



**NC Chapter of The Wildlife Society
Annual Meeting**

“Partnerships to Recovery”

**Lake Logan Episcopal Center
Canton, North Carolina
April 7-9, 2015**

2014-2015 Executive Board

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President-elect	Kelly Douglass	kelly.douglass@ncwildlife.org
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Awards	John Ann Shearer	johann_shearer@fws.gov
Communications	Steve Grodsky	smgrodsk@ncsu.edu
Conservation Affairs	Mike Baranski	mbaransk@catawba.edu
COWCH	VACANT	
Finance	Jon Shaw	jonathan.shaw@ncwildlife.org
Membership	Colter Chitwood	mcchitwo@ncsu.edu
Mentoring Program	Lara Pacifici	lara_pacifici@ncsu.edu
Nominations & Elections	Kelly Douglass	kelly.douglass@ncwildlife.org
Procedures	Kelly Douglass	kelly.douglass@ncwildlife.org
Professional Development	Jessie Birkhead	jbirkhead@tnc.org
Program (annual meeting)	Josh Parris	jdparris@haywood.edu
	Shannon Rabby	srabby@haywood.edu

The North Carolina Chapter of The Wildlife Society was founded in 1983 and is an association of wildlife professionals from all backgrounds. Members of the Chapter come from state and federal agencies, universities, private industry, private conservation organizations, and other natural resource agencies. The membership consists of wildlife professionals and students involved in research, management, education, administration, and other disciplines.

Mission Statement

The North Carolina Chapter of The Wildlife Society seeks to provide a forum for wildlife professionals and others to interact to improve wildlife conservation and management while fostering high professional standards and ethics for its members. It will strive to be an acknowledged source of current scientific information and expertise and act as a collective voice on matters relating to wildlife biology, management, education, and policy.

Annual Meeting Agenda

Tuesday, April 7th

- 1– 4 PM Field Trip—Eastern Band of the Cherokee Indian—Meet at Haywood Community College (HCC) at 1:00 PM (space is limited first come first served)
- 4:30 PM Registration
- 6:00 PM Dinner
- 7:00 PM Social/Quiz Bowl—hosted by the HCC Student Chapter

Wednesday, April 8th

- 7:00 AM Registration
- 8:00 AM Breakfast
- 8:45 AM Welcome/Door prizes
- 9:00 AM Keynote—Keith Norris—National Perspectives on Partnerships
- 9:45 AM Steve Grodsky & Kelly Douglass—Committing to Committees
- 10:30 AM Break
- 10:55 AM Door prizes
- 11:00 AM Dr. Caleb Hickman—Partnerships to Develop a Cherokee Wildlife Action Plan
- 11:30 AM Dean Simon—Management—Research Partnerships from a Manager’s Perspective
- 12:00 PM Lunch
- 12:50 PM Door prizes
- 1:00 PM Dr. Roland Kays—eMammal Citizen Science Camera Trapping – Collecting Big Data to Answer Wildlife Questions
- 1:30 PM Jeff Hall—Reptile and Amphibian Conservation Partnerships
- 2:00 PM Sue Cameron—Mountain Bogs National Wildlife Refuge: Conserving Some of the Mountain’s Rarest Places and Species
- 2:30 PM Break
- 2:50 PM Door prizes
- 3:00 PM Lisa Jennings—The Grandfather Restoration Project: Leveraging Partnerships for Landscape-scale Restoration

3:30 PM John Ann Shearer—2016 Annual TWS Conference
4:00 PM Rob Hawk—Aldo Leopold Speaks
4:30 PM Announcements
6:00 PM Dinner
7:00 PM Social/Auctions/Poster Session—hosted by the HCC Student Chapter

Thursday, April 9th

8:00 AM Breakfast
8:55 AM Door prizes
9:00 AM Justin McVey— Elk in North Carolina
9:30 AM NCTWS Business Meeting—Awards presentation, student chapter updates, and passing of the Goat
10:45 AM Break
10:55 AM Door prizes
11:00 AM Dr. Richard McDonald—Beetles Save Needles: Hemlock Woolly Adelgid, *Adelges tsugae*, Annand, Successfully Controlled as a Native Invader with Native Predators in NW NC
11:30 AM Kristin Frew—What Makes Kids Care About Wildlife?
12:00 PM Lunch/Adjourn
2015-2016 Executive Board meeting

**Don't forget to complete your ballot for the
2015-2016 Executive Board candidates!**

Abstracts

Using TWS's Conservation Affairs Network to Build Partnerships

KEITH NORRIS, Assistant Director of Government Affairs, The Wildlife Society, 5410 Grosvenor Lane, Suite 200, Bethesda, MD 20814, keith.norris@wildlife.org

The Conservation Affairs Network is a new strategic initiative designed to facilitate stronger connections between the units of The Wildlife Society – our chapters, sections, and headquarters. The Network allows all levels of TWS to more effectively and efficiently support the wildlife profession, particularly in the policy arena at local, regional, and national scales. Regularly communicating about wildlife policy issues allows chapters, sections, and TWS headquarters to coordinate their activities, develop more effective strategies, and support each other in their efforts to inform wildlife policy decisions. We have a responsibility as a professional society to ensure wildlife policies are informed by science and empower wildlife professionals to do their work of conservation and management. Partnerships are an important component of any policy-oriented engagement. The Conservation Affairs Network focuses on developing partnerships within the Society and with other conservation and professional organizations. The Government Affairs Team at TWS Headquarters regularly partners with other organizations and agencies to impact policy issues at the national level, and these partnerships can translate to the local and regional levels with chapters and sections.

Bio: Keith Norris is the Assistant Director of Government Affairs at The Wildlife Society headquarters in Bethesda, Maryland. He has undergraduate and graduate education in wildlife science and public policy. He works to advance the policy positions of The Wildlife Society and support the wildlife profession by engaging policy decision-makers and encouraging TWS members, sections, and chapters to do the same.

Committing to Committees: Getting to Know Your North Carolina Chapter

STEVE GRODSKY, PhD Candidate, North Carolina State University, Fisheries, Wildlife, and Conservation Biology Program, 110 Brooks Avenue, Raleigh, NC 27606, smgrodsk@ncsu.edu

KELLY DOUGLASS, Forest Stewardship Biologist, North Carolina Wildlife Resources Commission, PO Box 31063, Raleigh, NC 27622, kelly.douglass@ncwildlife.org

This interactive presentation is meant to provide members an opportunity to get to know their state chapter of TWS a little better, by explaining the role of each committee and Executive Board officer position and helping members determine which role might be best suited for them. Running the NC Chapter is a group effort – it takes the leadership of many individuals to make it work – and we want to see the membership take ownership of their Chapter by getting involved. The only way you can make a change is by participating!

Bio: Steve Grodsky is a PhD candidate in the Fisheries, Wildlife, and Conservation Biology Program at North Carolina State University. His research centers on the interface between renewable energy development and wildlife conservation. Currently, he serves as the Southeastern Section Representative, Communication Committee chair, and the editor of the NC Wildlifer for NCTWS.

Bio: Kelly Douglass is a private lands biologist with the NC Wildlife Resources Commission. Before transferring into this position in 2010, she worked as Captive Cervid Biologist with the NCWRC for 6 years. She obtained a bachelor's degree in Fisheries and Wildlife Sciences from NC State University in 2002, and a master's degree in Fisheries, Wildlife, and Conservation Biology from NCSU in 2011. She is a Certified Wildlife Biologist, a Certified NC Environmental Educator, and an alumni of the TWS Leadership Institute. Kelly is very active in The Wildlife Society, and has held many leadership roles with the NC Chapter, SE Section, and parent society since 2002.

Partnerships to Develop a Cherokee Wildlife Action Plan

CALEB R. HICKMAN, Supervisory Fish and Wildlife Biologist, Eastern Band of Cherokee Indians, Fisheries and Wildlife Management, PO Box 1747, Cherokee, NC 28719, calehick@nc-chokeee.com

Now more than ever, there is a challenge for wildlife managers to meld society and conservation priorities, but such a combination includes a variety of expertise not normally available in a single department. For an integrative wildlife action plan (WAP), the Eastern Band of Cherokee Indians (EBCI) Fisheries and Wildlife Management has implemented a conceptual design that includes internal and external partnerships. Public and professional input has provided crucial guidance to the WAP that expands the EBCI's ability to balance community development with natural resource conservation. EBCI's internal and external partnerships are necessary to manage a variety of species and natural resource issues. For example, federal and state programs have collaborated with EBCI to inventory, monitor and restore native wildlife on tribal lands. In addition, the Cherokee community and Tribal Historic Preservation Office helped to prioritize human needs for wildlife management, such as detailing species important to Cherokee culture and economics. By applying modern social-ecological frameworks that include humans as part of the environmental continuum, EBCI can more easily link complex interactions between humans and their environment. In a conceptual model, we describe our wildlife action plan with collaborations between professionals and the public that are necessary for future wildlife management in human-altered environments. This highly collaborative wildlife action plan could become a model for managers challenged with conserving wildlife in the presence of human-related issues.

Bio: Caleb Hickman is a Supervisory Biologist for the Fish and Wildlife Program of the Eastern Band of the Cherokee Indians. In addition to his duties with the tribe, he serves as adjunct assistant professor with the University of Tennessee and is chair of The Wildlife Society's Invasive Species Working Group. Originally from the Cherokee Nation of northeastern Oklahoma, he holds a bachelor's degree from Missouri Valley College, masters from Missouri State and a Ph.D. from the University of Wisconsin. He works with a variety of fish and wildlife species but specializes in the ecology of human-animal interactions.

Management–Research Partnerships from a Manager’s Perspective

DEAN M. SIMON, Mountain Region Wildlife Biologist/Forester, North Carolina Wildlife Resources Commission, 8676 Will Hudson Road, Lawndale, North Carolina 28090, dean.simon@ncwildlife.org

Natural resource managers have long desired to obtain user friendly, management directed answers from research results. Through partnerships with researchers, cooperative projects, and management hosted endeavors, mutually beneficial outcomes have been accomplished that provide quantifiable data and applicable direction for both research and management professionals. Often times, projects conducted by managers are further facilitated by having research associated elements, which provide support and justification through science based monitoring and assessment to evaluate outcomes and results. This information transfer from researchers to managers has been an evolving relationship cultured through understanding by both parties of needs, limitations, feasibility, and applicability. Flexibility and compromise by managers and researchers has been an integral part of this process as well. Numerous examples of successful ventures between managers and researchers have occurred, where research has been facilitated by the managers hosting these projects, while managers have benefited by site specific data of implemented management actions.

Bio: Dean Simon works for the North Carolina Wildlife Resources Commission, and has for the past 30 years, and currently works as a Regional Wildlife Biologist and Forester in the mountains of Western North Carolina. He previously received a Bachelor’s Degree in Forestry from Louisiana State University and a Master’s Degree studying fire ecology and wildlife at the University of Georgia. Dean is a Certified Wildlife Biologist, Registered Forester, and a Certified Prescribed Burner, and was recognized as Wildlife Biologist of the Year by the North Carolina Wildlife Resources Commission in 2007 and received the Management Excellence Award by the Southeastern Section of the Wildlife Society in 2008 for work with prescribed burning, fire management, and fire ecology research in the Southern Appalachian Mountains.

eMammal Citizen Science Camera Trapping – Collecting Big Data to Answer Wildlife Questions

ROLAND KAYS, North Carolina Museum of Natural Sciences, 9 West Jones Street, Raleigh, NC, 27601, roland_kays@ncsu.edu

Variation in the abundance of mammals on the landscape affects a broad range of ecosystem processes including herbivory, predation, disease spread, and seed dispersal. However, these patterns, and the effects of human disturbances on them, are poorly understood because of lack of data at the appropriate scales. The eMammal project recruits citizen scientists to survey mammal communities with motion-sensitive camera traps. Over the last two years our volunteers have used camera traps to sample 2300 sites, recording over 2.6 million photographs in ~50,000 trap-nights. We started with a study design addressing hypotheses about the effect of hunting and hiking on wildlife, and are now expanding into developed areas to survey repeated urban-wild gradients. Statistical analysis of animal diversity, abundance, and activity has given us new insight into the mechanisms that regulate animal abundance. For example, parks in developed areas had higher overall animal activity rates but lower species diversity. Hunted areas had lower deer but higher coyote activity than nearby unhunted preserves. Avoidance of hiking trails by animals was minor, and most nocturnal predator species were more commonly detected on-trail. These types of results are only achievable with a large, dispersed database, which would be impossible to collect with traditional methods. Our next challenge is to maintain the flow of data by expanding our involvement of citizen scientists and broadening our concept of volunteer data collectors. We look to grow the eMammal project by working with other research groups around the world interested in leading their own camera-trapping project. To this end we are developing customizable web portals and image analysis tools that will not only benefit researchers, but help engage more citizens in the fun activity of running camera traps outdoors, and give them the tools to make scientific discoveries with the data on their own.

Bio: Roland Kays is the director of the Biodiversity lab at the NC Museum of Natural Sciences and a professor in the Fisheries, Wildlife and Conservation Biology program at NC State University.

Reptile and Amphibian Conservation Partnerships

JEFFREY HALL, Partners in Amphibian & Reptile Conservation Biologist, North Carolina Wildlife Resources Commission, 405 Lancelot Drive, Greenville, NC 27858, jeff.hall@ncwildlife.org

Partnerships are making a difference in the conservation of North Carolina's reptiles and amphibians. The North Carolina chapter of Partners in Amphibian and Reptile Conservation, the North Carolina Herpetological Society, Project Bog Turtle, the Calling Amphibian Survey Program, and surveys targeting Hellbenders and Waterdogs are partnerships that work to achieve conservation goals. State and federal agencies, nonprofit groups, private industry, and the public are all stakeholders in these projects. Come and learn more about the workings of these conservation partnerships, and positive outcomes achieved, such as land conservation and restoration, public outreach and education, and improved knowledge base for priority species.

Bio: Hired in 2007 by the North Carolina Wildlife Resources Commission, Jeff Hall is the Partners in Amphibian and Reptile Conservation (PARC) Biologist. As PARC Biologist, Jeff works with landowners to promote habitat management that benefits reptiles and amphibians as well as other wildlife species. He coordinates the North Carolina chapter of PARC helping to bring public and private partners together to further conservation efforts for reptiles and amphibians. Jeff also participates in field work on a variety of projects including rare amphibian monitoring and habitat restoration, upland snake conservation, and Project Bog Turtle. In addition, Hall manages the Calling Amphibian Survey Program (CASP) which is designed to monitor long-term trends of frog and toad populations across the state. Jeff, his wife Shannon, and two boys live in Greenville, NC.

Mountain Bogs National Wildlife Refuge: Conserving Some of the Mountain's Rarest Places and Species

SUSAN CAMERON, Wildlife Biologist, US Fish and Wildlife Service, Asheville Field Office, 160 Zillicoa Street, Asheville, NC 28801, susan_cameron@fws.gov

Southern Appalachian Mountain bogs are among the rarest and most imperiled habitats in the United States and are host to several federally listed species, as well as many species of conservation concern. The Service and partners have been working for many years to conserve these areas, and while these efforts have been extremely productive, there are still many bogs in need of protection, management, and restoration. Nearly two decades in the making, Mountain Bogs National Wildlife Refuge was recently authorized and is close to being established and represents the next step in trying to protect these rare communities. The refuge could eventually include 23,478 acres scattered across as many as 30 sites in western North Carolina and eastern Tennessee. Partnerships are a vital component of bog conservation in general, in the success of Mountain Bogs National Wildlife Refuge, and in the recovery of rare species that inhabit mountain bogs.

Bio: Sue Cameron is a wildlife biologist with the US Fish and Wildlife Service in the Asheville Field Office where she works on terrestrial species of the southern Appalachian Mountains including small mammals, herps, and birds. Her primary duties entail working with partners to recover federally listed species. She has a Master's degree in Environmental Management from Duke University Nicholas School of the Environment. Prior to starting with the Service, Sue worked for NC Wildlife Resources Commission as a coastal waterbird biologist and Virginia Tech as a red-cockaded woodpecker biologist.

The Grandfather Restoration Project: Leveraging Partnerships for Landscape-scale Restoration

LISA N. JENNINGS, Natural Resource Specialist, Grandfather Ranger District,
Pisgah National Forest, 109 East Lawing Drive, Nebo, NC 28761,
lisanjennings@fs.fed.us

The Grandfather Restoration Project, one of twenty projects under the Collaborative Forest Landscape Restoration (CFLR) program, is a 10-year effort that will increase prescribed burning and other management practices on more than 40,000 acres of the Grandfather Ranger District in Pisgah National Forest. The project seeks to: (1) Restore fire adapted vegetation, benefit wildlife and T&E species, and reduce wildfire risks through increased fire management; (2) Improve wildlife habitat and forest composition through silviculture in degraded stands; (3) Address invasive pest problems by preserving the most important hemlock forests; (4) Maintain viable native plant communities by treating the most sensitive areas for non-native invasive plants; and (5) Restore riparian vegetation, remove fish passage barriers, reduce sedimentation and reconnect streams to their flood plains to benefit water quality and aquatic ecology. The Grandfather Restoration Project includes a diverse group of partners working with the US Forest Service, including state and national natural resource management agencies, local and regional environmental conservation organizations, special interest wildlife groups, and research partners. This presentation will provide an overview of the project, as well as explore specific examples of how partnerships have been leveraged for both planning and implementation of restoration activities on the Grandfather Ranger District.

Bio: Lisa received her Masters of Forestry, as well as a B.S. in Natural Resources, from NC State University. She has worked as the coordinator of the Grandfather Restoration Project since February 2014. Before coming to the Grandfather Ranger District, Lisa worked as a climate change outreach specialist for the US Forest Service's Southern Research Station office in Raleigh.

2016 Annual TWS Conference

JOHN ANN SHEARER, US Fish and Wildlife Service, Ecological Services, PO Box 33726, Raleigh, NC 27636-3726, JohnAnn_Shearer@fws.gov

Mark your calendars! The Annual TWS Conference is coming to Raleigh, North Carolina next year, from October 15-19, 2016, and we can use your help! John Ann Shearer is the Chair of the Arrangements Committee, the planning work-horse for the hosting chapter and primary liaison between NCTWS and the parent society on all conference arrangements. There are several different ways you can be involved in planning and preparing for this important event. Contact John Ann Shearer, or any of the subcommittee chairs listed below, to find out how you can help!

Fundraising	Colleen Olfenbuttel	colleen.olfenbuttel@ncwildlife.org
Marketing	Lori Williams	lori.williams@ncwildlife.org
	Susan Miller	Susan_Miller@fws.gov
Local Information	Kelly Douglass	kelly.douglass@ncwildlife.org
Field Trips	Danny Ray	daniel.ray@ncwildlife.org
Volunteers	VACANT	
Student Activities	Lara Pacifici	lara_pacifici@ncsu.edu
Local Networking & Engagement	Todd Menke	todd.a.menke@aphis.usda.gov

Bio: John Ann Shearer has served as the state coordinator for the US Fish and Wildlife Service's Partners for Fish and Wildlife Program in North Carolina since 1999. Prior to this position she worked over a 9 year period in refuge management at Wheeler Refuge in Alabama, Upper Souris Refuge in North Dakota, and Mattamuskeet Refuge in North Carolina. She has an undergraduate degree in Biology from the University of North Carolina at Chapel Hill and a master's degree in Wildlife Management from West Virginia University. John Ann currently spends most of her restoration and management work focused on longleaf pine, migratory birds, and prescribed fire. Away from work, she enjoys spending time with her husband and two daughters, worshipping, housekeeping, socializing, exercising, traveling, and gardening.

Aldo Leopold Speaks

ROBERT J. HAWK, County Extension Director for Jackson and Swain Counties, Livestock, Natural Resources and Community Development, NC Leopold Education Project State Coordinator, North Carolina Cooperative Extension Service, 538 Scotts Creek Road, Suite 205, Sylva NC 28779, robert_hawk@ncsu.edu

Leopold understood that ethics direct individuals to cooperate with each other for the mutual benefit of all. One of his philosophical achievements was the idea that this “community” should be enlarged to include non-human elements such as soils, waters, plants, and animals, “or collectively: the land.” This recognition, according to Leopold, implies individuals play an important role in protecting and preserving the health of this expanded definition of a community. Central to Leopold’s philosophy is the assertion to “quit thinking about decent land use as solely an economic problem.” While recognizing the influence economics have on decisions, Leopold understood that ultimately, our economic well being could not be separated from the well being of our environment. Therefore, he believed it was critical that people have a close personal connection to the land. Through the use of Leopold’s words and teachings, costume and props, I will present a unique view of Leopold and his work. People will have the unique opportunity to examine their own important work as it relates to this expanded definition of community and how to communicate that work with a wider audience.

Bio: Rob likes to nordic ski, hike, canoe and run, and is an Assistant Scoutmaster.

Elk in North Carolina

JUSTIN MCVEY, District 9 Wildlife Biologist, North Carolina Wildlife Resources Commission, 396 Ravenwood Lane, Horse Shoe, NC 28742,

justin.mcvey@ncwildlife.org

Reintroduced in 2002, elk are now part of the landscape in several North Carolina mountain counties. Originally released inside the Great Smoky Mountain National Park, elk quickly moved outside of park boundaries to inhabit private, public, and tribal lands. Given that elk do not recognize jurisdictional boundaries when moving across the landscape, it is imperative that the three region's entities (North Carolina Wildlife Resources Commission, Great Smoky Mountain National Park, and the Eastern Band of Cherokee Indians) work cooperatively to manage elk. In order to manage elk population across our shared lands, we are currently collaborating to design studies to estimate elk spatial ecology and population density in western North Carolina. This collaboration requires shared information on local elk ecology and interagency efforts to design projects and collect data.

Bio: Justin McVey is the mountain regional wildlife biologist for the North Carolina Wildlife Resources Commission. Justin has a Bachelor of Science degree in zoology and Master of Science in wildlife and conservation biology from North Carolina State University. He has been employed by the North Carolina Wildlife Resources Commission since 2005, holding the positions of captive cervid biologist, wildlife technician, permits biologist, and the recent position of district biologist. The duties of the district biologist includes providing technical guidance to landowners regarding wildlife, technical assistance regarding nuisance wildlife, development and review of hunting and trapping regulations, and monitoring of wildlife populations including the management of North Carolina's elk herd.

Beetles Save Needles: Hemlock Woolly Adelgid, *Adelges tsugae*, Annand, Successfully Controlled as a Native Invader with Native Predators in Northwestern North Carolina

RICHARD C. MCDONALD, Symbiont Biological Pest Management Company of Sugar Grove, 194 Shull's Hollar, Sugar Grove, NC 28679, drmcbug@skybest.com

The hemlock woolly adelgid, *Adelges tsugae* Annand, (HWA) was accidentally introduced into the eastern US through adelgid-infested weeping hemlocks (*Tsuga diversifolia*) from Japan. The HWA was discovered in Northwestern NC in 2002 at Grandfather Golf and Country Club. Originally, researchers working on controlling the HWA were under 3 assumptions: 1) The HWA was native to Asia; 2) There were no effective predators present in the East; and 3) The Hemlock ecosystem as we know it was doomed. By 2006, DNA work by the Forest Service showed the HWA was also native to the Pacific Northwest of the US, which changed the underlying assumptions. The 3 new successful working points: 1) HWA was native to the Pacific Northwest of the US; 2) The pest had excellent winter and summer predators that controlled it in our own country (*Laricobius nigrinus* and *Scymnus coniferarum*, respectively); and 3) We could save giant swaths of the hemlock ecosystem if we were able to release enough beetles. We will give a brief backstory and update on the latest efforts and areas that are experiencing regrowth due to beetles restoring balance to the hemlocks.

Bio: Dr. Richard McDonald has worked on HWA biological control since 1999 and was among the first researchers to receive a release of the winter HWA predator *Laricobius nigrinus* at Hemlock Hill in Banner Elk, NC in 2003. He has demonstrated one of the first successful area-wide control projects against the HWA in the High Country area of Northwestern North Carolina.

What Makes Kids Care About Wildlife?

KRISTIN FREW, Masters Student, North Carolina State University, Natural Resource Storage Building 1, Box 8008, Raleigh, NC 27695, knfrew@ncsu.edu

Public perceptions of wildlife will likely inform how we will allocate scarce resources for conservation. Among adults, endemism seems to be the most valued wildlife attribute, beating out those that are ecologically important, common species in rapid decline, and those with high chances of recovery. We surveyed over 400 3rd and 5th graders to understand their preferences and found that ecological importance and species in rapid decline were by far the most favored wildlife attributes. This presentation will highlight these findings and facilitate a discussion on the importance of environmental education (EE). The apparent generational difference between our findings and similar ones among adults could point to an age-related difference (that kids view wildlife differently than adults) or signal a shift in wildlife perceptions that could persist into the future. Regardless, elementary school students seem to be most concerned with conserving species of ecological importance and preventing extinction. If wildlife professionals aim to connect children with wildlife through education, these attributes may be important areas to focus on.

Bio: Kristin Frew is a Master's student in Fisheries, Wildlife, and Conservation Biology at North Carolina State University. Her area of focus is human dimensions of wildlife. She obtained her undergraduate degree in Wildlife and Fisheries Science at Mississippi State University in 2013. After graduating with her Bachelor's degree, she worked as an environmental educator in Georgia before accepting a research assistantship at NC State.

Posters

Cat Tracker: Mapping the Ecological Impact of Cats Through Citizen Science Animal Tracking

TROI PERKINS^{1,2}, Shelby Powers², Holly Menninger², Rob Dunn², and Roland Kays^{1,2}

1. North Carolina Museum of Natural Sciences

2. North Carolina State University

typerkin@ncsu.edu

Cats were domesticated for their ability to kill wildlife humans considered pests, but now have become pests themselves in some cases. Cats have moved with people to live all around the world, often at very high densities due to food subsidies from people. Cats have caused the extinction of numerous species endemic to islands, and are estimated to kill many billions of small mammals and birds in the continental United States each year. However, cats themselves are subject to predation by larger carnivores, which may limit the spatial extent of their hunting, and reduce their threat to native wildlife. Existing tracking studies of cats have found high variability in movement rates, but not had sufficient sample size to explain why some cats hunt widely in natural areas while others are homebodies. To address this question we have launched a citizen science project called 'Cat Tracker'. We recruit volunteers to use inexpensive GPS units to track their pet's movement for one week (or longer). In the last year we have tracked 80 different pet cats across nine states, making this the largest cat-tracking study to date. Preliminary analysis of these data shows that most North Carolina cats tend to stay within a small area around their house and don't venture into nearby natural areas. We aim to expand the study to reach a total of 1000 cats by loaning our GPS units to volunteers, and by encouraging them to purchase one themselves for \$50. Attention from national press has helped us already sign up another 200 participants across 48 States, four Canadian provinces, and two European countries. We are also working with colleagues to track cats in more areas with varied communities of larger predators including Long Island NY (no coyotes), Australia, and New Zealand (no native large predators).

Survival and Cause-specific Mortality of Coyotes in a Protected Area

ELIZABETH R. STEVENSON, M. Colter Chitwood, Marcus A. Lashley, Morgan B. Swingen, Christopher E. Moorman, and Christopher S. DePerno

Fisheries, Wildlife, and Conservation Biology, North Carolina State University

beth_stevenson@ncsu.edu

Coyotes (*Canis latrans*) recently expanded into the southeastern United States, creating ecologically novel interactions with other species. Much research has focused on these interactions rather than basic coyote population ecology. Coyote vital rates vary across its range, so understanding how the species could affect ecosystem processes in its new range relies on regional estimates of survival and cause-specific mortality. In 2011, we captured and radiocollared 31 coyotes at Fort Bragg Military Installation, North Carolina. We used a 21-month period (Feb 2011 – Oct 2012) and known-fate modeling in Program MARK to estimate annual survival. During the study period, coyotes were protected from harvest and we used field necropsies to determine causes of mortality. Annual survival estimates were 0.88 (2011; SE = 0.01) and 0.74 (2012; SE = 0.02). Survival did not vary by age or sex of coyotes, although our power to detect these differences was low. Mortalities (n = 7) included vehicles (n = 2, 29%), off-site trapping (n = 2, 29%), and unknown causes (n = 3, 43%). Coyote survival estimates at Fort Bragg were comparable to those reported in other forested regions of the Southeast, although they were slightly greater compared to areas where coyotes were subjected to hunting and trapping.

A Comparison of Methods to Estimate Resident Canada goose Abundance in North Carolina

MARK A. McALISTER, Christopher E. Moorman, and Christopher S. DePerno

Fisheries, Wildlife, and Conservation Biology, North Carolina State University

mamcalis@ncsu.edu

Since the early 1980s, the resident Canada goose (*Branta canadensis*) population in North Carolina has increased. The expansion of the population provides valuable wildlife viewing and hunting opportunities, but increased goose abundance leads to human-wildlife conflict and greater risk of zoonotic diseases. To help drive adaptive management of burgeoning goose populations, including assessment of specific management practices, an efficient method to accurately estimate goose abundance across North Carolina is needed. Our objective is to compare precision and efficiency between two common methods to estimate goose abundance. The first method (i.e., Lincoln-Peterson estimation) uses hunter band returns and the second (i.e., plot survey) uses surveys of 1-km² plots randomly located across potential Canada goose habitat. To quantify efficiency, we will record all expenses and time dedicated to goose banding and plot surveys. In June 2014, we banded 2396 geese at 43 sites across the state. To date, 141 band returns have been submitted, which will allow us to calculate harvest rate, the only unknown variable in the Lincoln-Peterson formula. This study will provide the first estimate of resident Canada goose abundance in North Carolina, and the comparison of methods will guide future state and regional efforts to monitor Canada goose abundance.

Effects of Military Training on Bachman's Sparrow Reproductive Success and Occupancy

ALEXANDER FISH, Christopher S. DePerno, and Christopher E. Moorman

Fisheries, Wildlife, and Conservation Biology, North Carolina State University

afish@ncsu.edu

The historic loss of longleaf pine (*Pinus palustris*) forests across the southeastern United States led to declines in many plant and animals species associated with the community. Military bases in the region are mandated to restore longleaf pine forest for these rare and endangered flora and fauna, but associated training exercises result in frequent ground disturbances that impact the vegetation structure and habitat of ground-dwelling wildlife like the Bachman's sparrow (*Peucaea aestivalis*). Bachman's sparrows nest and forage almost exclusively on the ground, making them an ideal species to investigate the effects of military training. We compared Bachman's sparrow nest survival and occupancy rates between high and low intensity training areas. Our preliminary results show similar nest success and occupancy rates between the two training areas and indicate that military training does not affect Bachman's sparrow nest success or occurrence.

Do Deer Benefit From Raccoon Eyes?

SUMMER D. HIGDON, Marcus A. Lashley, M. Colter Chitwood, Christopher S. DePerno, and Christopher E. Moorman

Fisheries, Wildlife, and Conservation Biology, North Carolina State University

sdhigdon@ncsu.edu

Vigilance in white-tailed deer (*Odocoileus virginianus*) is linked to predation risk, which creates a tradeoff between foraging and mitigating the risk of being killed. When deer overlap spatiotemporally with other prey species, interactions potentially affect their vigilance, feeding rate, and subsequent fitness. Deer should benefit from the presence of more individuals (regardless of species) according to the “many-eyes hypothesis.” We used camera traps at baited sites to quantify feeding rate and the interaction between deer and raccoons (*Procyon lotor*) at Fort Bragg Military Installation, North Carolina. In August 2011 – 2013, we collected 51,492 and 9,504 photos of deer and raccoons, respectively; they co-occurred in 2,527 photos. Deer and raccoon feeding rates were positively correlated, indicating they were vigilant to the same risk cues and not sharing vigilance. However, on average, across all 3 years raccoons increased feeding rate 11% in the presence of deer, while deer decreased feeding rate 42% in the presence of raccoons. Thus, raccoons apparently benefit from the presence of deer by increasing feeding rate, indicating the many-eyes hypothesis provides a plausible explanation (but not because of shared vigilance). Why raccoons have such antagonistic effects on deer feeding rate is unknown but warrants further study.

Bachman's Sparrow Home Range Size and Micro-habitat Selection

JASON M. WINIARSKI¹, Christopher E. Moorman¹, and John P. Carpenter²

1. Fisheries, Wildlife, and Conservation Biology, North Carolina State University

2. North Carolina Wildlife Resources Commission

jmwiniarski@gmail.com

Bachman's sparrow (*Peucaea aestivalis*) requires diverse herbaceous groundcover maintained by frequent fire in longleaf pine forests, and is a species of conservation concern throughout the southeastern United States. Yet, little is known regarding the species' home range characteristics and habitat preferences at the northern extent of its range. We used radio-telemetry to examine home range size and habitat associations of male Bachman's sparrows at two sites in the southeastern Coastal Plain of North Carolina. We radio-marked 10 Bachman's sparrows in 2014 and tracked them for up to 48 days, and measured vegetation characteristics at telemetry and nearby random locations. Mean home range size was 7.58 ± 0.64 ha. Male Bachman's sparrows selected locations with greater woody vegetation density than at random points. Our study was only the second to use radio-telemetry and fixed kernel density estimators to estimate Bachman's sparrow home range size, which may explain why home range estimates were larger than those previously reported from spot mapping. Hardwood sprouts maintained by frequent prescribed fire may have been selected by male sparrows for singing perches and cover from predators.

***Fascioloides magna* and Larval Tapeworm Infections in White-tailed Deer**

APRIL D. BOGGS¹, Christopher S. DePerno¹, and James R. Flowers²

1. Fisheries, Wildlife, and Conservation Biology, North Carolina State University

2. College of Veterinary Medicine, North Carolina State University

adboggs@ncsu.edu

Fascioloides magna, the giant liver fluke, is a parasite that infects the liver of several species of mammals. *F. magna* infections are not usually fatal in wildlife that are adapted to infection (e.g., white-tailed deer (*Odocoileus virginianus*)). However, some livestock (e.g., sheep (*Ovis aries*) and llamas (*Llama glama*)) are not adapted to infection and are dead-end hosts. In these cases, *F. magna* infections may be fatal. Recently, in North Carolina, a llama, two alpacas (*Vicugna pacos*), and a cow (*Bos taurus*) were infected and died from *F. magna* infections in multiple counties. Because significant financial losses can affect livestock producers, our objective was to determine the distribution of *F. magna* in white-tailed deer in select river basins across North Carolina by collecting and necropsying white-tailed deer livers. From September 2014 to January 2015, we collected, froze, and necropsied livers from hunter-harvested white-tailed deer within the Cape Fear, Roanoke, Catawba, Pasquotank, Lumber, Tar-Pamlico, Neuse, and Yadkin-Pee Dee River Basins. *F. magna* was detected in livers from the Catawba, Neuse, Yadkin-Pee Dee, Roanoke, and Tar-Pamlico River Basins with a prevalence of 13.4 percent. Larval tapeworms were detected in white-tailed deer livers from the Tar-Pamlico, Yadkin-Pee Dee, Lumber, Neuse, Roanoke, and Catawba River Basins a prevalence of 14 percent. Previous research indicated the Tar River and Roanoke River Basins composed the range of *F. magna* in North Carolina. Based on our research, it appears the range of *F. magna* has expanded into the Catawba, Yadkin-Pee Dee, and Neuse River Basins since the 1970s. Infections in two alpacas in the Tar-Pamlico River Basin, cattle in the Tar-Pamlico River Basin, and a llama in the Yadkin-Pee Dee River Basin may have been related to sharing pasture with infected white-tailed deer. Range expansion of *F. magna* could threaten the North Carolina livestock industry, and could be related to the increase in populations of white-tailed deer, which is the natural definitive host of *F. magna*.

Vigilance in Raccoons and Implications for the Mesopredator Release Hypothesis

SUMMER D. HIGDON, M. Colter Chitwood, Marcus A. Lashley, Christopher E. Moorman, and Christopher S. DePerno

Fisheries, Wildlife, and Conservation Biology, North Carolina State University

sdhigdon@ncsu.edu

Raccoons (*Procyon lotor*) are mesocarnivores and may serve as prey when larger carnivores like coyotes (*Canis latrans*) are present. Coyotes and raccoons represent an interesting case study in the southeastern United States for the mesopredator release hypothesis, which suggests that larger carnivores may limit mesopredator populations. If coyotes limit raccoon populations through direct predation or interference competition, then raccoons should exhibit vigilance behavior in response to predation risk from coyotes, which detracts from time spent foraging and decreases individual fitness. In August 2011-2013, we established baited camera traps at Fort Bragg Military Installation, North Carolina to observe the social and environmental factors influencing raccoon vigilance. Raccoons were vigilant 46% of the time but were less vigilant as group size increased ($p = 0.0163$) and when other species (i.e., white-tailed deer, eastern cottontail, grey fox, southern flying squirrel, wild turkey, or Virginia opossum) were present ($p < 0.0001$). Thus, they may benefit from the many-eyes hypothesis (i.e., more eyes confers more time foraging per individual), even when other species are present in the group. Additionally, they were more vigilant during full moon phases ($p < 0.0001$) and diurnal hours ($p = 0.0091$), suggesting raccoons are most comfortable foraging in low-light conditions, demonstrating adaptations to nocturnality. Raccoon vigilance measured in this study may indicate that raccoons do not perceive coyote predation risk as a major threat. If raccoons are not fearful of predation, it might suggest that coyotes fail to exert top-down influences and that coyote-raccoon interactions in some ecosystems do not conform to the mesopredator release hypothesis.

Carnivore Response to Various Attractants: A Camera Trapping Study

CANDICE MOREAU

Haywood Community College

clmoreau@haywood.edu

In early March 2015, the Wildlife Mammalogy class at Haywood Community College in Clyde, North Carolina conducted a three-week camera trapping study on campus. A series of six stations were set up along the Duke Energy transmission right-of-way, each equipped with a motion-detecting, night-vision trail camera directed at a hole approximately fifteen feet away. Each station received a different bait/scent treatment including carrion, carrion/fox scent, sardines, sardines/fox scent, fox scent only, and a control with an empty hole. The stations were re-baited or re-scented once per week with fresh carrion, sardines, or scent. The animals recorded during the study included Virginia opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), and northern raccoon (*Procyon lotor*). At the end of the study, it was concluded that the carrion station was the most used with 39.6% of total visits, followed by the sardine station with 23.4%. The stations with added scent had fewer visits than the unscented versions.

White-tailed Deer Population Dynamics and Adult Female Survival in the Presence of a Novel Predator

M. Colter Chitwood¹, Marcus A. Lashley¹, John C. Kilgo², Christopher E. Moorman¹, and Christopher S. DePerno¹

1. Fisheries, Wildlife, and Conservation Biology, North Carolina State University

2. USDA Forest Service-Savannah River

mcchitwo@ncsu.edu

Recent localized declines in white-tailed deer (*Odocoileus virginianus*) populations in the southeastern U.S. have been linked to increasing predation pressure from coyotes (*Canis latrans*). However, no study has used field-based vital rates to conduct sensitivity analyses or model deer population trajectories under potential management strategies. We used low, medium, and high values of fawn survival, adult female survival, and fecundity data collected from Fort Bragg Military Installation, NC, to demonstrate the current population trajectory for deer ($\lambda = 0.905$; low $\lambda = 0.788$, high $\lambda = 1.003$). We determined adult female survival was the most sensitive and elastic vital rate. Further, for three potential management scenarios, we projected the population for 10 years using estimated vital rates. Reducing adult female harvest ($\lambda = 0.935$; low $\lambda = 0.875$, high $\lambda = 1.002$) and coyote removal ($\lambda = 0.995$; low $\lambda = 0.898$, high $\lambda = 1.081$) reduced the current population decline, while combining both approaches ($\lambda = 1.024$; low $\lambda = 0.898$, high $\lambda = 1.141$) resulted in population increases. Our data indicate that for low-density deer populations with heavy predation pressure on neonates, protecting adult females from harvest may not be a magic bullet. Coyote removal might be a necessary strategy due to the possibility of increasing fawn survival, which appears to be the most important vital rate in our study. However, managers may have to start with reductions in adult female harvest because coyote removal would have to be consistently effective, making it an impractical management approach alone.

White-tailed deer Burned Area Selection and Site Fidelity Following Prescribed Fire

Marcus A. Lashley¹, M. Colter Chitwood¹, Roland Kays^{1,2}, Craig A. Harper³, Christopher S. DePerno¹, and Christopher E. Moorman¹

1. Fisheries, Wildlife, and Conservation Biology, North Carolina State University

2. North Carolina Museum of Natural Sciences

3. Department of Forestry, Wildlife, and Fisheries, University of Tennessee

malash12@ncsu.edu

Prescribed fire commonly is used to manage habitat for white-tailed deer (*Odocoileus virginianus*). Although the effects of fire on forage availability for deer have been studied, how female deer use burned areas is not well known, particularly as it relates to fire season and the years-since-fire. We used GPS tracking data from 16 adult female white-tailed deer to assess the effects of fire season and years-since-fire on habitat use during summer lactation. Females selected unburned drainages and older (>1yr-since-fire) burned areas, and avoided recently burned areas. Individuals with a greater percentage of their summer core area burned expanded the size of their summer home range but did not change summer core area size. Furthermore, summer core area site fidelity (i.e., % overlap between 2011 and 2012 core areas) decreased as the percentage of the 2011 summer core area burned in 2012 increased. Female deer increased selection of burned areas as years-since-fire increased, likely because there was a temporary loss of cover immediately following fire with plants slowly regenerating the subsequent growing seasons. Likewise, to avoid areas depleted of cover, females shifted their core areas away from recent burns when possible but increased their core area size when burned areas were unavoidable (i.e., a large portion of their home range was burned). Burning large contiguous areas may initially have a negative effect on female deer during lactation because of the depletion of cover.

Business Meeting Agenda

Thursday, April 9, 2015, 9:30 am
Lake Logan Episcopal Center, Canton, NC 28716

Welcome and Opening Comments – Katie Greenberg

Secretary's Report – Sue Cameron

Review and approval of minutes from the February 4, 2015 Executive Board meeting; minutes are available at

http://wordpress.nctws.org/members_section

Treasurer's Report and 2015-2016 Budget – Colleen Olfenbittel

Report is available at http://wordpress.nctws.org/members_section

Committee Reports – Katie Greenberg

Reports are available at http://wordpress.nctws.org/members_section

Student Chapter Updates

NC State University – Sam Freeze

Haywood Community College – Samuel Austin Crissman

Western Carolina University – Joe Franklin

2015 NCTWS Award Presentations – Chris Deperno

NCTWS Chapter Award

Wildlife Conservation Award

Ken Wilson Memorial Student Awards

Student Poster Award

Nominations and Elections – Katie Greenberg

Present new officers and "Passing of the Goat"

Words from the New President – Kelly Douglass