SDNHM Field Report: Grinnell Resurveys of the Mojave Desert

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The San Diego Natural History Museum's field work for the Centennial Resurvey of the San Jacinto Mountains is complete; draft species accounts have been completed for most taxa and distributed to some colleagues for review. Meanwhile, our participation in Grinnell resurveys of the Mojave Desert in collaboration with the Museum of Vertebrate Zoology, University of California at Santa Cruz, and University of New Mexico began last fall. We have now made nine field trips, from October to June. Eight of these 5-day trips were focused on mammals, while one, to Cedar Canyon in Mojave National Preserve, encompassed both birds and mammals. The mammal surveys also covered Ludlow, Amboy, Kelso Dunes, Essex, Rock Spring, Halloran Summit, Indian Cove (Joshua Tree National Park), and Colton Well.

Our trip to Cedar Canyon in the Mid Hills of the Providence Mountains, from 28 April to 2 May 2016, paralleled the visit of Joseph Grinnell, David H. Johnson, Elmer C. Aldrich, Dale Arvey, and Thomas L. Rodgers from 19 May to 4 June 1938. Cedar Canyon was one of the sites more

Bluff of Pinto Peak in Cedar Canyon photographed by Elmer Aldrich in 1938 (left), and by Lea Squires in 2016 (right). This is a different vantage point, but we will attempt to retake this photo and many others from the same vantage points, illustrating habitat change.

MVZ party camped in side canyon under pinyon pine, Cedar Canyon 1938 (left), and Phil Unitt setting up a mist net in the same side canyon 2016 (right).

intensively covered by the MVZ, entailing not only the 17-day spring visit but also a winter visit 6–8 January 1938. Our visit coincided with the peak of spring migration for many species of birds, contributing to our total of 77 species for the week—though little more than the 73 species of birds recorded by Grinnell and his students in 1938. But our most interesting observations were of breeding or resident species. The Zone-tailed Hawk has been seen in the Mid Hills of Mojave National Preserve since 2004, regularly since 2009, and a fledged juvenile was seen at Mid Hills Campground in 2012—the first confirmation of successful breeding of the Zone-tailed Hawk in California, following repeated failed attempts by two pairs in the Peninsular Ranges between 1978 and 1993. Thus our discovery of a Zone-tailed Hawk nest in a side canyon about a half mile north of the main axis of Cedar Canyon was notable. The female sat tightly while the male screamed loudly at passing intruders, such as a pair of Red-tailed Hawks also nesting nearby. We suspected the nest, in a pinyon tree, was still in an early stage of incubation, and we notified Neal Darby of Mojave National Preserve for possible follow-up. Because a pair of Zone-tailed Hawks was seen in early April at the Mid Hills Campground nearly 4 miles south of our nest, we suspect there may be at least two pairs of Zone-tailed Hawks in the Mid Hills area. We have now heard that Troy Maikis of the National Park Service has confirmed fledging of the nest, and has located an additional nest in the Granite Mountains, which was also successful. Before 1970 there were only six records of the Zone-tailed Hawk in all of California, but since then this species with a wide range to the south and southeast has become gradually more frequent, and now appears to have colonized Mojave National Preserve.

Male Zone-tailed Hawk (left) perched near nest being incubated by female (right). Cedar Canyon, 1 May 2016. Photos by Lea Squires.

A less expected bird was the Rufous-crowned Sparrow. *Aimophila ruficeps scottii* is widespread in Arizona but was unknown in California until 1972, in spite of the intensive work of teams from the Museum of Vertebrate Zoology in the Mojave Desert from 1938 to 1940. Remsen and Cardiff (*Western Birds* 10:45–46, 1979) reported that the species had colonized a few canyons at the north end of the New York Mountains, but subsequently the only additional population to come to light is on Clark Mountain. Thus it was with great surprise that we found the Rufous-

crowned Sparrow widespread in the side canyons north of Cedar Canyon: we saw it daily, with up to eight individuals per day, and collected two specimens. We can only surmise that in the 37 years since Remsen and Cardiff initially reported it, this inconspicuous species has continued to spread in the mountains of Mojave National Preserve without attracting birders' notice. The westward spread of *A. r. scottii* in the Mojave Desert is an interesting complement to the eastward spread of the coastal subspecies *A. r. canescens* that we recorded in the San Jacinto Mountains.

Two additions to the Cedar Canyon bird list since 1938 recall our observations of massive increase of these two species in the San Jacinto Mountains. In their report on the wildlife of the Providence Mountains Johnson et al. mentioned no Anna's Hummingbirds at Cedar Canyon—in the entire east Mojave Desert they had but a single occurrence, of one collected on Clark Mountain, and noted it was the "first substantiated record of this coastal species in the eastern part of the Mojave Desert." By contrast, in Cedar Canyon we noted Anna's Hummingbirds daily from 29 April to 2 May 2016, with up to 12 on 29 April. The species' range expansion over the past 80 years is well known—Anna's Hummingbird is now common in Arizona. But our observations help confirm this expansion is not due solely to the birds exploiting feeders and ornamental plants but to the species spreading in wilderness as well. Even though we focused our work in habitat not burned in the Hackberry Complex of fires in 2005, such habitat was just across the canyon from our campsite. Hummingbirds could be attracted to successional wildflowers growing in burned areas, though our data from San Diego County suggests this effect peaks just 2 or 3 years after the fire.

Similarly, the expedition of 1938 failed to find the Common Raven in Cedar Canyon. On this species in the region Johnson et al. wrote, "not common … one or more ravens flew along the railroad track, croaking occasionally, near our camp southwest of Kelso." Even though we saw only one raven per day, it was not in an area where it could exploit trash or road kill. The increase of the raven in the Mojave Desert, threatening desert tortoise hatchlings, is well known.

Two species not found in Cedar Canyon in 1938 that are now common: Rufous-crowned Sparrow (left, photo by Lori Hargrove), and Crissal Thrasher (right, photo by Lea Squires).

Johnson et al. noted the Crissal Thrasher at three sites in the Providence Mountains region but so few that they detailed every encounter in their published report. Cedar Canyon was not among the three. Since 1938 the Crissal Thrasher has been found to be widely if sparsely distributed in the eastern Mojave Desert, but it is regarded as a species of special concern in California, largely on the basis of habitat loss along the Colorado River and in the Coachella and Imperial valleys. In Cedar Canyon, we saw the Crissal Thrasher daily, with up to at least 8 individuals per day. Juveniles fledged this year were already full grown. Thus the species may have increased in Mojave National Preserve since 1938, a hypothesis for which we will want more data. Might decreased grazing have favored an increasing density of shrubs, favoring this bird typical of dense thickets?

The Violet-green Swallow, a conspicuous bird, was missed in Cedar Canyon in 1938 but found by us in numbers of up to 6 per day. We didn't find any nests, but the birds were circling and perching like local residents, not migrants. They could be nesting in holes excavated by the Ladder-backed Woodpecker in Joshua trees as well as in pinyons. Johnson et al. recorded the Violet-green Swallow nesting at some higher elevations in Mojave National Preserve but not Cedar Canyon.

Other birds new to Cedar Canyon were a single Peregrine Falcon on 29 April 2016 and a male Calliope Hummingbird displaying to a female on 30 April. Since its population began resurging in recent years, the Peregrine Falcon has colonized new sites beyond those known historically, and the cliffs rimming Pinto Mountain overlooking Cedar Canyon offer possible nest sites. Colonization by the Peregrine is possibly related to our failure to find the Prairie Falcon, which Grinnell and his students saw regularly there in 1938. Might the Peregrine be displacing the Prairie Falcon here and elsewhere? It's unclear whether the apparent pair of Calliope Hummingbirds represents breeding in atypical habitat outside the normal breeding range (montane coniferous forest) or just a social interaction during migration. Even during migration the Calliope Hummingbird is very rarely seen in the Mojave Desert.

Also notable was the Gilded Flicker entering a hole in an old Joshua tree. Though the Gilded Flicker is widespread in Arizona and Baja California, and formerly common along the Colorado River, the Colorado River population is now extirpated, and the species persists in California only in small numbers in the Joshua tree zone of Mojave National Preserve. It has been listed as endangered in the state by the California Department of Fish and Wildlife.

It was a disappointment to encounter no Gray Vireos in Cedar Canyon, despite a focused effort. In 1938, Grinnell and his students had found that species "conspicuous, though not abundant" in that area and estimated a population of four pairs per square mile. The Gray Vireo had been reported in Cedar Canyon via www.ebird.org as recently as 2010, but the decline that has affected apparently all of the species' California range evidently includes Mojave National Preserve.

Our surveys have yielded 39 species of mammals so far (analysis of bat calls recorded on the last two field trips still to be completed). Most of the nine sites surveyed were at lower elevations;

Cedar Canyon with its pinyons and junipers differed markedly. In Cedar Canyon, we found the Panamint chipmunk uncommon, noting no more than four per day. In 1938, it was "particularly abundant… on the piñon-covered plateau and the walls of the narrows side canyons cutting through it on the north side of the main canyon"—areas we covered intensively.

Less common carnivores revealed by motion-detecting cameras were the kit fox at Amboy and Essex, the spotted skunk at Essex, and the badger at Colton Well. Also, we recovered the carcass of a kit fox found struck by a vehicle near Amboy. Our 32-ounce pitfall cups yielded single desert gray shrews at Cedar Canyon and Indian Cove.

Spotted skunk at Essex (left) and badger at Colton Well (right), captured by motion-detecting cameras.

Bats were inadequately sampled historically, so it is not a surprise that our electronic detectors picked up at least three, possibly five species not collected at these sites previously. We failed to record the pallid bat, previously collected at both Indian Cove and Kelso, but it is less readily detectable by this technique than most other bats.

In spite of the cold nights during our early March visit to the Kelso Dunes (we awoke to a blanket of snow atop the nearby Providence Mountains on 7 March), capture rates and diversity were high. Notable captures were 13 of the canyon mouse. This species has a strong preference for rocky hillsides but was found in the dunes in large clumps of creosote among trash. Also unexpected was the presence and density of the desert cottontail. Typically this species is found among denser vegetation. Perhaps it has invaded as a result of being favored by the nearby human habitation or because the nearby tamarisk is watered daily. Similarly in the San Jacinto Mountains we found the desert cottontail in many altered habitats where it had been absent in 1908.

In Joshua Tree National Park's Indian Cove, the mammal surveys of Miller and Stebbins from MVZ entailed just a few days in May and July 1945, April 1951, and April 1960. But Chew and Butterworth (1964) studied the ecology of the rodents at Indian Cove from 1956 to 1958. Though

their survey in May 1957 also took place during a drought, the proportions of rodents they captured differed greatly from ours. They captured Merriam's kangaroo rat and the little pocket mouse commonly, the San Diego pocket mouse, cactus mouse, and desert woodrat only rarely, and the southern grasshopper mouse not at all. By contrast, in May 2016, we found the cactus mouse the most abundant rodent, followed by Merriam's kangaroo rat, the southern grasshopper mouse, and little pocket mouse. We did not capture the San Diego pocket mouse at all, which Miller and Stebbins also recorded at Indian Cove between 1945 and 1960. Neither did we encounter Merriam's chipmunk there, also recorded at Indian Cove by Miller and Stebbins.

Our review of historic field notes and literature is still continuing, so these preliminary comparisons are restricted to the most noticeable differences. Identifying additional changes, and placing it within an ecological context, of course awaits further collaborative analysis as more data accumulate over the next few years. Attached are spreadsheets listing our observations from these first few surveys, with more detailed results yet to come.

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