AMERICAN ALLIGATOR

THE ALLIGATORS among US

Commission biologists are answering questions about the state's American alligator population through tagging and tracking studies

written by Mike Zlotnicki
photographed by Melissa McGaw

Top: An American alligator suns itself on a log at Lake Waccamaw. Left: Leathery scales called scutes cover the alligator and are part of its protective armor that is difficult to penetrate.

Alicia Davis peered through her windshield with a furrowed brow. She brought her pickup truck to a quick stop, ran to the bed and grabbed a Penn Fierce II surf rod and reel. She stepped to the water, opened the bail and cast as hard as she could.

Davis wasn't at Cape Point throwing "8 and bait" (8 ounces of lead and a hunk of menhaden) for red drum. She was casting an unbaited, weighted treble hook at an alligator in a Columbus County pond in hopes of hooking it under a plate of armor and steering it close enough to shore, where a colleague would use a snare pole to help subdue the beast.

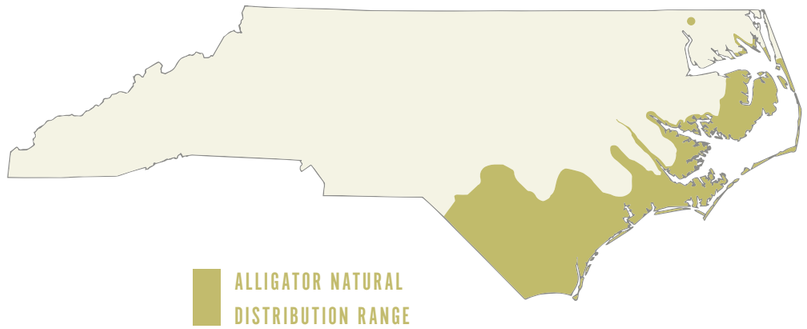
Why on earth would Davis want to hook an alligator of all things? It certainly is not for sport. She is the N.C. Wildlife Resources Commission's alligator biologist and is leading the Commission's efforts to better understand alligator populations, including their growth rates and nesting habits. Once the animal is on land her work would begin, including measuring, tagging, sexing and taking samples from the alligator before releasing it back in the water no worse for wear.

"There are a number of things we do not have significant data on, like nesting behavior, movement patterns and to some extent even occupied habitat," said Brad Howard, chief of the Commission's Wildlife Management Division. "The current management and research activities will continue to improve our knowledge and understanding of North Carolina's alligators and will provide the best data to allow the Commission to make informed management decisions as we move toward the future."

MEET THE AMERICAN ALLIGATOR

The American alligator is one of just two species of alligator in the world, the other being the Chinese alligator of the Lower Yangtze River Valley in China. North Carolina is the northernmost range of the American alligator, with the largest populations in the Coastal counties of Brunswick, New Hanover, Craven, Columbus, Onslow and Pender.

In North Carolina, male alligators can reach 13 feet in length and weigh up to 500 pounds or more. Females generally grow to be less than 9 feet and weigh up to 200 pounds. In the Southeast, alligators inhabit freshwater swamps, marshes, ponds and



the backwaters of rivers. They are sometimes even observed in brackish water and on beaches in the southern part of the state.

Adult alligators are usually solitary, but will congregate together in the spring during breeding season. Both males and females vocalize. Mating takes place from May through June. After mating, the female alligator begins to build a mound-like nest of leaves, sticks, mud and other debris. The nest, built near water, measures 2 to 3 feet tall and up to 6 feet in diameter. Heat is generated by the decomposition of the leaves and other debris. This acts as a natural incubator. The average clutch size is 30 to 45 eggs. After laying the eggs, the female covers them with mud and other debris and actively guards the nest. The sex of young alligators is not determined at conception; rather, it is determined by the average temperature of the nest. After approximately 65 days, the young hatch and are about 9 inches long.

Adult alligators feed on fish, snakes, frogs, turtles, birds and mammals. In fact, alligators are one of the only predators of invasive nutria, a large, destructive rodent native to South America. Alligator growth rates are significantly lower in North Carolina than alligators that live in warmer climates farther south. Alligators are reproductively mature after reaching around 6 feet, regardless of age. It likely takes at least 18 years for female alligators in North Carolina to reach more than 6 feet in length, compared to roughly half that length of time in Louisiana. In North Carolina, alligators rarely bite humans, and the bites that do occur are often caused by people who deliberately provoke or harass them.

"There are many interesting aspects of alligator biology," Davis said. "For instance, maternal investment is unique to alligators compared to other reptiles. A turtle, for example, lays her eggs and leaves; the young will hatch and fend for themselves from day one. An alligator will guard the nest throughout incubation, assist in the hatching process and help her hatchlings reach the water. Then, they will stay in a group called a pod in her territory, where she'll defend them from predators for the first few years of their lives."

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Davis also noted alligators' resistance to infection and disease. "The only sick gator I've ever seen had two lead sinkers in its belly and probably suffered from lead toxicity, which suppresses the immune system."

A UNIQUE STUDY

The alligator was first listed as Endangered in 1967 by the U.S. Fish and Wildlife Service. Populations have rebounded and it is now listed as Threatened due to Similarity of Appearance with other crocodilians. The current listing is associated with the illegal trade of other more imperiled crocodilian species across the globe and it simply places special restrictions on the trade and processing of alligator parts like meat and hide to protect the other species.

"The population viability of the alligator is not in question. Through many years of effort, alligator populations are recovered throughout their native range," Howard said.

The Commission's current studies of alligators are among its first in several decades and began with the creation of an Alligator Task Force in 2016 and the subsequent Alligator Management Plan passed by the Wildlife Commission in 2017. The Alligator Management Plan, which guides management of alligator populations in North Carolina, centers around five goals:

- Maintain viable populations of alligators in North Carolina
- Conduct research to support science-based management of alligators

Alligators' eyes rest relatively high on their head, allowing them to see at the surface of the water while most of their body is submerged. Alligators hear with ears located behind their eyes that are very sensitive to vibrations in the water.

THOMAS HARVEY/NCWRC

Top: During a training session at Lake Waccamaw, Commission biologists and law enforcement officers practice safely capturing and handling alligators before measuring (bottom left) and collecting data from the alligator. Bottom right: Commission biologist Alicia Davis talks with a resident during a research outing at Lake Waccamaw.

GOALS OF THE ALLIGATOR MANAGEMENT PLAN

- MAINTAIN VIABLE POPULATIONS OF ALLIGATORS IN NORTH CAROLINA
- CONDUCT RESEARCH TO SUPPORT SCIENCE-BASED MANAGEMENT OF ALLIGATORS
- PROMOTE PUBLIC SAFETY THROUGH MANAGEMENT OF ALLIGATOR POPULATIONS
- PROVIDE COMPREHENSIVE INFORMATION ABOUT ALLIGATORS AND ALLIGATOR MANAGEMENT
- PROVIDE OPPORTUNITIES FOR PUBLIC ENJOYMENT OF ALLIGATORS THROUGH HUNTING AND WILDLIFE VIEWING

- Promote public safety through management of alligator populations
- Provide comprehensive information about alligators and alligator management
- Provide opportunities for public enjoyment of alligators through hunting and wildlife viewing

Dr. David Cobb, now the research director for the Commission, was chief of Wildlife Management in the early years of North Carolina's alligator research. He said the original work in the late 1970s and early 1980s was targeted at learning about alligator biology and not necessarily population dynamics. The current research developments are offshoots of the Alligator Management Plan.

"It's more behavioral and reproductive studies now," Cobb said. "One of the things that we've learned from other places is that if you address the size and sex of alligators that are killed, that is, if you protect breeding females, then you can maintain a sustainable population."

The Commission is achieving its goal of studying alligators through a multi-division collaborative effort. The many hours Wildlife Management biologists spend in the field would not be possible without contributions from the Private Lands Program, Land and Water Access staff, and Law Enforcement officers who spend many hours alligator trapping, marking, relocating and collecting data.

Paying for alligator research is more difficult than other animals because the species does not qualify for funding that other projects receive, significantly limiting the Commission's ability to conduct research projects. A bill currently before Congress, the Recovering America's Wildlife Act, could be a boon for research into species like alligators. The act would provide more than 20 times the funding currently available to state wildlife agencies like the Commission to restore essential habitat and implement conservation strategies for many Species of Greatest Conservation Need as identified in Wildlife Action Plans, including alligators.

"If that passes that will bring a lot of important resources to the Commission," said Manley Fuller, vice president of conservation policy with the N.C. Wildlife Federation, whose career began as one of the original researchers to study North Carolina alligators in the late 1970s. "That would bring tremendous resources to the Commission to implement the Wildlife Action Plan. [It will benefit] game and nongame animals, Endangered [species], and a lot of [these funds will be used] to keep species from becoming Endangered."

GATHERING DATA

Davis, the surf-rod wielding caster in the opening paragraph, has been assisting with the Commission's alligator research and management efforts for the past three and a half years. The Division typically has several projects running concurrently. One of the first was to initiate a new marking and data collection protocol in which each animal is physically marked with a tag inserted under its hide.

"That applies to every single alligator that's handled for any reason, whether I'm going out working on this research project or whether our guys on the coast have to go catch an alligator on the beach and take it somewhere," Davis said. "Everybody, including other researchers that are permitted by us to be able to do their work, who puts their hands on an alligator in North Carolina moving forward since 2017, has to mark the animal and collect data and then submit those data back to us for us to have on-hand in our database in case it's recaptured."

Data collected include GPS location, total length, length from snout to vent (many gators lose parts of their tails at some point during their long lives) and a PIT (passive integrated transponder) tag inserted in the tail behind the right rear leg (the same kind of microchip used in pet dogs and cats). The animals are externally marked by tissue samples taken from scutes (the ridges on an alligator's tail), which will inform a trained observer about the year and watershed the animal was originally captured in. Staff biologists also determine sex by cloacal examination.

One of the Commission's research efforts centers around putting radio transmitters on adult female alligators to learn more about their nesting habitat. By using GPS technology, biologists can locate the tagged alligators by satellite.

THOMAS HARVEY/NCWRC

NATURE'S WAYS

How Do Alligators Find Their Meals?
See Nature's Ways, page 43.

Left: Commission biologists insert a PIT (passive integrated transponder) tag behind the right rear leg of each alligator they capture and release. This allows them to identify each alligator they recapture. Scutes are removed from the tails of captured alligators in a pattern that identifies date and location.

"We know very little about where nesting occurs in North Carolina," Davis said. "One of the drivers behind these efforts to track females to individual nest sites is that when we discover where nesting is taking place, particularly on our game lands, we can consider establishing those areas as sanctuaries."

Davis' work that day at Lake Waccamaw involved another facet of the job done by many Wildlife Management Division staff in the Coastal Region: training Commission staff and others on how to safely capture and handle alligators and follow the mandatory marking and data collection protocol.

"We've had five capture sessions now where we just take staff out and catch as many alligators as we can for three days. The data collected at Lake Waccamaw will be used to learn more about local population demographics, such as how many live there and how fast they grow," she said. "However, it also creates a really unique opportunity for our staff, other researchers and some external people who handle alligators for nuisance reasons to get some hands-on training."

Another ongoing project involves capturing alligators and putting GPS transmitters on some that are relocated to learn more about their movement upon relocation. It will help in evaluating relocation as a management tool.

"It's no secret that some alligators have a strong homing instinct and can show up in their original territory within a few months or years after being relocated," Davis said. "One thing we hope to learn through GPS tracking of individuals is which situations might be more successful than others. Maybe some release sites work better than others? Or a certain age-class for each sex? Or some combination of other factors yet to be identified? Whatever we learn is going to help us make more informed decisions down the road."

These transmitters will also help them learn more about how often gators don't survive relocation efforts. "If we get a mortality event," Cobb said, "through the GPS technology, we can go out with an antenna and use the VHF technology to find the dead alligator or transmitter or whatever's left."

Additionally, the Commission is planning and developing annual spotlight surveys, which are done at night using powerful flashlights to spot alligators' unique red eyeshine. This type of survey will help the Commission get a "pulse on the population," Davis said.

"We hear anecdotally from people who spend a lot of time on the water who say, 'I see more alligators than I used to see' while other people might say, 'I used to see a lot more than I'm seeing now,'" Davis said. "It may take a few years to establish a baseline range for each route, but by starting to survey the same routes every single year, we will hopefully be able to detect whether local numbers are increasing or decreasing or staying relatively stable. As a whole, that's something we're really interested in, but trends could also be different in different areas."

HANDS-ON WORK

So how does Davis, Commission biologists and wildlife technicians from local depots who know the game lands best catch alligators? I followed Davis around Gull Rock Game Land in Hyde County and Lake Waccamaw to get a first-hand look.

In Hyde County, Davis slowly cruised the myriad ditches and canals, often with an intern or wildlife technician in the bed acting as a spotter. When a small alligator was spotted, someone would scoop it up with a net. For bigger alligators, they'd try the snagging method with surf rods and treble hooks.

THOMAS HARVEY/NCWRC

Alligators grow slowly in North Carolina, the northern limit of the species' range. It may take this juvenile 16 years to reach sexual maturity.

To catch big gators that aren't around when the crew is on patrol, she creates a snare trap. Two pieces of plywood attached to angle iron are pounded into the ground to shape a funnel. A rope snare anchored to a stout tree trunk is open about halfway in. An aromatic hunk of roadkill is placed at the top of the trap. If all goes to plan, an alligator enters the trap, puts its head through the loop, and triggers the mechanism that tightens the snare as it tries to eat the bait. When Davis checks the trap the following morning, the gator will be swimming at the end of the rope, unharmed and ready to be hauled to shore.

Davis appreciates being on the cutting edge of research for such an ancient creature, and there are several factors driving interest. She notes that some constituents have expressed an interest in alligator hunting, which has been popularized by TV shows like "Swamp People" and "Gator Boys." Davis also points to an increase in the number of calls from the public concerning alligators, which is "not surprising, given the continuous land development and human population growth occurring in Coastal areas," she said.

Alligators were here long before humans settled North Carolina. The important research being conducted by Commission biologists will help us learn how to coexist with these ancient creatures. ◆

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A JOB FOR THE GATORS

Meet Alicia Davis, the N.C. Wildlife Resources Commission's alligator biologist. For the past several years, Davis has been leading the Commission's efforts to study alligator populations and habitats. Although she never dreamed of becoming an alligator biologist, the Jasper native describes her work as a dream job. Here's why:

"I love getting my hands on an alligator, knowing this is almost exactly how they looked millions of years ago," Davis said. "And I love the feeling you get when you catch one that hasn't been marked yet and you think, 'I can't wait to catch you in 10, 20, 30 years from now and find out how much you've grown.'

"Also, I still just really like helping people," Davis continued. "As much as what we do is focused on conserving the critters, I like to remind folks that ultimately, we are managing these wildlife resources for the sake of our constituents. I really like talking to people and listening to their concerns and teaching them about alligators because that's such an important part of wildlife management and what we should be doing in order to make the biggest conservation impact."

Davis joined the Commission in 2015 and spent her first year assisting constituents with their wildlife problems. That hard work, which included many calls about alligators, led to an opportunity to help restart the Commission's alligator research.

"I was asked to serve in a supportive role to the wildlife diversity coordinator and the Alligator Task Force in their efforts to develop the Alligator Management Plan [AMP]," Davis said. "While I was in that position, I ended up learning a lot about alligators and the management challenges specific to our state, I helped develop new protocols for marking and collecting data from handled alligators, and I began providing training and equipment to field staff to collect data from alligators. When the AMP was completed and adopted by our agency, they needed a biologist to implement the plan, so of course I applied for the job. And the rest is history."