

SDNHM Field Report: Grinnell Resurveys in Joshua Tree National Park

Philip Unitt, Scott Tremor, Lori Hargrove, Drew Stokes

May 20, 2017

In their book *The Lives of Desert Animals in Joshua Tree National Monument* (1964), Alden H. Miller and Robert C. Stebbins summarized early faunal surveys of the park, largely on the basis of work from 1945 to 1951 by biologists of the Museum of Vertebrate Zoology. We have now resurveyed 4 of Miller and Stebbins' sites in Joshua Tree, 2 (Pinyon Well and Quail Spring) where we focused on both birds and mammals, plus 2 (Cottonwood Spring and Indian Cove) where we have—so far—focused only on mammals. Each survey took 5 days, except at Quail Spring, where the logistics of working at a site without access by motor vehicle entailed spreading the survey over 7 days. Quail Spring also merited extra attention because it was one of the sites surveyed most intensively as part of the early biological exploration of the park, visited repeatedly from the late 1920s to the early 1950s. Our visits took place in the second week of May 2016 (Indian Cove), last week of September 2016 (Cottonwood Spring), second week of October 2016 (Pinyon Well), and last week of April 2017 (Quail Spring). Our visit to Pinyon Well was timed to correspond to a visit by Miller, Stebbins, and colleagues from 8 to 18 October 1945. Miller and Stebbins visited Quail Spring approximately 40 days spread through all seasons, but included 18–22 May 1945 and 21–23 April 1947. Although we have many sites yet to resurvey, we describe here our notable observations and the most obvious patterns of change.

Pinyon Well and Quail Spring are similar in that both lie near the lower edge of the zone of pinyon/juniper woodland. At both sites we covered elevations between about 3600 and 4200 feet. They are also similar in having extensive areas burned, followed by minimal recovery of pinyon and juniper trees. From Pinyon Well, we also hiked to the ridgeline of the Little San Bernardino Mountains, up into an unburned zone mainly between 4200 and 4700 feet elevation. In 1945, Miller noted that the scrub oak was “with heavy acorn crop,” which was not the case in 2016. Even in unburned areas above Pinyon Well, dying off of juniper trees, presumably from the drought, was conspicuous. Another important change is that both sites had more surface water historically—the well at Pinyon Well and the tank at Quail Spring are now both dry.



Pinyon Well, left photo “a characteristic S-facing slope above Pinyon Wells,” Robert C. Stebbins, October 1945 vs. right photo showing thinning juniper on these same unburned slopes, Lori Hargrove, 11 October 2016.



Quail Spring, left photo “looking eastward and showing piñon belt,” Alden H. Miller, 21 May 1945 vs. right photo showing decreased woodlands in same view, Lori Hargrove, 25 April 2017.



Canyon above Quail Spring with lone pinyon tree (photo by Andrea Rios-Dominguez)



Pinyon Well, burned slope with poor recovery (photo by Lea Squires, 10 October 2016)

At Pinyon Well we recorded 48 species of birds, notably fewer than the 59 recorded there in October 1945. Some differences in the bird list may be due to our visit being only half as long, or to 1945 being a better year than 2016 for irregular migrants such as the Cedar Waxwing, American Robin, and Pine Siskin. But the reduction in pinyon/juniper woodland clearly contributed substantially. Of the 24 species recorded in October 1945 but not October 2016, the Mountain Quail, Western Screech Owl, Pinyon Jay, California Thrasher, and Oak Titmouse are year-round residents whose apparent decrease or extirpation from the Pinyon Well area is consistent with the decrease in cover of shrubs, trees, or both. Miller and Stebbins noted flocks of the Mountain Quail on 8 of 11 days at Pinyon Well, but the park's biologists now consider that species as threatened with extirpation throughout Joshua Tree. The titmouse was particularly common at Pinyon Well in 1945 with 12 specimens collected and "many times heard." Resident species that we did record but are clearly less numerous now include the California Scrub Jay (6 collected in 1945; Miller noted "about 25" one day; we saw only 2 pairs) and Spotted Towhee (recorded daily in October 1945; Miller noted "about 10" per day, but we saw only 2 or 3 individuals). This reduction of tree and shrub cover evidently affected some winter visitors too, such as the flicker and Golden-crowned Sparrow, of which we found none, and the Fox Sparrow, of which we found only one. Miller and Stebbins recorded several of each of these.

The conclusion of decline in numbers and retraction in range of several species of woodland and chaparral was amplified after our trip to Quail Spring in April. Again, we did not find the Western Screech Owl, Pinyon Jay, or Oak Titmouse, all of which had been recorded at Quail Spring repeatedly by Miller and Stebbins. Furthermore, we did not encounter any Spotted Towhees, which Miller and Stebbins noted regularly. Of the Mountain Quail, California Scrub Jay, Blue-gray Gnatcatcher, and Black-chinned Sparrow we found only one or two individuals, generally on the steeper, higher slopes, whereas all of these were regular at the base of the hill around the spring itself in the late 1940s. Two pairs of California Thrashers were still persisting near the spring in April 2017.

One mammal that has clearly decreased is the California chipmunk. At Pinyon Well Miller wrote, “abundant in the areas of piñon and manzanita, less so in scattered juniper,” and they collected 5 specimens at both Pinyon Well and Quail Spring. We observed only a single individual in 5 days at Pinyon Well. Neither did we find the chipmunk at Indian Cove or Cottonwood Spring, where Miller and Stebbins had also collected it.

However, contrary to this general pattern of decline, we also noted a few apparent range extensions. The big-eared woodrat is another chaparral species at the eastern edge of its range in Joshua Tree. It not only persists near Quail Spring, as we confirmed by finding two nests and trapping one individual, but even near the guzzler above Pinyon Well. At that site, where Miller and Stebbins did not collect the big-eared woodrat, we found a nest and trapped one animal. Our effort trapping around this nest was rewarded not only with the woodrat but two pinyon mice, representing another species characteristic of woodland and chaparral but not previously known from this site or so far southeast along the axis of the Little San Bernardino Mountains. At Quail Spring, however, where Miller and Stebbins collected 12 pinyon mice on 8 dates, we did not catch a single individual, so it seems likely that this species too has declined with the reduction of pinyon, juniper, and chaparral shrubs.



Nest of the big-eared woodrat above Pinyon Well (photo by Chris Swarth).

We found strong evidence for a range extension of the California Towhee. In this case, we can be sure the apparent extension is an actual expansion over the past 60 years. Miller and Stebbins did not encounter this rather conspicuous species east of Little Morongo Canyon, west of the boundary of Joshua Tree National Park. Now it has spread widely in the northwestern section of the park, as attested by reports to www.ebird.org. We recorded it not only at Quail Spring, within the area outlined by eBird reports, with up to 5 per day, but also around the guzzler above Pinyon Well, with up to 3 individuals on 12 October 2016—7 miles south of the previous reports from Ryan and Jumbo Rocks campgrounds. Thus the California Towhee is countering the trend of characteristically coastal species to be contracting in Joshua Tree.

Perhaps the most notable range extension we discovered, however, was of the Baja pocket mouse (*Chaetodipus rudinornis*—a recent split from Bailey’s pocket mouse, *C. baileyi*), a species new to Joshua Tree National Park. We captured 10 individuals at Cottonwood Spring in September 2016. This species was long known in southern California only from the Anza-Borrego Desert and Bard along the Colorado River in Imperial County, and the range maps available on many websites, such as the Smithsonian’s (https://naturalhistory.si.edu/mna/image_info.cfm?species_id=613), still show it with a very restricted range in southeastern California. Since the 1970s, however, many specimens have been collected in eastern Riverside County, near the Colorado River or south of Interstate 10. According to www.vertnet.org, there is also a specimen collected in 1997 in the Twentynine Palms Marine Corps Base north of Joshua Tree, and during our extensive rodent surveys within the base in spring 2011 and spring 2012, we captured 14 individuals at 5 localities in 2011. Thus it is possible that the range of *Chaetodipus rudinoris* spread north to Joshua Tree and beyond since the 1950s, after the work of Miller and Stebbins.



Baja pocket mouse (*Chaedodipus rudinoris*), a new species for Joshua Tree National Park (photo by Jack Daynes, Cottonwood Spring, 26 September 2016)

Present in Joshua Tree in the 1940s but scarce was the Common Raven. In spite of their considerable effort at both Pinyon Well and Quail Spring, Miller and Stebbins did not record it at either site. Now it is common. At Pinyon Well we recorded it on most days, up to 4 per day, and found one used nest. At Quail Spring we saw no fewer than 4 daily and on two days saw large flocks of 40 to 55 individuals, one occasion mobbing a Golden Eagle. Another apparent increase is of the Phainopepla, at least at Quail Spring. Although Miller and Stebbins described the Phainopepla as common locally, they recorded it at Quail Spring on only 2 dates (Feb 11 and May 21), but we noted it daily with up to 25 per day—one of the most abundant and conspicuous birds.



Phainopepla at Quail Spring (photo by Lea Squires)

We deployed electronic bat-call detectors and mist-netted for three evenings at Quail Spring, where Miller and Stebbins had collected bats by stringing wires across the water-filled tank, which is now dry. The differences in methods and conditions make our results difficult to compare, but the California myotis was the only species we caught (two individuals, including one lactating female) and along with the abundant western pipistrelle or canyon bat the only species also recorded by Miller and Stebbins. They also collected four big brown bats and two specimens of the long-legged myotis. These two latter species are more characteristic of woodland rather than of desert and could have been affected by the reduction of pinyon, though we picked up possible calls of the big brown bat with our electronic detectors. By contrast, we recorded definite calls of the Mexican free-tailed bat, pallid bat, and hoary bat, and possible calls of the silver-haired bat and western small-footed myotis. The hoary and silver-haired bats are expected in Joshua Tree only as migrants, and were perhaps paralleling the many species of birds we found migrating at Quail Spring in late April.

We deployed the electronic detectors at Pinyon Well, Indian Cove, and Cottonwood Spring as well. The California myotis, western pipistrelle, and pallid bat were picked up at all four sites, reflecting their status as common desert species. Interesting was the big brown bat under desert conditions at Indian Cove, yet Miller and Stebbins reported it at similar or lower elevations at Cottonwood Spring and Pinto Wash Well.

Many typically desert species of both birds and mammals remain numerous and in April were taking advantage of last winter's rain and the following glorious bloom to reproduce. Aside from the California chipmunk, pinyon mouse, and long-legged myotis, we recorded every species of mammal listed for Quail Spring by Miller and Stebbins. These include the bobcat, picked up by two of our three motion-detecting cameras, and the bighorn sheep, of which we noted an old, weathered skull.



Bobcat, Quail Spring (too quick for motion-detection camera)

Since the Pinyon Well trip took place toward the end of fall migration and the Quail Spring trip near the peak of spring migration we recorded a variety of migrating birds. Most of these were expected in Joshua Tree, but a few were oddballs. Near the ridgeline of the Little San Bernardino Mountains above Pinyon Well, we saw a female Williamson's Sapsucker fly over on 12 October and an Acorn Woodpecker clinging to clusters of pinyon needles on 13 October. Neither of these species is strongly migratory but both occasionally wander outside their normal ranges, and Miller and Stebbins had recorded two or three individuals of each. There are a few reports of the Acorn Woodpecker from the northwestern section of Joshua Tree National Park to eBird but none of Williamson's Sapsucker. In April, the surprise at Quail Spring was a female Broad-tailed Hummingbird. A species that breeds primarily in the mountains of the Great Basin and in the Rocky Mountains, the Broad-tailed Hummingbird is extremely rare outside its normal range. It

was on the bird list for Joshua Tree National Park as a vagrant, but it was unrecorded by Miller and Stebbins and there are no reports from the park to eBird.

Despite the strong changes in faunal composition, there are numerous species described by Miller and Stebbins as common or widespread that remain so, at least at a coarse-scale. Examples of birds include the Gambel's Quail, Mourning Dove, Cactus Wren, Rock Wren, House Finch, and Black-throated Sparrow, and examples of mammals include the antelope ground squirrel, Merriam's kangaroo rat, desert woodrat, cactus mouse, coyote, and gray fox.



Cactus Wrens at Pinyon Well (photo by Jack Daynes)



Gray Fox, Pinyon Well



Coyote, Pinyon Well

Though reptiles were not a focus of our surveys, we noted any species observed. By far the most noteworthy was a Gilbert's skink at Quail Spring. This species is characteristic of higher elevations and more coastal slopes in southern California, and Joshua Tree National Park is at the margin of its range. Miller and Stebbins described it as rare in the park, on the basis of a collection from Lower Covington Flat and sightings at Black Rock and Quail springs. Our photograph confirms that Gilbert's skink persists at the easternmost locality where it has been recorded along the axis of the Transverse and Peninsular ranges.



Gilbert's Skink at Quail Spring (photo by Drew Stokes)

In preparation for future trips, Lori scouted Stubbe Spring on 1 May and Chris Swarth scouted Covington Flat on 14 May. These revealed some of the species rare or missing at Pinyon Well

and Quail Spring: 4 Mountain Quail, 16 Pinyon Jays, and 3 titmice near Stubbe Spring and 1 or 2 Mountain Quail at Covington Flat. Most exciting, though, was one Gray Vireo at Stubbe Spring and another at Covington Flat. Though Miller and Stebbins recorded the Gray Vireo as a scarce summer resident at Black Rock Spring, Lower Covington Flat, Smithwater Canyon, and Quail Spring, these are the first reports from Joshua Tree National Park for many years. We found no Gray Vireos at Quail Spring, and Lori searched Smithwater Canyon on 25 April with this species specifically in mind. The Gray Vireo is in serious decline throughout its California range, as we outlined in a recent publication (*Journal of Field Ornithology* 88:16–29, 2017; <http://onlinelibrary.wiley.com/doi/10.1111/jofo.12189/full>). Though we found the Scrub Jay to be the principal cause of failure of Gray Vireo nests in San Diego County in 2012 and 2013, brood parasitism by the Brown-headed Cowbird remains important, and we saw cowbirds in pairs on 3 days at Quail Spring.

Thanks to Mike Lewis, Tom Firth, and Cathy Firth for transportation of our gear and water by mule to Quail Spring. Thanks to volunteers Tommy Barwig, Sally Davis, Ryan Emery, Ryan Gillian, Gil Hernandez, Annie Hoang, William Huntly, Lauren Loyola, John Meitz, Miriam Phalan, Leslie Rapp, Amanda and Sam Reyes, Randy Scott, and coordinator Janet Morris for transporting our gear on foot back from Quail Spring to the trailhead. Thanks to Dan Wait and Andrea Rios-Dominguez from MVZ for their help at Quail Spring. Thanks to Chris Swarth for all his help in the field at both Pinyon Well and Quail Spring. Thanks to NPS staff Michael Vamstad, Mary Oster, Jeff Rangitsch, Cynthia Libby, James Bouknight, Kristen Lalumiere, Liz Roberts, and Jason Theuer for their help in coordinating and authorizing our work.



Mule team carrying gear to Quail Spring (photo by Chris Swarth)



Volunteer porters carrying gear back from Quail spring (photo by Lea Squires)