



## **Parks & Open Space**

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## **2019**

# **Winter Meeting Program**

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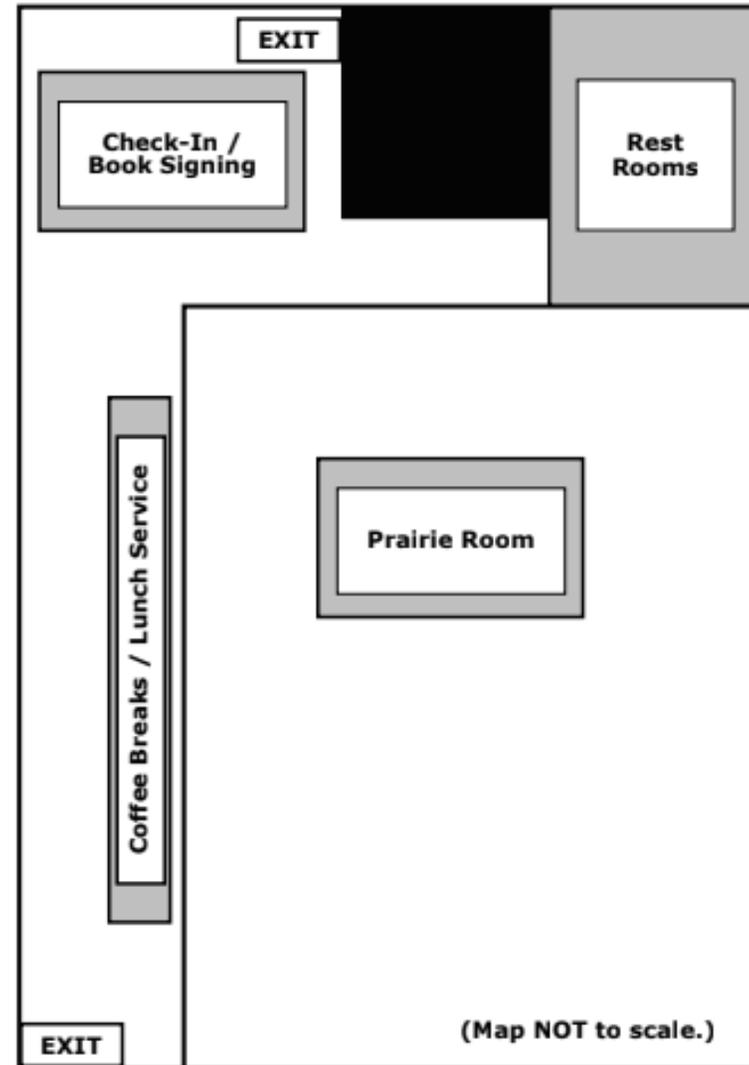
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Andrew DuBois	Priya Nanjappa
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### Program Overview

8:30 AM	Registration
9:00 AM	Welcome, Acknowledgments, Introduction
9:15 AM	Keynote Speaker - Sean Graham
10:00 AM	Morning Break - Photo Contest, Exhibition Tables
10:15 AM	Lightning Talks - Morning
10:45 AM	Oral Presentations - Morning
12:00 PM	Lunch (on your own)
1:30 PM	Herp Quiz
2:00 PM	Plenary Speaker – Bryan Hughes
2:45 PM	Colorado Parks & Wildlife Update
3:00 PM	Oral Presentations - Afternoon
4:00 PM	Lightning Talks - Afternoon
4:10 PM	CO PARC Updates, Announcements, and Elections
4:30 PM	Adjourn
5:30 PM	Dinner and Social at the Red Zone Live Auction, Herp Quiz and Photo Contest Results

## Boulder Parks and Open Space Map



## Program Schedule

### Welcome, Acknowledgments, and Introductions

9:00 AM

Andrew DuBois, CO PARC Steering Committee Co-Chair

### Keynote Speaker - Sean Graham

#### **Make Your Herping Count**

9:15 AM

Dr. Sean Graham, Assistant Professor at Sul Ross State University, author of *American Snakes*

### Morning Break

10:00 AM

Be sure to vote in the photo contest, bid on the silent auction, and check out the exhibition tables!

### Lightning Talks - Morning

10:15 AM

In order of delivery

#### **Hunter Johnson<sup>1</sup> and Jim Krick<sup>2</sup>**

**<sup>1</sup>3594 Larkspur Dr. Longmont CO 80503**

**<sup>2</sup>Department of Public Works & Natural Resources, City of Longmont, Longmont, CO 80501**

#### **Reptile Monitoring for Flood Restoration**

Recapping a 3 1/2 year survey effort to monitor the reptiles and amphibians of Peschel Open Space. The devastating floods of 2013 and the rerouting of the St Vrain Creek outside of Longmont drastically changed ecosystems. Restoration by the City of Longmont began soon after with conservation of sensitive reptiles and amphibians in mind. This multi-year effort located areas of special importance to herpetofauna and documented the occurrence of species.

#### **Doug Eifler<sup>1</sup>, Lise Aubry<sup>1</sup>, and Susannah French<sup>2</sup>**

**<sup>1</sup>Department of Fish, Wildlife and Conservation Biology, Colorado State University, Fort Collins, CO 80523-1474**

**<sup>2</sup>Department of Biology, Utah State University, Logan, UT 84322**

#### **Colorado Checkered Whiptail ecology: an integration of behavior, demography and physiology (season 1)**

In 2017, we initiated a study of Colorado Checkered Whiptail ecology at Ft. Carson and Pinon Canyon Maneuver Site. I will introduce the goals of the project, present some results from the first season, and share plans for the upcoming season.

#### **Carina Kusaka, Catherine Staley, and Rachel Pedersen**

**Department of Fish, Wildlife and Conservation Biology, Colorado State University, Fort Collins, CO 80523**

#### **Movement Ecology of Whiptail Lizards**

We compare the movement patterns of foraging Colorado Checkered Whiptail lizards (*Aspidoscelis neotesselata*) in two different habitat types: shrub-grassland and pinyon pine-juniper woodland. We characterized movement by 1) segmenting movement path trajectories into step lengths and turn angles and 2) determining first passage times (FPT). We also assessed plant cover within each area where FPT's occurred. Foraging lizards differed in their pattern of movement in the two habitats. In the more open woodland, a greater proportion of the step lengths of lizards were long and FPTs were shorter. Turn angles did not differ with habitat. First-passage times increased with the amount of plant cover in the woodland site. The habitat-based differences in movement may reflect differences in prey availability and predation risk.

## Oral Presentations - Morning

10:45 AM

Lauren J. Livo<sup>1</sup> and Todd L. Wilcox<sup>2</sup>

<sup>1</sup> 1835 South Van Gordon Street, Lakewood, CO 80228

<sup>2</sup> 865 Santa Fe Driver, Unit A, Denver, CO 80204

### ***Establishment of the Colorado Checkered Whiptail (Aspidoscelis neotesselatus) in Denver and Adams Counties, Colorado***

Natural arrays of the Colorado Checkered Whiptail (*Aspidoscelis neotesselatus*) occur in the Arkansas River drainage of southeastern Colorado. This triploid, all-female species arose from hybridization of a female *A. tessellatus* (a parthenogenetic species) with a male *A. sexlineatus* (a bisexual species) in southeastern Colorado. Because the Colorado Checkered Whiptail is parthenogenetic, a single individual theoretically is sufficient to establish an array in a suitable area. Beginning in May and continuing into October 2018, we encountered adult, juvenile, and hatchling Colorado Checkered Whiptails along an urbanized 4 km stretch of the South Platte River traversing Denver and Adams counties. This location is about 125 km north of the nearest natural occurrence of this species. We describe the pattern classes present in the array and suggest the likely mode of introduction.

Neil R. Balchan and Steve Mackessy

University of Northern Colorado, Greeley, CO 80639

### ***Packing heat: Venom mediated predator-prey interactions involving Colorado rattlesnakes and rodent prey***

Venomous snakes are distinct in their ability to incapacitate prey physiologically via envenomation prior to consumption, but coevolution between partners can result in unique prey defenses. In several examples, rodents have exhibited resistance to the venoms of their snake predators. My research

elucidates patterns of venom resistance in a Colorado grassland ecosystem, where Desert Massasaugas and Prairie Rattlesnakes predate upon a suite of rodent species. Field sites are located in Weld County and Lincoln County to investigate patterns of resistance between and within locations. Various assays (LD50s, serum tests, HPLC, etc) are used to determine resistance to venoms.

## Herp Photography

11:30 AM

Bill Gorum, New Mexico Herpetological Society

## Lunch

12:00 PM

On your own and at your own expense

## CO PARC Herp Quiz

1:30 PM

Hunter Johnson, CO PARC Steering Committee Jr. Member

## Plenary Speaker – Bryan Hughes

### ***Is Snake Relocation Really a Death Sentence?***

### ***Rattlesnake Relocation in Real-World Situations of Urban Conflict***

2:00 PM

Bryan Hughes, Owner, Rattlesnake Solutions LLC

The relocation of nuisance rattlesnakes is a controversial method of human-conflict mitigation. Long-distance translocation (LDT) of rattlesnakes show a low rate of success, often resulting in mortality due to increased movement. Short-distance translocation (SDT) has shown more promising results, with increased movement but no evidence of increased mortality or negative health impact. SDT is not considered a sustainable long-term solution, however, due to the frequent return of translocated snakes to the capture site. Examination

of relocation capture-site density and situations where rattlesnakes are encountered in urbanized contact zones in Phoenix, Arizona, in comparison to control instances used in relocation studies of Western Diamondback Rattlesnakes, reveals untested and common conflict situations. The distance of translocation, while an important factor, may not be useful when considered a lone criterion for successful mitigation relocation, and may in many cases exacerbate the problem. The immediate survival outlook of rattlesnakes found in real-world situations where SDT is a requested service is not considered in the current body of knowledge and may be a more relevant control for future SDT research. Release-site selection criteria, understanding of seasonal survival requirements, micro-habitat use, and improved prevention and education techniques may also play critical roles in improving the outlook of SDT as a reasonable and sustainable solution to expanding urban areas. I will present examples of these under-represented conflict situations and discuss possibilities for collaboration and topics in need of further study.

### **Colorado Parks & Wildlife Update**

**2:45 PM**

Tina Jackson, Species Conservation Coordinator  
Harry Crockett, Native Aquatic Species  
Coordinator

### **Oral Presentations - Afternoon**

**3:00 PM**

In order of delivery

**Bryon Shipley<sup>1</sup>, Mary Ann Bonnell<sup>2</sup>, Andrew DuBois<sup>2</sup>, Kelly Triage<sup>1</sup>, Ryan Borgmann<sup>1</sup>, and Joseph Ehrenberger<sup>1</sup>**

**<sup>1</sup>Adaptation Environmental Services LLC, Denver, CO 80206**

**<sup>2</sup>Jefferson County Open Space, Golden, CO 80401**

### ***What's all the buzz about?: Prairie Rattlesnake (C. viridis) movements at urban parks and public safety***

Public visitation in Colorado's Jefferson County Open Space (JCOS) parks is projected to increase annually. In 2017, an estimated 6.9 million visitors enjoyed the 28 JCOS parks. Contact with potentially dangerous wildlife, such as Prairie rattlesnakes, has raised concerns for public and pet safety on trails and other landscape features in both parks as visitor usage grows. Adaptation Environmental Services (AES) investigated the potential for negative visitor interactions with rattlesnakes at JCOS parks, North Table Mountain Park (NTM) and South Table Mountain Park (STM) in Golden, CO. We determined locations of over-wintering dens and identified areas of snake movements relative to trails. At NTM and STM we also conducted media interviews, contacted hikers, provided public presentations, produced a safety video and investigated visitors' knowledge, opinions, and beliefs about rattlesnakes. In addition, 26 visitors accompanied Adaptation Environmental Services staff on guided rattlesnake tracking experiences with pre- and post-tracking surveys given to measure changes in knowledge of Prairie rattlesnakes. Biological and social sciences surveys are important for species conservation and ecosystem health. Information about snake movements and denning locations will also be incorporated into park infrastructure development plans to minimize snake/human contact.

Pieter T. J. Johnson<sup>1</sup>, Dana M. Calhoun<sup>1</sup>, Travis McDevitt-Galles<sup>1</sup>, Wynne E. Moss<sup>1</sup>, Cheryl J. Briggs<sup>2</sup>, and Jason T. Hoverman<sup>3</sup>

<sup>1</sup> Department of Ecology & Evolution, University of Colorado, Boulder, CO, 80309

<sup>2</sup> Ecology, Evolution and Marine Biology, University of California, Santa Barbara, Santa Barbara, CA 93106-9610

<sup>3</sup> Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN 47907-2061

**Understanding infectious disease threats in wild amphibian populations: variation among host species, locations, and in response to drought?**

Lentic-breeding amphibian species can become infected by a diversity of macro- and microparasites. A key challenge in conservation management is to determine how infection threats vary among different amphibian species, across the landscape, and over time in response to extreme weather events, such as drought. Between 2013 and 2017, we sampled 12,217 amphibians from 133 ponds in the Bay Area of California. Our focus was on late-stage larvae and metamorphosing individuals of the following species: *Pseudacris regilla*, *Anaxyrus boreas*, *Rana catesbeiana*, *Taricha torosa* and *T. granulosa*). We used a combination of necropsy and qPCR to quantify infections by the trematode, *Ribeiroia ondatrae*, the chytrid, *Batrachochytrium dendrobatidis* [Bd], and the ranavirus, FV3, all of which can cause mortality or malformations in amphibians. Overall, 23% of hosts were infected with *R. ondatrae*, 18.9% with Bd, and 8.5% with FV3. Drought severity correlated negatively with infections by both Bd and *R. ondatrae* (1-year time lag), whereas FV3 prevalence was positively linked to drought. Among parasites, the influence of species, site and year varied sharply: for *R. ondatrae*, which requires a specific snail intermediate host, 81% of infection variance was associated with site. For Bd, host species and year accounted for 46.5% and 33.6% of the variation, respectively, reflecting the consistently higher infections in *P. regilla* and *A. boreas*. For FV3, which declined

from 32% prevalence in 2013 to <1% in 2017, year was the most influential term (65% of variance). We found little evidence implicating invasive bullfrogs (*R. catesbeiana*) as infection reservoir hosts.

**F. Boyd Wright III**

**Colorado Parks and Wildlife, 317 W. Prospect Rd, Fort Collins, CO 80526**

**From Tadpoles to Egg Masses: A Boreal Toad Reintroduction Success Story**

Populations of boreal toads, *Anaxyrus boreas boreas*, have been declining in the southern Rocky Mountains since the early 1980's. This decline is chiefly attributed to the spread of the amphibian chytrid fungus, *Batrachochytrium dendrobatidis* (B.d.). Reintroduction is a management action that contributes to maintaining populations on the landscape in the face of disease, and may facilitate species persistence into the future. However, relatively few reintroduction efforts have been attempted and only one has been deemed successful. This successful reintroduction site is an ephemeral pond located in the Cache la Poudre watershed of northern Colorado. The project was initiated in 2006 when tadpoles were first introduced into the site. Such tadpole introductions were continued annually from 2008 to 2013. Recruitment of adults was first documented in 2010 and the adult male population continued to increase in abundance through 2018. Natural reproduction was first documented at the site in 2014, when 5 egg masses were discovered. A similar level of reproduction has been documented every subsequent year, and in 2017 the population expanded breeding to a nearby lake. Maintaining populations on the landscape through reintroductions provides an opportunity for the development of disease resistance and may facilitate species persistence into the future.

**Lightning Talks - Afternoon**  
**3:00 PM**

**Katrina Cook<sup>1,2</sup>, Lusha Tronstad<sup>1</sup>, and Wendy Estes-Zumpf<sup>2</sup>**

<sup>1</sup> Wyoming Natural Diversity Database, University of Wyoming,  
Laramie, WY 82070

<sup>2</sup> Wyoming Game and Fish Department, Laramie, WY, 82070

***Do larger and more daphnia reduce the presence of chytrid?***

The zooplankton, *Daphnia*, is a group of filtering crustaceans which have been documented consuming the infectious size of chytrid fungus in lab studies. However there have been few field studies comparing whether the presence of larger and more *Daphnia* species help to reduce the presence of chytrid zoospores where amphibians occur. Zooplankton samples were collected during the summer of 2018 at sites in the Bighorn Mountains where amphibians were swabbed for chytridiomycosis. Some results include site filtering rate (1/hr) being effected by both tadpole number estimate and chlorophyll a (algae biomass). We predict sites where there are larger and more *Daphnia* will result in smaller numbers of zoospores on collected chytrid swabs.

**CO PARC Updates, Announcements, and Elections**  
**4:10 PM**

Andrew DuBois, CO PARC Steering Committee Co-Chair  
Melissa Johnson, CO PARC Steering Committee

**Adjourn**  
**4:30 PM**

**Dinner and Social at the Red Zone**  
**540 Main Street, Longmont, CO**

**5:30 PM**

At your own expense

We'll kick off the live auction, herp quiz results, and photo contest results at 6:30 PM!