

Department and Program Information
and Faculty Achievements

2009 SPRING GRADUATES

13 STUDENTS RECEIVE BACHELOR OF SCIENCE DEGREES; 3 GRADUATE DEGREES AWARDED



2009 Spring Graduates (from left) Drew Gregory, Ryan Jones, Joseph Krahe, Shannon Bowling, Jessie Birkhead, William Paugh, Greg Bustard, Brad Carey (MFW), Jeremy Remington, Edward Davis. Congratulations to all graduates.

A COMPLETE LIST OF GRADUATES AND THE DEGREES AWARDED. **PAGE 2**

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2009 SPRING GRADUATION

GRADUATION DINNER



Graduates, families, friends, faculty, and staff at the graduate dinner.

THE GRADUATES

BACHELOR OF SCIENCE IN FISHERIES AND WILDLIFE

► Wildlife Concentration

Jessie Birckhead
Shannon Bowling
Edward Davis
Joseph Krahe
Mary Beth O'Brien
William Paugh
Jeremy Remington

BACHELOR OF SCIENCE IN FISHERIES AND WILDLIFE

► Fisheries Concentration

Joseph Alderman
Emily Bryant
Gregory Bustard
Drew Gregory
Ryan Jones
Donna MacLennan

MASTER OF SCIENCE IN FISHERIES AND WILDLIFE SCIENCES

Adriana Cerbin (Advisor Dr. Steelman)
Amelia Savage (Advisor Dr.
Moorman)

MASTER OF FISHERIES AND WILDLIFE SCIENCES

Brad Carey (Advisor Dr. Lancia)



Dr. Chris Moorman addressing graduates and their families at the 2009 Fisheries and Wildlife Spring Commencement Dinner.

2009 SPRING GRADUATION DINNER

CONGRATULATIONS
TO ALL GRADUATES



Dave Woodward representing the Wake County Wildlife Club speaking to the graduates and their families.



Dr. Phil and Carolyn Doerr, Dr. Chris and Leslie Moorman, Donald and Joanna Kahn (daughter of Fred and Joan Barkalow) and Dr. Ian Sterling celebrated the life and accomplishments of Dr. Fred Barkalow after Dr. Ian Stirling's presentation of Natural History of Polar Bears as part of the Fred and Joan Barkalow Distinguished Conservationist Lecture.

HONORING BARKALOW

BIO: Ian Stirling is an Emeritus Research Scientist with the Canadian Wildlife Service and an Adjunct Professor in the Department of Biological Sciences, University of Alberta, Edmonton. He has conducted research on polar bears and polar seals (Arctic and Antarctic) for 39 years, particularly in the areas of ecology, behaviour, evolution, relationships between polar bears and seals, the biological importance of polynyas, and the conservation and management of polar marine mammals and ecosystems. For his work, he has won several awards including the Northern Science Award, being made an Officer in the Order of Canada, and being elected as a Fellow of the Royal Society of Canada. He participates in a number of national and international committees on polar bears and marine mammals and has authored or co-authored over 200 scientific articles and 3 books.



THE FREDERICK & JOAN BARKALOW DISTINGUISHED CONSERVATIONIST LECTURE

This lecture was created to honor Dr. Fred Barkalow's 37 years of dedicated public service to conservation of natural resources in NC and the nation. To recognize his career achievements, Fred was presented with US Department Of Interior Public Service Award, and was the first inductee into the NC Conservation Hall Of Fame. As a founder of NCSU's wildlife program, zoology department head, dedicated teacher, in field and classroom, Fred enthusiastically promoted wildlife conservation and mentored generations of students at State. Fred & Joan Barkalow's living legacy to students & the conservation community is this lecture series, intended to attract the world's leading scientists/wildlife biologists & conservationists to the NC State Campus in order provide students with informed exposure to science and policy challenges. The series is broad spectrum because to succeed, conservation requires a balance of science, philosophy/ ethics & activism metered by history; a sense of how/why we got to where we are. Fred laid the foundations for our stellar Wildlife & Fisheries program at NCSU, and to provide for this lecture in perpetuity was Fred and Joan's dream. That this dream is being realized is illustrated by the speakers roll;

Barkalow Lecture Speakers 1980-2009

1980-TOM KIMBALL
1981- FRANK BELROSE
1982- LLOYD KEITH
1983- DALE MCCULLOUGH
1984-VALERIUS GEIST
1985-DAVID WESTERN
1986-DENNIS RAVELING
1987- LARRY JAHN
1988-DAVID MECH
1989-F. EUGENE HESTER
1990-PETER MYERS
1991-LEIGH FREDRICKSON
1992- ULYSSES SEAL
1993-LYNN GREENWALT

1994-CHARLES E. MESLOW
1995-JAMES TEER
1996-DAVID EHRENFELD
1997- A.R.E. SINCLAIR
1998 -FRED GUTHERY
1999 - CURT MEINE
2000 – RANDALL EATON
2001 - MARGARET LOWMAN
2002-W. CARTER JOHNSON
2003 - EDWIN PHILLIP PISTER
2004 –JAIMIE CLARK
2005 - LUIGI BOITANI
2007 –SHANE MAHONEY
2009 – IAN STERLING

Ian Sterling: Emeritus Research Scientist

NATURAL HISTORY
OF POLAR BEARS



CONCLAVE 2009

AWARDS



Michael Nunnery won third place in the archery competition.



Chris Ayers won first place in the essay competition.



Colter Chitwood won second place in the flycasting competition.



Photos by Chris DePerno

2009 Conclave Team

CONCLAVE 2009

N.C. STATE STUDENTS WIN AWARDS IN DRAWING, ESSAY WRITING, ARCHERY AND FLYCASTING



Quiz Bowl Team: Jessie Birkhead, Miranda Wood, Brandon Sherrill, and Colter Chitwood.



Miranda Wood won second place for drawing/art.



Pete Bromley with the feral pig he killed on the hunt.



Joe Hightower with the feral pig he killed on the outing.



Jamie Sasser, wildlife biologist and director of Howell Woods, and his young daughter.

HUNTING FERAL HOGS AT HOWELL WOODS

Current and retired FWSP faculty enjoyed their Annual feral pig hunt at Howell Woods Environmental Learning Center. The hunt was a success and great fun was had by all. Many thanks to Jamie Sasser and Dick Lancia for organization and hospitality and to the staff for all their work and good cheer.



Photo by Chris DePerno

Graduate students Chris Ayers and Liz Rutledge distribute brochures to visitors at Lake Johnson.

Educating the public about wildlife

N.C. State graduate students and faculty produce a brochure on problems associated with feeding birds

On Sunday, 5 April 2009, Liz Rutledge (Ph.D. student), Chris Ayers (M. S. Student), and Dr. Chris DePerno spent a few hours at Lake Johnson educating the public about not feeding waterfowl. The trio spoke to the general public and handed out ~30 brochures. The brochures highlight five reasons why feeding waterfowl is detrimental to the birds and the environment: water pollution, nutritional deficiencies, disease, overpopulation, and habitat degradation.

The brochure was prepared by Liz, Chris, and Drs. DePerno and Moorman with content support from the North Carolina Wildlife Resources Commission and USDA-Wildlife Services. Financial support was provided by Greensboro Parks and Recreation, Raleigh Parks and Recreation, Apex Parks and Recreation, and the NCSU Fisheries and Wildlife Sciences Program. Layout and design was completed by Steve Allen. To date, 1500 brochures have been printed and distributed.

If interested in receiving a copy of the brochure, please contact Dr. Chris DePerno (chris_deperno@ncsu.edu)



College anglers fish for rivalry

N.C. State, UNC, Wake Forest take it easy in first Tobacco Road event

By Mike Zlotnicki
News & Observer Staff Writer

CARRBORO - The phrase "Tobacco Road" typically is associated with the college basketball rivalries of North Carolina, Duke, N.C. State and Wake Forest.

One day soon, it also could trigger images of similar bass fishing rivalries, albeit on a smaller scale.

On Saturday, angling teams from N.C. State, UNC, Wake Forest and East Carolina were among the eight teams that met at University Lake in Carrboro for the inaugural Tobacco Road Bass Tournament. (Duke was a no-show.)

And N.C. State again showed why the BassPack is one of the dominant clubs in competitive collegiate bass fishing.

The anglers arrived before 7 a.m., a few hiding bloodshot eyes behind sunglasses and managing bed heads with weathered ball caps, the telltale signs of late nights.

"It's been a long time since I saw so many sober college boys at one time," said lake warden Bob Glosson, an avid bass angler himself.

The anglers, 15 in all, loaded their gear in the 14-foot rental johnboats that would serve as their fishing platforms. No metal-flake fiberglass hulls with 250-horsepower outboards would be allowed this day. Only electric trolling motors are allowed on University Lake, and the live wells were aerated plastic tubs.

The BassPack anglers did sport team jerseys, though.

There was surprisingly little trash-talking between the participants, only some needling and banter among teammates.

"I'm bringing a West Coast swagger to the tournament," joked Wake's Andrew Jacobs, 19, formerly of Seattle.

"Drop shots and swim baits, baby," added partner Ryan Casey, describing the lures associated with Western states.

Casey, 19, from Roanoke Rapids, is the founder of the Wake Forest Fishing Demon Deacons.

After a rules briefing by the BassPack's Alex Freeman, the eight teams set out, and before long, the tournament began to have a distinct college feel to it.

Freeman came directly from his bartending job to the lake without any sleep.

Later in the morning, Glosson started to make the rounds, checking on his charges. The first boat he stopped at be-

longed to the BassPack team of Casey Johnson, 20, and Mark Kozazcki, 18. Things were looking promising.

"We should have four in there," Johnson said, motioning to his tub. "I had one on the measuring board, and it flopped in the water."

Johnson, who recently purchased a used bass boat, was still trying to adjust to the format.

"I think [the tournament] is a great idea," he said. "Johnboats, not so much. I'm used to a bigger johnboat."

At the lake office building, volunteer Doug DeWitt of Apex set up a portable weigh station, complete with a modest public-address system and a table for trophies. DeWitt liked seeing the kids on the lake.

"I think it's a good cause," he said. "I don't think there's enough attention paid to outdoor sports at the college and high school level."

Out on the water, Zach D'Alessio, 19, of East Carolina should have paid more attention to his boat driving. Before it even started, he was having a tough day already.

His partner couldn't make it at the last minute, so D'Alessio, a bass fishing rookie, gamely came on his own. In the morning, he accidentally backed his boat into a bush, where a snake became entangled in his propeller. He had to cut the dead snake out, and when he tried to lift his motor, the throttle unit came off.

D'Alessio was later spotted on the lake twisting the shaft for direction while manipulating the throttle with his other hand.

"Not a great day for ECU," said D'Allesio, who had released his two bass earlier when he thought he was out of it. He went through another motor before returning to the competition, but he never boated another bass.

In one cove, Will Cimino, 19, and Jarrett Wood, 21, of the Carolina Fishing Club were fishless.

Cimino, from Greensboro, is president of the club and was instrumental in organizing the event. He landed a small bass from the shallows.

"It's better than going back with your tail between your legs," he said.

In the Price Creek arm of the lake, BassPackers **Jared Beard** and **Drew Gregory**, both 23, shirtless and shoeless,

Please see, **Fishing** Page 10

Fishing

Continued from page 9

had figured out the fish and already had culled twice as they increased the weight of their five-fish limit.

They kept a radio tuned to a country station, and when Brad Paisley's ode to fishing, "I'm Gonna Miss Her," came on, the pair joined in the chorus "Oh, lookie there, I've got a bite."

They were using Texas-rigged Zoom Magnum Lizards.

"We're little bit superstitious," said Beard, who would celebrate his birthday at midnight. "We don't turn [the radio] on until after the first bite."

Their karma worked well enough for them to take first place with five bass weighing 8 pounds, 12 ounces.

Henry Veggian, an English professor at UNC and faculty adviser to the Carolina Fishing Club, was on hand for the weigh-in.

He liked the scale of the tournament and doesn't see it having to shed its grass-roots feel.

"I like it the way it is," he said. "Fishing, camaraderie and friendship."

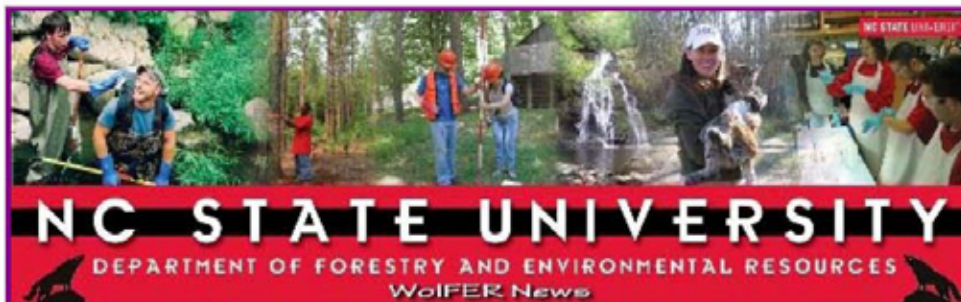
Freeman and Cimino agreed.

"This way it brings you back to your roots," Freeman said. "It's fun this way."

"I agree," Cimino said. "Fish don't care what you're driving."

Freeman said that 10 years from now, he would like every school within 100 miles to field teams, complete with trash-talking, jerseys and sponsors.

Time will tell whether the Tobacco Road Bass Tournament remains a johnboat event or grows into the metal-flake mainstream of bass fishing.



FER Student Success Depends on You

We Urgently Need Your Help

There comes a time in the life of any academic program at a public institution (ever the best ones) when economic factors threaten the successes of that program.

For the Department of Forestry and Environmental Resources (FER) at NC State, that time may be NOW.

As an alumnus, supporter or friend of Forestry and Environmental Resources, you probably realize that a key part of our historic success has been the availability of scholarship and discretionary funds to attract, educate and graduate promising students at the undergraduate and graduate levels.

What you may not know is that those funds are based on endowed investments and on income from the Hofmann Forest. Declining economic developments in the US and worldwide have severely curtailed both sources of funding. As a result, for the first time in its 80-year history, the department may be facing a staggering situation - ***over the next three years we may not be able to fund existing scholarships already committed or new scholarships.***

The effects of such a development would be long-lasting...and devastating. Despite the current economic situation, our employers will continue to have a strong need for entry-level and advanced natural resource professionals. Without students in the pipeline now, those positions will not be filled by the outstanding individuals needed to help our profession(s) survive and solve the complex environmental problems of the present and future.

WE NEED YOUR HELP!

We need donors to step forward and help us bridge the estimated 2-3 year gap until our regular funding sources are restored. Donations would help us sustain our scholarship awards through this difficult period, so that we can continue to provide high quality graduates that are prepared and ready to meet the needs of the future.

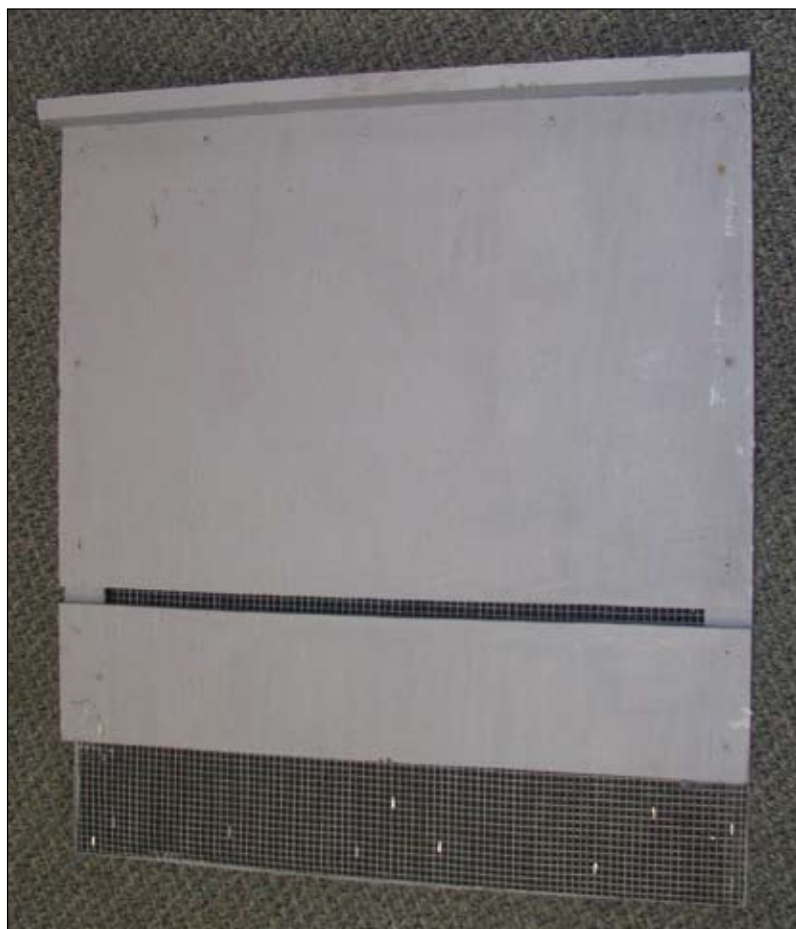
Can you please help us? Tax-deductable donations of any size will help us through this difficult period, and they will be greatly appreciated. The Give Online link below can be used to assist you in your donation. Once opened, be sure to make your "Gift To" either:

Friends of Forestry and Environmental Resources
Friends of Fisheries and Wildlife
Other: *write-in a specific fund or area*

Donations may also be made payable to and mailed to the following
Natural Resources Foundation - FER
Campus Box 8010
Raleigh, NC 27695



ENHANCE WILDLIFE HABITAT



GET YOUR BAT BOXES AND WOOD DUCK BOXES \$50 each from the Leopold Wildlife Club

If interested contact Dr. Chris DePerno (chris_deperno@ncsu.edu)

Alumni update: Jason Brown

Since graduation, Jason Brown, B.S. Fisheries & Wildlife Sciences Program, has been working with Progress Energy alongside corporate biologists to solve regulatory biological problems. He spends about 50% of his time in the field and the other 50% in a lab working up data and working on equipment.



Animals bridge the divide

Maria Palamar participates in bilingual story times at the N.C. Museum

By Denise Sherman
Eastern Wake New Staff Writer

KNIGHTDALE — The world got a little smaller Saturday as a pigmy opossum, a python, a litter of mice and a room full of children listened to language — both English and Spanish.

“We’re a bilingual family and we like anytime there is an opportunity that supports that,” said Janine Maldonado, who brought Joy, 16 months, and Joshua, 4, to the East Regional Library story time. “We’re always seeking out educational opportunities for our children. And the animals are an easy sell.”

On Saturday, the N.C. Museum of Natural Sciences partnered with the library, providing the creatures and bilingual storyteller Maria Palamar, a veterinarian who is pursuing a Ph.D. in wildlife studies at the N.C. State University School of Veterinary Medicine.

“I see that kids are losing Spanish because they are not speaking it,” said Palamar, who hails from Argentina.

Palamar intermingled English and Spanish in her story, “Los Animales No Se Visten” or “Animals Don’t Wear Clothes” so that the children got an appreciation and sense of both languages.

She also took out her cache of museum animals for children and adults to pet.

Palamar likes the opportunity to educate about wildlife.

“There are 30 different kinds of snakes in North Carolina,” she said, noting only a handful are poisonous. “Don’t be afraid. They say, ‘Oh, I don’t have any venom and I’d better run away.’”

Bilingual story times are part of the library’s regular offerings, said Andrea Purdy, children’s services librarian. But special funding brings in the animals.

Grants from the Citi Foundation, BASF and the Biogenidec Foundation help underwrite the 8-year-old program that serves eight branches of Wake County Public

Libraries this year, said Stephanie Bohr, curator of special populations at the museum.

“I think it’s a great way for the Spanish-speaking community of North Carolina to have an experience alongside the English-speaking community so that they can explore the importance of literacy and science,” said Bohr. “It’s also a great way to bring the museum out to the community.”

Most of the parents who brought children to the library speak both English and Spanish and want their children involved with both languages and cultures.

“We wanted for her to be dominant with one language before we started her on the next one,” said Aristobulo Loaiza, who came out with his wife, Jennifer and daughter, LiLiana, 3.

Loaiza, a scientist at BASF, was born in Colombia and grew up in Los Angeles. He said his daughter watches bilingual television shows and that he now speaks Spanish to her as well. He also said she gets good Spanish instruction at Bright Horizons, her preschool in RTP.

“We’ve been trying to make it for a couple of weeks,” said Cotu Hernandez of Durham. “We’re a bilingual family and there’s not a branch there that offers this.”

Hernandez and his wife, Zara, speak both English and Spanish to their son Caonabo, 7 months.

Valerie Luberecki’s first immersion in Spanish came when she studied in Costa Rica in college. Since, she’s traveled many times to Central and South America.

She wants her 2-year-old son Gabriel, who was born in Guatemala, to be exposed to both languages and cultures.

He listened with rapt attention, and after the story wandered over to the mice cage for a close look.

Julie Stark just stopped by the library to pick up a book with her two daughters and got a bonus in the story time room in the back of the library.

“She’s very interested in listening to Spanish,” Stark noticed of daughter Hannah, 4.



NATIVE FORBS AND GRASSES

What's available and how to establish and maintain plantings

Terry Sharpe and the Garrett Wildflower Seed Company Staff

WEDNESDAY, AUGUST 19, 2009



Time: 10:00 am – 3:00 pm

Location: 1591 Cleveland Road Smithfield NC

Number of Participants:

limited to 25

LUNCH PROVIDED

Other Details: Workshop will focus on establishing and maintaining native grass and forb plantings.

TOPICS TO BE DISCUSSED INCLUDE:

➤ Species availability: An overview of what is commercially available.

➤ Planting considerations and equipment
What to look for on the seed label (pls, dormancy, weed seeds, etc), soil preparation, fertilization, planting dates, planting techniques, seeding rates, and discussion of successes and failures

➤ **Stand Maintenance:** Pest control, burning

➤ Group discussion on factors limiting plantings and additional plant materials needed

Contact Terry Sharpe (sharpetl@etinternet.net; 910-652-6403) for more details and to sign up

ABSTRACT: AMELIA SAVAGE

Foraging habitats of Swainson's warbler

(UNDER THE DIRECTION OF DR. CHRIS MOORMAN)

Swainson's Warbler, (SWWA) *Limnothlypis swainsonii*, is a migratory songbird that breeds in bottomland hardwood forests across the south-eastern United States. It is believed to be one of the least abundant breeding songbird species in the region and has disappeared entirely from its historical ranges in Maryland, Delaware, Missouri, and Illinois. While nest-site selection has been well studied, little is known about SWWA foraging habits except that the species is insectivorous with a large bill used to flip fallen leaves on the forest floor. We captured and crop-flushed SWWA to determine diet, and sampled leaf litter arthropods and vegetation at each SWWA capture location. We compared the proportion of arthropod orders detected in crop-flush samples to the proportion of arthropods collected in the leaf litter to determine which orders were eaten by SWWA more or less than their proportional availability. Although Acari (mites and ticks) and Chilopoda (centipedes) were the most abundant arthropods recorded in the leaf litter samples (51% and 18%, respectively), these orders rarely occurred in crop flush samples. Conversely, Araneae (spiders) and Coleoptera (beetles) were uncommon in leaf litter samples (2% and 5%, respectively) but were the most abundant arthropod orders in SWWA crop flush samples. We conducted binary logistic regressions with the presence or absence of Aranids as the dependent variable and



Amelia Savage during a study abroad trip in Guatemala.

habitat measures as the independent variables. The probability that spiders were present in the leaf litter increased as leaf litter depth increased. Leaf litter depth can be maintained by having closed canopy forests, and a flooding regime that does not remove leaf litter.



ABSTRACT: JASON DOUGLAS GODBOUT

Interactions between Largemouth and Spotted Bass in Lake Norman

(UNDER THE DIRECTION OF JAMES A. RICE AND D. DEREK ADAY.)

Spotted bass *Micropterus punctulatus* were recently introduced into Lake Norman, which already supported a healthy largemouth bass *M. salmoides* population. After only ten years, spotted bass now make up about half of the black bass fishery.



Godbout

Because the two species are ecologically similar, and numbers and biomass of largemouth bass have been declining, biologists were concerned that spotted bass were negatively affecting largemouth bass. Additionally, morphological observations suggested the two species were hybridizing. To better understand these issues, hybridization, diet overlap, and habitat use by black bass in Lake Norman were quantified. Genetic analyses confirmed largemouth and spotted bass were hybridizing. Genetic information on individuals was paired with morphological characteristics at juvenile (50 – 100 mm total length, TL; n =

60) and adult (300 – 500 mm TL; n = 78) life stages, and reliable patterns for field identification of spotted bass, largemouth bass, and hybrids were developed (78-88% correct). To understand potential competition between the taxa, juvenile (n = 132) and adult (n = 120) black bass were collected for diet and habitat comparisons. Diet information was collected from juveniles from 31 July – 08 Aug 2007, 29 April 2008, and 10 June 2008 at different spatial scales. Zooplankton and benthic invertebrates were collected to estimate availability. Diet information was collected from adult fish from 29 April – 01 May 2008 and from 12 May – 16 May 2008. Habitat information on substrate and cover use was collected from locations of where fish were captured, and habitat availability of substrate and cover was estimated from 300-m transects (n = 12) throughout the reservoir. Proportion similarity index and Morisita's index were used to quantify diet overlap by percent by number and

percent by occurrence, and 10,000 bootstrap values were generated so that 95% confidence intervals could be estimated. Estimates of habitat selection were calculated with Jacob's improved Ivlev's index of electivity and the Strauss index of selectivity. Estimates of diet overlap were high, and 95% confidence intervals were typically in the upper half of the range of the indices. Based on prey availability samples, selection of invertebrate prey was largely opportunistic and similar between species. Habitat selection of both substrate and cover was similar with few exceptions. Because largemouth and spotted bass are hybridizing in Lake Norman, and overall, they show high overlap in use of prey items and habitat at both juvenile and adult life stages, they are likely competitors in Lake Norman. These findings should guide future research and educate managers and anglers about the potential effects of introducing spotted bass or largemouth bass into lakes already containing a healthy black bass fishery.



Spotted bass



Largemouth bass

ABSTRACT: STEPHEN RUSSELL MIDWAY

Habitat Ecology of the Carolina Madtom

(UNDER THE DIRECTION OF D. DEREK ADAY AND THOMAS J. KWAK.)

The Carolina madtom *Noturus furiosus* is an imperiled stream catfish (Ictaluridae) endemic to the Tar and Neuse river basins in North Carolina. The species is listed as State Threatened, and whereas the Tar Basin population resembles its historical distribution, the Neuse Basin population has shown recent significant decline.

Quantifying habitat use and availability is critical for effective management and subsequent survival of the species. This study combined field and laboratory research to investigate habitat use and suitability, as well as efficacy of an artificial cover unit. To assess habitat suitability, we investigated six reaches (three in each river basin) to (1) quantify Carolina madtom microhabitat use, availability, and suitability, (2) compare suitable microhabitat availability between the two basins, and (3) examine the effectiveness of an instream artificial cover unit. We also conducted laboratory experiments to examine madtoms' use of the same artificial cover unit relative to three natural cover types.

Carolina madtom were located and their habitat use was quantified at four of six survey reaches; the species appeared to be absent at two reaches in the impacted Neuse Basin. Carolina madtom most frequently occupied shallow to moderate depths (0.5 m) of swift moving water over a sand substrate using cobble for cover. Univariate and principal components analyses both showed Carolina madtom use of instream



Carolina Madtom

habitat to be selective, or nonrandom. Interbasin comparisons suggested that most suitable microhabitats (particularly water depth and velocities) were more prevalent in the Neuse than in the Tar Basin, which is interesting considering that the Neuse population appears to be the more impacted of the two. Consequently, we suggest that other physical or biotic factors must be responsible for the decline in the Neuse Basin population.

Our instream artificial cover units were occupied mainly by Carolina madtom (25% of the time), and rarely by a suite of other stream animals. Comparing areas with the artificial cover units ('treated areas') to those without them ('control areas'), Carolina madtom abundance among all treated areas was statistically higher than the controls, demonstrating that madtoms will use suitable artificial cover when available.

Microhabitat characteristics of occupied artificial cover units closely resembled those of natural microhabitat use. Results from the field component of the study provide hab-

itat suitability criteria that can inform management and conservation of the Carolina madtom, and the artificial cover units present a cost-effective conservation and restoration option if increased management is deemed necessary.

In the laboratory component of the study, Carolina madtom were placed in an experimental stream tank (44 cm x 88 cm in area and about 45 cm deep) and given 24 hours to make a selection among four cover options, three natural (one each of rock, leaf pack, and mussel shell) and the artificial cover unit. Among 30 experimental trials, Carolina madtom preferred the artificial cover unit, selecting it 63% of the time. Rock was selected 23% and leaf pack 13% of the time. Contrary to previous anecdotal observations, mussel shells were not selected during any trials. Results from the laboratory experiments, coupled with similar findings from instream work, indicate that artificial cover may be a viable option for species conservation and restoration.

Given the State Threatened status and limited distribution, our results have implications for conservation and restoration of this native and endemic southeastern catfish. Successful management and conservation of declining Carolina madtom populations is dependent upon preserving Tar Basin habitat, identifying Neuse Basin impacts, and restoring Neuse Basin populations.

Publications & Presentations



Publications

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Publications & Presentations



Presentations

- Ayers, C. R., C. S. DePerno, C. E. Moorman, F. H. Yelverton, J. Wang and S. Kennedy-Stoskopf.** 2009. Chemical control of resident Canada geese and a survey of fecal contaminants. 4th Annual Graduate Student Research Symposium, McKimmon Center, North Carolina State University, Raleigh, North Carolina.
- Ayers, C. R., C. S. DePerno, C. E. Moorman, F. H. Yelverton, and S. Kennedy-Stoskopf.** 2009. Chemical control of resident Canada Geese and a survey of fecal contaminants. 2009 Annual Meeting of the North Carolina Chapter of The Wildlife Society, Haw River State Park, Brown Summit, North Carolina.
- Chitwood, M. C., C. S. DePerno, M. N. Peterson, and R. A. Lancia.** 2009. Understanding dog hunting culture in the Southeast: the use of dogs to hunt white-tailed deer and black bear. 2009 Annual Meeting of the North Carolina Chapter of The Wildlife Society, Haw River State Park, Brown Summit, North Carolina.
- Chitwood, M. C., C. S. DePerno, M. N. Peterson, and R. A. Lancia.** 2009. Understanding dog hunting culture. 4th Annual Graduate Student Research Symposium, McKimmon Center, North Carolina State University, Raleigh, North Carolina.
- Cope, W. G., R. B. Bringolf, R. M. Heltsley, C. Eads, T. J. Newton, S. Fraley, and D. Shea.** 2009. Accumulation and effects of pharmaceuticals on native freshwater mussels. Invited paper presented at the 8th Annual Surface Water Monitoring and Standards Meeting, Chicago, IL, February 10-12, 2009.
- Friedl, S. E., J. A. Buckel, J. E. Hightower, F. S. Scharf, and K. H. Pollock.** 2009. Effects of implanting a relatively large sonic telemetry tag on growth, survival, and tag retention in age-1 spot. Tidewater Chapter, American Fisheries Society, Wilmington, North Carolina, March 12-14, 2009.
- Harris, J. E., and J. E. Hightower.** 2009. Migratory patterns of American shad transported above dams on the Roanoke River. NC Chapter, American Fisheries Society, Burlington, North Carolina, February 23-25, 2009.w
- Golden, K. E., C. S. DePerno, C. E. Moorman, M. N. Peterson, and R. E. Bardon.** 2009. Surveying North Carolina private landowners. 4th Annual Graduate Student Research Symposium, McKimmon Center, North Carolina State University, Raleigh, North Carolina.
- Golden, K. E., C. S. DePerno, C. E. Moorman, M. N. Peterson, and R. E. Bardon.** 2009. NIP landowner interest in wildlife-related fee access in North Carolina. 2009 Annual Meeting of the North Carolina Chapter of The Wildlife Society, Haw River State Park, Brown Summit, North Carolina.
- Hazelton, P. D., W. G. Cope, M. C. Barnhart, and R. B. Bringolf.** 2009. Evaluating the effects of emerging contaminants on reproduction in fatmucket (*Lampsilis siliquoidea*). 6th Biennial Symposium of the Freshwater Mollusk Conservation Society, Baltimore, MD, April 19-24, 2009.

Publications & Presentations



- Jacques, C. N., J. A. Jenks, C. S. DePerno, T. W. Grovenburg, J. D. Sievers, T. J. Brinkman, C. C. Swanson, and B. A. Stillings.** Evaluating ungulate mortality associated with helicopter net-gun captures in the Northern Great Plains. Wisconsin Department of Natural Resources Science Services Statewide Meeting, Wausau, Wisconsin.
- Karns, G. R., R. A. Lancia, C. S. DePerno, M. C. Conner, and M. S. Stoskopf.** Intracranial abscessation as a natural mortality factor in adult male white-tailed deer. 32nd Annual Meeting of the Southeast Deer Study Group, Hotel Roanoke, Roanoke, Virginia.
- Karns, G. R., R. A. Lancia, C. S. DePerno, and M. C. Conner.** 2009. Impact of hunting pressure on adult male white-tailed deer behavior at Chesapeake Farms, Maryland. 32nd Annual Meeting of the Southeast Deer Study Group, Hotel Roanoke, Roanoke, Virginia.
- Mitchell, W. A., J. C. Taylor, J. A. Buckel, J. E. Hightower, and M. T. Pratt.** 2009. Feasibility of using mobile hydroacoustic surveys for estimating spawning stock size of blueback herring in western Albemarle Sound, North Carolina. NC Chapter, American Fisheries Society, Burlington, North Carolina, February 23-25, 2009.
- Mosher, S., and W. G. Cope.** 2009. Na⁺,K⁺-ATPase activity as a biomarker of lead exposure in freshwater mussels. 6th Biennial Symposium of the Freshwater Mollusk Conservation Society, Baltimore, MD, April 19-24, 2009.
- Newton, T. J., and W. G. Cope.** 2009. Biological responses of unionid mussels to environmental contaminants. Invited Plenary Paper presented at the 17th Annual Meeting of the Society of Environmental Toxicology and Chemistry Midwest Chapter, La Crosse, WI, March 30-April 1, 2009.
- Pandolfo, T. J., and W. G. Cope.** 2009. Implications of temperature sensitivities for managing native mussel populations and their host fishes. Invited Short Course Presentation at the Annual Meeting of the North Carolina Chapter American Fisheries Society, Burlington, NC, February 23-25, 2009.
- Pandolfo, T. J., W. G. Cope, R. B. Bringolf, and M. C. Barnhart.** 2009. Temperature sensitivities of freshwater mussels and implications for population management. Invited paper presented at the 8th Annual Surface Water Monitoring and Standards Meeting, Chicago, IL, February 10-12, 2009.
- Pandolfo, T. J., W. G. Cope, R. B. Bringolf, and M. C. Barnhart.** 2009. Beating the heat: upper thermal tolerances of the early life stages of freshwater mussels. 6th Biennial Symposium of the Freshwater Mollusk Conservation Society, Baltimore, MD, April 19-24, 2009.
- Shake, C., and C. E. Moorman.** 2009. Effects of patch size and shape on scrub-successional bird communities. 4th Annual Graduate Student Research Symposium, McKimmon Center, Raleigh, North Carolina.
- Shake, C. S. and C. E. Moorman.** 2009. Effects of patch size and shape on scrub-successional bird communities. NCTWS Annual Meeting, Haw River State Park.

Publications & Presentations



Smith, J. A., and J. E. Hightower. 2009. Spawning activity and migratory characteristics of American shad and striped bass in the Cape Fear River, NC. NC Chapter, American Fisheries Society, Burlington, North Carolina, February 23-25, 2009.

Tyndall, J. M., M. C. Chitwood, S. E. Pratt-Phillips, C. S. DePerno, and S. K. Kennedy-Stoskopf. 2009. Leptin radioimmunoassay validation and correlation to body condition in white tailed doe. 18th Annual North Carolina State University Undergraduate Research Spring Symposium, McKimmon Center, North Carolina State University, Raleigh, North Carolina.

Extension Presentations

Chitwood, C., B. Sherrill, and C. S. DePerno. 2009. Careers in fisheries and wildlife sciences. 29th Annual Dixie Deer Classic Youth Day, North Carolina State Fairgrounds, Raleigh, North Carolina. (3 seminars).

DePerno, C. S., and A. P. Rockhill. 2009. Challenges and solutions at Bull Neck Swamp Research Forest. Presented to 9 members of the North Carolina Forestry Foundation, Hofmann Forest, Deppe, North Carolina.

DePerno, C. S. 2009. Animal Damage—white-tailed deer, moles, voles, and rabbits. Presented to 9 individuals at the Pitt County Master Gardener Volunteer Training, Greenville, North Carolina.

DePerno, C. S. 2009. Coyotes and other predators to livestock. Presented to 47 individuals of Moore County, Livestock Producers, Carthage, North Carolina.

Moorman, C. E. 2009. Urban Wildlife Management. Eastern NC Landscape Conference and Trade Show, Nash County Center (200 people).

Moorman, C. E. 2009. Will Prescribed Fire Remain in Our Toolbox? NCTWS Annual Meeting, Haw River State Park (95 people).

Moorman, C. E. 2009. Habitat Management for Deer: Beyond the Food Plot. The Future of White-tailed Deer Management: A Workshop for Wildlife Managers. Dixie Deer Classic, Raleigh (40 attendees)

Moorman, C. E. 2009. Christmas in Guatemala (with N. Chartier). Richmond County Wild Game Supper, Ellerbe, NC (100 attendees)

Moorman, C. E. 2009. Using Native Plants in Your Backyard. NCSU DFER Arbor Day Celebration, Raleigh (5 people)

Moorman, C. E. 2009. Tour of the Turner House Native Plant Demo Garden. NCSU DFER Arbor Day Celebration, Raleigh (3 people)

Moorman, C. E., and R. Strnad. 2009. New WHEP manual training for 4-H Volunteer Leaders (25 people)

Publications & Presentations



Rutledge, E. M., C. S. DePerno, and C. E. Moorman. 2009. Canada goose movement around PTI airport, Greensboro, North Carolina. Greensboro Parks and recreation Department, Greensboro, North Carolina.

Realtree Publications

Chitwood, M. C., G. Karns, and C. S. DePerno. All about antler development. Realtree.com Whitetail OLOGY 18 December 2008. <http://whitetail.realtree.com/whitetailology/whitetail-insider/antler-development-explained/>

Moorman, C. Oaks for Bucks. Whitetail-ology, www.realtree.com <http://whitetail.realtree.com/whitetailology/land-management/oaks-bucks/>

Awards

Sarah Friedl honored by the North Carolina Association of Environmental Professionals

Annually, the North Carolina Association of Environmental Professionals awards a scholarship to a qualifying graduate student majoring in an environmental field such as ecology, fisheries, forestry, geology, geography, environmental engineering, environmental planning, impact assessment, natural resource management, or conservation. A GPA of at least 3.0 is required, one scholarship is awarded for the academic year, and the student must be enrolled full-time at an accredited college or university in North Carolina.



Corey Shake

Corey Shake wins the Best Student Presentation. At the 2009 Annual Meeting of the North Carolina Chapter of the Wildlife Society, Corey Shake won the Best Student Presentation. The presentation was titled, "Effects of patch size and shape on scrub-successional bird communities" and was coauthored by Dr. Chris Moorman.



Jay Mays and Greg Cope

Marybeth Brey (Ph.D. student of **Drs. Rice and Aday**) won the Robert M. Jenkins Memorial Scholarship from the Southern Division of the American Fisheries Society.

Mays, J. W., W. G. Cope, T. J. Kwak, and D. Shea. 2009. Bioaccumulation of platinum group metals in the freshwater mussel *Elliptio complanata*. 6th Biennial Symposium of the Freshwater Mollusk Conservation Society, Baltimore, MD, April 19-24, 2009. Winner of the Best Student Platform Presentation.

Grants

Aday, D. D., and J. Rice. 2009. White perch invasion dynamics in North Carolina reservoirs. North Carolina Wildlife Resources Commission. \$127,460. 2010-2014.

Blackman, E., C. S. DePerno, M. N. Peterson, and C. E. Moorman. 2009. Agricultural Wintering Habitat as a Limiting Factor for Woodcock in the Southeast: Thirty Years of Agroecosystem Change. United States Fish and Wildlife Service, Webless Migratory Game Bird Research Program, \$59,103; 1 year.

Correa, M., M. N. Peterson, C. S. DePerno, and M. Palamar. 2009. Development and implementation of a bilingual (English and Spanish) community public health education program for zoonoses associated with wildlife in urban environments. North Carolina State University Office of Extension & Engagement & Economic Development Seed Grant. \$9,068; 1 year.

DePerno, C. S., and M. J. Hoff. 2009. Deer and feral pig management on the Currituck Outer Banks. United States Fish and Wildlife Service Challenge Cost Share Grant. \$50,000; 3 years.

Focus on Wildlife

READER PHOTOS OF NORTH CAROLINA'S NATIVE NATURAL WONDERS

CATCHING SOME RAYS



Photo by Steve Allen

These two turtles were caught sunning themselves on a log at Lake Johnson.

Odds & Ends



READ BACK ISSUES ONLINE

If you missed the last issue of the Fisheries and Wildlife newsletter you can catch up on back issues on the department's Web site under the news tab.

<http://www.cnr.ncsu.edu/fer/fishwild>



SCHOLARSHIPS AND OPPORTUNITIES

Please see the NC State Fisheries and Wildlife Sciences website for additional scholarship opportunities. <http://www.cnr.ncsu.edu/fer/fishwild/fwschol.html>

BULL NECK SWAMP SCHOLARSHIP

A new scholarship has been established for an outstanding undergraduate student in the Fisheries and Wildlife Program at NCSU. The Bull Neck Swamp Scholarship will provide \$2,000/semester (\$4,000 annually) to a qualified Fisheries and Wildlife student filing scholarship applications. This scholarship will be awarded to students who have demonstrated strong academic achievement. For incoming freshmen, a high school grade point average of at least 3.5 and a total SAT score of 1150 are required. For transfer students and current students at NC State, a total grade point average of at least 3.2 is required. Applications are due 1 May 2008.

GIVING BACK

SUMMER CAMP STUDENT ENDOWMENTS

You may consider giving to our two Summer Camp student endowments. There is one camp for Fisheries and one camp for Wildlife. These endowments help undergraduate students attend the Wildlife and Fisheries Summer Camp.

For more information on how to contribute, contact **Dr. Chris Moorman** at 919-515-5578 or chris_moorman@ncsu.edu

PHIL DOERR ENDOWMENT FUND

Also, you may consider giving to the **Phil Doerr Endowment Fund**. The endowment, established with the North Carolina Forestry Foundation, will be used to fund an annual award to assist undergraduate or graduate student(s) in gaining valuable field experience. For more information on how to contribute, contact **Dr. Chris Moorman** at 919-515-5578 or chris_moorman@ncsu.edu

THE NEWSLETTER

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Got a story idea or a great photo?

Send your article submissions or pictures of North Carolina's native wildlife to steveallen@nc.rr.com.