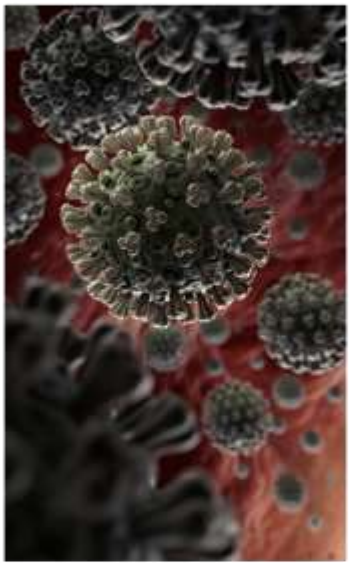
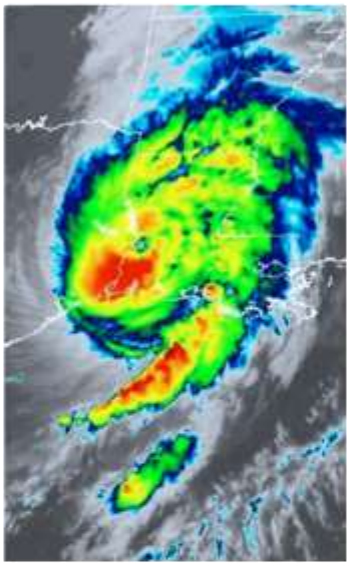
2021 Fall Meeting & Research Symposium

of the

Louisiana Association of Professional Biologists

and the

Louisiana Chapter of The Wildlife Society

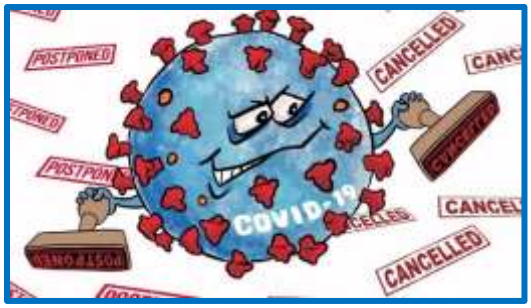

Overcoming Natural Resource Management Challenges of 2020

August 12 – 13, 2021

School of Agricultural Sciences & Forestry
Louisiana Tech University
Ruston, Louisiana

The Wildlife Society will allow a maximum of 11 Continuing Education Units (CEUs) in Category I of the Certified Wildlife Biologist® Renewal/Professional Development Certificate Program for participation in the 2021 Fall Meeting and Research Symposium of the Louisiana Association of Professional Biologists and the Louisiana Chapter of The Wildlife Society.

Due to recent COVID-19 mandates for the state of Louisiana, the LAPB/TWS 2021 Fall Meeting & Research Symposium will be held virtually via Zoom. All those who wish to attend the virtual meeting but are not a focus session presenter must be a paid member of the Louisiana Association of Professional Biologists/Louisiana Chapter of The Wildlife Society. You can update your membership at https://www.labiologists.org/. If you have questions regarding the status of your membership, contact LAPB Secretary Ashley Long (225.578.4940; amlong@agcenter.lsu.edu).



Given this meeting has transitioned from a face-to-face to a virtual format, the following meeting events have been cancelled:

- Pre-meeting field trip
- Photography contest
- Student-Professional Morning Mixer

Thursday, August 12, 2021

8:50 – 9:00 AM Welcome & Introduction (Heidi Adams, LAPB President-Elect, Associate Professor, Louisiana Tech School of Agricultural Sciences & Forestry)

Student Research Presentations
9:00 AM – Noon

Names of presenting authors are italicized.

Session 1 – Moderator: Dr. Ashley Long (Louisiana State University)
Abstracts ~ Pages 6 – 8

9:00 – 9:20 AM Stationary PIT-tag readers provide new insights on nest box use, survival and recruitment of cavity-nesting waterfowl in Louisiana (*Katie Miranda* and Kevin M. Ringelman, LSU School of Renewable Natural Resources)

9:20 – 9:40 AM Evaluating the mottled duck nest predator community in southwest Louisiana using camera traps and artificial nests (*Alexandre L. Dopkin* and Kevin M. Ringelman, LSU School of Renewable Natural Resources)

9:40 – 10:00 AM Spatial and temporal variation in survival of female mottled ducks in southwest Louisiana (*Elizabeth S. Bonczek* and Kevin M. Ringelman, LSU School of Renewable Natural Resources)

10:00 – 10:20 AM Black-bellied whistling-duck and wood duck breeding season overlap and implications of interspecific nest parasitism (*Dylan Bakner* and Kevin M. Ringelman, LSU School of Renewable Natural Resources)

10:20 – 10:40 AM Weather effects on invertebrate abundance in wetlands in the Prairie Pothole Region (*Ashley K. Tunstall*, LSU School of Renewable Natural Resources; Catrina V. Terry, Ducks Unlimited; Kevin M. Ringelman, LSU School of Renewable Natural Resources)

10:40 – 10:55 AM Break

Session 2 – Moderator: Dr. Kim Marie Tolson (University of Louisiana-Monroe)
Abstracts ~ Pages 9 – 11

10:55 – 11:15 AM A novel protozoan associated with the reproductive tract of white-tailed deer (*Odocoileus virginianus*) in Louisiana (*Hope Hebert* and Kim Marie Tolson, School of Sciences, College of Arts, Education, and Sciences, University of Louisiana-Monroe; Jim LaCour, Louisiana Department of Wildlife and Fisheries)

11:15 – 11:35 AM Spatially explicit population estimation of the Louisiana black bear (*Dustin Champagne*, Louisiana Tech School of Biological Sciences; Heidi L. Adams, Louisiana Tech School of Agricultural Sciences & Forestry; Joseph D. Clark, USGS Southern Appalachian Field Branch)

11:35 – 11:55 AM The 2020 survey of Louisiana waterfowl hunters (*Michael Sullivan*, Luke Lombarde, and Michael Kaller, LSU School of Renewable Natural Resources)

11:55 AM – 12:15 PM The influence of commercial forestry practices on seasonal bat species occurrence and relative activity in central Louisiana (*Jane M. Kunberger* and Ashley M. Long, LSU School of Renewable Natural Resources)

12:15 – 1:00 PM Lunch

Session 3 – Moderator: Dr. Bill Patterson (Louisiana Tech University)
Abstracts ~ Pages 11 – 13

1:00 – 1:20 PM Characterization of a shell-rot disease affecting freshwater turtles in a northeast Louisiana bayou (*Nelle L. Jenkins*, Kim Marie Tolson, and John L. Carr, School of Sciences, College of Arts, Education, and Sciences, University of Louisiana-Monroe; Jim LaCour, Louisiana Department of Wildlife and Fisheries)

1:20 – 1:40 PM Pass the salt! Environmental predictors of brown shrimp abundance in Louisiana (*Caitlyn A. Fontenot*, Louisiana Tech School of Biological Sciences; Abigail Bockus, Louisiana Universities Marine Consortium; Terri J. Maness, Louisiana Tech School of Biological Sciences)

1:40 – 2:00 PM Water quality of Redwine Creek in the Grambling, LA area (*Austin R. Daily* and William B. Patterson, Louisiana Tech School of Agricultural Sciences & Forestry)

2:00 – 2:20 PM An analysis of drought and flood tolerance in bottomland hardwood trees (*Alexandra Eisley* and Brett T. Wolfe, LSU School of Renewable Natural Resources)

2:20 – 2:30 PM Break

LAPB Fall Business Meeting
2:30 – 4:30 PM

The LAPB Fall Business Meeting will include officer reports, old business discussions, and new business discussions. All current LAPB members are encouraged to attend.

Keynote Presentation
5:45 – 7:00 PM

5:45 – 6:00 PM Oral Presentation, Publication, & Photography Award Announcements

6:00 – 7:00 PM Wildlife and my life: how wildlife changes me toward positivity (*Dr. Chokchai Box Leangsuksun*, Wildlife Photographer, Louisiana Tech Department of Computer Science)

Dr. Box Leangsuksun is an Associate Professor of Computer Science and SWEPCO Endowed Professor at Louisiana Tech University. His true passion, however, is wildlife photography, traveling the world seeking to capture perfect moments that tell a story of his life changing journey. Several of his recent works have been awarded and decorated in various national and international venues, such as the Highly Honored award in Nature Best's Yellowstone Forever International Nature Photography Contest and multiple years as winner of the top 100 images from the National Audubon Society Photo Contest. His images have also been published in National Geographic's magazine and on their website.

Friday, August 13, 2021

Focus Session
Abstracts ~ Pages 13 – 14

9:00 – 9:45 AM	Effects of severe weather in 2020–2021 on waterfowl survival (*Kevin M. Ringelman* and Elizabeth S. Bonczek, LSU School of Renewable Natural Resources; Paul T. Link, Louisiana Department of Wildlife & Fisheries; Douglas C. Osborne, University of Arkansas-Monticello)
9:45 – 10:30 AM	The impact of severe weather events on the Kisatchie National Forest (*Matt Pardue*, U. S. Forest Service, Kisatchie National Forest Calcasieu Ranger District)
10:30 – 11:15 AM	A look back at higher-education adaption to the Coronavirus (*Joshua P. Adams*, Louisiana Tech School of Agricultural Sciences & Forestry)
11:15 AM	Closing Remarks

Kevin Ringelman

Matt Pardue

Joshua Adams

Student Research Symposium – Presentation Abstracts

Stationary PIT-tag readers provide new insights on nest box use, survival and recruitment of cavity-nesting waterfowl in Louisiana

Katie Miranda, Undergraduate Student, LSU School of Renewable Natural Resources
Kevin M. Ringelman, Associate Professor, LSU School of Renewable Natural Resources

Although North American ducks are a well-studied group of birds, we know astonishingly little about the nesting ecology of black-bellied whistling-ducks (*Dendrocygna autumnalis*). Native to Central and South America, the breeding distribution of this species has rapidly expanded throughout the United States since the late 20th century. Intraspecific brood parasitism is a common breeding strategy for black-bellied whistling-ducks, and recent research at LSU has indicated widespread interspecific parasitism of wood duck (*Aix sponsa*) nests, which has the potential to negatively affect egg hatchability and reproductive success. Typical field methods used to study nesting waterfowl involve analysis of the incubating individual that is captured and banded on the nest, as well as nest information (e.g. clutch size, nest age, parasitism) at 7-day intervals. This excludes other potential drivers of reproductive success including nest prospecting behavior, parasitic egg laying behavior, and number of nests failing prior to capture/incubation. Our objective is to quantify those drivers using radio frequency identification (RFID) technology. Stationary RFID readers were installed in May 2021 on duplex style nest boxes to detect several hundred wood ducks and whistling-ducks that were marked with passive integrated transponder tags (hereafter, PIT-tag) in 2020 and 2021. These readers record each time a PIT-tagged individual enters or leaves the nest box, giving way for the study of the once excluded individuals mentioned before. Although many of the readers eventually failed due to Louisiana's harsh climate (Louisiana-proofing them is an ongoing battle), the data we were able to collect during the 2021 field season has provided novel insight on the nesting patterns of both species. Many individuals detected by the RFID readers were never otherwise captured on the nest, suggesting how new technology can reshape the way we study cavity-nesting waterfowl.

Evaluating the mottled duck nest predator community in southwest Louisiana using camera traps and artificial nests

Alexandre L. Dopkin, Graduate Student, LSU School of Renewable Natural Resources
Kevin M. Ringelman, Associate Professor, LSU School of Renewable Natural Resources

Mottled ducks (*Anas fulvigula*) are a waterfowl endemic to the Gulf Coast of the United States. Although their population in Texas is relatively stable, the mottled duck population in Louisiana has declined by more than two thirds in the past decade. Recruitment, driven by nest success, is the most important factor limiting closely-related dabbling duck populations, and predation of eggs is the most frequent cause of mottled duck nest failures. Between March – July 2021, we deployed trail cameras and artificial nests to investigate the predator community in southwest Louisiana, identify important nest predators, and estimate the relative predation risk in important mottled duck breeding habitats (i.e., upland, cutgrass marsh, cordgrass meadows, and terraces). Data analysis is ongoing, however preliminary review of trail camera footage has documented American mink (*Neovison vison*), common raccoon (*Procyon lotor*), coyote (*Canis latrans*), American alligator (*Alligator mississippiensis*), western ratsnake (*Pantherophis obsoletus*),

American crow (*Corvus brachyrhynchos*), grackles (*Quiscalus* spp.), clapper rail (*Rallus criptans*) and king rail (*Rallus elegans*), and purple gallinule (*Porphyrio martinicus*) depredating artificial nests. Inundation and land management practices such as plowing also contributed to a substantial proportion of nest failures. We will compare Mayfield nest success rates, with at least one egg surviving the trial period indicating a success, between each of these habitats and calculate the proportion of depredations caused by each predator species. This information directly supports efforts to better understand causes of mottled duck nest failure, and how the severity of nest depredations may be contributing to the decline of Louisiana mottled ducks.

Spatial and temporal variation in survival of female mottled ducks in southwest Louisiana

Elizabeth S. Bonczek, Graduate Student, LSU School of Renewable Natural Resources
Kevin M. Ringelman, Associate Professor, LSU School of Renewable Natural Resources

Mottled ducks (*Anas fulvigula*) are endemic to the Gulf Coast of the southern United States, and are non-migratory throughout their range. Because of this, they rely on coastal marsh and associated habitat to completely fulfill their needs across the annual cycle. Mottled duck numbers have shown a decline over the past few decades and the 2018 Louisiana breeding survey recorded the lowest number of birds since the survey started. As the landscape changes, it is crucial to identify the times of the year mottled ducks are most vulnerable to mortality and how this may be influenced by habitat. We captured 148 female mottled ducks during the summer remigial molt 2017-2019 and outfitted them with GPS-GSM transmitters to collect locations every two hours. We used the Known Fate procedure in program MARK to examine temporal and spatial variation in survival. According to our top model, temporal variation in survival was best explained by the teal season, first and second hunting season splits, the non-hunted period and the proportion of locations logged in agricultural habitat. Mottled ducks, which logged a higher proportion of locations in agriculture, exhibited higher weekly survival. Annual survival was 62%. By understanding when mottled ducks are most vulnerable to mortality and how this risk may vary across the landscape, wildlife managers can implement targeted conservation and management strategies for the benefit of this flagship coastal marsh species.

Black-bellied whistling-duck and wood duck breeding season overlap and implications of interspecific nest parasitism

Dylan Bakner, Graduate Student, LSU School of Renewable Natural Resources
Kevin M. Ringelman, Associate Professor, LSU School of Renewable Natural Resources

Over the last 30 years, Louisiana Department of Wildlife and Fisheries (hereafter, LDWF) has maintained 2,000 nest boxes for wood ducks (*Aix sponsa*) across the state. During this time, the breeding distribution of black-bellied whistling-ducks (*Dendrocygna autumnalis*) has expanded. LDWF biologists now frequently encounter black-bellied whistling-ducks occupying nest boxes. There is a growing concern that both species may be competing for nest boxes, which could limit wood duck productivity. No studies have focused on how both species interact with one another during the breeding season. Therefore, our objectives are to 1) determine the duration of overlap in nest initiation dates, 2) quantify interspecific nest parasitism, and 3) compare nest success estimates for both traditional and parasitized wood duck nests. During February 4 – July 28, 2020, we monitored 314 nest boxes weekly at Sherburne and Alexander State Forest Wildlife

Management Areas. For each nest, we estimated a nest initiation date, documented clutch characteristics (e.g., how many eggs belonging to each species), and determined if it hatched or failed. We constructed nest survival models to derive estimates of nest success. Nest initiation dates for wood ducks ranged from January 21 – June 22, and March 21 – July 27 for black-bellied whistling-ducks. There was a period of 93 days when nest initiation dates overlapped for both species. Of the 420 wood duck nests we monitored, 192 were initiated during the overlap period where 56 were parasitized by black-bellied whistling-ducks. Our nest success estimate for nests containing no parasitic eggs was 46.5% and 31.5% for those containing parasitic eggs. Our results suggest wood ducks spend over half the breeding season nesting along with black-bellied whistling-ducks. Interspecific nest parasitism does occur and lowered wood duck nest success. Our future research will focus on determining the broader consequences to the wood duck population.

Weather effects on invertebrate abundance in wetlands in the Prairie Pothole Region

Ashley K. Tunstall, Undergraduate Student, LSU School of Renewable Natural Resources
Catrina V. Terry, Ducks Unlimited, Great Plains Regional Office
Kevin M. Ringelman, Associate Professor, LSU School of Renewable Natural Resources

The Prairie Pothole Region of North and South Dakota provides brood rearing habitat for a variety of waterfowl species, most of which migrate to the southern United States during winter. Waterfowl broods particularly rely on invertebrates to survive during early weeks of development. The abundance and species composition of invertebrates in the region may be influenced by ephemeral abiotic factors that are difficult to evaluate, especially variation in daily weather. Using weather data downloaded from The National Oceanic and Atmospheric Administration (NOAA) and invertebrate samples from prairie wetlands collected from surface activity traps in the summers of 2019 and 2020, we attempted to diagnose the effects of weather conditions on total invertebrate abundance. We log-transformed total invertebrate abundance and used regression to diagnose effects of maximum and minimum temperature, average daily wind speed, and percent lunar illumination. We found no relationship between invertebrate abundance and any of the weather conditions we modeled (confidence intervals for all coefficients bounded zero). However, our invertebrate samples were collected over a relatively short time period to achieve objectives of a related study, so the corresponding weather data may not have been variable enough to drive differences in invertebrate abundance. Improved experimental design would be necessary to improve external and internal validity. Nevertheless, knowing that modest summer variation in weather does not impact prairie wetland invertebrate abundance has important implications for understanding the daily forage availability of ducklings that later make their way to the southern states in fall and winter.

A novel protozoan associated with the reproductive tract of white-tailed deer (*Odocoileus virginianus*) in Louisiana

Hope Hebert, Graduate Student, ULM School of Sciences, College of Arts, Education, and Sciences
Kim Marie Tolson, Professor, ULM School of Sciences, College of Arts, Education, and Sciences
Jim LaCour, State Wildlife Veterinarian, Louisiana Department of Wildlife and Fisheries

White-tailed deer (*Odocoileus virginianus*) are the primary large game mammal found in Louisiana and are therefore monitored regularly by the Louisiana Department of Wildlife and Fisheries to ensure healthy and thriving populations. In 2017, hunter harvest data from Sherburne WMA indicated a decrease in fawn production and lowered lactation rates of adult does (J. LaCour, personal communication). Hunter-harvested deer from three regions in Louisiana were tested for *Tritrichomonas foetus*, a protozoan often found in cattle herds. The protozoan is responsible for trichomoniasis, a sexually transmitted infection that results in spontaneous miscarriage and infertility in cows after copulation with an infected bull. In cattle, bulls are often asymptomatic and lifelong carriers, and common practice is to cull infected males to prevent further infection. *Tritrichomonas foetus* is found in a variety of animal hosts, but there has never been a study showing its presence in white-tailed deer. This research project aims to determine the presence and prevalence of *T. foetus* in the deer population, providing the groundwork for future research into the pathology and improving management practices for deer in Louisiana.

Spatially Explicit Population Estimation of the Louisiana Black Bear

Dustin Champagne, Graduate Student, Louisiana Tech School of Biological Sciences
Heidi L. Adams, Associate Professor, LaTech School of Agricultural Sciences & Forestry
Joseph D. Clark, Branch Chief, USGS Southern Appalachian Field Branch

The Louisiana black bear (*Ursus americanus luteolus*) inhabits a small portion of the former species' range, prior to European colonization and subsequent habitat fragmentation and loss. The species gained threatened status in 1992 from the U. S. Fish and Wildlife Service (USFWS) and benefited greatly from a recovery plan indicating a minimum of 2 viable subpopulations. Black bears currently exist in 4 subpopulations in Louisiana: in the Tensas River Basin (TRB), Upper (UARB) and Lower Atchafalaya River Basins (LARB), and the Repatriated Subpopulation (REPAT). In 2015, the Louisiana black bear threatened status was removed by the USFWS as viable populations were found in suitable habitat in the TRB and UARB, with ongoing successful repatriation happening in east-central Louisiana. Our objectives are to estimate population abundance and density of the Louisiana black bear across the Mississippi Alluvial Valley (MAV) in the TRB, REPAT, and UARB using spatially explicit methods with cluster sampling. Spatially explicit capture-mark-recapture (SCR) has been used to acquire DNA through hair samples captured on barbwire hair snares arranged in 3 x 3 clusters, with each snare 2 km apart and each cluster centered 16 km apart. Landscape variables such as cover, distance to water or human habitation, distance to roads, and habitat types will be detected with samples as covariates that will inform extrapolation analyses and population estimates. Westward expansion of black bears in Louisiana due to flooding and their successful population recovery has also created a number of anthropogenic nuisance and conflict scenarios across the state. Estimating the black bear population across the majority of its known range will allow for more precise management and conservation of the species, which in turn benefits other wildlife as well.

The 2020 Survey of Louisiana Waterfowl Hunters

Michael Sullivan, Graduate Student, LSU School of Renewable Natural Resources
Luke Lombarde, Instructor, LSU School of Renewable Natural Resources
Michael Kaller, Professor, LSU School of Renewable Natural Resources

Louisiana surveys waterfowl hunters every 5 years to assess harvest, harvest effort, demographics, specific management objectives, and to research hypotheses derived from previous surveys of waterfowl hunters. In the 2020 survey, research hypotheses addressed hunter perceptions of changing waterfowl migration patterns, and relationships between perceptions and avidity with survey distribution waves and sample coverage. We surveyed a stratified census of 68,578 Louisiana waterfowl hunters by email following the 2019–2020 season, and asked 31 questions about waterfowl-hunting effort, success, satisfaction, regulatory alternatives, and demographics. We used generalized linear models to test hypotheses about hunters' perception of waterfowl migration to Louisiana, satisfaction patterns (since 2005), associations of satisfaction, and locations hunted. We received 13,483 total responses and 8,218 usable responses with a qualified response rate of 12.0%. We compared qualified respondents to the overall population of HIP registrants (169,891), and found no significant differences for age class ($P = 0.99$), geographic distribution ($P = 0.92$), and license type ($P = 0.99$). Model outcomes indicated that surveys should be distributed in multiple waves, as avidity (days hunted) decreased in later waves of distribution ($P < 0.01$). Results from the survey also indicated that both success in harvest, and meeting and exceeding harvest expectations, increase satisfaction ($P < 0.01$). Furthermore, hunters' satisfaction was independent of how many waterfowl they saw ($P = 0.06$), which zone they hunted ($P = 0.35$), or whether they were members of conservation organizations ($P = 0.60$). These findings suggest that both accurate expectations and success in harvest define hunters' satisfaction.

The influence of commercial forestry practices on seasonal bat species occurrence and relative activity in central Louisiana

Jane M. Kunberger, Graduate Student, LSU School of Renewable Natural Resources
Ashley M. Long, Assistant Professor, LSU School of Renewable Natural Resources

In the southeastern U.S., where forests are the primary land cover type and trees are often harvested for production purposes, understanding how commercial forestry practices influence bat distributions is critical for bat conservation and management. Our goal was to examine the influence of commercial forestry practices on seasonal bat species occurrence and relative activity in loblolly pine (*Pinus taeda*) forests of central Louisiana. We deployed passive acoustic bat monitors at sites representing six treatments (group selection harvests, thinned stands, and clearcuts in loblolly pine; pine managed for red-cockaded woodpeckers [*Leuconotopicus borealis*]; bottomland hardwood forest; and controls), during seasons that corresponded with "non-breeding" (January–February) and "breeding" (July–August) periods. We also collected environmental data at the landscape and local scales to characterize our study sites. We detected *Eptesicus fuscus, Lasiurus borealis, Myotis austroriparius*, *Perimyotis subflavus, Tadarida brasiliensis,* and *L. cinereus* during both seasons, and additionally detected *Nycticeius humeralis* during the breeding season. *P. subflavus, N. humeralis,* and *L. borealis* were more active in group selection harvest compared to other treatments during the 2020 breeding season, and *L. borealis* was more active in group selection harvest compared to control and thinned treatments

during the 2021 non-breeding season. The results of our occupancy analyses suggested that the predicted probability of *M. austroriparius* occupancy decreased with increasing DBH and snag density during the 2020 non-breeding season, but increased with increasing DBH and snag density during the 2020 breeding season. Similarly, the predicted probability of *E. fuscus* occupancy increased with increasing shrub cover during the 2020 breeding season but decreased with increasing shrub cover during the 2021 non-breeding season. Our research is ongoing and will help identify forest management practices and habitat characteristics that promote high bat species diversity and activity and will improve our knowledge on the natural history of southeastern bat species.

Characterization of a shell-rot disease affecting freshwater turtles in a northeast Louisiana bayou

Nelle L. Jenkins, Undergraduate Student, ULM School of Sciences, College of Arts, Education, and Sciences
Kim Marie Tolson, Professor, ULM School of Sciences, College of Arts, Education, and Sciences
John L. Carr, Professor, ULM School of Sciences, College of Arts, Education, and Sciences
Jim LaCour, State Wildlife Veterinarian, Louisiana Department of Wildlife and Fisheries

Freshwater turtles that inhabit the small stretch of Bayou Desiard that runs through the University of Louisiana Monroe campus have been studied by ULM biology classes over the past 20 years. In this time, faculty have observed turtles in the family Emydidae were exhibiting chronic ulcerative shell lesions. This is to be the first investigative study into the disease in this area. Investigators hope to assess the ecological impact of this event by determining the percentage of total population affected as well as the geographic distribution. Since June of 2020, 140 freshwater turtles have been captured on ULM's campus. Of these, every species that is normally found in Bayou Desiard is represented at least once. From the 140 turtles captured, 93 individuals belonged to the family Emydidae. Of all turtles captured, 23 exhibited shell lesions which results in a 16.43% prevalence rate within the total population. However, the captured individuals who exhibited lesions belonged strictly to Emydidae, resulting in a prevalence within that family of 24.73%. Infected turtles that are captured are held in the lab as behavioral and physical data are collected and then euthanized according to IACUC protocol. All turtles exhibiting lesions are scored according to the method (Total Shell Disease Score) of Hernandez, et al. (2009). Turtles receiving a TSDS of ≥15 (out of 24) exhibited a depressed mentation and slowed righting response. Turtles with a TSDS of ≥20 exhibited severe lethargy demonstrated by absence of a righting response and decreased flexor response. Turtles with similar shell lesions have been documented in other states, but none have been successful in documenting a causative agent. It is the hope of researchers that this study will standardize investigative efforts for future studies of this nature.

Pass the Salt! Environmental predictors of brown shrimp abundance in Louisiana

Caitlyn A. Fontenot, Undergraduate Student, Louisiana Tech School of Biological Sciences
Abigail Bockus, Assistant Professor, Louisiana Universities Marine Consortium
Terri Maness, Associate Professor, Louisiana Tech School of Biological Sciences

Shrimp are a crucial part of Louisiana's economy and ecosystems. Understanding the environmental factors that affect shrimp abundance can help us protect them and their habitats. It can also inform fisherman of the best times and places to catch shrimp. We assessed the influence of salinity, temperature, turbidity, oxygen, and trawling equipment on brown shrimp (*Farfantepenaus aztecus*) abundance across coastal Louisiana. Louisiana Department of Wildlife and Fisheries trawling data were analyzed from January to August 2020 using general linear mixed models. The dataset included 1539 trawls from 194 different trawling sites with site treated as a random variable. Date and type of trawling gear both influenced how many shrimp were caught in trawls. The most important environmental predictor of abundance was salinity in that abundance declined rapidly when salinity dropped below 8 ppt. Temperature and turbidity were also important indicators explaining variability in number of shrimp caught. Our results allow us to examine how changes in estuaries and marshes will impact shrimp survival and abundance with important implications for coastal management, including the creation and management of river diversions.

Water quality of Redwine Creek in the Grambling, LA area

Austin R. Daily, Undergraduate Student, Louisiana Tech School of Ag. Sciences & Forestry
William B. Patterson, Associate Professor, Louisiana Tech School of Ag. Sciences & Forestry

The Watershed Management class at Louisiana Tech University has measured water quality in Redwine Creek in Lincoln and Jackson Parishes since 1998, and has measured elevated levels of phosphate at times during this period. In order to understand this observed trend, students from 2013 to the present measured water quality in Redwine Creek at five locations: near its headwaters at Fiberboard Rd. west of Grambling, Igoe Inn Rd. west of Grambling, Grambling State University at Facilities Rd., at US 80 just downstream of the City of Grambling's water treatment plant, and downstream at Ansley Rd. in Jackson Parish. Discharge (flow) was calculated based on measured velocity and cross-sectional area. Phosphate, Nitrate, Nitrite, and Ammonia concentrations were measured using Chemetrics CHEMets ampoule kits. Dissolved Oxygen and temperature were measured using the YSI ProODO Optical Dissolved Oxygen Meter. Turbidity was measured using the MicroTPW Field Turbidimeter. Water pH was measured using the Oakton pHTestr 20 double junction pH meter. Coliform presence was indicated by incubation. Aquatic species were sampled on one date by seining, dip netting, and cast netting for 30 minutes at each location. Results reported here are from four dates in Spring 2019. Discharge or flow of Redwine Creek increased downstream from Fiberboard Rd. to Igoe Inn Rd., to Grambling State University, to US80, and peaked at Ansley Rd. Phosphate and Ammonia concentrations at US 80 were elevated beyond proposed water quality impairment levels for EPA's South Central Plains Ecoregion. The US80 location also had the highest temperature and lowest Dissolved Oxygen of all the sampled locations, despite having the second highest flow. Coliform bacteria were present at each location. Aquatic species richness decreased from Fiberboard Rd. to US80. Results indicate that the US80 location had impaired water quality for phosphate and ammonia.

An analysis of drought and flood tolerance in bottomland hardwood trees

Alexandra Eisley, Graduate Student, LSU School of Renewable Natural Resources
Brett T. Wolfe, Assistant Professor, LSU School of Renewable Natural Resources

Climate change is expected to create prolonged physiological stress on the planet's forests. This fact merits research into plant physiological traits related to tolerance to water stress is gaining priority for incorporation into projective ecological modeling and species selection. Therefore, I investigated the plant physiological trait, turgor loss point (TLP) and its role as an indicator of drought and flood tolerance within bottomland hardwood forest species in Louisiana, while simultaneously testing a new method of TLP acquisition with tree species. To explore these connections, leaf samples from 20 tree species were collected on Richard K. Yancey Wildlife Management Area, located in Concordia Parish, Louisiana, U.S. First, I explored the efficiency of remote sensing as a method for acquiring TLP using a spectroradiometer to measure leaf reflectance spectra. A partial least square regression (PLSR) was used to relate the spectral reflectance values to values of TLP obtained via the osmotic potential at full turgor within the same leaf samples. Results from the PLSR found a relationship between the observed values of TLP and predicted TLP (r^2 = 0.63) within species. Secondly, to explore a connection between TLP and drought and flood tolerance, two Pearson's Correlation analyses were performed between values of averaged species TLP and species drought and flood tolerance rankings obtained from related literature. A weak relationship was found (r^2= 0.45) within the drought tolerance analysis, with TLP being inversely related to tolerance rankings. No significance was found within the flooding tolerance correlation (r^2 = 0.29). Lastly, I explored the spatial plasticity of TLP across two site conditions (flooded and non-flooded), however after preforming a paired t-test analysis no significant differences were found in averaged TLP between the two habitats. Future research will continue with the exploration into temporal plasticity of TLP within growing season (early and late) after a second round of collection in the fall of 2021.

Focus Session – Presentation Abstracts

Effects of severe weather in 2020–2021 on waterfowl survival

Kevin M. Ringelman, Associate Professor, LSU School of Renewable Natural Resources
Elizabeth S. Bonczek, Graduate Student, LSU School of Renewable Natural Resources
Paul T. Link, Waterfowl Biologist Manager, Louisiana Department of Wildlife & Fisheries
Douglas C. Osborne, Associate Professor, University of Arkansas-Monticello

Severe storms along the Gulf Coast have the potential to negatively affect waterfowl survival, either through acute effects (i.e., direct mortality) or chronic effects (i.e., habitat loss and degradation). These storms include hurricanes in the late summer which have the potential to affect breeding and post-breeding mottled ducks (*Anas fulvigula*), and ice storms in winter, which can affect numerous species of non-breeding waterfowl. Often, direct mortalities caused by storms are difficult to document, especially in the case of hurricanes where data collection is either logistically impossible or deprioritized in the wake of human tragedy. Here, we used data collected using GPS-GSM transmitters to provide information on survival rates of mottled ducks following the passage of Hurricane Laura on 27 August 2020, and also document widespread

mortality in greater white-fronted geese (*Anser albifrons*), and dabbling ducks (*Anas* and *Mareca* spp.) following the ice storm that crippled the southern United States in late February 2021. Mottled ducks suffered 58% mortality (7 out of 12 ducks) in when Hurricane Laura made landfall, and 67% overall mortality (12 out of 18 ducks) during the two month period bracketing landfall. Telemetry data indicated widespread mortality of geese and ducks following the February ice storm, and retrieval of those transmitters revealed mass mortality events of non-transmittered waterfowl in the surrounding area. Severe storms clearly have the potential to cause mass mortality events in both breeding and wintering waterfowl, and such storms are forecast to increase in frequency and intensity with climate change.

The impact of severe weather events on the Kisatchie National Forest

Matt Pardue, Wildlife Biologist, U. S. Forest Service, Kisatchie National Forest Calcasieu Ranger District

The Calcasieu Ranger District (RD) consists of over 100,000 acres across Rapides and Vernon Parish. It is 1 of 5 districts of the Kisatchie National Forest. It is split into 2 units – the Evangeline Unit and the Vernon Unit. The Calcasieu Ranger District hosts some of the best remaining longleaf forest in Louisiana. It is a very diverse landscape and home to many rare plants and animals as well as a healthy population of game birds and mammals. The Vernon-Fort Polk population of red-cockaded woodpeckers (RCW) is the largest in the state. The Vernon Unit in particular received significant damage from three separate wind events – the December 19, 2019 tornado and hurricanes Laura and Delta in 2020. Over 25,000 acres of severe damage to timber were identified since the aftermath of the wind events. More than half of the 1,500 RCW cavity trees were snapped or on the ground due to the wind events. This talk will focus on the tremendous efforts to install artificial cavities for RCW, road clearing, fire line clearing, timber salvage operations, the efforts to get recreational sites functional, ATV/UTV trail rehabilitation, and the future plans and potential obstacles for the Calcasieu RD.

A look back at higher-education adaption to the Coronavirus

Joshua P. Adams, Associate Professor of Silviculture and Forest Genetics, Interim Director of the Louisiana Tech School of Agricultural Sciences & Forestry

A little over a year and a half ago, higher education faced a challenging pivot to total remote learning. As the virus waves oscillated, programs grappled with how we could manage the online teaching, research, and outreach. During this time, new challenges emerged that most have not faced including student and professor quarantines, mental health, and the still daunting "how to teach a field class online." Various strategies to meet the imminent needs were greatly varied but coalesced around several prevalent constant themes. First, student engagement synchronously was both beneficial for their academic advancement and their mental health. Second, technology must be continually explored and invested in, and, with proper training, to meet any quick pivots due to quarantine and field lab needs. Third, lab-based research had the largest potential to be negatively affected. Finally, in most cases with most students, there is a need to get back face-to-face as quickly and safely as possible. Going forward, however, there is an opportunity to incorporate our new capabilities to improve our efficiency in our teaching and research as well as the dissemination to a larger audience.