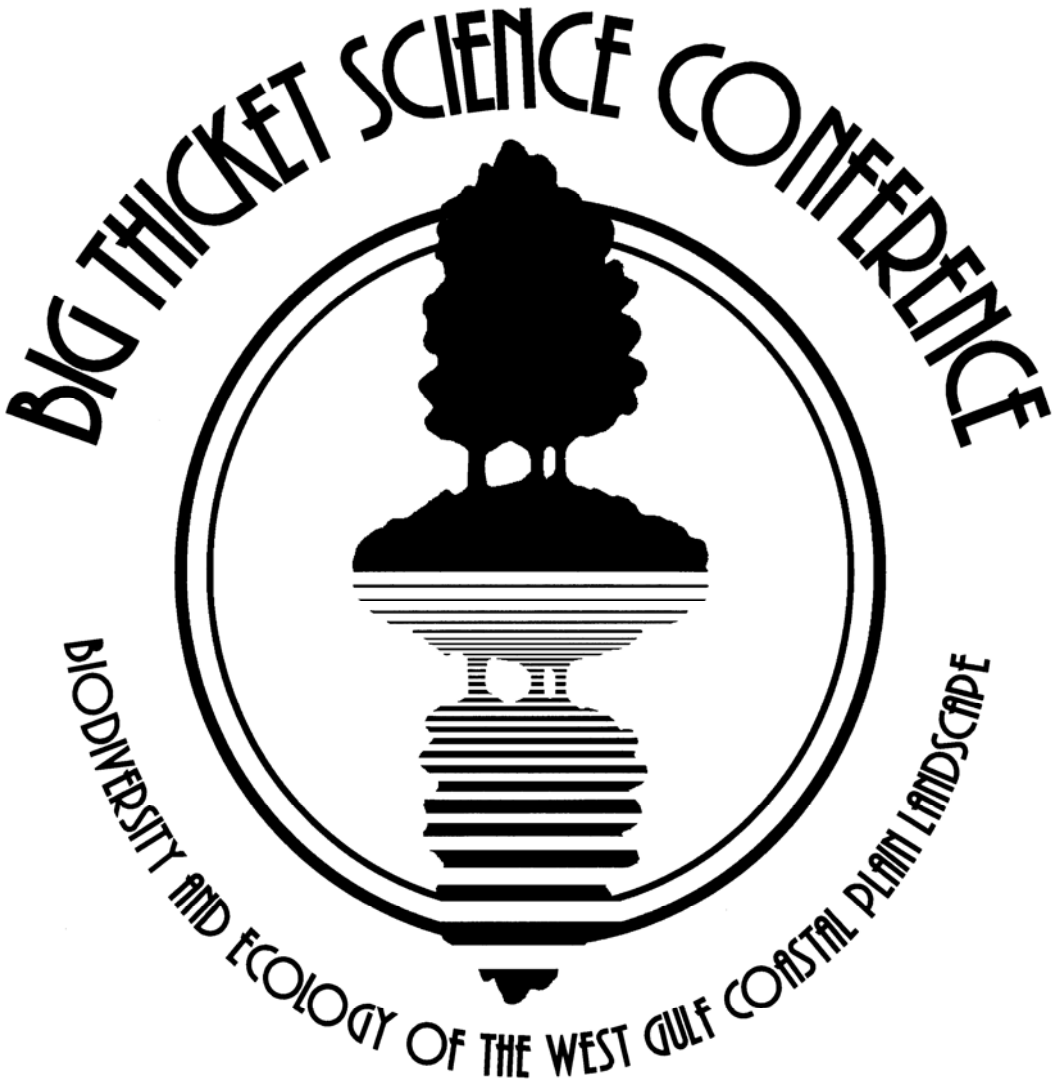


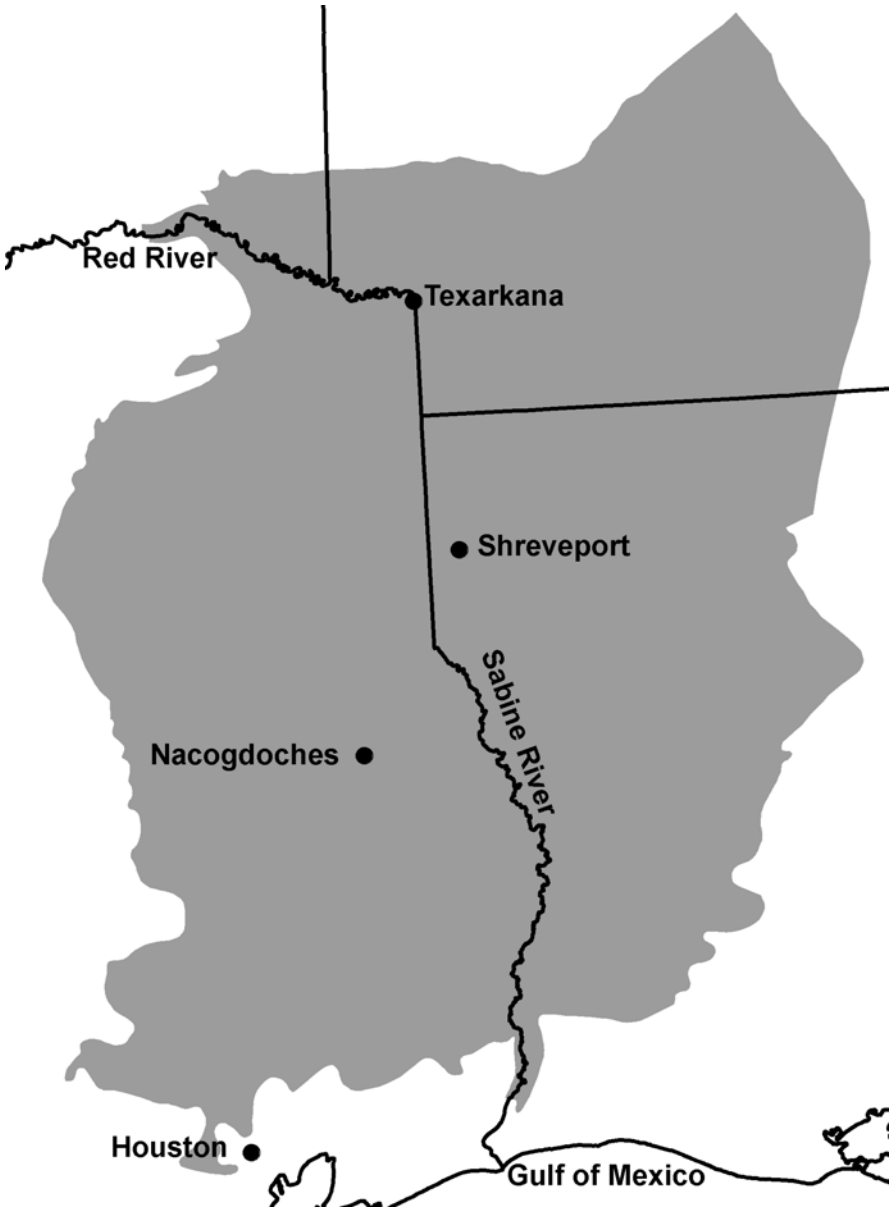
APRIL 8-10, 2011

STEPHEN F. AUSTIN STATE UNIVERSITY

NACOGDOCHES, TEXAS

CONFERENCE FOCUS

The Big Thicket is a biologically rich area within the West Gulf Coastal Plain where the influences of southeastern swamps, eastern deciduous forests, central plains, pine savannas and xeric sandhills meet and intermingle. The region provides habitat for many rare species and favors unusual combinations of plants and animals.



The purpose of the West Gulf Coastal Plain and Big Thicket Science Conference is to highlight the results of recent ecological research and conservation efforts to understand, manage and restore the unique biological diversity of the Big Thicket and surrounding West Gulf Coastal Plain. Selected papers will be published in a supplementary edition of *The Southeastern Naturalist.*

CONFERENCE UNDERWRITERS

U.S. Fish and Wildlife Service

U.S.D.A. Forest Service – Southern Research Station

Texas Parks and Wildlife Department

CONFERENCE SPONSORS (alphabetical order)

Advanced Ecology

Arthur Temple College of Forestry and Agriculture,
Stephen F. Austin State University

Azimuth Forestry

Big Thicket Association

Big Thicket National Preserve (National Park Service)

Pineywoods East Texas Partners

TABLE OF CONTENTS

CONFERENCE EVENTS

REGISTRATION AND INFORMATION

Registration begins at 7:30 AM, in *the Atrium on the Second Floor of the Baker Patillo Student Center*. (See map below). Walk-in registrants will be accepted Friday and Saturday. Information and personal messages can be obtained at the registration desk for the duration of the conference. See map below for location of the Foyer, Regent's Suite A, Regent's Suite B, and the Theatre.

PRESENTATIONS

All *presentations and posters* are to be submitted and/or delivered to the volunteers at the registration desk upon arrival to the Conference. We encourage all who are delivering oral presentations to deliver an electronic copy of their presentation to these volunteers so as to minimize last-minute confusion at the beginning of the different sessions. We request that all who are presenting posters to drop their poster to the volunteers at the registration desk upon arrival to the Conference. Volunteers will hang posters in their assigned positions.

All oral presentations will be delivered in either *Regent's Suite B* or the *SFASU Theatre*. Each presentation will be 20 minutes, and presenters are encouraged to allow ***up to*** 5 minutes of that time for questions.

All posters will be displayed in *Regent's Suite A*. The formal poster session is from 10:30-12:00 on Friday, April 8th. All posters can be a maximum of 48" long and 36" tall (or smaller). They will be displayed throughout the conference.

LUNCHES

Lunches will be located in the *Twilight Ballroom* on Friday (April 8th) and Saturday (April 9th) from 12:00-1:00. Lunches are included in the registration fee. A box lunch and drink is included in the field trip registration fee.

FRIDAY EVENING SOCIAL

A Texas-style buffet-barbeque and social will be held from 5:30-10:30 at The Vineyard (located 0.5 mi east of Loop 224 on FM 1878; see attached map). Beverages will be provided.

Live Texas-folk and historical-string music will be performed by the Attoyac Valley String Ensemble.

FIELD TRIPS

Optional field trips are planned for Sunday, April 10th.

Attendees will be required to sign-up for one specific trip and provide an e-mail address so that supporting materials and updates may be provided before the trip. Some privately-owned sites will NOT allow entry without a waiver and ID provided several days before the field trip. All travel will be by private vehicles. Conclusion points are provided below. Cave trip will be 30-40 min. jaunts between sites. Tonkawa Sandhills trip will involve roadside parking and walking in approximately 0.5 mile to sites. Be prepared to sign liability waivers for Field Trips 1 and 2.

Field trips will assemble on Sunday, April 10th at the Kroger grocery store parking lot under a U.S. flag. Kroger store #566 is located at 1215 North Street in Nacogdoches just south of SFA (see map below). Field trips will leave promptly at 8am. We will arrange the carpooling so that single-occupant vehicles will be kept to a minimum.

April is typically very pleasant and sometimes warm. Be prepared to encounter thick brush, wetlands and stinging and biting insects. Participants should wear appropriate clothing and closed footwear. It is suggested that participants bring a hat, sunscreen, insect repellent, extra drinking water and snacks. Optional items include field guides, cameras and binoculars. Field trip leaders will have first aid kits.

FIELD TRIP 1:

East Texas Sand Caves. Led by Will Godwin (wgodwin@hmns.org)

Three of these little known natural features occur within an hour of Nacogdoches. All occur on private property and this will be your lifetime opportunity to see them. Cave Springs Cave is relatively unchanged from Walker's 1891 description. All occur at the head of spring-fed beech ravines. All support wintering bat colonies which will be gone by the time of the visits. Other endemics are present. Historic and prehistoric evidence demonstrating the antiquity of Gunnels Cave will be visible. We plan to visit in order: Tonkawa Springs Cave, Cave Springs Cave, and Gunnel's Cave (a.k.a. Neuville Cave). Prepare yourself by reading Atkinson, G. L. 2003. The Caves and Pseudokarst of East Texas. Published by The Texas Speleological Survey Bulletin. Flashlights and rubber boots required. A helmet is recommended. Trip concludes on Hwy 96 between Center and San Augustine.

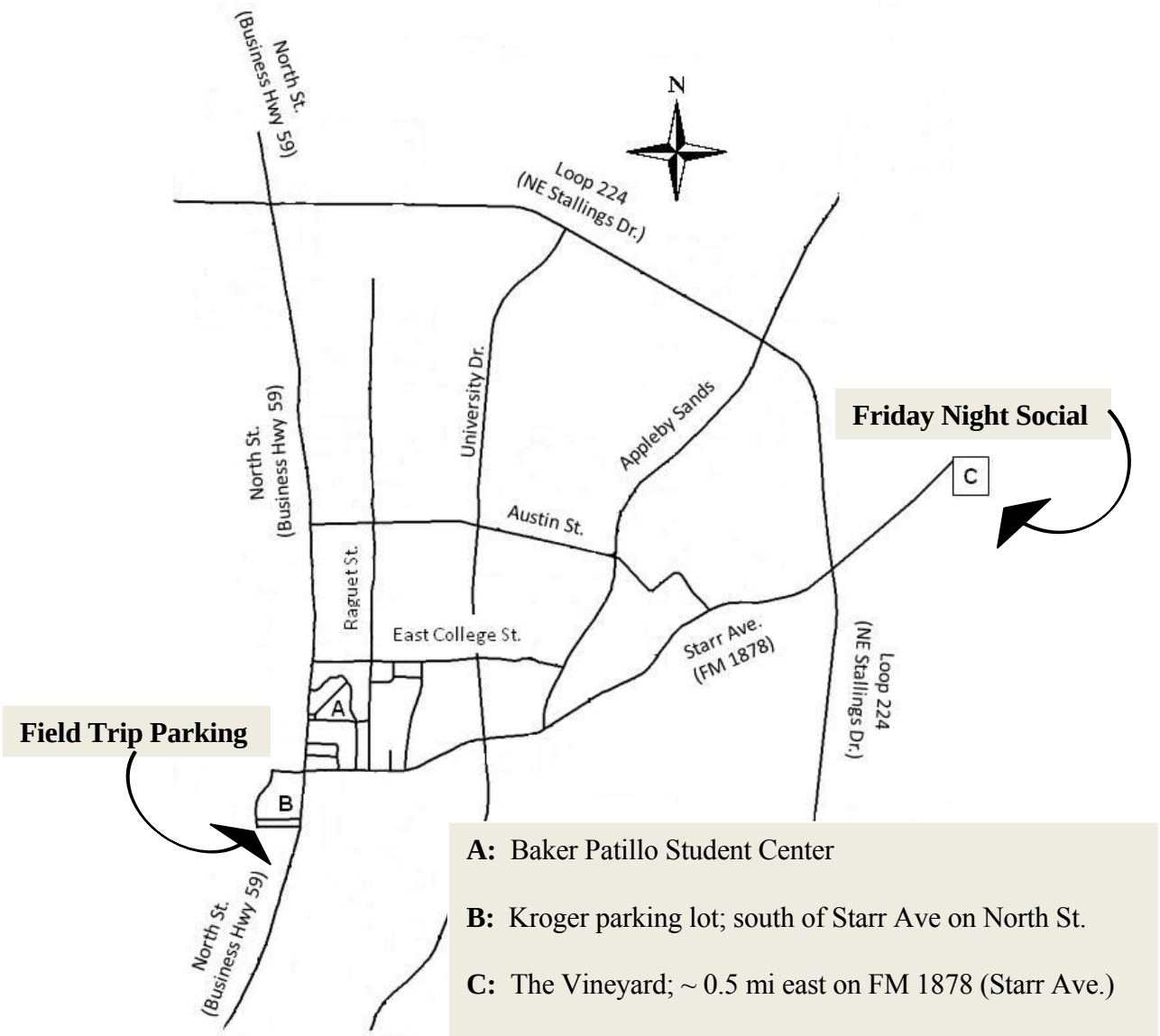
FIELD TRIP 2:

Tonkawa Sandhills Led by Jason Singhurst (jason.singhurst@tpwd.state.tx.us)

Tonkawa is located about 15 miles north of Nacogdoches. See acid seep forest and beech woods close to their NW range limit. Tonkawa Sandhills and springs is a unique ecosystem in eastern Texas. This system is a complex of xeric upland sandhills dominated by bluejack oak and a very diverse herbaceous flora. The sandhills are dissected by spring fed Fenton and Sandy Branch of Golandrina Creek and Naconiche Creek which contains baygall and peat substrate acid seep forests. Fenton Springs also contains a mature mesic slope forests dominated by American beech, white oak, hickory, and maple species, and rich herbaceous flora. Unique flora that will be encountered on this trip will include Texas trillium, rare Texas endemic Nixon's hawthorn, rare Texas endemic Carrizo leather flower, and a diversity of shrubs including spicebush, azalea, and spring form of grass of parnassus and barbed rattlesnake root. Boots and hiking/walking attire required. Rubber boots recommended. Trip concludes on Hwy 259 between Nacogdoches and Mount Enterprise.

FIELD TRIP 3:

Birding SFA Experimental Forest. Led by Cliff Shackelford (clifford.shackelford@tpwd.state.tx.us) Located about 25 minutes southwest of Nacogdoches, the SFA Experimental Forest is owned and managed by the U.S. Forest Service. This site includes a variety of habitats from bottomland hardwood forests to upland pine forests, which results in a diversity of birds. We will look for several forest species including a number of woodpeckers, warblers, and vireos. For many species, early April is the start of the breeding season and, with the forests full of birdsong, we will focus on detecting birds with our ears. Wear comfortable walking shoes and bring binoculars. Trip concludes at the front gate of the Experimental Forest shortly after lunch. For a list of the birds of the Pineywoods, please visit the West Gulf Coastal Plain ecoregional checklist found here: http://www.tpwd.state.tx.us/huntwild/wild/birding/pif/ecoregions/

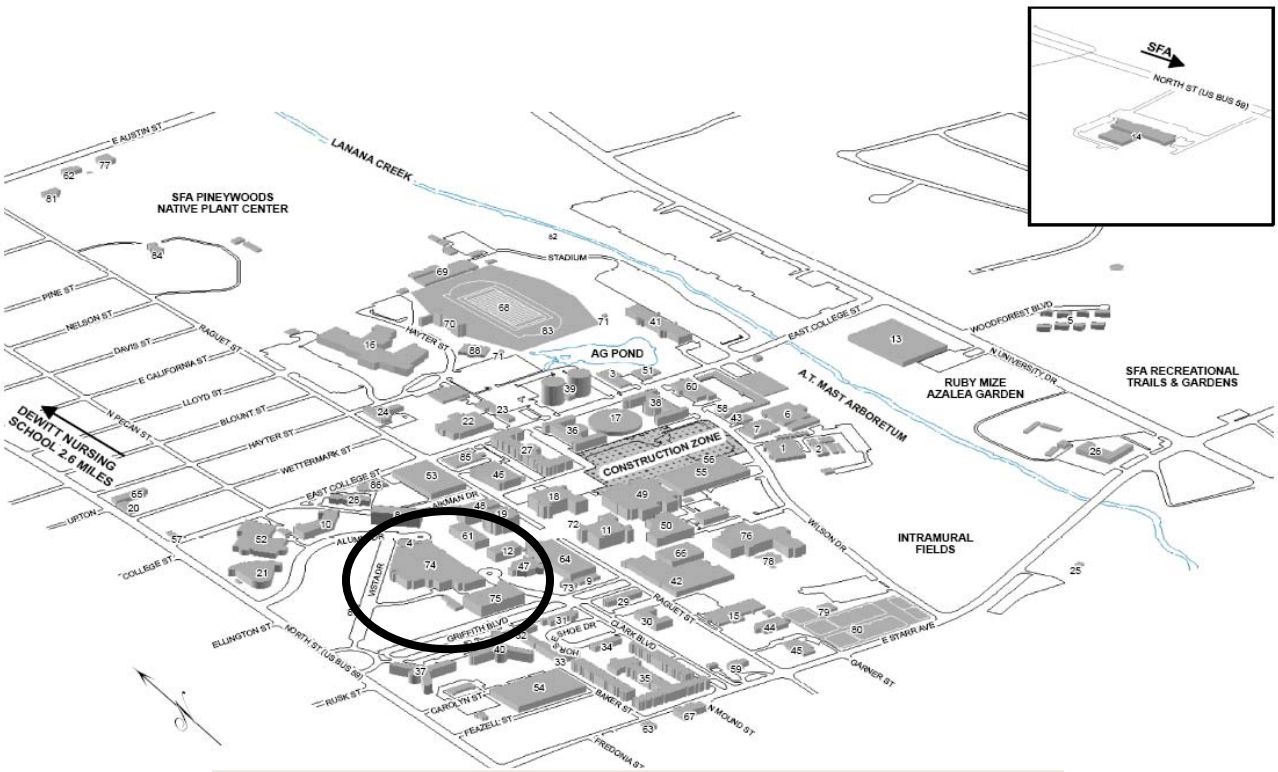


A: Baker Patillo Student Center

B: Kroger parking lot; south of Starr Ave on North St.

C: The Vineyard; ~ 0.5 mi east on FM 1878 (Starr Ave.)

STEPHEN F. AUSTIN STATE UNIVERSITY
CAMPUS MAP



Building #74: Baker Patillo Student Center

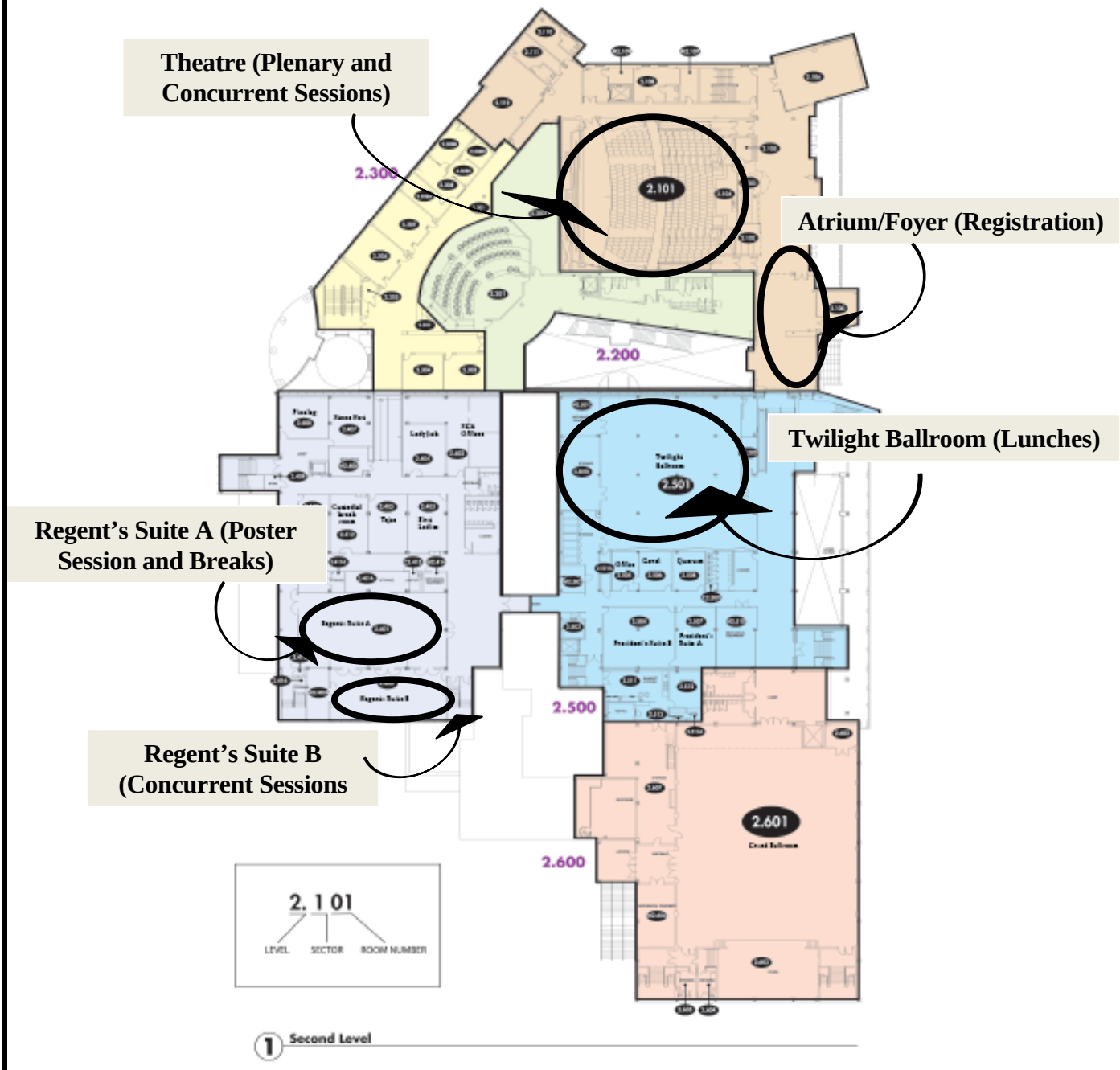
Building #75: Baker Patillo Student Center Parking Garage

Columbia
Regional Geospatial Service Center

REVISED 07/28/2010

STEPHEN F. AUSTIN STATE UNIVERSITY

Baker Patillo Student Center



CONFERENCE SCHEDULE

FRIDAY APRIL 8TH, 2011

TIME	EVENT	LOCATION
7:30 a.m.	**Registration/Check-In**	**Atrium/Foyer**
8:15-8:30	**Opening Remarks:** *Dr. Dan Saenz; USDA, US Forest Service* *Dr. Steven Bullard; Stephen F. Austin State University* *Dr. Warren Conway/Dr. Chris Comer; Program Chairs*	**Theatre**
8:30-10:30	**Plenary Session:** *Dr. R. Neal Wilkins; Texas A&M University* *Dr. Camille Parmesan; University of Texas - Austin*	**Theatre**
10:30-12:00	**Poster Session**	**Regent's Suite A**
12:00-1:00	**Lunch**	**Twilight Ballroom**
1:00-4:40	**Concurrent Sessions**	
1:00-2:40	**Session I: *LONGLEAF PINE***	**Theatre**
1:00-2:40	**Session II: *INVERTEBRATE ECOLOGY***	**Regent's Suite B**
2:40-3:00	**Break**	**Regent's Suite A**
3:00-4:40	**Session III: *ANIMAL ECOLOGY I***	**Theatre**
3:00-4:40	**Session IV: *ECOLOGICAL HISTORY AND PLANNING***	**Regent's Suite B**
5:30-10:30	**Social/BBQ Buffet**	**The Vineyard**

CONFERENCE SCHEDULE

SATURDAY APRIL 9TH, 2011

TIME	EVENT	LOCATION
8:00-12:00	**Concurrent Sessions**	
8:00-9:40	**Session V: *ANIMAL ECOLOGY II***	**Theatre**
8:00-9:40	**Session VI: *ANIMAL ECOLOGY III***	**Regent's Suite B**
9:40-10:00	**Break**	**Regent's Suite A**
10:00-12:00	**Session VII: *RESTORATION ECOLOGY***	**Theatre**
10:00-12:00	**Session VIII: *RIPARIAN/WETLAND ECOLOGY***	**Regent's Suite B**
12:00-1:00	**Lunch Buffet**	**Twilight Ballroom**
1:00-4:40	**Concurrent Sessions**	
1:00-3:00	**Session IX: *PLANT ECOLOGY I***	**Theatre**
1:00-3:00	**Session X: *ANIMAL ECOLOGY IV***	**Regent's Suite B**
3:00-3:20	**Break**	**Regent's Suite A**
3:20-5:00	**Session XI: *PLANT ECOLOGY II***	**Theatre**
3:20-4:40	**Session XII: *ECOSYSTEM CONSERVATION***	**Regent's Suite B**

PLENARY SPEAKERS: BIOGRAPHIES

DR. R. NEAL WILKINS:

Dr. Wilkins is a Professor of Wildlife Science and Director of the Institute of Renewable Natural Resources at Texas A&M University. His primary focus is management and conservation of land, water, and wildlife resources on private lands. Much of his work integrates science, policy, and economics for developing incentive-based conservation programs. Until 2006 he was statewide program leader for wildlife & fisheries with Texas Agrilife Extension Service. Prior to joining the Texas A&M faculty in 1998, he directed wildlife and fisheries programs for Port Blakely Tree Farms, a forest landowner in the Pacific Northwest. He currently serves as Vice President for the Texas Wildlife Association and is a professional member of the Boone & Crockett Club. He is a Governor appointee to the Texas Farm & Ranchlands Conservation Council and serves on the Board of Trustees for the Foundation for Economics and the Environment, Texas Wildlife Association Foundation and Houston Wilderness. Professor Wilkins holds a Bachelor of Science degree in Forestry from Stephen F. Austin State University, a Masters of Wildlife Science from Texas A&M University, and a Ph.D. in Wildlife Ecology from the University of Florida.

DR. CAMILLE PARMESAN:

Dr. Parmesan is on the faculty in Integrative Biology at the University of Texas at Austin. Her work focuses on the current impacts of climate change on wildlife, from field-based work on American and European butterflies to synthetic analyses of global impacts on a broad range of species across terrestrial and marine biomes. This body of research has received multiple awards from ISI for being highly cited. She has been involved as an author and reviewer in multiple reports for the Intergovernmental Panel on Climate Change, and shares in the Nobel Peace Prize awarded to IPCC in 2007.

She works actively with governmental agencies (*e.g.* USFWS) and non-governmental organizations (*e.g.* WWF, IUCN, TNC) to help develop conservation assessment and planning tools aimed at preserving biodiversity in the face of climate change. She has received several awards for these efforts: the National Wildlife Federation's Conservation Achievement Award in Science; named as "Outstanding Woman Working on Climate Change," by IUCN; and named as "Who's Who of Women and the Environment" by the United Nations Environment Program (UNEP) in honor of "International Women's Day". Her work has been highlighted in hundreds of scientific and popular press articles, such as in *Science News,* the New York Times, the London Times, National Geographic, Scientific American, Science ét Vie, Audubon magazine, National Public Radio, Earth&Sky, the BBC film series "State of the Planet" with David Attenborough, and ABC's "Nature's Edge" series with Bill Blakemore.

DETAILED SESSION SCHEDULE

FRIDAY APRIL 8, 2011

THEATRE: SESSIONS I AND III 1:00-4:40

SESSION I: LONGLEAF PINE

- **Session Moderator: Todd Nightingale**

1:00-1:20 NIGHTINGALE, T. ***Texas-Louisiana Longleaf Taskforce Implementation Team.***

1:20-1:40 LOPEZ, R. ***America's Longleaf: a landscape restoration initiative.***

1:40-2:00 HAYWOOD, J.D. ***Influence of climate and management on seasonal needle fall in a longleaf pine stand in central Louisiana.***

2:00-2:20 ELLEDGE, J. ***Restoring longleaf pine ecosystems in mixed pine stands.***

2:20-2:40 ADAMS, C. AND M. BRIAN. ***Hard won lessons – reintroducing longstraw to private landowners.***

2:40-3:00 BREAK

SESSION III: ANIMAL ECOLOGY I

- **Session Moderator: Cory Adams**

3:00-3:20 GERMAN, D. AND A. TREUER-KUEHN. ***Texas ecological systems database project: east Texas maps and conservation tools.***

3:20-3:40 STUEMKE, L.A., C.E. COMER, W.C. CONWAY, AND M.L. MORRISON. ***Roost selection by Rafinesque's big-eared bats and Southeastern myotis in east Texas.***

3:40-4:00 KAMINSKI, D.J., C.E. COMER, N.P. GARNER, G.E. CALKINS, I. HUNG, D. G. SCOGNAMILLO, AND D.R. UNGER. ***Occupancy assessment and landscape-scale habitat suitability modeling for the Louisiana black bear* (Ursus americanus luteolus*) in east Texas.***

4:00-4:20 SIEGMUND, T.M., C.E. COMER, N.P. GARNER, AND R. MAXEY. ***Habitat suitability of three northeast Texas river systems in the historical range of the Louisiana black bear (*Ursus americanus luteolus*).***

4:20-4:40 HASAPES, S.K. AND C. E. COMER. ***Comparison of white-tailed deer fawn survival and home range between dominant habitat types in northwestern Louisiana.***

FRIDAY APRIL 8, 2011
REGENT'S SUITE B: SESSIONS II AND IV 1:00-4:40

SESSION II: INVERTEBRATE ECOLOGY

- **Session Moderator: Craig Rudolph**

1:00-1:20 STEPHENS, J.D., S.R. SANTOS, AND D.R. FOLKERTS. ***Genetic divergence and strong population structure of* Exyra semicrocea *(Lepidoptera: Noctuidae) and the implications for pitcher plant bog conservation.***

1:20-1:40 BILLINGS, R.F., D.M. GROSMAN, AND H.A. PASE, III. ***Soapberry borer,* Agrilus prionurus *(Coleoptera: Buprestidae): an exotic pest threatens western soapberry in Texas.***

1:40-2:00 MEYER, H.A., M.N. DOMINGUE, AND J.G. HINTON. ***Tardigrade diversity of the West Gulf Coastal Plain, including new records and species from Louisiana.***

2:00-2:20 CLARKE, S.R. ***Are RCW management and forest health mutually exclusive?***

2:20-2:40 HINTON, J.G. AND H.A. MEYER. ***A tale of two ATBIs: comparing tardigrade diversity in the Big Thicket National Preserve and Great Smoky Mountains National Park.***

2:40-3:00 BREAK

SESSION IV: ECOLOGICAL HISTORY AND PLANNING

- **Session Moderator: Jim Neal**

3:00-3:20 WESTGATE, J.W. ***Recent additions to an Eocene tropical rain forest/mangrove swamp community on the western edge of the Gulf Coastal Plain at Laredo, Texas.***

3:20-3:40 GALAN, V. ***The current state of archaeology in the Big Thicket.***

3:40-4:00 DRURY, B. ***A proposal for a Big Thicket Research Center near Woodville, Texas.***

4:00-4:20 JOHNSTON, M.C. ***The Big Thicket, history and rationale for preservation.***

4:20-4:40 SHACKELFORD, J. ***Conserving land within the Neches River National Wildlife Refuge: the history and the future.***

SATURDAY APRIL 9, 2011

THEATRE: SESSIONS V AND VII 8:00-12:00

SESSION V: ANIMAL ECOLOGY II

- **Session Moderator: Dan Saenz**

8:00-8:20 RYBERG, W.A., J.C. CATHEY, AND L.A. FITZGERALD. ***Genetic relationships of American alligator populations distributed across different ecological and geographic scales.***

8:20-8:40 KWIATKOWSKI, M.A. AND D.C. RUDOLPH. ***Conservation genetics of Louisiana pine snakes,* Pituophis ruthveni*: effects and implications of small, isolated populations.***

8:40-9:00 PIERCE, J.B., D.C. RUDOLPH, B. WAGNER, S. REICHLING, E. SMITH, M. A. KWIATKOWSKI, R.R. SCHAEFER, D. FULLER, M. SEALY AND D. SAENZ. ***A reintroduction experiment with the Louisiana pine snake (*Pituophis ruthveni*).***

9:00-9:20 KAVANAGH, B. AND M. KWIATKOWSKI. ***Community characteristics of turtle populations inhabiting two small streams of east Texas.***

9:20-9:40 SYMMANK, M.E. AND C.E. COMER. ***Using infrared-triggered cameras to monitor activity patterns of forest carnivores in east Texas.***

9:40-10:00 BREAK

SESSION VII: RESTORATION ECOLOGY

- **Session Moderator: Warren Conway**

10:00-10:20 ROGERS, W.E., D. TWIDWELL, AND T. L. BLANKENSHIP. ***Restoring west Gulf coastal prairies using prescribed extreme fires.***

10:20-10:40 TWIDWELL, D., J.M. MEZA, C.J. TURNEY AND W.E. ROGERS. ***Alien fire ant and native harvester ant responses to coastal prairie restoration with fire.***

10:40-11:00 OSWALD, B.P., M.M. BATAINEH, I.V. MCWHORTER, M.H.LEGG, AND D.R. UNGER. ***Effects of fire exclusion within the* Pinus palustris *Mill. communities of Upland Island Wilderness, Texas.***

11:00-11:20 SCOTT, D.A. ***Ecosystem restoration in the highly erodible Kisatchie Sandstone Hills.***

11:20-11:40 RUDOLPH, D.C., D. E. PLAIR, D. JONES, J.H. WILIAMSON, C.E. SHACKELFORD, R.R. SCHAEFER, AND J.B. PIERCE. ***Restoration and winter avian use of small isolated prairies in eastern Texas.***

11:40-12:00 MIDDLETON, B.A. AND B.J. ROBERTS. ***Remediation after the Deepwater Horizon incident pushed oil from coast, and provided pulsed hydrology to coastal swamps.***

SATURDAY APRIL 9, 2011
REGENT'S SUITE B: SESSIONS VI AND VIII 8:00-12:00

SESSION VI: ANIMAL ECOLOGY III

- **Session Moderator: Cliff Shackelford**

8:00-8:20 NOVAK, L.D., C.E. COMER, W.C. CONWAY, D.G. SCOGNAMILLO, AND R.D. GAY. ***Nest success and nest site selection of early successional songbirds in restored longleaf pine savannah in east Texas.***

8:20-8:40 ALLEN, R.A. AND D.B. BURT. ***Vegetation characteristics of Bachman's sparrow habitat in the western terminus of the longleaf pine ecosystem.***

8:40-9:00 RIGBY, E.A. AND D.A. HAUKOS. ***A matrix population model for mottled ducks on the western Gulf Coast of Texas.***

9:00-9:20 TWEDT, D.J. ***Bird monitoring at Big Thicket National Preserve.***

9:20-9:40 KEISTER, A.K., D.J. TWEDT, S.K. MCKNIGHT, AND J.M. TIRPAK. ***Prioritization of open pine management for landbirds of the West Gulf Coastal Plain and Ouachita Mountains.***

9:40-10:00 BREAK

SESSION VIII: RIPARIAN/WETLAND ECOLOGY

- **Session Moderator: Chris Comer**

10:00-10:20 FORBES, M., R. DOYLE, J. YELDERMAN, JR., A. CLAPP, AND W. FORBES. ***Water storage and water quality functions of Texas coastal prairie freshwater wetlands.***

10:20-10:40 MCBROOM, M.W. ***Riparian forest structure and large woody debris loadings on the lower Sabine River.***

10:40-11:00 HARGRAVE, C.W., K.P. GARY AND S. HAMONTREE. ***Local, regional and temporal patterns of species richness and assemblage structure in streams of the Big Thicket National Preserve.***

11:00-11:20 GARY, K.P. AND C.W. HARGRAVE. ***How riparian protection can affect ecosystem structure and function in low gradient streams.***

11:20-11:40 DAVID, J.L AND B.A. MIDDLETON. ***Modeled climate change impacts on the production of bald cypress swamps across latitudinal and longitudinal gradients.***

11:40-12:00 MIDDLETON, B.A. ***Climate change and function of western*** **Taxodium distichum** ***swamps.***

SATURDAY APRIL 9, 2011

THEATRE: SESSIONS IX AND XI 1:00-5:00

SESSION IX: PLANT ECOLOGY I

- **Session Moderator: Matt Kwiatkowski**

1:00-1:20 LOOS, P.M. AND T.C. PHILLIPS. ***Reintroduction of* Cypripedium kentuckiense *into east Texas forests.***

1:20-1:40 SINGHURST, J.R., T.C. PHILLIPS, AND P.M. LOOS. ***Status and habitat characteristics of* Cypripedium kentuckiense *(Kentucky lady's slipper) in Texas.***

1:40-2:00 ALLEN, C. ***Vascular flora of Fort Polk, Louisiana.***

2:00-2:20 CARR, S. ***Floristic composition of shortleaf pine-hardwood woodlands of the West Gulf Coastal Plain.***

2:20-2:40 ALLEN, C., P. LEWIS, AND D. LEWIS. ***Vascular flora of Newton County, Texas.***

2:40-3:00 TULLOSS, R.E. AND D.P. LEWIS. ***Amanita (Basidiomycota) of east Texas, Louisiana and Mississippi Gulf Coast***

3:00-3:20 **BREAK**

SESSION XI: PLANT ECOLOGY II

- **Session Moderator: Rick Schaefer**

3:20-3:40 RUDOLPH, D.C., B. MACROBERTS, M.H. MACROBERTS, AND D.W. PETERSON. ***Floristics and restoration of ephemeral ponds in east central Texas.***

3:40-4:00 ZHOU, L. AND D. CREECH. ***A summary of five years of salinity studies with baldcypress,* Taxodium distichum*, at SFA Gardens.***

4:00-4:20 VAN KLEY, J.E. ***Compositional shifts in wetland vegetation at Caddo Lake Texas, USA, resulting from multiple exotic plant invasions.***

4:20-4:40 ROSS, W.G., D.L. KULHAVY, W. C. CONWAY, AND R. N. CONNER. ***Resin flow in Texas loblolly and shortleaf pines used by red-cockaded woodpeckers.***

4:40-5:00 CREECH, D. AND L. ZHOU. **Taxodium** ***genotype performance at SFA Gardens.***

SATURDAY APRIL 9, 2011
REGENT'S SUITE B: SESSIONS X AND XII 1:00-4:40

SESSION X: ANIMAL ECOLOGY IV

- **Session Moderator: Matt Symmank**

1:00-1:20 ADAMS, C.K. AND D. SAENZ. ***The effects of an invasive species (Chinese tallow) on amphibian egg hatching.***

1:20-1:40 HALL, T.L., D. SAENZ, M.A. KWIATKOWSKI, AND M.L. COLLYER. ***Quantifying Anuran plasticity: a practical application for geometric morphometrics with phenotypic change analyses.***

1:40-2:00 SCHAEFER, R.R., R.R. FLEET, D.C. RUDOLPH, AND N.E. KOERTH. ***Microhabitat preferences of green anoles (*Anolis carolinensis*) in open longleaf pine (*Pinus palustris*) forests of eastern Texas.***

2:00-2:20 FUCIK, E.M., D. SAENZ, AND M.A. KWIATKOWSKI. ***Interactions between invasive species and climate change: the effects on an east Texas Anuran.***

2:20-2:40 FRICKE, K.A., D.G. SCOGNAMILLO, C.E. COMER, AND W.C. CONWAY. ***Nocturnal movement patterns of raccoon, striped skunk, and opossum in east Texas.***

2:40-3:00 THAPA, V., M. F. ACEVEDO, P. DONG, AND P.A.Y. GUNTER. ***Use of potential development and habitat suitability index maps to observe impacts on potential red-cockaded woodpecker (*Picoides borealis*) habitat areas near Big Thicket National Preserve, Texas.***

3:00-3:20 **BREAK**

SESSION XII: ECOSYSTEM CONSERVATION

- **Session Moderator: Julie Shackelford**

3:20-3:40 SUNDA, C., G. KRONRAD, AND D. SPETHMANN. ***Emerging markets for ecosystem services: economic research at Stephen F. Austin State University.***

3:40-4:00 KNIGHT, C.E., M.W. GILL-SHAW, AND J. SILVA. S***haping the future: the Big Thicket Summer Research Institute, an undergraduate research program to promote careers in Science, Technology, Engineering and Mathematics (STEM).***

4:00-4:20 ROZELLE, K.B., D.L. KULHAVY, W.G. ROSS, W.C. CONWAY, AND R.N. CONNER. ***A comparison of resin production in naturally excavated red-cockaded woodpecker cavity trees with artificial cavity-insert trees.***

4:20-4:40 GODWIN, W. B. AND J. R. GIBSON. ***Survey of east Texas sand caves and associated fauna.***

POSTERS

FORMAL POSTER SESSION FRIDAY APRIL 8, 2011

REGENT'S SUITE A: 10:30-12:00

Posters are arranged by poster number and corkboard number in Regent's Suite A.

1. ADAMS, C.K. AND D. SAENZ. ***Negative impacts on anuran eggs and hatchlings caused by Chinese tallow (*Triadica sebifera*).*** *(corkboard # 1 front)*

2. COTTEN, T.B., M.A. KWIATKOWSKI, D. SAENZ, AND M.L. COLLYER. ***Effects of Chinese tallow on development and survival of anuran larvae.*** *(corkboard #1 back)*

3. HALL, T.L., D. SAENZ, AND M.A. KWIATKOWSKI. ***Differential jumping performance in newly metamorphosed Blanchard's cricket frogs (*Acris blanchardi*).*** *(corkboard # 2 front)*

4. KAVANAGH, B.T., D. SAENZ, AND M. A. KWIATKOWSKI. ***The amphibian chytrid fungus (*Batrachochytrium dendrobatidis*) in eastern Texas.*** *(corkboard #2 back)*

5. MELDER, C.A., S.M. ECREMENT, S. CARNAHAN, AND B. COOPER. ***Red-cockaded woodpecker artificial drilled cavity usage on Fort Polk military installation***. *(corkboard #3 front)*

6. GONZALEZ, J.M., D.L. KULHAVY, D.R. UNGER, W.R. ROSS, AND I. HUNG. ***Assessing impact of Hurricane Rita on red-cockaded woodpecker (*Picoides borealis*) clusters in Angelina National Forest, Texas***. *(corkboard # 3 back)*

7. NEAL, J., S. CARR, AND J. STEPHENS. ***Old-growth characteristics of Little Sandy National Wildlife Refuge.*** *(corkboard # 4 front)*

8. NEAL, J., D.C RUDOLPH, AND R.R. SCHAEFER. ***Old-growth forest remnants in eastern Texas.*** *(corkboard # 4 back)*

9. TINERALLA, P.P. ***Bugs, beetles, and Big Thicket aquatic biodiversity: preliminary results of survey and inventory of aquatic true bugs (Insecta: Heteroptera) and aquatic beetles (Insecta: Coleoptera) of the Big Thicket National Preserve, southeastern Texas***. *(corkboard #5 front)*

10. LINDGREN, N.K., A.D. ARCHAMBEAULT, J.L. COOK, AND S.R. BUCHELI. ***Insect ecology and biodiversity: island ecosystems of the Hancock Forest Management, a member of the Thicket of Diversity ATBI***. *(corkboard# 5 back)*

11. CANNING, L.D. AND W.H. DEES. ***The effect of temperature and humidity on mosquitoes in southwest Louisiana.*** *(corkboard # 6 front)*

12. CANNING, L.D., B.M. CLARK, H.A. MEYER, C.E. HENNIGAN, J.D. LAND, M. WAGLE, J.H. DEES, J.T. GUIDRY, A.M.J. SHUDES, T.L. SYLVESTER, AND W.H. DEES. ***A long-term mosquito ecology project in southwest Louisiana***. *(corkboard # 6 back)*

POSTERS

FORMAL POSTER SESSION FRIDAY APRIL 8, 2011

REGENT'S SUITE A: 10:30-12:00

13. DEES, W.H., A.P. FIGUEROA, J. HIGHTOWER, AND T.L. SYLVESTER. ***Mosquito vectors of West Nile virus in southwest Louisiana***. *(corkboard # 7 front)*

14. DEES, W.H., G.W. SCHULTZ, R.G. ROBBINS, D.W. HILL, AND B.M. CLARK. ***Mosquito and tick identification aids for medical entomology, pest management, field zoology and field public health courses.*** *(corkboard # 7 back)*

15. PIERCE, J.B., D.C. RUDOLPH, S.J. BURGDORF, R.R. SCHAEFER, R.N. CONNER, M.J. EALY, J.G. HIMES, AND C.M. DURAN. ***Hibernacula and winter movement patterns of Louisiana pine snakes (*Pituophis ruthveni*).*** *(corkboard #8 front)*

16. WAGNER, R.O., J.B. PIERCE, D.C. RUDOLPH, R.R. SCHAEFER, AND D.A. HIGHTOWER. ***Modeling Louisiana pine snake (*Pituophis ruthveni*) habitat use in relation to soils.*** *(corkboard # 8 back)*

17. PRESTON, J., M. HODGES, AND W. FORBES. ***Monitoring east Texas forest habitats for restoration potential.*** *(corkboard #9 front)*

18. PACKARD, J.M., P. WEEKS, M. PAOLISSO, AND M. SRINIVASAN. ***Cultural model approach to land conservation: a quantitative perspective.*** *(corkboard # 9 back)*

19. WARD, K., I.V. MCWHORTER, K. EVANS, AND R. POTTS. ***Ecosystem restoration on National Forest lands in the Longleaf Ridge Conservation Area, Texas***. *(corkboard # 10 front)*

20. KAMINSKI, D.J., C.E. COMER, N.P. GARNER, G.E. CALKINS, I. HUNG, D. G. SCOGNAMILLO, AND D.R. UNGER. ***A landscape scale approach for modeling habitat suitability for the Louisiana black bear (*Ursus americanus luteolus*) in east Texas.*** *(corkboard # 10 back)*

21. HAILE, K.C. AND S.L. HATCH. ***Comparison of the grass flora across selected units of the Big Thicket National Preserve.*** *(corkboard # 11 front)*

22. ANEMAET, E.R. AND B.A. MIDDLETON. ***Dendrobands made easy: using modified cable ties to measure incremental growth of trees.*** *(corkboard # 11 back)*

23. SULLIVAN, J.B. AND D.B. BURT. ***Habitat variables associated with brown-headed nuthatch (*Sitta pusilla*) nesting success in east Texas forests.*** *(corkboard # 12 front)*

24. SCHAEFER, R.R., D.C. RUDOLPH, AND J.B. PIERCE. ***Nesting Cooper's hawks (*Accipiter cooperi*) and sharp-shinned hawks (*A. striatus*) in the Pineywoods of eastern Texas***. *(corkboard #12 back)*

POSTERS

FORMAL POSTER SESSION FRIDAY APRIL 8, 2011

REGENT'S SUITE A: 10:30-12:00

25. DAILEY, K.R., H.M. WILLIAMS, W.C. CONWAY, AND B.P. OSWALD. ***Investigating the competitive influence of Chinese tallow (*Triadica sebifera*) on the morphology and physiology of artificially regenerated oak (*Quercus *spp.) species***. *(corkboard # 13 front)*

26. SVOBODA, H.T. AND J.E. VAN KLEY. ***Effect of exotic species removal at the SFA Pineywoods Native Plants Center on native forest understory vegetation***. *(corkboard # 13 back)*

27. TIRPAK, J., T. BRADY, S. SHIVLEY, AND B. TIRPAK. ***A decision support tool for Louisiana pearlshell mussel conservation: prioritizing search and restoration sites***. *(corkboard # 14 front)*

28. DUNITHAN, A.D., M. WILLIAMS, N. FORD, AND L.R. WILLIAMS. ***Habitat modeling using MAXENT for rare and endangered fish and mussel species in the Neches River, TX***. *(corkboard # 14 back)*

ABSTRACTS

ADAMS, C. AND M. BRIAN. Advanced Ecology, Ltd. ***HARD WON LESSONS – REINTRODUCING LONGSTRAW TO PRIVATE LANDOWNERS.***

A group of consulting foresters working for private non-industrial landowners in the East Texas region have been regenerating longleaf for the past twenty-seven years. This presentation strives to share their experiences and lessons learned while managing sites for longleaf on the western edge of the southern pine/hardwood forest. Management techniques derived from the ever-changing knowledge base concerning longleaf regeneration have been applied to private forestlands, and incorporate specific methodologies developed to address problem sites. The combination of custom herbicide prescriptions, mulching technology, and integration of containerized seedlings has greatly increased the success rate for establishing longleaf, even on challenging sites. Natural regeneration, hand planting both bareroot and containerized seedlings, and direct seeding have been used in these efforts to regenerate and establish longleaf pine. The management of landowner goals and expectations combined with long-term personal and family issues has proven to be the greatest test for consultants in achieving longleaf reforestation success. Site suitability becomes secondary when compared to the commitment level of private landowners to continue forest management for the long term. Overall, there is an apparent relationship between available cost shares and the willingness of landowners to reforest with longleaf, especially on sites with heavy underbrush components with correspondingly high reforestation costs. Landowners and/or families must be willing to commit to long term forest management and to the appropriate expenditure of reforestation dollars to have success at managing and/or establishing longleaf forests. **(ORAL PRESENTATION).**

ADAMS, C.K. AND D. SAENZ. Southern Research Station, USDA Forest Service. ***THE EFFECTS OF AN INVASIVE SPECIES (CHINESE TALLOW) ON AMPHIBIAN EGG HATCHING.***

Chinese tallow (*Triadica sebifera*) is a subtropical deciduous tree native to China and Japan. It was first introduced into the United States in the late 1700s and in Texas in the early 1900s. Chinese tallow is now an invasive and extremely abundant in parts of eastern Texas. It has the capability of producing monocultures which can be in or near wetlands that are utilized by breeding amphibians. The impact Chinese tallow has on most amphibians is currently unknown. We determined if Chinese tallow has an effect on the hatching of a common anuran, *Lithobates sphenocephalus*. We found that Chinese tallow leaf litter significantly affects dissolved oxygen, pH and turbidity. At low concentrations, Chinese tallow can be lethal to *L. sphenocephalus* eggs. We determined that by controlling dissolved oxygen, eggs exposed to low concentrations of Chinese tallow hatched, but died in higher concentrations. Also we found that at low concentrations Chinese tallow significantly reduced the time to hatching. Since Chinese tallow appears to negatively affect water chemistry and is an aggressive invasive species it could be a significant threat to amphibians. (**ORAL PRESENTATION).**

ADAMS, C.K. AND D. SAENZ. Southern Research Station, USDA Forest Service. ***NEGATIVE IMPACTS ON ANURAN EGGS AND HATCHLINGS CAUSED BY CHINESE TALLOW (TRIADICA SEBIFERA).***

Chinese tallow (*Triadica sebifera*) is an aggressive invasive tree species found in the southeastern United States and California. It is extremely abundant in parts of its range and has the capability of producing monocultures, which can be in or near wetlands that are utilized by breeding amphibians. The purpose of this study was to determine if Chinese tallow leaf litter affected hatching of a common anuran, the Southern Leopard Frog (*Lithobates sphenocephalus*), when compared to leaf litter of native tree species. Chinese tallow and red maple (*Acer rubrum*) reduced hatching success of *L. sphenocephalus* eggs. Water containing Chinese tallow and red maple leaf litter had lower pH and dissolved oxygen than other treatments. The reduced hatching success we observed could be due to these effects. We suggest that Chinese tallow could have a much greater impact than native species that produce similar hatching success, since Chinese tallow can occur in much higher densities than native species. We also observed that hatchlings from eggs exposed to Chinese tallow leaf litter were significantly less developed at hatching and significantly smaller in total length than other treatments. As a result, Chinese tallow leaf litter may reduce hatching success of amphibian eggs as well as reduce survival in the larval stage. **(POSTER PRESENTATION).**

ALLEN, C. Colorado State University, CEMML-Fort Polk Station. ***VASCULAR FLORA OF FORT POLK, LOUISIANA.***

Fort Polk (approximately 200, 000 acres) is located in west central Louisiana primarily in Vernon Parish but also in a small portion of Natchitoches and Sabine parishes. The vascular flora has been documented by herbarium specimens since the 1960's but intensive efforts were initiated and continued since 1983. Fort Polk maintains an active herbarium and duplicate specimens are being sent to Louisiana and Texas herbaria. The current flora consists of more than 1400 species with 51 state listed rare species. Fort Polk is the only location for yellowroot in Louisiana and the only extant location for broadleaved Barbara's button. Texas grama, Missouri blackeyed Susan, and white fringed orchid are found only on Fort Polk and one additional parish in the state. More than 20 clumps of yellow lady slipper along four different drainages makes Fort Polk the largest refugium for this rare species in the West Gulf Coast Region. **(ORAL PRESENTATION).**

ALLEN, C.[1], P. LEWIS[2], AND D. LEWIS[2]. [1]Colorado State University, CEMML-Fort Polk Station; [2]262 CR 3062, Newton, TX. ***VASCULAR FLORA OF NEWTON COUNTY, TEXAS.***

Newton County, an area of 940 square miles, is the eastern most county in Texas. It is bounded to the north by Sabine County, the west by Jasper County, the south by Orange County, and the east by the Sabine River and Louisiana. The authors have been collecting plants from the county since the spring of 2007 and have made more than 20 trips throughout the growing season. More than 1100 species have been collected and identified from this county. A sedge (*Cyperus pilosus*) and a grass (*Glyceria declinata*) were reported new to Texas based on our field work. Newton County is the home to several rare plants of Texas including Carolina crownbeard, silky camellia, toothache grass, climbing hydrangea, tall rattlesnakeroot, sweetshrub and fetterbush. **(ORAL PRESENTATION).**

ALLEN, R.A.[1] AND D.B. BURT[2]. [1]United States Fish and Wildlife Service; [2]Department of Biology, Stephen F. Austin State University. ***VEGETATION CHARACTERISTICS OF BACHMAN'S SPARROW HABITAT IN THE WESTERN TERMINUS OF THE LONGLEAF PINE ECOSYSTEM.***

While the Bachman's Sparrow will utilize several habitats (pine savanna, pine plantations, clear cuts and abandoned fields), specific vegetation conditions must be present for a site to be acceptable for this species. Bachman's Sparrow presence/absence was examined in forested (mature longleaf pine forest and mid-aged pine plantations) and early successional habitats (clear cuts and three-year old pine plantations) in order to determine which vegetation variables are indicative of occupied sites and best for predicting occurrence. Across all sampled habitats, Bachman's Sparrow probability of presence increased with increases in canopy cover and percent grass ground cover. Probability of presence decreased with increases in shrub layer rating and percent bare ground. When considering only forested habitats, Bachman's Sparrow probability of presence increased with increasing canopy cover and percent grass ground cover, but decreased with increasing shrub height. In early successional habitats, Bachman's Sparrow probability of presence decreased with increasing percent leaf litter and percent bare ground. Also, there was a greater concentration of occupied sites in forested habitats versus early successional habitats. In addition, territoriality was initiated earlier in the breeding season in forest habitats versus early successional habitats. **(ORAL PRESENTATION).**

ANEMAET, E.R.[1] AND B.A. MIDDLETON[2]. [1]IAP Worldwide Services, Inc., U.S. Geological Survey, National Wetlands Research Center; [2]U.S. Geological Survey, National Wetlands Research Center. ***DENDROBANDS MADE EASY: USING MODIFIED CABLE TIES TO MEASURE INCREMENTAL GROWTH OF TREES.***

Dendrometer bands are a useful method for making sequential repeated measurements of tree radial growth, but traditional dendrometer bands are expensive, time consuming and difficult to construct. The traditional dendrometer band approach uses materials that are hard to handle and require gloves to avoid injury to the installer. Our alternative method of band construction and installation uses stainless steel cable tie and attachable rollerball heads, which are faster and easier to install. To compare the performance of dendrometer bands, traditional and cable tie dendrometer bands were installed on 12 baldcypress trees at the National Wetlands Research Center in Lafayette, LA (one band of each type on each tree) by both an experienced and a novice installer. Band installation times were recorded, and tree growth measurements were taken after approximately one year. The cable tie dendrometer bands were successful in that the annual growth measurements recorded were comparable to traditional dendrometer bands. **(POSTER PRESENTATION).**

BILLINGS, R.F., D.M. GROSMAN, AND H.A. PASE, III. Texas Forest Service. ***SOAPBERRY BORER, AGRILUS PRIONURUS (COLEOPTERA: BUPRESTIDAE): AN EXOTIC PEST THREATENS WESTERN SOAPBERRY IN TEXAS.***

A new insect pest of western soapberry (*Sapindus saponaria* var.*drummondii*) has recently been detected in Texas. The soapberry borer (*Agrilus prionurus*), a native of Mexico, was first reported in Travis County in 2003. Since then, it has been detected in 40 additional counties, including near or within the cities of Houston, Fort Worth, Dallas, Waco, College Station, Austin, and Corpus Christi. As its populations expand rapidly in Texas, this buprestid is killing all sizes of soapberry trees > 2 inches DBH. It may eventually threaten western soapberry populations throughout the tree's range, which extends from northern Mexico to Missouri, and west to Arizona. Infestations of soapberry borer are similar to those of emerald ash borer, *Agrilus planipennis*, a close relative not yet found in Texas. Western soapberry appears to be this insect's sole host in Texas and the tree exhibits little resistance to this introduced pest. Little else is known about the insect's biology. Treatments with systemic insecticides are showing promise as a means to protect valuable soapberry trees in rural and urban landscapes. **(ORAL PRESENTATION).**

CANNING, L.D. AND W.H. DEES. Department of Biology and Health Sciences, McNeese State University. ***THE EFFECT OF TEMPERATURE AND HUMIDITY ON MOSQUITOES IN SOUTHWEST LOUISIANA.***

Long-term studies of nocturnally-active mosquitoes in the Sabine National Wildlife Refuge (an intermediate salt/brackish/freshwater marsh) and in Moss Bluff (a freshwater marsh) in Louisiana have been conducted for more than four years and are still underway. These studies involve collecting mosquitoes before, during and after sunset and sunrise, and throughout the night using Centers for Disease Control mosquito light traps. Traps are placed 1.5m above ground in areas with little to no competing light. Meteorological conditions, specifically temperature and humidity, are monitored when mosquitoes are collected. To date, mosquito species have been collected during times of low and high relative humidity (23-95+% RH). On a given trap night, average relative humidity ranged between 54-85%. Temperature showed greater affect on the distribution of species than humidity. Mosquitoes were collected when average nightly temperatures on a given trap night ranged between 8.8°C (low -1.5°C) and 31.1°C (high 37.0°C). No mosquitoes were collected when average temperatures were at or below 6.4°C on a given trap night. *Culex* spp. and *Culiseta* spp. were more abundant at lower temperatures while *Aedes* spp., *Coquillettidia* spp., *Psorophora* spp. and *Uranotaenia* spp. were more prevalent at higher temperatures. Data from this study will broaden our understanding of mosquito flight activity under different meteorological conditions and may provide environmental parameters to better understand the risk of mosquito-borne disease pathogen transmission in southwest Louisiana. **(POSTER PRESENTATION).**

CANNING, L.D., B.M. CLARK, H.A. MEYER, C.E. HENNIGAN, J.D. LAND, M. WAGLE, J.H. DEES, J.T. GUIDRY, A.M.J. SHUDES, T.L. SYLVESTER, AND W.H. DEES. Department of Biology and Health Sciences, McNeese State University. ***A LONG-TERM MOSQUITO ECOLOGY PROJECT IN SOUTHWEST LOUISIANA*.**

An on-going nocturnal periodicity study of mosquito community composition continues in the Sabine National Wildlife Refuge in southwestern Louisiana. Mosquitoes are collected during new moon phases before, during and after sunset and sunrise, and at other intervals throughout the night. A modified-Centers for Disease Control mosquito light trap with a rotating collector is placed 1.5m above ground, in an area with little to no competing light and where no pesticide applications are conducted. Studies were initiated in July 2006. Over the past 4½ years, eighteen species have been collected. *Aedes sollicitans*, *Anopheles crucians*, *An. quadrimaculatus, Culex nigripalpus* and *Cx. salinarius* have been the most commonly collected species to date. Data from this study will broaden our understanding of mosquito population dynamics and mosquito-borne disease pathogen transmission in southwest Louisiana. Studies such as this are excellent for undergraduate research projects. **(POSTER PRESENTATION).**

CARR, S. University of Wisconsin, Madison, Savannah River Site. ***FLORISTIC COMPOSITION OF SHORTLEAF PINE-HARDWOOD WOODLANDS OF THE WEST GULF COASTAL PLAIN*.**

Shortleaf pine-hardwood woodlands were historically widespread in the West Gulf Coastal Plain, as well as the Atlantic Coastal Plain and Piedmont regions of the southeastern United States. Currently, few remnants of the former native shortleaf pine-hardwood landscape exist in the Upper West Gulf Coastal Plain. Shortleaf pine-hardwood woodland remnants exist within the longleaf pine landscape region of the Lower Gulf Coastal Plain, typically in side-slope landscape positions. Although shortleaf pine-hardwood forests have been described and classified by their tree species, few quantitative investigations of shortleaf pine-hardwood groundcover vegetation exist. This study presents a quantitative description of shortleaf pine-hardwood communities of northwestern and central Louisiana, and compares groundcover vegetation to that of proximate longleaf pine woodlands. I used descriptive multivariate methods to describe vegetation typical of native shortleaf pine-hardwood communities, and compare vegetation between these sites and frequently burned longleaf pine woodlands. Plant community composition of shortleaf pine-hardwood communities varied by landscape position and geographic location. A species richness gradient is a likely driver of observed community variation. Shortleaf pine-hardwood communities were floristically distinct from nearby longleaf pine woodlands. Longleaf sites harbored more heliophytic herbaceous species, whereas shortleaf pine-hardwood areas contained herbs and woody species typical of mesic hardwood communities. Although the two broad community types were consistently floristically distinct, both types mirrored similar patterns of species richness and compositional gradients. Species richness and herbaceous species diversity of WGCP shortleaf pine-hardwood communities rival that of other fire maintained pine savannas in the southeastern United States, further supporting the observation that the distribution of species-rich pine savannas is not strictly concurrent with the distribution of longleaf pine. Because this community type is so rare and affected by fire suppression in the WGCP, shortleaf pine-hardwood savannas should receive high conservation and restoration priority in this region. **(ORAL PRESENTATION).**

CLARKE, S.R. Forest Health Protection, USDA Forest Service. ***ARE RCW MANAGEMENT AND FOREST HEALTH MUTUALLY EXCLUSIVE?***

Gains in red-cockaded woodpecker (RCW) populations in the Western Gulf Coastal Plain (WGCP) have been undone during southern pine beetle outbreaks and storm events. Are such large-scale losses an expected occurrence in RCW population dynamics, or are they symptomatic of problems in population management? A one-size-fits-all RCW management strategy across the WGCP may not be the best approach. The relationship of forest health and the various aspects of RCW management will be discussed, with an emphasis on mitigating losses of RCW numbers and cavity trees. **(ORAL PRESENTATION).**

COTTEN, T.B.[1], M.A. KWIATKOWSKI[1], D. SAENZ[2], AND M.L. COLLYER[1]. [1]Department of Biology, Stephen F. Austin State University; [2]Southern Research Station, USDA Forest Service.
EFFECTS OF CHINESE TALLOW ON DEVELOPMENT AND SURVIVAL OF ANURAN LARVE.

Amphibians are currently considered one of the most threatened vertebrate groups. While numerous studies have addressed the many causes of amphibian population decline, little is known about effects of invasive plants. Chinese tallow (*Triadica sebifera*) is an exotic deciduous tree that has invaded the southeastern United States. Amphibian larvae in environments invaded by Chinese tallow may be negatively impacted as autumn leaf litter decomposes in natal areas. We compared the effects of leaf litter decomposition from Chinese tallow and two native tree species on survival and development of four species of anuran larvae from east Texas. Larvae from *Pseudacris fouquettei*, *Lithobates sphenocephalus*, *Hyla versicolor*, and *Incilius nebulifer* were introduced into mesocosms containing leaf litter from one of the three tree species. *Pseudacris fouquettei* and *L. sphenocephalus,* species that breed earlier in the year, had lower survival within the Chinese tallow pools. *Pseudacris fouquettei* were smaller in Chinese tallow mesocosms compared to native tree species, while *L. sphenocephalus* tadpoles were larger in Chinese tallow. *Hyla versicolor* showed significant developmental and morphological differences in Chinese tallow; however, survivorship was not significantly different among treatments. Leaf litter treatment did not affect survivorship or development in *Incilius* nebulifer. Our results suggest that breeding season may determine how each species survives and develops in an environment with Chinese tallow leaf litter. Chinese tallow leaf litter breaks down faster than native species. Therefore, negative effects may be short lived but pose a greater threat to species that breed soon after leaf fall. **(POSTER PRESENTATION).**

CREECH, D. AND L. ZHOU. Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University. **TAXODIUM *GENOTYPE PERFORMANCE AT SFA GARDENS*.**

Baldcypress is an important constituent of wetlands and remains a vital part of Big Thicket ecosystems. There are three primary Taxodium genotypes native to the southern USA and Mexico: *Taxodium distichum* (L.) Rich. var. *distichum* (Baldcypress, BC), *Taxodium distichum* var. *imbricarium* (Nutt.) Croom (Pond Cypress, PC), and *Taxodium distichum* var. *Mexicanum* (Carriere Gordon) (Montezuma Cypress, MC). SFA Gardens includes over 136 *Taxodium* genotypes and cultivars in the accession database. Since 2001, SFA Gardens has collaborated with the *Taxodium* improvement program of Professor Yin Yunlong at the Nanjing Botanical Garden (NBG), Nanjing, China. Six accessions from that program are currently under evaluation at SFA Gardens and in other locations. BC X MC crosses exhibit salt and alkalinity tolerance, fast growth rate, persistent foliage into winter, and early bud break in spring. Young clones have been easy to root: cuttings collected from upright vigorous growth in June – August, slight wound, 5000 PPM K-IBA 5-second dip, and placed under intermittent mist. Roots generally occur in 8 to 12 weeks. T302, a BC X MC cross, was introduced in 2002 and named 'Nanjing Beauty' (NB) in 2004. In 2006, a genotype evaluation study was initiated along LaNana creek in the SFA Mast Arboretum. Trees were not irrigated, but 1.2 m circles around each tree were kept mulched and weed free. A randomized block design was used with 17 genotypes, two plants per genotype, with three blocks for a total of 102 plants in this study. Genotypes from across the southern USA included selections from Krauss in Louisiana, Rockwood in Florida, and NB from Yunlong in China. After five years, considerable variation is evident in tree height, form, diameter at breast height (dbh), and foliage retention. In another field trial, drip irrigated T27 (¾ MC, ¼ BC from NBG) planted as 3'-tall trees in March 2008, averaged 14' after only two growing seasons and 20' after three. There are opportunities for selecting superior Taxodium genotypes adapted to specific wetland remediation and landscape projects. **(ORAL PRESENTATION).**

DAILEY, K.R., H.M. WILLIAMS, W.C. CONWAY, AND B.P. OSWALD. Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University. ***INVESTIGATING THE COMPETITIVE INFLUENCE OF CHINESE TALLOW (TRIADICA SEBIFERA) ON THE MORPHOLOGY AND PHYSIOLOGY OF ARTIFICIALLY REGENERATED OAK (QUERCUS SPP.) SPECIES.***

Since its introduction in the mid-1800s, Chinese tallow (*Triadica sebifera* (L.) Small has naturalized and often forms monospecific stands, frequently replacing native species. Research is needed to determine the competitive influence of *Triadica* on native woody species. In 1996, a wetland mitigation study identified that control of *Triadica* was important during site preparation in southeast Texas. However, the long-term effects of *Triadica* competition remain unknow. This study used a novel approach to examine the competitive influence of *Triadica* on planted oak (*Quercus* spp.) species in a wetland mitigation area. Using ESRI ArcInfo® 9.3, each competitor stem was plotted respectively to an oak species used as plot center for a 1/100th acre plot. Each tree, planted oak, and competitors had a buffer area implemented using ArcInfo 9.3 using the predetermined competition radius factor (CRF). Overlap area was then estimated in ArcInfo 9.3, and a competition quotient was compared across plots and sites, where overlap area was assumed to be the competitive tree ability. Regression analysis was used to examine relationships among competition quotient (dependent variable) and DBH, distance to competitors, distance to *Triadica*, live crown ratio, total number of competitors, total basal area of all competitors, total number of only *Triadica* within the plot, and total basal area of only *Triadica*. Only 37.4% of the competition quotient for all competitors could be explained using the independent variables across all sites and plots. Oaks associated with opposing competition quotients were similar in net photosynthesis, but stomatal conductance and transpiration were greater in plots with high competition quotients for cherrybark oak (*Quercus pagoda*) and willow oak (*Quercus phellos*). Therefore, measures taken did not assess the competitive influence of *Triadica* or other naturally regenerated competitor tree species on planted oaks. **(POSTER PRESENTATION).**

DAVID, J.L[1,2] AND B.A. MIDDLETON[2]. [1]Department of Natural Resource & the Environment, University of Connecticut; [2] U.S. Geological Survey, National Wetlands Research Center. ***MODELED CLIMATE CHANGE IMPACTS ON THE PRODUCTION OF BALD CYPRESS SWAMPS ACROSS LATITUDINAL AND LONGITUDINAL GRADIENTS***

Climate change is predicted to create hotter and drier conditions on the western edge of the baldcypress swamp region of North America, and this could cause the distribution of these swamps to shift and shrink in Texas. We compared field observations of annual productivity of Taxodium distichum from the North American Bald Cypress Swamp Network to simulated productivity of swamps based on historic climatic data and the results of an ensemble of regional climate models (GFDL, RCM3). These regional climate models are part of a suite of models used to generate multi-model regional climate scenarios under the North American Regional Climate Change Assessment Program (NARCCAP). Results of predicted temperatures and annual productivity were correlated with observed measurements within the North American Bald Cypress Swamp Network, but also revealed a systematic bias in temperature near the Gulf Coast. Overall, the modeled results predicted a 2.37^{o}C change over the next 50 years, which translated to roughly a 1.7 degree northward shift in the distribution of *Taxodium distichum*. Such analyses are helpful in modeling biological functioning and distribution shifts associated with climate change. **(ORAL PRESENTATION).**

DEES, W.H.[1], A.P. FIGUEROA[1], J. HIGHTOWER[2], AND T.L. SYLVESTER[1]. [1]Department of Biology and Health Sciences, McNeese State University; [2]Department of Mosquito and Rodent Control, Calcasieu Parish Police Jury. ***MOSQUITO VECTORS OF WEST NILE VIRUS IN SOUTHWEST LOUISIANA.***

Ecological investigations of pest mosquitoes and vectors of West Nile virus (WNV) were conducted near a brackish marsh in Cameron Parish, Louisiana. We employed three CO_2-baited Centers for Disease Control light traps inside and outside of a wooden storage building to survey for potential WNV vectors. Traps employed outside were placed on opposite sides of the building away from an open doorway. One trap was placed on the side closest to the Intracoastal Waterway; the other on the side near a marsh. Eight species of mosquitoes in four different genera (*Aedes*, *Anopheles*, *Culex*, and *Psorophora*) were collected. Fifty percent of *Culex quinquefasciatus*, a known vector of WNV, were collected inside the building. *Culex salinarius*, an important potential bridge vector of WNV, was collected the least (n=16) and only collected outside the building. Seven percent of another potential vector, *Cx. nigripalpus*, was collected inside the building. Information on the general bionomics of mosquitoes collected in this study and on WNV transmission potential in southwest Louisiana will be presented. **(POSTER PRESENTATION).**

DEES, W.H.[1], G.W. SCHULTZ[2], R.G. ROBBINS[2], D.W. HILL[2], AND B.M. CLARK[1]. [1]Department of Biology and Health Sciences, McNeese State University; [2]Armed Forces Pest Management Board.
MOSQUITO AND TICK IDENTIFICATION AIDS FOR MEDICAL ENTOMOLOGY, PEST MANAGEMENT, FIELD ZOOLOGY AND FIELD PUBLIC HEALTH COURSES.

Computer-based teaching programs on tick and larval and adult mosquito morphology and identification have been developed to complement laboratory education and training in medical entomology, pest management and public health. These programs aid in the identification of ticks and larval and adult mosquitoes to the species level. The programs contain (1) tutorials in tick and larval and adult mosquito morphology, (2) student identification practices, (3) glossaries of tick and mosquito morphology, (4) pictorial and non-pictorial identification keys to ixodid ticks from seven geographical regions worldwide in PDF format and either larval mosquito chaetotaxy diagrams or adult mosquito drawings, and (5) program maps to aid users in moving about each tutorial. The tick program addresses identification of ticks in eight genera to the species level in the family Ixodidae. In the larval mosquito program, 29 mosquito genera and over 800 PDFs of chaetotaxy diagrams are presented. In the adult mosquito program, 28 mosquito genera and over 600 PDFs of adult mosquito drawings are presented. A calculator and plastic ruler are recommended when using these programs. A soundcard and Adobe Acrobat™ are required to operate these programs. **(POSTER PRESENTATION).**

DRURY, B. Big Thicket Association. ***A PROPOSAL FOR A BIG THICKET RESEARCH CENTER NEAR WOODVILLE, TEXAS.***

With more research being conducted in the Big Thicket area, there is a need for a more extensive facility to accommodate that research. The Big Thicket Association has been offered as a conservation easement or as an outright gift a 47 acre tract of natural forest just southwest of Woodville, Texas. The property is ideally located for a large science center that would provide state-of-the-art laboratories, dormitories, a small library and perhaps curation facilities for scientists and students from all of the universities, community colleges and high schools in east Texas and beyond. The facility would provide a fantastic laboratory for monitoring changing landscapes and changing climates. The property offered to us by Dr. Megan Biesele is typical of the northern reach of the Big Thicket, with a wide variety of flora and fauna, free from human intervention (but unfortunately not free of hurricane damage) for upwards of 70 years that would constitute a living laboratory within walking distance from the proposed Science Center. The property shelters several rare plant species and provides much-needed wildlife habitat that is contiguous with two established nature trails, one at Heritage Village north of Highway 190 and one along Turkey Creek within the Woodville City Limits. The land is located just outside the city limits of Woodville and thus has city services such as water, sanitation, and fire protection. This plot of prime forest adjoins the 70 acre McAfee Nature Preserve managed by the Texas Land Conservancy. The McAfee Preserve, which includes an area of re-established long leaf pine, would also be available for research. Across the access road is a partially cleared area included in the offer that would be appropriate for the structures and parking for the proposed Big Thicket Research Center. This project would require significant public and private financial support for the infrastructure, but it is assumed that the property can be used as leverage for the local contribution. **(ORAL PRESENTATION).**

DUNITHAN, A.D., M. WILLIAMS, N. FORD, AND L.R. WILLIAMS. Department of Biology, University of Texas at Tyler. ***HABITAT MODELING USING MAXENT FOR RARE AND ENDANGERED FISH AND MUSSEL SPECIES IN THE NECHES RIVER, TX.***

The population decline of rare and endangered fish and mussel species has become a topic of concern. The Sabine shiner, *Notropis sabinae*, blue sucker, *Cyleptus elongatus*, creek chubsucker, *Erimyzon oblongus*, sandbank pocketbook, *Lampsilis satura*, southern hickorynut, *Obovaria jacksoniana*, Louisiana pigtoe, *Pleurobema riddellii*, and Texas pigtoe, *Fusconaia askewi* are rare species that have been collected in the Neches River in East Texas. Little information is known about the ecology of these species. Ecological niche modeling is being used, with the software package MAXENT, to predict the probability of occurrence of rare fish and mussel species in the Neches River. Through the use of this software, we will be able to determine locations and quantities of similar habitat and geomorphology in the Neches River to help describe the amount of available habitat for these species and predict their probability of occurrence. **(POSTER PRESENTATION).**

ELLEDGE, J. Longleaf Consultants, LLC. ***RESTORING LONGLEAF PINE ECOSYSTEMS IN MIXED PINE STANDS.***

Interest in restoring longleaf pine ecosystems has increased in recent years. If restoration efforts are left solely to government lands, longleaf pine will remain only as scattered fragments of living museums. Meaningful restoration efforts must involve private landowners. Industrial forest owners are focused primarily on fiber production, and have little to gain in restoring longleaf pine. The hope of region-wide restoration on any meaningful level, then, rests on non-industrial private landowners. Surveys indicate that private landowners place several non-intrinsic values above timber production, including aesthetics, wildlife, and family legacy among others. Longleaf pine is commonly restored by conversion; that is clearing an existing pine stand and replanting to longleaf pine. This is a canopy focused, or "top-down" approach. This approach might not be attractive to landowners who desire to maintain aesthetics, for instance, or those with smaller tracts. An alternative is a groundcover focused, or "bottom-up" approach. This management approach uses common forestry tools, such as fire, herbicides, thinning and planting to gradually restore a site to longleaf pine over a period of time. A mixed pine overstory is retained functioning as longleaf surrogates, while a grassy, pyrogenic understory is developed. Gaps are created and regenerated to longleaf pine, either naturally or artificially. In time, an uneven-aged longleaf pine forest results. **(ORAL PRESENTATION).**

FORBES, M.[1], R. DOYLE[1], J. YELDERMAN, JR.[2], A. CLAPP[3], AND W. FORBES[4]. [1]Center for Reservoir and Aquatic Systems Research, Baylor University; [2] Department of Geology, Baylor University; [3] Department of Environmental Sciences, Baylor University; [4]Department of Social and Cultural Analysis, Stephen F. Austin State University. ***WATER STORAGE AND WATER QUALITY FUNCTIONS OF TEXAS COASTAL PRAIRIE FRESHWATER WETLANDS.***

Coastal Prairie Wetlands (CPWs) are characterized by depressions and flats common in the Coastal Prairie ecosystem along the Texas coastal plain. Their small size and perception as "isolated" greatly threatens their conservation and the cumulative loss of water quality and flood storage function associated with the rapid disappearance of these wetlands. There are few quantitative data available to explain hydrologic processes of so called "isolated" palustrine wetlands nationwide, and far less in the Texas Coastal Prairie region. This study monitored six CPFWs with a combination of weirs, piezometers and rain gages; each with data loggers to record wetland, groundwater and nearby surface water levels. Data were collected for approximately 18 months with some small gaps due to Hurricane Ike. Water budgets were calculated to evaluate annual, seasonal and event storage volumes as well as discharge to receiving waters. As expected, the wetland water budgets were strongly affected by season. All six CPFWs discharged surface water during the study, with water level response to precipitation depending largely on antecedent conditions. We also evaluated the nutrient levels in surface waters of 12 coastal prairie wetlands relative to incoming precipitation and found that while precipitation was high in ammonia and nitrate nitrogen, CPWs were consistently low in these constituents. Concentrations of nitrate-nitrogen in wetland surface water were orders of magnitude lower than incoming precipitation. Conversely, organic nitrogen and phosphorus in wetland surface waters were consistently high and thus provide a potentially important source of organic material to receiving waters. Annualized nutrient export and retention rates were calculated for the six CPWs with hydrologic data, and CPWs were found to be strong sinks for inorganic nitrogen and phosphorus, and moderate sinks for organic nitrogen and phosphorus. These nutrient transformation abilities, together with the abundance and location of coastal freshwater wetlands, suggest that they could play a significant role in local and regional hydrology and water quality. **(ORAL PRESENTATION).**

FRICKE, K.A., D.G. SCOGNAMILLO, C.E. COMER, AND W.C. CONWAY. Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University. ***NOCTURNAL MOVEMENT PATTERNS OF RACCOON, STRIPED SKUNK, AND OPOSSUM IN EAST TEXAS.***

Describing animal movement patterns is key to understanding how species perceive and respond to landscape heterogeneity. We quantified nocturnal movement patterns of raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and Virginia opossum (*Didelphis virginiana*) in a mixed pine-hardwood forest in east Texas. Locations along nightly movement paths of seven raccoons, nine skunks, and nine opossums were estimated via triangulation of VHF radiocollars and analyzed in program FRACTAL. Relation between movement pattern and spatial scale was described using fractal dimension. Overall nocturnal paths were analyzed, in addition to path segments within specific habitat types. Overall, skunks responded to spatial heterogeneity differently above and below 235.5 m, while no transitions in spatial scale were detected in raccoon or opossum movements. Raccoon and opossum movement patterns changed when analyzed at scales of ~100-120 m within bottomland hardwoods and non-thinned pine stands, while skunk movement patterns were not correlated with spatial scale within any specific habitat types. Our results suggest differences in the spatial scale at which these species perceive heterogeneity may be a component of the mechanisms allowing them to coexist. **(ORAL PRESENTATION).**

FUCIK, E.M.[1], D. SAENZ [2], AND M.A. KWIATKOWSKI [3]. [1] Department of Biology, Stephen F. Austin State University; [2] U.S. Forest Service, Southern Research Station, Wildlife Habitat and Silviculture Lab, [3] Department of Biology, Stephen F. Austin State University. ***INTERACTIONS BETWEEN INVASIVE SPECIES AND CLIMATE CHANGE: THE EFFECTS ON AN EAST TEXAS ANURAN.***

There are various factors contributing to amphibian decline, and sometimes there are multiple interactions among factors. Climate change can affect breeding phenology of some anurans, affect the distribution of native or non-native plants and animals, and affect the timing of leaf decomposition in water. Invasive species can have negative impacts on native plants and animals when introduced into a new area. The goal of this study is to investigate the interaction between Chinese tallow (*Triadica sebifera*) and southern leopard frog (*Lithobates sphenocephalus)* larvae when influenced by changes in climate. Tadpoles were raised in five mesocosm treatments, each treatment with Chinese tallow leaf litter at different stages of decomposition. The treatments are intended to represent scenarios where weather influences amphibian breeding phenology and timing of aquatic decomposition of Chinese tallow leaf litter. Three water chemistry measurements; pH, salinity, and dissolved oxygen, were taken within each treatment throughout the experiment. Tadpoles in treatments with shorter decomposition times had significantly lower survival and significant morphological differences. Treatments also had significant differences in water chemistry. The breakdown of Chinese tallow leaf litter could have a direct affect on survival or an indirect affect due to changes in water chemistry. It is important to understand how invasive plant species affect anuran larvae in the context of local weather and climate change. Studying the dynamics between contributing factors will broaden the knowledge of amphibian decline and provide information to work toward finding solutions to this growing problem. **(ORAL PRESENTATION).**

GALAN, V. Deep East Texas Archaeological Consultants, Nacogdoches, Texas. ***THE CURRENT STATE OF ARCHAEOLOGY IN THE BIG THICKET.***

Archaeological sites are non-renewable resources that have received little attention in southeast Texas. Previous investigations show that the area was occupied for the past 10,000 years, but research is limited to a few surveys and even fewer excavations. The purpose of this paper is to provide an overview of the history of archaeological investigations, a description of prehistoric population's material culture, and the current methodologies for documenting archaeological sites. Preservation of these unique and fragile resources is an essential part of preserving the unique diversity of the Big Thicket. **(ORAL PRESENTATION).**

GARY, K.P. AND C.W. HARGRAVE. Center for Biological Field Studies, Department of Biological Sciences, Sam Houston State University. ***HOW RIPARIAN PROTECTION CAN AFFECT ECOSYSTEM STRUCTURE AND FUNCTION IN LOW GRADIENT STREAMS.***

We conducted two studies to investigate the potential role of riparian protection in promoting efficient ecosystem functioning in low-gradient, Gulf coastal streams. The first was a large-scale observational study, which examined the potential influence of riparian zone on several abiotic and biotic stream properties. The second was an experimental stream study aimed at directly testing the effects of in-stream structure on stream function. In the field study, we found that riparian protection was correlated with lower bank erosion, greater in-stream habitat complexity (namely woody debris), coarser substrates, lower turbidity, less suspended material in the water column, and greater species and functional richness of fish assemblages. In the experimental stream study, we found that increased in-stream structure reduced turbidity and downstream transport of suspended materials. This enhanced benthic primary production, aquatic invertebrate biomass and species richness, and caused greater secondary production in a generalist fish species. This research supports the general hypothesis that management aimed at riparian protection may promote healthy structure and function of stream ecosystems through a variety of direct and indirect pathways. **(ORAL PRESENTATION).**

GERMAN, D. AND A. TREUER-KUEHN. Texas Parks and Wildlife Department. ***TEXAS ECOLOGICAL SYSTEMS DATABASE PROJECT: EAST TEXAS MAPS AND CONSERVATION TOOLS.***

The Texas Parks and Wildlife Department is cooperating with private, state, and federal partners to produce a new land classification map for Texas, the Texas Ecological Systems Database Project. We are using new techniques to provide a map with better spatial and thematic resolution, and better accuracy, versus what is currently available. The basic steps include identification of mapping targets using ecological systems as a starting point, data collection from air photos and ground-truthing to implement a supervised classification, and the use of ecoregions, SSURGO soils, DEM-based variables, and hydrology which help to interpret the ecological meaning of final mapping targets. We have completed the first three phases of the six year project which includes the West Gulf Coastal Plain region of Texas. Uses of these data, specific to East Texas, include conservation products such as: mapping potential longleaf pine habitat, reservoir impacts zones, and preferred habitat for the threatened species, *Corynorhinus rafinesquii.* Other potential uses currently being explored include mapping target conservation lands and maps of wildlife corridors essential for species like the Louisiana Black Bear. **(ORAL PRESENTATION).**

GODWIN, W. B.[1] AND J. R. GIBSON[2]. [1] Biology, Jarvis Christian College; [2]San Marcos National Fish Hatchery and Technology Center. ***SURVEY OF EAST TEXAS SAND CAVES AND ASSOCIATED FAUNA.***

This presentation will summarize and update current knowledge about sand caves in the Carrizo Sand Formation of East Texas. It will discuss their origin, distribution, conservation status and associated fauna. Cave locations and conditions will be discussed and mapped. Cave fauna will be broadly defined to include associated aquatic spring organisms, and troglophile/trogloxene species associated with the cave habitat. Invertebrates and vertebrates will be included. Species accounts will be presented serially. **(ORAL PRESENTATION).**

GONZALEZ, J.M.[1], D.L. KULHAVY[1], D.R. UNGER[1], W.R. ROSS[2], AND I. HUNG[1]. [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2]School of Forestry, Louisiana Tech University. ***ASSESSING IMPACT OF HURRICANE RITA ON RED-COCKADED WOODPECKER (PICOIDES BOREALIS) CLUSTERS IN ANGELINA NATIONAL FOREST, TEXAS.***

Intensive management of RCW habitat in Angelina National Forest in Texas is a priority for this endangered species. The research inventoried downed timber in endangered red-cockaded woodpecker clusters on the Angelina National Forest in Texas following Hurricane Rita and utilized a geographic information system to analyze and display data to assess RCW habitat. In the Bannister Wildlife Management Unit of the Angelina National Forest, pine trees either uprooted or snapped by Hurricane Rita in September 2005 were located and mapped to the nearest meter using either a Trimble ProXRS GPS Unit or a Juno(TM) ST handheld GPS unit. Data taken for each pine included diameter at 4.5 feet, height of pine, height to limbs, crown width, species, direction of disturbance, cause of disturbance and associated insect and disease signs and symptoms. Measurement of aggregation of disturbances in the red-cockaded woodpecker indicated that RCW clusters and replacement stands were aggregated [Index of Patchiness (IP) > 1]. There were significant differences between all clusters and replacement clusters combined for DBH ($P < 0.001$), for HT ($P < 0.001$), but not for bearing ($P = 0.533$) (*t-test*). Area impacted in the clusters ranged from a high of 9.9 % in the Bum Cluster to a low of 0.9 percent in the Norwood Cluster. Area impacted in the replacement stands ranged from a high of 4.4 percent in the Bum Cluster to a low of 0.6 percent in the Norwood Cluster. Areas nearest to a recent clearcut had the highest impact (Bum, Peninsula, Pretty, Toothpick and Wilderness Clusters). The area impacted by Hurricane Rita in the cluster and replacement stands was greater than the combined damage in these clusters over a period of 15 years. Both loblolly and shortleaf pine were impacted and resulted in the loss of 1,021 pines in seven cluster and replacement stands. Loss was greater in the clusters even when adjusted for area. Pines were blown down in the direction of the hurricane winds (generally SSW) and larger pines were affected (ave DBH, 19.43 in; average HT, 85.41 ft). The percent of the cluster affected varied with both the intact nature of the canopy and distance from the track of the storm. Large disturbances can devastate RCW clusters and have been documented in the Gulf Coastal Plain. **(POSTER PRESENTATION).**

HAILE, K.C.[1] AND S.L. HATCH[1,2]. [1]Ecosystem Science and Management Department, Texas A&M University; [2]S.M. Tracy Herbarium, Ecosystem Science and Management Department, Texas A&M University. ***COMPARISON OF THE GRASS FLORA ACROSS SELECTED UNITS OF THE BIG THICKET NATIONAL PRESERVE.***

A comparison was made of the grass flora reported within the Hickory Creek, Beech Creek, Turkey Creek and Canyonlands Units of the Big Thicket National Preserve. These units are compared by number of grass species within each unit along with the different numbers of tribe and genera. A total number of species will be calculated and within each unit. Each species wetland indicator status is presented and the percentages of each indicator value are compared between the different units. The longevity, season of flowering, and origin of each species will also be presented. A special note will be made on species that are considered to be invasive in this region. These first three sites were chosen because of their location relative to the Canyonlands Unit. The Hickory Creek Unit 668 acres, Turkey Creek Unit 7800 acres, Beech Creek Unit 4856 acres and the Canyonlands Unit 1476 acres. The species list for the Hickory Creek, Beech Creek and Turkey Creek units are taken from previous floristic studies that have taken place in these units. The species information for the Canyonlands Unit will be from our floristic study of this unit**. (POSTER PRESENTATION).**

HALL, T.L.[1,2], D. SAENZ[2], M.A. KWIATKOWSKI[1], AND M.L. COLLYER[1]. [1] Department of Biology, Stephen F. Austin State University ; [2] U.S. Forest Service Wildlife and Silviculture Laboratory, Southern Research Station. ***QUANTIFYING ANURAN PLASTICITY: A PRACTICAL APPLICATION FOR GEOMETRIC MORPHOMETRICS WITH PHENOTYPIC CHANGE ANALYSES.***

Anuran phenotypic plasticity is well documented in many species; however many of these studies fail to comprehensively describe ontogenetic morphological changes between ecological factors. We used geometric morphometric techniques applied to recently developed phenotypic change analyses to create a morphological portrait documenting the presence of predator induced phenotypic plasticity in Blanchard's cricket frogs (*Acris blanchardi*). We then investigated whether behavior or morphology enhanced survival among different predator regimes. Distinct anti-predator morphotypes occurred in this species with many features representing predator specific phenotypically plastic traits. Tadpole behavior differed among predators, suggesting that behavioral anti-predator mechanisms were also plastic. Anti-predator morphologies were important to survival only among certain predators, while behavioral responses were important when anti-predator morphologies were not effective. This study utilizes a comprehensive quantitative method for analyzing morphological change in tadpoles by documenting phenotypic and behavioral anti-predator approaches in larval cricket frogs. **(ORAL PRESENTATION).**

HALL, T.L.[1,2], D. SAENZ[2], AND M.A. KWIATKOWSKI[1]. [1] Department of Biology, Stephen F. Austin State University ; [2] U.S. Forest Service Wildlife and Silviculture Laboratory, Southern Research Station.
DIFFERENTIAL JUMPING PERFORMANCE IN NEWLY METAMORPHOSED BLANCHARD'S CRICKET FROGS (ACRIS BLANCHARDI).

Organisms that adopt phenotypically plastic anti-predator strategies in the larval stage may incur fitness costs later in development, however these are typically difficult to define in many species. Experimentally, the difficulty of identifying ecological trade-offs may be compounded if the comparisons do not adequately mirror naturally occurring predator-prey relationships. We captured 61 newly metamorphosed *Acris blanchardi* from ponds known to induce alternate phenotypic responses at the larval stage. We used jumping performance as a measure of post-metamorphic fitness, and measured morphological traits to test for differences in morphology and jump ability between natal pond predator types. Jumping performance varied significantly between ponds, and morphological measurements indicated that overall frog size determined differences in jump ability. Similarly, differences in frog size presumably resulted from differences in developmental anti-predator morphologies. **(POSTER PRESENTATION).**

HARGRAVE, C.W., K.P. GARY AND S. HAMONTREE. Department of Biological Sciences, Sam Houston State University.
LOCAL, REGIONAL AND TEMPORAL PATTERNS OF SPECIES RICHNESS AND ASSEMBLAGE STRUCTURE IN STREAMS OF THE BIG THICKET NATIONAL PRESERVE.

We sampled fishes at local, regional and temporal scales across corridor units in the Big Thicket National Preserve from June 2008 through October 2010. We analyzed fish species richness assemblage structure at all three scales and compared temporal stability in species richness and assemblage structure for all corridor units. We found that at the local scale, species richness was driven largely by availability of in-stream structure within corridor units. For example, local habitats with in-stream had greater species richness than local habitats lacking such structure. At the regional scale, we found that different corridor units each contributed to the total richness in the Big Thicket. We identified 3 major stream types that each had unique species assemblages. They included small sand-bottom streams, large sand-bottom rivers and swamps. At the temporal scale, total species richness in the Big Thicket was influenced to some degree by season. This probably resulted from migratory species moving into and out of stream reaches throughout the year. The degree of temporal stability within corridors was predictable based on stream type. In general, small sand-bottom streams were the most variable in terms of assemblage structure. The large rivers and swamp habitats had the greatest degree of temporal stability in assemblage structure. **(ORAL PRESENTATION).**

HASAPES, S.K. AND C.E. COMER. Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University. ***COMPARISON OF WHITE-TAILED DEER FAWN SURVIVAL AND HOME RANGE BETWEEN DOMINANT HABITAT TYPES IN NORTHWESTERN LOUISIANA.***

White-tailed deer (*Odocoileus virginianus*) fawn home range and survival are products of the doe's home range, habitat, terrain, food availability, and predation pressure. Fawn survival is well documented in the southeastern United States with predation being a major factor in survival rates. Past studies have tried to explain how habitat characteristics affect fawn survival with conflicting results. Our study aims at determining differences in survival and home range characteristics for two dominant habitat types on Barksdale Air Force Base, Bossier Parish, Louisiana. Barksdale Air Force Base's East Reservation (7,000 ha) is managed for timber harvest, hunting, fishing, and oil/gas production and is dominated by pine uplands with hardwood drainages in the east and hardwood uplands and bottomlands in the west. We trapped 15 adult does and fitted them with Sirtrack global positioning system (GPS) collars and vaginal implant transmitters (VITs). GPS collars were programmed to obtain one location per hour for one year. The VITs aided in obtaining parturition site locations and locating neonates. Captured fawns (n = 12) were fitted with Sirtrack very high frequency (VHF) expandable collars. Fawn locations were obtained through triangulation ≥4 times a week until 3 months of age or mortality. Fawn mortality rate was 50% for 2009 and 2010 combined. Mortality was 83% in the west and 17% in the east. Two fawns died at three days old; one from abandonment and one from predation. Four fawns died between 25 and 31 days old from predation. Average fawn home range size was 24.96 ha (SE = 4.37). Home range size was 35.4 hectares in the west and 14.5 hectares in the east. Following recovery of GPS collars in March 2011, we will compare fawn home range composition to doe home range composition for the first 3 months after parturition.

HAYWOOD, J.D. USDA Forest Service, Southern Research Station, Pineville, Louisiana. ***INFLUENCE OF CLIMATE AND MANAGEMENT ON SEASONAL NEEDLE FALL IN A LONGLEAF PINE STAND IN CENTRAL LOUISIANA***

General climatic conditions in the West Gulf Coastal Plain have resulted in droughts developing 34% of the time since 1895 to the present, but severe to extreme drought occurs only 4% of the time. Between 1989-1994, drought (expressed as Palmer Drought Severity Index) developed only 11% of the time; however, an effort was made to relate drought condition to monthly needle fall patterns from 1991 through 1994 in a 35- to 38-yr-old, 100-ha stand of longleaf pine (*Pinus palustris* Mill.) that averaged 20.9 m^2/ha of basal area and originated from direct seeding. During this wetter-than-normal period, Palmer's Drought Severity Index was not associated with needle fall. Fertilization, prescribed fire, and pine straw harvesting did not influence overall needle fall over the 4-yr period in which needles were collected. However, management activities were associated with short-term and significant (α=0.05) changes in needle fall—expressed in kg/ha of oven-dried weight of pine straw that was collected in 0.91 m^2 traps. Scorch following prescribed burning was associated with more needle fall 2 months following the month in which fires were set. Annual pine straw harvesting in March and April was associated with greater needle fall during August and September only to be off-set by greater needle fall on non-harvested plots in November and December. Needle fall the summer after application of diammonium phosphate fertilizer was less than on non-fertilized plots, but that trend was reversed in the next 2 years. The ability of longleaf pine trees to retain or drop needles in response to stress and the ability of longleaf pine trees to physiologically adapt to environmental changes by rapidly replenishing lost needles probably resulted in the needle fall in this stand of longleaf pine averaging 336 kg/ha/month and ranging from 315 to 349 kg/ha/month across all treatments over the 4-yr period. **(ORAL PRESENTATION).**

HINTON, J.G. AND H.A. MEYER. Deparement of Biology and Health Sciences, McNeese State University. ***A TALE OF TWO ATBIS: COMPARING TARDIGRADE DIVERSITY IN THE BIG THICKET NATIONAL PRESERVE AND GREAT SMOKY MOUNTAINS NATIONAL PARK.***

Over 200 species of freshwater and terrestrial water bears (Phylum Tardigrada) are known to occur in North America. Their true diversity remains poorly known, in part because the method and geographical extent of sample collection vary widely among studies. The methods used in All Taxa Biological Inventories can estimate the true diversity of tardigrades in an area. An ATBI in the Great Smoky Mountains National Park, North Carolina, found 73 tardigrade species from 23 genera. We performed an ATBI in Big Thicket National Preserve, Texas, basing our methods on the GSMNP study. We found 26 species in 10 genera. One species, in the genus *Echiniscus*, is probably new to science. Lower tardigrade diversity in BTNP is consistent with other studies in the Gulf Coast states of the USA. The absence of altitudinal variation at BTNP partly explains its lower tardigrade diversity. Freshwater tardigrades are especially poorly represented at BTNP. Streams at BTNP are eutrophic and muddy, and may be poor tardigrade habitat. **(ORAL PRESENTATION).**

JOHNSTON, M.C. President, Big Thicket Association and Kountze Middle School. ***THE BIG THICKET, HISTORY AND RATIONALE FOR PRESERVATION.***

The Big Thicket region once covered over two million acres and served as a barrier to civilization. The tangled woods penetrated first only along waterways was rich in natural resources. By the late nineteenth century, however, settlers, railroads and timber companies assaulted this wilderness. By the 1920's fortunes were amassed and much had been destroyed. Spurred by the continued destruction of the region, the conservation movement began. Using materials from the Maxine Johnston historical collection, award winning Master educator Mary Catherine Johnston will present an overview on the Big Thicket's history and the basis for its preservation. She will share information on the Big Thicket Association's exciting Thicket of Diversity All Taxa Biodiversity Inventory project and strategies and work samples on how to integrate Big Thicket science into the Middle School curriculum. **(ORAL PRESENTATION).**

KAMINSKI, D.J.[1], C.E. COMER[1], N.P. GARNER[2], G.E. CALKINS[2], I. HUNG[1], D. G. SCOGNAMILLO[1], AND D.R. UNGER[1]. [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2]Texas Parks and Wildlife Department. ***OCCUPANCY ASSESSMENT AND LANDSCAPE-SCALE HABITAT SUITABILITY MODELING FOR THE LOUISIANA BLACK BEAR (URSUS AMERICANUS LUTEOLUS) IN EAST TEXAS.***

Historically ranging throughout east Texas, the Louisiana black bear (*Ursus americanus luteolus*) was considered extirpated by the 1940's. Since the 1970's reliable sightings have been recorded in east Texas with increasing occurrence. Despite these sightings, little information is known regarding occupancy of the current population or the suitability of habitat in east Texas. In order to develop baseline occupancy estimates we are using non-invasive genetic sampling and DNA analysis. Barbed-wire hair-trap stations have become standard for sampling free-ranging bear populations in North America. In 2009 and 2010 we implemented 103 hair-traps along the Sabine River corridor and collected 217 hair samples over 2715 trap-nights. We pre-sorted samples using microscopic analysis with genetic analysis results pending. In order to evaluate the suitability of habitat we developed an *a priori* landscape-scale habitat suitability index (HSI) model for 15 counties in east Texas. Because of the coarseness of most GIS data, HSI models are well suited for habitat generalists and species with large spatial requirements such as black bears. Our HSI model is based on linear regression equations from existing models, the 2009 Texas Vegetation Classification Project (TVCP) land classification model, and literature review. We developed models for 8 life requisite variables and calculated food, cover, and human impact component indices in ArcGIS 9.3.1. We combined component indices to develop an *a priori* HSI model. We will validate our model with detailed vegetation analysis and readjust the SI scores of the *a priori* model accordingly to develop a final model consistent with the results of our vegetation measurement. **(ORAL PRESENTATION).**

KAMINSKI, D.J.[1], C.E. COMER[1], N.P. GARNER[2], G.E. CALKINS[2], I. HUNG[1], D. G. SCOGNAMILLO[1], AND D.R. UNGER[1]. [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2]Texas Parks and Wildlife Department. ***A LANDSCAPE SCALE APPROACH FOR MODELING HABITAT SUITABILITY FOR THE LOUISIANA BLACK BEAR (URSUS AMERICANUS LUTEOLUS) IN EAST TEXAS.***

By the 1940's, the Louisiana black bear (*Ursus americanus luteolus*) was considered extirpated from east Texas. In 1992, with mounting concerns that the population was approaching the minimum viable threshold throughout its occupied range, the U.S. Fish and Wildlife Service provided federal protection under the Endangered Species Act. Since the late 1970's, reliable sightings have been recorded in east Texas with increasing occurrence. Despite these sightings, little quantitative information is known regarding the suitability of habitat. We developed an *a priori* landscape-scale habitat suitability index (HSI) model for 15 counties in east Texas. Our model is based on linear regression equations from existing HSI models as well as the Texas Vegetation Classification Project (TVCP) habitat classification model and literature review. We developed a ranking system and assigned SI scores for 4 food and 2 cover variables to 94 habitat classifications within the TVCP in ArcGIS 9.3.1. We buffered low and high density urban areas and state and county roads and assigned SI scores. We combined each variable score to develop food, cover, and human impact components as well as the *a priori* HSI model. We will validate our model with detailed vegetation analysis and readjust the SI scores of the *a priori* model accordingly to develop a final model consistent with the results of our vegetation measurement.

KAVANAGH, B.T. AND M. KWIATKOWSKI. Department of Biology, Stephen F. Austin State University.

COMMUNITY CHARACTERISTICS OF TURTLE POPULATIONS INHABITING TWO SMALL STREAMS OF EAST TEXAS.

A study was undertaken in order to assess the influences of urbanization on the characteristics of two turtle communities of East Texas. La Nana Creek, a stream heavily influenced by the effects of urbanization, and Bernaldo Creek, a stream relatively unaltered by anthropogenic disturbances, were sampled for turtles in the spring and summer of 2007 and 2008. Additionally, in order to investigate the potential influences of urbanization on the movement patterns of a species of aquatic turtle, 23 *Sternotherus carinatus* were caught and radio tracked throughout the course of the study. Five species of turtle were trapped from La Nana Creek and 6 species of turtle were trapped from Bernaldo Creek. *Machrochelys temminckii* from Bernaldo Creek and *Trachemys scripta* from La Nana Creek displayed male-biased sex ratios. Mean curved carapace lengths reported for the sex of each species provided no evidence of increased mortality rates on female turtles inhabiting the more urbanized La Nana Creek. Analysis of the movement data recorded from radio-tagged *Sternotherus carinatus* indicate that male and female movement patterns did not differ between Bernaldo and La Nana Creeks. Turtle conservation and stream management are discussed with respect to these results. **(ORAL PRESENTATION).**

KAVANAGH, B.T.[1], D. SAENZ[2], AND M. A. KWIATKOWSKI[1]. [1]Department of Biology, Stephen F. Austin State University; [2]Southern Research Station, U.S. Forest Service, U. S. Department of Agriculture. ***THE AMPHIBIAN CHYTRID FUNGUS (BATRACHOCHYTRIUM DENDROBATIDIS) IN EASTERN TEXAS.***

The amphibian chytrid fungus, *Batrachochytrium dendrobatidis* (*Bd*), is a pathogen known to be a major threat to amphibians resulting in mass die-offs and population declines throughout the world. *Batrachochytrium dendrobatidis* has been detected on amphibians from sites across North America including the Southeastern United States but there have been no reports of *Bd* from amphibian populations in East Texas. We sampled amphibians for the presence of *Bd* in four geographically disjunct sites in eastern Texas (approximately 31° N latitude) to determine *Bd* infection rates in areas not previously surveyed. Also, we attempted to determine which species might be at greatest risk to *Bd* in this region. Overall, we sampled a total of 266 adult amphibians of 18 different species, from 8 different families. Of these 18 species, 6 had at least one individual that tested positive for *Bd*. Thirteen of the 266 individuals tested positive for an overall detection rate of 4.8%. Though the fungus is present in East Texas, to our knowledge, no amphibian declines have been attributed to the amphibian chytrid fungus in this region. **(POSTER PRESENTATION).**

KEISTER, A.K.[1], D.J. TWEDT[2], S.K. MCKNIGHT[1], AND J.M. TIRPAK[3]. [1]Lower Mississippi Valley Joint Venture Office; [2] USGS Patuxent Wildlife Research Center; [3] Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative. ***PRIORITIZATION OF OPEN PINE MANAGEMENT FOR LANDBIRDS OF THE WEST GULF COASTAL PLAIN AND OUACHITA MOUNTAINS.***

We used digital geographic information to identify priority areas for management of open pine habitat for bird species associated with open-canopy pine ecosystems in the West Gulf Coastal Plain/Ouachitas Bird Conservation Region. A working group focused on landbird conservation under the auspices of the Lower Mississippi Valley Joint Venture identified 4 species representative of open pine habitat: Red-cockaded Woodpecker, Bachman's Sparrow, Northern Bobwhite and Brown-headed Nuthatch. Although these species are characteristic of open pine habitat, they differ markedly in their breeding densities, dispersal capabilities, and associations with specific structural habitat cues. We obtained demographic information (breeding density, minimum viable population, dispersal ability) for these species from the literature, and combined these with geospatial data depicting 2001 land cover and topographic land position (including floodplains) to identify areas with sufficient pine habitat that meet biological thresholds for supporting minimum viable populations of these species (provided pine habitat is managed to maintain open-canopy conditions). The resultant depiction of priority areas for management of open-canopy pine habitat within the West Gulf Coastal Plain and Ouachita Mountains provides a model to support decisions regarding allocation of resources for long-term management of open pine ecosystems. **(ORAL PRESENTATION).**

KNIGHT, C.E., M.W. GILL-SHAW, AND J. SILVA. Eastfield College**,** National Science Foundation: Project Pathways**.** ***SHAPING THE FUTURE: THE BIG THICKET SUMMER RESEARCH INSTITUTE, AN UNDERGRADUATE RESEARCH PROGRAM TO PROMOTE CAREERS IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM).***

In 2005 Eastfield College received a National Science Foundation (NSF) Grant, Project Pathways: Broadening Access and Success for **S**cience, **T**echnology, **E**ngineering and **M**athematics (**STEM)** Students. The Project objectives were to: increase number of students in STEM programs by 25%; improve retention in STEM programs by 20%; increase transfers and graduation rates by 15%; and increase the number of underrepresented students by 15%. One strategy to achieve these objectives was to expand undergraduate research. Freshman and sophomore community college students were to be introduced early in their academic career to basic STEM-related research. The Big Thicket Summer Research Institute (BTSRI) was established to provide these opportunities. The Big Thicket National Preserve was selected to conduct the Institute because of its biological diversity, low cost of housing and facilities, availability of nationally known mentors, and potential contributions to basic science. Four-ten week summer institutes (SRI) have been conducted since 2007. Thirty-eight undergraduate students from Eastfield College and eight mentors have participated in the program. BTSRI students conducted field studies with mentors, wrote project proposals, prepared papers and posters, gave presentations (some presented at national meetings), learned the importance of nature photography and contributed data to the **A**ll **T**axa **B**iodiversity **I**nventory (**ATBI**). The Big Thicket National Preserve proved to be an excellent resource to introduce undergraduate students to basic research. Fungi, plants, vertebrate, invertebrates, and water quality have provided a wealth of study materials. Thirty-six of the 38 BTSRI students are continuing or have completed their undergraduate degree, 34 in science fields. The program has been recognized nationally and has received several awards. Based on our findings, undergraduate research programs should be expanded in the Big Thicket National Preserve to increase the number of students seeking careers in basic research and creating an environmental awareness in future scientists. Community and four year colleges and universities should seek the support of industry, local community leaders, nonprofit organizations and government entities to develop and fund academic endeavors in National Parks. **(ORAL PRESENTATION).**

KWIATKOWSKI, M.A.[1] AND D.C. RUDOLPH[2]. [1]Department of Biology, Stephen F. Austin State University; [2]Southern Research Station, Wildlife Habitat and Silviculture Lab. ***CONSERVATION GENETICS OF LOUISIANA PINE SNAKES,* PITUOPHIS RUTHVENI*: EFFECTS AND IMPLICATIONS OF SMALL, ISOLATED POPULATIONS.***

Recent data indicate the Louisiana Pine Snake, *Pituophis ruthveni*, persists as small, fragmented populations scattered across its' historic range. Most, if not all of these populations are vulnerable to habitat degradation and the impacts of fragmentation, which can have considerable consequences for population fitness. As populations fragment, movement and migration is reduced, effectively decreasing gene flow. To investigate the conservation genetics of Louisiana Pine Snakes, sixteen microsatellite loci were isolated and characterized at the Savanna River Ecology Laboratory. Loci were screened in 24 individuals from locations throughout its distribution in Louisiana and Texas. The number of alleles per locus ranged from 4 to 12 and observed heterozygosity ranged from 0.200 to 0.875 with an average expected heterozygosity of 0.693 and an average observed heterozygosity of 0.542. Five of the 16 loci showed significant deviations from expectations under Hardy-Weinberg Equilibrium. When pairwise comparisons were made among regional areas (Texas, northern Louisiana, southern Louisiana), limited genetic structure was observed with F_{ST} values ranging from 0.029 to 0.047. However, exact tests suggested there is genetic differentiation between the Louisiana populations north and south of the Red River, and between Texas snakes and those from Louisiana south of the Red River. Although limited by small samples sizes, these results suggest genetic diversity in Louisiana Pine Snakes may be impacted by small population sizes. Reduction of heterozygosity, potential for inbreeding, and increased effects of genetic drift are all of considerable conservation concern. **(ORAL PRESENTATION).**

LINDGREN, N.K., A.D. ARCHAMBEAULT, J.L. COOK, AND S.R. BUCHELI. Department of Biological Sciences, Sam Houston State University. ***INSECT ECOLOGY AND BIODIVERSITY: ISLAND ECOSYSTEMS OF THE HANCOCK FOREST MANAGEMENT, A MEMBER OF THE THICKET OF DIVERSITY ATBI***

The Hancock Forest Management is a private actively logged forest adjacent to the Big Thicket National Preserve (BTNP), and a member of the "Thicket of Diversity" All Taxa Bio Inventory (ATBI) being administered by the Big Thicket Association in cooperation with the National Park Service. Geographic islands of the Hancock Forest have been untouched and contain old growth forest that is an analogue to parts of the BTNP. Conducting an insect ecological survey of the Hancock Forest is a unique opportunity to study the richness, abundance and characteristics of these ecological islands. The aim of this biodiversity study is to establish a base line that can be used to asses other forests in the region to understand geographic, environmental and temporal differences. We are collecting diversity through the use of malaise traps, sweep netting, pit fall traps, and lighted bucket traps. The insects collected will be housed and maintained at Sam Houston State University for reference and future work. **(POSTER PRESENTATION).**

LOOS, P.M.[1] AND T.C. PHILLIPS[2]. [1]Ecovirons; [2]U.S. Forest Service, National Forests and Grasslands in Texas. ***REINTRODUCTION OF* CYPRIPEDIUM KENTUCKIENSE *INTO EAST TEXAS FORESTS***

In spring 2007, a discussion began about the possibility of trying in East Texas to duplicate a recent Lady Slipper reintroduction project done in part of the Kisatchie National Forest in Louisiana. After funding was secured for the East Texas project, a partnership or working team was formed that included Tom Philipps, National Forest Service (NFS); Doug Harris, Houston Orchid Society (HOS); Joe Liggio and Peter Loos, Native Plant Society of Texas (NPSOT); and a team from Stephen F. Austin State University (SFASU) that included Dr. David L. Creech, Greg Grant, Dawn Stover, and Trey Anderson. Bill Steele of Spangle Creek Labs, who had worked on the Louisiana project, was contracted to germinate the seeds. Several Slipper sites in the Sabine National Forest and one in the Angelina National Forest that earlier in the spring had blooms were revisited in late October in an unsuccessful search of fruit to utilize in the project. Finally, two fruit (capsules) were found in the Sabine in the Matlock Hills region located off FR108. Half of the seed was germinated in-vitro (test tubes) for almost a year and a half (17 months) before they were developed enough for shipping. These were subsequently grown out further before being ready for transplanting back into the wild. I n April 2009, SFASU received 400 seedlings that were immediately potted into 4 inch pots. The 2009 seedling plants will be reintroduced to the wild in Spring 2011, preferably in March after they have emerged from winter dormancy. Site choices include enhancement of populations at currently known sites, sites where they occurred historically, and appropriate sites where conditions are such that they should occur or may have occurred. The goal of this project is to reintroduce seedlings back into the wild to increase the total number of plant specimens, to increase genetic diversity, and to increase total number of sites that are home to Lady Slipper Orchids (*Cypripedium kentuckiense).* Several private landowners, as well as the SFASU Gardens (PNPC and Arboretum) that have appropriate habitat and knowledge of this species will be allotted a limited number of seedlings to introduce to their land, again in an attempt to increase diversity as well as the number of sites where Slippers occur. **(ORAL PRESENTATION).**

LOPEZ, R. Texas A&M Institute of Renewable Natural Resources, Texas A&M University. ***AMERICA'S LONGLEAF: A LANDSCAPE RESTORATION INITIATIVE*.**

Longleaf pine (*Pinus palustris*) forests once ranged from the Atlantic Coastal Plain of southeastern Virginia to the West Gulf Coastal Plain of Texas, comprising more than 90 million acres of the North American landscape. Often times referred to as the tree that built America, today longleaf pine forests occupy a small portion their former range – approximately 3.4 million acres. In 2005, the *America's Longleaf Restoration Initiative (ALRI)* was established to promote a focused, range-wide approach to the restoration of the longleaf pine ecosystem. The ALRI was instrumental in drafting a Range-Wide Conservation Plan for Longleaf Pine. The Conservation Plan has an ambitious goal to maintain, improve or restore 8 million acres of longleaf pine forests across its historic range, within a 15 year horizon, from the current 3.4 million acres. It calls for strategic coordination of science-based conservation at the regional and local levels. Efforts to implement the Conservation Plan will be discussed with an emphasis on activities of the Texas-Louisiana Longleaf Taskforce, a local implementation team supporting *America's Longleaf*. **(ORAL PRESENTATION).**

MCBROOM, M.W. Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University. ***RIPARIAN FOREST STRUCTURE AND LARGE WOODY DEBRIS LOADINGS ON THE LOWER SABINE RIVER.***

Instream large woody debris (LWD) is an extremely important structural and functional component in aquatic ecosystems. Few studies in the southeast have examined the relationship between riverine processes, riparian forest structure, and LWD loading. Riparian forest structure and LWD were measured on four meander wavelengths (1-2 river km) on the lower Sabine River, downstream of Toledo Bend Reservoir. Bankside vegetation within 20 m of the river was measured and identified. In addition, all in-stream LWD in the study reaches was measured, identified, and categorized. Just downstream of Toledo Bend Reservoir was the Burkeville site which contained significantly greater LWD volume (85.29 m^3 km^{-1}) than the other three, since higher river bank erosion rates below Toledo Bend combined with similar riparian vegetation density to the other three sites resulted in greater LWD recruitment. About 80-90% of LWD originated from direct river bank erosion on the study reach. Transport of LWD from upstream to the study reach was a less significant component; therefore, Toledo Bend Reservoir is not likely to directly impact downstream LWD loading due to lacustrine wood storage. LWD residence time was estimated at 12-14 years for relatively decay resistant species like riparian oaks, loblolly pine and baldcypress. Less decay resistant species like black willow, sweetgum, and Chinese tallow tree, which characterized forest mid- and understory of more downstream sites, will have shorter residence times and thus potentially lower future LWD volumes. Since this lower coastal plain river is supply rather than transport limited for LWD, maintaining riparian forest structure and diversity is the most important factor for optimum LWD recruitment and thus for conserving this significant aquatic habitat component. **(ORAL PRESENTATION).**

MELDER, C.A., S.M. ECREMENT, S. CARNAHAN, AND B. COOPER. Fort Polk ENRMD, Conservation Branch, Endangered Species Section (ESS). ***RED-COCKADED WOODPECKER ARTIFICIAL DRILLED CAVITY USAGE ON FORT POLK MILITARY INSTALLATION.***

The red-cockaded woodpecker (*Picoides borealis*, RCW) received federal protection with the passage of the Endangered Species Act in 1973. The primary decline of the species has been due to habitat loss. In the 1980's it was reported that the loss of natural RCW cavities was exceeding excavation of new cavities. Additionally, catastrophic events such as beetle outbreaks and hurricanes gave rise to an obvious need for artificial cavity development. The USFWS approved two forms of artificial cavities, the cavity insert and drilled cavity. Artificial cavity inserts have been the preferred choice of artificial cavities throughout the species' western range. This presentation will discuss the use of drilled cavities as an additional tool for RCW managers. Artificial cavity inserts have been installed on Fort Polk military installation since the summer of 1993 to resolve suitable cavity shortages within RCW cluster sites. In the spring of 2005, ESS biologists began installing drilled cavities on Fort Polk. The seventy-five drilled cavities and forty-six cavity inserts used in this analysis were installed within active RCW sites from July 2004 through July 2009. These cavities were monitored through February 2011 to verify activity status and the percent utilization as nest trees. Sixty-six percent of drilled cavities used in this study became active and 41% were used as nest trees. Seventy-six percent of inserts became active and 26% were used as nest trees. The requirements needed and reasons for utilizing the drilled cavity method, in addition to artificial inserts, will be discussed. **(POSTER PRESENTATION).**

MEYER, H.A., M.N. DOMINGUE, AND J.G. HINTON. Department of Biology and Health Sciences, McNeese State University. ***TARDIGRADE DIVERSITY OF THE WEST GULF COASTAL PLAIN, INCLUDING NEW RECORDS AND SPECIES FROM LOUISIANA*.**

Over 200 species of freshwater and terrestrial water bears (Phylum Tardigrada) are known to occur in North America. In the West Gulf Coastal Plain, including parts of Oklahoma, Texas, Arkansas and Louisiana, the presence of 20 species of tardigrade has been reported. Lichens we collected in Crowley, Acadia Parish, Louisiana, in spring 2010 contained nine species of water bear, three of which are new to science. *Minibiotus acadianus* sp. n. has a unique pattern of small gibbosities on the fourth pair of legs, in three caudal rows, and in a single row at the level of the third pair of legs. A second new species belongs to the "*Macrobiotus hufelandi*" complex, and is distinguished by its exceptionally long distal egg processes; this species is also found in Florida. A third species, belonging to the genus *Murrayon*, is distinguished by its large size, especially in its wide buccal tube and very large claws and lunules. The results of this study and those of an All Taxa Biological Inventory in Big Thicket National Preserve raise the number of known WGCP species to 41. **(ORAL PRESENTATION).**

MIDDLETON, B.A. U.S. Geological Survey, National Wetlands Research Center. ***CLIMATE CHANGE AND FUNCTION OF WESTERN* TAXODIUM DISTICHUM *SWAMPS***

Predictions can be made about the effects of climate change on wide-ranging ecosystems based on observations of changes in their function across their geographical extent. *Taxodium distichum* is a forested wetland type that spans the southeastern part of North America and a good candidate for climate analysis. Study sites were established in similar swamps at each of seven latitudes in the Mississippi River Alluvial Valley from Illinois to Louisiana to make comparisons of production and regeneration dynamics across the climate gradient. An additional set of study sites may be added in Texas to capture the driest swamps in the western part of the region. Ongoing studies include studies of carbon storage and regeneration dynamics. Swamp leaf production was highest in midrange, and lower in the northern and southern parts of the range, i.e., exhibiting a curvilinear pattern. Seed bank densities are generally related to precipitation levels and so may be vulnerable to climate change. Overall, these functional studies suggest that climate warming and drying may decrease the range of swamps in the western and southern part of the range. Knowledge of the response of baldcypress swamps to differences in climate across the latitudinal range can give evidence of the response of these species to climate change and thus help lead to models that more accurately predict the distribution of these wetlands in the future. **(ORAL PRESENTATION).**

MIDDLETON, B.A.[1] AND B.J. ROBERTS[2]. [1]U.S. Geological Survey, National Wetlands Research Center; [2]Louisiana Universities Marine Consortium (LUMCON). ***REMEDIATION AFTER THE DEEPWATER HORIZON INCIDENT PUSHED OIL FROM COAST, AND PROVIDED PULSED HYDROLOGY TO COASTAL SWAMPS.***

The hydrological remediation used to prevent oil intrusion onto the Gulf Coast after the Deepwater Horizon Incident could aid in the maintenance of elevations in sinking coastal wetlands by improving environments for plant growth. We are studying ecosystem processes related to elevation maintenance including production, decomposition, tree growth and the emission of gases following hydrological remediation. The project is located in coastal baldcypress swamps across the Gulf Coast including in Jean Lafitte NHP&P (Louisiana; with remediation), Big Thicket (Texas; control) and St. Marks/Aucilla (Florida; control). The hypotheses we will test include that in comparison to control sites: hydrologically remediated sites will have either increased or decreased peat accumulation, above- and below-ground production, decomposition, and elevation. We will monitor the rates of CO_2, N_2O and CH_4 emissions from the wetlands, because we anticipate that decomposition and other biogeochemical processes could shift in response to the disturbance. Thus, our research represents an opportunity to capture key shifts in processes related to the remediation of the Deepwater Horizon Incident. In the pulsed hydrology after the opening of diversions to remediate the oil spill, baldcypress trees grew twice as much in 2010 as in 2009 (mean growth increment = 10 versus 20 mm, respectively) in Jean Lafitte National Historic Park and Preserve (NHP&P). The project is on-going and funded by a National Science Foundation RAPID award within the Ecosystems program. **(ORAL PRESENTATION).**

NEAL, J.[1], S. CARR[2], AND J. STEPHENS[1]. [1]U.S. Fish and Wildlife Service; [2]Southern Research Station, Savannah River Site, University of Wisconsin. ***OLD-GROWTH CHARACTERISTICS OF LITTLE SANDY NATIONAL WILDLIFE REFUGE.***

Little Sandy National Wildlife Refuge, located along the Sabine River in Wood County, Texas, is a 1539 hectare conservation easement conserved by the US Fish and Wildlife Service and is part of the Little Sandy Hunting and Fishing Club. Little Sandy represents the largest known old-growth bottomland hardwood forest site in the West Gulf Coastal and perhaps the second largest site in the south. In order to characterize the area, the site was sampled in fall of 2007-2008; 674 spatially explicit plots were sampled for trees, shrubs, vines, and herbaceous species using the point-centered quarter method. The number of dead down and standing snags also was recorded. Little Sandy represents only 0.08% of the land area of east Texas, but has 12% of the total plant species while only containing one major plant community type. Little Sandy also has one-half of the plant families of east Texas, 33% of the trees, 30% of the vines, and 36% of the shrubs. A quantitative description of the forest composition and structure and how the bottomland community varies over the landscape based on soil, surface geology, and micro topography will be determined. Another study will compare the old-growth characteristics of Little Sandy with an adjacent younger site, the Old Sabine Bottom Wildlife Management Area. Little Sandy will serve as a reference site for restoration purposes. **(POSTER PRESENTATION).**

NEAL, J.[1], D.C RUDOLPH[2], AND R.R. SCHAEFER[2]. [1]U.S. Fish and Wildlife Service; [2]U.S. Forest Service, Southern Research Station. ***OLD-GROWTH FOREST REMNANTS IN EASTERN TEXAS.***

Very little of the pre-European forest ecosystems survive in the West Gulf Coastal plain of eastern Texas. Only 6-7 remnant sites remain ranging in size from a few hectares to approximately 1250 hectares. Other small patches of old-growth undoubtedly exist, but have not been sufficiently documented. Representative sample forests include Longleaf Pine (*Pinus palustris*), Shortleaf Pine (*P. echinata*)-hardwood, American Beech (*Fagus grandifolia*)-Southern Magnolia (*Magnolia grandifolia*), mesic hardwoods, bottomland hardwoods, Bald Cypress (*Taxodium distichum*), and Bald Cypress-Water Tupelo (*Nyssa aquatica*). Major forest types; including upland hardwoods, shortleaf pine savannah, and various forest types with a loblolly pine component; have no known old-growth examples in eastern Texas. Several of these sites have been substantially degraded because of the alteration of pre-European fire or hydrological regimes. All of these sites remain highly vulnerable to future alteration and disturbance. The continued survival of these remnants would be enhanced by restoration or maintenance of an appropriate fire regime, control of exotic vegetation, and maintenance of forested buffer zones. These sites are of inestimable value as refugia for rare and threatened species, as outdoor laboratories for research, and as historic examples of the pre-European forested landscape. **(POSTER PRESENTATION).**

NIGHTINGALE, T. Texas Co-Chair, Texas/Louisiana Longleaf Pine Taskforce. ***TEXAS-LOUISIANA LONGLEAF TASKFORCE IMPLEMENTATION TEAM.***

Longleaf pine forest once covered more than 90 million acres in the southeastern United States, serving as one of the most diverse ecosystems outside of the tropics. Today, only 3.4 million acres remain. The decline in ecosystem area has been accompanied by a decline in ecosystem health. The remaining longleaf pine forest provides critical habitat for 29 threatened or endangered species. The Texas-Louisiana Longleaf Restoration Task Force is comprised of natural resource agencies/partners and landowners that share the common goal to accelerate longleaf ecosystem restoration on private forestlands adjacent to public lands, and to support the larger, range-wide America's Longleaf Restoration Initiative, whose purpose is to increase longleaf pine acreage from 3.4 to 8.0 million acres in the next 15 years. **(ORAL PRESENTATION).**

NOVAK, L.D.[1], C.E. COMER[1], W.C. CONWAY[1], D.G. SCOGNAMILLO[1], AND R.D. GAY[2]. [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2]Henderson Trust, Lufkin, Texas. ***NEST SUCCESS AND NEST SITE SELECTION OF EARLY SUCCESSIONAL SONGBIRDS IN RESTORED LONGLEAF PINE SAVANNAH IN EAST TEXAS.***

Nest success of early successional birds is crucial for evaluating restoration success of longleaf *(Pinus palustris*) forests in east Texas. We searched for nests of early successional bird species in young longleaf stands (2 – 4 years old), mid-aged longleaf stands (7 – 10 years old), and young loblolly (*Pinus taeda*) stands (4 – 5 years old) during the breeding season (March – July), 2009 and 2010. We located and monitored a total of 66 nests from 5 species, including indigo bunting (*Passerina cyanea, n*=21), prairie warbler (*Dendroica discolor, n*=6), Northern cardinal (*Cardinalis cardinalis, n*=20), yellow-breasted chat (*Icteria virens, n*=15), and white-eyed vireo (*Vireo griseus, n*=4). We determined nesting success and the effect of habitat variables such as percent canopy cover and distance to closest edge on nest success and nest site choice per species. We found more nests in young loblolly stands than in young and mid-aged longleaf stands, although nesting success in all stands for all species was very low. We also monitored occurrences of brown-headed cowbird (*Molothrus ater*) parasitism and found the majority of parasitized nests were located in the young longleaf stands. Indigo buntings were the only species parasitized, and all nests were abandoned after the cowbird egg was laid, except one nest which was predated the day after all chicks had hatched. **(ORAL PRESENTATION).**

OSWALD, B.P.[1], M.M. BATAINEH[2], I.V. MCWHORTER[3], M.H. LEGG[1], AND D.R. UNGER[1]. [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2]Department of Geography, University of British Columbia; [3]United States Forest Service, National Forests and Grasslands of Texas. ***EFFECTS OF FIRE EXCLUSION WITHIN THE* PINUS PALUSTRIS *MILL. COMMUNITIES OF UPLAND ISLAND WILDERNESS, TEXAS.***

This study quantifies two decades of change, attributed to fire exclusion, in longleaf pine communities of Upland Island Wilderness of eastern Texas and examines the efficacy of a frequent burning regime, with a mean fire return intervals of 4-5 years, as a management and restoration tool. Two decades of fire exclusion have resulted in substantial change in the form of reduced herbaceous species richness and cover, shift in species composition toward shrubs and other pines in the understory and midstory, development of a dense midstory, and reduced longleaf regeneration. Vegetation response to fire exclusion did not seem to be shaped by the underlying local edaphic and physiographic gradients. Our data demonstrated effectiveness of the burning regime in producing positive changes, however increasing burning frequency to 2-3 years may be necessary to reduce hardwood re-sprouts from emerging into the understory and eventually midstory strata. **(ORAL PRESENTATION).**

PACKARD, J.M.[1], P. WEEKS[2], M. PAOLISSO[3], AND M. SRINIVASAN[4]. [1] Texas A&M University; [2] Houston Advanced Research Center; [3] University of Maryland, College Park; [4] National Oceanic and Atmospheric Administration. ***CULTURAL MODEL APPROACH TO LAND CONSERVATION: A QUANTITATIVE PERSPECTIVE.***

The goal of this mixed-mode study was a deeper understanding of the diverse ways that stakeholders use cultural knowledge to make sense of disparate approaches to protect working landscapes (e.g. a mosaic of private and public properties). We applied principal components analysis to data from a survey instrument designed to measure validity of cultural schemas associated with the construct of "land conservation." Survey questions were informed by in-depth qualitative interviews structured to identify the range of cultural beliefs and values that stakeholders express about diverse topics, such as land conservation, development, rural livelihoods, rural heritage, nature and community. We show how integration of quantitative and qualitative data can help unpack the complexities inherent in how people reconcile using and protecting land, a resource that is valued as property by some stakeholders and by others as a substrate for ecological services that benefit a broader public. **(POSTER PRESENTATION).**

PIERCE, J.B.[1], D.C. RUDOLPH[1], B. WAGNER[2], S. REICHLING[3], E. SMITH[4], M. A. KWIATKOWSKI[5], R.R. SCHAEFER[1], D. FULLER[6], M. SEALY[6] AND D. SAENZ[1]. [1]USDA Forest Service, Southern Research Station; [2]Quantitative Ecological Services; [3]Memphis Zoo; [4]USDA Forest Service, Kisatchie National Forest; [5] Department of Biology, Stephen F. Austin State University; [6]US Fish & Wildlife Service. ***A REINTRODUCTION EXPERIMENT WITH THE LOUISIANA PINE SNAKE (*PITUOPHIS RUTHVENI*).***

Ongoing surveys suggest that the Louisiana Pine Snake (*Pituophis ruthveni*) is declining; and currently occupied habitat is limited to a few small, isolated blocks of degraded and fragmented habitat. Research suggests that the species requires frequently burned sites with a well developed herbaceous understory capable of supporting populations of its primary prey, Baird's Pocket Gopher (*Geomys breviceps*). Recent changes in management practices on U. S. Forest Service lands have resulted in restoration of substantial blocks of suitable habitat, which are now available for reintroduction. A captive population consisting of 100+ individuals has been established from wild-caught snakes from Bienville Parish, LA. The reintroduction site is located on the Catahoula District of the Kisatchie National Forest, which is thought to be currently unoccupied due to past fire suppression. Eleven individuals were released in 2010, and 9 snakes are currently being head-started and will be released in April 2011. We plan to continue to breed captive snakes and release 50% of available animals (~30-40) as neonates immediately following post-natal shed, while the remaining snakes will be head-started and released the following April. Currently, automated pit tag readers (APTR) are the primary monitoring technique, however canine detection, radiotelemetry, and trapping may be used in the future. Eight of 11 snakes were released at APTRs, 5 of which were detected by the APTRs 12-26 days post-release. Production of neonates and release of young will be repeated annually until a viable population is established or it is concluded that further releases are not likely to result in establishment of a population. **(ORAL PRESENTATION).**

PIERCE, J.B.[1], D.C. RUDOLPH[1], S.J. BURGDORF[2], R.R. SCHAEFER[1], R.N. CONNER[1], M.J. EALY[3], J.G. HIMES[4], AND C.M. DURAN[5]. [1]U.S.D.A. Forest Service, Southern Research Station; [2]U.S. Fish & Wildlife Service; [3]Texas Parks & Wildlife Department; [4]Florida Fish & Wildlife Conservation Commission; [5]The Nature Conservancy. ***HIBERNACULA AND WINTER MOVEMENT PATTERNS OF LOUISIANA PINE SNAKES (*PITUOPHIS RUTHVENI*).***

Despite concerns that the Louisiana pine snake (*Pituophis ruthveni*) has been extirpated from large portions of its historic range, only a limited number of studies on their movement patterns have been published. Winter movement patterns are of particular interest since it has been hypothesized that impacts of management practices would be less during the winter. Using radiotelemetry, we determined winter movement patterns of Louisiana pine snakes (8 males, 8 females) in 5 study areas (2 in Louisiana and 3 in Texas). Movements during winter (November–February) were greatly curtailed compared to the remainder of the year, however snakes occasionally undertook substantial movements. Relocations were typically within the previous active season's home range, and movements were concentrated in the early portion of winter. All hibernation sites were within Baird's pocket gopher (*Geomys breviceps*) burrow systems with a depth range of 13-25 cm. Snakes were <1 m from the presumed point of entrance into the burrow system. Winter refuge placement was similar to the positions occupied by snakes at other seasons when using pocket gopher burrows for foraging and refuge. Louisiana pine snakes did not use communal hibernacula, nor did individual snakes return to previously used sites in successive years. **(POSTER PRESENTATION).**

PRESTON, J., M. HODGES, AND W. FORBES. Geography Program, Stephen F. Austin State University.
MONITORING EAST TEXAS FOREST HABITATS FOR RESTORATION POTENTIAL

Stephen F. Austin University's Geography Program volunteered to conduct mapping and monitoring of local nature reserves owned by the Texas Land Conservancy, whose main office lies over 200 miles away in Austin, Texas. This poster describes efforts made through undergraduate classes and Geography Club field activities to build baseline information on two reserves: 1) Catahoula Preserve, a ridgetop, longleaf pine stand located adjacent to the Upland Island Wilderness, is approximately sixty miles south of the University and about six miles southeast of Zavalla, at the northern end of the Big Thicket region; and 2) Banita Creek Preserve, an urban, streamside forest two and a half blocks west of the University. Students measured stand density and native grass cover before (and will do so after) a prescribed burn in the fire-suppressed Catahoula Preserve, to help determine restoration results. They also researched the environmental attitudes and history of human communities adjacent to the Preserve. Students measured vegetation transects and mapped and photographed soil erosion sites in Banita Creek Preserve, to help determine restoration needs. Such partnerships can build student field skills in plant identification, forest and stream monitoring, and geographic information technology. These efforts can also help document land health restoration results and opportunities, while building social capital in local protected areas. **(POSTER PRESENTATION).**

RIGBY, E.A.[1] AND D.A. HAUKOS [2]. [1]University of Minnesota; [2]U.S. Fish and Wildlife Service, Texas Tech University. ***A MATRIX POPULATION MODEL FOR MOTTLED DUCKS ON THE WESTERN GULF COAST OF TEXAS.***

The mottled duck population in Texas has declined >80% during the last 15 years based on breeding pair surveys on National Wildlife Refuges. Reduction in habitat quality and quantity leading to declining recruitment is considered to be the dominant factor in the decline. Development of a population model would greatly aid management decisions regarding mottled ducks on the western Gulf Coast. We used existing vital rate estimates of mottled ducks on the western Gulf Coast of Texas to construct a matrix population model. We assumed a pre-breeding census and birth-pulse reproduction. We calculated estimates for composite vital rates such as population growth rate (λ), fecundity, and recruitment using 1,000 iterations of the model. We also performed 20 meta-iterations of the population model to obtain mean coefficient of determination (r^2) values for the linear regression of each vital rate and composite rates on λ. Based on current population vital rates, overall λ was low, 0.511 (SE=0.055). Mean fecundity was low, F=0.039 (SE=0.032). The elasticity analysis suggested that proportional changes in both fecundity (r^2 =0.404) and survival (r^2=0.600) played major roles in explaining the variation in λ. For the vital rates that composed F, breeding propensity (r^2=0.196) and nest success (r^2=0.115) explained the most variation in λ. Results indicated that the mottled duck population is in a steep decline, with very low fecundity. If current rates do not change, the mottled duck population does not appear to be sustainable on the western Gulf Coast. **(ORAL PRESENTATION).**

ROGERS, W.E. [1], D. TWIDWELL [1], AND T. L. BLANKENSHIP[2]. [1]Department of Ecosystem Science and Management, Texas A&M University; [2]Welder Wildlife Foundation. ***RESTORING WEST GULF COASTAL PRAIRIES USING PRESCRIBED EXTREME FIRES.***

West Gulf coastal prairies were once highly diverse ecosystems but the few remaining remnants are losing native plant diversity due to woody plant encroachment and invasion of exotic herbaceous species. Historically, intense fires were critical to maintenance of coastal prairies and prescribed extreme fires are beginning to be used in many grassland restoration efforts. However, land managers are concerned that prescribed extreme fires will decrease native species richness, either directly or by facilitating invasions of alien invasive grass and forb species. Further, there are concerns regarding safety and efficacy of using prescribed extreme fires compared to more traditional management efforts. We have been conducting experimental studies at the Welder Wildlife Refuge near the southern boundary of the Texas coastal prairie region to assess the utility of prescribed extreme fire to reverse woody plant dominance and to determine its effect on native and exotic plant species richness. In June 2008, we intentionally burned at the end of a severe 5-month drought when precipitation was 96% below the long-term monthly average. This resulted in extreme fire intensities where maximum flame lengths exceeded 6 m and temperatures averaged 933 ± 18 ^{o}C. Significant decreases in woody plant cover were achieved and many resprouting woody plants were killed. Total species richness was significantly greater in burned treatments as a result of significantly greater richness of native forbs. Alternatively, exotic species richness and frequency of King Ranch bluestem did not differ between burned and unburned plots. An inverse relationship between total live and dead herbaceous biomass and species richness along a burned-unburned gradient was identified, indicating that heavy litter accumulation is a primary, negative constraint on species richness in coastal prairie. Our findings suggest that concerns regarding extreme fires decreasing herbaceous species richness or increasing the abundance of undesirable exotic herbaceous species are unwarranted. Combined with the benefits achieved by reducing woody plant encroachment, prescribed extreme fires appear to offer a viable restoration strategy for coastal prairie ecosystems. Nevertheless, widespread application of prescribed extreme fire as a restoration tool hinges on our ability to shift the social perceptions driving the application of fire on rangelands. We also highlight how some social groups have overcome constraints to apply prescribed extreme fires across expansive regions in Texas with the aim of restoring the ecological integrity and economic productivity of rangeland environments. **(ORAL PRESENTATION).**

ROSS, W.G.[1], D.L. KULHAVY[2], W. C. CONWAY[2], AND R. N. CONNER[3]. [1]School of Forestry, Louisiana Tech University; [2]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [3](retired) USDA Forest Service, Southern Research Station. ***RESIN FLOW IN TEXAS LOBLOLLY AND SHORTLEAF PINES USED BY RED-COCKADED WOODPECKERS.***

Resin flow was measured in both loblolly (*Pinus taeda* L.) and shortleaf (*Pinus echinata* Mill.) pines in stands used and not used by red-cockaded woodpecker, (*Picoides borealis* Vieillot), in the Angelina and Davy Crockett National Forests. Resin flow is important to red-cockaded woodpeckers in two respects, as birds use resin flow to form barriers against rat snake predation while resin flow also is a defense against bark beetle attack, fungal inoculation and fire damage. Resin flow varied by study area, species, and stand position. In woodpecker stands, trees experiencing low levels of competition were able to tolerate continual resin drainage associated with red-cockaded woodpecker resin well pecking. In the Angelina National Forest, all new cavity trees excavated during the study were on forest edges. This and other studies, indicate that the woodpeckers choose trees most likely to be good resin producers. Silviculture in loblolly and shortleaf pine stands should favor edge and an open stands when red-cockaded woodpeckers are a major management consideration. **(ORAL PRESENTATION).**

ROZELLE, K.B.[1], D.L. KULHAVY[1], W.G. ROSS[2], W.C. CONWAY[1], AND R.N. CONNER[3]. [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2]School of Forestry, Louisiana Tech University; [3](retired) USDA Forest Service, Southern Research Station. ***A COMPARISON OF RESIN PRODUCTION IN NATURALLY EXCAVATED RED-COCKADED WOODPECKER CAVITY TREES WITH ARTIFICIAL CAVITY-INSERT TREES.***

Resin flow was measured in red-cockaded woodpecker (*Picoides borealis* Vieillot) clusters in longleaf (*Pinus palustris* L.) pine stands in the southern region of the Angelina National Forest, Texas. Resin flow from its cavity trees is important to the endangered red-cockaded woodpecker because the resin inhibits rat snake (*Elaphe* spp.) climbing of cavity trees and subsequent predation. Resin flow is also important for the protection of the tree against southern pine beetle (*Dendroctonus frontalis* Zimm.) attack. The trees sampled for resin flow were categorized as either natural active woodpecker cavity trees, artificial (insert) active cavity trees, natural inactive cavity trees, artificial inactive cavity trees, or control trees. The pattern of resin flow throughout the year was different in resin yields and followed patterns found previously. Cavity tree categories were similar in resin flow, although variation was observed at categories > 90th percentile. Cavity tree categories that fell within the upper ranges were defined as super resin producing trees and should be considered for inserts. **(ORAL PRESENTATION).**

RUDOLPH, D.C.[1], B. MACROBERTS[2], M.H. MACROBERTS[2,] AND D.W. PETERSON[3]. USDA Forest Service, Southern Research Station; [2]Herbarium, Museum of Life Sciences, Louisiana State University in Shreveport, and Bog Research; [3] USDA Forest Service, National Forests and Grasslands in Texas. ***FLORISTICS AND RESTORATION OF EPHEMERAL PONDS IN EAST CENTRAL TEXAS.***

Since 2009 we have surveyed the vegetation of ephemeral ponds in Sabine and Nacogdoches counties in east-central Texas. These ponds are shallow, flat-bottomed, and support a small, but distinct flora dominated by grasses (Poaceae) and sedges (Cyperaceae). The flora of these ponds is most similar to that of flatwoods ponds located on the lower coastal plain. Once more common on the landscape, ponds of this type have been altered or destroyed by land use changes, and fire suppression leading to massive encroachment of woody vegetation. The pond in Nacogdoches County has been regularly mowed for 20 years to prevent woody encroachment. Currently, prescribed burning in late summer and mechanical removal of encroaching woody vegetation is being applied to better understand management options to maintain and restore these and similar sites in east-central Texas. **(ORAL PRESENTATION).**

RUDOLPH, D.C.[1], D. E. PLAIR[2], D. JONES[3], J.H. WILIAMSON[1], C.E. SHACKELFORD[3], R.R. SCHAEFER[1], AND J.B. PIERCE[1]. [1]USDA Forest Service, Southern Research Station; [2]USDA Forest Service, Sam Houston National Forest, [3]Texas Parks and Wildlife Department. ***RESTORATION AND WINTER AVIAN USE OF SMALL ISOLATED PRAIRIES IN EASTERN TEXAS.***

Small isolated calcareous prairies were once common within the pine forests of eastern Texas. Most have been lost due to land use changes, including agriculture, forestry, and grazing. Fire suppression has also resulted in woody encroachment on many of the remaining sites. A considerable number of sites on the Sam Houston National Forest in Walker and Montgomery counties are still recognizable as prairie. These sites, often only a hectare or so in extent, have been degraded by past land use practices, grazing, and fire suppression. Beginning in 2004, a concerted attempt was initiated to restore these prairie sites using mechanical removal of woody vegetation and prescribed fire. Winter bird surveys were initiated in 2008 to document the use of these prairie sites by birds, especially *Ammodramus* sparrows. Restoration has resulted in a dramatic increase in grass cover and wintering *Ammodramus* sparrows, most noticeably after the first growing season following mechanical removal of woody encroachment. **(ORAL PRESENTATION).**

RYBERG, W.A.[1], J.C. CATHEY[2], AND L.A. FITZGERALD[1]. [1] Department of Wildlife and Fisheries Sciences, Texas A&M University; [2]Texas AgriLife Extension Service, Department of Wildlife and Fisheries Sciences, Texas A&M University. ***GENETIC RELATIONSHIPS OF AMERICAN ALLIGATOR POPULATIONS DISTRIBUTED ACROSS DIFFERENT ECOLOGICAL AND GEOGRAPHIC SCALES.***

Although much work has been conducted on coastal populations of the American alligator (*Alligator mississippiensis*), less is known about the population dynamics and genetic structure of populations of alligators confined to inland habitats. DNA microsatellite loci, derived from the American alligator, were used to investigate patterns of genetic variation within and between populations of alligators distributed at coastal and inland localities in Texas. These data were used to evaluate the genetic discreteness of different alligator stocks relative to their basic ecology at these sites. Observed mean heterozygosities across seven loci for both coastal and inland populations ranged from 0.50–0.61, with both inland and coastal populations revealing similar patterns of variation. Measures of F_{st} revealed significant population differentiation among all populations; however, analyses of molecular variance (AMOVAs) failed to demonstrate any apparent geographic pattern relative to the population differentiation indicated by F_{st} values. Each population contained unique alleles for at least one locus. Additionally, assignment tests based on the distribution of genotypes placed 76% of individuals to their source population. These genetic data suggest considerable subdivision among alligator populations, possibly influenced by demographic and life history differences as well as barriers to dispersal. These results have clear implications for management. Rather than managing alligators in Texas as a single panmictic population, translocation programs and harvest quotas should consider the ecological and genetic distinctiveness of local alligator populations. **(ORAL PRESENTATION).**

SCHAEFER, R.R.[1], R.R. FLEET[2], D.C. RUDOLPH[1], AND N.E. KOERTH[1]. [1]USDA, U.S. Forest Service, Southern Research Station; [2]Department of Mathematics and Statistics, Stephen F. Austin State University.

MICROHABITAT PREFERENCES OF GREEN ANOLES (*ANOLIS CAROLINENSIS*) IN OPEN LONGLEAF PINE (*PINUS PALUSTRIS*) FORESTS OF EASTERN TEXAS.

We related green anole (*Anolis carolinensis*) abundance to vegetative variables, with an emphasis on shrub-level (≥ 0.5 m and < 3 m) vegetation, at 40 plots of varying shrub densities in open longleaf pine (*Pinus palustris*) forests in eastern Texas. We surveyed anoles during late spring (4-17 June) and mid-summer (10-24 August) for three consecutive years (2005-2007). Anoles were more common at plots with a greater number and greater volume of shrubs. Shrub-level vegetation (including vines) was the most commonly used perch substrate (n = 252 obs.) followed by midstory (≥ 3 m and below the canopy) vegetation (n = 19 obs.). Certain shrub species were preferred over others. Shrub-level plants harboring green anoles averaged wider, taller, and greater in volume than those available in plots where anoles were detected. **(ORAL PRESENTATION).**

SCHAEFER, R.R., D.C. RUDOLPH, AND J.B. PIERCE. USDA, Forest Service, Southern Research Station.

NESTING COOPER'S HAWKS (ACCIPITER COOPERI) AND SHARP-SHINNED HAWKS (A. STRIATUS) IN THE PINEYWOODS OF EASTERN TEXAS.

Cooper's hawk (*Accipiter cooperi*) and sharp-shinned hawk (*A. striatus*) populations declined noticeably in the West Gulf Coastal Plain region during the early twentieth century. Their reputation as "chicken killers" led to intense human persecution which was greatly exacerbated by government bounties. Pesticide use after World War II, particularly DDT, led to reproductive failures and further population declines. An amendment to the Migratory Bird Treaty Act in 1972 protecting all North American raptors and the ban of DDT during that same year, along with changes in human behavior and attitude have led to gradual increases in populations of both species. Both are currently rare breeders in eastern Texas. We compared nests, habitat characteristics immediately surrounding nest trees, and habitats within a 1-kilometer radius around nest trees of Cooper's hawks (n = 3 nests) and sharp-shinned hawks (n = 5 nests) in eastern Texas. Hardwood canopy basal area was greater around Cooper's hawk nests. Pine canopy and pine mid-story basal areas were greater around sharp-shinned hawk nests. Sharp-shinned hawks nested in taller trees and placed nests higher than Cooper's hawks. Two of three Cooper's hawk nests were located in urban woodlots. Four of five sharp-shinned hawk nests were located on National Forest lands, and all five were found in open pine stands with virtually no hardwood mid-story or canopy. Conclusions drawn should be viewed with caution due to small sample sizes. **(POSTER PRESENTATION).**

SCOTT, D.A. Southern Pine Ecology and Management, Southern Research Station, USDA Forest Service. ***ECOSYSTEM RESTORATION IN THE HIGHLY ERODIBLE KISATCHIE SANDSTONE HILLS.***

Restoring the unique and diverse longleaf pine-dominated habitats in the Kisatchie Sandstone Hills requires the re-introduction of fire to reduce fuel accumulation and promote herbaceous vegetation, but some soils in the area are extremely erodible, and past fires have resulted in high erosion rates. I measured the overstory and understory vegetation, down fuels, and other stand attributes of stands receiving either no management or two prescribed burns after over 20 years of fire exclusion. The two burns (one dormant season and one growing season) succeeded in reducing the live fuel load and forest floor by 90 and 71%, respectively, while the down fuels were not different. Understory woody plant diversity was not affected by burning, but burning did stimulate both colonization and sprouting. Habitat for the Red Cockaded Woodpecker and other wildlife was improved; understory plant height was reduced by 2 m and herbaceous vegetation was found in 40% of the areas sampled in the burned stands while it was found in only 6.7% of the reference stands. Erosion risk was still elevated due to the sparse forest floor. Future management will need to consider timing and intensity of additional burns to maximize the time in which the forest floor is present to prevent erosion yet continue to convert the woody understory to an herbaceous understory for habitat improvement. **(ORAL PRESENTATION).**

SHACKELFORD, J. The Conservation Fund. ***CONSERVING LAND WITHIN THE NECHES RIVER NATIONAL WILDLIFE REFUGE: THE HISTORY AND THE FUTURE.***

The bottomland hardwood forests south of Lake Palestine on the upper Neches River have long been considered high priorities for protection by the U.S. Fish and Wildlife Service. After years of work and a major legal victory by the Service and numerous partners, the 25,281 acre Neches River National Wildlife Refuge, including 38 miles of Neches River frontage, was established in 2006. Despite this, land protection struggles continue as lands along the River are increasingly fragmented and funding is scarce. The Conservation Fund and the U.S. Fish and Wildlife Service continue working to add land to the Refuge, including a 6,700 acre tract that will be its cornerstone. **(ORAL PRESENTATION).**

SIEGMUND, T.M.[1,2], C.E. COMER[1], N.P. GARNER[2], AND R. MAXEY[2]. [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2]Texas Parks and Wildlife Department.
HABITAT SUITABILITY OF THREE NORTHEAST TEXAS RIVER SYSTEMS IN THE HISTORICAL RANGE OF THE LOUISIANA BLACK BEAR (*URSUS AMERICANUS LUTEOLUS*)

Black bears (*Ursus americanus americanus* and *Ursus americanus luteolus),* historically occupied the eastern 1/2 of the state of Texas. Habitat destruction and over harvest led to extirpation from all parts of the state by the 1940's. Recently, expanding bear populations in Oklahoma, Arkansas, and Louisiana and their documented movements have coincided with an increase in the number of bear sightings in East Texas. This increase in sightings made it necessary to accurately identify, quantify, and assess the quality of habitat potentially available to immigrating black bears in East Texas. Using a Habitat Suitability Model (HSI) developed for the Southern Appalachians (Van Manen 1991), and used in Texas in the past (Garner and Willis 1996) habitat was evaluated over Summer 2007 and 2008. This HSI model derived a numerical suitability scored based on density of hard and soft mast producing species, human conflict zones, escape cover, denning cover, and road densities. Vegetation sampling covered 850km^2 in the Cypress, Sulphur, and Red River basins of Northeast Texas with 799 total vegetation sampling points. A total of 19 individual study sites were visited with Overall HSI values ranging from 0.43-0.78 on a 0.0-1.0 scale. Suitability scores for these areas were comparable to those produced by Garner and Willis (0.73-0.89) in East Texas and Van Manen (0.49-0.71) in Kentucky; suggesting that adequate habitat exists within East Texas. Increased efforts by conservation organizations and local municipalities need to be undertaken to educate a public that has been disconnected from a large omnivore for over half a century. Furthermore, steps to protect, enhance, and connect isolated habitat blocks can begin using identified suitable areas as focal sites for conservation efforts. The presence of adequate habitat, expanding populations in neighboring states, and increased sightings within East Texas suggest that in the absence of education and conservation efforts now; costly bear nuisance behavior, bear mortalities, and dangerous bear/human interactions in the future may be a problem. **(ORAL PRESENTATION).**

SINGHURST, J.R.[1], T.C. PHILLIPS[2], AND P.M. LOOS[3]. [1]Texas Parks & Wildlife Department; [2]U.S. Forest Service, National Forests and Grasslands in Texas; [3]Ecovirons.
STATUS AND HABITAT CHARACTERISTICS OF* CYPRIPEDIUM KENTUCKIENSE *(KENTUCKY LADY'S SLIPPER) IN TEXAS.

Cypripedium kentuckiense (Kentucky lady's slipper) is a long-lived herbaceous perennial that is primarily restricted to calciphilic hardwood slope forests, mesic ravines, and hardwood terraces above floodplains in East Texas. It occurs in Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, Oklahoma, Tennessee, Texas, and Virginia. In Texas, *C. kentuckiense* occurs in Cass, Harrison, Marion, Nacogdoches, Newton, Red River, Sabine, Shelby, San Augustine, and Tyler counties. *C. kentuckiense* is considered imperiled (S2) in Texas and Tennessee and critically imperiled (S1) in all other states in its range except Arkansas (S3). The objectives of this study were to (1) determine whether known populations of *C. kentuckiense* were persisting in Texas, (2) characterize habitat structure, (3) identify indicator species, and (4) monitor reproduction for three years. 37 sites were surveyed from 2000 to 2006 for populations of *C. kentuckiense* and 15 populations were found. The populations that were relocated numbered fewer than 30 total stems. **(ORAL PRESENTATION).**

STEPHENS, J.D., S.R. SANTOS, AND D.R. FOLKERTS. Department of Biological Sciences, Auburn University. ***GENETIC DIVERGENCE AND STRONG POPULATION STRUCTURE OF* EXYRA SEMICROCEA *(LEPIDOPTERA: NOCTUIDAE) AND THE IMPLICATIONS FOR PITCHER PLANT BOG CONSERVATION***

In this study, we elucidated genetic connectivity of *Exyra semicrocea*, an endemic arthropod associate within pitcher plants, in order to develop a holistic approach to conservation of pitcher plant bogs throughout the southeastern United States Coastal Plain. Findings indicate that *E. semicrocea* populations have a genetic divergence across the Mississippi alluvial plain. In addition, strong genetic structure was found among the three populations in the West Gulf Coastal Plain, which contrasts with similarly distance populations occurring within the eastern portion of the Coastal Plain. These results highlight the need to conserve this unique region by taking into account other endemic and associated community members when conserving and restoring pitcher plant bogs. **(ORAL PRESENTATION).**

STUEMKE, L.A.[1], C.E. COMER[1], W.C. CONWAY[1], AND M.L. MORRISON[2]. [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2]Department of Wildlife and Fisheries Sciences, Texas A&M University. ***ROOST SELECTION BY RAFINESQUE'S BIG-EARED BATS AND SOUTHEASTERN MYOTIS IN EAST TEXAS.***

Bottomland hardwoods throughout the southeast United States represent the ecological range for two bat species of concern: the Rafinesque's big-eared bat and the Southeastern myotis. The Pineywoods eco-region of east Texas is the western extent of the range for both species. Our objective was to identify characteristics of cavity trees and surrounding habitat that influence diurnal roost selection in east Texas. During the summers of 2008-2009, we located 17 new roosts within cavity trees in 7 study areas across the region. We compared characteristics of roost trees with randomly selected cavity trees in the areas using univariate analysis of variance. There was no difference in roost characteristics between the two bat species ($P = 0.84$). Both species showed an affinity for roosting in trees of the genus *Nyssa*, with 67% of diurnal roosts in *Nyssa aquatica* and 29% in *Nyssa sylvatica*. These two species comprised approximately 15% of available trees with cavities in the area but over 90% of roost trees. Our results indicate that characteristics of the individual trees, including diameter at breast height, interior cavity dimensions, number of entrances into the cavity, and the distance of the cavity entrance from the ground were the most significant variables impacting roost selection. Characteristics describing a tree's location on the landscape (e.g., distance to a permanent water source, distance to the closest habitat edge, and distance to a man-made structure) also influenced roost selection, but characteristics of the stand around the tree (e.g., canopy closure, stem density) appeared to have minimal influence. These data will be used to identify areas likely to contain suitable roosting sites for these species and prioritize future conservation efforts. **(ORAL PRESENTATION).**

SULLIVAN, J.B. AND D.B. BURT. Department of Biology, Stephen F. Austin State University. ***HABITAT VARIABLES ASSOCIATED WITH BROWN-HEADED NUTHATCH (SITTA PUSILLA) NESTING SUCCESS IN EAST TEXAS FORESTS.***

This study examines the effects of forest habitat structure on nesting success in the brown-headed nuthatch in East Texas forests. Previous studies have suggested that Brown-headed Nuthatches have certain strong breeding habitat preferences that may affect the likelihood of nesting success. A total of 7 nests were observed in 3 distinct forest habitats from 2008-2010. We compared habitat variables measured at successful and failed nest sites in an attempt to find variables associated with nesting success. Univariate tests indicate that successful nests have shorter ground cover height smaller basal area of pine mid-story, taller pine mid-story and over-story, larger diameter at breast height of over-story trees and a greater number of large and small snags. Several logistic exposure models were considered to see how combinations of habitat variables might best explain nesting success. The accuracy of correctly predicting nest outcome of these models varied from 54-89%. The most accurate model indicates a greater probability of nest success with larger nest snag diameter, lower nest entrance height, greater percentage of bark remaining on the snag, thicker canopy cover, greater percentages of herbaceous ground cover and bare ground, increased basal area of the hardwood mid-story, decreased basal area of hardwood over-story, reduced foliage density in the understory, an abundance of large and small snags near the nest, and greater proximity to roads and open areas. **(POSTER PRESENTATION).**

SUNDA, C.[1,2], G. KRONRAD[1], AND D. SPETHMANN.[2] [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2]Working Lands Investment Partners, LLC. ***EMERGING MARKETS FOR ECOSYSTEM SERVICES: ECONOMIC RESEARCH AT STEPHEN F. AUSTIN STATE UNIVERSITY.***

Emerging markets for ecosystem goods and services, including water quality trading, wetland mitigation, carbon offsets, bio-energy, and outdoor recreation, have the potential to increase economic returns from rural lands. These new markets allow rural lands to compete for working capital and may reduce the rate of land conversion. Researchers at the Arthur Temple College of Forestry and Agriculture at Stephen F. Austin State University have been developing the science and technology to aid rural East Texas landowners in making sound economic decisions concerning land use. This presentation will summarize economic research being conducted at Stephen F. Austin as it pertains to these emerging markets. **(ORAL PRESENTATION).**

SVOBODA, H.T. AND J.E. VAN KLEY. Department of Biology, Stephen F. Austin State University. ***EFFECT OF EXOTIC SPECIES REMOVAL AT THE SFA PINEYWOODS NATIVE PLANTS CENTER ON NATIVE FOREST UNDERSTORY VEGETATION.***

Chinese privet (*Ligustrum sinense*) is a non-native invasive shrub that is capable of replacing native forest understory with a near-monoculture. The Pineywoods Native Plant Center (PNPC) on the campus of Stephen F. Austin State University, Nacogdoches, Texas includes a wet-mesic bottomland forest which was heavily infested with privet. During the summer of 2009, much of the privet on the property was mechanically removed with subsequent follow-up spot herbicide treatments. During 2010, thirty $10m^2$ plots were established in order to monitor vegetation changes associated with the privet removal effort. Plots were located in three treatment areas: 1) uncleared privet-infested, 2) recently (summer 2009) privet-cleared, and 3) a portion of the property that had been maintained privet-free for at least 20 years by hand-removal. Data were subject to canonical correspondence analysis (CCA) and multivariate classification and the Shannon-Wiener diversity index was calculated for each plot to observe any differences in the flora between the three sample areas. Even after removing effects of environmental covariables of soil texture and micro-elevation, floristic differences were evident between the three treatments and plots from the three were located largely in distinct regions of a partial-CCA ordination space. Species richness was not significantly different between the three groups of samples but the Shannon-Wiener diversity index was lower for the uncleared privet plots. Total vegetative coverage was higher in the uncleared privet plots than in the others but coverage in the recently-cleared plots was not significantly different from that of the privet-free plots. The results suggest that diversity and species richness were not adversely effected by the mechanical removal of *L. sinense* and the first-season post-removal community had already substantially recovered. **(POSTER PRESENTATION).**

SYMMANK, M.E.[1,2] AND C.E. COMER[1]. [1]Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University; [2] Texas Parks and Wildlife Department. ***USING INFRARED-TRIGGERED CAMERAS TO MONITOR ACTIVITY PATTERNS OF FOREST CARNIVORES IN EAST TEXAS.***

The activity patterns of four forest carnivore species were monitored 24 hr/day, 7 day/week, using infrared-triggered cameras, within a 1,318-ha study area in east Texas. A total of 161 capture events were recorded during a 17 week camera trapping period comprised of 1,925 trap nights. Capture events were comprised of 18 bobcat (*Lynx rufus*), 109 raccoon (*Procyon lotor*), 21 Virginia opossum *(Didelphis virginiana*), and 13 coyote (*Canis latrans*). We developed an easily replicated method of measuring time on a percent scale in order to compare activity data over a period of many months, accounting for changes in sunrise and sunset times. Forest carnivore species varied in their temporal activity patterns. Bobcats were the most diurnally active, with 38.9% crepuscular and 22.1% diurnal. Raccoons and Virginia opossums were truly nocturnal with 94.5% and 100% nocturnal activity respectively. Coyotes appeared to be intermediate, although 77% of their activity was at night. Moon phase based on percentage of visible light had no effect on either raccoon or Virginia opossum activity level. Temporal partitioning of foraging and other activity may be a mechanism to limit competition among various forest carnivores and mitigate predation risk by smaller species. **(ORAL PRESENTATION).**

THAPA, V.[1], M. F. ACEVEDO[2], P. DONG[3], AND P.A.Y. GUNTER[4]. [1]Department of Biological Sciences, University of North Texas; [2] Department of Geography and Electrical Engineering, University of North Texas; [3]Department of Geography, University of North Texas; [4]Department of Philosophical Studies, University of North Texas. ***USE OF POTENTIAL DEVELOPMENT AND HABITAT SUITABILITY INDEX MAPS TO OBSERVE IMPACTS ON POTENTIAL RED-COCKADED WOODPECKER (PICOIDES BOREALIS) HABITAT AREAS NEAR BIG THICKET NATIONAL PRESERVE, TEXAS.***

We combine land-use (LU) change models and habitat suitability index (HSI) models to observe impacts on the amount of potentially suitable habitats of red-cockaded woodpecker for various scenarios of hypothetical development. LU models are increasingly used to forecast conversion of vegetated land parcels to urban land cover. These models require varied information that range from physical structures, population density, to information on current land cover. In this paper, we describe the processes involved in creating predictor variables that drive a LU modelsuch as proximity to roads, population density and several land cover types. Geographic Information Systems (GIS) and remote sensing are useful tools in the construction of these variables. We combined these variables to find potential development probabilities for residential, commercial, industrial, as well as total probability of LU change. Then, we used HSI models to calculate the amount of potentially suitable habitats available before and after the hypothetical developments have occurred. Our results indicate this method is useful and effective to evaluate the effects of urbanization on wildlife habitat or other ecologically sensitive lands. This method could be even more effective when more data are available through the use of high resolution images and field work and when functions are validated empirically. **(ORAL PRESENTATION).**

TINERALLA, P.P. Department of Entomology, University of Minnesota, St.Paul. ***BUGS, BEETLES, AND BIG THICKET AQUATIC BIODIVERSITY: PRELIMINARY RESULTS OF SURVEY AND INVENTORY OF AQUATIC TRUE BUGS (INSECTA: HETEROPTERA) AND AQUATIC BEETLES (INSECTA: COLEOPTERA) OF THE BIG THICKET NATIONAL PRESERVE, SOUTHEASTERN TEXAS.***

Southeastern Texas contains a variety of aquatic habitats that support a wealth of largely unexplored invertebrate biodiversity. Moreover, the unique geologic and biologic history of the region indicates a complex assemblage and distributional crossroads of a number of aquatic insects, including aquatic and semiaquatic true bugs (Heteroptera) and aquatic and semiaquatic beetles (Coleoptera). Preliminary results and synthesis from 2009 to Present, are presented of survey and biotic inventory efforts documenting the diversity of these two abundant and important groups of insects, from Big Thicket National Preserve (BITH), the Roy E. Larson Sandylands Sanctuary (RELSS; The Nature Conservancy), and other adjacent lands. To date, collections processed from these areas have yielded a diverse assemblage of aquatic true bugs and beetles, totaling nearly 200 species. Among this total are numerous new distributional points for southeastern Texas, the state, and the region. In addition, several species in at least three (3) families of aquatic beetles are new species to science and are being prepared for formal scientific description. Survey and inventory results are presented, along with a species list and recorded habitat and ecological associations. Discussion is provided on species assemblages and ecological associations throughout BITH and the region, with emphasis on faunistics through the West Gulf Coastal Plain and region. **(POSTER PRESENTATION).**

TIRPAK, J.[1], T. BRADY[2], S. SHIVLEY[3], AND B. TIRPAK[4]. [1]Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative; [2]Natchitoches National Fish Hatchery – U.S. Fish and Wildlife Service; [3]Kisatchie National Forest – USDA Forest Service; [4]The Nature Conservancy, Mississippi Chapter. ***A DECISION SUPPORT TOOL FOR LOUISIANA PEARLSHELL MUSSEL CONSERVATION: PRIORITIZING SEARCH AND RESTORATION SITES.***

The Louisiana pearlshell mussel (*Margaritifera hembeli*; hereafter, LPM) is a federally threatened freshwater bivalve endemic to the West Gulf Coastal Plain; the species' range is currently restricted to Grant and Rapides Parishes in central Louisiana. Initially listed as endangered in 1988, subsequent discovery of a previously unknown population significantly increased the population size and led to a reclassification of the species as threatened in 1993. Subsequent surveys have yet to find additional populations; however, mussel specimens documented from outside the current range offer hope that some may exist. Active culturing of the LPM at Natchitoches National Fish Hatchery is being pursued to provide stock for active restoration. Both additional search and active restoration efforts would benefit from a prioritization tool that could identify potential LPM habitat across the potential range. We developed an LPM habitat model that utilized habitat characteristics available in regional and national datasets. The model included parameters related to stream permanence, flow, substrate, and water temperature. Excepting stream permanence that was directly available from NHDPlus, we relied on proxy variables to index the other model parameters. For flow, we used stream order and gradient of the stream bed (itself derived from a DEM). For substrate, we used the slope perpendicular to the stream bed, assuming steep slopes adjacent to the streambed provided a source for the preferred gravel substrates. Lastly, water temperature was indexed for each 100 m reach of stream by determining the percent of canopy cover and non-forested habitat within each subwatershed draining into each 100 m stretch of stream. Mussel locations were compared to all habitats in the landscape, and mussels were distributed non-randomly with respect to each. Mussels were found in first- to third-order permanent streams with moderate stream gradients along gently sloping areas in predominantly forested landscapes with greater canopy cover than on average. We used a GIS to identify unoccupied but potentially suitable habitats with these characteristics across the landscape. These results and potential next steps will be discussed. **(POSTER PRESENTATION).**

TULLOSS, R.E[1]. AND D.P. LEWIS[2]. [1]P.O. Box 57, Roosevelt, New Jersey; [2]262 CR 3062, Newton, Texas.

AMANITA (BASIDIOMYCOTA) OF EAST TEXAS, LOUISIANA AND MISSISSIPPI GULF COAST

The mushroom genus *Amanita* is estimated to include 900 - 1000 species—with about 40 basal taxa having retained a saprobic lifestyle and the morphologically diverse remainder being environmentally important ectomycorrhizal symbionts. The range of *Amanita* extends from subarctic and subalpine heaths to tropical forests to Tierra del Fuego. *Amanita* includes some species that are of significant value as comestible commodities and others that are significant public health hazards because of evolution of four chemically and toxicologically distinct toxins. One group of toxins has recently been demonstrated to comprise primary metabolites of taxa such as *A. phalloides,* the major cause of death due to mushroom ingestion. Research over the past half century yielded a number of new records and species of *Amanita* for eastern Texas. Reports by Thiers (1957), Bas (1969), Lewis & McGraw (1984), Jenkins (1986), Tulloss & Lewis (1994), Jejelowo & Abraham (1998) and Lewis & Cibula (2000), data at www.amanitaceae.org, unpublished data of the late A. H. Smith (including data on many Texas collections deposited at the University of Michigan), and unpublished data of the authors indicate a probable minimum of 100 *Amanita* taxa for the study region—representing (1) all seven recognized sections of *Amanita* , (2) both saprobic and ectomycorrrhizal life styles, and (3) producers of all four toxins. Seasonally dry, fire-prone ecosystems (e.g., Longleaf Pine) of eastern Texas are part of a chain of similar regions extending eastward along the Gulf Coast and northward in the Atlantic Coastal Plain at least as far as Cape Cod. This environment has famously given rise to specialized plants. Its impact has apparently contributed to evolution of unusually elongate spores in some taxa of *Amanita* sect. *Lepidella*—a trait shared, in its extremity, only with spores of lepidellas from xeric Western Australia. Endemism dominates in *Amanita.* European names from old lists are almost exclusively erroneous determinations. Apparent novelties comprise 35 – 45% of provisionally recognized taxa including all such taxa of *Amanita* sect. *Vaginatae*. We mention recent new records for Texas (e.g., *A.arkansana, A. elliptosperma, A. longipes, A. murrilliana, A. nauseosa, A. peckiana, A. praelongispora, A. rhoadsii, A. roanokensis, A. spreta, A. subsolitaria,* and *A. virginiana*) and list new east Texas sites for the rare *A. westii* and *A. hesleri*. **(ORAL PRESENTATION).**

TWEDT, D.J. U.S. Geological Survey, Patuxent Wildlife Research Center, Vicksburg, MS. ***BIRD MONITORING AT BIG THICKET NATIONAL PRESERVE.***

Birds are an important attraction for visitors to Big Thicket National Preserve. Monitoring bird populations at can provide insight regarding local and regional habitat conditions. Monitoring objectives for migratory and resident birds at Big Thicket National Preserve are to document trends in species diversity and relative abundance. However, the dispersed and dendritic character of this Preserve combined with difficult access to many areas, present problems for volunteer bird monitors. Therefore, under guidelines develop for the entire Gulf Coast Network of the National Park Service, the proposed monitoring of breeding birds at Big Thicket National Preserve will be primarily along 8 Breeding Bird Survey routes. Each route will be located within 15 miles of Preserve boundaries. Data from these annual, roadside-based surveys will be used to monitor abundance of regional populations and concurrently contribute to a database for continental bird populations. At each of 50 stops along each survey route, bird detections will be recorded during a 3-minute count, with species, time of detection (in 1-min. intervals), and distance to each detected bird (< or >50 m) recorded. Preliminary data collected along 4 routes during 2010 indicate the potential for monitoring abundance of many commonly detected bird species. To monitor a specific local bird population on the Turkey Creek Unit of Big Thicket National Preserve, if resources allow, breeding birds may also be annually surveyed using 10-min., time and distance-based detection surveys at 10 to 40 random locations within the Turkey Creek Unit. Finally, to monitor non-breeding birds during winter, the Preserve will rely on data collected annually, during area-searches of 15-mile diameter circles (i.e., Christmas Bird Counts). These data are currently being collected at 3 locations but, if resources permit, data may be collected within ≤3 newly established Christmas Bird Count circles. **(ORAL PRESENTATION).**

TWIDWELL, D., J.M. MEZA, C.J. TURNEY, AND W.E. ROGERS. Department of Ecosystem Science and Management, Texas A&M University, College Station. ***ALIEN FIRE ANT AND NATIVE HARVESTER ANT RESPONSES TO COASTAL PRAIRIE RESTORATION WITH FIRE.***

Red imported fire ants (*Solenopsis invicta*) pose a considerable threat to biodiversity in the southern United States. Fire ants have a long-standing reputation as a superior competitor, decimating abundance and diversity of native ant populations. Recent experimental manipulations suggest fire ants and native ants are mere passengers in ecosystems, increasing or decreasing as a function of human-driven changes in ecosystem structure and composition. These distinct pathways are important to conservation practices. If fire ants are superior competitors and displace native ants, independently of changes in habitat, then managers are likely to chemically treat fire ant mounds. However, if fire ant and harvester ant numbers are a function of widespread shifts from prairie to thorn-scrub dominated ecosystems, then managers are likely to initiate habitat restoration efforts. We established a prescribed fire experiment at the Welder Wildlife Refuge located near Sinton, TX, to determine (1) efficacy of individual mound-based fire ant chemical control strategies, and (2) changes in densities of fire ant and native red harvester ant mounds (*Pogonomyrmex barbatus*) in response to prescribed fire treatments. Eighteen plots were assigned random fire treatments of burned annually, burned once, or unburned. Fire ant and harvester ant mound densities were measured in burned and unburned plots immediately after prescribed fires. Measurements were repeated yearly from 2008-2010. Immediately after treatment, we located 33% fewer mounds in unburned plots due to removal of herbaceous plants that visually obstructed small, irregular fire ant mounds. Fire ant and harvester ant mound densities did not differ among treatments in years following initial restoration efforts. However, fire ant mound densities changed over time, due to the high degree of interannual variation in precipitation. Chemical application of individual mounds is not likely to control fire ants in coastal prairies because substantial portions of populations would not be found by chemical applicators. Using chemical control in combination with fire, may improve fire ant control. **(ORAL PRESENTATION).**

VAN KLEY, J.E. Department of Biology, Stephen F. Austin State University, Nacogdoches, Texas.

COMPOSITIONAL SHIFTS IN WETLAND VEGETATION AT CADDO LAKE TEXAS, USA, RESULTING FROM MULTIPLE EXOTIC PLANT INVASIONS.

Caddo Lake, on the Texas-Louisiana, border includes extensive *Taxodium distichum* swamps and is an internationally important wetland under the Ramsar Convention. In 1995 we established permanent plots and described wetland plant communities. Vegetation composition was strongly related to a hydrological gradient. We resampled in 2005 and 2009 and subjected the data to multivariate analysis including ordination and classification. 1995 communities were largely dominated by native species with *Eichhornia crassipes* (water hyacinth) restricted to a limited area. By 2005 water hyacinth had become abundant in all but the western portion of the study area, *Alternanthera philoxeroides* and *Hydrilla verticillata* had increased, and *Hygrophila polysperma* had appeared. By 2009, *Salvinia molesta* (giant salvinia) had established and become abundant throughout, *Eichhornia* remained abundant, and *Hygrophila* had increased its range. These changes were reflected by a shift in ordination scores for many plots. The first ordination axis was correlated with water levels and the underlying hydrologic gradient. The second axis was related to the year of sampling and was correleated with abundance levels of exotic species. Samples from 1995, 2005, and 2009 generally had high, intermediate, and low scores respectively. Communities throughout the hydrologic gradient were altered: invaders such as *Hygrophilla* largely impacted shallower swamps while *Salvinia* and *Eichhornia* became dominant in deeper water. The altered communities generally had increased biomass and vegetative cover on the water surface. GIS mapping showed marked shifts in abundances and distribution of invasive exotic plants in the study area. **(ORAL PRESENTATION).**

WAGNER, R.O.[1], J.B. PIERCE[2], D.C. RUDOLPH[2], R.R. SCHAEFER[2], AND D.A. HIGHTOWER[1]. [1]Quantitative Ecological Services; [2]USDA Forest Service, Southern Research Station.

MODELING LOUISIANA PINE SNAKE (PITUOPHIS RUTHVENI) HABITAT USE IN RELATION TO SOILS.

Ongoing surveys suggest that the Louisiana Pine Snake (*Pituophis ruthveni*) is declining; and currently occupied habitat is limited to a few small, isolated blocks of degraded and fragmented habitat. Research suggests that the species requires frequently burned sites with a well developed herbaceous understory capable of supporting populations of its primary prey, Baird's Pocket Gopher (*Geomys breviceps*). Baird's Pocket Gophers are associated primarily with sandy, well-drained soils. However, past attempts to identify the relationship between soil attributes and Louisiana Pine Snake occurrence at local and landscape scales were marginally successful. To develop a landscape-scale model of potential habitat, which is required for species management and recovery, we developed a resource selection function to predict suitability across the species range based on soil characteristics. We evaluated 26 *a priori* models consisting of different combinations of candidate SSURGO soil variables to explain the distribution of used and available resources at 162 individual historic snake locations. Of the models considered, the model consisting of hydrologic group (hydgrp) alone best fit the data. Hydrologic group is a categorical measure of runoff potential, incorporating water table depth and soil permeability. Model results indicate that hydrologic group A was used in excess of its availability ("preferred"), B was used in proportion to availability ("suitable"), and C and D were used less than available ("unsuitable"). We used a dataset of 22 radio-tagged snakes to validate the model, both within and across individuals. Recently this model was used to rank potential sites for an ongoing reintroduction effort, to select potential conservation areas on private lands, and to identify suitable acres on federal lands. **(POSTER PRESENTATION).**

WARD, K., I.V. MCWHORTER, K. EVANS, AND R. POTTS. USDA, USFS-National Forests and Grasslands in Texas. ***ECOSYSTEM RESTORATION ON NATIONAL FOREST LANDS IN THE LONGLEAF RIDGE CONSERVATION AREA, TEXAS.***

Longleaf pine (*Pinus palustris*) is a native species that once covered a vast land area in the southeastern U.S. Only 3% of the original longleaf pine forest remains due to deforestation and over-harvesting. Efforts are underway to restore the longleaf pine ecosystem within its natural range. The best examples of longleaf pine within the range in Texas lie in the Longleaf Ridge Conservation Area. The Ridge encompasses over 481,000 acres in the West Gulf Coastal Plain and includes southern portions of the Angelina and Sabine National Forests. In 2002 the Ridge area was identified by The Nature Conservancy as one of the highest conservation priorities in the region. The National Forests and Grasslands in Texas is using an ecosystem management approach to restore and maintain structure, composition and function of native longleaf pine on National Forest lands within the Ridge. The first step in developing an approach specific to the area was to identify priority sites for longleaf pine restoration. A total of 376 longleaf pine stands were assessed for midstory and canopy condition and for herbaceous layer status. The results of the analyses identified 13 priority restoration project areas on National Forest lands within the Ridge. Treatments in priority areas will include prescribed burning, regeneration cuts, thinning, underplanting, and improvement of the understory and ground layer. Several industrial and private timber producers are restoring longleaf pine ecosystems on lands adjacent to the National Forest project areas so completion of the 13 restoration projects would increase connectivity of high-quality longleaf pine lands across the entire Ridge. **(POSTER PRESENTATION).**

WESTGATE, J.W. Department of Earth and Space Sciences, Lamar University, Texas State University System; and Vertebrate Paleontology Lab, Texas Natural Science Center, University of Texas-Austin. ***RECENT ADDITIONS TO AN EOCENE TROPICAL RAIN FOREST/MANGROVE SWAMP COMMUNITY ON THE WESTERN EDGE OF THE GULF COASTAL PLAIN AT LAREDO, TEXAS.***

The Casa Blanca fossil fauna and flora was a diverse tropical rain forest/mangrove swamp dwelling community. Fossil specimens come from the late middle Eocene Laredo Formation of the Claiborne Group, near Lake Casa Blanca at Laredo, Texas. All vertebrate specimens are housed at the Vertebrate Paleontology Lab, Texas Natural Science Center, University of Texas-Austin. Although most specimens were collected and identified between 1984-1996, identity of three mammal species has been determined more precisely; the mesonychid, *Mesonyx uintensis*; the brontothere, *Notiotitanops mississippiensis*; and the cercomoniine primate, *Mahgarita* cf. *M. stevensi*. Twenty-eight associated mammal species include a new omomyine primate species (understudy), two small marsupials, two insectivores, a bat, two carnivores, a horse, two rhinos, six artiodactyls, a sirenian and at least eight rodent species. Although > 1/3 of the mammalian taxa are new and endemic, others allow correlation with non-marine mammalian communities in interior North America. Remains of *Epihippus gracilis*, *Amynodon advenus*, and *Mytonomys* new sp., indicate that the middle Laredo Formation is Uintan in age, and *Protoreodon petersoni* and *Procynodictis* cf. *P. vulpiceps* suggest it is a Uinta C correlate. The geographic range of the coastal brontothere, *Notiotitanops mississippiensis,* formerly known only from the Cook Mountain Formation of eastern Mississippi, is extended westward to the Mexican border. Non-mammalian vertebrate, invertebrate, and floral paleoecological analyses indicate that the community lived in a coastal margin, tropical rain forest and *Nypa* mangrove-estuarine complex. Vertebrae from the giant aquatic snake *Pterosphenus schucherti* mark its first record in middle Eocene strata. The presence of cf. *Allaeochelys, Galeocerdo eaglesomei, Diaphyodus wilsoni, Pterosphenus schucherti* and a megalopid indicates the community had Tethyan affinities. This is the oldest megalopid record from North America. The paralic middle Laredo Formation has been correlated with the open marine Hurricane Lentil in the Cook Mountain Formation of east Texas using the marine gastropod *Turritella cortezi*. Based on nannoplankton analyses, the Cook Mountain Formation has been correlated with lower Bartonian strata of western Europe. **(ORAL PRESENTATION).**

ZHOU, L. AND D. CREECH. Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University. ***A SUMMARY OF FIVE YEARS OF SALINITY STUDIES WITH BALDCYPRESS,* TAXODIUM DISTICHUM*, AT SFA GARDENS.***

This presentation will summarize five years of baldcypress, *Taxodium distichum*, salinity and asexual propagation research at Stephen F. Austin State University. The baldcypress of the southern USA is an important constituent of wetlands. With coastal degradation and subsidence, the intrusion of salt and brackish waters into baldcypress habitats is of major concern. With models predicting rising levels of sea water due to global warming, there has been a renewed interest in understanding salinity and alkalinity tolerance in the genus Taxodium and developing strategies to deal with habitat degradation. For the last five years, we have conducted five research projects to better understand baldcypress tolerance to chronic and acute applications of varying degrees of saltwater. Specific studies include an acute application study on the effects of different salt sources and rates on three Taxodium genotypes, the effects of submersion and salt rates on two Taxodium genotypes, the influence of four salinity treatments on growth and leaf nutrient content of three Taxodium genotypes, and the results of several cutting propagation studies using various elite clones. Baldcypress is one of the most salt tolerant of trees in the Gulf Coastal Plain and variability in salt tolerance among and between genotypes indicates great opportunity for selecting improved genotypes and select clones. **(ORAL PRESENTATION).**

CONFERENCE PLANNING COMMITTEE

These people played a key role in conference development and organization:

- Jerry Cook, Sam Houston State University
- Bruce Drury, Big Thicket Association
- Maxine Johnston, Big Thicket Association
- Wendy Ledbetter, The Nature Conservancy
- Jim Neal, U.S. Fish and Wildlife Service
- Craig Rudolph, US Forest Service, Southern Research Station
- Dan Saenz, US Forest Service, Southern Research Station
- Warren Conway, Stephen F. Austin State University
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- Julie Shackelford, The Conservation Fund
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- Jason Singhurst, Texas Parks and Wildlife Department
- Will Godwin, Jarvis Christian College