

2026 Annual Meeting & Research Symposium
of the
Louisiana Association of Professional Biologists



The New Frontier: Managing Wildlife at
the Public-Private Land Interface

October 8 – 9, 2026

Hosted by the
University of Louisiana at Monroe
Monroe, Louisiana

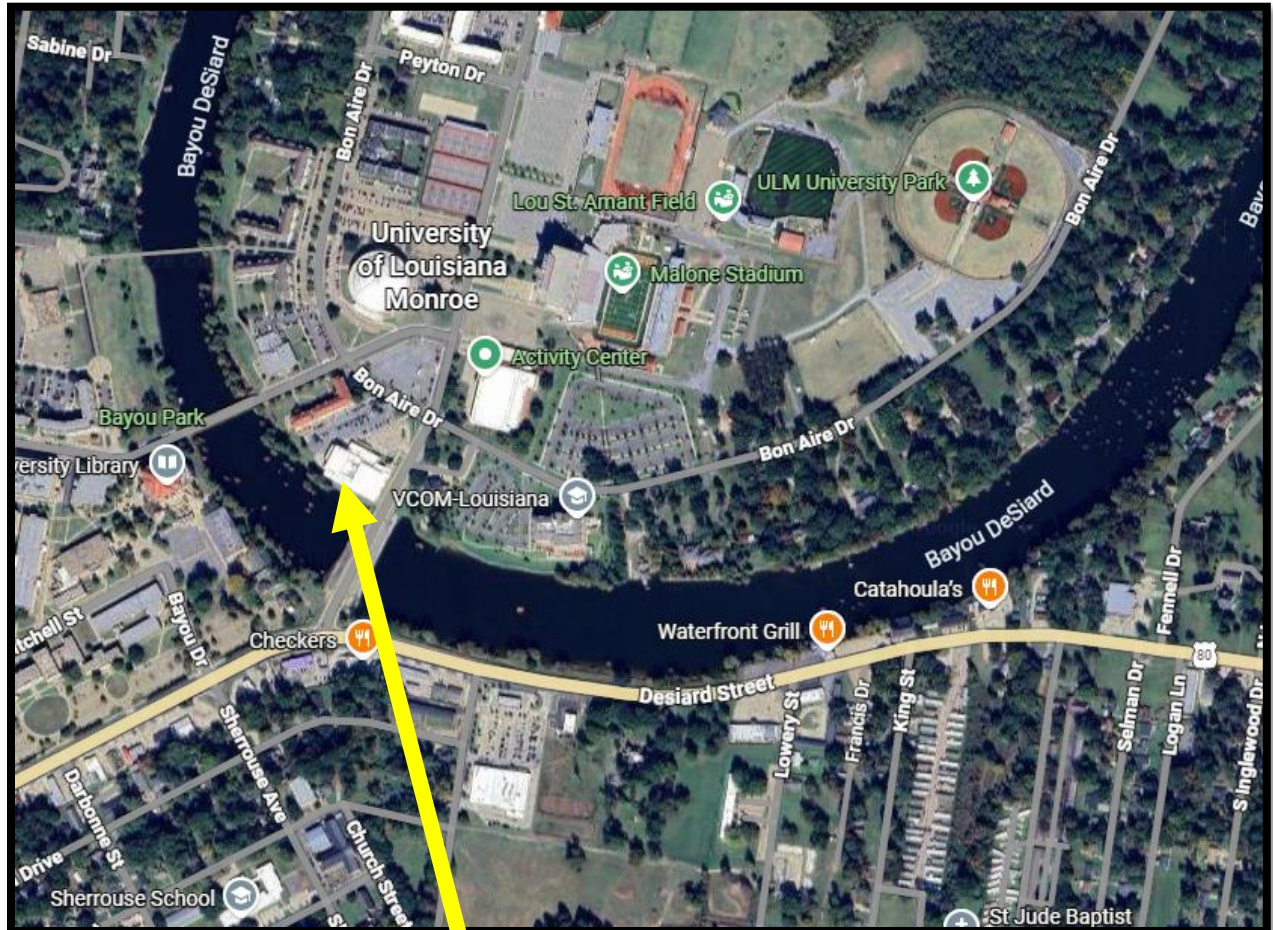
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**THE
WILDLIFE
SOCIETY**

All events for the 2026 Annual Meeting and Research Symposium of the Louisiana Association of Professional Biologists will take place at Bayou Pointe on the University of Louisiana at Monroe Campus.



Bayou Pointe

Monroe Area Restaurants

Restaurant	Street Address	Approx. drive from ULM	Type of food	Price	Atmosphere / Best use
Waterfront Grill	5201 DeSiard St.	2-3 min	Louisiana / Seafood / American — catfish, shrimp, grilled fish, steaks, chicken, burgers	\$\$	★★★★ My top choice close to ULM. Attractive bayou setting; nice without being overly formal
Catahoula's	5321 DeSiard St.	2-3 min	Louisiana / Cajun / Seafood — catfish, shrimp, po'boys, burgers, meat pies, salads	\$\$	★★★½ Bayou view and outdoor seating; more casual than Waterfront
Himalayan Cafe	3600 DeSiard St.	4-5 min	Indian / Nepalese — butter chicken, curries, tandoori, biryani, naan, momos, vegetarian dishes	\$\$	★★★½ Pleasant and interesting; particularly good for lunch
Naruto Ramen of Monroe	3600 DeSiard St., Ste. D	4-5 min	Japanese — ramen, rice bowls, noodles, bao/buns, Japanese appetizers	\$\$	★★★ Casual but attractive; fun alternative to American food
Athena Greek & Lebanese Restaurant	3101 Sterlington Rd.	~5-6 min	Greek / Lebanese / Mediterranean — gyros, chicken shawarma, hummus, kabobs, salads, Mediterranean platters	\$\$	★★★½ Good sit-down lunch option; lots of lighter choices
Catfish Charlie's	2329 Louisville Ave.	~7-8 min	Cajun / Seafood — catfish, shrimp, po'boys, gumbo, grilled/blackened fish, salmon	\$\$	★★★ Casual Louisiana restaurant; good local-food choice
Genusa's Italian Restaurant	815 Park Ave.	~8-10 min	Italian / Seafood / Steak — pasta, Italian entrées, seafood, steaks	\$\$	★★★★ Nice, traditional sit-down restaurant; better suited to dinner
Flying Tiger Brewery and Pizza Bar	506 N. 2nd St.	~9-10 min	Pizza / American — wood-fired pizza, salads, sandwiches, appetizers	\$\$	★★★½ Trendier and more casual; good for a relaxed group meal

Event Schedule

Thursday, October 8

8:30 AM – 9:00 AM On-site Registration & Check-in

9:00 AM– 9:15 AM Welcome (Elliot Boudreaux, President-Elect, C.H. Fenstermaker & Assoc.)

Session #1 Moderator: *Dr. John D. Foret, C.H. Fenstermaker & Associates*

9:15 AM – 9:40 AM Programmatic avian restoration, conservation and adaptive management
John Wiebe

9:45 AM – 10:10 AM TBD

10:15 – 10:30 AM Break

Session #2 Moderator: *Dr. Heidi Adams, Louisiana Tech*

10:30 AM – 10:45 AM Low prevalence of avian coronaviruses detected in Louisiana waterfowl and first documented cases in Wood Duck (*Aix sponsa*) and Ruddy Duck (*Oxyura jamaicensis*)
Allison Vestal-Laborde, Rebecca Christofferson, Kevin Ringleman, and Ashley Long

10:50 AM – 11:05 AM Alligator snapping turtle (*Macrochelys temminckii*) abundance based on stream characteristics in Kisatchie National Forest
Austyn Becker and Ross Couvillon

11:10 AM – 11:25 AM Assessing the effectiveness of using two trap sizes in a turtle population survey
Ethan Hancock and Ross Couvillon

11:30 AM – 1:00 PM Lunch (on your own)

Session #3 Moderator: *Dr. Ross Couvillon, University of Louisiana at Monroe*

1:00 PM – 1:15 APM Phenological changes in a Louisiana bottomland hardwood forest: A 10-year cross sectional study
Diane Sao, Grant Erbelding, and Joydeep Bhattacharjee

1:20 PM – 1:35 PM Using UAV-derived LiDAR to evaluate pine stand structure across fire regimes
Brock Eppinette and Joydeep Bhattacharjee

1:40 PM – 1:55 PM	Spectral fingerprints of bottomland hardwood species: limitations of contemporary remote forest monitoring <i>Grant Erbelding and Joydeep Bhattacharjee</i>
2:00 PM – 2:15 PM	Break
<u>Session #4</u> <i>Moderator: Anastasia Couvillon, University of Louisiana at Monroe</i>	
2:15 PM – 2:30 PM	Women in the woods – increasing female participation in the forestry profession through mentorship, community outreach, and experiential learning <i>Elizabeth Parker, Nikki Holland, Heidi Adams, and Nan Nan</i>
2:35 PM – 2:50 PM	Gulf Coast canids: spatial ecology across a wetland-dominated coastal landscape <i>Tanner Broussard, Joseph Hinton, Justin Hoffman, Sarah Baker, and Eddie Lyons,</i>
2:55 PM– 3:10 PM	Assessing damage and the ecological impacts of nutria (<i>Myocastor coypu</i>) across marshes of the southeastern Louisiana Gulf Coast <i>Brianna Rice, Andy Nyman, Tracy Quirk, and Drew Fowler</i>
3:15 PM – 3:30 PM	Flushed with discovery: masculinization in live-bearing fishes in sewage-affected residential ditches <i>Shubhum Vijay Kumar Yadav, Nigel D'souza, and Emily Kane</i>
3:35 PM – 4:00 PM	Break
4:00 PM – 5:00 PM	<i>Poster Session</i>
5:00 PM – 6:00 PM	LAPB Meeting
6:00 PM – 7:00 PM	Dinner (Catered)
7:00 PM – 7:30 PM	Awards

Friday, October 9

8:30 – 9:15 AM	Student/Professional Breakfast Mixer
9:15 – 9:45 AM	Sunlight and Fire – Open Pine RCPP <i>Katharine Huggins</i>
9:45 – 10:15 AM	Prescribed Burn Association: A successful Model of Wildlife Conservation on Private Lands <i>Jesse Davis</i>
10:15 – 10:45 AM	Break

10:45 – 11:15 AM	Scientific Credibility or Policy Advocates across Louisiana's Landscapes <i>Troy Mallach</i>
11:35 – 12:15 PM	Guest Speaker #4 TBD
12:15 – 12:25 PM	Closing Remarks (John D. Foret)
12:30 PM	Depart

Student Oral Presentation Abstracts

Low Prevalence of Avian Coronaviruses Detected in Louisiana Waterfowl and First Documented Cases in Wood Duck (*Aix sponsa*) and Ruddy Duck (*Oxyura jamaicensis*)

Allison Vestal-Laborde, Rebecca Christofferson, Kevin Ringelman, and Ashley Long

Avian coronaviruses (CoVs) occur across a wide range of bird species globally, yet surveillance for these viruses remains limited across most avian taxa, and key aspects of their disease ecology remain poorly understood. Although CoVs are frequently detected in waterfowl, research on the occurrence and ecology in this group also remains sparse compared with surveillance and morbidity study efforts for other pathogens such as avian influenza. From 2022 to 2024, we tested 157 birds sampled through routine banding activities and 534 hunter-harvested birds to estimate avian CoV prevalence in free-ranging Louisiana waterfowl; characterize the occurrence of avian CoVs across species, locations, and sampling periods; and provide baseline data for future avian CoV surveillance within an important region of the Mississippi Flyway. We found low levels of CoVs in the birds we sampled (1.3% overall prevalence in the 691 samples tested across both methods) and found evidence that CoV prevalence may vary seasonally or annually (for example, 8.1% CoV positivity in banded Blue-winged Teal in 2022, with 0% in 2023 and 2024). Notably, our study found CoVs in two species not previously documented with the virus, Wood Duck (*Aix sponsa*) and Ruddy Duck (*Oxyura jamaicensis*). Our results underscore the need for further research on the host range and ecology of avian CoVs in free-ranging, migratory waterfowl and highlight the importance of longitudinal surveillance to better understand temporal variation in virus occurrence and to inform future research and management.

Alligator Snapping Turtle (*Macrochelys temminckii*) Abundance based on Stream Characteristics in Kisatchie National Forest

Austyn Becker and Ross Couvillon

Hydrologic conditions within waterways can influence freshwater turtle abundance by shaping overall habitat quality. We explored whether watershed area, sinuosity, stream order, habitat type, and connectivity correspond to abundance of alligator snapping turtle (*Macrochelys temminckii*; AST) and razorback musk turtles (*Sternotherus carinatus*; RMT) within Kisatchie National Forest (KNF) in northcentral, Louisiana. We trapped turtles in various stream orders (4-7). Smaller stream orders are often left out of AST research and are abundant within KNF. Across 1546 trap nights, we captured 50 unique ASTs (catch per unit effort [CPUE] = 0.032) and 69 RMTs (CPUE = 0.044). Additionally, we confirmed AST presence in 22/32 sites and RMT presence in 15/32 sites. Understanding stream hydrology can be vital for future conservation effort for species like alligator snapping turtles, a candidate species for listing as federally threatened.

Assessing the Effectiveness of Using Two Trap Sizes in a Turtle Population Survey

Ethan Hancock and Ross Couvillon

In turtle research, it has historically been difficult to get a complete profile of size classes within a population. This is especially true for juvenile individuals, as they are often underrepresented in typical sampling methods. In an attempt to better target small individuals (<200 mm SCL) within a population, we paired 0.3 m diameter hoop traps with 1.2 m diameter hoop traps when sampling. We sampled waterways on three wildlife management areas within the northern part of Louisiana. During 804 trap nights, only one of 35 (~3%) alligator snapping turtles (*Macrochelys temminckii*) were captured with a 0.3 m trap. However, 0.3 m traps worked better in capturing other turtle species – 23 of 64 (~36%) razor-backed musk turtles (*Sternotherus carinatus*) and 8 of 66 (~12%) spiny softshell turtles (*Apalone spinifera*) were captured in 0.3 m traps. This research is ongoing and can help to determine the efficacy of using multiple trap sizes to help attain a more accurate representation of turtle communities during sampling.

Women in the Woods - Increasing Female Participation in the Forestry Profession through Mentorship, Community Outreach, and Experiential Learning

Elizabeth Parker, Nikki Holland, Heidi Adams, and Nan Nan

Recent studies have shown young women may not consider forestry as a possible profession because they view it as a male-dominated field. Experiential learning from female foresters, as well as developing professional relationships with these women, may help counter negative stereotypes and encourage future generations of women to become foresters. This characterizes the goal of our program—to bring together young women and professional female foresters to learn and network, thus increasing female interest and participation in forestry. This innovative program offered through Louisiana Tech University has three components: mentorship, community outreach, and experiential learning. Louisiana Tech Women in the Woods holds an annual workshop where students and faculty, as well as industry and government volunteers, lead high school girls at a weekend of activities at the Louisiana Ecological Forestry Center near Florien, LA. These girls are given the opportunity to learn more about components of forestry and do activities with soil and water, learn how to set wildlife traps and take forest measurements of tree plots, find out what a prescribed burn entails, and meet women who are already professional foresters. Feedback surveys are given at the end of the weekend. The girls have mentioned the sense of community helped them feel welcome, and they were glad they were able to hear from professionals about what got them involved in forestry. A future goal of the program is to facilitate the first Little Women in the Woods during spring 2027, which will be a collaborative project with the Louisiana Girl Scouts of America.

Phenological Changes in a Louisiana Bottomland Hardwood Forest: A 10-year cross-sectional study

Diane Sao, Grant Erbelding, and Joydeep Bhattacharjee

Abiotic environmental cues drive plant phenology and play a significant role in maintaining ecosystem processes in temperate forests. In deciduous systems, plants rely on interacting environmental signals, such as temperature, photoperiod, and water availability, to transition between phenophases. Deviations in these cues under changing climate conditions can alter phenophase timing. In this study, canopy phenology was monitored using the green chromatic coordinate (GCC) derived from PhenoCam imagery at the Russell Sage Wildlife Management Area, northeast Louisiana, from 2013 to 2024. Data were analyzed alongside high-frequency meteorological data to evaluate phenological transitions of trees. Transition dates were identified using GCC thresholds corresponding to the onset of budburst (R10) and senescence (F50). Results indicated that the AGSI model most accurately predicted budburst, suggesting that leaf emergence is driven primarily by temperature, while being constrained by additional environmental factors such as light and water availability. The PTTs model's performance was comparable to the AGSI, with fewer parameters, suggesting that additional complexity in the model may not improve prediction for budburst. For senescence, the TTs and the PTTs models performed identically. The incorporation of photoperiod sensitivity in the PTTs model, however, provided a more biologically meaningful representation of the timing of senescence. Therefore, providing evidence that photoperiod is a dominant driver in growth cessation in temperate deciduous species. These results highlight that spring and autumn phenophases in bottomland hardwood forests are regulated by distinct environmental mechanistic models, which can improve predictions of phenological responses effectively under increased environmental variability.

Using UAV-Derived LiDAR to Evaluate Pine Stand Structure Across Fire Regimes

Brock Eppinette and Joydeep Bhattacharjee

Longleaf pine ecosystems once covered millions of hectares across the Southeastern United States, but now persist as remnant fragments due to logging, land-use change, fire suppression, and climatic pressures. These have caused reduced ecosystem resilience, increase fuel loads, and heightened vulnerability to wildfires and insect outbreaks. Longleaf pine habitats are recognized as a critical conservation concern, emphasizing urgent risk to biodiversity and the need for improving monitoring tools for active management. This study utilizes UAV LiDAR-derived variables to assess how varying prescribed fire frequencies influence vegetation structure. Fifteen permanent plots were established at the LEAF Center to compare structural differences among three distinct fire treatment regimes and evaluate vegetation densities across standard forest layers within each treatment type. All evaluated variables revealed significant treatment-by-layer interactions: total LiDAR returns ($F = 56.68$, $p < 0.001$), average returns per voxel ($F = 30.83$, $p < 0.001$), and the number of occupied voxels ($F = 73.40$, $p < 0.001$). Post hoc analysis revealed that within the canopy layer, treatments differed significantly in total LiDAR returns ($p < 0.0001$) and occupied voxels ($p < 0.001$). For the ground cover and the midstory layer, burn treatments differed significantly from the control across all variables ($p < 0.0001$). Further, post hoc analysis showed no significant difference between individual prescribed fire regimes within the ground cover layer for all variables, and within the midstory layer for all variables. These results show that the

presence of prescribed fire itself impacts vegetation structure more than total number of burns. Building on these results, the project will evaluate how fire activity interacts with varying stand densities, giving land managers an efficient tool to monitor landscape scale structural changes.

Spectral Fingerprints of Bottomland Hardwood Species: Limitations of Contemporary Remote Forest Monitoring

Grant Erbeling and Joydeep Bhattacharjee

Remotely sensed data, including satellite and UAV imagery in particular, are increasingly being used to supplement labor-intensive field surveys and enable scalable, continuous monitoring of vulnerable ecosystems. This study, as part of a broader effort to apply remote data to a complex, closed-canopy bottomland hardwood forest (BHF). The main objective therein is to automate the process of canopy species identification via convolutional neural network (CNN) classification of aerial forest imagery, and examine the spectral and structural characteristics underlying model performance. UAV-derived imagery, including multispectral and LiDAR-derived structural metrics, were collected across nearly 800 trees representing eight dominant species over two growing seasons in an old-growth BHF in northeastern Louisiana. To identify species, we analyzed species-specific spectral profiles and found that strong separation between genera was due primarily to distinct red edge reflectance and canopy density. While the accuracy of discriminating oaks and non-oak species was 85.6%, we arrived at low accuracies for differentiating among the various oaks ($67.6\% \pm 4.2$). The three co-occurring Oak species (*Q. texana*, *Q. lyrata*, and *Q. phellos*) possess highly similar spectral and structural characteristics, resulting in poor separability and classification accuracy. Classification separability only slightly improved in late-season imagery, demonstrating phenological differentiation as a limited discriminator. These overlapping signatures represent the primary constraint on CNN classification accuracy and define a practical ceiling for species-level discrimination for the oak species in bottomland hardwood forests from multispectral and structural data alone. However, the ability of this technique to discriminate among other species is high and has potential for application in other upland mixed forests.

Gulf Coast Canids: Spatial Ecology Across a Wetland-Dominated Coastal Landscape

Tanner Broussard, Joseph Hinton, Justin Hoffman, Sarah Baker, and Eddie Lyons

Hybridization among *Canis* species can increase genetic variation in North American canid populations, with evolutionary and ecological consequences. Along the coast of southwestern Louisiana, coyotes (*Canis latrans*) retain substantial red wolf (*Canis rufus*) ancestry and exhibit morphological and ecological characteristics consistent with a wetland-associated ecotype, often referred to as the Gulf Coast canid. Previous findings indicate that Gulf Coast canids select coastal wetlands and floodplains, maintain relatively small resident home ranges compared with other southeastern coyote populations, and experience high annual survival. Our research expands on these findings through continued GPS monitoring and camera trapping of packs and transient individuals across marsh, coastal prairie, and adjacent upland forest in Cameron and Calcasieu parishes. We are evaluating fine-scale movement and habitat selection in relation to wetland

conditions, landscape structure, behavioral status, and estimated red wolf ancestry. This work will clarify how Gulf Coast canids navigate a dynamic coastal landscape and whether remote wetlands and associated landscape features facilitate the persistence of introgressed red wolf ancestry. By identifying habitats and landscape features important to resident and transient canids, this research will improve understanding of the ecological processes maintaining this distinctive Louisiana population. Results from this research will inform management of Gulf Coast canids and have broader implications for red wolf conservation and recovery.

Assessing Damage and the Ecological Impacts of Nutria (*Myocastor coypu*) Across Marshes of the Southeastern Louisiana Gulf Coast

Brianna Rice, Andy Nyman, Tracy Quirk, and Drew Fowler

Invasive nutria (*Myocastor coypu*) pose a significant threat to coastal wetlands globally because their high proliferation rates can cause marsh vegetation “eat-outs” and may affect the ability of marshes to keep up with subsidence and sea-level rise. Current federal and state programs in Louisiana focus on control rather than eradication to manage nutria populations. Here we hypothesize that marsh vegetation communities and accretion rates differ between areas of targeted nutria removal versus non-removal. We constructed twelve nutria exclosures in the Pontchartrain Estuary; six in areas of high nutria removal and six in areas of low removal. We also constructed six exclosures on North Breton Island where the entire island is an area of high nutria removal; three in coastal dunes and three in the back-barrier marsh. Species richness, percent cover, and rate of sediment accretion is being measured in each plot. Preliminary data show no significant difference in species richness or percent cover between exclosure and control plots, though seasonal comparisons suggest that exclosure plots trend toward higher species richness. If this relationship is shown to be significant over time, that would support our hypothesis that nutria negatively impact marshes and would support the need for further research into management efforts. Future vegetation monitoring and accretion rate measurement across habitat types is necessary to fully illustrate the impact nutria have had on coastal ecosystems.

Flushed with Discovery: Masculinization in Live-bearing Fishes in Sewage-affected Residential Ditches

Shubham Vijay Kumar Yadav, Nigel D’souza, and Emily Kane

Anthropogenic wastewater is an increasingly important source of endocrine-active contaminants in freshwater ecosystems, yet their effects on non-model and ecologically important fishes remain poorly understood. In Louisiana, residential onsite wastewater treatment systems discharged treated effluent into drainage ditches, particularly in areas with heavy clay soils and limited subsurface drainage. These discharges may introduce endocrine-active compounds capable of disrupting reproductive development in aquatic organisms. This study investigates potential wastewater-associated masculinization in female mosquitofish (*Gambusia affinis*) inhabiting

Yadav et al. continued

residential drainage systems and its impacts on reproduction and survival. We surveyed female mosquitofish and collected field measurements of physiochemical parameters across sites influenced by residential wastewater effluent and sites served by municipal sewer systems as controls. We quantified morphological indicators of masculinization, including anal fin elongation and gonopodial spine development, alongside reproductive and condition related traits. We also deployed experimental cages to examine responses of fish to wastewater-influenced environments over time. In the lab, we evaluated survival, reproductive performance, and rate of masculinization. Observations indicate that females collected from wastewater-influenced sites exhibit pronounced anal fin elongation and gonopodial spine development while retaining functional ovaries and developing oocytes, suggesting masculinization rather than complete reproductive sex reversal. Masculinization developed within 30 days of exposure and was observed across all three live bearing (Sailfin molly (*Poecilia latipinna*) and the least killifish (*Heterandria Formosa*)) species examined, with more than 85% of females and juveniles exhibiting morphological signs of masculinization. Masculinization was associated with significant reductions in brood size in affected populations, and some highly masculinized females produced stillborn offspring, suggesting that wastewater-associated masculinization may have substantial consequences for reproductive success.

Student Poster Presentation Abstracts

Influence of Nest Box Size and Color on Eastern Bluebird Selection Preference

Lake Allen, Laiden Broadway, Holly Eubanks, and Heidi Adams

Eastern Bluebirds are a small North American migratory cavity-nesting bird. When cavities are not available, they often use nest boxes built, placed, and maintained by people. There has been a large community science effort of placing nest boxes to help Eastern Bluebird populations during their reproductive season, but many different sizes are available for use, and some are painted, possibly to make them more aesthetically pleasing to people. Our objective of this pilot study is to determine if nest box size and color influence selection preference by Eastern Bluebirds. We developed a split-pot experimental design which includes two treatments of nest box size (small and large), with nest box color (blue, green, and unpainted [control]) as a sub-plot treatment. Blue and green were selected as treatment colors as they match the two most common habitat colors during the spring (i.e., sky and vegetation). Boxes were placed on Louisiana Tech's South Campus with a minimum separation distance of 300 ft, at least 25 ft from a forest edge, and 100 ft² of open, early successional cover. We placed game cameras 15 ft away facing the box front to monitor avian activity surrounding each associated box. We conducted nest box checks to assess usage and nest success. Initial results indicate a selection preference of blue nest boxes regardless of size. Future results may help biologists and bird enthusiasts select a nest box most preferred by the birds, thus contributing to potential population growth.

A Clear Improvement: A Modification of the Clearing and Staining Protocol

Dominic Muguira, Maci Louque, and Shubham Yadav

Clearing and Staining, also known as Diaphanization, is a widely used and effective way to observe the various morphological features of the skeleton in small vertebrates. It is commonly used method of observation in various morphological and biomechanical studies. It does, however, present several issues when used for larger quantities of specimens of various sizes, including its cost, the yellowing of specimens over time, over staining, and over digestion. During a larger research project, focusing on changes in certain skeletal features of fish ranging from just a few millimeters to over five centimeters long, we encountered all of these issues. To remedy these problems, we formulated a modified protocol. We lowered our cost by utilizing an over-the-counter trypsin supplement as our clearing agent instead of typical laboratory grade trypsin. This saved us roughly four dollars for every gram of trypsin. We also accommodated various body sizes by adjusting concentrations and durations of steps, and to improve specimen clarity, we implemented a destaining step and a practice of removing bubbles during bleaching. We expressed valuable results especially in minute specimens which are particularly difficult to work with.

Python Based Algorithm for Building a Coyote Observation Database from Trail-camera Video

Darren Guidry, Tanner Broussard, Joesph Hinton, and Justin Hoffman

Trail-camera surveys can generate large volumes of video that require substantial time to review, organize, and convert into usable ecological data. This project developed a Python based workflow to support the creation of a dataset for assessing coyote (*Canis latrans*) land use, behavior, and habitat associations in the Gulf Coast regions of southwest Louisiana and southeast Texas. The workflow uses existing wildlife detection and classification tools to screen trail-camera videos. File and camera metadata are incorporated into a standardized, user-friendly observation table, including video identity, location, date, time, temperature, species observations, behavior, and habitat characteristics. In an initial set of 104 videos (35.5 minutes), the workflow identified 26 (25%) as coyote-positive, allowing the reviewer to prioritize one-quarter (8.5 minutes) of the source videos. The program was also able to separate other wildlife sightings which included domestic cattle, feral hogs (*Sus scrofa*), raccoons (*Procyon lotor*), white-tailed deer (*Odocoileus virginianus*), and Virginia opossum (*Didelphis virginiana*). These preliminary findings demonstrate how existing Python tools can minimize search time by prioritizing target species footage and organizing ecological observations.

Detection of Flooding and Drought Stress in *Quercus Lyrata* through Multispectral Imaging

Macy Cason, Shifat Saiful, and Joydeep Bhattacharjee

As the effects of global climate change become more apparent, there is a growing need to develop efficient, consistent monitoring methods to better understand its effects on forest ecosystems and vegetation. Vulnerable forest ecosystems are subjected to irregular environmental conditions such as prolonged drought and flooding, causing the native plant species substantial stress. When subjected to these conditions, a tree's growth and photosynthetic capacity can be severely stunted. One growing method of measuring vegetative health/performance is through the use of powerful remote sensors such as multispectral imaging. Multispectral images capture wavelengths of light beyond visible light; near-infrared light in particular can be used to measure the health of vegetation. In this study, a multispectral camera was used to measure the effects of extreme drought and flooding conditions on *Quercus lyrata* seedlings, a species characteristic of bottomland hardwood forests. Multispectral images were then compared alongside morphological (basal diameter, leaf length and width, and height) and physiological (chlorophyll and nitrogen content) measurements for validation. These measurements were taken once a week, inside a growth chamber designed to simulate stressful conditions. When measured over six weeks, changes were noticeable in certain morphological aspects.

Importance of Environmental Factors in Understanding Forest Regeneration and the Use of Spectral Analysis in Identifying Species in the Northwoods

Tiffany Shorty, Pooja Chapagain, Nazareth Morales, Michael Parent, and Nathan Swenson

Forest regeneration depends on the growth and survival of tree seedlings, which can be influenced by environmental conditions and species identity. This study examined seedling growth and survival in relation to soil moisture, canopy openness, heat load index (HLI), and topographic wetness index (TWI) in a northern hardwood forest. Seedlings were monitored during 2023 and 2026, and relative growth rate was calculated from changes in seedling height. We also evaluated the ability of partial least squares discriminant analysis (PLS-DA) and a one-dimensional convolutional neural network (1D-CNN) to classify 12 tree species using leaf reflectance spectra. Seedling survival increased with soil moisture, but growth rates varied among species. Environmental variables explained only a small portion of growth variation. PLS-DA achieved 93.4% classification accuracy and outperformed the 1D-CNN, likely because spectral differences among species were largely linear and the CNN was affected by the small training dataset and differences between laboratory and field samples. These findings highlight the importance of both environmental conditions and species identity in understanding forest regeneration and demonstrate the potential of spectral methods for tree species classification.

Habitat and Mesocarnivore Associations with Gray Fox (*Urocyon cinereoargenteus*) Occupancy in Kisatchie National Forest

Catrina Weiner, Ross Couvillon, Kim Marie Tolson, Anastasia Couvillon

The gray fox (*Urocyon cinereoargenteus*) is a widespread mesocarnivore that has experienced population declines in portions of its range, yet the habitat characteristics influencing its occupancy remain poorly understood across much of its geographic range. This study addresses a geographic knowledge gap by examining gray fox habitat associations in Louisiana. We conducted an observational camera-trap study within the Winn Ranger District of Louisiana's Kisatchie National Forest to evaluate gray fox occupancy in a federally managed, pine-dominated forest. We used a Bayesian single-species occupancy model and backward model selection to identify habitat and anthropogenic landscape characteristics that best predicted gray fox occupancy at the home-range scale. Overall, our results provide additional insight into gray fox ecology within managed southeastern forest ecosystems.

Using Leaf Spectroscopy to Assess Turgor Loss Point in a Tropical Forest and Bottomland Forest

Rebecca Wesley, Brett Wolfe, and Alex Easley

To better understand trees' responses to environmental conditions, namely droughts, functional traits such as turgor loss point (TLP) are assessed. Traditional methods of measuring TLP are destructive and time consuming. Leaf spectroscopy is a non-destructive method of measuring leaf characteristics but has not been widely used to measure TLP. There has been a proven correlation between leaf spectra and TLP, though it was only shown for a single bottomland hardwood (BLH) forest. I tested leaf spectroscopy to measure TLP in two additional forest types, one being a terrace forest at Burden Museum and Gardens in Louisiana and one tropical forest at Barro Colorado Island (BCI) in Panama. Data from these two sites were then combined to make one statistical model that can be used to assess TLP with spectroscopy across biomes. The model was able to accurately and rapidly assess TLP across biomes ($R^2=0.74$). Using this model, TLP can be assessed across forest biomes rapidly and accurately, adding to the many leaf functional traits that can be assessed spectroscopically.