TULANE UNIVERSITY

Department of Ecology & Evolutionary Biology

NEWSLETTER
VOL. 5, FALL 2007

Dear EEBer:

This is our first newsletter post Katrina, and it comes to you with great enthusiasm and expectations for the future of your department. Although we lost two faculty after the storm, we have hired one new molecular ecologist – Dr. Michael Blum – whose research focuses on wetlands (plants mostly) and the evolutionary ecology of fishes. We are now advertising two new positions we hope to fill this year: one will be a laboratory scientist studying global change biology, wetland ecology, or tropical biology; and the other will be a computational biologist studying theoretical ecology, ecology and evolution modeling, or landscape ecology. If we successfully fill these positions, we will have nine tenured or tenure-track faculty in the Department.

In addition to hiring Dr. Blum last year, we also hired a new Professor of the Practice – Dr. John Caruso – who is dedicated to teaching. Dr. Caruso is fast developing a program in marine biology. Part of his effort thus far has been to develop a minor in marine biology for both EEB majors and non-majors.

EEB is now part of the School of Science and Engineering at Tulane. This change has opened many exciting possibilities for EEB's future. It also has brought a change in the location of the departmental office and some faculty offices. The Department's office is now located in room 400 of the Lindy Boggs Center.

We also now have an endowment fund for the EEB Department. More information about it appears in the newsletter. We greatly appreciate the generosity of Katherine S. Giffin, whose gift allowed us to establish the endowment fund to receive contributions to support the mission of the Department.

David C. Heins, Professor & Chair

We've Moved!!!!!!!

We're now part of the School of Science and Engineering!

The EEB department is now located in the Boggs Center for Energy and Biotechnology, Suite 400

EEB STUDENT HONORS & AWARDS
2006-2007

Undergraduate Students

The Fred R. Cagle Memorial Prize
Kory Northrop
Victoria Martin

The Senior Scholar Award
Victoria Martin
Erin Healen

The Zoology Prize
Stephanie Short

The Gerald E. Gunning Memorial Award
Lindsey Powers
Eric Soycher

Graduate Students

Teaching Assistant Award
Nicole Michel
Rebecca Hazen

George Henry Penn Award
David Brown

Completed Dissertations

The following Ph.D. candidates have successfully defended their dissertations:

Bryan Sigel-"The Susceptibility of Tropical Forest Bird Communities to Habitat Fragmentation."

Rebecca Blanton-Johansen- " Evolution of the Fantail Darter, *Etheostoma Flaballare (Percidae:Catonotus):* Systematics, Phylogeography and Population History"

Rita Malia Fincher-Gentry– "Patterns of Plant Defense in the Genus *Piper*"

Kudos to:

Dr. Lee Dyer for his recent paper in ***Nature***: "Host Specificity of Lepidoptera in Tropical and Temperate Forests." Nature 448: 696-699 (9 August 2007)

Dr. Jeffery Chambers for his recent publication in ***Science*** "Hurricane Katrina's Carbon Footprint on U.S. Gulf Coast Forests," 315:1107 (16 November 2007)

Work in **Lee Dyer's** laboratory focuses on direct and indirect trophic interactions in complex biotic communities with emphases on global change, documenting the diversity of tritrophic interactions, and examining the effects of plant secondary compounds on insect herbivores and their natural enemies. Researchers who are currently working in the laboratory include 1 research faculty, 1 laboratory technician, 10 graduate students, 3 field technicians in Costa Rica, 5 field technicians in Ecuador, and 5 undergraduate students. Recent notable achievements include the following: Rebecca Hazen (graduate student) received a $20,000 grant for her research on the effects of hurricanes Rita and Katrina on parasites of caterpillars; Malia Fincher (graduate student) and Grant Gentry (postdoctoral researcher) finished their work in our lab and started faculty positions at Samford University in Alabama; we discovered a very strong relationship between hurricane damage in natural habitats in Louisiana and insect diversity. The major themes of our research efforts include: *chemical ecology, diversity of tropical plants and insects, effects of climate change on insects, biological control of pest herbivores,* and *natural history of moths and butterflies.* We investigate how plant chemistry and parasites affect insect herbivores in banana plantations, tropical rain forests, alfalfa fields, and temperate grasslands. Our exhaustive collecting and rearing programs in Costa Rica, Ecuador and Louisiana, are uncovering patterns that help us answer questions such as how will global warming affect outbreaks of insects in forests and agricultural fields and how many species of insects are there in the world? Papers addressing these questions were recently published in the journals *Nature* and the *Proceedings of the National Academy of the Sciences.* Basic natural history data and keys to immatures are continually entered into an online database (http://www.caterpillars.org).

www.caterpillers.org

In the summer of 2007 **Donata Henry** completed her third season operating a MAPS (Monitoring Avian Productivity and Survival) station in the Pearl River Wildlife Management Area. She established the station in collaboration with the Louisiana Department of Wildlife and Fisheries - an effort which has proven to be quite productive. With the help of local birders and students from Tulane and UNO, she has netted nearly 1,400 individuals and 32 different species of birds. The team captures a variety of warblers, vireos, thrushes, flycatchers, woodpeckers, and even the occasional hummingbird and owl. Her personal all time greatest catch was a pair of yellow-billed cuckoos. Donata is also continuing her research on the breeding biology and habitat selection patterns of Swainson's warblers within the core area of the station. Because the site was clear-cut in the 1990's, and since she has both pre- and post-Katrina data, the system is ideal for addressing a number of research topics, including the impacts of intensive forest management and storm disturbance on breeding bird communities. In the near future Donata hopes to have a website up with schedules, reports, and photos from her station. Until then, if you'd like to come out and visit or have any other questions, please feel free to contact her at droome@tulane.edu. A trip to the MAPS station is a great way to get a new look at a familiar bird, get a first look at species you may never have been able to track down before, observe how birds are captured, banded, and measured, learn about a nationwide research program, or simply take a pleasant walk in the woods. Visitors are welcome!

Donata with a pair of yellow-billed cuckoos.

News from **Tom Sherry's** lab: We're up and running (literally) post-Katrina, with lots going on. David Brown ("Food supply and the dry-season ecology of a tropical resident bird community and an over-wintering migrant bird species", recipient of **George Henry Penn Award** for best dissertation in the EEB Dept.) and Jennifer Coulson ("Intraguild predation, low reproductive potential, and social behaviors that may be slowing the recovery of the Northern Swallow-tailed Kite"), both defended their dissertations successfully in 2006. David, now teaching at LSU, Baton Rouge, continues to survey birds with Sherry in post-Katrina Bogue Chitto NWR, to monitor the storm's impacts. Bryan Sigel defended his dissertation ("The susceptibility of tropical forest bird communities to forest fragmentation") in May, 2007, then immediately flew to La Selva Biological Reserve, Costa Rica, to present his findings to scientists addressing the global change impacts on this premier field station. Bryan is back at Tulane this year as lecturer in "Diversity of Life", and other courses. Other tropical students, meanwhile, continue to make discoveries: Stefan Woltmann is finding a genetic signature of forest fragmentation on Chestnut-backed Antbirds, and thereby pioneering methods (microsatellite DNA plus sophisticated population genetic software) to address population and landscape-scale phenomena; and Nicole Michel has already obtained promising experimental data on the impacts of peccaries, insectivorous birds, and bats on understory rainforest ecosystems and arthropod communities. Sherry has successfully funded an NSF Long Term Research in Environmental Biology (LTREB) grant, on the fourth try, which will support the next five years of research on wintering migratory bird populations in Jamaica in collaboration with Pete Marra & Scott Sillett, Smithsonian, Washington, DC. Other projects include diet comparisons of a variety of birds wintering in shade-coffee plantations in Jamaica (in collaboration with former students Matt Johnson, now tenured at Humboldt State University, CA, Amanda Medori, and Jordana Kaban); demographic matrix modeling of migratory birds to address questions of summer vs. winter population control; and geographic variation in nesting ecology of American Redstart.

News from the University **Herbarium**

Over the summer our Herbarium Curator, Anne Bradburn, with help from EEB Operations Manager Christy Day, organized and supervised the moving of Tulane's 120,000 plant specimens from Dinwiddie Hall to renovated quarters in Stanley Thomas Hall. Along with the plant collections went the Minna Koch Botanical Library, reprint files, and several hundred fossil plant specimens. This was only the second time in the Herbarium's 115-year history that the collections had been moved (the Herbarium was taken from Gibson Hall to Dinwiddie when that building opened in 1924). It will be several more months before the Herbarium is fully operational again as a center for plant identification, but we look forward to settling into the bright, new space, and continuing several long-range projects, such as documenting Tulane's historical plant collections, and collaborating with other universities to develop a web-based Flora of Louisiana. In November, Herbarium Director Steve Darwin attended a three-day, NSF-sponsored conference on the Specify Software Project, a research application, database, and network interface for biological collections information. Visit the Herbarium website at http://www.tulane.edu/~darwin/Herbarium/herbarium_index.htm.

Two Louisiana holly specimens collected ca. 1850 by Dr. Josiah Hale and Dr. John L. Riddell. Both men were early faculty in the Medical College of Louisiana and much interested in medicinal plants.

Hank Bart, his students and research associates are continuing their work on their NSF-funded Assembling the Cypriniformes Tree of Life research project systematics and evolutionary ecology of fishes. Hank, Mollie Cashner and Mike Doosey presented papers on cypriniform fishes at the Ichthyological Society of Japan annual meeting in Shizuoka Japan, and the 2nd Special Symposium on the Biology of Cypriniform Fishes at the Chinese Academy of Science, Institute of Hydrobiology in Wuhan China in October 2006. Hank, Mike Doosey and Nelson Rios participated in a symposium on the biology of cypriniform fishes at the XII European Congress of Ichthyology in Dubrovnik (Cavtat), Croatia in September 2007. They are participating in the 3rd Special Symposium on the Biology of Cypriniform Fishes in Chiang Rai, Thailand, in November 2007, hosted by the World Wildlife Fund of Thailand.

Threespine stickleback
(Courtesy National Science Foundation)

Research in the laboratory of **David Heins** continues on threespine and ninespine stickleback from Alaska. This year Amanda Burr (senior, TN '08) is conducting research to ask if the reproductive biology of stream populations of ninespine stickleback differs from lake populations. She seeks to learn whether they differ in the same way in which lake and stream populations of threespine stickleback differ. Research on differences between stream and lake populations of threespine stickleback was published by David and other authors in the Biological Journal of the Linnean Society a few years ago. Along with Melissa Toups (N '04) and Emily Birden (N '01), David is writing another paper addressing the question of whether the cestode parasite *Schistocephalus solidus* that infects threespine stickleback is a parasitic castrator or a consumer.. Some prior research from Europe indicates the parasite is a castrator, whereas research from fish in Alaska shows it is a consumer. If the host-parasite relationship differs across geographic regions of the world, is that because there are different evolutionary forces at work in the host-parasite relationship in different regions or does the variation reflect previously unknown cryptic species of parasites? That question is for another study or studies. The lab also includes a new graduate student, Travis Haas, who likely will pursue a dissertation addressing the reproductive biology of blacktail shiners from streams of the Gulf Coastal Plain. He is presently involved in a project looking at sexual dimorphism in size and shape variation of blacktail shiners. Also working in the lab are Lynda Aririguzo (junior, TN '09) and Nicole Najecki (freshman, TN '11). Both are helping out with work study; Nicole is also learning about the research in the lab with the interest of starting her own project.

Dr. **Michael Blum**, who just joined the department this Fall semester, is pursuing research on the evolutionary ecology of freshwater fishes and coastal marsh plants. Since arriving on campus late this past summer, Dr. Blum and his students (also known as the Molecular Ecology lab group) have installed an aquatics facility in Blessey Hall to carry out experimental studies on the effects of land use on freshwater fishes. This work involves rearing many thousands of live fishes to track changes in reproductive success across several generations to understand how land use practices elevate extinction risk. Dr. Blum and his students are now setting up a molecular genetics laboratory in the Israel Environmental Science Building to carry out complementary studies on the genetic diversity of populations in agricultural and urban watersheds. In addition, members of the Molecular Ecology lab group are carrying out research on responses of coastal marshes to global environmental change. Focusing on the effects of sea level rise, this work involves "resurrecting" plants from seeds isolated from layers of marsh sediments deposited since before the industrial revolution. Greenhouse studies of the resurrected plants aim to show how plants have responded to changes in estuarine salinity, to determine whether species evolve at the pace of contemporary environmental change. Building on previous work carried out in the Chesapeake Bay, members of the lab have just begun isolating seeds from sediment cores that span 800 years of environmental change at Bayou Lacombe on the northeastern shore of Lake Pontchartrain. For more information on this work and related studies, visit the lab's website at www.tulane.edu/~mjblum .

The weekend of 27,28 October, **John Caruso's** Marine Biology class took a field trip to the Louisiana Universities Marine Consortium (LUMCON) Marine Center in Cocodrie, LA. The group took a four hour educational cruise on LUMCON's 58' R/V Acadiana to use as many sampling devices and techniques as possible. Because of John's experience in leading such cruises, he found myself serving as both instructor and crew for this cruise. It was an absolutely beautiful day. Students had the opportunity to observe salinity measurements using both optical density and conductivity; temperature, salinity and dissolved measurement using a YSI meter, benthic samples using a Wildco petite ponar grab; plankton samples using a 50 cm X 80 micron plankton net, and nekton samples using an 8m flat trawl. With only two trawl samples, we obtained 16 species of fishes representing 10 families, and nine invertebrate species representing seven families and three phyla. After the cruise John spent an hour or so in the laboratory demonstrating copepods and bryozoans under dissecting scopes, and discussing various adaptations of fishes to the estuarine environment. This semester the Marine Biology class was very fortunate to have Dr. Archie Ammons join the trip and share his expertise on marine invertebrates. Our most sincere thanks are extended to the Provost for helping to defray the cost of room and board at the Marine Center from the Undergraduate Student/Faculty Activities Fund, and to Dr. David Heins for allowing the Department to cover the cost of the R/V Acadiana.

General Endowed Fund

Department of Ecology and Evolutionary Biology

The General Endowed Fund of the Department of Ecology and Evolutionary Biology was established during the 2007 fall semester thanks to the generosity of **Mrs. Katherine S. Giffin** (BA, 1925). The purpose of the fund is to support the activities of the Department with income produced by the endowment corpus.

One purpose to which the income will be applied is to develop an undergraduate fellowship program. As an Undergraduate Fellow, students will join a cadre of leaders among ecology and evolutionary biology majors by participating in undergraduate teaching as peer teachers. The peer-teaching program involves serving as a laboratory aide in freshman courses under the supervision of the Department's Laboratory Supervisor during the junior and senior years. Peer teaching is an extremely valuable educational experience, providing the ecology and evolutionary biology scholars with a deeper understanding of ecology and evolutionary biology and experience in working effectively in groups. Any qualified sophomore, junior or senior who has declared a major in the Department may apply to become an Undergraduate Fellow in the Ecology and Evolutionary Biology Scholars Program. A limited number of students are admitted to the program, therefore, admission is competitive.

Fellowships are honorary awards which are renewable each semester and provide each Undergraduate Fellow with a small supplemental income (honorarium) of $400 each semester in their first (usually junior) year and $500 each semester in the second (usually senior) year as long as the scholar meets all of the peer teaching responsibilities and the cumulative GPA requirements in Ecology and Evolutionary Biology as a major in good standing at Tulane.

In the years to come, the Department will add to its programs using the income from the endowed fund to support the Undergraduate Fellows. Other activities the income may support include undergraduate research as a part of the overall research mission of the Department.

Anyone wishing to contribute to the General Endowed Fund in Ecology and Evolutionary Biology should send a check to the Department of Ecology and Evolutionary Biology, 400 Lindy Boggs Center, Tulane University, New Orleans, LA 70118. The check should be made out to "Tulane University – EE Biology" and "General Endowed Fund" written on the memo line. Gifts of any size will increase the corpus of the Fund, thus increasing the income to be used for scholarly programs of the Department.

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Davi Battistella, Executive Secretary
Christy Day, Operations Manager

If you are an EEB alum, we would love to hear from you! Please send your career news to eebalums@tulane.edu. We welcome pictures and brief descriptions of what you're up to lately!

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