



# **CLIMATE CHANGE IMPACTS ON FLORIDA WILDLIFE**

**Florida Chapter of the Wildlife Society**

2023 Spring Conference

March 22-24, 2023

**Embassy Suites Jacksonville Baymeadows**

9300 Baymeadows Road, Jacksonville, FL 32256

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# 2023 FLTWS MEETING AGENDA

## WEDNESDAY, March 22

**11:00 am** - Registration (Atrium), Poster setup (Jacksonville)

**Lunch on your own**

**1:00pm** - Symposium: Wildlife and Natural Disasters: Case Studies (St. Johns/Nassau)

**3:40 pm** - Break

**4:00 pm** - Business Meeting: all are encouraged to attend-Prizes!! (St. Johns/Nassau)

**5:30pm** - Networking Social and Student Recruitment Fair (Atrium)

**Dinner on your own**

## THURSDAY, March 23

**Breakfast on your own (hotel provided)**

**8:30 am** - Plenary Session: Climate Change Impacts on FL Wildlife (Nassau)

**10:15 am** - Field Trip Announcements

**10:30 am** - Break

**10:45 am** - Break-out Sessions (St. Johns/Nassau)

**11:40 am** - Lunch (Chelsea's)

**12:40 pm** - Technical Session - STUDENTS (St. Johns/Nassau)

**2:40 pm** - Break

**3:10 pm** - Concurrent Technical Sessions (St. Johns/Nassau)

**5:30 pm** - Poster Session Social & Silent Auction (Atrium/Jacksonville)

**7:00 pm** - Banquet and Awards Ceremony (St. Johns/Nassau)

## FRIDAY, March 24

**Breakfast on your own (hotel provided)**

**8:00 am** - Concurrent field trips (pre-registration required)

- Field trip to Little & Big Talbot Island State Parks (birding excursion)
- Field trip to Guana River Wildlife Management Area (habitat management)
- Field trip to Jacksonville Zoo and Gardens (a behind-the-scenes tour)

**Noon Adjourn**

# SYMPOSIUM PRESENTATIONS

## Wildlife and Natural Disasters: Case Studies

**Welcome Address:** *Maria Zondervan, President-Elect of the Florida Chapter of The Wildlife Society*

**1:05– 1:30** HURRICANE IRMA EFFECTS ON THE LAKE APOPKA NORTH SHORE

**Jim Peterson, St. Johns River Water Management District,**  
*[jpeterson@sjrwmd.com](mailto:jpeterson@sjrwmd.com), 352-427-0926*



### Abstract:

Lake Apopka, once the second largest lake in the state, is now the fourth largest lake in Florida and covers 31,000 surface acres. A well-known fishing lake in the early 1900's to the 1950's, the lake became hypereutrophic after receiving multiple nutrient inputs for decades including farm discharges from the Lake Apopka North Shore. After the undertaking of an aggressive restoration plan by the St. Johns River Water Management District, the lake was showing a great trajectory of improvement in 2017.

Hurricane Irma struck the Central Florida area September 10–11, 2017. The storm caused significant damage to the Lake Apopka perimeter levee, flooding the marsh restoration area, and affecting wildlife and human recreation activity on the 20,000-acre property. Considerable expenses and time were required to repair and restore the area. The presentation looks at the steps needed to repair and restore the area, and the wildlife behavior during that time.

### BIO:

James “Jim” Peterson has environmental undergraduate degrees from the Florida Institute of Technology and additional postgraduate studies. After working in Aquaculture and Environmental Consulting for over a decade, Jim began working on the Lake Apopka restoration project in 1994. Jim has worked for nearly 29 years supervising water quality and biological monitoring in the Central Florida area for the St. Johns River Water Management District. Special projects during this time include assisting with the Lake Apopka North Shore, Marsh Flow-Way, and additional projects including pesticide bioaccumulation and vegetation restoration work.

# SYMPOSIUM PRESENTATIONS

## Wildlife and Natural Disasters: Case Studies

**1:30– 1:55** NATURAL THREATS TO FLORIDA MANATEES: AN OVERVIEW OF MASS MORTALITY EVENTS.

**Martine De Wit**, *Florida Fish and Wildlife Conservation Commission*,  
[Martine.deWit@MyFWC.com](mailto:Martine.deWit@MyFWC.com), 727-893-2905

### Abstract:

Over the past three decades, the federal Working Group on Marine Mammal Unusual Mortality Events has recognized fourteen mass mortality events in Florida manatees. Red tide blooms are a major threat to manatees in southwest Florida and extreme cold weather caused catastrophic statewide mortality in 2010. More recently, the collapse of habitat in the Indian River Lagoon resulted in unprecedented mortality of manatees on the Atlantic coast. This presentation provides an overview of natural disasters that threaten manatees.



### BIO:

Martine de Wit received her DVM from Utrecht University in the Netherlands. Before dedicating her work fulltime to manatees, she gained experience in a wide variety of species through small animal practice, an ABVP residency in avian practice, and exotic animal and research internships. Over the past 17 years, de Wit has worked for the Florida Fish and Wildlife Conservation Commission (FWC) monitoring Florida manatee health through live animal assessments and thousands of necropsies. FWC is responsible for coordinating rescues of sick and injured manatees and examining manatee carcasses from the waters of the State of Florida to determine cause of death, working closely with Law Enforcement, trained volunteers, and partner agencies. Information gathered from these cases helps inform manatee managers in their conservation efforts.



# SYMPOSIUM PRESENTATIONS

## Wildlife and Natural Disasters: Case Studies

**1:55 – 2:20** SEA TURTLE COLD-STUNNING EVENTS

**Allen Foley**, *Florida Fish and Wildlife Conservation Commission*,  
[allen.foley@myfwc.com](mailto:allen.foley@myfwc.com), 904-696-5904



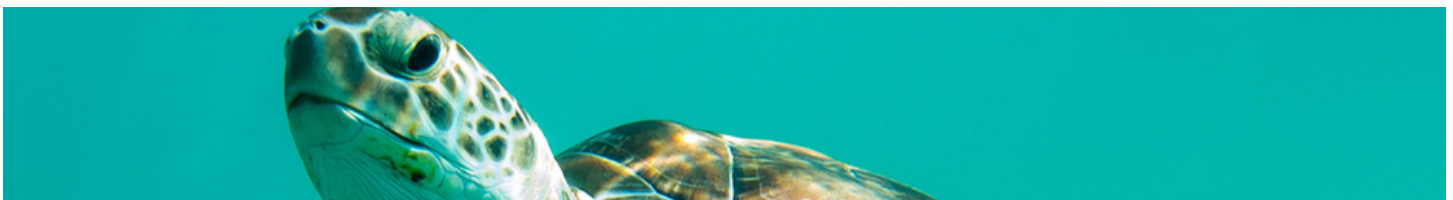
### **Abstract:**

Sea turtles tolerate a wide range of water temperatures, including the typical winter-time water temperatures in the southeastern US. However, in the water below 10°C, cheloniid (hard-shelled) sea turtles are at risk of becoming cold-stunned. When this happens, they become lethargic and float, often washing ashore. Cold-stunned sea turtles may drown, eventually die from metabolic disruptions, or be killed by predators or scavengers. Sea turtle cold-stunning may occur anywhere but is most common in largely enclosed,

shallow-water coastal areas where there are large aggregations of sea turtles. We categorize sea turtle cold-stunning events as either acute (shorter-duration, intermittent events in the southeastern US) or chronic (longer-duration, regular events in the northeastern US). Sea turtle cold-stunning events often involve hundreds to thousands of live sea turtles. An effective response to these events requires a great deal of preparation that includes developing methods for predicting cold-stunning events and strategies for the search and rescue, rehabilitation, and release of large numbers of sea turtles. These events provide unique opportunities to collect data on, sample, and tag (and recapture) many sea turtles. These data help in characterizing sea turtle populations and in determining and monitoring demographic parameters.

### **BIO:**

Allen Foley, BS, PhD University of South Florida. He's worked as a sea turtle biologist at the Florida Fish and Wildlife Conservation Commission for 34 years and currently leads the sea turtle research group at the Fish and Wildlife Research Institute.



# SYMPOSIUM PRESENTATIONS

## Wildlife and Natural Disasters: Case Studies

**2:20 – 2:45** MANAGING COASTAL IMPOUNDMENTS IN A CHANGING CLIMATE

**Stanley Howarter**, U.S. Fish, and Wildlife Services, [Stanley\\_howarter@fws.gov](mailto:Stanley_howarter@fws.gov),  
321-863-6208



### **Abstract:**

Merritt Island NWR encompasses 26,000 acres of coastal marsh which was impounded to control mosquitos in the 1960s. Water level control in the impounded marshes proved beneficial to the management of habitat for wintering waterfowl, wading birds, and shorebirds. Isolation of marshes from the lagoon system and extended periods of flooding had unintended consequences on the health of the overall estuary. Rising sea levels and tropical weather systems have impacted the function and efficacy of the levee infrastructure.

The Refuge has shifted the management of impoundments to keep up with the changing environment. Impoundments not needed for mosquito control and of low habitat value for target waterbirds have been reconnected or restored. Priority impoundments are being enhanced with living shorelines and managed retreats in order to remain effective in the changing climate.

### **BIO:**

Stan received his M.S. in Wildlife Ecology and Conservation from the University of Florida and his B.S. in Wildlife Management from Humboldt State University. He has worked for the U. S. Fish and Wildlife Service for the last 21 years, serving as a wildlife biologist at Lacassine NWR and Tensas River NWR before coming to Merritt Island NWR in 2008. He is responsible for the coordination and integration of wetland management with the Brevard County Mosquito Control, the St. Johns River Water Management District, the National Park Service and NASA's Kennedy Space Center.



# SYMPOSIUM PRESENTATIONS

## Wildlife and Natural Disasters: Case Studies

**2:45 – 3:10** RESPONSE OF FISHES TO SUBMERGED AQUATIC VEGETATION (SAV) LOSS IN THE LOWER ST. JOHNS RIVER, FLORIDA: INSIGHTS FROM THE FWC-FWRI FISHERIES INDEPENDENT MONITORING (FIM) PROGRAM

**Russell Brodie**, Research Administrator I, Florida Fish and Wildlife Conservation Commission, Fisheries-Independent Monitoring, [Russell.Brodie@MyFWC.com](mailto:Russell.Brodie@MyFWC.com)



### Abstract:

Submerged aquatic vegetation (SAV) plays an important role in aquatic environments by serving as a refuge and food source for a variety of aquatic animals, juveniles in particular. It also reduces sediment suspension and erosion by stabilizing substrates, provides additional oxygen to shallow littoral zones, and aids in water filtration through capturing of excess nutrients. The Fisheries-Independent Monitoring (FIM) program of the Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute (FWC-FWRI) has been conducting monthly fisheries surveys in the Lower St. Johns River since 2001.

The vast stands of SAV (primarily eelgrass/tape-grass *Vallisneria americana*) historically found from Doctors Lake south to Palatka were greatly reduced after the passage of Hurricane Irma in 2017. In this talk, I present a preliminary examination of the response of fish populations to this disturbance to better understand the important role that SAV has in the Lower St. Johns River.

### BIO:

Russell Brodie, BS Marine Biology, Florida Institute of Technology. Russ is the Research Administrator for the Florida Fish and Wildlife Conservation Commission's (FWC) Fisheries-Independent Monitoring (FIM) program in northeast Florida. He started working for FWC in 1997 and has been in Jacksonville supervising the northeast Florida FIM program since its inception in 2001. His group is responsible for monitoring the relative abundance of fishery resources in the St. Marys, Nassau, and the lower St. Johns rivers as well as conducting offshore reef fish surveys along Florida's Atlantic coast focused primarily on Red Snapper. The FIM group has provided fishery analysis to a variety of agencies concerning locally important projects, provided data to a variety of federal and state agencies in support of fisheries management, as well as provided data and biological specimens to researchers at local and national universities for species-specific research.



# SYMPOSIUM PRESENTATIONS

## Wildlife and Natural Disasters: Case Studies

**3:10 – 3:35** NAVIGATING THE GAUNTLET OF FLORIDA'S HURRICANE RECOVERY IN FLORIDA

**Stacey Gallagher**, *Sea Turtle Conservancy*, [stacey@conserveturtles.org](mailto:stacey@conserveturtles.org), 352-373-6441



### **Abstract:**

The impacts from climate change – including warming seas that fuel stronger hurricanes – are a major threat to Florida's sea turtles and the habitats upon which they depend. In 2022, Hurricanes Ian and Nicole struck in quick succession. In addition to the horrific loss of life, property, and livelihoods caused by these hurricanes, the environmental implications could be felt for decades. Severe beach erosion from heightened storm surge inundated nests that were still incubating, but also washed out large swathes of suitable nesting habitat for adult turtles nesting late in the season.

One of the most immediate threats to sea turtles in Florida will be the reactive, short-sighted responses that coastal property owners and decision-makers will carry out to shore up damaged homes. These include an increase in hard armoring projects that can impact nesting and reproductive success and further drive erosion. In a rush to drive business back to fragile barrier islands as soon as possible, coastal governments may also approve hasty development plans in the same places that were just leveled by the storm, as has occurred in other regions of Florida. It is crucial for Florida's sea turtles – a vital piece of the ecosystem and an economic driver for the state – to be considered and protected as management decisions are made.

### **BIO:**

Stacey Gallagher has been a development coordinator and sea turtle lighting specialist at the Sea Turtle Conservancy (STC) for six years. In addition to managing STC's foundation support and assisting coastal homeowners with using turtle friendly lighting, Stacey participates in education and outreach on behalf of sea turtles and regularly mobilizes the support of various audiences for their protection. Stacey's academic and employment backgrounds were previously focused on mass communication and journalism, which allows Stacey to inspire stakeholders to take conservation action.

# PLENARY PRESENTATIONS

## Climate Change Impacts on Florida Wildlife

**Welcome Address: Monica Folk**, *President of the Florida Chapter of The Wildlife Society*

**8:35– 9:05** Florida Wildlife Corridor and Florida's Future

**Tom Hctor**, *Center for Landscape Conservation Planning at the University of Florida*, [tomh@geoplan.ufl.edu](mailto:tomh@geoplan.ufl.edu)



### Abstract:

The Florida Wildlife Corridor has the potential to re-energize conservation land protection in Florida to the extent that we will have good opportunities to protect functionally connected regional landscapes across Florida despite the pace of human population growth. I will focus on the future of landscape-scale conservation in Florida with additional discussion about Florida within its regional ecological context. Protecting functional ecological connectivity is essential to protect Florida's EVOsystem including our native biodiversity, ecosystem services, and resilience.

The University of Florida Center for Landscape Conservation Planning is currently working with many partners to update and create new connectivity models for many of our landscape-dependent focal species, developing and assessing data to determine potential impacts from future development and sea level rise, developing new statewide prioritizations of surface water restoration and coastal storm protection, determining opportunities for land conservation aligned with agricultural land protection, identifying needs for future wildlife crossing structures within the Florida Wildlife Corridor, and developing GIS models of potential candidate areas for other conservation easement programs including Forest Legacy, NRCS Wetland Reserve Easements, and NRCS Agricultural Land Easements.

We are also working with the Florida Natural Areas Inventory, the Florida Wildlife Corridor partnership, and the Florida Department of Environmental Protection to identify both strategic priorities and potential bottlenecks and other barriers for protecting a statewide ecological network to help guide land conservation protection.

# PLENARY PRESENTATIONS

These efforts require a concomitant commitment to at least several decades of very well-funded state land conservation protection programs including Florida Forever and Rural and Family Lands Protection, a significant reduction in future low-density greenfield development through higher densities and redevelopment, efforts to protect and facilitate watershed and coastal resiliency, and support for the monitoring and iterative science essential to keep plans up-to-date and to modify plans as necessary to address future change.

## **BIO:**

Tom Hctor is the director of the Center for Landscape Conservation Planning at the University of Florida. He has an undergraduate degree in History and Science from Harvard University and a Masters and Ph.D. in Conservation Biology and Landscape Ecology from the University of Florida. Dr. Hctor is an expert on GIS applications for identifying conservation priorities and implementation actions for maintaining biodiversity and ecosystem services including focal species habitat modeling, reserve design, wildlife corridors, recommendations for expanding protected lands to address climate change impacts, and conservation strategies for ensuring effective conservation in a future with continuing conflicts with land use change and habitat loss. He has served as principal or co-principal investigator on many regional-scale conservation analysis and planning projects in Florida and the U.S. His current projects include the Florida Ecological Greenways Network and Florida Wildlife Corridor, the Critical Lands and Waters Identification Project, the Identification of Florida Air Force Installation Conservation Priorities project, Florida 2070 Sea Level Rise, Southeast Regional Longleaf Pine Ecological Connectivity with the Longleaf Alliance, and working with the National Wildlife Refuge Association and the U.S. Fish and Wildlife Service on Regional Landscape Conservation Design projects in Florida and the Gulf Coast.



# PLENARY PRESENTATIONS

## Climate Change Impacts on Florida Wildlife

**9:05– 9:35** Policy Engagement for Wildlife Professionals and The Wildlife Society in the Face of Global Climate Change

**Kelly O'Connor**, *The Wildlife Society*, [koconnor@wildlife.org](mailto:koconnor@wildlife.org), (301) 897-9770 x332



### **Abstract:**

Climate change and adaptation is a core policy engagement principle of The Wildlife Society (TWS). TWS monitors and engages in policies that support efforts to limit the extent and rate of human-caused climate change, mitigate its effects on wildlife and wildlife habitat, and adapt to the reality of an altered climate. TWS units have a major role to play both in supporting TWS' climate change advocacy at the U.S. Federal level, and in advocating for science-based decision-making that accounts for local impacts of climate change.

We'll discuss how TWS advocates for responsive climate adaptation research within the U.S. Geological Survey, resilient management planning for federal lands such as the National Wildlife Refuge System, and robust funding for at-risk species conservation in the face of global climate change. We'll also explore several cases of unit-led engagement with climate change policy, and identify opportunities for future engagement in Florida and the southeastern U.S.

### **BIO:**

Kelly has been The Wildlife Society's Conservation Affairs Network Fellow since 2021. She received her BS and MS from the University of Connecticut. She relocated from New England to Florida in 2015, where she has worked on implementing policy and management strategies for state-listed wildlife. She was a Regional Gopher Tortoise Conservation Biologist for the Florida Fish and Wildlife Conservation Commission, and also worked as the Stakeholder Coordinator for the FWC's Imperiled Species Policy program where she managed partner and stakeholder engagement with permitting guidelines for state-listed species. In her current role with The Wildlife Society, Kelly coordinates the policy engagement efforts of TWS' chapters and sections across the U.S. and Canada. She provides support to units looking to translate the professional expertise of their members into science-based policy at the local level and facilitates the involvement of units in TWS' national policy activities.

# PLENARY PRESENTATIONS

## Climate Change Impacts on Florida Wildlife

**9:35– 9:55** Managing Florida's Habitats and Species Under Changing Conditions

**Logan Benedict**, *Florida Fish and Wildlife Conservation Commission*,  
*Logan.Benedict@MyFWC.com*, (352) 213-1655



### **Abstract:**

Florida's unique landscape is one of the most rapidly changing and vulnerable ecological systems within the United States. The state is vulnerable to rising seas and impacts from severe storms due to its low elevation and geographic location. While it's easy to think of this as a problem for the future, these changes are already impacting species distributions, life histories, community composition, and ecosystem function. It is imperative as wildlife managers that we recognize areas where we can enhance ecosystem and species resiliency and adapt our management.

Since 2008, the FWC has been engaged in the research, planning, and management necessary to build the resiliency of our coastal ecosystems and adapt to a changing environment. This management involves forward thinking and adaptive strategies to address the impacts of climatic shifts already set in motion while aiming toward desired future conditions. This approach may shift our focus from restoring or maintaining historic land cover conditions that are likely to be unsustainable and allow for transition to new, sustainable systems that encourage migration of our ecosystems and our species inland.

Adaptation, as it pertains to species management, is by design an ongoing process requiring periodic revisiting and revising. With this in mind, FWC remains dedicated to an adaptive approach to wildlife and habitat management and a resilient Florida.

### **BIO:**

Logan Benedict is the Adaptation and Landscape Specialist for the Florida Fish and Wildlife Conservation Commission (FWC). He received his BA in zoology from Southern Illinois University Carbondale and his MS in Biology with a focus on restoration ecology from the University of Illinois Springfield. Since moving to Florida and joining FWC in 2015, Logan has focused on proactive planning and implementation efforts related to human development, sea level rise, landscape-scale conservation, and endocrine-disrupting chemicals. Logan spends his free time with his family raising chickens, gardening, kayaking, snorkeling, birding, and simply enjoying all the wild spaces of Florida.

# TWS CONTINUING EDUCATION OPPORTUNITIES

## CEUs

### How to obtain CEUs (Contact Hours) during the FLTWS Spring Conference:

1. Attend Meeting Sessions that have been approved by TWS for Contact Hours (see below).
2. Record the actual time spent attending sessions, workshops, etc. in your Personal Activity Record (at the end of the conference, round the overall number to the nearest half).
3. Sessions missed, workshops not attended, etc. may not be recorded as Contact Hours.

#### Wednesday, March 22

	CEU's Available
<b>1:00 pm</b> Symposium – Wildlife and Natural Disasters	2.5
<b>4:00 pm</b> Business Meeting	1.5

#### Thursday, March 23

<b>8:30 am</b> Plenary Session: Climate Change Impacts	1.5
<b>1:00 pm</b> Technical Paper Sessions	1.5
<b>3:10 pm</b> Concurrent Sessions (Technical Papers)	1.5
<b>5:30 pm</b> Poster Session	1.0

#### Friday, March 24

<b>8:00am</b> Fieldtrip – Jacksonville Zoo and Gardens	*1.0
<b>8:00 am</b> Fieldtrip – Birding Excursion	*1.0
<b>8:00 am</b> Fieldtrip – Habitat Management for Brackish Ecosystems and Impoundments at Guana River Wildlife Management Area	*1.0
<b>Noon Adjourn</b>	

The conference has a maximum of 10.5 Category I Contact Hours available if attending a field trip.

\*An attendee can only earn Contact Hours on one of the post-meeting field trips, as they are simultaneous.

# SCHEDULE - TECHNICAL SESSION

## THURSDAY, MARCH 23

### SESSION I – STUDENTS (St. Johns/Nassau)

**12:40 – 1:00** – Wild pig management on private lands in Florida. B. Ryver and E. H. Ellington

**1:00–1:20** – Breeding season selection of anthropogenic resources varies across age and pre-breeding movement modes in the American white ibis. C. K. Gulick, K. Zhang, and A. Powell

**1:20–1:40** – Utilizing social science to manage human-wildlife conflict of bottlenose dolphins in the Gulf of Mexico. H. Henry, T. Olivas, S. Gumbleton, N. Shaffer, and K. Dunning

**1:40–2:00** – Long-term evaluation of black crappie growth in Florida’s changing climate. T. S. Coleman, R. W. Eckelbecker, M. Vilchez, and A. K. Carlson

**2:00–2:20** – Parasitism during secondary forest recolonization: Anolis-Malaria in Puerto Rico. M. Quigg, L. Papadopoulous, J. Rodriguez, and M. Acevedo

**2:20–2:40** – Haemosporidian parasites of wading birds captured from breeding colonies in coastal Alabama. K. Zhang, C. K. Gulick, and A. N. Powell

### BREAK 2:40–3:10

### CONCURRENT SESSIONS:

#### SESSION II-A (Nassau)

**3:10–3:30** – Altering hydrology of wetlands to benefit imperiled pond-breeding amphibians. R. P. M. Means

**3:30–3:50** – Searching for rare amphibians in Northeast Florida. A. H. Greene

**3:50–4:10** – The freshwater restoration: The Florida Master Naturalist Program. M. Magrino

**4:10–4:30** – Evaluating extinction risk of coastal vertebrates due to rising seas, saltwater intrusion, and intensifying hurricanes: a need for conservation strategies. S. C. Walls

**4:30–4:50** – Evaluating the potential to restore Black Creek crayfish populations by removing a nonindigenous species. D. Ganas, B. Hayman, L. Reisinger, D. Cook

**4:50 – 5:10** – Perceptions and tolerance of American crocodiles and their management by South Florida residents. V. Deem, D. Steen, A. Brunell, M. Cleary

#### SESSION II-B (St. Johns)

**3:10–3:30** – Species conservation measures and permitting guidelines for Imperiled Beach-nesting Birds. R. Blair Hayman, A. Fitzwilliam, A. Kropp, M. Vandeventer, and C. Faulhaber

**3:30–3:50** – Waterbird colony island prioritization tool. D. E. Gawlik, D. A. Essian, D. J. Newstead, B. M. Ballard, and R. Mirzadi

**3:50–4:10** – Use of remote cameras for monitoring wild felids: Lessons learned in the field over 15 years. J. M. Korn

**4:10–4:30** – How, where, and when did the panther cross the road? B. Shepherd and J. Houck

**4:30–4:50** – Land acquisition in a designated Critical Natural Lands project: The Wekiva to Ocala Greenway. Jay H. Exum and Larame Ferry.

**4:50–5:10** – Working with a detection dog: lessons from the field. L.M. Smith, K. Hassler, and A. Sylvia

# TECHNICAL PRESENTATIONS

## SESSION I – STUDENTS (St. Johns & Nassau)

**12:40 – 1:00 PM – WILD PIG MANAGEMENT ON PRIVATE LANDS IN FLORIDA.**

**BRIER RYVER**, University of Florida, [bryver@ufl.edu](mailto:bryver@ufl.edu); E. HANCE ELLINGTON, University of Florida, [e.ellington@ufl.edu](mailto:e.ellington@ufl.edu)

### **ABSTRACT:**

Invasive wild pigs cause extensive damage to natural and agricultural landscapes across North America and are firmly established in Florida. Effective management practices for wild pig control (whole sounder trapping) are deployed on some public land but are not widely adopted on private land. Our primary objective was to identify the major barriers that private landowners across Florida experience in implementing effective wild pig management on their property. These barriers are likely hierarchical; for example, to implement effective wild pig management, landowners must first be aware of negative wild pig impacts, then they must have knowledge of the most effective management practices, then have the resources (including financial and equipment) to enact effective management. To assess barriers encountered by landowners, we distributed a survey to 1,998 livestock producers and 1,994 rural residents stratified randomly by counties across Florida. Our survey assessed respondents' (1) knowledge of wild pigs, (2) attitude towards wild pigs, (3) damage experienced from wild pigs, and (4) management implemented (including hunting). We received 205 survey responses (125 rural residents, and 80 livestock producers). Livestock producers were more likely to hold negative opinions on wild pigs than rural residents (90% versus 64%) and much more likely to implement some form of wild pig management (68% versus 11%). Yet the use of whole sounder trapping was rare and hunting-related control measures (which are ineffective) were the most commonly employed. The most common reasons given for not managing wild pigs were not enough time and lack of equipment. Promisingly, nearly 30% of respondents signified interest in learning how to manage wild pigs more effectively on their property. Rural residents and livestock producers face different barriers to implementing effective wild pig management and our future outreach and education programs will be tailored to what these different groups need.



# TECHNICAL PRESENTATIONS

## SESSION I – STUDENTS (St. Johns & Nassau)

### **1:00 – 1:20 PM – BREEDING SEASON SELECTION OF ANTHROPOGENIC RESOURCES VARIES ACROSS AGE AND PRE-BREEDING MOVEMENT MODES IN THE AMERICAN WHITE IBIS (Student)**

**CHRISTOPHER K. GULICK**, Department of Wildlife Ecology and Conservation, University of Florida, [cgulick@ufl.edu](mailto:cgulick@ufl.edu); **KE ZHANG**, Department of Wildlife Ecology and Conservation, University of Florida, [kezhang1122@ufl.edu](mailto:kezhang1122@ufl.edu); **ABBY POWELL**, Department of Wildlife Ecology and Conservation, University of Florida, USGS Florida Cooperative Fish and Wildlife Research Unit, [abbypowell@ufl.edu](mailto:abbypowell@ufl.edu)

#### **ABSTRACT:**

Humans have extensively altered landscapes across the southeastern United States, which has resulted in major negative impacts to waterbird habitat in the region. Anthropogenic changes in resource predictability can influence birds' foraging habitat and philopatry to breeding sites, thereby influencing population structure. Additional research on this subject would enhance our understanding of human-related impacts on waterbird populations. To help fill this knowledge gap, we tracked movements of twenty-three white ibises (*Eudocimus albus*) in the northern Gulf of Mexico across multiple subsequent breeding seasons using satellite telemetry. White ibises are known to facultatively forage in human-altered landscapes and may alter their movements to capitalize on available resources in these areas. We hypothesized that ibises that dispersed from their previous breeding range would be less likely to select anthropogenic resources, compared to individuals that returned to their previous breeding range. Further, we expected that inexperienced subadult birds would be more likely to rely on stable resources in human-altered landscapes, compared to adults with more foraging experience. To test this hypothesis, we estimated average cover of human-altered landscapes (pastures, croplands, and developed areas containing roads, parking lots, buildings, or other human infrastructure) across the breeding home ranges of seventeen white ibises from 2020 to 2022. We used logistic regression in a resource selection framework to estimate the probability that an individual would select anthropogenic resources during the breeding season. Dispersing white ibises tended to select against anthropogenic resources, whereas residents and migrants did not show a strong preference for or against these human-altered landscapes. Counter to our expectations, we found that subadults selected against anthropogenic resources, whereas adults did not select for or against human-altered landscapes. Our preliminary results indicate that anthropogenic resources influence resource selection of white ibises, and that this effect is modulated by age and movements prior to the breeding season. This suggests that human-caused landscape change is influencing wading birds' movement and habitat in the northern Gulf of Mexico. This project is awaiting an additional year of data collection before final analysis.

# TECHNICAL PRESENTATIONS

## **1:20 – 1:40 PM – UTILIZING SOCIAL SCIENCE TO MANAGE HUMAN-WILDLIFE CONFLICT OF BOTTLENOSE DOLPHINS IN THE GULF OF MEXICO** (Student)

**HANNAH HENRY**, Auburn University College of Forestry, Wildlife, and Environment, hah0070@auburn.edu; **TIANNA OLIVAS**, Auburn University College of Forestry, Wildlife, and Environment, tmo0017@auburn.edu; **SARAH GUMBLETON**, Alabama Department of Conservation and Natural Resources, sarah.gumbleton@dcnr.alabama.gov; **NICOLE SHAFFER**, Alabama Department of Conservation and Natural Resources, nicole.shaffer@dcnr.alabama.gov; **KELLY DUNNING**, Auburn University College of Forestry, Wildlife, and Environment, khd0008@auburn.edu

### **ABSTRACT:**

Bottlenose dolphins are among the most widely recognized and charismatic flagship species for ocean conservation, particularly in the Gulf of Mexico region, often reflecting the health of coastal ecosystems and other species. However, bottlenose dolphins continue to face wide and diverse threats to their survival, especially through increased human-wildlife conflict as coastal populations continue to grow. Primary threats faced by bottlenose dolphins include interactions with fishing gear, habitat destruction and degradation, and illegal harassment and feeding activities. According to the Marine Mammal Protection Act, harassment is defined as any act of pursuit with the potential to disturb a marine mammal in the wild by disrupting behavioral patterns. Due to regional norms and a hypothesized lack of knowledge or understanding of wildlife laws and regulations, the pursuit of dolphins using watercraft and illegal feeding are rooted in coastal communities and are highly prevalent in states surrounding the Gulf of Mexico. The focus of this research is to comprehend the public's perceptions, knowledge of wildlife laws and regulations, and willingness to change behavior for bottlenose dolphin conservation to lessen cases of harassment. To better understand this phenomenon, we are deploying a large-scale survey to key wildlife stakeholders to characterize the different perceptions of coastal tourists and wildlife tour operators. These surveys are documenting the awareness that coastal tourists and wildlife tour operators have toward the behavior and ecology of bottlenose dolphins, as well as associated wildlife laws, regulations, and threats these species face. Preliminary results show that social science can reduce human-wildlife conflict through education programs on voluntary behavior changes, primarily through better-informed education efforts by state and federal fish and wildlife agencies. This research will be the first of its kind, determining where coastal tourists and wildlife tour operators get their information, and how willing they are to alter behaviors that may lead to protecting dolphins for the next generation.

# TECHNICAL PRESENTATIONS

## **1:40 – 2:00 PM – LONG-TERM EVALUATION OF BLACK CRAPPIE GROWTH IN FLORIDA’S CHANGING CLIMATE** (Student)

TYLER STEVEN COLEMAN, Florida Cooperative Fish and Wildlife Research Unit, Department of Wildlife Ecology and Conservation, University of Florida; [tscoleman3@gmail.com](mailto:tscoleman3@gmail.com); ROBERT W. ECKELBECKER, Montana Cooperative Fishery Research Unit, Department of Ecology, Montana State University; [robert.eckelbecker@student.montana.edu](mailto:robert.eckelbecker@student.montana.edu); **MARIA GUADALUPE VILCHEZ**, School of Forest, Fisheries, and Geomatics Sciences and Department of Wildlife Ecology and Conservation, University of Florida; [mvilchez@ufl.edu](mailto:mvilchez@ufl.edu); ANDREW K. CARLSON, U.S. Geological Survey, Florida Cooperative Fish and Wildlife Research Unit, School of Forest, Fisheries, and Geomatics Sciences and Department of Wildlife Ecology and Conservation, University of Florida; [andrew.carlson@ufl.edu](mailto:andrew.carlson@ufl.edu)

### **ABSTRACT:**

Black crappie (*Pomoxis nigromaculatus*) are popular and widely distributed sport fish in the United States. Therefore, evaluating black crappie population dynamics in a changing climate is important from multiple perspectives (e.g., angler satisfaction, fisheries sustainability). Fish growth and survival are known to vary with latitude, a point of particular importance for species at the southern end of their range, such as black crappie in Florida. However, habitat availability and complexity can also impact these population parameters. We assessed the effects of latitude, temperature, and precipitation on black crappie growth across Florida over two decades. Utilizing data from the Florida Fish and Wildlife Conservation Commission, we found that, statewide, black crappie mean length did not change significantly over time. However, black crappie growth was greatest in northern Florida, while declining significantly through time in southern Florida. As climate change intensifies throughout Florida and the Southeast, continued research on black crappie populations will be important for developing adaptive management programs and policies.

# TECHNICAL PRESENTATIONS

**2:00 – 2:20 PM – PARASITISM DURING SECONDARY FOREST RECOLONIZATION: ANOLIS-MALARIA IN PUERTO RICO. Parasitism during secondary forest recolonization: Anolis-Malaria in Puerto Rico. M. Quigg, L. Papadopulous, J. Rodriguez, and M. Acevedo (Student)**

**MARNE QUIGG**, University of Florida, m.quigg@ufl.edu; LUCIA PAPADOPULOUS, University of Florida, papadopuloslucia@ufl.edu; JESUS RODRIGUEZ, University of Florida, jesus.rodriguezr@ufl.edu; MIGUEL ACEVEDO, University of Florida, macevedo@ufl.edu.

## **ABSTRACT:**

While deforestation is ongoing, particularly in the tropics, in many areas deforestation is followed by forest recovery. As these secondary forests recover, eventually they can provide the minimum requirements for fauna recolonization. In the 1930s, forest cover in Puerto Rico was estimated as low as 6%. Most of the deforested land was converted to agricultural fields, since abandoned due to socioeconomic changes, and allowed to undergo ecological succession. Low densities of fauna recolonize the areas, some of which are infected with parasites. Therefore, we hypothesize that recovering forests will have lower rates of parasitism when compared to old-growth forests. To test this hypothesis, we collected blood samples from *Anolis gundlachi*, an endemic tropical lizard, in the summer of 2019 at the El Verde Field Station located in the El Yunque National Forest in northeastern Puerto Rico. Field sites are categorized into three forest stand ages: young (< 30 yrs), mid (50–70 yrs), and old (> 70 yrs). Three species of *Plasmodium* infect *Anolis* species in this region: *P. azurophilium*, *P. floridense*, and *P. leucocyta*. Anoles were captured by hand or lasso and kept in individual cloth bags until processing. Morphological data and blood samples were collected. We collected blood through a tail clip. The blood samples were used to make thin blood smears on microscope slides, or dried onto cellulose paper for molecular analysis. For this study, we diagnosed infection presence in each individual by extracting DNA from the blood samples, then using polymerase-chain reaction (PCR) to determine if *Plasmodium* was present in each individual. We analyzed the data by modeling the presence of a malaria parasite as a function of forest age using a generalized linear model with a binomial distribution and logit link function. We found a statistically significant difference in the probability of infection between young and old forests. Young forests had a lower probability of infection than old forests. Furthermore, there was no significant difference between the probability of infection for mid and old forests. Multiple non-mutually exclusive hypotheses may explain this pattern, including low density of hosts or less habitat for vector breeding.

# TECHNICAL PRESENTATIONS

## **2:20 – 2:40 PM – HAEMOSPORIDIAN PARASITES OF WADING BIRDS CAPTURED FROM BREEDING COLONIES IN COASTAL ALABAMA** (Student)

**KE ZHANG**, University of Florida, kezhang1122@ufl.edu; CHRIS K. GULICK, University of Florida, cgulick@ufl.edu; ABBY N. POWELL, USGS Florida Cooperative Fish and Wildlife Research Unit, abbypowell@ufl.edu.

### **ABSTRACT:**

Avian malarias, caused by haemosporidian parasites transmitted through blood-feeding vectors, are common infectious diseases found in birds. Avian species that have long-distance migration behaviors may expand the distribution of these parasites and thus facilitate the spread of avian malaria. There has been limited study on the infection of haemosporidian parasites of wading birds, which can travel across long distances during their full life cycles, creating opportunities for them to encounter a large variety of vectors and thus to be infected by multiple lineages of parasites. We obtained baseline data on parasite prevalence in blood samples collected from white ibis (*Eudocimus albus*, n = 97) and tricolored herons (*Egretta tricolor*, n = 68) captured at breeding colonies in coastal Alabama, USA, 2020–2022. We used a nested PCR method to target fragments of the mitochondrial cytochrome-b gene in the genera *Plasmodium*, *Haemoproteus*, and *Leucocytozoon*. We deployed satellite transmitters on captured individuals to track their movements and used a Net Squared Displacement (NSD) method to classify birds as residents or migrants. To date we have tested samples from 42 white ibis and 28 tricolored herons. Preliminary data detected infection in 11 (26%) white ibis and one (4%) tricolored heron. Among the white ibis, at least two were migratory and three were residents. We did not receive enough movement data to classify the movement of other infected birds. The one infected tricolored heron wintered in Belize. We found that in four of the infected white ibis, the cytochrome-b fragments had over 95% similarity with the *Haemoproteus* lineage EUDRUB01, which was formerly reported on scarlet ibis (*Eudocimus ruber*) in São Paulo Zoo in Brazil. To improve our understanding of the relationship between wading birds' movement and their infection of haemosporidian parasites, we will continue our analyses of migration patterns and parasite lineages with regard to age class (juvenile vs. adult) of all birds sampled.

# TECHNICAL PRESENTATIONS

## SESSION II-A (Nassau)

### 3:10 – 3:30 PM – ALTERING HYDROLOGY OF WETLANDS TO BENEFIT IMPERILED POND-BREEDING AMPHIBIANS

**REBECCA P. M. MEANS**, Coastal Plains Institute, [rebecca@coastalplains.org](mailto:rebecca@coastalplains.org), RYAN C. MEANS, Coastal Plains Institute, [ryan@coastalplains.org](mailto:ryan@coastalplains.org)

#### ABSTRACT:

Anthropogenic activities and the changing climate are reducing the hydroperiod of many of Florida's ephemeral wetlands. This alteration has impacted many of the amphibian species that obligately breed in these unique wetland types. These habitat specialists cannot successfully reproduce unless the hydroperiod in the breeding pond is sufficient for metamorphosis to occur. In the Munson Sandhills region of the Apalachicola National Forest, the wetland hydroperiod of many historic striped newt breeding wetlands has been depressed such they can no longer support newt reproduction. As part of our larger Striped Newt Repatriation Project, we installed liners within three wetlands to enhance repatriation sites and ensure sufficient pond hydroperiod for larval metamorphosis. We compared lined wetlands to paired, nearby unlined wetlands to test the effectiveness of these liners in both prolonging hydroperiods and enabling the successful reproduction of striped newts, gopher frogs, ornate chorus frogs, and other amphibian species. Our results showed that liners extended hydroperiods and allowed for increased breeding opportunities for resident amphibians compared to unlined ponds. Additionally, our lined wetlands periodically dried so ephemerality of the wetlands remained intact. While installing liners in ephemeral wetlands on a landscape level is not a practical management tool, our project could provide a template for targeted active management practices in instances where drought and climate change may have severe and lasting negative impacts. Those activities could include relocation, repatriation, or translocation, and efforts to increase population sizes of imperiled amphibian species expected to be negatively impacted by climate change-induced drought.

# TECHNICAL PRESENTATIONS

**3:30 – 3:50 PM – SEARCHING FOR RARE AMPHIBIANS IN NORTHEAST FLORIDA.**

**AUBREY HEUPEL GREENE**, Florida Fish and Wildlife Conservation Commission,  
Aubrey.Greene@MyFWC.com

## **ABSTRACT:**

The carpenter frog (*Lithobates virgatipes*) and many-lined salamander (*Stereochilus marginatus*) are Species of Greatest Conservation Need in Florida, where both reach the southern periphery of their geographic ranges. Both species are only documented from the extreme northeastern counties of the state. Most Florida records of these species are from the 1970's and known documentation had not occurred in over a decade. There was growing concern these species may be extirpated from the state, range contractions that could be associated with a decline in habitat quality caused by a changing climate. The Florida Fish and Wildlife Conservation Commission (FWC) is clarifying the status and distribution of carpenter frogs and many-lined salamanders in Florida by surveying historic localities and other potentially suitable habitats. Additionally, FWC will quantify attributes of occupied habitat for each species. Results will be used to inform management and determine the appropriate conservation status of carpenter frogs and many-lined salamanders in Florida. The carpenter frog (*Lithobates virgatipes*) and many-lined salamander (*Stereochilus marginatus*) are Species of Greatest Conservation Need in Florida, where both reach the southern periphery of their geographic ranges. Both species are only documented from the extreme northeastern counties of the state. Most Florida records of these species are from the 1970's and known documentation had not occurred in over a decade. There was growing concern these species may be extirpated from the state, range contractions that could be associated with a decline in habitat quality caused by a changing climate. The Florida Fish and Wildlife Conservation Commission (FWC) is clarifying the status and distribution of carpenter frogs and many-lined salamanders in Florida by surveying historic localities and other potentially suitable habitats. Additionally, FWC will quantify attributes of occupied habitats for each species. Results will be used to inform management and determine the appropriate conservation status of carpenter frogs and many-lined salamanders in Florida.

# TECHNICAL PRESENTATIONS

## **3:50 - 4:10 PM - FRESHWATER RESTORATION: THE FLORIDA MASTER NATURALIST PROGRAM**

**MADELEINE MAGRINO**, University of Florida/Florida Master Naturalist Program, mmagrino@ufl.edu; **MARTIN MAIN**, University of Florida/Florida Master Naturalist Program, mmain@ufl.edu.

### **ABSTRACT:**

Educating and motivating the public to understand, support, and participate in conservation efforts and education is becoming increasingly important as pressures on our natural resources continue to increase. The Florida Master Naturalist Program (FMNP) is an adult education program that includes multiple courses delivered by a statewide network of professional educators. Courses are taken by both lay and professional audiences and include topics on Florida natural history, habitat and wildlife monitoring, conservation science and interpretation, and a new series on habitat restoration. This presentation will provide a brief overview of the FMNP and the newest FMNP course, Freshwater Restoration. Florida's freshwater environments are facing threats to their hydrology, water quality, habitat, and wildlife. This newly developed Freshwater Restoration course seeks to provide course participants with a basic understanding of the importance of Florida's freshwater systems, what is causing their degradation, and how to combat these threats and restore or enhance degraded wetlands and freshwater habitats. This course provides 24 contact hours that include three presentations that provide an overview and discuss restoration strategies at large and small scales. The course also includes three field trips and incorporates additional time for guest speakers, interpretive discussions, and hands-on activities. The objective of this course is to get citizens involved either directly or indirectly in large and small-scale restoration efforts. By recognizing, addressing, and mitigating the threats to freshwater environments, we hope to promote a stronger respect for Florida's freshwater ecosystems and encourage their protection and restoration. For more information about the FMNP please visit [masternaturalist.ifas.ufl.edu](http://masternaturalist.ifas.ufl.edu) or [www.MasterNaturalist.org](http://www.MasterNaturalist.org).



# TECHNICAL PRESENTATIONS

## **4:10 - 4:30 PM - EVALUATING EXTINCTION RISK OF COASTAL VERTEBRATES DUE TO RISING SEAS, SALTWATER INTRUSION, AND INTENSIFYING HURRICANES: A NEED FOR CONSERVATION STRATEGIES**

**SUSAN C. WALLS**, U.S. Geological Survey, Wetland and Aquatic Research Center, swalls@usgs.gov

### **ABSTRACT:**

Climate change is anticipated to be one of the most significant drivers of ecological and societal change in the coming century. Accelerating sea level rise, saltwater intrusion, hurricanes, and other cyclonic storms increasingly threaten freshwater wetlands, low-lying islands, and other vulnerable coastal habitats. I present two examples of Florida wildlife that occur in such areas and are being impacted by climate change. St. Marks National Wildlife Refuge, located along the northern Gulf of Mexico's coast in the panhandle of Florida, is one of the two remaining strongholds for the federally-threatened frosted flatwoods salamander (*Ambystoma cingulatum*). In 2018, storm surge from Hurricane Michael pushed sea water into some ephemeral freshwater ponds in which this species breeds. Post-hurricane specific conductance was, on average, more than 90 times higher for overwashed wetlands that were measured both before and after the storm. An ongoing capture-mark-recapture study showed that captures of adult flatwoods salamanders immigrating to breeding ponds in Fall following Hurricane Michael decreased by approximately 70%, whereas the following Spring emigration of metamorphosing juveniles away from ponds decreased by approximately 95%. The number of salamander captures since the storm has fluctuated but remains low with no indication of recovery to pre-storm levels of captures. In a second example, the rim rock crowned snake (*Tantilla oolitica*) and the Key ring-necked snake (*Diadophis punctatus acricus*) are two state-listed species of conservation concern that are being evaluated for possible federal listing. These two species occur in pine rockland and tropical hardwood hammock habitat on low-lying islands and coastal mainland areas of South Florida; this habitat is subject to coastal flooding due to sea level rise, storm surge, and flooding during high tide events. We evaluated changes in the extent of rockland habitat under various scenarios of future sea level rise, tidal flooding, and human development. We predicted that saltwater intrusion could negatively affect rocklands by 2050, with complete inundation occurring by 2080. These two herpetofaunal examples highlight a need for the development and implementation of climate adaptation strategies that could help ensure the long-term persistence of these and other species in the face of a changing climate.

# TECHNICAL PRESENTATIONS

## **4:30 – 4:50 PM – EVALUATING THE POTENTIAL TO RESTORE BLACK CREEK CRAYFISH POPULATIONS BY REMOVING A NONINDIGENOUS SPECIES**

**DANIELLE GANAS**, Florida Fish and Wildlife Conservation Commission, [danielle.ganas@myfwc.com](mailto:danielle.ganas@myfwc.com); BLAIR HAYMAN, Florida Fish and Wildlife Conservation Commission, [rebecca.hayman@myfwc.com](mailto:rebecca.hayman@myfwc.com); LINDSEY REISINGER, University of Florida, [lreisinger1@ufl.edu](mailto:lreisinger1@ufl.edu); DAVID COOK, Florida Fish and Wildlife Conservation Commission, [david.cook@myfwc.com](mailto:david.cook@myfwc.com)

### **ABSTRACT:**

The introduction of non-native species can alter community structure and can result in the replacement of native species. Non-native crayfish are a threat globally and competitive advantages combined with life history advantages have resulted in local extinctions of native crayfishes in favor of non-native invaders. In northeast Florida, the state-Threatened Black Creek crayfish (BCC; *Procambarus pictus*) is endemic to the lower St. Johns River basin, and long-term surveys indicate that the species is in rapid decline. The BCC decline is coincident with the introduction and rapid spread of the nonindigenous white-tubercled crayfish (WTC; *Procambarus spiculifer*). Comparing historical survey data with current survey data, there is an indication of large-scale replacement throughout the Black Creek drainage. Sites within the drainage where BCC remain without WTC all occur behind a barrier (e.g., culvert, waterfall, lake system). We used experimental trapping to assess its efficacy at removing WTC from 1 km of stream. Baited minnow traps were placed every 10 m ( $n = 100$ ) and deployed for 36 nights each (3,600 trap nights) from 2021 to 2022. Traps were checked daily while deployed and crayfish species, carapace length, sex, and reproductive form were recorded. All WTC were removed and euthanized. In total, 2,090 WTC were collected and removed. WTC abundance in traps declined over time while BCC made up a greater proportion in traps over time. WTC remain abundant at control sites suggesting intensive trapping could be an effective solution for management of the species, though longer-term trapping data are needed to determine the longevity of this effect. In in situ enclosure experiments, WTC grew faster than BCC. In competition experiments, WTC outcompeted BCC when it had a size advantage, but BCC was a strong competitor in size-matched interactions. These results suggest competition may be a mechanism for this replacement. Fortifying or creating barriers to prevent immigration of WTC into trapped or WTC free areas may support BCC populations.

# TECHNICAL PRESENTATIONS

## **4:50 – 5:10 PM – PERCEPTIONS AND TOLERANCE OF AMERICAN CROCODILES AND THEIR MANAGEMENT BY SOUTH FLORIDA RESIDENTS**

**VINCENT DEEM**, Florida Fish and Wildlife Conservation Commission, [vincent.deem@myfwc.com](mailto:vincent.deem@myfwc.com); DAVID STEEN, Florida Fish and Wildlife Conservation Commission, [david.steen@myfwc.com](mailto:david.steen@myfwc.com); ARNOLD BRUNELL, Florida Fish and Wildlife Conservation Commission (retired); MATT CLEARY, Florida Fish and Wildlife Conservation Commission, [matt.cleary@myfwc.com](mailto:matt.cleary@myfwc.com)

### **ABSTRACT:**

The American crocodile (*Crocodylus acutus*) is a federally and state-protected species classified as threatened, however, its population has increased since gaining legal protection in 1975. Concurrently, the number of reported human-crocodile conflicts has also increased, analogous to known conflicts surrounding other large (typically terrestrial) predators recovering from historic population declines. Although biology and ecology are the foundation of effective wildlife management strategies, human dimensions need to be considered to generate realistic and attainable conservation objectives. To better understand how South Florida residents perceive American crocodiles and their management, we used a “push to the web” survey. We obtained survey data from 28 May 2021 to 20 September 2021 from people living within the range of the American crocodile in Florida. Six management actions were presented under three different human-crocodile interaction scenarios. Potential for Conflict II analysis showed very little variation in opinions between each of the three scenarios. The strongest consensus was found around euthanizing a crocodile (highly unacceptable under all three scenarios) with the management action “Leave the crocodile alone/monitor the situation” showing the least amount of consensus, shifting from slightly acceptable to slightly unacceptable the closer the crocodile was said to be to the respondent’s private property. Regression modeling showed respondents who were older, women, and those with children at home were less likely to tolerate larger crocodile populations.

Respondents who perceived more benefits from crocodiles, less risk from them, were more knowledgeable about them and had higher trust in FWC were more likely to tolerate larger crocodile populations. Mapping revealed several hot and cold spots of tolerance for crocodiles and trust in FWC’s ability to manage them.

# TECHNICAL PRESENTATIONS

## SESSION II-A (St. Johns)

### 3:10 – 3:30 PM – SPECIES CONSERVATION MEASURES AND PERMITTING GUIDELINES FOR IMPERILED BEACH-NESTING BIRDS

**R. BLAIR HAYMAN**, Florida Fish and Wildlife Conservation Commission, rebecca.hayman@myfwc.com; **ADRIENNE FITZWILLIAM**, Florida Fish and Wildlife Conservation Commission, adrienne.fitzwilliam@myfwc.com; **ALEX KROPP**, Florida Fish and Wildlife Conservation Commission, alexander.kropp@myfwc.com; **MICHELLE VANDEVENTER**, Florida Fish and Wildlife Conservation Commission, michelle.vandeventer@myfwc.com, **CRAIG FAULHABER**, former Florida Fish and Wildlife Conservation Commission, craig\_faulhaber@fws.gov

#### **ABSTRACT:**

Two species of seabirds (black skimmer, *Rynchops niger*, and least tern, *Sternula antillarum*) and two species of shorebirds (American oystercatcher, *Haematopus palliatus*, and snowy plover *Charadrius nivosus*) are listed as state Threatened on Florida's Endangered and Threatened Species List. These Imperiled Beach-nesting Birds (IBNBs) nest in "scrapes" (shallow depressions in sand, shell, or similar substrates) along beaches, barrier islands, spoil islands, and oyster rakes. Key threats to IBNBs are losses in nesting, brood-rearing, and roosting habitat. These habitats are part of extremely dynamic systems impacted by factors such as hurricanes and other storms, development, coastal engineering projects, beach management practices, and recreational activities. Additionally, sea level rise and the resulting coastal squeeze will further limit the amount of available habitat and exacerbate these threats in the future. Rule 68A-27.003, Florida Administrative Code (F.A.C.), prohibits the take of these species, further defining take to include "harm" and "harassment." Harm includes an act that kills or injures wildlife and significant habitat modification. Harassment includes intentional or negligent act or omission which creates the likelihood of injury to wildlife by disrupting normal behavioral patterns. The Florida Fish and Wildlife Conservation Commission (FWC) has previously evaluated the need for permits on a case-by-case basis for projects and activities that may take IBNBs. FWC recently adopted Species Conservation Measures and Permitting Guidelines for Imperiled Beach-nesting Birds, which go into effect September 2023. These Guidelines are designed to inform stakeholders about voluntary conservation measures that can benefit IBNBs, clarify how to rule requirements relate to permitting, and provide a biological context for understanding take. The Guidelines also describe new roles, including the IBNB Permitted Monitor.

# TECHNICAL PRESENTATIONS

## **3:30 – 3:50 PM – A PLANNING TOOL FOR PRIORITIZING WATERBIRD COLONY ISLANDS ON THE TEXAS COAST**

**DALE E. GAWLIK**, Harte Research Institute for Gulf of Mexico Studies, Texas A&M University Corpus Christi, dale.gawlik@tamucc.edu; **DAVID A. ESIAN**, Harte Research Institute for Gulf of Mexico Studies, Texas A&M University Corpus Christi, david.essian@tamucc.edu; **DAVID J. NEWSTEAD**, Coastal Bend Bays and Estuaries Program, dnewstead@cbbep.org; **BART M. BALLARD**, Caesar Kleberg Wildlife Research Institute, Texas A&M University Kingsville, Bart.Ballard@tamuk.edu; **ROSTAM MIRZADI**, Harte Research Institute for Gulf of Mexico Studies, Texas A&M University Corpus Christi, rmirzadi@islander.tamucc.edu

### **ABSTRACT:**

Resource managers have begun rehabilitating waterbird colony islands because this important habitat is susceptible to erosion from storms, sea level rise, and ship traffic. Large investments (>\$27 mil) have been, and will continue to be, committed towards colony island projects along the Gulf coast. However, with >200 colony islands on just the Texas coast, agencies do not have enough funds to rehabilitate all of them. Nor do all islands have the same potential to increase regional waterbird populations. A data-driven prioritization tool that incorporates bio-geo-physical constraints on nesting, as well as economic considerations, is needed by managers to prioritize colony islands for rehabilitation. Therefore, in 2022 we initiated the Colony Island Network Design and Implementation project (CINDI), which uses a co-production process to develop a prioritization tool for rehabilitating islands to help conserve colonial waterbird populations on the Texas coast. The results from 2022 are presented here. Interviews with managers identified that the major sources of uncertainty were related to funding and operations, rather than around ecological responses. Survey respondents identified availability of nesting substrate, amount of human disturbance, presence of predators, and amount of foraging habitat as the greatest constraints on breeding abundance. We delineated foraging habitat around colonies based on movements of 10 radio-tagged black skimmers (*Rynchops niger*) and eight caspian terns (*Hydroprogne caspia*). Six of the terns have remained almost entirely within the Texas Laguna Madre system and two are overwintering on the Gulf coast of Mexico. Brood size at fledging (n=223 nests) of the two focal species above and the great egret (*Ardea alba*), reddish egret (*Egretta rufescens*), and tricolored heron (*Egretta tricolor*), calculated from weekly drone surveys varied from 1.5 to 1.9 among species, with less variation among islands. As a first step toward producing the quantitative tool for CINDI, we developed dynamic spatial occupancy models for our focal species from Texas Colonial Waterbird Survey breeding pair counts (1973–2014). Models indicated a >50% decline over the period in the number of islands occupied by black skimmers and tricolored herons, and they identified areas with a high persistence of nesting across years for the black skimmer.

# TECHNICAL PRESENTATIONS

## **3:50 – 4:10 PM – USE OF REMOTE CAMERAS FOR MONITORING WILD FELIDS: LESSONS LEARNED IN THE FIELD OVER 15 YEARS**

**JENNIFER M. KORN**, Johnson Engineering, Inc., [jmk@johnsoneng.com](mailto:jmk@johnsoneng.com)

### **ABSTRACT:**

Remote cameras are used worldwide for a variety of wildlife research and management. They are an extremely effective non-invasive tool that can be used for population estimation, investigating animal behavior, determining presence, and more. The use of remote cameras has evolved from using film cameras with separate triggers, to the modern digital game camera that is compact, affordable, offers photographs and video, and can even include options to send photographs wirelessly. Prior to starting a new study, a researcher must determine their budget, the number of cameras needed to detect the species in question, and total SD cards and batteries required, then choose a brand of camera. Sometimes these decisions can seem daunting without previous knowledge and experience. Additionally, depending on the species, many factors must be considered for deployment: camera settings, site selection and access, placement, and length of time between retrieval. Planning out data storage for the thousands of photographs and videos and organization of the files are also crucial. Fifteen years ago, I monitored endangered ocelots in South Texas using some of the first affordable digital remote cameras, where access was hampered by unfriendly vegetation and elusive study subjects. For 10 years in Florida, I have used camera trapping to monitor endangered Florida panther, where access in the wet season might include swimming, losing a camera to nosy black bears, having a standoff with an alligator, and, of course, hurricanes. Remote camera monitoring is one of the best methods for monitoring the Florida panther population, and Florida Fish and Wildlife Conservation Commission uses them as one tool to aid in population estimation and recovery. Camera surveys are what provided the photographs in 2016 of the first female Florida panther north of the Caloosahatchee River since 1973, and eventually the first litters of kittens. This presentation provides an overview of the lessons learned (and plenty of photographs and videos) from camera trapping elusive and endangered wild felids in two states with some of the least accessible, but also most breathtaking habitats. Hopefully, these insights will provide other researchers with useful tips for their future camera study endeavors.

# TECHNICAL PRESENTATIONS

**4:10 - 4:30 PM - HOW, WHERE, AND WHEN DID THE PANTHER CROSS THE ROAD?**

BEN SHEPHERD, Inwood Consulting Engineers, Inc., [bshepherd@inwoodinc.com](mailto:bshepherd@inwoodinc.com); **JASON HOUCK**, Inwood Consulting Engineers, Inc., [jhouck@inwoodinc.com](mailto:jhouck@inwoodinc.com)

## **ABSTRACT:**

Florida's population grew by more than 14 percent between 2010 and 2020, to nearly 22 million people. By 2040, the University of Florida's Bureau of Economic and Business Research projects that Florida's population may exceed 26.5 million people. As Florida grows, highway capacity improvement projects are necessary to ease congestion and improve public safety. These projects, however, can increase habitat fragmentation and isolation. The Florida Department of Transportation (FDOT) has been at the forefront of the planning, design, and construction of wildlife crossings to improve habitat connectivity and reduce wildlife-vehicle collisions. Additionally, the INVEST in America Act and the Florida Wildlife Corridor Act will inject millions into habitat connectivity and roadways projects that should benefit fish and wildlife. What may have started as a simple bridge or culvert retrofit project can now evolve into a landscape-level ecological restoration project. This presentation will focus on the increased need for habitat connectivity via wildlife crossings in Florida, including some of the most recent FDOT projects that have addressed habitat connectivity and wildlife movement across the state.

# TECHNICAL PRESENTATIONS

## **4:30 – 4:50 PM – LAND ACQUISITION IN A DESIGNATED CRITICAL NATURAL LANDS PROJECT: THE WEKIVA TO OCALA GREENWAY**

**JAY EXUM**, Exum Associates, Inc., Jay.Exum@Exumassoc.com; LARAME FERRY, Florida Fish and Wildlife Conservation Commission, Larame.Ferry@MyFWC.com

### **ABSTRACT:**

The Wekiva to Ocala Greenway was identified by the State as a priority corridor project for acquisition in 1995. The Greenway would connect state-owned land associated with Wekiwa Springs State Park and Seminole State Forest to the Ocala National Forest. The Greenway totals over 82,000 acres, almost 60,000 of which have been protected by fee simple acquisition or the purchase of conservation easements. More than 22,000 acres in the Greenway remain to be acquired, and there are significant challenges to the acquisition of these tracts that are essential to sustaining the ecological linkage. The uniquely designed Wekiva Parkway includes more than 7,000 feet of wildlife underpasses including a span that encompasses the 100-year floodplain of the Wekiva River. If substantial portions of the Greenway are not acquired or protected by a conservation easement, the investment in underpasses at strategic locations along this roadway will be compromised. Even though classification as a Critical Natural Lands project establishes the need for acquiring lands in the Greenway, the process of identifying willing landowners, assessing properties, and closing on lands in the Greenway can be lengthy and often prove difficult for landowners. Multiple state agencies, including the Florida Fish and Wildlife Conservation Commission, are involved with the acquisition of Critical Natural Lands projects like the Wekiva to Ocala Greenway, but communicating with dozens of landowners to determine their interest in selling their properties or their development rights can be difficult for a limited number of state acquisition staff and many priority state acquisition projects (129). Involvement by local conservation groups such as the Friends of the Wekiva River supplements the work of state agencies and improves the likelihood of success. Collaboration with environmental advocates, land trusts, local governments, and state agencies provides the best opportunity for identifying and acquiring key parcels. Recent closings on contracts for the purchase of land in the Greenway provide some optimism, but protecting all of the remaining 22,000 acres is still a daunting challenge.



# TECHNICAL PRESENTATIONS

## 4:50 – 5:10 PM – WORKING WITH A DETECTION DOG: LESSONS FROM THE FIELD

**LISA M. SMITH**, Florida Fish and Wildlife Conservation Commission, Lisa.Smith@myfwc.com; KENDYL HASSLER, Florida Fish and Wildlife Conservation Commission, Kendyl.Hassler@myfwc.com; ANDREA SYLVIA, Florida Fish and Wildlife Conservation Commission, Gainesville, Andrea.Sylvia@myfwc.com

### ABSTRACT:

Detection dogs have been used extensively in wildlife to directly, and indirectly, detect a variety of mammals, birds, reptiles, and even insects. Detection dogs are advantageous for locating cryptic species that have large home ranges and occur in low densities and have been proven to be more effective in detecting rare mammals than camera traps or hair snares. Additionally, the collection of scat can have multiple advantages when coupled with laboratory analysis, including the ability to identify species, individuals, density, habitat use, diet, and hormone levels. Each scat produces a scent cone, where the strongest concentration of vapor molecules exists closer to the target and disperses out in lower concentrations until the scent is undetectable. The probability of detection, and thus the detection distance, can be affected by weather and potential habitat conditions. Despite extensive survey efforts, both the Everglades mink (*Neovison vison evergladensis*) and long-tailed weasel (*Mustela frenata*) have proven difficult to reliably detect using traditional survey methods and, therefore, we acquired a detection dog. To determine how far away scat could be reliably detected during surveys (effective sweep width) and to evaluate the impact of weather and habitat on detection, we conducted controlled field trials where the dog searched for mink scat along transects in four different vegetation classes (open, dense understory, dense overstory, and trail). We used the program jagsUI in program R, using Bayesian Markov chain Monte Carlo methods to evaluate the impact of corresponding covariates. We determined our detection dog had an effective sweep width of 50 m, surprisingly with no significant impact of weather or vegetation covariates. Additionally, when deciding to use a detection dog or planning a study, we recommend several considerations related to the biology of the intended species and the environment to be surveyed to determine the practicality and increase the probability of success.

# POSTER SESSION

## POSTER TITLES:

Testing simulated social cues as a management tool for the Everglade snail kite (*Rostrhamus sociabilis plumbeus*). M. A. Beatty and R. J. Fletcher, Jr

Assessing benefits of corridor creation for Anastasia Island beach mice at Fort Matanzas National Monument. J. Eells, T. Doonan, M. Gillikin, and K. Foote

Anoles as a model organism in the field of disease ecology. B. Gonzalez

Habitat use and diet of spotted skunks in a coastal environment. K. N. Hassler and L. M. Smith

Implications of phospholipase A2 characterization in the eastern coral snake (*Micrurus fulvius*). V. Remley

Ecological niche modeling of *Asimina tetramera*, *Paronychia chartacea*, and *Prunus geniculata*. C. Sproha, M. E. Mabry, D. E. Soltis, and P. S. Soltis

Social responses to habitat manipulation in a new water management area. M. Vilchez, T. S. Coleman, B. C. Thompson, and A. K. Carlson

Examining the deregulation, drought, and increasing fire impact on Amazonian biodiversity. A. Walford

Diet analysis of non-native Cuban knight anoles (*Anolis equestris*) across thermal gradients in Florida. A. F. Willer, M. E. A. Harman, C. M. Romagosa

# POSTER ABSTRACTS

## **TESTING SIMULATED SOCIAL CUES AS A MANAGEMENT TOOL FOR THE EVERGLADE SNAIL KITE (*ROSTRHAMUS SOCIABILIS PLUMBEUS*).**

**MEGHAN A. BEATTY**, Department of Wildlife Ecology and Conservation, University of Florida, meghan.beatty@ufl.edu; **ROBERT J. FLETCHER, JR.** Department of Wildlife Ecology and Conservation, University of Florida, robert.fletcher@ufl.edu

### **ABSTRACT:**

Avian habitat management and restoration often rests on the assumption that if you build it, birds will come. However, avian habitat selection requires that birds use information when searching for habitat as well as for settlement decisions. For unoccupied high-quality habitat, simulating social cues can be a useful management tool to attract birds. There is strong evidence for avian conspecific attraction, where acoustic (e.g., playbacks) or visual (e.g., decoys) cues are often successful at increasing settlement. The Everglade snail kite (*Rostrhamus sociabilis plumbeus*) is a federally endangered wetland raptor endemic to Florida in the United States. A management tool that could attract snail kites to restored wetlands could greatly benefit the recovery of this endangered species. Yet, it is unknown how snail kites use social information and whether simulated social cues could be a successful management strategy to influence settlement. We propose to experimentally test if snail kites can be attracted to breed in unoccupied sites using simulated social cues. Experimental treatments will be deployed in unoccupied sites across the snail kite's range in high-quality habitat. Decoys and playback equipment will be deployed for one month starting in the first week of July when most of the breeding for the year has concluded (post-breeding treatment) and again in the first week of February, before most breeding has begun (pre-breeding treatment). All treatments will include adult calls and decoys to simulate conspecific density and fledgling calls to simulate conspecific reproductive success. To determine if breeding has occurred at any of the treated sites, surveys will be conducted at least once a month in the breeding season following the pre-breeding treatment. In each survey the site will be fully searched for snail kites and nests. A site will be considered successfully 'settled' if at least one nest is initiated. Great effort is put into maintaining and restoring wetlands to expand snail kite breeding habitat. Yet, snail kites will not always find or use all the habitat available. This project could directly benefit conservation and management by testing a new management tool for attracting snail kites to restored wetlands.

# POSTER ABSTRACTS

## **ASSESSING BENEFITS OF CORRIDOR CREATION FOR ANASTASIA ISLAND BEACH MICE AT FORT MATANZAS NATIONAL MONUMENT**

**JENNIFER EELLS**, Florida Fish and Wildlife Conservation Commission, Jennifer.Eells@myfwc.com; Terry Doonan, Florida Fish and Wildlife Conservation Commission, Terry.Doonan@myfwc.com; Mike Gillikin, United States Fish and Wildlife Service, Mike\_Gillikin@fws.org; Kurt Foote, United States Park System, Kurt\_Foote@nps.gov

### **ABSTRACT:**

Fort Matanzas National Monument (FMNM) supports one of two populations of the Anastasia Island beach mouse (AIBM; *P. p. phasma*), a federally listed endangered species, which occurs only in beach dune habitats. The principal threat to these mice is loss and fragmentation of the dune habitat. At FMNM, dune erosion from increased severe weather is a major concern and appears to be increasing with effects from climate change. Dunes along the northern beach on the eastern coast of FMNM have rapidly eroded, leaving only an area of thick coastal scrub and coastal strand, where AIBM persist only in small openings and their movement is restricted. As a pilot project, we established a corridor through an area of coastal scrub habitat within the dune system to reduce the density of vegetation and connect existing openings. The expectation was that an increase in bare ground would promote movement by beach mice through the otherwise densely vegetated scrub-strand area. To monitor beach mouse use, we deployed both track tubes and camera traps before and after the establishment of the corridor. Vegetation measurements and an isolation index were recorded within a 1-meter radius of each tube. A beach mouse presence index (BMPI) was also calculated. Cameras deployed before creation of the corridor did not detect beach mice. Immediately after vegetation thinning was complete, we began detecting beach mice regularly within the constructed corridor. Statistical analysis in R (Kruskall – Wallis one way analysis of variance and the Wilcoxon rank sum test) showed that only the variable % isolation ( $X^2 = 8.05$ ,  $p = 0.02$ ,  $df = 2$ ) significantly affected BMPI. These results indicate the importance of corridors for maintaining connectivity and promoting movement of beach mice through poor quality habitat. As sea level rise continues and habitat is lost, constructed corridors may become more important for connecting and maintaining isolated populations.

# POSTER ABSTRACTS

## **ANOLES AS A MODEL OF ORGANISM IN THE FIELD OF DISEASE ECOLOGY**

**BELLA GONZALEZ**, University of Florida, bellagonzalez@ufl.edu

### **ABSTRACT:**

For over 50 years, anoles have served as windows to a wide range of biological, ecological, and evolutionary processes. Lizards in the genus *Anolis* are often used as model organisms as a result of their relative abundance and diversity. *Anolis* as a genus comprises nearly 400 currently described species and, as a result of such diversity, has occupied an expansive array of habitats and niches. Further, many *Anolis* species are highly abundant, readily observable, and easily handled in field settings. This makes them excellent subjects for field-based studies of both observational and experimental natures. In laboratory settings, *Anolis* lizards are often favored as a result of their robustness and adaptability. They are easily housed and maintained and readily display natural behaviors even when kept in captivity. *Anolis carolinensis* was the first reptile to have its complete genome sequenced in 2011 and anoles of a variety of species have been used as model systems in studies relating to behavior, reproduction, neurology, physiology, endocrinology, and more. For the reasons outlined previously, *Anolis* lizards have extraordinary potential for use as model organisms in the field of disease ecology. The extensive knowledge base surrounding anoles that have been accumulated over the past five decades enables an increased understanding of the effect that a given disease may have on an *Anolis* representative. A number of fungal, viral, bacterial, and parasitic pathogens are associated with *Anolis*. Additionally, the distribution and adaptive radiation of *Anolis* lizards allow for significant insight into the effects of organismal habitat, diet, and lifestyle on the acquisition, progression, and spread of disease.

# POSTER ABSTRACTS

## HABITAT USE AND DIET OF SPOTTED SKUNKS IN A COASTAL ENVIRONMENT

**KENDYL N. HASSLER**, Florida Fish and Wildlife Conservation Commission, Kendyl.Hassler@myfwc.com; LISA M. SMITH, Florida Fish, and Wildlife Conservation Commission, Lisa.Smith@myfwc.com

### ABSTRACT:

Eastern spotted skunks (*Spilogale putorius*) have been declining since the early 1940s, resulting in extirpation from broad areas of their historical range and classification as vulnerable by the IUCN. There are 2 spotted skunk subspecies in Florida: *S. p. putorius* (Appalachian Spotted Skunk), occurring in northern Florida and throughout much of the southeastern U.S., and *S. p. ambarvalis* (Florida Spotted Skunk), occurring from north central Florida through peninsular Florida. Florida spotted skunks, particularly those on barrier islands, are reported to occur at higher densities than other eastern spotted skunks. However, outside of Florida, spotted skunks are seemingly absent from the Atlantic coastal region. Spotted skunks in coastal Florida have been documented in coastal strand, scrub, and even open beaches, but no formal habitat analysis has been conducted. Similarly, their diet has not been studied and it is unknown if a specialized diet may contribute to the higher density of spotted skunks observed in these areas. To better understand the current distribution, habitat use, and diet of coastal spotted skunks, we began a study involving the use of enclosed camera traps to detect spotted skunks for occupancy analysis and the use of a detection dog to locate scat for diet analysis. We will compare the occupancy of spotted skunks in 4 habitat groups (coastal strand, scrub, open canopy forest, and closed canopy forest) on publicly managed lands in coastal Flagler, Volusia, Brevard, Indian River, and St. Lucie counties. We will also evaluate the effects of proximity to development and urban areas, patch size, and location (mainland or barrier island). Preliminary results show spotted skunks are detected most frequently in scrub habitat (71%), though occupation across sites is low overall (17%; n=41). When present, spotted skunks were quickly detected after setting cameras (mean=1.6 days [SE=0.8]) and exhibited peaks of activity around sunset and shortly after midnight. Additional camera surveys and detection dog surveys will be performed through May 2023. By improving our understanding of how environmental and dietary factors may be influencing the density of spotted skunks in coastal areas, biologists can better manage for the conservation of eastern spotted skunks.

# POSTER ABSTRACTS

## IMPLICATIONS OF PHOSPHOLIPASE A2 CHARACTERIZATION IN THE EASTERN CORAL SNAKE (MICRURUS FULVIUS)

VICTOR REMLEY, University of Florida, remleys@ufl.edu

### ABSTRACT:

The eastern coral snake (*Micrurus fulvius*) is one of six venomous snakes native to Florida and commonly occurs in the Southeastern United States. It represents the only species of the family Elapidae native to the state. Elapid venoms tend to induce more neurotoxic effects as compared to those of more hemotoxic viperid venoms. Historically, the enzyme constituents of viperid venoms have been more thoroughly characterized than those of elapids relative to the abundance of each family. Old World elapids (i.e., cobras, mambas, etc.) are also more studied than their New World counterparts. Within the last ten years, more research on the analysis of coral snake toxins has been published. However, difficulties with both availability of specimens due to the snakes' specialized diets and the yield of venom extraction due to their body size have necessitated that researchers refine methods to capture, rear, and extract venom from coral snakes extensively in order to better understand their venom. As proteomics technology has advanced, techniques such as transcript analysis have also become applicable and *M. fulvius*'s toxins have been better characterized. Literature focuses on phospholipases A2 (PLA2) present in the species' venom due to their role as the main toxin with a wide range of effects, and many focus on the enzyme PLA2 -17, which induces intravascular hemolysis in mice and dogs. PLA2 -17 represents the fascinating implications of toxinology in that its hemolytic effect is unique to *M. fulvius*. The mechanisms of this phospholipase are of medical significance, and this makes a case for further research on understudied venoms of New World elapids along with groups like Colubridae.

# POSTER ABSTRACTS

## **ECOLOGICAL NICHE MODELING OF ASIMINA TETRAMERA, PARONYCHIA CHARTACEA, AND PRUNUS GENICULATA.**

**CHARISSE SPROHA**, University of Florida, charissesproha@ufl.edu ; MACKENZIE E.MABRY, Florida Museum of Natural History, enziemabry@floridamuseum.ufl.edu; PAMELA SOLTIS, Florida Museum of Natural History, psoltis@flmnh@ufl.edu; DOUGLAS SOLTIS, Florida Museum of Natural History, dsoltis@ufl.edu

### **ABSTRACT:**

The sand scrub habitat is a unique habitat in Florida, with biodiversity that includes many species of endemic plants and wildlife. These areas are quickly contracting and disappearing due to residential and agricultural development. The Florida scrub habitat is listed as Critical Habitat for a variety of Endangered species, and this habitat is quickly being lost, with 34% lost to development and only 34% of the total habitat protected. The unique plant community of Florida scrub is vital to the ecosystem, and many of the species are listed as endangered, specifically the four-petal pawpaw (*Asimina tetramera*), the papery witlow-wort (*Paronychia chartacea*), and the scrub plum (*Prunus geniculata*). This study aims to develop ecological niche models for each of these three endangered plant species. Additionally, models will be projected to future climate models to explore if species ranges expand, contract, or remain the same. We used global databases to download occurrence points for the species and environmental variables. The models can then be used to make predictions about the vulnerability of the Florida scrub resulting from climate change.



# POSTER ABSTRACTS

## **SOCIAL RESPONSES TO HABITAT MANIPULATION IN A NEW WATER MANAGEMENT AREA.**

**MARIAGUADALUPE VILCHEZ**, School of Forest, Fisheries, and Geomatics Sciences and Department of Wildlife Ecology and Conservation, University of Florida, [mvilchez@ufl.edu](mailto:mvilchez@ufl.edu); TYLER STEVEN COLEMAN, Florida Cooperative Fish and Wildlife Research Unit, Department of Wildlife Ecology and Conservation, University of Florida; [tscoleman3@gmail.com](mailto:tscoleman3@gmail.com); BRANDON C. THOMPSON, Florida Fish and Wildlife Conservation Commission, [brandon.thompson@myfwc.com](mailto:brandon.thompson@myfwc.com); ANDREW K. CARLSON, U.S. Geological Survey, Florida Cooperative Fish and Wildlife Research Unit, School of Forest, Fisheries, and Geomatics Sciences and Department of Wildlife Ecology and Conservation, University of Florida, [andrew.carlson@ufl.edu](mailto:andrew.carlson@ufl.edu)

### **ABSTRACT:**

The upper basin of Florida's longest river—the St. Johns—was leveed and drained for agriculture beginning in the early 1900s, resulting in removal of 62% of the basin's floodplains by the 1970s. Direct negative impacts on the Indian River Lagoon, St. Johns wildlife, and public water supply ensued, causing the Saint Johns River Water Management District (SJRWMD) and partner agencies to implement rehabilitation efforts focused on reestablishing floodplain connectivity. One primary river-floodplain rehabilitation strategy is the creation of water management areas (WMAs). Fellsmere WMA (FWMA) is a key component of the St. Johns River rehabilitation project. Before constructing FWMA, agencies sought to diversify and enhance habitat that had been simplified by monotypic vegetation and flat topography resulting from agriculture. Between 2011 and 2014, the SJRWMD and Florida Fish and Wildlife Conservation Commission (FWC) invested \$1.356 million to modify >800 ha, which created a mosaic of habitats. As WMAs are flooded following construction, newly inundated terrestrial habitats are known to cause trophic upsurge. Trophic upsurge in FWMA, combined with land modifications and the presence of stocked and naturally produced fishes, created optimum conditions for a popular largemouth bass (*Micropterus salmoides*) fishery. The FWMA opened to motorboat angling in August 2020 and has since been named "Jurassic Lake" due to its renowned largemouth bass abundance and size structure. Therefore, we are currently collecting information on angler attitudes and behaviors with FWC. For instance, we are using angler diaries in a volunteer angler data (VAD) program to examine largemouth bass catch, effort, size structure, condition, and bait preferences, and to compare these variables in treatment and control sections of FWMA. By evaluating if and how habitat modification has impacted the fishery, we will derive insights for fisheries management, emphasizing VAD programs and the benefits they offer compared to traditional fisheries data collection methods.

# POSTER ABSTRACTS

## **EXAMINING THE DEREGULATION, DROUGHT, AND INCREASING FIRE IMPACT ON AMAZONIAN BIODIVERSITY**

**ASHLEY WALFORD**, University of Florida, walford.ashley@ufl.edu

### **ABSTRACT:**

Earth's remaining 40% of tropical systems are supported by the Amazon Basin, creating a significant impact on climate change regulation. Amazonia biodiversity contains 10% of all species, playing a vital role in the earth's climate regimes. The species richness of the Basin strengthens ecosystem durability, with an estimated 1,000 tree species in every single square kilometer area. Extreme genetic variability among tree species shapes the secondary recovery of forests and has created stability against the ever-changing climate in the Amazon. Forest cover has continued to suffer since the 1960s due to fires and deforestation. If this degradation continues, forest and species diversity will rapidly decline, and the Amazon could transition to a savannah ecosystem. These impacts were defined over the past 20 years by researchers using remote sensing estimates and comprehensive estimates of fire and deforestation. Three thousand seventy-nine vertebrate species and 11,514 plant species were used in determining the quantification. While deforestation contributes to massive habitat loss, fires magnify this issue and result in an even larger bearing on Basin biodiversity. The extent of species ranges was estimated in parts of the Amazonia Forest that were directly impacted by fires within the last 20 years. Previous research suggests close interactions between drought conditions, forest policy changes, and areas impacted by fires. Forest policies were established in Brazil in the mid-2000s and coincided with decreased burning rates, but unfortunately, these restrictions began to loosen in 2019, countering this movement. Thus, it is important to highlight the appropriate association of policy change and enforcement within conservation, which determines ecological success in the Amazon Basin.

# POSTER ABSTRACTS

## DIET ANALYSIS OF NON-NATIVE CUBAN KNIGHT ANOLES (*ANOLIS EQUESTRIS*) ACROSS THERMAL GRADIENTS IN FLORIDA

**ABIGAIL F. WILLER**, University of Florida, abigail.willer@ufl.edu; MADISON E. HARMAN, University of Florida, madison.harman@ufl.edu; CHRISTINA M. ROMAGOSA, cmromagosa@ufl.edu

### ABSTRACT:

Cuban knight anoles (*Anolis equestris*) were first introduced to South Florida in the 1950s and have since spread throughout much of the state, though little is known about their impact on the ecosystem. They are omnivorous, diurnal, arboreal lizards. In their native range, Cuban knight anoles are known to prey upon small vertebrates such as nesting birds, making them a potential threat to Florida fauna. I aim to analyze differences in the diet of 90 Cuban knight anoles across three thermal gradients in south and central Florida to assess risk in different ecosystems. Anoles will be necropsied to collect parasites, gastrointestinal contents, and body condition data. Diet contents will be washed, sorted, and identified morphologically to the lowest possible taxonomic level. Preliminary results show the consumption of various insects, fruits, and small lizards in Key Largo. We anticipate that the diet will differ across the three temperature gradients in Florida due to differences in prey availability, with southernmost individuals contrasting greatly with the northernmost individuals. The southernmost individuals may have more vertebrates due to an increase in invasive reptiles in the area compared to the northernmost individuals. This study will provide management agencies with data to assess risk to native species.



# FIELD TRIP

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DATE: March 24, 2023

TIME: 8:15 am (leave hotel, drive/carpool to destination) - 12pm (fieldtrip finishes)

## **Jacksonville Zoo and Gardens ([www.jacksonvillezoo.org](http://www.jacksonvillezoo.org)) – Behind The Scenes Tour**

Maximum capacity: 20 people

**Meeting Location: Zoo is 30 minutes North of the hotel. [Address: 370 Zoo Parkway, Jacksonville, FL 32218.] Tour will be 9am (zoo opens) - 12pm. Jacksonville Zoo and Gardens closes at 5pm.**

**Cost: \$40 per person (cost includes Behind The Scenes Tour and Day Access to the Zoo)**

**Description:** Since 1987, Jacksonville Zoo and Gardens [Jacksonville Zoo and Gardens, JZG] has been an accredited AZA member. JZG is the only walking safari in Northeast Florida and features a natural wood stork rookery. This is one of the few institutions with a dedicated Animal Wellness team who are dedicated to ensuring the animals are given the opportunity to thrive. With their award-winning exhibits, Land of the Tiger and African Forest, as well as their extensive conservation work, JZG is a world-class institution.

Their Manatee Critical Care Center is one of seven who rescue and rehabilitate Florida's manatees [Manatee Rescue and Rehabilitation]. JZG has a Marine Mammal Response Team made up of Zoo staff who assists Florida Fish and Wildlife Conservation Commission with the rescue and transport of injured marine mammals to nearby rehabilitation centers, including the Manatee Critical Care Center at the Zoo. Once animals have recovered, they are released back into the wild.

In 1999, a new wood stork rookery formed on Zoo grounds and it soon began to show signs of annual growth. This was brought to the attention of the U.S. Fish and Wildlife Service (USFWS) and resulted in the Jacksonville Zoo and Gardens' Wood Stork Conservation Project and Partnership with the USFWS in 2003 when careful monitoring began. Banding of nestlings began in 2003, the following year JZG began satellite tagging and banding adult wood storks. The program plans to use banded storks to monitor nest attendance by sex and to determine the site fidelity of the species. Since the rookery's inception, JZG staff has provided veterinary care for any injured birds. Over the last eleven years the JZG rookery has been one of the most productive in the Southeastern U.S, and volunteers have logged hundreds of hours monitoring its success [Wood Storks | Jacksonville Zoo and Gardens].

In addition, JZG has teamed up with other zoos around the southeast to breed and release striped newts back into their native habitat.

The Jacksonville Zoo and Gardens is open from 9am to 5pm every day. The Behind The Scenes Tour includes access to the Zoo and Gardens for the rest of the day!

FLTWS Contact Person: Monica Folk

Jacksonville Zoo Contact Person: Donna Bear



# FIELD TRIP

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## **Birding Excursion at Little Talbot Island State Park (Little Talbot Island State Park | Florida State Parks) and Big Talbot Island State Park (Big Talbot Island State Park | Florida State Parks)**

Maximum Capacity: 12-15 people

**Meeting Location: 45 minutes from the hotel. Leave Hotel at 8am. Meeting location will be determined by the trip leader March 23rd. Check with Registration for the meeting location.**

**Cost: FREE**

**Description:** Enjoy the morning viewing shorebirds and wading birds at one of the Great Florida Birding Trail's premier birding sites at Big Talbot Island State Park, Little Talbot Island State Park, and Huguenot Park. The area offers a wide diversity of bird species at different times of year in multiple habitat types. You may see black skimmers, ospreys, piping plovers, terns (including the threatened least tern) and brown pelicans on the beach. In the marshes you might find the threatened wood stork, egrets, herons, ibis and osprey. Venturing inland you might find barred owls, painted buntings (other times of year), doves and pileated woodpeckers. American bald eagles are often seen soaring along the shoreline and perched in the pines at Spoonbill Pond during the winter months.

FLDEP State Park staff will be on hand to give you an overview of the area and the birds you may see, as well as assist with bird identifications. Site visitation order will be determined based on local tides and conditions the morning of the field trip by the trip leader and also be determined by time spent at each site.

Site A: Spoonbill Pond (Big Talbot Island, near bridge to Amelia Island): Enjoy quiet study of the colorful wading birds and foraging shorebirds from a covered birding pavilion along the elevated boardwalk at Spoonbill Pond. This salty seep pond at the north end of the island is tidally inundated and provides ample marine life for the birds to enjoy. [Access: Parking at Sawpit Creek Boat Ramp across street from the end of the Spoonbill Pond Boardwalk at 15500 Buccaneer Trail, Jacksonville, FL 32226]

Site B: Little Talbot Island (south side): From migrating red knots and piping plovers to great horned owls, Talbot does not disappoint. In late spring you may catch rare glimpses of nesting shorebirds and their young, such as least terns, Wilson's plovers and black skimmers.

Site C: Near Huguenot Park (south side of Little Talbot Island, near bridge): A portion of Huguenot Park is designated as a critical wildlife area for nesting terns and shorebirds. It is roped off to protect these nesters in season. [Access location will be the Fort George River Parking Lot just north of the A1A Heckscher Drive Bridge over the Fort George River. There is a footpath that goes under the bridge to view Huguenot Memorial Park.] [Huguenot Memorial Park itself is NOT FREE. The actual address of Huguenot Park is 10980 Heckscher Dr, Jacksonville, FL 32226, COJ.net - Huguenot Memorial Park, south of the bridge. Park Fees are \$5 per vehicle (up to 6 people) and \$1 extra for each additional person.]

**PERSONAL EQUIPMENT TO BRING:** water/snacks, binoculars, shorebird and wading bird identification manuals, optional: spotting scope, zoom lens camera

FLTWS Contact: Jodi Slater  
Field Trip Leader: Gian Basili, USFWS



# FIELD TRIP

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## **Habitat Management for Brackish Ecosystems and Impoundments at Guana River Wildlife Management Area**

Maximum Capacity: 12-15 people (6 cars)

**Meeting Location: Leave hotel at 8am. Meet up at 8:45 at the Dam at the main entrance [Address: Guana River Dam, 505 Guana River Rd, Ponte Vedra Beach, FL 32082]**

**Cost: FREE**

**Description:** After almost a hundred years of anthropogenic alterations, the area was purchased in 1984 by the state through its Conservation and Recreation Lands (CARL) program, and Guana Tolomato Matanzas National Estuarine Research Reserve and Guana River Wildlife Management Area were established.

The diversity of natural habitats within a small area is one of Guana River's most striking features. For example, from the observation tower along Capo Road, you can see salt marsh, maritime hammocks, and pine flatwoods. Scrub is also present. These communities are highly influenced by coastal maritime conditions and are similar to the Sea Island Coastal Region of southern Georgia.

Biologists at Guana River WMA are actively involved in a number of management and restoration activities. Water levels on Lake Ponte Vedra and the interior impoundments are controlled to produce a mosaic of desirable, natural plant communities of benefit to wildlife. Scrub is being restored through roller chopping and the use of prescribed fire. Pine flatwoods are being managed through thinning and prescribed fire on a 3- to 5-year rotation. Maritime forest hammocks and salt marshes are not fire dependent and are thus managed passively.

In addition to the management work described here, biologists with the Florida Fish and Wildlife Conservation Commission rely on a wide range of techniques to ensure that natural areas throughout the state stay healthy for wildlife and are inviting to visitors. Guana River Wildlife Management Area ([myfwc.com](http://myfwc.com)) Recreational Guide pdf Guana River WMA Trail System ([myfwc.com](http://myfwc.com)) Trail maps Guana River - Planning Your Visit | FWC ([myfwc.com](http://myfwc.com))

Turkey Hunting is open on Guana River WMA at the time of the field trip, so some upland areas will be restricted to group access.

PERSONAL EQUIPMENT TO BRING: boots & appropriate outdoor clothes, water/snacks, and binoculars are optional but advantageous

FLTWS Contact: Jodi Slater

Field Trip Leader: Wade Brenner, FWC Biologist and Land Manager, Guana River WMA

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