



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

**“Wildlife Professionalism and the
Digital Age”**

**Haw River State Park
Browns Summit, North Carolina
February 27-March 1, 2018**

2017-2018 Executive Board

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Annual Meeting Agenda

Tuesday, February 27th

- 12 PM Registration (open until 5:30 PM)
- 1 – 5 PM Field Trips—Concurrent Field Workshops
- Option A:** Large Mammal Necropsy – Dr. Kennedy-Stoskopf, Dr. Troan, NCSU (1pm, 3pm)
- Option B:** Avian Techno-Naturalist Walk – Holly Ferreira, UNCW (1pm, 3pm)
- Option C:** Acoustic Monitoring Basics – Dr. Jeff Humphries, NCWRC (1pm, 3pm)
- 6:00 PM Dinner
- 7:00 PM Social/Jam Session

Wednesday, February 28th

- 7:00 AM Registration (open until 8:45 AM)
- 8:00 AM Breakfast
- 8:55 AM Door Prizes
- 9:00 AM Welcome
- 9:05 AM *Benefits of Being Wildlife Certified* – Colleen Olfenbuttel, NCWRC
- 9:15 AM *TWS Updates* – Dr. Mike Conner, SE Section Representative on TWS Council, Joseph W. Jones Ecological Research Center
- 9:25 AM *Characterizing Habitat for Harpy Eagles with UAVs and Machine Learning* – Dr. Jamie Rotenberg, UNC-W
- 9:55AM *Professional Development Course for Students* – Dr. Rachel Urbanek, UNC-W
- 10:15 AM Break (registration open)
- 10:25 AM Door Prizes
- 10:30 AM *The Beauty of the Flock: Crowdsourcing and Community Science for Bird Conservation* – Curtis Smalling, NC Audobon
- 11:00 AM *NC Candid Critters* – Dr. Roland Kays, NCSU
- 11:15 AM *iNaturalist: NC Alligators* – Alicia Davis, NCWRC
- 11:30 AM Awards Presentation
- 12:00 PM Lunch
- 12:55 PM Door Prizes

- 1:00 PM Concurrent Sessions: Hands On
Choose three different 30-minute sessions to attend.
Sessions run from 1:05-1:35PM, 1:40-2:10PM, 2:15-2:45PM.
1. *Social Media: Messages and Metrics* – Stephanie Schuttler, NC Museum of Natural Sciences
 2. *Acoustic Monitors* – Kevin Parker, UNC-G
 3. *UAV Basics* – Dr. Jamie Rotenberg, UNC-W
 4. *Mobile Devices and Maps* – Mark Endries, USFWS
 5. *Mobile Conservation Photography* – Brady Beck, NCWRC
- 2:45 PM Break (registration open)
- 2:55 PM Door Prizes
- 3:00 PM *Social Media with a Conservation Message* – Dr. Marcella Kelly, Virginia Tech
- 3:30 PM *Social Science and Public Engagement* – Debbie Crane, TNC
- 4:00 PM *Small Group Discussions (with table moderators)*
- 5:00 PM Break/ Open-Gym
- 6:00 PM Dinner
- 7:00 PM Social/Poster Session/Auctions/Jam Session

Thursday, March 1st

- 8:00 AM Breakfast
- 8:55 AM Door Prizes
- 9:00 AM NCTWS Business Meeting—Committee updates, student chapter updates, and Passing of the Goat
- 10:00 AM *Turkey Gobbling Chronology* – Chris Kreh, NCWRC
- 10:15 AM *Spatial Analysis in Wildlife Biology* – Dr. Krishna Pacifici, NCSU
- 10:30 AM Break
- 10:40 AM Door Prizes
- 10:45 AM *Endangered Species in Novel Times* – Pete Benjamin, USFWS
- 11:15 AM COWCH Interview Screenings
- 11:30 AM *What Makes a Scientist?* – Kelly Douglass, NCWRC
- 11:45 AM Closing Remarks/Adjourn
- 12:00 PM Lunch
- 2018-2019 Executive Board meeting

Field Trips/Workshops

Large Mammal Necropsy

DR. SUZANNE KENNEDY-STOSKOPF, Research Professor, Department of Clinical Sciences, NC State University, skstosko@ncsu.edu

Dr. BRIGID TROAN, Clinical Instructor of Anatomic Pathology, Department of Population Health and Pathobiology, NC State University, bvtroan@ncsu.edu

This wetlab workshop will demonstrate techniques to conduct necropsies in field settings with limited available resources. Emphasis will be placed on anticipated outcomes of a necropsy, personal safety, and the importance of a thorough external examination before beginning the actual necropsy.

Bio: Suzanne Kennedy-Stoskopf received her DVM from Michigan State University in 1976. She was a Smithsonian Fellow (1976-1978) and then organized and taught one of the first core curricula in zoological medicine at the University of Tennessee, College of Veterinary Medicine, Department of Environmental Practice (1978-1980). She became a Diplomate in the American College of Zoological Medicine in 1984 and earned her PhD in Immunology and Infectious Diseases in 1986 from Johns Hopkins University. She came to NC State University in 1990 and is currently a professor in the Department of Clinical Sciences and Fisheries, Wildlife and Conservation Biology Program. Her clinical expertise in wildlife combined with her research experience in infectious diseases directs her current interests in transmission of infectious agents at the wildlife/livestock/human interface.

Bio: Brigid V. Troan is a veterinarian and Diplomate of the American College of Veterinary Pathologists, specializing in zoo and wildlife species. She has been the diagnostic pathologist at the North Carolina Zoological Park since 2003, and returned to her alma mater North Carolina State University College of Veterinary Medicine in 2014 as a Clinical Instructor. Dr. Troan has also worked as a study pathologist on toxicologic studies of fish, amphibian and avian species for Integrated Laboratory Services since 2011. She is passionate expanding knowledge of non-traditional animal species and loves teaching both in classroom and informal environments.

Avian Techno-Naturalist Walk

HOLLY FERREIRA, M.S. Candidate, Environmental Studies, University of North Carolina Wilmington, President, Seahawk Wildlife Society, Hej8868@uncw.edu

In this workshop, Holly will lead participants on a walk-through of Haw River State Park, showing various methods of using mobile devices to assist in bird identification and surveying. Participants will learn how to use the Merlin and eBird apps by Cornell Lab of Ornithology to help identify bird species and record bird sightings. For the participants who enjoy photography, she will also demonstrate how to digiscope with their phone and binoculars and how to use a DSLR camera for bird photography.

Bio: Holly is a graduate student at UNCW, where she is pursuing her Master of Science in Environmental Studies (concentrations in Environmental Conservation and Management & Coastal Management) and a post-baccalaureate GIS certificate. She obtained her Bachelor of Science degree in Biology from Greensboro College in 2014. She is the founder and president of Seahawk Wildlife Society at UNCW. Her current research concerns Reconyx game cameras and the bird community at Fort Fisher State Recreation Area. In addition, she is a Land and Wildlife Resources Intern at Marine Corps Base Camp Lejeune, where her primary project involves studying nesting bald eagles. In her free time, she enjoys traveling, hiking, nature photography, birding, and spending time with her husband and two dogs.

Using Automated Recorders to Detect and Monitor Wildlife Populations

DR. JEFF HUMPHRIES, Wildlife Diversity Program, NC Wildlife Resources Commission, Jeff.humphries@ncwildlife.org, (919) 928-4071

This workshop will focus on the use automated recorders (e.g., “Frogloggers”) to detect and monitor frog and toad species, but can also be applied to work on birds, bats, and other species that vocalize. The workshop will cover the setup of recording schedules, analysis of data, identification of specific calls, and provide real-world examples of how automated recorders have been used to detect rare species and monitor the progress of restored wetlands over time.

Bio: Jeff Humphries is a Wildlife Diversity Biologist with the NC Wildlife Resources Commission, focusing on amphibian and reptile conservation in the eastern part of North Carolina. He received a Ph.D. in Forestry and Natural Resources from Clemson University in 2005, focusing on the effects of pine plantations on amphibian and reptile populations. Jeff is currently involved in multiple survey and monitoring projects as well as the creation and restoration of isolated wetlands in the Sandhills and Coastal Plain.

Invited Speakers

Benefits of Being Wildlife Certified

COLLEEN OLFENBUTTEL, NCTWS President-elect, NC Wildlife Resources Commission, Black Bear & Furbearer Biologist, Certified Wildlife Biologist®, colfenbu@vt.edu

The Wildlife Society (TWS) offers two types of certifications for members; an Associate Wildlife Biologist® (AWB®) and a Certified Wildlife Biologist® (CWB®). These certifications are offered to support the development and advancement of wildlife professionals in their careers. Becoming a CWB® is a distinction that demonstrates one has met high standards for education, experience, and ethics in the wildlife profession. Certification can provide several benefits, such as increased competitiveness for jobs, salary bonuses, and credibility with the public. The value of the certification program is further demonstrated by the number of colleges and universities that have worked with TWS to verify that their wildlife program meets the educational requirements for certification. There are approximately 300 AWBs® and 1,300 CWBs®. This talk will provide a brief overview of the certification program, as well as the benefits and application process.

Bio: Colleen Olfenbuttel is the Black Bear and Furbearer Biologist for the NC Wildlife Resources Commission since 2007. Prior to this position, she served as the Furbearer Biologist for the Massachusetts Division of Fisheries and Wildlife. She received her B.S. in wildlife biology from Ohio University and her M.S. in wildlife management from Virginia Tech. Colleen has been a member of The Wildlife Society since 1997 and has been a board member for the TWS Wildlife Damage Management Working Group and the TWS Hunting, Trapping, and Conservation Working Group. She is the co-principal investigator on multiple research projects, including river otters, urban/suburban bears, and eastern spotted skunks, and conducts multiple surveys on furbearers and black bears.

New Methods for Characterizing Forest Habitat for Harpy Eagles in Belize Using Drones and Machine Learning

DR. JAMIE ROTENBERG, Associate Professor, Environmental Sciences, University of North Carolina Wilmington, rotenbergj@uncw.edu

Investigating hard-to-reach habitats can be difficult due to a variety of problems ranging from inaccessible mountain valleys and ridges with rugged terrain, to waterlogged bogs, forests and pocosins. Yet, it is vital for ecologists and conservationists to understand the dynamics, variety and diversity of these ecosystems. In this presentation, I demonstrate a low-cost method for obtaining high-resolution aerial imagery using a small-unmanned aerial vehicle (UAV-drone) in the mountains of Belize in Central America. The high-resolution imagery (10 cm) is much higher than standard satellite data obtained from, for example, Landsat (30 m). The Structure-from-Motion (SfM) imagery can be used to characterize vegetation variables such as canopy height, and biomass, and can be combined with other remotely sensed data such as LIDAR. I will also show how advances in computer machine learning, specifically deep learning, enable processing the imagery collected by drones to obtain highly accurate population counts of trees that is extendable to multiple species. These data can then be used to help characterize remote habitat and allow for a better understanding of the needs of wildlife – in this case, rare harpy eagles.

Bio: James (“Jamie”) Rotenberg is an Environmental Ecologist in the Department of Environmental Sciences at UNCW. He received his PhD at the University of California Riverside, specializing in tropical community ecology. Jamie has worked and lived in Guatemala and the Yucatan in Mexico, and now carries out research in Belize as well as North and South Carolina. He uses birds as environmental indicators of habitat change and condition. Current projects include: Bird community dynamics in rainforests along a watershed in Belize as well as using Unmanned Autonomous Vehicles (UAV-drones) and machine learning to characterize rainforest habitat. Data from drone missions are now used to investigate hard-to-reach habitat for the northernmost and only-known harpy eagle nesting pair in Belize – discovered by Jamie and his team. Other projects in Belize include Cacao (chocolate) agroforestry restoration, and single-species conservation of migratory Wood Thrush. Here in North Carolina, Jamie worked as a member of the “Eastern Painted Bunting

Working Group” and surveyed painted buntings along the coast of North Carolina. He has forthcoming publications on the demographics of painted buntings, specifically the effects of habitat quality, change, and loss. Jamie’s most recent work includes nesting habitat for white ibis, doing an ecological and geomorphic assessment of Battery Island, in the Cape Fear River, North Carolina, where approximately 75% of the North Carolina ibis population annually nests.

Exploring a Wild Profession: A Professional Development Course for Students

DR. RACHAEL E. URBANEK, Assistant Professor of Environmental Sciences, University of North Carolina Wilmington, Certified Wildlife Biologist®, urbanekr@uncw.edu

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Scientific conferences build professional skills and identity in students and provide opportunities for increasing social skills, developing a sense of belonging to their field, and exploring career opportunities. Instructors from the University of North Carolina Wilmington, Purdue University, and West Virginia University collaborated to develop a course with the objective of training students to attend their first professional conference. The course framework involved meetings with students and course assignments before, during, and after the conference. Students learned about the overarching conservation profession, current research in the profession, and current threats to the conservation of natural resources. Students also learned appropriate etiquette at a professional conference, how to network with professionals, and had daily opportunities to engage with students from other universities in related fields. Student feedback from the 2016 TWS conference course was positive and indicated that student experiences were enhanced through enrollment in the course. Assessment results indicated that student outcomes included a greater sense of belonging to their profession, social benefits, gains in confidence, and career confirmation. Our results suggest that formal preparation for attendance at a national scientific meeting maximizes the potential for students to benefit from their experience and reduces the anxiety many students express about attending a professional conference.

Bio: Rachael Urbanek is an Assistant Professor in the Department of Environmental Sciences at University of North Carolina Wilmington. She is a Certified Wildlife Biologist® and the chair of the Conservation Affairs Committee for the North Carolina TWS Chapter. Rachael is the Applied Service

Learning and Internship coordinator of her department and is the Faculty Advisor of the Seahawk Wildlife Society. Her research focuses broadly on urban wildlife ecology and management and human dimensions of wildlife.

The Beauty of the Flock: Crowdsourcing and Community Science for Bird Conservation

CURTIS SMALLING, Director of Conservation, NC Audubon,
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The National Audubon Society's annual Christmas Bird Count is one of the longest running citizen science efforts in the world. Now in its 118th year, this count has proven to be a valuable data set for tracking trends, distributions, and engaging large numbers of people. It is the best known but one of many bird centric citizen science efforts like eBird, Great Backyard Bird Count, Hummingbirds at Home, and the newest addition for Audubon, Climate Watch. This talk will provide an overview of these projects and others, their utility, research outcomes, and engagement possibilities. We will also present some acknowledgment of the inherent pitfalls and biases and current approaches to deal with these shortcomings. But optimistically, we will also present some of the real benefits of the engagement and human dimensions side of the equation.

Bio: Curtis Smalling is the Director of Conservation for Audubon North Carolina. As such he oversees the Coast, Bird Friendly Communities, and Working Lands Programs of the state office. His research on species like the golden-winged warbler, wood thrush, and yellow-bellied sapsucker have informed his conservation planning and implementation work. He has worked closely with the network of Audubon chapters and members on a variety of community science efforts including the Christmas Bird Count, Breeding Bird Surveys, Adopt an IBA program, and many species-specific surveys efforts.

North Carolina's Candid Critters: Citizen Science Camera Trapping as Science, Conservation, and Public Engagement

Dr. ROLAND KAYS, Head, Biodiversity Research Lab, NC Museum of Natural Sciences, Research Associate Professor, Fisheries, Wildlife & Conservation Biology, NC State University, Roland.kays@naturalsciences.org

Citizen science can engage the public with nature while also accelerating the rate of data collection, which is critical to track the rapid pace of modern environmental change. Camera traps are ideal tools for citizen science because their photographs can be verified by experts, and the unique animal pictures provide an enjoyable experience for volunteers. Although not a replacement for traditional museum collections, these archives of photo-vouchers can be accumulated faster, over larger areas, and are noninvasive. Through the North Carolina Candid Critters project, we have developed field protocols, training modules, education materials, and the cyberinfrastructure to enable large citizen science camera trapping programs. We have worked with volunteers across the state to monitor over 1600 sites on public and private land, recording 0.5 million detections in >700 camera-years of monitoring effort. These data are useful for documenting the distribution and relative abundance of wildlife across the state and can be used to create models evaluating the impacts of human and natural factors on animal populations. Furthermore, the act of running camera traps and examining the photos is very engaging for our citizen scientists, who become stronger advocates for wildlife after participating.

Bio: Roland Kays is a Research Associate Professor in the Fisheries, Wildlife, and Conservation Biology program at North Carolina State University and the Head of the Biodiversity Lab at the North Carolina Museum of Natural Sciences. He has a Bachelor's degree from Cornell University and a Ph.D. from the University of Tennessee. His research projects aim to be at the intersection of scientific discovery, conservation, and public engagement, and often involve spatial ecology (camera traps, animal tracking etc...) and mammals. He is the author of *Mammals of North America* (Princeton University Press, 2009) and *Candid Creatures* (Johns Hopkins University Press, 2016).

iNaturalist: NC Alligators

ALICIA DAVIS, Wildlife Diversity Biologist, NC Wildlife Resources Commission,
Alicia.davis@ncwildlife.org

Last year, NCWRC launched a citizen science project called NC Alligators on the iNaturalist website. iNaturalist is a crowdsourced species identification system and an organism occurrence recording tool. Unlike other citizen science platforms, it also has much of the functionalities of social media applications. Public users can view observations made by others, share their own observations with the community, and interact with other observers and project curators. The goals of the NC Alligators project are to increase our knowledge of local distributions of American alligators, identify areas of high potential for human-alligator interaction, and develop a network of citizens interested in alligator conservation and management in North Carolina.

Bio: Alicia Davis is a Wildlife Diversity Biologist with the NC Wildlife Resources Commission. Her current position is responsible for coordinating implementation of the objectives in the NC Alligator Management Plan that was adopted by NCWRC in October 2017. In her prior work as a natural resources technician with NCWRC, she assisted in the development of the Alligator Management Plan, provided support to the NC Alligator Task Force, and contributed to several other alligator-related projects. Alicia completed her bachelor's degree in Fisheries, Wildlife, and Conservation Biology from NC State University in 2015.

Concurrent Sessions

Social Media: Messages and Metrics

DR. STEPHANIE SCHUTTLER, Postdoctoral Research Associate, NC Museum of Natural Sciences, stephanie.schuttler@gmail.com

With millions of people contributing their thoughts, photographs, and videos to the Internet, social media can be an invaluable source for wildlife managers to understand public opinions on wildlife and offer opportunities to study species through crowdsourced data. In this “digital age” of #CeciltheLion and #Harambe, it is no longer considered a luxury to ignore public hashtags about wildlife, yet, it can seem overwhelming to navigate this virtual world with an audience of millions. In this workshop, learn how you can make sense of social media, how it can help your career in wildlife science, promote your organization, and offer direct interactions with the public. We’ll focus on maximizing Twitter, Instagram, and a few other apps to engage the public in wildlife research and conservation. New to social media? No problem! We’ll provide a brief overview and if you’re not ready to #scicomm (communicate science) on your own, we’ll also show you how to understand what people are talking about (including local trends). To maximize this hands-on experience, have the Twitter and Instagram apps downloaded and ready to use on your phone.

Bio: Stephanie Schuttler is a mammologist at the NC Museum of Natural Science interested in the intersection of animal behavior, conservation biology, and ecology. She uses eMammal citizen science camera trap research in K-12 school classrooms to study mammal populations around the world. She is active on Twitter (@FancyScientist), Instagram (@Fancy_Scientist), and blogs regularly (wildlifesnpits.wordpress.com) on science and conservation issues.

Acoustic Monitors for Bats

KEVIN PARKER, M.S. Candidate, University of North Carolina Greensboro,
kaparker@uncg.edu

Acoustic surveys represent a non-invasive, scalable method to investigate and monitor bat populations. As with any survey method, understanding the strengths and limitations of that method is imperative to interpreting results. In this workshop I hope to give managers an overview of the strengths and limitations of acoustic surveys for bats, as well as a starting point to begin monitoring bats with acoustic detectors. The workshop will cover:

- What you can and cannot get from acoustics.
- Basic overview and cost/benefits of current recording technologies.
- Some equipment options.
- Estimated cost.
- Basics of detector placement for bats.
- Options for displaying calls.
- Basics of species identification to phonic group, resources for NC bat identification.

Participants will take away a document with everything they will need to know to start monitoring bats acoustically.

Bio: Kevin is currently finishing up a MSc in Biology at the University of North Carolina at Greensboro. His main interest center around animal behavior, landscape ecology and wildlife technologies. His thesis focuses on using acoustic detectors to investigate low-temperature thresholds for bat activity across North Carolina. He has been part of the team implementing the North American bat monitoring program (NABat) in North Carolina since 2016. He has 5 years of experience in acoustic monitoring. Kevin has worked on wildlife related projects in NV, MO, CA, WV, NC, AZ, MT, WY, Mexico, and Chilean Patagonia. When not working, he enjoys shuffling around his woodshop.

Mobile Devices and Maps

MARK ENDRIES, Wildlife Biologist, US Fish & Wildlife, Asheville Office,
mark_endries@fws.gov

In this hands-on session people will be able to interact with some of the latest technology and software available to people for field data collection.

Bio: Originally from Wisconsin, Mark Endries received a B.S. in Biology and an M.S. degree in ecology from the University of Wisconsin-Oshkosh. Mark's professional interests lie in applying the tools of Geographic Information Systems (GIS) to assist with and improve habitat protection planning and wildlife conservation. Mark spent the first ten years of his professional career as a GIS Analyst with the Florida Fish and Wildlife Conservation Commission (FWC). While employed by the FWC, Mark authored a report entitled Wildlife Habitat Conservation Needs in Florida, which recommends and maps needed conservation lands called Strategic Habitat Conservation Areas throughout the state. The last six years Mark has been employed with the US Fish and Wildlife Service (USFWS) in Asheville, NC. For the USFWS Mark has developed distribution models for over 250 aquatic species, as well as applied GIS to a variety of listed species conservation efforts.

Mobile Phone Conservation Photography

BRADY BECK, Wildlife Biologist, NC Wildlife Resources Commission,
brady.beck@ncwildlife.org

Improve your conservation photography skills with a tool most of us have in our pockets all the time – your mobile phone. We will discuss basic photography principles and techniques, as well as how your camera/phone functions. We will also look at how to improve your images after you click the shutter. We will briefly touch on video capabilities if time permits.

Bio: Brady Beck was born in West Lafayette, Indiana. He moved with his family to Raleigh, NC in 1986. He earned a B.S. in Wildlife Science from North Carolina State University in 1992. Since then he has worked as a biologist for several conservation groups in the Sandhills region of North Carolina. He currently works as a land manager and Wildlife Biologist studying red-cockaded woodpeckers with the NC Wildlife Resources Commission. His photography interests grew out of a desire to capture on film the unique habitats and animals he saw throughout his daily field work. He is passionate about conserving the remaining Longleaf Pine ecosystem in the Sandhills, as well as educating others about the beauty and diversity of plant and animal life that rely on a healthy ecosystem. Visit his website:

www.bradybeckphotography.com

Invited Speakers

Social Media with a Conservation Message

DR. MARCELLA KELLY, Professor, Department of Fish & Wildlife Conservation, Virginia Tech, makelly2@vt.edu, www.mjkelly.info twitter: @marcellajkelly @whapavt

DR. ANNE HILBORN, Department of Fish & Wildlife Conservation, Virginia Tech, ahilborn@vt.edu, twitter: @AnneWHilborn and @whapavt

While scientists often excel at speaking to the academic community and their peers, they often do a poor job reaching out to the general public and/or they talk past or above the level that engages non-scientists. Yet communication of science to the public often is necessary to generate support for scientific research and/or to make better informed decisions about wildlife management. In general, science communication refers to presenting scientific research or science related topics to non-experts. It has also evolved into its own professional field. While there are numerous ways and platforms from which to conduct science communication, in this talk, we present on the use of twitter as a tool for better science communication. Twitter's short format communication (now 280 characters) easily can be combined with photographs or videos to catch the eye of non-scientists and draw them into a topic they might not normally consider. Remote camera photographs and animal photographs in general often catch attention long enough to read a short tweet. We discuss many aspects of using twitter for "scicom" including: time commitment, starting up, tweeter feeds, going viral, storifying, and more. We also discuss potential pitfalls and issues concerning documenting scicom experiences.

Bio: Marcella Kelly is a professor in the Fish and Wildlife Conservation Department at Virginia Tech where she works on population dynamics and parameter estimation for numerous wildlife species. She focuses on predator ecology using a combination of non-invasive methods (e.g. remote cameras and genetic sampling) with more traditional methods such as GPS telemetry. Recently, she has used social media (i.e. twitter) as a platform from which to

share photographs and conduct science communication through her lab's work on carnivore conservation.

Bio: Anne Hilborn completed her PhD in 2017 working on hunting behavior in Serengeti cheetahs. She has been highly successful in using her experience in the field and lab to engage in science communication with the general public to increase knowledge and understanding of cheetah conservation. She has a large twitter following and currently works for the center for communicating science at Virginia Tech.

Social Science and Public Engagement: Talking Outside the Choir

DEBBIE CRANE, Communications Director, The Nature Conservancy, NC Chapter, dcrane@TNC.org

We're all very good when it comes to talking with each other about conservation issues. But how do we talk to the public about our work? The Nature Conservancy conducts public opinion research to learn the best way to talk about conservation outside of conservation circles. This talk will highlight that work.

Bio: Debbie has almost three decades of experience in communications. A graduate of UNC-Chapel Hill, she spent the first years of her career in the news business – as a reporter and television assignment director. She moved on to government public information – serving as public affairs director for North Carolina's environment and health/human service agencies. She joined The Nature Conservancy in 2008 and calls it her "dream job."

Small Group Discussions

Join your peers in a discussion about social media and how it applies to YOU!

Sample discussion questions include:

- Who are you representing on social media?
- What are your goals? (Provide some examples)
- Who is (are) your target audience(s)?
- What platforms will work best to accomplish your goals?
- How much time do you want to devote to social media? Is this enough to accomplish your goals?
- How do you track the effectiveness of your message?
- Where do you want to direct your audience? (Your website? Your papers?)
- Is there an “ask” for your audience? (e.g. donations)
- How do you build a presence or “following” on social media
- How do you document your time/engagement with social media (for example on your resume)

Turkey Gobbling Chronology

CHRIS KREH, Upland Game Bird Biologist, NC Wildlife Resources Commission, Certified Wildlife Biologist®, chris.kreh@ncwildlife.org

The NCWRC's regulatory management of wild turkeys takes into account many factors, including turkey ecology, hunter density, turkey population density, habitat and landscape attributes, and hunting traditions. Principal among these factors is the need for an understanding of turkey reproductive ecology. There are several facets to reproductive ecology, including gobbling activity, egg laying, incubation, nest predation, and nesting success rates. Gobbling activity, and patterns of gobbling activity through the spring, attracts the interest and attention of turkey hunters. The timing of gobbling activity, the timing of the spring turkey season, hunter success, and hunter satisfaction are all intertwined. As such, an understanding of gobbling chronology is paramount to successful turkey management. Gobbling activity is generally thought to follow a bimodal pattern, with peaks at two specific times during spring. Peaks are expected to occur before the primary breeding period (prior to hens being receptive to breeding) and again after that period (when hens are incubating nests). The second peak in gobbling identifies the time when toms can be safely taken from the population without impacting the reproductive process and is therefore the ideal time for a spring turkey season. In 2016, we began using acoustic recorders to collect data on patterns of wild turkey gobbling across North Carolina, with 50 recorders deployed in the southeastern and northwestern regions of the state. After encouraging preliminary results in 2016, we deployed our acoustic recorders statewide in 2017, with at least 5 recorders in each of the NCWRC's nine administrative districts. To date, we have collected more than 34,000 hours of audio recordings and tallied more than 50,000 wild turkey gobbles. We plan to collect additional data in 2018 and 2019. Ultimately, these data will provide a better understanding of turkey biology and will help inform regulatory decisions in order to maximize both hunter satisfaction and turkey reproduction.

Bio: Chris Kreh is the Upland Game Bird Biologist for the North Carolina Wildlife Resource Commission. His duties chiefly focus on coordinating survey and research activities for grouse, quail, and turkeys.

Spatial Analysis in Wildlife Biology

DR. KRISHNA PACIFICI, Department of Forestry and Environmental Resources, Fisheries, Wildlife, and Conservation Biology Program, NC State University, jkpacifi@ncsu.edu

The number of large georeferenced data sets continue to increase in wildlife biology. Although the increase in data permits the potential to explore complex questions in wildlife biology, the large amount of spatial data presents unique challenges. Concurrently the need for more sophisticated tools increases in order to maximize the information gain from these large data sets. In this talk I will describe some of the recent developments in spatial modeling and discuss an application for integrating multiple data sources (e.g., designed surveys and opportunistic observations through citizen science) using a Multivariate Conditional Autoregressive model to understand species distribution. I will highlight the exciting challenges in spatial wildlife biology that necessitate the development and use of innovative statistical methods to move the field of wildlife biology forward.

Bio: Krishna Pacifici is an Assistant Professor in the Program in Fisheries, Wildlife, and Conservation Biology and Department of Forestry and Environmental Resources at NCSU. His research interests focus on developing and applying novel statistical methods to answer applied problems in wildlife and fisheries ecology. He has a B.S. and M.S. in Wildlife Biology from NCSU and a Ph.D. in Wildlife Biology and M.S. in Statistics from the University of Georgia.

Endangered Species in Novel Times

PETE BENJAMIN, Field Supervisor, US Fish & Wildlife Service, Raleigh Office,
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Presentation of the Fish and Wildlife Service's approach to Endangered Species Act implementation in the Southeast in general and North Carolina in particular. Includes detailed updates on proposed and upcoming species status assessments, listing decisions, at-risk species conservation initiatives, and other proposed and anticipated changes to Endangered Species Act implementation. Discussion will also cover how USFWS conservation partners fit into listed and at-risk species conservation.

Bio: Pete Benjamin supervises the U.S. Fish and Wildlife Service Field Office in Raleigh North Carolina. Mr. Benjamin has worked for the Fish and Wildlife Service since 1991 and has been the Field Supervisor in Raleigh since 2004. He received a Bachelor's degree from Ohio University and a Master's degree from Indiana State University. That was eons ago, so don't ask him about them because he can't remember. He has a wife and daughter, and in his spare time he sits in a tiny cabin in the woods and writes angry letters to the government.

COWCH Committee Interview Screenings

CLINT BROOKS, Cabarrus County, Natural Resources Conservation Service,
clinton.brooks@nc.usda.gov

JOHN HENRY HARRELSON, District Wildlife Biologist, NC Wildlife Resources
Commission, john.harrelson@ncwildlife.org

A glimpse into interviews conducted by the COWCH (Celebrating our Wildlife Conservation Heritage) Committee. Retired wildlife professionals share about career highlights and offer advice to the next generation. Selected interviews include:

- Bob Brown
- Mike Bryant
- John Heisterberg
- Eugene Hester
- Tommy Hughes
- Garland Pardue
- Perry Sumner
- David Woody

What Makes a Scientist?

KELLY DOUGLASS, Technical Assistance Biologist, NC Wildlife Resources Commission, Certified Wildlife Biologist®, kelly.douglass@ncwildlife.org

This presentation is meant to identify the characteristics of a good scientist – the attributes that we inherently demonstrate on a daily basis or constantly strive to improve – that we all have in common and which make us a community of wildlifers and TWS family. How we approach challenges, adapt to new technology, and communicate with and present ourselves to others is a direct result of our scientific nature and can have significant impacts on our relationships and ultimately our careers. Join me in this light-hearted journey to explore the unique attributes we possess that make us scientists so special.

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, a Licensed Pesticide Operator, and an alumna 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 she became a member in 2002.

Student Posters

Effects of Growing-season Prescribed Fire on Northern Bobwhite Nesting Ecology

SARAH B. ROSCHE¹, Christopher E. Moorman¹, Christopher S. DePerno¹, and Jeffrey G. Jones²

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Although, growing-season prescribed fire benefits northern bobwhite (*Colinus virginianus*) by maintaining desirable vegetation structure and composition, little is known about bobwhite nesting success or breeding-season habitat selection following growing-season fire. We used VHF-telemetry to locate and monitor northern bobwhite nests and conducted vegetation surveys at nest-sites and paired random points and at telemetry locations and paired random locations on Fort Bragg Military Installation, which is burned on a 3-year return interval, largely in the early growing season. We calculated the risk of nest destruction by prescribed fire as the proportion of active nests multiplied by the proportion of the study area burned during each week of the nesting season. Two (7%) nests were destroyed by prescribed fire, and average weekly exposure rates (0.16%) to fire were low overall. Northern bobwhite primarily (80%) used areas at least 2 years post fire for nesting cover and sites burned the same year or the previous year were used much less frequently for nesting. Overall, individual bobwhite selected for areas with lower basal area of hardwoods and pines and denser woody understory than random sites. Because of the low site index on Fort Bragg and the rest of the Sandhills region, vegetation takes longer to recover post fire; hence, we suggest that fire-return intervals more frequent than every 3 years could remove critical nesting and escape cover for bobwhite. Additionally, because bobwhite use older roughs (2+ years since fire) for nesting, shortening the fire return interval to less than 3 years could put bobwhite nests at greater risk for destruction and could decrease available nesting cover. Although few nests were destroyed by early growing-season fires, fires conducted later in the growing season could increase the risk of nest destruction.

Wild Suburbia: Diversity, Relative Abundance and Occupancy of Mammals in Developed Areas are Similar to Wild Areas

ARIELLE W. PARSONS^{1,2}, Tavis Forrester^{3,4}, Megan C. Baker-Whatton⁵, William J. McShea⁴, Christopher T. Rota⁶, Stephanie G. Schuttler¹, Joshua J. Millsbaugh⁷, and Roland Kays^{1,2}

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3 Oregon Department of Fish and Wildlife, La Grande, OR

4 Smithsonian Conservation Biology Institute, Front Royal, VA

5 The Nature Conservancy, Arlington, VA

6 Wildlife and Fisheries Resources Program, Division of Forestry and Natural Resources, West Virginia University, Morgantown, WV

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Disturbance is thought to truncate food webs and reduce species abundance and diversity leading to the paradigm that developed areas have low species diversity, low animal abundance, few native predators, and thus have low resilience and ecological function. However, diversity can be mediated by food availability. For animals living in urban areas, food resources and disturbance could become decoupled if species can adapt to exploit human surpluses and altered habitat. Working with citizen scientists to survey mammals at 1427 sites across two urban development gradients (wild-rural-exurban-suburban-urban) and four plot types (large forests, small forest fragments, open areas and residential yards) in the eastern US, we show that developed areas had higher mammal occupancy, richness, diversity and detection rate, including native predators. Most (92.3%) of the 13 mammal species detected >20 times occupied all levels of development above the urban level, suggesting substantial adaptation to human disturbance. Occupancy probabilities for carnivores in these developed landscapes were similar to those reported for carnivores in protected areas around the world, and their variation was better described by local measures of green space than by degrees of urbanization. Our results suggest that in areas where apex predators have been extirpated, suburban and exurban areas can maintain species diversity and abundance at similar, if not higher levels, than wild areas. We suggest these results may be due to the ability of mammals to acclimate to and take advantage of urban

food resources and protection from over-exploitation despite chronic human disturbance. However, our limited sampling of truly urban habitats suggests the highest levels of urbanization remain problematic for mammals, thus conservation of wild areas and mitigation of negative impacts of urbanization remain necessary to foster mammalian adaptation and persistence in the Anthropocene.

Habitat Buffers Benefit Grassland Birds

EDWARD LANDI¹ and Lara Pacifici¹

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Borders between farmland provide prime habitat buffers for sparrows in the family Emberizidae and other grassland birds because they are covered in grasses and seldom managed. However, small family farms with smaller fields bordering one another are being replaced with large, industrial scale fields as a modern farming technique. Large farm fields eliminate borders that provide grassland habitat. Further research is needed to see if alternative farming methods, intended to provide grassland habitat, increase the density (individuals/km²) of sparrows and other grassland birds. Little research has been done on species of birds that overwinter in the strips of habitat buffers. The results of monitoring current densities of sparrows and grassland species in response to habitat buffers helps farmers improve current management methods. The study site to monitor current density are the managed habitat buffers in the farm fields in Alligator River National Wildlife Refuge. Fields at Alligator River uses filter strips, a type of habitat buffer that has warm and cold season grasses, under the CP 33 management plan. Refuge biologists are in collaboration with this project to quantify the effects of filter strips.

Species-specific Low-temperature Thresholds for Bat Activity in North Carolina

KEVIN A. PARKER¹, Han Li¹, and Matina C. Kalcounis-Rueppell¹

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Low-temperatures drive hibernation and migration in temperate region bats which in turn can influence mortality via white-nose syndrome (WNS) and wind turbine interactions. However, the low-temperatures at which bats are able to be active remains unknown. The goal of this study was to describe the species-specific winter low-temperature thresholds (TLT) for bat activity across the state of North Carolina (NC), USA. NC has a wide range of winter climates and is well situated latitudinally to study TLT. We defined the TLT as the mean daily temperature at which there was a 50% probability of activity. We had 2 hypotheses: 1.) different species of bats would have different TLT 2.) for each species, TLT will vary by 50 year mean winter temperature (MWT). For the first hypothesis, we predicted larger species would have lower TLT due to their smaller surface area to volume ratio. For the second hypothesis, we predicted that TLT would be lower in cooler MWT than in warmer MWT. We acoustically monitored winter bat activity from sunset to sunrise nightly from December to February at 11 sites across a large temperature gradient (-10 °C to 25 °C). We recorded bat activity in at least one site every night of winter (927 recording nights total). Silver-haired bats (*Lasionycteris noctivagans*) had lower TLT than big brown bats (*Eptesicus fuscus*), and tri-colored bats (*Perimyotis subflavus*) had higher TLT than big brown bats. We found that big brown bats and Silver-haired bats had lower TLT in cooler MWT. However, tri-colored bats showed no difference in TLT between climates. We found lower TLT in species less affected by WNS, suggesting that behavioral adaptations to winter temperatures affect WNS susceptibility. Our results can be used to model winter bat activity in the southeastern USA where WNS affected species may be active in winter.

Using Airborne LiDAR to Detect and Quantify Understory Vegetation Cover for White-tailed Deer

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Understory vegetation cover is an important feature of the landscape for many wildlife species, but is difficult to quantify over large areas, especially under forest canopies. Light Detection and Ranging (LiDAR) is an active remote sensing technology that can detect understory cover, even under forest canopies, and high-density, discrete-return data is now available over large parts of North Carolina. While LiDAR-derived variables have been combined with field-based sampling to predict wildlife distribution across several taxa, few have explicitly reported how LiDAR relates to field-based vegetation cover measurements such as vegetation profile boards or cover poles. Though coverage gaps in high-density LiDAR data exist, field-based techniques are consistently available, and understanding the relationship between the two tools may help natural resource managers predict conditions at areas not sampled. Furthermore, LiDAR acquisition in eastern United States usually occurs during dormant periods as studies of geomorphology and hydrology (e.g., floodplain mapping) are of primary interest, though wildlife researchers are often interested in leaf-on conditions, resulting in a temporal mismatch of applications with little known about how LiDAR collected during dormant conditions relate to leaf-on periods. To assess the relationship between field-based sampling techniques and LiDAR-derived variables, we established 100 sampling points stratified by forest vegetation type in Wake County, North Carolina during January 2018. Dormant season measurements at the 100 locations will be made during February 2018 and resampled during May-June 2018 to evaluate leaf-on conditions. We will compare the percentage of points detected in the understory (0.5 – 2.5m strata) by airborne LiDAR collected for the North Carolina Floodplain Mapping Program to the average percent of cover detected across seasons using standard methods for a cover pole. If we find that LiDAR is an accurate measure of understory cover we will use it to assess the importance of this habitat feature for white-tailed deer at the state-level using mammal detection data from camera traps run by the NC Candid Critters project.

Impact of Logging Residue Retention on Small Mammals in the Mountains of North Carolina

APRIL D. BOGGS¹, Christopher E. Moorman¹, Dennis W. Hazel², and Cathryn H. Greenberg³

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There is growing interest in the use of wood for bioenergy. However, removing low value woody material for renewable energy could reduce downed wood important as food and cover for ground-dwelling wildlife that use young forest. We examined the relationship between levels of downed woody debris and occurrence of mice (*Peromyscus* spp.) following timber harvests in western North Carolina. We sampled mice in 10 sites that were clearcut or shelterwood harvested in 2013-2015; 5 of the sites were hardwood stands prior to harvest and the other 5 were dominated by white pine (*Pinus strobus*). From May to August of 2016 and 2017, we captured mice using 60 Sherman traps per site spaced every 15 m and checked for 5 consecutive days. Traps were categorized as either ≤ 5 m from coarse woody debris (near debris) or >5 m from coarse woody debris (far from debris). Variables for analysis also included vegetation structure and composition at each trap and site-level woody debris volumes, measured using prism sweep sampling. Approximately 67% of the traps were located near debris and 33% were far from debris. Total captures were greater in white pine stands (935) than in hardwood stands (626), possibly because of greater volumes of downed woody material present after harvest in white pine stands. Logistic regression analysis indicated a greater likelihood of capture at traps near coarse woody debris and a lower likelihood of capture at traps surrounded by more grass and forb cover. Piles of logging debris retained following harvest may provide critical resources for mice and other early succession wildlife.

Assessing Impacts of Environmental Conditions and Predator Presence on Fawn/Doe Ratios

HAILEY M. BOONE¹, Krishna Pacifici¹, and Roland Kays^{1,2}

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Understanding how variation in habitat quality and predator abundance influence wildlife reproduction and the survival of their young offers the potential to address interesting ecological questions that are also relevant to management decisions. The ratio of young animals to adult females is a useful index for fawn recruitment rates, the percentage of fawns that are likely to survive to reproductive maturity. From Aug to Nov 2017, we conducted camera trap surveys of terrestrial wildlife from 10 North Carolina counties selected to represent different deer biological management zones. In 4,710 camera nights of survey effort we obtained a total of 8,200 photographic captures of white-tailed deer (*Odocoileus virginianus*) with 1025 of fawns and 3882 of adult female deer. Fawn/doe ratios were highest in Surry county (12.7%) and lowest in Haywood county (0.6%). Across all sites, no real difference is shown when examining fawn/doe ratios in relation to habitat classes: large forest, small forest, and open. When examining habitat classes at the county level, fawn/doe ratios were higher in small forests for 6 counties, which follows our prediction that transitional habitat zones would yield higher fawn/doe ratios. The cameras also record potential predators of fawns at these sites including coyote (*Canis latrans*), black bear (*Ursus americanus*), domestic dog (*Canis familiaris*), and bobcat (*Lynx rufus*). Future work will consider the relationships between predator detections and fawn prevalence. When we took account spatial variation, we were able to highlight patterns in habitat quality and predator abundance that were not initially demonstrated across a single site or all sites. We provide the first landscape-scale study to use camera traps to test effects of multiple environmental conditions and predator presence on fawn/doe ratios in North Carolina. This project highlights patterns that can give insights to the fawn declines in parts of the state.

Effects of Hunting on Local Deer Density

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Deer density is often of interest to managers, particularly when trying to make decisions to allow or regulate hunting. Overabundance of deer can result in heavy browsing and negative impacts to the herbaceous layer and tree regeneration. At The Nature Conservancy (TNC)'s Bluff Mountain Preserve (NC), deer hunting is currently not allowed, and anecdotal evidence suggests that there are higher numbers of deer and subsequent overbrowsing. TNC is interested in obtaining an estimate of deer density at the protected preserve, and comparing this number with deer densities in surrounding hunted gamelands. In the fall of 2017, we began a deer density study using camera-trap and associated methodology developed by the NC Museum of Natural Sciences. We installed 20 camera traps at Bluff Mountain. The cameras ran for approximately 3 weeks at each site. We used the resulting photographs to identify male deer during antler season by their unique antler branching pattern. We will collect site-level covariates that might influence detection including habitat types, edges, roads and trails, and presence of coyotes (also obtained from the cameras). To estimate density, we will run maximum-likelihood spatially-explicit capture-recapture models using package SECR in Program R. This will result in site-specific deer density estimates that will allow us to make decisions about whether it would be appropriate to allow deer hunting at the Bluff Mountain Preserve. An additional point of interest in this study is how well camera traps can be utilized to estimate population, particularly by preserve managers. This study is currently ongoing.

Assessing Carnivore Density and Distribution in the Southern Appalachians

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The goal of this project was to conduct a preliminary study to estimate distribution and density of mammals across on two contrasting tracks of land in the Southern Appalachians. Balsam Mountain Preserve (BMP, 4,500 acres) and Waynesville Watershed (WWS, 8,500 acres) are close in proximity and similar in terms of topography, geology, soils, forests, and logging history. However, they vary in terms of their current land use. We placed 24 cameras over approximately 13,000 acres from May 2017 through February 2018. We captured 15 and 13 mammal species at BMP and WWS, respectively. American black bear was the only species recorded at all camera locations. Coyote were captured at a much higher rate and distribution at WWS (34 captures/100 trap nights) than BMP (6 captures/100 trap nights).

Business Meeting Agenda

Thursday, March 1, 2018, 9:00 am

Haw River State Park, Browns Summit, NC

Welcome and Opening Comments – Jeff Marcus

Secretary's Report – Sue Cameron

Review and approval of minutes from the December 5, 2017 Executive Board meeting; minutes are available at <http://nctws.org/wordpress/members>

Treasurer's Report and 2018-2019 Budget – Kacy Cook

Report is available at <http://nctws.org/wordpress/members>

Committee Reports – Committee Chairs

Reports are available at <http://nctws.org/wordpress/members>

Student Chapter Updates

NC State University – Moriah Boggess

Haywood Community College – Dylan Poplin

Western Carolina University – Hunter Layman

University of North Carolina Wilmington – Holly Ferreira

2018 NCTWS Award Presentations – Chris Deperno

NCTWS Chapter Award

Wildlife Conservation Award

Ken Wilson Memorial Awards

Best Poster Award

Nominations and Elections – Jeff Marcus

Present new officers and "Passing of the Goat"

Words from the New President – Colleen Olfenbuttel

Awards

NCTWS CHAPTER AWARD

This award is presented to a chapter member for individual effort and contributions to wildlife conservation through The Wildlife Society. Service to the Society and Chapter is strongly considered, along with professional achievement. The award includes a certificate or plaque and a copy of the commendation read during the awards ceremony. Presentation to the recipient is typically made at the annual meeting of the Chapter.

WILDLIFE CONSERVATION AWARD

This award is presented to individuals or groups within North Carolina who deserve recognition for achievement in wildlife conservation, education, research or related endeavors. There is no requirement for Society or Chapter membership. The recognition is for accomplishments widely recognized and publicized. The award includes a certificate or plaque and a copy of the commendation read at the awards ceremony. The award is presented to the recipient or organization at a time and location that is meaningful to the recipient and to the Chapter in terms of future interaction with others who work for the betterment of wildlife conservation.

KEN WILSON MEMORIAL AWARD

The Ken Wilson Memorial Award is presented annually to a student or students, nominated by the wildlife faculty of the various schools within the State having student chapters (NC State University, Haywood Community College, Western Carolina University, and University of North Carolina Wilmington) and selected by the Awards Committee. Awards are presented for academics, contributions to research, work projects that contribute to State wildlife conservation efforts, involvement with the student chapter of The Wildlife Society, and other accomplishments that the Chapter deems worthy of recognition. Recipients receive a cash award, a plaque, a copy of the Sand County Almanac, and a copy of the commendation signed by the Chapter President.

BEST POSTER AWARD

This award is given to a Chapter member for the most outstanding poster presented at the annual meeting. The poster must be presented during the specified poster session period when the poster evaluation is performed.