Mitchell L. Coleman
Botanist

Contact

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Education

M.S. in Biology; Plant Ecology and Physiology concentrations (December 2017)

California State University, Bakersfield
Bakersfield, California
Advisor: Dr. R. Brandon Pratt

Thesis: "Factors affecting seedling recruitment of the desert shrub *Atriplex polycarpa* (Torr.) S. Watson (Chenopodiaceae) in the San Joaquin Valley of California"

B.S. in Biology, Environmental track, Chemistry minor (May 2014)
Westmont College
Santa Barbara, California
Advisor: Dr. Frank Percival

Professional Experience

Conservation Science Manager (May 2018-present), Tejon Ranch Conservancy, Frazier Park, California 93225

As a Bakersfield native, I grew up with the lore and scenic backdrop of Tejon Ranch. At 270,000 acres, Tejon Ranch is the largest contiguous property in California and of vital ecological importance because of its location at four biogeographic crossroads, among other factors. In 2008, the landowner negotiated a historic land use agreement with various environmental organizations throughout the state, which set aside 90% of the Ranch for conservation, to be managed by an independent Conservancy. I first became affiliated with the Conservancy in January 2015 as part of the Environmental Educational Partnership Impacting Colleges and Careers (EPIC), which provided funding to conduct my thesis research on the Ranch. I joined the Conservancy as its Staff Biologist in May 2018. My role at that time primarily consisted of assisting senior staff to carry out science and stewardship initiatives throughout the Ranch, leading tours for local students and the general public, and serving as the organization's dedicated easement monitor for the 10 active conservation easements on the Ranch. In October 2019, I transitioned to the role of Conservation Science Manager, responsible for the Conservancy's science and stewardship programs.

Adjunct Biology Professor (May 2018-present), Department of Biology, Bakersfield College, Bakersfield, California 93311

I have taught non-majors Introductory Biology (BIOL 11) each semester since the Fall of 2018. This course includes lectures and lab, and covers basic biological concepts from Cell Theory up through Ecology and Evolution. In order to demonstrate the Scientific Method, I require all students to attend a field trip with me to Tejon Ranch and formulate a basic question, hypothesis, and experimental design regarding some natural phenomenon. The results of the effort become part of their "independent project," which is presented to the rest of the students at the end of the semester.

Lecturer A (September 2016-May 2019), Department of Biology, California State University, Bakersfield, California 93311

I began this position as a Teaching Assistant while working on my master's degree at CSU Bakersfield. I instructed two lab sections of Introductory Biology (BIOL 1099) for non-majors in the fall semester of 2016. This was a thirty-minute lecture and two-hour lab, twice per week. Topics included data analysis, physiological measurements, microscopy, systematics, ecology, and evolution. I also proctored lecture examinations, graded assignments, and held formal office hours. The main course instructors were Dr. Danielle Dodenhoff and Dr. Michele Engel. I also instructed two lab sections of Principles of Ecology for non-majors (BIOL 1039) in the spring and fall semesters of 2017. The labs consisted of a thirty-minute lecture and two-hour lab, twice per week. Topics for this lab included photosynthesis, population estimates, vegetation analysis, modeling, optimal foraging, diversity indices, acclimation, evolution, and climate change. I also proctored lecture examinations, graded assignments, and held formal office hours. The main course instructor was Dr. David Germano. I instructed two lab sections of Introduction to Botany (BIOL 2120) in the spring semester of 2018. Topics in this lab included many activities from plant cells up to taxonomy and ecology. The main course instructor was Dr. Timothy Miller. In the fall semester of 2018, I was promoted to adjunct lecturer and assigned as the main course instructor for Introduction to Botany. For the Spring 2019 semester, I was main course instructor for Principles of Ecology.

Laboratory Technician (January 2018-January 2019), Dr. Anna Jacobsen's lab, Department of Biology, California State University, Bakersfield, California 93311

I assisted Dr. Anna Jacobsen with her research on plant structure and function. Much of this work involved analyzing the hydraulic response of Mediterranean shrubs to extreme drought.

Assistant Environmental Scientist (May 2015-May 2018), Quad Knopf Inc., Bakersfield, California 93309

I was the team lead botanist and conducted protocol-level surveys for special-status species in the San Joaquin and Mojave Deserts of California, including the Blunt-Nosed Leopard Lizard (*Gambelia sila*), San Joaquin Kit Fox (*Vulpes macrotis mutica*), Tipton Kangaroo Rat (*Dipodomys nitratoides nitratoides*), Giant Kangaroo Rat (*Dipodomys ingens*), Swainson's Hawk (*Buteo swainsonii*), and many special status plants. I also provided environmental compliance monitoring to project sites, including petroleum, solar, and construction operations. I assisted with permitting and report writing in compliance with the California Environmental Quality Act (CEQA), the federal Endangered Species Act (ESA), and California Department of Fish and Wildlife (CDFW). I also assisted with waters delineations. I used ArcGIS software to map and collect biological information on multiple project sites. I managed and curated the company herbarium and was the lead developer for the company's standard operating procedure for rare plant surveys. Lastly, I developed the company's methodology for conducting revegetation surveys of completed solar sites, in compliance with state and local regulations.

Research Assistant (April 2015-December 2017), Dr. Brandon Pratt's lab, Department of Biology, California State University, Bakersfield, California 93311

I assisted Dr. Brandon Pratt with his research on California chaparral communities in relation to drought. I conducted physiological measurements on multiple species of chaparral shrub for a multi-year study, including gas exchange (LICOR-6400), branchlet water potentials, foliar light/ dark-adapted fluorescence, and high-resolution computer tomography (HRCT). This study pertained to how certain chaparral species recover after a high intensity multi-year drought with a specific emphasis on hydraulic function. Also, I assisted with a competition experiment involving Tidy Tips (*Layia platyglossa*) and Red Brome (*Bromus madritensis* ssp. *rubens*).

Intern (May 2016-August 2016), Tejon Ranch Conservancy, Frazier Park, California 93225

I assisted the Conservancy with maintaining a grid of camera stations which monitored the fecundity and movement of feral pigs, bears, and mountain lions on Tejon Ranch. I assisted with data analysis which helped to identify the population dynamics of various social groups. I also assisted the Conservancy with an effort to map the extent of native saltbush shrublands (*Atriplex* sp.) in the northern part of the Ranch. This internship was in conjunction with my master's thesis work, which provided funding through the Environmental Educational Partnership Impacting Colleges and Careers (EPIC) program.

Horticultural Apprentice (August 2013-August 2014), Santa Barbara Botanical Garden, Santa Barbara, California 93105

I assisted with a restoration project of the garden's meadow display to a native representation of wildflowers and perennial grasses. I used multiple weed management techniques including rototilling, sun-sterilization, and targeted grazing to eradicate a dense seedbank of ripgut brome (*Bromus diandrus*) and successfully restored the area by hydroseeding and hand-planting natives. I also assisted the herbarium manager with cataloging the garden's herbarium into a computer database, as well as cataloging individual specimens in the garden into an ArcGIS database. I

assisted the nursery staff by propagating and transplanting plants in preparation for the annual native plant sale. I provided general labor and maintenance throughout the garden.

Research Assistant (January 2011-May 2012), Dr. Frank Percival's lab in the Department of Biology, Westmont College, Santa Barbara, California 93108

I assisted Dr. Frank Percival in developing a concise and accurate method of liberating and identifying the epiphytic bacteria associated with biofilms on the surface of Giant Bladder Kelp (*Macrocystis pyrifera*), using a triple-enzyme detergent.

Publications

M. L. Coleman and R. B. Pratt (2019). The effects of invasive grass on seedling recruitment of native *Atriplex polycarpa* (Torr.) S. Watson (Chenopodiaceae) shrubs in the San Joaquin Valley of California. Biological Invasions 21 (6): 1871-1876

*__M. L. Coleman__, C. E. Mayence, M. D. White, A. L. Jacobsen, and R. B. Pratt. Factors affecting seedling recruitment of the native desert shrub *Atriplex polycarpa* (Torr.) S. Watson at Tejon Ranch, California.

*L. Pavliscak, C. E. Mayence, N. Kramer, **M. L. Coleman**, and M. D. White. Botanical conservation on active rangeland: effects of complete grazing exclusion on plant population dynamics – and a comparison of two methods for quantifying plant community composition, California, USA.

*M. Ennajeh, **M. L. Coleman**, A. L. Jacobsen, and R. B. Pratt. Plant hydraulic characteristics of *Atriplex polycarpa* and *Atriplex lentiformis* in the San Joaquin Desert, California.

*J. Buck-Diaz, R. O'Dell, **M. L. Coleman**, and C. J. Lortie. San Joaquin Desert, Past and Present. Chapter 3 of *Rewilding California*, Island Press.

(*manuscripts under peer review as of November 2019)

Non-Peer Reviewed Publications

Welcome, Autumn! Tejon Ranch Conservancy Newsletter, October 2019
(https://spark.adobe.com/page/aP07PPcH6bua5/)

On The Ranch, Tejon Ranch Conservancy Newsletter, May 2019
(https://spark.adobe.com/page/ax7k2bzTIaRrl/)

Wildflowers: Fizzle or Fantastic? Tejon Ranch Conservancy Newsletter, March 2019
(https://spark.adobe.com/page/Tk8M8vecyN0SV/).

Researcher Showcase: Dr. Brandon Pratt and Dr. Anna Jacobsen at CSU Bakersfield, Tejon Ranch Conservancy Newsletter, October 2018 (https://spark.adobe.com/page/WPGxLdbJQieGU/)

Epic Saltbush Study on Tejon Part of Master's Journey, Tejon Ranch Conservancy Newsletter, February 2018 (https://spark.adobe.com/page/Sa8vRMftQ7P7l/)

Honors, Grants, and Awards

(May 2018). First place presentation at the 32nd Annual California State University Statewide Research Competition, Biological and Agricultural Sciences Category, Graduate Level. Award of $500.

(May 2018). Outstanding Graduate Student of the School of Natural Sciences, Mathematics, and Engineering, 2017-2018 Academic Year, California State University, Bakersfield. Award of $100.

(April 2018). Outstanding Graduate Student in the Biology Department, 2017-2018 Academic Year, California State University, Bakersfield.

(March 2018). First place presentation in the Student Research Competition, Biological and Agricultural Sciences Category, Graduate Level, at California State University, Bakersfield. Award of $100.

(March 2018). Second place student oral presentation at the 2018 California Native Plant Society Conservation Conference. Award of $300.

(October 2017). Awarded $480 from the California Native Plant Society for acceptance of an abstract at the 2018 California Native Plant Society Conservation Conference in Los Angeles, California.

(May 2017). Second place poster in the Student Research Poster Competition, Graduate Student in Biology Division, at California State University, Bakersfield.

(April 2017). Awarded $2,000 from the National Science Foundation (NSF) Center for Research Excellence in Science and Technology (CREST) grant (HRD-1547784), to study the effects of drought and disturbance on saltbush shrubs (*Atriplex polycarpa*) at Tejon Ranch, California.

(April 2017). First place oral presentation at the 2017 California Botanical Society Graduate Student Symposium. Award of $100.

(April 2017). Awarded $170 from the grants office at California State University, Bakersfield, as part of the Travel Support for Student Researchers (TSSR) program.

(March 2017). First place presentation in the Student Research Oral Competition, Biological and Agricultural Sciences Category, Graduate Level, at California State University, Bakersfield. Award of $100.

(2016-2017). Awarded $6,000 to study saltbush (*Atriplex* spp.) ecology at Tejon Ranch as part of the Environmental Educational Partnership Impacting Colleges and Careers (EPIC).

(2016-2017). Awarded $2,000 as part of the Student Research Scholars (SRS) program at California State University, Bakersfield, to conduct master's thesis work.

(2015-2017). Awarded $1,000 for the Graduate Student Fellowship by the grants office at California State University, Bakersfield, for meritorious undergraduate scholarship.

Presentations

(April 2019). "Factors affecting seedling recruitment of the shrub *Atriplex polycarpa* across six sites in the San Joaquin Desert of California" – presentation given at the 2019 California Botanical Society Graduate Student Symposium.

(March 2019). "Factors affecting seedling recruitment of the shrub *Atriplex polycarpa* across six sites in the San Joaquin Desert of California" – presentation given at the 2019 Wildlife Society Natural Communities Conference, San Joaquin Chapter, Bakersfield, California.

(June 2018). "Research on Tejon Ranch: A Land Lost to Time" – presentation given at the 2018 Tejon Ranch Conservancy Docent Training, Frazier Park, California.

(May 2018). "Factors affecting seedling recruitment of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – presentation given at the 2018 Carrizo Colloquium, San Luis Obispo, California.

(May 2018). "Factors affecting seedling recruitment of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – presentation given at the 32nd Annual California State University Statewide Research Competition, Sacramento State University, Sacramento, California. *Awarded first place presentation in the Biological and Agricultural Sciences category, graduate level, out of 20 total presentations.*

(March 2018). "Factors affecting seedling recruitment of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – presentation given at the 2018 Wildlife Society Natural Communities Conference, San Joaquin Chapter, Bakersfield, California.

(March 2018). "Factors affecting seedling recruitment of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – presentation given at the Annual Student Research Competition at California State University, Bakersfield. *Awarded first place in the Biological and Agricultural Sciences category, graduate level, out of four total presentations.*

(February 2018). "Factors affecting seedling recruitment of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – presentation given at the 2018 California Native Plant Society Conservation Conference in Los Angeles, California. *Awarded second place in the student oral presentation conference out of 24 total presentations.*

(November 2017). "Factors affecting seedling recruitment of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – public seminar in conjunction with master's thesis defense at CSU Bakersfield.

(October 2017). "Factors affecting seedling recruitment of native *Atriplex polycarpa* shrubs at Tejon Ranch, California" – presentation given to the Educational Partnership Impacting Colleges and Careers (EPIC) supervisory board at CSU Bakersfield.

(August 2017). "Factors affecting germination of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – presentation given at the annual Ecological Society of America meeting in Portland, Oregon.

(April 2017). "Factors affecting germination of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – presentation given at the 31st Annual California State University Statewide Research Competition, California Polytechnic State University, San Luis Obispo.

(April 2017). "Factors affecting germination of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – presentation given to the Kern Chapter of the California Native Plant Society.

(April 2017). "Factors affecting germination of native *Atriplex polycarpa* shrubs in the San Joaquin Valley of California" – presentation given at the 26th California Botanical Society Graduate Student Symposium, Santa Barbara Botanical Garden, California. *Awarded first place for best oral presentation out of 37 total presentations.*

(March 2017). "Seedling recruitment of native *Atriplex polycarpa* (Chenopodiaceae) shrubs in invasive grass dominated areas of the San Joaquin Valley, California" – presentation given at the Annual Student Research Competition at California State University, Bakersfield. *Awarded first place in the Biological and Agricultural Sciences category.*

(March 2012). "Removal of epiphytic bacteria from *Macrocystis pyrifera* fronds using a triple-enzyme detergent" – presentation given at the 37th West Coast Biological Sciences Undergraduate Research Conference, Point Loma Nazarene University, San Diego, California.

Professional Societies

Botanical Society of America (2017-present, Member # 20170215004)
California Native Plant Society (2016-present, Member # 2016-30887)
Ecological Society of America (2016-present, Member # 163511)
California Botanical Society (2016-present)

Licenses and Certifications

(March 2019). Class "C" commercial driver's license, State of California

(June 2017). Certified Associate Ecologist, Ecological Society of America. Expires June 2022.

(May 2016). Level II Blunt-Nosed Leopard Lizard (*Gambelia sila*) surveyor through the California Department of Fish and Wildlife.

Continuing Education

(June 2018). Wildlife tracking workshop, Earth Skills, Frazier Park, California. Instructors: Jim Lowery and Mary Brooks.

(January 2018). California Environmental Quality Act (CEQA) 101 workshop, California Native Plant Society Conservation Conference, Los Angeles, California. Instructors: Greg Suba and David Magney.

(January 2018). Using ArcGIS to create habitat suitability maps for restoration and reintroduction of at-risk plant species, California Native Plant Society Conservation Conference, Los Angeles, California. Instructor: Dr. Erin Questad.

(January 2018). Calflora's new tools for mapping and conservation, California Native Plant Society Conservation Conference, Los Angeles, California. Instructors: Cynthia Powell and John Malpas.

(April 2016). California native plant propagation/ restoration workshop, Theodore Payne Foundation, Sun Valley, California. Instructor: Timothy Becker.

CEQA Project Experience

Note: All projects listed below were performed as an Assistant Environmental Scientist at Quad Knopf Inc.

(March 2018). Madera Pools Project, Caltrans, Madera County, California. In March 2018, delineated 150 vernal pool features using ArcGIS software on this 200-acre site. The site was created as a mitigation bank by Caltrans for adjacent highway expansions. Also conducted a protocol floristic survey on the site, and observed numerous vernal pool endemic plants, and one special status plant: spiny sepaled button celery (*Eryngium spinosepalum*). Also observed multiple

populations of vernal pool fairy shrimp (*Branchinecta lynchi*) and assisted certified QK staff with identification. Project is ongoing.

(June 2017-May 2018). Sentinel Peak Water Well Injection Project, Hopkins Petroleum Lease, Kern County, California. Conducted reconnaissance level and protocol floristic surveys on this 1,200-acre site. Identified numerous burrows of San Joaquin antelope squirrel and San Joaquin kit fox. Delineated all burrows with ArcGIS software. Project is ongoing.

(May 2017-May 2018). Gettysburg Solar Project, Lend Lease (US) Energy Development, LLC, Rosamond, California. Conducted reconnaissance and protocol level floristic surveys of this 300-acre site. Wrote a letter report to the client. Project is ongoing.

(March 2017-May 2018). Redwood Cluster Solar Project, Sustainable Power Group (sPower), Inc., Kern County, California. Conducted revegetation surveys of this 200-acre site by analyzing species composition, percent coverage, and success rate of a hydroseeding mix in accordance with the County revegetation plan. Wrote revegetation report to the County and client, to be updated annually. Project is ongoing.

(March 2017-May 2018). SEPV Mojave West Solar Project, Sustainable Power Group (sPower) Inc., Kern County, California. Conducted revegetation surveys of this 300-acre site by analyzing species composition, percent coverage, and success rate of a hydroseeding mix in accordance with the County revegetation plan. Wrote revegetation report to the County and client, to be updated annually. Project is ongoing.

(2016-2018). Beacon Solar Project, Sustainable Power Group (sPower) Inc., Kern County, California. Conducted revegetation surveys in a 1,000-acre solar farm by analyzing species composition, percent coverage, and success rate of a hydroseeding mix in accordance with the County revegetation plan. Wrote summary findings report to the client, to be updated annually. Also assisted with protocol-level surveys for desert kit fox. The site was under active construction and involved clearing large collections of materials for presence/absence of kit fox and monitoring the gates with motion-activated cameras. Kit fox were observed with the cameras, but not during the surveys. Project is ongoing.

(2016-2018). Plains Pipeline Maintenance, Plains All-American Company, LLC, numerous sites in California. Provided environmental compliance monitoring for pipeline anomaly repair with crews working in habitat with special status species present. Attended daily safety meetings and conducted biological sweeps of the dig sites every 30 minutes, maintaining a record of all observed species and construction activities. Staked out project boundary and footprint, and tagged all potential burrows. Excavated burrows within footprint and found no species within. Throughout all monitoring projects, observed numerous special status species including blunt-nosed leopard lizard, San Joaquin antelope squirrel, San Joaquin kit fox, Swainson's hawk, desert tortoise, burrowing owl, and Tule elk.

(2016-2017). Jaye Street Bridge Expansion Project, City of Porterville, Porterville, California. Conducted reconnaissance-level survey of project site prior to construction. Identified numerous elderberry shrubs along a riparian corridor, suitable habitat for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). Delineated all sensitive habitat areas with ArcGIS software and assisted with report preparation. No sign of the beetles was observed. Identified three

potential San Joaquin kit fox dens during reconnaissance-level survey of the project site. Marked dens with diatomaceous earth and monitored for three days to determine presence/absence of kit fox. No kit fox sign was observed. Backfilled dens and assisted with report preparations. Conducted protocol-level survey for Swainson's hawk in two-mile buffer around project site, no nest or signs were observed. Delineated all trees in riparian corridor tagged for removal, provided report to the City. Delineated riparian corridor along Tule Creek with ArcGIS, including ordinary high-water mark and bank, in 100-yard buffer on both sides of the project. Conducted daily monitoring during ground disturbing activities in compliance with 1602 (1600-2014-0041-R4), 401, and 404 (SPK-2014-00440) permit requirements for mitigation to avoid negative effects to San Joaquin kit fox and riparian habitat. Conducted weekly environmental compliance checks through project completion.

(2016-2017). Trafalgar Solar Project, Lend Lease (US) Energy Development, LLC, Kings County, California. Conducted 13 protocol-level blunt-nosed leopard lizard surveys on this 400-acre project site. No lizards were observed. Met requirements for Level II blunt-nosed leopard lizard surveyor during this project. Assisted with locating, identifying, and mapping 8 San Joaquin kit fox dens. This involved identifying positive kit fox sign (dig aprons, latrines, matted grass, pointed scats, etc.) and collecting waypoints for each den with ArcGIS software. Visually identified a lone kit fox near one of the dens. Conducted protocol-level surveys for Swainson's hawk in ten-mile buffer around project site. No nests or sign were observed. Conducted floristic surveys of the site, recording all observed plant species, and noting relative abundance. Identified one special-status plant species: San Joaquin woolly threads (*Monolopia congdonii*). Assisted with delineation of ephemeral waters following the MESA protocol. Dug soil cores and observed presence of oxidation reduction. Assisted with preparation of the wetland delineation report. Lastly, assisted with an effort to determine the presence of vernal pool habitat on an intermittent wetland on site. This involved sweeping the entire project area, identifying potential vernal pools, and taking a waypoint of each potential pool. After wetland delineation, no vernal pools were found to be present on site. Assisted with the writing of a Biological Analysis Report (BAR) and wetlands delineation report.

(2016-2017). Apollo Solar Project, Lend Lease (US) Energy Development, LLC, Rosamond, California. Conducted reconnaissance-level surveys of this 400-acre project site. Conducted protocol-level survey for Swainson's hawk in two-mile buffer around project site. No nests or sign were observed. Conducted protocol floristic surveys of the site, recording all observed plant species, and noting relative abundance. Identified two special status plant species: Clokey's cryptantha (*Cryptantha clokeyi*) and Lemmon's jewelflower (*Caulanthus lemmonii*). Assisted with writing the Biological Analysis Report (BAR) for this project. Assisted with delineation of ephemeral waters on this 400-acre site, following MESA protocol. Assisted with preparation of the wetland delineation report.

(July 2017). Laird's Corner Roundabout Construction Project, HDR Engineering Inc., Kern County, California. Conducted a reconnaissance-level survey of the project site and identified a nesting site for Swainson's hawk. Wrote a letter report to the client.

(May-July 2017). Glasspoint Solar Project, EB Natural Resources Corp., Kern County, California. Conducted protocol floristic, blunt-nosed leopard lizard, and San Joaquin kit fox surveys of this 250-acre site. Found and delineated numerous populations of one special-status plant: San Joaquin

woolly blue curls (*Trichostema ovatum*) with ArcGIS software. Observed three adult kit fox and seven pups during spotlighting surveys.

(June 2017). Gossamer Grove Housing Development, Lennar Inc., Bakersfield, California. Conducted reconnaissance-level biological survey of this 300-acre site. Wrote a letter report to the client.

(May-June 2017). Tulare Culvert Replacement Project, HDR Engineering Inc., Springville, California. Conducted reconnaissance-level and protocol-level floristic surveys along a ten-mile stretch of Highway 190 northeast of Porterville. The project footprint was in the Sequoia National Forest. Wrote a letter report to the client.

(May 2017). Sunland Avenue Road Expansion Project, City of Ridgecrest, Ridgecrest, California. Conducted a reconnaissance-level survey of a half-mile stretch of dirt road planned for paving construction. Delineated two burrowing owl burrows with ArcGIS software. Wrote a letter report to the client.

(April 2017). Kern River Holdings Well Pad Construction Project, Energy Project Solutions, LLC, Bakersfield, California. Conducted reconnaissance level surveys of project site prior to construction of new oil well pad. Wrote letter report to the client.

(March 2017-June 2017). Borax Solar Project, Lend Lease (US) Energy Development, LLC, Boron, California. Conducted general reconnaissance- and protocol-level floristic surveys on this 450-acre project site and observed positive sign of the Mojave Desert tortoise (*Gopherus agassizii*).

(January-October 2017). Airport Drive/Golden Gate Avenue Bridge Retrofitting and Seismic Restoration Project, Caltrans, Bakersfield, California. Conducted surveys for silvery legless lizard (*Anniella pulchra*) throughout project site. No sign of the lizards was observed. Wrote a letter report on silvery legless lizards to the client. Thereafter, provided environmental awareness training and compliance monitoring during ground disturbance and weekly site checks.

(July 2016). Dunkin Donuts Development Project, Frontier Real Estate Investments, Tehachapi, California. Conducted a pre-construction survey of this 3-acre site in preparation for the construction of a Dunkin Donuts branch. Wrote a letter report to the client.

(April 2016). Highway 198 Widening Project, HDR Engineering Inc., Visalia, California. Assisted with spotlighting effort for San Joaquin kit fox along 10 miles of Hwy 198 and nearby backroads. No foxes were observed during spotlighting effort.

(April 2016). Varsity Avenue Road Construction, Arvin, California. Provided environmental awareness training for San Joaquin kit fox and migratory birds to construction crew and conducted pre-construction clearance survey for kit fox on the project site.

(March-August 2016). Cherry Avenue Shoulder Widening Project, Caltrans, Bakersfield, California. Under direction of permitted QK staff, assisted with a three-night trapping effort along shoulder of the highway. Set traps in the evening and checked them during the night. Recorded demographic data on all individuals caught. No Tipton kangaroo rats were caught during trapping effort.

(March 2016). Little Walker Shoulders Delineation of Wetlands and Waters, Parsons Inc., Caltrans, Mono County, California. Delineated wetlands and waters of the U.S. on 36 acres of a 3-mile segment of U.S. Route 395 north of Bridgeport using standard methods described in the 1987 Army Corps of Engineers Wetland Delineation Manual and Arid West Supplement. Dug soil cores and became familiar with soil classification procedures. Also, delineated portions of Little Walker Creek where it intersected the highway, including Ordinary High-Water Mark (OHWM) and low water mark and bank space, using ArcGIS software. The surveys resulted in findings of nine wetland meadows, six streams, and five ditches.

(2015-2016). Solari Sand and Gravel Project, Granite Construction Company, Kern County, California. Conducted 37 protocol-level surveys for blunt-nosed leopard lizard (adult and juvenile) on this 550-acre project site. Assisted with writing the Biological Analysis Report (BAR) for this project. No lizards were observed during the surveys.