated from genetic samples indicate a large and healthy breeding population that uses the site year after year.



*In May, this sicklefin redhorse was the first one collected upstream from the removed Dillsboro Dam site and after six years of reintroduction efforts.*

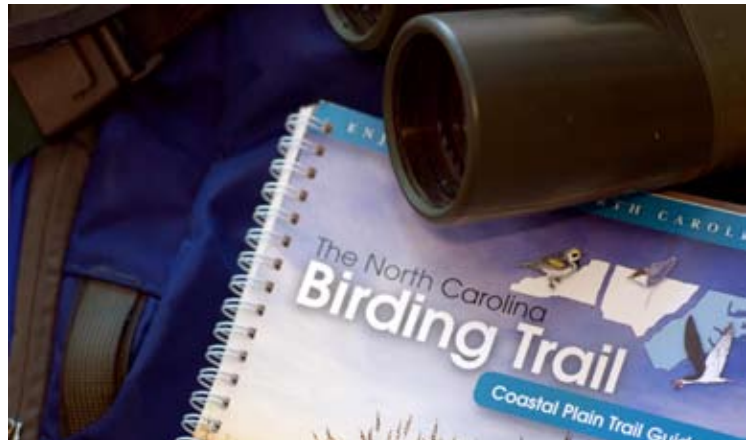




## North Carolina Partners in Flight and North Carolina Birding Trail Updates

Birding is big business. In 2011, wildlife watchers (the vast majority of whom are bird watchers) spent \$929 million on equipment and travel expenses in North Carolina. The North Carolina Birding Trail (NCBT) was designed to publicize great birding locations across the state. Recently, the NCBT significantly re-designed its website (<http://www.ncbirdingtrail.org>) to provide faster, more accurate information on birding in North Carolina. The main feature of the website is a statewide interactive map of all 327 NCBT sites, with links to detailed descriptions, driving directions, and a full bird list.

What if you want to see a particular species (an American redstart for instance)? The map allows you to search by species, displaying all the sites where you might likely see the bird, including records from other birders who have observed the species in the previous 14 days.



Scott Anderson



Indigo bunting





Scott Anderson



## 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.  

Name \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_ E-mail address \_\_\_\_\_

Credit Card # \_\_\_\_\_

Amount \_\_\_\_\_

Signature \_\_\_\_\_  
(if paying by credit card)

Donate online by visiting: [www.ncwildlife.org/give](http://www.ncwildlife.org/give)



## THE WILDLIFE DIVERSITY PROGRAM



The Wildlife Diversity Program was established in North Carolina in 1983 to prevent nongame species from becoming endangered by maintaining viable, self-sustaining populations of all native wildlife, with an emphasis on species in decline.

More than 1,000 nongame animals call North Carolina home. Many nongame species, including mammals, reptiles, birds, amphibians, snails, mussels, and fish, are common and can be seen or heard in your own backyard. Other nongame animals, such as bald eagles and peregrine falcons, were, at one time, considered endangered, but now soar high in the sky, thanks to the work conducted by Wildlife Diversity biologists.

The men and women who work for the Wildlife Diversity Program are dedicated to conserving and promoting nongame wildlife and their habitats through a variety of survey and monitoring programs, species management, and habitat conservation or restoration projects. While these programs and projects target nongame animals and their habitats, 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](http://www.ncwildlife.org/conserving).

## BUY A T-SHIRT AND KEEP NORTH CAROLINA WILD

Through the purchase of this commemorative wildlife buttons T-shirt, you can help keep North Carolina wild for future generations to enjoy and appreciate. T-shirt sale proceeds benefit the N.C. Wildlife Resources Commission's Wildlife Diversity Program, thanks to a generous donation by Neuse Sport Shop, located in Kinston. T-shirts are \$15 for adult sizes and \$12 for youth sizes. They can be purchased online at the Wildlife Commission's N.C. Wild Store, [www.ncwildstore.com](http://www.ncwildstore.com). Or online at Neuse Sport Shop, [www.nssnc.com](http://www.nssnc.com).







## 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](http://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