

Southwest Partners in Amphibian & Reptile Conservation



Third Annual Meeting

Program and Abstracts

The Courtyard Marriot
St. George, Utah

September 12-13, 2009

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INTRODUCTION

About the Hosting Society

Southwest PARC

The mission of PARC is to conserve amphibians, reptiles, turtles and their habitats as integral parts of our ecosystem and culture through proactive and coordinated public/private partnerships. Southwest PARC is a non-profit working group organized for the purpose of implementing the PARC mission within the Southwest, including Arizona, California, Colorado, Oklahoma, Nevada, New Mexico, Texas, Utah, Hawaii, Baja California and Mexico. These areas have a very high diversity of amphibians, reptiles and turtles, including the most rattlesnake species as well as some of North America's most threatened frog and toad species. The Southwest faces a number of conservation challenges, including ongoing drought and water resource consumption, ever-expanding human populations, habitat and land conversion, and the introduction of crayfish, bullfrogs, and other non-native species into amphibian, reptile and turtle habitats.

Organizational Officers

2009 Meeting Planning Committee

Laura Hines, *Chair*
Brian Aucone
Clint Henke

Diane Barber
Tom Giermakowski
Polly Conrad

PARC National Coordinators

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Keynote Speaker

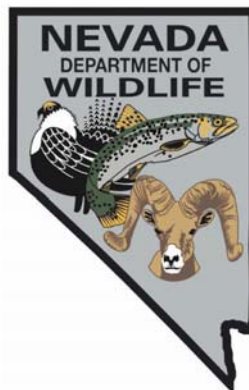
About Dr. Daniel D. Beck

Growing up along the Wasatch front in Utah, Daniel D. Beck found his early calling by keeping chickens and catching snakes, for which he built special cages. After stints as a zookeeper and a cabinetmaker, Dan earned BS and MS degrees in biology from Utah State University, and a PhD in ecology and evolutionary biology from the University of Arizona. His research on the ecology, physiology, and behavior of helodermatid lizards and rattlesnakes spans nearly 3 decades, and has taken him throughout the deserts of the Southwestern U.S. and the Tropical Dry Forests of Mexico and Guatemala. Once, while doing fieldwork in Sonora, Mexico, a Gila Monster even crawled into Dan's sleeping bag! Dr. Beck's book "Biology of Gila Monsters and Beaded Lizards" (University of California Press, 2005) was released in paperback this summer. Dan's interest in building also persists as many friends recently helped him and his family build a straw-bale house they now inhabit in Ellensburg, Washington.

Daniel D. Beck is a professor of biology at Central Washington University in Ellensburg, Washington.



Sponsors



SWPARC 3rd Annual Meeting

Meeting Schedule Overview

Saturday – September 12, 2009

0700-0800: Registration
0800-0815: Welcome & Opening Remarks
0815-0915: Keynote Presentation – Dr. Dan Beck
0915-0945: National PARC Updates
0945-1015: Break
1015-1115: Bull Frog Removal Presentations & Group Discussion
1115-1215: Invited Speaker – David Wojnowski
1215-1330: Lunch (on your own)
1330-1445: Oral Presentation
1445-1530: State Updates
1530-1545: Break
1545-1600: State Updates
1600-1730: Poster setup
1800-2100: Social, Poster Session, Live Auction

Sunday – September 13, 2009

0700-0800: Registration
0800-0900: SWPARC Steering Committee Meeting
0900-0930: SWPARC Working Group Updates
0930-1030: SWPARC Information and Issues
1030-1100: Break
1100-1130: SWPARC Information and Issues continued
1130-1230: Working Lunch (lunch provided)
1130-1330: Herpetofauna Conservation Break Out Groups
1330-1400: Break Out Group reports
1400-1515: SW PARC Organizational Meeting continued
1515-1530: Closing Comments

Monday – September 14, 2009:

On your own Field Trips:
Red Cliffs Desert Reserve
Snow Canyon State Park
Zion National Park

Daily Schedule of Events: Saturday, September 12

0700-0800 Registration

Welcome and Opening Remarks

0800-0815 Laura Hines, Cynthia Tait

Moderator: Laura Hines

Keynote Speaker

0815-0915 Dr. Daniel D. Beck

What We Can Learn from Monsters in the Desert: a Reflection on the Value of Biodiversity

National PARC updates

0915-0945 National PARC updates
Priya Nanjappa-Mitchell

0945-1015 Break (Refreshments Provided)

Bull Frog Removal Series

1015-1045 C. R. SCHWALBE (presenter), P. C. ROSEN, D. O. SUHRE, B. H. SIGAFUS,
and D. H. HALL

Chiricahua Leopard Frog Response to Bullfrog Removal

CHRISTINA AKINS and THOMAS R. JONES (presenter)

Bullfrog removal in the Peña Blanca Lake area, Coronado National Forest, Arizona

GLENN P. FREDERICK (presenter), and BROOKE S. GEBOW

Managing Earthen Stock Tanks for Bullfrog Elimination and Chiricahua Leopard Frog Reestablishment in the Huachuca Mountains, Arizona

1045-1115 Question and Discussion

Invited Speaker

1115-1215 David Wojnowski

The Shadow of Kasigau: A pictorial overview of five years of herpetofauna conservation education research in Kenya.

Lunch (on your own)

1215-1330

Moderator: Cynthia Tait

Oral Presentations

1330-1345 PHILLIP ROSEN (presenter)

Status of and Threats Facing Mud Turtles (*Kinosternon*) in Arid Southwestern North America.

1345-1400 CHRISTOPHER W. Brown (presenter), TOMMY OWENS and ROBERT N. FISHER

USGS Riparian Herpetofaunal Studies in Coastal San Diego, California.

1400-1415 JONES, LARRY (presenter), ELISA BACA, and GARY PAYNE

Sabino Canyon Guided Lizard Walks for Urban Youths.

1415-1430 TOM GIERMAKOWSKI (presenter), and HOWARD L. SNELL
Where species could be: statewide models of distribution for amphibians and reptiles of New Mexico.

1430-1445 PHILLIP ROSEN (presenter).
Integration of the Declining Sonoyta Mud Turtle into Modernization of Municipal Sonoyta, Sonoran, Mexico

State Updates

1445-1500 UTAH
Jason Jones

1500-1510 NEVADA
Polly Conrad

1510-1520 CALIFORNIA
Rob Lovich

1520-1530 OKLAHOMA
Brian Aucone

1530-1545 Break

1545-1600 ARIZONA, NEW MEXICO, TEXAS, COLORADO, HAWAII

Evening Social, Poster Session, and Live Auction (cash bar and light refreshments)

1600-1730 Poster Setup (outside Courtyard Marriot Garden or inside at the restaurant – dependent on weather)

1800-2000 Social, Poster Session, Live Auction

Daily Schedule of Events: Sunday, September 13

- 0700-0800 Registration
0800-0900 SWPARC steering committee meeting

Session Moderators: Polly Conrad & Brian Aucone

Working group updates

- 0900-0930
Outreach to Mexico – Rob Lovich
Habitat Management Guidelines – Rob Lovich
Southwest Priority Species List – Erika Nowak
Outreach to Enthusiasts – Erin Muths
Living with Venomous Reptiles – Erika Nowak

Southwest PARC information and issues

- 930-1000 SWPARC organizational information
Polly Conrad and Brian Aucone
- 1030-1100 Break (refreshments provided)
- 1100-1130 Identifying Herp Conservation Priorities for the Southwest Region
Polly Conrad and Brian Aucone, Moderators
- 1130-1200 Identify New Working groups
- 1130-1200 Lunch (provided)
- 1200-1330 Break out groups discussion, brainstorming session (work through lunch)
- 1330-1400 Break out group reports
- 1400-1430 Break out group wrap up and motivation for the upcoming year
Polly Conrad & Brian Aucone

Southwest PARC Organizational Meeting

- 1430-1445 Elect new Steering Committee Members
- 1445-1500 Elect new Co-Chair
- 1500-1515 2010 Annual Meeting and Planning Committee selection
Rob Lovich
- 1515-1530 Wrap up and Closing Comments

Abstracts

Alphabetic Order by First Author

1. AUTHORS: AUDREY K OWENS. (presenter) and CRISTINA A. JONES

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PRESENTATION: poster

TOPIC: Herpetofaunal publicity/education

The Arizona Game and Fish Department's Turtles Project Ornate Box Turtle Watch Program. The ornate box turtle (*Terrepenne ornata luteola*) remains understudied in southeastern Arizona, mainly because finding them often is a matter of being in the right place at the right time. For this reason, the Turtles Project initiated an Ornate Box Turtle Watch program which encourages individuals who are birding, hiking, or engaged in other watchable wildlife activities to become citizen scientists by collect data on when and where they encounter box turtles in the wild. To participate, the citizen scientists fill out and mail in an observation form which can be downloaded from our website (www.azgfd.gov/boxturtlewatch). Because southeastern Arizona is a mecca for birders, they will likely be an important resource for this program. Therefore, we participated at the 2009 Southwest Wings, a well-attended birding and nature festival in southern Arizona, by delivering a presentation on the Ornate Box Turtle Watch as well as hosting a vendor booth where we provided information on box turtles, the program, and on the importance of not collecting box turtles from the wild. We present a poster used as one of the outreach materials from the Southwest Wings vendor booth.

2. AUTHOR: BETSY C. BOLSTER

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PRESENTATION: Oral

Synopsis of current California Department of Fish and Game (CDFG) activities related to amphibian and reptile conservation. Brief updates on the following activities will be provided: a statewide amphibian and reptile "strategic plan", revision of Jennings and Hayes 1994 "Amphibian and Reptile Species of Special Concern in California" document, CDFG-funded research and restoration projects, frog and turtle live food market importation issue, participation in a multi-state State Wildlife Grant to address amphibian and reptile conservation needs, status of the state listing process for California tiger salamander, status of a conservation strategy for the Western pond turtle, and status of a CDFG/USFWS joint EIR/EIS being prepared in response to a fish stocking lawsuit.

3. AUTHORS: BROOKE GEBOW (presenter), GLENN FREDERICK, MATT KILLEEN, VALERIE BOYARSKI, JIM RORABAUGH

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PRESENTATION TYPE: Poster

Building Leopard Frog Metapopulations in the Huachuca Mountains, Arizona. Maintenance of native leopard frogs in the Huachuca Mountains of southeastern Arizona is currently guided by the Ramsey Canyon Leopard Frog (*Rana subaquavocalis*—soon to be absorbed into federally threatened *R. chiricahuensis*) Conservation Team. Populations are small and mostly found in manmade impoundments. Key threats and causes of decline include disease, disrupted metapopulation dynamics, non-native predators, and habitat loss and degradation. Conservation team members include the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, Coronado National Forest, BLM San Pedro Riparian NCA, Fort Huachuca, The Nature Conservancy, and additional private land owners. This poster shows the team's progress in establishing and maintaining frogs through securing habitat, translocating multiple life stages, monitoring populations, and continuously addressing threats. Currently the east side of the Huachucas is the focus of most of the work with one west-side site undergoing renovation. We report progress within

a recovery framework that stipulates populations at 5 focal sites, 10 supplemental sites, and 2 refugium sites. Focal sites contain perennial water and all life stages, supplemental sites contain water and frogs for parts of years and easy access to other water, and refugium sites are extremely isolated but self-sustaining. Disease remains a significant barrier to recovery.

4. AUTHORS: C. R. SCHWALBE, P. C. ROSEN, D. O. SUHRE, B. H. SIGAFUS, and D. H. HALL

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PRESENTATION: Oral

Chiricahua Leopard Frog Response to Bullfrog Removal

Breeding populations of the American Bullfrog (*Rana catesbeiana*) were removed from Buenos Aires National Wildlife Refuge, Altar Valley, Arizona, in 1999-2001, primarily by hand capture and draining of ponds, in some cases with pond-encircling fencing. Maintenance removals of bullfrogs that immigrated each year from off-refuge populations prevented them from reproducing on-refuge for the subsequent decade. In 2003, Chiricahua Leopard Frogs (*R. chiricahuensis*) were reintroduced at three of the bullfrog-free refuge locations and have since been seen at 11 refuge ponds, with reproduction observed at five of those sites. Bullfrog control has been facilitated by recent, ongoing drought, which has limited dispersal opportunities for the bullfrogs. However, rainfall in summer 2007, the wettest summer yet recorded for the refuge, allowed some normally ephemeral ponds to hold water through the winter and bullfrogs moved into several sites, including four leopard frog breeding sites. Volunteers from multiple stakeholders responded to requests for assistance in removing these immigrant bullfrogs before they could breed in 2008. In 2009, the ranch containing the remaining bullfrog breeding populations in Altar Valley has given permission to remove those bullfrogs and is seeking a Safe Harbor Agreement with U.S. Fish and Wildlife Service for the Chiricahua Leopard Frog.

5. AUTHOR(S): CHRISTINA AKINS and THOMAS R. JONES (presenter).

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PRESENTATION: Oral

TOPIC (optional): Bullfrog Removal and Chiricahua Leopard Frog conservation

Bullfrog removal in the Peña Blanca Lake area, Coronado National Forest, Arizona. Bullfrogs are one of the single greatest impediments to successful conservation of native aquatic wildlife in Arizona. Peña Blanca Lake, an 18 hectare lake about 15 miles west of Nogales, has provided secure bullfrog habitat for decades, and has been a source for a widespread bullfrog metapopulation in the Atascosa and Pajarito mountains. Stock tanks, seeps and springs have since become additional bullfrog sources and sinks, or stepping stones facilitating wider dispersal. In Fall and Winter 2008 - 2009, the USFS drained the lake to remove mercury-contaminated sediments. Temporary loss of bullfrog habitat in the lake provided an opportunity for Arizona Game and Fish Department and partners in USFS, USFWS, University of Arizona, and Sky Island Alliance to systematically attack the remaining metapopulation, and to remove completely all bullfrogs from within an approximately five-mile radius of the lake. AGFD and partners surveyed nearly 100 sites and identified 11 with bullfrogs. Efforts to date, coupled with a regional drought, have resulted in success at 8 sites, and near elimination at the remaining three. This work has demonstrated that a landscape approach to bullfrog removal can be successful, and has great potential to contribute to regional recovery of native ranid frog populations.

6. AUTHORS: CHRISTOPHER W. Brown (presenter), TOMMY OWENS and ROBERT N. FISHER.

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PRESENTATION: Oral

USGS Riparian Herpetofaunal Studies in Coastal San Diego, California. Riparian systems in coastal San Diego have endured heavy impacts from fragmentation, urban development, altered hydrology, invasive species and high intensity wildfires. These systems are home to the federally endangered arroyo toad and the western pond turtle, both of which are covered under the San Diego Multi-Species Conservation Plan. This interagency habitat conservation

plan was implemented to conserve nearly forty different animal species in the region and even more plant species. The USGS San Diego Field Station has been studying the response of these two species to these impacts. First, we are examining the arroyo toad's response to catastrophic wildfires across four watersheds with varying degrees of urbanization and water usage. Second, we are studying the recovery of the western pond turtle in a population heavily impacted by exotic species and altered hydrology. This population has produced gravid females in the wild but no detectable recruitment in recent years. In collaboration with the San Diego Zoo, we are implementing and assessing effectiveness of two management tools by removing invasives from available habitat and headstarting in an effort to increase survival probability.

7. AUTHOR: DANIEL D. BECK (presenter)

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PRESENTATION: Oral

"What We Can Learn from Monsters in the Desert: a Reflection on the Value of Biodiversity"

In 1982, I began my career as a field biologist studying Gila monsters in St. George, Utah. At that time little was known about their habits in the wild, but in the intervening 27 years we have learned much about the amazing family of venomous lizards called the "Monstersauria" – from Utah to Guatemala. There is much wonder, folklore, and myth associated with these lizards – just as there is for many other reptiles and amphibians— and much of what we've discovered is perhaps even more fascinating than that folklore. Here, I'll summarize some of these discoveries, including our recent work on the status of the Gila monster in Utah, and I'll address perennial questions such as: do Gila monsters and Beaded lizards use their venom for defense or for feeding? Are they diurnal or are they nocturnal? Are they tropical or are they desert animals? Are they sedentary, or are they active foragers? You might guess that the answer to many of these questions is "yes they are." Monstersaurs provide a fine example of how nature seldom presents black and white answers to simple questions. The most revealing answers are seldom simply "yes" or "no" - but more often a combination of "both" "and."

We all have our monsters, and to most people venomous reptiles are among the scariest of all. That fear often extends to all things creepy and crawly, including many other reptiles and amphibians. So as natural habitats shrink and resources dwindle, one of our most important tasks is to enlighten people about the wonder and beauty of reptiles and amphibians – soften the fear – so the public will support our efforts to prevent the tragic loss of biodiversity. We must clearly answer the common question: "what good is *that*?" I'll close my talk with a discussion of monstersaur venom and share a story about Exenatide, the new drug discovered from Gila monster venom that has made huge contributions to treating type II diabetes. From this, the monstersaurs provide an awesome example of the value of biodiversity – right here in our own world of herpetology.

8. AUTHOR: DAVID WOJNOWSKI (presenter)

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PRESENTATION: Oral

TOPIC (optional): International herpetofaunal conservation issues

The Shadow of Kasigau: A pictorial overview of five years of herpetofauna conservation education research in Kenya.

In 2004, David Wojnowski traveled to southeast, Kenya and was intrigued by the unique ecosystem of the Taita Hills, inhabited by many endemic reptiles and amphibians, in particular, those living in the geologic outliers of Mt. Kasigau and Sagalla Hill. (Mt. Kasigau is one of the oldest and most isolated mountains in Kenya; rising over 3000 ft [1000 m] from very arid bushland to a cloud-mist forest in one very steep climb.) Interested in the interaction of the Kitaita (indigenous peoples of the Taita Hills, including the sub-groups of Kikasigau and Kisagalla) and the local herpetofauna, I have investigated local teachers' and villagers' conceptions of snakes, chameleons and caecilians through participant observation, and individual and focal group interviews, as well as facilitated herpetofauna workshops conducted by visiting herpetologists from the National Museums of Kenya. Join me as we explore the fascinating interplay between the traditional conceptions of reptiles and amphibians of the Kitaita with that of a visiting muzungu's western scientific perspective.

9. AUTHORS: DEREK B. HALL (presenter), and PAUL D. GREGER

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PRESENTATION: Poster

Western Red-tailed Skink Distribution In Southern Nevada: Initial Results. The western red-tailed skink (*Eumeces gilberti rubricaudatus*) is a sensitive species. Information about this species is lacking, especially for southern Nevada. A multi-year study was initiated in 2006, to determine western red-tailed skink distribution on the Nevada Test Site. Objectives during the first year included: (1) evaluate habitat use by trapping in a variety of habitats including historic and new locations, (2) develop trapping methods and protocol for determining western red-tailed skink distribution, and (3) collect tissue samples for DNA analysis. Skink capture success was compared in trap arrays with and without drift fences. A total of 9 western red-tailed skinks were captured in 6,092 trap days (0.1%, 1 skink/677 trap days). Four of the 7 locations where skinks were caught were near springs or mesic washes; the other 3 were in dry, rocky habitat. No skinks were captured in trap arrays with drift fences. Thus, setting funnel traps near rocks without drift fences is the preferred technique. This greatly reduces the effort and cost required to capture skinks. Twenty other reptile species were captured or observed during skink trapping. Lessons learned from this study and ideas for future work are discussed

10. AUTHORS: GLENN P. FREDERICK (presenter), and BROOKE S. GEBOW

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PRESENTATION: Oral

TOPIC: Bullfrog Removal and Chiricahua Leopard Frog conservation

Managing Earthen Stock Tanks for Bullfrog Elimination and Chiricahua Leopard Frog Reestablishment in the Huachuca Mountains, Arizona. The American bullfrog is a significant predator, competitor and source of infectious disease for the Chiricahua leopard frog. For both species, earthen stock tanks, constructed as water sources for livestock, support source populations and serve as stepping stones for wider dispersal. Stock tanks can be important to proper livestock distribution but it should not be assumed every tank is needed for this purpose. Temporary draining a stock tank or its permanent removal and replacement with a water trough can be practical ways to eliminate bullfrogs. The Coronado National Forest, The Nature Conservancy, Arizona Game and Fish Department, U.S. Fish and Wildlife Service, Department of Defense and others have eliminated bullfrogs from Scotia Canyon, historic habitat for leopard frogs in the Huachuca Mountains, Arizona, first by removing three of five stock tanks, then eradicating bullfrogs at the remaining ponds and throughout the canyon. All other stock tanks within 5-mile radius of Scotia Canyon were evaluated for bullfrog occurrence, importance to the livestock operation, and threats to native amphibians. A plan is being developed to reestablish leopard frogs and prevent bullfrogs from reinvading Scotia Canyon.

11. AUTHORS: JON C. SJÖBERG, MAURICIA M. M. BACA and MARK SLAUGHTER

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PRESENTATION: Poster

TOPIC: Herpetofauna conservation throughout the Southwest

Development of a protected refuge for the relict leopard frog, a critically imperiled Southwestern amphibian. Current distribution of the relict leopard frog, *Rana onca*, is restricted to only 12 natural and established populations representing a small portion of its known historic range, with most sites within Lake Mead National Recreation Area. Although the Muddy River was once occupied by relict leopard frogs, all known populations in that drainage system have been extirpated because of habitat alteration, introduced predators and other factors. This project will establish a protected refuge population of the amphibian using an innovative barrier fence design intended to exclude access to the site by bullfrogs, *Rana catesbeianus*, which are established in low density along the adjacent Muddy River main channel. Construction of the fence was completed in July 2009 at the 0.25 ha (0.6 acre) Perkins Pond, located on a conservation property managed by The Nature Conservancy of Nevada (TNC) near the headwaters of the Muddy River. After further enhancements to the pond, frogs will be introduced to the site in spring 2010 and monitored through a cooperative project and study between TNC, the Nevada Department of Wildlife and the Bureau of Land

Management to evaluate the success of the translocation effort and the efficacy of the bullfrog exclusion fence design.

12. AUTHOR: JONES, LARRY (presenter), ELISA BACA, and GARY PAYNE.

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PRESENTATION: Oral

TOPIC: Educational Programs

Sabino Canyon Guided Lizard Walks for Urban Youths. Because of a growing awareness by public agencies of the Nature Deficit Disorder, the president enacted into law the “No Child Left Inside Act of 2009.” In response, the Chief of the Forest Service said the “More Kids in the Woods” program was one of her top three national priorities. We saw this as our beckoning to develop a new educational program for Sabino Canyon, a desert riparian area just outside of Tucson, Arizona. This area has 16 species of lizards, making it one of the most species-rich venues in the United States, and its lacertilian denizens are very approachable, having acclimated to the 1.75 million visitors per year. The USDA Forest Service, Sabino Canyon Volunteer Naturalists, and Tucson Parks and Recreation formed an alliance and brought a Guided Lizard Walk program into fruition. One day per week during the spring and summer, we lead three groups of eight children into Sabino Canyon to look for lizards. We saw 14 of the 16 species and each group averaged 42 lizard sightings per walk (usually 1-1.5 h). The program was wildly successful and will continue as a standard NatureWatch program in the future.

13. AUTHORS: PHILLIP ROSEN (presenter).

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PRESENTATION: Oral

Status of and Threats Facing Mud Turtles (*Kinosternon*) in Arid Southwestern North America

Mud turtles (*Kinosternon*, 13 taxa) dominate the unique chelonian fauna of 32 taxa in the desert and semiarid regions of the southwestern United States and central and northwestern Mexico. Local assemblages typically contain two *Kinosternon* species, one in ephemeral, summer rain pools, and one in largely perennial waters such as springs and streams. As in amphibians, the ephemeral water species appear to be persisting robustly, while the perennial water taxa may be declining significantly. The only known global extinction of a non-insular chelonian taxon, the Viesca Mud Turtle (*Kinosternon hirtipes megacephalum*) occurred in this regional fauna; a result of anthropogenic habitat desiccation. Desiccation produced by groundwater withdrawal and surface water diversion for agriculture appears to be the most widespread severe threat to aridlands *Kinosternon*. However, in Arizona there is evidence that non-native crayfish may be decimating populations of the perennial water-inhabiting Sonoran Mud Turtle, *K. sonoriense*. Generally, little attention has been paid to this unique and diverse (speciose) New World assemblage, and other unrecognized threats are likely in operation. Status survey for the group - especially the perennial water taxa in the *K. hirtipes* (Rough-footed Mud Turtle) complex, as well as several other, highly endemic species - should be recognized as a biodiversity conservation priority. These surveys are needed in context of a broad, marked threat facing the entire aquatic vertebrate fauna of this region.

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PRESENTATION: Oral

Integration of the Declining Sonoyta Mud Turtle into Modernization of Municipal Sonoyta, Sonoran, Mexico

The Sonoyta Mud Turtle, *Kinosternon sonoriense longifemorale*, is an endemic subspecies declining due to historic erosion and ongoing groundwater depletion in the isolated Rio Sonoyta oasis of arid southwestern Arizona and Northwestern Sonora. It persists in two sewage-maintained populations at Sonoyta, at isolated Quitovac Oasis nearby, at Quitobaquito Oasis in the United States at Organ Pipe Cactus National Monument (ORPI), and 2 km S of Quitobaquito in the last natural reach of Rio Sonoyta. The multi-agency, international Rio Sonoyta Conservation Team (RSCT) anticipated the trend of this decline, and is working with private groups, schools, conservation lands, and local government to preserve this turtle along with co-occurring, long-isolated native fishes. It would appear that

for this subspecies to persist, it must live in close association with human facilities and communities. Recognizing this, the federal agency SEMARNAT (Secretaría de Medio Ambiente Y Recursos Naturales) issued at legal finding in December 2008 requiring Sonoyta to provide for the turtle during much-needed modernization of its public health infrastructure. The RSCT is seeking means to enforce this finding while preserving the necessary progress in public health. Complex cultural and financial issues remain to be resolved by RSCT working with U.S. EPA and the Border Environmental Cooperation Commission.

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PRESENTATION: Poster

***Batrachochytrium dendrobatidis* in Amphibians of Utah's Central Region.** The amphibian chytrid fungus, *Batrachochytrium dendrobatidis*, has been implicated in amphibian declines and extinctions around the world. Annual monitoring of Boreal toads (*Bufo boreas*) and Columbia spotted frogs (*Rana luteiventris*) in Utah reveals a trend of decreasing population size and, in several cases, local extinction. Amphibian populations in the Central Region of Utah have been surveyed for the presence of the amphibian chytrid fungus since the pathogen was detected in the area in 2001. Boreal toad (n = 77), western chorus frog (*Psuedacris triseriata*) (n = 66), tiger salamander (*Ambystoma tigrinum*) (n = 84), Columbia spotted frog (n = 170), American bullfrog (*Rana catesbeiana*) (n = 2), and Woodhouse toad (*Bufo woodhousei*) (n = 2) were surveyed in Wasatch, Utah, Summit, San Pete, and Juab counties. Results from the 2007-2008 surveys showed disease presence along the Wasatch Front in wild populations of Boreal toad, tiger salamander, western chorus frog, and Columbia spotted frog. Surveys are ongoing in an effort to assess the threat of this pathogen to Utah's imperiled amphibians.

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PRESENTATION: Oral

Where species could be: statewide models of distribution for amphibians and reptiles of New Mexico. Because the statewide distribution of amphibians and reptiles in New Mexico is poorly known, we evaluated which of two computational methods could best predict herpetofaunal occurrences. Specimen-based locality records and remotely measured climatic, hydrologic, geologic, and vegetation data were combined to calculate landscape suitability for each species. We initially used the MaxEnt algorithm but validation of its predictions identified inconsistent results and we found it difficult to qualitatively assess which variables were most responsible for estimates of potential distribution. Using the same variables, we shifted to an approach based on principal component analyses (PCA). We compared both methods with new occurrences of 20 different species gathered throughout New Mexico. The PCA methodology allowed for simpler descriptions of suitability and it provided more consistent predictions across species. Predictions with MaxEnt were more variable between species and overall failed to correctly identify highly suitable areas. The PCA approach is useful at scales appropriate for design of statewide conservation efforts and at scales where land ownership and policy change. Maps generated with this methodology will help increase overall knowledge of New Mexico's herpetofauna and are helpful in the design of monitoring and inventory efforts.

17. AUTHOR(S): WESLEY M. ANDERSON (presenter), EMILY HENRY, GAD PERRY, and SANDRA RIDEOUT-HANZAK.

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PRESENTATION: Poster

Ecology of the Texas Horned Lizard in Central and Northern Texas. *Phrynosoma cornutum* is considered threatened in Texas and has declined over much of its range. Significant geographical variation suggests that local data may be essential for elucidating possible causes for the decline and determining evolutionary influences on life history. From 2007-2009, we monitored two populations of horned lizards on a Texas Army National Guard facility

near Brownwood and a private ranch near Mason, TX. Disregarding hatchlings, a total of 69 lizards were encountered and 22 were radio-tracked. Average snout-vent length (SVL) for the Brownwood population supports the existence of a latitudinal sex gradient, while the average SVL for the Mason population is significantly smaller than expected. Average SVL of identified females (80.5 mm, 75.6 mm) is significantly larger than that of males (72.33 mm, 64.2 mm) for the Brownwood and Mason populations, respectively. Growth rate is significantly correlated with SVL, with smaller lizards having much higher growth rates. Eggs were laid from mid May into the middle of July. Aspects of the ecology in these two populations are compared to a reference population studied from 2005-2008 in the Texas Panhandle. While various life history aspects of these populations are similar, densities at both sites in Central Texas appear much lower.

FIELD TRIPS (ON YOUR OWN)

Red Cliffs Desert Reserve

(Information from <http://www.redcliffsdesertreserve.com/>)

When you step over one of the Reserve's distinctive "step-over" gates, you are entering a special place, a place it is a privilege to visit. Not just another mountain bike trail, not just another horseback ride. You are entering a 62,000-acre scenic wildlife reserve set aside to protect the desert tortoise and other rare and sensitive plants and animals.



At the merging of three great ecosystems, the Mojave Desert, the Great Basin, and the Colorado Plateau, the reserve is biologically rich with an array of [animals](#) and [plants](#) rarely seen in one place. The Reserve contains the most northern populations of the Mojave Desert Tortoise, Gila monster, sidewinder rattlesnake, and chuckwalla – reptiles typically associated with hotter and more southerly deserts, like the Mojave. A significant portion of the shrubs in this area, such as blackbrush, are more commonly associated with the cooler Great Basin Desert. The conditions in the region are such that several endemic species, those which occur no where else in the world, are found here.

The Reserve was established in 1996 to protect a large, diverse, and functional expanse of habitat capable of sustaining wildlife populations threatened by rapid development and habitat loss across Washington County in southwestern Utah. Located immediately adjacent to several growing communities, the Reserve also protects the cities' scenic red rock backdrop and an increasingly popular area for recreation.

The Reserve spans across the north central portion of Washington County in southwest Utah. The Reserve is approximately 20 miles wide and 6 miles deep. The Reserve is northerly of Ivins, Santa Clara, St. George and Washington City, south of Leeds, and westerly of Hurricane and LaVerkin. The Reserve is trisected by Highway 18 in the west and I-15 in the east. There are many access points and trails for recreational opportunities within the Reserve.



<http://www.redcliffsdesertreserve.com/>

Snow Canyon State Park

(Information from <http://stateparks.utah.gov/parks/snow-canyon>)

Contrary to its name, winter visitors will rarely find any "white stuff" at this 7,400-acre desert park. Named after Lorenzo and Erastus Snow, early Utah leaders, Snow Canyon offers 16 miles of hiking trails, technical rock climbing, horseback riding, year-round camping, nature studies, wildlife viewing, and photographic opportunities galore. All of this is set against a stunning backdrop of towering sandstone cliffs in red and white, and peaks and valleys of jumbled black lava rock interspersed with serpentine sandy washes.

Park Hours:

Year-Round - 6 a.m. to 10 p.m.

Holiday Closures: None

Day Visits:

\$5 per vehicle (up to 8 people)

\$75 Annual Passes are available at the park



Directions:

From I-15 Northbound: Take exit 6 (Bluff Street). Head north on Bluff Street to the intersection with Snow Canyon Parkway. Take a left onto Snow Canyon Parkway and proceed approximately 3.5 miles and take a right onto Snow Canyon Drive. Follow this road to the south entrance of the park.

From I-15 Southbound: Take exit 10 (Washington). Turn right off the ramp and take an immediate left at the light. Follow this road for approximately 5 miles to the intersection with Bluff Street/ SR-18. Proceed through the light and continue on Snow Canyon Parkway for approximately 3.5 miles and take a right onto Snow Canyon Drive. Follow this road to the south entrance of the park.

Zion National Park

(Information from <http://www.nps.gov/Zion/index.htm>)

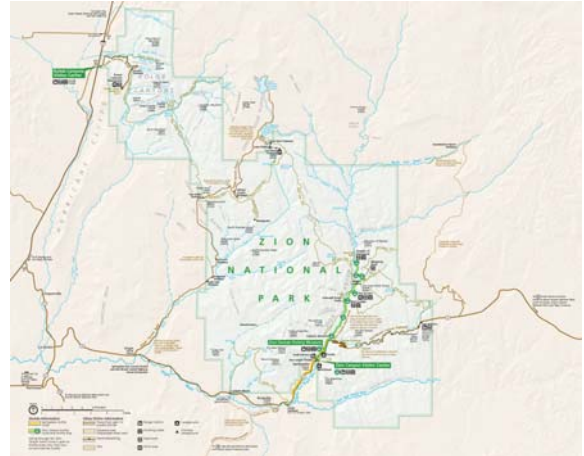
Utah's First National Park

Massive canyon walls ascend toward a brilliant blue sky. To experience Zion, you need to walk among the towering cliffs, or challenge your courage in a small narrow canyon. These unique sandstone cliffs range in color from cream, to pink, to red. They could be described as sand castles crowning desert canyons.

Getting To Zion National Park

Car/Motorcycle:

I-15 passes west of the Park and connects with UT-9 and 17 to the Park. US-89 passes east and connects with UT-9 to the Park. The Zion Canyon Visitor Center is a short distance from the Park's South Entrance adjacent to Springdale. The Visitor Center at the Kolob Canyons entrance is accessible from I-15, exit 40.



RV/Coaches/Trailers/All Large Vehicles:

Drivers of large vehicles approaching Zion National Park from the east on UT-9 need to be aware of the large vehicle size restrictions.

Vehicles sized 7'10" in width or 11'4" in height, or larger, are required to have an "escort" (traffic control) through the Zion-Mt. Carmel Tunnel. Vehicles this size are too large to stay in their lane while traveling through the tunnel. Nearly all RV's, buses, trailers, 5th wheels, and some camper shells will require an escort.

(Note: It is possible to visit Zion with a large vehicle without going through the Zion-Mt. Carmel Tunnel. To do this enter and exit through the south entrance of the park, near Springdale).