



# 74<sup>th</sup> Annual Southeastern Association of Fish & Wildlife Agencies Virtual Conference

OCTOBER 26-28, 2020

## ON DEMAND SESSIONS

***These contributed oral presentations will be available as a pre-recorded video that you can watch On Demand on the virtual site. Live Q&A sessions with the primary/presenting author have been scheduled for Tuesday, October 27, from 8:30 AM – 12:00 PM. Please check the schedule for details.***

### TRACK: FISHERIES

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#### (1) Comparison of Angled and Electrofished Bluegill: Implications for Harvest-mediated Growth

Primary Author: Ben C. Neely - Kansas Department of Wildlife, Parks, and Tourism

**Abstract :** Bluegill (*Lepomis macrochirus*) are a broadly distributed and popular sport fish that can experience declines in population size structure and altered behavior resulting from sustained exploitation of a specific subset of the population. This phenomenon is more pronounced because of their colonial spawning strategy where the largest individuals in the population congregate to build and defend nests. These spawning colonies are often in shallow water and are easily accessible and identifiable by anglers. In turn, anglers can quickly exploit many of the largest bluegill in a population because of dominant bluegills' aggressive behavior while defending nests. We compared growth of active nest-tending bluegill collected with angling and a random subset of the population collected with electrofishing to determine how pre-maturation growth (estimated somatic growth between age-1 and age-2) patterns differed in 12 small Kansas impoundments. Angled bluegill exhibited greater pre-maturation growth than bluegill collected with electrofishing in six populations. Growth did not differ between groups in the remaining six impoundments. These findings support previous studies that highlight the importance of protecting spawning bluegill in situations where quality fish is the management objective. Additionally, they preface the potential for fisheries-induced evolution in bluegill populations susceptible to sustained over-exploitation.

**Author(s):** Ben C. Neely, Kansas Department of Wildlife, Parks, and Tourism; Jeff D. Koch, Kansas Department of Wildlife, Parks, and Tourism; Connor J. Chance-Ossowski, Kansas Department of Wildlife, Parks, and Tourism

**Tags (Key Words):** spawning, ecology, behavior, nesting, fisheries-induced evolution

#### (2) Evaluating Mechanical Removal Rates for Rehabilitating Over-Crowded Largemouth Bass Populations in Alabama Small Impoundments

Primary Author: Taylor T. Beaman - Auburn University

**Abstract:** Largemouth Bass populations in small impoundments often reach high densities and exhibit poor growth and body condition. Largemouth Bass harvest is often used to manage these systems, but its effectiveness at restoring severely overcrowded populations to a desirable size structure remains unclear. We evaluated mechanical removal rates for rehabilitating overcrowded Largemouth Bass populations in Alabama small impoundments. Via boat electrofishing, we removed 0-80% of Largemouth Bass under 356 mm from eleven Auburn University research ponds (mean: 4 ac range: 1 - 13 ac) in 2019 and 2020. Upon initial population assessment in 2019, bass populations less than 356 mm were composed of ages 1-7 with a mean relative weight of 89 (82-98). Mean annual growth increments were 158 mm (119-232) for age-1 and 74 mm (50-103) for age-2 Largemouth Bass, and mean proportional size distribution (PSD-Q) was 22 (2-57). Following the removals, we evaluated compensation in bass recruitment and growth as well as estimated changes in bass energy allocation as a function of age and size across mechanical removal rates. An analysis of electrofishing effort revealed that an average of 6 complete shoreline circuits were required to achieve a 50% population reduction, and bass catchability declined with increasing removal effort.

**Author(s):** Taylor T. Beaman, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University; Matthew J. Catalano, PhD, School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University

**Tags (Key Words):** Largemouth Bass, Small Impoundments, Applied Ecosystem Management

### **(3) Identifying Factors That Influence Anglers' Perceptions of Fishery Quality on State-owned Fishing Impoundments**

Primary Author: Hunter Roop - Georgia Department of Natural Resources

**Abstract:** Literature on recreational fisheries has shown that many aspects of the fishing experience that are non-catch related influence angler satisfaction. Since satisfaction as an independent metric may fail to produce sufficient information regarding perceptions of fishing quality, which may be a more salient component of the fishing experience from a management perspective, this study focused on what influences fishing quality in the minds of anglers. We used data collected from a yearlong, on-site survey of anglers at the Marben Public Fishing Area near Mansfield, Georgia, USA, in an ordinal logistic regression model to investigate anglers' perceptions of fishery quality. Results showed that anglers who caught more fish of their target species reported significantly higher ratings of fishing quality than anglers experiencing poor catch rates or who advocated changes to management to produce more fish, larger fish or both. The results suggest that perceptions of fishing quality are strongly influenced by the catch-related aspects of the fishery and these attributes would serve as suitable criteria for guiding future management efforts at this fishery and among similar fisheries elsewhere.

**Author(s):** Hunter J. Roop , Georgia Cooperative Fish and Wildlife Research Unit, Warnell School of Forestry and Natural Resources, University of Georgia; Neelam C. Poudyal , Warnell School of Forestry and Natural Resources, University of Georgia; Cecil A. Jennings, U.S. Geological Survey, GA Cooperative Fish and Wildlife Research Unit, Warnell School of Forestry and Natural Resources, University of Georgia

**Tags (Key Words):** human dimensions, fisheries management, recreational angling

### **(4) Population Characteristics and Recruitment Variability of Blue Catfish, Channel Catfish, and Flathead Catfish in Thunderbird Reservoir, Oklahoma**

Primary Author: Austin D. Griffin - Oklahoma Department of Wildlife Conservation

**Abstract:** Blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), and flathead catfish (*Pylodictis olivaris*) are popular sport fishes throughout North America, and are therefore intensively managed by numerous natural resource agencies. Catfish management relies on sufficient natural reproduction and recruitment to sustain these populations. However, few studies have evaluated the variables that effect recruitment in catfish populations. Therefore, the objectives of this study are to describe population characteristics (age and size structure, condition, growth, mortality, and recruitment) and evaluate the effects of hydrology, water quality, and temperature on the year class strength (using catch-curve residuals) of blue catfish, channel catfish and flathead catfish in Thunderbird Reservoir, Oklahoma. During 2017 and 2018, 235 blue catfish, 194 channel catfish and 120 flathead catfish were collected. In general, these catfish species are slow growing, long-lived, have low mortality rates, and experience variable recruitment. Blue catfish recruitment was negatively impacted by higher average January air temperatures. Channel catfish recruitment was positively affected by increased average annual and seasonal (spring/summer) exchange rate and increased spring/summer average reservoir volume (ha-m), conversely higher annual average total hardness (mg L<sup>-1</sup>) resulted in decreased recruitment for channel catfish. Flathead catfish recruitment was negatively impacted by an increase in annual reservoir volume (ha-m) and increased annual city water intake (m<sup>3</sup> S<sup>-1</sup>). This study is one of the first to describe variables influencing year class formation of blue catfish, channel catfish, and flathead catfish in reservoirs. Although the variables determined to effect catfish recruitment in this evaluation are outside of the control of fisheries managers, the resulting management strategies include, the promotion of downstream angling opportunities for blue catfish that escape during reservoir release events, supplemental stocking of channel catfish in systems with consistently high total water hardness, and the ability to inform angler expectations following periods of low recruitment.

**Author(s):** Austin D. Griffin, Oklahoma Department of Wildlife Conservation; Richard A. Snow, Oklahoma Department of Wildlife Conservation; Michael J. Porta, Oklahoma Department of Wildlife Conservation

**Tags (Key Words):** catfish, recruitment variability, multiple regression

## **(5) Assessing the Effectiveness of Hay Additions in Reducing Colloidal Clay Turbidity in Ponds and Small Lakes**

Primary Author: Eric Pelren - University of Tennessee at Martin

**Abstract:** Adding hay to reduce suspended clays is often recommended in pond and small lake management handbooks in the Southeastern and Midwestern United States. We conducted experiments to assess the efficacy of hay additions in reducing turbidity resulting from colloidal clays. We used two replicated mesocosm studies ( $n = 24$  each) and one replicated pond study ( $n = 6$ ), treating twelve of the mesocosms and three of the ponds with hay and holding the remaining mesocosms/ponds as controls. In the mesocosms, hay additions resulted in significant pH reductions that in turn significantly reduced turbidity; however, the hay additions also caused a highly significant reduction of dissolved oxygen concentration. Overall, both turbidity and dissolved oxygen concentrations were highly and positively correlated to pH in the mesocosms. In the pond study, despite using generous hay additions, there was no significant effect on pH. Likewise, there were no significant differences in turbidity or dissolved oxygen concentrations between the Hay and No Hay ponds, although dissolved oxygen was consistently lower in the Hay ponds. We conclude that, at best, hay additions are ineffective at reducing turbidity in ponds and small lakes. At worst, hay additions can result in hypoxic conditions that could adversely impact fish and aquatic invertebrates.

**Author(s):** Jack W. Grubaugh, University of Tennessee at Martin; Eric C. Pelren, University of Tennessee at Martin; Brandon Weber, University of Tennessee at Martin

**Tags (Key Words):** dissolved oxygen, hay, pH, pond, suspended sediment, turbidity

## **(6) Conservation Status of Texas Freshwater Fishes: Informing State-based Species Protections**

Primary Author: Timothy W. Birdsong - Texas Parks and Wildlife Department

**Abstract :** In Texas, freshwater fishes recognized as State Threatened or Endangered (STE) receive special attention as Texas Parks and Wildlife Department (TPWD) consults with other local, state, and federal agencies on projects that have the potential to alter freshwater systems. Regulatory oversight by TPWD of scientific and zoological collections, fish stockings, commercial fishing, disturbances to state-owned streambeds, and exotic species management must also ensure that no adverse impacts occur to STE freshwater fishes. Furthermore, those species are prioritized by TPWD for voluntary-based investments in research, monitoring, habitat restoration, and habitat protection. Given these and other protections afforded to STE freshwater fishes, it is important that the lists of STE species be frequently revisited with consideration of the best available science on status, trends, and threats to species and their habitats. In 2018, TPWD adopted a standardized methodology, listing criteria, and listing thresholds to comprehensively assess the status of the diversity of species of fish, wildlife, and plants within the resource management purview and jurisdiction of TPWD. This methodology was applied to assess the status of Texas freshwater fishes and assemble recommended revisions to the lists of STE species. As a result, 16 additional species of freshwater fish were recognized as STE in 2020. This presentation will profile the species conservation status assessment and stakeholder input processes used to identify species recommended as STE, and shares recommendations and lessons learned transferrable to other states that maintain similar state-based protected species lists.

**Author(s):** Timothy W. Birdsong, Texas Parks and Wildlife Department; Gary P. Garrett, University of Texas at Austin; Megan G. Bean, Texas Parks and Wildlife Department; Stephen G. Curtis, Texas Parks and Wildlife Department; Kevin B. Mayes, Texas Parks and Wildlife Department; Sarah M. Robertson, Texas Parks and Wildlife Department

**Tags (Key Words):** native fish conservation, threatened and endangered species, conservation status assessment, species protection

## **(7) Demonstration of Split-pond Production Systems for Production of Channel Catfish, *Ictalurus punctatus*, Fingerlings**

Primary Author: Herbert E. Quintero F. - University of Arkansas at Pine Bluff

Testing alternative pond production systems that may aid in reducing avian predation at aquaculture facilities is of high interest to agency hatchery managers and commercial producers. Avian predation is particularly problematic for juvenile fish ranging in size from 5 cm up to 30 cm (large stockers). This study evaluated production of channel catfish (*Ictalurus punctatus*) fingerlings in split-pond production systems. Six 0.04-ha ponds (three split-pond systems and three traditional earthen ponds) were stocked with 200,000 catfish fingerlings per hectare. Fingerlings were cultured for 99 -days and fed a formulated diet twice a day at an allowance of 4.0- 6.5% of total body weight during the first 73 -days; thereafter, fish were fed ad libitum due to a drop-in water temperature. Following the culture period there were no significant differences between treatments for any production parameters. Fish raised in the split pond system displayed lower condition factor, lower survival, lower yield, and higher FCR.

## **(8) Population Genomics of the Grotto Sculpin (*Cottus specus*)**

Primary Author: Leah Berkman - MO Dept of Conservation

**Abstract:** The grotto sculpin (*Cottus specus*) is a federally endangered fish that inhabits a range restricted to the karst system in Perry County, Missouri, which has been designated an area of high conservation priority by the Missouri Department of Conservation. This area contains thousands of sinkholes within an urban-agricultural landcover matrix; thus, agricultural practices, industrial pollution, and urban runoff pose a persistent threat to this aquatic system. In addition to habitat degradation, the USFWS identified small population size, restricted range, and inbreeding as a threat to grotto sculpin persistence. Cave-adapted species, like the grotto sculpin, generally have little to no connectivity or gene flow among cave systems even when connected to surface populations. To better understand the distribution of genetic diversity and the genetic structure of the grotto sculpin, we sought to determine genetic differences within and among cave systems and among cave and surface systems. We collected over 600 grotto sculpin fin clips during several surveys from 2015-2019 and we paired samples by location and survey season. Single nucleotide polymorphisms and mtDNA sequences were used to examine fine and broad scale patterns. Information from this project will help guide management to minimize potential impacts of disease, reduce extinction risk, improve resiliency, and identify appropriate sources for population supplementation, if such an action becomes warranted.

**Author(s):** Leah Berkman, Missouri Department of Conservation; Michael Sandel, University of West Alabama; Jason Crites, Missouri Department of Conservation; Molly Sobotka, Missouri Department of Conservation; Dave Herzog, Missouri Department of Conservation

**Tags (Key Words):** endangered species, cave, genetics

## **(9) Using GIS and a Multi-Criteria Decision Tool to Prioritize Estuarine and Marine Resources for Restoration and Enhancement**

Primary Author: Jennifer A. Bock - Florida Fish and Wildlife Conservation Commission

**Abstract:** In Florida, the marine and estuarine environments contain biologically productive and economically valuable fish and wildlife habitats, providing a diversity of species with spawning grounds, nurseries, shelter, and food. Additionally, these habitats provide numerous ecological services, such as sheltering coastal property from storm damage, maintaining water quality, producing oxygen, sequestering carbon, and augmenting fisheries production that supports a vibrant natural resource-based economy. Although several governmental and nongovernmental conservation and recreation efforts have significantly slowed wetland losses, the remaining estuarine wetlands are threatened by shoreline development, altered hydrology, pollution, dredging, mosquito control impoundments, and climate change. Because of rapid human population expansion and economic growth, Florida faces the demanding challenge of balancing human requirements with those of natural resource conservation. A geographic information system (GIS)-based process was used for assessing publicly accessible estuarine and marine resources, to support a multi-criteria decision analysis tool to prioritize those resources for actions related to habitat restoration and enhancement. Estuarine and marine habitat were identified, mapped, and quantified based on a suite of parameters representing their socioeconomic value, fish and wildlife

value, and opportunity for restoration (i.e., the need, feasibility, and potential for habitat restoration). Parameters were equally weighted, so habitat quantification was additive. A total of 283 sub-watersheds containing 1,061,864 ha of estuarine habitat and 9244 5-km<sup>2</sup> gridded cells of marine habitat were prioritized. This prioritization process provides scientifically based regional and statewide maps directing conservation efforts for estuarine and marine habitat into the foreseeable future. The spatial products from this evaluation can be combined with those for freshwater habitats in Florida to allow for landscape scale management of aquatic resources across ecosystems while sequencing and connecting upstream and downstream projects to achieve optimal desired outcomes.

**Author(s):** Jennifer Bock, Florida Fish and Wildlife Conservation Commission; Kent Smith, Florida Fish and Wildlife Conservation Commission; Maria Merrill, Florida Fish and Wildlife Conservation Commission; Beacham Furse, Florida Fish and Wildlife Conservation Commission; Corey Anderson, Florida Fish and Wildlife Conservation Commission; Jeff Beal, Florida Fish and Wildlife Conservation Commission; Becca Hatchell, Florida Fish and Wildlife Conservation Commission; Katie Konchar, Florida Fish and Wildlife Conservation Commission; Erin McDevitt, Florida Fish and Wildlife Conservation Commission; Annie Roddenberry, Florida Fish and Wildlife Conservation Commission

**Tags (Key Words):** GIS, prioritization, estuaries

#### **(10) Angler Practices and Preferences for Managing Alligator Gar in Texas**

Primary Author: John W. Schlechte - Texas Parks and Wildlife Department

**Abstract:** Some anglers have questioned Texas' statewide one-a-day alligator gar (*Atractosteus spatula*) regulation. Simulations suggested other regulations might be preferred; however, angler support was unknown. Texas Parks and Wildlife Department (TPWD) administered an online survey in summer 2018 to measure attitudes and preferences of Texas alligator gar anglers. Respondents who fished for alligator gar (n = 3980) were primarily Texas resident anglers; 68% fished for gar using a rod-and-reel, but 23% used bow-and-arrow. Most anglers supported using length limits for reducing harvest, regardless of their primary gear. Whereas 40% of anglers fished for alligator gar to eat, most anglers harvested few fish, despite having the opportunity to harvest one fish daily. Overall, most anglers supported the use of localized catch-and-release regulations to promote trophy fisheries; however, whereas rod-and-reel anglers strongly supported these regulations, bow anglers were more evenly split. Most anglers supported mandatory reporting of harvested alligator gar (68% of rod-and-reel anglers and 58% of bow anglers). Many anglers were unsure whether there was a consumption advisory on their primary waterbody, but 47% had concerns about the water quality where they fished. Of those, 43% agreed that poor water quality caused them to reduce their days fishing. Improving awareness of consumption advisories, regulating harvest to younger fish via length limits, or the development of catch-and-release only fisheries in some places may be useful and acceptable management options. To balance the resiliency of alligator gar stocks with the diversity of desires from constituents TPWD has a statewide one fish daily bag on most waterbodies, and has imposed a 122-cm TL maximum length limit along with an annual quota of no more than 160 fish above 122-cm on the Trinity River. Texas also has mandatory harvest reporting for most waterbodies.

**Author(s):** J. Warren Schlechte, Texas Parks and Wildlife Department; Daniel J. Daugherty, Texas Parks and Wildlife Department; Nathan G. Smith, Texas Parks and Wildlife Department; David L. Buckmeier, Texas Parks and Wildlife Department

**Tags (Key Words):** "Human Dimensions" "Alligator Gar"

#### **(11) Comparison of Bowfin, *Amia calva*, Diets in the Upper Barataria Estuary and Atchafalaya River Basin**

Primary Author: Alexis V. Rixner - Coastal Protection and Restoration Authority

**Abstract:** The life histories of many organisms are directly tied to floodplain inundation for access to spawning grounds, nurseries, and feeding. Although the Atchafalaya River Basin (ARB) floodplain is hydrologically modified, it receives an annual flood pulse from the Atchafalaya River. The upper Barataria Estuary (UBE) has been separated from the Mississippi River by anthropogenic modifications and lacks an annual flood pulse. The lack of a flood pulse can reduce the lateral exchange of nutrients between terrestrial and aquatic habitats and alter trophic webs that include fish species such as bowfin (*Amia calva*). The goal of this project was to determine if bowfin diets in the ARB and UBE were similar. Bowfin (n=232) were collected by boat electrofishing in the ARB (n = 89) and UBE (n = 143) from March 2017 to August 2017. The stomach contents of each bowfin were identified to the lowest possible taxon, and grouped into six diet

categories. The overall mean percent of empty bowfin stomachs was similar between basins with 25.8% empty in the ARB and 30.1% empty in the. The mean abundance of crayfish was higher in ARB bowfin stomachs compared to UBE bowfin, and UBE bowfin had a more diverse diet including insects, amphibians, and reptiles. This study provides a baseline to evaluate the effects of floodplain inundation on trophic dynamics as coastal restoration activities progress (river diversions) and can be used as a tool to evaluate restoration success.

**Author(s):** Alexis V. Rixner\*, Coastal Protection and Restoration Authority; Allyse M. Ferrara, Nicholls State University; Quenton C. Fontenot, Nicholls State University

**Tags (Key Words):** Mississippi River · Flood pulse · Trophic dynamics

## **(12) Low Water During Spawning Season Can Lead to a Population Wide Skipped Spawning Event for Bowfin in Floodplain Systems**

Primary Author: Alexis V. Rixner - Coastal Protection and Restoration Authority

**Abstract:** The hydrologic regime of historic Mississippi River deltaic floodplains is characterized by a spring flood pulse that normally inundates low-lying terrestrial areas in late winter and peaks in spring. The Atchafalaya River Basin (ARB) and the Barataria Estuary are river floodplains created by sediments delivered by the Mississippi River. The ARB is a major distributary of the Mississippi River and has an annual flood pulse similar to the Mississippi River. However, the upper Barataria Estuary (UBE) has been cut off from the Mississippi River by flood protection measures, and modern water level is dependent on local rainfall. Many organisms endemic to the Mississippi River deltaic plain have evolved a life history strategy that includes use of newly inundated floodplains for spawning and feeding in the spring. Bowfin (*Amia calva*) nest in shallow vegetated waters in the floodplain, but because water level in the UBE is dependent on local precipitation, spawning habitat for Bowfin may be limited when low water levels coincide with the spawning season. This study evaluated gonadosomatic index (GSI) and used histological analysis to categorize ovarian reproductive stage for Bowfin collected from the ARB and the UBE. Based on our analyses, the percentage of bowfin that spawned differed [X<sup>2</sup> (df=2, N=61) =50.7, P

**Author(s):** Alexis V. Rixner\*, Coastal Protection and Restoration Authority; Johnathan G. Davis, Young Harris College; Allyse M. Ferrara, Nicholls State University; Quenton C. Fontenot, Nicholls State University

**Tags (Key Words):** Flood pulse, Life History, Bowfin

## **(13) Seasonal Food Habits and Prey Selectivity of Alligator Gar from Texoma Reservoir, Oklahoma**

Primary Author: Richard A. Snow - Oklahoma Department of Wildlife Conservation

**Abstract :** Alligator gar (*Atractosteus spatula*) were once viewed negatively by anglers and state agencies, but interest in the reintroduction and trophy management of gar has increased in many states across their range, including Oklahoma. Therefore, the Oklahoma Department of Wildlife Conservation is planning to reintroduce alligator gar back into their native range. Thus, biologists decided to implement a food habits study to determine potential impacts of alligator gar to other fish populations and alleviate angler concerns. The objectives of this study were to describe seasonal food habits and prey selection of alligator gar collected from Texoma Reservoir. Fish were mostly collected using gill nets but 36% were donated by anglers. Diets were pooled into two seasonal groupings (winter-spring and summer-fall). Stomach contents were analyzed from a sample of 138 alligator gar (56 in winter-spring; 82 in summer-fall). Alligator gar were primarily piscivorous, with gizzard shad being the predominant prey item consumed across seasons. Although alligator gar primarily consumed nongame fish, striped bass (*Morone saxatilis*) occurred in 11% of diets with other sportfish representing a combined occurrence

**Author(s):** Richard A. Snow, Oklahoma Department of Wildlife Conservation; Michael J. Porta, Oklahoma Department of Wildlife Conservation

**Tags (Key Words):** piscivore, stomach contents, prey selectivity, reservoir

## **TRACK: MARKETING, R3 & COMMUNICATIONS**

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### **(1) Tracking Chronic Wasting Disease (CWD) and Data Delivery in 2020 and Beyond**

Primary Author: Chris Gerecke - Timmons Group

**Abstract:** Chronic Wasting Disease (CWD) is a deadly disease found in white-tailed deer and other members of the Cervidae family. The Missouri Department of Conservation (MDC) has been testing for CWD since 2001. The first captive breeding facility with CWD was found in 2010 and the first free-ranging positive was found in 2012. Over time the geographic extent and number of samples taken has grown exponentially. We will discuss how MDC's data management, data collection techniques, mobile sampling observation app, and data delivery to the citizens of Missouri has evolved over time to handle this growing challenge.

**Author(s):** Chris Gerecke, Timmons Group; Ritchie Jenkins, Missouri Department of Conservation

**Tags (Key Words):** cwd, mobile, data

### **(2) Understanding the Career Motivations, Barriers, and Social Supports of the Virginia Conservation Police Officers**

Primary Author: Rene X. Valdez - Virginia Department of Wildlife Resources

**Abstract:** There are multiple efforts to increase the number of women and ethno-racial minorities in natural resource professions. These efforts have focused on STEM careers and overlooked Conservation Police Officers (CPOs). CPOs are critically important to the management of fish and wildlife resources and they are a highly-visible workforce. In Virginia, CPOs outnumber state fish and wildlife biologists and have more direct interactions with the public. The job responsibilities and career pathways to becoming a CPO are different from both biologists and traditional police officers. What these differences mean for people considering a CPO career is uncertain. To better understand the career motivations, potential barriers, and social support for becoming a CPO, we surveyed current Virginia CPOs, and a group of potential applicants, who were interested in applying for future CPO positions. Online survey invitations were distributed in February 2020; 121 CPOs and 293 potential applicants completed the surveys. Results of the surveys indicate that CPOs and potential applicants are demographically similar, with few women or ethno-racial minorities. Both CPOs and potential applicants have high hunting and fishing participation rates, stemming from childhood experiences. Both groups have high levels of support from friends and family for their decision to go into law enforcement but have relatively few friends and family in law enforcement. Taken together, these results indicate a need to develop interest in both wildlife recreation and natural resource careers at a young age to attract diverse candidates. The unique role of a CPOs means that agencies and their partners will need to be proactive in this effort. We discuss how agencies can begin changing law enforcement communication practices, including information about hiring and recruitment. We conclude with long-term strategies for recruiting more diverse officers, by complementing and enhancing current agency outreach and R3 efforts.

**Author(s):** Rene X. Valdez, Virginia Department of Wildlife Resources; Shari L. Rodriguez, Clemson University

**Tags (Key Words):** human dimensions; career motivations; diversity and inclusion

### **(3) Visualizing Progress Towards Your Agency's Performance Measures**

Primary Author: Lowell Ballard

**Abstract:** The Missouri Department of Conservation (MDC) is a complex organization that includes multiple branches covering statewide resource management, community & private land conservation, science and protection. Over the past few years, MDC has continued to evolve their strategic planning process. As part of this effort, MDC has been working diligently on defining key agency goals, outcomes and actionable measures. As part of the presentation, we will review the workflows, lessons learned, and technology behind MDC's Strategic Planning Measurement Tool (SPMT) that helps the agency visualize progress towards performance measures and as a result goals and outcomes within their strategic plan.

**Author(s):** Chris Gerecke, Timmons Group; Ritchie Jenkins, Missouri Department of Conservation

**Tags (Key Words):** strategic, measures,dashboards

## TRACK: WILDLIFE

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### (1) A Meta-analysis to Quantify Secretive Marshbird Habitat Use Across the Full Annual Cycle in the Mississippi Flyway

Primary Author: Kristen M. Malone - University of Missouri

**Abstract:** Secretive marshbirds have experienced widespread population declines due to the loss of wetland habitat on which they depend. Because of their cryptic behavior, secretive marshbirds are challenging to study and information on their habitat requirements is limited, especially across the full annual cycle. Identifying flyway-wide trends in secretive marshbird habitat across the annual cycle was recognized as a priority by the Mississippi Flyway Council. Consequently, our objective was to use a meta-analysis to quantify secretive marshbird habitat trends across life history events, species, and regions within the Mississippi Flyway. For the meta-analysis we incorporated results from 40 studies that quantitatively assessed habitat associations of at least one of 7 focal species, including bitterns and rails. Most studies examined breeding season habitat, whereas only 13% reported on habitat use during migration. At landscape scales ( $\geq 1000\text{m}$ ), marshbirds were positively associated with amount of wetlands (mean effect size=0.11, 95% CI=0.08 – 0.15, N=64), especially in the Great Lakes region, and negatively associated with amount of urban landcover (mean effect size=-0.14, 95% CI =-0.23 – -0.06, N=22), particularly for American Bittern. At the wetland scale ( $< 1000\text{m}$ ), marshbirds were positively associated with cattail coverage (mean effect size=0.21, 95% CI=0.09 – 0.33, N=27) and other emergent vegetation (mean effect size=0.12, 95% CI=0.07 – 0.17, N=53). Marshbirds were negatively associated with woody wetland vegetation (mean effect size=-0.09, 95% CI=-0.12 – -0.06, N=62) although effects were weaker in the prairie pothole region of the flyway. During autumn migration, moist-soil vegetation coverage was important for rails in the lower Midwest (mean effect size=0.12, 95% CI=0.06 – 0.18, N=9). The habitat use trends we identified across studies can guide future management of wetland habitats for secretive marshbirds. Future studies identifying secretive marshbird habitat during migration and winter will facilitate a more comprehensive understanding of habitat requirements throughout the annual cycle.

**Author(s):** Kristen M. Malone, School of Natural Resources, University of Missouri; Elisabeth B. Webb, US Geological Survey, Missouri Cooperative Fish & Wildlife Research Unit and School of Natural Resources, University of Missouri; Doreen Mengel, Missouri Department of Conservation & Mississippi Flyway Council, Non-game Bird Technical Section

**Tags (Key Words):** marsh birds; wetlands; habitat use

### (2) Aerial Strip-transect Surveys to Monitor Autumn-winter Waterbird Abundance and Distribution in South Carolina

Primary Author: Nick M. Masto - Tennessee Technological University

Aerial surveys integrating probability-based sample designs have been implemented successfully to estimate relative abundance of wintering ducks in Arkansas, Louisiana, Mississippi, and Missouri but these approaches have not been evaluated in the Atlantic Flyway except for American black ducks (*Anas rubripes*) along the Atlantic coast. Furthermore, these surveys have not been used to index abundance of other nonbreeding waterbirds. Given elimination or reduction of resources allocated to the Midwinter Waterfowl Survey in the Atlantic Flyway and elsewhere, the South Carolina Department of Natural Resources (SCDNR) expressed a need for reliable surveys to monitor waterfowl and other waterbirds during autumn through winter. We designed stratified aerial strip-transect surveys to estimate population indices for migrating and wintering dabbling ducks (*Anatini*), diving ducks (*Aythini*, *Mergini*, *Oxyurini*), pelagic and piscivorous waterbirds (*Anhingidae*, *Laridae*, *Pelicanidae*, *Phalacrocoracidae*), and wading birds (*Ardeidae*, *Ciconiidae*, *Threskiornithidae*) in coastal and inland regions of South Carolina during autumns–winters 2017–2019. We used unequal probability random sampling to estimate population indices with deemed adequate precision (i.e., coefficient of variation [CV]  $\leq 20\%$ ) and estimated theoretical survey efforts needed to achieve desired precision for future aerial surveys. Indices met our goal for precision in September and January 2018 for wading birds, in February and November 2018 for pelagic waterbirds, and in February 2018 for diving ducks but never for other ducks during South Carolina waterfowl hunting season. We detected peak abundance of dabbling and diving ducks in January and wading birds and wood storks (*Mycteria americana*) in September. We estimated ~2.5 times greater survey effort was needed across waterbird taxa than was expended to achieve a CV = 20%. We also used survey data to depict spatiotemporal variation in waterbird

distributions across the study area. Our surveys are applicable for the SCDNR and other agencies seeking to monitor autumn–winter waterbird populations. Although survey refinements are necessary to increase precision, our waterbird indices are useful to assess population trends through time, guide habitat management and restoration efforts, refine local harvest regulations, inform law enforcement to detect illicit activities (e.g., baiting), and monitor possible shifting waterbird distributions in response to land-use and climate change. Key words: aerial survey, abundance estimation, design-based sampling, precision, South Carolina, survey effort, waterfowl, waterbirds

### **(3) An Evaluation of Avian Use of Marsh Terraces in Gulf Coastal Wetlands**

Primary Author: Madelyn McFarland - Mississippi State University

**Abstract:** Gulf of Mexico coastal wetlands support millions of migratory birds annually. However, between 2004 and 2009, Gulf states have experienced 71% of the total decline of coastal wetlands within the conterminous United States with Louisiana accounting for most of this loss. Marsh terracing is one method used to combat coastal wetland loss. This restoration technique uses in situ sediment to construct segmented ridges in open water areas of shallow coastal wetlands to dissipate erosive wave energy, reduce turbidity, increase submerged aquatic vegetation production, and create habitat for a diversity of avian species. Despite widespread use of marsh terraces in coastal restoration, research on their value as bird habitat is limited and inconclusive. Using both ground and aerial surveys, our study evaluates avian use of marsh terraces across multiple paired sites (terraced and non-terraced) in coastal Louisiana. Surveys focused on two guilds of birds: breeding secretive marsh birds and wintering waterfowl. Preliminary results from our first field season indicated: 1) for secretive marsh birds, 35.6% used terraced sites and 64.4% used non-terraced sites, 2) we detected a greater number of focal secretive marsh bird species in non-terraced sites, 3) and wintering waterfowl species abundances varied in space and time. Field efforts are ongoing, and data collection will be completed by July 2021. Future analysis will examine relationship between avian use and habitat characteristics of study sites (e.g., submerged aquatic vegetation, diversity and structure of emergent vegetation).

**Author(s):** Madelyn McFarland, Mississippi State University; Brian Davis, Mississippi State University; Mark Woodrey, Mississippi State University; Larry Reynolds, Louisiana Department of Wildlife and Fisheries; Mike Brasher, Ducks Unlimited, Inc.; Fernando Vizcarra, Mississippi State University

**Tags (Key Words):** marsh terrace, coastal restoration, marsh birds

### **(4) Collaborative Species Distribution Modelling to Improve Conservation Outcomes in the SE United States: Opportunities for Engagement**

Primary Author: Todd Jones-Farrand - USFWS

**Abstract:** The US Fish and Wildlife Service is collaborating with NatureServe and the SEAFWA Wildlife Diversity Committee on the project “Collaborative Species Distribution Modelling to Improve Conservation Outcomes”. The primary output, a library of vetted distribution models for a suite of priority species in the southeastern US, underpins the ultimate objective of the project, which is to empower the FWS & its partners to 1) more efficiently guide field inventory efforts; 2) better understand the spatial configuration, ownership, and ecological condition of suitable habitats for imperiled species; 3) target the highest value areas for land acquisition and co-management efforts with partners; and, in combination with other spatial data, 4) contribute to better understanding of threats and the development of best management practices to proactively sustain our nation’s natural heritage. A key aspect of the project is to meaningfully engage relevant stakeholders in identifying focal species, reviewing existing models and model-related information resources, and creating or refining models with an eye to the needs of managers and other decision makers. An early activity of the project has been the development of a list of 27 focal species based on a prioritization exercise applied to 1708 species occurring on one or more of 1) the FWS’s list of Southeast Trust Species, 2) their “At-Risk Species List”, and 3) SEAFWA’s Regional SGCN list. We are collecting existing range-wide models for these focal species and evaluating their use for classes of conservation decisions. For species without existing range-wide models, we will develop new models. Existing and newly-developed models will be vetted through expert review and revised as needed before being distributed through the library. We will review other project milestones and opportunities for additional collaboration to ensure optimal outcomes for stakeholders.

**Author(s):** D. Todd Jones-Farrand, US Fish & Wildlife Service; Healy Hamilton, NatureServe; Regan Smyth,

NatureServe; Peter Cutter, NatureServe

**Tags (Key Words):** At-risk species, modeling, decision support

## **(5) Does Amount of Urban Area at Banding Sites for Mourning Doves Affect Harvest in the Carolinas?**

Primary Author: Michael F. Small - South Carolina Department of Natural Resources

**Abstract:** We investigated whether harvest of Zenaida macroura (mourning doves) in North Carolina and South Carolina are affected by the proportion of urban landscape at banding sites. We hypothesized that there was no linear association between proportions of urban area at banding sites and dove band recoveries in the Carolinas. We used geographic information systems (GIS) and data from the National Land Cover Database (NLCD) to extract five km extents around banding sites and determined proportions of urban landscape within each. We used linear regression of the proportion of urban landscape associated with each site and the proportion of banded doves harvested. While urban doves were slightly less likely to be harvested than rural doves, the data did not differ significantly and the relationship between variables was very weak. From an urban vs. rural harvest perspective, banding as currently implemented in North Carolina and South Carolina likely provide an unbiased sample based on level of urbanization (on a continuum) at these sites.

**Author(s):** Michael F. Small, South Carolina Department of Natural Resources, Joseph C. Fuller, North Carolina Wildlife Resources Commission, Michael W. Hook, South Carolina Department of Natural Resources, William F. Dukes, Jr., South Carolina Department of Natural Resources.

**Tags (Key Words):** mourning doves, habitat, harvest, banding

## **(6) Effect of Time Since Fire on Wild Turkey Nest Success in the Talladega National Forest**

Primary Author: Mariah G. McInnis - Auburn University

**Abstract:** Previous research on the effects of prescribed fire on wild turkeys (*Meleagris gallopavo*) has mainly examined the direct (e.g., nest destruction) effects of small-scale fires (i.e.,

**Author(s):** Mariah G. McInnis, School of Forestry and Wildlife Sciences, Auburn University; William D. Gulsby, School of Forestry and Wildlife Sciences, Auburn University; Robert A. Gitzen, School of Forestry and Wildlife Sciences, Auburn University.

**Tags (Key Words):**

## **(7) Spatial Barriers to Black Bear Dispersal and Population Connectivity in Alabama**

Primary Author: Hannah J. Leeper - Auburn University

Corridors are important for many species, especially for black bears (*Ursus americanus*), which use corridors for juvenile dispersal and connectivity among local and regional populations. Black bears are historically native throughout Alabama; however, historic populations have diminished, in part from habitat degradation and decreased connectivity. At present, only two small populations of black bears occur in Alabama. One is a newly recolonized population in northern Alabama, whose numbers are growing quickly. The other is a remnant population in the Mobile River Basin that is genetically isolated from other black bear populations in the southeastern U.S. Neither population exhibits the spatial growth patterns characteristic of what small populations could achieve. One proposed explanation for the observed limited spatial growth and genetic isolation is a lack of corridors, resulting in decreased connectivity. In this study, we created Geographic Information System (GIS) models of corridor suitability for black bears in Alabama. We used reports and sightings of bears from 1911 to 2020 to parameterize and test the model. ROC curves confirmed that the GIS models were good predictors of proportional probability of use of a location by black bears. Models indicated that a lack of available corridors in south Alabama may be limiting gene flow with black bear populations in Florida. Conversely, potential corridors in north Alabama may be facilitating population connectivity and expansion.

## **(8) Agency Trust and Satisfaction with Service Related to Human Wildlife Interaction in Florida**

Primary Author: Ramesh Paudyal - Florida Fish and Wildlife Conservation Commission

**Abstract:** Urbanization and habitat degradation have increased the frequency of human interactions with wildlife. This trend has challenged natural resource agencies tasked with managing and responding to human-wildlife conflicts. There is growing recognition of the need for social science to inform effective outreach and management strategies. However, social science research projects and outreach programs often struggle with identifying appropriate target audiences. Over time, the Florida Fish and Wildlife Conservation Commission (FWC) has compiled a statewide wildlife incident database which contains information related to the nature of incidence, species of concern, location, and the FWC's response. Using this wildlife incident database as a sampling frame, we conducted an online survey of residents who had contacted the FWC regarding their interaction with wildlife. Survey included questions related to the incident, method of contact, agency trust and compliance, and satisfaction with the FWC's response. Majority of respondents expressed strong trust toward FWC in managing Florida's fish and wildlife resources. Results also indicate strong relationships of agency trust with respondents' compliance and satisfaction related to agency's response to their interaction with wildlife. We will share these survey results and discuss the management implications and future direction of our programs.

**Author(s):** Ramesh Paudyal and Greg Kaufmann, Florida Fish and Wildlife Conservation Commission

**Tags (Key Words):** agency trust, satisfaction, conflict-wildlife

## **(9) An Evaluation of Expandable GPS Collars for White-tailed Deer Fawns**

Primary Author: Zachary G. Wesner - University of Georgia

**Abstract:** Integrating GPS technology with expandable collars will allow researchers to more efficiently investigate survival and movements of white-tailed deer (*Odocoileus virginianus*) fawns. During 2018-2020, we tested fit and function of 5 GPS-sized expandable collar designs on fawns at Whitehall Deer Research Facility, Athens, GA. We fitted 46 newborn fawns with collars (20 Vectronic Vertex v1.0, 3 Telonics TGW v1.0, 3 Telonics Recon v1.0, 10 Vectronic Vertex v2.0, 10 Telonics TGW v2.0) and ear-tagged 15 control fawns without collars. Additionally, we conducted observations of fawns to evaluate potential effects of collars on behavior. The expandable folds of 88% (14 of 16) of Telonics collars expanded prematurely by  $59 \pm 2$  (mean  $\pm$  SD) days, resulting in extremely loose collars. Ninety-four percent (15 of 16) of Telonics collars failed (i.e., dropped or removed) before 365 days, lasting a mean of  $89 \pm 39$  days before failure. Overall, expandable folds of Vectronic collars functioned properly and accommodated fawn growth during the first year. However, one fawn stepped through a loose-fitting Vectronic Vertex v2.0 collar with its right forelimb at 261 days, resulting in a substantial laceration. Twenty percent (6 of 30) of Vectronic collars dropped from fawns before 365 days dropping at a mean of  $161 \pm 81$  days. Collared fawns spent 46% less time vigilant than uncollared fawns during the first 4 weeks of life (p

**Author(s):** Zachary G. Wesner, University of Georgia; Andrew S. Norton, South Dakota Game, Fish, and Parks; Tyler R. Obermoller, Minnesota Department of Natural Resources; David A. Osborn, University of Georgia; Gino J. D'Angelo, University of Georgia

**Tags (Key Words):** Deer, Technology, Behavior

## **(10) Effects of Thinning and Prescribed Fire on White-tailed Deer Use of Managed Forests**

Primary Author: Dylan G. Stewart - Auburn University

**Abstract:** Thinning and prescribed fire can improve forage availability for white-tailed deer (*Odocoileus virginianus*). However, the relationship among thinning intensity, prescribed fire, forage availability, and concealment cover on deer use of areas has not been adequately quantified. Thus, we performed an experiment within loblolly pine (*Pinus taeda*) stands treated with various forest management practices to quantify this relationship. Specifically, we measured percent coverage of preferred deer forage and visual obstruction within 5 stands thinned to 9 (low), 14 (medium), and 18 m<sup>2</sup>/ha (high) basal areas in central Georgia during 2017. We applied prescribed fire to half of each treatment unit during spring 2018. We randomly placed two camera traps within each subplot (n = 60) from 7 August -14 September, 2019 and used

Poisson regression to analyze the number of deer photographs per camera trap and provide an index of deer use of each treatment. On average, deer use was two-times greater within the 14 and 9 m<sup>2</sup>/ha units compared to the 18 m<sup>2</sup>/ha units. Compared to unburned units, deer use averaged 2.5 times greater in burned units. Because both visual obstruction and preferred deer forage increased with decreasing basal area and were similar between burned and unburned units, we could not assess the relative contribution of cover and forage availability to deer use. However, we hypothesize that increased coverage of select deer forage species within burned units may have led to increased use. Specifically, compared to unburned plots, coverage of ragweed (*Ambrosia artemisiifolia*) was 11 times greater and coverage of pokeweed (*Phytolacca americana*) was 18 times greater in burned plots. Overall, thinning to lower basal areas increased both preferred forage and cover, resulting in increased deer use of treated loblolly pine stands, while prescribed fire further increased deer use across thinning treatments.

**Author(s):** Dylan Stewart, Auburn University; William Gulsby, Auburn University; James Martin, University of Georgia; Kristina Johannsen, Georgia Department of Natural Resources; Stephen Ditchkoff, Auburn University

**Tags (Key Words):** deer, thinning, fire

## (11) Habitat Diversity on Wetland Reserve Program Easements Can Increase Avian Species Richness

Primary Author: Jon Podoliak - University of Missouri

**Abstract:** Bottomland hardwood (BLH) forested wetlands were once the dominant ecosystem in the Lower Mississippi Alluvial Valley (LMAV), however conversion for agricultural purposes reduced BLH forest area across the LMAV by 75%. Due to wetland loss and subsequent detrimental effects on biotic communities and water quality, the Wetland Reserve Program (WRP) was initiated in 1990 to restore marginal agricultural lands to wetlands. Our project objective is to evaluate the effectiveness of WRP easements in providing habitat for wetland-dependent taxa in the LMAV. We sampled avifauna and vegetation annually at WRP easements in western Tennessee and Kentucky in 2019 and 2020. We classified habitats on easements into four categories: remnant forest, planted forest, naturally regenerated forest, and shallow water area (SWA). Preliminary data analysis from 11 sites sampled across 3 seasons (autumn, winter, and spring) indicate avian species richness was greater at easements with more habitat types ( $\text{Rho} = 0.64$ ,  $p = 0.03$ ). Across seasons, total avian species richness on-easement ranged from 18 to 37 species. We observed no difference in species richness among habitat types ( $F = 2.48$ ,  $p = 0.08$ ), which suggests that a diversity of habitat types on a site is more important than any one singular habitat type. Our results indicate the importance of providing a diversity of habitat types on restored easements to increase bird species use of restored BLH forests in the LMAV. Providing data on the response of biotic communities to WRP restoration can aid in guiding future restoration efforts to ensure that project goals are met. Further data collection is planned at an additional 20 easements during 2020-21.

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**Tags (Key Words):** Wetlands, Avian, Forested Wetland

## (12) Influence of Soil Amendment on Forage Quality and Vegetation Structure in Old-Field Communities

Primary Author: Mark A. Turner - University of Tennessee

**Abstract:** Old-field plant communities provide habitat components for several game species, including white-tailed deer (*Odocoileus virginianus*) and wild turkeys (*Meleagris gallopavo*). Prescribed fire, herbicide application, and disking are commonly applied to improve forage and cover within old-fields, but plant response on sites with nutrient-poor soils is not always favorable. Although it is reasonable to expect vegetation to respond to liming and fertilization, little information exists on how forage nutrient content and structure of old-field plants are influenced by soil amendment. We designed an experiment to test the effects of three amendment treatments (lime, fertilizer, lime+fertilizer) on four old-fields across Tennessee. We tested soils during spring 2017 and 2018, and applied treatment amendments based on soil test recommendations. During summer 2018, we measured vegetation structure and collected young and old forage from common ragweed (*Ambrosia artemisiifolia*), horseweed (*Conyza canadensis*), Canada goldenrod (*Solidago canadensis*), pokeweed (*Phytolacca americana*), and blackberry (*Rubus canadensis*) for nutritional analysis. The effect of amendment

varied based on species and nutrient, but crude protein in old goldenrod leaves was the only forage/nutrient combination that soil amendment raised to meet minimum nutrition requirements of a lactating doe with twin fawns. Although soil amendment failed to significantly raise most nutrient values, it did influence the structure of old-fields, with vegetation height increased by 71% following fertilization and 65% following fertilizer+lime application. Additionally, visual obstruction from 50–100 cm, 100–150 cm, and 150–200 cm was greater following fertilizer and fertilizer+lime applications. In fields where the cover is limited because of low soil productivity, amendments can be applied to increase vegetation structure for various wildlife species.

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**Tags (Key Words):** old-field, fertilization, deer forage

#### **(13) The Exotic Asian Longhorned Tick, *Haemaphysalis longicornis*, and the Risks It Poses to Animal and Human Health**

Primary Author: Alec Thompson - Southeastern Cooperative Wildlife Disease Study

**Abstract:** Ticks and tick-borne diseases often are best framed in a One Health context, as many ticks utilize multiple hosts (wildlife, domestic animals, humans) and the pathogens they transmit are sometimes zoonotic. One vector of recent significance in the U.S. is *Haemaphysalis longicornis*, the Asian longhorned tick. This tick is native to eastern Asia but has become invasive in several countries where it is a major pest to a large range of hosts including livestock, companion animals, wildlife, and humans. To better assess the current geographic distribution of *H. longicornis* and to identify potential wild mammal and avian host species, we conducted wildlife surveillance using a passive regional survey in collaboration with wildlife management agencies and wildlife rehabilitation centers throughout the eastern U.S. For rehabilitation centers, all wildlife species were sampled, whereas regional surveillance by agencies targeted cervids and bears. Collectively, our surveillance detected *H. longicornis* infestations on 40 individual cervids (white-tailed deer and elk) from seven states, 50 mesomammals (raccoon, Virginia opossum, red fox, and gray fox) from three states, 2 woodchuck from two states, 4 domestic dogs, 2 coyotes, 1 black bear, 1 eastern cottontail, 1 red-tailed hawk, 1 great-horned owl, and 1 brown booby from one state each. In addition, pathogen screening is being conducted to determine what native or exotic pathogens are associated with this tick. To date, we have detected infections with an exotic strain of *T. orientalis* (a parasite primarily of livestock concern) and *Rickettsia felis*, a zoonotic bacterium with cosmopolitan distribution. Our wildlife host surveillance coupled with pathogen surveillance resulted in numerous new host, state, and county records for *H. longicornis* and provide valuable pathogen detection data relevant for the various host species this tick has been found on. Collectively, these data raise multiple One Health concerns for this tick in the U.S. warranting further investigations.

**Author(s):** Alec Thompson, Southeastern Cooperative Wildlife Disease Study, University of Georgia; Seth White, Southeastern Cooperative Wildlife Disease Study, University of Georgia; Emily Doub, Southeastern Cooperative Wildlife Disease Study, University of Georgia; Stacey Vigil, Southeastern Cooperative Wildlife Disease Study, University of Georgia; Mark Ruder, Southeastern Cooperative Wildlife Disease Study, University of Georgia; Michael Yabsley, Southeastern Cooperative Wildlife Disease Study, University of Georgia

**Tags (Key Words):** *Haemaphysalis longicornis*, Asian longhorned tick, wildlife surveillance

#### **(14) Using Ecological Niche Modeling to Direct Survey Efforts for Crawfish Frogs (*Lithobates areolatus*) in Louisiana**

Primary Author: Simon R. Boycott - Department of Biological Sciences, Louisiana Tech University

**Abstract:** One-third of amphibian species globally are experiencing population declines due to habitat loss and alteration, environmental contaminants, disease, introduced species, exploitation, and climate change. The Crawfish Frog (*Lithobates areolatus*) has declined by 35% throughout much of its historic range primarily due to conversion of its habitat to

agriculture. In Louisiana, most records are from prior to the 1970s, and more recently the species has been documented at just one location. This study aims to assess the current distribution and status of *L. areolatus* in Louisiana and determine the species' climatic and habitat associations. In Spring 2019, we conducted nighttime call surveys along roads near historic *L. areolatus* locations in Louisiana and in areas where potentially suitable habitat remains. Despite considerable effort, we encountered no individuals. To confirm that our survey routes were in suitable areas and to identify other suitable areas for future surveys, we generated a distribution model using locality information from 1990–present from Louisiana, Texas, and Oklahoma, and bioclimatic and land cover variables. Our model indicated that marginally suitable conditions for *L. areolatus* occur in the northwestern, northcentral, and southwestern parts of Louisiana. One area of high predicted suitability is a National Wildlife Refuge unit where a U.S. Fish and Wildlife Service intern claimed to have heard *L. areolatus* calling in 2008. We established five new routes for 2020 based on the model, and surveyed them along with our 2019 routes. We also deployed 12 automated acoustic detectors on National Wildlife Refuge units and state Wildlife Management Areas to aid our efforts. Upcoming work will incorporate additional environmental data on soil and hydrology into our distribution model, and all audio recordings collected by the 12 automated acoustic detectors will be analyzed for presence and occupancy of any individuals. As of now, we have detected no *L. areolatus*.

**Author(s):** Simon R. Boycott, School of Biological Sciences, Louisiana Tech University; Julia E. Earl, School of Biological Sciences, Louisiana Tech University; Donald B. Shepard, School of Biological Sciences, Louisiana Tech University.

**Tags (Key Words):** Modeling, surveying, rare species

#### **(15) Wild Turkey Recruitment in Relation to Forest and Flood Characteristics in West Tennessee**

Primary Author: Eric Pelren - University of Tennessee at Martin

**Abstract:** Wild turkey (*Meleagris gallopavo*) recovery efforts were widely successful throughout Tennessee in the 1970s and 1980s. While the middle and eastern regions of the state typically report substantial numbers of wild turkeys, populations in West Tennessee have experienced limited growth despite efforts by managers and biologists to increase recruitment. Prolonged and unpredictable spring flood events caused by rising water levels in the Mississippi River and its tributaries limit the amount of potential habitat that is available during turkey nesting and brood-rearing seasons. This study investigated effects of annual flooding on wild turkey populations by comparing juvenile-to-adult ratios among areas with differing extents of flooding. Six counties in West Tennessee were chosen for comparison. Juvenile-to-adult ratios observed and noted on summer brood survey forms between 2003 and 2017 were obtained from the Tennessee Wildlife Resources Agency (TWRA). Monthly averages were derived for each county. Forest cover was considered potential wild turkey habitat and ArcGIS raster data was used to determine the percentage of forest in each county. Landsat imagery was used to determine the percentage of forest habitat that flooded at least 36.5 days per year between 1983 and 2011. A General Linear Model (GLM) was used to estimate the effects of percent of county forested, percent of forest that floods, and time (month) on juvenile-to-adult ratios ( $P = 0.06$ ). Counties with more forest had higher juvenile-to-adult ratios. Flood effects on juvenile-to-adult ratios in areas with 30 to 50% forest ( $P = 0.02$ ) and >50% forest ( $P = 0.03$ ) were also significant, which indicates flooding in relatively heavily forested counties negatively affects the ratio. Time (month) was also significant ( $P$ ).

**Author(s):** Ashley Cathey, U. S. Fish & Wildlife Service; Eric Pelren, University of Tennessee at Martin; Scott Parrott, University of Tennessee at Martin

**Tags (Key Words):** recruitment, flood, nest