Restoring Balance: Integrating Invasive Species and Native Wildlife Conservation

Florida Chapter of The Wildlife Society

2024 Spring Professional Development Conference

April 24-26, 2024

FLORIDA CHAPTER

Executive Board and Committee Chairs

Florida Chapter of The Wildlife Society Executive Board 2023-2025

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Florida Chapter of The Wildlife Society Committee Chairs

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Awards Review: Larame Ferry

Certification and Continuing Education: Vacant

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Program: Tyler Pittman

Scholarship: Monica Folk

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2024 Spring Conference Committee

Program: Paul Moler, Maria Zondervan, Tyler Pittman

Field Trips: Lisa Smith

Technical Papers: Paul Moler

Poster Session: Eric Tillman, Paul Moler

Certification and Continuing Education: Vacant

Audio/Visual/Music: Maryann Krisovitch

Registration: Tyler Mostellar

Website: Eric Tillman

Social Media: Jennifer Korn

Fundraising/Sponsors: Larry Perrin, Mark Ausley

Volunteers/Student Coordination: Monica Folk

Agenda Summary

Wednesday, April 24

11:00am	Registration (Rosen Foyer – 1st floor)
1:00pm	Symposium. *Success Stories from Invasive Species Management* (Rosen Ballroom)
3:30pm	Break
4:00pm	FLTWS Chapter Business Meeting (all encouraged to attend—Prizes!!) (Rosen Ballroom)
5:30pm	Networking Social / Raffle (Grandville Ballroom – 2nd floor)
5:30pm	Student Scavenger Hunt (Grandville Ballroom)

Thursday, April 25

	Breakfast on your own
8:30am	Plenary Session: The Science of Invasion – Dr. Matthew Thomas, University of Florida, Invasion Science Institute, Director (Rosen Ballroom)
9:30am	Break
10:00am	Concurrent Technical Sessions (Track A Rosen Ballroom, Track B Cypress Room – 2nd floor) *Field Trip introduction
12:00pm	Lunch on your own
1:30pm	Technical Sessions (Track A Rosen Ballroom, Track B Cypress Room)
2:30pm	Break
3:00pm	Concurrent Professional Development Workshops (Track A Rosen Ballroom, Track B Cypress Room)
5:30pm	Poster Session Social and Silent Auction (Grandville Ballroom)
7:00pm	Banquet and Awards Ceremony (The Westin Rooftop = 3rd floor)

Friday, April 26

	Breakfast on your own
8:00am	Control and Management of Invasive Plants in Florida (FDACS CEUs 3 Natural Areas, 1 Core) (Cypress Room)
8:00am	Field Trip Departs for Babcock-Webb Wildlife Management Area
Noon	Adjourn

Success Stories from Invasive Species Management

1:00pm Welcome Address: Tyler Pittman, *President-Elect of the Florida Chapter of The Wildlife Society*

1:10-1:40 Sarah Funck – Florida Fish and Wildlife Conservation Commission, Wildlife Impact Management Section Leader

Sarah Funck earned a bachelor's degree in biology from Millersville University and a master's degree in environmental science from Florida Gulf Coast University. She has a diverse work history with a focus in herpetology. Sarah currently serves as the Wildlife Impact Management Section Leader for Florida Fish and Wildlife Conservation Commission. In this role, she leads a team of biologists and administrative staff that strive to prevent and minimize human-wildlife conflict issues through technical assistance, stakeholder engagement, nonnative species management, permitting, policy development, rule promulgation, and various education and outreach strategies. Outside of work, she loves hiking, kayaking, traveling, painting, and sewing.

1:40-2:10 Aimee Cooper – Chair, Florida Invasive Species Council, St. Lucie County Environmental Resources Department

Aimee Cooper completed her BA in 2005 in Life Science with a concentration in Biology at Otterbein College in Westerville, OH. She was employed with the University of Florida between 2005-2016, first with the Center for Aquatic and Invasive Plants providing research assistance for numerous invasive plant species throughout Florida, then becoming the coordinator for the IFAS Assessment of Non-Native Plants in Florida's Natural Areas (IFAS Assessment), and lastly with Florida Medical Entomology Laboratory (FMEL) examining the efficacy biocontrol organisms for mosquito populations and investigating how non-native bromeliads provide an ideal breeding habitat for mosquitoes. Currently, Aimee is the Environmental Regulations Manager for St. Lucie County's Environmental Resources Department. She assists in protecting the County's valuable natural resources, sensitive habitats, and wildlife via objectives and policies established in St. Lucie County's Comprehensive Plan, as well as implements the County's environmental regulations from the Land Development Code, pertaining to vegetation removal, tree mitigation, dune vegetation trimming, invasive plant removal, wetlands and buffers, coastal zones & riverine shorelines, listed species protection, and landscaping.

Symposium Presentations (Wednesday PM)

2:10-2:40 **TBD**

2:40-3:30 **Q & A/Panel Discussion**

4:00 **FLTWS Chapter Business Meeting**

5:30 **Networking Social**

Plenary Session (Thursday AM)

8:30-9:30am Thursday -- Dr. Matthew Thomas, Professor, Department of Entomology & Nematology Director, Invasion Science Research Institute University of Florida

Matthew is from the UK and obtained his degrees from the University of Cardiff and the University of Southampton. He has held tenured positions at Imperial College London, CSIRO in Australia, the Centre for Infectious Disease Dynamics and Department of Entomology at Penn State University in the US, and most recently served as the Director of the York Environmental Sustainability Institute at the University of York in the UK. In late 2022 he returned to the US to take up the exciting new challenge of helping develop the Invasion Science Research Institute at the University of Florida.

He has experience researching a wide range of projects and problems on the ecology and control of insects and diseases. The work has encompassed a range of techniques and approaches from detailed studies in the laboratory through to large-scale field experiments in both temperate and tropical settings. He has published extensively (Google Scholar) but also has a strong focus on implementation and the development of practical solutions.

He is an elected Fellow of the American Association for the Advancement of Science, the Entomological Society of America, and the American Society of Tropical Medicine and Hygiene.

CEUs

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

1. CEUs are now self-reported to TWS for certification renewal.
2. Record the actual time spent attending sessions and a field trip in your Personal Activity Record (at the end of the conference, round the overall number to the nearest half).
3. Sessions missed, field trip not attended, etc. may not be recorded as Contact Hours.

Wednesday, April 24		CEU's Available
1:00pm	Symposium	2.5
4:00pm	Business Meeting	1

Thursday, April 25		
8:30am	Plenary Session	1
10:00am	Technical Sessions (Technical Papers)	2
1:30pm	Technical Sessions (Technical Papers)	1
3:00pm	Concurrent Professional Development Workshops	2

The conference has a maximum of 9.5 Category I Contact Hours available

Friday, April 26		
8:00am	Field trip – Babcock-Webb Wildlife Management Area	*1.5
8:00am	Invasive Plant Management Workshop	*4
Noon	Adjourn	

The conference has a maximum of 13.5 Category I Contact Hours available if a fieldtrip is attended.

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

Schedule – Technical Sessions (Thursday)

Session I-A: 10:00-11:40 – *(Rosen Ballroom)*

10:00-10:20 Confirmed range expansion signals potential establishment of *Enterococcus lacertideformis*, a novel bacterial pathogen, through *Anolis sagrei* infections in Florida. S. Shukla, A. Basham, J. S. Doody, A. Mulla, and R. J. Ossiboff (STUDENT)

10:20-10:40 Fang Fest: Understanding and addressing the human dimensions of snake coexistence through an outreach festival in north-central Florida. C. R. Fernandez, S. A. Johnson, N. Morales, L. Ng, C. Coulombe, and L. Haskins (STUDENT)

10:40-11:00 An introduction to the Leftovers Initiative. D. J. E. Sturgeon and P. Evans

11:00-11:20 Current applications and future potential of citizen science data. B. M. Mason and C. T. Callaghan

11:20-11:40 Florida panther conservation on private lands: incentive programs for landowners. Z. M. Wardle, C. E. Rizkalla, M. M. Jenkins, and A. T. Grossman.

Session I-B: 10:00-11:40 – *(Cypress Room)*

10:00-10:20 Rapid growth of black bear population in the eastern panhandle of Florida. D. Doran-Myers, B. K. Scheick, P. Schueller, J. W. McCown, and A. Mullaney

10:20-10:40 Failure of a novel method to monitor black bear cub survival by gluing transmitters to hair. B. K. Scheick, S. S. Shiver, A. J. Mullaney, and P. Schueller

10:40-11:00 Occurrence and habitat use of spotted skunks in a coastal environment. K. Hassler, L. Smith, A. Sylvia, and E. Braun de Torrez

11:00-11:20 Unraveling the impacts of Burmese python invasion on Florida's biodiversity: Insights into prey naivete and ecological functioning. R. K. McKee and R. A. McCleery (STUDENT)

11:20-11:40 Ecology of Nile monitor lizards in Southwest Florida: Preliminary findings. A. M. Mulla and J. S. Doody (STUDENT)

Schedule – Technical Sessions (Thursday)

Session II-A: 1:30-2:30– *(Rosen Ballroom)*

1:30-1:50 Culverts provide alternative roosting habitat for cave bats in North Florida. L. M. Smith, A. Sylvia, T. J. Doonan, and J. A. Gore

1:50-2:10 Wading bird response to date within the Kissimmee River Restoration Project. R. A. Botta

2:10-2:30 Avian biodiversity on Florida rangelands: Using AI to determine the impact of cattle management strategies. Z. B. Holmes and E. H. Ellington (STUDENT)

Session II-B: 1:30-2:30– *(Cypress Room)*

1:30-1:50 The effects of sertraline on the antipredatory behavior in grass shrimp (*Palaemonetes paludosus*). D. Downes, C. Potts, L. Trevillian (STUDENT)

1:50-2:10 Applying multidimensional environmental resistance of native species for invasion risk assessment under climate change. Y. Liu and M. B. Thomas

2:10-2:30 Initiating a commercial harvest program to remove tilapia from St. Johns River lakes. A. Baggs, S. J. Miller, A. Bernhardt, R. Fink

Poster Session

Thursday 5:30-7:00pm – *Grandville Ballroom*

Implications of novel urban edge communities in urban ecology and horticulture. F. Amory, K. Gintoli, K. Headlee, K. Johnsen, and M. Preuss

Polk County wildlife-vehicle crashes. M. B. Bardales Cruz and C. Knothe.

Age class distribution and ecosystem services provided by longleaf pine (*Pinus palustris*) in urban mesic flatwoods. A. Costa, K. Barker, and C. Cardenas.

Survey of lichen diversity and abundance in a Florida scrub in relation to various temporal stages of burn recovery. C. M. Brandt and M. M. Holst

Impacts of vegetation complexity on juvenile *Lepomis* foraging success in native and invasive plant environments. D. Durfee, D. R. Carey, and P. J. Daniell

Assessment and surveillance of Argentine black and white tegu abundance in Charlotte County, FL. A. S. Furst, V. Young, C. M. Romagosa, S. A. Johnson, M. B. Main, E. H. Ellington

Effects of microplastics on the growth and interspecific competition of native *Phyla nodiflora* and invasive *Richardia grandiflora*. N. Henderson and A. Danucalov

Ecological dynamics of tick-host interactions and tick-borne disease risks in urban coyote habitats. M. Imeri and H. Ellington

Addressing rodents in sugarcane production through extension programming. C. L. Kammerer, E. H. Ellington, and M. T. VanWeelden

Do you smell that? - A preliminary analysis of relationships between floral morphological and volatile traits within *Helianthus*. C. McComb, M. Preuss, and P. Seth.

Enhancing biodiversity monitoring: camera trapping along UCF's northeast wildlife corridor. Y. E. Reeve, A. Wazny, E. Geiger, E. Jose, S. Macool, R. Chabot.

Poster Session

Potential boat interactions between recreational boating and snail kite nesting. F. C. Roy, L. Elmquist, and R. J. Fletcher, Jr

A survey of vertebrate commensal species richness at gopher tortoise (*Gopherus polyphemus*) burrows with GIS seasonal hotspot analysis. S. N. Schaefer and A. K. Hastings.

The impacts of megaherbivores on the savanna ecosystem in southern Africa. C. Sproha, C. Greene, L. Davis

Concurrent Professional Development Workshops
Thursday 3:00pm – 5:00pm

Survey123 Applications for Invasive Species Management – Brittany Bankovich, Florida Fish and Wildlife Conservation Commission - (Cypress Room)

About the workshop:

In this workshop, Brittany will guide participants through basic web based Survey123 application development and introduce more advanced Survey123 application development through ArcGIS Survey123 Connect. She will also walk participants through real-life examples using Survey123 to solicit expert opinions on invasive Burmese pythons in Florida and demonstrate how PATRIC (Python Action Team Removing Invasive Constrictors) contractors use Survey123 in the field.

About the presenter:

Working as a spatial analyst for the Florida Fish and Wildlife Conservation Commission, Brittany models distribution patterns of fish and wildlife, and helps to identify lands and waters that are conservation priorities. Given the recent boom in leveraging mobile data collection applications to conduct field-based surveys, Brittany has worked to develop applications in ESRI Field Maps and Survey123, saving time and money for the agency, as well as reducing data-entry errors. Brittany earned her BS in Biology from The University of Akron and MS from The University of Florida in Wildlife Ecology and Conservation.

The ins and outs of iNaturalist as a tool for quantifying biodiversity and engaging the public – Corey T Callaghan and Brittany Mason, University of Florida Global Ecology Research Group – Rosen Ballroom

About the workshop:

Our workshop, titled "The ins and outs of iNaturalist as a tool for quantifying biodiversity and engaging the public" will equip participants with the knowledge, skills, and practical experience required to be effective leaders in leveraging the popular citizen science platform iNaturalist. Data collected through this platform is used for research on a wide variety of topics including species range and distribution, non-native species introduction, and animal biology and behavior that can lead to species conservation and non-native species management. Additionally, iNaturalist can be used as a powerful engagement tool to get the public involved in collecting biodiversity data while also learning more about their local ecosystem. Through this training, participants will

become empowered to explore iNaturalist data and to engage with and educate the public using the iNaturalist app. We expect that participants will learn how to navigate and effectively use the iNaturalist platform to collect and document biodiversity data; acquire hands-on experience in capturing and managing data using the iNaturalist app; and be capable of creating and managing iNaturalist projects, tailored to specific conservation initiatives. This workshop is geared towards beginner users of the iNaturalist platform, but no prior experience is required.

About the presenters:

The workshop will be given by Corey T. Callaghan and Brittany Mason from the University of Florida Global Ecology Research Group. Corey is an Assistant Professor in the Department of Wildlife Ecology and Conservation, and Brittany is the Data Management Analyst in the research group. Their research and extension program focuses on using biodiversity data generated by citizen science (e.g., eBird and iNaturalist) to answer applied and theoretical questions in the biodiversity sciences. For example, their research ranges from quantifying biodiversity in space and time to understanding how citizen science data are being used in environmental impact statements to quantifying iNaturalist user behavior to understand data quality and how to best engage users at different stages of their citizen science journey. Both Corey and Brittany are avid iNaturalist users and in their free time can be found documenting and observing Florida's plants and animals. They are passionate about sharing the platform with the public via direct interaction or through teaching organizations how to lead their own engagement program using citizen science platforms.
Working as a spatial analyst for the Florida Fish and Wildlife Conservation Commission, Brittany models distribution patterns of fish and wildlife, and helps to identify lands and waters that are conservation priorities. Given the recent boom in leveraging mobile data collection applications to conduct field-based surveys, Brittany has worked to develop applications in ESRI Field Maps and Survey123, saving time and money for the agency, as well as reducing data-entry errors. Brittany earned her BS in Biology from The University of Akron and MS from The University of Florida in Wildlife Ecology and Conservation.

Friday Professional Development Workshop (8am - noon)

Control and Management of Invasive Plants in Florida – Cypress Room

Workshop Details:

The workshop will consist of presentations related to the identification of Florida invasive plants, chemical controls of those plants, application methods for herbicides, and general herbicide safety practices and regulations. Specific topics will include (50 minutes) application methods for herbicides in natural resources management programs including, cut-stump, basal, bark, and spraying methodology. We will focus on proper chemical selection, mixing procedures, equipment calibrations, and safety procedures. We will also have presentations on old world climbing fern (50 minutes), a challenging invasive for wildlife managers, its control, and implications for wildlife. Additionally, we will have presentation on common invasive plants, the UF/IFAS invasive plant management guides and plant specific control methods and efficacies (50 minutes). Finally, we will have a general pesticide/herbicide safety and best practices lecture that will cover PPE, safety procedures, documentation, record keeping, and regulations related to the use of chemical for invasive control in natural areas and on public lands.

Tyler Pittman is an Agriculture and Natural Resources Extension Agent with the University of Florida Institute of Food and Agriculture Science. Tyler earned his Bachelor and Master of Science in wildlife biology from Clemson University and his Doctorate degree in Biology from the University of Arkansas-Fayetteville. Before working for UF/IFAS, Tyler served for 4 years as the state upland gamebird research biologist for the Florida Fish and Wildlife Research Institute. In his current role, Tyler is working with commercial agriculture producers and homeowners to ensure responsible land use decisions. Tyler has been a member of the Wildlife Society since 2008, serving as the president of two university student chapters. He has been a member of the Florida Chapter of the Wildlife Society since 2016 and served on the state executive board since 2018 as a Member-at-Large and currently as Secretary. He also earned his Certified Wildlife Biologist credential in 2017. Tyler is married and has a 2-year-old son whom he lives with on their farm just outside of Newberry, FL.

CEUs for this workshop: 3 Natural Areas & 1 Core

Babcock-Webb Wildlife Management Area

Field Trip will Depart at 8:00am for Babcock-Webb Wildlife Management Area

History of Babcock-Webb Wildlife Management Area:

The powerful Calusa Indians once thrived in villages and towns along coastlines of the sea, rivers and lakes–areas that much later became Charlotte County. The Seminoles immortalized these mostly-maritime natives by naming the major river in the area Caloosahatchee or “river of the Calusa.” Development of Charlotte County began in earnest in 1881 with a four-million-acre purchase of “swamp and overflowed lands” in South Florida. By 1883, Col. Isaac Trabue of Kentucky, bought enough land for a town he called Trabue, now known as Punta Gorda. It briefly became the pineapple capital of the U.S. because of his influence in cultivating the fruit to raise prize money for an annual town chess tournament. The more typical industries of cattle ranching, timbering and phosphate mining soon took over. In 1914, Edward Babcock bought two townships to the east for a hunting preserve and his “Crescent B” cattle ranch. During the 1930s, Babcock leased the timber rights, allowing railroad grades to be built through the flatwoods. Timber was shipped as far away as Africa, to be used in the diamond mines. Remnants of a water tower used to fill steam engines in 1930 still remain along the Seaboard Grade.

In 1941, the Florida Game and Fresh Water Fish Commission purchased 19,200 acres from Fred Babcock. The WMA was originally named for Cecil M. Webb, who served as commissioner from 1948-53. The area was renamed Fred C. Babcock/Cecil M. Webb Wildlife Management Area in 1995.

In 1957, field trial grounds were set up in conjunction with organizations that donated materials and supplies for a clubhouse, stables, kennels and picnic area. Since 1969, the grounds have been open for limited quail hunting. In 1968, the Commission leased 1,280 acres of the field trial grounds to the Boy Scouts for a camp and facilities. In the 1990s, the Charlotte Harbor Flatwoods and the Yucca Pens Unit were added to the management area. The name Yucca is a derivative of “euchre” (pronounced “you-ker”). Herds of cattle were lost or gained during euchre, a gambling card game played at the cow pens where cattle were sold before shipment to Cuba. A northern reporter wrote a story about the trick-taking game but misspelled it as “yucca” and this variant stuck.

With over 80,700 acres, this WMA is among the last undeveloped expanses of hydric (wet) pine flatwoods in Southwest Florida, although it is surrounded by residential development, citrus groves and improved pasture.

Wildlife At Babcock-Webb:

A birding hot spot in southwest Florida, Babcock/Webb is home to numerous resident and migratory, birds including the peregrine falcon, bald eagle, wood stork, wild turkey, Bachman’s sparrow, burrowing owl and brown-headed nuthatch. A variety of warblers are common during the winter. This area is a stronghold of the eastern bluebird and

many other birds whose habitat has been lost to development. Babcock/Webb's open stands of slash pine flatwoods are home to colonies of the federally listed endangered red-cockaded woodpecker. Their cavity trees are marked with a white-painted ring. Other highlights of this property include American and least bitterns, king rail, sedge wren and many more.

The southern fox squirrel, a state listed species of special concern, has been observed on this area. Northern bobwhite quail, eastern cottontail rabbits, gray squirrels, raccoons, white-tailed deer and nonnative wild hogs are common inhabitants of the flatwoods. Wading birds regularly forage in wet prairies and marshes.

The canal along the Seaboard Grade is a good place to look for wood storks and wading birds of various types, as well as alligators. Sandhill cranes are frequently found in the field west of the shooting range.

IMPLICATIONS OF NOVEL URBAN EDGE COMMUNITIES IN URBAN ECOLOGY AND HORTICULTURE (POSTER)

Faith Amory, UCF, faithamory@ucf.edu; Kaekanna Gintoli – kaekanna.gintoli@ucf.edu; Kassidy Headlee, UCF, ka784050@ucf.edu; Katherine Johnsen, UCF, katherine.johnsen@ucf.edu; Marie Preuss, UCF, ma975618@ucf.edu

As the development of human infrastructure around the world continues to accelerate, awareness of the negative environmental impacts associated with anthropogenic stressors has increased. As this awareness increases so too does the effort to restore natural areas to their historic ecological organizations and functions, often by means of removing exotic species which have carved a niche for themselves. Vegetation assemblages established in urban-influenced areas are frequently found to contain a greater proportion of non-native plant species than less anthropogenically influenced natural spaces. These novel assemblages, containing both native and non-native plant species, have frequently been determined to increase the structural complexity of the ecosystem while still providing essential ecosystem services. This study aims to characterize the vegetation assemblages observed in urban-adjacent forest edges and interior, less anthropogenically influenced forest plots to identify co-occurrences of native and exotic flora across various habitat types. For this study, we will be creating a buffer zone along the wildland-urban edge and establishing a zone of less impacted, more highly-managed natural area with the same land use code. Randomized plot points within these zones will be assessed and analyzed using bipartite analysis and adjacency matrices to illustrate co-occurrences of plants, (native-exotic, native-native, exotic-exotic) while we also record the species abundance, plot percent coverage, and individual plant health. This will give clarifying insight on compatible native and non-native plant assemblages when considering creating assemblages for Florida urban landscaping purposes. It is predicted that the novel vegetation communities formed in urban-adjacent forest edges will display a higher co-occurrence rate between natives and non-natives, supporting greater vegetation diversity, compared to interior plots which will likely display a higher co-occurrence rate between native species. The adaptability of the assemblages in these urban-influenced environments may be of particular interest to land managers and horticulturists working to incorporate native and exotic species together in an urban space.

INITIATING A COMMERCIAL HARVEST PROGRAM TO REMOVE TILAPIA FROM ST. JOHNS RIVER LAKES

ANABELLE BAGGS, St. Johns River Water Management District, abaggs@sjrwmd.com; STEVEN J. MILLER, St. Johns River Water Management District, sjmiller@sjrwmd.com; ARTHUR BERNHARDT, Florida Fish and Wildlife Conservation Commission, arthur.burnhardt@myfwc.com; RANDY FINK, St. Johns River Water Management District, rfink@sjrwmd.com

Over the past few years Tilapia (*Oreochromis spp.*) have proliferated in lakes within the St. Johns River watershed; however, quantitative data on actual abundance are lacking. In 2022-23 the St. Johns River Water Management District began exploring the use of haul seines to commercially harvest Tilapia as a nutrient removal and water quality improvement strategy. Haul seines were conducted on Lake Winder in 2022 and

on Lakes Florence and Poinsett in 2023. In total, 9 haul seines captured and removed 68,795 lbs. of Tilapia from the three lakes. This equated to an estimated direct phosphorous removal of 567 lbs. Tilapia were the dominant species captured and generally comprised > 60% of the total biomass of all fish collected and game fish were relatively rare. The average standing stock of Tilapia in the areas seined was 187 lbs. per acre. Results suggest that haul seining may provide a cost-effective method for removing nutrients from other shallow St. Johns River lakes with minimal impact to sport fish populations. In 2024, we are expanding the program to harvest Tilapia from several other lakes in the Upper St. Johns River Basin.

POLK COUNTY WILDLIFE-VEHICLE CRASHES (POSTER)

MICHELLE A. BARDALES CRUZ, Circle B Bar Reserve, Michelle.Bardales@ucf.edu; CANDICE KNOTHE, Circle B Bar Reserve, CandiceKnothe@polk-county.net

Wildlife-vehicle crashes (WVCs) are an increasing safety concern for both wildlife and humans as the buffer between nature and human development narrows. Road construction and resulting habitat fragmentation continue to expand across Florida. This expansion is particularly seen in Polk County, one of the fastest growing counties in not only the state, but also the entire country. We explore and map the WVCs occurring in Polk County from the years 2012 to 2017, as well as 2019. Information about WVCs in Polk County were obtained from police reports and used to determine the coordinates of the locations of the WVCs. The wildlife affected and the locations and times of the WVCs were summarized and analyzed. Polk WVC coordinates along with Florida panther and black bear road mortality sites were mapped in ArcMap 10.7.1. WVC hotspots were computed and mapped. Results showed that most, nearly 30%, of the WVCs in Polk County involved deer. Hogs and cows were each involved in approximately 17% of the WVCs. Hotspots were mostly located in south central parts of the county. Most WVCs occurred on major roads and between dusk and dawn during the months of October to December. The higher number of WVCs during these times may be due to low visibility during the night and less daylight hours during the fall and winter months. Thus, increasing nighttime visibility on roads and adding signage or wildlife corridors in WVC hotspot areas and major roads may be a solution to help prevent WVCs in the future.

WADING BIRD RESPONSE TO DATE WITHIN THE KISSIMMEE RIVER RESTORATION PROJECT

RICHARD A. BOTTA, South Florida Water Management District, rbotta@sfwmd.gov

The primary goal of the Kissimmee River Restoration Project (KRRP) is to restore ecological integrity to the river-floodplain system by backfilling the C-38 flood control canal, which channelized the meandering river system and drained its floodplain, along with modifying the water regulation schedule that controls flow to the river and floodplain. While quantitative pre-channelization data on birds are sparse, available data and anecdotal accounts suggest that the system supported an abundant and diverse avian population prior to channelization. Restoration of the Kissimmee River and floodplain is expected to reproduce the necessary conditions to support such an assemblage once again. Wading birds exhibit a high degree of mobility, and they are

likely to respond rapidly to restoration of appropriate habitat. Prior to the KRRP, dry season abundance of long-legged wading birds in the Phase I restoration area averaged (± SE) 3.6 ± 0.9 birds/km^2 in 1997 and 14.3 ± 3.4 birds/km^2 in 1998. Since completion of Phase I, annual dry season abundance has ranged from 11.0 ± 1.9 birds/km^2 to 102.3 ± 31.7 birds /km2 (mean for 2002–2023 = 39.0 ± 3.0 birds/km^2). The long-term annual three-year running mean (2002–2023) is 41.4 ± 3.2 birds/km^2, significantly greater than the restoration expectation of 30.6 birds/km^2 (t-test, $p < 0.002$). However, since surveys began in 2002, only 4 of these years have had at least 85% of dry season surveys with over 30.6 birds/km^2, so only one of the components of the expectation is being met. Hydropatterns and hydroperiods are expected to improve now that reconstruction of the physical characteristics of the Kissimmee River and floodplain is complete, and continued improvements in the hydrologic characteristics of inflows will take place under the Headwaters Revitalization Schedule (HRS), which is currently projected for full implementation in 2026. These changes are expected to develop extensive areas of quality wetland habitat, promoting higher aquatic prey production and enhanced foraging conditions. Several past years with high wading bird use on the Kissimmee River floodplain have demonstrated such a response, and full implementation of HRS should expand on this trend. Less productive years are likely due to inadequate floodplain inundation in the wet season to sustain a suitable prey base, and/or premature drying of the floodplain in dry season, which reduces available foraging habitat. Both of those conditions are expected to improve under HRS.

SURVEY OF LICHEN DIVERSITY AND ABUNDANCE IN A FLORIDA SCRUB IN RELATION TO VARIOUS TEMPORAL STAGES OF BURN RECOVERY (POSTER)

CASSIDY M. BRANDT, Florida Southern College, cassidymbrandt@gmail.com;
MEGHAN M. HOLST, Florida Southern College, mmholst@yahoo.com

With the increased usage of prescribed burns in recent years, it is critical to understand their impacts not only on their primary target species, but also on the entire biological community. Lichens are among species that have intricate symbioses with other organisms and provide ecosystem services, so gaining knowledge of how fire affects them is particularly important. Some ground-dwelling species of lichen may be extirpated from prairie and grassland environments as a consequence of the application of fire, but less is known about the temporal stages of burn recovery within Florida scrublands. This dry, sandy ecosystem houses Florida's only federally endangered lichen, the Florida perforate lichen (*Cladonia perforata*). Prescribed burns are now a routine management practice in the Florida scrublands, as scrubland communities are adapted to the presence of fire. Surveying the lichens of the Florida scrub is important because of its role in early plant succession following fire. We surveyed the effects of fire regime on terrestrial lichen abundance and diversity in the Lakeland Highlands Scrub, an area of palm scrub habitat in Central Florida. We calculated percent cover of lichens and the Lichen Diversity Value (LDV) in four areas of scrub and scrubby flatwoods habitat with different burn histories (unburned; and two years, eight years, and ten years since last burn). According to the LDV calculations, there appears to be higher diversity in the most extreme temporal groups. This finding contradicted our initial prediction that the highest lichen diversity and abundance would be in the intermediately disturbed areas (two and eight years since last burn). Our study yields beneficial

information to assist future decisions made regarding fire regimes and their frequency of implementation within the Florida scrublands habitat. These preliminary data suggest waiting a longer period between implementing prescribed burns in this scrub habitat would allow lichen communities a greater opportunity to recover.

AGE CLASS DISTRIBUTION AND ECOSYSTEM SERVICES PROVIDED BY LONGLEAF PINES (*PINUS PALUSTRIS*) IN URBAN MESIC FLATWOODS (POSTER)

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Mesic flatwoods are dominated by the largest of the southern United States' pine species, the longleaf pine (*Pinus palustris*). In addition to being an optimal habitat for several threatened and endangered bird species found in mesic pine flatwoods, these trees serve as a vital carbon sink. In recent years, longleaf pine ecosystems have diminished in size due to habitat degradation and fragmentation. Ecosystem services provided by remaining longleaf pines in urban forests hold an even greater significance when located in areas of dense human population where anthropogenic stressors pose a greater risk to global climate change. This survey seeks to determine the age class distribution and ecosystem services, including carbon sequestration, and pollution mitigation, and avian habitat suitability of *P. palustris* in an area of mesic pine flatwoods within the University of Central Florida's Arboretum. With the use of ArcGIS Pro software, six 0.48-acre survey plots were randomly distributed within a 16-acre restoration parcel. Metrics such as height, DBH, width, light exposure, and general health were taken from all trees within these survey plots. Each tree was tagged physically and virtually with ArcGIS Survey123 Connect mobile application. Additionally, an increment borer was used to core each surveyed longleaf pine with a DBH greater than 18 inches for dendrochronological analysis. Total percent cover per shrub species was also measured for each plot. Ecosystem services analysis was performed with the use of iTree Eco's unstratified sample plot urban forest model

BLACK BEAR POPULATION GROWTH IN THE EASTERN PANHANDLE OF FLORIDA

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The Florida black bear (*Ursus americanus floridanus*) was listed by the State of Florida as Threatened 1974 – 2012, and there were approximately 4,000 bears in the state by 2015. The hunting season is currently closed. This study assessed the growth rate of a subpopulation of bears in the eastern panhandle using data collected from 2016 to 2019.

Our results indicate a rapid annual population growth rate of +12.6%, driven by high adult female and moderately high cub survival. If these vital rates are accurate for the subpopulation, we project it could grow from 910 females in 2015 to 3,094 in 2025, including all ages. These results highlight the ability of black bear populations to rebound when provided with suitable environmental conditions and legal protections. The implications of the rebound in Florida black bears are significant for wildlife conservation and human-wildlife coexistence in the eastern panhandle of Florida and management strategies may need to be tailored to the bear management unit in which this subpopulation resides. This study contributes valuable insights into regional Florida black bear demographics and into the mechanisms by which black bear populations can recover.

THE EFFECTS OF SERTRALINE ON THE ANTIPREDATORY BEHAVIOR IN GRASS SHRIMP (*PALAEMONETES PALUDOSUS*) (STUDENT)

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Rapid urbanization, population growth, and widespread psychiatric advancements have led to elevated use and disposal of pharmaceuticals such as selective serotonin reuptake inhibitors (SSRIs). The active compounds from these pharmaceuticals pose a threat to the ecological balance of wetland habitats. The chemicals seep into our waterways by human consumption and excretion, directly interacting with aquatic biota. Sertraline is a commonly prescribed SSRI used to treat depression and PTSD in humans. We aimed to analyze potential harm inflicted on the trophic structure of valuable freshwater environments, specifically through negative impacts on an indicator species. We examined the effects of sertraline on the behavior responses of grass shrimp (*Palaemonetes paludosus*) to dragonfly (*Anisoptera*) predator cues. We hypothesized that shrimp would exhibit bolder behavior in high sertraline concentrations. Over the course of 27 days, shrimp were exposed to one of three different sertraline concentrations (0 ug/L, 0.1 ug/L, and 1.0 ug/L). Every 9 days, we conducted behavioral trials and scored potential antipredator responses, including the latency to enter burrows and time spent at the perimeter of the tank. Shrimp were more likely to enter burrows during control trials than during predator cue trials. Additionally, shrimp in low sertraline concentrations spent more mean time in burrows (mean=7.5% of sampling points) than shrimp in high sertraline concentrations (mean=4% of sampling points). Our research provides a more in-depth look on how SSRIs are affecting the behavioral ecology of grass shrimp. Because grass shrimp are an ecologically important species whose presence, health, and abundance are critical for regulating meiofaunal communities and recycling nutrients, any change to their populations would likely have broader implications within those communities.

IMPACTS OF VEGETATION COMPLEXITY ON JUVENILE *LEPOMIS* FORAGING SUCCESS IN NATIVE AND INVASIVE PLANT ENVIRONMENTS (POSTER)

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Sunfish (*Lepomis spp.*) are common game fish found in lakes, streams, and marshes with muddy bottoms throughout the United States. Juvenile warmouth (*Lepomis gulosus*) and bluegill (*L. macrochirus*) hunt for small invertebrates near vegetation-rich areas and forage during daylight hours. The impacts of vegetation on their foraging behavior, however, remains understudied. An understanding of their foraging behavior would provide insight into the broader dynamics of freshwater communities, including predator-prey relationships, resource competition, and ecosystem stability. We assessed the effects of vegetation complexity on juvenile *Lepomis* foraging success and predicted that foraging would be most successful in native vegetation. Fish (n = 18) were housed in pairs in tanks with either uniform vegetation (native eelgrass [*Zostera sp.*] and knotgrass [*Polygonum aviculare*] or invasive hydrilla [*Hydrilla verticillata*] and water hyacinth [*Eichhornia crassipes*]) or complex vegetation (native and invasive). All fish first underwent a one-week acclimation period to the vegetation. Then, we observed the fish during feeding trials (1 trial/day, 5 consecutive days) immediately after four live bloodworms (*Glycera*) were added into their tanks. We scored latency to capture, total handling time, and total foraging time for each fish and used instantaneous sampling to record how much time the fish spent swimming in the vegetation and open water. Juvenile *Lepomis* had greater foraging success in the uniform invasive vegetation and complex vegetation than in the uniform native vegetation. Our results showed that fish exposed to the invasive plants had a shorter latency to feed compared to fish foraging in the native vegetation. These results highlight the differential effects of native and invasive plant environments on *Lepomis* foraging success, with implications for ecosystem resilience and management strategies. This study advances our knowledge of how trophic interactions and ecosystem functions may be affected by changes in vegetation complexity from the encroachment of invasive species, which informs conservation and restoration initiatives meant to maintain freshwater biodiversity and ecosystem stability.

FANG FEST: UNDERSTANDING AND ADDRESSING THE HUMAN DIMENSIONS OF SNAKE COEXISTENCE THROUGH AN OUTREACH FESTIVAL IN NORTH-CENTRAL FLORIDA (STUDENT)

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Fang Fest's conception was born from the desire to build a festival in north-central Florida that paralleled the economic and community drivers of rattlesnake roundups, but with conservation and coexistence at its core. After conducting a literature review to determine the festival's target audience and educational foci, we found little existing literature documenting perceptions and drivers of snake persecution within the United States. Of the literature found, most studies were concentrated in the northeast and southwestern regions of the country–with one published study from the southeast, but

not from Florida. The review also revealed that perceptions and behaviors towards snakes can vary greatly by regional and cultural context–a finding that emphasized the importance of understanding Florida's human dimensions of snakes. Once this gap was identified, the purpose of Fang Fest pivoted–it would not only be an educational event, but a research opportunity. Before designing a survey, we conducted a needs assessment to inform and direct the questions that would comprise it. Fifteen semi-structured interviews were conducted with key stakeholders of snake conservation and conflict in Florida. The interviews revealed seven areas of educational need: snake biology, ecology and human value, identification of species and behavior, common misconceptions, conflict mitigation, safety, and conservation concerns. A mixed-method survey assessing attitudes of and experiences with snakes was developed and will be administered upon entry to the event via clipboard contacts and QR codes. The event will be hosted at an agritourism farm, congruent to their annual blueberry festival, which attracts thousands of participants daily. This reduces the survey bias that would occur if participants were only coming to Fang Fest itself, intercepting individuals who may not otherwise engage in a snake-related event. In addition to the survey, several activities have been developed to address the identified areas of educational need, and will be implemented–and evaluated–at the event. Though Fang Fest began as a simple outreach event, it has morphed into an interdisciplinary, interorganizational undertaking–now officially designated as a UF/IFAS Extension event. With UF/IFAS Extension's adoption, this novel event can be improved annually to meet Florida's snake conservation and coexistence objectives.

ASSESSMENT AND SURVEILLANCE OF ARGENTINE BLACK AND WHITE TEGU ABUNDANCE IN CHARLOTTE COUNTY, FL, USA (POSTER)

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Invasive species represent a significant threat to global biodiversity and cause substantial economic burden to the United States. The spread of invasive species is often regarded as the second greatest threat to global biodiversity behind habitat destruction, as invasive species can change ecosystem function, alter habitat structure, and can outcompete native species for resources. The Argentine black and white tegu (*Salvator merianae*) are large-bodied, actively foraging lizards that were introduced to Florida via the pet trade. There are at least four breeding populations of tegus in Florida. Tegus are generalist omnivores and consume numerous animal groups and their eggs, including some of Florida's keystone species, such as the American alligator (*Alligator mississippiensis*) and the gopher tortoise (*Gopherus polyphemus*). Successful tegu management plans require accurate estimates of abundance and spatial extent. With accurate estimates of density and spread in an area, management agencies can

deploy effective and efficient control efforts for tegus and monitor effectiveness of these efforts. We sought to estimate the population abundance and spatial extent of the breeding population of tegus in Charlotte County. We used a combination of live traps in the core introduction area and camera traps in the assumed peripheral area. We are developing population estimates using removal model framework with tegu trap data collected from 2018 to 2024. Key components of precise population estimates using this method are equal and consistent trap effort and trap susceptibility. We are estimating spatial extent of the tegu population from our network of camera traps. Beyond generating estimates of tegu abundance and spatial extent, our efforts have also revealed the challenges of deploying effective invasive species management in predominantly privately owned land. But we have also demonstrated a potential blueprint for management agencies to conduct invasive species removal efforts while also collecting data in a robust manner.

OCCURRENCE AND HABITAT USE OF SPOTTED SKUNKS IN A COASTAL ENVIRONMENT

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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. To better understand the current distribution and habitat use of coastal spotted skunks, we set out 89 enclosed camera traps across 4 habitat groups (coastal strand, scrub, open canopy forest, and closed canopy forest) on publicly managed lands in coastal Nassau, Duval, St. Johns, Flagler, Volusia, Brevard, Indian River, and St. Lucie counties. We also evaluated the effects of proximity to urban areas, road density, patch size, and property size. Preliminary results show spotted skunks are detected most frequently in scrub and coastal strand habitats, though occupation across sites was low overall (22%). When present, spotted skunks were quickly detected after setting cameras (mean=2.7 days [SE=0.6]) and exhibited nocturnal activity. By gaining a better understanding of the occurrence and habitat associations of spotted skunks in coastal areas, we can more effectively inform management actions aimed at conserving this species.

EFFECTS OF MICROPLASTICS ON THE GROWTH AND INTERSPECIFIC COMPETITION OF NATIVE *PHYLA NODIFLORA* AND INVASIVE *RICHARDIA GRANDIFLORA* (POSTER)

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Much of Florida's terrestrial ecosystems have been overtaken by invasive species that are outcompeting native flora and negatively altering the naturally occurring biological communities. Microplastics are a major pollutant that poses another challenge to terrestrial ecosystems by impeding plant growth and altering soil properties. We do not yet understand how these pollutants interfere in the competition between invasive and native plants. We simulated interspecific competition between the invasive largeflower Mexican clover (*Richardia grandiflora*) and native turkey tangle frogfruit (*Phyla nodiflora*) in the presence of microplastic pellets to determine the effects of these pollutants on growth in the presence and absence of competitors. We grew *R. grandiflora* and *P. nodiflora* together both in and out of interspecific competition within three different treatments: control, low (5 mL microplastics), and high (25 mL microplastics). We hypothesized that *R. grandiflora* would have higher rates of growth and would outcompete *P. nodiflora* when in competition and when exposed to a higher concentration of microplastics. Initially, the mean stem length decreased for both species, however, a greater number of *R. grandiflora* also appeared unhealthy with increasing microplastic concentration. The microplastic treatments also exhibited faster drainage of water from the surface level due to the spacing disruption of the pellets in the soil. Studies on interspecific competition between plants under current environmental threats like the presence of microplastics in soil warrants further research. Our findings suggest that microplastics can negatively impact growth in low-lying herbaceous plants and potentially alter competitive interactions between native and invasive species. Consideration of which plants are most vulnerable to microplastics in the soil and their ability to outcompete other species would benefit planning of future terrestrial restoration and remediation projects.

AVIAN BIODIVERSITY ON FLORIDA RANGELANDS: USING AI TO DETERMINE THE IMPACT OF CATTLE MANAGEMENT STRATEGIES (STUDENT)

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The avian community indicative of grassland habitat has seen the highest decline in recent decades across North America. In south-central Florida, rangelands can serve as a suitable alternative habitat for over 75 avian species that relied on historic grassland systems at some point in their life history, including six state or federally listed species. The objectives of our study were to determine how avian biodiversity varied across pasture types and under different cattle grazing management techniques. We conducted our study at the Range Cattle REC, Hardee County, Florida. To estimate avian species richness, we deployed automated recording units (ARU, n = 20) in ten pastures that corresponded with varying stocking densities and cattle rotation schedules, we recorded sound continuously for one hour during dawn and dusk chorus and sampled 15 minutes of every hour in between. All avian species were identified

using a deep neural network, BirdNET. We tested BirdNET performance under a variety of situations (location, time of day, season) and settings (sensitivity and overlap) using approximately 200 hours of manually annotated recordings from our study area. Our study begins to fill the knowledge gap on how avian species of varying guilds respond to ongoing cattle management strategies on rangelands in south-central Florida.

ECOLOGICAL DYNAMICS OF TICK-HOST INTERACTIONS AND TICK-BORNE DISEASE RISKS IN URBAN COYOTE HABITATS (POSTER)

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Coyotes (*Canis latrans*) are prevalent in urban areas of Florida, potentially acting as reservoirs for tick-borne pathogens. This study aims to investigate tick-host interactions and disease risks in urban coyote habitats. Ectoparasites will be collected from coyotes in collaboration with USDA Wildlife Services, focusing on Cape Canaveral, Patrick, and Homestead airports. Morphological identification and DNA extraction techniques will be employed to characterize tick species and assess pathogen prevalence. Parasite burden calculations and correlation analyses will evaluate associations between host characteristics and tick infestation rates. Understanding the diversity of tick species associated with coyotes in urban habitats and their potential role as disease vectors is crucial for wildlife and public health management. This research will provide insights into tick-borne disease risks in urban coyote populations, informing targeted surveillance and control strategies to mitigate disease transmission. Through collaborative efforts with stakeholders and wildlife management agencies, this study seeks to address knowledge gaps in tick-host interactions and contribute to the conservation of urban wildlife and human health.

ADDRESSING RODENTS IN SUGARCANE PRODUCTION THROUGH EXTENSION PROGRAMMING (POSTER)

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Sugarcane (*Saccharum* interspecific hybrids) is grown across roughly 400,000 acres in South Florida. With pest pressures reducing the yield of a crop, rodents are considered the biggest threat. Increased restrictions to rodenticide use in and around sugarcane makes farmers open to novel approaches for rodent management. We are planning to investigate the effect of sugarcane production on rodent ecology, predator-prey relationships in sugarcane, and integrated rat management with the overall goal to reduce yield loss from rodents. Through an ongoing extension program, field research is being conducted and planned to address the objective. Education is being provided through seminars, newsletters, working groups, and field visits. Ongoing research is

being conducted and planned to address questions necessary for reducing rodent depredation. These findings will be used to develop a robust strategy to manage rodents.

APPLYING MULTIDIMENSIONAL ENVIRONMENTAL RESISTANCE OF NATIVE SPECIES FOR INVASION RISK ASSESSMENT UNDER CLIMATE CHANGE

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Biological invasions pose an escalating threat to global biodiversity and ecosystem functionality. Models offer valuable tools for identifying potential invasive species and guiding monitoring efforts. While many predictions rely on ecological niche models to pinpoint suitable invasion areas, their accuracy can be limited due to factors like rapid niche shifts post-invasion and mismatches between invaded ranges and environments. Environmental resistance (ER), gauged by biological similarities between native and invaded communities, presents a promising alternative for predicting invasion risk, especially when niche information or potential invader identities are lacking. Here, we employed ER-based models to discern the primary drivers of invasive species spread and forecast invasion dynamics under future climate scenarios. Focusing on 1,454 invasive plants and 533 animals in the eastern US at a 10-arcminute spatial resolution, our model simulated species spread based on the assumption that a grid cell is more susceptible to invasion if it resembles neighboring invaded cells (i.e., low ER). ER was quantified through multidimensional indexes, including biotic similarities in species assemblages, phylogenetic and functional traits, and abiotic similarities in climate, elevation, soil and human disturbances. Each invasive species underwent ER modeling, with model performance evaluated by comparing simulated and observed invasive ranges. The optimal ER model was used to predict species invasion extents by identifying regions with low ER yet to be invaded. Invasion risk patterns were then produced by overlaying the predictions of all species, and invasion dynamics were evaluated by comparing shifts of species invasion extents under different climate change scenarios. Our findings underscore climatic similarity as the primary driver of invasion, and most species are expected to expand their invasive extents in the future, particularly under the SSP585 scenario for 2061-2080. Our study introduces a novel framework for invasion risk prediction, offering a valuable decision-making tool for detecting potential invaders in specific regions. By integrating ER into predictive modeling, we enhance our ability to anticipate and mitigate the impacts of biological invasions on ecosystems.

CURRENT APPLICATIONS AND FUTURE POTENTIAL OF CITIZEN SCIENCE DATA

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Data from citizen science initiatives, such as iNaturalist and eBird, are increasing at an exponential rate and represent a valuable resource for biodiversity monitoring and decision-making processes. Yet, the use of such data, for example in published papers or in policy-related usage, are rarely summarized, leading to a significant knowledge

gap of how these data are being used. We aimed to fill this gap by quantifying the use of citizen science data in two distinct, but related forms: (1) environmental impact statements (EIS) and (2) peer-review literature. Analyzing over 1,000 EISs under the United States National Environmental Policy Act (NEPA), we found that citizen science data are increasingly being incorporated into the environmental review process. In 2022, 40% of EISs mentioned, utilized, or suggested the use of citizen science data. Furthermore, we examined the peer-reviewed literature leveraging iNaturalist data and found a parallel trend to the growth in iNaturalist observations with an increasing number of publications using these data through time. We identified various study areas, taxa, and topics explored in these publications. While species distribution and range are the predominant focus, iNaturalist data have been used to study species biology, behavior, climate change effects, environmental impacts, biodiversity metrics, population trends, and even the discovery of new species. Several articles evaluated the data quality of iNaturalist, while others discussed its educational value. Our results indicate that citizen science data are becoming increasingly common in environmental review and the scientific literature through time. However, many considerations need to be broadly discussed before widespread adoption of citizen science data in environmental review. Additionally, understanding the current landscape of literature using iNaturalist data will help inform the future direction of research in this space. Taken together, our results illustrate the growing significance and potential of citizen science data in both environmental assessments and scientific research, highlighting the need for continued exploration and integration of these resources to inform and enhance biodiversity conservation efforts.

DO YOU SMELL THAT? - A PRELIMINARY ANALYSIS OF RELATIONSHIPS BETWEEN FLORAL MORPHOLOGICAL AND VOLATILE TRAITS WITHIN *HELIANTHUS* (POSTER)

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A pollination syndrome is the set of floral traits that result from selective pressure from pollinators, which includes such traits as flower shape, size, orientation, and scent. Scent in particular has been understudied because it is hard to quantify until recent technological developments. To better understand pollination syndromes within the sunflower genus (*Helianthus*), floral morphological data from 31 species of *Helianthus*, grown in common gardens, was collected via standardized photography and analyzed via ImageJ. Floral volatile data were also collected from live *Helianthus* disks, weighed, and characterized by SPME GC-MS. We will create a correlation matrix of all traits and identify strong correlations between morphological and volatile traits. These floral traits are otherwise unrelated, so strong correlations across the phylogeny could be indicative of a pollination syndrome. We hypothesize that metrics of inflorescence size are positively correlated with metrics of volatile abundance. The results of this study will inform the selection of traits to incorporate into larger models predicting pollinator visitation as a function of floral traits. This work has major agricultural implications. By identifying traits that are attractive to sunflower pollinators, this work can be used for

breeding efforts that will increase crop yield of the crop sunflower *H. annuus*, which represents the third largest oilseed crop globally.

UNRAVELING THE IMPACTS OF BURMESE PYTHON INVASION ON FLORIDA'S BIODIVERSITY: INSIGHTS INTO PREY NAIVETE AND ECOLOGICAL FUNCTIONING IMPLICATIONS OF NOVEL URBAN EDGE COMMUNITIES IN URBAN ECOLOGY AND HORTICULTURE (STUDENT)

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Since its introduction in the 1990s, the invasive Burmese python (*Python molurus bivittatus*) has become a significant threat to Florida's terrestrial vertebrate communities. Despite growing evidence linking pythons to declines in native mammal populations, uncertainties persist regarding the role of behavioral factors in the population declines of native mammals. Notably, prey naivete—the inability of prey species to recognize and respond to cues from novel predators—may play a pivotal role in shaping the vulnerability or resilience of native mammals. Furthermore, our understanding of the broader implications of mammal population declines on ecosystem function remains incomplete. To address these knowledge gaps, we conducted foraging experiments both within and beyond the zone of python invasion. Specifically, we established foraging stations north of the invasion front to assess prey naivete in hispid cotton rats and raccoons, two model mammal species with distinct population responses following the python invasion. To evaluate the potential impacts of python-associated mammal declines on two critical ecosystem functions—scavenging and frugivory—we placed foraging stations in areas with and without mesomammals present and monitored the efficiency of these processes. Our behavioral experiments revealed evidence of prey naivete in raccoons (a declining species) but not in the hispid cotton rat (a resilient species). Experimental evidence from scavenging and frugivory experiments suggests these processes to be robust to losses in mesomammals. Collectively these findings contribute to a deeper understanding of the python invasion and its diverse effects on species and ecological processes.

ECOLOGY OF NILE MONITOR LIZARDS IN SOUTHWEST FLORIDA: PRELIMINARY FINDINGS (STUDENT)

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The Nile monitor lizard (*Varanus niloticus*) is among the most notorious invasive reptiles in Florida and has been established in the state for roughly 40 years. However, the ecology of this species in Florida is poorly understood. In May of 2023, we began to address this knowledge gap by using radiotelemetry to study individuals in Cape Coral, Florida. The objectives of our ongoing research are to determine third and fourth order resource selection, characterize movement patterns, and quantify home ranges. While one major aim is to inform better management decisions, we also hope to understand how this species persists in its novel range through the framework of optimal foraging theory. We will provide a brief history of this elusive species in Florida and discuss preliminary findings from in-progress research.

ENHANCING BIODIVERSITY MONITORING: CAMERA TRAPPING ALONG UCF'S NORTHEAST WILDLIFE CORRIDOR (POSTER)

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Ongoing research continues to shape the way we understand urban ecosystems. Urbanization has triggered shifts in animal behavior and distribution, leading to gaps in knowledge regarding their use of urban-wildland interfaces. Traditional trapping and surveying methods can be invasive and disruptive to animals, their behavior, and their environments. These issues have led to an increased adoption of non-invasive techniques that allow researchers to study and monitor animal populations without causing stress or disturbance. Camera traps have proven effective in gathering valuable data about animal behavior and populations while minimizing environmental impact. The University of Central Florida (UCF) owns and manages approximately 850 acres of natural lands situated directly adjacent to a portion of the Kissimmee-St. Johns-Ocala Wildlife Corridor. This land is home to various native plant and animal species and features a variety of natural habitats, including diverse wetlands, forests, and lakes. This study uses camera trapping as a non-invasive method to collect data on animal abundance, distribution, and activity. Our study area comprises approximately 70 acres in the northeast corner of UCF's main campus. This parcel of land acts as a wildlife corridor – animals move into the natural lands to the south of our study area and are funneled by several urban barriers to movement. These barriers include roads, neighborhoods, and university buildings that can prevent animals from moving freely between habitats. We will deploy 10 strategically placed Bushnell cameras along a trail to document the habitat use and movement of animals along these corridors by capturing three photo bursts. Cameras will be deployed at a 0-15° angle from horizontal. One of these will be placed in a culvert underpass to observe changes in species richness and diversity at a bottlenecked point. Camera placement will focus on wildlife corridors, migration routes, and ecological factors. Analyses of variation in species richness, abundance, and chronological use patterns among the camera sites will allow for more information on how different species navigate urban-wildland interfaces and utilize wildlife corridors, aiding conservation, urban planning, and wildlife management.

POTENTIAL BOAT INTERACTIONS BETWEEN RECREATIONAL BOATING AND SNAIL KITE (*ROSTRAMUS SOCIABILIS PLUMBEUS)* NESTING (POSTER)

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Anthropogenic disturbance is a major cause for concern for wildlife because it influences animal behavior, changes how species use habitats, and drives biodiversity loss. Recreational boating impacts many species and can lead to behavioral changes

and mortality. In 2021, Florida had over one million registered aquatic vessels; combined with a rapidly increasing population, there is increased potential for boat disturbance across the state's waterways. Boats that come too close can negatively affect foraging and nesting success of birds. Studies have shown boat disturbance can impact nestling growth rate, body mass, and stress levels. The Everglade snail kite (*Rostramus sociabilis plumbeus*) is a federally endangered raptor reliant on wetlands across Florida that are frequently utilized by boaters. Here we aim to examine how boats interact with snail kite nesting. Boat totals were counted during routine surveys from April 2023 through March 2024 at historical breeding locations of the snail kite throughout the state. We will locate boat ramps, airboat tour agencies, and houses with docks present at chosen wetlands of interest and collate them on a map with known nest locations of the snail kite for the 2023 and 2024 breeding seasons. This will give us an idea of the number of boat access points and how boats may come into contact with snail kite nests. To examine whether the boats present on each wetland can physically interact with snail kite nests, we will measure vegetation structure around each nest and distance to open water using ArcGIS software. We expect that nests surrounded by more dense vegetation and further away from open water are less accessible to motorboats. This study aims to give wetland managers site-specific information that could influence management practices surrounding recreational boat traffic. It will show managers which wetlands have a high probability of boaters interacting with snail kite nests, and therefore influence signage and communication with the public. This study will help managers strike a balance between preserving endangered snail kites and allowing recreational boating for the public.

A SURVEY OF VERTEBRATE COMMENSAL SPECIES RICHNESS AT GOPHER TORTOISE (*GOPHERUS POLYPHEMUS*) BURROWS WITH GIS SEASONAL HOTSPOT ANALYSIS (POSTER)

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The gopher tortoise (*Gopherus polyphemus*) is a threatened, native Florida reptile known for its valuable role as an ecosystem engineer in the sandy upland habitat in which it lives. The numerous underground burrows each individual creates during its life are utilized by over 360 recorded commensal species, some of which are threatened or endangered (e.g., eastern indigo snake.) These burrows offer protection from Florida's unpredictable weather and act as a safe haven during fires that are characteristic of pine scrub habitat. Because these fires are increasingly suppressed in Florida and urban sprawl is expanding, gopher tortoises are often relocated from their original homes to designated recipient sites. Our study location, the uplands habitat of Circle B Bar Reserve in Lakeland, Florida, is a designated waif site. Due to the large number of waif tortoises, which are translocated tortoises from unknown origins, Circle B houses a unique "melting pot" tortoise population that may affect the dynamic of these tortoises and their commensals. For our study, we examined images from 35 camera traps collected in 2020-2022 and identified all vertebrate species visible in the roughly 100,000 photos. We then ran a series of hotspot analyses to determine seasonal changes in spatial patterns of species richness in gopher tortoise habitat. We then

compared the hotspots and location preferences of these commensal species and gopher tortoises to find whether these preferences are impacted by seasons. Our results reveal a wide array of vertebrate species that differ based on proximity to burrows. We documented some species far more often at tortoise burrows (e.g., bobcats and eastern cottontails), while others were more often observed in wooded areas away from burrows (e.g., wild boars and various perching bird species). Other species, such as nine-banded armadillos, common raccoons, and Virginia opossums had seemingly no preference of burrow proximity. Interestingly, seasonality had little effect on species richness in general, further exemplifying the strong influence gopher tortoises have on their environment. These results will assist with the management of gopher tortoises and their commensals within Central Florida's environmental lands.

FAILURE OF A NOVEL METHOD TO MONITOR BEAR CUB SURVIVAL BY GLUING TRANSMITTERS TO HAIR

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We are monitoring adult female Florida black bears (*Ursus americanus floridanus*) and their cubs in southwest Florida to estimate their annual survival for calculating the subpopulation's growth rate. Bears in Florida do not hibernate deeply, only pregnant females consistently den, and they leave their den when approached. Methods used to calculate cub survival elsewhere are impossible. Seeking an alternative method, we glued VHF transmitters to the rumps of cubs in spring 2022 and 2023. Transmitters were epoxied to mesh fabric prior to deployment (mean weight 12.8g). In 2022, transmitters had an internal antenna and were attached with Gorilla Glue. Transmitters in 2023 had an external antenna and epoxy was applied over the glue once it became tacky. Hair was pulled through the mesh using a crochet hook and then glued to itself and the mesh. Overall, we located the natal dens of 15 GPS collared females and examined 33 cubs; none of the bears were immobilized. One cub was abandoned at the den and removed from further analysis, five cub mortalities were documented, 15 transmitters dropped, and 12 transmitters were never recovered. Excluding mortalities, transmitters remained on cubs for an average of 74 days (range 16 - 148 days) with high variation between years. We found that adding epoxy to the fur increased retention time from 43 days in 2022 to 92 days in 2023. However, we determined that doubling mean retention time was still insufficient to provide annual survival rate useful for a matrix model of the subpopulation. In addition to retention issues, the VHF signals were not strong enough. However, cub hair was long enough (about 2.5 cm) and transmitters were not pulled off in the den, demonstrating the potential of gluing transmitters to cubs. To our knowledge, this is the first use of this technique to monitor black bear cubs and further testing is needed to improve transmitter retention and performance. We currently recommend this method for short-term use only.

CONFIRMED RANGE EXPANSION SIGNALS POTENTIAL ESTABLISHMENT OF *ENTEROCOCCUS LACERTIDEFORMIS*, A NOVEL BACTERIAL PATHOGEN, THROUGH *ANOLIS SAGREI* INFECTIONS IN FLORIDA (STUDENT)

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Multisystemic enterococcosis, an emerging infectious disease caused by the novel bacterial pathogen *Enterococcus lacertideformis*, was first documented in the Western Hemisphere in 2019 within an invasive population of brown anoles (*Anolis sagrei*) in Pinellas County, Florida. We now confirm the first geographic expansion of this disease by identifying a case in a separate *A. sagrei* population in Hillsborough County. A deceased adult male exhibited clinical signs consistent with *E. lacertideformis* infection, later confirmed through diagnostic testing. This range expansion beyond the initial isolated population signals likely establishment across broader Florida anole communities. The ability of *E. lacertideformis* to exploit multiple novel lizard hosts across broad geographic ranges is concerning given Florida's high diversity of native and invasive lizard species, with frequent habitat overlap. The state harbors approximately 40 established non-native lizard species, mostly anoles and geckos - two families documented as hosts for this pathogen. Expanded geographic surveillance and epidemiological mapping are critical to forecast further invasion into new hosts, identify high-risk areas, and guide evidence-based policies and conservation strategies. Sustained tracking of prevalence, coupled with molecular characterization and elucidation of environmental transmission drivers, provides an early detection system to mitigate impacts on Florida's herpetofauna. This invasive pathogen threatens biodiversity if perpetuated within native fauna, especially the native green anole (*Anolis carolinensis*), underscoring the urgency of tracking the spread of this pathogen within Florida.

CULVERTS PROVIDE ALTERNATE ROOSTING HABITAT FOR CAVE BATS IN NORTH FLORIDA

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Culverts under roads can provide important habitat for bats that typically roost in caves. To better manage bats in structures, it is necessary to understand regional variation in culvert use. We surveyed 211 culverts 1-3 times during the winter torpor period in 2018

and 2019 and in summer in 2018 in north Florida. To determine temporal variation in use during winter, we surveyed 34 culverts repeatedly from November 2019–April 2020. For each culvert, we recorded values for 19 characteristics related to conditions inside the culvert, outside the entrances, and the surrounding landscape. We used logistic regression to determine the influence of environmental and physical variables on the probability of encountering bats and generalized linear regression models to evaluate the influence on counts of bats. Southeastern myotis (*Myotis austroriparius*) was the most common species observed in culverts in both seasons. Southeastern myotis were more likely to be present when culvert entrances were farther from the road edge, in culverts with multiple structures, weep holes present, and in rural areas and were more abundant in longer concrete culverts with multiple consecutive tunnels. During winter, southeastern myotis were present in >50% of culverts and peaked in abundance in mid-November. Wintering tricolored bats (*Perimyotis subflavus*) occurred in ~15% of culvert, while in summer, only two bats were detected at a single site. Tricolored bats were more likely to be encountered when culvert entrances were farther from paved roads. Tricolored bats were first observed roosting in culverts in mid-November and increased in abundance until late January. Our study highlights the use of culverts as alternative roosting sites for southeastern myotis and tricolored bats in Florida and provides insights into culvert features and seasonal variation in culvert use that may be useful to develop conservation guidelines.

THE IMPACTS OF MEGAHERBIVORES ON THE SAVANNA ECOSYSTEM IN SOUTHERN AFRICA (POSTER)

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Megaherbivores are large mammalian herbivores that have recently been lost in the ongoing defaunation crisis. The loss of megaherbivores in a landscape drastically alters ecosystem processes and biodiversity through direct effects on nutrient cycling, vegetation structure, and trophic cascades. This study sought to analyze the impacts of elephants on seed and germinant predation, ungulate fear-based behavior, and rodent parasite biodiversity. The experimental design for two parts of the study included five treatments: large herbivore exclosures, simulated megaherbivore behavior, habitat, and behavior-habitat effects, along with control plots within Mlawula Game Reserve, Eswatini. To determine the impacts of elephants on germinant and seed predation, we focused on cryptic herbivores and investigated the roles of these cryptic herbivores on the plant demography of the knobthorn tree, *Senegalia nigrescens*. We used a nested exclusion experimental approach using *S. nigrescens* seeds and germinants that were placed in a series of 1x1m wire exclosures in both the absence and simulated presence of megaherbivores. To determine parasite biodiversity, we live-trapped rodents and analyzed how elephants can affect disease transmission via the transfer of endoparasites within their populations. Feces samples were taken from each individual, and these were used to determine parasite loads? To determine the effects of elephants on ungulate behavior, twelve Automated Behavioral Response systems were deployed within the Hlane, Mbuluzi, and Mlawula conservation sites. They consisted of a motion-detecting camera, speakers, and an ABR programming device that was set to

randomize megaherbivore vocalizations as animals passed by. We identified behavioral responses to treatment calls for mid-sized herbivores observed in videos, and identified whether the prevalence of fleeing and vigilance behavior differed across treatment. We concluded that the presence of elephants on the landscape has a disproportionate effect on rodent endoparasite diversity, ungulate behavior, and seed predation.

AN INTRODUCTION TO THE LEFTOVERS INITIATIVE: IDENTIFYING KNOWLEDGE GAPS FOR NON-NATIVE AND INVASIVE SPECIES IN FLORIDA

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Florida has a historic problem with non-native and invasive species. Despite extensive efforts dedicated to the management and monitoring of these species, much is still unknown in terms of ecology, behavior, and social science. The Leftovers Initiative seeks to better understand these gaps by using available data to explore trends and identify opportunities for critical yet missing research. We employed bibliometric and content analysis methodologies to investigate the current state of scientific research pertaining to amply researched species (such as Burmese pythons, lionfish, and feral hogs) and under-researched species (such as greenhouse frogs, brown basilisks, and nutria). These combined methodologies allow for multiple forms of data exploration, such as the investigation of theme frequency, emerging trends and patterns through both objective and subjective evaluation methods. Publications were identified by completing a Topic search within Web of Science (which searches the Title, Abstract, Keywords, and KeyWords Plus®) for the Latin names of each species of interest. Keywords were used as identifiers of potential gaps in fields of study of each species, while content analysis was used to further quantify and analyze gaps in knowledge required to understand each species. The goal of this research is to identify actionable items to aid in monitoring of these species. We will present an example of this via a comparison of prevalence and depth of habitat modelling research in terms of amply and under studied species. Overall, ‘flagship’ invasive species had quantifiable broader research conducted on them, but still lacked knowledge compared to native species.

FLORIDA PANTHER CONSERVATION ON PRIVATE LANDS: INCENTIVE PROGRAMS FOR LANDOWNERS

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The endangered Florida panther population has grown from an estimated 20–30 individuals in the early 1990s to 120–230 panthers today. Habitat protection, genetic restoration, management actions, and research contributed to this rebound. Population expansion from the core breeding range in Southwest Florida to historic habitats on

public and private lands is occurring slowly, and for the first time in decades, reproduction was documented north of the Caloosahatchee River. However, land conversion and social factors pose challenges to continued northward expansion as well as population persistence in South Florida, especially in areas with development pressures and panther-livestock conflict. The Florida Fish and Wildlife Conservation Commission is developing incentive programs to promote conservation and increase acceptance of panthers on private lands. A new state-led depredation compensation program aims to offset economic losses caused by panthers by providing payment to commercial cattle ranchers whose calves are depredated by panthers. A forthcoming Payment for Ecosystem Services program will encourage panther habitat conservation by providing per-acre payments to private landowners who improve or maintain high-quality habitat areas. Technical assistance on both livestock depredation mitigation and habitat management will be offered to landowners in support of program objectives. These pilot programs will be modified as needed to maximize outcomes and provide proof of concept for program expansion and development of additional conservation incentive programs.

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