

**FORTY-SECOND ANNUAL MEETING AND SYMPOSIUM OF THE
DESERT TORTOISE COUNCIL**

**Sam's Town Hotel and Gambling Hall, Las Vegas, Nevada
February 24–26, 2017**

**Speaker order: First person listed is the speaker, unless an asterisk indicates another author
NOTE: Time is specific to each speaker*

THURSDAY EVENING, FEBRUARY 23, 2017

7:00–9:00 p.m. Mixer, Sponsored by SNEI, Las Vegas—RED ROCK ROOM

FRIDAY MORNING, FEBRUARY 24, 2017

8:00–8:45 a.m. Annual Business Meeting – VIRGINIA CITY ROOM

8:00–9:30 a.m. Registration and Greetings – FOYER TO THE VIRGINIA CITY ROOM;
SEARCHLIGHT AND CARSON CITY ROOMS

8:00–11:30 a.m. Coffee, Tea, and Water — CARSON CITY/SEARCHLIGHT ROOM

OPENING SESSION–VIRGINIA CITY ROOM

9:30 a.m. **Welcome to Members and Guests**
*Bruce Palmer: Chairperson, Desert Tortoise Council Board of Directors;
Jacobs Engineering Group, Inc., Phoenix, AZ*

9:45 a.m. **Announcements and Introductions**
*Meeting Chairs: Al Muth¹ and Bruce Palmer^{2,3}: ¹Director, Boyd Deep Canyon
Desert Research Center; ²Jacobs Engineering Group, Inc., Phoenix, AZ;
³Member, Desert Tortoise Council Board of Directors*

Session 1. Plenary Addresses: Winners of the Kristin H. Berry Annual Award and the Robert C. Stebbins
Research Award

Chair: Bruce Palmer, Jacobs Engineering Group, Inc., and Desert Tortoise Council Board of
Directors

Kristin H. Berry Annual Award Winner: Ann M. McLuckie

9:55 a.m. **25 Years of Desert Tortoise Recovery: The Challenges of Managing a
Tortoise Population at an Urban Interface**
Ann McLuckie: Utah Division of Wildlife Resources, Hurricane, UT

Robert C. Stebbins Research Award: Scott Abella

10:40 a.m. **Restoring and Conserving Nutritionally Rich Diets for Desert Tortoises**
Scott R. Abella: University of Nevada, Las Vegas

Session 2. The Fossil Record and Evolution of Desert Tortoises

Chair: Michael Tuma, U.S. Geological Survey, Riverside

- 11:10 a.m. **Burrowing and How it Shaped Gopher Tortoise Evolution:
Evidence from the Fossil Record and Beyond**
*D. M. Bramble¹ and J. H. Hutchison²: ¹University of Utah and ²University of
California, Berkeley*
- 11:35 a.m. **Ecological Constraints Imposed by Burrowing Behaviors Drove the
Evolution of Divergent Sexual Size Dimorphism in the North American
Gopherus Tortoises**
Michael W. Tuma: University of Southern California, Los Angeles
- 11:50 a.m. PANEL DISCUSSION
- 12:00 p.m. LUNCH

FRIDAY AFTERNOON, FEBRUARY 24, 2017—VIRGINIA CITY ROOM

Session 3. Recovery Actions by Federal and State Agencies and Non-profit Organizations: Past and
Future

Chair: Rebecca Jones, California Department of Fish and Wildlife

- 1:30 p.m. **U.S. Fish and Wildlife Service Update on the Desert Tortoise Recovery
Activities**
Roy C. Averill-Murray: U.S. Fish and Wildlife Service, Reno, NV
- 1:40 p.m. **California BLM: Tortoise Update**
Amy Fesnock: Bureau of Land Management, Sacramento, CA
- 1:50 p.m. **Clark County Multiple Species Habitat Conservation Plan Update**
Scott Cambrin: Clark County Desert Conservation Program, Las Vegas, NV
- 2:00 p.m. **Desert Tortoise Management and Research in Joshua Tree National Park**
Michael Vamstad: Joshua Tree National Park, CA
- 2:10 p.m. **Recovery Progress at Mojave National Preserve**
*Troy Maikis, Neal Darby, Debra Hughson, Danette Woo, and Todd Sues:
Mojave National Preserve, CA*
- 2:20 p.m. **Department of Fish and Wildlife and the Desert Tortoise, Our State Reptile**
*Rebecca Jones: California Department of Fish and Wildlife, Inland Deserts
Region, Ontario*
- 2:40 p.m. **Quadstate Local Governments Authority**
Bill Lamb

2:50 p.m. PANEL DISCUSSION

3:10 p.m. REFRESHMENT BREAK — CARSON CITY/SEARCHLIGHT ROOM

Session 4. Research on Morafka’s (Sonoran) Desert Tortoise: Collaborative Approaches to Monitoring Population Trends, Identifying and Ameliorating Threats, and Mapping the Genome of Sonoran Desert Tortoises

Chair: Cristina A. Jones, Arizona Game and Fish Department, Phoenix

3:30 p.m. **Informing Landscape Approaches and Species-Level Conservation Needs: Quantifying Potential Threats from Development to Sonoran Desert Tortoise Habitat to Evaluate and Inform Conservation Actions**
Sarah K. Carter¹, Ian Leinwand², Natasha B. Carr¹, Todd Esque³, Ken Nussear⁴, Elroy Masters⁵, and Richard D. Inman^{3,6}: ¹U.S. Geological Survey, Fort Collins, CO; ²Cherokee Services Group, Inc.; ³U.S. Geological Survey, Las Vegas, NV; ⁴University of Nevada, Reno; ⁵Bureau of Land Management, AZ; ⁶Arizona State University

3:45 p.m. **Progress Towards a Sonoran Desert Tortoise Genome to Advance Conservation and Wildlife Management**
Greer A. Dolby, Dale F. DeNardo, Kenro Kusumi*: Arizona State University, Tempe*

4:05 p.m. **Return to the Harquahala Mountains and Hualapai Foothills Sonoran Desert Tortoise Demographic Plots**
Chad A. Rubke¹, Daniel J. Leavitt¹, Woodrow L. Crumbo¹, Cristina A. Jones¹, and Timothy Hughes²: ¹Arizona Game and Fish Department, Phoenix; ²Bureau of Land Management, Phoenix, AZ

4:20 p.m. **Sonoran Desert Tortoises and Arizona Highways**
Scott C. Sprague, Daniel J. Leavitt, Chad A. Rubke, and Cristina A. Jones: Arizona Game and Fish Department, Phoenix

4:35 p.m. PANEL DISCUSSION

Session 5. Patterns in Anthropogenic Impacts to Habitat for Agassiz’s Desert Tortoises

Chair: Ken Nagy, Emeritus Professor, University of California, Los Angeles48

4:50 p.m. **Recurring Themes in Models of Anthropogenic Impacts to Agassiz’s Desert Tortoises**
Kristin H. Berry¹, Lisa Lyren², and Julie L. Yee³: U.S. Geological Survey, ¹Riverside, CA; ²Carlsbad, CA; and ³Dixon, CA

5:05 p.m. QUESTIONS

5:10 p.m. ADJOURN

FRIDAY EVENING, FEBRUARY 24, 2017 — RED ROCK ROOM

6:00 to 9:00 p.m. MIXER AND BUFFET DINNER

BOOK-SIGNING and SIGNED BOOKS: Jim Rorabaugh will sign his new book with Julio A. Lemos-Espinal, *A Field Guide to the Amphibians and Reptiles of Sonora, Mexico* (2016). Also available will be signed books on wildflowers by Pam Mackay and Tim Thomas, (field guides to *Mojave Desert Wildflowers* and *Southern California Mountain Wildflowers*)

7:30 p.m. POSTER SESSION

POSTERS: available on Friday evening in the RED ROCK ROOM, at which time authors will be present at their posters from 7:30 to 9:00 p.m. POSTERS will be available for viewing all day Friday and Saturday, as well as Sunday morning in the CARSON CITY/SEARCHLIGHT ROOM.

Best Management Practices for California Sensitive Reptile and Amphibian Highway Crossings

Cheryl S. Brehme¹, Robert N Fisher¹, Anthony P. Clevenger², and Tom E.S. Langton³: ¹U. S. Geological Survey, San Diego, CA; ²Western Transport Institute, Montana State University; and ³Herpetofauna C I Ltd., Suffolk, United Kingdom

A New Species of *Xerobates* from the Early Pleistocene of Sonora, Mexico: Implications for the Pleistocene Biogeography of Gopher Tortoises

J. H. Hutchison¹ and D. M. Bramble²: ¹University of California, Berkeley, and ²University of Utah, Salt Lake City

SATURDAY MORNING, FEBRUARY 25, 2017

6:30 to 7:45 a.m. BREAKFAST BUFFET — RED ROCK ROOM

SATURDAY MORNING SESSION — VIRGINIA CITY ROOM

Session 6. Mule and White-tailed Deer in Deserts: Science and Conservation Challenges

Introduction of the Chair, Vernon Bleich, University of Nevada, Reno, by Glenn R. Stewart, Emeritus Professor, California State Polytechnic University, Pomona

8:00 a.m. **Introduction**
Vernon C. Bleich: University of Nevada, Reno

8:05 a.m. **White-tailed and Mule Deer in the Arid Southwest: Taxonomy and Niche**
James R. Heffelfinger: Arizona Game and Fish Department, Phoenix

8:25 a.m. **Managing Deer Habitat on a Changing Biological, Regulatory, and Social Landscape: the Arid Southwest**
Steven S. Rosenstock: Arizona Game and Fish Department, Phoenix

8:45 a.m. **Bucks and Does and Jacks and Jennies: Mule Deer and Donkeys in the Sonoran Desert**
Vernon C. Bleich: University of Nevada Reno

- 9:05 a.m. **Coping with Water and Heat Stress: Behavioral and Physiological Adaptations of Desert Ungulates**
James W. Cain III: U.S. Geological Survey and New Mexico State University, Las Cruces
- 9:25 a.m. **Nutritional Ecology of Deer in Arid Lands**
David G. Hewitt: Texas A&M University-Kingsville, Kingsville
- 9:45 a.m. **Sexual Segregation and its Implications for Deer Inhabiting Arid Environments**
R. Terry Bowyer: University of Alaska Fairbanks
- 10:05 a.m. REFRESHMENTS — CARSON CITY AND SEARCHLIGHT ROOMS
- 10:20 a.m. PANEL DISCUSSION
- 10:35 a.m. **Density Dependence in Life Histories and Population Dynamics of Large Mammals: Examples from Mule Deer and White-Tailed Deer**
Kelley M. Stewart: University of Nevada, Reno
- 10:55 a.m. **Predators and Their Influence on Mule Deer in Arid Environments**
Justin M. Shannon: Utah Division of Wildlife Resources, Salt Lake City
- 11:15 a.m. **Monitoring Populations of Mule and White-tailed Deer: Implications for Harvest**
Brian F. Wakeling: Nevada Department of Wildlife, Reno
- 11:35 a.m. **Antlers of Southwestern Ungulates: A Hornographic Obsession or a Valued Ecological Indicator?**
Kevin L. Monteith: Wyoming Cooperative Fish and University of Wyoming, Laramie
- 11:55 a.m. LUNCH

SATURDAY AFTERNOON, FEBRUARY 25, 2017

Session 6, continued. Mule and White-tailed Deer in Deserts: Science and Conservation Challenges

Chair: Vernon Bleich, University of Nevada, Reno,

- 1:30 p.m. **Exploring Desert Deer Ecology through Ecoimmunology**
Cynthia J. Downs: Hamilton College, Clinton, NY
- 1:50 p.m. **Desert Mule Deer Conservation: Moving from Wildlife Disease to Health**
Peregrine L. Wolff: Nevada Department of Wildlife, Reno
- 2:10 p.m. PANEL DISCUSSION

Session 7: Health and Disease of Desert Tortoises and Associated Management Issues

Chair: Jerry Simecka, Department of Molecular Biology and Immunology, University of North Texas, Health Science Center, Ft. Worth, TX

- 2:30 p.m. **Broad Host Range of *Mycoplasma agassizii*: Exposure and Infection in Chelonian Species** (Student Paper)
Alexandra M. Burne, Lori D. Wendland, Daniel R. Brown, Paul A. Klein, and Mary B. Brown: University of Florida, Gainesville
- 2:45 p.m. **Transcript Profiling Improves Assessment of Health and Immune Function in the Agassiz's Desert Tortoise**
Kristina Drake^{1,2,3}, Elizabeth Bowen¹, Christina Aiello^{1,5}, Todd Esque¹, Kenneth Nussear⁴, A. Keith Miles^{1,2}, Rebecca Lewison³, and Peter Hudson⁴: ¹U. S. Geological Survey, CA; ²University of California-Davis; ³San Diego State University; ⁴University of Nevada-Reno; and ⁵Pennsylvania State University
- 3:00 p.m. REFRESHMENTS — CARSON CITY/SEARCHLIGHT ROOM
- 3:20 p.m. **Novel *Anaplasma* Species in the Environmentally Threatened Florida Gopher Tortoise**
Mary B. Brown¹, Francly L. Crosby¹, Liliet Peltierra¹, Amy L. Weeden², James F.X. Wellehan¹, Anna M. Lundgren¹ and Anthony F. Barbet¹: ¹College of Veterinary Medicine, University of Florida; and ²Gribbles Veterinary, Auckland, New Zealand
- 3:35 p.m. PANEL DISCUSSION

Session 8. Research and Conservation on Behalf of the Bolson and Thornscrub Tortoises

Chair: Robert Murphy, Royal Ontario Museum, Toronto, Canada

- 3:50 p.m. **Bolson Tortoise Burrows and their Role as Refuges for Vertebrates at the Biosphere Reserve of Mapimi** (Student Paper)
Sara Isabel Valenzuela Ceballos¹ and Gamaliel Castañeda Gaytán²: ¹Autonomous University of Hidalgo State, Carretera Pachuca-Tulancingo Hidalgo, MX; and ²Juarez University of the State of Durango, Durango, MX
- 4:05 p.m. **Genetic Diversity and Conservation of the Bolson tortoise, *Gopherus flavomarginatus*** (Student Paper)
Sara Isabel Valenzuela Ceballos¹, Norma L. Manríquez Morán¹, Gamaliel Castañeda Gaytán³: ¹Autonomous University of Hidalgo State, Carretera Pachuca-Tulancingo, Hidalgo, MX; and ²Juarez University of the State of Durango, Durango, MX
- 4:20 p.m. **From Grassroots to Solid Gold – A Conservation Success Story**
Alice E. Karl¹, Mercy Vaughn², Jennifer MacKay³, Lycia Lozana³, Philip Rosen⁴, Cristina Melendez Torres⁵, Martin Gabriel Figueroa⁶, Taylor Edwards⁴, Eric V. Goode⁷, and Robert W. Murphy⁸: ¹ Davis, CA; ²Paso Robles, CA; ³NCI, Alamos, Sonora, MX; ⁴University of Arizona, Tucson; ⁵Comision de Ecologia y Desarrollo Sustentable del Estado de Sonora, Sonora, MX; ⁶Alamos, MX; ⁷Turtle Conservancy, New York, NY; ⁸Royal Ontario Museum, Toronto, Canada

4:40 p.m. PANEL DISCUSSION

4:55 p.m. ADJOURN

SATURDAY EVENING, FEBRUARY 25, 2017—SAM'S TOWN LIVE

5:00 p.m. MIXER: Meet and Greet Winners of the *Kristin H. Berry Annual Award*, Ann McLuckie; *Robert C. Stebbins Research Award*, Scott Abella; and *Honored Guest*, Eric Goode

BOOK-SIGNING and SIGNED BOOKS: Jim Rorabaugh will sign his new book with Julio A. Lemos-Espinal, *A Field Guide to the Amphibians and Reptiles of Sonora, Mexico* (2016). Also available will be signed books on wildflowers by Pam Mackay and Tim Thomas, (field guides to *Mojave Desert Wildflowers* and *Southern California Mountain Wildflowers*)

6:00 p.m. DINNER

7:00 p.m. PHOTO CONTEST AND AWARDS

7:40 p.m. BANQUET ADDRESS: **A Great Conservation Success for the Endangered Bolson Tortoise!**
Eric Goode: The Turtle Conservancy, New York

8:00 p.m. AUCTION AND RAFFLE

SUNDAY MORNING, FEBRUARY 26, 2017

6:30 to 7:45 a.m. BREAKFAST — RED ROCK ROOM

SUNDAY MORNING SESSIONS — VIRGINIA CITY ROOM

Session 9. Conservation Efforts on Behalf of Desert Tortoises and Other Tortoises in the Genus *Gopherus*

Chair: Jeff Aardahl, Defenders of Wildlife, Sacramento, CA

8:00 a.m. **A Framework for Restoration to Support Desert Tortoise Recovery in the Western Mojave** (Student Paper)
Dannique Albu, Erik Martinez, Amber Reedy, and Devin Rothman: Bren School of Environmental Science and Management, University of California, Santa Barbara

8:15 a.m. **The Role and Implications of Expanding Boundaries at the Desert Tortoise Research Natural Area**
Jillian Estrada: Desert Tortoise Preserve Committee, Inc., Riverside, CA

8:30 a.m. **Desert Tortoise: Conserve, Protect, Recover**
Ileene Anderson¹, Lisa Belenky², and Jenny Loda²: Center for Biological Diversity, ¹Los Angeles, and ²Oakland, CA

8:45 a.m. PANEL DISCUSSION

Session 10. Renewable Energy Development: Mitigation Measures and the Effectiveness for Recovering Desert Tortoises

Chair: Amy Fesnock, Bureau of Land Management, Sacramento

9:00 a.m. **50 Years of Conservation Planning in the California Desert: A History of the California Desert Conservation Area**
Mark Massar: Bureau of Land Management, California Desert District, Moreno Valley, CA

9:15 a.m. **From Density Estimates to Translocation: Lessons from 8,500 Acres of Solar Development in the Mojave Desert**
Chris Blandford and Danna Hinderle: Ironwood Consulting, San Bernardino, CA

9:30 a.m. **Adaptive Management Lessons Learned at Ivanpah Solar Electric Generating Systems (ISEGS)**
Doug Davis¹ and Amanda Scheib²: ¹NRG Energy and ²Scheib Biological LLC

9:45 a.m. **Process- and Scale-based Determinants of Survival for Translocated Mojave Desert Tortoises in the Ivanpah Valley, California.**
Brett Dickson¹, Rick Scherer¹, Miranda Gray¹, Amanda Scheib², Bruce Weise³, Arriana Brand¹, Giancarlo Sadoti⁴, and Brian Cohn⁵: ¹Conservation Science Partners; ²Scheib Biological LLC, Henderson, NV; ³Southwestern Ecological Research Co., Tucson, AZ; ⁴gsadpto@syredu; and ⁵Upwelling, Ojai, CA

10:00 a.m. BREAK — CARSON CITY/SEARCHLIGHT ROOM

10:30 a.m. **Connectivity of Desert Tortoise Populations Bridging Man-made and Natural Constrictions in Habitat**
Kenneth Nussear^{1,2}, Todd Esque³, Amy Vandergast³, Kirsten Dutcher¹, Kristina Drake³, Anna Mitelber³, and Jill Heaton²: ¹Southwest Ecology LLC; ²University of Nevada, Reno; ³U.S. Geological Survey Western Ecological Research Center

10:45 a.m. **Providing Context for the Benefits of Roadside Mitigation Fencing in Recovering and Protecting Desert Tortoise Populations**
Brian D. Todd¹; J. Mark Peadar¹; A. Justin Nowakowski¹; Tracey D. Tuberville²; and Kurt A. Buhlmann²: ¹University of California, Davis; and ²Savannah River Ecology Lab, University of Georgia, Aiken, SC

11:00 a.m. **How to Navigate Difficult Situations on Projects**
Kathryn Simon: Ironwood Consulting, Inc., Redlands, CA

11:15 a.m. PANEL DISCUSSION

11:45 a.m. LUNCH

1:00 p.m. Announcement of Student Award
Glenn R. Stewart. Emeritus Professor, California State Polytechnic University, Pomona, and Michael W. Tuma, U.S. Geological Survey, Riverside

Session 11: Efforts to Combat Hyper-predation of the Common Raven on Agassiz's Desert Tortoises

Chair: Mari Quillman, ECORP Consulting, Inc., and Desert Tortoise Council Board of Directors

- 1:15 p.m. **Raven Management in California**
Brian Croft: U.S. Fish and Wildlife Service, Palm Springs, CA
- 1:30 p.m. **Coalition for a Balanced Environment**
Lawrence F. LaPré: Riverside, CA
- 1:45 p.m. **Lasers and 3D Printing as Raven Management Tools: A Hardshell Labs
Progress Report**
Tim Shields and William I. Boarman: Hardshell Labs, Inc., Haines, AK
- 2:00 p.m. PANEL DISCUSSION
- 2:30 p.m. MEETING ADJOURNS

VENDORS AND EXHIBITS—ALAMO/GOLDFIELD ROOMS

Nonprofit Organizations

Basin and Range Watch. *Laura Cunningham, P.O. Box 70, Beatty, NV 89003.
Phone: (775) 553-2806. Email: bluerockiguana@hughes.net*

Center for Biological Diversity. *Ileene Anderson, 8033 Sunset Blvd., #447, Los Angeles, CA 90046. Phone: (323) 654-5943
Website: <http://www.biologicaldiversity.org>. Email: ianderson@biologicaldiversity.org*

Desert Tortoise Council. *4654 East Avenue S, #257, Palmdale, CA 93552
Website: <http://www.deserttortoise.org>
Biology and Conservation of North American Tortoises, as well as other books will be on sale at discounted prices; all proceeds will go to the Desert Tortoise Council.*

Desert Tortoise Preserve Committee, Inc. *Jillian Estrada, 4067 Mission Inn Avenue, Riverside, CA 92501. Phone: (955) 683-3872; Fax: (951) 683-6949
Website: <http://www.tortoise-tracks.org>. E-mail: dtpc@pacbell.net*

Tortoise Group. *Kobbe Shaw. PO Box 33866, Las Vegas, NV 89133; Phone: (702) 739-7113
Website: <http://www.tortoisegroup.org>. E-mail: kobbeshaw@tortoisegroup.org*

Art, Books, Drawings, Sculptures, Jewelry, and Other Products

Monster in My Garden. *Donald Fisher, 542 Calumet Avenue, Beaumont, CA 92223;
Phone: (909) 214-2090. Email: dfish902@verizon.net*

Buffalo Rose. *Florence Gardipee, 6576 Moonshadow Circle, Las Vegas, NV 89108. Phone: (406) 396-3708. Email: flogardipee@gmail.com*

Hector Sanchez. *P.O. Box 438, Weldon, CA 93283. Phone: (760) 378-3814
Email: hsanchez1166@yahoo.com. Website: 3-hector-sanchez@pixels.com*

Field and Laboratory Equipment

Hardshell Labs. *Tim Shields.
Phone: (909) 556-4264
Website: <http://www.HardshellLabs.com>. Email: t.shields@hardshelllabs.com*

Holohil Systems Ltd. *Fred W. Anderka and John Edwards. 112 John Cavanaugh Drive, Carp, Ontario, Canada K0A 1L0. Phone: (613)859-5036. Email: fred@holohil.com or info@holohil.com; Website: <http://www.holohil.com>.*