

## 42nd Annual Conference of Western Field Ornithologists

*Pueblo, Colorado • August 16-20, 2017*

### Science Program

*August 18 and 19, 2017 • Pueblo Convention Center, Fortino Grand Hall*

#### Schedule of Presentations and Identification Challenges

##### *Friday, August 18, 2017*

- 12:15–12:20 Welcoming remarks by WFO President TOM BLACKMAN.
- 12:20–12:50 Opening presentation by ANGELA DWYER, LARRY SNYDER, LAURA QUATTRINI, DAVID PAVLACKY, and ADAM BEH. **Private lands stewardship: implications for avian conservation in the West.**
- 12:50–1:10 STEPHANIE PITT and LAURYN BENEDICT. **Why sing so many song types? Assessing the function of large song repertoire size in Rock Wrens.**
- 1:10–1:30 TEODELINA MARTELLI and VICTORIA MARTELLI. **Saving the California Condor: materials and methods.**
- 1:30–1:50 JENNY NEHRING. **Acoustic monitoring methods for presence/absence detection of Yellow-billed Cuckoo, Southwestern Willow Flycatcher, and northern leopard frog.**
- 1:50–2:10 **Break.**
- 2:10–2:30 EDWARD R. PANDOLFINO. **Use of song to clarify the breeding ranges of Plumbeous and Cassin's Vireos in northeastern California and western Nevada.**
- 2:30–2:50 DAN WENNY. **Upslope molt migration of Orange-crowned Warblers on the west slope of the Sierra Nevada in Alpine County, California.**
- 2:50–3:10 PAUL MCPHAIL, NORA COVY, and LAURYN BENEDICT. **Nest factors influencing the populations of a Cliff Swallow parasite.**
- 3:10–3:30 W. DAVID SHUFORD, KRISTIN A. SESSER, ROBERT H. DOSTER, MATTHEW E. REITER, and BLAKE BARBAREE. **Waterbird response to the dynamics of drought in California's Central Valley and the interior of the western United States: expectations and surprises.**
- 3:30–4:00 **Break.**
- 4:00–5:30 **Bird Sound Identification: Team Challenge**, moderator NATHAN PIEPLOW.

***Saturday, August 19, 2017***

- 12:20–12:50 TED FLOYD. **Freeware, crowdsourcing, and cheap pocket recorders in the service of western field ornithology: a Boulder County, Colorado, case study.**
- 12:50–1:10 CONNOR DOWD, CLAIRE RAMOS, and CLARK JONES. **Environmental and human factors on Lark Bunting reproductive success and populations.**
- 1:10–1:30 MAKENNA FAIR and CLAIRE RAMOS. **Sex ratio bias in the Lark Bunting.**
- 1:30–1:50 AMBER CARVER, SUSAN SKAGEN, DAVID AUGUSTINE, and MICHAEL WUNDER. **Reproductive adaptations in ground-nesting shortgrass prairie passerines.**
- 1:50–2:10 **Break.**
- 2:10–2:30 ANDREW FLOYD and TED FLOYD. **The Mexican Duck in Colorado: status, distribution, and field identification.**
- 2:30–2:50 JESSICA GORSKI, CLAIRE RAMOS, and CLARK JONES. **Observing burrowing owl nesting site preferences between disturbed and undisturbed habitat.**
- 2:50–3:10 CLAIRE RAMOS, DEL NIMMO, and SCOTT HERRMANN. **Can terrestrial songbirds be used to assess mercury levels in an adjacent aquatic environment?**
- 3:10–3:30 STEVE ROTTENBORN. **2017 update from the California Bird Records Committee.**
- 3:35–4:00 **Break.**
- 4:00–5:30 **Photo Identification: Expert Panel**, moderator ED HARPER.

*Banquet and Evening Program – Fortino Grand Hall*

- 6:30–9:30 Keynote Address by LAURYN BENEDICT. **He sings, she sings: female songbirds in your backyard.**

## Featured Speakers

*Science Sessions Day 1 – Opening Presentation  
Friday, August 18. 12:20 p.m. Fortino Grand Hall*

DWYER, ANGELA, LARRY SNYDER, LAURA QUATTRINI, DAVID PAVLACKY, and ADAM BEH. **Private Lands Stewardship: Implications for Avian Conservation in the West.** *Bird Conservancy of the Rockies, 230 Cherry Street Fort Collins, Colorado 80521; angela.dwyer@birdconservancy.org; larry.snyder@birdconservancy.org; laura.quattrini@birdconservancy.org; david.pavlacky@birdconservancy.org; adam.beh@birdconservancy.org.*

Bird Conservancy of the Rockies (Bird Conservancy) has been working to conserve birds and their habitats for nearly 30 years through an integrative model of science, education, and private lands stewardship. For the past decade we have been monitoring bird populations in Colorado and 12 western states, and in addition we have created a Private Lands Wildlife Biologist Program to connect these monitoring data to conservation on private lands. Private lands stewardship is vital to bird conservation, as more than 70% of land in the U.S. is privately owned. We currently have eight private lands biologists in the Intermountain West (five in Colorado) who work directly with farmers and ranchers to deliver voluntary, incentive-based conservation programs. We present two examples of successful integration of private lands conservation, referencing our work on Mountain Plover (*Charadrius montanus*) and Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*), both species of special concern.

The Mountain Plover has been a model for successful community-driven private lands conservation. Mountain Plovers nest on crop fields in parts of their range, which can lead to a risk of nest loss during farming operations. Bird Conservancy has worked with more than 300 farmers in Colorado and Nebraska to maintain profitability and nest success. The Lesser Prairie-Chicken has a limited breeding range in the shortgrass prairie ecoregion, and in particular on working rangelands. We compared how activities on ranches enrolled in the Lesser Prairie-Chicken Initiative (2014 US Farm Bill) affected other shortgrass-obligate songbirds. Early results suggest that Lesser Prairie-Chicken habitat management benefits songbirds such as the Cassin's Sparrow (*Peucaea cassinii*) and Lark Bunting (*Calamospiza melanocorys*), but species that require keystone features, such as the Long-billed Curlew (*Numenius americanus*) and Burrowing Owl (*Athene cunicularia*), may need additional conservation measures. Our goal is to create an integrated approach to land stewardship through community-based conservation, as demonstrated with our two case studies, providing an opportunity for achieving ecologically and economically viable farms and ranches.

**Angela Dwyer** is the Grassland Habitat Coordinator for Bird Conservancy of the Rockies. She has a Master's in Wildlife Management and has spent most of her career working with avian conservation in coastal systems of the east coast and grasslands in the Great Plains. She has been with Bird Conservancy for 5 years, and currently coordinates grassland bird conservation on private lands.

*Keynote Address  
Saturday, August 19. 6:30 p.m. Fortino Grand Hall*

LAURYN BENEDICT. **He sings, she sings: Female songbirds in your backyard.** *2480 Ross Hall, Campus Box 92, University of Northern Colorado, 501 20<sup>th</sup> St., Greeley, CO 80639; lauryn.benedict@unco.edu.*

The songs of birds have captivated human listeners for centuries. For most of that recorded history, bird song was thought to be exclusively a trait of males. Early researchers noted occasional female songs, but tended to label them as “aberrant” or “male-like” behavior and rated them as “mistakes” of nature. In the second half of the twentieth century, attitudes about female song began to change as ornithologists recorded and reported conspicuous songs given by female birds. Many of these reports came from tropical regions of the world, including Africa and Central America, causing the ornithological community to recognize that females of tropical species regularly sing, and that those songs

have important, evolved functions similar to the functions of male song. More recently, those conclusions have been applied to other regions of the globe, as ornithologists have found that females of many temperate zone species also sing. In this talk, I will offer examples of female song in North American bird species. I will describe the discovery of functional female songs in several common backyard birds, and I will discuss the implications of these discoveries. I will argue that researchers studying bird song have been focusing on only half of the picture for far too long. In order to fully understand why and how birds sing, we need to listen for, document, and examine the songs of both males and females in all locations across the globe.

**Lauryn Benedict** is an Associate Professor of Biological Sciences at the University of Northern Colorado. She teaches courses on ornithology and animal diversity, and curates the University's Zoology Museum. Lauryn's research program studies the vocalizations and behavior of wild birds, including songs given by both sexes as well as nesting and habitat use behavior. She has been honored with teaching and research awards, including elective membership in the American Ornithological Society (previously the AOU), and she serves as an associate editor for the journal *The Auk: Ornithological Advances*. You can often find Lauryn observing and recording Rock or Canyon Wrens on the many beautiful public lands of Northern Colorado

### Abstracts of Scientific Presentations

CARVER, AMBER<sup>1</sup>, SUSAN SKAGEN<sup>2</sup>, DAVID AUGUSTINE<sup>3</sup> and MICHAEL WUNDER<sup>1</sup>. **Reproductive adaptations in ground-nesting shortgrass prairie passerines.** <sup>1</sup>*Department of Integrative Biology, University of Colorado Denver, Campus Box 171, PO Box 173364, Denver, CO 80217-3364; amber.carver@ucdenver.edu;* <sup>2</sup>*U.S. Geological Survey – Fort Collins Science Center, 2150 Centre Avenue, Building C, Fort Collins, CO 80526-8118; skagens@usgs.gov;* <sup>3</sup>*U.S. Department of Agriculture Agricultural Research Service – Crops Research Laboratory, 1701 Centre Avenue, Fort Collins, CO 80526; david.augustine@ars.usda.gov.*

Bird species breeding in the same area often differ with respect to nest-site vegetation and parenting strategy, despite facing similar environmental pressures. This suggests environmental features affect species differently and that nest placement and parenting behavior are interrelated. The shortgrass prairie of western North America has minimal vertical habitat structure, so most birds that breed there nest on the ground. Despite this environmental limitation and the superficial similarity among nests, these species nest in different microhabitat. This selectivity could be the product of natural selection, if vegetation influences the probability of nest detection by predators. However, prior research has found a weak to neutral relationship between nest-site vegetation and predation probability. Parent behavior may compensate for within-species variation in nest-site vegetation. Our project focused on the intersection between nest placement and parent behavior in ground-nesting songbirds at a managed grassland in northern Colorado. Our objectives were to: 1) quantify the impact of nest-site vegetation on nest survival, and 2) estimate the effect of microhabitat on parent behavior. In 2014-2016, we monitored 1,130 nests of five species: Lark Bunting (*Calamospiza melanocorys*; n=907), Horned Lark (*Eremophila alpestris*; n=88), McCown's Longspur (*Rhynchophanes mccownii*; n=84), Western Meadowlark (*Sturnella neglecta*; n=47), and Grasshopper Sparrow (*Ammodramus savannarum*; n=14). We measured vegetation composition and volume at 739 of these nests. We located additional nests in 2017 and measured parent nest attendance and visitation rate with video cameras. Preliminary analyses based on 2014-2016 data confirm that nest-site vegetation differs among species. However, vegetation features that best distinguished nests were not those that had the greatest impact on nest survival. We expect for parent behavior to vary with nest-site microhabitat. This research further clarifies the role fine-scale habitat patterns play in nesting success, identifies reproductive behavioral adaptations, and informs management of grassland breeding bird habitat.

DOWD, CONNOR<sup>1</sup>, CLAIRE RAMOS<sup>1</sup>, and CLARK JONES<sup>2</sup>. **Environmental and human factors on Lark Bunting reproductive success and populations.** <sup>1</sup>Colorado State University – Pueblo, Biology Department, 2200 Bonforte Blvd., Pueblo, CO 81001; cb.dowd@pack.csupueblo.edu; claire.ramos@csupueblo.edu; <sup>2</sup>U.S. Fish and Wildlife Service, Colorado Fish and Wildlife Conservation Office, PO Box 25486, Denver, CO 80225; clark\_jones@fws.gov.

The Lark Bunting (*Calamospiza melanocorys*) is native to the prairie regions of North America and the state bird of Colorado. In recent years, the species' populations have declined, yet this remains an understudied species. Reproductive success is an important component of population viability. Our research objective was to determine how certain habitat factors affect Lark Bunting reproductive success. In order to determine reproductive success, nests were found and monitored for predation rates and the number of offspring produced, and adult birds were trapped and marked. Vegetation characteristics of nest sites were recorded and correlated with reproductive success. These data can provide information for future Lark Bunting conservation.

FAIR, MAKENNA and CLAIRE RAMOS. **Sex ratio bias in the Lark Bunting.** Colorado State University – Pueblo, Biology Department, 2200 Bonforte Blvd., Pueblo, CO 81001; 2makenna@gmail.com; claire.ramos@csupueblo.edu.

According to the Fisherian sex ratio theory, sexual selection leads to an equal investment in male and female offspring. Thus, many species have relatively equal numbers of males and females. The Lark Bunting (*Calamospiza melanocorys*), a migratory songbird which breeds on the Great Plains of Colorado, has been shown to have a male-biased breeding sex ratio. The source of the bias is currently unknown. It could arise either in the primary sex ratio through the biasing of offspring sex by female birds, or in the secondary, or tertiary (mature) sex ratios through differential mortality between the sexes. Therefore, the purpose of our study was to determine at what point in the Lark Bunting life cycle the male sex ratio bias was established within the population of Lark Buntings nesting at the Pueblo Chemical Depot in southwestern Colorado. Adult Lark Buntings were captured on the breeding grounds and the adult sex ratio was determined using plumage characteristics. We also captured hatchlings from the nests. Nestlings were sexed genetically using markers found on the W and Z chromosomes. We will discuss the results of our investigations.

FLOYD, ANDREW<sup>1</sup> and TED FLOYD<sup>2</sup>. **The Mexican Duck in Colorado: status, distribution, and field identification.** <sup>1</sup>Lafayette Elementary School; andrewfloyd729@gmail.com; <sup>2</sup>American Birding Association, 2009 South Fork Drive, Lafayette, CO 80026; tfloyd@aba.org.

Because it is “uncountable,” the Mexican Duck (*Anas [platyrhynchos] diazi*), flies under the radar of many birders. The bird probably goes unnoticed in most instances, and even correctly identified Mexican Ducks may not make their way into the ornithological literature. In this presentation, we (1) review the field identification of the Mexican Duck in Colorado, (2) assess the evidence, such as it is, for the taxon's current status in Colorado, (3) examine the possibility that the population is increasing in Colorado, and (4) ask what factor or factors might be driving a presumptive range expansion in Colorado.

As to (1) field identification, we emphasize the importance of understanding seasonal variation in duck plumages and knowing the plumages of ducks in the Mallard (*Anas platyrhynchos*) complex other than the Mexican Duck. As to (2) current status, we rely unsurprisingly on the massive eBird database, especially eBird records supported by photographs. As to (3) population change, we are thwarted by the problem that the taxon has likely gone undetected and underreported, but we are hopeful that today's enlightened field ornithologists are getting up to speed and that future range shifts will be credibly documented. And as to (4) causative agents, we are uncertain, but we note that expansion northward into Colorado is consistent with anthropogenic influences, including climate change.

Finally, we encourage birders and field ornithologists to view the Mexican Duck through a genetic lens. Instead of worrying about whether such-and-such a duck is a pure *diazi* (whatever that means), let alone “countable,” it is most advantageous to attempt to document the occurrence and possible expansion of the Mexican Duck genome in

Colorado. This outlook has possible consequences for conservation and definite consequences for how we humans interpret and appreciate birds and other objects and phenomena in nature.

FLOYD, TED. **Freeware, crowdsourcing, and cheap pocket recorders in the service of western field ornithology: a Boulder County, Colorado, case study.** *American Birding Association, 2009 South Fork Drive, Lafayette, CO 80026; tfloyd@aba.org.*

Recording birds in their natural environments used to be expensive, backbreaking, and exceedingly cumbersome. Editing, analyzing, and sharing recordings was even worse—for all intents and purposes, totally impracticable. All that has changed with the advent in recent years of inexpensive, lightweight, user-friendly, digital technology for documenting bird vocalizations. Drawing from the oeuvre of audio recordings I have made in Boulder County, Colorado, I present the following five major applications of this new technology: (1) detection of vagrants; (2) description of novel vocalizations; (3) documentation of nocturnal migration; (4) clarification of range limits of cryptic species; and (5) enjoyment and appreciation of the beauty of birdsong.

“Getting the bird,” i.e., obtaining a recording, is straightforward, but analyzing the data has proved to be more vexing, at least in terms of the receptivity of the birding and field ornithological communities. Even though sound spectrograms, regrettably called “sonograms” by many birders, were introduced to the masses more than a half century ago in the pioneering and influential *Golden Guide* (1966), they simply have not caught on. That is unfortunate because being able to read a spectrogram is every bit as important as knowing feather tracts, understanding molt, and appreciating geographic variation in plumage. So I gently but firmly exhort birders and field ornithologists to stop hearing birds and actually start listening to them—by seeing what their spectrograms say to us.

GORSKI, JESSICA<sup>1</sup>, CLAIRE RAMOS<sup>1</sup>, and CLARK JONES<sup>2</sup>. **Observing burrowing owl nesting site preferences between disturbed and undisturbed habitat.** <sup>1</sup>*Colorado State University – Pueblo, Biology Department, 2200 Bonforte Blvd., Pueblo, CO 81001; jl.gorski@pack.csupueblo.edu; claire.ramos@csupueblo.edu.* <sup>2</sup>*U.S. Fish and Wildlife Service, Colorado Fish and Wildlife Conservation Office, PO Box 25486, Denver, CO 80225; clark\_jones@fws.gov.*

Extensive studies have been conducted on the habitat of the Burrowing Owl (*Athene cunicularia*). This small ground-nesting owl prefers wide-open spaces, devoid of trees or thick scrub. In eastern Colorado Burrowing Owls typically nest in burrows created by black-tailed prairie dogs (*Cynomys ludovicianus*) and other fossorial mammals, but they may also adapt their nesting preferences to manmade constructs should the opportunity present itself. Such constructs include road culverts, pipe entrances, and even buckets. Even so, Burrowing Owl reproductive success is most closely associated with prairie dog colonies. In this study we investigate Burrowing Owls on the Pueblo Chemical Depot in Southwestern Colorado. At this site recent outbreaks of sylvatic plague have eliminated some prairie dog colonies. There are also varying levels of human activity in different areas of the Depot. Burrowing Owls live in both active and inactive prairie dog colonies and in disturbed and undisturbed regions of the Depot. We will discuss the results of our investigations of Burrowing Owl occupancy of active prairie dog colonies and inactive colonies, and whether human disturbance factors into Burrowing Owl density and reproductive success.

MARTELLI, TEODELINA and VICTORIA MARTELLI. **Saving the California Condor: materials and methods.** *1647 El Dorado Drive, Thousand Oaks, CA 91362; teodelinamartelli@gmail.com.*

The success of the California Condor (*Gymnogyps californianus*) Recovery Program in elevating the condor population and slowly but surely beginning the species' reestablishment in its original territories is eminent. Organized on saving a bird we knew little about, the work initially hinged on makeshift improvisation that was on occasions very controversial. Over 40 years into saving condors, the field work in the program is now protocol that can serve in other species conservation issues. The methods used are specialized to the condor in their sum - but separately, each may be applicable to other species in decline. In this presentation we will delineate the methods perfected by the Recovery

Program and the effects these methods are having on the California Condor population, focusing on the captive breeding aspect.

MCPHAIL, PAUL, NORA COVY, and LAURYN BENEDICT. **Nest factors influencing the populations of a Cliff Swallow parasite.** *University of Northern Colorado, 501 20<sup>th</sup> St., Greeley, CO 80639; mcph5765@bears.unco.edu; lauryn.benedict@unco.edu.*

The swallow bug (*Oeciacus vicarious*) is a bloodsucking parasite that is very closely related to the bedbug. Swallow bugs feed almost exclusively on Cliff Swallows (*Petrochelidon pyrrhonota*), and large numbers of them affect chick survival, migration patterns, and nest choice. Because of these effects, our study aimed to better understand what helps regulate swallow bug populations. Specifically, we looked at four potential factors: nesting colony size, seasonality, the number of other parasites, and the location of the colony. Research has shown that larger bird colonies have larger swallow bug populations. Additionally, the parasites can survive very well inside the nest while the Cliff Swallow is wintering in South America. Because swallow bugs compete with other parasites for the blood of the baby bird, we expected to find fewer swallow bugs when more parasites were present. Finally, we expected to find significantly different swallow bug population sizes on colonies built on man-made structures, such as bridges and overpasses, compared to natural sites. To test which of these environmental factors influenced swallow bug populations, empty nests were removed from the colony, insects were removed from the nests, and all the parasites were identified and counted. We confirmed the previous research, but found that the presence of the number of other parasites did not have a negative effect on swallow bug populations. This means that Cliff Swallow nests can potentially have to cope with large infestations of up to three parasites at the same time. Finally, we found that colonies built on a man-made surface hosted significantly more swallow bugs. The reason for the increased number of swallow bugs is still a mystery. It is possible that extra food from living near the highway may help the chicks host a larger number parasites and survive, or that predation from Canyon Wrens (*Catherpes mexicanus*) in the more rural locations keeps swallow bug numbers down.

NEHRING, JENNY. **Acoustic monitoring methods for presence/absence detection of Yellow-billed Cuckoo, Southwestern Willow Flycatcher, and northern leopard frog.** *Wetland Dynamics, LLC 416 Adams St., Monte Vista, CO 81144; jennynehring@hotmail.com.*

Acoustic monitoring is a cost effective and efficient means of collecting presence/absence information for wildlife species that vocalize. It has utility for consistent monitoring of species in a wide variety of habitats and in project areas pre- and post-treatment. This method is especially useful for rare or endangered species monitoring when minimizing disturbance to the species is desired. In this study acoustic monitoring was used to determine presence/absence of the Federally Endangered Southwestern Willow Flycatcher (*Empidonax traillii extimus*), Threatened Yellow-billed Cuckoo (*Coccyzus americanus*), and Colorado state species of concern northern leopard frog (*Lithobates pipiens*). This technology has advantages over typical field surveys: observer bias is removed as animals are monitored while humans are absent; monitoring can be conducted over days or weeks without the expense, logistics, or energy required for direct observation; animals can be monitored at night, in thick vegetation or poor weather conditions where visual tracking or observation would be impossible or difficult; the need for call playback surveys is reduced, decreasing elements of disturbance and harassment to wildlife; and data are consistently collected and analyzed, eliminating human error. Using a variety of field recordings a “classifier” was created for each species that allows computer analysis of field recordings to rapidly search hours of data to find vocalizations of the species of interest thereby documenting the presence of the species as well as an index of activity levels. This is a relatively low-cost technology and has potential for gathering long-term, consistent presence/absence information in a way that does not disrupt wildlife and that greatly reduces the man-hours needed for typical surveys.

PANDOLFINO, EDWARD R. **Use of song to clarify the breeding ranges of Plumbeous and Cassin's Vireos in northeastern California and western Nevada.** 1328 49<sup>th</sup> Street, Sacramento, CA 95819; [erpfromca@aol.com](mailto:erpfromca@aol.com).

There are significant inconsistencies among published sources regarding the breeding ranges of Plumbeous Vireo (*Vireo plumbeus*) and Cassin's Vireo (*Vireo cassinii*) in northeastern California. Some sources show Plumbeous Vireo breeding in the northeastern corner of California, while others show Plumbeous Vireo breeding no further north in California than Mono County, more than 300 km south of that area. These discrepancies are likely due to the difficulty of distinguishing spring/summer Cassin's Vireos in worn, faded plumage from Plumbeous Vireos. While some field guides suggest it is possible to distinguish these species by song, there has been no quantitative comparison of their songs. I analyzed songs of both species using recordings (from Macaulay Library, xeno-canto, and my own collection) made within the core breeding ranges of each species. I found that many of the song characteristics cited in field guides (e.g., degree of frequency modulation, song rate) were not useful for identification. The one factor that showed a significant difference was the average pitch of song phrases. Cassin's Vireo song was significantly higher in average pitch than Plumbeous ( $3600 \pm 200\text{Hz}$  for Cassin's vs.  $3100 \pm 200\text{Hz}$  for Plumbeous). There was a slight overlap in range with the lowest Cassin's song at 3300Hz and the highest Plumbeous at 3400Hz. Therefore, not every individual may be identifiable to species based on song alone. However, given a good quality recording of song, most birds can be assigned to species. I am recording "Solitary" vireos in northeastern California and western Nevada to determine their actual ranges. Preliminary results have shown that Plumbeous Vireos do breed north of Mono County with birds identified both visually and by song in eastern Alpine and Sierra counties.

PITT, STEPHANIE and LAURYN BENEDICT. **Why sing so many song types? Assessing the function of large song repertoire size in Rock Wrens.** University of Northern Colorado, 501 20<sup>th</sup> St., Greeley, CO 80639; [stephanie.pitt@unco.edu](mailto:stephanie.pitt@unco.edu); [lauryn.benedict@unco.edu](mailto:lauryn.benedict@unco.edu).

Researchers have long used song repertoire size as a measure of complexity in birdsong and studied it in regards to the selective pressures driving its evolution. It is often evaluated in terms of female choice, but male-male competition may also select for large song repertoires. My research uses field observations of color-banded birds and field playback experiments to test whether large song repertoires confer benefits to male Rock Wrens (*Salpinctes obsoletus*) in mate acquisition and/or territory defense. During 2016 and 2017, I successfully completed playback experiments to 24 male Rock Wrens and examined their responses to a small and a large song repertoire experimental track. I also acquired information on nesting ecology and breeding success using a combination of focal bird pair observations and motion-detection field cameras placed near the entrances of nests. Preliminary results from 12 experiments in 2016 show that males sang faster and sang more songs in response to playback of a large repertoire than they did to a small repertoire. These results support the hypothesis that male Rock Wrens discriminate between repertoire sizes, and that song repertoires are relevant to males in a territory defense context. Observations and camera data show that both males and females care for chicks by bringing food to the nest, and future analyses will test whether males that sing with larger repertoires contribute more help feeding offspring and raise more chicks to fledging.

RAMOS, CLAIRE, DEL NIMMO, and SCOTT HERRMANN. **Can terrestrial songbirds be used to assess mercury levels in an adjacent aquatic environment?** Colorado State University – Pueblo, Biology Department, 2200 Bonforte Blvd., Pueblo, CO 81001; [claire.ramos@csupueblo.edu](mailto:claire.ramos@csupueblo.edu).

Birds have been suggested as bioindicators to detect environmental contaminants because their ecology is well established and they are often high on the food chain. In aquatic ecosystems, the focus has been on bird species that feed directly on aquatic species, fish or emergent insects, but terrestrial birds living adjacent to contaminated sites have been shown to accumulate aquatic contaminants to equally high levels. Here we assess whether contaminant levels in terrestrial birds reflect the levels seen in aquatic organisms from an adjacent stream. Research was conducted on Fountain Creek, a stream on the Front Range of Colorado known to be contaminated with mercury. Mercury levels have been measured in fish and bryophytes and have been shown to increase with increasing elevation. We sampled a variety of terrestrial birds in riparian zones within 100 m of Fountain Creek. We expected that resident species will

match mercury levels in aquatic biota more closely than migrant species. We also predicted that juvenile birds raised near the creek will more accurately reflect mercury levels in the aquatic species. These results should indicate whether terrestrial birds adequately mirror aquatic contaminant levels and can thus be used as bioindicators.

**ROTTENBORN, STEVE. 2017 update from the California Bird Records Committee. H. T. Harvey & Associates, 983 University Avenue, Bldg. D, Los Gatos, California 95032; srottenborn@harveyecology.com.**

Since September 2016, the California Bird Records Committee (CBRC) has accepted first state records of the Purple Sandpiper (*Calidris maritima*) – with the same individual seen at two locations more than 500 miles and 8 days apart – and Buff-breasted Flycatcher (*Empidonax fulvifrons*). These two additions, coupled with the recent merger of Thayer's Gull (formerly *Larus thayeri*) into Iceland Gull (*Larus glaucooides*) by the American Ornithological Society, bring the California list to 665 species. A potential addition to the state list currently being considered by the committee is Jouanin's Petrel (*Bulweria fallax*), based on two reports. Other interesting recent records accepted by the CBRC include the state's second Swallow-tailed Kite (*Elanoides forficatus*) and Ross's Gull (*Rhodostethia rosea*), third Marsh Sandpiper (*Tringa stagnatilis*), and fourth Common Pochard (*Aythya ferina*) and Black-tailed Gull (*Larus crassirostris*). A recent flurry of Nazca Booby (*Sula granti*) records has prompted discussion of the extent to which this species hybridizes with Masked Booby (*Sula dactylatra*) and how pure birds can be distinguished from hybrids, particularly in subadult birds. Little Gull (*Hydrocoloeus minutus*), Magnificent Frigatebird (*Fregata magnificens*), and Magnificent/Great/Lesser Frigatebird (*Fregata magnificens/minor/ariel*) were removed from the review list in January 2017 due to the number of accepted records and regularity of occurrence.

**SHUFORD, W. DAVID<sup>1</sup>, KRISTIN A. SESSER<sup>1</sup>, ROBERT H. DOSTER<sup>2</sup>, MATTHEW E. REITER<sup>1</sup>, and BLAKE BARBAREE<sup>1</sup>. Waterbird response to the dynamics of drought in California's Central Valley and the interior of the western United States: expectations and surprises. <sup>1</sup>Point Blue Conservation Science, 3820 Cypress Drive # 11, Petaluma, CA 94954; dshuford@pointblue.org; <sup>2</sup>U.S. Fish and Wildlife Service, Migratory Bird Program, 2800 Cottage Way, Sacramento, CA 95825; rob\_doster@fws.gov.**

We provide an overview of the patterns of waterbird and shorebird response to a period of extreme drought in California and the western United States during the period 2006–2015. Because of the unpredictability of drought occurrence and duration, its effects can be difficult to study over broad regions. We fortuitously censused the size and location of colonies of breeding waterbirds in California during both a very wet period in the late 1990s and in the recent drought. We also conducted annual surveys (2011–2015) and an intensive tracking study of nonbreeding shorebirds during the drought. Three species of terns varied in their patterns of response, but all greatly declined in numbers in all or parts of their interior breeding ranges in California, including the Central Valley, during the drought. Numbers of Black Terns (*Chlidonias niger*) unexpectedly declined in numbers in rice fields of the Sacramento Valley despite an increase in planted rice acreage between the two periods. Censuses of gull colonies were conducted across the interior West during the recent drought, but no comparable data were available from a wet climatic period. Data on numbers of breeding gulls in the interior of California showing declines from the late 1990s to the recent drought period, coupled with drought-intensity maps for all of the interior West, suggest populations in the broader region also reached lows in the drought. Shorebird distribution was dynamic in the Central Valley with marked birds moving farther in landscapes with high variability in surface water distributions, and overall less shorebird use was observed in landscapes with declining average water availability.

**WENNY, DAN. Upslope molt migration of Orange-crowned warblers on the west slope of the Sierra Nevada in Alpine County, California. San Francisco Bay Bird Observatory, 524 Valley Way, Milpitas, CA 95035; dwenny@sfbbo.org.**

In California's Sierra Nevada, Orange-crowned Warblers (*Oreothlypis celata*) nest in the foothills below about 1500m (5000 ft). In mid to late summer they can be the most common bird species in willow thickets at higher elevations. This movement has been described as upslope migration, post-breeding dispersal, or molt migration, yet

little is known about the dynamics of these movements. I mist-netted and banded birds in several locations at about 2400m (8000 ft) elevation in Alpine County, California in the summers of 2014 to 2016 to better understand the purposes and timing of these upslope movements. Orange-crowned Warblers begin to arrive in Alpine County as soon as the willows leaf out after snowmelt, typically in early June. The vast majority (89%) of birds captured were hatch-year birds in the midst of, or having just completed, a partial prebasic molt. Typically this molt included all the body feathers and greater coverts and occasionally tertials and a few rectrices. The few after-hatch-year birds captured were invariably undergoing a complete molt including the primaries. By early October birds had completed molting. Scant recaptures indicate some birds do stay in one meadow for 2-3 weeks but most appear to wander from one site to the next. Thus, the higher elevation moist meadows are important for Orange-crowned Warblers, and the upslope movement seems to be an opportunistic molt migration. Why so few adult birds were captured deserves further study.

## Presenter Biographies

**Amber Carver** is a doctoral student at the University of Colorado Denver. She obtained a BSc from The Evergreen State College in Olympia, WA and worked on various field ornithology projects in the western US. Her research interests include avian biogeography and community ecology. She is on the board of the Colorado Field Ornithologists and the Western Bird Banding Association.

**Connor Dowd** was born and raised in Pueblo Colorado. He is currently a senior at CSU Pueblo studying biology with an emphasis in environmental biosciences. He also currently works at Lake Pueblo State Park as a seasonal boat ranger. He hopes to utilize his degree as a wildlife researcher for the state of Colorado.

A fifth grader at Lafayette Elementary School, **Andrew Floyd** especially enjoys math and science. His hobbies include mountain biking, birding at night, playing the piano, and road trips to strange places. Next week, he is going to Steamboat Springs to lead an Osprey-watching trip at a Sandhill Crane festival. Andrew is skipping the first day of school to be with us!

**Ted Floyd** proudly serves as Editor of *Birding* magazine, published by the American Birding Association (ABA), and as Managing Editor of *North American Birds*, also published by the ABA. He has served on the boards of Western Field Ornithologists and Colorado Field Ornithologists, and is the author of five books and 200+ technical papers and magazine articles.

**Jessica Gorski** currently attends Colorado State University—Pueblo pursuing a degree in Wildlife and Natural Resource Management. She originally hails from Camp Creek, WV and also holds a degree in Business Administration. She served five years active duty in the US Army and would like to use her military experience and her current education to manage wildlife on US military installations.

**Teodelina Martelli** is a sixteen-year old homeschooler. She lives in southern California and has been birding since she was twelve. Within ornithology, she is specifically interested in behavior and evolution. Experiencing condor fieldwork has fired her fascination with the magnificent bird and its protectors. She is attending her fourth WFO conference.

**Paul McPhail** is a senior at the University of Northern Colorado majoring in Biology, with an emphasis on ecology and evolution, and Anthropology. He has been working on swallow bug population measurements since 2014. Additionally, this summer he has been assisting another graduate student at UNC collect data on Rock Wren song repertoires.

**Jenny Nehring** was born and raised in the suburbs of Denver, CO and has been a bird lover as long as she can remember. Jenny earned a B.A. in Environmental Biology at the University of Colorado and a MS in Biology from Middle Tennessee State University. Her Master's thesis project was an analysis of 30 years of migration casualty data from a 1200 foot television tower in Nashville, TN. Jenny has lived and worked in the San Luis Valley of Colorado for 19 years and during that time has worked with nearly every agency or organization in the Valley on bird related projects. Since 2012 Jenny has been a partner in the small environmental consulting company Wetland Dynamics, LLC providing ecosystem management, monitoring and technical services.

**Edward Pandolfino** has devoted his post-retirement years to conservation, birding, and research that connects the two. He co-authored *Birds of the Sierra Nevada: Their Natural History, Status, and Distribution* with Ted Beedy, illustrated by Keith Hansen. He has previously served as President of Western Field Ornithologists and as a regional editor for northern California for *North American Birds*.

**Stephanie Gobert Pitt** moved to the U.S. in 2007 to attend Colorado State University for a Bachelor of Science in Zoology. After completing her degree, she spent a year working on various conservation projects both in Brazil and the U.S. mostly working with bird species. She is currently in her second year of Master's in Biology at the University of Northern Colorado studying Rock Wrens with the Benedict Behavioral Ecology Lab.

**Dr. Claire Ramos** is an assistant professor at Colorado State University – Pueblo where she specializes in vertebrate biology, animal behavior, and biostatistics. Her research focuses on songbird behavior and the effects of environmental pollutants on birds.

**Steve Rottenborn** is an ecologist with H. T. Harvey & Associates in Los Gatos, California. He is a member of the WFO Board of Directors, Chair of the California Bird Records Committee, and a Northern California regional editor for *North American Birds*.

**Dave Shuford** has spent his career at Point Blue Conservation Science studying the abundance, distribution, and ecology of shorebirds and waterbirds throughout California and the West. A recurring theme of his work is the conservation of these birds in agricultural lands of California's Central Valley.

**Dan Wenny** is Landbird Senior Biologist at the San Francisco Bay Bird Observatory working on burrowing owls, urban bird surveys, and bird banding at Coyote Creek Field Station. Before that he was Grassland Avian Ecologist for the Illinois Natural History Survey.

## Identification Challenges

**Sounds: Team Challenge.** *Friday, August 18. 4:00–5:30 p.m. Fortino Grand Hall.* **Nathan Pieplow** returns with this pub-quiz style competition to challenge participants with the varied sounds that birds make. Start forming your teams\*\* now! The audience will have plenty of opportunity to participate, too, so come ready to use what you know about bird sounds and to learn even more. WFO logo prizes will be awarded to the winning team!

**Nathan Pieplow** is the author of the *Peterson Field Guide to Bird Sounds*. He is a former editor of the quarterly journal *Colorado Birds* and an author of the *Colorado Birding Trail*. He teaches writing at the University of Colorado in Boulder.

\*\* Teams can include up to 6 people, but please, no more than two “experts” per team, defined as current or past members of a bird records committee, field guide authors, and/or professional bird tour leaders. Teams are encouraged to come up with their own creative team name!

**Photos: Expert Panel.** *Saturday, August 19. 4:00–5:30 p.m. Fortino Grand Hall.* In this ever-popular staple of WFO conferences, a distinguished panel of identification experts will examine and comment on photographs of "mystery" birds. Panelists will analyze photographs of birds and discuss the relevant aspects of each bird's particular characteristics that lead to an identification. The intent is to provide a real learning experience for audience and panel alike. Panel moderator is **Ed Harper**.

**Ed Harper** is one of the finest birders and bird photographers in the country. His lively talks and programs are always highly informative and full of humor. An educator at heart, he taught mathematics and field ornithology classes at American River College for 34 years before recently retiring to spend more time in the field. An active birder, he travels widely and he and his wife, Susan Scott, lead birding and natural history tours all over the world.