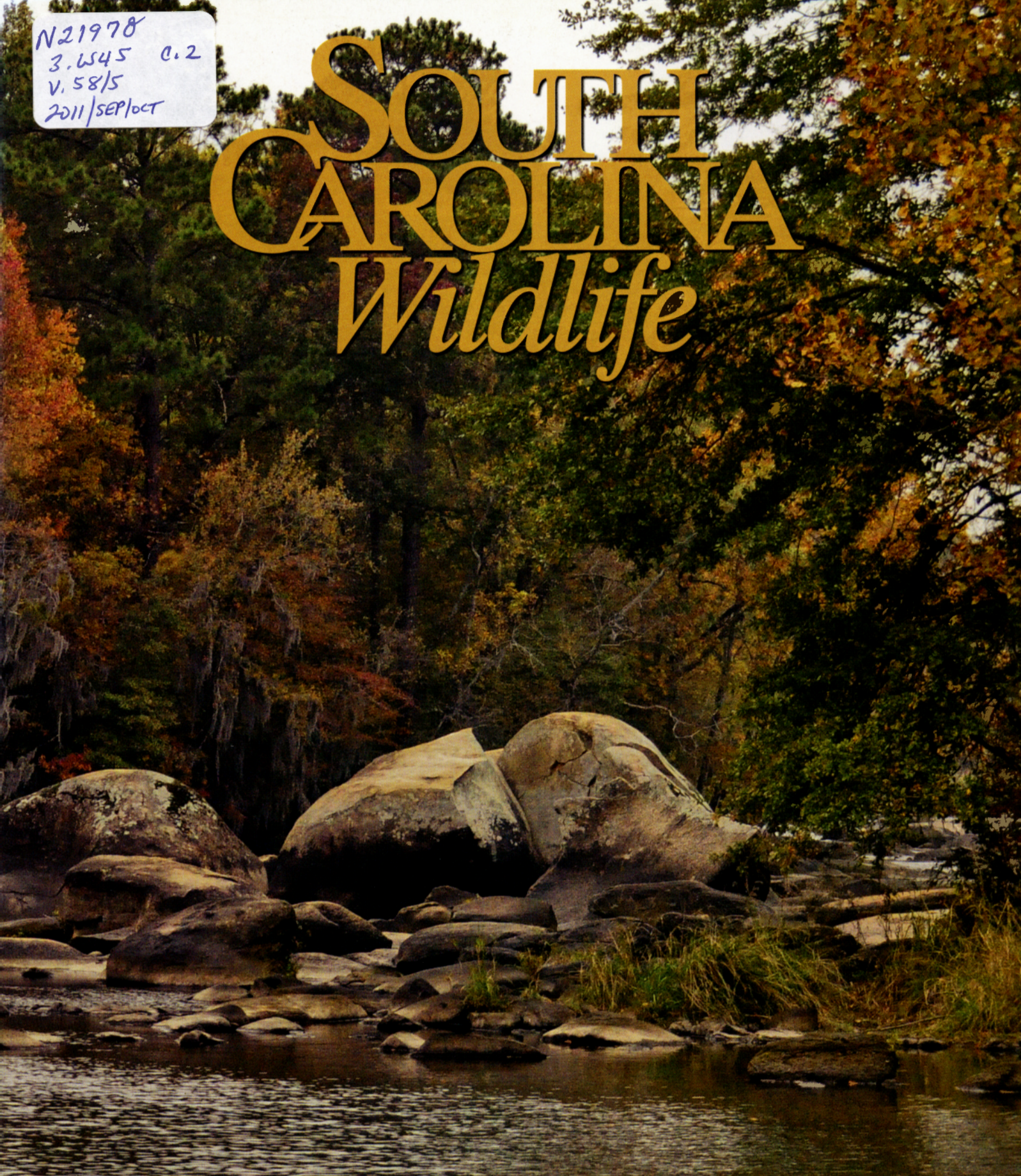


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South Carolina Wildlife Magazine is Dedicated to the Conservation, Protection and Restoration of Our Wildlife and Natural Resources, and to the Education of Our People to the Value of These Resources.



Directions

When I was a young man studying marine biology at the College of Charleston and wildlife biology at Clemson, computers were not yet a tool we thought of as playing a major role in the science of natural resources management. This was still the era of room-sized computers and punch cards, and very few folks could envision what a personal computer would look like. What a difference a few decades make! As with every other scientific endeavor, today we can't imagine doing our jobs without them. Nearly everything the scientists and natural resources managers at the DNR do is intensively data-driven, and computers have dramatically improved our ability to collect and organize useful information about the natural world that helps us do our jobs.

Computers, spreadsheets and number-crunching databases might be the last things on someone's mind when they are sitting quietly in a deer stand, fishing on one of our beautiful scenic rivers or enjoying a long solitary hike down a trail through a wilderness area, and I sincerely hope they are. After all, that's one of the things we value most about our natural resources and wild places — their inherent ability to allow us to relax, forget the stresses and demands of modern life and revel in the glory of God's creation. (At least until the cell phone beeps.) But, when it comes to protecting those natural resources, there's no doubt that technology has enhanced our ability to make better, science-based decisions.

Computers and the Internet have enhanced the "advocacy" aspect of the DNR's core mission as well. Outreach programs providing information about our natural resources to state citizens have long been a primary focus for us, one that *South Carolina Wildlife* magazine was created to help fulfill back in 1954. Our goal is to educate and motivate people — especially young people — to become actively engaged in the outdoors. *SCW* is, and will continue to be, a great tool for this, providing our readers with a window into our state's bountiful natural resources. But increasingly, the Internet and social media sites such as Facebook, YouTube and Twitter are changing the way we communicate. Let's face it, attempting to reach a college-aged or younger audience today without utilizing these new communications tools would be virtually impossible, and the DNR is actively employing them to engage citizens and advance our advocacy mission. Our News Section maintains an agency Facebook page that currently has approximately 17,000 fans, with more being added each day. We are approaching 2,000 "followers" on Twitter, and at last count, our YouTube video channel had recorded more than 60,000 views. Soon we'll be posting a new series of how-to videos, beginning with fishing basics, on our YouTube channel. Our agency website, www.dnr.sc.gov, provides a wealth of information for folks interested in the outdoors, including an inventory of all of our managed lands, with maps, directions and permitted activities listed for each site. And of course, you can find lots of great stories and photographs to whet your imagination on the magazine's homepage at www.scwildlife.com (not to mention subscription information). In short, there's a wealth of information available right through your computer about the great South Carolina outdoors. I encourage you to access it, and then turn off that screen and get busy experiencing it. I'll see you out there. 🐛

—John E. Frampton, Director
South Carolina Department of Natural Resources



EMILY COPPE

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DNR PHOTO



John Cely tracking swallow-tailed kites in 1986.

Kudos for Kites, John Cely . . .

Loved the latest (May-June 2011) issue of *SCW*. I'm a longtime subscriber from Raleigh, North Carolina, and continue to enjoy your excellent publication. John Cely continues to put out great work (with his article "Aerialists Supreme").

I can absolutely guarantee that kites exist (then and now) in southeastern North Carolina. I grew up in Robeson County, living about equidistant between the Lumber and Cape Fear rivers. I have seen kites since I was a young boy. I sighted them this spring on the Cape Fear River, near Lock One. To be precise, it was April 3, 2011, at 2:12 p.m. We were fishing (cut shad) for blue and flathead catfish about two miles east of the lock when the unmistakable sight of a kite came into view. It was feeding fairly steadily in the area in which we were fishing.

Great publication, great article about the groundbreaking scientific history of these birds . . . particularly

as they apply to South Carolina.

Keep up the good work!!!

Carlton Howard
Raleigh, N.C.

. . . and *SCW*!

The latest issue of *South Carolina Wildlife* is one of the best ever; a beautiful cover, articles about native plants and rain gardens, and a fine article on swallow-tailed kites by John Cely.

Like him, we remember our first sighting of these exceptionally beautiful birds. It was on Bulls Island, not far from where he saw them, in the spring of either 1970 or 1971. A quarter-of-a-century later we saw five or six soaring and dipping on the slopes of Mt. Chirripo in Costa Rica, and we've seen them from Interstate-95 as we left Florida heading north. His subject matter is breath taking, and his manner of writing is worthy of it. It is exciting to know what he and his fellow birders are doing within our area to preserve and increase the range of these raptors.

We're always glad to see your maps and articles about significant sites within the state; we're certain that we're not the only ones who save them for planning field trips. Thank you for your fine work.

Dr. Samuel B. and Eva S. Pratt
Inman

SCW welcomes comments or questions about the articles we run or on other issues pertaining to our state's natural resources. Send letters to David Lucas, SCW magazine, P.O. Box 167, Columbia, S.C. 29202-0167, or via e-mail to lucasd@dnr.sc.gov. Please include your name, address and telephone number. We reserve the right to edit letters for length or clarity. 🐛



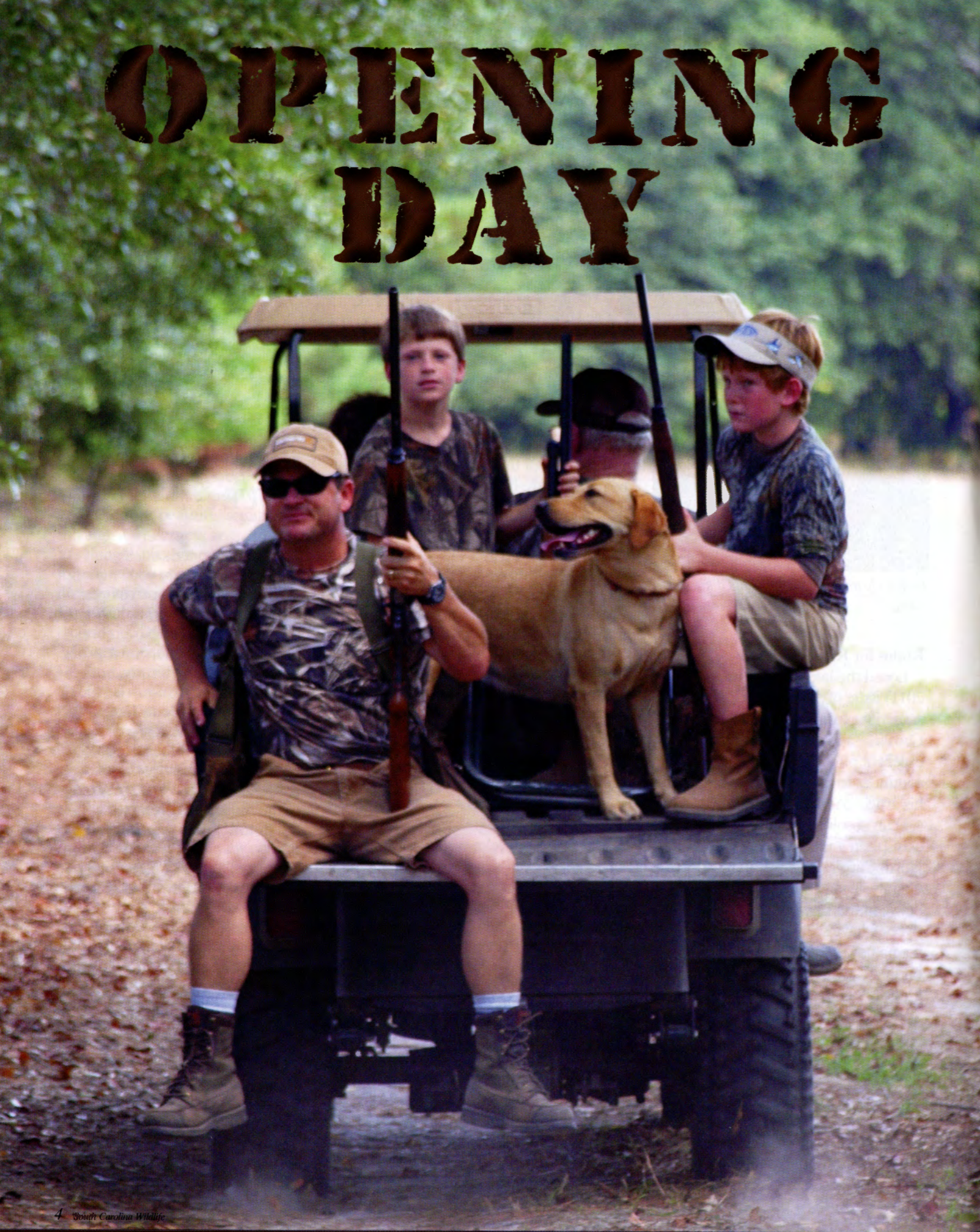
STEWART GRINTON

IN OUR NEXT ISSUE . . .

A wise man once said, if you want to know where you're going, look back at where you've been. You've got to know your history, in other words. Our November-December issue offers up a strong dose of our state's history, both the natural and the man-made kind, with a feature on John James Audubon's Charleston connection, a tour of some of the state's coolest natural history museum collections, and a trip to see some of the modern-day remnants of the historic Cherokee Path.

Plus . . . The job of Natural Resources Conservation Officer requires courage and sacrifice — sometimes the ultimate sacrifice. *SCW* remembers Frank Floyd, an officer lost in the line of duty in 1949. We'll also showcase the best outdoor photographs from the 2010 Palmetto Sportsmen's Classic/*South Carolina Wildlife* magazine photography competition, share some wonderful outdoor memories with longtime contributor Rick Leonardi, and tag along on an Out Scoutin' adventure to Lewis Ocean Bay Heritage Preserve. 🐛

OPENING DAY



With pen and camera, Kelly Marie Brown captures the scenes and conversations of a cherished Labor Day weekend ritual — opening day of dove season.
text and photos by Kelly Marie Brown



"I GOT SEVEN!" announces eight-year-old Bryson, looking up at Alex, towering above him against a bright blue sky.

"Wow, buddy, seven you say? That's darn good," replies Alex, with authentic enthusiasm.

"Yes sir, but one got away."

And, as is the custom with dove shoots, laughter commences.

It's the first dove hunt of the season — an annual gathering of family, friends, kids and dogs — and one can tell immediately that this is no ordinary hunt. It's more like a Fourth of July party, except, instead of fireworks, the afternoon stillness is punctuated by the steady sound of shotguns firing as participants pit their wing-shooting skills against the lightning fast streaks of brown feathers known as mourning doves. For this most-anticipated event in our household barring Christmas, the excitement of our youngest son can barely be contained. Even though the fields are dusty and the first hunt of the year is typically the hottest, it's the most enjoyable because as Bryson says, "It's Finally Here!"

Just about the time school teachers have memorized their new pupils' names, the questions begin — "Are we hunting birds soon? Is it this weekend? Do I have shells?" — on and on it goes. And then we're there, standing outside the truck, gathering packs, coolers, bucket seats, pup and kids. There are many people gathered at this opening day dove hunt — usually ten to twenty hunters, plus kids, the hunters' better halves and best friends (usually of the furry sort; the best friends, that is, not the spouses). What it really is, is an annual coming together; an opportunity to reconnect with the things, people and traditions that matter most to us down here in the South Carolina Lowcountry.

And should you arrive without a child, friend, relative, spouse or pooch in tow, don't worry, you're bound to gain a friend or even figure out you're kin to one of the folks standing around before the day is over. I've seen it happen, not once, but twice. Granted it was a distant relation, but two people who didn't even know each other left the shoot with a new cousin.

But the hunt is what brings us together, and when the call is made to "kennel up" you can breathe in the excitement. Even my heart pounds at the thought of what lies ahead. For most of our group, it's the challenge of getting a limit of the fast-moving birds, but for me it's the photo opportunities. Regardless of the motivation, we all

Never mind the heat! The looks on the faces of the participants — both two-legged and four-legged — at the beginning of the first hunt of the year say it all. Excitement and anticipation are in the air.



A canine companion, whether a new pup learning the ropes, or a graying veteran eager for one more chance at a successful retrieve, is a valuable addition to any dove-hunting team.

load up without hesitation. Normally, an eighty-year-old man might decline the request to hop on the back of an ATV, but not today. Everyone is ready and willing for their chance to climb aboard and get to their designated spot.

Some hop off with a bucket and gun. Some carry a bucket and a gun with a dog following. Some carry two buckets and two guns. The two-bucket folks are generally the ones with a young son or daughter. Our Bryson has to carry his own equipment. "If you can't tote it, then you're not big enough to use it," says my husband, Angus. Nonetheless, I have seen him carry all of the above, including sleeping child, rambunctious dog and cooler all at the same time.

For a while, it was only us three — Angus, Bryson and me — but now we have Jill, a great bird dog and beloved member of the family. Before Jill, first me, and then Bryson, were the designated retrievers. Bryson loved to tell people this and even got into the habit of lifting his leg on trees like a pup. It took us a while to break him of that habit.

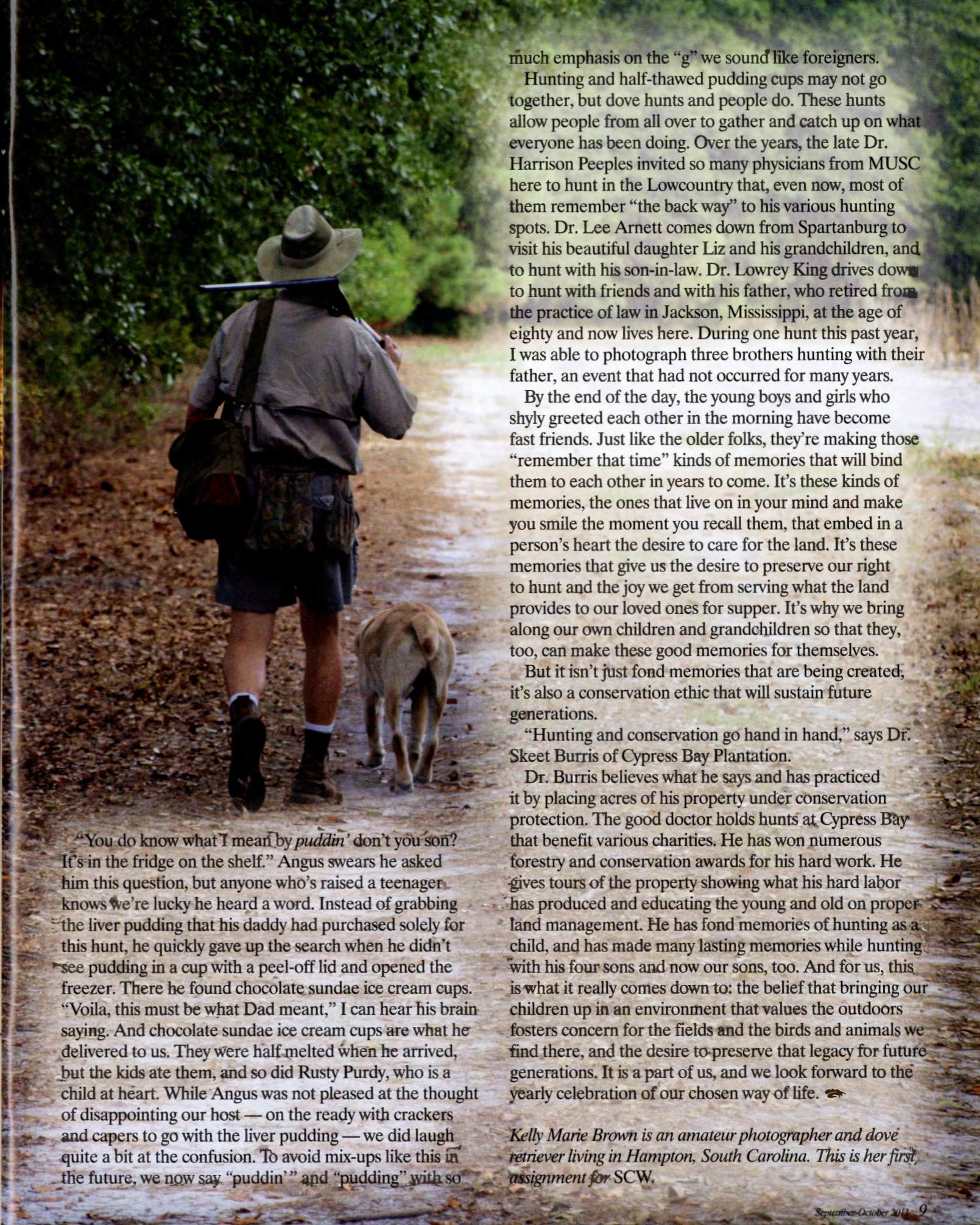
Most dove dogs are very well-socialized. They have to be, because they run free in the field and must have good manners. "Dead bird" lets your retriever locate a fallen bird. The shooter calls out "dead bird, dead bird," as this sort of cheers on the hound (or the Mrs. in some cases) to keep searching until the bird is found. (At least this is my interpretation; it may not be completely accurate.) I always felt like I'd found gold when I

located the downed bird.

All good things must come to an end, as the saying goes, but that's not the case with opening day hunts. If the pre-hunt gathering is like a festival, then the post-hunt must be Mardi Gras. When the last bird is bagged, the fun is really just beginning. Being "First Man Out" lends bragging rights to the gentleman or gentle woman who limits before anyone else. The funny thing is, the first man out doesn't usually brag at all. It's the men (not the women — factual information here) who burn through two or more boxes of shells that talk the most trash. That's the fun of it though.

Back at the shed, a host of grills are fired up to cook everything from salmon to skewered duck. Coolers, having been unloaded and added to the host's provisions, provide an abundance of beverages for all. Some folks make a casual walk out to their vehicles about every thirty minutes and seem to peer into a secret treasure chest. I don't quite know what they do out there, but they always return with a full cup — probably Gatorade or some other hydrating juice. Dips, desserts and divine specialties are spread out for all to enjoy. No one goes home hungry. There's an abundance of great food provided by host and guests alike. We've taken many different dishes over the years, but I will never forget the time we took liver pudding to a shoot.

We were running short on time, so Angus asked our older son, Saul, to fetch the *puddin'* in the office refrigerator and bring it to the field.



much emphasis on the “g” we sound like foreigners. Hunting and half-thawed pudding cups may not go together, but dove hunts and people do. These hunts allow people from all over to gather and catch up on what everyone has been doing. Over the years, the late Dr. Harrison Peebles invited so many physicians from MUSC here to hunt in the Lowcountry that, even now, most of them remember “the back way” to his various hunting spots. Dr. Lee Arnett comes down from Spartanburg to visit his beautiful daughter Liz and his grandchildren, and to hunt with his son-in-law. Dr. Lowrey King drives down to hunt with friends and with his father, who retired from the practice of law in Jackson, Mississippi, at the age of eighty and now lives here. During one hunt this past year, I was able to photograph three brothers hunting with their father, an event that had not occurred for many years. By the end of the day, the young boys and girls who shyly greeted each other in the morning have become fast friends. Just like the older folks, they’re making those “remember that time” kinds of memories that will bind them to each other in years to come. It’s these kinds of memories, the ones that live on in your mind and make you smile the moment you recall them, that embed in a person’s heart the desire to care for the land. It’s these memories that give us the desire to preserve our right to hunt and the joy we get from serving what the land provides to our loved ones for supper. It’s why we bring along our own children and grandchildren so that they, too, can make these good memories for themselves. But it isn’t just fond memories that are being created, it’s also a conservation ethic that will sustain future generations.

“You do know what I mean by *puddin’* don’t you son? It’s in the fridge on the shelf.” Angus swears he asked him this question, but anyone who’s raised a teenager knows we’re lucky he heard a word. Instead of grabbing the liver pudding that his daddy had purchased solely for this hunt, he quickly gave up the search when he didn’t see pudding in a cup with a peel-off lid and opened the freezer. There he found chocolate sundae ice cream cups. “Voila, this must be what Dad meant,” I can hear his brain saying. And chocolate sundae ice cream cups are what he delivered to us. They were half melted when he arrived, but the kids ate them, and so did Rusty Purdy, who is a child at heart. While Angus was not pleased at the thought of disappointing our host — on the ready with crackers and capers to go with the liver pudding — we did laugh quite a bit at the confusion. To avoid mix-ups like this in the future, we now say “puddin’” and “pudding” with so

“Hunting and conservation go hand in hand,” says Dr. Skeet Burris of Cypress Bay Plantation. Dr. Burris believes what he says and has practiced it by placing acres of his property under conservation protection. The good doctor holds hunts at Cypress Bay that benefit various charities. He has won numerous forestry and conservation awards for his hard work. He gives tours of the property showing what his hard labor has produced and educating the young and old on proper land management. He has fond memories of hunting as a child, and has made many lasting memories while hunting with his four sons and now our sons, too. And for us, this is what it really comes down to: the belief that bringing our children up in an environment that values the outdoors fosters concern for the fields and the birds and animals we find there, and the desire to preserve that legacy for future generations. It is a part of us, and we look forward to the yearly celebration of our chosen way of life. 🐾

Kelly Marie Brown is an amateur photographer and dove retriever living in Hampton, South Carolina. This is her first assignment for SCW.

Nature Takes

the Long View

Twenty-two years after Hurricane Hugo violently redrew the topography of Bulls Island, its ever-changing landscape is a fascinating place to witness the slow but steady pace of nature.

by T. Travis Brown

*J*ust off the South Carolina coast, a humid breeze buffets our faces, and the surprising remoteness of our barrier island destination begins to sink in. My wife and I are aboard the Coastal Expeditions ferry to Bulls Island, (sometimes called Bull Island), a barrier island at the southern end of Bulls Bay. We've departed from a dock that is only about twenty miles from the ever-growing Charleston suburbs, yet the island we're headed to is essentially undeveloped. Part of the Cape Romain National Wildlife Refuge, it's an amazing place to experience the ecology and wildlife of a natural barrier island. It's also a great place to study the effects

of a natural disaster and witness the healing power of nature. Twenty-two years ago, the landscape of Bulls was decimated by the high water and destructive winds of Hurricane Hugo's leading edge, an event that drastically changed the character of the island.

The natural "boneyard" on the beach at the north end of Bulls Island is evidence of the gradual changes that occur over time on South Carolina's coastal barrier islands. However, scientists and managers with the U.S. Fish and Wildlife Service believe the pace of erosion on the island is accelerating due to rising sea levels.



MICHAEL FOSTER

The thick, jungle-like understory that now shades Bulls' interior is a relatively new phenomenon in the life of the island, created after Hurricane Hugo wiped out the majority of the loblolly pines that previously dominated the landscape.

On the ferry ride, our guide relates some of the history and ecology of the area, pointing out American oystercatchers, cordgrass and other common inhabitants of the marsh. If we had been here a few years ago, we might have had a chance to glimpse a red wolf or find some tracks. The island was once used as a breeding site for these endangered canines, though the island breeding program was discontinued in 2005.

My wife and I lived on the coast for about a year, but to see what a barrier island looks like in its natural state

is a relatively new experience for us. Though perhaps the phrase “natural state” is a bit misleading. Actually, what a natural barrier island looks like can change, literally, overnight. That’s what happened here on Bulls Island during Hugo; forests of towering old-growth pines were snapped by high winds, and the landscape was drastically rearranged by a twenty-foot storm surge. According to Captain Chris Crolley (owner, operator and lead naturalist of Coastal Expeditions), much of the island was once shaded by huge loblolly pines. It was a climax maritime forest with very little undergrowth, but after Hugo, the island became a jumble of downed trees, shrubs and vines. The broken trunks and carcasses of those huge pines can still be seen along the island’s trails and roads. “For all intents and purposes, every live pine that we see on the island today is twenty-one years old [or younger],” says Captain Chris.

Still, the habitat that we are seeing as we traverse the island has healed remarkably. While we pass quite a bit of undergrowth, there are still some large trees. In a paper published in the journal *Forest Ecology and Management*, William Conner, David Mixon and Gene Wood describe the changes in habitat they have measured since the hurricane. Many sabal palmettos and live oaks survived Hugo’s pounding, but the pines were almost eliminated. However, after about a decade the pines showed rapid recovery, with young trunks covering about 70 percent of the area that they did before the storm. Unfortunately, increased sunlight and moisture also created ideal conditions for invasive exotic species, like Chinese tallow or popcorn tree, to colonize parts of the island.

Vegetation on the island's sand dunes is sculpted by the near constant breeze and stunted by the ocean's salt spray. (Below) Sand dollars are a common sight on the Bulls Island beach.



MICHAEL FOSTER



TRAVIS BROWN



MICHAEL FOSTER

Hugo's storm surge breached the dikes of "Jack's Pond," first constructed as a managed waterfowl impoundment in the 1930s. Since then, attempts to repair the dike have met with limited success, saltwater intrusion has made the pond less hospitable for waterfowl and wading birds, and the ocean-side perimeter levee is now in danger from increased erosion. However, an \$879,000 grant obtained through the American Reinvestment and Recovery Act is allowing refuge managers to improve water management capabilities and habitat on other impoundments closer to the island's interior.

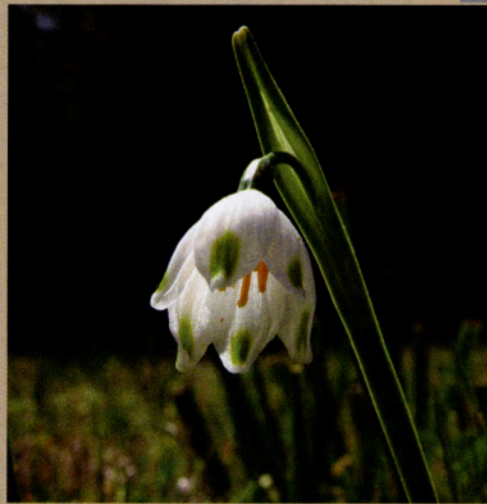
As we travel through these recovering forests, we spot one of the island’s huge black fox squirrels. Despite massive loss of habitat, the island’s population of these unique rodents has managed to hang on, and may eventually rebound to the large numbers once supported by the island’s pre-storm live oak population. Eventually, we emerge onto the beach and are greeted by the vast expanse of ocean, dunes and maritime forest sculpted by the saline winds coming from the ocean. The footprint of civilization has failed to leave a lasting mark on this landscape, and only the effects of wind and ocean are evident among the sand dunes and trees that receive the brunt of the pruning salt spray. As in many maritime forests, the trees on the side nearest the ocean are stunted by the spray, while trees behind them gradually increase in size. Without the huge pines to shield them from the salty wind, many of the live oaks that survived Hugo have suffered from canopy die-back in the decades since the storm.

We travel northeast along the beach, encountering more sand dollars than either of us have ever seen and reveling in a beachcomber’s paradise of horseshoe crabs, whelks, fish bones and various other gifts from the ocean. As we near the north end of the island, we come upon the boneyard beach. Here, the stark, bleached remains of a maritime forest are left on the beach in the form of dead trees and driftwood. In this part of the Atlantic Coast, currents are constantly eroding the northern end of barrier islands and depositing material on the southern end. As the current erodes this part of the island, salt water kills the trees that make up the “boneyard.” In contrast to the punctuated changes brought on by Hugo, the continual evolution typical of a barrier island’s southward migration is evident here. This process might seem a little sad to those of us who love forests, but it is part of a natural cycle in the life of a barrier island — one that has created a landscape with an eerie beauty.



TRAVIS BROWN

The freshwater impoundments on the island provide habitat for species such as this green tree frog.



TRAVIS BROWN

This early-blooming flower, identified by the author as a non-native snowdrop (genus *Galanthus*), and likely cultivated here purposely, is evidence of Bulls Island's long history of human occupation.



TRAVIS BROWN

In addition to creatures of the salt marsh and the sea, Bulls Island is home to a variety of upland animals, like this black racer.

As we search for the trail/road heading southwest down the middle of the island, it becomes apparent that I have scheduled way too much fun for one day. We are not going to make it back for the noon ferry and will have to wait for the 4:00 p.m. trip instead. Oh well, we have plenty of water and sunblock, and there is still much to see. Now it's time to find a way back down the center of the island, a task that our Coastal Expeditions guide warned might be a little difficult. After several dead ends, we pick up the trail leading to Lighthouse Road. The trail passes Jacks Pond, a large basin that provides habitat for wintering waterfowl. It is said to have been one of the best freshwater fishing holes in the area at one time. It is also the site of one of the most destructive effects of Hugo on the island. The massive storm surge compromised the dike, and almost a mile of it had to be rebuilt. Since the first breach, the impoundment has suffered a series of smaller breaches. Salt water has infiltrated the basin, and as the fresh water evaporates, it becomes hypersaline and unsuitable for many of the fish that once lived here.

Traveling on, we find ourselves in "Alligator Alley," which the guide suggested as an excellent place to find these huge crocodilians. Alligators are present in astounding abundance here on the island. We spot some huge ones sunning on the banks, along with great egrets wading in the shallows and even a tiny green tree frog clinging to the bulrushes. As we continue southeast down the center of the island, we travel through a variety of habitats, including some drier areas with stately live oaks. Fox squirrels flee, and a black racer suns its coils as we pass by.

Eventually we make it down to the Dave Clough wildlife viewing platform. Not much is moving at mid-day, but there are a few alligators, and this would be an excellent spot to look for water birds first thing in the morning. It strikes me how much difference a few feet of elevation can make on an island like this. In one area there is a bone-dry sunny spot complete with prickly pear cactus, while just a few yards away is a vast marsh full of alligators. It's a good reminder that many of the plants and animals here live right on the cusp of survival. A few inches of sea level rise or a big storm can change the landscape substantially.

Soon it's time to meet the ferry back at the dock, and we watch some seaside sparrows flit around the marsh as we wait. In his book, *Exploring Bull Island: Sailing and Walking Around a South Carolina Sea Island*, Bob Raynor recalls looking out at the island's salt marsh a few days after the storm: "Unlike everything on the



MICHAEL FOSTER

The Dave Clough viewing platform looks out on Bulls' more than 2,000 acres of salt marsh and is an excellent vantage point to spot alligators or other saltmarsh residents.



TRAVIS BROWN



MICHAEL FOSTER

The "Island Cat," operated by Coastal Expeditions under contract with the USFWS, takes visitors to and from the island. For schedules and rates, visit www.bullislandferry.com or call (843) 881-4582.

mainland, with the forest broken, defoliated and brown, there was no evidence of damage or destruction in the vivid green marsh." This salt marsh is one habitat that was affected very little by Hugo. The plants and animals of the coast have lived with storms like Hugo for thousands of years and are remarkably capable of recovering from a hurricane's wrath. Bulls Island may not be exactly the same now as it was before Hugo, but it is an amazing place to view the resiliency of nature first-hand. Despite its fearful intensity, decades from now, visitors may only see the slightest sign of the storm's passing.

T. Travis Brown is a working wildlife biologist and freelance writer/photographer. You can see more of his photography at brownswildimages.com or photoshelter.com.

Taking Stock



PHOTOS BY TIM HANSSON



The Walhalla State Fish Hatchery, built by FDR's Civilian Conservation Corps during the

Great Depression, now helps drive a major segment of the state's booming outdoor tourism market. by Tim Hanson



PHOTOS BY MICHAEL FOSTER

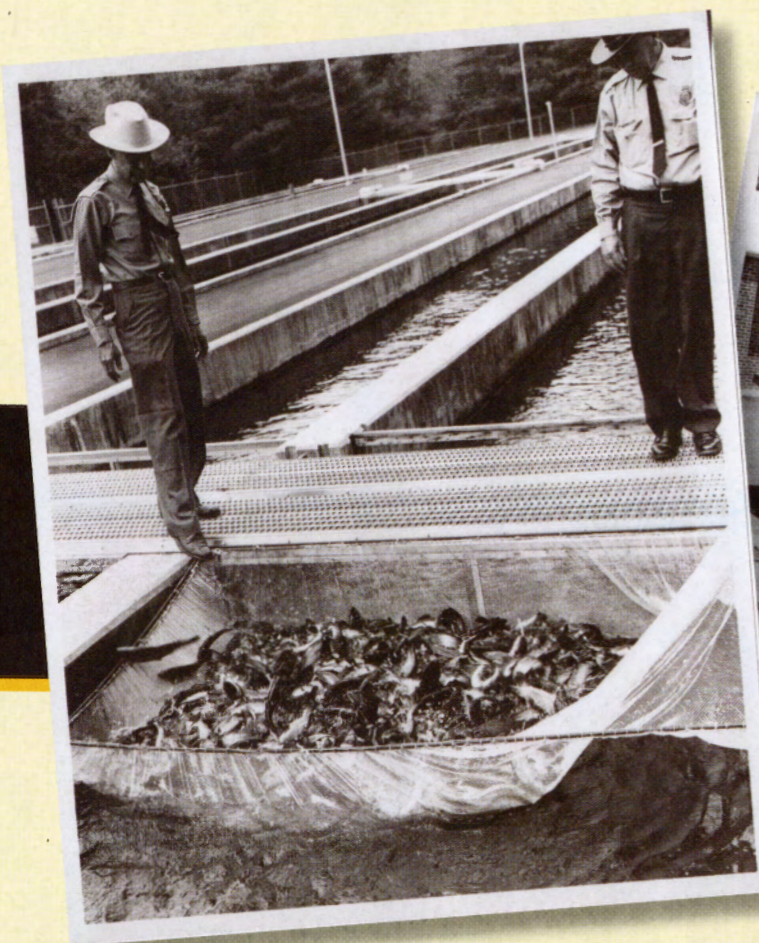
The bright yellow Bell 407 helicopter hovers a few feet over the heads of the half-dozen or so men loading hatchery-raised trout into the large orange "Bambi Bucket" tethered by cables to the aircraft. The wash from the rotors tears at their clothes and sends twisted strands of dried grass and bits of dirt whipping through the air. They work quickly, emptying two thirty-two-gallon plastic trash cans filled with fingerling trout into the bucket. Moments later, their task completed, the men retreat to safer ground and watch as the chopper disappears over a ridge. Then it's up to the pilot to locate

a deep pool in the nearby Chattooga River and empty his payload of trout before returning to the staging area for more fish.

(Above) Vapor from a delivery of liquid oxygen, used to supplement the water in hatchery raceways during the hottest months of summer, shrouds the historic main building at Walhalla State Fish Hatchery. (Opposite page) Helicopter stocking of hatchery-reared trout feeds the demand for recreational trout fishing opportunities, generating millions of dollars in outdoor tourism-related economic activity in South Carolina.



MICHAEL FOSTER



Employees of the U.S. Fish and Wildlife Service oversee the collection of rainbow trout from hatchery raceways in these photographs, taken in the mid-1960s.

This scene, played out late last year in the far northwestern corner of South Carolina, was repeated dozens of times throughout the day, and by sundown the chopper had planted some 40,000 trout — rainbows, browns and brooks — in remote areas of the Chattooga and Chauga rivers. Although dramatic and grand in scale, the annual military-style aerial stocking operation is just one cog in a much larger year-round cycle of trout production and stocking that begins at the S.C. Department of Natural Resources' Walhalla State Fish Hatchery.

Located along the southeastern edge of the Ellicott Rock Wilderness in Oconee County, the hatchery produces more than a half-million trout each year. Eggs from the hatchery's own brood stock and supplemental eggs from Erwin National Fish Hatchery in Tennessee are raised at Walhalla to produce fingerling trout large enough to be released into rivers and lakes in Oconee, Greenville and Pickens county streams, as well as the tailrace waters of lakes Hartwell and Murray.

Operating on an annual budget of less than \$400,000, the hatchery produces the trout that surveys estimate lure approximately 50,000 anglers to rivers, lakes and streams around the state each year. An activity that,

according to the DNR-published booklet "South Carolina Trout Fishing," generates something in the neighborhood of \$18 million in annual economic impact for the state. ("South Carolina Trout Fishing" is available as a free PDF download at www.dnr.sc.gov/fishing.)

"It doesn't take a businessman to see that this is an excellent return," says Hatchery Manager Scott Poore.

Fred Marcinak, a Walhalla dentist and past president of the Chattooga River chapter of Trout Unlimited, says the hatchery plays a vital role in maintaining a robust trout fishing environment in South Carolina.

"We're kind of on the borderline here for successful trout habitat," Marcinak says, referring to the fact that trout thrive in the cold mountain streams found mostly in more northern parts of the country. "Without the hatchery, the only trout we would really have would be in the headwater streams where the water stays cool and the oxygen content is high enough to sustain a trout population. So the hatchery is very, very important. It provides a means for people to take trout for food and for recreation."

The hatchery was constructed in the mid-1930s by the Civilian Conservation Corps, President Franklin



The trucks are newer, but the basic processes for spawning and raising trout at the facility have not changed over the years. Today, a small team of S.C. Department of Natural Resources employees maintains and operates the hatchery year-round.

Roosevelt's massive, federally-funded work program that kept young Americans employed during the desperate years of the Great Depression. Between 1933 and 1942, the two-and-a-half-million men who served in what would later become known as "Roosevelt's Tree Army" planted millions of trees; built roads, trails, dams and bridges; fought forest fires; and constructed hundreds of nature preserves and state parks.

Sixteen of those parks, including Oconee State Park, Myrtle Beach State Park and Kings Mountain State Park, were built in South Carolina by the nearly 50,000 men deployed to the state during the program's nine-year run.

And, of course, they built the hatchery.

Two early photographs show workers standing near circular fish ponds, some of which apparently were still under construction. The photos also show the main hatchery building — a solid, two-story structure with stone walls that remains today.

The photos, donated last year during a visit by a man who said his father had helped build the facility, offer a

rare glimpse into early days of the hatchery.

A few snippets of history can also be found in a 1986 booklet entitled "A Brief History of Mountain Rest, South Carolina" (Mountain Rest is located roughly 15 miles south of the hatchery), which notes that the facility was built in 1934 and 1935. In addition to the buildings on site, the history confirms that the CCCs also built the winding two-mile-long road that leads from S.C. Highway 107 down to the confluence of the East Fork of the Chattooga River and Indian Camp Creek where the hatchery is located.

For decades after its construction, the hatchery remained under federal control. Then, in the mid-1990s, the U.S. Fish and Wildlife Service announced that because of budgetary constraints, it planned to close the hatchery.

Realizing that this decision would mean the loss of millions of dollars to the state's economy, in 1996 South Carolina's congressional delegation worked

to pass federal legislation transferring control of the hatchery to the state government. Since then, the hatchery has been operated by the DNR.



Visitors to the hatchery in the fall can watch the DNR team at work, harvesting and fertilizing thousands of eggs taken from hatchery brood stock.



MICHAEL FOSTER

Hatchery Manager Scott Poore strips the eggs from a female trout. Each trout can provide up to 4,000 eggs, which are then fertilized and raised to maturation at the hatchery.

Today a team of six people — Poore, three full-time employees and two part-time workers — operate the hatchery and maintain an active program of stocking rivers and lakes with trout throughout the year. The hatchery was designed to work without electric pumps, instead using a system that takes advantage of the natural flows of the East Fork of the Chattooga River, which supplies the hatchery with about 80 to 85 percent of its water, and Indian Camp Creek.

“It’s all gravity-fed — no pumps,” Poore says. “And that is the beauty of the whole system, because we are so remote that we suffer power outages quite regularly. And by not having pumps, the flows

coming through the hatchery are not affected by that.”

Water flows into the main hatchery building where fertilized eggs and fingerlings are kept, and also outdoors into the concrete “raceways” — built in the 1960s to replace the original circular fish ponds — where the more mature fish and brood stock are held.

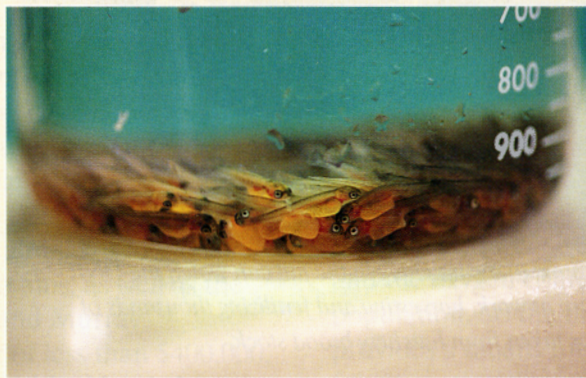
“Indian Camp Creek tends to be slightly cooler and a bit more pure than East Fork, so we use Indian Camp to go into our stone hatchery building,” Poore says. “That’s where we incubate the eggs and the small fry. Indian Camp also supplies the water in which we grow our brook trout. Brook trout tend to be a more sensitive species, and so we try to keep them in that cooler, purer water to preserve them.”

The water that flows through the hatchery is eventually collected in one pipe and emptied back into the East Fork. The quality of the water is monitored regularly to ensure that it complies with the state’s Department of Health and Environmental Control regulations.

The largest operating expense is fish feed — some eighty-four tons is consumed by hatchery fish every year. The feed is produced by the Utah-based Silver Cup Fish Feed Company and costs the hatchery just over \$100,000 annually. During feeding time at the hatchery, when workers toss scoops-full of feed into the raceways, the surface of the water erupts into a spontaneous boil of thousands of fish.

Every fall, Poore and his crew set up a work table beneath a metal canopy that covers a portion of one of the raceways. There, thigh-deep in water, they strip by hand as many as 4,000 eggs from each female trout. The eggs are then fertilized in a bowl and moved into the hatchery building to join other eggs — as many as 850,000 — that originated from the hatchery in Tennessee.

The eggs are kept in trays that hold around 23,000 eggs each and remain there to incubate for five or six weeks until the eyes of the fish (really nothing more than two black dots at this stage) become visible.



TED BORG

At four to eight weeks following fertilization (depending on water temperature), the eggs will begin to hatch.

“At this point they become more durable and can be handled more easily,” Poore says. “Then we take them out of these trays and put about 30,000 of them into large plastic containers called McDonald jars.”

Water is forced into the jars through a hose, which ensures a constant circulation around the eggs, mimicking what would occur in a natural streambed. The eggs remain in



PHOTOS BY MICHAEL FOSTER

The fingerling trout are raised to a size of nine to twelve inches in the hatchery's raceways before being collected and taken by truck to be stocked in seventy different locations around the state, where, hopefully, they will end up on the end of a happy angler's line.

the jar from two to four weeks until they begin to hatch out and become what are called “fry.”

Next, the recently hatched fish are moved into large cement tanks in the adjoining room, and, over the following several weeks, fed a powdery fish meal high in fat, protein and fiber. There are twelve tanks in the room, and each can hold as many as 80,000 fish.

When they grow to three or four inches, the fish are moved outside into one of the raceways, where they mature and grow until released into the wild. Most of the trout are cultured to a catchable size of nine to twelve inches before they are released.

While the helicopter stocking operation occurs just once each year, fish are planted regularly by DNR personnel who drive pickup trucks tricked out with aluminum tanks filled with fish fresh from the hatchery. The men introduce the fish to about seventy different locations around the region.

“Typically, we stock from mid-February through late June,” Poore says. “That’s the heaviest time. In July, August and September, when the temperatures are high and rainfall is low, it’s just harder for the fish to survive, and so we won’t stock quite as frequently. When we

get into the fall, it’ll start to pick up again, and we’ll continue until late November or early December. Then it will slow down again until the middle of February.”

The goal, says Poore, is to stock about a half-million trout each year. But over the past several years, the hatchery team has exceeded the target number by as many as 250,000.

That level of production allows for an abundance of first-rate trout fishing in South Carolina — from right outside the gates of the hatchery itself to some of the more remote areas along the Chattooga or Chauga rivers.

And while trout fishing infuses the state’s economy with millions of dollars every year, benefitting everyone, the biggest winners are those outdoor enthusiasts who hook into a rainbow, a brook or a brown. However brief, they enjoy a connection with nature and the outdoors that is special and — as any trout angler will attest — absolutely priceless. 🐟

Tim Hanson teaches journalism at Francis Marion University and is a frequent contributor to South Carolina Wildlife.

Showing No Mercy

The competition is fierce and the action nonstop, when the young men and women of the South Carolina Youth Shooting Foundation take the field.

*by Rick Leonardi
photos by Stewart Grinton*





(Opposite page) Rocky Creek Sporting Clays team member Seth Roddy takes aim. (Inset) Safety is the first priority at all SCYSF events, as well as a large part of the rigorous training provided to team members. (Above) DNR Law Enforcement Officer and Hunter Safety educator Stephanie Brown holds a pre-meet safety meeting. (Left and below) The intensity of the competition at these events is evident on the faces of the young participants.

Strolling the grounds at Live Oak Sportsman's Club in Swansea on a chilly morning last January, I found myself immersed in a sea of youngsters packing shotguns. Every muzzle pointed to the sky, every bolt locked back, every double gun broken open, chambers empty, for the world to see. Nearly three hundred participants, ranging from second graders to high school seniors, waited with barely restrained excitement for the event to begin. Theirs was a common goal ... break as many clay birds as they could, and do it safely.

This was one of six scheduled sporting clays events conducted by the South Carolina Youth Shooting Foundation (SCYSF), a nonprofit organization devoted to introducing the shooting sports to the young people of our state and developing the skills and mind set essential to these activities. It is this writer's observation, after spending many hours with these young folks at three separate events, that these goals are being solidly accomplished.

Have you ever shot a sporting clays course? I have, many times, and will humbly admit that my scores have ranged from uninspiring to bleak. For the uninitiated, sporting clays is a shotgun sport wherein clay birds are launched skyward in wooded settings like flushing quail or grouse, or bounced over uneven ground to simulate a scurrying rabbit, or skimmed across the surface of a pond like a turbocharged teal, or ... well, you get the idea. Basically, sporting clays is the hunting version of skeet and trap, with the attendant variations in setting, speed, direction and visibility of the target. It is great fun, sometimes very frustrating,

and many of these young people are very good at it. Having shot skeet and trap, I can tell you both sports are challenging but consistent, almost rhythmic in their nature. Sporting clays, on the other hand, presents an endless variety of shooting scenarios, like those found on the marsh and duck ponds, in the quail woods, or on the dove fields. The similarity to these sports is no accident.

According to David Chestnutt, chairman of SCYSF and owner of Rocky Creek Sporting Clays in Richburg, four years ago a group of shooting enthusiasts formed an organization to promote the shooting sports among young people in South Carolina. In 2008, the SCYSF was launched as a 501(c)(3) nonprofit organization, and Chestnutt, along with Donny Roth, both SCYSF founding members, met with S.C. Department of Natural Resources Chief of Staff Don Winslow. The agency agreed to provide assistance to the fledgling effort by defraying some of the costs of entry fees for the contestants and helping to pay for the training of the coaches. The training of a "head coach" for a member team involves three days of classroom and outside instruction and represents a significant commitment of time. The DNR requires that all shooters hold a South Carolina State Hunter Safety certificate. This has been a very successful marriage.

SCYSF now has 360 young members. Teams are sponsored by many shooting facilities throughout the state, 4-H chapters, the South Carolina Independent School Association and by two public schools: North Central High School in Kershaw and Hill Crest High School in Greenville. The 2011 state tournament held at Hermitage Farm in





Many of the Rocky Creek team members volunteer as "trappers" at the annual High Cotton Classic charity shoot.



Team members eagerly take the measure of the next shooting station.

Camden in May hosted 325 shooters and their families.

It takes a great deal of planning, preparation and teamwork to square three hundred youngsters, some as young as seven years of age, through a meandering wooded course of twelve to fourteen shooting stations in a timely fashion. The single day event begins with a safety session for all shooters and coaches, with a coach's meeting immediately following. In Swansea, Sgt. Stephanie Brown, a DNR conservation officer and education specialist, was on hand to begin the safety meeting, bringing with her the significant authority of her badge and office. Everyone listened.

Each squad then moved to its assigned station, and, on a pre-arranged signal, a shotgun start was launched. No pun intended. The rules require that when a young shooter takes his or her place at the shooting box, there is an adult coach within arm's length, watching carefully for muzzle control and empty chambers. If a gun malfunctions, it is immediately given to the coach, who clears it and checks it for proper operation. Without exception, no gun is carried

from the shooting box loaded ... ever. This writer watched carefully over many hours of shooting by literally hundreds of youngsters and never witnessed the slightest hint of unsafe gun handling.

These young people are very serious about their sport. Boys and girls participate, and the ponytails and painted fingernails acquit themselves very well. You need not ask Joanna Rogers, a diminutive redhead from Rocky Creek, if she is serious about this sport. Just watch her shoot. She gives nothing away to the boys, and shows no mercy when the clays fly.

Sporting clays courses vary significantly in degree of difficulty, and it was my observation that little accommodation was shown to these participants because of their tender ages. Allowed to ask the trapper to launch a clay bird before they shot so they might observe the direction and speed of its flight, each three-member squad would gather at the shooting box and track the free bird with outstretched arms, using a thumb or forefinger as a front site. Given some of the tricky setups with which

handling, and stifle the urge to giggle when a hapless adult moves on to the next station. Many of these young folks, you see, are very, very good at this sport.

The prizes awarded to the winning shooters are lovely silver platters, and sponsors donate fine shotguns that are offered in raffles.

But the focus of the dozens of people who invest enormous effort prior to, during and after the competition is nobler. This is a charitable event, conducted annually to raise money for organizations that need and would welcome financial help. The 2010 High Cotton Classic raised some \$55,000 for local charities and schools — a job well done. 🐾



Visit the HCC website at www.highcottonclassic.com

The High Cotton Classic

There are times when men and women gather to do good for the benefit of their fellow man, and perhaps have some fun in the process. The High Cotton Classic is one of those gatherings.

Each year, shooting enthusiasts from far and near gather at the beautiful farm of Rusty Darby in Chester, eat terrific barbecue, pay their entry fees and compete in a sporting clays contest on a course set up solely for this event and then dismantled. Open exclusively to adults, the only minors allowed on the grounds are the "trappers," who launch the clay birds at each station, watch with eagle eyes to ensure safe gun

It's a family affair. Moms, dads, brothers, sisters and even four-legged friends turn out to cheer on the shooters at SCYSF events.



they were confronted, one can see how this would be of great help. At one station, a clay was launched at a tilted trampoline (yes, trampoline) that suddenly altered its direction of flight and changed its speed from moderate to knuckle ball.

Missed clays often caused a tight-jawed retreat from the shooting box, followed by a thousand-yard stare while the shooter replayed in his or her mind the flight of the bird and the swing of the gun, the sight picture and the follow through. This was especially evident among the older shooters, who were there to do well and win. And when a station found itself at the mercy of a skilled squad and all the clays were broken without a miss, no end-zone celebration ensued, just a round of subdued fist bumps and the quiet smiles of the supremely satisfied.

In Chester, at the High Cotton Classic, an annual adult sporting clays charity event attended by shooters from throughout the Southeast, I was fortunate to meet the national champion team of Intermediate Advanced shooters (sixth through eighth graders), who, that day, were pulling traps for the older folks. These young men, Seth Roddey, Andrew Moxley and Teddy Hutchison from the Rocky Creek Sporting Clays team, traveled to the national championships in Sparta, Illinois, last summer and humbled the field, taking first place in their division in the sporting clays competition. They broke a cumulative 462 of 600 clays over two days, against twenty-two skilled and determined squads.

I had to push them to tell me about it.

At Backwoods Quail Club in Georgetown, I encountered another champion team from Florence Christian School. Braxton Ivey, Austin Mogy and Richmond Wilhoit are five-time state sporting clays champions in the Junior and Senior Varsity Advanced division, have two national titles to their credit, and recently won a skeet shooting event in Spartanburg to



V is for victory, and all the participants in the SCYSF win big by learning sportsmanship, safety and other skills that will help them in the field and in life.

boot. It should be noted that Richmond broke ninety-nine of a hundred at Backwoods, and his squad achieved a cumulative score of 288 of 300, winning its division. That is really, really good.

It is worth noting that several colleges and universities field shooting teams, and recruit and offer scholarships to outstanding candidates. Clemson University is among them.

More than high scores, however, good sportsmanship, absolute and unyielding gun safety, and family participation and values are paramount to the SCYSF mission. Moms and dads follow their offspring around the course in an endless variety of all terrain vehicles, little brothers and sisters in tow. Many others walk the course with the shooters. It's subdued in the sense that there is no cheering when a clay bird is broken, no groaning when one escapes, and conversations are in muted tones so as not to disrupt a shooter's concentration. Okay, the shooting isn't subdued, but if you've ever been in a duck blind, whispering to your hunting partner as the sun rises, you know what I mean.

Nothing is simple in sporting clays, with intervening trees and brush affording only glimpses of a clay bird as it passes literally through windows of opportunity, flickering from sunlight to shadow, changing direction and speed. It takes concentration, focus, coordination and good timing to do this well. These young shooters develop confidence and humility, learn to handle both the highs and lows with dignity, and discover that on a sporting clays course, just as in life, practice, self discipline and teamwork pay off. 🐾

Rick Leonardi, a longtime contributor to SCW, lives in Charleston.

Take Me to the River



The community councils created by the State Scenic Rivers Act play an integral role in the DNR's efforts to protect these beautiful public resources.

*by Craig Brandhorst
photos by Stewart Grinton*



South Carolina's State Scenic Rivers program currently protects river corridors on ten waterways around the state. (Opposite page) A great egret takes flight on a section of the Ashley River. (Above, left to right) Paddlers float down the Little Pee Dee; fall color breaks over the rocks below the Riverbanks Zoo on the Lower Saluda; the canoe launch at Lynches River County Park provides easy access.

Drawn by the rush of a nearby waterfall, a fisherman emerges from a wood of hemlock and rhododendron beside a gurgling whitewater river, miles from the nearest paved road. Mayflies skim the surface of a downstream pool, and as the fisherman makes his way along the bank, the shadow of a trout flashes across the river's pebbly bottom.

Launched in the tailrace below the hydroelectric dam, a team of rafters drift through a suburban forest toward the largest city in the state. Sunbathers sprawl across giant gray boulders near the banks and dip their toes in shallow whirlpools, but the deeper water gushes faster, splashes higher, rushes louder, drawn by the approaching rapids.

An amateur birder paddles a canoe across the placid water of a wide tidal river. The cordgrass sways in a warm breeze, darkening with the passage of afternoon clouds. Gnarled oaks and massive magnolias lean in from the sunlit lawn of a plantation along the bank. At the bend downstream, a great egret tiptoes out on a pluff mud spit before lifting its head, spreading its wings and taking flight.

South Carolina's rivers are as diverse as the people who enjoy them and the wildlife they sustain. They provide not just energy and fresh water, but remarkable corridors of natural beauty, distinguished by riparian forests, black water cypress and tupelo swamps, salt marsh sanctuaries and class V whitewater rapids. That's why, more than twenty years ago, the state legislature passed the South Carolina Scenic Rivers Act — to identify and protect some of our most precious natural resources through community involvement and constructive dialogue facilitated by the S.C. Department of Natural Resources.

Through the program, DNR-led advisory councils have

helped mitigate the effects of riverfront development and worked to reduce pollution, educate the public and improve river access on designated scenic rivers across the state. Since the Scenic Rivers Act went into effect in May of 1989, sections of ten rivers have received the designation, including a pristine five-mile stretch of the Middle Saluda located entirely within Jones Gap State Park, and a 102-mile stretch of the Lynches River that winds through pine forests, farmland and blackwater swamp. Other officially recognized stretches include parts of the Catawba, the Ashley, the Broad, the Black, the Lower Saluda, the Great Pee Dee and two separate segments of the Little Pee Dee. Each designated corridor is overseen by a ten-person advisory council chaired by a DNR representative. Councils are composed of conservationists and other stakeholders, including representatives from area industries, though the majority of the members are riparian landowners. Together, these councils draw up river management plans which, as required by law, consider the specific land management concerns of all involved parties. Once a plan is in place, council members respond to that river's unique needs as situations arise.

Unfortunately, multiple rounds of state budget cuts in recent years mean those rivers may not get the attention they've enjoyed over the past twenty. A program that once employed nine full-time agents, educators and researchers now employs a single coordinator who receives assistance from DNR staff working in other areas. Moreover, as the program observes an officially-mandated moratorium on adding new waterways to the scenic rivers list, a waiting list of other rivers and other communities that would benefit from Scenic River status grows longer.

What's at Stake?

It's no secret that our rivers are under a tremendous amount of stress and have been for years. As South Carolina's population continues to grow, threats to the river system can only increase. According to Bill Marshall, a program manager in the DNR's Land, Water and Conservation Division and Chairman of the Lower Saluda River Advisory Council, the state's rivers already face significant threats from development and point-source pollution (with spills from wastewater treatment plants being a major contributor), as well as *nonpoint-source* pollution (such as stormwater runoff) that finds its way into our waters, even in rural areas.

"When a watershed gets covered over by asphalt and houses get built, the water that used to slowly soak into the soil before making its way to the river doesn't do that anymore," Marshall explains. "It hits those hard surfaces and rushes all at once into the creeks and into the river itself. It blows out all the feeder streams, so they become unstable and aren't as ecologically functional as they used to be. And then, of course, you have all the pollutants from the roads, the oil and grease, and from the land, the chemicals, fertilizers and pesticides."

In other words, river pollution isn't just the problem of the people living along the rivers or of the industries operating in their immediate proximity.

"With nonpoint-source pollution, every human being is responsible," DNR State Scenic Rivers Program Coordinator Mary Crockett explains. "It comes from what we put on our yards, how much nonpervious surface area we develop and what we bring to the river when we recreate."

Of course, our rivers also face other threats. Logging is a major concern, says Crockett, particularly along rural rivers. When private investors buy riverfront tracts, they often sell off the timber to help finance the purchase. The loss of that old-growth timber buffer can lead to increased erosion, particularly in the more mountainous terrain of the piedmont. Logging can also disturb a river's scenic profile, though Crockett describes that as a more temporary problem.

"Those areas will be green in ten years and on the road to recovery," says Crockett. "That's one nice thing about the South — vegetation grows back quickly. In five years, if you paddled past those areas and didn't know what had happened, you wouldn't notice. It would still be scenic, just not quite as impressive as the old-growth trees were."

But the erosion that occurs in the meantime can affect the adjacent river for years to come — in ways that aren't so easily seen or remedied. Creating buffer zones between logged areas and the water's edge, one goal of the Scenic Rivers program, can help alleviate this problem significantly.



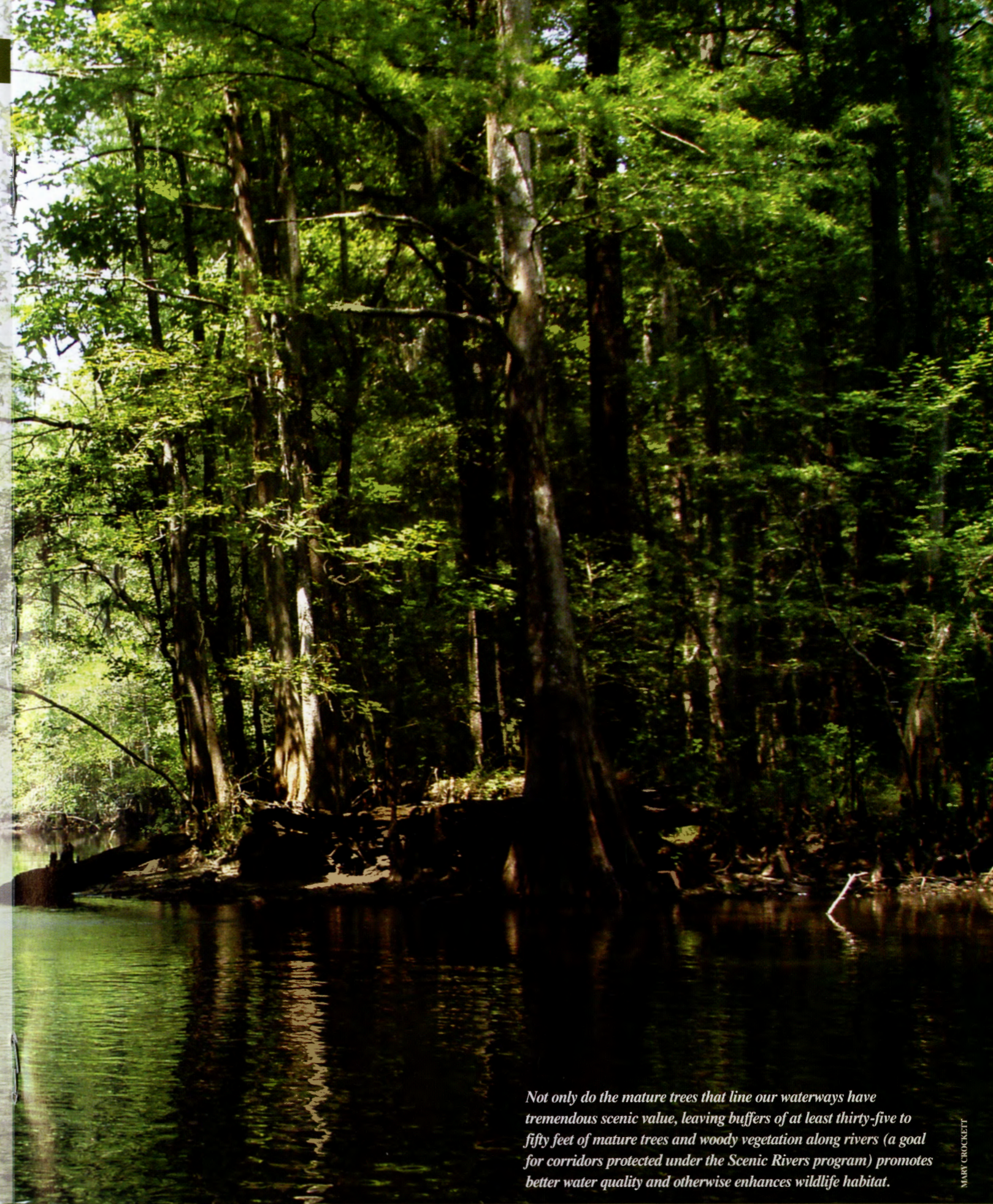
For anglers who like to bring the bounty of the rivers to their table, water quality and access are high on their list of concerns.



Many bird species, like this tricolored heron, as well as a wide variety of other wildlife, call one of South Carolina's designated scenic rivers home.



Access and use breed stewardship of natural resources, and a key component of the Scenic Rivers program involves encouraging people to get out and experience what these wonderful natural resources have to offer.



Not only do the mature trees that line our waterways have tremendous scenic value, leaving buffers of at least thirty-five to fifty feet of mature trees and woody vegetation along rivers (a goal for corridors protected under the Scenic Rivers program) promotes better water quality and otherwise enhances wildlife habitat.

Urban Scenic Rivers: Right in Our Backyard

Of course not all scenic rivers are located in rural areas. Rivers like the Lower Saluda, the Ashley and parts of the Catawba run through densely populated regions, qualifying them as urban rivers — which means they face a variety of unique issues simply because of where they are located.

“An urban river will have different pressures on it,” says Marshall. “There are issues related to the physical nature of the watershed, and there are differences just in terms of the number of people. You’ve got the benefits of people using the river, and then you’ve got the problems of people using the river, so it’s sort of two sides of one sword.”

Malcolm Leaphart, who has represented the conservation group Trout Unlimited on the Lower Saluda River Advisory Council in Columbia since its inception in 1991, knows that stretch of river intimately. Over the past twenty years, Leaphart and fellow council members have monitored everything from the discharges of Midlands-area sewage treatment plants to oxygen levels in the river, both of which have improved as a result of the council’s efforts. The Lower Saluda Council has also worked to educate developers about the need to maintain wooded buffers along the banks and properly manage runoff with silt fences and sedimentation ponds. In some cases, the council has successfully pushed for tighter regulations at the county level, though in other cases council watchdogs have been able to reach a compromise with developers and industries.

“It’s really up to the counties to decide if they’re going to have riparian zones and sedimentation laws,” Leaphart explains. “But the council has provided a wonderful forum, and I think that’s the key. It’s a forum to bring

together different groups, so it’s not just Trout Unlimited saying ‘don’t cut the trees down’ or ‘don’t muddy up the river.’ We’ve got everybody on board, from Riverbanks Zoo to SCE&G.”

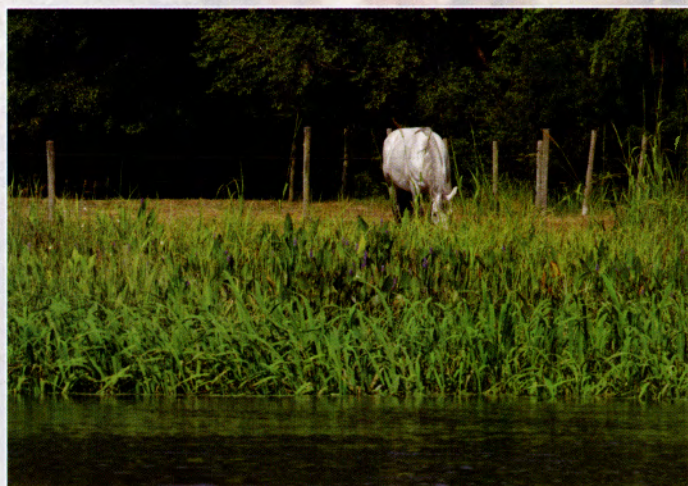
Another issue the council has been actively pursuing concerns working with SCE&G to manage outflows from the utility company’s spillway at Lake Murray, which at times can cause this nine-mile segment of urban river to turn extremely wild with little advance warning.

Whereas the Lower Saluda Council aims most of its efforts at monitoring sewage releases and sedimentation and pushing for better river safety, members of the Lowcountry’s Ashley River Advisory Council focus largely on making sure property owners keep dock construction within the guidelines spelled out in the special area management plan they helped draft.

“We have a really good balance of not only going against things, but also being really proactive, so we’re not just that group that says ‘no, no, no, you can’t do this, you can’t do that,’” says council member Emily Pack, who represents historic Drayton Hall Plantation. “I think in any type of advocacy work you have to strike that balance if you want to be successful in the long term.”

And the Ashley River Council has been very successful, says Pack, who credits the DNR’s involvement with giving the council legitimacy — even as the department’s overall presence has fallen off somewhat due to budget restraints.

“Being a part of DNR makes people think, ‘Oh, the Ashley River is part of the Scenic River program,’ so it has more weight in people’s perception,” Pack explains. “Now we’ve been around long enough that no matter what, I hope people would still listen to what we have to say.”



A horse grazes in a fenced pasture near the Ashley River.



Owning a home on the river is a dream come true for many South Carolinians, and increasing development along the more urban stretches of our state’s waterways brings its own unique challenges.



Human activity along the banks of rivers is certainly nothing new, as these large quarried stones on the west bank of the Lower Saluda River near Columbia can attest.



MARY CROCKETT

The early morning sun peeks through a dense canopy of cypress and mixed hardwood trees on an August paddling trip down the Lynches River.

Lynches River Journal

The following excerpts are from a trip journal kept by State Scenic Rivers Program Coordinator Mary Crockett during a ten-day journey down the Lynches River in 2008. You can read her complete journal and see more pictures on our website at www.scwildlife.com. The "Lynches River Water Trail Guide" provides detailed information about exploring the river and can be downloaded for free at www.dnr.sc.gov/water/envaff/river/scenic/lynchespub.

Day Two ... Cooking a nice breakfast, breaking camp and setting up a shuttle run for the vehicles put us on the water a little later. Two hours into the trip we had to choose whether to take the older river channel to the right or the newer river channel to the left. We decided on the river channel to the left and then log-jumped one fallen tree.

Day Three ... The river at the Highway 76 landing was slower and more lake-like than its normal, swift-moving current. Half an hour into the trip, we did the "limbo" under a downed pine tree. Past this blowdown,

the floodplain was dense, lush and green with lots of bird sounds. A prothonotary warbler crossed our path and a kingfisher escorted us downriver.

Day Five ... As we started down the river, we noticed signs of beaver activity, such as chew marks on the bases of trees as well as on limbs over the river, and a possible den behind a root ball of a fallen log. Later, a river otter poked its head out of the water and took a look at us. Around noon, we arrived at the Lynches River County Park Canoe Launch where we pulled our canoe into the launch area and stretched our legs by walking up the hill to check out the new educational discovery center.

Day Seven ... The last half of this river section of the trail is a large swamp floodplain forest, giving us many options as to which channel to paddle. We took a small channel with fast-flowing water, winding through the trees past an old shad fishing hut, that led us to a lake-like area above Half Moon Landing. 🦉



Framed by beautiful old oaks, a chimney from the remains of the Runnymede Plantation home built by Charles C. Pinckney is one of many beautiful sights that can be seen along the Ashley River.

Future Steps

The kind of recognition Pack describes is critical going forward. While the Ashley River hasn't faced much in the way of large-scale residential or commercial development since the '90s, the council's work is far from done, particularly when it comes to people's ability to access the river.

"Access to the Ashley River is actually not that great," Pack explains. "There aren't that many places to put in a kayak or boat, for example. It's one of the things we're working on. If you want somebody to protect something, they have to love it. If they can't get out on it, they're not going to feel like it's a part of their community."

Crockett agrees. And while she stresses that the state is doing everything in its power to protect its natural resources, she says the scenic rivers of South Carolina belong to everyone, and public access is critical to building support for river conservation efforts. In short, people value most what they can see and experience.

"Not everybody can live next to the river," says



This juvenile double-crested cormorant also calls the Ashley River home.

Crockett. "So in order for people to have that connection to the river, you've got to have parks, walkways and access points so people can canoe, kayak, motorboat, go tubing, swimming, fishing or just walking the banks."

As for the future of the State Scenic Rivers program, despite budget constraints and a much smaller staff, Crockett is upbeat. She'd like to do more for the rivers already in the program and see new rivers become a part of it. Realizing that goal, particularly in these difficult budget times, will require more volunteers like Leaphart, Pack and the hundreds of other citizen-conservationists who have given their time and energy to the Scenic Rivers program during the last two decades. Luckily, another natural resource that South Carolina is blessed with is volunteers willing to help the DNR with the conservation of our waterways. 🌿

Craig Brandhorst is a Columbia-based freelance writer. This is his first assignment for SCW.

Biodiversity on the (Blue) Line



ARTWORK BY MARK CONRARDY

Native plants such as doghobble, mountain laurel, rhododendrons and large ferns, as well as tall trees, provide cooling shade along the banks of streams in the Blue Ridge eco-region. Animal species found in these streams might include the (clockwise from upper left) blackbelly salamander, Western blacknose dace, striped jumprock, crayfish, mottled sculpin, turquoise darter or brook trout.

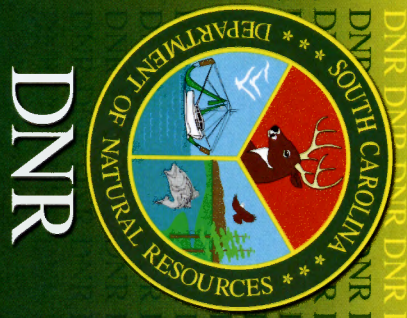
The DNR's South Carolina Stream Assessment provides a bellwether for scientists monitoring the health of the state's waterways, both large and small.

by Kevin Kubach

Troy Cribb stands ankle deep at the head of a cobble-strewn riffle, eyeing a promising spot where the stream hugs the roots of a towering beech before settling out into a placid pool. The dark, undercut bank has fish written all over it. But Cribb isn't casting spinners for

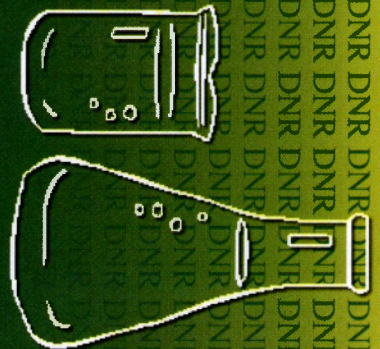
scrappy sunfish or drifting dry flies over rising trout. Today, Sixmile Creek is a classroom. An excited group of eight- to twelve-year-old girls and boys in the Pickens County Junior Naturalist program lines the sandbar and watches eagerly as Cribb and Drew Gelder,

fisheries technicians with the S.C. Department of Natural Resources' Stream Team, make some final adjustments to the electrofishing unit on Cribb's back. Moments later, at the push of a button, the piedmont stream comes to life. With surgical precision, Gelder



DNR

SCIENCE



TROY CRIBB

Students in the Pickens County Junior Naturalist program examine the morning's catch on the bank of Sixmile Creek in the Clemson Experimental Forest.

begins netting emerging critters from the crevices between rocks as Cribb sweeps the electrode through the water and herds the silvery school towards a seine held a few yards downstream. The broad net is hoisted out of the water, revealing dozens of lively fish, a crayfish and an assortment of aquatic insects. Soon a catch bucket boils with fins and claws — a biological report

card for the stream and, more importantly, its watershed.

Electrofishing is just one of many techniques used by DNR freshwater fisheries crews working on the South Carolina Stream Assessment, an effort to measure the condition of streams in the state and study the link between these streams and their watersheds. Approximately 35,000 miles of freshwater streams, rivers and swamps course through the Palmetto State. Unwound and placed end to end, they would reach all the way around the earth at the equator and nearly halfway again. They might not wear reflective green name tags or carve the boundaries of counties and states like their larger counterparts, but wadeable streams — creeks generally less than waist deep and narrower than thirty feet in most places—make up about 90 percent of all stream and river miles in South Carolina. Such streams are the threads that bind land to river, collectively influencing the quantity and quality of virtually all waters downstream — from rivers and lakes to coastal estuaries.

Spilling off the Blue Ridge Mountains at more than 3,000 feet in elevation, or snaking through flatwoods flirting with sea level,



PHILLIP JONES

The DNR Stream Team samples an urban creek in Maxcy Gregg Park near downtown Columbia.

South Carolina's streams drain a diverse landscape via four major Atlantic river basins: the Savannah, Santee, Pee Dee and Ashepoo-Combahee-Edisto (ACE). Thanks in large part to this wide range of settings and the long isolation of species in different river basins, these waters teem with an equally rich array of life. All told, the fresh waters of the state and their associated habitats support about 140 native species of fish, 39 crayfish (several of which have only been found in the Palmetto State), 33 mussels and countless other invertebrate groups. Depending on factors such as size and location, a given stream may hold ten, twenty, even upwards of thirty fish species, and a far greater variety of invertebrates. But more importantly, most streams harbor several widespread species plus a handful of localized types unique to certain river basins, regions and habitats. These sets of species,



PHOTOS BY PHILLIP JONES

Electrofishing is a common aquatic sampling method in which electricity is used to temporarily immobilize fish so they can be collected and identified. (Insets left to right) Specimens collected in the sample of this urban stream in North Columbia include crayfish, mosquitofish and even a small panfish.



KEVIN KUBACH

Stream habitat quality and complexity are strongly influenced by conditions in the watershed and riparian zone. DNR biologist Cathy Marion measures depth, flow and substrate (bed material) in Bush Branch, a tributary of the Edisto River.



KEVIN KUBACH

Streams in the Blue Ridge geologic zone are characterized by relatively steep gradient and swift currents. They support many coldwater species.

or assemblages, define South Carolina's wealth of landscapes and streamscapes. Preserving this biodiversity is at the core of the DNR's Comprehensive Wildlife Conservation Strategy.

On the bank of Sixmile Creek, the Junior Naturalists soak up a diverse world which only minutes earlier was hidden beneath the ripples of the humble stream. What began in the net as a mass of flickering fins has taken shape in two aquariums as a stunning collection of native fish: yellowfin shiners, bluehead chubs, striped jumprocks, speckled madtoms, mottled sculpins, rosyface chubs and turquoise darters, just to name a few. A miniature gladiator match unfolds as a crayfish tangles with a dobsonfly larva, or hellgrammite, a fearsome yet reclusive bottom-dwelling insect. Though most are small in size, these animals are part of a much larger picture. Each species has a distinct niche in the stream

ecosystem and forms a critical link in the food web, converting energy into larger predators, both terrestrial and aquatic (a young largemouth bass lurks in the corner of one tank, sizing up a few shiners). They are valuable indicators of watershed health. Since certain species are more sensitive to changes in the environment, the fauna can say a lot about what's happening upstream — and on the land.

Fortunately for these animals, Sixmile Creek has a good report card. It is a reference stream, one of ninety such creeks across the state selected to represent highest quality watersheds in each of the state's freshwater eco-regions and river basins. Reference streams are sampled annually by DNR regional freshwater fisheries crews to help provide benchmarks — pictures of what streams should look like with minimal human disturbance to the watershed. Most of the land draining into Sixmile Creek, for

example, is forested, and there is little urban development upstream or along its banks.

But as DNR fisheries research biologist Dr. Mark Scott knows, this could change, just as it already has in many other areas of South Carolina. Sprawling development often brings alterations to aquatic ecosystems and decline, or even loss, of native species. This is precisely why Scott and his colleagues drew up the plans for the Stream Assessment, which began in 2006.

"Aquatic biodiversity in the southeastern United States is incredibly high — greater than any place outside the tropics," says Scott, whose experience includes stream conservation projects in Maryland and the southern Appalachians. "But freshwater faunas are also becoming imperiled at an accelerated pace when compared with most other groups. The need for a proactive approach

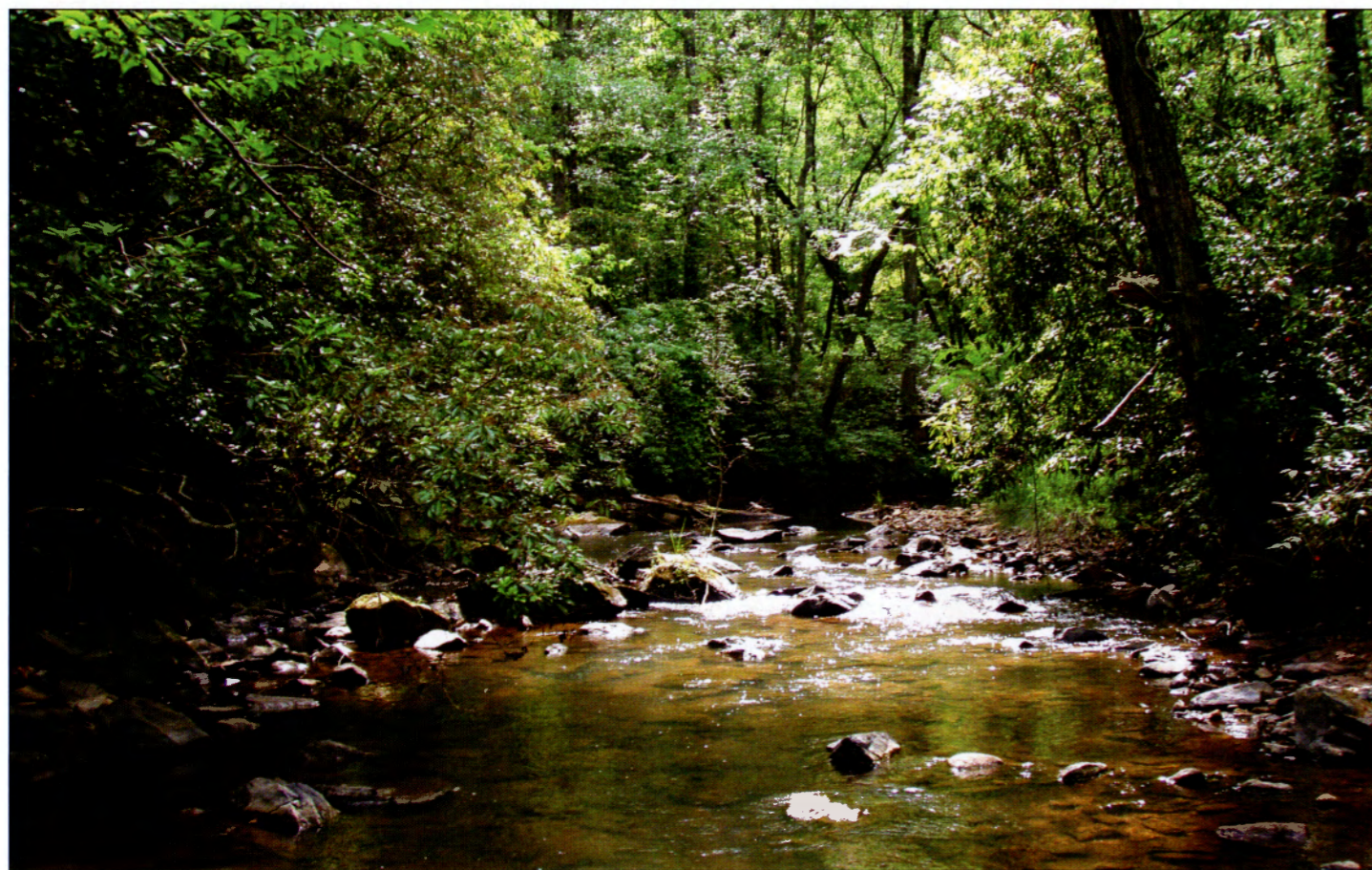
to conserving these resources is greater than ever.”

In order to understand relationships between watersheds and stream quality, it is necessary to see the good, the bad and the ugly. Enter the Stream Team. This crew of biologists and technicians within the DNR’s Freshwater Fisheries Research unit, along with collaborators from Clemson University, scours the state collecting data — everything from water quality and habitat to fish, crayfish and insects — in streams chosen randomly by a computer program. The list, pushing 450 sites by the end of this year, covers the entire spectrum, from unspoiled blackwater beauties to urban channels stripped of trees and surrounded by concrete. Sadly, many are in stark contrast to the model reference streams.

Whereas habitat loss from development on the land is often apparent, the effect of these activities on streams and rivers is not as easy to see. The clearing of natural vegetation renders land susceptible to increased erosion, and resulting sediment can smother stream habitats. Impervious surfaces, such as parking lots and rooftops, further reduce the land’s ability to absorb rainfall, leading to rampant runoff. Consider all the water running across hot pavement and down storm drains during an August downpour, carrying a slew of urban pollutants and sparking surges in stream flow and temperature. Especially damaging is the clear-cutting of trees in the riparian zone, the area bordering the stream channel itself. Riparian cover not only provides shade and buffers streams against runoff, but also supplies aquatic ecosystems

with crucial energy and habitat in the form of fallen leaves and wood. Perhaps nowhere is this proving more apparent than in the South Carolina coastal plain, a complex region that blankets two-thirds of the state and is home to scores of unique species. DNR fisheries biologist Cathy Marion sees it on the streams and in the data. Her research shows a key connection between forests and fish.

“Where natural forested coastal plain landscapes are lost, we observe less large wood in streams,” explains Marion. “Large wood provides vital habitat and supports food sources for coastal plain fish assemblages. The decrease in large wood habitat leads to lower fish diversity and especially the decline of endemic southeastern coastal plain species such as swampfish, sawcheek darter and lowland shiner.”



Above is a shallow stream typical of the piedmont, or “foothills,” a geographic region of moderate topographic relief between the Blue Ridge and the coastal plain.



Spanning more than two-thirds of the state, the coastal plain includes a wide range of aquatic habitats, from sandhills streams to blackwater swamps such as the one pictured here.

Marion’s research underscores one of many challenges to preserving biodiversity. The endemics — those localized species that set certain places apart — are often the first to succumb to the pressures wrought by an ever-expanding human population. If habitat alteration and other threats such as non-native species and pollution continue to take their toll on streams, we risk losing the very elements that make these waters unique. The Stream Assessment is essential to pinpointing the levels of land-use change, such as forest loss or urban development, at which streams become impaired. “This work will provide an invaluable conservation guidance tool for land management and development decisions,” adds Marion.

Conserving streams is a win-win situation. “Water runs downhill,” says Mark Scott. “While that may seem like a silly thing to point out, actually there are huge implications. Every tiny headwater contributes to a bigger stream, and these combine in river networks. So the quality of our rivers, reservoirs and estuaries is directly related to how we treat the lands they drain. Adopting land management practices that protect headwaters can accumulate benefits downstream for a multitude of our most cherished resources.”

Toward the end of the Sixmile Creek outing, the Junior Naturalists spread out to do some sampling of their own. Not five minutes into the foray, excitement erupts from a small group exploring a riffle upstream. A boy is standing at the fringe of

the water, proudly examining his prize as other students make their way over. Clamped firmly between his thumb and forefingers is a picture-perfect dusky brown crayfish with stout, orange-rimmed claws — a gem, whether you’re a kid, naturalist, or both. The sounds of rocks being shuffled in the shallow water steadily pick up.

Kevin Kubach is a fisheries research biologist working on the DNR’s South Carolina Stream Assessment. He and the other Stream Team members would like to thank the landowners who provide access to streams across the state for helping to ensure that these fascinating resources — and those downstream — are preserved for all who value South Carolina’s natural diversity.

Red-shouldered Hawk



PHOTOS BY PHILIP JONES

The chickens at my house pretty much have it made. In exchange for eggs during their productive years, the hens get food and housing, free medical care and great retirement benefits. They've got a big yard to peck around in, fresh water twice a day, a fan in the summer and a heat lamp in the winter.

If there's a drawback to the lifestyle, it lies in their popularity with predators. It's true — everything likes chicken. Through the years, we've had foxes, raccoons, possums, skunks and dogs go after them, and it's taken a lot of trial and error to varmint-proof their coop.

When they're out in the yard, they rely on a built-in wariness that is perhaps most evident when it comes to hawks. Let them see one, or hear the tell-tale scream of a red-shouldered or the higher-pitched cry of a red-tailed, and they'll quickly skedaddle under a bush or cedar tree or back into the coop.

The taste hawks have developed for the occasional chicken has put them on the long list of creatures farmers don't want around. For centuries, "chicken hawks," a catch-all term for several species, have earned the enmity and the shotgun blasts of farmers.

Which is unfortunate, since red-shouldered hawks aid in pest control, helping to check populations of mice, among other small mammals. They are also more likely

to go after easily obtained creatures like frogs, lizards, crayfish and grasshoppers than something as big as a chicken, and that preferred diet reflects their affinity for riparian terrain.

"A nice wetland with deciduous trees that borders on an open area where they can hunt would be ideal," says Jim Elliott, founder and executive director of the Avian Conservation Center in Awendaw, South Carolina.

Far more than other hawks, they'll also take snakes, which Elliott calls "one of their favorite things to feed their young prior to and even after they fledge."

These are creatures with great eyesight and broad, strong wings that give them great soaring ability.

Normally, though, they will watch patiently for prey from unobstructed perches.

"One thing that separates them from other raptors of that size," says Elliott, "is that you'll see the red-shouldered sitting on power lines, usually near a swale or ditch where they can find amphibians. They'll just drop down and get what they can, eating it there or taking it back to the perch."

Like the red-tailed hawk, the red-shouldered has a nocturnal counterpart.

"A red-shouldered is to a barred owl what a red-tailed is to a great horned owl," says Elliott. "There's a similar diet preference, but one is nocturnal and one diurnal in what works out as a beautiful arrangement."

Found throughout the eastern United States and along a strip of the West Coast, the red-shouldered is a mid-sized hawk, ranging from sixteen to twenty-two inches in length, and with a wingspan of between thirty-eight and forty-two inches. Females are a little larger than males. These hawks are slim, with a long tail, and weigh only about a pound-and-a-half. The adult has a brown head, a red breast and a white belly with reddish bars. The tail is dark, with three or four narrow white stripes.

The wings are a symphony of white, black and gray, with the underside a lighter version. The "red shoulder" is particularly visible when the hawk is perched — a time when another tell-tale field mark is evident.

"Perched," says Elliott with a laugh, "they have the kind of stoop-shouldered posture my mother would have corrected me for."

One key to telling them from the red-tailed in flight is a "window in the wings," a spot through which light can shine, in the red-shouldered. Another involves the breast; red-shouldered hawks typically have reddish or creamy-colored underparts. "If you see that white front," says Elliott, "that's a red-tailed."

These are monogamous birds whose courtship involves a "sky dance" that includes diving, soaring and circling flight as well as a good deal of calling.

"Their vocalizations are really loud and wonderful," says Elliott. "It sounds African, like the soundtrack to a jungle movie."

Red-shouldered hawks will start building or refurbishing a nest in late winter or early spring, spending a week or more constructing an eighteen-inch-wide bowl of sticks, twigs, leaves and bark in the crotch of a large tree and lining it with moss, lichens, fine twigs and bark. The female lays four dull white, brown-blotched eggs on average, and begins incubating with the first egg so that hatching takes place over several days. During the five weeks she is on the nest, the male brings food. The eggs and young are vulnerable to raccoons and great horned owls, as well as other hawks, and the females themselves are vulnerable

Red-shouldered Hawk

Buteo lineatus (striped hawk)

Description: 16 to 22 inches, 40-inch wingspan. Brown head, black, white and gray wings, reddish breast and shoulders.

Range and habitat: Woods, particularly near water. Throughout the eastern U.S.

Reproduction: Four eggs on average, young fledge at 5 to 6 weeks.

Viewing Tips: Red-shouldered hawks breed between April and July, and are known for conspicuous courtship displays that include steep dives and wide spirals performed while soaring. Listen for their calls, which are generally deeper than those of red-tailed hawks.

while on the nest.

Once the young are hatched, both male and female bring them food. The young, helpfully enough, can project their waste over the top of the nest and onto the ground. They fledge at five to six weeks, although it takes another two or three weeks before they have any real facility at capturing their own food.

"Most of the red-shouldered here [in South Carolina] are resident birds," says Elliott. "Some do move, but those may be first-year birds that aren't

mature enough for a pair bond and haven't established a territory yet. They're generally looking for a safe and predictable food source."

Red-shouldered form strong pair bonds and are thought to have a high degree of nest site fidelity.

"There are continuous territories, and even nests, documented for thirty or forty years," says Elliott.

These were once among the most populous hawks in the Southeast, but hunting and forest clearing diminished their numbers greatly. They have made somewhat of a comeback, but still face challenges.

"A lot of it is habitat alteration or loss throughout their range," says Elliott. "They're associated with wetlands and those kinds of low areas that offer the kind of prey they like, and many of those areas are being disturbed or eliminated."

The same is true for all birds of prey.

"Available habitat just won't sustain numbers like it used to," says Elliott. "At one time there were five hundred pairs of bald eagles in South Carolina, and that many could never be supported again. We're hoping that perhaps the decline in the number of hawks will level out and the population will reach a sustainable level."

It would indeed be a shame to lose more of these creatures, whose keen senses give them such a lofty perch atop their portion of the food chain. 🦅

— Rob Simbeck

Rob Simbeck is an award-winning freelance writer living in Nashville, Tennessee.

Webb Wildlife Center *text by Rick Leonardi; photos by Stewart Grinton* *From hunters and hikers to birdwatchers, paddlers and anglers, the DNR's Webb Wildlife Center offers something for outdoor enthusiasts of all stripes.*



The Webb Center's canoe and nature trails feature views of huge cypress and tupelo trees rising over blackwater swamps and creeks.

Twenty-six thousand acres, nine oxbow lakes, three fishing ponds, majestic cypresses and live oaks, mature pines where turkeys roost, one hundred twenty deer stands, red-cockaded woodpeckers, blue grosbeaks and indigo buntings, miles of trails, an archery range, a rifle range, a lodge for overnight stays and meetings ... and it's all ours — yours and mine.

Welcome to the Webb Center, Palachuola and Hamilton Ridge complex; three contiguous S.C. Department of Natural Resources Wildlife Management Areas stretching fourteen miles along the Savannah River, zealously overseen and meticulously managed by a dedicated complement of DNR biologists, technicians and conservation officers.



Egrets and other birds nest in colonies on the Webb Center's rookery.

Admission is free, (appropriate hunting and fishing licenses are required for those activities) and they are open every day of the week.

Known for its vast array of bird species, and designated an "Important Bird Area" by the Audubon Society, the Webb Wildlife Center near Garnett, South Carolina, and its sister wildlife management areas encompass forty square miles of diverse wildlife habitat, from river lowlands and swamps to upland pinewoods. Numerous migratory

and resident songbirds visit, and colonial nesters, such as little blue herons, green herons and egrets establish rookeries here. The rare and endangered red-cockaded woodpecker, found only in eleven states, is not an

uncommon sight.

The array of species to be found, both game and nongame, is remarkable, thanks to the efforts of Unit Wildlife Biologist Jay Cantrell and his staff. They work tirelessly to manage for wildlife; planting and burning, maintaining culverts and riser systems and miles of roads and trails, thinning trees and conducting timber sales. This land is an excellent example of what stewardship is all about.

Deer and turkey are plentiful, and the DNR conducts drawings for deer hunts each year. Last year, more than 1,200 applicants competed for slots on thirteen hunts on Webb. Almost three hundred hunters are selected by computer, and drawn hunters may harvest two deer:



DNR biologist Jay Cantrell counsels a hunter prior to a drawn deer hunt.

a buck and a doe, or two does. Bucks must have four points on one side, or a spread of at least twelve inches. Typical deer outings begin with an afternoon hunt, then dinner and lodging on the property (I'm told the fried chicken is terrific), then a morning hunt and breakfast to top off the trip. The staff will take you to your stand, pick you up after your hunt and handle the butchering of your deer if you've been successful. You can't beat that for \$125. The successful harvest rate is roughly 30 percent, which is quite good. Palachuola and Hamilton Ridge also offer draw hunts, with similar harvest rates, but without the food and lodging accommodations.

I happened to visit the Webb Center on a mid-morning during spring turkey season and saw five gobblers checked in during my talk with property manager Jay Cantrell. There is no drawing for turkey hunts. Just sign in, be respectful of others who may have arrived earlier, and have at it. You must check in your trophy (any mature turkey is a trophy) before leaving the property. All three tracts are open to turkey hunters.



Careful planning and preparation by DNR staff provides participants in the Webb Center's lottery-drawn deer hunts with safe, enjoyable hunting experiences, fellowship and fun with other hunters, and take-home memories that will last a lifetime.

Miles of roads and trails wind through the property, perfect for hiking and biking and the observation of wildlife. Take care not to miss the magnificent live oaks in the uplands and the bald cypress trees in the swamps, some of them ten feet in diameter with knees rising some six or seven feet above the water. While afoot, be aware of the presence of poisonous snakes, like eastern diamondback and canebrake rattlers and cottonmouths.

Canoeing is a favorite activity on the oxbows and well-marked water trails that ultimately lead to Flat Lake and Bluff Lake, where the fishing can be very good for largemouth bass, bluegill, crappie, shell



This doe and fawn were captured crossing one of the many roads on the property during a heavy spring rainstorm.



The boardwalks and other viewing areas at Webb are prime locations for spotting a wide array of plant and animal species. (Inset left) DNR avian biologists capture and band songbirds at Webb, one of many ongoing research projects conducted on the property.

cracker, catfish and chain pickerel. The DNR conducts numerous educational programs at Webb in its training facility; built in 1990, it's an architecturally unique structure containing staff offices and classrooms. Seminars on managing for quail are conducted annually, and while I was there, DNR law enforcement officers were gathering for an overnight stay and meetings. The classrooms are used not only by the department, but also by the U.S. Forest Service, the Nature Conservancy and other natural resource organizations by special arrangement.

There is a rifle range on Palachuola where shooters are welcome to practice their marksmanship, and where an annual Range Day is held by the DNR to introduce and reinforce the safe use of firearms to youngsters and adults. Twenty-two caliber pistols, shotguns, air rifles, and archery equipment are the order of the day, with fishing to boot. Clemson Extension's 4-H program for youth and the DNR's Hunter Education program join in this effort, with the DNR providing all guns and ammunition.

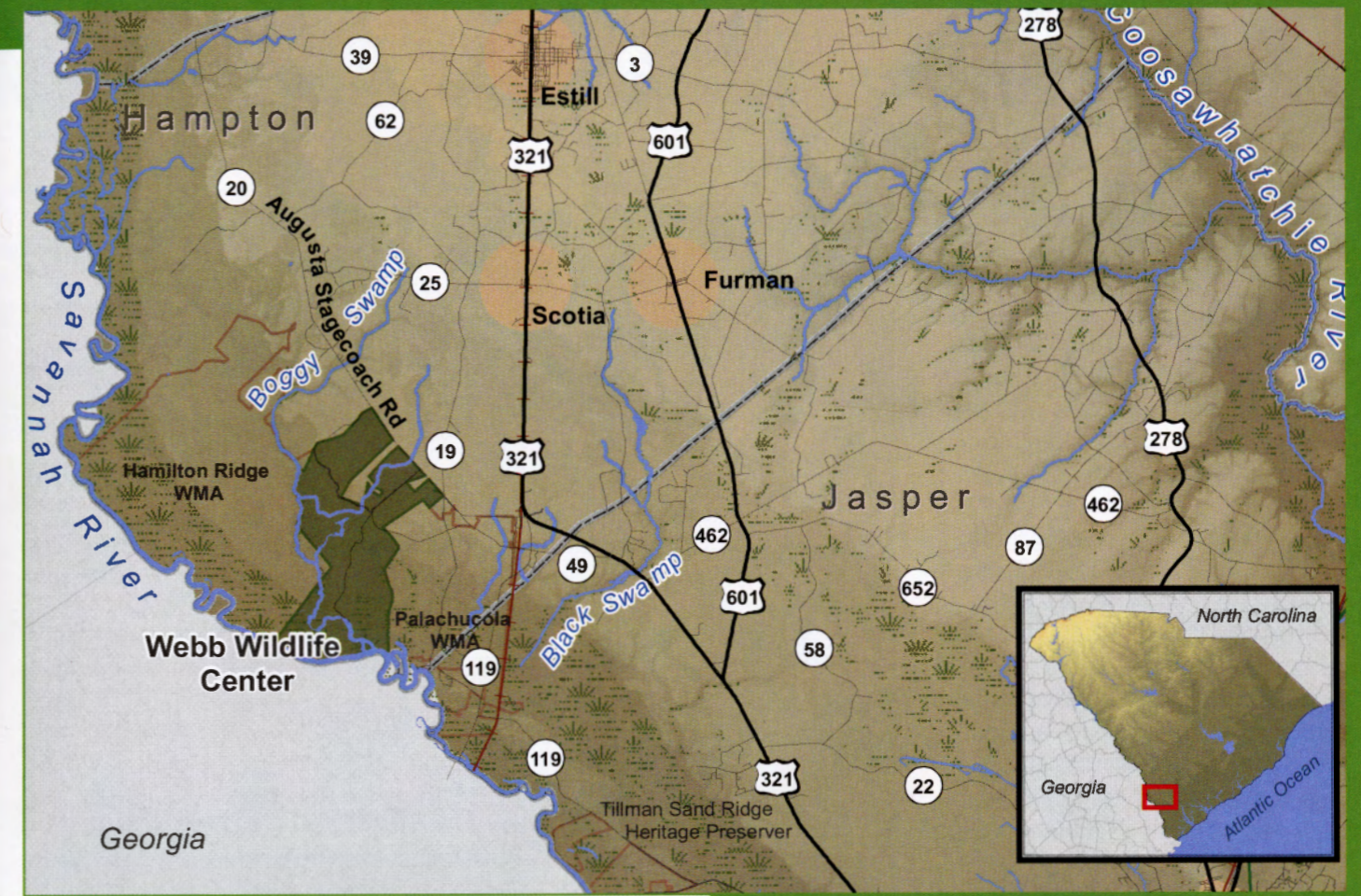
A one-week summer camp called "4-H Wild at Webb," another collaboration between the DNR and the 4-H program, is held each year in June and hosts middle-school-aged children who participate in shooting sports, spend time studying wildlife and natural resources, camp, and enjoy other fun outdoor

activities. Throughout the year, the Webb Center hosts numerous school groups and university classes on field trips and tours.

Another prime example of the Webb Center's emphasis on the young people of our state is the annual state Youth Coon Hunting Championship, held here for youngsters six-to-seventeen-years-of-age. This is a "no kill" hunt, wherein coons are trailed and treed, then left to prowls the woods again.

I tried the archery course during my visit, a deluxe setup if ever there was one, with a fourteen-foot raised tower from which an archer can shoot at three-dimensional foam targets of deer, hog and turkey. Safety cables are provided, to which shooters must attach required safety vests when using the elevated stand. I will modestly report that I shot quite well, managing to find all my arrows ... eventually.

The history of the Webb Center is almost as interesting as the land itself. Bestowed by a grant of the king of England on one John Tison (a very lucky fellow, he) in the mid 1700s, the 5,800-acre tract remained in Mr. Tison's family for some 150 years, whereupon it was sold to John King Garnett, after whose family the town of Garnett is named. Mr. Garnett built the lodge sometime thereafter, and then sold the land to August Belmont, a well-heeled New York banker and horse fancier (think Belmont Park). Thoroughbred race



DNR TECHNOLOGY DEVELOPMENT PROGRAM

horses were wintered on the property during this time. In 1941, the then S.C. Game and Fish Commission purchased the property, and ultimately renamed it the Webb Wildlife Center after James F. Webb, executive director of the S.C. Wildlife and Marine Resources Department from 1959 to 1974.

The 6,700-acre Palachuola WMA was purchased by the federal government as partial mitigation for the Lake Richard B. Russell project, managed by the DNR for the U.S. Army Corps of Engineers for several years, and then deeded to the state by the Corps in 2005.

The 13,000-acre Hamilton Ridge tract was purchased from International Paper Company by the state in 2006 and opened for draw hunts the same year. These sprawling tracts are as lovely a natural setting as you will find in our state and are nurtured with great care.

"The place takes care of itself," claims Jay Cantrell. His modesty is admirable, but his dedication and that of his staff is undeniably evident, and we, the citizens of South Carolina, as well as the many wildlife species that thrive here, are the beneficiaries. 🌿

Longtime SCW contributor Rick Leonardi lives in Charleston. Check out his feature story on the South Carolina Youth Shooting Sports Foundation beginning on page 22 of this issue.

Driving Directions and Resources:

From Columbia (approximately 100 miles) take S.C. Highway 321 south to Garnett. In Garnett, the road will fork; stay right on S.C. Highway 119 and turn right onto Augusta Stagecoach Road across from the Garnett Post Office. Cross the railroad tracks and go approximately 2.6 miles. After turning in to the James W. Webb Wildlife Management Area entrance on the left, follow the road approximately 1.5 miles to the main office.

For more information about any of the programs or activities offered at the Webb Center, call (803) 625-3569 or visit the DNR's managed lands website at www.dnr.sc.gov/mlands/lookup. For more information about the annual 4-H camp, contact the Hampton County Clemson Extension Office at (803) 943-3427.

STATEWIDE DEER HARVEST DECREASES IN 2010

Results of the 2010 Deer Hunter Survey conducted by the DNR indicate that the statewide harvest of deer last season totaled 222,649, a decrease of 4 percent from the previous year. An estimated 116,755 bucks and 105,894 does made up this total, according to Charles Ruth, Deer and Wild Turkey Program Coordinator for the DNR.

Since 1997, the DNR's Wildlife Section has employed an annual random mail survey to estimate the harvest of deer at the state and county level. The 2010 survey was sent to 25,000 hunters. Prior to 1997, deer harvest figures were dependent on Deer Check Station reports in the 18-county Upstate region and reports from hunt clubs in the 28-county Coastal Plain region.

"The old way of documenting the deer harvest had flaws, including failure to report harvested deer and the fact that there was no reporting required in many cases," said Ruth. "Based on the survey work that has been done since 1997, it appears that the old system was documenting only about half of the deer being harvested annually in South Carolina, which is exactly why the DNR is now using the survey technique."

After increasing rapidly throughout the 1970s and '80s, the deer population in South Carolina has been stable to declining since the mid-1990s, says Ruth. The decline in 2010 is consistent with the trend in recent years reflecting about a 30 percent overall decline from the record harvest established in 2002. The reduction in harvest seen since 2002 can likely be attributed to a number of factors, including habitat change. Although timber management activities stimulated growth in



STEWART GRINTON

DNR wildlife biologist Jay Cantrell assists deer hunters participating in a lottery-drawn deer hunt at Webb Wildlife Center in November of 2010.

South Carolina's deer population in the 1980s, considerable acreage is currently in even-aged pine stands that are greater than 10 years old, a situation that does not support deer densities at the same level as younger stands in which food and cover is more available. Wildlife population densities are directly tied to habitat, and since habitats are always changing, population densities are also always changing.

Coyotes are a rapidly growing part of the South Carolina landscape and are another piece of the deer population puzzle. DNR is currently involved in a major study with researchers at the Savannah River Site investigating the affects coyotes are having on the survival of deer fawns. Cumulative data throughout the study indicates approximately 70 percent total fawn mortality on the studied property,

with coyotes being responsible for approximately 80 percent of these mortalities. If these findings even moderately represent a statewide situation, this "new mortality factor" is clearly involved in the reduction in deer numbers. This is especially true when combined with extremely liberal deer harvests that have been the norm in South Carolina. The study is currently in the process of determining if coyote control leads to increased fawn survival on the study area.

Although the annual survey focuses on deer hunting activities, there are also questions related to the harvest of wild hogs and coyotes in the state. Results indicate that approximately 30,804 coyotes and 36,401 wild hogs were killed statewide in 2010, with each figure representing about a 2 percent increase over 2009.

Harvest figures like those provided

by the annual survey allow DNR biologists to reconstruct the deer population using computer modeling. It is a relatively simple procedure: plug in the number of bucks and does harvested, along with age structure and reproductive data, and the computer model determines the number of deer that were theoretically in the population prior to harvest. According to this modeling, reported Ruth, South Carolina's deer population peaked during the mid-1990s with just a bit more than one million deer in the pre-hunt population. Currently, the statewide deer population is estimated at about 725,000.

Top counties for harvest in 2010 included Bamberg, Allendale, Orangeburg, Anderson and Spartanburg, with each of these counties exhibiting harvest rates in excess of 15 deer per square mile, which should be considered extraordinary. Very few areas in the United States consistently yield comparable harvest figures.

Other survey statistics indicate that 125,362 South Carolina residents and 15,100 nonresidents deer hunted in the state in 2010. Deer hunters reported an overall success rate of 70 percent, which is outstanding. Resident hunters averaged about 16 days of deer hunting, nonresidents about 14 days, and the total effort expended on deer hunting in 2010 was estimated at 2,271,319 days.

"The number of days devoted to deer hunting in South Carolina is very significant and points not only to the availability and popularity of deer as a game species, but to the obvious economic benefits related to this important natural resource," Ruth said. About \$200 million in direct retail sales is related to deer hunting in South Carolina annually.

—Brett Witt, DNR News Section

TWO SOUTH CAROLINA COUNTIES NOW IN SEVERE DROUGHT

Members of the S.C. Drought Response Committee, meeting via teleconference on July 14, upgraded Horry and Marion counties to severe drought status and Lancaster, Kershaw, Lexington and Richland counties to moderate drought status. The committee's decision to maintain or upgrade was driven by continuing concern over agricultural impacts, low stream flows and increased forest fire activity. Sporadic and localized rainfall has not mitigated the ongoing drought status throughout the state.

Aiken, Allendale, Bamberg, Barnwell, Beaufort, Berkeley, Calhoun, Charleston, Chesterfield, Clarendon, Colleton, Darlington, Dillon, Dorchester, Edgefield, Florence, Georgetown, Hampton, Jasper, Lee, Marlboro, Orangeburg, Sumter and Williamsburg counties maintained moderate drought status. The remaining counties maintain

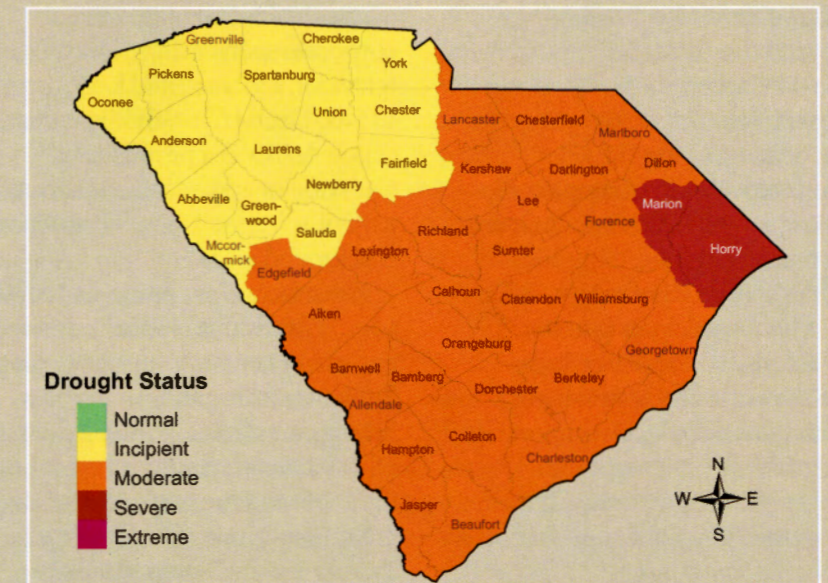
incipient drought status.

"The heat really stretches things," said David Tompkins with the S.C. Department of Agriculture. "We're looking at total corn crop failures in some counties, as well as stress on other crops. The lack of rainfall is taking a toll on pastures and grazing lands. Livestock owners are worried about where feed supplies will come from if we stay hot and dry."

The purpose of the declaration is to increase awareness that drought conditions are intensifying. Water systems are asked to review their drought response plans and ordinances and implement as needed. The drought committee also encourages the public to be cautious with any outdoor burning activity.

To find the most up-to-date information about the current drought status of all 46 South Carolina counties, as well as other climate and meteorological information, visit the DNR's State Climatology Office online at www.dnr.sc.gov/climate/sco.

—DNR News Section



As of July 14, residents in two South Carolina counties in the Pee Dee region are suffering severe drought conditions.

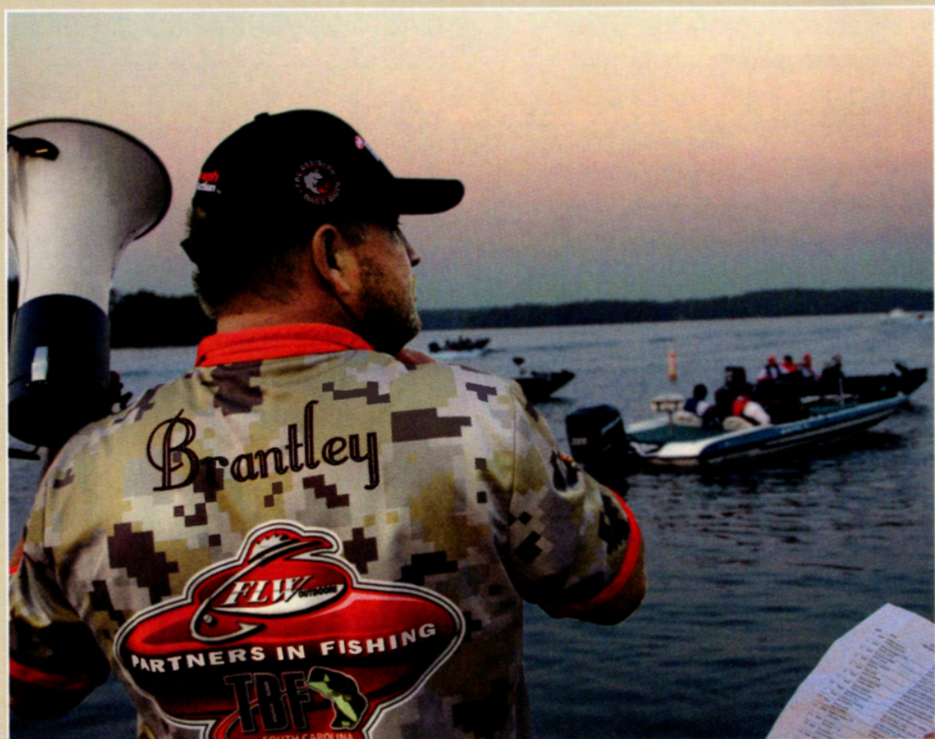
DIXIE HIGH SCHOOL TAKES STATE BASS FISHING CHAMPIONSHIP

Youth participants in a popular and growing DNR-sponsored fishing program met at Billy Dreher Island State Park May 21 to compete for the honor of being named state champions in the sport of competitive bass fishing. Six of the state's DNR Youth Bass Fishing Clubs and one Bass Federation Junior Club competed in the tournament. The school clubs participating included:

- Dixie High School
- Saluda High School
- Camden High School
- Santee Junior Bassmasters (Wilson Hall in Sumter)
- North Augusta Middle School
- Bonds Career Center (Greer)

When the day's fishing was completed, Dixie High School was declared the State's Bass Fishing Champion Team for the 2011 season, with a total weight of 22.9 pounds for the tournament. Six students competed from Dixie to help the team win this title, and two Dixie team members, Alex Davenport (for the 11-14 age group with five fish at 6.17 pounds) and Kameron Harbin (for the 12-18 age group with four fish at 9.06 pounds), will be heading to the National Guard Junior World Championship later this year in Hot Springs, Arkansas, for a chance to fish for thousands of dollars in college scholarships. Dixie High School participating team members also received free rods and reels courtesy of tournament sponsor Pure Fishing. Davenport and Harbin also received funds from Pure Fishing to help with their travel to the National Guard Junior World Championship.

The popularity of tournament-style competitive bass fishing has grown by



DAVID LUCAS

Pete Brantley, Youth Director for The Bass Federation of South Carolina, prepares to give the signal for participants in the 2011 S.C. Junior Bass Fishing Championship to begin fishing. The 2011 state championship tournament was held in May at Billy Dreher Island State Park on Lake Murray.

leaps and bounds over the past decade, with regular tournaments at locations across the United States, major corporate sponsorships, extensive television coverage and large prizes. In fact, Dixie High School graduate Casey Ashley is a professional tournament angler and has served as a mentor for the school's club since it was formed in 2009.

The process for getting started with a youth bass fishing club is fairly simple, and the benefits are very rewarding. Students participating in the bass fishing clubs develop fishing skills and ethics, a greater appreciation for the outdoors and the environment, and great friendships with other students sharing these interests. All that's required to start a club is a minimum of six students (within the 11-18-year-

old range). There is a cost associated with participating in the program; participants pay dues of \$40 per year as student members of The Bass Federation. Adult sponsors are needed to help lead the club, provide advice and help coordinate tournaments, fundraisers, speakers and other learning sessions pertaining to fishing for club meetings.

To learn more about Youth Bass Fishing Clubs or the other aquatic education programs conducted by the DNR, contact DNR Aquatic Education Coordinator Lorianne Riggan at (803) 737-8483, e-mail her at RigganL@dnr.sc.gov or visit the program's page on the DNR website at www.dnr.sc.gov/aquaticed.

—Lorianne Riggan,
DNR Education Section

NRCS INITIATIVE WILL HELP LANDOWNERS CURB DESTRUCTIVE INVADER

A major effort by state and local authorities is underway to address the growing problem of the invasive exotic Chinese tallow tree (*Triadica sebifera*), also known as popcorn tree, in the coastal plain of South Carolina.

A native of China, the tree was introduced to South Carolina in 1776 for ornamental purposes and seed oil production. Tallow tree is an extremely aggressive woody invader because it grows rapidly, begins reproduction after only three years and produces abundant viable seed. Chinese tallow tree has invaded coastal marshes, bottomland hardwood forests, pine forests, shorelines of inland water bodies, isolated wetlands, river and stream banks, and ditches within at least 12 South Carolina counties. The plant has been labeled a "Severe Threat" by the South Carolina Exotic Pest Plant Council.

Chinese tallow tree is considered such a serious threat because of the way it can alter the composition of both terrestrial and wetland forest communities, including high quality, undisturbed natural areas. Once introduced, tallow tree swiftly replaces natural plant communities with nearly monospecific stands. High amounts of tannins present in tallow leaf litter create inhospitable soil conditions for most native plant species once tallow tree invades. This reduction in the diversity of native herbs and shrubs can promote soil erosion and alter plant communities, which then no longer provide quality habitat or forage for native wildlife. Tallow tree can invade an area quickly after a disturbance such as logging, construction or a storm event. Seeds are also spread by birds



JAMES H. MILLER, USDA FOREST SERVICE, BUGWOOD.ORG

The showy white seeds that give the Chinese tallow tree its more commonly known name of popcorn tree make it a popular choice for landscaping, but this exotic invasive poses a severe threat to native wildlife habitat in the Lowcountry of South Carolina.

and water. Seedlings are shade and flood tolerant, enabling tallow tree to establish itself in undisturbed areas as well.

Several agencies have begun coordinated efforts aimed at addressing the large number of infested acres on public and private land in South Carolina. Landowners may be able to obtain funding to assist with control of Chinese tallow tree on their property through several avenues. The U.S. Department of Agriculture's Natural Resources Conservation Service offers cost share funding to those who apply and qualify through two Farm Bill programs: the Wildlife Habitat Incentives Program (WHIP), and the Environmental Quality Incentives Program (EQIP). The U.S. Fish and Wildlife Service also facilitates two programs that may provide assistance: the Partners for Fish and Wildlife and Coastal programs. In addition, the DNR's Aquatic Nuisance Species program has agreed to target tallow tree control efforts in the vicinity of this initiative. The initial effort to control Chinese

tallow tree will focus on land located within several southern outer coastal counties, since infestations are dense and contiguous with protected natural areas there.

A landowner workshop will be held September 27 at Nemours Plantation (Nemours Wildlife Foundation) in Yemassee (Beaufort County). Federal and state agency personnel will present possible funding opportunities, and public and private land managers will present methods and results of ongoing control projects. Chemical and mechanical demonstration treatments have been applied at Nemours Plantation in a few different habitat types. Participants will be able to tour the treatment area and talk with those who conducted the work. Visit www.nemourswildlifefoundation.org for workshop location information, and look for a feature story in an upcoming issue of *SCW* detailing tallow tree control efforts on North Williman and Combahee islands in Beaufort County.

—contributed by Sudie Daves Thomas,
USDA, NRCS



LORIANNE RIGGIN

DNR law enforcement officers provided shooting safety instruction for kids involved in the Natural Resources School program Field Day at North Camden Plantation in Kershaw County, a 5,000-plus-acre property owned and managed intensively for wildlife conservation by Mr. Leonard Price.

NATURAL RESOURCES SCHOOL PROJECT COMES TO A CLOSE

In July of 2008, the idea for a pilot program for a public school choice option similar to a magnet school, conceived by DNR Director John Frampton and then-South Carolina State Superintendent of Schools Jim Rex, got started with a series of classes at Palmetto Middle School in Williamston, South Carolina. Known as the Natural Resources School project, the pilot was expanded to two additional schools after the first year, and by 2011, students in two different middle schools, Palmetto and North Central Middle in Kershaw, as well as fifth graders at Rice Creek Elementary in Blythewood, were

immersed in a variety of natural resources related topics like wildlife management, geology, climatology, fisheries and more, through classroom experiences, school open houses, field trips and after-school programming. Unfortunately, because of limited funding resources and staff related to the state budget situation, the program has been put on hold for the time being. The DNR staff involved with the program would like to thank the teachers, parents and administrators at all three schools, as well as Leonard Price and Jake Rasor for donating the use of their properties for the 2011 NRS Field Day activities. 🌿

DNR ASSISTANT DIRECTOR RECEIVES NATIONAL AWARD

Emily Cope, the DNR's Assistant Director for Special Projects and National Affairs, has been named the recipient of the 2010 Forest Legacy Conservation Excellence Award. This national award is presented annually by the USDA Forest Service to one of its state partners for exceptional leadership in conserving forested land at the state level.

Cope, a Palmetto State native born in Lodge, began working for the state DNR in 1999 and has worked with the Forest Legacy Program (FLP) for 12 years, which makes her the longest tenured state coordinator in the Southeast. Through her exceptional leadership and tireless dedication, Cope developed the FLP in South Carolina into the largest in the region, and it now protects more than 75,000 acres of forest land that will benefit future generations. Cope played a leading role in developing project participation with land trust organizations such as The Conservation Fund, Katawba Valley Land Trust, The Nature Conservancy,

Ducks Unlimited and the National Wild Turkey Federation. Working closely with conservation program managers within federal, state and private agencies, Cope has always demonstrated a willingness and ability to share her knowledge, experience and leadership to help make the FLP a success. Cope's leadership and logistical skills were amply demonstrated when she hosted the national FLP meeting in 2006 and the regional FLP meeting in 2009.

The Forest Legacy Program is a federal program that provides grants to states for the purchase of forested land threatened with development. In 2010, the FLP celebrated its 20th year of existence and surpassed the 2 million-acre mark in protecting forests around the nation. The Southern Region of the Forest Service is made up of 13 states in the southeastern portion of the United States. 🌿

USFWS WEBSITE EXPLORES SEA LEVEL RISE AT CAPE ROMAIN

Rising sea levels at Cape Romain National Wildlife Refuge northeast of Charleston are the focus of an April 22 posting on a website called *Open Spaces* that was created by the U.S. Fish and Wildlife Service to draw attention to the impacts of global climate change on fish and wildlife populations in each of the 50 states. The article details the problems that record high tides over the last decade are creating for nesting sea turtles and other wildlife that depend on the barrier islands that make up the heart of the refuge. Visitors can read this and other state articles; access photo galleries, videos and other information; and post their own comments about the issue on the *Open Spaces* site. The complete URL is www.fws.gov/news/blog/index.cfm/south-carolina. 🌿

SEPTEMBER-OCTOBER EVENTS

SEPTEMBER 3, 10, 17, 24; OCTOBER 1, 8, 15, 22, 29. Birding. Murrells Inlet. Contact Huntington Beach State Park, 16148 Ocean Highway, Murrells Inlet, SC 29576, (843) 237-4440.

SEPTEMBER 3; OCTOBER 1. Rivers Bridge Battlefield Guided Tour. Ehrhardt. Contact Rivers Bridge State Historic Site, 325 State Park Road, Ehrhardt, SC 29081, (803) 267-3675.

SEPTEMBER 5, 12, 19, 26; OCTOBER 3, 10, 17, 24, 31. Coastal Kayaking. Murrells Inlet. Contact Huntington Beach State Park Education Center, (843) 235-8755, or Huntington Beach State Park, 16148 Ocean Highway, Murrells Inlet, SC 29576, (843) 237-4440.

SEPTEMBER 10, 24. Annual Hawk Watch. Cleveland. Preregister one day prior to program. Contact Caesars Head State Park, 8155 Geer Highway, Cleveland, SC 29635, (864) 836-6115.

SEPTEMBER 17. Beach Sweep. Myrtle Beach. Contact Myrtle Beach State Park, 4401 South Kings Highway, Myrtle Beach, SC 29575, (843) 238-5325 or (843) 238-0874.

SEPTEMBER 20. The Nature of Things with Rudy Mancke. Columbia. Contact McKissick Museum, (803) 777-7251 or visit www.cas.sc.edu/mcks.

SEPTEMBER 23-25. 36th Annual Atalaya Arts & Crafts Festival. Murrells Inlet. Contact

Huntington Beach State Park, 16148 Ocean Highway, Murrells Inlet, SC 29576, (843) 237-4440.

OCTOBER 1. National Hunting and Fishing Day. Seneca. Contact Duke Energy, (800) 777-1004 or visit www.duke-energy.com/worldofenergy.

OCTOBER 1-31. Archaeology Month. Statewide. Contact Nena Rice, USC's Institute of Archaeology and Anthropology, 1321 Pendleton Street, SC 29208, (803) 777-8170.

OCTOBER 12-23. State Fair. Columbia. Contact South Carolina State Fair, (803) 799-3387, extension 16 or visit www.scstatefair.org.

OCTOBER 15. 22nd Annual Wooden Boat Show. Georgetown. Contact Georgetown Wooden Boat Show, P.O. Box 2228, Georgetown, SC 29442, (877) 285-3888, (843) 545-0015, or visit www.woodenboatshow.com.

OCTOBER 21-23. Oktoberfest. Walhalla. Contact Walhalla Chamber of Commerce, (864) 638-2727 or visit www.walhallas.com.

OCTOBER 22. Fall Color Walk. Greenville. Contact Paris Mountain State Park, 2401 State Park Road, Greenville, SC 29609, (864) 244-5565.

OCTOBER 29. Jack-O-Lantern Jubilee. North Augusta. Contact City of North Augusta, (803) 441-4310. 🌿



PHOTO COURTESY THE ANDERSON INDEPENDENT MAIL

NATIONAL HUNTING AND FISHING DAY AN UPSTATE TRADITION

October 1. The fifth annual Upstate National Hunting and Fishing Day celebration is scheduled for 9 a.m. to 3 p.m. on Saturday, October 1, at the World of Energy at Oconee Nuclear Station near Seneca.

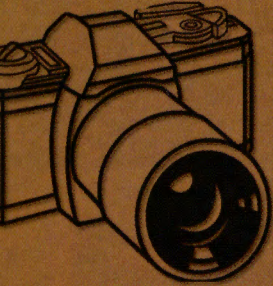
The event, which began as a way to promote outdoor recreation to the young and young-at-heart, attracted more than 2,000 people in 2010.

Participants can learn to kayak, practice shooting bows and arrows, or test their fly-tying skills, in addition to many other hands-on activities. Representatives from more than three dozen conservation agencies and organizations will be on hand to discuss the responsibilities that come with protecting South Carolina's environment and natural resources.

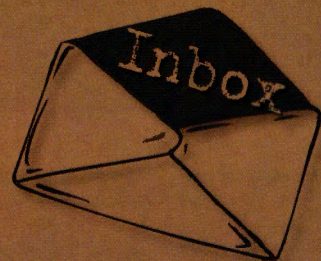
All activities and parking are completely free, with a shuttle service provided from the event parking area off of S.C. Highway 130. Guests can bring their own picnic lunches or purchase food from the on-site vendor.

The event is a partnership between Duke Energy, Upstate Forever, the S.C. Department of Natural Resources, Trout Unlimited, Clemson Extension 4-H, the South Carolina Wildlife Federation, the Harry Hampton Memorial Wildlife Fund, The Weatherby Foundation, Calm Water Kayak Tours and Sunrift Adventures.

For directions and more information, call 1-800-777-1004. 🌿



outdoors



Panhandling Alligator



STEPHEN THOMAS

Shades of Captain Hook! *SCW* reader Stephen Thomas of Fort Mill was gator hunting near Bushy Park on the Cooper River in September 2008 when he snapped a picture of this twelve-footer — reminiscent of the hand-hungry reptile in *Peter Pan* — hoping for a handout from a nearby crabbing vessel. It wasn't unexpected. The gator had previously approached Thomas' boat while he was fishing with his family. Unfortunately, it's a learned behavior that can have bad consequences for both humans and gators, which should never be deliberately fed in the wild. The shot was taken with a Canon 40D with a 70-200mm zoom lens set at 100mm.

Guidelines for Submitting Photos

- Photographs should be submitted by amateur photographers who are *SCW* subscribers/readers.
- To be considered, attach a digital photograph to an e-mail with the subject line "*SCW* reader submitted photo feature" and e-mail to readerphoto@dnr.sc.gov.
- The body of the e-mail should contain the photographer's

name, age, place of residence, any information you can share about the photo (such as where it was taken, what type of camera was used, etc.) and a daytime telephone number.

- Each e-mail should have one (1) high-resolution photograph attached (jpeg photo files of 1 MB or larger work best for publication — smaller images may not be usable).
- Links to photo sharing websites such as Picassa will not be

considered, nor will e-mails with multiple attachments.

- **Sunrise over South Carolina.** Between now and September 23, send us photos of your most cherished South Carolina locations taken at sunrise. These submissions will be considered for an upcoming feature devoted to sunrises over the Palmetto State. Submit just like you would normally for *Outdoors Inbox*, but be sure and put "**Sunrise**" in the subject line of your e-mail. 🐊



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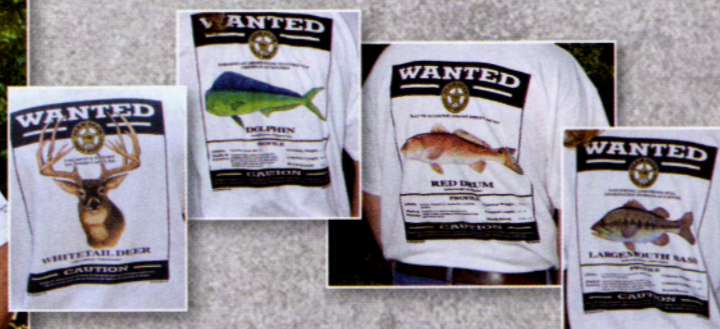
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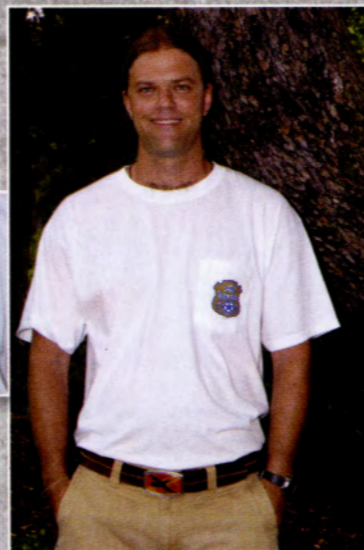
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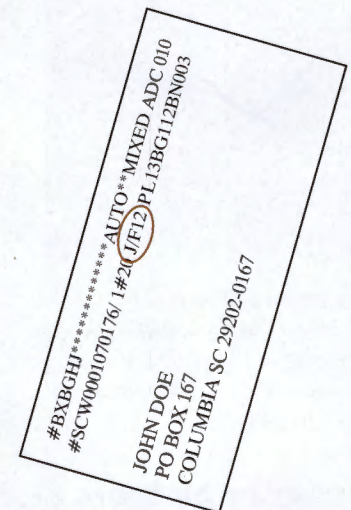
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