



Poster Abstracts for 2020 Symposium Sessions

A Wingleaf Soapberry Forest from the Lower San Pedro River Valley, Arizona

Abstract

We are studying the natural and cultural history of *Sapindus saponaria* (Sapindaceae), which grows as a shrub or tree and is native to the New World. It is also known as: a'e, abolillo, amole, amolillo, boliche, chirrión, guayul, jaboncillo, mata muchacho, palo blanco, soapberry, western soapberry, and wingleaf soapberry. We hope to illustrate the characteristics of this species as an aid for identification and appreciation. One of our primary study sites is possibly the largest soapberry stand documented in Arizona and is situated within a well-preserved mequite bosque along the Lower San Pedro River, near Mammoth, Arizona, at the 7B Ranch. This soapberry stand consists of over 5,200 individual soapberry trees and shrubs concentrated in an area about 400 square meters. The largest soapberry trees here are estimated to be over a century old and rise to about 20 m in height, visually dominating the surrounding mesquite and hackberry canopies. The 7B Ranch is owned by Resolution Copper and managed by the Nature Conservancy. Funding for this research was provided by Resolution Copper.

Presenter: Daniel McNair, Celeste Andresen, Dawn Rocha, Shanelle Sakeva, Anthony Villarreal, Trent Tu'tsi, Rachel Evens-Beauty, Aaron Graham, Chuck Powell, Jack Taylor

Brief Bio

We are a team of collaborators including biologists, land managers, and tribal monitors. Presenters represent the Nature Conservancy, The Tonto National Forest Tribal Monitor Program, and WestLand Resources, Inc.

Amphibian Exposure to Disease in Isolated Desert Waters

Abstract

Water limitation is a critical issue for many species of desert wildlife. Managers in the Sonoran Desert have attempted to alleviate this problem by constructing water catchments with rain-filled reservoirs to supplement natural waters for large mammals and other game species to drink, but other species, like anurans (frogs and toads), also take advantage of these sites for breeding habitat. Limited sampling during the summer of 2013 detected the amphibian pathogen *Batrachochytrium dendrobatidis* (Bd) in constructed catchments in the Sonoran Desert, but it was not detected in the natural isolated water sites. Consequently, anurans using these constructed catchments may be exposed to Bd. Bd has caused extensive declines of amphibian species globally, but was thought to be excluded from hot deserts due to its sensitivity to heat. However, the design of the constructed catchments reservoirs may be providing a thermal refugia for the Bd, allowing it to persist in an environment where it would otherwise be excluded. To determine if the use of constructed catchments leads to Bd exposure in Sonoran Desert anurans, we tested for the presence of Bd in the water of constructed catchments and natural water sites using environmental DNA methods. To determine the extent of Bd infections in Sonoran Desert anurans, we evaluated Bd infection presence by directly swabbing anurans and determined if Bd is causing mortality by collecting tissue from dead individuals. This study will provide information about how Bd is distributed throughout the landscape and to what extent Bd infects desert anurans. These results will be used to identify ways to improve management of waters to better support desert anuran conservation.

Presenter: Sadie Roth

**Brief Bio**

I grew up in Tampa, Florida and earned a B.S. in Environmental Biology from the University of South Florida. I am currently attending Texas Tech University and working towards my M.S. in Wildlife, Aquatic, and Wildlands Science and Management. My research interests include identifying management strategies for amphibian and reptile species facing disease-related population declines.

Connectivity Analysis of Border Travel Paths to Protect Sensitive Resources**Abstract**

The border region between the United States and Mexico has been subject to intensive human activities that are creating pressure on sensitive natural and cultural resources in the biodiverse and culturally rich Sonoran Desert. In response to a growing critical need for protecting at-risk natural and cultural resources in this area, a collaboration has been formed among Organ Pipe Cactus National Monument (OPCNM), Texas Tech University (TTU) and La Reserva de la Biosfera El Pinacate y Gran Desierto de Altar (RBPGDA) with potential to include additional collaborators. This cross-border partnership between the US and Mexico seeks to identify areas where border traffic places sensitive resources at risk. Project objectives include (1) quantifying the structural connectivity of documented and (2) undocumented roads, (3) assessing susceptibility of sensitive species and cultural resources to border traffic, and (4) modeling of barriers and movement of threatened, endangered, and sensitive species. Addressing these objectives will entail geospatial analyses of data that are freely available online, data provided from various resource providers and land managers, and from the synthesis of remote sensing data such as high-resolution aerial imagery and satellite images to create a contiguous landuse/landcover dataset of OPCNM, RBPGA, and adjacent lands.

We are in the initial stages of this multi-year project and will be presenting maps of connectivity models for select resources and graphics depicting how these analyses are performed. Our goal is to provide a sophisticated multi-species, multi-resource risk analysis that offers spatially explicit guidance and updatable planning resources for managing sensitive resources on both sides of the border, with management actions that can be targeted to vulnerable places.

Presenter: Sean Sutor

Brief Bio

I am a Ph.D student conducting research on effects of roads on natural and cultural resources at the United States/Mexico border. I have the honor of serving both the McIntyre Lab in the Department of Biological Sciences and Griffis-Kyle lab in Natural Resource Management at Texas Tech University. I am interested in questions addressing effects of human activity on the natural world and utilize GIS and geospatial technologies in my approach. I am a passionate conservationist, a naturalist, and have a particular fascination with reptiles and amphibians.

Erosion Control on Drag Roads at BMGRE**Abstract**

The poster purpose is to study, monitor, analyze, and determine the effects of drag road operations as well as weather conditions in BMGR-East roads. The project highlights the importance of mutual understanding between BMGR land managers (U.S. Air Force, U.S. Marine Corps) and U.S. Border Patrol (USBP) to protect existing natural and cultural resources from dragging activities in order to assess potential adverse effects of dragging operations and to prevent increases in erosion and changes to surface hydrology.



Presenter: Mauricio Nicolls

Brief Bio

Mauricio Nicolls is a GIS analyst with the US Air Force Barry M. Goldwater Range East.

Fronterazine

Abstract

The handmade booklet, or 'zine, is an inexpensive and accessible technology, and can accommodate writers and artists at all levels. The format of the 'zine is ideal for a simple and rapidly-executed trans-border or cross-cultural arts/environmental education project. Fronterazine will be in its second year in 2020, and facilitates small-scale publishing and other documentary and community practices to develop a network of artists and writers around a border or edge, whether geographical, temporal, or conceptual. It was introduced in Spring of 2019 at the F eria Internacional del Libro UABC in Mexicali, and can be adapted to any border, multicultural, or multi-generational setting.

Presenter: Alisa Slaughter

Brief Bio

I teach creative writing and environmental studies at the University of Redlands. My creative nonfiction has appeared in many publications, including terrain.org, Flyway, and Santa Monica Review. I am publisher and facilitator for Fronterazine and ClimaCuentos, two small-scale, community-based publication projects.

Implementing New Technology for Documenting Cultural Resources on the Sonoran Desert National Monument

Abstract

Recent archaeological survey efforts on the Sonoran Desert National Monument (SDNM) were conducted utilizing new technology. This approach is proving to be fruitful in allowing the Phoenix District Cultural Resource Working Group (CRWG) to better document archaeological resources, streamline workflow, and to manage data more effectively. This is one of several pilot projects that the CRWG is utilizing to develop a new workflow for recording sites and investigations in a spatial digital format.

Presenter: Amber Redger and Tim Watkins

Brief Bio

Amber Redger is an archaeological technician for the Bureau of Land Management (BLM) Lower Sonoran Field Office. An ASU alumni, her interests include bioarchaeology and geospatial data collection and management as well as archaeological site protection.

Tim Watkins is an archaeologist for the BLM Agua Fria National Monument. His interests include archaeological site protection and sacred geography.



Improving habitat for monarch butterfly in the Lower San Pedro River basin, Arizona

Abstract

The monarch butterfly (*Danaus plexippus*) is in decline according to numerous recent studies, especially the Western Monarch Butterfly Conservation Plan 2019-2069. The species is being considered for listing as federally Endangered Species, with a listing decision due June 2019. Westland Resources, Inc. has teamed up with the Tonto National Forest Tribal Monitors and The Nature Conservancy to plant native milkweeds, the obligate host plant for monarch caterpillars, at a conservation property near Mammoth Arizona. The site, the 7B Ranch, is owned by Resolution Copper and managed by the Nature Conservancy. We discuss our planting strategies and lessons learned from the project.

Presenter: Daniel McNair, Celeste Andresen, John Melko, Selwyn Selina, Lance Wells, Joaquin Leonard

Brief Bio

We are a team of collaborators including biologists, land managers, and tribal monitors. Presenters represent the Nature Conservancy, The Tonto National Forest Tribal Monitor Program, and WestLand Resources, Inc.

Prehistoric Agriculture in the Western Papaguería: New Data From the Barry M. Goldwater Range East

Abstract

Recent archaeological investigations conducted by Statistical Research, Inc. (SRI), on the Barry M. Goldwater Range (BMGR) East have added welcome data to our sparse knowledge of prehistoric agriculture in the Western Papaguería. Agricultural features as well as maize remains found in several botanical samples indicate that, despite environmental challenges, agriculture played an important role in local food economies. SRI's excavations at the large GPS site—which lies in an area conducive to ak chin farming—have provided two of the three radiocarbon dates obtained so far for maize remains on the BMGR East. A different kind of farming appears to have occurred along the Growler Mountains near Daniels Arroyo. Here, on a nearly flat terrace susceptible to runoff from higher areas, SRI recorded a site with over 70 rock piles resembling features in the Hohokam area that are associated with runoff agriculture—in particular, agave cultivation. The site may have been part of a larger agricultural system centered on Verbena Village, located 12.5 km downstream. This poster highlights these findings and what they say about ancient food production in the Western Papaguería.

Presenter: Rein Vanderpot

Brief Bio

Rein Vanderpot, a principal investigator at Statistical Research, Inc., Tucson, has been fascinated by the Papaguería ever since his first archaeological survey on the Barry M. Goldwater Range three decades ago.

Sonoran Pronghorn on the Barry M. Goldwater Range – East

Abstract

The Barry M. Goldwater Range-East (BMGR-E) is an active military training ground within the geographic range of the US population of endangered Sonoran pronghorn (SPH; *Antilocapra americana sonoriensis*). In 1996 the US Air Force began monitoring SPH on the BMGR-E within the North and South Tactical Ranges (NTAC, STAC) to comply with the Endangered Species Act to minimize potential impacts of



military activity on SPH and assist in the management and recovery of the subspecies. Here we assess temporal patterns of SPH distribution on N/STAC across biological seasons (i.e., breeding, fawning, post-weaning) using kernel density estimation. We find SPH change their use of the range, which included unexpected seasonal variation. More specifically, we did not observe SPH on NTAC for nearly the entire post-weaning season in 2019. We suspect the absence of SPH during this period is attributed to the lack of rainfall during the monsoon season, in conjunction with seasonal migration. Due to the dynamic use of N/STAC by SPH, the ESA and SPH Recovery Plan require continual assessments of the distribution and demography to sustain both healthy SPH populations and military training on the BMGR-E.

Presenter: Kelsey E. Paolini, Mary K. Strickland, Jessica L. White, Patrick J. Terry and Courtney L. Kipp

Brief Bio

We are a group of wildlife biologists that are contracted to study endangered Sonoran pronghorn on the Barry M. Goldwater Range - East to ensure Endangered Species Act compliance and assist in the recovery of the species.

Strategies to reduce fire risk and improve viewsheds along the U.S. southern border

Abstract

The Southern Border Fuels Management Initiative seeks to reduce wildland fire risk and improve border security through actively conducting fuels management treatments on Department of Interior (DOI) lands within 100 miles of the U.S. southern border. This project serves as a pilot study for USFWS, DOI Office of Wildland Fire, and the Department of Homeland Security within the Buenos Aires National Wildlife Refuge in southern Arizona. Like many DOI and adjacent lands along the border, the refuge has experienced expansion of woody plants and invasion by non-native species, which increase fuel load, fire hazard, and fire-line intensity. The objectives of this study are to: 1) develop metrics to evaluate change in wildfire risk and viewshed due to fuels treatment, 2) refine fuels mapping methods with satellite imagery and ground-based measurements, 3) determine the recovery time following fire and the effects of fuels treatments, 4) assess current and future fire behavior under different management scenarios. Expected products are a fuels map for the refuge that can be updated at management relevant time-scales, an evaluation of how historical fires and fuel treatments affect different fuel types and viewsheds over the short- and long-term, and an assessment of future fire risk under different management scenarios. The tools and products developed in this pilot study can be expanded to understand wildfire risk and viewsheds across the entire southern border region.

Presenter: Molly McCormick*, Miguel Villarreal, Seth Munson - USGS; Steve Sesnie - USFWS

Brief Bio

Molly McCormick is an ecologist for the USGS Southwest Biological Science Center in Flagstaff, Arizona. She received a B.A.S. degree in Southwest Studies from The Colorado College and an M.S. in Environmental Science and Policy, emphasis in restoration ecology from Northern Arizona University. At USGS, she coordinates the Restoration Assessment and Monitoring Program for the Southwest (RAMPS) whose mission is to connect science and land management to improve degraded desert ecosystems. This network includes over 40 agencies, tribal communities, and organizations and engages with over 400 people to develop creative solutions to complex environmental issues in the beloved desert ecosystems of the Southwest U.S. Molly realizes the important role of science and collaboration to help guide novel decisions given today's rapidly changing landscapes and complex socio-ecological systems.
