



A BIENNIAL NEWSLETTER BY THE ANIMAL BEHAVIOR SOCIETY CONSERVATION COMMITTEE

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The ABS Conservation Committee



Committee Members

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Lisa Angeloni
Colorado State University
Daniel T. Blumstein
University of California Los Angeles
Debbie Boege-Tobin
University of Alaska Anchorage
Richard Buchholz
University of Mississippi
Esteban Fernández-Juricic
Purdue University
Misty McPhee
Cornell University
Sarah Mesnick
NOAA Fisheries Service
Guillermo Paz-y-Miño-C
University of Massachusetts Dartmouth
Debra M. Shier
San Diego Zoo Institute for Conservation Research
Mark L. Wildhaber
Columbia Environmental Research Center

Created in 1997, the Conservation Committee aims to encourage ABS members to participate in research programs addressing the interface between animal behavior and conservation science. By identifying and evaluating the areas in which behavioral research has contributed to conservation, as well as the fields that need development, the Committee seeks to generate discussion and promote studies in behavior and conservation.

Upcoming events and programs

Student Grant Program Submission Deadline: Friday January 11, 2013, see <http://animalbehaviorsociety.org/> for details

The 50th Annual Conference of the Animal Behavior Society will be held in Boulder, Colorado, July 28- August 1, 2013.

It's a good year for Conservation Behavior...

Conservation Behavior workshop July 28 at ABS Boulder 2013. For information contact mcpheem@uwosh.edu or bruce.schulte@wku.edu

Conservation Behavior Symposium at ABS Boulder 2013. For information contact efernan@purdue.edu



Fig 1. Spring Lake headwaters (and slew arm) (Photo Joe Fries)

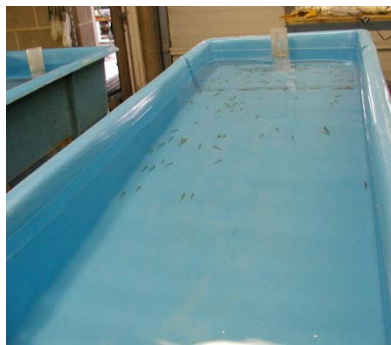


Fig 2. Flow through breeding tank for fountain darters (Photo Joe Fries)



Fig 3. Breeding tanks and chambers for San Marcos salamanders (Photo Joe Fries)

Predator-prey interactions in fish and salamanders: a conservation perspective

By: Caitlin Gabor and Chelsea Blake Texas State University – San Marcos

The Gabor lab has had the good fortune to be smack in the middle of an endemics hotspot. The Headwaters of the San Marcos river (Spring Lake) originates and runs through the city of San Marcos, TX where Texas State University is situated (Fig. 1).

The springs upwell from the Edwards Aquifer into Spring Lake at a mild 21.5C year round (Groeger et al. 1997) and are crystal clear due to the effective cleaning service performed by the limestone makeup of the Aquifer. The average discharge is 7m³/s, thus this is a large flowing body of water. The US Fish and Wildlife Department and Texas Parks and Wildlife have designated the San Marcos Springs and Spring Lake as critical habitat. Eight threatened and endangered endemics are found in Spring Lake including the Texas blind salamander, *Eurycea rathbuni*, the San Marcos salamander, *Eurycea nana*, and the fountain darter, *Etheostoma fonticola* (US Department of the Interior, 1980). In an attempt to prevent the complete loss of so many endemics the US Fish and Wildlife San Marcos National Fish Hatchery and Technology Center (SMNFHTC) has been housing captive populations of these three species and others as a refugium (Fig. 2 & 3).

The SMNFHTC has been so successful at breeding these species that unlike many other threatened and endangered species there are many individuals available for scientific research.

Our lab has taken advantage of these organisms and has been examining predator-prey interactions and other studies that may impact management and conservation of these species. Hereafter we outline the studies our lab has performed, what we have found and our future plans.

One of the main questions our lab has focused on is the effect of introduced fish predators on endemic species. Many fish predators have been introduced into Spring Lake and many of them have been able to persist due to the mild conditions year round. We hypothesized that the introduction of fish predators would result in a lack of anti-predator behavior by the San Marcos salamander due to the inability to recognize introduced predators (Epp & Gabor 2008). We tested the anti-predator response (reduction in activity) of the San Marcos salamander in response to the chemical cues of a native fish predator, non-native fish predator, a native non-predator, and a water control (Fig. 4).



Fig. 4. San Marcos Salamander, *Eurycea nana* (Photo Drew Davis)

We tested the response of captive reared and wild collected San Marcos salamanders. We found that both predator naïve and predator experienced salamanders significantly decreased activity in response to native fish predators.

These results indicate that the San Marcos salamanders have innate predator recognition because even predator naïve salamanders respond to predators. Contrary to our prediction, however, the predator naïve salamanders decreased activity in response to the non-native fish predator. These results indicate that while there is an innate component to predator recognition in *E. nana*, learning may be important and that the lack of response by predator experience salamanders to predators may be a result of risk assessment in a complex habitat full of predators. These results lead us to hypothesize that the recognition of introduced fish predators may be an outcome of predator generalization. The introduced predator was a red-breasted sunfish, *Lepomis auritus*. We hypothesized that the introduced *Lepomis* may share chemical cues with other native congeneric *Lepomis* predators found in Spring Lake (Davis et al. 2012e) found that, indeed, *E. nana* show predator generalization in response to novel sunfish (the allopatric sunfish *L. gibbosus*) and to the sympatric non-native, non-centrarchid cichlid (*Herichthys cyanoguttatum*) indicating that predator generalization can occur among perciform families too. In future studies we plan to address the physiological stress response to both native and introduced predators to understand the long term fitness impact of predator introduction on *E. nana*.

The federally endangered fountain darter is also primarily found in Spring Lake and is hypothesized to require crystal clear waters for survival.

Given this, we wanted to determine what cues fountain darters use to recognize and respond to predators and if turbidity affected their responses (Swanbrow-Becker & Gabor 2012). We found that fountain darters show anti-predator responses (decreased activity) only when presented with a combination of visual and chemical cues of green sunfish, *Lepomis cyanellus*. When we simulated turbidity by placing tinting (equivalent to 20 NTU) between the darter tank and the predator tank (Fig. 5) we found that simulated turbidity decreased anti-predator response as fountain darters did not decrease activity in response to visual and or chemical cues of predators. Our lab will follow this study with further studies examining additional impacts of turbidity on fitness in *E. fonticola*.



Fig. 5. *E. fonticola* testing chamber for visual and chemical cues (Photo Lily Swanbrow Becker)

Our lab is also interested in the impacts of invasive species on the behavior and adaptations of endemic species like the Largespring mosquitofish (*Gambusia geiseri*). We found (Blake & Gabor, in prep) that the endemic San Marcos Spring *G. geiseri* population displays correlated behaviors, and individuals exhibit one of a variety of different behavioral types. We are currently exploring whether these behavioral differences impact the survival of individual mosquitofish in the face of invasive species. Future studies will also examine how behavioral correlations compare across mosquitofish populations with different invasion histories.

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JENNIFER TENNESSEN, PENN. STATE UNIVERSITY RECEIVES 2012 E.O. WILSON CONSERVATION AWARD

“We are witnessing (and causing) the greatest extinction rate this planet has known. Human activities have had devastating consequences on all levels of biodiversity, and our impact does not show signs of halting. I believe it is important for scientists to turn our attention toward helping prevent further biodiversity loss. I believe that animal behavior research is critical to informing conservation efforts,” said Tennesen on learning that the ABS grants committee chose to fund her proposal “Impacts of novel sounds: Acoustic competition between invasive and native species”. She received the 2012 E.O. Wilson Student Research Grant for Conservation.

Tennesen’s study will examine acoustic competition between invasive Cuban tree frogs and native tree and cricket frog in Florida.

“Jenny’s research investigates an under-considered mode of impact of invasive species – that of competition for acoustic space”, says advisor Tracy Langkilde, Assistant Professor at Penn. State. “Acoustic communication is vital to many species, and frogs faced with noisy invaders will likely have to do something to ensure they can still effectively attract mates. This provides important insight into how animals are able to cope with novel selective pressures, such as noise, and how acoustic competition can structure communities.

Jenny is an excellent scientist and promises to be a leader in the field of behavior conservation. She has identified an important and poorly understood area of research – that of the behavioral consequences of noise – and has developed elegant and creative ways of testing this important issue.”



Photo Travis Tennesen

Jennifer Tennesen



Photo Jennifer Tennesen

A Cuban treefrog (*Osteopilus septentrionalis*)



Photo Travis Tennesen

Jennifer Tennesen deploys a Song Meter

The Conservation Behaviorist talked with Jennifer Tenneson about the E.O. Wilson Conservation Award:

CB: What was your immediate reaction to receiving the E.O. Wilson award?

JT: I was thrilled and honored to receive the E.O. Wilson award. I read and re-read the notification email several times to make sure it was really true! I am grateful to the awards committee for selecting my proposal.

CB: Why do you work in the interface of animal behavior-conservation biology?

JT: We are witnessing (and causing) the greatest extinction rate this planet has known. Human activities have had devastating consequences on all levels of biodiversity, and our impact does not show signs of halting. I believe it is important for scientists to turn our attention toward helping prevent further biodiversity loss. I believe that animal behavior research is critical to informing conservation efforts. Indeed, without an understanding of behavior many conservation initiatives including captive breeding programs, wildlife reintroductions and establishment of protected areas have fallen short of their conservation goals. By working at the interface of animal behavior and conservation biology, scientists discover information that is vital for designing effective conservation programs.

CB: What do you think about the award? Will it encourage students to present more proposals with conservation content?

JT: The E.O. Wilson award gives students who are researching topics at the interface of animal behavior and conservation a rare opportunity. It can be challenging for graduate students to fund research that has a conservation component, so the award serves an important purpose. Hopefully this means that more students will be inspired and encouraged to consider the potential conservation implications of their work, and to research topics at the interface of animal behavior and conservation.

CB: How did you become interested in the effects of acoustic competition between invasive and native treefrogs?

JT: Our planet is getting noisier every year. Many terrestrial and marine species live in environments dominated by human-generated noises, including sounds from transportation, construction and military activities. These sounds can interfere with animals' ecological processes, which can have negative consequences on survival and reproduction. I first became fascinated with the ways that noise impacts behavior during college, when I studied the relationship between sonar testing and beaked whale strandings. I went on to pursue a M. S. where I explored how a population of killer whales off the Pacific coast responded to increased noise from whale watching operations. These projects both had in common the question of how novel sounds - those which species did not evolve alongside - impact behavior. When I began my Ph.D. research, I read a lot about the different kinds of novel sounds to which animals are exposed. It became clear to me that invasive species that use acoustic signals to communicate produce sounds that are novel to native species. I realized that many of the same questions we ask about the biological impacts of human-generated noise we can ask about sounds from invasive species. Furthermore, since the sounds from invasive species represent novel pressures on total available acoustic space, we can ask whether invasive and native species compete for acoustic space, just as species compete for other limited resources. What better place to ask these questions than southern Florida, a region with high diversity of native and invasive anurans (frogs and toads). Since anurans rely on sound to attract mates and defend territories, studying whether native treefrogs compete with invasive Cuban treefrogs will allow me to quantify the extent to which an invasive species alters the acoustic environment, and determine whether native and invasive treefrogs compete for the ability to communicate.

CB: How do you see yourself in the future? Academic work? Conservation-oriented work?

JT: I believe we do our best work when it is on topics about which we are passionate. I hope to stay in academia to continue researching problems at the interface of animal behavior and conservation, with the goal of informing and helping design efforts to conserve the incredible biodiversity on our planet.

The E.O. Wilson Award

Deadline for Registered ABS Students: 11 January 2013

The Edward O. Wilson Conservation Award seeks to encourage graduate students of animal behavior to participate in meaningful conservation-related research. This single award of up to US \$2000 is given in recognition of a research proposal considered meritorious for its integration of behavior and conservation. E. O. Wilson, professor at Harvard University, who in 2002 received the ABS Distinguished Animal Behaviorist Award, is one of the world's most eminent scientists and pioneers in biodiversity conservation.

Students who have paid their society dues in full prior to Tuesday, 8 January 2013 will be eligible to submit a grant application. Applications can be submitted by logging in through the ABS website after they have contacted the ABS Central Office to verify their status. If you have any questions about your membership or the submission process, contact the ABS Central Office (aboffice@indiana.edu) prior to Tuesday, 3 January 2013. Example applications are available on the [grant application website](#).

13 THINGS A BEHAVIORAL BIOLOGIST CAN DO ABOUT *CONSERVATION

1. Study an endangered species.
2. Work in an endangered habitat.
3. Work on a question of conservation concern.
4. Study more than one species at a time.
5. Capitalize on 'unnatural' experiments.
6. Apply Tinbergen's Four Questions to a conservation question.
7. Develop and test predictive models of animal behavior that apply to endangered and non-endangered species.
8. Talk with a wildlife manager.
9. Comment on a conservation plan.
10. Teach conservation behavior.
11. Go to lunch with a population biologist.
12. Go public.
13. Don't give up!

* based on the *10 Things a Behavioral Biologist Can Do to Help Conservation* by Dan Blumstein modified by the Conservation Committee; For full descriptions see <http://animalbehaviorsociety.org:8786/Committees/ABSCConservation/thirteen.html>

ORANGUTANS AND PALM OIL

By Elizabeth Peterson

We are always searching for ways that we can contribute substantially to preserving the environment and critically endangered species. It's difficult to make this contribution unless we have devoted our careers to studying and fighting for it.

But alas! There is a way that we can modify our habits and choices in order to make an impact globally. As the holidays quickly approach, we can choose food and products that are free of palm oil or palm oil derivatives. By reading labels and preferentially purchasing products that are devoid of palm oil, we can decrease the demands for the development of more palm oil plantations, which are destroying the habitats of endangered orangutans, among many other species.

BE A PART OF THE SOLUTION

What is palm oil?

Palm oil is a type of vegetable oil that is used in cooking, processed foods, biofuels, cleaning products, and personal care products.^{1,3} In fact, 50% of all consumer goods contain palm oil, a recent 485% increase in the last decade in the U.S.^{1,3} Labeling of palm oil can be deceptive but is usually written as "palm kernel oil" or "sodium lauryl sulfate". For a complete list, visit the Rainforest Action Network website listed below.

Why is the palm oil industry a concern to orangutan survival?

The palm oil industry is responsible for the substantial decline in orangutan population rates over the last 25 years.² In order to make more room for the palm oil plantations, rainforests are leveled in Indonesia, Malaysia, and Papua New Guinea.¹ Species reliant upon these forests for their survival are in peril, including orangutans, Sumatran tigers and Sumatran elephants.¹ Because consumer demand has grown, another 18 million hectares are expected to be demolished by 2020.¹ It's estimated that orangutans will go extinct within the next few decades due to the palm oil industry.² Orangutans are especially vulnerable because they only reproduce about once every eight years⁴ and male territories are likely to be much larger than previously estimated⁵. There is currently no published research on the effects of deforestation on Orangutan behavior.

We can make a substantial difference by choosing products that are palm oil free, especially with the "yummy" food-filled holidays quickly approaching. Have a merry palm oil free holiday!

For a complete list, see the Orangutan Friendly Sustainable Palm Oil Halloween Candy List as www.cmzoo.org/docs/palmOilCandyGuide and the Rainforest Action Network Website at <http://understory.ran.org/2011/09/22/palm-oils-dirty-secret-the-many-ingredient-names-for-palm-oil-or-what-ingredients-contain-palm-oil/>

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MEET THE NEW ABS CONSERVATION COMMITTEE MEMBERS

Dr. Lisa Angeloni

Dr. Angeloni is an Assistant Professor in the Biology Department at Colorado State University. Her primary research area within behavior conservation focuses on the effects of human disturbance on wildlife behavior (e.g., the effects of recreational noise on elk and pronghorn behavior in a national park, the effects energy development noise on mule deer behavior, and the effects of urbanization on prairie dog behavior).



Photo Kevin Crooks



Photo Karen Corbell

Dr. Sarah Mesnick

Dr. Mesnick is the science liaison for the Southwest Fisheries Science Center, NOAA Fisheries Service, an ecologist in the Protected Resources Division and co-founder of the Center for Marine Biodiversity and Conservation (CMBC) at Scripps Institution of Oceanography, UC San Diego. Her research focuses on the conservation and behavioral ecology of marine vertebrates. She studies patterns of sociality and the impacts of anthropogenic activities on social structure and population dynamics. Her work integrates information derived from genetic, acoustic, observational and phylogenetic sources.

Dr. Debbie Boege-Tobin

Dr. Boege-Tobin is an Associate Professor in the Biology Department at the Kachemak Bay Campus of KPC-University of Alaska Anchorage. She has been involved in behavior conservation for over 15 years. Her primary research focuses on foraging ecology, play, olfactory behavior and human animal conflict in marine mammals. Some of her study species include the North American river otter, giant otters, killer whales and humpback whales.



Photo Balaena, Gulf of CA 2009

Interact with the Conservation Behaviorist

Send letters, announcements, comments and contributions to: The Conservation Behaviorist dshier@sandiegozoo.org. Deadlines for articles are the 15th of the month preceding the next news update. The next deadline is May 15th. Contributions submitted by members of the Animal Behavior Society and judged by the Conservation Committee to be appropriate will be published in the Conservation Behaviorist. The publication of such material does not imply ABS or the Conservation Committee endorsement of the opinions expressed by contributors.

Editor: **Debra M. Shier**

Associate Editor: **Guillermo Paz-y-Miño-C**

Editorial Staff: **Chelsea Blake and Elizabeth K. Petersen**

