



PROGRAM

43rd Annual Meeting and Symposium
Sam's Town Hotel and Gambling Hall, Las Vegas, NV
February 23–25, 2018

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Kristin H. Berry

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

**Sam's Town Hotel and Gambling Hall, Las Vegas, Nevada
February 23–25, 2018**

**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, 2018

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

FRIDAY MORNING, FEBRUARY 23, 2018

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

8:00 a.m.–5:00 p.m. Registration and Greetings – FOYER TO THE VIRGINIA CITY ROOM;
SEARCHLIGHT AND CARSON CITY ROOMS

8:00 a.m.–5:00 p.m. Coffee, Tea, and Water—CARSON CITY/SEARCHLIGHT ROOM

OPENING SESSION—VIRGINIA CITY ROOM

9:30 a.m. **Welcome to Members and Guests; Announcements and Introductions**
Meeting Chairs: *Al Muth¹ and Bruce Palmer^{2,3}: ¹Director Emeritus, Boyd Deep
Canyon Desert Research Center, UCNRS; ²Jacobs Engineering Group, Inc.,
Phoenix, AZ; ³Member, Board of Directors, Desert Tortoise Council*

9:35 a.m. **Desert Tortoise Council Activities—2017**
*Bruce Palmer: Chairperson, Desert Tortoise Council Board of Directors;
Jacobs Engineering Group, Inc., Phoenix, AZ*

Session 1. Plenary Address: Winner of the Robert C. Stebbins Research Award

Chair: Kristin H. Berry—U.S. Geological Survey, CA

9:50 a.m. Winners, ROBERT C. STEBBINS RESEARCH AWARD:

**No Paternal Genetic Integration in Agassiz Desert Tortoises Following
Translocation into an Existing Population**

*Kevin P. Mulder¹, Andrew D. Walde², William I. Boarman³, A. Peter Woodman⁴,
Emily Latch^{1,5}, and Robert C. Fleischer^{1*}: ¹Smithsonian Conservation Biology
Institute, Natl. Zoological Park, Washington, DC; ²Walde Research and
Environmental Consulting, CA; ³Conservation Science Research and
Consultation; ⁴Kiva Biological Consulting, CA; ⁵University of Wisconsin*

Session 2. Research Findings from Translocation Studies of Desert Tortoises

Chair: Bryan Wallace—Conservation Science Partners, Truckee, CA

- 10:20 a.m. **Inferences and Lessons Learned from Comprehensive Monitoring of Tortoise Translocations in the Ivanpah Valley**
Bryan P. Wallace¹, Brett G. Dickson¹, Rick Scherer¹, Miranda Gray¹, Amanda Kissel¹, Brian Cohn², Amanda Scheib³, and Bruce Weise⁴: ¹Conservation Science Partners, CA; ²cohnmail@gmail.com; ³Scheib Biological LLC NV; ⁴Southwestern Ecological Research Company, AZ
- 10:35 a.m. **Estimates of High and Invariant Survival for Translocated Tortoises in the Ivanpah Valley**
Brett Dickson¹, Rick Scherer¹, Amanda Kissel¹, Bryan Wallace¹, Miranda Gray¹, Amanda Scheib², and Bruce Weise³: ¹Conservation Science Partners, CA; ²Scheib Biological LLC, NV; ³Southwestern Ecological Research Co., AZ
- 10:50 a.m. **The 2017 Tortoise Translocation by the Marine Corps Air Ground Combat Center**
Brian T. Henen: Marine Air Ground Task Force Training Command and Marine Corps Air Ground Combat Center, Twentynine Palms, CA
- 11:05 a.m. **Invasive Plants and Habitat Selection Influence the Success of Translocated Juvenile Desert Tortoises**
Kristina Drake¹, Todd Esque¹, Melia Nafus^{2,3}, Roy Averill-Murray⁴, Kenneth Nussear⁵, and Ronald Swaisgood²: ¹U.S. Geological Survey, NV; ²San Diego Zoo Global, CA; ³U. S. Geological Survey, CO; ⁴U.S. Fish and Wildlife Service, NV; and ⁵University of Nevada-Reno
- 11:20 a.m. **Are Females Smellier than Males: Survival and Predation in Translocated Juvenile Desert Tortoises**
Derek B. Hall¹, Bruce A. Kimball², Jeanette A. Perry¹, Jennifer M. Germano³: ¹Mission Support and Test Services, NV; ²USDA National Wildlife Research Center, PA; and ³New Zealand Department of Conservation
- 11:35 a.m. **Coyote Cues Elicit Behavioral Responses in the Desert Tortoise**
Melia G. Nafus¹, Jennifer M. Germano², and Ronald R. Swaisgood³: ¹U.S. Geological Survey, CO; ²New Zealand Department of Conservation, NZ; and ³San Diego Zoo Global, CA
- 11:50 a.m. PANEL DISCUSSION
- 12:10 p.m. LUNCH

FRIDAY AFTERNOON, FEBRUARY 23, 2018—VIRGINIA CITY ROOM

Session 3. Recovery Actions by Federal and State Agencies: Recent and Future

Chair: Rebecca Jones—California Department of Fish and Wildlife; Member, Board of Directors, Desert Tortoise Council

- 1:30 p.m. **Guidelines for Translocations of Mojave Desert Tortoises (*Gopherus agassizii*)**
Kimberleigh J. Field and Roy C. Averill-Murray: U.S. Fish and Wildlife Service, Reno, NV
- 1:45 p.m. **Population Augmentation as a Recovery Strategy for the Mojave Desert Tortoise**
Roy Averill-Murray and Kimberleigh Field: U.S. Fish and Wildlife Service, Reno, NV
- 2:00 p.m. **U.S. Fish and Wildlife Service Update on the Desert Tortoise Recovery Activities**
Linda Allison: U. S. Fish and Wildlife Service, Reno, NV
- 2: 10 p.m. **California BLM: Update on Tortoise Management Actions**
Amy L. Fesnock: Bureau of Land Management, Sacramento, CA
- 2:20 p.m. **Tortoise Abundance on SITLA and BLM Lands West of St. George, Utah**
Mike Schijf and Cameron Rognan: Washington County HCP, UT
- 2:35 p.m. **Desert Tortoise Management and Research in Joshua Tree National Park**
Michael Vamstad: Joshua Tree National Park, CA
- 2:45 p.m. **Clark County Multiple Species Habitat Conservation Plan Update**
Scott Cambrin: Clark County Desert Conservation Program, NV
- 2:55 p.m. REFRESHMENTS — CARSON CITY/SEARCHLIGHT ROOM
- 3:20 p.m. **2017/2018 Desert Tortoise Recovery Implementation Teams and Management Oversight Group Update: Priorities and Progress**
Florence M. Gardipee: U.S. Fish and Wildlife Service, Las Vegas, NV
- 3:30 p.m. **Quadstate Local Governments Authority, a Coalition of Local Governments Engaged in Land Management in the Mojave and Sonoran Deserts**
Gerry Hillier, Quadstate Local Governments Authority, CA
- 3:40 p.m. PANEL DISCUSSION

Session 4. Non-Profit Organizations: Efforts to Recover Desert Tortoises and Their Habitats

Chair: Greer Dolby—Postdoctoral Research Associate, Arizona State University; and Member, Board of Directors, Desert Tortoise Council

- 4:00 p.m. **Winner of the KRISTIN H. BERRY ANNUAL AWARD: *Changing Landscapes, Perpetual Protection: A 30 Year Retrospective on Land Acquisition***
Jun Y. Lee, Esq., Director of Land Acquisition, Desert Tortoise Preserve Committee, Inc.
- 4:15 p.m. **Desert Tortoise: Still Protected but Still Declining...**
Ileene Anderson and Patrick Donnelly: Center for Biological Diversity, CA and NV
- 4:35 p.m. **Fences Actually Work, We Have Proof**
Jillian Estrada: Desert Tortoise Preserve Committee, Inc., CA
- 4:50 p.m. **Doing More with Less: NGO Partnerships and the Preservation of Desert Tortoises**
Kobbe Shaw: Tortoise Group, NV
- 5:05 p.m. PANEL DISCUSSION
- 5:20 p.m. ADJOURN

FRIDAY EVENING, FEBRUARY 23, 2018 HAWTHORNE ROOM

6:00 to 9:00 p.m. MIXER AND BUFFET DINNER. Meet and Greet Award Winners

Robert C. Stebbins Research Award: *Kevin P. Mulder, Andrew D. Walde, William I. Boarman, A. Peter Woodman, Emily Latch, and Robert C. Fleischer*

Kristin H. Berry Annual Award: *Jun Y. Lee*

7:30 p.m. POSTER SESSION

POSTERS: Available on Friday evening in the HAWTHORNE 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 in the CARSON CITY/SEARCHLIGHT ROOM.

Biodiversity of Amphibians and Reptiles at the Camp Cady Wildlife Area, Mojave Desert, California

Kristy L. Cummings¹, Shellie R. Puffer¹, Jeffrey E. Lovich², and Kathie Meyer-Wilkins²:

¹U.S. Geological Survey, Flagstaff, AZ and ²Apple Valley, CA

Modeling as a Tool to Guide Head-Starting, Translocation and Monitoring Decisions for the Mojave Desert Tortoise

Kristen McCarty, Elizabeth A. Hunter, Margarete Walden, and Kevin T. Shoemaker: University of Nevada, Reno, NV

SATURDAY MORNING, FEBRUARY 24, 2018

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

SATURDAY MORNING SESSION — VIRGINIA CITY ROOM

Session 5. At Risk Species Occurring in Desert Tortoise Habitats

Chair: Ed LaRue—Circle Mountain Biological Consultants; Member, Board of Directors, Desert Tortoise Council

- 8:00 a.m. **Introduction**
Ed LaRue, Desert Tortoise Council
- 8:05 a.m. **When it Comes to Surviving in the Desert, Gila Monsters Ignore the Lizard Playbook: Delayed Hatching Emergence as Another Non-lizard Survival Strategy**
Dale F. DeNardo¹, Karla T. Moeller¹, Mark Seward², and Roger Repp³: ¹Arizona State University; ²Colorado Springs, CO; and ³National Optical Astronomy Observatory, AZ
- 8:35 a.m. **Status and Migratory Behavior of the Western Burrowing Owl: Parallels between Burrowing Owls and Desert Tortoises**
Courtney J. Conway: U.S. Geological Survey and University of Idaho
- 9:05 a.m. **Bird Population change in the United States Range of the Desert Tortoise: Results from the North American Breeding Bird Survey, 1968-2015**
John R. Sauer, William A. Link, and Daniel K. Niven: U.S. Geological Survey, Patuxent Wildlife Research Center, MD
- 9:35 a.m. **Current Status of the Mohave Ground Squirrel**
Phil Leitner: Endangered Species Recovery Program, California State University, Stanislaus
- 10:05 a.m. REFRESHMENTS — CARSON CITY AND SEARCHLIGHT ROOMS
- 10:35 a.m. **Potential Impacts of Off-Highway Vehicle Use to Wildlife in the Southwest: Kit Foxes as a Case Study**
Andrew S. Jones: Arizona Game and Fish Department, Phoenix
- 11:05 a.m. PANEL DISCUSSION

Session 6. Drought and Fire Effects on a Southern California Population of Pond Turtles

Chair: Ken MacDonald—NewFields, NV; Member, Board of Directors, Desert Tortoise Council

- 11:30 a.m. **The Effects of Drought and Fire in the Extirpation of an Abundant Semi-aquatic Turtle from a Lacustrine Environment in the Southwestern USA**
Jeffrey E. Lovich¹, Mari Quillman², Brian Zitt², Adam Schroeder², Charles Yackulic¹, David Green³ and Paul Gibbons⁴: ¹U.S. Geological Survey, Flagstaff; ²ECORP Consulting, Inc., CA; ³U.S. Geological Survey, Natl. Wildlife Health Center; ⁴Turtle Conservancy, New York

11:45 a.m. LUNCH

SATURDAY AFTERNOON, FEBRUARY 24, 2018

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

- 1:30 p.m. **Ticks and Tick-borne Pathogens of Mojave Desert Tortoises (STUDENT PAPER)**
*Molly Bechtel¹, Todd Esque², Jeff Lovich³, Mike Teglas⁴, and Nate Nieto¹:
¹Northern Arizona University; ²U.S. Geological Survey, NV; ³U.S. Geological Survey, AZ; ⁴University of Nevada, Reno*
- 1:45 p.m. **Challenges of Virulence Testing in Reptilian Mycoplasmas: Validation of a Model System (STUDENT PAPER)**
Alexandra Burne: University of Florida, Gainesville
- 2:00 p.m. **Life History of *Mycoplasma agassizii*: Implications for Conservation of Desert Tortoise**
C. Richard Tracy¹, F.C. Sandmeier², C. L Weitzman¹, K.N. Maloney³, D. Hyde¹, R. Marlow¹, K.W. Hunter¹, S. DuPre¹, H. Mohammadpour¹: ¹University of Nevada, Reno; ²Colorado State University; ³Vanderbilt University Medical Center, TN
- 2:15 p.m. **Upper Respiratory Tract Disease Overview: Past, Present, and Future**
Mary B. Brown: University of Florida, Gainesville
- 2:35 p.m. PANEL DISCUSSION
- 2:50 p.m. REFRESHMENTS — CARSON CITY/SEARCHLIGHT ROOM

Session 8. The Importance and Power of Education and Teaching

Chair: Maggie Fusari—Member, Board of Directors, Desert Tortoise Council

- 3:15 p.m. **The Power of Collaboration: A Case Study of How to do More with Less**
*Chris Noddings: Cardno, and Desert Tortoise Council, Board of Directors**
- 3:30 p.m. **Desert Tortoise/Desert Biome Student Project**
Julie Bookman and Peter Coddington: Lancaster High School, CA
- 3:45 p.m. **The Desert's Canary: A Narrative Examination of the Socio-Political Role of the Threatened Desert Tortoise (Student Paper)**
Halle Kohn, Humboldt State University, CA
- 4:00 p.m. PANEL DISCUSSION

Session 9. Diversity of Reptiles and Amphibians in the Mojave Desert

Chair: Michael Tuma—Member, Board of Directors, Desert Tortoise Council

- 4:15 p.m. **Assessing Multi-scale Reptile and Amphibian Biodiversity: Mojave Ecoregion Case Study**
William G. Kepner¹, Kenneth G. Boykin², Alexa J. McKerrow³, and Anne C. Neale⁴: ¹U.S. Environmental Protection Agency, NV; ²New Mexico State University, Las Cruces, NM; ³U.S. Geological Survey, NC; ⁴U.S. Environmental Protection Agency, NC
- 4:30 p.m. ADJOURN

SATURDAY EVENING, FEBRUARY 24, 2018—SAM’S TOWN LIVE

- 5:30 p.m. NO HOST MIXER: Meet and Greet Honored Guests
Dale DeNardo, Courtney J. Conway, John R. Sauer, Phil Leitner, and Andrew S. Jones
- 6:30 p.m. DINNER
- 7:30 p.m. PHOTO CONTEST AND AWARDS
- 7:50 p.m. **BANQUET ADDRESS: The Consequences of Native Plant Diversity, Discovery, and Rarity in the Desert Tortoise Realm**
James M. Andre, Director, Granite Mountains Desert Research Center, University of California Natural Reserve System
- 8:30 p.m. AUCTION AND RAFFLE

SUNDAY MORNING, FEBRUARY 25, 2018

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

SUNDAY MORNING SESSIONS — VIRGINIA CITY ROOM

Session 10. Methods and Techniques for Monitoring, Research, Mitigation, and Conservation for Desert Tortoises and Other Animals

Chair: Mari Quillman—ECORP Consulting Inc., CA; Member, Board of Directors, Desert Tortoise Council

- 8:00 a.m. **A Drone-based Desert Tortoise Detection Evaluation: Operational Wildlife Survey Implications**
Robert Jannarone¹, Scott Cambrin², Gregory Schaefer¹, Grant Mercer¹, Anna Agoha¹, Kirk Ellern³, Rob Dunbar³, and Lee Bice²: ¹Brainlike, Inc.; ²Clark County Desert Conservation Program, NV; and ³Above Geo, Inc., NV

- 8:15 a.m. **Use of Modified GPS Loggers to Monitor Resident and Translocated Gopher Tortoises (*Gopherus polyphemus*) in Southeastern Georgia** (Student Paper)
Lance Paden and Kimberly M. Andrews: University of Georgia
- 8:30 a.m. **Road Mortality Mitigation: The Effectiveness of Animex Fencing vs. Mesh Fencing**
John C. Milburn-Rodriguez¹, Jeff Hathaway¹, Kari Gunson², Darrelle Moffat¹, Dean Swensson³, and Steve Béga³:¹ Scales Nature Park, Canada; ²Eco-Kare International, Canada; ³Animex International, UK
- 8:45 a.m. PANEL DISCUSSION

Session 11. The Latest in Genetics and Genomics for *Gopherus agassizii* and *G. morafkai*

Chair: Robert Murphy—Centre for Biodiversity and Conservation Biology, Royal Ontario Museum, Toronto, Canada

- 9:00 a.m. **Geologic History and Genomic Divergence between *Gopherus agassizii* and *G. morafkai***
Greer A. Dolby, Timothy H. Webster, Dale F. DeNardo, Melissa A. Wilson Sayres, and Kenro Kusumi: Arizona State University, Tempe
- 9:15 a.m. **A Genomic View of Adaptation and Population History in Desert Tortoises**
Timothy H. Webster, Greer A. Dolby, Dale F. DeNardo, Kenro Kusumi, and Melissa A. Wilson Sayres: Arizona State University, Tempe
- 9:30 a.m. **New Genome-level Analyses of Genetic Structure Reveal Important Differences in Agassiz's Desert Tortoise Populations on a Landscape Scale**
Santiago Sánchez-Ramírez^{1,2}, Yessica Rico³, Kristin H. Berry⁴, Taylor A. Edwards⁵, Alice E. Karl⁶, Brian T. Henen⁷, and Robert W. Murphy^{1,2}: ¹University of Toronto and ²Royal Ontario Museum, Canada; ³Instituto de Ecología, MX; ⁴U.S. Geological Survey, CA; ⁵University of Arizona Genetics Core, Tucson; ⁶Alice E. Karl & Associates, CA; and ⁷MAGTFTC MCAGCC, CA
- 9:45 a.m. PANEL DISCUSSION
- 10:00 a.m. REFRESHMENTS — CARSON CITY/SEARCHLIGHT ROOM

Session 12. Research on Demography and Applied Sciences for Agassiz's Desert Tortoise and the Sonoran Desert Tortoise

Chair: Cristina Jones—Arizona Game and Fish Department; Member, Board of Directors, Desert Tortoise Council

- 10:30 a.m. **Return to the Harcuvar Mountains, Bonanza Wash and Four Peaks Sonoran Desert Tortoise Demographic Plots**
¹Woodrow L. Crumbo, ¹Chad A. Rubke, ¹Daniel J. Leavitt, ¹Cristina A. Jones, and ²Elroy Masters: ¹Arizona Game and Fish Department; and ²Bureau of Land Management, AZ

- 10:45 a.m. **Desert Tortoise Occupancy in Association with Landscape Predictors Using Multiple Methods and Years**
Seth Harju¹ and Scott Cambrin²: ¹Heron Ecological, LLC, ID, and ²Clark County Desert Conservation Program, NV
- 11:00 a.m. **Reproductive Ecology of Desert Tortoises (*Gopherus agassizii*) in the Sonoran Desert Region of Joshua Tree National Park and the Nearby Orocochia Mountains**
Shellie R. Puffer¹, Jeffrey E. Lovich¹, Mickey Agha², Joshua R. Ennen³, Kathie Meyer-Wilkins⁴, Laura A. Tennant¹, Amanda L. Smith⁵, Kristy L. Cummings¹, and Michael S. Vamstad⁶: ¹U.S. Geological Survey, AZ; ²University of California, Davis; ³Tennessee Aquarium; ⁴Apple Valley, CA; ⁵University of Arizona, Tucson; and ⁶Joshua Tree National Park, CA
- 11:15 a.m. **Recurring Themes in Models of Anthropogenic Impacts to Agassiz's Desert Tortoises**
Kristin H. Berry¹, Julie L. Yee², and Lisa Lyren³: U.S. Geological Survey, ¹Riverside, ²Dixon, and ³Carlsbad, CA
- 11:30 a.m. **Monitoring Movements of Sonoran Desert Tortoises in Relation to Wildlife Crossing Structures in Southern Arizona**
Chad A. Rubke, Daniel J. Leavitt, Scott C. Sprague, and Colin A. Beach: Arizona Game and Fish Department, Phoenix
- 11:45 a.m. PANEL DISCUSSION
- 12:00 p.m. LUNCH
- 1:15 p.m. Announcement of BEST STUDENT PAPER AWARD
Michael W. Tuma, U.S. Geological Survey, Riverside; Desert Tortoise Council, Board of Directors

Session 13: Head-starting Research: Critical Questions Directed Toward Augmenting Populations

Chair: Judy Hohman—Member, Board of Directors, Desert Tortoise Council

- 1:30 p.m. **Movements, Growth, and Survival of Head-started Juvenile Tortoises at Edwards Air Force Base**
¹Michael W. Tuma, ¹Jeremy S. Mack, ¹Kristin H. Berry, and ²Kemp Anderson: ¹U.S. Geological Survey, CA; and ²Seal Beach, CA
- 1:45 p.m. **Update on Desert Tortoise Head-starting Studies at the Mojave National Preserve**
J. Mark Peaden¹, Tracey D. Tuberville², Kurt A. Buhlmann², and Brian D. Todd¹: ¹University of California, Davis; and ²University of Georgia's Savannah River Ecology Laboratory, SC
- 2:15 p.m. PANEL DISCUSSION
- 2:30 p.m. MEETING ADJOURNS

VENDORS AND EXHIBITS—ALAMO/GOLDFIELD ROOMS

Nonprofit Organizations

Center for Biological Diversity. *Ileene Anderson, 660 S. Figueroa Street, Suite 1000, Los Angeles, CA 90017. Phone: (323) 490-0223
Website: <http://www.biologicaldiversity.org>. E-mail: 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*

The Living Desert. *Sarah Greely, 47900 Portola Ave., Palm Desert, CA 92260. Phone (760) 346-5694, ext. 2129. E-mail: sgreely@livingdesert.org*

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*

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Brainlike, Inc. *Robert J. (Bob) Jannarone Ph.D., and CEO. Brainlike, Inc. 2223 Clearwater Lake Drive, Henderson, NV 89044. Phone: (619) 887-1153. Website: <http://www.brainlike.com/>
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