2011 SUMMER CAMP

FISHERIES, WILDLIFE, AND CONSERVATION BIOLOGY STUDENTS TEST THEIR KNOWLEDGE DURING SUMMER CAMP - PAGE 2

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DR. ZEB HOGAN - 2011 FRED AND JOAN BARKALOW DISTINGUISHED LECTURER

Imperiled Giants: Ecology and Conservation of the World's Largest Freshwater Fish

Wednesday, Sept. 14th at 1:30
in Room 101 David Clark Labs ..............................6

The 2011 Fisheries, Wildlife, and Conservation Biology Class (not pictured Josh Street).

Photo by Tanner Stanfield
A total of 37 Fisheries, Wildlife, and Conservation Biology students attended the 6-week summer camp program. The Fisheries and Wildlife camp was taught by Dr. Chris DePerno, Dr. Tom Kwak, and Dr. Jeff Buckel with many guest lectures. The course was TA’d by M.S. student Sharon Hux and undergrad students Byron Levon and Rachel Conley.

Thank you to all faculty, staff, and students who made the 2011 Summer Camp a great success!
Nathan Howell holding an eastern king snake at The Fork Farms.

Photos by Nathan Howell

Ph. D candidate Aimee Rockhill shows how to scruff a gray fox.

Mist netting birds at Hill Forest during Summer Camp.
ABSTRACT: NYEEMA CHARMAINE HARRIS

The Biogeography of Carnivore Hosts and their Parasites: Implications for Conservation in North America

(UNDER THE DIRECTOR OF DR. ROBERT R. DUNN AND STACY A.C. NELSON.)

Much effort in ecology seeks to understand what processes maintain and erode patterns in biological diversity. However, little effort has focused on understanding determinants of species diversity for parasites; despite them being speciose and detrimental. Overall, my dissertation research aims to disentangle the mechanisms responsible for generating variation in parasite diversity across space and among species using carnivores as focal hosts. Carnivores are a useful model group because the order Carnivora includes species that vary in their geographic extent as well as their rarity/abundance. As a consequence, the parasites of carnivores comprise both abundant species with potential as zoonotic vectors (e.g., raccoons and rabies) and parasites likely to be in need of conservation. Chapter 1: Using host associations to understand spatial patterns of variation in parasites of North American Carnivores. I developed a parasite diversity model based on known host associations with 29 North American carnivores. Because wide-ranging hosts disproportionately contributed to total and specialist parasite diversity, conservation programs that focus on these common hosts may capture much biological diversity, but also unwittingly sources of human diseases. I supply the first parasite diversity model to understand broad scale patterns in species richness for North American carnivores, which can inform both future parasite conservation and disease management efforts. Chapter 2: The influence of carnivore extinction on the composition and geography of zoonotic parasites. I used presence-absence matrices of host-parasite associations for 29 North American carnivore species and simulated the corresponding changes in parasite community composition and diversity with the random extinction of hosts. I also explored the spatial distribution of zoonotic parasite diversity under three carnivore host composition scenarios. I found that the composition of the parasite assemblage community changed independently across parasite groups with the proportion of zoonotic viruses markedly increasing with carnivore host extinctions. The loss of widespread carnivore hosts had the greatest impact by reducing overall zoonotic diversity and shifting the geographic distributions of parasite-rich areas. If high host diversity dilutes disease prevalence in humans, my findings demonstrate an added benefit of conserving widespread species for human health. Chapter 3: Revisiting parasite conservation in endangered species. I explored whether endangered species have endangered parasites using one of the most endangered North American carnivore species - the black-footed ferret (Mustela nigripes). I sampled over 600 individuals and found that the most abundant ectoparasite is an important vector for plague, a flea Oropsylla hirsuta. I found that the extant parasite community on black-footed ferrets comprised species that are not host-specific, have low probabilities of extinction, and are found commonly in association with prey species. Black-footed ferrets like other endangered species undergo repeated parasite removal and vaccination efforts to facilitate population recovery, which may have unintentionally contributed to their depauperate ectoparasite community.

Chapter 4: Conserving endemic host-parasite interactions in rare species. I evaluated whether the role of an endangered species to supply habitat for ectoparasites varied across the range of the host. I captured 234 island foxes (Urocyon littoralis), an endemic carnivore of the Channel Islands, from three populations: Santa Catalina (n=72), Santa Rosa (n=79), and San Miguel (n=83). I identified 8 ectoparasites species in total, but ectoparasite diversity varied among populations. Furthermore, I found there to be unique host-parasite associations in each island fox population. Given this information, I would be able to assign a fox of unknown origin to its respective population 70% of the time. My findings highlight the importance of conserving populations to maintain endemic interactions and emphasize always considering the role of a species in a local-specific context.
Identifying Barriers to Conservation Subdivisions in N.C.

(UNDER THE DIRECTION OF DR. SUSAN E. MOORE AND CHRISTOPHER E. MOORMAN).

Rapid urbanization, population movement into suburban and rural areas, and the ensuing land use changes reduce open space and associated biodiversity. Conservation subdivisions have emerged as an option to conserve open space, protect water quality and wildlife habitat, and maintain scenic views without compromising property rights. We used a mixed method study combining a survey of 576 people who attended conservation subdivision workshops with a qualitative case study of four communities that successfully developed conservation subdivisions. Survey respondents indicated the top barrier to completion of conservation subdivisions was the lack of incentives for developers. Other barriers, in order of ranking, were the perception that conservation subdivisions are more expensive to build, lack of interest from elected officials, smaller lot sizes, restrictive zoning, and concerns over the long-term management of open space. The case study communities overcame resistance from developers and landowners through educational efforts including informal meetings, charrettes, and workshops focusing on the environmental and economic benefits of conservation subdivisions. The communities had support from elected officials, and planning staff devoted necessary resources to rewrite ordinances, review sketch plans, and perform site visits. To overcome barriers to conservation subdivisions, communities could provide incentives including density bonuses and expedited approval processes. Encouraging participation in workshops and design charrettes for proposed developments also may alleviate concerns of landowners who may perceive a loss of property rights from new regulations and aid in the acceptance of conservation subdivisions.

Some communities are more successful at implementing environmentally friendly land use practices such as conservation subdivisions than others, but the specific reasons behind that success are largely unknown. We used logistic regression models to identify variables that predict county level success at adopting an ordinance and having a conservation subdivision built. Important predictors for adopting ordinances were median income, percent urban population, and a negative interaction between the two variables; important predictors for successfully completing a conservation subdivision were the adoption of an ordinance allowing conservation subdivisions and college education level. Urban counties and the rural counties with higher median income were most successful adopting ordinances. Urban counties with higher education levels and an ordinance in place were most likely to have a conservation subdivision built within them. In poor rural counties, implementation of conservation subdivisions may be more difficult because of limited resources to develop ordinances; these counties could collaborate with land trusts, other planning departments, or a regional council of governments to help lessen the financial burden associated with rewriting ordinances and implementing new land use practices.
Dr. Zeb Hogan has extensive experience studying the world’s freshwater ecosystems and works to merge conservation science with conservation education and action. Currently, he is an assistant research professor at the University of Nevada-Reno, a National Geographic Emerging Explorer, United Nations Convention on Migratory Species Scientific Councilor for Fish, and hosts the National Geographic television series “Monster Fish.” Zeb’s research and efforts with the Mekong Fish Conservation Project and the National Geographic-sponsored Megafishes Project have aided in understanding migratory patterns and population structures of imperiled giant freshwater fish. Zeb received his Ph.D. in Ecology from the University of California-Davis and his research has been featured in scientific journals including Science and Conservation Biology and popular publications such as Time Magazine and National Geographic Magazine.
STUDY ABROAD IN NAMIBIA
AFRICAN ECOLOGY AND CONSERVATION

This year’s trip was unusual in some respects. Namibia has received more than twice the annual rainfall during the rainy season, the highest rainfall in 75 years. Many rivers were still flowing towards the end of May allowing us to swim in the desert. Floating in knee deep water past the sand dunes in an otherwise arid environment was a once in a lifetime experience.

In the Etosha N.P. we usually encounter elephants, but this year we had two herds of elephants including very young calves walk within a few yards past our truck. Students had a front row seat to this unique spectacle and were awestruck. Another seldom seen incident was a zebra lying in the road that was dying of anthrax. It was still barely alive, but we could do nothing to relieve the zebra from its suffering. These were just some of the highlights and read more what students had to say:

I don’t think it is possible for anyone to truly understand Africa unless you physically go there. Namibia was an extraordinary place where I felt like I was part of the actual “wild,” an environment that becomes more scarce every day; no zoo necessary. It’s one thing to have an adrenaline rush before a sporting event, it’s another to have one when your tour vehicle is between you and a herd of African Elephants as they walk directly towards you, the only barrier being your car.

Shane, NC State

Namibia is an incredible country. Our class got to experience an array of ecosystems and observe the biodiversity at each site up close, then practice research and management techniques firsthand. I would recommend this amazing adventure to anyone.

Erin, NC State

SIGN UP NOW FOR NEXT YEAR’S TRIP TO NAMIBIA

Dr. Dorgeloh will be leading the trip again during summer of 2012. For more information contact Dr. Werner Dorgeloh (wgd@nc.rr.com).

MORE ONLINE
http://cnr.ncsu.edu/fer/fishwild/fwstudab.html

Center for Wildlife Education to host Wildlife Expo

The Centennial Campus Center for Wildlife Education will host a Wildlife Expo in recognition of National Hunting and Fishing Day on Sept. 24. The Center is located at 1751 Varsity Drive, Raleigh on the Centennial Campus of NCSU and will be open with special Saturday hours of noon to 5 p.m. for this special event. Activities are all FREE and include outdoor cooking, archery, mountain man camp, pellet range, tracking, fishing skills at nearby Lake Raleigh and much more.

Contact Beth Gunn at 707-0205 or email at beth.gunn@ncwildlife.org.
Research Publications


Research Presentations


Extension and Outreach


Popular press

SCHOLARSHIPS AND OPPORTUNITIES

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

BULL NECK SWAMP SCHOLARSHIP

The Bull Neck Swamp Scholarship will provide $2,000/semester ($4,000 annually) to a qualified Fisheries and Wildlife student. 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 2011.

GIVING BACK

SUMMER CAMP STUDENT ENDOWMENTS

Please consider giving to our two Summer Camp student endowments. These endowments help undergraduate students attend the Fisheries and Wildlife 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 Natural Resources 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

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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 stevecallen@nc.rr.com.