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Taylor. R. C. *Recent Population Dynamics of Elegant Trogons in Southeast Arizona* (2015)

Tibbetts, T., and S. Richardson. *The Ferruginous Pygmy-Owl in Southern Arizona: Natural History, Distribution, and Status* (2018)

Tomoff, C. *Effects of the Spring 2011 Pickett Fire on Avian Life* (2011)

Vander Pluym, D. *A Survey of Spring Migration at Lake Havasu with an Emphasis on Waterbirds* (2014)

— *A Look at the Seabirds of Arizona* (2016)
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Vander Pluym, D., and L. Harter. *Mexican Ducks in Arizona: An Overview of Identification and Distribution* (2011)

Vojta, C. D. *Enhancement of Kachina Wetlands for Wildlife and Environmental Education* (2019)

Weekley, O. *Open Pipes Are a Danger to Wildlife* (2024)

Williamson, S. *The"H-word": Recognizing, Documenting, and Understanding Hybrid Hummingbirds* (2024)

Wrieden, J. *Assessing Artificial Burrow Improvements by Evaluating Signs of Burrowing Owl Occupation and Available Burrow Status* (2022)

Papers

2008

Yellow-billed Cuckoo Distribution, Breeding Status, and Habitat Use Along the Lower Colorado River. *Stewart, L. R., M. J. Johnson, C. M. Calvo, and G. Bland, Northern Arizona University, Flagstaff, AZ 86011*

We documented western Yellow-billed Cuckoo (*Coccyzus americanus*) distribution, abundance, and habitat use along the lower Colorado River within the Multi-Species Conservation Plan boundary area. We conducted cuckoo surveys using playback recordings. Cuckoos were detected at 32% of the areas surveyed in 2006 and 35% of the areas in 2007. In 2006, the majority of the cuckoo detections occurred at the Bill Williams River National Wildlife Refuge AZ sites (n = 117) and the Grand Canyon National Park–Lake Mead National Recreation Area AZ delta sites (n = 29 detections). In 2007, most of the detections again occurred at Bill Williams River NWR (n = 140 detection), while at the Grand Canyon-Lake Mead sites we did not detect cuckoos. The sudden absence of cuckoos at the Lake Mead Delta sites may be due to the ongoing drought, which affects water levels in Lake Mead Reservoir and the amount of water available to the riparian vegetation the cuckoo depends on. We compared the distribution and abundance of woody species between occupied and unoccupied sites. Occupied sites tended to have higher average canopy cover, attributable to higher average cover of the mid and low canopy. In addition, occupied sites in most areas had lower than average total tree density whereas unoccupied sites were denser than average. When densities of trees in different size classes were compared between occupied and unoccupied sites within areas, it appeared that cuckoos did not use sites with the highest density of small trees (< 8 cm dbh), mostly tamarisk.

We also measured microclimate variables (temperature, relative humidity, soil moisture) at occupied and unoccupied sites at Grand Canyon NP–Lake Mead NRA and Bill Williams River NWR. We found that locations occupied by Yellow-billed Cuckoos were generally slightly cooler and more humid than unoccupied sites.

2009

The Status of the "Cactus" Ferruginous Pygmy-Owl in Arizona and Northern Mexico. *Richardson, S. U.S. Fish and Wildlife Service, Arizona Ecological Services, Tucson, AZ.*

The "Cactus" Ferruginous Pygmy-Owl (*Glaucidium brasilianum cactorum*) is a small, reddish-colored owl that inhabits portions of the southern U.S. and Mexico. The species lacks ear tufts and the tail is relatively long for an owl. The crown is lightly streaked, and a pair of dark brown/black spots outlined in white occurs on the nape, suggesting “eyes”. Pygmy-Owls have large feet and talons relative to their body size and are fearless predators.

Few birds have generated as much controversy and interest in the southwestern U.S. as the pygmy-owl has. Little was known of this species until it was listed as endangered under the Endangered Species Act (ESA) in 1997. While Texas and Mexico were considered under the original listing proposal, the pygmy-owl was ultimately listed only in Arizona. With this listing, residents of Arizona came face-to-face with the realities of ESA enforcement. What followed were many years of controversy, lawsuits, and attempts to understand the needs of the pygmy-owl. The listing of the pygmy-owl generated more interest and resources to study this species,

but it also generated conflict and misunderstanding. Research and monitoring were intensified in both Arizona and northern Mexico. Survey efforts were expanded because survey clearance was required for land-use activities. Genetic studies were initiated at Texas A&M University, in addition to their ongoing natural history work on pygmy-owls in Texas. However, the listing, designation of critical habitat, development of a survey protocol, and conflicts with development all lead to scrutiny, questions, and, ultimately, lawsuits. The listing did spark beneficial regional environmental planning efforts and the conservation of important habitats in southern Arizona. Declines in pygmy-owl populations in Arizona and northern Mexico were documented. However, when the extended court battles were finally resolved, the result was the delisting of the pygmy-owl in 1996.

Efforts to better understand and conserve the pygmy-owl have been continued post-delisting. Research related to the effectiveness of nest boxes and captive breeding were initiated. Additional genetic sampling occurred in Sonora and Sinaloa in northern Mexico. Population monitoring and telemetry work has continued in Sonora, Mexico through the University of Arizona. Unfortunately, pygmy-owl population declines continue to be evident in both Arizona and northern Mexico.

In March of 2007, the Fish and Wildlife Service (FWS) was petitioned to relist the pygmy-owl under the ESA. This new petition included a request to consider a change in taxonomic classification and to include populations in Mexico in the analysis. In June of 2008, the FWS issued a 90-day finding on the petition that indicated that the petition was valid and that listing of the pygmy-owl under the ESA may be warranted (73 FR 31418). That finding initiated a more detailed 12-month status review that will determine whether the pygmy-owl does or does not warrant listing. The 12-month finding is expected early in 2010. In the meantime, efforts continue related to captive breeding, nest box investigations, refining the genetic analysis, habitat conservation planning, and cooperation with Mexico to achieve conservation of the pygmy-owl.

2011

Detection Rates of Thrashers Vary Between Seasons and Survey Methods. *Arnett, J. E.*
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John.arnett@luke.af.mil.

Because detection probability affects counts and population estimates of wildlife populations, sources of variation in detectability should be explicitly addressed and quantified. In this study, we examined detection rates of LeConte's Thrasher (*Toxostoma lecontei*) and congeners between two seasons [winter (January-February) and spring (April-May)] and two survey methods (passive observation and call-broadcast). Surveys were conducted at stop locations of 15 Breeding Bird Survey and three *ad hoc* routes within the Sonoran/Mojave BCR in Arizona. LCTH detection rates were lowest (0.01 bird/route) during spring passive surveys, moderate (0.04 bird/route) during winter passive surveys, and greatest (0.08 bird/route) during winter playback surveys. Other thrasher species responded vigorously to the broadcast LCTH song. Crissal Thrasher (*T. crissale*) detections doubled (winter) and quadrupled (spring) in response to the LCTH song and, in general, were greater in winter than spring. Curve-billed Thrasher (*T.*

curvirostre) detections increased in response to the LCTH song, but during passive surveys this species was 50% more detectable in spring than winter. Our results suggest that data collected in April and May, when BBS routes are typically conducted, may provide biased counts and spatial distributions of LeConte's and Crissal Thrashers. Development pressure on thrasher habitat has increased our need for unbiased population estimates and spatial occurrence data for these species. We recommend targeted surveys occur when detectability is highest (January-February). Though broadcast surveys significantly improve detection rates for thrashers, surveyors should apply this method judiciously to avoid disturbing these species during the breeding season.

Tamarisk: An Inconvenient Truth. *Beatty, G., U.S. Fish and Wildlife Service, Arizona Ecological Services Office, 2321 West Royal Palm Road, Suite 103, Phoenix, Arizona 85021* Greg_Beatty@fws.gov

The federally endangered Southwestern Willow Flycatcher (*Empidonax traillii extimus*) uses the exotic plant tamarisk in just over 50 percent of all known flycatcher territories. Therefore, this plant plays an important role in its persistence, success, and recovery. However, there is a concurrent effort to remove tamarisk throughout the flycatcher's range, because of the long-held beliefs that removing tamarisk will save water, improve wildlife, and lead to native riparian plant recovery. Contributing to the effort to remove tamarisk, an exotic tamarisk-eating leaf beetle was introduced recently into the western United States. This insect was not anticipated to be able to occur or persist in the southwestern United States, but is now thriving and spreading in southern Nevada and Utah as well as northern Arizona and New Mexico. I will provide a broad overview and discuss the role of tamarisk in flycatcher recovery, the varying points of view of tamarisk, introduction of the tamarisk leaf beetle, and the future of these combined issues.

First Statewide Surveys of Wintering Mountain Plovers in Arizona, *Corman, T. E. 3918 E. Laurel Lane, Phoenix, AZ 85023, aplomado@cox.net*

Like many grassland species, Mountain Plover populations have declined across their range and are a species of concern in most states and provinces in which they occur. The winter distribution and abundance of these plovers in Arizona is quite incomplete. With support from the U.S. Fish and Wildlife Service and similar efforts in southern California, AZFO coordinated the first ever statewide surveys for Mountain Plovers during the winter of 2010-2011. The number of plovers detected was fewer than expected, but similar poor results were also obtained in California, suggesting wintering populations in the Southwest were well below normal levels this past winter. There is potential for conducting additional surveys during the winter of 2011-2012 in an effort to assess current population levels.

Shades of Gray: Changes in Abundance of Gray Hawk Nests on the San Pedro River over 13 Years, *Dorr, S. and T. Theimer, Department of Biology, Northern Arizona University, Flagstaff AZ 86011, Samantha.Dorr@nau.edu; M. Johnson and J. Holmes, Colorado Plateau Research Station, Northern Arizona University, Flagstaff, AZ 86011*

We conducted surveys for Gray Hawks in the San Pedro National Riparian Conservation Area (SPRNCA) in southeastern Arizona 2010-11. Gray Hawks have been historically studied in this area, which gives us a unique opportunity to study changes in their distribution and abundance

over time. When compared to previously collected data, Gray Hawk territories have increased from an average of 25 territories per year 1995-97 to an average of 54 territories per year 2010-11. While we did not find a strong relationship between mesquite height and number of young produced per nest, our data express a pattern in which nest initiation date is correlated with number of young produced per nest and that nests at lower elevations also initiate earlier in the season. With these patterns, we argue that nest initiation date could be used as an indicator for habitat quality with Gray Hawks. In addition, previously unoccupied habitats within the SPRCA are currently successful breeding habitats, so we will use NDVI to assess whether this change is due to Gray Hawks occupying marginal habitats, or if the riparian vegetation within the SPRNCA is expanding.

The Arizona Bald Eagle Management Program, *McCarty, K. M., Arizona Game and Fish Department,5000 W. Carefree Highway, Phoenix, AZ 85086,* kmccarty@azgfd.gov

For more than 30 years, Arizona's nesting Bald Eagles have been monitored, studied, and conserved by numerous partners, represented as the Southwestern Bald Eagle Management Committee since 1984. The Arizona Game and Fish Department has been the lead agency in management efforts for the species since 1991, annually conducting nest searches and productivity assessments, demography studies (banding nestlings and identifying banded adults), seasonal closures, the Arizona Bald Eagle Nest Watch Program, mortality and threat tracking, and coordinating a winter count. The Bald Eagle breeding population in Arizona has increased 600% since 1978 and expanded into new areas of the state. Productivity (fledged young per occupied breeding area) averaged 0.92 from 2002 to 2011. In 2011, 55 of the 62 known breeding areas were occupied and fledged 56 young. Breeding density varies from as high as one breeding area per 5 km of river on the lower Verde River, to one per 22.4 km on the upper Verde and Salt rivers. Of 152 breeders in 1987-2003, 81 were of undetermined origin (unbanded or unidentified), 70 were Arizona-born, and one was born outside of Arizona. Most adults (86%) breed within 150 km of their natal area, with females (average 109.7 km, n=21) dispersing farther than males (45.1 km, n=35). The average tenure in a breeding area for an adult is 9.8 years (n=83).

Effects of the Spring 2011 Pickett Fire on Avian Life, *Tomoff, C., Prescott College, Prescott AZ, tomoff@northlink.com*

The Pickett Fire swept through 526 ha of Sonoran Desert vegetation west of Boyce Thompson Arboretum in Pinal County on 8-9 May 2011. Responses to habitat changes by breeding birds were observed between May and early September. Some species stopped breeding while others continued or resumed nesting activity. Vignettes describing these responses are presented for species using saguaros, chollas, shrubs, or trees for nest sites.

Mexican Ducks in Arizona: An Overview of Identification and Distribution, *Vander Pluym, D. and L. Harter, 2841 McCullough Blvd. N. #1, Lake Havasu City, AZ 86403,* scre@aol.com, lbharter@gmail.com

The Mexican Duck (*Anas platyrhynchos diazi*), though apparently declining within its historic range in Mexico, appears to be expanding its range within the United States. In Arizona the

taxon is known mainly from the southeast corner of the state, but individuals have been found throughout Arizona in recent years. Identification of Mexican Ducks in Arizona is complicated, with a large range of variation including intergrades with "Northern" Mallard. Though the Mexican Duck is currently considered a subspecies of Mallard, recent genetic data suggest it is more closely related to other monochromatic Mallard-like species. This evidence suggests that the Mexican Duck deserves specific rank, which has renewed interest among ornithologists and birders. We will discuss identification criteria as well as the recent range expansion and current distribution of this taxon in Arizona.

2012

Breeding Biology of Red-faced Warblers in the Santa Catalina Mountains

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Conway, C.J., U. S. Geological Survey, Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho, PO Box 441141, Moscow, ID 83844

Red-faced Warblers (*Cardellina rubrifrons*) have a relatively restricted breeding range in the United States, but unusually high densities of breeding Red-faced Warblers occur in the Santa Catalina Mountains of southeastern Arizona. We have studied Red-faced Warblers breeding from 1800 m to 2800 m on Mount Lemmon since 2002, encompassing the entire elevational extent of the species' breeding range. Very little is known about the breeding biology of this species, and we have learned much about their breeding behavior. One of the most intriguing observations that we've made is that birds at the top of the mountain typically lay fewer eggs than birds at lower elevations. Our research suggests that differences in nest predators may explain why high-elevation birds lay fewer eggs. We were also surprised to see that nestlings grew more rapidly at high elevation. Understanding the differences in breeding biology and behaviors among warblers at different elevations will help aid efforts to predict the effects of climate change on montane birds in the southwestern United States.

Migratory and Wintering Strategies of Yellow-eyed Juncos in Southeastern Arizona.

Lundblad, C.G., Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona, 104 Biosciences East, Tucson, AZ 85719, carl.lundblad@gmail.com
Conway, C.J., USGS, Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho, P.O. Box 441141, Moscow, ID 83844

Yellow-eyed Juncos (*Junco phaeonotus*) make facultative short-distance migrations along elevational gradients in the Sky Island mountain ranges of southeastern Arizona. From 2011-2012 we color-banded 850 juncos on their breeding grounds at 5 sites spanning the elevational extent of the species' breeding range in the Santa Catalina Mountains. We surveyed each site for banded juncos every 2 weeks September-February and found evidence for female-biased migration. We found individuals moving between sites as early as the first week of September. Most movements away from breeding areas are assumed to be downslope, but we found evidence of some individuals temporarily moving upslope at the end of summer. The presence of persistent open ground was related to flock formation at some sites. Flocking behavior may represent an alternative strategy to migration and may explain uphill movements. All juncos

temporarily vacated breeding areas following extreme snow events. All major hypotheses proposed to explain partial migration predict the observed differences in migratory tendency among sex classes. We tested explicit predictions of each hypothesis in order to gain insight into the relative importance of each mechanism that could explain why some juncos migrate downslope and why others do not. Nests of resident individuals succeeded 59% of the time while those of migrants succeeded at a rate of 44%. Residents initiated nests an average of 2.5 days earlier than migrants, but nestling growth rate was not related to migratory status. Residents and migrants did not differ in response to simulated territorial incursions intended to measure interspecific aggression.

Results from Nine Years of Winter Banding and Bird Surveys on the Lower Colorado River. *Dodge, C., Bureau of Reclamation and LCR MSCP; Boulder City, NV, 89006*

For nine years, starting in the fall of 2002, the Bureau of Reclamation and the Lower Colorado River Multi-Species Conservation Program conducted a winter banding program using a mist net capture scheme at several restoration sites along the lower Colorado River. Mist netting was conducted at two or three sites each year and was conducted from October to March. These restoration sites were comprised of dense plantings of cottonwood (*Populus fremontii*), willow (*Salix spp.*) and some mesquite (*Prosopis spp.*). Three species were captured consistently in each year at each site; these species were the Orange-crowned Warbler (*Oreothlypis celata*), Ruby-crowned Kinglet (*Regulus calendula*), and the Audubon's subspecies of the Yellow-rumped Warbler (*Setophaga coronata auduboni*). Other species showed high capture rates in one year but low capture rates in most other years indicating a possible irruptive pattern to winter use by several species. Area searches were also conducted and compared to the mist-netting results. Overall the mist-netting was more effective at determining the number and abundance of species present, although both methods detected species that the other method did not.

What Gale Taught Me About Raptors and So Many Other Things.
Glinski, R., editor of "Raptors of Arizona," and Park Supervisor, Desert Outdoor Center at Lake Pleasant, Maricopa County Parks & Recreation Dept. rich.glinski@gmail.com

In my view Gale Monson left us two incredible gifts: for those lucky enough to know him, he was a great friend and teacher, and for the rest is a collection of writings that likely is among the most detailed natural history accounts ever recorded. Gale's connection to the natural world was amazing, but his tendency to reach out to others was inspiring. Since his passing in February of this year, Bill Broyles and I have assembled a collection of remembrances about Gale from those whose lives he touched, and that process has left me pondering Joni Mitchell's song... "Don't it always seem to go that you don't know what you've got 'til it's gone."

Riparian Bird Monitoring and Population Estimates for the Lower Colorado River.
Leist, A. J., D. M. Fletcher, E. M. Ammon, Great Basin Bird Observatory, Reno, Nevada, USA
Sabin, L. U.S. Bureau of Reclamation, Boulder City, NV

The lower Colorado River is a major center of bird diversity of the U.S. Southwest, and significant efforts are currently underway through the Lower Colorado River Multi-Species

Conservation Program (USBOR) to re-establish native riparian habitats. Toward this effort our work aims to estimate current population density of breeding riparian birds as a baseline for long-term population monitoring throughout the lower Colorado River system and to identify critical habitat requirements that can serve as guidelines for restoration of riparian habitats. Our focus for this project is on 6 species covered by the LCR MSCP (Gilded Flicker *Colaptes chrysoides*, Gila Woodpecker *Melanerpes uropygialis*, Vermilion Flycatcher *Pyrocephalus rubinus*, Arizona Bell's Vireo *Vireo bellii arizonae*, Sonoran Yellow Warbler *Dendroica petechia sonorana*, and Summer Tanager *Piranga rubra*). To survey for riparian birds we use a double-sampling area search spot mapping method. We conducted surveys at 80 randomly selected plots and in all established habitat creation sites each spring from 2007 through 2012. Plots were surveyed twice during the breeding season using a rapid area search method, with a subsample of these plots surveyed intensively (eight times during the breeding season) to determine actual numbers of breeding birds present in each plot. For this talk we will be giving an overview of our findings from the past 5 years and will discuss habitat requirements for species of interest.

Effects of Tamarisk Beetles on Southwestern Willow Flycatchers and Their Habitats. *McLeod, M. A.* and A. Pellegrini, SWCA Environmental Consultants, 114 N. San Francisco Street, Suite 100, Flagstaff, AZ 86001. *Presenter*

The southwestern Willow Flycatcher (*Empidonax traillii extimus*) is an endangered migratory passerine that breeds in dense, mesic habitats in the southwestern U.S. Occupied areas include native (e.g., willow), nonnative (tamarisk), and mixed vegetation with inundated or saturated soils. Starting in 2001, tamarisk leaf beetles (*Diorhabda* spp.) were released in the western U.S. as a biocontrol agent for tamarisk. The beetle now defoliates tamarisk annually along extensive river reaches, including areas occupied by southwestern Willow Flycatchers along the Virgin and Muddy rivers. The defoliation caused by tamarisk leaf beetles in areas of exotic or mixed vegetation alters flycatcher habitat in ways that are detrimental to the reproductive success of breeding flycatchers. Data from breeding flycatchers in St. George, Utah from 2008–12 suggest that reproductive success in tamarisk stands in the presence of tamarisk leaf beetles is poor, but that flycatchers may move into nearby, suitable native vegetation in subsequent years. At the end of the flycatcher breeding season in 2011, beetles reached the largest flycatcher breeding site along the Virgin River at Mormon Mesa near Overton, Nevada, and tamarisk within this mixed site was defoliated throughout the 2012 breeding season. Flycatchers at Mormon Mesa in 2012 had lower than average clutch sizes and fecundity, a higher than average rate of nest desertion, and fewer renests following failed nests. There are no suitable stands of native vegetation in the vicinity, and studies need to continue in 2013 to determine how flycatcher site fidelity will be affected by tamarisk beetles.

Insights from Five Years of Monitoring the Return of Yellow-billed Cuckoos to Restored Riparian Forests of the Lower Colorado River. *McNeil, S. E., 1708 E 9th St., Tucson, AZ 85719*

Yellow-billed Cuckoos (*Coccyzus americanus*) have suffered steep declines over the past century and are now rare breeding migrants to remnant riparian forests of the western United States. Following 7 years of habitat restoration under the Lower Colorado River Multi-Species

Conservation Program (LCR MSCP), Yellow-billed Cuckoos are colonizing new cottonwood-willow forests within the historic floodplain of the LCR. The cryptic nature of Yellow-billed Cuckoos has for decades confounded attempts at measuring their basic life-history traits; however, improvements in capture techniques and the opportunity to study these elusive birds over a relatively long period have provided new insights into their ecology and response to habitat restoration. From 5 years of capturing, color-banding, and radio-tracking cuckoos in restored LCR riparian forest patches in Arizona and California, we have found increases in breeding evidence each year, from just two confirmed breeding territories in 2008 to over 30 in 2012. Contrary to the idea that cuckoos require mature forest for nesting, we have found nests in new habitat patches after just two growing seasons. We also observed high site fidelity and limited between-site dispersal within the study area; of 15 confirmed resights from 2009-2012, all but two returned to the natal or previous breeding site. It remains unclear whether sufficient breeding habitat and connectivity exists in this fragmented western landscape for recovery of a viable western Yellow-billed Cuckoo population.

2013

Common Black Hawk Riparian Migration Corridors in Arizona. *Collins, P. 13934 E Placita flor del Desierto Vail, AZ 85641, pcollins AT houstone.com*

In the mid-2000s, local birders detected a Common Black Hawk spring migration route along the Santa Cruz River near Tubac. In 2008 over 40 Black Hawks were recorded in 90 minutes. This led to increasing efforts to quantify the migration, pooling reports from two observation sites, the Tubac Bridge and the Ron Morris County Park. In 2012 a 13-day count was conducted from the bridge, counting 92 Black Hawks, 28 Zone-tailed Hawks, and a variety of other raptors. Count days typically covered 3 hours each morning. Careful merging of reports from the park and nearby sites indicated 109 Black Hawks could be observed, a large percentage of the Arizona population estimate. In 2013 a 31-day count was conducted from Ron Morris Park. Over twice as many Black Hawks (231) were observed during 188 observation hours, suggesting this area of the Santa Cruz River is a significant riparian migration corridor. Overnight roosts along the river south of the park in an otherwise barren area are likely concentrating migrating birds near the park. An exploratory count organized by Erika Wilson at the Charleston Bridge on the San Pedro River well east counted nine Black-Hawks over 18 March mornings, many emerging from overnight roosts along the river, supporting the premise that Black Hawks are using riparian migration corridors when returning to Arizona. All Black Hawks at these two counts were adults. Reports of immature hawks in late April along the Santa Cruz encouraged an extended count period in future years.

The Distribution and Extent of Heavy Metal Accumulation in Song Sparrows of the Upper Santa Cruz River Watershed. **Lester, M. B., mlester126 AT gmail.com and C. van Riper, III. 1110 E. South Campus Dr., Room 123, Tucson, AZ 85721*

Riparian ecosystems in arid environments provide critical habitat for breeding, migratory, and wintering birds, yet are often at risk of contamination with heavy metals. Birds and other animals living in contaminated areas are susceptible to adverse health effects as a result of long-term

exposure and bioaccumulation of heavy metals. Our study took place as part of a collaborative effort to quantify the level of contaminants in the upper Santa Cruz River watershed. We chose to examine five study sites and a reference site that reflect different potential sources of contamination. We investigated the extent of heavy metal accumulation in blood and feathers of Song Sparrows (*Melospiza melodia*) over two breeding seasons. Birds at our 5 study sites typically had higher metal concentrations than birds at our reference site, though most metals were below background concentrations determined from previous studies. Copper, mercury, nickel, and selenium in Song Sparrows did exceed background levels. Song Sparrows generally showed lower heavy metal concentrations compared to Killdeer (*Charadrius vociferus*) collected along the Santa Cruz River in 1998, however, concentrations tended to be higher for Song Sparrows compared to Abert's Towhees (*Melozone aberti*) and Yellow-breasted Chats (*Icteria virens*) sampled in 2008 and 2009. Continued monitoring of heavy metal concentrations in birds in the upper Santa Cruz watershed is recommended, as well as future studies examining how heavy metal contamination affects avian health and productivity.
**Presenting author*

Exploring the Effects of Wildfires on the Avifauna within Arizona's Life Zones: The Sky Islands and Beyond. *Hough, E. R., P.O. Box 2842, Overgaard, AZ 85933, thebirdwhisperer22 AT yahoo.com*

Populations of bird species are adapted to particular biotic communities and are thus affected when environmental disturbances occur. Fires are a naturally-occurring disturbance within arid ecosystems and are intertwined with secondary seral succession. However, due to decades of fire suppression by humans, altered seasonality of fires, invasion by exotic-invasive plant species that alter fire regimes, and increased occurrence and severity of drought conditions associated with climate change, fires have now become more frequent, larger scale, and are burning with higher intensity. Avian communities are thereby also affected in response to changing fire regimes, with many species being either positively or negatively impacted across the landscape in regards to suitable nesting substrates and microclimates, food availability, and predation risk. The state of Arizona is one such arid region that has experienced more catastrophic fires across the landscape in recent years than during historical conditions, which are already impacting the state's diverse avifauna. This presentation will explore how fire will likely impact the avifauna within Arizona's several life zones, including the representative southeastern Arizona "sky islands" as well as other affected areas of the state, and which bird species are likely to be winners or losers following these disturbances.

Arizona Important Bird Areas Program's Most Important Partner: Birders! *MacFarland, J., Conservation Biologist, Tucson Audubon Society, 300 E. University Blvd., #120, Tucson, AZ 85705, jmacfarland AT tucsonaudubon.org*

There are currently 43 identified Important Bird Areas in Arizona. Thirteen of these areas have been officially recognized as Global IBAs and are part of an international network of sites that maintain the long-term viability of wild bird populations while engaging the public to conserve those areas of critical habitat. This would not have been possible without the help of over 500 skilled birders generously giving their time over the past 10 years. Thousands of surveys containing hundreds of thousands of observations made by trained volunteer birders make up the

Arizona IBA database. Examples of this successful partnership will be presented here, along with a summary of the IBA program itself, the amazing contributions of its volunteers, some of the great expeditions we have done with partners such as AZFO, and some of the data we have collected.

Observations on the Occurrence of Breeding White-Eared Hummingbirds in Miller Canyon, Huachuca Mountains, Arizona. *Melton, C. W., PO Box 592, Hereford, AZ 85615, cwmelton AT nearfamous.com*

The White-eared Hummingbird (*Hylocharis leucotis*) is a rare summer resident anywhere north of Mexico, and is most easily observed by birdwatchers at feeding stations in just a few locations in southeastern Arizona. Even rarer are observations of nesting individuals. During the Arizona Breeding Bird Atlas surveys in the 1990s, only two nests were confirmed. During the spring and summer of 2013, observations were made of White-eared Hummingbirds in Miller Canyon in the Huachuca Mountains. One nest was observed and its progress was followed. Shortly after the young fledged a second nesting attempt was begun. Utilizing photographs and video for comparison, at least four different individuals were seen, excluding nestlings and recent fledglings. These observations will be summarized and presented, and will also include comments on wing molt.

"Mexican" Spotted Owls and Fire in Southern Arizona. *Moors, A. K., Moors Wildlife Management Services, 1217 Crestwood Drive, Globe, AZ 85501, amoors AT cableone.net*

Stand-replacing wildfires are listed as a major threat to the continued existence of "Mexican" Spotted Owls (*Strix occidentalis lucida*), according to the 2012 Mexican Spotted Owl Recovery Plan. Arizona has seen an increasing number of large wildfires in the last decade. However, it is unclear how Spotted Owls actually respond to fire. During the last decade, I have been monitoring Spotted Owl territories in several mountain ranges in southern Arizona both before and after major wildfires. Owl surveys were conducted using the standard survey protocol developed by the USFS and USFWS. I have found that most pairs of Spotted Owls will continue to live and reproduce in territories that have burned, as long as the roosting and nesting groves still remain intact. Because Spotted Owls tend to select the coolest and moistest areas to roost and nest, those areas are more likely to survive a fire than other parts of their territories. I have found that in the years post-fire, Spotted Owls will often have exceptionally high reproductive rates.

2014

A Survey of Spring Migration at Lake Havasu with an Emphasis on Waterbirds. *Vander Pluym, D. 2841 McCulloch Blvd N. #1, Lake Havasu City, AZ, 86403*
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The development of reservoirs along the Colorado River has changed the ecology of the region and offered habitat for many species of aquatic birds where none existed historically. Aquatic bird surveys were done to look at use of the location as a stopover site and to gain an understanding of what species may now use the area regularly in migration. I conducted surveys at the north end of Lake Havasu between mid-March and mid-May 2014. The main focus was on

aquatic bird migration, although land birds were also counted. An attempt was made to use sound recording equipment to detect nocturnal migration. This was done to see how effective this type of survey method would be, with negative results. A total of 41,292 individuals representing 59 species of land birds and a total of 42,519 individuals representing 57 species of waterbirds were detected, excluding likely resident and breeding species, but including some likely wintering birds. Several aquatic species formerly considered rare were found regularly during the survey period and in recent years or were found in higher numbers than previously recorded, such as Common Loon, Eared Grebe, Red-necked Phalarope, and Bonaparte's and Franklin's gulls. This information can be used to judge future changes in aquatic bird use of reservoirs along the Colorado River.

Habitat, Diet, and Density: Gray Hawk Expansion on the San Pedro River. *La Porte, A. School of Life Sciences, PO Box 874501, Arizona State University, Tempe, AZ 85287 Email:* ariana.laporte@gmail.com *Website:* http://azgrayhawks.tumblr.com *Twitter: @AZGrayHawks*

The Gray Hawk (*Buteo plagiatus*) population in southeastern Arizona has been increasing since it was first censused in the 1980s, particularly along the upper San Pedro River and into the nearby Huachuca Mountains (Glinski 1988, Bibles 2004, Dorr 2011). In order to shed light on the causes and consequences of this expansion, I will examine Gray Hawk diet and foraging habitat in historic and newly established territories and estimate nest density and success. In this 2014 pilot season, I monitored Gray Hawk nests along a 30 km stretch of the upper San Pedro River and analyzed Gray Hawk diet in 3 territories that differed in habitat, historical occupancy, and water permanence. Nest density in this area increased by 30% since the last census in 2011, with some nests as close as 400 m apart. I visually confirmed nest success (chicks reached at least 75% of fledging age) for 71.43 % of nests (60% visual, 11.4% auditory). I confirmed a failure rate of 8.7%, and could not determine the success of 20% of nests. Diet and habitat analysis revealed that surrounding vegetation could influence prey selection. More samples are needed to detect patterns in foraging behavior, but my preliminary data show that Gray Hawks may adapt to available resources rather than specializing on a particular food source.

Seasonality, Habitat, and Diet of Gray Vireos at Kofa NWR in Southwestern Arizona. *Arnett, J. E., 7101 Jerstad Lane, Bldg. 500 Luke AFB, AZ 85309*
Kondrat-Smith, C. (presenting author), 27324 N 219 Ave., Wittmann, AZ 85361
azdesertbird [at] gmail.com

The winter distribution of Gray Vireo (*Vireo vicinior*) closely matches the distribution of small trees in the genus *Bursera*, particularly elephant tree (*B. microphylla*), that produce calorie-rich fruits. Thus, it is surprising that Gray Vireos have been reported by Gale Monson and others during the winter at Kofa National Wildlife Refuge (Kofa) in southwestern Arizona where no *Bursera* occur. Additionally, recent observations suggest that Kofa is an important early (e.g., late February and early March) migration stopover for north-bound vireos. To examine vireo occurrence and diet at Kofa, we conducted seven surveys from December 2012 to May 2013 at three canyons and two valley xeroriparian washes. We detected a surprisingly high number of vireos in December, including eight at Alamo Wash. Subsequently, a dramatic drop in vireo detections coincided with a hard freeze, followed by a gradual increase in detections in late March and April. We observed vireos eating caterpillars and possibly spiders. We did not

observe vireos eating fruit, though mistletoe and wolfberry fruits were plentiful. We conclude Gray Vireos may be more widespread than previously thought during the autumn and winter where arthropod prey is available and *B. microphylla* is absent until the first hard freeze occurs, after when vireos likely move to where *B. microphylla* fruit is available. Our results suggest that a winter-time monitoring strategy for the vireo and its habitat would need to consider the plasticity of the vireo's winter distribution, diet, and habitat use.

Winter Distribution and Plumage Characteristics of Sagebrush and Bell's Sparrows in Arizona. *McCreedy, C.,3820 Cypress Dr., Petaluma, CA 94954, cmccreedy@pointblue.org*
Kovach, A., G87 Rudman Hall, 46 College Rd., Univ. of New Hampshire, Durham, NH, 03824
Lester, M., 501 E 1st Ave #3, Salt Lake City, UT

The American Ornithologists' Union recently split the former Sage Sparrow (*Artemisiospiza belli*) into two taxa, Sagebrush Sparrow (*A. nevadensis*) and Bell's Sparrow (*A. belli*). Sagebrush Sparrow and the interior subspecies of Bell's Sparrow (*A.b. canescens*) have similar plumage characteristics and call notes, and these similarities render separation of the two taxa problematic in the field. Both Sagebrush and Bell's sparrow winter in Arizona, and their respective wintering distributions in the state are not well understood. In February 2014 we captured 85 *Artemisiospiza* sparrows at 5 sites representing 5 distinct vegetation assemblages across southern and western Arizona. We used plumage and morphological characteristics described in previous work to identify 74 individuals in the hand; one bird was left unidentified due to ambiguity in its plumage characteristics and in its intermediate wing size. To test our field identifications, we sampled blood from these 75 individuals to establish sex and genetic identification. Our field identifications were consistent with lab classification for 68 of 74 (92%) of our samples. We are further sequencing the gene for the remaining 6 samples, as the restriction fragment length polymorphism (RFLP) approach used by previous authors does not differentiate the species 100%. Our field identification success rate is thus preliminary and is a minimum. Preliminary results (considering only the 68 individuals with matching classifications) reveal that mixing between the two species was rare. At 4 sites only 1 species was present. At Robbins Butte (Maricopa Co.), 26 of 30 captures were identified as Bell's Sparrow (87%). This segregation was unexpected and suggests the two species hold divergent habitat preferences on their wintering grounds in Arizona. We photographed all captures from multiple views, and we will also discuss key identification points that may be used to separate these species in the field.

An Update on Neotropic Cormorants in Arizona: Using Citizen Science Data to Explore Trends in Range Expansion. *Hough, E. R., P.O. Box 2842, Overgaard, AZ 85933, thebirdwhisperer22 AT yahoo.com*

Neotropic Cormorants (*Phalacrocorax brasilianus*) were first detected in Arizona in 1961 and initially were rare in the far southern part of the state for the first few decades of occurrence. Breeding was suspected during the Arizona Breeding Bird Atlas surveys in the 1990s but was not confirmed until 2004. In the decade since, several colonies have become established in the Phoenix metropolitan area and the statewide population now numbers as many as a couple thousand. While generally a sedentary species, postbreeding wanderers are common and have now been documented across all regions of Arizona and into adjacent states. Using nesting

colony data and citizen science data generated by eBird (ebird.org), Christmas Bird Counts, the North American Migration Count, the Greater Phoenix Area Waterbird Census, and the AZFO sightings database, recent patterns in range expansion of Neotropic Cormorants across Arizona and the southwest U.S. will be explored.

Prolonged Physiological Effects of Capture and Brief Restraints in Male Rufous-Winged Sparrows. *Deviche, P. School of Life Sciences, Arizona State University, Tempe, AZ 85287-4501, (deviche@asu.edu)*

Capturing, marking, and then releasing birds are essential to studying many aspects of their biology. The potential physiological and/or behavioral impact of these activities is poorly understood, as are the specific nature and duration of this impact after birds are released. We investigated this question in adult male Rufous-winged Sparrows (*Peucaea carpalis*). The behavioral response to conspecific song playback was measured before sparrows were mist-netted. After captured, birds were immediately bled to determine initial blood parameters, confined in a cloth bag for 30 minutes, bled again, marked, and released. Capture and restraint increased plasma corticosterone (CORT; main stress hormone; 313%) and decreased plasma testosterone (T; main male gonadal hormone; 51%), uric acid (UA; main antioxidant; 37%), and glucose (GLU; main energy source; 7%), indicating rapid hormonal and metabolic effects. The next day, sparrows were located and their behavior measured again, followed with capture and immediate bleeding. Compared to first capture, males did not differ behaviorally and had similar plasma CORT and UA, but plasma T remained depressed and plasma GLU was 30% above initial concentration. Thus, despite no overt behavioral consequences, capture and brief restraint has prolonged (> 24 hrs), parameter-specific physiological effects. Support: National Science Foundation Award 1026620.

Geotagging Purple Martins on the Lower San Pedro River. *MacFarland, J., Conservation Biologist, Tucson Audubon Society, 300 E. University Blvd., #120, Tucson, AZ 85705, jmacfarland AT tucsonaudubon.org*

Purple Martins are a familiar bird to many in the United States, but the subspecies that nests in SE Arizona has some surprising traits that distinguish it from the nominate subspecies found in eastern North America. The *Progne subis hesperia*, also known as the Desert-Nesting Purple Martin, is an engaging bird that nests in saguaro cavities adjacent to riparian zones and has been little studied. Kevin Frasier of York University has studied eastern Purple Martins for years. In the summer of 2014 he partnered with the Arizona IBA program to place geotagging devices on some individual *P. s. hesperia* birds in an attempt to discover their migration route and wintering location. The experience was entertaining, and we made some unexpected discoveries along the way. This partnership will resume in 2015 and information on how you can help will be included in the presentation.

2015

Monitoring Diurnal Raptor Migration at a High-Elevation Site in the Central Highlands of Arizona: A Pilot Study during Fall 2013 and Spring 2014. *Smith, Z., Independent Raptor*

Biologist, 843 N. Citrus Ave., Los Angeles, CA 90038, zsgavilan@gmail.com, gavilanphoto.smugmug.com

Monitoring raptor migration at strategic locations has been in practice for several decades at numerous sites across North America. Most migrant raptor species are difficult to monitor during the breeding season and migration counts can provide data to help track population changes. Sites in western United States are typically located on north-south trending mountain ridges that create orographic wind currents that provide energy-saving lift for migrant birds. During the fall of 2013 and the spring of 2014, I made observations of migrant raptors from the Sierra Prieta Overlook in the Bradshaw Mountains west of Prescott, Arizona. The most common species observed during fall include Turkey Vulture (35% of flight), Cooper's Hawk (22%), Sharp-shinned Hawk (15%), Red-tailed Hawk (10%), and American Kestrel (9%). During spring, the most commonly seen species were Cooper's Hawk (24%), Swainson's Hawk (21%), Turkey Vulture (21%), and Sharp-shinned Hawk (11%). The majority of birds observed passed the site on days when the wind direction had a westerly component.

Gray Hawk Expansion on the San Pedro River: Density Dependence, Habitat, and Diet. *La Porte, A., School of Life Sciences, Arizona State University, Tempe, PO Box 874501, AZ 85287, Email:* ariana.laporte@gmail.com *Website:* http://azgrayhawks.tumblr.com *Twitter: @AZGrayHawks*

The Gray Hawk population along the San Pedro River has been expanding since it was first documented in the late 1970s. Gray Hawks first settled the northern areas of the San Pedro National Riparian Conservation Area (SPRNCA), where mesquite flanks the cottonwood gallery. But within the last two decades they have begun nesting in the southern, grassy end of the SPRNCA, and in the sycamore, juniper, and Madrean oak forests of the Huachuca Mountains. What might this population expansion indicate? The Fretwell-Lucas model of habitat selection states that preferred areas are settled first, and "overflow" individuals are consigned to lower quality habitats where productivity is lower. But are grassland and oak forest marginal habitat for these raptors? I am comparing Gray Hawk productivity and diet of pairs in these newly settled areas to those in historically occupied ones to determine how these raptors use different types of habitat and whether the Fretwell-Lucas model of population growth applies. Preliminary results suggest that overall productivity has not declined as the population has expanded. Though the percentage of nests that succeed is lower in newly settled areas, successful pairs produce more chicks in grassland and oak territories than those in historically occupied mesquite ones. These observations are from the 2015 breeding season only, and further research will determine whether these patterns hold over time. More data are needed to support a robust conclusion.

First Recorded Nesting of Crested Caracara in Saguaro National Park. *Norris, L. L., Adjunct Professor, The Southwest Center, The University of Arizona, Tucson, AZ 85721-0185, llnorris@email.arizona.edu*

A nesting pair of Crested Caracara (*Caracara cheriway*) was discovered in the Tucson Mountain District of Saguaro NP on 24 March 2015 by a National Park Service (NPS) resources management crew. Norris was asked by the NPS to set up a monitoring plan for this first known nesting of this species in the park. Brian Walsh, Pima County Water Reclamation, assisted in the field work. Generally, twice a week monitoring sessions were conducted over the next 76 days,

lasting until a few days after fledging. Data were collected on behavior of adult caracaras at the nest, development of young in the nest, frequency of foraging efforts, food transfers and food drops at the nest, types of prey items brought to the nest, and feeding behavior. Ultimately, two young were successfully fledged from the nest. The cooler than normal spring weather may have assisted the successful fledging.

Recent Population Dynamics of Elegant Trogons in Southeast Arizona. *Taylor, R. C., 2875 Hilltop Rd., Portal, AZ 85632, richardcachortaylor@gmail.com*

Annual late spring population surveys of Elegant Trogons (*Trogon elegans)* in the Chiricahua Mountains have been conducted using volunteer observers since 1978, and, intermittently, in the Huachuca Mountains since 1981. Beginning in 2013, with the help of volunteers recruited by the Tucson Audubon Society, similar surveys have been undertaken in the Atascosa, Santa Rita, and Patagonia Mountains, as well as continuing in the Huachuca and Chiricahua Mountains. Protocols for conducting trogon censuses, as well as the problems obtaining reliable results, are discussed. Population trends are reviewed for all 5 mountain ranges presently known to harbor breeding Elegant Trogons, as well as possible explanations for population changes.

Red Crossbill and Evening Grosbeak Call Types: Why and How to Identify Them.
O'Donnell, R. P., 6445 S. Maple Ave., Apt. 2150, Tempe, AZ 85283, Tsirtalis@hotmail.com

Evening Grosbeaks and Red Crossbills are widespread finch species with significant regional variation. Both species have call types that correspond to varying degrees with geographic distribution, morphology, and for the crossbills at least, diet and habitat. Accordingly, it has been suggested that these species might represent "species complexes," and that the various call types might actually constitute a number of biological species. Evening Grosbeaks of at least two types, "Type 4" and the enigmatic "Mexican" call type, Type 5, occur in Arizona but their distributions are very poorly known. Likewise with Red Crossbills: Types 2, 3, 4, 5, and 6 have all been documented in Arizona, but their distributions are very poorly known. Thus, birders and ornithologists in Arizona have a unique opportunity to contribute to the understanding of the distribution of these call types. This presentation will focus on the mechanics of call type identification, specifically: 1) equipment selection and use, including the recording gear most birders already have, like cameras and phones; 2) generating sonograms with free software; 3) interpreting call types from sonograms and matching them to published descriptions of calls; and 4) making findings available to the wider scientific community.

Using eBird Data: For Birders. *Harter, L. B. 2841 McCulloch Blvd. N. #1, Lake Havasu City, AZ 86403, lbharter@gmail.com*

One of the most important recent technologies in birding is the citizen science database eBird. This has become a popular way to contribute to citizen science year-round, to keep track of bird lists and birding outings, and to report rare bird sightings. Since its launch in 2002, eBird has quickly grown into one of the world's largest natural history databases. Scientists all over the world use this database in a very large array of analyses, and AZFO volunteers rely on it to compile seasonal reports, but how can birders delve into this database themselves? What can be

learned using the simple tools provided on the website, eBird.org? This presentation will be an overview of several of these tools, focusing on the learning-centered tools, demonstrating what can be learned from eBird about migration timing, abundance, distribution, individual sightings, and more.

Yellow-billed Cuckoo Nesting in the Coronado National Forest. *MacFarland, J. Conservation Biologist, Tucson Audubon Society, 300 E. University Blvd., #120, Tucson, AZ 85705, jmacfarland@tucsonaudubon.org*

The western population of Yellow-billed Cuckoo (*Coccyzus americanus*) was recently listed as "threatened" under the Endangered Species Act of 1973. Part of the process of listing is determining where to designate critical habitat to effectively manage the species for success – but where does the Yellow-billed Cuckoo nest in Arizona? The long-held belief that it primarily uses low-elevation river corridors such as the Santa Cruz and San Pedro rivers was challenged by a nest found in Montosa Canyon in the Santa Ritas in an oak tree. The Tucson Audubon Society and the Coronado National Forest teamed up to determine where else in the National Forest these birds are nesting, and they discovered some amazing things about Yellow-billed Cuckoos in the Sky Islands of southeastern Arizona.

AZFO Volunteers in Action: Increasing Our Knowledge of Arizona Birds by Contributing to the Coordinated Bird Monitoring Program. *Corman, T. E., Avian Monitoring Coordinator, Nongame Wildlife Branch, AZ Game and Fish Dept., 5000 W. Carefree Hwy., Phoenix, AZ 85086, tcorman@azgfd.gov*

The number of bird species documented in Arizona is 555, with 300+ documented as breeding at least occasionally in the state. Many of these birds have a significant part of their U.S. distribution (seasonal or entire) in Arizona; therefore, the state has an important responsibility to conserve them. Monitoring is a critical element in any conservation effort as it contributes to the decision-making processes. Monitoring data provides a better understanding of bird distribution, population size, and trends to undertake, evaluate, or modify conservation actions and plans. Arizona Coordinated Bird Monitoring projects have benefited from AZFO support, including winter Gray Vireo and Mountain Plover surveys, plus breeding bird discoveries in the Galiuro Mountains. From expeditions to little-known regions of Arizona or to conduct surveys for priority species, learn how your participation with AZFO activities is contributing to an ongoing statewide program.

Scientific Collecting Permits for Birds and Other Wildlife in Arizona. *Kondrat-Smith, C., 27324 N. 219 Ave., Wittmann, AZ 85361,azdesertbird@ gmail.com*

When preparing for a project involving wildlife in Arizona, it is important to understand what is needed to get a project started. The field researcher must prepare carefully everything, including funding, land access, and if required, obtaining both federal and state permits. (Even individuals simply observing wildlife need to understand what actions are legally unacceptable, and whether a special license is required.) Permits are important for ensuring wildlife protection, preventing unnecessary duplication in collecting birds and other animals and plants, and protecting public safety. Understanding the process for obtaining permits is vital to a successful project. This paper will explain what permits are legally required for scientific collecting in Arizona and the reasons

for these requirements. It will also describe the materials needed and the procedures to follow in applying for state and federal permits.

A Decade's Change in an Urban Riparian Bird Community.

Banville, M. J. (presenter), Central Arizona-Phoenix Long-Term Ecological Research. Julie Ann Wrigley Global Institute of Sustainability, Arizona State University,PO Box 875402, Tempe, AZ 85287, email: melanie.banville@asu.edu
Bateman, H. L., Arizona State University – Polytechnic campus, 6073 S. Backus Mall – MC 2580,Mesa, AZ 85212
Earl, S. R., Central Arizona-Phoenix Long-Term Ecological Research,Julie Ann Wrigley Global Institute of Sustainability, Arizona State University, PO Box 875402,Tempe, AZ 85287
Warren, P. S., Natural Resources Conservation, University of Massachusetts-Amherst, Holdsworth Hall, Amherst, MA 01003.

Riparian zones provide critical resources for wildlife and are hotspots for biodiversity. Urbanization can affect biotic communities in riparian zones by altering land cover of the surrounding landscape. However, shifts in communities may occur slowly, and there are few long-term studies in urban areas. The Central Arizona–Phoenix Long-Term Ecological Research (CAP LTER) program has been monitoring bird populations within the Phoenix metropolitan area and surrounding Sonoran Desert since 2001. Monitoring sites include 12 riparian sites that span four habitat types featuring natural or engineered settings with perennial or ephemeral flows. Here, we used long-term data to address three questions: (1) How does bird species composition vary among seasons and riparian habitat types? (2) Which environmental variables explain variation in habitat characteristics among riparian types? (3) How have riparian bird community composition, abundance, and species richness and diversity changed through time? Our analyses indicate that the migrant population varies among seasons. Engineered habitat types support more urban-adapted bird species; whereas, natural habitat types support more specialists. Environmental variables at the site level and landscape level explained differences in habitat characteristics across riparian types. Over time, bird communities decreased in abundance, species richness, and diversity. As contrasted with engineered habitat types, bird communities in natural settings experienced greater decreases and composition shifts. Overall, the riparian bird community of the greater Phoenix metropolitan area is shifting toward an assemblage dominated by fewer, more abundant species, with more resident urban-adapted species that are characteristic of riparian areas with less water and more impervious surfaces.

2016

The Evolution of Hummingbird Coloration and Courtship.

Simpson, R. K.(presenter), School of Life Sciences, Arizona State University, PO Box 874601, Tempe, AZ 85287-4601, rksimps1@asu.edu
McGraw, K. J., School of Life Sciences, Arizona State University, PO Box 874501, Tempe, AZ 85287-4501

Birds display an incredible diversity of exaggerated traits used for communication. The sensory drive hypothesis states that selection will favor signaling traits that can be effectively transmitted through the environment and can interact with each other to improve transmission efficacy. We are studying how the evolutionary interactions between colorful ornaments and display behaviors

led to the diversity in these traits across bee hummingbirds. We have filmed male courtship displays and plucked feathers from several species for color measurements. We then used these data to recreate each species' courtship displays, and we photographed each species' plucked feathers as we moved them through the recreated display to measure perceived male coloration. We then compared each species' plumage patch, display behavior, and perceived coloration. Our results indicate a strong negative relationship between patch size and display width. Additionally, we found that display shape is related to changes in male coloration as he displays across species. Our results demonstrate the importance of signal interactions and behavioral displays when evaluating color/trait diversity and coevolution.

Gray Hawk Expansion in the San Pedro River Valley: Habitat, Diet, and Density Dependence. *La Porte, A., School of Natural Resources and the Environment, University of Arizona, 138 E. 14th St., Tucson, AZ 85701-2428, ariana.laporte@gmail.com*

Models of ideal despotic distribution predict that populations of territorial animals will exhibit density dependent growth because newly arriving individuals will be relegated to inferior habitat where productivity is lower. Interference can also be a mechanism for density dependence if individuals devote more energy to territorial defense—and less to reproduction— as an area becomes more crowded. I examined these hypotheses in an expanding population of Gray Hawks (*Buteo plagiatus*) in southeast Arizona. As Gray Hawk numbers increased, pairs began to settle at higher elevations and in places with different foraging habitat. In the most recently occupied environments, pairs likely foraged in grasslands or oak woodland as opposed to mesquite bosques. I assessed vegetation and productivity in new and historical territories to determine if fecundity is declining with population growth and whether habitat heterogeneity might contribute to this pattern. I also analyzed nestling diet to assess how foraging habitat might affect the quantity and composition of prey that Gray Hawks feed their chicks. Preliminary results suggest that productivity is not lower in more recently occupied environments, though incubating females may be more vulnerable to predation in these areas. Mammals appear to comprise a greater portion of Gray Hawk diet in areas with grassland foraging habitat, while lizard prey appear to dominate in areas surrounded by mesquite.

A Look at the Seabirds of Arizona. *Vander Pluym, D., 2841 McCulloch Blvd. N, Apt. 1, Lake Havasu City, AZ 86403-6049, dvanpluym@gmail.com*

Despite being a landlocked state, Arizona's close proximity to the Gulf of California has given birders the chance to record multiple species of seabirds. Though there is no single definition of what a seabird is, I focus on the more pelagic species, including two species of shorebirds (Scolopaciade), three jaegers (Stercorariidae), three gulls/terns (Laridae), two tropicbirds (Phaethontidae), one albatross (Diomedeidae), three shearwaters/petrels (Procellariidae), three storm-petrels (Hydrobatidae), one frigatebird (Fregatidae) and two boobies (Sulidae). Hurricane Newton brought several new species which are currently pending. Looking forward, several species of seabirds have occurred elsewhere in the inland Southwest and could potentially occur in Arizona as well. Although most birders associate these occurrences with tropical storms in the late summer and early fall, including recently Hurricane Newton, the causes and timing of these events are often more complex than perceived. An understanding of these factors, as well as of identification, can help prepare birders for an encounter with these species.

Hurricane Newton Meets Tucson Wildlife Center. *Latas, P. J. (presenter), M. L. Bates, L. R. Whitehead, L. R., C. Richardson, Tucson Wildlife Center, Inc., 13275 E. Speedway Blvd., Tucson, AZ 85748-7125, pjlatasdvm@gmail.com*

Hurricane Newton swept northward over the Gulf of California during the first week of September, 2016. The well-organized remnants of the storm crossed southern Arizona and Tucson 6-7 September and deposited diverse pelagic and near-pelagic seabird species. What is a boon to excited birders and biologists is a major tragedy to these birds. Several individuals were presented to Tucson Wildlife Center for urgent veterinary care. As a modern and cutting-edge facility, Tucson Wildlife Center was ready for many situations but an influx of pelagic seabirds was never on the training agenda. This presentation will discuss the species involved; the veterinary care and planning; interpretation of a rare natural weather event on wildlife rescue, care and reintroduction; and the lessons learned.

Partners in Flight Landbird Plan Revision: What It Means for Arizona. *Beardmore, C. J., 14239 N. 10th St., Phoenix, AZ 85022-4311, Carol_beardmore@fws.gov*

Partners in Flight has revised its 2004 North American Landbird Conservation Plan, and the 2016 version is now available. New analyses of Breeding Bird Survey data, eBird data, and other data sources provide a new view of the vulnerability of landbirds. The new "half-life" analysis presents information on the length of time until current species' populations will decline by half. For example, Bendire's Thrashers will decline by 50% in only 18 years at the current rate of decline. The Partners in Flight "Watch List" and a new grouping of vulnerable birds titled "Common Birds in Steep Decline" are highlighted. Both lists point to urgent conservation needs in Arizona's desertscrub and grassland habitats. Information is presented on a continental level as well as on a Bird Habitat Joint Venture level.

A Recovery Effort: California Condor Distribution, Breeding, and Challenges in the Southwest Population. *Hauck, T., PO Box 6123, Marble Canyon, AZ 86036-6123, Hauck.tim@peregrinefund.org*

Few species have been monitored and studied as closely as the California Condor. Since The Peregrine Fund began releasing condors into the wilds of northern Arizona in 1996, its range, breeding activity and population size have all significantly increased. In the early years, bird movements were limited to the Vermilion Cliffs, their natal area and location of the condor release site. As the population has grown and matured, the range has expanded to the South Rim of the Grand Canyon, the Kaibab Plateau and into southern Utah. Using conventional very high frequency (VHF) transmitters and the Global Positioning System (GPS), biologists are now able to clearly see patterns in seasonal movement that directly correlate to breeding behavior and food availability. While the highest number of potential breeding pairs and nesting attempts in the program's history were recorded in 2016, the population still faces many challenges to becoming self-sustaining. The leading cause of death and biggest limiting factor to population growth continues to be lead poisoning. Lead fragments found in gut piles and carcasses in the field pose a serious threat to the California Condor as well as other scavenging raptors. The Peregrine Fund

is working with state wildlife agencies to address this issue in an effort to forge social and cultural change within the hunting community.

A Summary of Bird Monitoring of Restoration Sites on the Lower Colorado River. *Dodge, C., Wildlife Biologist, Lower Colorado River Multi-Species Conservation Program,U.S. Bureau of Reclamation, PO Box 61470, Boulder City, NV 89006-1470, cdodge@usbr.gov*

Since 2005, the Lower Colorado River Multi-Species Conservation Program (LCR-MSCP) has been developing restoration sites along the Lower Colorado River, with cottonwood-willow, mesquite, marsh and backwater habitats represented. These sites have provided new areas of native habitat for breeding and migrating birds. The LCR-MSCP has monitored birds at these restoration sites and at existing habitat along the entire river. Bird monitoring includes surveys for southwestern Willow Flycatchers, Yellow-billed Cuckoos, marsh birds like the Ridgway's Rail, and other riparian breeding birds such as Summer Tanagers and Arizona Bell's Vireos. Productivity and survivorship are being tracked at bird banding stations through the Monitoring Avian Productivity and Survivorship (MAPS) Program. These surveys have gathered a large dataset on bird use at both restoration sites and the entire LCR as a whole. As the acreage of restoration sites increases on the river, they will play an increasing role in providing habitat for the bird community on the LCR and are designed to offset losses of habitat from diverting and delivering water to communities and agriculture.

Spatial Ecology of the Lower Colorado River Valley Population of Greater Sandhill Cranes. *Conring, C. C., B. A. Grisham (presenter), W. C. Conway, Department of Natural Resources Management, Texas Tech University, Box 42125, Lubbock, TX 79409-2125, blake.grisham@ttu.edu*
Collins, D. P., Region 2, US Fish and Wildlife Service, PO Box 1306, Albuquerque, NM 87103-1306

The lower Colorado River Valley population (LCRVP) of Greater Sandhill Crane (*Antigone candensis tabida*) is among the smallest and least studied population of Sandhill Cranes in North America. We equipped 18 greater Sandhill Cranes on 2 study sites in southwest Arizona and southeast California to assess the spatial ecology of the LCRVP. Our goal was to assess 3 objectives regarding LCRVP greater Sandhill Crane spatial ecology: overwinter space use and habitat selection at two scales (population, social group), and identification of migratory pathways and areas of migration importance (AMIs). Ten groups had > 85% overlap with their home range from the previous year. All home ranges partially overlapped, and six groups overlapped 100% with at least one home range from another group. The home ranges reported were larger than home range estimates in previous Sandhill Crane studies, indicating resources on wintering grounds are not arranged in space that minimized home ranges. Our results indicated that roosting locations were the principal driver of resource selection at both spatial scales and are likely a limiting factor for the overwintering LCRVP. Fall and spring migration corridors covered similar areas, but the fall corridor was a straighter and more direct path between breeding and wintering areas while the spring corridor was 50 km wider. We identified 16 AMIs over the four migration events; the Mojave National Preserve, Pahranagat National Wildlife Refuge and Wayne E. Kirch Wildlife Management Area were the most used AMIs.

Bringing Back the Colorado River Delta for People and Birds, *Hinojosa Huerta, O., Pronatura Noroeste, Calle Décima No. 60, Zona Centro, Ensenada, Baja California, México,* *osvelhh@gmail.com*

The Colorado River is one of the world's hardest-working and most loved rivers, and it has been the basis for growth in western United States and northwestern Mexico. The harnessing of the river has caused severe environmental impacts all over the basin, but this has been more severe in the delta of the Colorado in Mexico. However, significant wetlands have remained, maintained by agricultural run-off, seepage, and inadvertent releases since the 1970's, creating habitat for over 250,000 wintering waterbirds and maintaining the largest population of the endangered Ridgway's Rail. These remnant wetlands have shown amazing resilience and represent one of the best opportunities for ecological restoration in the region. Over the past decade, policymakers, agencies, academic institutions, communities, and nongovernmental organizations from the United States and Mexico have begun working cooperatively to create historic change for the delta.

In 2012, a milestone was reached when the U.S. and Mexican governments agreed to a set of restoration provisions for the Delta in a historic, binational water-sharing agreement known as Minute 319. This new and innovative policy framework allows the United States and Mexico to share water surpluses in times of plenty and reductions in times of drought, provides incentives for leaving water in storage, and conserves water through joint investments in projects from water users in both countries. It also lays the foundation for ongoing environmental restoration projects in the Colorado River Delta, including the allocation of 195 thousand acre-feet of water for the environment, provided jointly by the United States, Mexico, and a binational coalition of environmental organizations, as well as funding for on-the-ground riparian restoration, which has regenerated just over 405 ha of cottonwood, willow, and mesquite forests in the delta.

In addition, a binational scientific monitoring effort is being implemented, to evaluate the hydrological and ecological response of the ecosystem to the environmental flow releases and the restoration efforts. The ecological response has been strong and positive. The greenness of the floodplain has increased, as well as the cover of native riparian trees at the restoration sites. The bird community has responded accordingly, with a significant increase in diversity and abundance, especially in key riparian species, such as Vermillion Flycatcher, Yellow-breasted Chat, and Abert's Towhee. Other wildlife is making a comeback, including beavers and bobcats.

At the same time, the response from the local communities in the delta has been astounding. During the environmental flow releases, thousands of people collected by the river to celebrate the revival of the Colorado, and for the younger generations, this was the first time they ever saw the river flowing. This has created a strong momentum in the region for the continuation of this initiative. The restoration efforts in the Colorado River Delta represent a sign of hope for the people, birds, and other wildlife that depend on a healthy river. It is an unprecedented and unique undertaking in the global context, and we hope to use the momentum of this historic work to bring more water to the delta in the future, as well as create a model for future transnational river restoration efforts throughout the world.

2017

Citizen Science in Action: Birders Working to Conserve Birds through Arizona Important Bird Areas. *MacFarland, J., Tucson Audubon Society, 300 E. University Blvd., Ste. 120, Tucson, AZ 85705,* jmacfarland@tucsonaudubon.org.

Arizona has an unusually active and productive Important Bird Areas (IBA) program. This is largely due to its band of dedicated and talented volunteers, and its valued partnerships with the Arizona Game and Fish Department, land management agencies, and local birding and "friends" groups around the state. There are 48 IBAs in Arizona, with four being quite close to Cottonwood. They are Lower Oak Creek IBA, Tuzigoot IBA, Upper Verde River State Wildlife Area IBA, and Watson and Willow Lakes Ecosystem IBA. These IBAs in particular have dedicated volunteer survey teams that shed important light on the conservation importance of these areas. Some of the larger survey projects manned by IBA volunteers and the results of these studies will also be outlined, as well as the astonishing contribution of volunteers to the overall statewide program.

Range Expansion of Mexican Ducks in Arizona. *Swarbrick, B. M., 115 E. Canyon View Dr., Tucson, AZ 85704, bonnie.swarbrick@gmail.com.*

The "Mexican" Mallard (*Anas platyrhynchos diazi*) has expanded its range in Arizona beyond its historic distribution to include the Sonoran Desert, primarily due to human-altered wetlands such as urban parks and sewage-treatment ponds. These recently created habitats have not only influenced distribution of this subspecies of mallard but have also altered "Northern" Mallard (*Anas platyrhynchos platyrhynchos*) migration patterns. As a result, both of these subspecies of the Mallard (*Anas platyrhynchos*) are now migrants and winter visitors to formerly vacant nesting habitats. Substantial interbreeding is evident between "Northern" and "Mexican" Mallards, resulting from broods of both raised in and near water-treatment sites. This study documents the yearlong presence of Mexican Ducks and hybrids within rural and urban ponds in the Sonoran Desert. "Northern" Mallards are generally absent during the nesting season, with the exception of urban ponds. Therefore, pairing of "Northern" and "Mexican" Ducks is limited during summer but may be prominent in the winter months. Although intergrades of "Northern" and "Mexican" Mallards may be increasing in these new subtropic habitats, the lower number of "Northern" Mallards prevents genetic swamping. Rural and remote areas, where "Northern" Mallards are few or in low numbers, are generally populated with "Mexican" phenotypes. The above phenomena are attributed to the influence of nutrient-rich water-treatment ponds on "Mexican" and "Northern" Mallard recruitment.

Nonnative Grasses Decouple Habitat Selection from Fitness in Grassland Birds. *Andersen, E. M. (presenter), and R. J. Steidl, School of Natural Resources and the Environment, University of Arizona, 1064 E. Lowell St., Tucson, AZ 85721, erikandersen@email.arizona.edu.*
Nonnative plants that are structurally similar to native species may present misleading cues to animals, indicating the availability of resources that are no longer abundant in invaded areas. Migratory birds that breed in arid grasslands may be especially susceptible to this disassociation between evolutionarily honed cues and future resources, because they establish breeding sites in spring but delay nesting until summer when monsoon rains trigger increases in abundance of the insect prey needed to provision nestlings. We established 140 plots across a

gradient of invasion by nonnative grasses in southeastern Arizona, where we studied density and nesting success of grassland birds along the invasion gradient. For the two most common bird species, density and nest success were not associated positively. Specifically, as dominance of nonnative grasses increased, density of Grasshopper Sparrows (*Ammodramus savannarum*) decreased by 75% and daily nest survival increased by 19% across the invasion gradient. This suggests that individuals avoid invaded areas that enhance reproductive success. Conversely, as dominance of nonnative grasses increased, density of Botteri's Sparrows (*Peucaea botterii*) increased by 33% and daily nest survival decreased by 4% across the invasion gradient. This suggests that invaded areas might function as ecological traps, attracting individuals from areas of high-quality habitat into areas where reproductive success is lower. By decoupling settlement cues from the resources associated with those cues over evolutionary time, nonnative plants can substantially alter the distribution and demography of grassland birds.

eBird—Crowdsourcing Ornithology. *Davies, I., Cornell Lab of Ornithology, 159 Sapsucker Woods Rd., Ithaca, NY 14850, id99@cornell.edu.*
As a researcher or conservationist, the work that you do is pretty much always going to be limited by money and time. What if there was a way to collect data from the crowd to inform your work? eBird taps into the global interest in birds, engaging more than 350,000 birders worldwide to collect more than 450 million bird observations from every country—all available for free for you to use. This presentation will focus on what eBird resources are available for birdwatchers, conservationists, and researchers, including some case studies and examples of recent work by both Cornell Lab and external analysts.

North America's only Caracara: Wide-ranging but Little Known., *Morrison, J. L., 390 Rincon Rd., Corrales, NM 87048, Joan.morrison@trincoll.edu.*
In North America, populations of the Crested Caracara (*Caracara cheriway*) occur in Florida, Texas, and Arizona, and in parts of northern Mexico. Despite being relatively common where it occurs, the species has received little attention compared to many North American raptors. My research on the Florida population represents the only in-depth study of this species anywhere throughout its range. The Arizona population has never been formally studied, although groups of caracaras are now regularly seen foraging in agricultural areas—the largest numbers observed during winter months. Our upcoming studies in Arizona are likely to provide new insights on this intriguing raptor. The fact that Florida's population is isolated likely has had a strong influence on its ecology, so this nonmigratory population may not be representative of the species generally. The landscape is quite different among areas where caracaras occur, so its ecology likely varies geographically as well. Also worthy of investigation are the species' vagrancy patterns. During the past 10 years, caracaras have been increasingly reported in far northern states, and even in Canada. Why has this raptor received so little attention? Perhaps because it is most often perceived as a scavenger, and it regularly associates with vultures. Or, given the caracara's association with agricultural lands, issues of access to nests and roosts on private land may deter interest in developing further studies. To better understand our only caracara, however, these perceived barriers must be overcome.

Distribution and Habitat of Elf Owls in Riparian Environments in Arizona.
Vander Pluym, D. (presenter), 2841 McCulloch Blvd. N., Apt. 1, Lake Havasu City, AZ 86403, dvanpluym@gmail.com

Boone, J. D., Great Basin Bird Observatory, 1755 E. Plumb Ln., Ste. 256A, Reno, NV 89502; Flesch, A. D., School of Natural Resources and the Environment, University of Arizona, 1675 Alklam Rd., Tucson, AZ 85745

The Elf Owl (*Micrathene whitneyi*) has experienced declines on the western edge of its range and is a covered species under the Lower Colorado River Multi-Species Conservation Program. As part of a broader study on riparian habitat use in this species, we assessed the distribution and habitat use of Elf Owls across a gradient of riparian and adjacent upland environments in portions of southern and western Arizona. Specifically, we assessed occurrence probabilities of owls in three different riparian and adjacent upland vegetative communities in areas with and without potential nest cavities provided by saguaro cacti; identified environmental factors that explain occurrence probabilities; and evaluated the significance of broadleaf-deciduous riparian vegetation to owls in these communities. In the spring of 2015, we used call broadcast to survey owls at 1,397 survey stations along 112 transects (193 km in total length) and obtained 855 detections of Elf Owls that represented approximately 553 individuals. Probability of Elf Owl occurrence increased markedly with presence of saguaro cacti, suggesting the importance of nest cavities they provide. Occurrence probabilities in areas dominated by mesic and xeric riparian vegetation were similar, but lower at stations in exotic riparian vegetation dominated by salt cedar. Moreover, probability of Elf Owl occurrence increased with cover of broadleaf deciduous trees and mesquite in riparian areas, with cover of mesquite in uplands, and with increasing height of upland vegetation, but only in areas where saguaros were present, with no effect elsewhere.

2018

Conservation of Western Burrowing Owls in an Urban/Suburban Desert Landscape.

Loyd, K. A. T. (presenter), k.loyd@asu.edu; New College of Interdisciplinary Arts and Sciences, Arizona State University Colleges at Lake Havasu, 100 University Way, Lake Havasu City, AZ 86403,Watkins, R. T., Davey, C. S., and Young, C. L.

Burrowing Owl (*Athene cunicularia hypugaea*) is a species of conservation concern in Arizona. In Lake Havasu City, AZ, owls occupy nontraditional habitats—desert washes (arroyos) in developed locations. We began studying habitat characteristics and productivity of local Burrowing Owls in February of 2014. Over the past 5 breeding seasons, we monitored 112 nests. Nest success ranged from a low of 44% in 2014 to a high of 75% in 2015 with an average of 70% over all 5 years. The mean number of fledglings per nest to date is 2.9 (range 1-8). Nineteen nests were abandoned for unknown reasons and 16 experienced a mortality of 1 or more adults and chicks (predation and suspected secondary poisoning). Four breeding pairs were relocated to Phoenix from our population in 2017 due to wash stabilization projects. Results from regression models suggest that nest sites experiencing a mortality were less likely to produce fledglings but those with larger burrow diameters were more likely to have a larger number of offspring. This season, to address movement and juvenile dispersal, we began capturing and banding urban owls using walk-in traps at nests. We captured 29 individual owls from 16 nest locations and 6 females, 1 male and 22 juveniles were banded. We will be recording information on resighted birds over the next 2 months and I discuss these results as well as challenges of capturing urban

birds during my presentation. In the future, we will continue to work to provide baseline data on this unique population.

Do Solar Facilities in the Southwestern U.S. Pose a Threat to Yuma Ridgway's Rails?
Harrity, E. J. (presenter), Idaho Cooperative Fish & Wildlife Research Unit, Department of Fish & Wildlife Sciences, University of Idaho, 875 Perimeter Dr., MS 1141, Moscow, ID 83844, 808-938-0546, eharrity@uidaho.edu.

Conway, C. J, USGS, Idaho Cooperative Fish & Wildlife Research Unit, Department of Fish & Wildlife Sciences, University of Idaho, 875 Perimeter Dr., MS 1141, Moscow, ID 83844, 208-885-6176, cconway@uidaho.edu.

The Yuma Ridgway's Rail (*Rallus obsoletus yumanensis*) is a federally endangered marsh bird endemic to wetlands throughout the lower Colorado River basin. The U.S. population has declined in recent years for unknown reasons. Yuma Ridgway's Rails depend on fragmented patches of emergent wetland vegetation that are separated by large expanses of nonhabitat, primarily agricultural lands or desert. Yuma Ridgway's Rails were thought to be sedentary, but recent rail mortalities at solar energy facilities suggest that these rails fly over desert regions during dispersal or migratory movements. Efforts to prevent future mortalities and potentially mitigate the effects of solar facilities require information on dispersal and migratory behavior of these rare birds (information that is currently lacking). We attached solar satellite transmitters to 16 Yuma Ridgway's Rails in 2017 to document annual movement behavior. Three of the radio-marked rails moved in the fall to estuaries in Mexico along the Gulf of California (as far as 250 km south). These movements are the first documented records of rails moving from the U.S. to Mexico. We attached transmitters to 30 Yuma Ridgway's Rails in 2018 and are currently monitoring their movements. Additional information on the annual movement behavior (i.e., direction, distance, and phenology of long-distance movements) of Yuma Ridgway's Rails will help inform land management actions and permitting decisions in the region, especially at solar facilities that may need to account for their impact to this endangered species.

The Ferruginous Pygmy-Owl in Southern Arizona: Natural History, Distribution, and Status.
Tibbitts, T. J. (presenter), 2828 W. Calle Arandas, Tucson, AZ 85745. *ttibbitts000@gmail.com; Richardson, S. U.S. Fish and Wildlife Service, 201 N. Bonita, Suite 141, Tucson, AZ 85745.*

The "Cactus" Ferruginous Pygmy-Owl (*Glauciudium brasilianum cactorum*) is a small owl distributed irregularly in lower elevations of southern Arizona, generally below 1,220 m elevation. More common and widespread a century ago, this pygmy-owl has experienced declines likely related to loss and degradation of habitat, climate change, and other factors and has been the subject of controversy and conservation in southern Arizona. This presentation will provide an overview of the species' natural history, habitat, and historical and currently known distributions. Variations in habitat across its range will be examined. Conservation and management actions will be discussed, including captive breeding /population augmentation and a history of its status under the Endangered Species Act.

From Thorny Chaco Winters to Summer Love Triangles: A Year in the Life of a Cuckoo.
McNeil, S. sem.ssrs@gmail.com; Southern Sierra Research Station, Tucson, AZ.

After leaving their southwestern riparian breeding grounds in August-September, western Yellow-billed Cuckoos (*Coccyzus americanus*) of the lower Colorado River fly south through western Mexico and Central America, seemingly always within bird's-eye view of the Pacific coast. They continue to Colombia and beyond in December arriving with the hot rainy season in the thorny Gran Chaco forest of Bolivia, Paraguay, and Argentina, where they spend up to 5 months molting and recovering from their journey. In April the cuckoos begin following the rains north, back through Colombia, Central America, and Mexico. They cross the Chihuahuan and Sonoran deserts, finally arriving back to their breeding grounds in time for another hot summer monsoon season. Love triangles ensue.

The Aleutian Cackling Goose in Arizona. *Vander Pluym, D., dvanpluym@gmail.com ;2841 McCulloch Blvd. N., #1, Lake Havasu City, AZ 86403.*

There is little published information about the occurrence of Aleutian Cackling Geese (*Branta hutchinsii leucopareia)* in Arizona, though it has long been suspected to occur in the state. Formerly placed on the Endangered Species List in the United States, this taxon has rebounded, which has led to an increase in numbers occurring outside of its historical range, including into Arizona. Though the "white-cheeked" *Branta* geese are an identification challenge, *B. h. leucopareia* is fairly distinctive within the group. Here we look at the status and the history of this taxon in Arizona as well as its identification.

Escaping the Migrant Trap-Field Ornithology in Underbirded Locations, *McCreedy, C. cmccreedy-RA@pointblue.org; Atwell and Point Blue Conservation Science, Tucson, AZ.*

Things that are simultaneously supremely fun and supremely useful should be celebrated, and exploring underbirded locations is one of them! Data collected by Arizona Field Ornithologists are more important than ever, given rapid climatic change in our deserts and at best, static funding for avian research and monitoring projects. This talk will focus on the importance of escaping 'the migrant trap', a play on words based on a tendency for birders to devote a large proportion of their efforts to visiting the same locations repeatedly – locations that may not be necessarily representative of the surrounding habitat matrix. We will discuss desert avicaching, review examples of great data taken at underbirded locations, and suggest ways you can explore underbirded locations, take a walk on the wild side, and contribute to the Avian Knowledge Network.

How Citizen Science Results (eBird) are Used for Vulnerability Analyses and Conservation Planning and Management. *Beardmore, C. J. Dchrysoparia@gmail.com; 14239 N. 10th St., Phoenix, AZ 85022.*

Partners in Flight, a bird conservation consortium, has assessed vulnerability of bird species in Canada, the United States, Mexico, and the Central American countries since the early 1990s. In the past, Partners in Flight has used data from the Breeding Bird Survey, Christmas Bird Counts, various regional monitoring projects, and experts to carry out the analyses. Partners in Flight's process scores population size, population distribution, population trend, threats, and relative density to devise a total score both at the continental/global and regional levels. These scores are

combined to determine a species' vulnerability and need for conservation planning and management at two levels of concern, continental and regional. More recently Partners in Flight has begun using eBird data to supplement or replace some of these data sources. eBird data are fast becoming as rich as the Breeding Bird Survey and are being used for calculating relative density and population trends. The use of eBird data underscores the importance of participating in eBird data collection and ensuring our eBird data are complete and accurate. Because most of the vulnerability assessment relates to breeding birds, it is especially important that eBirders record breeding code notations when observed. Examples of how the scores are combined to inform conservation planning and management will be given.

2019

Enhancement of Kachina Wetlands for Wildlife and Environmental Education. *Vojta, C.D., christina.vojta@nau.edu Audubon's Kachina Wetlands Bird Sanctuary, 2263 Utility Rd Flagstaff, AZ 86005*

Kachina Wetlands consists of approximately 100 acres of land owned and managed by Kachina Village Improvement District (KVID) for the storage and evaporation of treated wastewater. KVID also allows the public to visit the site, and it has become a popular place for walking, bicycling and bird watching. This presentation describes historic and current habitat enhancement work performed at the wetlands and how that work mobilized individuals from several communities and organizations. Recent grants have enabled the promotion of environmental education, weed abatement, and the establishment of a pollinator garden. The current eBird tally for this area is 233 species, over half of which are wetland-associated.

Bark Thickness is Related to Hairy Woodpecker Excavation of Prey in Northern Arizona Ponderosa Pine Forests. *Hammond, R. L., rlh267@nau.edu and Theimer, T.C., Biological Sciences Department Northern Arizona University 617 S. Beaver St. Flagstaff, AZ 86011*

Woodpeckers are important forest species, creating habitat for a diversity of animals by excavating nest cavities and aiding in the control of the forest pests on which they feed. Better understanding of the ecology of umbrella and keystone species, such as woodpeckers, in threatened environments is needed as Global Environmental Change and human population growth exacerbate the current forest loss rate of 0.6% per year. In the Coconino National Forest in northern Arizona, Hairy Woodpeckers excavate for food in live and healthy ponderosa pines (*Pinus ponderosa*) ~27 times more per available tree area in forests growing on young and coarse cinder soils than in forest growing on older and finer soils. Using data collected at 3 sites on coarse and 3 on fine soils, we investigated 2 hypotheses to explain why birds use coarse soil sites more than fine soil sites: I) there are fewer large-diameter trees available, thus increasing the use of each available tree, II) tree characteristics that potentially affect woodpeckers and their wood-boring prey differ between the two forest soil types. Hypothesis I was not supported, with no relationship existing between tree use and available tree-area per bird ($n=6$ sites, $\beta=-16.9$, $p=0.16$). Hypothesis II was supported. Phloem and bark thickness were both significantly smaller (~3mm, $n=110$; phloem $t107-2.57$, $p=0.01$; bark $t104-1.94$,$p=0.05$, respectively) in used trees vs. unused trees, with bark thickness being strongly correlated with use at unstressed sites ($r=0.71$, $p<0.001$).

A Multiscale Framework for Assessing Potential Conflict of Wind Energy Development for Golden Eagles in Arizona Using Random Forests. *Losee, M. J., michele@raptorfalconrycenter.org; International Raptor & Falconry Center, P.O. Box 33 Cornville, AZ 86325; Jacobson, J. and McCarty, K., Arizona Department of Game and Fish 5000 W. Carefree Highway Phoenix, AZ 85086; Cushman, S. A., Rocky Mountain Research Station 2500 S. Pine Knoll Dr. Flagstaff, AZ 86001; Wan, H. Y., Northern Arizona University 1899 S. San Francisco St. Flagstaff, AZ 86001*

The demand for renewable energy has been rising in recent decades and wind power is the fastest growing clean energy source. The cost of wind power facility development has been reduced considerably, making wind power a feasible option to reduce harmful emissions while providing affordable electricity. Nonetheless, because ideal locations for wind power projects can potentially coincide with key habitats of wildlife species, there is growing concern about the impact increasing construction of wind facilities can have on wildlife, especially on avian species that are susceptible and vulnerable to wind turbines collisions. We describe a multiscale optimization modeling approach to assess potential conflict with wind turbine placement in wildlife habitat. Also, we demonstrate the application of the approach to prioritize conservation and management efforts for the Golden Eagle (*Aquila chrysaetos*) in Arizona as an example. We establish how the approach helps identify economically feasible sites for wind turbine placement, while minimizing conflict within nesting habitat of the Golden Eagle. The approach explained here provides a conceptual and quantitative framework for evaluating potential conflicts with wind power development on other wildlife habitats, while acknowledging the need for renewable wind energy and providing practical solutions for such developments.

Western Yellow-Billed Cuckoos in the Sky Islands of Southeastern Arizona: A Watershed Perspective. *Beauregard, N. D., nickbeauregard@gmail.com; PO Box 1842 Flagstaff, AZ 86002*

In recent years, Yellow-billed Cuckoos (*Coccyzus americanus*) have been observed in many upland ephemeral drainages in the mountains and foothills of southeastern Arizona, though little data exists on their breeding status in these atypical habitats. If most of these cuckoos are breeding, this newly discovered population could have important implications for species recovery. Leveraging enormous citizen science contributions and multiorganizational collaboration, we evaluated cuckoo breeding status and distribution in a subset of the Sky Islands mountain ranges, sampling over 80 drainages along elevational and habitat gradients. Over 2 field seasons, breeding was documented in most drainages where cuckoos were detected and in most habitat types sampled. However, cuckoos did vacate some sites after stopovers, particularly in highest elevation and sparsely vegetated field sites. These results indicate that the Sky Islands contain important breeding and migratory habitat much different than that of typical cottonwood-willow riparian woodlands and that conservation measures for Yellow-billed Cuckoos should take place on a watershed scale. Preliminary analyses of biogeographic patterns of cuckoo occupancy will be presented, with an emphasis on the Santa Cruz River watershed. An assessment of citizen scientist contributions will also be discussed, highlighting the importance of volunteerism and collaboration in conservation research.

Landscape Characteristics of Montezuma Quail Habitat Use in Southeast Arizona.
Chavarria, P. M, Pedro.Chavarria@asu.edu; Department of Science and Mathematics, Arizona State University-Polytechnic, Mesa, AZ 85212; Silvy, N. J., Lopez, R. R., Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77843; Pina, Jr., M. Department of Agricultural Leadership, Education, and Communications, Texas A&M University, College Station, TX 77843

Montezuma Quail (*Cyrtonix montezumae mearnsi*; MOQU) habitat use at second- and third-order scales has remained unexamined historically due to limited or lack of mark-recapture and telemetry studies. Existing habitat-use models derived in GIS thus lack the accuracy needed for conservation of this species where management actions for its habitat are concerned. We evaluated landscape characteristics of MOQU habitat use in southeast Arizona using georeferenced locations in 3 study sites combined from flush-surveys and radio-telemetry. We used logistic regression to evaluate a combination of 61 landscape variables in a model to examine components MOQU were selecting when comparing actual to random locations. Landscape characteristics evaluated include elevation, aspect, ruggedness, and major Gap Analysis Program (GAP) vegetation associations. Our analysis revealed that quail use other vegetation types more so than Madrean oak woodlands and Encinal Mixed Oak, where they are typically expected to occur. Populations at the Appleton-Whittell Research Ranch (AWRR) predominantly used Semidesert-Mixed Grass, dominated by Sacaton (*Sporobolus wrightii*) bottomlands, even when the Encinal Mixed Oak vegetation type was available within their immediate range. Where *Sporobolus* was absent from a population's range, quail selected for Encinal Mixed Oak rather than more open grasslands. Elevation, ruggedness, and the interaction of these are significant components for Hog Canyon, where quail selected for high elevation and more rugged topography. At AWRR, elevation was a significant component for the time-independent and all time-dependent tests, but ruggedness was only significant for time interval 2 (1100–1459 hours) and interval 3 (1500–1859 hours).

2022

Getting to Know the Wild Purple Martins.
MacFarland, J., jmacfarland@tucsonaudubon.org Tucson Audubon Society, 300 E. University Blvd. #120, Tucson, AZ 85705

The Desert Purple Martin is the least studied subspecies of Purple Martin. A "wild" and independent martin, it nests almost exclusively in cavities in two species of giant cacti—the saguaro and the cardón; it does not currently use any human-created cavities. Its migration pathways and overwintering sites are unknown, as well as many components of its basic biology. Tucson Audubon is working with numerous partners to study many of the basic life history aspects of these desert martins. This involves significant physical obstacles including natural-cavity nests that cannot be opened for easy access, that are frequently at 20' or higher, are enclosed in thorns, located in remote and frequently protected desert locations with breeding season temperatures well above 100˚F. Desert martin research and conservation are critical as saguaros in Arizona are under dramatic threat due to invasive plant driven fires, which the saguaros cannot withstand, and climate change. The timescale to regenerate breeding-cavity size saguaros exceeds a century—leading Tucson Audubon to begin numerous 19 habitat conservation activities for desert

martins even with significant gaps in life history. We'll discuss what is currently known, what we're learning, and demonstrate many of the logistical hurdles we face in these conservation and research efforts.

Bendire's Thrasher Regional Efforts and Pathway Project Preliminary Results. *Kondrat, C. and Borgman, C. Ckondrat@azgfd.gov, Arizona Game and Fish Department, 5000 W. Carefree Hwy., Phoenix, AZ 85086*

At the current estimated rate of decline, Bendire's Thrasher populations are predicted to fall another 50% in 18 years (Partners in Flight 2019). The species is considered a Species of Greatest Conservation Need by Arizona and other states as well as a species of concern by the U.S. Fish and Wildlife Service. The Desert Thrasher Working Group was formed to address significant data gaps for the species, including many aspects of their basic biology, habitat needs, and distribution. In 2019, a partnership within the working group was initiated to investigate this species' migratory and winter movements. A total of 54 GPS tags have been deployed on birds across Arizona and New Mexico sites in 2019, 2021, and 2022. To date, 19 tags have been retrieved providing new insights into the migration patterns of the species. The knowledge gained from this study will inform conservation planning regionally and internationally and further guide management of the species range wide.

Birds as Hosts for The Agents of Tick-Borne Relapsing Fever in Arizona. *Motyka, P. J. pjm232@nau.edu, 2607 N. Nelson Drive, Flagstaff, AZ 86001*

Wild birds have great potential to contribute to the transmission, maintenance, and spread of infectious diseases. I investigated how wild birds might contribute to the ecology of tick-borne relapsing fever (TBRF) in northern Arizona. TBRF infects humans and wildlife, and occurs when bacterial spirochetes, *Borrelia hermsii*, infect a host after being transmitted by an Ornithodoros tick. Rodents are the primary vertebrate hosts for TBRF, but whether birds interact with the ticks or the spirochetes remains untested. I collected blood samples from mist-netted wild birds and tested them for *Borrelia hermsii*. I also collected material from nest sites in search of ticks. Molecular tests and blood smears determined that zero birds were captured with active TBRF infections, and zero ticks were found infesting nest material. These results suggest the role of birds in the ecology of TBRF is minimal, but research into other vector-borne diseases like Lyme disease and West Nile Virus show that relationships are not always straightforward. Future climate change is predicted to shift the range of TBRF, and many questions about the relationships between birds and TBRF still remain.

Advances in Pinyon Jay Conservation Science and the Role of New Technology. *Ammon, E. ammon@gbbo.org, Great Basin Bird Observatory, 1755 E. Plumb Lane #256, Reno, NV 89502*

Arizona has been among first states to systematically monitor Pinyon Jays even before its proposed listing under the Endangered Species Act in 2022. Over the past two years, the Great Basin Bird Observatory (GBBO), U.S. Forest Service, Bureau of Land Management, and Arizona Game and Fish Department helped develop and implement the first standardized monitoring protocol for the species in Arizona, and GBBO has worked with

local Audubon chapters to create a smartphone compatible data collection method for Pinyon Jay community science. Bird conservation science has come a long way in the past 20 years, with much improved technological tools ranging from advanced spatial analysis tools that can pinpoint conservation hotspots and habitat types of greatest interest to some species, to improved understanding of year-round relevance of certain habitat types, and to the great advancement of online technology that helps all birders and naturalists to participate in conservation science. In this paper, I will present the recent insights from these advancements for bird conservation using the example of Pinyon Jay research that GBBO has conducted for the past decade and is now intensifying by engaging community scientists and birders in Arizona and around the West.

The Secret Lives of Lucy's Warblers: Tucson Audubon Nest Box Research, *Weekley, O. oweekley@tucsonaudubon.org, Tucson Audubon Society, 300 E. University Ave., Tucson, AZ 85705*

Lucy's Warblers are one of only two cavity-nesting warblers in the United States and a species of Conservation Concern. Due to their small breeding range and elusive behavior this species is much understudied and previously unknown to use nest boxes, unlike other secondary cavity-nesters. Tucson Audubon has been studying Lucy's Warbler nesting needs using innovative techniques to design a nest box style that they will readily use. We conducted a multiyear experiment testing 12 designs across 60 points. The "triangle nest box" design ended up being used over 70% of the time. Armed with this knowledge we were able to study some of the other little-known facts of their life history.

Birds of the Barry M. Goldwater Range-West, Yuma County, Arizona, *O'Donnell, R. P., Don, R., Nelson, H. rodonnell@azgfd.gov, Arizona Game and Fish Department (AGFD), 5000 W Carefree Hwy., Phoenix, AZ 85086, J. Pennell, Range Management Department Marine Corps Air Station-Yuma, P.O. Box, 99134/Building 151, Yuma, AZ 85369; Ingraldi, M. F., AGFD, 5000 W Carefree Hwy., Phoenix, AZ 85086*

It is critical that baseline conditions for species be established on managed landscapes so that natural resource managers can determine how best to allocate effort to protect natural resources, but often even species presence is poorly known, especially in areas that are remote or otherwise difficult to access. The Barry M. Goldwater Range-West (BMGR-W) includes 700,000 acres of Sonoran Desert near Yuma, Arizona, and little is known about the birds of the area. In 2020, we began a three-year inventory of birds on the BMGR-W, with objectives including: 1) lists of species indicating which are local breeders or migrants; 2) description of diversity and evenness across habitat types; and 3) recommendations for future monitoring efforts and natural resource stewardship. We surveyed for birds using four different methods, one targeting all diurnal species, one focused specifically on diurnal raptors and raptor-like birds, one focused on owls, and one focused on nightjars. Across these four methods, we documented 111 species of birds, including 43 locally breeding species and 68 migrants. Bird diversity and evenness were highest in mountain and wash habitats, and lowest in sands and creosote flats. These data provide a baseline against which future inventories can be compared and demonstrate a rich variety of

species in this large, protected tract of Sonoran Desert. Our surveys are ongoing and this baseline study will conclude in early 2023.

Adapting to City Life: Physiology and Behavior of Urban and Desert House Finch. *Polekoff, S. E. spolekof@asu.edu, Arizona State University, Life Sciences Center, 427 E. Tyler Mall, Tempe, AZ 85281*

Urban environments generally have reduced biodiversity, but some species thrive and reach higher abundances in urban compared to nonurban environments. Urban populations often differ from their nonurban counterparts behaviorally and physiologically, but few studies focus on multiple traits in the same individuals. To address this issue, I am investigating the effects of urbanization across multiple physiological and behavioral traits in the House Finch (*Haemorhous mexicanus*), a widespread and locally abundant native songbird. I am measuring multiple indicators of oxidative stress as well as exploratory behavior in individual, wild birds sampled in urban and Sonoran Desert environments. The goal of this project is to identify behavioral and physiological differences between urban and desert populations, and to determine whether associations between oxidative stress and behavior are consistent across contexts. I captured over 160 House Finches between 2020 and 2022 during both breeding and nonbreeding seasons, from a total of four locations across the Phoenix valley. I will present my final behavioral analysis and partial oxidative stress analysis based on blood samples I collected. I predict that compared to nonurban finches, urban birds will display more exploratory behavior and higher oxidative damage in their blood.

Assessing Artificial Burrow Improvements by Evaluating Signs of Burrowing Owl Occupation and Available Burrow Status. *Wrieden, J. jenohn@hotmail.com, 8613 S 51st St. Phoenix, AZ 85044*

Artificial Burrowing Owl burrows are becoming a necessity due to agricultural land conversion. Wild at Heart has developed and is continuing to improve its artificial burrow design and translocation process to keep the Western Burrowing Owl (*Athene cunicularia hypugaea*) population stable and thriving. After a study by New Mexico State University, in partnership with David Johnson's Global Owl Project, several suggestions were made to help improve the design of the burrows and active translocation procedures. In 2018, burrow openings were increased from four to six inches in diameter and a 55-gallon drum, cut in half, was used to create two burrow chambers. This was in the hope of increasing both the number of eggs laid and the numbers of surviving baby owls. The timing of release was also changed to start in the winter and extend to the beginning of summer. Finally, the release tent size was reduced, and only two owls were put into each tent. In order to determine the outcome of these changes, burrow occupancy was assessed at three location sites by looking for fresh signs of Burrowing Owl use: pellets, white-wash, prey items and remains, decoration, and feathers. These sites included 300 available burrows on BLM and CAP land adjacent to agricultural areas in Wenden, Vicksburg, and Florence, Arizona. The original sites proposed somewhat changed due to the number of owls that needed to be relocated and damage to burrows from badgers and the weather. This study is the beginning of ongoing monitoring needed to determine the best practices for Burrowing Owl translocation success and the long-term use of artificial burrows.

2023

The Natural History of Thick-billed Parrots in Arizona: An Interdisciplinary Perspective. Keynote Speaker: *John A. Moretti*

The skeletal remains of ancient parrots and macaws are found in archaeological sites across the American Southwest. Those birds do not inhabit the region today and their presence in the past appears foreign and exotic. Accordingly, those birds have long been interpreted as trade items originating from present-day Mexico. Multiple lines of evidence support that interpretation for Scarlet Macaws. Yet, Thick-billed Parrots are also found in Southwestern archaeological sites and the ecology and natural history link this species to regional conifer forests. Bones of Thick-billed Parrots are present in 10 archaeological sites in Arizona and New Mexico. Those sites document a relationship between their past Native American inhabitants and resources procured from regional montane conifer forests. Sites in Arizona, including Wupatki and Buena Vista Ruins, are particularly informative for understanding the natural history of parrots in the region. Historic records document Thick-billed Parrots foraging in mountain forests, including those near archaeological sites that contain parrot bones. Re-introduced flocks visited some of the same mountain forests in the 1980's and further demonstrate the viability of these habitats. Linking together data on the ecology, natural history, and archaeological occurrence of Thick-billed Parrots, I outline a hypothesis positing that the species was native to Arizona and the surrounding region and that parrots from archaeological contexts were procured locally. This perspective has the potential to improve our understanding of Thick-billed Parrots, including their response to past episodes of climatic and anthropogenic perturbations, and may aid conservation of this endangered species.

Implementation of a Motus Maps Banding Station at the Hassayampa River Preserve, *Stein, A.C. Arizona State University. Phoenix, Arizona 85022 USA. Adam.C.Stein@asu.edu

In the spring of 2022, a Monitoring Avian Populations Survivorship (MAPS) bird banding station was initiated at the Hassayampa River Preserve in Maricopa County. To date, over 400 birds have been banded and data on several of the most common species are starting to emerge. This project contributes to a larger nationwide effort for monitoring birds across North America with the Institute of Bird Populations.

The Motus Wildlife Tracking System: A Collaborative Network of Automated Radio Telemetry Stations for Studying the Movement of Birds and Other Wildlife, *Juarez, E. Arizona Game and Fish Department. 5000 West Carefree Highway, Phoenix, AZ 85086 USA. ejuarez@azgfd.gov.; Webb, M. Bird Conservancy of the Rockies. 14500 Lark Bunting Ln. Brighton, CO 80603

Motus is an international collaborative research network that uses coordinated automated radio telemetry that offers an effective method to study the movements of birds and other small animals. As a tagged animal passes within range (~15km) of one of > 1,600 Motus stations, a detection is logged and then uploaded to an online database. There is no need to recapture the animal to learn of its movements. Any animal tagged with a Motus transmitter will be recorded by the station, thus

helping many researchers and many projects. The key is having enough stations to gain a better understanding of the targeted species movements. By utilizing this technology and collaborating with partners, we can begin to fill in knowledge gaps about birds and other wildlife and guide conservation efforts that benefit species, their habitats, and people.

eBird Tips and Tricks: How to Avoid the Most Common Mistakes, *O'Donnell, R.P., Arizona Game and Fish Department. 5000 West Carefree Highway, Phoenix, AZ 85086 USA. rodonnell@azgfd.gov

eBird has become the most popular tool to record bird sightings, and the data gathered is used every day to monitor populations, make management decisions, and implement conservation actions. The utility of eBird data depends directly on its quality, which is a result of both diligence by the global network of citizen scientists who contribute data and by the global team of volunteers who review that data. In my eleven years as an eBird reviewer, I have noticed patterns in common errors that even experienced eBird users make, many of which are not obvious or intuitive. I will explain the most common errors eBird reviewers catch, the most common errors that reviewers can't catch, and how to avoid making those errors. Errors are commonly made in recording standardized estimates of effort, supporting the identification of rare sightings and high counts, and interpreting the meaning of "complete" lists, among others. Learning to recognize and avoid these errors will improve the accuracy and reliability of eBird data from even experienced eBird users and thus improve the quality of the data that conservation biologists and wildlife managers rely on to protect birds.

Phylogeography of the Ferruginous Pygmy-Owl in Arizona and Western Mexico, *Cobbold, S.M. Arizona Game and Fish. Department. 5000 West Carefree Highway, Phoenix, AZ USA, 85086. scobbold@azgfd.gov; Ingraldi, M.F. Arizona Game and Fish Department. 5000 West Carefree Highway, Phoenix, AZ 85086 USA.; DeYoung, R.W. Caesar Kleberg Wildlife Research Institute. Texas A&M University-Kingsville MSC 218, 700 University Blvd Kingsville, TX 78363 USA., Clark, N.D. Arizona Game and Fish Department. 5000 West Carefree Highway, Phoenix, AZ 85086 USA., *O'Donnell, R.P. Arizona Game and Fish Department. 5000 West Carefree Highway, Phoenix, AZ, 85086 USA.

In Arizona and Mexico, genotypic variation in the Ferruginous Pygmy-Owl (*Glaucidium brasilianum*) has been characterized by a pattern of isolation by distance, and populations in Arizona, Sonora, and Sinaloa are considered genetically distinct from those populations in Texas, Tamaulipas, and south-central Mexico. However, sampling effort in southwestern Mexico has been limited, generating uncertainty in a portion of the Ferruginous Pygmy-Owl 's range where the Mexican Transvolcanic Belt may represent a barrier to dispersal. We used eleven polymorphic microsatellite loci and sequences from the mitochondrial cytochrome b gene to investigate fine-scale population structure and genetic diversity in the Ferruginous Pygmy-Owl by collecting samples in Nayarit, Jalisco, and Colima and comparing them with samples previously collected in Arizona and other portions of Mexico. Our microsatellite and mitochondrial DNA data confirm that Ferruginous Pygmy-Owl's in Arizona and western Mexico are characterized by gradual genetic differentiation influenced by spatial distance and that populations correspond to two mitochondrial DNA clusters, with samples from Nayarit, Jalisco, and Colima belonging to the southern group that is distinct from the northern group occurring in Arizona, Sonora, and Sinaloa. There was no evidence of a discrete genetic break associated with the Mexican Transvolcanic Belt within our study area. The genetic differences observed between owls residing in arid deserts and semidesert grasslands versus the

tropical and subtropical forests of western Mexico imply that populations in arid ecosystems provide unique contributions to the genetic diversity of the species.

Avian Technology and Artificial Intelligence, *Kauphusman, J. 51 West 3rd Street, Suite 450, Tempe, AZ 85281 USA. jkauphusman@logansimpson.com

Currently, the standard avian surveys for the majority of our Arizona Endangered Species Act (ESA) protected species consist of two approaches. The first approach involves a substantial survey effort, wherein teams of biologists traverse expansive project boundaries to document various target species through visual and auditory observations, or by deploying various Autonomous Recording Units (ARUs). Under the first approach, a biologist must be highly trained and experienced with a particular ESA species to verify presence and have great hearing. Unfortunately, avian species can still elude detection despite multiple surveys. The ARU approach involves the deployment of these recording devices into the site, and then subsequently dedicating the next 1-2 months to meticulously sift through the audio recordings in order to identify the calls of the target species. This process, though effective, can be painstakingly time-consuming. I present to you a supplemental survey protocol and pilot study using a novel approach with ARUs paired with artificial intelligence (AI) software to alleviate the shortcomings of both survey approaches for avian surveys. Specifically, using the currently available bio-acoustic AI model (BirdNET), developed by Dr. Stefan Kahl at the Cornell Lab of Ornithology, I will present a pilot study using the new survey approach and share my step-by-step guide on how to deploy ARUs and leverage BirdNET to assist with future avian surveys. Following the conference, this bio-acoustic survey protocol will be publicly available with the raw code and a simple webpage tutorial demoing the workflow.

Studying Bendire's Thrasher Winter and Migratory Movements: New Discoveries and Opportunities for Full Life-Cycle, *Kondrat, C.L. Arizona Game and Fish Department. 5000 West Carefree Highway, Phoenix, AZ 85086 USA. ckondrat@azgfd.gov.; Borgman, C. U.S. Fish and Wildlife Service, Division of Migratory Birds Southwest Region. Albuquerque, New Mexico USA. corrie_borgman@fws.gov

According to Partners in Flight 2019, Bendire's thrasher populations are expected to decline by 50% in 18 years. The species is of greatest conservation need in Arizona and other states and is also considered a species of concern by the US Fish and Wildlife Service. To investigate the species' migratory and winter movements, a partnership was formed between the US Fish and Wildlife Service and the AZ Game and Fish Department. From 2019 to 2022, a total of 54 GPS tags were used to track birds across Arizona and New Mexico sites. The final data will provide insights into the migration patterns of the species, which will help inform conservation planning regionally and internationally to further guide management recommendations for the species range-wide.

Range-wide Western Yellow-billed Cuckoo Survey Results and Occupancy Estimates, *Beauregard, N. D. Southern Sierra Research Station, 7872 Fay Ranch Rd, Weldon, CA 93283, nick.beauregard@southernsierraresearch.org; Stanek, J. Southern Sierra Research Station, 7872 Fay Ranch Rd, Weldon, CA 93283; Whitfield, M. Sierra Research Station, 7872 Fay Ranch Rd, Weldon, CA 93283; Juarez, E. Arizona Game and Fish Department, 5000 West Carefree Highway; Phoenix, Arizona 85086; Norvell, R. Utah Division of Wildlife Resources, 1594 W. North Temple, Salt Lake City, UT 84116; Duvuvuei, E. New Mexico Department of Game and Fish, 1 Wildlife Way, Santa

Fe, NM 87507; Clipperton, N. California Department of Fish and Wildlife, 715 P St, Sacramento, CA 95814

The western Yellow-billed Cuckoo (*Coccyzus americanus*) is a neotropical migrant that was historically common in lowland riparian woodland habitat west of the Continental Divide from northern Mexico to southern Canada. Following extensive loss of riparian forest over the last century, cuckoo populations suffered significant range reductions and local extirpations. In 2014 the U.S. Fish and Wildlife Service listed the cuckoo as Threatened under the Endangered Species Act, estimating a total population of 395-450 pairs. In the summer of 2022, eleven states across the western DPS coordinated a range-wide survey effort, conducting surveys at 402 sites on federal, state, county, private, and tribal lands. Over three surveys at each site, cuckoos were detected 951 times in total. The majority were detected in New Mexico, Arizona, and California, with 435, 396, and 61 detections, respectively. Fewer cuckoos were detected in TX, CO, NV, ID, UT, and WY, and none were detected in WA or OR. Cuckoos were primarily detected in native riparian habitat, but also in Madrean-evergreen woodland in the Sky Islands, and exotic Russian Olive in CO and tamarisk in NM, AZ, and CA. These results represent the first range-wide assessment of cuckoo populations, and data will be used for ongoing species distribution modeling and occupancy analyses.

2024

Motus Research in Arizona: Recent Developments and Projects, Nick D. Beauregard, Southern Sierra Research Station; Edwin Juarez, Arizona Game and Fish Department; Chrissy Kondrat, Arizona Game and Fish Department; Steven Prager, Audubon Southwest; Adam Stein, Arizona State University; Adam Hannuksela, U.S. Fish and Wildlife Service, Sonoran Joint Venture; Chris Dodge, U.S. Bureau of Reclamation

Recent advances in Motus technology allow researchers to track bird movements across multiple spatial and temporal scales. Signals sent from Motus tags are automatically detected by receiving stations when within range, making it useful for migration studies. Localized arrays of Motus nodes also allow researchers to study small-scale movements of breeding or resident birds. Motus stations are abundant in the eastern United States, but development of station infrastructure has been slow in the west, with many large geographic gaps without coverage. Many state, federal, and NGO partners have recently come together to facilitate Motus infrastructure development in Arizona. We highlight recent Motus projects in Arizona and the southwestern region and discuss opportunities for future work. Recent projects include station installation at the Audubon Southwest Appleton-Whittell Research Ranch and subsequent tag deployments on several grassland bird species, tag deployments on Southwestern Willow Flycatchers at Alamo Lake State Park, monitoring Snowy Plover movements, and new insights into Western Yellow-billed Cuckoo movements from birds tagged on the Kern River in California. Upcoming projects include additional station deployments throughout the state and new tagging projects. While Arizona is still in early stages of Motus development, these projects demonstrate their versatility as a collaborative conservation tool.

Highlights and Observations from Two Seasons of Morning Flight Migration Counts over Pinal County, Arizona, Paul Heveran, Florence, AZ, and J.P. Gyekis, State College, PA

The phenomenon of migratory birds engaging in morning flight over Arizona has been poorly studied throughout much of the state's ornithological history. From July 20 to December 1, 2023, author Heveran conducted observations of birds in flight in the Lower Sonoran Desert region of Pinal County for 15-200 minutes after sunrise on 52 mornings. The second season of counting at the same site began on July 1, 2024, and monitoring is ongoing. Time and direction were noted for each passing migrant, and patterns of average flight height and behavior of different species were recorded. Weather and sky conditions were also recorded each morning. In 2023 a total of 7,641 migrants were recorded, representing at least 90 species. By continuing past the monsoon season, late-season migrants such as Brewer's Blackbirds were recorded. White-winged Doves predominantly flew south, while Lark Sparrows and others moved in a range from south to east. Tallies in July through late August 2024 of known monsoon molt migrants (Western Kingbird, Phainopepla, and Bullock's Oriole) were much higher than in 2023 when monsoon moisture was delayed. We documented the passage of multiple species not typically found in this open desert habitat. Particularly notable were the occurrence of multiple Black Swifts, a major Arizona rarity, and large numbers of Vaux's Swifts migrating through. Much more remains unknown about morning flight statewide. Collaboration between multiple count sites would improve our understanding of when these movements happen and how they are affected by weather, geography, and other factors.

The Monitoring Avian Productivity and Survivorship (MAPS) and Monitoring Overwintering Survival (MoSI) Programs: Summary and Recent Results, Danielle Kaschube, The Institute for Bird Populations; Steven Albert, The Institute for Bird Populations

The Institute for Bird Populations (IBP) initiated two long-term bird monitoring programs using banding to use banding data to calculate demographic rates in bird populations. IBP's flagship program, the Monitoring Avian Productivity and Survivorship (MAPS) program, is a temperate zone breeding season monitoring program. Since its inception in 1989, over 1300 stations have operated, and it has become North America's largest, long-term, constant-effort bird banding program. Its data has been used in over 150 peer-reviewed publications, including publications showing the effects of climate change on time of breeding and bird size. To help increase the accessibility of the data to researchers, IBP created the MAPS Data Exploration Tool, which allows researchers access to raw data and calculated continent-wide demographic estimates. The Monitoring Overwinter Survival (MoSI) program began in 2002, and over 250 stations have operated in 22 countries. MoSI has increased the understanding of Neotropical birds, and through a series of grants, banders have also been able to implement conservation actions. Both MAPS and MoSI began with goals of demographic research, but the stable network of banders over a large geographic area has been instrumental in helping cooperative efforts like the Bird Genoscape Project.

Alas del Bosque Seco: Describing Sinaloa's Main Habitat Diversity, Alfredo Leal Sandoval, Facultad de Biología, Universidad Autónoma de Sinaloa.

The Tropical Dry Forest (TDF) is one of the world's most threatened ecosystems, and Mexico has a significant extent of this habitat, with numerous species of birds (both migratory and resident) dependent on it. The TDF of Sinaloa (TDFSS) is the largest ecoregion in the country,

which faces deforestation and conversion to agricultural systems. Tropical Dry Forest has a high seasonality that intensely defines the patterns in its annual ecological cycle. Here, we describe the general vegetation structure in Cosalá, Sinaloa, and its relationship with the abundance, richness, and diversity of birds. In 2020 we conducted 53-point counts distributed across different vegetation types and detected 133 residents, 61 Neotropical, 25 summer, and 6 vagrant migratory species. We also analyzed vegetation structure variables and the bird community, using data from a permanent banding station. We also evaluated the plant-hummingbird interaction network and the change in key and peripheral species during three weather periods. Finally, we examined the organization, diversity, and composition of the bird community in deciduous forests, sub-deciduous forests, secondary deciduous forests, and agroecosystems). The results show that vegetation structure is crucial for birds: lower trees provide food, shelter, and protection. Bird richness and abundance in the TDF had a negative correlation with vegetation height. In the case of hummingbirds, our results reveal a significant influence of floral resources and long-distance and altitudinal migratory movements on the interactions of these birds. Regarding vegetation types with the highest diversity and migratory species, agroecosystems have the most diversity and migratory species.

Lake Havasu City as an Oasis for Burrowing Owls: Emerging Patterns after 10 Years of Monitoring, Kerrie Ann Loyd, Arizona State University, Arizona Field Ornithologists &Western Bird Banding Association

Western Burrowing Owls (*Athene cunicularia hypugaea*) are declining across their geographic range, yet in Arizona this species is frequently observed using urban and suburban habitats. This poses new anthropogenic challenges to owl conservation. With the help of numerous ASU undergraduates, I've monitored the Lake Havasu City (LHC) burrowing owls for the past 10 nesting seasons to help answer questions about habitat choices, movement and behavior and document any conservation concerns. I monitored 217 nests, banded 287 birds, and recaptured 51 to date. Nest success averages 73% with a mean of 4.1 fledglings per successful nest. I hypothesized that nest site characteristics (diameter, height in wash, plant cover, nearby satellite burrows) might influence nest success but logistic regression revealed no significant predictors (model X2 (5) = 4.595, p= 0.454). Dispersal distances are higher than other populations reported in the literature and female birds moved farther (Mean= 2875 meters, n =46) than males M=1568, n = 25). I hypothesized that sex, habitat (greenspace, residential, suburban commercial or urban business), competition -fledglings at nest, nearest neighbor, or artificial light at night might predict dispersal distances but results of linear regression suggest that only the number of siblings at the nest site explained variance in natal dispersal (p= 0.017) (F 5,25 =1.912, p=0.128, R2=0.277). Conservation challenges include secondary poisoning and loss of active burrows to development. Understanding more about our LHC population can help fill gaps in knowledge about this species in human-dominated environments and help us focus on conservation measures and public education efforts.

MAPS Banding in Southeast Arizona: The Empire Ranch Banding Station, Aya Pickett, Tucson Audubon

The Empire Ranch Banding Station is one of the farthest south MAPS banding operations in the continental U.S. and has been operating for over 20 years. This presentation will provide an

overview of the station including capture rates, operational procedures, a summary of the 2024 season, and future plans for expansion.

Evidence for Oxidative Stress in Urban Birds: A Meta-analysis, Sarah Polekoff, Arizona State University, Life Sciences Center; P. Deviche, Arizona State University, Life Sciences Center

Urban environments expose animals to many potential stressors including habitat alteration, pollution, and increased disease vectors. These stressors can increase the organism's exposure to and/or production of pro-oxidants which, unless compensated by antioxidants, can result in oxidative stress and lead to physiological damage and pathologies. We performed a meta-analysis using 26 studies, for a total of 137 effect sizes, to test the hypothesis in birds that exposure to urban sources of pro-oxidants is associated with elevated oxidative damage but also with upregulated levels of antioxidants and, therefore, not with a state of oxidative stress. We grouped measures of oxidative balance into categories and ran a model for each. We found that urban avian populations have lower antioxidant capacity, higher dietary oxidative stress, and a tendency for higher oxidative stress overall when compared to nonurban populations of the same species. However, we did not observe consistent effects of urbanization across studies in levels of specific endogenous antioxidants. The effect of urbanization on oxidative stress was most apparent in less commonly studied species. Additionally, the effect of urbanization on oxidative damage differed among species. These analyses suggest that urban birds have higher oxidative stress than nonurban birds, but that the effect varies by species. Differences may also be due to yet unidentified differences among cities or study design, especially for endogenous antioxidants. More studies are needed from a greater variety of habitats and climates to confirm whether trends identified in this meta-analysis are universal.

Weight of Migratory Birds at Bear Divide: Comparison to the Literature
Walter H. Sakai, Thousand Oaks, CA; T. E. Romero, Los Angeles, CA; Lauren Hill, Los Angeles, CA,

Weight or mass is a useful characteristic to assess the condition and health of a bird and is normally measured during bird banding. At Bear Divide, a dawn spring migration site just within greater Los Angeles, over 1500 birds are banded by the Bear Divide Banding Station every spring during mid-March to mid-May composed of 80+ species of which more than 75% are migratory bird species. From 2021-2024, the Bear Divide Banding Station banded over 100 birds of some migrant species every year. Upwards of 20-25% of some migratory bird species [e.g. Warbling Vireo (*Vireo gilvus*); Wilson's Warbler (*Cardellina pusilla*)] were outside of the weight ranges, or individuals weighed less than the mean weight presented in Pyle's Identification Guide to North American Birds, 2nd ed. Other migratory bird species [e.g. Western Tanager (*Piranga ludoviciana*); Black-headed Grosbeak (*Pheucticus melanocephalus*)] mirrored the normal weight distribution presented by Pyle suggesting species-dependent or the biases in banding data focused on certain parts of a bird's annual cycle (e.g. breeding). This creates a problem as the Bird Banding Laboratory relies on the range of weight values presented in Pyle's book. Here we present some of our findings on the weights of some of these migratory bird species and discuss some of these problems.

Open Pipes Are a Danger to Wildlife, Olya Weekley, Tucson Audubon Society

Open-top vertical pipes, often referred to as "Death Pipes," present a significant but underrecognized threat to birds and other small wildlife. These structures, used for various purposes such as fence posts, gate anchors, and irrigation/ventilation systems, can become lethal traps for animals seeking shelter or nesting sites. Once inside, creatures are often unable to escape due to the smooth walls and tight spaces, leading to a slow and agonizing death. Cavity-nesting birds are the most frequent victims, but other animals, including reptiles and small mammals, are also at risk. The full extent of the fatalities caused by these pipes is difficult to determine, as the trapped animals often go unnoticed until the pipes are removed. A notable discovery by Audubon California revealed hundreds of deceased animals within a single 20-foot pipe, highlighting the severity of this issue. To address this issue, the Tucson Audubon Society, with support from Arizona Sportsmen for Wildlife Conservation, expanded Project Death Pipes through public education and agency outreach. In 2023, a total of 641 pipes were permanently capped, potentially saving thousands of small animals into the future.

The "H-word": Recognizing, Documenting, and Understanding Hybrid Hummingbirds, Sheri Williamson, Southeastern Arizona Bird Observatory

Hummingbirds hybridize more freely than almost any other family of birds. Thanks in large part to digital photography, community (citizen) science platforms such as eBird and iNaturalist, and social media, the number of known and suspected hybrid combinations involving hummingbird species that breed north of Mexico has doubled since the publication of *A Field Guide to Hummingbirds of North America in 2002*. Most of these are intergeneric and some are intercladal, typically involving a member of the Bee clade (Mellusugini) and either an Emerald (Trochilini) or Mountain-gem (Lampornithini). Nevertheless, many birders remain unaware of this phenomenon, and while some banders make special efforts to document hybrids, others avoid banding them. More consistent and thorough documentation of hybrids is necessary to aid identification both in the field and in hand and to understand the prevalence, behavioral bases, and evolutionary and biogeographic implications of the phenomenon.

Posters

2011

Bird Monitoring Expeditions to Mexico, 2008 and 2010, *Beardmore, C. J. Sonoran Joint Venture, U.S. Fish and Wildlife Service, Phoenix, AZ carol_beardmore@fws.gov*

The Sonoran Joint Venture in collaboration with Western Field Ornithologists conducted Bird Monitoring Expeditions to the Reserva Biosfera Sierra La Laguna in Baja California Sur in 2008 and to the Area Protegida Flora y Fauna Sierra Alamos y Rio Cuchujaqui near Alamos, Sonora in 2010. These are five days in the field using intensive bird monitoring protocols. Similar to the Arizona Coordinated Bird Monitoring Program, we used area search with double sampling and the national nightjar protocol along with other techniques. Professional biologists and citizen scientists from both the U.S. and Mexico volunteer a week of their time to add to the bird monitoring data for Mexico.

Corticosterone's Relationship with Parental Investment in a Sonoran Desert Passerine, the Rufous-winged Sparrow. *Bittner, S. (ssbittne@asu.edu) and P. Deviche (deviche@asu.edu), School of Life Sciences, Arizona State University, Tempe, AZ*

The hormonal control of parental investment in birds, particularly the factors that control variation in parental care, are poorly known. This control is hypothesized to involve several hormones including corticosterone (CORT). Corticosterone is secreted into the blood in response to stress, inhibits the activity of the reproductive system, and promotes behaviors that increase survival, such as escape and foraging that draw parents away from maintenance of the clutch. We used Rufous-winged Sparrows (RWSP) to investigate whether plasma initial (i.e., in nonstressed birds) CORT or stress-induced (SI) CORT predicts parental investment. We hypothesized that (1) RWSP modulates the stress response to control parental decisions and (2) plasma initial and/or SI CORT affect(s) parental investment, with higher CORT being associated with less investment. We predicted that parents with higher plasma initial CORT would invest less in their offspring – as estimated by fewer eggs per nest and less care towards the eggs - than parents with low plasma initial CORT. We also predicted that the SI increase in plasma CORT would be smaller in males with a higher investment in offspring than in males with few offspring and lower investment. We located RWSP nests at the Santa Rita Experimental Range, recorded the number of eggs contained in each nest to estimate parental investment, and measured hatching success. Parental investment is assumed to affect reproductive success, and higher investment in incubation would, therefore, result in more successfully hatched chicks. Males, which like females provide parental care, were caught using Japanese mist nets and bled within minutes of capture to determine plasma initial CORT. Birds were then exposed to a standard noninvasive stress (holding in a breathable cloth bag for 30 minutes) to induce a stress response and bled again to determine plasma SI CORT. The procedure was repeated on the same birds after eggs hatched. Our hypotheses were not supported. Plasma initial CORT was not correlated with the investment of the parents as estimated by clutch size or number of chicks hatched. The SI increase in plasma CORT did differ between parents with different sizes of clutch and thus investment, but in the opposite direction than predicted: the more eggs laid, the higher the SI increase in plasma CORT. The SI increase in plasma CORT increased as a function of the number of chicks but the significance of this observation is unclear as relatively few nests were found to contain chicks.

The Influence of Urbanization on the Reproductive Phenology and Morphometrics of the Abert's Towhee. *Davie, S., and P. Deviche, School of Life Sciences, Arizona State University, Tempe, AZ 85287,* sdavies1@asu.edu

To successfully breed, birds must time their seasonal reproductive activity to coincide with peak food abundance. A mistiming between reproduction and peak food availability can have severe fitness costs. Consequently, the timing of reproduction (reproductive phenology) is considered one of the major life history traits reflecting the adaptation of birds to local environmental characteristics. The strongest, most consistent pattern emerging from studies of the effects of urbanization on birds is that urbanization is associated with advancement of reproductive phenology. We tested the hypothesis that urbanization of Phoenix, AZ advances the onset of seasonal breeding in urban Abert's Towhees, *Melozone aberti*. We measured testis volume and cloacal protuberance width of adult male towhees caught in urban localities of the Phoenix

metropolitan area and outlying desert localities. We also measured body mass, tarsus length, and fat stores to investigate whether urbanization is associated with morphological differences in towhee populations. The data suggest that urbanization of Phoenix is not associated with differences in body mass, tarsus length, or fat stores. However, testis volume and cloacal protuberance suggest that urbanization of Phoenix is associated with an advancement of reproductive phenology of urban towhees. The mechanism responsible for this difference is unknown and requires further study. We are currently testing the hypothesis that this difference in reproductive phenology is a result of greater food abundance in urban areas and will present data from a captive study supporting this hypothesis. Support: Central Arizona Phoenix – Long-Term Ecological Research (CAP LTER) grant to S.D.

Rapid Effects of Capture and Handling on Circulating Hormone Concentrations in the Male Rufous-winged Sparrow. *Deviche, P., S. Gao, S. Davies, School of Life Sciences, Arizona State University,Tempe, AZ 85287-4501,* pierre.deviche@asu.edu

Many studies on wild birds involve the capture of these birds for the purpose of marking and of measuring morphological and physiological parameters. These studies rarely examine the physiological effects of capture and subsequent restraint or the duration of these effects. We measured circulating concentrations of the glucocorticoid corticosterone (**CORT**, which in birds is rapidly released in response to stress) and of testosterone (**T**, the testicular hormone that controls male reproductive behaviors and morphology) of adult male Rufous-winged Sparrows, *Peucaea carpalis*, sampled during their summer reproductive season at the Santa Rita Experimental Range, Pima Co., AZ. Based on previous work, we predicted plasma CORT and T to increase and decrease, respectively, in response to capture and handling. Sparrows were caught using playback songs and Japanese mist nets, bled within two minutes to measure initial (baseline) hormone levels, held in individual breathable cloth bags, bled again 5, 10, 20, or 30 min later to measure stress-related hormone levels, and then marked and released. As predicted, capture and handling markedly increased plasma CORT. The experimental procedure was also associated with a 30-50 % decrease in plasma T that was detected as early as 10 min after capture and persisted until birds were released up to 30 min later. The relative magnitude of the decrease was positively, although not linearly, related to baseline plasma T. Sparrows were then recaptured 1-7 hours after release to determine the duration of the stress-associated decrease in plasma T. When re-captured using the same method as for the initial capture, birds still had depleted plasma T and, from this standpoint, did not show signs of recovery relative to when they were released after the first capture. Thus, capture and handling markedly affected plasma hormones. In the case of plasma T, the effect was persistent and individually but predictably variable. The implications of these findings require further study because it is unknown whether the observed stress-related hormonal changes are associated with behavioral and/or physiological effects that might compromise short-term survival and/or reproductive success. Support: National Science Foundation Award 1026620 to P.D.

Arizona Golden Eagle Management. *Jacobson, K. AZ Game and Fish Dept., 5000 W. Carefree Hwy., Phoenix, AZ 85086, kjacobson@azgfd.gov*

The Golden Eagle population in the western United States has been recently estimated at around 30,000 individuals, however, some evidence suggest numbers are declining. With the U.S. Fish

and Wildlife Service's newly established Bald and Golden Eagle Protection Act permitting process coupled with concerns for possible population declines, the states need current information on golden eagle breeding distribution, occupancy, and productivity. In Arizona, very little current information exists. In order to start filling this data gap, the Arizona Game and Fish Department, in cooperation with the Bureau of Land Management, initiated a two-year helicopter flight survey to document potential Golden Eagle nesting sites throughout the state. The 2011 surveys concentrated on surveying the western third of Arizona's cliff nesting habitat. These cliff nesting surveys will continue during spring 2012 to cover high priority areas in central and eastern Arizona. Pending future funding, occupancy and reproductive assessments will be conducted beginning in the spring of 2013. Any information from birders regarding Golden Eagle nest locations and sightings can help refine the state population estimates. Golden eagle sighting information during the breeding season (March to July) and potentially active nests can be reported at goldeneagle@azgfd.gov.

The Probable Breeding of Cassin's Sparrow in Pinal County. *Jenness, D.,4375 E. Rollins Rd., Tucson, AZ 85739,* d_jenness@hotmail.com

Before the summer of 2006 there was no documented evidence of Cassin's Sparrow breeding in Pinal County. Following an especially wet monsoon season that summer, Cassin's Sparrow was discovered singing and skylarking in an extensive semidesert grassland area from northern Pima County to east of Oracle in Pinal County. The skylarking behavior of males suggested the presence of females and probable nesting. In the following five years surveys were conducted to determine whether the 2006 expansion was simply the result of unusually high rainfall one summer or was the discovery of a population that may have been previously undetected. In those five years Cassin's Sparrow was detected in some of the areas where it had been observed in 2006, but in no years was it found in as wide an area. The number of skylarking males varied each year, but generally was most concentrated along Willow Springs Road northeast of Oracle Junction, with the greatest concentration in this area in 2008. Of the five years the greatest dispersion was in the summer of 2011. It is difficult to determine if some of the Cassin's Sparrows in this area are resident year-round as they are usually silent and elusive when not breeding. However, in the spring of 2009 a male Cassin's Sparrow was heard singing along Willow Springs Road as early as March. No nests have yet been discovered, but extensive breeding behavior in this appropriate habitat suggests that nesting is taking place and may well have been the case for many years

2012

Advances in Our Knowledge of the Winter Distribution of Gray Vireo in Arizona. *Arnett, J., Wildlife Biologist, 56th Range Management Office, 7101 Jerstad Lane, Bldg 500, Luke Air Force Base, AZ 85309, john.arnett.1@us.af.mil*

Recent Arizona Field Ornithologists (AZFO) Field Expeditions focused on elucidating the nonbreeding season (winter) distribution and habitat affinities of Gray Vireo (*Vireo vicinior*) in Arizona. Two important sources provided the basis for these expeditions: the observations of wintering vireos reported by Gale Monson and his contemporaries, as reported in Phillips et al. (1964) and Monson and Phillips (1981); and publications by John Bates about the importance of Elephant Tree (*Bursera microphylla)* as a winter food source for the vireo. This poster illustrates

how our knowledge of the Gray Vireo winter distribution in Arizona has changed in recent years, due in large part to important contributions by AZFO and its members.

Recent Movement of Crested Caracaras into Southern Pinal County. *Jenness, D., 4375 E. Rollins Rd., Tucson, AZ 85739, d_jenness@hotmail.com, 520-909-1529*

The only confirmed resident community of Crested Caracaras (*Caracara cheriway*) in Arizona is in south-central Pima County on the Tohono O'odham Nation. Wandering individual birds have been regularly reported throughout the lower two-thirds of the state, but there are only two breeding records away from the Tohono O'odham lands. Beginning in 1996 caracaras began to be reported in the Santa Cruz Flats area of Pinal County. At first there were winter reports of one to four individuals, but beginning in 2006 larger concentrations, as large as 40-50, began to be reported. These are bigger concentrations than any reported elsewhere in the state away from the Tohono O'odham Nation. They have now been reported there in every month of the year. Once in May one was observed carrying food and in April a pair was engaged in mating behavior. This study pulls together data from dozens of reported sightings to show the dynamic of this development, including the overall growth in numbers and the monthly fluctuations. Although no nests have been discovered and the data doesn't confirm nesting, the existence of such a large population with adult birds remaining year-round suggests this is likely. Moreover, there is favorable nesting habitat in the area. Hopefully this study will help inspire and aid further fieldwork to investigate why caracaras have moved into this area and the prospects of caracaras nesting in this area.

Developing Techniques to Document Migration of Tree Swallows along the Lower Colorado River. *Piest, L. A., Arizona Game and Fish Department, 9140 E. 28th Street, Yuma, AZ 85365, lpiest@azgfd.gov*

The lower Colorado River is a major corridor for spring and fall migrant Tree Swallows. These birds create impressive spectacles as they congregate in swarms in the evening and descend to their roosts in marsh vegetation, and again in the morning when they depart. It is obvious that the LCR is of critical importance to western populations of Tree Swallows, and biologists have estimated migrations of several million birds, but we know little about actual numbers of roosts or individuals, their distribution along the river, or the seasonality of the migration. Difficulty of access and dim lighting have made estimates of individuals in roosting swarms difficult. Several attempts I have made to photograph swarms against the evening sky and count individuals have resulted in estimates of about 40,000 in individual swarms. This technique has involved considerable extrapolation and is generally far from rigorous. Roost flights are apparent on Doppler radar and this technology should help us fill in many of the gaps in our knowledge of Tree Swallow migration.

2013

Wintering Grasshopper Sparrows in the Verde Valley. **Grahame, J., jdgrahame AT gmail.com; *T. Linda, roughlegged AT gmail.com; J. Crouse, Joseph.Crouse AT nau.edu; C. Drost, Charles_drost AT usgs.gov, Flagstaff, AZ*

The winter distribution of the Grasshopper Sparrow (*Ammodramus savannarum*) in the United States is rather poorly known. Monson and Phillips (1981) describe the species as "fairly common" in southeastern Arizona in the winter, but they note that the species is "lacking in central Arizona; uncommon and irregular ... farther west, even to the Colorado River, where there are about six records, including two specimens..." Museum records and historical surveys from the Verde Valley of north-central Arizona do not show any reports of Grasshopper Sparrows. However, three were captured and banded in Verde Valley grassland habitat on 4 April 2000, and one individual was recorded in similar habitat on the Verde Valley Christmas Bird Count of 26 December 2010. We made a concerted effort to search this habitat for the species during the winter and early spring of 2013. Seventy-eight sightings of Grasshopper Sparrows were made over the course of 14 visits between 7 January and 4 May. The birds were regularly found in lightly to moderately grazed grasslands with low shrub density. We believe the birds to be the widely-distributed western subspecies, *A. s. perpallidus*. The authors hope that their work will result in an increase in winter surveying for Grasshopper Sparrows in north-central Arizona grasslands.
**presenting authors*

The Expansion of Tropical Kingbirds in Arizona. *Jenness, D., 4375 E. Rollins Rd., Tucson, AZ 85739, d_jenness AT hotmail.com, 520-909-1529*

"Based on their history in the state, the nesting distribution of Tropical Kingbirds is expected to continue expanding in Arizona." This forecast by Troy Corman in the *Arizona Breeding Bird Atlas* (2005) has proved to be accurate. For the past five decades Tropical Kingbirds have been gradually moving northward, primarily along the San Pedro and Santa Cruz rivers. At the time of the *Atlas* surveys in the 1990s and early 2000s they had reached the confluence of the San Pedro and Gila rivers at Winkelman and had moved northward along the Santa Cruz River valley to Marana and a pecan grove south of the Pinal Air Park. Outlier pairs were also found nesting near Yuma, at Organ Pipe Cactus National Monument, and the Hassayampa River Preserve near Wickenburg. The latter was the most northern site up to that time. Since then new nesting sites, farther north and west, have been discovered along the lower Colorado River valley in Mohave and La Paz counties. Moreover, they have continued expanding along the Santa Cruz River valley, most notably at the Sweetwater Wetlands in Tucson and farther north into the primarily agricultural Santa Cruz Flats area of Pinal County. The latter area is particularly intriguing as an estimated 15 to 20 pairs of Tropical Kingbirds have been discovered nesting in rows of healthy pecans along farm roads. It's not clear when nesting began in this area. This study pulls together nesting data that shows the continued expansion of Tropical Kingbirds since the *Atlas* surveys were completed with special attention to the Santa Cruz Flats area.

Sonoran Desert Breeding Bird Surveys: A Coordinated Approach. ***** *Juarez, E. and T. E. Corman, Arizona Game and Fish Department, 5000 W. Carefree Highway, Phoenix, AZ 85086. Ejuarez AT azgfd.gov, 623-236-7516; Arnett, J. 56th Range Management Office, 7101 Jerstad Lane, Building 500, Luke Air Force Base, AZ 85309-1647; C. Beardmore, Sonoran Joint Venture, U.S. Fish and Wildlife Service, 2321 W. Royal Palm Rd. Suite 103, Phoenix, AZ 85021.*

Over 60 species of birds breed in the Sonoran Desert and many populations are naturally small and typically at low density. As a result, these species may be particularly vulnerable to

progressively growing threats, including habitat loss and fragmentation. These threats have made a robust monitoring program necessary to assess the status and trends of these desert-dwelling species, inform conservation strategies for priority species, and help keep common species common. Through the Arizona Bird Conservation Initiative (ABCI, a partnership coordinated by the Arizona Game and Fish Department) various partners have joined to promote the development of a unified breeding bird monitoring strategy. The study area includes native Sonoran Desert habitats (Upper and Lower Sonoran), including dry washes in southern and western Arizona. This three-year project began in 2012 and will run through the 2014 breeding season, with additional three-year cycles to be repeated in the future to quantify long-term trends. We have established monitoring plots (16 or 24 ha) across the desert and are using a double sampling methodology (with an area search approach) for surveying plots. To date, we have recorded over 130 species. An important component of this project is the high level of coordination across the landscape. This coordination facilitates pooling of resources to work at a much larger scale than would be possible otherwise. It also helps resource managers in the region to better understand their level of stewardship for Sonoran Desert birds.
**presenting author*

Preliminary Findings: The Diet of Arizona's Golden Eagle. **Losee, M. J., Antioch University New England, 2850 Blue Horizon, Sedona, AZ 86336, Michele.losee AT gmail.com, 571-271-1193; Jacobson, T., Licence, K. and McCarty, K., Arizona Department of Game and Fish, 5000 W. Carefree Highway, Phoenix, AZ 85086*

In Arizona, the Golden Eagle (*Aquila chrysaetos*) has been largely unstudied. In 2011, Arizona Game and Fish Department (AZGFD) began a two-year nest survey for cliff nesting Golden Eagles throughout the state. Golden Eagle occupancy and diet assessments began in 2013. During the 2013-nesting season, we collected prey remains from 6 active Golden Eagle nests in the northern region of the state. The number of prey items ranged from three to 29 with the number of different species ranging from 2 to 6. The Black-tailed Jack Rabbit (*Lepus californicus*) was the only prey species found in all 6 nests and the highest percentage (33-81%) of total species found in each nest as well as contributing to the highest biomass (2.7-5.9kg) for each nest. The 2 heaviest, single prey species were a Pronghorn Antelope (Antilocapra americana) fawn (3kg) and a juvenile Gray Fox (*Urocyon cinereoargenteus*) (3.2kg). The more unique prey species were snake, an adult Common Raven (*Corvus corax*), domestic feline, and a juvenile Pinyon Jay (*Gymnorhinus cyanocephalus*). The nest with most diversity of prey species (6) was the only nest with 2 nestlings. These preliminary findings revealed important information pertaining to the dietary habits of Golden Eagles nesting in Northern Arizona. This information as well as data collected from next year's nesting season will help describe the dietary and foraging requirements for Golden Eagle pairs nesting in Arizona. These requirements coupled with occupancy data will assist AZGFD to generate better conservation action and policy recommendations.
**presenting author*

2014

Breeding Ecology and the Use of Nesting Platforms of the Cordilleran Flycatcher in Southwest Colorado. *Darrah, A. J.[1] and van Riper III, C.[2]*

[1]*School of Natural Resources, University of Arizona, Tucson, AZ, USA*
[2]*USGS/Sonoran Desert Research Station, University of Arizona, Tucson, AZ, USA*
Email: adarrah@email.arizona.edu.

Despite the fact that the Cordilleran Flycatcher **(*Empidonax occidentalis*)** is relatively common and widespread in western North American forests, it is one of the least-studied North American songbirds. We undertook this study to describe its breeding biology, to examine the willingness of this species to accept nesting platforms, and to use nesting platforms to manipulate opportunities for polygamy. This study took place at private residences and adjacent areas of the San Juan National Forest in Montezuma County, Colorado, during the breeding seasons of 2012-2014. Cordilleran Flycatcher pairs readily used nesting platforms that were placed on houses and on trees in the surrounding forest. Length of the incubation period, feeding rates, and nest attendance were similar to those of the Pacific-slope Flycatcher (*Empidonax)*. Both parents provisioned the nestlings and fledglings roughly equally, although only the female incubated eggs. Polygamy was observed in 2012 only, a wet year. In 2013 and 2014, we tracked fledglings using radio telemetry to observe feeding rates and movement patterns. In 2013 (dry year) we observed presumed transient adults attempting to feed or mount fledglings, which created disruptions to parental feeding as the male frequently chased intruders away from the brood. We demonstrate that the Cordilleran Flycatcher readily accepts artificial nesting platforms, and the availability of additional nesting sites may encourage polygamy in years of high resource abundance. The disruption of fledgling feeding by early migrants in 2013 suggests that climatic factors that decrease breeding success in one area may indirectly affect breeding success in adjacent areas.

2015

Ten Years of the Santa Cruz Flats Raptor Count. *Jenness, D. 4375 E. Rollins Rd., Tucson, AZ 85739,* d_jenness@hotmail.com

Since 2006, volunteers have conducted an annual one-day survey of raptors wintering at the Santa Cruz Flats in Pinal County. The count is conducted on the third Saturday of January. Santa Cruz Flats, dominated by diverse agriculture, is one of the principal areas in southern Arizona that draws these winter visitors. Located along the basin of the Santa Cruz River, which flows northwest across the county towards the Gila River, the area encompasses approximately 900 km² and has an average elevation of 520 m. The results were 236 to 448 raptors reported, with a 10-year mean of 341. Species reported range from 13 to 16. The most numerous species are Red-tailed Hawk, American Kestrel, and Northern Harrier. Overall, the numbers of these species appear to be declining. For the first 4 years of the count, all 3 surpassed their 10-year averages; in the last 6 years, Red-tailed Hawk and Northern Harrier have surpassed their averages only once and American Kestrel twice. White-tailed Kite and Barn Owl reported in the first years of the count haven't been detected in recent years. However, there has been an increase in the number of wintering Crested Caracaras. The reason for the apparent decline in the 5 named species and the increase in wintering caracaras merits further study.

2016

Prescribed Fire, Resource Objective Fire, and Wildfire Effects on American Three-toed Woodpecker. *Crouse, J.*and D. Huffman, Ecological Restoration Institute, Northern Arizona University, PO Box 15017, Flagstaff, AZ 86011-5017, Joseph.Crouse@nau.edu*

Prescribed burning and naturally ignited "resource objective" fires are used by land managers to manage fuels, as tools for ecosystem restoration, and to help reduce the size and severity of wildfires in ponderosa pine and ponderosa pine/Douglas-fir forests. These ecosystems are the preferred habitat for the American Three-toed Woodpecker in Arizona. A recent study in these forest types showed that the woodpeckers prefer areas with moderate burn severity that contain a mix of unburned to severely burned trees. Large snags (≥ 30 cm diameter) for nesting, and trees averaging 63 cm for foraging, are critical habitat components. We combined Monitoring Trends in Burn Severity (MTBS) and field plot data to analyze woodpecker habitat created by 105 prescribed fires, resource objective fires, and wildfires covering nearly 610,000 ha. Moderate severity fire comprises 23% of wildfire landscapes, 12% of resource objective fire landscapes, and only 1% of prescribed fire landscapes. Although wildfires create the greatest amount of moderate burn severity areas, resource objective fires—because they occur during conditions that generally do not allow them to become extremely large or to become threats to human life and structures—are likely the best compromise to meet both American Three-toed Woodpecker habitat requirements and forest restoration targets.
**presenting author*

Population and Density Estimates of Breeding Birds in the Sonoran Desert and Riparian Habitats of Arizona. *Juarez, E.*and T. E. Corman, Arizona Game and Fish Department, 5000 W. Carefree Hwy., Phoenix, AZ 85086-5000, Ejuarez@azgfd.gov; Arnett, J., 56th Range Management Office, Luke Air Force Base, 7101 Jerstad Ln., Bldg. 500, Luke Air Force Base, AZ 85309-1647; Beardmore, C., Sonoran Joint Venture, US Fish and Wildlife Service, 9828 N. 31st Ave., #C3, Phoenix, AZ 85051-2517*

In Arizona, continental-scale bird monitoring programs such as the North American Breeding Bird Survey (BBS) do not adequately sample major bird groups, including species that: 1) breed in riparian habitats, and 2) Sonoran Desert species that breed earlier or later than most BBS surveys are conducted. Coincidentally, multiple species from these two habitats are represented on Arizona's Species of Greatest Conservation Need (SGCN) list, which means that many of Arizona's priority species are poorly monitored. To address this gap, the Arizona Game and Fish Department and partners implemented a study to estimate population size and density of breeding birds in Arizona's Sonoran Desert and riparian habitats. A total of 17 species (12%) on the SGCN list regularly nest in the Sonoran Desert, and many more species (47, or 32%) on this list nest in riparian habitat. We used multiple criteria to define the study area for each habitat and stratified random sampling to select survey plots. To estimate detection rates we used double sampling, by which all plots are surveyed rapidly (i.e., infrequently) and a random subset is surveyed intensively (i.e., more often). For the Sonoran Desert we recorded 15,909 birds of 74 breeding species, and estimated population size and density for 10 of the 17 SGCN species. We estimated the total population size in the study area at about 30 million birds, with an overall density of 437 birds/km^2. For the riparian habitat, we recorded 34,748 birds of 197 breeding species, and estimated population size and density for over 100 species, 23 of which were SGCN. Total population size in the study area was estimated at about 1.5 million birds, with a

density of about 1,950 birds/km^2. Repeating these surveys over time will provide long-term trend data that can inform conservation and adaptive management at relevant scales.
**presenting author*

Preliminary Findings: Golden Eagle Nesting Phenology. *Losee, M. J.*, Antioch University New England, 40 Avon St., Keene, NH 03431-3516, mlosee@antioch.edu; T. Jacobson, K. Licence, K. McCarty, Arizona Game and Fish Department, 5000 W. Carefree Hwy., Phoenix, AZ 85086-5000*

In Arizona, the Golden Eagle (*Aquila chrysaetos*) has been largely unstudied. Beginning in 2011, the Arizona Game and Fish Department (AZGFD) began surveying Golden Eagle occupancy throughout the state. Nesting phenology and productivity data were collected for seasons 2011 thru 2014. Preliminary analyses show courting ranges from 3 February to 23 March—with the average being 19 February, the mean-date for egg-laying is February 26, and the incubation period ranges from 3 March to 7 April. The mean-date for hatching is 1 April, and the nestling period ranges from 29 April to 1 June. Fledging occurs mainly between 11 June and 5 July. Occupancy for individual nests was 30% and pair productivity was 38% collectively for all four seasons. These are preliminary findings relating to a larger study of Golden Eagles nesting in Arizona. Establishing a foundation timeline for Golden Eagle nesting phenology is important for any future studies, especially those involving the impact of global environmental change. By building a model to relate climate parameters, we can better understand how the effects of future climate change might influence nesting throughout the state. These findings, coupled with occupancy and productivity data, will assist the AZGFD to generate better conservation action and policy recommendations.
**presenting author*

Breeding Habitat Selection of the Western Distinct Population of the Yellow-billed Cuckoo within Important Bird Areas. *Supplee, T.* and S. Prager, Audubon Arizona, 3131 S Central Road, Phoenix, AZ 85040, tsupplee@audubon.org*

Understanding breeding habitat preferences of the western distinct population of the Yellow-billed Cuckoo (*Coccyzus americanus*), a species listed by the United States Fish and Wildlife Service (USFWS) as Threatened, is key to its conservation. Natural history accounts of the bird note that, in its breeding range, it nests in cottonwood/willow riparian gallery forests and relies on adjacent mesquite bosque for foraging. In the summer of 2015, Audubon Arizona staff and permittees surveyed 5 Audubon Important Bird Areas (IBAs) to determine cuckoo presence/absence and to assess breeding status. Using the protocol published by the USFWS, surveyors detected cuckoos 154 times in 4 of the 5 IBAs. Of these sites, 3 supported birds that were likely breeding. One site contained habitat consistent with cuckoo natural history accounts – extensive cottonwood/willow riparian gallery forest with adjacent mesquite upland scrub and Madrean pinyon-juniper woodland. The second site was less consistent with cuckoo habitat descriptions, with most detections occurring in extensive mesquite bosque along dry, ephemeral portions of the San Pedro River. The third site was the least consistent with previous cuckoo breeding habitat descriptions. Detections at this site were made in ephemeral drainages dominated by encinal oak woodlands and adjacent semidesert grasslands. This use of what was thought to be atypical cuckoo habitat was also observed by Tucson Audubon biologists during

their 2015 surveys of several oak-dominated drainages within southeastern Arizona sky island IBAs. Studies looking to determine presence/absence of cuckoos and eventual designation of critical habitat should consider these and potentially other habitat types.
**presenting author*

2017

Hummingbird Monitoring at Montezuma Castle National Monument. *Greenawalt, T., National Park Service, 527 S. Main St., Camp Verde, AZ 86322, Tina_greenawalt@nps.gov.*
In 2015, the National Park Service partnered with the Hummingbird Monitoring Network to establish a monitoring station in the Verde Valley. Monitoring stations are currently active throughout western North America from Mexico to British Columbia. Each station collects detailed demographic information on hummingbird populations, which can help estimate abundance so that population trends can be detected. Migration timing and movement patterns can also be detected with the information collected. After conducting feeder watches at two potential sites in the spring and summer of 2015, we chose Montezuma Castle National Monument as the best location for a monitoring station. We began our monitoring sessions in April 2016 and recently finished our second season. Over the course of the last 2 seasons, we have banded over 200 hummingbirds of 3 different species. While our station does not have sufficient data for analysis on recapture rates, I will share data for recaptures at other sites in Arizona.

Western Burrowing Owls Face Multiple Challenges Associated with Urban Living in Western Arizona. *Loyd, K. A. T., Osinski, J. J., Beckwith, M. T., Arizona State University Colleges at Lake Havasu City, 100 University Way, Lake Havasu City, AZ 86403, K.Loyd@asu.edu.*

The western race of the Burrowing Owl (*Athene cunicularia hypugaea*) is labeled as a species of conservation concern across the western United States. In Lake Havasu City, Arizona, these owls are commonly observed in nontraditional habitats—desert washes (arroyos) in developed locations. Urban and suburban washes may offer a large prey base and abundant existing burrows, but the owls are susceptible to disturbance from humans, predation by high densities of coyotes, and exposure to poisoned prey. We began studying habitat characteristics and productivity of local Burrowing Owls in February 2014. Over the past 4 breeding seasons, we have monitored 84 nests. Nest success increased from 2014 to 2015 (44% to 75%), with an average of 69% over all four years. The mean number of fledglings per nest to date is 4.1 (range 1-7). Seventeen nests were abandoned for unknown reasons, and 16 experienced a mortality of one or more adults and chicks. Four fresh carcasses found in 2014 and one in 2015 were confirmed to be contaminated with high levels of brodifacoum, the compound commonly used in second generation anticoagulant rodenticides. High levels of mortality throughout our study area in 2014 may be responsible for the difficulty we experienced in locating nesting pairs of owls in 2016. Results from regression models suggest that nest sites experiencing a mortality were less likely to produce fledglings, but those with larger burrow diameter were more likely to have a larger number of offspring. No significant differences were found when comparing plant cover, prey availability, burrow diameter, or height from wash floor at successful vs. failed nest sites.

Our research over future seasons will continue to provide baseline data on the local population, as well as help biologists and managers understand the owls' unique habitat preferences.

Ten-Year Summary of Grassland Bird Point Counts at Appleton-Whittell Research Ranch. *Supplee, T., **S.** Prager, C. Wise, National Audubon Society, Audubon Arizona, 3131 S. Central Ave., Phoenix, AZ 85040, tsupplee@audubon.org*

Annual roadside point counts for grassland birds were established on the Appleton-Whittell Research Ranch of the National Audubon Society (AWRR) and the Babacomari Ranch in 2006. Points are located in 0.8 km increments on the main road from the Upper Elgin Road junction to the AWRR headquarters; 7 of the 12 points are on the Babacomari Ranch that has livestock grazing, and another 10 points are on East Mesa Road within the AWRR boundary. The points are surveyed from mid-August to early September, when breeding birds are singing. Birds heard or seen are counted during a 5-minute period at each point. Trends for those birds that are of conservation focus are presented for each survey route.

Influence of Fire and Burn Severity on Bird Species. *Crouse, J. and D. Normandin, Ecological Restoration Institute, Northern Arizona University, Flagstaff, AZ 86011, Joseph.Crouse@nau.edu; T. Linda, 5700 N. Villa Cir., Unit 466, Flagstaff, AZ 86004; R. Crouse, 444 S. Cortez St., Apt. C, Prescott, AZ 86303*

Point counts were conducted in a chronosequence of northern Arizona wildfires to determine species composition. The fires surveyed were the Leroux (2001), Independence (2009), General (2014), and Highline (2017). Each fire was stratified by burn severity as determined by Monitoring Trends in Burn Severity (MTBS) data. Criteria for fires included available MTBS data, majority of vegetation in ponderosa pine and mixed conifer vegetation types, and similar elevations. Species diversity was greatest in low burn- severity areas in both the Leroux and Independence fires. The total number of species seen was greatest in the Independence fire, but results for all fires were very similar. Red-breasted Nuthatch, Mountain Chickadee, and Western Bluebird were the most common species across all fires, with the Red-breasted Nuthatch and Mountain Chickadee most common in the unburned to moderate burn-severity areas, and the Western Bluebird most common in high severity areas.

2018

Results of Yellow-billed Cuckoo Surveys along the Upper San Pedro River: Evidence of Breeding Behavior in Mesquite Bosque. *Cobbold, S. M., scobbold@acstempe.com; Archaeological Consulting Services, Ltd., 424 W. Broadway Rd., Tempe, AZ 85282 Stewart, L. R., lstewart@acstempe.com*

We describe the results of our 2018 surveys for western Yellow-billed Cuckoo (*Coccyzus americanus*) in support of an Arizona Department of Transportation bridge replacement project located on AZ 80 on the upper San Pedro River near Benson, Arizona. Our surveys were conducted in potential cuckoo habitat within 0.8 km of the San Pedro River Bridge and covered a total length of 3.2 km along 3 watercourses: the San Pedro River, Dragoon Wash, and an unnamed wash. Vegetation in the survey area is dominated by mesquite bosque, which is widely

recognized as a component of Yellow-billed Cuckoo breeding habitat but is less well-documented as breeding habitat in its own right. We discuss multiple Yellow-billed Cuckoo observations that suggest the presence of established breeding territories throughout the survey area.

Seasonal Movements of Crested Caracaras in Arizona—Preliminary Data. *Jenness, D., d_jenness@hotmail.com,4375 E. Rollins Rd., Tucson, AZ 85739; Glinski, R., rich.glinski@gmail.com, PO Box 243, Arivaca, AZ 85601; Morrison, J. L., joan.morrison@trincoll.edu; 390 Rincon Rd., Corrales, NM 87048*

In 2017 we launched a project to place GPS/GSM transmitters on Crested Caracaras (*Caracara cheriway*) in Arizona. Our goal is to learn more about the seasonal movements of caracaras, particularly nonbreeding birds. So far, we have placed transmitters on a recent fledgling (now a second-year bird) and a nestling. The second-year bird was released at a Santa Cruz Flats agricultural field in November 2017. After a week near the release area, it traveled to Avra Valley, spending most of its time northwest of Marana. Between early April and early June it traveled back and forth between Avra Valley and the Santa Cruz Flats. Since 6 June it has not returned to Avra Valley, remaining at the Santa Cruz Flats except for several long jaunts to the southwest. The area it has moved in stretches 83 km east to west and 56 km south to north. It has remained primarily in agricultural fields, typically foraging in cattle pastures and alfalfa and recently disked cotton fields. It mostly roosts in Sonoran Desert Scrub adjacent to farm fields. A fledgling tagged in early June has remained within 0.5 km of its nest and is moving around regularly in the nearby Sonoran Savanna Grassland. An abundance of ground squirrels, lizards, and young quail in this habitat in the summer likely constitute good food resources for young caracaras as they learn how to forage independently.

Movement Patterns, Survivorship, and Home Range Size of LeConte's Thrasher on the Barry Goldwater Range. *Kondrat-Smith, C., ckondrat-smith@azgfd.gov and S. Lowery, S., slowery@azgfd.gov, Arizona Game and Fish Department, 5000 W. Carefree Hwy., Phoenix, AZ 85086*

The LeConte's Thrasher (*Toxostoma lecontei*) is a species of conservation concern included on the Red Watch List of Partners in Flight. The species distribution range consists of sparsely vegetated Sonoran Desert landscapes (Lower Colorado Subdivision) across the U. S. Southwest and northwestern Mexico. In southwestern Arizona, the Department of Defense (DoD) manages large tracts of habitat on the Barry M. Goldwater Range (BMGR) and Yuma Proving Grounds (YPG). Given the large scale of this area, DoD installations play a major role in the conservation of this ecoregion. The Arizona Game and Fish Department conducted occupancy surveys during the 2011-2013 breeding seasons on the BMGR and YPG to better understand species distribution and identify potential habitat relationships. Survey results were used to develop detection probabilities across the DOD installations, and a Prediction of Occurrence model was built to provide a predictive index of the species habitat. In addition to species surveys, active nests were identified to monitor fledglings using VHF telemetry (2013). Fourteen birds were radio-tracked from the nestling to postfledgling dispersal periods. Tracking results provided an understanding of survival, movement, and home range size of LCTH postfledging. Results from this study allowed military installations in this ecoregion to adapt their Integrated Natural

Resource Management Plans to better conserve LCTH habitat while maintaining military readiness into the future.

2019

Urban Burrowing Owl Nest Ornamentation in Lake Havasu City, AZ. *Boelter, A. R., ale64976@gmail.com; Loyd, K. A. T. Arizona State University, 100 University Way Lake Havasu City, AZ 86403*

Burrowing Owls in Lake Havasu City scatter paper and other litter, as well as domestic dog waste, in front of their nests. Their ornamentation behavior has been studied previously in several locations in western North America, however, the only hypothesis with some support is that birds are marking their nests with items, so the sites won't be selected by other owls. Research on Black Kites (*Milvus migrans*) that exhibit nest ornamentation showed higher productivity at nests with more litter, suggesting a relationship between bird status, fitness, and nest productivity. We monitored 24 nests in urban/suburban Lake Havasu in spring 2019 and hypothesized that a relationship exists between ornamentation and productivity. We documented the number of fledgling birds at each nest, the number of individual items, number of different types of items, and percent cover of items present early in nesting season. We used the 21 successful nests in analysis. The mean number of juveniles was 5. The average number of items used was 42 with an average of 5.7 different types. The most used item was domestic dog feces, and 3 nests had over 100 items. We did not find a significant relationship between the number of fledglings and any category describing ornamentation activity. We suspect this may be due to lack of variation in the number of juveniles at each nest this year. A relationship may be determined with greater sample size or the ornamentation behavior may not be a factor influencing productivity when appropriate habitat and resources are abundant.

Lucy's Warbler Nest Box Experiment. *Phillips, O., ophillips@tucsonaudubon.org; 300 E. University Blvd. #120 Tucson, AZ 85705*

The Lucy's Warbler (*Oreothlypis luciae*) is North America's smallest cavity-nesting bird and is a secondary cavity nester. It is intricately tied to mesquite trees (*Prosopis* spp.) for foraging, so much so that it has previously been called the Mesquite Warbler. However, the reduction in groundwater levels has resulted in die-offs of entire stands of these native trees. Wood from large mesquites is also commercially valuable and has been substantially harvested from the few locations where they still manage to grow. With the reduction in the mesquite-based obligate habitat has come a concurrent reduction in the population of Lucy's Warblers. Part of this reduction is due to overall loss of habitat affecting the availability of suitable nesting cavities. Could nest boxes be a conservation tool for this species? Tucson Audubon's Lucy's Warbler Nest Box Project centers on breaking down the long-held notion that Lucy's Warblers will not use nest boxes. Tucson Audubon set out to prove that it is all a matter of finding the right design. Learn about our multiyear experiment of creating 8 different nest box designs installed at 60 points in Lucy's Warbler habitat in southeast Arizona to identify the preferred nest box design. With the tremendous support from the public with construction, installation and monitoring of these boxes, we have narrowed down the winning design: the triangle nest box, which mimics the natural nests in peeling bark of mature mesquite trees.

Flagstaff Kestrel Project—Integrating Community into Conservation. *Rappaport, M. J., mjr486@nau.edu; 1185 W University Ave Unit 109 Flagstaff, AZ 86001*

The Flagstaff Kestrel Project (FKP) integrates community into conservation. Driven by scientific inquiry, FKP seeks to understand the best practices for engaging laypeople into conservation work, while concurrently creating a long-term monitoring program for American kestrels in northern Arizona. This research will have wide-ranging implications for other communities that wish to become involved in conservation efforts. FKP is working to create and strengthen community, contribute to scientific research, furnish participants with experience in field biology, and create nesting habitat for a declining species of falcon.

Assessing the Feasibility of Using Citizen Science for Songbird Monitoring to Evaluate Four Forest Restoration Initiative Treatment Effects. *Sanderlin, J. S., jamie.l.sanderlin@usda.gov; Strohmeyer, B. E., Ganey, J. L., Rocky Mountain Research Station, USDA Forest Service 2500 S. Pine Knoll Dr. Flagstaff, AZ 86001; Schwartz, M. K., Rocky Mountain Research Station, USDA Forest Service, 800 E. Beckwith Ave. Missoula, MT 59801*

The Four Forest Restoration Initiative (4FRI) is a Collaborative Forest Landscape Restoration Program that demonstrates shared stewardship in Arizona spanning 4 National Forests (Coconino, Kaibab, Apache-Sitgreaves, Tonto). Because of this effort's large spatial extent and consequent potential for proposed treatments to impact large areas, it is crucial to understand how those treatments affect native wildlife. The 4FRI Multi-party Monitoring Board selected songbirds to monitor treatment effects because they are excellent ecological indicators due to their linkages to specific resources based on foraging and nesting requirements, and multiple species can be monitored simultaneously, reducing costs. Monitoring objectives include: (1) evaluating songbird community metrics of species richness, species evenness, community dynamics, and multi-scale occupancy for all species in the community within project areas and across the region of the Coconino and Kaibab National Forests; (2) evaluating multiscale habitat relationships with abundance of select songbird species with respect to treatment effects. Successfully monitoring songbirds within the 4FRI treatment areas in an era of shrinking federal budgets will require innovative, cost-efficient approaches. Citizen science may offer an opportunity to reduce monitoring costs while increasing public interest in songbirds and forest restoration, but the feasibility of incorporating citizen scientists in this effort is currently unknown. We present plans for a pilot study to provide the data necessary to rigorously evaluate the feasibility of using citizen scientists in songbird monitoring within the 4FRI area.

Spatial Prioritization for Endangered Yuma Ridgway's Rail Habitat on the Gila River in Maricopa County, AZ. *Supplee, T., tsupplee@audubon.org; Flores, E., 3131 S. Central Avenue Phoenix, AZ 85040*

The Yuma Ridgway's Rail (*Rallus obsoletus yumanensis*) is a subspecies of Ridgway's Rail (*Rallus obsoletus*) that can be found in freshwater marsh habitats along the lower Colorado River, the Gila River, and the Salton Sea. However, due to the disappearance and deterioration of their habitats, they are listed as a federally endangered species. Emergent marsh habitats on the Gila River near Phoenix are in small patches and not adequately mapped. Because of changing land uses and water regimes on the Gila River west of Phoenix and above Gillespie Dam, a need

exists for more accurate identification of emergent marsh. Although a predictive occupancy model exists and was considered for use by the project team, important habitat details were lacking. Audubon Arizona initiated a habitat suitability project using Geographic Information Systems technology as the main tool for building a localized preliminary habitat model. This poster presentation expands on the development and workflow of refining the model, as well as the development of a field survey protocol compatible with the North American Marsh Bird Survey Protocols for verifying habitat features.

2022

Lingering Impact of the 2020 Drought Upon Bird Populations of Southeastern Arizona. Helentjaris, T. tnhelentjaris@msn.com, Tucson, AZ

Arizona is in a long cycle of increasing temperature and decreasing precipitation, but the drought of 2020 was the most severe of the last 40+ years. Looking at weather data, annual precipitation values vary widely across southeastern Arizona but most of this can be accounted for by site elevation. Hence, higher elevations in the Sky Islands receive much more precipitation and also lost less in 2020. Starting from birder observations that some species were very hard to find after 2020, I looked at eBird data to characterize this loss. I found that while most species did not show any difference in frequency of observation, a number of species were severely affected, showing up most obviously in 2021 but extending into 2022. As a group, affected species were mostly from lower elevations, smaller in size, and resident breeders with little proclivity for migration or wandering. These species are also the ones most likely to show no evidence of recovery in 2022. While climate change and its effect upon species is most often thought of in terms of gradual degradation, these data suggest that this period can also be "punctuated" by large losses, from which some species may never recover.

One of Arizona's Newest Christmas Bird Counts, Safford CBC: Challenges, Approaches, and Results. Drobka, D. sunny1az@yahoo.com, 225 West 100 South, Pima, Arizona 85543

I first proposed a Safford CBC in the early 1990s while working as a wildlife biologist for the Bureau of Labor Management Safford Field Office. With few birders in Graham County, I knew that recruiting participants would be challenging and did not have time to pursue implementation. After my retirement, with encouragement from Troy Corman and support from Chrissy Kondrat to recreate my hand-drawn count circle in GIS, I agreed to organize the first CBC, hoping that our amazing habitats would entice volunteers from across Arizona. The count circle's lowest point circa 2,900' along the Gila River and highs over 10,000' in the Pinaleño Mountains likely make it Arizona's CBC with the broadest elevation range. The circle was divided into nine blocks to include a sampling of eBird hotspots and water features in each. December 27, 2020 was chosen as the date for the first-ever CBC in Graham County. Recruitment of volunteers was challenging, and I worried that we would not meet Audubon's minimum of ten. Local media provided great coverage both before and after the count. Thanks to participants from Phoenix, Vail, Globe, Fort Thomas and Pima, we had 11 birders. This was not enough to have a team for each section; three of the five teams each surveyed two blocks and one block was not covered. Despite that division of time, 104 species were seen on count day and

another nine species during count week. A few species were noted in the Arizona Rare Bird Alert: Northern Beardless-Tyrannulet (unexpected in winter), Yellow-bellied Sapsucker, American Goldfinch, and Greater White-fronted Goose, plus a Harlan's Hawk seen during count week. An Excel spreadsheet shows species and locations. More volunteers are needed for better coverage in future Safford CBCs, so please email me if you can help.

2023

CONDITIONS AFFECTING THE DETECTION OF BURROWING OWLS: PRELIMINARY RESULTS OF A THREE-YEAR SURVEY AT SANTA CRUZ FLATS, PINAL COUNTY, *Jenness, D., 4375 East Rollins Road, Tucson, AZ 85739 USA. dougjenness@gmail.com.

A three-year survey (2021-24) of a 180 km² section of the Santa Cruz Flats agricultural area in Pinal County, is being conducted to determine the number of nesting Burrowing Owl (*Athene cunicularia*) pairs and the wintering population. The study focuses on the combination of conditions that may affect detection of this owl, which is key to determining seasonal populations. These conditions include date, time of day, temperature, cloud cover, and wind speed. Thirty burrows have been discovered in the study area, although not all have been active during the entire survey period, or in some cases, most of it. Between 19 February 2021 and 31 July 2023 more than 900 visits have been made to burrows at different times of day in every month. Preliminary results show that visits between the hours of 0400 and 0800 and between 1800 and 2000 produce a 75% detection rate per visit, that is the presence of at least one owl at a burrow. Visits made between 0800 and 1800 average a 45% detection rate. Visits made between 5° C and 27° C average 59% detection compared to the average of 25% for visits at -6° C to 4° C and 41% for visits between 27° C and 43° C. Average detections per visit between March through August is 58% compared to 42% between September and February. The highest number of owls detected was 51 between 1800 and 2000 on 4 July 2022. Preliminary results indicate the Burrowing Owls are present throughout the year at the Santa Cruz Flats, with a reduced wintering population. At the conclusion of the study logistic regression will be used to evaluate all the factors that could potentially affect the probability of detection.

2024

The Value of Monitoring Urban and Peri-urban Bird Communities, Shane Ashton Henderson, Arizona State University

In the Valley of the Sun, the city of Phoenix surrounds the Salt River, which provides essential habitat and resources for the unique species in this region. However, urbanization in Phoenix may significantly impact native flora and fauna. It is important to monitor these impacts in order to inform urban wildlife management. Birds are frequently used as indicators of ecosystem health due to their high mobility and visibility. In this poster, I share bird point count data collected by the Central Arizona-Phoenix Long-Term Ecological Research (CAPLTER) project since 2000 and discuss how long-term trends reflect the pressures placed on bird communities by urbanization and human activities. Data were collected via 15-minute bird point count surveys conducted at 106 sites across the Phoenix metropolitan area. Surveys were completed during the winter and spring seasons of each year from 2000 until the present, where each site was visited

twice per season. The data show negative trends for both abundance and occupancy for bird species in the Phoenix area, where abundance decreased over time for all species and occupancy notably decreased over time for some species. As Phoenix has grown, so too have the pressures placed on its natural resources. The long-term CAP bird point count data reveals troubling declines in bird abundance and occupancy, highlighting the importance of proactive urban wildlife management. Monitoring these trends is crucial to balancing urban growth with the preservation of ecological health in Phoenix and the surrounding area.