



**August 11-14, 2016**

**Sul Ross State University**

**Alpine, Texas**



**Annual Meeting Agenda**

## Itinerary

### Thursday August 11, 2016

7-9 p.m. Steering Committee Meeting      Location: Harry's Tinaja

Check in at Lobo Village office before 5 p.m. for dorm accommodations. After 5 p.m., call 432-294-0464 to check in.

### Friday August 12, 2016

Check in at Lobo Village office before 5 p.m. for dorm accommodation. After 5 p.m., call 432-294-0464 to check in.

9:30 a.m. Check-in, coffee and pastries.      Warnock Science Building seminar room 223

10 a.m. Welcome – Sean P. Graham      Warnock Science Building Room 201

**All speakers will have 15 minutes for their presentations plus 5 minutes for questions!**

Morning oral presentations: *Action, Advocacy, and Outreach*

10:15 a.m. **Keynote speaker**    John B. Jensen: “**Efforts to reform rattlesnake roundups in Georgia.**”

10:45 a.m.    Jenny Loda: “**Using Advocacy and the Legal System to Protect Rare Amphibians and Reptiles in the Southwest.**”

11:05 a.m.    Daniel Martin: “**A Standardized Sampling Approach for Guiding Conservation of Terrestrial Reptiles.**”

11:25 a.m. M.L. Robinson: “**Educational publication evolution.**”

11:45 a.m. Melissa Amarello: “**The Secret Social Lives of Snakes and Why They Matter.**”

12:05 p.m. Larry Jones: **“SWPARC Habitat Management Guidelines are Here!”**

Lunch: On your own. Several fast food and sit-down establishments within walking distance of Sul Ross campus. Local field trip opportunities will be suggested (see last page).

7-10 p.m. Evening Social: Herp crossword challenge and poster session.

Kokernot Lodge (directions TBA; meals and beverages provided; vegetarian options available).

Posters:

Mike Pingleton: **“HerpMapper: Mobilizing Citizen Science for Herp Conservation & Research.”**

Ciara Brodie: **“The Effect of Plasma Storage Time on Bacterial Killing Capacity in Rio Grande Turtles.”**

Connor Adams: **“Resolving Questionable Museum Records of the Louisiana Pinesnake (*Pituophis ruthveni*).”**

## **Saturday August 13, 2016**

9:30 a.m. coffee and pastries  
seminar room 223

Warnock Science Building

10:00 a.m. Announcements

Warnock Science Building 201

Morning Oral Presentations: *Conservation Research*

10:05 a.m. Drew R. Davis **“The effects of urbanization on physiological stress of Jollyville Plateau salamanders, *Eurycea tonkawae*.”**

10:25 a.m. Lawrence Jones **“Influence of the North American Monsoon on Surface Activity of Lizards in Southeastern Arizona.”**

10: 45 a.m. Alex Krohn **“Physiological Color Change and Population Genomics of Lava Flow Lizards in New Mexico”**

11:05 a.m. Travis LaDuc **“Research and cooperation: understanding the natural history of the enigmatic Spot-tailed Earless Lizard (*Holbrookia lacerata*).”**

11: 25 a.m. Mark Herr: **“New Records for Amphibians and Reptiles in Manuel Benavides, Chihuahua, Mexico.”**

11:45 a.m. Jennifer Smith: **“Movement, Habitat Preference and Growth Rate of the Rough-footed Mud Turtle, *Kinosternon hirtipes murrayi*.”**

12:05 p.m. Sean P. Graham **“Good News at Last: Conservation Status of the Seepage Salamander and Implications for Species of Special Concern in the Southwest.”**

12:15 p.m. Lunch: On your own.

2:00 p.m. Announcements

Warnock Science Building 201

Afternoon Oral Presentations: *PARC national and regional updates*

2:00 pm. Michelle Christman: **“2016 National PARC update.”**

2:40 p.m. Tom Jones: **“Herpetology at the Arizona Game and Fish Department.”**

3:00 p.m. Laura Patterson: **“State of the State: A California Department of Fish and Wildlife Perspective.”**

3:20 p.m. Leland Pierce: **“State of the State: New Mexico.”**

3:40 p.m. Jason Jones: **“Nevada State of the State: Reptiles.”**

4:00 p.m. Cristina Jones (for Ann McLuckie): **“A Glimpse into Utah’s Herp World.”**

4:20 p.m. Rob Lovich and Chris Peterson: “**Department Of Defense PARC – 2016 Update.**”

Local field trip opportunities will be suggested (see last page).

7-9 p.m. Evening Social: SWPARC trivia and live auction.

Sunny Grove (directions TBA; meals and beverages provided; vegetarian options available).

## **Sunday August 14, 2016**

### **Field Trips**

10 a.m. Meet at Fine Arts Building parking lot (closest lot to Warnock Science Building).

*Big Bend National Park:* 10:15 a.m. August 14 to 2:00 a.m. August 15. Trip Leader: Sean P. Graham. Hike the trails for canyon lizards and wade the Rio Grande for Big Bend Sliders! Late night road cruise on the best park road for night driving. Free ride in Sul Ross 15 passenger van; first come, first serve. Those wishing to return to Alpine earlier must drive separately.

*Davis Mountains.* 10:15 a.m. August 14 to 2:00 a.m. August 15. Trip Leader: Sky Stevens. Daytime lizard and snake hunt and exceptional road cruising. Free ride in Sul Ross 15 passenger van; first come, first serve. Those wishing to return to Alpine earlier must drive separately.

## **Presentation Abstracts**

### **Morning Oral Presentations, Friday August 12**

**John B. Jensen: “Efforts to reform rattlesnake roundups in Georgia.”**

Southeastern US rattlesnake roundups were originally started as local, community-level efforts to remove those snakes that took up residence near houses, offices, playgrounds, schools, etc., which were viewed as posing a legitimate danger to humans and pets. Today, these nuisance rattlesnakes are only a fraction of what is collected, with the bulk coming from distant, mostly undeveloped lands where the snakes are actively searched for and removed despite the negligible threat they pose. Although civic groups that organize rattlesnake roundups donate proceeds to charities and other nonprofit organizations, growing concerns about the negative impact these events have on wildlife make them in need of significant reform. Organizers of rattlesnake roundups insist that snakes are no longer obtained through the “gassing” of gopher tortoise burrows, but organizers have little control of the actions of individual hunters, and consequently can provide little guarantee of how snakes are actually obtained. Whether or not they significantly impact declining eastern diamondback rattlesnake populations, roundups provide an overall negative conservation message to the public for venomous snake species, perpetuating disrespect for their deserving place in the natural world. Georgia DNR has offered incentives, in the form of financial, personnel, service, and promotional support, to organizers of rattlesnake roundups for changing to wildlife friendly festivals, and has succeeded in such conversions at two of the three Georgia roundups.

**Jenny Loda: “Using Advocacy and the Legal System to Protect Rare Amphibians and Reptiles in the Southwest.”**

The Center for Biological Diversity works to secure a future for all species, great and small, especially those hovering on the brink of extinction. By petitioning the U.S. Fish and Wildlife Service to provide Endangered Species Act protection for imperiled amphibians and reptiles - and following up with lawsuits when necessary - the Center is working to obtain federal safeguards and protected habitat for herps in the Southwest and across the country. The Center works to insure compliance with the Endangered Species Act for species that are already listed under the ESA and uses advocacy at the local, state, and federal levels in its campaign to address the amphibian and reptile extinction crisis. In this presentation, Jenny discusses the Center's work to protect turtles, snakes, frogs, lizards and salamanders in the Southwest. These efforts include filing the largest-ever Endangered Species Act petition focused on amphibians and reptiles, securing adequate habitat protections and recovery plans for listed species, advocating to ban harmful gassing to hunt snakes in Texas, and litigating to insure public agencies are fulfilling their duties under the Endangered Species Act.

**Daniel Martin: “A Standardized Sampling Approach for Guiding Conservation of Terrestrial Reptiles.”**

In the face of rapidly-changing climate and continued habitat alteration, it is increasingly important for wildlife conservation decisions to be guided by robust survey data. Much of our contemporary understanding of reptile distributions is based on presence-only records, and these data fail to provide information needed for critically evaluating changes in species' status over time and space. To guide improved landscape-scale conservation efforts, surveys for reptiles should include probability-based sampling approaches and standardized methods that (at least for many temperate species) enable incorporation of detection probability. Here, we describe the first landscape-scale standardized survey for terrestrial reptiles in North America. Our approach uses a probability-based design and simple, standardized survey protocols. We randomly-selected survey sites on public and private lands for which we had access in 8 states within the Great Plains. We used visual encounter surveys, including road and off-road-based methods and during day and night. Our sampling design is flexible enough to incorporate different detection methods that may be necessary for some species and habitats. In addition, our landscape-scale approach could be adjusted for local or regional-scale sampling efforts. The benefits of this approach include estimates of occupancy for species over time and space – that account for imperfect detection and misidentification bias, and include estimates of precision. This more robust effort should improve the quality of information that guides future conservation decisions and could be applied across North America.

M.L. Robinson: “Educational Publication Evolution.”

Educating the public through correct information is essential to the protection of wildlife. Over the years, the University of Nevada Extension, the Division of Wildlife and private citizens have worked together to develop educational materials. In the twenty years that this partnership has existed, the same publication has been produced in different forms to meet the needs of the current clientele. This presentation explores the different formats and designs of the same publication over that time period, and shows how and why such publications need to evolve.

Melissa Amarello: “The Secret Social Lives of Snakes and Why They Matter.”

Social structure affects many aspects of ecology including reproductive success, gene flow, and space use. Here we describe the social structure of two communities within a population of Arizona black rattlesnakes (*Crotalus cerberus*) using association indices and social network analysis. We used remote timelapse cameras and opportunistic observations to semi-continuously sample rattlesnake behavior at communal basking sites during early April through mid-May in 2011 and 2012. We calculated an association index (proportion of time snakes spent together) for each pair of rattlesnakes, which we used to construct a weighted, undirected social network for each community. We found that individual *C. cerberus* are selective about with whom they associate. Females and juveniles formed preferred associations with each other and with males, but males did not form preferred associations with each other. Our study is the first to show preferred associations among individual snakes, but to our knowledge it is also the first to use association indices and social network analysis to examine association patterns among snakes. This information has some surprising applications to the conservation of all snakes.

## Morning Oral Presentations: Saturday August 13

Drew R. Davis: “The effects of urbanization on physiological stress of Jollyville Plateau salamanders, *Eurycea tonkawae*.”

Jollyville Plateau Salamanders (*Eurycea tonkawae*) are aquatic salamanders endemic to two highly populated counties in central Texas. They inhabit streams in urban and non-urban catchments and have lower densities and have experienced population declines in heavily urbanized areas. While it is recognized that urbanization alters hydrology and decreases water quality no study has examined the physiological impact of urbanization on salamanders. Assessing stress levels in field-caught animals may provide important insights into population health. Using a water-borne hormone assay we compared the corticosterone (CORT) levels of salamanders from urbanized and rural streams over three years. Additionally, we examined the stress response of salamanders to an agitation test (HPI stress responsiveness). We found significant effects of both year and urbanization. Specifically, we found that salamanders from urban sites had significantly higher CORT levels than salamanders in non-urban sites in the first two years but not the third. Most populations had higher CORT after agitation except one urban population in the first year and one rural and two urban populations in the last year. We propose that urban populations may be more stressed than non-urban populations but that there is some yearly fluctuation. Weather and/or flooding may drive the differences we saw across years. Given the year-to-year variation we predict that the long-term data on both baseline CORT and the stress response to agitation will help us gain a better understanding of factors that are affecting the stress response and overall health of these declining populations of this federally threatened species.

Lawrence Jones: “Influence of the North American Monsoon on Surface Activity of Lizards in Southeastern Arizona.”

The North American Monsoon brings increased moisture from Mexico to parts of the American Southwest during the late summer and early fall. Although it is a well-known seasonal climate phenomenon, climatological information on the monsoon is relatively scant and its geographic boundaries are poorly defined. The monsoon is known to influence surface activity of snakes, anurans, and turtles, but little information is available for lizards. In order to determine effects of the monsoon on an assemblage of lizards in southeastern Arizona, I conducted road-transect surveys for six years before, during, and after the monsoon. A total of twenty species were detected, the highest diversity of lizards recorded for any small area in the U.S., but only eight species were abundant enough for analysis. Three basic patterns of surface activity emerged: (1) some species were unaffected by the changes in weather; (2) others were positively correlated with the monsoon season; or (3) some species responded positively to rain events. Overall, numbers of surface active animals essentially doubled with the onset of the monsoon. This study led to further defining (mapping) the North American Monsoon, based on precipitation amounts and seasonal percentages, along the Border States. The monsoon area encompasses the region between about Ajo, Arizona, to Del Rio, Texas. The ranges of numerous taxa (species and subspecies) are influenced by this climatic zone, although other factors play into species' distributions.

Alex Krohn: “Physiological Color Change and Population Genomics of Lava Flow Lizards in New Mexico.”

Many desert animals exhibit dramatic variation in coloration throughout their ranges, often associated with different habitat types. For example, reptiles on desert lava flows repeatedly show substantially darkened coloration, known as melanism, compared to surrounding populations. Melanism on lava flows has been hypothesized to be due to strong natural selection for background matching. Quantifying color differences and assessing the degree of genetic isolation among populations is important for understanding the evolutionary history and conservation status of uniquely colored populations. We studied three lizard species, *Sceloporus cowlesi*, *Crotaphytus collaris*, and *Urosaurus ornatus*, both on and off three separate lava flows in southern New Mexico: the Carrizozo Lava Flow, the Pedro Armendariz Lava Flow and the Aden-Afton Lava Flow. Using phenotypic measurements of color, we found that lava flow individuals were significantly darker than non-lava conspecifics on most, but not all, of the lava flows. On the lava flows with melanic forms, we found that dark color was not due to rapid physiologically plastic color change. Using RAD sequencing, we found that lava flow populations were not genetically distinct from neighboring typically-colored populations. We found no strong population structure and no evidence that the lava flows are a barrier to gene flow. The surprising finding of phenotypic differentiation without genetic differentiation could be explained by high degrees of ongoing gene flow and/or few loci of large effect controlling coloration.

Travis LaDuc: “Research and cooperation: understanding the natural history of the enigmatic Spot-tailed Earless Lizard (*Holbrookia lacerata*).”

Little natural history data exist for the wary and infrequently seen Spot-tailed Earless Lizard (*Holbrookia lacerata*). In 2011, the US Fish and Wildlife Service (FWS) found substantial information that listing this species (species of greatest conservation need in TX) may be warranted. In 2013, the Texas Legislature earmarked \$5M to fund research studies on this and other species of state and federal interest; the Texas Comptroller of Public Accounts (TCPA) administers this program. One of the first grants awarded under this program went to a team of scientists from UT-Austin and The Nature Conservancy in 2014 focus on lizard surveys and creating models of lizard habitat and fragmentation of habitat. Because of the potential impacts of a future FWS listing of the species on the state’s economy, the TCPA organized working group to provide a direct line of communication between researchers and stakeholders. Following discussions within this group, the team identified additional data gaps and TCPA approved additional funding for research addressing natural history parameters, genetics, and population demographics, all feeding into a future population viability analysis. As a result, collaborators from Texas A&M University and UT-Arlington joined the group to expand field surveys and initiate genetic work. Studies on lizard diet and morphology as well as models projecting future habitat/development have been initiated. An invitation from the FWS to the research group the compilation of the Species Status Assessment represents a significant step towards transparency and a paradigm shift in the FWS listing process.

Mark Herr: “New Distribution Records for Amphibians and Reptiles of Manuel Benavides, Chihuahua, Mexico.”

The recent publication of detailed state herpetology books for Coahuila and Chihuahua, Mexico constitute an excellent resource for students interested in contributing to our understanding of amphibian and reptile distributions in Mexico. We conducted a one week survey of a private ranch in Municipio Manuel Benavides (“Municipalities” are equivalent to U.S. counties),

adjacent to the Big Bend region of Texas, in an effort to generate new geographic records. We detected 17 new “municipality records,” which ranged from common species like Couch’s spadefoot to rarer species like the ringneck snakes and Smith’s black-headed snakes. We vouchered all specimens using high quality digital photograph and audio recordings, precluding the need to apply for troublesome collection and import-export permits. We encourage others to do likewise and look south of the border for adventurous research opportunities.

Jennifer Smith: “Movement, Habitat Preference and Growth Rate of the Rough-footed Mud Turtle, *Kinosternon hirtipes murrayi*.”

The Rough-footed mud turtle, *Kinosternon hirtipes*, is listed as Threatened on the Texas Parks and Wildlife Department’s nongame list. Four of the known seven populations have disappeared over the past four years, leaving only two viable populations and one with only males present. The purpose of this on-going study is to investigate growth, sexual dimorphism, habitat preferences, movement and genetic diversity. Turtles were collected by traditional trapping methods using double throat wire mesh traps. Notches were made on the marginal scutes as well as a 3.6 g. transmitter attached for a telemetry study. Shavings were collected for DNA analysis. General size distribution was calculated and a growth model was produced showing increased growth rate of juveniles until approximately 100 mm then a slowing trend with growth rate faster than other Kinosternids, including *Kinosternon hirtipes murrayi* from Mexico. A significant sexual dimorphism emerged from the data, with males significantly larger than females and the *K. hirtipes murrayi* in Texas larger than those found in Mexico. The telemetry study has revealed a much greater affinity to water than other Kinosternids with movement during active season restricted to their aquatic habitats. Genetic analysis with Geneious software and Fu and Li’s tests indicated a possible recent bottleneck. This information is invaluable when implementing a strategic management plan for this Threatened species. Funding for the telemetry study was provided by the Texas Parks and Wildlife Conservation License Plate Grant.

Sean P. Graham: “Good News at Last: Conservation Status of the Seepage Salamander, with Implications for Species of Special Concern in the Southwest.”

Until recently, the Seepage Salamander’s conservation status in the southeastern U.S. was questionable, and a report that it was extirpated from its type locality in North Carolina raised concern that this species may be experiencing a range-wide decline. This uncertainty led to its petitioning for listing for protection under the U.S. Endangered Species Act. Surveys throughout the known range of this species led to documentation of the persistence of this species at most historic collection localities, and identified many newly-identified localities, including some > 100 km outside of the known distribution for the Seepage Salamander. This study led to the immediate withdrawal of this species from the ESA petition, and constitutes rare good news in the age of amphibian declines. This study also illustrates the need for additional basic inventories of species of special concern. Such species have traditionally been relatively ignored by researchers, since they are less common than typical species chosen for basic biological research, yet are more common than those that typically receive conservation funding (e.g., endangered species). This situation may therefore lead certain species to escape our attention and slip

through the cracks. Several potential species in the SWPARC region offer similar research opportunities for conservation researchers.

### Afternoon Session

Michelle Christman: “National PARC 2016 Update.”

Tom Jones: “Herpetology at the Arizona Game and Fish Department.”

Laura Patterson: “State of the State: A California Department of Fish and Wildlife Perspective.”

Leland Pierce: “State of the State: New Mexico.”

Jason Jones: “Nevada State of the State: Reptiles.”

Cristina Jones (for Ann McLuckie): “A Glimpse into Utah’s Herp World.”

Rob Lovich and Chris Peterson: “Department Of Defense PARC – 2016 Update.”

*Additional talks TBA.*

### Posters

Mike Pingleton: “HerpMapper: Mobilizing Citizen Science for Herp Conservation & Research.”

Launched in September of 2013, the volunteer-driven HerpMapper project bridges the gap between field herpers and others willing to record their species observations, and organizations and projects that can make use of that data. The HerpMapper toolset allows users to create real-time records in the field using a mobile device, and to document past observations via web browser ([www.herpMapper.org](http://www.herpMapper.org)). Recorded observations are added to a secure central database, and users agree up-front to make their records available to HerpMapper’s data partners - vetted groups and institutions who use the data for research, conservation, and preservation purposes. Only the contributing user and the appropriate data partner have access to all data within a record, and partners only have access to records that fall within their geographic work area and project scope. Other users and the general public can only see very basic information in submitted records – specific locality data is stripped from public view. In less than three years, the project has accumulated more than 150,000 records, and has established relationships with more than 40 organizations, including federal and state agencies, university research and education projects, and state atlases. Global in scope, HerpMapper is envisioned and structured as a long-term, multi-generation project.

Ciara Brodie: “The Effect of Plasma Storage Time on Bacterial Killing Capacity in Rio Grande Turtles.”

Ecoimmunology is a relatively new field of research, which clarifies geographical and temporal variations in infectious disease. The bacterial killing assay (BKA) is a compelling tool in ecoimmunology with many methodological advantages. BKA assesses the ability of blood plasma to lyse bacterial cells; a measure of innate humoral immune response. To address storage time artifacts in future research, the effect of plasma storage time in  $-2^{\circ}\text{C}$  on bacterial killing activity was assessed. Blood samples were obtained from turtle species (*Apalone spinifera*,  $n=17$  and *Trachemys gaigeae*,  $n=8$ ). Samples were allocated into separate micro centrifuge tubes, and frozen. Bacterial killing was assessed at 0–4 days of frozen storage. Initial analysis by linear regression shows no ( $R^2=0.0683$ ) relationship between storage time and bacterial killing capacity within this time frame.

Connor Adams: “Resolving Questionable Museum Records of the Louisiana Pinesnake (*Pituophis ruthveni*).”

The Louisiana Pinesnake (*Pituophis ruthveni*) is considered one of the rarest snakes in North America. This species is currently under review by the U.S. Fish & Wildlife Service (FWS) for threatened or endangered species listing. Specimens of *P. ruthveni* are not well represented in scientific collections, and many museum records are questionable or unverified. In past studies, these records have been used to create distribution and habitat models for this species. Some of these records have been resolved, but uncertain records still exist. The purpose of this study is to resolve questions surrounding unverified museum records of *P. ruthveni*. We measured 13 morphological characters of 28 museum specimens of *P. ruthveni*, and 15 museum specimens of *P. catenifer*. Multivariate statistics were used to distinguish among the two groups. Questionable records of *P. ruthveni* have been identified, and represent *P. catenifer*.

---

Sul Ross Campus Map – Talks will be presented at 10; dorms at 16



# Sul Ross State University

*A Member of the Texas State University System*

- |   |   |
|---|---|
| 1. President's Home                                       | 12. Fletcher Hall                                       |
| 2. Wildenthal Memorial Library                            | 13. Industrial Technology Building                      |
| 3. Morgan University Center<br>(Espino Conference Center) | 14. Art Annex   |
| 4. Briscoe Administration Building                        | 15. Physical Plant                                      |
| 5. Morelock Academic Building<br>(Marshall Auditorium)    | 16. Lobo Village Housing Complex                        |
| 6. Academic Computer Resource Center                      | 17. Residential Living Office                           |
| 7. Lawrence Hall  | 18. Graves-Pierce Complex                               |
| 7A. Cactus Garden   | 19. Pete P. Gallego Center                              |
| 8. McCoy Building (Museum of the Big Bend)                | 20. Tennis Courts                                       |
| 9. Francois Fine Arts Building (Studio Theatre)           | 21. Turner Range Animal Science Agricultural<br>Complex |
| 10. Warnock Science Building                              | (P) Parking Lot   |
| 11. Ferguson Hall   | (E) Entrance  |

## Thanks to our Meeting Sponsor:



## Local Herping Suggestions:



23 miles NW of Alpine off TX 118; entrance on the right. Many species, including rock rattlers and copperheads, have been seen there. They know we're coming!

Also feel free to explore Hancock Hill just behind Sul Ross campus; a few miles of hiking trails weave through rocky desert grassland. Many snakes and lizards have been found right on campus. Main trailhead is up the hill behind Physical Plant near the abandoned apartment buildings.