

30 November 2014

Dear Friends and Family,

It's raining hard as I start writing this letter, with both thunder and lightning at 10 a.m., an unusual occurrence. After three years of drought, we are hoping for at least normal rainfall this winter, as our botanical field work has been suffering, and our homeowners' association came close to running out of water this summer – a well drilled in the 1970s had to be brought back on-line, and it could fail at any time. Consequently, the association made an emergency hookup to a nearby municipal water supply, and I am now investigating whether we should pursue a permanent hookup, and abandon our water system, which is quite expensive to maintain.

One of our bigger pieces of news this year is that Aptina was acquired in August by ON Semiconductor, a company with about 17,000 employees, with headquarters in Phoenix. One positive aspect of this was that our stock options, which had no value until we went public or were bought, were cashed out at a reasonable price, producing a nice contribution to our investment account. I was fortunate in retaining my same grade, at a VP level, with a title of Technical Fellow, one of two in the company. I also received from ON Semi a generous grant of restricted stock, which will be fully vested in Sept. 2017, a plausible target retirement date.

In the past year, about half of my job time has been spent on patent-related work, and the remainder has been divided between technology assessments and development, modeling, simulation, metric development, etc. Although the coming year will likely be pretty similar, I'll need to free up some time to set up a new technical council that spans all the areas within ON Semi that relate to imaging. Although former Aptina is the largest such entity, there are three other successful imaging divisions with complementary products and expertise, and it is important to encourage interactions and to identify synergies.

In other news, our local real estate market finally essentially recovered. When we refinanced this fall, an independent appraisal of our home was done, and we were thrilled that the appraised value was about 5% higher than what we paid – when just a few years ago it was worth about 40% less than its original cost. Although this estimate was probably a bit optimistic, we're clearly near break-even, which is quite a relief psychologically.

When we were getting ready to sell the house in Rochester, our realtor recommended new carpet and flooring. It made such a huge difference, that we resolved that in our next house, we would do such upgrades a few years before selling, so that we could enjoy them ourselves. With this in mind, in January we embarked on our first set of significant home improvements since our first year in the house, eight years ago. Our kitchen is tiny, and the cabinetry was dark wood, which, with the orangeish walls and tan flooring, made the room seem even smaller, and somewhat

dingy. So the first order of business was to have the cabinetry and walls painted white, and the flooring replaced with a lighter material, which completely transformed the room.

We also replaced the badly stained, ugly carpet in the great room with light-colored wood laminate, which produced quite a glamorous effect, and had the additional benefit of making the house smell much fresher. This inspired us to also recarpet the downstairs. Finally, I spent a long weekend using silver foil insulation and tape to cover over all the ugly ductwork and exposed fiberglass insulation in our utility room. The result is perhaps a bit over the top, in a discothèque sort of way, but it certainly has brightened up the room that serves as our chief way in and out of the house. We have been very pleased with all these improvements, and are glad we did not wait any longer to pursue them.

With retirement slowly approaching, each winter we have tried to address some of the issues that have to be resolved before we can live full-time in a camper (e.g., donating our plant specimen collection, and scanning our best slides). This winter, we've been sorting and donating a substantial number of our accumulated possessions, and we just finished trading in all our film-based photographic gear that was no longer being used. We're currently working our way through our negatives, and old family prints without negatives, which we will have scanned. This will wrap up all our photographic loose ends except what to do with about 150 mounted but not framed enlargements, which used to be displayed in our home in Rochester. I have done internet searches each of the last few years, looking for a good way of repurposing these prints, but so far have had no luck.

Eileen's favorite books of the year were "Great River: The Rio Grande in North American History", by Paul Horgan (two volumes); and "Gettysburg: The Last Invasion" by Allen Guelzo. We both thoroughly enjoyed rereading the five books in the James Herriot series, describing veterinary practice in Britain; these are surely some of the most beloved books ever written. We've continued to get a lot of use out of our Kindles, Eileen is able to find a lot of interesting reading material that is free or just a few dollars. She does rely to some degree on reviews to identify better possibilities; there is quite a proliferation of poorly written, e-published books.

Eileen and I have worked our way through a few more of The Great Courses, from what was formerly known as The Teaching Company (<http://www.thegreatcourses.com/>). This is a fantastic resource – about 500 courses at the college level, covering a wide array of subject matter, taught by some of the best lecturers in the country. Most courses have ten to a few tens of lectures of 30 or 45 minutes each. Every course goes on sale at least once per year, for about ¼ its usual price (bringing it down to \$30–\$75 in most cases), so with some patience, you can acquire any of the courses for a reasonable cost. We're currently watching a course on the relationships between music and mathematics, which is excellent, and Eileen is looking forward to a course on Abraham Lincoln.

Eileen made a point this year of trying to tame some of the birds in the yard, as she has done with the chipmunks. By the end of the summer, she was hand-feeding a number of Chestnut-backed Chickadees, a few Pygmy Nuthatches, and rarely Dark-eyed Junco and Mourning Dove. This year we added two new yard birds, both falcons (American Kestrel and Merlin), and one new yard mammal (Western Red Bat). The bat was a big surprise, as this species is normally found in riparian areas, but it is migratory and the record was in October, when the species could be expected to be on the move.

We sent last year's letter in mid-December, so I'll start the chronological part of this letter at that point. We spent the first half of Christmas week 2013 in El Paso, visiting Eileen's folks. Then on Christmas day we flew to McAllen, TX, to bird the Lower Rio Grande Valley for the first time since 2001. We had 4½ days of birding, during which it rained over one-third of the time. Eileen added three species to her ABA life list: Groove-billed Ani at Salineño, Fulvous Whistling-Duck at Progreso Lakes, and Clay-colored Robin at Santa Ana! (ABA = American Birding Association; the ABA area is basically the continental U.S. + Canada) We both got a life mammal, Hispid Cotton Rat, at Bentsen. A day-roosting Pauraque was a treat. Finally, we had a tantalizing view of a black cat at Sabal Palms that could possibly have been a Jaguarundi.

We began botanizing in late January, looking for new genera and also making a particular effort to track down some of the manzanitas (genus *Arctostaphylos*) that we have not seen. This beautiful genus of evergreen shrubs has numerous small, urn-shaped flowers in attractive clusters, and frequently has striking smooth, red bark. There are 95 taxa (species, subspecies, and varieties) in the state, many of which are neoendemics -- very recently evolved taxa with small, isolated ranges. Worldwide, there are only about four additional species, so this is truly a quintessential California genus. Many of the species are restricted to unusual geological substrates, making them a fascinating study. Manzanitas flower in winter and spring, and so provided an ideal focus for field work early in the year, especially as they were less affected by the multi-year drought than many other native plants. During the course of the year, we found 20 manzanita taxa that we had not seen previously, bringing our total to 66, or about 70%.

Although we usually take an international birding trip about once every two years, and our last one was to Thailand in early 2013, we took a 3-week tour to Colombia this April, getting back on our original "even-year" schedule. We were invited by our friends Terry and Rhys, whom we met on the Thailand tour, to join their Canadian group. The tour was led by Fabrice Schmitt, just before he started working as a tour leader with Wings. Colombia has the highest bird list of any country, principally because of its prime location in the neotropics; the varied topography created by the Andes splitting into three parallel ranges at their northern end; and the presence of both Caribbean and Pacific coasts. Because of safety issues, few birders went to Colombia for a period of about 20 years, but about 5 years ago, the situation had improved enough that all the major bird tour companies started up tours there again.



Indigo-capped Hummingbird, northwest of Bogota, Colombia.



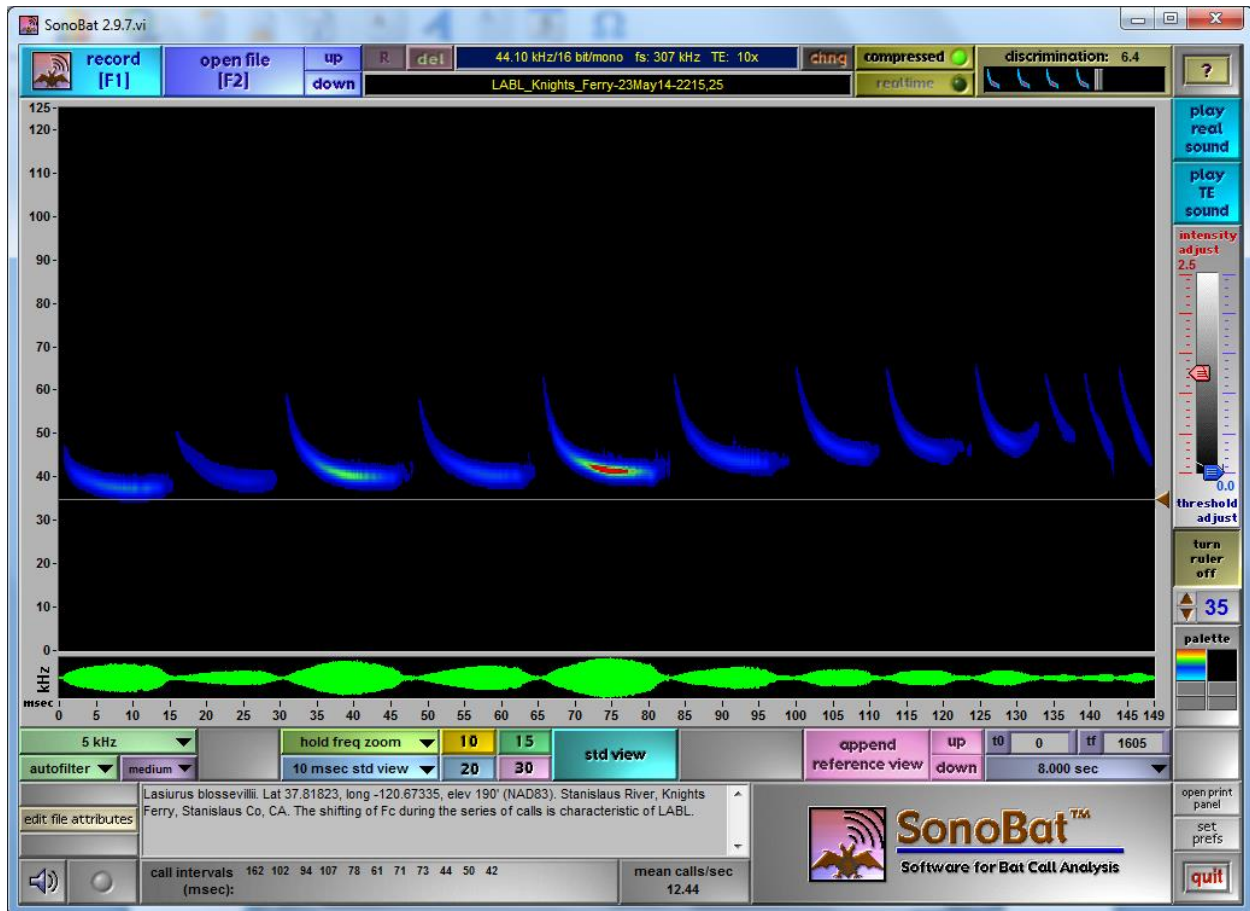
Cloud Forest, Santa Marta Mountains, Colombia.

The trip started and ended in the capital, Bogota. We visited the eastern and central branches of the cordillera; the valley in between; the Caribbean coast; and the isolated Santa Marta Mountains in the northeast corner of the country. Elevations ranged from sea level to 13,300 feet. The group was exceptionally nice, and we felt lucky to be able to join a collection of people who got along so well and enjoyed traveling so much. The birding was generally very good, though we felt that other neotropical countries we have visited were slightly better, in part because their habitat was less fragmented. April is a bit late in the year to visit Colombia, as the rainy season is picking up then, and birds are somewhat less territorial and responsive to recordings; January and February are probably the prime months. Colombia has not yet built up a good infrastructure, and though it is very exciting for a birder to visit, we would not particularly recommend it at this time for general tourists.

Some favorite birds from the trip were Bogota Rail, Ruby-Topaz Hummingbird, Torrent Duck, Collared Trogon, Red-ruffed Fruitcrow, Golden Tanager, Bronze-winged Parrot, Scarlet-bellied Mountain Tanager, White-mantled Barbet, Indigo-capped Hummingbird, Chestnut Piculet, White-tailed Starfrontlet, Blossomcrown, Santa Marta Whitestart, and White-tipped Quetzal. Favorite mammals were South American Otter and Silvery-Brown Bare-face Tamarin. In total we saw 451 species of birds, of which 226 were new for Eileen, bringing her life list to 2972 species. I saw 234 lifers, ending the trip with 3104 species; Red-rumped Woodpecker was #3000! We each saw 5 new mammal species, a low number as expected, given that Colombia is not particularly good for mammals, and that we have visited nearby Ecuador and Costa Rica previously.

One highlight of the spring was visiting Mt. Diablo State Park to see the spectacular display of native wildflowers following last fall's extensive wildfire. There are a surprising number of plants called "fire followers" that lay dormant as part of the seed bank for decades, then flower in abundance for one to a few years after a fire. Several plants were seen on Mt. Diablo this spring that were last detected in the region in 1931, the year of the most recent really large burn. To give an idea of how unusual the flora was, the evening we arrived, at our first stop, we found three plants new to us in a circle only about 100 yards across!

We had a very fun 4½-day trip across the Sierras over Memorial Day. The first night we camped at Knights Ferry in the Central Valley, to try for Western Red Bat along the riparian corridor of the Stanislaus River. We were successful in getting one beautiful sequence showing the classic shift in frequency between calls in the series. The image on the next page shows this sequence. The horizontal axis is time in milliseconds (with dead spaces between the calls removed – the total elapsed time is 1.6 seconds). The vertical axis is frequency in kilohertz (kHz). Humans can hear up to about 20 kHz if they are young and lucky. Most bat echolocation calls lie in the range of 10 – 100 kHz. The sequence below drifts upward by about 10 kHz from beginning to end.



The next day we continued driving almost to the Nevada border, where we finally found our last cactus species in California, the diminutive Sand Cholla, east of Deep Springs. We had looked for this several times before in other locations, without success, so when Eileen called me over to look at something, it did not even occur to me that she had found the plant! That night we camped along a lovely creek and recorded 7 species of bats. The next day we drove to northern Death Valley, where we found four new plants, but did not locate either of the rarities we were looking for. The last evening we recorded bats at the top of the Owens Gorge, near the Long Valley Dam that forms Crowley Lake (a few years ago we had a soaking wet Badger walk out of the Owens River at this spot). Our target species here was Spotted Bat, once thought to be the rarest mammal in North America. This remarkable animal, which can forage 50 miles from its day roost, has three large white spots on the back, large pink ears, and a very low-pitched call, averaging only 10 kHz at the end. We were close to quitting for the night when Eileen announced that she could hear one – her high-frequency hearing is very good – and a few minutes later we got two nice recordings, so that I could count it too!

We took a 5½-day trip to San Diego County in mid-June, celebrating our 28th wedding anniversary at a nice restaurant in Julian. Eileen brought cake along, which we ate in the field while recording bats and listening to Spotted Owl at 4100 feet elevation in the Peninsular

Ranges. I told Eileen she could see her present on the laptop screen -- a set of tickets for a Miranda Lambert concert in August. (which was great fun). We had very good luck tracking down new bats and plant genera on this trip, locating five of six target species. One night was spent in Split Mountain Wash in Anza-Borrego Desert State Park, where there is a known roost of Pocketed Free-tailed Bats. We set up between the canyon walls and as soon as we started recording, well before dark, there was constant triggering by the echolocation calls of this southerly bat. We obtained hundreds of good recordings, which we sent to a bat biologist for analysis, as acoustic differentiation of this species from other free-tailed bat species is still being worked out.

Another evening we hiked cross-country into the Southwest Grove in Mountain Palm Springs, where we finally succeeded in recording Western Yellow Bat amidst the many pipistrelles (tiny bats that start foraging well before dark, and can be abundant in desert areas with good canyons for roosting). Western Yellow Bat is scarce in California and is only found in the southernmost portions of the state. It is noted for its fondness of roosting in dried palm fronds that hang from living trees, just below the lowest living fronds (the “skirt” of the palm tree). The off-trail hike back around midnight was very challenging, though a consolation was seeing a Banded Gecko. We found three plant genera that had eluded us previously, *Verbesina* (a sunflower-like plant growing only in coastal hills above Laguna Beach), *Matelea* (a tiny climbing milkweed), and *Carlowrightia* (a rare desert plant related to chuparosa).

In mid-June we joined a California Native Plant Society rare plant search in the Silver Peaks Wilderness Area, part of the rugged Inner South Coast Ranges, very roughly halfway between Monterey and San Luis Obispo. We left vehicles at each end of the nominally 7-mile trail, the ends of which were about 1¼ hours apart by road, and camped near the uphill end. On Sunday we hiked downhill the whole day, finding a number of interesting serpentine plants. When we were roughly a mile from the end of the trail, Eileen tripped and hit her head on a rock, cutting quite a gash, and she also bruised most of the left side of her body, injuring her knee and one finger particularly. The group was terrific in helping out with first aid, carrying her gear down, and staying with her while I was ferried back to get the truck at the uphill trailhead. We really appreciate everyone’s help and support! It was still quite a drive to the nearest emergency room in Monterey, where we arrived at 11 p.m., about 7 hours after the accident. The emergency room staff took exceptional care of her. After checking her other injuries, they did a CT scan to check for a concussion (none detected, and she never did lose consciousness), and then spent 45 minutes sewing her up – the 5.5-cm gash went to the bone and took both internal dissolvable stitches and 14 external stitches to close. This healed very well, though it is still sensitive, and her knee slowly recovered. She eventually underwent therapy for her finger, and it is considerably better, but definitely not back to normal. What an ordeal!

Eileen handled all of this very well, with perhaps the hardest part being to resume hiking on rough trails or off-trail after the accident. But she persevered and was able to complete a fairly difficult hike just 16 days later, during an 11-day botanical foray to far northern California. Early in that trip, we stayed with Carol and CJ Ralph in Arcata for two nights, then the four of us traveled together for five days. From Arcata, on the Fourth of July, we hiked 7.5 miles to look for *Cascadia*, a saxifrage that is known from only one location in the state. A careful search turned up a single plant in flower, which was enchanting! On the road trip, we camped for three nights in a wonderful site in dispersed camping below beautiful Castle Lake, southwest of Mt. Shasta. On one day, we hiked seven miles on logging roads in surprising heat to search for Rattlesnake Fern, a species scarce in California, though we have seen it in locations from British Columbia to Ontario and Virginia. Through good detective work, Carol found interesting habitat in an unlikely spot, and soon after I found the first of 35 Rattlesnake Ferns that we would ultimately locate – a good team effort! The next day we took a very scenic hike to Heart Lake, affording fine views of Mt. Shasta and Black Butte. Here we found our target *Luetkea*, a lovely subalpine ground cover in the rose family. Other interesting finds in the Castle Lake area were Goshawk, Red Crossbill, and Yellow-pine Chipmunk. On the last morning we paddled around the lake, and were surprised to find a serpentine seep flowing into the lake, complete with a healthy colony of the insectivorous Cobra Plant, a type of pitcher plant.

We then took leave of Carol and CJ; they headed home while we continued northeast to Lava Beds National Monument, a favorite place of ours. We recorded bats here for two nights. On the second night, hiking back to our campsite around midnight, we got wonderful looks at a life mammal, California Kangaroo Rat. The next day we headed for the Pit River in Modoc County, to search again for Water Stargrass (*Heteranthera*), our most wanted plant in the state. This aquatic plant is California's sole representative of the only family of vascular plants that we have not seen in the state. We had carefully searched by canoe the area it was seen in the 1940s, and had convinced ourselves that it no longer occurred there. But a 2007 record surfaced last year during the review process for adding the plant to the state's rare plant inventory, in part based on our unsuccessful searches. This record was just downstream of the historic occurrence, about ¼ mile from the endpoint of our previous search. Sure enough, we quickly located the species and began wading downstream to map out its occurrence. With permission from a local landowner, we ultimately documented a healthy population stretching at least four miles, with tens of thousands of plants, though we only saw a few individuals in flower (photo on next page). The plant has narrow submersed leaves and straw yellow flowers with six narrow petals (technically, three of the apparent petals are actually colored sepals). This, our 162nd and final family in the state, completed our Family Quest, begun in 2010!

We did our third mammal big day on Aug 23, trying to see as many species of native mammals as possible in one day, midnight to midnight. We made a huge improvement over our two previous efforts, which yielded 16 and 17 species; this time we located 27 species! The higher

total mostly resulted from greatly improved knowledge regarding bat detection; our list of bats increased from four species and two species previously, to ten species this time. A short account of the big day is given separately at the end of this letter. We'll likely try another mammal big day in 2015 – the big question is what should we do instead of a whale-watching trip on Monterey Bay? It's cost us 5 – 6 hours each time (boating and extra driving combined), yet has only added three, one, and two species in the three attempts, a poor return. We either need to take a longer trip that gets farther offshore, or punt completely, just trying for cetaceans from land with a telescope for an hour or two.



Another mammal adventure was camping on Santa Cruz Island, which is owned by The Nature Conservancy and the National Park Service, and is reached from Ventura Harbor. The Island Fox, a cat-sized species evolved from Gray Fox, was nearing extinction when scientists figured out that it was being preyed upon by Golden Eagles, which formerly had been excluded from the island by territorial Bald Eagles. Once the former were relocated and the latter reintroduced, the foxes rebounded and we had heard that in recent years it had become possible to see them at the east end of the island, in the Scorpion Cove Campground. So we spent an idyllic 24 hours

visiting this location, seeing between ten and fifteen foxes (photo below), and observing such interesting behavior as their climbing trees to feed on fruit! We also saw the Island Jay, a split from Scrub Jay that is found nowhere except on this island, and Catalina Ironwood, a stunning tree in the rose family that occurs only on four of the Channel Islands.



I had a workshop to attend in Phoenix in late September, at the ON Semi corporate headquarters, so we traveled out a few days early to visit the Chiricahua Mountains in extreme southeast Arizona. This area has the highest bat diversity in the U.S., in addition to being an outstanding birding area. Unfortunately, after being saturated with a month of monsoonal rains, this mountain range was then ravaged by hurricane Odile, causing serious damage in Cave Creek Canyon. We arrived just eight days later, and stayed at Cave Creek Ranch. Most roads and all campgrounds in the area were closed, and the ranch had sustained substantial damage, with creek levels having risen at least eight feet and flooded many buildings.

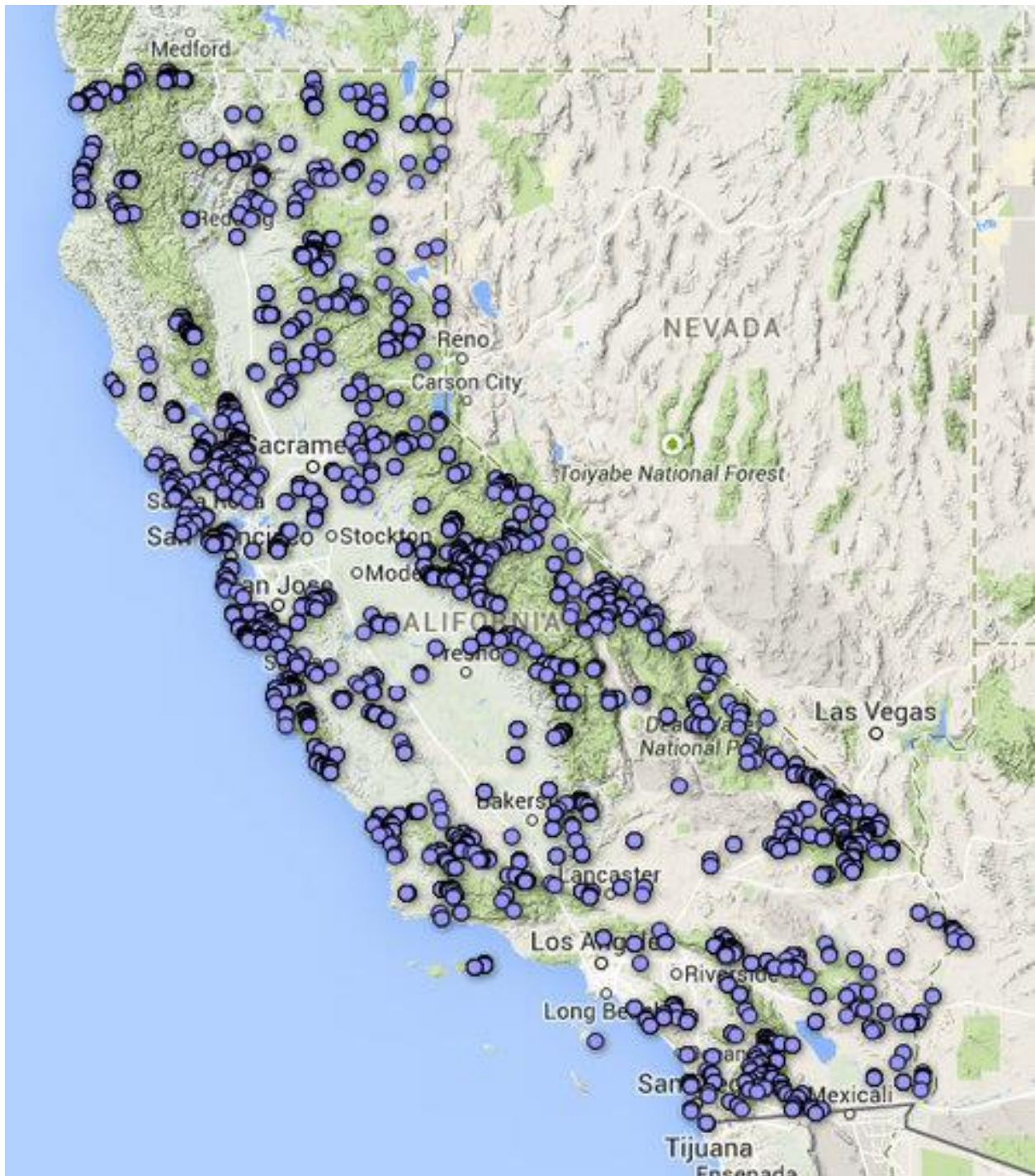
There are three species of nectar-feeding bats that visit the U.S. from Mexico in the warmer months, coming just barely north of the border from Texas to Arizona and very rarely California. Two of these were possible in the Chiricahuas in September, and we did manage to record one, the Lesser Long-nosed Bat, and see it at a hummingbird feeder at the ranch! Also at the ranch, we recorded Lappet-browed Bat, another life mammal, and saw Hooded Skunk, which was new

for Eileen! Other highlights of the long weekend were Coatimundi, Black-tailed Rattlesnake, and a number of birds, including fantastic looks at a family group of Arizona Woodpeckers.



Our last significant field trip of the year was a 9-day trip to the eastern deserts, to which we had been looking forward since planning it the previous winter. Our principal targets were 13 plant genera (several very unlikely in the drought) and two bat species. Oct. 11 was a banner day, as we hit two milestones that had been many years in the making. In the afternoon, at the fascinating Palen Sand Dunes, east of the south end of Joshua Tree National Park, we saw *Wislizenia*, a member of the unusual spiderflower family, which was cooperatively both flowering and fruiting. This had the distinction of being our 3253rd taxon of native vascular plant in California, breaking the 50% mark! (see photo above). I figure that I keyed over 8000 plants

in eight years to see half the taxa in the state. Some idea of the thoroughness with which we have covered the state to achieve this goal can be seen in the map below, which plots coordinates of our plant records since 2007. As a reminder of scale, California spans almost 9.5 degrees of latitude, and it takes over 17 hours without stops or traffic (hah!) to drive from Pelican State Beach in the northwest corner of the state, to Picacho State Recreation Area in the southeast corner, a distance of over one thousand miles.



That same evening found us camped on BLM land, at the Stonehouse Mine, southwest of Blythe, a known roost for two species of bats that are very restricted in the state. About half an hour after sunset, the first of these two, California Leaf-nosed Bat, began flying. Sometimes several would be just over our heads, but their echolocation calls apparently were quite soft, as despite the proximity, they did not always trigger the detector. However, we obtained a few excellent recordings showing the strong harmonics that characterize the species. This was a special event for me, because this bat was my 200th native mammal species in the ABA area!! There are about 432 native mammal species in this region (continental U.S. and Canada), but the majority are nocturnal and very difficult to detect and identify, and there is generally rather little information available on where to look for them, compared to birds. Mammal life lists are not published the way bird lists are, so I can only speculate, but I think it unlikely that more than a few people have reached this milestone before, if any.

We also recorded Cave Myotis at Stonehouse Mine, though we would like to obtain a larger sample of recordings. This was #193 for Eileen, so she should also be able to reach 200, probably in a few years. Over the next week we worked north along the east edge of the state, passing into the Mojave Desert and finishing at Death Valley, where we spent our 800th night in our camper, since buying it in 2002. We located 7 of our 13 target plant genera, a decent result, especially given that three were annual or biennial and so very improbable given the drought. We finished the trip and the year with these California native vascular plant statistics: 162/162 = 100% of families; 924/992 = 93.1% of genera; and 3265/6565 = 50.1% of taxa. We'll continue working on genera next year, in hopes of reaching 95% someday, but that is a stretch. Of the remaining 68 genera in the state, we'd need to find another 19. About 20 genera have no recent, re-locatable records on publicly accessible lands. Of the remainder, only 17 are perennials, and only two of those have well-specified locations to search. The other roughly 30 genera are annuals and a few biennials, which are far more problematical to locate, especially under drought conditions, when they are unlikely to germinate at all. To have a chance to reach 95%, we need a year with high winter rainfall in the eastern deserts, especially the area from the Mojave National Preserve to southern Death Valley, the only region of the state with any concentration of new genera to be seen.

We spent Thanksgiving week in El Paso, and enjoyed seeing all the family members in the El Paso and Albuquerque area. Kathleen and Mahrla arranged a birthday party for me two days early, before we left, which was very sweet of them, and a nice surprise! We visited the TechH₂O Center, with many interesting displays related to water and its treatment in the region, and the War Eagles Air Museum, which had a 1.5-acre hangar full of functional planes, particularly those from the World War II and Korean Conflict eras. Of course, we also had a wonderful Thanksgiving dinner and ate a number of great Mexican meals, both home-cooked and at restaurants.

I started this letter by writing about rain, so I'll finish the same way (not that it is an obsession, or anything). A number of things have delayed getting this letter off; it's now 20 days since I began writing it. At that time, we had somewhat below-average rainfall for the date (5½ inches, counting from July 1, in the dry season). Since then, it has rained frequently and sometimes heavily, accumulating a remarkable 22 inches of rain, bringing our yearly total to 27½ inches! The average annual rainfall here in Boulder Creek is about 42 inches, and the average for this date is about 12 inches, so that is quite a heartening development! The eastern deserts have not received much rain from these storm systems, but most areas have gotten at least a little rain in the last month, and one key area has received about three inches, so there is some potential for a decent spring there, though it will require additional rain later in the winter.

Eileen and I hope that you and your families are doing well. We always like to hear from people or have them visit if in the area; our contact info is given below. Happy holidays!

Brian and Eileen Keelan

keelan@warppmail.net

[Home Page](#) [Photos](#)

831-331-1507 (Brian's cell)

831-331-9590 (Eileen's cell)

580 Burnside Bend

Boulder Creek, CA 95006

Mammal Big Day 2014

We tried our third mammal big day on 23 August 2014, following a similar but slightly expanded route compared to our previous attempts on 24 September 2011 and 21 September 2013. These two big days yielded 16 and 17 native species, respectively, but this year we got more serious and organized, and found 27 native species! This seems like a good total for the route – we generally had good luck, except on the whale watching trip on Monterey Bay, which consumed about 6 hours, but only added two species.

At midnight, we headed out our door and quietly walked around the property, opening small mammal live traps that had already been positioned. We then drove to Quail Hollow Ranch County Park, where over many visits we have recorded 11 species of bats. At 1:04 a.m. we detected two bats, one right after the other: Yuma Myotis (#1 for the day) and Red Bat (2). The latter was perhaps our best mammal of the whole day. We heard what was probably Dusky-footed Woodrat foraging in the oaks, but were not confident of the identification and so had to let it go. We quit around 2 a.m., and then drove roads in the Santa Cruz Mountains, finding Striped Skunk (3) and Mule Deer (4), but missing Raccoon, which we also did not see at Pinnacles -- our worst miss for the day. Arriving home, we checked the traps and had one California Mouse at 3:30 a.m. (5). We set up the bat recording equipment on our deck, but added only Mexican Free-

tailed Bat (6). A mouse scurried by several times, but we did not see it well enough to confirm that it was the expected species, Brush Mouse. The first of our large population of Merriam's Chipmunk (7) finally woke up at 6:50 a.m., after which we tore out of the house.

We drove the crest of the Santa Cruz Mountains but did not see Western Gray Squirrel as hoped. Staff at UC Santa Cruz Arboretum, where Eileen volunteers, were kind enough to let us in before the opening time, allowing us to find our only Brush Rabbit (8) of the day. A quick stop at Moss Landing on Monterey Bay netted Harbor Seal (9), Sea Otter (10), California Ground Squirrel (11), and California Sea Lion (12). The whale watching trip into Monterey Bay was great for Humpback Whales (13) but poor for diversity. We were on the way back with just one species added, when I spotted three large dolphins well behind the boat. I called to one of the biologists that it looked like Risso's Dolphins (14) in the distance, and to my surprise, they turned the boat around and in about 5 minutes we caught up with them. It turned out to be a pod of about 400 animals, the largest aggregation of this species that we have ever seen! They put on a spectacular show and the company gave me a lifetime 20% off pass for two in appreciation for spotting them!

After docking, we headed for the San Luis National Wildlife Refuge, near Los Banos. On the way we stopped at San Luis Reservoir, where we finally flushed a Desert Cottontail (15). At the refuge, we saw the Tule Elk (16) herd. These animals are from a reintroduction, but because they are within the original range and habitat of this subspecies, we counted them as a native. We left the refuge around 5 p.m., and after checking in at the campground at Pinnacles National Park, we hit the trail. There are two excellent locations for bats in the park, between which we have recorded 15 of 16 species known in the park, but it is not possible to reach both in one evening. On the previous weekend, we had tried both locations on successive nights, and we used the lists from that weekend to choose which would be more likely to add more species today. The winner was the reservoir, a roughly one mile hike that we started around 7 p.m..

Our first bat, at 7:48 p.m., was Western Pipistrelle (17), followed in the next two hours by Western Mastiff Bat (18), Townsend's Big-eared Bat (19), California Myotis (20), Hairy-winged Bat (21), Silver-haired Bat (22), and Pallid Bat (23). Just after 10 p.m., we heard a beautiful Coyote (24) chorus, and at 10:30 we started packing up. We found fresh Gray Fox (25) scat on the hike back. We got to the truck with about 45 minutes left to drive the few, short roads in the park, before midnight. We added a Kangaroo Rat (26), probably Heermann's, at 11:33, then a Black-tailed Jackrabbit (27) at 11:39, our final species of the day. When we got to our campsite, it was covered with Raccoon tracks, and we wished we'd thought of sweeping the site when we arrived!

Overall, this was a very satisfying big day, and a great improvement over previous results! All the species we saw were at or near locations where we had found them before, so there were no real surprises, but just about half the species could easily have been missed. It was a lot of fun, but next year we have to figure out how to stock up on sleep ahead of time!